

**SUBMITTAL DATA**  
**FOR**  
**AUTOMATIC SPRINKLER SYSTEMS**  
**DATE**

**SUMMIT SQUARE III**

**800 & 810 NW WARD ROAD  
LEE'S SUMMIT, MO**

**INSTALLED / DESIGNED BY:**

**RANGER FIRE, INC.**  
**1000 S. MAIN STREET, SUITE #150**  
**GRAPEVINE, TX 76051**  
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# EQUIPMENT LIST

<u>DESCRIPTION</u>	<u>MODEL NUMBER</u>	<u>MANUFACTURER</u>
• STEEL PIPE	SCHEDULE 10 & 40	SAHA THAI, AKW, WHEATLAND, BULL MOOSE
	SUPER FLOW	AKW
	DYNA-FLOW & DYNA-THREAD	ALLIED
	EDDY FLOW & EDDY THREAD	BULL MOOSE
• THREADED FITTINGS	DUCTILE IRON	TITUS, SIGMA
	CAST IRON	SIGMA, ANVIL, WARD
	MALLEABLE IRON	ANVIL, WARD
	BRANCHLET	AEGIS
• WELDED OUTLETS		RELIABLE, VICTAULIC
• GROOVED FITTINGS		PHD
• CPVC HANGERS	070,075,076,077	PHD
• LOOP HANGERS	141	PHD
• ALL-THREAD ROD	20	PHD
• RISER CLAMPS	550	PHD
• BEAM CLAMPS	350	PHD
• SAMMYS	SIDEWINDER, X-PRESS	ITW BUILDEX
• CHECK VALVE	G, REL-CV	RELIABLE
• BUTTERFLY VALVE	REL-BFG-300	RELIABLE
• BUTTERBALL VALVE	RBV	RELIABLE
• DRY PIPE VALVE	NXT	VICTAULIC
	NXT	VICTAULIC
	757	VICTAULIC
• AIR MAINTENANCE DEVICE	SIZED TO SYSTEM	GAST
• AIR COMPRESSOR	5015	CROKER
• HOSE VALVE	5713	CROKER
• HOSE VALVE CAP & CHAIN	7245	CROKER
• H.V. REDUCER – 2 1/2" x 1 1/2"	1810-10-A	POTTER ROEMER
• HOSE VALVE CABINET	6624 – 4"	GUARDIAN
• FDC	CR, RESIDENTIAL	RELIABLE
• RISER MANIFOLD	C200	AMES
• DC BACKFLOW PREVENTER	F1FR56	RELIABLE
• PENDENT SPRINKLER	F1FR56	RELIABLE
• UPRIGHT SPRINKLER	F1FR56	RELIABLE
• HORIZONTAL SIDEWALL SPRINKLER	F1FR56	RELIABLE
• RESIDENTIAL PENDENT SPRINKLER	F1Res49	RELIABLE
• RESIDENTIAL SIDEWALL SPRINKLER	F1Res44	RELIABLE
• DRY PENDENT	F3QR56	RELIABLE
• DRY FLEXIBLE PENDENT	VS1	VICTAULIC
• RES. DRY PENDENT SPRINKLER	LFII	TYCO
• SPARE SPRINKLER CABINET		RELIABLE
• PRESSURE SWITCH	EPS10, EPS40	SYSTEM SENSOR
• WATER & AIR PRESSURE GAUGE	UA	RELIABLE
• AUTOMATIC BALL DRIP	C	RELIABLE
• TRIM VALVES	GV, AGV, BL, 3W	RELIABLE
• FIRE CAULK & ASSEMBLIES	SPECSEAL LCI SEALANT	STI
• ACCESS PANELS	DW, ED, FR, FRC	ELMDOOR

## ASTM A53 TYPE E GRADE A and B PIPE



### SCOPE

Covers black and hot-dipped galvanized electric resistance welded, Grade A and B. Pipe is intended for mechanical and pressure applications and is acceptable for ordinary uses in steam, water, gas and air lines. SAHATHAI ASTM A53 is UL Listed, sizes 1/2" through 8" nominal. Pipe is suitable for welding, threading, grooving and bending. Pipe is furnished either non-expanded or cold expanded at the option of the manufacturer. Produced to ASTM A53/A53M latest revision.

### MANUFACTURE

The weld seam of electric resistance welded pipe in Grade B sizes 4" through 8" nominal, shall be heat treated after welding to a min 1000 °F so that no untempered martensite remains.

### HOT-DIP GALVANIZED

The average weight of zinc coating shall be not less than 1.8 oz. per sq. ft. of surface (inside and outside). When galvanized pipe is bent or otherwise fabricated to a degree which causes zinc coating to stretch or compress beyond the limit

### CHEMICAL REQUIREMENTS

Composition, max. %

	C	Mn	P	S	Co <sup>A</sup>	Ni <sup>A</sup>	Cr <sup>A</sup>	Mo <sup>A</sup>	V <sup>A</sup>
Grade A	0.25 <sup>B</sup>	0.95	0.05	0.045	0.40	0.40	0.40	0.15	0.08
Grade B	0.30 <sup>C</sup>	1.20	0.05	0.045	0.40	0.40	0.40	0.15	0.08

A : The combination of these five elements shall not exceed 1.00%.

B : For each reduction of 0.01 % below the specified carbon maximum, an increase of 0.06 % manganese above the specified maximum will be permitted up to a maximum of 1.35 %.

C : For each reduction of 0.01 % below the specified carbon maximum, an increase of 0.06 % manganese above the specified maximum will be permitted up to a maximum of 1.65 %.

### TENSILE REQUIREMENTS

	Grade A	Grade B
Tensile Strength, min, Psi	48 000	60 000
Yield Strength, min, Psi	30 000	35 000
Elongation in 2"	Refer to A53 Table x 4.1, latest	

### BENDING TEST (COLD) FOR NPS 2 and UNDER:

	Degree of Bend	Diameter of Mandrel
Standard	90°	12 x outside pipe diameter
Close Coiling	180°	8 x outside pipe diameter

### FLATTENING TEST - NPS 2-1/2 and Greater

Weld located 0/90 degree from line of direction of force.

Stage-1 : For weld ductility unit 2/3 of outside dia of specimen pipe.

Stage-2 : For ductility of steel unit 1/3 of outside dia of specimen pipe.

Stage-3 : Full flattening for testing of laminated and unsou

Rev.16/05/16

### HYDROSTATIC TESTING

Hydrostatic test pressures for plain-end pipe are indicated below

NPS	0.188 in.		SCH 40		SCH 80	
	GR.A	GR.B	GR.A	GR.B	GR.A	GR.B
1/2" through 1	-	-	700	-	850	-
1-1/4"	-	-	1200	-	1800	-
1-1/2"	-	-	1200	-	1800	-
2"	-	-	2300	-	2500	-
2-1/2"	-	-	2500	-	2500	-
3	-	-	2220	-	2500	-
3-1/2"	-	-	2030	-	2800	-
4"	1500	1750	1900	2210	2700	2800
5"	1220	1420	1670	1950	2430	2800
6"	1020	1190	1520	1780	2350	2740
8"	780	920	1340	1570	-	-

### DIMENSIONS and WEIGHTS

BLACK PLAIN END						
Nominal Size	OD Inches	Wall 0.188 in.	SCH 40		SCH 80	
		Weight Lb./Ft.	Wall Inches	Weight Lb./Ft.	Wall Inches	Weight Lb./Ft.
1/2"	.840	-	.109	.85	.147	1.09
3/4"	1.050	-	.113	1.13	.154	1.48
1"	1.315	-	.133	1.68	.179	2.17
1-1/4"	1.660	-	.140	2.27	.191	3.00
1-1/2"	1.900	-	.145	2.72	.200	3.63
2"	2.375	-	.154	3.66	.218	5.03
2-1/2"	2.875	-	.203	5.80	.276	7.67
3"	3.500	-	.216	7.58	.300	10.26
3-1/2"	4.000	-	.226	9.12	.318	12.52
4"	4.500	8.67	.237	10.79	.337	14.98
5"	5.563	10.80	.237	14.62	.375	20.78
6"	6.625	12.94	.28	18.97	.432	28.57
8"	8.625	16.96	.322	28.58	-	-

### PERMISSIBLE VARIATIONS IN WALL THICKNESS

Minimum wall thickness at any point shall not be more than 12.5% under nominal wall thickness specified.

### PERMISSIBLE VARIATIONS IN OUTSIDE DIAMETER

NPS 1-1/2 and under  $\pm .016"$

NPS 2 and over  $\pm 1\%$

### PERMISSIBLE VARIATIONS IN WEIGHT PER FOOT

Pipe shall not vary more than  $\pm 10\%$  from the standard specified.

### END FINISH

Plain End:

NPS 1-1/2 and smaller: unless otherwise specified on order, end finish shall be at the option of the manufacturer.

NPS 2 and larger: Sch 40 and Sch 80 weights: ends beveled to angle of 30°, +5°, -0° with a root face of 1/16"  $\pm$  1/32".

Threaded: To ANSI Standard B 1.20.1

Couplings: To ASTM Standard A865.

### PRODUCT MARKING

Each length of pipe 1/2 NPS and larger is continuously stenciled to show the manufacturer, the grade of pipe (ASTM A53), the kind of pipe (E for electric resistance welded, A,B for Grade A,B) the size, and length. Stencil markings indicate UL Listing Approval for sizes 1/2" through 8" nominal, Bar Coding is acceptable as a supplementary identification method.

All information contained herein is accurate as known at the time of publication.

STS reserves the right to change product specifications without notice and without incurring obligations.

SAHATHAI STEEL PIPE CO.,LTD – 78 MOO 3 POOCHAO ROAD, BANGYAPRAEK, PHRAPRADAENG, SAMUTHPRAKARN 10130 THAILAND

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## ASTM A135 GRADE A and B PIPE



### SCOPE

Covers two grade of electric resistance welded. steel piping to meet ASTM specifications A135 Grade A and Grade B that is often used in the conveying of gas, vapor, water or other liquids. While the ASTM A135 specification references nominal pipe sizes (NPS), SAHATHAI produces piping sizes up to 8" OD and in wall thicknesses up to 0.148" nominal that meet the requirements called out for in produced to ASTM A135/A135M latest revision.

### MANUFACTURE

The weld seam of electric resistance welded pipe in Grade B sizes 3" through 8" nominal, shall be heat treated after welding to a min 1000 °F so that no untempered martensite remains.

### CHEMICAL REQUIREMENTS

Composition, max. %

	C	Mn	P	S
Grade A	0.25	0.95	0.035	0.035
Grade B	0.30	1.20	0.035	0.035

### TENSILE REQUIREMENTS

	Grade A	Grade B
Tensile Strength, min, MPa	330	415
Yield Strength, min, MPa	205	240
Elongation in 2 in. min, % :		
Wall thickness less than 1/16 in	56t+16.5	148t+14
Tested using a full-size	35	30

### FLATTENING TEST

Weld located 0/90 degree from line of direction of force.

Stage-1 : For weld ductility unit 2/3 of outside dia of specimen pipe.

Stage-2 : For ductility of steel unit 1/3 of outside dia of specimen pipe.

Stage-3 : Full flattening for testing of laminated and unsound material.

### PERMISSIBLE VARIATIONS IN WALL THICKNESS

Minimum wall thickness at any point shall not be more than 12.5% under nominal wall thickness specified.

### PERMISSIBLE VARIATIONS IN OUTSIDE DIAMETER

The outside diameter shall not vary more than  $\pm 1\%$  from the nominal size specified.

### PERMISSIBLE VARIATIONS IN WEIGHT PER FOOT

Pipe shall not vary more than  $\pm 10\%$  from the standard specified.

### DIMENSIONS, WEIGHTS AND TEST PRESSURES

NPS	DN	OD Inches	SCH 10		Test Pressure, psi	
			Wall Inches	Weight Lb./Ft.	Grade A	Grade B
3/4"	20	1.050	.083	.86	2500	-
1"	25	1.315	.109	1.40	2500	-
1-1/4"	32	1.660	.109	1.81	2400	-
1-1/2"	40	1.900	.109	2.09	2100	-
2"	50	2.375	.109	2.64	1700	-
2-1/2"	65	2.875	.120	3.53	1500	-
3"	80	3.500	.120	4.33	1200	1400
3-1/2"	90	4.000	.120	4.97	1000	1200
4"	100	4.500	.120	5.61	900	1100
5"	125	5.563	.134	7.77	850	1000
6"	150	6.625	.134	9.27	750	900
8"	200	8.625	.148	13.41	650	750

### END FINISH

Plain End:

Schedule 10: Plain ends pipe for welding beveled to angle of 30°, +5°, -0° with a root face of 1/16"  $\pm$  1/32".

Threaded: To ANSI Standard B 1.20.1

Couplings: To ASTM Standard A865.

### PRODUCT MARKING

Each length of pipe 3/8 NPS and larger is continuously stenciled to show the manufacturer, the grade of pipe ASTM A135 (Electric Resistance Welded, A,B for Grade A,B) the size, and length. Bar Coding is acceptable as a supplementary identification method.

## AS 1074

### SCOPE

This Standard specifies the requirements for threaded steel tubes and tubular, and plain-end steel tube suitable for screwing as specified in AS1722.1, and of DN8 to DN150 inclusive (nominal size). Three wall thickness of tube, designated Light, Medium and Heavy

### CHEMICAL REQUIREMENTS

Tubes shall be manufactured from steel which shows, not more than 0.045 percent of sulfur and not more than 0.045 percent of phosphorus. Carbon equivalent as calculated from the following equation shall not exceed 0.4

### TENSILE REQUIREMENTS

Minimum Yield Strength 195 MPa

Minimum Tensile Strength 320 MPa

Minimum Elongation in 5.65√S<sub>0</sub> 20 %

### BENDING TEST (COLD) FOR DN 50 AND SMALLER:

	Degree of Bend	Diameter of Mandrel
Ungalvanized	180°	6 x outside pipe diameter
Galvanized	90°	8 x outside pipe diameter

### FLATTENING TEST (COLD) FOR LARGER THAN DN 50 :

As a test for quality of the weld, position the weld at 90° from the direction between the plates is less than 75 % of the original outside diameter. No cracks or breaks in the metal elsewhere than in a weld shall occur unit the direction between the plates is less than 60 % of the original outside diameter of the tube

### TOLERANCES FOR THICKNESS AND MASS

#### Thickness

Light welded tubes +unlimited, - 8%

Medium and heavy welded tubes +unlimited, - 10%

#### Mass

Standard mass for singer tube +10%, -8%

### DIMENSIONS OF STEEL TUBE

#### LIGHT

Nominal size	Outside diameter,mm		Thickness mm	Mass of black tube,Kg/m	
	Min	Max		Plain or screwed ends	Screwed and socketed
DN 8	13.2	13.6	1.8	0.515	0.519
DN 10	16.7	17.1	1.8	0.670	0.676
DN 15	21.0	21.4	2.0	0.947	0.956
DN 20	26.4	26.9	2.3	1.38	1.39
DN 25	33.2	33.8	2.6	1.98	2.00
DN 32	41.9	42.5	2.6	2.54	2.57
DN 40	47.8	48.4	2.9	3.23	3.27
DN 50	59.6	60.2	2.9	4.08	4.15
DN 65	75.2	76.0	3.2	5.71	5.83
DN 80	87.9	88.7	3.2	6.72	6.89
DN 100	113.0	113.9	3.6	9.75	10.0

### MEDIUM

Nominal size	Outside diameter,mm		Thickness mm	Mass of black tube,Kg/m	
	Min	Max		Plain or screwed ends	Screwed and socketed
DN 8	13.3	13.9	2.3	0.641	0.645
DN 10	16.8	17.4	2.3	0.839	0.845
DN 15	21.1	21.7	2.6	1.21	1.22
DN 20	26.6	27.2	2.6	1.56	1.57
DN 25	33.4	34.2	3.2	2.41	2.43
DN 32	42.1	42.9	3.2	3.10	3.13
DN 40	48.0	48.8	3.2	3.57	3.61
DN 50	59.8	60.8	3.6	5.03	5.10
DN 65	75.4	76.6	3.6	6.43	6.55
DN 80	88.1	89.5	4.0	8.37	8.54
DN 100	113.3	114.9	4.5	12.2	12.5
DN 125	138.7	140.6	5.0	16.6	17.1
DN 150	164.1	166.1	5.0	19.7	20.3

### HEAVY

Nominal size	Outside diameter,mm		Thickness mm	Mass of black tube,Kg/m	
	Min	Max		Plain or screwed ends	Screwed and socketed
DN 8	13.3	13.9	2.9	0.765	0.769
DN 10	16.8	17.4	2.9	1.02	1.03
DN 15	21.1	21.7	3.2	1.44	1.45
DN 20	26.6	27.2	3.2	1.87	1.88
DN 25	33.4	34.2	4.0	2.94	2.96
DN 32	42.1	42.9	4.0	3.80	3.83
DN 40	48.0	48.8	4.0	4.38	4.42
DN 50	59.8	60.8	4.5	6.19	6.26
DN 65	75.4	76.6	4.5	7.93	8.05
DN 80	88.1	89.5	5.0	10.3	10.5
DN 100	113.3	114.9	5.4	14.5	14.8
DN 125	138.7	140.6	5.4	17.9	18.4
DN 150	164.1	166.1	5.4	21.3	21.9

### SCREW THREADS

The screw thread of all threaded tubes shall comply with AS 1722.1, except as provided below and except that on Light tubes the basic length of useful thread shall be reduce to 80% of the sum of the fitting.

### GALVANIZING

Tubes ordered galvanized shall comply with AS1650.

Tubes which are to be threaded shall be galvanized before threading.

### LEAK TIGHTNESS TEST

Every tube shall be tested at the manufacturer work by a hydrostatic test at a pressure of 5 MPa maintained for at least 5 s. The tube shall not leak during the test.

### PRODUCT MARKING

Tube distinguished by color at one end as follows:

Light tube	Brown.
Medium tube	Blue.
Heavy tube	Red.

All information contained herein is accurate as known at the time of publication.

STS reserves the right to change product specifications without notice and without incurring obligations.

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## AS/NZS 1163

### SCOPE

This Standard specifies the requirements for cold-formed, electric resistance-welded, carbon steel hollow sections used for structural purposes. It considers three strength grades, with or without impact properties, that are suitable for welding.

### CHEMICAL REQUIREMENTS

Composition, max. %

Grade	C	Si	Mn	P	S	Cr	Mo	Al #1	Ti	Micro alloying elements	CE
C250, C250L0	0.12	0.05	0.50	0.03	0.03	0.15	0.10	0.10	0.04	0.03 #2	0.25
C350, C350L0	0.20	0.45	1.6	0.03	0.03	0.30	0.10	0.10	0.04	0.15 #3	0.43
C450, C450L0	0.20	0.45	1.7	0.03	0.03	0.50	0.35	0.10	0.04	0.15 #3	0.43

#1: Limits specified are for soluble or total aluminium.

#2: Applies to Ni, V only. However, Ni greater than 0.010% is not permitted

#3: Applies to Ni, V and Ti only. However, V greater than 0.10% is not permitted

### TENSILE REQUIREMENTS

Grade	Yield strength	Tensile strength	Min. Elongation as a proportion of the Gauge length of 5.65√S <sub>0</sub> , %					
			Circular : d <sub>0</sub> /t			Rectangular : b/t, d/t		
			Min.	Min.	Min.	Min.	Min.	Min.
C250, C250L0	250	320	18	20	22	14	16	18
C350, C350L0	350	430	16	18	20	12	14	16
C450, C450L0	450	500	12	14	16	10	12	14

### CHARPY V-NOTCH IMPACT REQUIREMENTS

Grade	Test Temp. °C	Min. Absorbed energy : Joules					
		Size of test piece					
		10 mm x 10 mm		10 mm x 7.5 mm		10 mm x 5 mm	
		Average 3 tests	Individual test	Average 3 tests	Individual test	Average 3 tests	Individual test
C250L0	0	27	20	22	16	18	13
C350L0							
C450L0							

### COLD FLATTENING TEST

As a test for quality of the weld, position the weld for OD ≤ 60 mm : 45°, OD > 60 mm : 90° from the direction of force and flatten until the OD is 0.75 of the original outside diameter. No cracks shall occur along the inside or outside surface of the weld.

### TOLERANCES FOR SHAPE AND MASS

Characteristic	Circular	Square and Rectangular
External dimensions	±1%, with min. of ±0.5 mm.	±1%, with min. of ±0.5 mm.
Thickness	±10%	±10%
Out-of-roundness	2% for hollow sections having a diameter to thickness ratio not exceeding 100	-
Concavity/convexity	-	Max. 0.8% or 0.5 min.
Squareness of sides	-	90° ±1°
Twist	-	2+0.5 mm/m length
Straightness	0.20% of total length	0.15% of total length
Mass	Not less than 0.96 times the specified mass on individual length	

### EXTERNAL CORNER PROFILE

Perimeter mm.	External corner profile mm.
Equivalent to 50x50 or less	1.5t to 3.0t
Equivalent to greater than 50x50	1.8t to 3.0t

### TOLERANCES ON LENGTH

Type of length	Range mm.	Tolerance
Random length	4000 to 6000 with a range of 2000 per order item	10% of section supplied may be below the minimum for the ordered range but not less than 75% of the minimum
Mill (or 'unspecified') length	All	+100 mm. 0
Precision length	< 6000 ≥ 6000 ≤ 10000 > 10000	+5 mm. 0 +15 mm. 0 +5 mm. +1 mm./m. 0

### DIMENSIONS and WEIGHTS

#### Circular hollow section

Size mm.	Wall mm.	Weight Kg/m	Size mm.	Wall mm.	Weight Kg/m	Size mm.	Wall mm.	Weight Kg/m
17.2	2.3	0.845	60.3	3.6	5.03	76.1	2.3	4.19
	2.9	1.02		4.5	6.19		3.2	5.75
21.3	2.6	1.20		5.4	7.31	88.9	2.6	5.53
	3.2	1.43		3.6	6.44		3.2	6.76
	3.6	1.57	76.1	4.5	7.95		4.8	9.96
	2.6	1.56		5.9	10.2		5.5	11.3
26.9	3.2	1.87		4.0	8.38	101.6	2.6	6.35
	4.0	2.26	88.9	5.0	10.3		3.2	7.77
	3.2	2.41		5.9	12.1		3.2	8.77
33.7	4.0	2.93	101.6	4.0	9.63	114.3	3.6	9.83
	4.5	3.24		5.0	11.9		4.8	13.0
	3.2	3.09		4.5	12.2		6.0	16.0
42.4	4.0	3.79	114.3	5.4	14.5	139.7	3.0	10.1
	4.9	4.53		5.0	16.6		3.5	11.8
	3.2	3.56	139.7	5.4	17.9	165.1	3.0	12.0
48.3	4.0	4.37	165.1	5.0	19.7		3.5	13.9
	5.4	5.71		5.4	21.3	168.3	4.8	19.4
							6.4	25.6
							7.1	28.2
						219.1	4.8	25.4
							6.4	33.6
							8.2	42.6

#### Square and Rectangular hollow section

Square						Rectangular					
Size mm.	Wall mm.	Weight Kg/m	Size mm.	Wall mm.	Weight Kg/m	Size mm.	Wall mm.	Weight Kg/m	Size mm.	Wall mm.	Weight Kg/m
20	1.6	0.873	65	3.0	5.66	50	1.6	1.63	102	6.0	12.0
	2.0	1.05		4.0	7.23	x20	2.0	1.99		3.5	9.07
	1.6	1.12		5.0	8.75		2.5	2.42		5.0	12.5
25	2.0	1.36		6.0	10.1		3.0	2.83	x76	6.0	14.7
	2.5	1.64		2.5	5.56		1.6	1.75		3.0	8.96
	3.0	1.89		3.0	6.60	50	2.0	2.15	125	4.0	11.6
	1.6	1.38	75	3.5	7.53	x25	2.5	2.62		5.0	14.2
	2.0	1.68		4.0	8.49		3.0	3.07		2.0	5.57
30	2.5	2.05		5.0	10.3		2.0	2.93	150	2.5	7.53
	3.0	2.38		6.0	12.0	65	2.5	3.60	x50	3.0	8.96
	1.6	1.63		3.5	9.06		3.0	4.25		4.0	11.6
	2.0	1.99	89	5.0	12.5		1.6	2.38		5.0	14.2
	2.5	2.42		6.0	14.6	75	2.0	2.93	150x	4.0	14.8
	3.0	2.83		2.5	7.53	x25	2.5	3.60	100	5.0	18.2
35	1.6	1.88		3.0	8.96		2.0	3.72		6.0	21.4
	2.0	2.31		4.0	11.6		2.5	4.58		9.0	30.6
	2.5	2.82	100	5.0	14.2	75	3.0	5.42	152x	5.0	16.4
	3.0	3.30		6.0	16.7	x50	4.0	6.92	76	6.0	19.4
	4.0	4.09		9.0	23.5		5.0	8.35		4.0	17.9
40	1.6	2.38		4.0	14.8		6.0	9.67	200x	5.0	22.1
	2.0	2.93		5.0	18.2		2.0	4.50	100	6.0	26.2
	2.5	3.6	125	6.0	21.4		2.5	5.56		9.0	37.7
	3.0	4.25		9.0	30.6	100	3.0	6.60			
	4.0	5.35		5.0	22.1		3.5	7.53			
	5.0	6.39	150	6.0	26.2		4.0	8.49			
50	2.0	3.88		9.0	37.7		5.0	10.3			
	2.5	4.78									

All information contained herein is accurate as known at the time of publication.

STS reserves the right to change product specifications without notice and without incurring obligations.

SAHATHAI STEEL PIPE CO.,LTD – 78 MOO 3 POOCHAO ROAD, BANGYAPRAEK, PHRAPRADAENG, SAMUTHPRAKARN 10130 THAILAND

Phone: (662)3859023 ► Fax: (662)3859288 ► EMAIL: [export@sahathai.com](mailto:export@sahathai.com)



## BS 1387 : 1985

### SCOPE

This Standard specifies the requirements for screwed and socketed steel tubes and tubular, and plain-end steel tube suitable for welding or for screwing to BS 21 pipe threads. This standard is applicable to tube of nominal size DN8 to DN150 in three series of thickness, designated Light, Medium and Heavy

### MACHANICAL PROPERTIES

The mechanical properties at room temperature

Chemical composition, Max.				Mechanical properties		
C	Mn	P	S	Tensile strength	Yield strength (Min.)	Elongation on gauge length $L_0 = 5.65\sqrt{S_0}$ (Min.),%
%	%	%	%	MPa	MPa	
0.20	1.20	0.045	0.045	320-460	195	20

### BENDING TEST FOR DN 50 AND SMALLER:

	Degree of Bend	Diameter of Mandrel
Ungalvanized	180°	6 x outside pipe diameter
Galvanized	90°	8 x outside pipe diameter

### FLATTENING TEST FOR GREATER THAN DN 50 :

As a test for quality of the weld, position the weld at 90° from the direction between the plates is less than 75 % of the original outside diameter. No cracks or breaks in the metal elsewhere than in a weld shall occur unit the direction between the plates is less than 60 % of the original outside diameter of the tube

### TOLERANCES FOR THICKNESS AND MASS

#### Thickness

Light welded tubes	+unlimited, - 8%
Medium and heavy welded tubes	+unlimited, - 10%

#### Mass

Standard mass for singer tube	+10%, -8%
-------------------------------	-----------

### DIMENSIONS OF STEEL TUBE

#### LIGHT

Nominal size	Outside diameter, mm		Thicknes s mm	Mass of black tube,Kg/m	
	Min	Max		Plain ends	Screwed and socketed
DN 8	13.2	13.6	1.8	0.515	0.519
DN 10	16.7	17.1	1.8	0.670	0.676
DN 15	21.0	21.4	2.0	0.947	0.956
DN 20	26.4	26.9	2.3	1.38	1.39
DN 25	33.2	33.8	2.6	1.98	2.00
DN 32	41.9	42.5	2.6	2.54	2.57
DN 40	47.8	48.4	2.9	3.23	3.27
DN 50	59.6	60.2	2.9	4.08	4.15
DN 65	75.2	76.0	3.2	5.71	5.83
DN 80	88.9	88.7	3.2	6.72	6.89
DN 100	113.0	113.9	3.6	9.75	10.0

### MEDIUM

Nominal size	Outside diameter,mm		Thickness mm	Mass of black tube,Kg/m	
	Min	Max		Plain or screwed ends	Screwed and socketed
DN 8	13.3	13.9	2.3	0.641	0.645
DN 10	16.8	17.4	2.3	0.839	0.845
DN 15	21.1	21.7	2.6	1.21	1.22
DN 20	26.6	27.2	2.6	1.56	1.57
DN 25	33.4	34.2	3.2	2.41	2.43
DN 32	42.1	42.9	3.2	3.10	3.13
DN 40	48.0	48.8	3.2	3.57	3.61
DN 50	59.8	60.8	3.6	5.03	5.10
DN 65	75.4	76.6	3.6	6.43	6.55
DN 80	88.1	89.5	4.0	8.37	8.54
DN 100	113.3	114.9	4.5	12.2	12.5
DN 125	138.7	140.6	5.0	16.6	17.1
DN 150	164.1	166.1	5.0	19.7	20.3

### HEAVY

Nominal size	Outside diameter,mm		Thickness mm	Mass of black tube,Kg/m	
	Min	Max		Plain or screwed ends	Screwed and socketed
DN 8	13.3	13.9	2.9	0.765	0.769
DN 10	16.8	17.4	2.9	1.02	1.03
DN 15	21.1	21.7	3.2	1.44	1.45
DN 20	26.6	27.2	3.2	1.87	1.88
DN 25	33.4	34.2	4.0	2.94	2.96
DN 32	42.1	42.9	4.0	3.80	3.83
DN 40	48.0	48.8	4.0	4.38	4.42
DN 50	59.8	60.8	4.5	6.19	6.26
DN 65	75.4	76.6	4.5	7.93	8.05
DN 80	88.1	89.5	5.0	10.3	10.5
DN 100	113.3	114.9	5.4	14.5	14.8
DN 125	138.7	140.6	5.4	17.9	18.4
DN 150	164.1	166.1	5.4	21.3	21.9

### JOINTS

All screwed tubes and sockets shall be threaded in accordance with BS 21 except as provided below and except that on Light tubes the length of useful thread shall be reduce to 80% of that shown in column 12 of table2 of BS 21:1985.

### HOT-DIP ZINC COATING

Where tubes are supplied hot-dip zinc coated, they shell first be thoroughly descaled, washed as necessary and then dipped in a bath of molten zinc, containing not less than 98.5% by mass of zinc.

### LEAK TIGHTNESS TEST

Every tube shall be tested at the manufacturer work by a hydrostatic test at a pressure of 5 MPa maintained for at least 5 s. The tube shall not leak during the test.

### PRODUCT MARKING

Tubes and tubular shall be marked with the appropriate color as follows:

Light tube	Brown.
Medium tube	Blue.
Heavy tube	Red.

All information contained herein is accurate as known at the time of publication.

STS reserves the right to change product specifications without notice and without incurring obligations.

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# EN 10219 : 2006



## SCOPE

This Standard specifies the technical delivery conditions for cold formed welded structural hollow section of circular, square or rectangular forms and applies to structural hollow section formed cold without subsequent heat treatment

## CHEMICAL REQUIREMENTS

Composition, max. %

Grade	C	Si	Mn	P	S	N <sup>a</sup>
S235JRH	.17	-	1.40	.040	.040	.009
S275J0H	.20	-	1.50	.035	.035	.009
S275J2H	.20	-	1.50	.030	.030	-

a: The max. value for N does not apply if the chemical composition shows a min. total Al content of 0.020% with a min. Al/N ratio of 2:1, or if sufficient other N-binding elements are present. The N-binding elements shall be recorded in Inspection Document.

## TENSILE AND IMPACT REQUIREMENTS

Grade	Min. yield strength MPa	Tensile strength MPa	Min. elongation A <sup>d</sup> %	Min. Impact Energy KV <sup>e</sup> J		
				At test temperature		
				Specified thickness mm.		
				≤ 16	< 3	≥ 3 ≤ 40
				≤ 40	-20°C	0°C 20°C
S235JRH <sup>a</sup>	235	360-510	360-510	24 <sup>b</sup>	-	- 27
S275J0H <sup>a</sup>	275	430-580	410-560	20 <sup>c</sup>	-	27 -
S275J2H					27	- -

a : The impact properties are verified only when Option 1.3 is specified.

b : For thicknesses >3 mm and section size D/T <15 (round) and (B+T)/2T <12.5 (square and rectangular) the min. elongation is reduced by2. For thicknesses ≤ 3mm. the min. value for elongation is 17%

c : For section sizes D/T <15 (circular) and (B/T)/2T < 12.5 (square and rectangular) the min. elongation is reduced by2.

d : For thickness <3mm. see 9.2.2

e : For impact properties for reduced section test pieces see 6.7.2

## TOLERANCES FOR SHAPE AND MASS

Characteristic	Circular	Square and Rectangular
Outside dimensions	±1%, with min. of ±0.5 mm. And a max. of ± 10 mm.	H,B<100 = ±1%,with min. of ±0.5 mm. 100≤H,B≤200 = ±0.8%
Thickness	T ≤ 5mm = ±10% T > 5 mm. = ± 0.5 mm.	
Out-of-roundness	2% for hollow sections having a diameter to thickness ratio not exceeding 100	-
Concavity/conve xity	-	Max.0.8% with a min. of 0.5 mm.
External corner	-	T ≤ 6mm. = 1.6t to 2.4t 6 < T ≤ 10 mm. = 2.0t to 3.0t T > 10 mm. = 2.4t to 3.6t
Squareness of side	-	90° ±1°
Twist	-	2+0.5 mm/m length
Straightness	0.20% of total length and 3 mm. over any 1m. length	0.15% of total length and 3 mm. over any 1m. length
Mass	± 6 % on individual delivered lengths	

## DIMENSIONS and WEIGHTS

Circular hollow section

Size mm.	Wall mm.	Weight Kg/m	Size mm.	Wall mm.	Weight Kg/m	Size mm.	Wall mm.	Weight Kg/m
21.3	2.0	0.95	76.1	2.0	3.65	114.3	4.0	10.90
	2.5	1.16		2.5	4.54		5.0	13.50
	3.0	1.35		3.0	5.41		6.0	16.00
26.9	2.0	1.23		4.0	7.11		6.3	16.80
	2.5	1.50		5.0	8.77		8.0	21.00
	3.0	1.77		6.0	10.40		3.0	10.10
33.7	2.0	1.56	88.9	6.3	10.80	139.7	4.0	13.40
	2.5	1.92		2.0	4.29		5.0	16.60
	3.0	2.27		2.5	5.33		6.0	19.80
42.4	2.0	1.99		3.0	6.36		6.3	20.70
	2.5	2.46		4.0	8.38		8.0	26.00
	3.0	2.91		5.0	10.3	168.3	3.0	12.20
	4.0	3.79		6.0	12.3		4.0	16.20
48.3	2.0	2.28	101.6	6.3	12.8		5.0	20.10
	2.5	2.82		2.0	4.91		6.0	24.00
	3.0	3.35		2.5	6.11		6.3	25.20
	4.0	4.37		3.0	7.29		8.0	31.60
60.3	5.0	5.34		4.0	9.63	219.1	4.0	21.20
	2.0	2.88		5.0	11.90		5.0	26.40
	2.5	3.56		6.0	14.10		6.0	31.50
	3.0	4.24		6.3	14.80		6.3	33.10
	4.0	5.55	114.3	2.5	6.89		8.0	41.60
	5.0	6.82		3.0	8.23			

Square and Rectangular hollow section

Square

Rectangular

Size mm.	Wall mm.	Weight Kg/m	Size mm.	Wall mm.	Weight Kg/m	Size mm.	Wall mm.	Weight Kg/m	Size mm.	Wall mm.	Weight Kg/m
20	2.0	1.05	80	3.0	7.07	40x20	2.0	1.68	200x100	6.3	27.40
25	2.0	1.36		4.0	9.22		2.5	2.03		8.0	33.90
	2.5	1.64		5.0	11.30		3.0	2.36		10.0	41.30
30	3.0	1.89	90	3.0	8.01	50x30	2.0	2.31		12.0	47.10
	2.0	1.69		4.0	10.50		2.5	2.82		12.5	48.70
	2.5	2.03		5.0	12.80		3.0	3.30			
40	3.0	2.36	100	3.0	8.96	60x40	2.0	2.93	100x50	2.5	5.56
	2.0	2.31		4.0	11.70		2.5	3.60		3.0	6.60
	2.5	2.82		5.0	14.40		3.0	4.25		4.0	8.59
50	3.0	3.30	150	4.0	18.00		2.5	5.56		5.0	10.50
	2.0	2.93		5.0	22.30		3.0	6.60		6.0	14.90
	2.5	3.60		6.0	26.40		4.0	8.59		8.0	22.30
60	3.0	4.25		6.3	27.40		5.0	10.50			
	4.0	5.45		8.0	33.90	120x80	4.0	11.70	200x100	5.0	22.30
	2.0	3.56		10.0	41.30		4.0	14.90		6.0	26.40
	3.0	5.19		12.0	47.10	150x100	4.0	18.00			
	4.0	6.71		12.5	48.70		5.0	22.30			
	5.0	8.13					6.0	26.40			

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STS reserves the right to change product specifications without notice and without incurring obligations.

SAHATHAI STEEL PIPE CO.,LTD – 78 MOO 3 POOCHAO ROAD, BANGYAPRAEK, PHRAPRADAENG, SAMUTHPRAKARN 10130 THAILAND

Phone: (662)3859023 ► Fax: (662)3859288 ► EMAIL: [export@sahathai.com](mailto:export@sahathai.com)

## SAHATHAI STANDARD MAKE TO ORDER ; MTO

### SCOPE

This Standard specifies the technical delivery conditions for cold formed welded structural hollow section of circular, square or rectangular forms and applies to structural hollow section formed cold without subsequent heat treatment. Produced to SAHATHAI

### MANUFACTURE

The weld seam of electric resistance welded pipe in Circular Hollow sections sizes 1/2" to 2-1/2", square hollow sections size 1"x1" to 4"x4" and rectangular hollow sections size 2"x1" to 6"x2".

### HOT-DIP GALVANIZED

The average weight of zinc coating shall be not less than 300 g/m<sup>2</sup> of surface (inside and outside). When galvanized pipe is bent or otherwise fabricated to a degree which causes zinc coating to stretch or compress beyond the limit

### CHEMICAL REQUIREMENTS

Composition, max. %

C	Mn	P	S
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

### TENSILE REQUIREMENTS

Tensile Strength, min, MPa	330
Yield Strength, min, MPa	N/A
Elongation in 2" min, %	15

### BENDING TEST FOR CHS SIZE 2 and UNDER:

	Degree of Bend	Diameter of Mandrel
Standard	90°	6 x outside pipe diameter
Close Coiling	180°	8 x outside pipe diameter

### FLATTENING TEST FOR CHS SIZE 2-1/2:

As a test for quality of the weld, position the weld at 90° from the direction between the plates is less than 2/3 D of the original outside diameter. No cracks or breaks

### DIMENSIONS and WALL THICKNESS

CHS		SHS		RHS	
SIZE	Thickness (mm.)	SIZE	Thickness (mm.)	SIZE	Thickness (mm.)
1/2"	1.4 - 2.0	1"	1.2 - 2.0	2" x 1"	1.2 - 2.0
3/4"		1-1/4"		3" x 1-1/2"	
1-1/4"		1-1/2"		4" x 2"	
1-1/2"		2"		5" x 3"	2.0 - 3.0
2"	2.0 - 2.6	3"	2.0 - 3.0	6" x 2"	
2-1/2"		4"			

### PERMISSIBLE VARIATIONS IN WALL THICKNESS

Minimum wall thickness at any point shall not be more than 0.1 mm. under nominal wall thickness specified.

### PERMISSIBLE VARIATIONS IN OUTSIDE DIAMETER

CHS +3 mm., -2 mm.

SHS, RHS ± 3 mm.

### PERMISSIBLE VARIATIONS IN WEIGHT PER FOOT

Pipe shall not vary more than ± 10% from the standard specified.

### HYDROSTATIC TESTING

Every tube galvanized threaded and threading; GTT shall be tested at the manufacturer work by a hydrostatic test at a pressure of 5 MPa maintained for at least 5 s. The tube shall not leak during the test.

Threaded: To ANSI Standard B 1.20.1



# SUBMITTAL SHEET



[www.akwsupply.com](http://www.akwsupply.com)

TEL: 714-919-7814 FAX: 714-464-5474

Job Name: \_\_\_\_\_

Contractor: \_\_\_\_\_

Location: \_\_\_\_\_

Quantity: \_\_\_\_\_

Engineer: \_\_\_\_\_

Date: \_\_\_\_\_

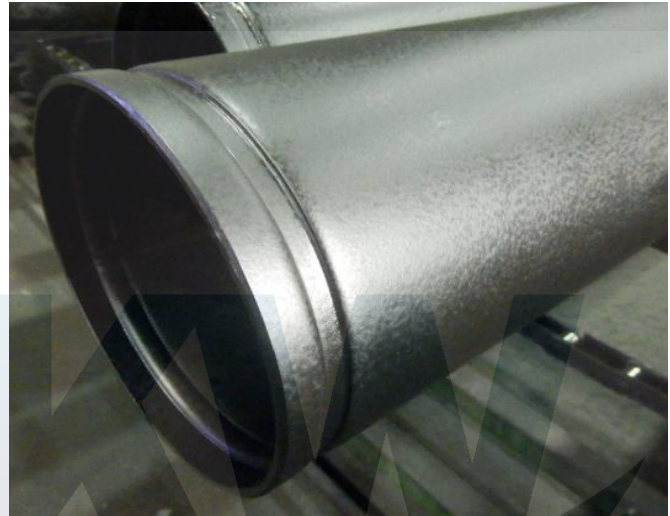
## Steel Pipes SCH 10

### Features

- \* Manufactured According to ASTM A53
- \* Sch 10, ERW, Grade A, Type E
- \* Plain Ends or Grooved Ends
- \* Black Color
- \* Paint Coating
- \* UL List & FM Approved

### Chemical Composition (Max. %)

C	Mn	P	S
0.25	0.95	0.05	0.045



### Tensile Strength (Min. Psi)

Yield	Tensile
30,000	48,000

### Specification

Pipe Brand: STS

Country of Origin: Thailand

Nominal Pipe Size: 1-1/4" to 6"

Length: 21 Feet



Size	O.D.	I.D.	Lbs/Ft	Test Pressure	PCS/Bundle
1-1/4"	1.660"	1.442"	1.810	1,000 Psi	61
1-1/2"	1.900"	1.682"	2.090	1,000 Psi	61
2"	2.375"	2.157"	2.640	1,000 Psi	37
2-1/2"	2.875"	2.635"	3.530	1,000 Psi	19
3"	3.500"	3.260"	4.340	1,000 Psi	19
4"	4.500"	4.260"	5.620	1,200 Psi	19
6"	6.625"	6.357"	9.300	1,000 Psi	7

AKW Supply Co. product specifications and dimensions are approximate and are provided for reference only. It's the user's responsibility to observe and adapt such precautions as may be advisable for the protection of personnel and property in the handling and use of our products. AKW Supply Co. reserves the right to change or modify product design, construction, specification, model number or material without prior notice and without incurring any obligation to make such changes on AKW Supply Co. previously sold.

# SUBMITTAL SHEET



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TEL: 714-919-7814 FAX: 714-464-5474

Job Name: \_\_\_\_\_

Contractor: \_\_\_\_\_

Location: \_\_\_\_\_

Quantity: \_\_\_\_\_

Engineer: \_\_\_\_\_

Date: \_\_\_\_\_

## Steel Pipes SCH 40

### Features

- \* Manufactured According to ASTM A53
- \* Sch 40, ERW, Grade A, Type E
- \* Plain Ends or Threaded & Coupled
- \* Black or Galvanized
- \* Varnished Coating



### Chemical Composition (Max. %)

C	Mn	P	S	Residual
0.25	0.95	0.05	0.045	Note 1

Note 1: Residual Elements Cu (0.4), Ni (0.4), Cr (0.4), Mo (0.15), and V (0.08) Combined Shall Not Exceed 1%.

### Tensile Strength (Min. Psi)

Yield	Tensile
30,000	48,000



### Specification

Brand: STS

Country of Origin: Thailand

Nominal Pipe Size: 1/2" to 2" NPT

Length: 10 Feet to 21 Feet

Size	O.D.	I.D.	Lbs/Ft	Test Pressure	PCS/Bundle
1/2"	0.840"	0.622"	0.850	700 Psi	127
3/4"	1.050"	0.824"	1.130	700 Psi	91
1"	1.315"	1.049"	1.680	700 Psi	61
1-1/4"	1.660"	1.380"	2.270	1,200 Psi	61
1-1/2"	1.900"	1.610"	2.720	1,200 Psi	61
2"	2.375"	2.067"	3.660	2,300 Psi	37

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# Fire Sprinkler Pipe

Schedule 10

## Submittal Data Sheet



### FM Approved and Fully Listed Sprinkler Pipe

Wheatland Tube's Schedule 10 steel fire sprinkler pipe is FM Approved and UL® and C-UL Listed.

Wheatland Tube is the only manufacturer with FM Approval on 10 NPS Schedule 10 steel fire sprinkler pipe.

### Approvals and Specifications

Schedule 10 meets or exceeds the following standards:

- ASTM A135, Type E, Grade A (Schedule 10, 1-10 NPS)
- NFPA® 13 and NFPA 14

### Manufacturing Protocols

Schedule 10 is subjected to the toughest possible testing protocols to ensure the highest quality and long-lasting performance.

### Finishes and Coatings

Schedule 10 can be ordered in black or hot-dip galvanized to meet FM/UL requirements for dry systems that meet the zinc coating specifications of ASTM A53 or A795.

Schedule 10 receives a proprietary mill coating to ensure a clean, corrosion-resistant surface that outperforms and outlasts standard lacquer coatings. This coating allows the pipe to be easily painted without special preparation.

Every black steel Schedule 10 pipe also receives our MIC SHIELD™ antimicrobial coating to limit corrosion from microbes on the interior of the pipe.

### Product Marking

Each length of Wheatland fire sprinkler pipe is continuously stenciled to show the manufacturer, type of pipe, grade, size and length. Bar coding is acceptable as a supplementary identification method.

## SUBMITTAL INFORMATION

PROJECT:

---

CONTRACTOR:

---

DATE:

---

ENGINEER:

---

SPECIFICATION REFERENCE:

---

SYSTEM TYPE:

---

LOCATIONS:

---

COMMENTS:

---

☐ BLACK

☐ HOT-DIP GALVANIZED



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A DIVISION OF ZEKELMAN INDUSTRIES

# Fire Sprinkler Pipe

Schedule 10

## Submittal Data Sheet



### SCHEDULE 10 WEIGHTS AND DIMENSIONS

NPS	NOMINAL OD		NOMINAL ID		NOMINAL WALL		WT./FT.	WT./FT. H <sub>2</sub> O FILLED	PCS./LIFT	WT./LIFT 21'	WT./LIFT 24'	WT./LIFT 25'	UL
	in.	mm	in.	mm	in.	mm	lbs.	lbs.		lbs.	lbs.	lbs.	CRR*
1	1.315	33.4	1.097	27.9	0.109	2.77	1.405	1.814	70	2065	2360	2459	11.4
1¼	1.660	42.2	1.442	36.6	0.109	2.77	1.807	2.514	61	2315	2645	2756	7.3
1½	1.900	48.3	1.682	42.7	0.109	2.77	2.087	3.049	61	2673	3055	3183	5.8
2	2.375	60.3	2.157	54.8	0.109	2.77	2.640	4.222	37	2051	2344	2442	4.7
2½	2.875	73.0	2.635	66.9	0.120	3.05	3.354	5.895	30	2226	2544	2651	3.5
3	3.500	88.9	3.260	82.8	0.120	3.05	4.336	7.949	19	1730	1977	2060	2.6
4	4.500	114.3	4.260	108.2	0.120	3.05	5.619	11.789	19	2242	2562	2669	1.6
5	5.563	141.3	5.295	134.5	0.134	3.40	7.780	17.309	13	2124	2427	2529	1.5
6	6.625	168.3	6.357	161.5	0.134	3.40	9.298	23.038	10	1953	2232	2325	1.0
8	8.625	219.1	8.249	209.5	0.188	4.78	16.960	40.086	7	2493	2849	2968	1.7
10**	10.750	273.0	10.374	263.5	0.188	4.78	21.230	57.803	2	892	1019	1062	—

\* Calculated using Standard UL CRR formula, UL Fire Protection Directory, Category VIZY. The CRR is a ratio value used to measure the ability of a pipe to withstand corrosion. Threaded Schedule 40 steel pipe is used as the benchmark (value of 1.0).

\*\* 10 NPS Schedule 10 is FM Approved but not UL Listed.



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**Wheatland** Tube  
A DIVISION OF ZEKELMAN INDUSTRIES

WFS-072921

# Fire Sprinkler Pipe

Schedule 40

## Submittal Data Sheet



### FM Approved and Fully Listed Sprinkler Pipe

Wheatland Tube's Schedule 40 steel fire sprinkler pipe is FM Approved and UL® and C-UL Listed.

### Approvals and Specifications

Schedule 40 meets or exceeds the following standards:

- ASTM A795, Type E, Grade A (Schedule 40, 1-2 NPS)
- ASTM A53, Type E, Grade B (Schedule 40, 2-8 NPS)
- ASTM A53, Type F, Grade A (Schedule 40, 1-4 NPS)
- NFPA® 13 and NFPA 14

### Manufacturing Protocols

Schedule 40 is subjected to the toughest possible testing protocols to ensure the highest quality and long-lasting performance.

### Finishes and Coatings

Schedule 40 can be ordered in black or hot-dip galvanized to meet FM/UL requirements for dry systems that meet the zinc coating specifications of ASTM A53 or A795.

Schedule 40 receives a proprietary mill coating to ensure a clean, corrosion-resistant surface that outperforms and outlasts standard lacquer coatings. This coating allows the pipe to be easily painted without special preparation.

Every black steel Schedule 40 pipe also receives our MIC SHIELD™ antimicrobial coating to limit corrosion from microbes on the interior of the pipe.

### Product Marking

Each length of Wheatland fire sprinkler pipe is continuously stenciled to show the manufacturer, type of pipe, grade, size and length. Bar coding is acceptable as a supplementary identification method.

## SUBMITTAL INFORMATION

PROJECT:

---

CONTRACTOR:

---

DATE:

---

ENGINEER:

---

SPECIFICATION REFERENCE:

---

SYSTEM TYPE:

---

LOCATIONS:

---

COMMENTS:

---

☐ BLACK

☐ HOT-DIP GALVANIZED



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# Fire Sprinkler Pipe

Schedule 40

## Submittal Data Sheet



### SCHEDULE 40 WEIGHTS AND DIMENSIONS

NPS	NOMINAL OD		NOMINAL ID		NOMINAL WALL		WT./FT.	WT./FT. H <sub>2</sub> O FILLED	PCS./LIFT	WT./LIFT 21'	WT./LIFT 24'	WT./LIFT 25'	UL
	in.	mm	in.	mm	in.	mm	lbs.	lbs.		lbs.	lbs.	lbs.	CRR*
1	1.315	33.4	1.049	26.6	0.133	3.38	1.68	2.055	70	2470	2822	2940	1.000
1¼	1.660	42.2	1.380	35.1	0.140	3.56	2.27	2.922	51	2431	2778	2894	1.000
1½	1.900	48.3	1.610	40.9	0.145	3.68	2.72	3.602	44	2513	2872	2992	1.000
2	2.375	60.3	2.067	52.5	0.154	3.91	3.66	5.109	24	1845	2108	2196	1.000
2½	2.875	73.0	2.469	62.7	0.203	5.16	5.80	7.871	20	2436	2784	2900	1.000
3	3.500	88.9	3.068	77.9	0.216	5.49	7.58	10.783	13	2069	2365	2464	1.000
3½	4.000	101.6	3.548	90.1	0.226	5.74	9.12	13.400	10	1915	2189	2280	1.000
4	4.500	114.3	4.026	102.3	0.237	6.02	10.80	16.311	10	2268	2592	2700	1.000
5	5.563	141.3	5.047	128.2	0.258	6.55	14.63	23.262	7	2151	2458	2560	1.000
6	6.625	168.3	6.065	154.1	0.280	7.11	18.99	31.498	5	1994	2279	2374	1.000
8**	8.625	219.1	7.981	202.7	0.322	8.18	28.58	50.240	5	3001	3430	3573	1.000

\* Calculated using Standard UL CRR formula, UL Fire Protection Directory, Category VI-ZY. The CRR is a ratio value used to measure the ability of a pipe to withstand corrosion. Threaded Schedule 40 steel pipe is used as the benchmark (value of 1.0).

\*\* 8 NPS Schedule 40 is FM Approved but not UL Listed.



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WFS-072921



## APPROVALS AND SPECIFICATIONS

- ASTM A135, Grade A
- ASTM A795, Type E, Grade A
- Pressure rated to 300 psi
- Underwriters Laboratories—United States of America
- Underwriters Laboratories—Canada
- Factory Mutual
- NFPA-13
- NFPA-13R
- NFPA-14
- CIVIL DEFENSE APPROVAL—United Arab Emirates
- Made in the United States of America
- UL, ULC & FM listed for roll-groove, plain-end and welded joints for wet, dry, preaction and deluge sprinkler systems.
- LEED v4 Certified

## FINISHES AND COATINGS

- Schedule 10 & 40 Sprinkler Pipe receives an OD mill coating of water-based paint which has corrosion protection expected with a painted carbon steel product, i.e. it would be expected to resist corrosion for an extended and indefinite period in a clean and dry environment and, as environmental conditions deteriorate, the corrosion protection would also diminish.
- Schedule 10 & 40 Sprinkler Pipe (black) receives an ID mill coating of Eddy Guard II MIC preventative coating. EG2 has been tested at independent laboratories to resist bacterial growth and maintain minimal bacterial count after multiple flushes (25) of the pipe.
- Schedule 10 & 40 Sprinkler Pipe when Hot Dip Galvanized by ASTM A123 and supplied by Bull Moose Tube is UL listed and FM approved.

## PRODUCT IDENTIFICATION

- Every length of Bull Moose fire sprinkler pipe features large, easy-to-read, continuous stenciling, clearly identifying the manufacturer, type of pipe, size, and length.

Nominal Pipe Size (inches)		1	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"	6"	8"
Schedule 10	O.D. (in)	1.315	1.660	1.900	2.375	2.875	3.500	4.500	6.625	8.625
	I.D. (in)	1.097	1.442	1.682	2.157	2.635	3.260	4.260	6.357	8.249
	Empty Weight (lb/ft)	1.410	1.810	2.090	2.640	3.530	4.340	5.620	9.290	16.940
	Water Filled Weight (lb/ft)	1.800	2.518	3.053	4.223	5.893	7.957	11.796	23.038	40.086
	C.R.R.*	15.27	9.91	7.76	6.27	4.92	3.54	2.50	1.158	1.805
	Pieces per Lift	91	61	61	37	30	19	19	10	7
Schedule 40	O.D. (in)	1.315	1.660	1.900	2.375	2.875	3.500	4.500		
	I.D. (in)	1.049	1.380	1.610	2.067	2.469	3.068	4.026		
	Empty Weight (lb/ft)	1.680	2.270	2.720	3.660	5.800	7.580	10.800		
	Water Filled Weight (lb/ft)	2.055	2.918	3.602	5.114	7.875	10.783	16.316		
	C.R.R.*	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
	Pieces per Lift	70	51	44	30	30	19	19		

\*Calculated using Standard UL CRR formula, UL Fire Protection Directory, Category VIZY \*\*Not Eddy Guard II treated/Not produced by BMT

## SUBMITTAL INFORMATION



Project

Contractor

Engineer

Specification Reference

Date  System Type

Locations

Comments

☐ Schedule 10 - Black
 ☐ Schedule 10 - Hot Dip Galvanized
 ☐ Schedule 40 - Black
 ☐ Schedule 40 - Hot Dip Galvanized

# SUBMITTAL SHEET



[www.akwsupply.com](http://www.akwsupply.com)

TEL: 714-919-7814 FAX: 714-464-5474

Job Name: \_\_\_\_\_

Contractor: \_\_\_\_\_

Location: \_\_\_\_\_

Quantity: \_\_\_\_\_

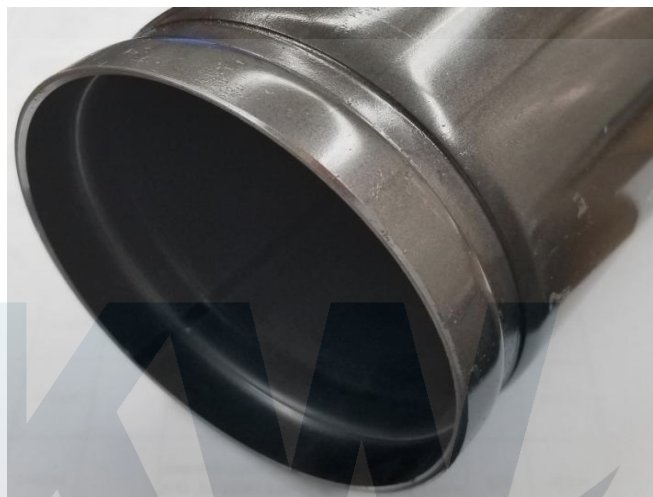
Engineer: \_\_\_\_\_

Date: \_\_\_\_\_

## Steel Pipe Super Flow

### Features

- \* Manufactured According to ASTM A795
- \* ERW, Grade A, Type E
- \* Meets NFPA 13
- \* Plain Ends or Grooved Ends
- \* Corrosion Resistant Surface
- \* Mill Lacquer Coated
- \* 300 PSI Rated
- \* UL List & FM Approved



### Specification

Pipe Mill: MS Pipe

Country of Origin: South Korea

Nominal Pipe Size: 1-1/4" to 4"

Length: 21 Feet

Size	O.D.	I.D.	Empty		Pcs/Lft	CRR*
			Lbs/Ft	WFW**		
1-1/4"	1.660"	1.494"	1.399	2.194	61	3.70
1-1/2"	1.900"	1.710"	1.833	2.875	61	4.42
2"	2.375"	2.185"	2.315	4.016	37	3.58
2-1/2"	2.875"	2.709"	2.477	5.092	30	1.37
3"	3.500"	3.320"	3.281	7.207	19	1.27
4"	4.500"	4.298"	4.750	11.330	19	1.10

\*CRR=Corrosion Resistance Ratio Calculated Using UL CRR Formula Under UL Category VIZY.

This Ratio Value Is Used to Measure the Ability of A Pipe to Withstand Corrosion.

\*\*WFW=Water Filled Weight



AKW Supply Co. product specifications and dimensions are approximate and are provided for reference only. It's the user's responsibility to observe and adapt such precautions as may be advisable for the protection of personnel and property in the handling and use of our products. AKW Supply Co. reserves the right to change or modify product design, construction, specification, model number or material without prior notice and without incurring any obligation to make such changes on AKW Supply Co. previously sold.



# Dyna-Flow®

## High Strength Steel Pipe

- **Exceptional hydraulics**
- **Lightweight and easy to install**
- **Available factory roll grooved**
- **ABFII coated ID**
- **UL and cUL listed**
- **FM approved**

### ➤ **The original high-strength light wall sprinkler pipe with superior hydraulics.**

Dyna-Flow® is the “original” high-strength light wall sprinkler pipe. With outstanding hydraulic capabilities, Dyna-Flow is recognized as the most popular alternative to Schedule-10 pipe. Lightweight and easy to cut, Dyna-Flow is a valuable addition to any fire protection system.

With an inside diameter (ID) of up to 11% larger than Schedule-40 and up to 7% larger than Schedule -10, Dyna-Flow pipe hydraulics are exceptional. Larger ID's enable Dyna-Flow and related components to be down-sized within the system, increasing the potential for job cost savings. For complete Hazen Williams charts, refer to “Dyna-Flow Hydraulic Data Tables”.

Dyna-Flow pipe has metallurgical properties that provide excellent fabrication characteristics for end prep finishes, welding and roll grooving. There are no special processes or equipment needed for fabrication and installation

Dyna-Flow Specifications				
NPS In; mm	Nominal I.D. In; mm	Wt. Lbs/Ft; kg/m	Wt. (H2O Filled) Lbs/Ft; kg/m	CRR Unthreaded
1"	1.191	0.830	1.31	2.41
25	30.3	1.2	1.95	—
1¼"	1.536	1.059	1.87	1.55
32	39.0	1.6	2.78	—
1½"	1.728	1.667	2.71	3.44
40	43.9	2.5	4.03	—
2"	2.203	2.104	3.79	2.78
50	56.0	3.1	5.64	—
2½"	2.703	2.564	5.10	1.60
65	68.7	3.8	7.59	—
3"	3.314	3.387	7.18	1.48
80	84.2	5.0	10.69	—
4"	4.310	4.473	10.86	1.00
90	109.5	6.7	16.16	—



### ➤ **Superior Coating**

Dyna-Flow products are coated with an environmentally approved and specially formulated modified-acrylic or water-based coating. This durable coating is paintable and acts as an excellent primer while resisting weather and UV degradation from outdoor storage.

The internal surface of all black Allied Tube & Conduit Fire Sprinkler pipe products up to 4.500" in diameter is coated with our new Antibacterial Formula, “ABFII”. In scientific laboratory tests, ABFII proved to have superior resistance to microbial colonization of pipe walls, thereby inhibiting or possibly preventing the onset of Microbiologically Influenced Corrosion (MIC) upon installation and the first 25 flushes of the fire sprinkler system.\*

### ➤ **American Made**

Meets “Buy American” requirement and is available through distributors in the USA, Canada, Mexico and Latin America.

### ➤ **Specifications & Approvals**

Dyna-Flow pipe is manufactured to meet ASTM A-795 Type E, Grade A and is in compliance with NFPA-13 and NFPA-14. All sizes of Dyna-Flow are UL and cUL listed and FM approved.

Dyna-Flow is UL and cUL listed for use with roll grooved, plain-end and welded joints for wet, dry, pre-action and deluge systems. It is FM approved for roll grooved, plain end and welded joints for wet systems. Dyna-Flow is available “hot-dip” galvanized\*\* and has been specifically approved by FM for dry system uses. Dyna-Flow complies with NFPA 13 and is rated at 300 psi working pressure.

\* See ABFII warranty

\*\* must be ordered in 10 bundle increments

# Dyna-Thread®

## Full Line Schedule 40 Replacement

- Widely accepted substitute for Schedule 40
- No thread gauge warnings
- Standard hanger spacing
- ABFII coated ID
- UL and cUL listed
- FM approved

### ➤ Combining the safety and longevity of Sch-40 with quality and hydraulic advantages.

Dyna-Thread® pipe is the full line Schedule 40 replacement with the same CRR of Schedule 40, 1.00, providing Dyna-Thread with the same life expectancy as Sch-40. With outstanding hydraulic capabilities, Dyna-Thread is a more widely accepted product substitution than lightwall threadable pipe when Sch-40 is specified.

Dyna-Thread's inside diameter is up to 3.6% larger than Sch-40 and provides improved hydraulics. When used in combination with Dyna-Flow pipe, downsizing of pipe and related components often occurs, thereby reducing costs.

The consistent quality of steel used to make Dyna-Thread facilitates smooth threading and lower maintenance costs. Increased strength and lighter weight allows Dyna-Thread to reduce installation fatigue and makes it ideal for retro-fit applications.

Dyna-Thread Specifications					
NPS	Nominal I.D.	Wt.	Wt. (H2O Filled)	CRR	CRR
In; mm	In; mm	Lbs/Ft; kg/m	Lbs/Ft; kg/m	Unthreaded	Threaded
1"	1.080	1.330	1.75	11.39	1.00
25	27.4	2.0	2.60	—	—
1¼"	1.408	1.870	2.54	9.50	1.00
32	35.8	2.8	3.78	—	—
1½"	1.639	2.290	3.22	9.14	1.00
40	41.6	3.4	4.79	—	—
2"	2.104	3.050	4.57	8.41	1.00
50	53.4	4.5	6.80	—	—



### ➤ Superior Coating

Dyna-Thread products are coated with an environmentally approved and specially formulated modified-acrylic or water-based coating. This durable coating is paintable and acts as an excellent primer while resisting weather and UV degradation from outdoor storage.

The internal surface of all black Allied Tube & Conduit Fire Sprinkler pipe products up to 4.500" in diameter is coated with our new Antibacterial Formula, "ABFII". In scientific laboratory tests, ABFII proved to have superior resistance to microbial colonization of pipe walls, thereby inhibiting or possibly preventing the onset of Microbiologically Influenced Corrosion (MIC) upon installation and the first 25 flushes of the fire sprinkler system.\*

### ➤ American Made

Meets "Buy American" requirement and is available through distributors in the USA, Canada, Mexico and Latin America.

### ➤ Specifications & Approvals

Dyna-Thread pipe is manufactured to meet ASTM A-135, Grade A, is in compliance with NFPA-13 and all sizes are rated at 300 psi working pressure. Dyna-Thread is UL and cUL listed for wet, dry deluge and pre-action sprinkler systems and FM approved for use in wet systems. Dyna-Thread can be hot dip galvanized\*\* to meet FM requirements for use in dry systems. Dyna-Thread is approved for all threaded couplings and welded outlets and is suitable for all roll-grooved and plain end fittings.

\* See ABFII warranty

\*\* must be ordered in 10 bundle increments

## APPROVALS AND SPECIFICATIONS

- ASTM A135, Grade A
- ASTM A795, Type E, Grade A
- Pressure rated to 300 psi
- Underwriters Laboratories—United States of America
- Underwriters Laboratories—Canada
- Factory Mutual
- NFPA-13
- NFPA-13R
- NFPA-14
- CIVIL DEFENSE APPROVAL—United Arab Emirates
- Made in the United States of America
- UL, ULC & FM listed for roll-groove, plain-end and welded joints for wet, dry, preaction and deluge sprinkler systems.
- LEED v4 Certified

## FINISHES AND COATINGS

- Eddy Flow Sprinkler Pipe receives an OD mill coating of water-based paint which has corrosion protection expected with a painted carbon steel product, i.e. it would be expected to resist corrosion for an extended and indefinite period in a clean and dry environment and, as environmental conditions deteriorate, the corrosion protection would also diminish.
- Eddy Flow Sprinkler Pipe (black) receives an ID mill coating of Eddy Guard II MIC preventative coating. EG2 has been tested at independent laboratories to resist bacterial growth and maintain minimal bacterial count after multiple flushes (25) of the pipe.
- Eddy Flow Sprinkler Pipe when Hot Dip Galvanized by ASTM A123 and supplied by Bull Moose Tube is UL listed and FM approved.

## PRODUCT IDENTIFICATION

- Every length of Bull Moose fire sprinkler pipe features large, easy-to-read, continuous stenciling, clearly identifying the manufacturer, type of pipe, size, and length.

Nominal Pipe Size (inches)	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"
<b>O.D. (in)</b>	1.660	1.900	2.375	2.875	3.500	4.500
<b>I.D. (in)</b>	1.530	1.728	2.203	2.705	3.334	4.310
<b>Empty Weight (lb/ft)</b>	1.222	1.844	2.330	2.809	3.361	4.968
<b>Water Filled Weight (lb/ft)</b>	2.019	2.860	3.982	5.299	7.144	11.290
<b>C.R.R.*</b>	1.98	3.44	2.78	1.66	1.00	1.00
<b>Pieces per Lift</b>	61	61	37	30	19	19

\*Calculated using Standard UL CRR formula, UL Fire Protection Directory, Category VIZY



## SUBMITTAL INFORMATION

Project

Contractor

Engineer

Specification Reference

Date  System Type

Locations

Comments

☐ Eddy Flow - Black ☐ Eddy Flow - Hot Dip Galvanized

## APPROVALS AND SPECIFICATIONS

- ASTM A135, Grade A
- ASTM A795, Type E, Grade A
- Pressure rated to 300 psi
- Underwriters Laboratories—United States of America
- Underwriters Laboratories—Canada
- Factory Mutual
- NFPA-13
- NFPA-13R
- NFPA-14
- CIVIL DEFENSE APPROVAL—United Arab Emirates
- Made in the United States of America
- UL, ULC & FM listed for roll-groove, plain-end and welded joints for wet, dry, preaction and deluge sprinkler systems.
- LEED v4 Certified

## FINISHES AND COATINGS

- Eddythread Sprinkler Pipe receives an OD mill coating of water-based paint which has corrosion protection expected with a painted carbon steel product, i.e. it would be expected to resist corrosion for an extended and indefinite period in a clean and dry environment and, as environmental conditions deteriorate, the corrosion protection would also diminish.
- Eddythread Sprinkler Pipe (black) receives an ID mill coating of Eddy Guard II MIC preventative coating. EG2 has been tested at independent laboratories to resist bacterial growth and maintain minimal bacterial count after multiple flushes (25) of the pipe.
- Eddythread Sprinkler Pipe when Hot Dip Galvanized by ASTM A123 and supplied by Bull Moose Tube is UL listed and FM approved.

## PRODUCT IDENTIFICATION

- Every length of Bull Moose fire sprinkler pipe features large, easy-to-read, continuous stenciling, clearly identifying the manufacturer, type of pipe, size, and length.

Nominal Pipe Size (inches)	1	1-1/4"	1-1/2"	2"
O.D. (in)	1.295	1.650	1.900	2.375
I.D. (in)	1.083	1.418	1.654	2.123
Empty Weight (lb/ft)	1.461	2.070	2.547	3.308
Water Filled Weight (lb/ft)	1.860	2.754	3.468	4.842
C.R.R.*	1.00	1.00	1.00	1.00
Pieces per Lift	70	51	44	30

\*Calculated using Standard UL CRR formula, UL Fire Protection Directory, Category VIZY



## SUBMITTAL INFORMATION

Project	<input type="text"/>		
Contractor	<input type="text"/>		
Engineer	<input type="text"/>		
Specification Reference	<input type="text"/>		
Date	<input type="text"/>	System Type	<input type="text"/>
Locations	<input type="text"/>		
Comments	<input type="text"/>		

☐ Eddythread - Black
 ☐ Eddythread - Hot Dip Galvanized

TITUS DUCTILE IRON FITTINGS

- Fittings are manufactured in accordance with ASME B16.3
- Bushings and Plugs are manufactured in accordance with ASME B16.4
- Unions are manufactured in accordance with ASME B16.39
- Threads NPT per ASME B1.20.1
- Available in 1/2" - 2 1/2"
- Fittings are 100% air tested
- For current listing/approval details contact a Titus representative



CAST IRON	MALLEABLE IRON	DUCTILE IRON
Available in sizes from 1" to 2½", Class 125 Standard	Available in sizes from 1/8" to 6", Class 150	Available in sizes from 1/2" to 2", Class 150 Standard DI
UL / FM Approved at 300 psi	UL / FM Approved at 300 psi	UL / FM Approved at 500 psi
Air Tested	Air Tested	Air Tested

## TITUS DUCTILE IRON FITTINGS - CONTINUED

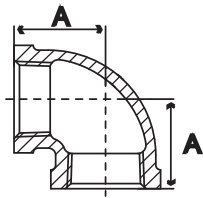


FIG. ADBL90 ELBOW 90°							
SIZE (INCH)	A (in)	B (in)	C (in)	WEIGHT (LBS.)	INNER BOX PCS/BOX	MASTER Ctn. PCS/Ctn.	Remarks
1/2	1.12			0.25	50	200	UL, FM
1	1.50			0.57	20	60	UL, FM
1 1/4	1.75			0.97	20	40	UL, FM
1 1/2	1.94			1.43	15	30	UL, FM
2	2.25			1.93	8	16	UL, FM
2 1/2	2.70			2.89	12	12	UL, FM

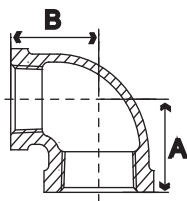


FIG. ADBRL REDUCING ELBOWS							
SIZE (INCH)	A (in)	B (in)	C (in)	WEIGHT (LBS.)	INNER BOX PCS/BOX	MASTER Ctn. PCS/Ctn.	Remarks
1 X 1/2	1.26	1.40		0.43	25	100	UL, FM
1 X 3/4	1.37	1.45		0.56	50	100	UL, FM
1 1/4 X 1/2	1.34	1.53		0.61	20	80	UL, FM
1 1/4 X 3/4	1.45	1.62		0.71	15	60	UL, FM
1 1/4 X 1	1.58	1.67		0.73	10	40	UL, FM
1 1/2 X 1/2	1.52	1.75		0.71	15	60	UL, FM
1 1/2 X 3/4	1.52	1.75		1.01	10	40	UL, FM
1 1/2 X 1	1.65	1.80		0.92	10	40	UL, FM
1 1/2 X 1 1/4	1.82	1.88		1.04	15	30	UL, FM
2 X 3/4	1.60	1.97		1.10	9	36	UL, FM
2 X 1	1.73	2.02		1.22	14	28	UL, FM
2 X 1 1/4	1.90	2.10		1.48	10	20	UL, FM
2 X 1 1/2	2.02	2.16		1.56	10	20	UL, FM

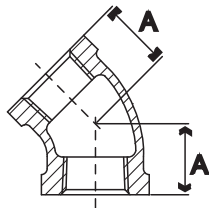


FIG. ADBL45 ELBOW 45°							
SIZE (INCH)	A (in)	B (in)	C (in)	WEIGHT (LBS.)	INNER BOX PCS/BOX	MASTER Ctn. PCS/Ctn.	Remarks
1	1.12			0.55	20	60	UL, FM
1 1/4	1.29			0.85	20	40	UL, FM
1 1/2	1.43			1.12	10	30	UL, FM
2	1.68			1.54	12	24	UL, FM

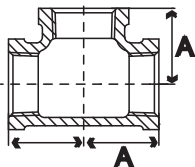
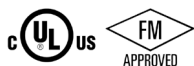


FIG. ADBT TEES							
SIZE (INCH)	A (in)	B (in)	C (in)	WEIGHT (LBS.)	INNER BOX PCS/BOX	MASTER Ctn. PCS/Ctn.	Remarks
1	1.50			0.83	20	40	UL, FM
1 1/4	1.75			1.30	14	28	UL, FM
1 1/2	1.94			1.68	12	24	UL, FM
2	2.25			2.79	8	16	UL, FM



## TITUS DUCTILE IRON FITTINGS - CONTINUED

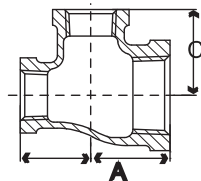


FIG. ABGRT REDUCING TEES

SIZE (INCH)	A (in)	B (in)	C (in)	WEIGHT (LBS.)	INNER BOX PCS/BOX	MASTER Ctn. PCS/Ctn.	Remarks
3/4 X 3/4 X 1/2	1.20	1.20	1.22	0.52	20	80	UL, FM
3/4 X 3/4 X 1	1.45	1.45	1.37	0.63	40	80	UL, FM
3/4 X 3/4 X 1 1/4	1.62	1.62	1.45	0.82	20	60	UL, FM
1 X 1/2 X 1/2	1.26	1.12	1.40	0.48	20	80	UL, FM
1 X 1/2 X 3/4	1.37	1.22	1.45	0.54	20	80	UL, FM
1 X 1/2 X 1	1.50	1.22	1.45	0.69	15	60	UL, FM
1 X 3/4 X 1/2	1.26	1.20	1.40	0.58	20	80	UL, FM
1 X 3/4 X 3/4	1.37	1.31	1.44	0.66	15	60	UL, FM
1 X 3/4 X 1	1.50	1.45	1.50	0.75	30	60	UL, FM
1 X 1 X 1/2	1.26	1.26	1.40	0.64	15	60	UL, FM
1 X 1 X 3/4	1.37	1.37	1.45	0.70	12	48	UL, FM
1 X 1 X 1 1/4	1.67	1.67	1.58	1.09	11	44	UL, FM
1 X 1 X 1 1/2	1.80	1.80	1.65	1.22	9	36	UL, FM
1 X 1 X 2	2.02	2.02	1.93	1.54	12	24	UL, FM
1 1/4 X 1/2 X 1	1.58	1.36	1.67	0.88	20	40	UL, FM
1 1/4 X 1/2 X 1 1/4	1.75	1.53	1.75	1.03	20	40	UL, FM
1 1/4 X 3/4 X 3/4	1.45	1.31	1.62	0.81	10	40	UL, FM
1 1/4 X 3/4 X 1	1.58	1.45	1.67	0.94	10	40	UL, FM
1 1/4 X 3/4 X 1 1/4	1.75	1.62	1.75	1.09	20	40	UL, FM
1 1/4 X 1 X 1/2	1.34	1.26	1.53	0.83	20	40	UL, FM
1 1/4 X 1 X 3/4	1.45	1.37	1.62	0.87	20	40	UL, FM
1 1/4 X 1 X 1	1.58	1.50	1.67	1.01	20	40	UL, FM
1 1/4 x 1 x 1 1/4	1.75	1.67	1.75	1.16	15	30	UL, FM
1 1/4 x 1 x 1 1/2	1.88	1.88	1.82				UL, FM
1 1/4 x 1 1/4 x 1/2	1.34	1.34	1.53	0.87	20	40	UL, FM
1 1/4 x 1 1/4 x 3/4	1.45	1.45	1.62	0.97	20	40	UL, FM
1 1/4 x 1 1/4 x 1	1.58	1.58	1.67	1.06	20	40	UL, FM
1 1/4 x 1 1/4 x 1 1/2	1.88	1.88	1.82	2.13	12	24	UL, FM
1 1/4 x 1 1/4 x 2	2.10	2.10	1.90	1.83	12	24	UL, FM
1 1/2 x 1/2 x 1 1/2	1.94	1.66	1.94	1.46	12	24	UL, FM
1 1/2 x 3/4 x 1 1/2	1.94	1.75	1.94	1.44	12	24	UL, FM
1 1/2 x 1 x 1	1.65	1.50	1.80	1.21	15	30	UL, FM
1 1/2 x 1 x 1 1/4	1.82	1.67	1.88	1.33	12	24	UL, FM
1 1/2 x 1 x 1 1/2	1.94	1.80	1.94	1.58	12	24	UL, FM
1 1/2 x 1 1/4 x 1/2	1.41	1.34	1.66	1.01	12	24	UL, FM
1 1/2 x 1 1/4 x 3/4	1.52	1.43	1.75	1.10	12	24	UL, FM
1 1/2 x 1 1/4 x 1	1.65	1.58	1.80	1.25	12	24	UL, FM
1 1/2 x 1 1/4 x 1 1/4	1.82	1.75	1.88	1.41	12	24	UL, FM
1 1/2 x 1 1/4 x 1 1/2	1.94	1.88	1.94	1.54	12	24	UL, FM
1 1/2 x 1 1/4 x 2	2.16	2.16	2.02	2.02	8	16	UL, FM
1 1/2 x 1 1/2 x 1/2	1.41	1.41	1.66	1.03	18	36	UL, FM
1 1/2 x 1 1/2 x 3/4	1.52	1.52	1.75	1.28	15	30	UL, FM
1 1/2 x 1 1/2 x 1	1.65	1.65	1.80	1.40	10	30	UL, FM
1 1/2 x 1 1/2 x 1 1/4	1.82	1.82	1.88	1.51	12	24	UL, FM
1 1/2 x 1 1/2 x 2	2.16	2.16	2.02	2.05	8	16	UL, FM
2 x 1/2 x 2	2.25	1.88	2.25	2.20	8	16	UL, FM
2 x 3/4 x 2	2.25	1.97	2.25	1.62	8	16	UL, FM
2 x 1 x 1 1/2	2.02	1.80	2.16	1.89	10	20	UL, FM
2 x 1 x 2	2.25	2.02	2.25	2.20	8	16	UL, FM
2 x 1 1/4 x 1 1/4	1.90	1.75	2.10	1.76	8	16	UL, FM
2 x 1 1/4 x 1 1/2	2.02	1.88	2.16	2.21	8	16	UL, FM
2 x 1 1/4 x 2	2.25	2.10	2.25	2.20	8	16	UL, FM
2 x 1 1/2 x 1/2	1.73	1.65	2.02	1.70	10	20	UL, FM
2 x 1 1/2 x 1	1.73	1.65	2.02	1.60	10	20	UL, FM
2 x 1 1/2 x 1 1/4	1.90	1.82	2.10	1.76	8	16	UL, FM
2 x 1 1/2 x 1 1/2	2.02	1.94	2.16	1.90	8	16	UL, FM
2 x 1 1/2 x 2	2.25	2.16	2.25	1.88	8	16	UL, FM
2 x 2 x 1/2	1.49	1.49	1.88	1.71	10	20	UL, FM
2 x 2 x 3/4	1.60	1.60	1.97	1.70	10	20	UL, FM
2 x 2 x 1	1.73	1.73	2.02	1.80	10	20	UL, FM
2 x 2 x 1 1/4	1.90	1.90	2.10	2.05	8	16	UL, FM
2 x 2 x 1 1/2	2.02	2.02	2.16	2.09	8	16	UL, FM

## TITUS DUCTILE IRON FITTINGS - CONTINUED

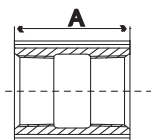


FIG. ADBS COUPLING							
SIZE (INCH)	A (in)	B (in)	C (in)	WEIGHT (LBS.)	INNER BOX PCS/BOX	MASTER Ctn. PCS/Ctn.	Remarks
1	1.67			0.47	25	100	UL, FM
1 1/4	1.93			0.66	16	64	UL, FM
1 1/2	2.15			0.94	18	36	UL, FM
2	2.53			1.49	12	24	UL, FM

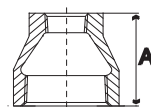


FIG. ADBRS REDUCING COUPLING							
SIZE (INCH)	A (in)	B (in)	C (in)	WEIGHT (LBS.)	INNER BOX PCS/BOX	MASTER Ctn. PCS/Ctn.	Remarks
3/4 x 1/2	1.44			0.26	60	180	UL, FM
1 x 1/2	1.69			0.37	30	120	Hexagon small end, UL, FM
1 x 3/4	1.69			0.42	25	100	Hexagon small end, UL, FM
1 1/4 x 1/2	2.06			0.57	25	75	UL, FM
1 1/4 x 3/4	2.06			0.60	25	75	UL, FM
1 1/4 x 1	2.06			0.62	15	60	UL, FM

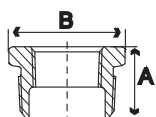


FIG. ADBBU BUSHINGS							
SIZE (INCH)	A (in)	B (in)	C (in)	WEIGHT (LBS.)	INNER BOX PCS/BOX	MASTER Ctn. PCS/Ctn.	Remarks
3/4 x 1/2	1.02			0.14	75	300	outside head, UL, FM
1 x 1/2	1.14			0.28	50	200	outside head, UL, FM
1 x 3/4	1.14			0.19	50	200	outside head, UL, FM
1 1/4 x 3/4	1.30			0.37	30	120	outside head, UL, FM
1 1/4 x 1	1.30			0.30	30	120	outside head, UL, FM
1 1/2 x 1	1.34			0.52	25	75	outside head, UL, FM
1 1/2 x 1 1/4	1.34			0.37	25	75	outside head, UL, FM
2 x 1/2	1.50			0.90	20	60	inside head, UL, FM
2 x 3/4	1.50			0.67	20	60	inside head, UL, FM
2 x 1	1.50			0.88	20	60	inside head, UL, FM
2 x 1 1/4	1.50			0.79	20	60	outside head, UL, FM
2 x 1 1/2	1.50			0.66	20	60	outside head, UL, FM

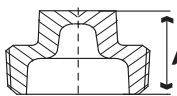


FIG. ADBP PLUGS							
SIZE (INCH)	A (in)	B (in)	C (in)	WEIGHT (LBS.)	INNER BOX PCS/BOX	MASTER Ctn. PCS/Ctn.	Remarks
1/2	0.95			0.10	50	600	hollow, UL, FM
3/4	1.07			0.16	35	420	hollow, UL, FM
1	1.25			0.26	20	240	hollow, UL, FM
1 1/4	1.36			0.31	40	120	hollow, UL, FM
1 1/2	1.42			0.55	30	90	hollow, UL, FM
2	1.57			0.65	20	60	hollow, UL, FM

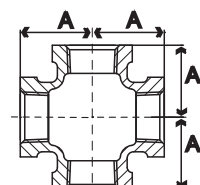


FIG. ADBCR CROSS							
SIZE (INCH)	A (in)	B (in)	C (in)	WEIGHT (LBS.)	INNER BOX PCS/BOX	MASTER Ctn. PCS/Ctn.	Remarks
1	1.50			0.98	15	30	UL, FM
1 1/4	1.75			1.55	10	20	UL, FM
1 1/2	1.94			1.84	8	16	UL, FM
2	2.25			3.26	5	10	UL, FM

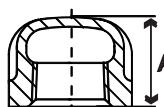


FIG. ADBC CAP							
SIZE (INCH)	A (in)	B (in)	C (in)	WEIGHT (LBS.)	INNER BOX PCS/BOX	MASTER Ctn. PCS/Ctn.	Remarks
1	1.16			0.32	25	100	UL, FM
1 1/4	1.28			0.49	20	80	UL, FM
1 1/2	1.33			0.67	18	54	UL, FM
2	1.45			0.88	12	36	UL, FM





### **Malleable Threaded Fittings**

ALL MALLEABLE THREADED FITTINGS MANUFACTURED FOR AND BY SIGMA PIPING PRODUCTS CONFORM TO, COMPLY WITH, AND ARE MANUFACTURED TO THE FOLLOWING STANDARDS:

ASTM A 197	Standard Spec for Cupola Malleable Iron
ASTM A 153	Standard Spec for Zinc Coating (Hot Dip) on Iron and Steel
ANSI B 16.3	Malleable Iron Threaded Fittings Classes 150
ANSI B 16.39	Malleable Iron Threaded Union Classes 150
ANSI/ASME B1.20.1	Pipe Threads, General Purpose (Inch) NPT

### **Ductile Iron Threaded Fittings**

ALL DUCTILE IRONS MANUFACTURED FOR AND BY SIGMA PIPING PRODUCTS CONFORM TO, COMPLY WITH, AND ARE MANUFACTURED TO THE FOLLOWING STANDARDS:

ASTM A 536	Grade 65-45-12
ASME B 16.3	Ductile Iron Threaded Fittings Classes 150
ANSI/ASME B1.20.1	Pipe Threads, General Purpose (Inch) NPT

### **Cast Iron Threaded Fittings**

ALL CAST IRONS MANUFACTURED FOR AND BY SIGMA PIPING PRODUCTS CONFORM TO, COMPLY WITH, AND ARE MANUFACTURED TO THE FOLLOWING STANDARDS:

ASTM A 126	Class B Standard Spec for Cupola Cast Iron
ANSI B 16.4	Cast Iron Threaded Fitting Classes 125
ANSI/ASME B1.20.1	Pipe Threads, General Purpose (Inch) NPT

### **Merchant Steel Couplings**

ALL STEEL THREADED FITTINGS MANUFACTURED FOR AND BY SIGMA PIPING PRODUCTS CONFORM TO, COMPLY WITH, AND ARE MANUFACTURED TO THE FOLLOWING STANDARDS:

ASTM A 865	Carbon Steel
ASTM B 633	Standard Spec for Electro Galvanized Fittings
ANSI/ASME B1.20.1	Pipe Threads, General Purpose (Inch) NPT

### **Steel Pipe Nipples**

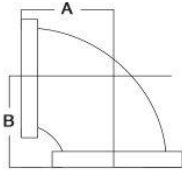
ALL STEEL PIPE NIPPLES MANUFACTURED FOR AND BY SIGMA PIPING PRODUCTS CONFORM TO, COMPLY WITH, AND ARE MANUFACTURED TO THE FOLLOWING STANDARDS:

ASTM A 733	Standard Spec for Welded Steel Nipple
ASTM A 53	Standard Spec for Black & Hot Dip Galvanized Steel Pipe
ANSI/ASME B1.20.1	Pipe Threads, General Purpose (Inch) NPT

# THREADED FITTINGS

## 90 Elbow Ductile Iron

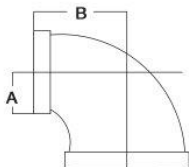
- Dimensions: ANSI B16.3 CLASS 150
- Material: Ductile Iron per ASTM A536 Grade 65-45-12
- Coating: Black
- Threads: Pipe Threads, General Purpose ASME B1.20.1



NOM SIZE	ITEM CODE BLK	DIMENSION (IN)		WEIGHT (LBS)
		A	B	
1"	1D90B0606	1.50	1.50	0.62
1-1/4"	1D90B0707	1.75	1.75	0.90
1-1/2"	1D90B0808	1.94	1.94	1.20
2"	1D90B0909	2.25	2.25	1.85

## 90 Reducing Elbow Ductile Iron

- Dimensions: ANSI B16.3 CLASS 150
- Material: Ductile Iron per ASTM A536 Grade 65-45-12
- Coating: Black
- Threads: Pipe Threads, General Purpose ASME B1.20.1

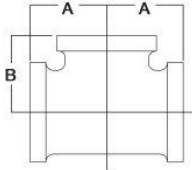


NOM SIZE	ITEM CODE BLK	DIMENSION (IN)		WEIGHT (LBS)
		A	B	
1" X 1/2"	1D90R0604	1.26	1.36	0.44
1" X 3/4"	1D90R0605	1.37	1.45	0.52
1 1/4" X 1/2"	1D90R0704	1.34	1.53	0.64
1 1/4" X 3/4"	1D90R0705	1.45	1.62	0.72
1 1/4" X 1"	1D90R0706	1.58	1.67	0.75
1 1/2" X 1"	1D90R0806	1.65	1.80	0.92
1 1/2" X 1 1/4"	1D90R0807	1.82	1.88	1.08
2" X 1/2"	1D90R0904	1.49	1.88	1.08
2" X 3/4"	1D90R0905	1.60	1.97	1.24
2" X 1"	1D90R0906	1.73	2.02	1.40
2" X 1 1/4"	1D90R0907	1.90	2.10	1.52
2" X 1 1/2"	1D90R0908	2.02	2.16	1.65

Notice: D.I. Fittings have higher tensile strength than that of steel pipe, over tightening can cause damage to pipe threads which may cause leakage. D.I. Fitting should be tightened three turns beyond hand tight, no more than four turns.

## Straight Tee Ductile Iron

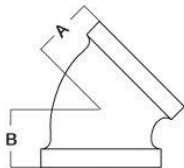
- Dimensions: ANSI B16.3 CLASS 150
- Material: Ductile Iron per ASTM A536 Grade 65-45-12
- Coating: Black
- Threads: Pipe Threads, General Purpose ASME B1.20.1



NOM SIZE	ITEM CODE	DIMENSION (IN)		WEIGHT (LBS)
	BLK	A	B	
1"	1DT060606	1.50	1.50	0.85
1-1/4"	1DT070707	1.75	1.75	1.22
1-1/2"	1DT080808	1.94	1.94	1.55
2"	1DT090909	2.25	2.25	2.45

## 45 Elbow Ductile Iron

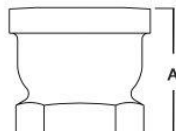
- Dimensions: ANSI B16.3 CLASS 150
- Material: Ductile Iron per ASTM A536 Grade 65-45-12
- Coating: Black
- Threads: Pipe Threads, General Purpose ASME B1.20.1



NOM SIZE	ITEM CODE	DIMENSION (IN)		WEIGHT (LBS)
	BLK	A	B	
1"	1D45B0606	1.12	1.12	0.46
1-1/4"	1D45B0707	1.29	1.29	0.73
1-1/2"	1D45B0808	1.43	1.43	0.92
2"	1D45B0909	1.68	1.68	1.50

## Reducing Coupling Ductile Iron

- Dimensions: ANSI B16.3 CLASS 150
- Material: Ductile Iron per ASTM A536 Grade 65-45-12
- Coating: Black
- Threads: Pipe Threads, General Purpose ASME B1.20.1



NOM SIZE	ITEM CODE	DIMENSION (IN)	WEIGHT (LBS)
	BLK	A	
1" X 1/2"	1DCR0604	1.69	0.39
1" X 3/4"	1DCR0605	1.69	0.53

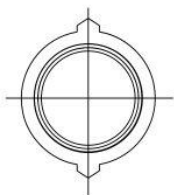
Notice: **D.I. Fittings** have higher tensile strength than that of steel pipe, over tightening can cause damage to pipe threads which may cause leakage.  
**D.I. Fitting** should be tightened three turns beyond hand tight, no more than four turns.

# THREADED FITTINGS

## Coupling Ductile Iron



- Dimensions: ANSI B16.3 CLASS 150
- Material: Ductile Iron per ASTM A536 Grade 65-45-12
- Coating: Black
- Threads: Pipe Threads, General Purpose ASME B1.20.1

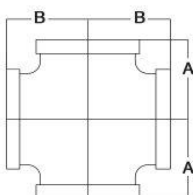


NOM SIZE	ITEM CODE	DIMENSION (IN)	WEIGHT (LBS)
	BLK	A	
1"	1DCP0606	1.50	0.85
1-1/4"	1DCP0707	1.75	1.22
1-1/2"	1DCP0808	1.94	1.55
2"	1DCP0909	2.25	2.45

## Cross Ductile Iron



- Dimensions: ANSI B16.3 CLASS 150
- Material: Ductile Iron per ASTM A536 Grade 65-45-12
- Coating: Black
- Threads: Pipe Threads, General Purpose ASME B1.20.1



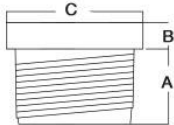
NOM SIZE	ITEM CODE	DIMENSION (IN)		WEIGHT (LBS)
	BLK	A	B	
1"	1DX0606	1.50	1.50	0.98
1 1/4"	1DX0707	1.75	1.75	1.50
1 1/2"	1DX0808	1.94	1.94	1.90
2"	1DX0909	2.25	2.25	2.95
1 1/4" X 1"	1DX0706	1.58	1.58	1.27
1 1/2" X 1"	1DX0806	1.65	1.65	1.45
2" X 1"	1DX0906	1.73	1.73	2.10

Notice: D.I. Fittings have higher tensile strength than that of steel pipe, over tightening can cause damage to pipe threads which may cause leakage.  
D.I. Fitting should be tightened three turns beyond hand tight, no more than four turns.

## Bushing Ductile Iron



- Dimensions: ANSI B16.3 CLASS 150
- Material: Ductile Iron per ASTM A536 Grade 65-45-12
- Coating: Black
- Threads: Pipe Threads, General Purpose ASME B1.20.1



NOM SIZE	ITEM CODE BLK	DIMENSION (IN)			WEIGHT (LBS)
		A	B	C	
1" X 1/2"	1DBUS0604	0.75	0.25	1.42	0.22
1" X 3/4"	1DBUS0605	0.75	0.25	1.42	0.17
1 1/4" X 1"	1DBUS0706	0.80	0.28	1.76	1.28
1 1/2" X 1"	1DBUS0806	0.83	0.31	2.00	0.44
1 1/2" X 1 1/4"	1DBUS0807	0.83	0.31	2.00	0.30
2" X 1"	1DBUS0906	0.88	0.41	1.95	0.66
2" X 1 1/4"	1DBUS0907	0.88	0.34	2.48	0.72
2" X 1 1/2"	1DBUS0908	0.88	0.34	2.48	0.61

## Cap Ductile Iron



- Dimensions: ANSI B16.3 CLASS 150
- Material: Ductile Iron per ASTM A536 Grade 65-45-12
- Coating: Black
- Threads: Pipe Threads, General Purpose ASME B1.20.1



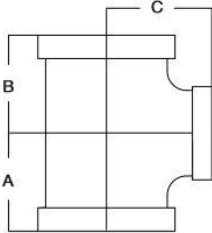
NOM SIZE	ITEM CODE	DIMENSION (IN)	WEIGHT (LBS)
	BLK	A	
1"	1DK06	1.16	0.32
1-1/4"	1DK07	1.28	0.43
1-1/2"	1DK08	1.33	0.60
2"	1DK09	1.45	0.91

Notice: **D.I. Fittings** have higher tensile strength than that of steel pipe, over tightening can cause damage to pipe threads which may cause leakage.  
**D.I. Fitting** should be tightened three turns beyond hand tight, no more than four turns.

# THREADED FITTINGS

## Reducing Tee Ductile Iron

- Dimensions: ANSI B16.3 CLASS 150
- Material: Ductile Iron per ASTM A536 Grade 65-45-12
- Coating: Black
- Threads: Pipe Threads, General Purpose ASME B1.20.1



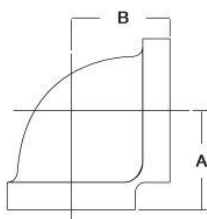
NOM SIZE	ITEM CODE	DIMENSION (IN)			WEIGHT (LBS)
		A	B	C	
1" x 1" x 1/2"	1DT060604	1.26	1.26	1.36	0.64
1" x 1" x 3/4"	1DT060605	1.37	1.37	1.45	0.73
1" x 1/2" x 1"	1DT060406	1.50	1.36	1.50	0.71
1" x 3/4" x 1"	1DT060506	1.50	1.45	1.50	0.76
1" x 1" x 1 1/4"	1DT060607	1.67	1.67	1.58	0.98
1" x 1" x 1 1/2"	1DT060608	1.80	1.80	1.65	1.16
1 1/4" x 1" x 1/2"	1DT070604	1.34	1.26	1.53	0.82
1 1/4" x 1" x 3/4"	1DT070605	1.45	1.37	1.62	0.90
1 1/4" x 1" x 1"	1DT070606	1.58	1.50	1.67	1.00
1 1/4" x 1" x 1 1/4"	1DT070607	1.75	1.67	1.75	1.08
1 1/4" x 1" x 1 1/2"	1DT070608	1.88	1.88	1.82	1.42
1 1/4" x 1 1/4" x 1/2"	1DT070704	1.34	1.34	1.53	0.86
1 1/4" x 1 1/4" x 3/4"	1DT070705	1.45	1.45	1.62	0.92
1 1/4" x 1 1/4" x 1"	1DT070706	1.58	1.58	1.67	0.95
1 1/4" x 1 1/4" x 1"	1DT070708	1.88	1.88	1.82	1.45
1 1/4" x 1 1/4" x 2"	1DT070709	2.10	2.10	1.90	1.75
1 1/2" x 1" x 1/2"	1DT080604	1.41	1.34	1.66	0.95
1 1/2" x 1" x 3/4"	1DT080605	1.52	1.37	1.75	1.14
1 1/2" x 1" x 1"	1DT080606	1.65	1.50	1.80	1.17
1 1/2" x 1" x 1 1/4"	1DT080607	1.82	1.67	1.88	1.34
1 1/2" x 1" x 1 1/2"	1DT080608	1.94	1.80	1.94	1.45
1 1/2" x 1 1/4" x 1/2"	1DT080704	1.41	1.34	1.66	1.05
1 1/2" x 1 1/4" x 3/4"	1DT080705	1.52	1.45	1.75	1.15
1 1/2" x 1 1/4" x 1"	1DT080706	1.65	1.58	1.80	1.25
1 1/2" x 1 1/4" x 2"	1DT080709	2.16	2.10	2.02	1.90
1 1/2" x 1 1/2" x 1/2"	1DT080804	1.41	1.41	1.16	1.15
1 1/2" x 1 1/2" x 3/4"	1DT080805	1.52	1.52	1.75	1.24
1 1/2" x 1 1/2" x 1"	1DT080806	1.65	1.65	1.80	1.30
1 1/2" x 1 1/2" x 1"	1DT080807	1.82	1.82	1.88	1.48
1 1/2" x 1 1/2" x 2"	1DT080809	2.16	2.16	2.02	1.98
2" x 1" x 2"	1DT090609	2.25	2.02	2.25	2.15
2" x 1 1/4" x 2"	1DT090709	2.25	2.10	2.25	2.30
2" x 1 1/2" x 1/2"	1DT090804	1.49	1.41	1.88	1.50
2" x 1 1/2" x 3/4"	1DT090805	1.60	1.52	1.97	1.62
2" x 1 1/2" x 1"	1DT090806	1.73	1.65	2.02	1.64
2" x 1 1/2" x 1 1/4"	1DT090807	1.90	1.82	2.10	1.80
2" x 1 1/2" x 1 1/2"	1DT090808	2.02	1.94	2.16	2.00
2" x 1 1/2" x 2"	1DT090809	2.25	2.16	2.25	2.35
2" x 2" x 1/2"	1DT090904	1.49	1.49	1.88	1.60
2" x 2" x 3/4"	1DT090905	1.60	1.60	1.97	1.68
2" x 2" x 1"	1DT090906	1.73	1.73	2.02	1.85
2" x 2" x 1 1/4"	1DT090907	1.90	1.90	2.10	2.04
2" x 2" x 1 1/2"	1DT090908	2.02	2.02	2.16	2.18
2" x 2" x 2 1/2"	1DT090910	2.60	2.60	2.39	3.61
2 1/2" x 2" x 3/4"	1DT100905	1.74	1.60	2.32	2.28

# THREADED FITTINGS



## 90 Elbow Cast Iron

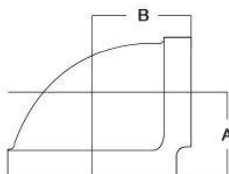
- Dimensions: ANSI B16.4 CLASS 125
- Material: Cast Gray Iron per ASTM 126 Class B
- Coating: Black
- Threads: Pipe Threads, General Purpose ASME B1.20.1



NOM SIZE	ITEM CODE	DIMENSION (IN)		WEIGHT (LBS)
	BLK	A	B	
1"	1C90B0606	1.50	1.50	0.85
1-1/4"	1C90B0707	1.75	1.75	1.22
1-1/2"	1C90B0808	1.94	1.94	1.55
2"	1C90B0909	2.25	2.25	2.45
2-1/2"	1C90B1010	2.70	2.70	4.80

## 90 Reducing Elbow Cast Iron

- Dimensions: ANSI B16.4 CLASS 125
- Material: Cast Gray Iron per ASTM 126 Class B
- Coating: Black
- Threads: Pipe Threads, General Purpose ASME B1.20.1

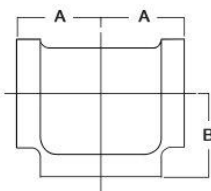


NOM SIZE	ITEM CODE	DIMENSION (IN)		WEIGHT (LBS)
	BLK	A	B	
1" X 1/2"	1C90R0604	1.26	1.36	0.44
1" X 3/4"	1C90R0605	1.37	1.45	0.52
1 1/4" X 1/2"	1C90R0704	1.34	1.53	0.64
1 1/4" X 3/4"	1C90R0705	1.45	1.62	0.72
1 1/4" X 1"	1C90R0706	1.58	1.67	0.75
1 1/2" X 1/2"	1C90R0804	1.60	1.70	1.17
1 1/2" X 3/4"	1C90R0805	1.61	1.72	1.30
1 1/2" X 1"	1C90R0806	1.65	1.80	0.92
1 1/2" X 1 1/4"	1C90R0807	1.82	1.88	1.08
2" X 1/2"	1C90R0904	1.49	1.88	1.08
2" X 3/4"	1C90R0905	1.60	1.97	1.24
2" X 1"	1C90R0906	1.73	2.02	1.40
2" X 1 1/4"	1C90R0907	1.90	2.10	1.52
2" X 1 1/2"	1C90R0908	2.02	2.16	1.65

# THREADED FITTINGS

## Straight Tee Cast Iron

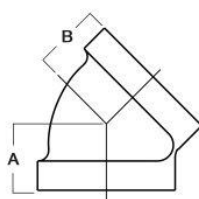
- Dimensions: ANSI B16.4 CLASS 125
- Material: Cast Gray Iron per ASTM 126 Class B
- Coating: Black
- Threads: Pipe Threads, General Purpose ASME B1.20.1



NOM SIZE	ITEM CODE	DIMENSION (IN)		WEIGHT (LBS)
	BLK	A	B	
1"	1CT060606	1.50	1.50	0.85
1-1/4"	1CT070707	1.75	1.75	1.22
1-1/2"	1CT080808	1.94	1.94	1.55
2"	1CT090909	2.25	2.25	2.45
2-1/2"	1CT101010	2.70	2.70	6.39

## 45 Elbow Cast Iron

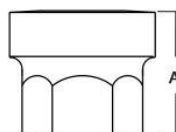
- Dimensions: ANSI B16.4 CLASS 125
- Material: Cast Gray Iron per ASTM 126 Class B
- Coating: Black
- Threads: Pipe Threads, General Purpose ASME B1.20.1



NOM SIZE	ITEM CODE	DIMENSION (IN)		WEIGHT (LBS)
	BLK	A	B	
1"	1C45B0606	1.12	1.12	0.46
1-1/4"	1C45B0707	1.29	1.29	0.73
1-1/2"	1C45B0808	1.43	1.43	0.92
2"	1C45B0909	1.68	1.68	1.50

## Reducing Coupling Cast Iron

- Dimensions: ANSI B16.4 CLASS 125
- Material: Cast Gray Iron per ASTM 126 Class B
- Coating: Black
- Threads: Pipe Threads, General Purpose ASME B1.20.1

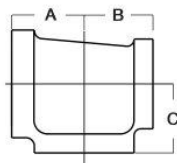


NOM SIZE	ITEM CODE	DIMENSION (IN)	WEIGHT (LBS)
	BLK	A	
1" X 1/2"	1CCR0604	1.69	0.62
1" X 3/4"	1CCR0605	1.69	0.69



## Reducing Tee Cast Iron

- Dimensions: ANSI B16.4 CLASS 125
- Material: Cast Gray Iron per ASTM 126 Class B
- Coating: Black
- Threads: Pipe Threads, General Purpose ASME B1.20.1



NOM SIZE	ITEM CODE	DIMENSION (IN)			WEIGHT (LBS)
		A	B	C	
1" x 1" x 1/2"	1CT060604	1.26	1.26	1.36	0.95
1" x 1" x 3/4"	1CT060605	1.37	1.37	1.45	1.10
1" x 1/2" x 1"	1CT060406	1.50	1.36	1.50	1.08
1" x 3/4" x 1"	1CT060506	1.50	1.45	1.50	1.18
1" x 1" x 1 1/4"	1CT060607	1.67	1.67	1.58	1.52
1" x 1" x 1 1/2"	1CT060608	1.80	1.80	1.65	1.73
1 1/4" x 1" x 1/2"	1CT070604	1.34	1.26	1.53	1.17
1 1/4" x 1" x 3/4"	1CT070605	1.45	1.37	1.62	1.38
1 1/4" x 1" x 1"	1CT070606	1.58	1.50	1.57	1.47
1 1/4" x 1" x 1 1/4"	1CT070607	1.75	1.67	1.75	1.80
1 1/4" x 1" x 1 1/2"	1CT070608	1.88	1.80	1.82	2.05
1 1/4" x 1 1/4" x 1/2"	1CT070704	1.34	1.34	1.53	1.37
1 1/4" x 1 1/4" x 3/4"	1CT070705	1.45	1.45	1.62	1.54
1 1/4" x 1 1/4" x 1"	1CT070706	1.58	1.58	1.67	1.65
1 1/4" x 1 1/4" x 1 1/2"	1CT070708	1.88	1.88	1.82	2.21
1 1/4" x 1 1/4" x 2"	1CT070709	2.10	2.10	1.90	2.55
1 1/2" x 1" x 1/2"	1CT080604	1.41	1.34	1.66	1.41
1 1/2" x 1" x 3/4"	1CT080605	1.52	1.37	1.75	1.65
1 1/2" x 1" x 1"	1CT080606	1.65	1.50	1.80	1.65
1 1/2" x 1" x 1 1/4"	1CT080607	1.82	1.67	1.88	2.00
1 1/2" x 1" x 1 1/2"	1CT080608	1.94	1.80	1.94	2.30
1 1/2" x 1 1/4" x 1/2"	1CT080704	1.41	1.34	1.66	1.58
1 1/2" x 1 1/4" x 3/4"	1CT080705	1.52	1.45	1.75	1.72
1 1/2" x 1 1/4" x 1"	1CT080706	1.65	1.58	1.80	1.85
1 1/2" x 1 1/4" x 1 1/4"	1CT080707	1.82	1.75	1.88	2.22
1 1/2" x 1 1/4" x 1 1/2"	1CT080708	1.94	1.88	1.94	2.45
1 1/2" x 1 1/4" x 2"	1CT080709	2.16	2.10	2.02	2.80
1 1/2" x 1 1/2" x 1/2"	1CT080804	1.41	1.41	1.66	1.76
1 1/2" x 1 1/2" x 3/4"	1CT080805	1.52	1.52	1.75	1.87
1 1/2" x 1 1/2" x 1"	1CT080806	1.65	1.65	1.80	1.94
1 1/2" x 1 1/2" x 1 1/4"	1CT080807	1.82	1.82	1.88	2.29
1 1/2" x 1 1/2" x 2"	1CT080809	2.16	2.16	2.02	3.28
2" x 1" x 2"	1CT090609	2.25	2.02	2.25	3.40
2" x 1 1/4" x 2"	1CT090709	2.25	2.10	2.25	2.80
2" x 1 1/2" x 1/2"	1CT090804	1.49	1.41	1.88	2.09
2" x 1 1/2" x 3/4"	1CT090805	1.60	1.52	1.97	2.40
2" x 1 1/2" x 1"	1CT090806	1.73	1.65	2.02	2.54
2" x 1 1/2" x 1 1/4"	1CT090807	1.90	1.82	2.10	2.85
2" x 1 1/2" x 1 1/2"	1CT090808	1.49	1.41	1.88	2.24
2" x 1 1/2" x 2"	1CT090809	2.25	2.16	2.25	3.75
2" x 2" x 1/2"	1CT090904	1.49	1.49	1.88	2.60
2" x 2" x 3/4"	1CT090905	1.60	1.60	1.97	2.71
2" x 2" x 1"	1CT090906	1.73	1.73	2.02	2.97
2" x 2" x 1 1/4"	1CT090907	1.90	1.90	2.10	3.32
2" x 2" x 1 1/2"	1CT090908	2.02	2.02	2.16	3.72
2" x 2" x 2 1/2"	1CT090910	2.60	2.60	2.39	5.10

## 90° Elbow (Class 125 Standard) Fig. 351



### Standards and Specifications

#### Cast Iron Threaded Fittings

	Dimensions	Material	Galvanizing*	Thread	Pressure Rating
Class 125	ASME B16.4	ASTM A126 (A)	ASTM A153	ASME B1.20.1	ASME B16.4
Class 250	ASME B16.4	ASTM A126 (A)	ASTM A153	ASME B1.20.1	ASME B16.4

#### Cast Iron Plugs and Bushings

	Dimensions	Material	Galvanizing*	Thread	Pressure Rating
	ASME B16.14	ASTM A126 (A)	ASTM A153	ASME B1.20.1	ASME B16.14

**Note:**

\* ASTM B633, Type I, SC 4, may be supplied as alternate zinc coating per applicable ASME B16 product standard.



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## 90° Elbow (Class 125 Standard) Fig. 351



Anvil standard and extra heavy cast iron threaded fittings are manufactured in accordance with ASME-B16.4 (except plugs and bushings, ASME B16.14). Dimensions also conform to Federal Specifications, WW-P-501 (except plugs and bushings WW-P-471).

Cast iron threaded fittings are available in both black and galvanized.

For Listings/Approval Details and Limitations, visit our website at [www.asc-es.com](http://www.asc-es.com) or contact an ASC Engineered Solutions™ Representative.

See following page for standards and specifications.

### Cast Iron Threaded Fittings Pressure - Temperature Ratings

Pressure			Pressure		
Temperature	Class 125	Class 250	Temperature	Class 125	Class 250
°F/°C	PSI/bar	PSI/bar	°F/°C	PSI/bar	PSI/bar
-20°–150°	175	400	300°	140	310
-28.9°–65.6°	12.1	27.6	148.9°	9.7	21.4
200°	165	370	350°	125	300
93.3°	11.4	25.5	176.7°	8.6	20.7
250°	150	340	400°	—	250
121.1°	10.3	23.4	204.4°	—	17.2

#### Note:

Anvil standard and extra heavy cast iron threaded fittings are manufactured in accordance with ASME B16.4. Plugs and bushings are manufactured in accordance with ASME B16.14.

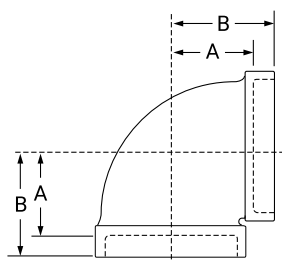
Figure 367 Concentric Reducers do not meet the overall length requirement of ASME B16.4. All other dimensions are in compliance.



PROJECT INFORMATION	APPROVAL STAMP
Project:	<input type="checkbox"/> Approved
Address:	<input type="checkbox"/> Approved as noted
Contractor:	<input type="checkbox"/> Not approved
Engineer:	Remarks:
Submittal Date:	
Notes 1:	
Notes 2:	

## 90° Elbow (Class 125 Standard)

**Fig. 351**



Size	A	B	Unit Weight Black	Size	A	B	Unit Weight Black
NPS/DN	In./mm	In./mm	Lbs./kg	NPS/DN	In./mm	In./mm	Lbs./kg
1/4	1/2	13/16	0.16	2 1/2	1 13/16	2 11/16	4.94
8	13	22	0.07	65	47	68	2.24
3/8	9/16	15/16	0.25	3	2 3/16	3 1/8	7.21
10	14	24	0.11	80	56	79	3.27
1/2	1 1/16	1 1/8	0.40	3 1/2	2 7/16	3 7/16	9.67
15	17	29	0.18	90	62	87	4.39
3/4	1 3/16	1 15/16	0.60	4	2 11/16	3 13/16	12.17
20	22	33	0.27	100	68	98	5.52
1	1 5/16	1 1/2	0.92	5	3 5/16	4 1/2	21.46
25	24	38	0.42	125	84	114	9.73
1 1/4	1 1/8	1 3/4	1.44	6	3 7/8	5 1/8	31.33
32	29	44	0.65	150	98	130	14.21
1 1/2	1 5/16	1 15/16	1.95	8	5 3/16	6 9/16	64.56
40	33	49	0.88	200	132	167	29.28
2	1 9/16	2 1/4	3.13				
50	40	57	1.42				

**Note:**

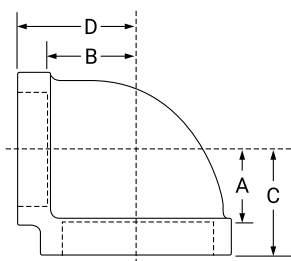
See first page for pressure-temperature ratings.



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## 90° Reducing Elbow (Class 125 Standard) Fig. 352



Size		A	B	C	D	Unit Weight Black
NPS/DN	NPS/DN	In./mm	In./mm	In./mm	In./mm	Lbs./kg
1/2 15	1/4 8	5/8 16	3/4 19	1 1/16 27	1 1/16 27	0.40 0.18
	3/8 10	5/8 16	11/16 17	1 1/16 27	1 1/16 27	0.34 0.15
3/4 20	1/2 15	11/16 17	13/16 22	1 1/4 32	1 1/4 32	0.51 0.23
	1 25	11/16 17	15/16 24	1 3/8 35	1 3/8 35	0.67 0.30
1 25	3/4 20	13/16 22	15/16 24	1 7/16 37	1 7/16 37	0.76 0.34
	1/2 15	11/16 17	1 1/16 27	1 1/2 38	1 1/2 38	1.07 0.49
	3/4 20	13/16 22	1 1/8 29	1 5/8 41	1 5/8 41	1.02 0.46
1 1/4 32	1 25	15/16 24	1 1/8 29	1 11/16 43	1 11/16 43	1.21 0.55
	1/2 15	3/4 19	1 1/4 32	1 5/8 41	1 5/8 41	1.53 0.69
	3/4 20	7/8 22	1 5/16 33	1 13/16 47	1 13/16 47	1.55 0.70
1 1/2 40	1 25	1 25	1 1/4 32	1 13/16 47	1 13/16 47	1.44 0.65

### Note:

See first page for pressure-temperature ratings.

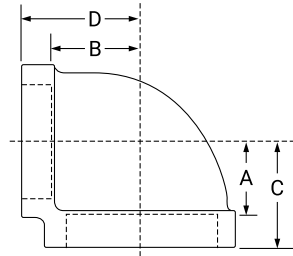


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Building connections that last™

## 90° Reducing Elbow (Class 125 Standard) Fig. 352

(Continued)



Size		A	B	C	D	Unit Weight Black
NPS/DN	NPS/DN	In./mm	In./mm	In./mm	In./mm	Lbs./kg
1½ 40	1¼ 32	1⅜ 30	1¼ 32	1⅞ 48	1⅞ 48	1.74 0.79
	½ 15	1⅜ 30	1⅞ 37	1⅜ 35	1⅜ 35	2.22 1.01
2 50	¾ 20	1⅝ 33	1½ 38	2 51	2 51	2.20 1.00
	1 25	1⅞ 27	1⅞ 37	2 51	2 51	2.08 0.94
	1¼ 32	1⅜ 30	1⅞ 37	2⅞ 52	2⅞ 52	2.33 1.06
	1½ 40	1⅝ 33	1½ 38	2⅞ 54	2⅞ 54	2.59 1.17
	1 25	1 25	1¾ 44	2⅝ 59	2⅝ 59	2.93 1.33
2½ 65	1¼ 32	1⅜ 30	1¾ 44	2⅜ 60	2⅜ 60	3.41 1.55
	1½ 40	1⅝ 33	1⅞ 47	2⅞ 62	2⅞ 62	3.68 1.67
	2 50	1⅞ 40	1⅞ 48	2⅞ 65	2⅞ 65	4.01 1.82
	1¼ 32	1⅝ 41	2⅝ 59	2⅞ 75	2⅞ 75	5.98 2.71

**Note:**

See first page for pressure-temperature ratings.

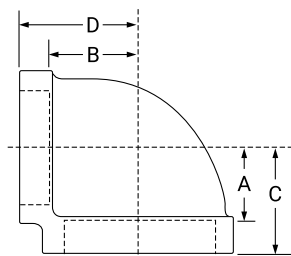


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## 90° Reducing Elbow (Class 125 Standard) Fig. 352

(Continued)



Size		A	B	C	D	Unit Weight Black
NPS/DN	NPS/DN	In./mm	In./mm	In./mm	In./mm	Lbs./kg
3 80	1½ 40	1⅝ 41	2⅝ 59	2⅝ 75	2⅝ 75	5.65 2.56
	2 50	1⅝ 41	2¼ 57	2⅝ 75	2⅝ 75	5.25 2.38
	2½ 65	1⅞ 48	2⅜ 56	3⅛ 78	3⅛ 78	6.44 2.92
4 100	2 50	2⅜ 56	2⅝ 75	3⅝ 92	3⅝ 92	11.89 5.39
	2½ 65	2⅜ 56	2¾ 70	3⅝ 92	3⅝ 92	11.27 5.11
	3 80	2⅜ 56	2⅞ 68	3⅝ 92	3⅝ 92	10.63 4.82
5 125	4 100	2⅞ 73	3⅝ 84	4⅜ 111	4⅜ 111	16.47 7.47
6 150	3 80	2⅝ 59	3⅞ 98	4⅞ 124	4⅞ 124	19.43 8.81
	4 100	2⅞ 73	3⅞ 98	4⅞ 125	4⅞ 125	23.53 10.67
	5 125	3⅞ 86	3⅞ 98	5 127	5 127	26.66 12.09

**Note:**

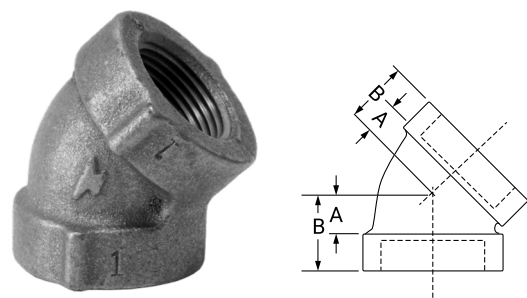
See first page for pressure-temperature ratings.



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**Fig. 356**  
45° Elbow (Straight)



Size	A	B	Unit Weight Black
NPS/DN	In./mm	In./mm	Lbs./kg
1/4 8	7/16 11	3/4 19	0.16 0.07
3/8 10	7/16 11	13/16 22	0.23 0.10
1/2 15	7/16 11	7/8 22	0.37 0.17
3/4 20	1/2 13	1 25	0.55 0.25
1 25	9/16 14	1 1/8 29	0.83 0.38
1 1/4 32	5/8 16	1 1/4 32	1.33 0.60
1 1/2 40	13/16 22	1 7/16 37	1.79 0.81
2 50	1 25	1 11/16 43	2.89 1.31

**Note:**  
See first page for pressure-temperature ratings.

**Fig. 356R**  
45° Reducing Elbow



Size	A	B	Unit Weight Black
NPS/DN	In./mm	In./mm	Lbs./kg
2 1/2 65	1 1/16 27	1 15/16 49	4.29 1.95
3 80	1 3/16 30	2 3/16 56	6.44 2.92
3 1/2 90	1 3/8 35	2 3/8 60	8.42 3.82
4 100	1 9/16 40	2 5/8 67	10.64 4.83
6 150	2 3/16 56	3 7/16 87	26.02 11.80
8 200	2 7/8 73	4 1/4 108	50.17 22.75

Size	A	B	C	D	Unit Weight Black
NPS/DN	In./mm	In./mm	In./mm	In./mm	Lbs./kg
1 x 1/2 25 x 15	1/2 15	7/8 22	1 1/16 27	1 5/16 33	0.95 0.43



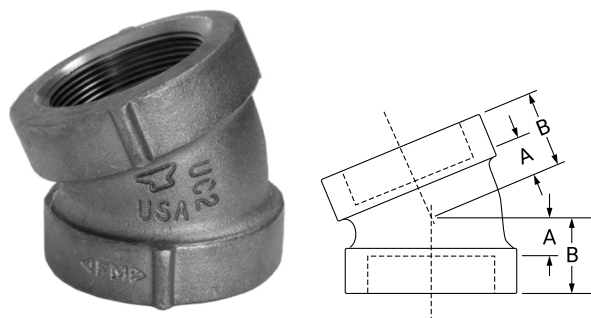
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**Fig. 356A**

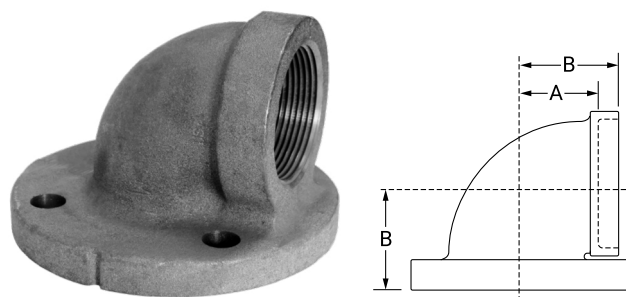
22 1/2° Elbow (Class 125 Standard)



Size	A	B	Unit Weight Black
NPS/DN	In./mm	In./mm	Lbs./kg
3/4	3/8	7/8	0.52
20	10	22	0.24
1	7/16	1	0.80
25	11	25	0.36
1 1/4	1/2	1 1/8	1.40
32	13	29	0.63
1 1/2	5/8	1 1/4	1.64
40	16	32	0.74
2	3/4	1 7/16	2.50
50	19	37	1.13
2 1/2	3/4	1 5/8	3.95
65	19	41	1.79

**Fig. 371**

90° Elbow, Flange & Screw (Class 125 Standard)



Size	A	B	Unit Weight Black
NPS/DN	In./mm	In./mm	Lbs./kg
2 1/2	1 13/16	2 11/16	10.22
65	47	68	4.63
3	2 3/16	3 1/8	13.25
80	56	79	6.01
4	2 11/16	3 13/16	21.56
100	68	98	9.78
6	3 7/8	5 1/8	40.50
150	98	130	18.37

**Notes:**

Nominal Pipe Sizes of 4" (100 DN) and larger have two holes tapped for stud or tap bolts.

**Note:**

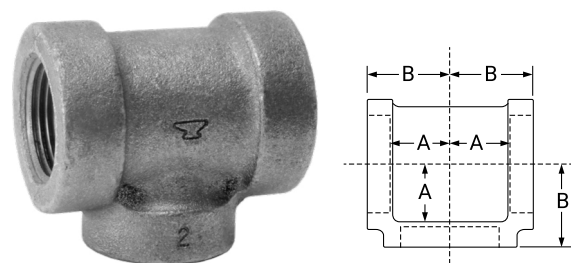
See first page for pressure-temperature ratings.



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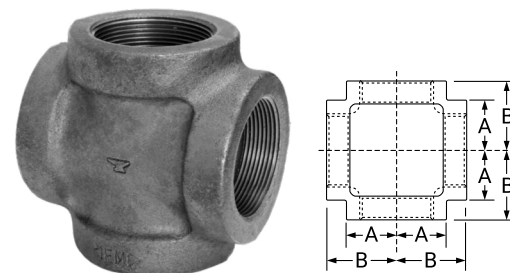
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**Fig. 358**  
Tee



Size	A	B	Unit Weight Black	Size	A	B	Unit Weight Black
NPS/DN	In./mm	In./mm	Lbs./kg	NPS/DN	In./mm	In./mm	Lbs./kg
1/4	1/2	13/16	0.22	2	1 9/16	2 1/4	4.23
8	13	22	0.10	50	40	57	1.92
3/8	5/8	1	0.35	2 1/2	1 13/16	2 11/16	6.67
10	16	25	0.16	65	47	68	3.02
1/2	1 1/16	1 1/8	0.56	3	2 3/16	3 1/8	10.00
15	17	29	0.25	80	56	79	4.54
3/4	1 3/16	1 5/16	0.84	3 1/2	2 7/16	3 7/16	13.29
20	22	33	0.38	90	62	87	6.03
1	1 5/16	1 1/2	1.25	4	2 11/16	3 3/4	16.33
25	24	38	0.57	100	68	95	7.41
1 1/4	1 1/8	1 3/4	2.03	5	3 5/16	4 1/2	27.33
32	29	44	0.92	125	84	114	12.39
1 1/2	1 5/16	1 15/16	2.70	6	3 7/8	5 1/8	40.85
40	33	49	1.22	150	98	130	18.53
<b>Note:</b> See first page for pressure-temperature ratings.				8	5 3/16	6 9/16	79.00
				200	132	167	35.83

**Fig. 360**  
Cross



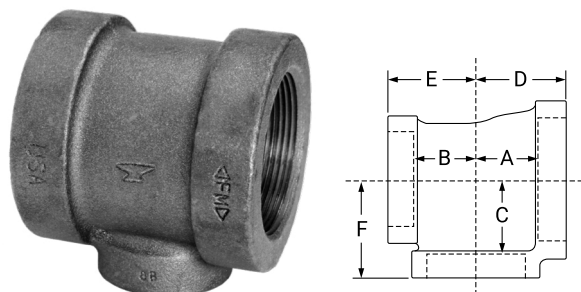
Size	A	B	Unit Weight Black
NPS/DN	In./mm	In./mm	Lbs./kg
1/2	9/16	13/16	2.80
15	14	22	1.27
3/4	1 3/16	1 5/16	1.03
20	22	33	0.47
1	1 5/16	1 1/2	1.59
25	24	38	0.72
1 1/4	1 1/8	1 3/4	2.42
32	29	44	1.10
1 1/2	1 5/16	1 15/16	3.21
40	33	49	1.46
2	1 9/16	2 1/4	5.28
50	40	57	2.39
2 1/2	1 13/16	2 11/16	8.07
65	47	68	3.66
3	2 3/16	3 1/8	11.84
80	56	79	5.37
4	2 3/4	3 13/16	19.63
100	70	98	8.90



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## Reducing Tee (Class 125 Standard) Fig. 359



Size			A	B	C	D	E	F	Unit Weight Black
NPS/DN	NPS/DN	NPS/DN	In./mm	In./mm	In./mm	In./mm	In./mm	In./mm	Lbs./kg
1/2 15	1/2 15	1/4 8	1 1/16 17	11/16 17	13/16 22	1 1/8 29	1 1/8 29	1 1/8 29	0.57 0.26
		3/8 10	1 1/16 17	11/16 17	3/4 19	1 1/8 29	1 1/8 29	1 1/8 29	0.57 0.26
		3/4 20	1 3/16 22	13/16 22	11/16 17	1 1/4 32	1 1/4 32	13/16 22	0.68 0.31
		1 25	1 25	1 25	13/16 22	1 7/16 37	1 7/16 37	1 3/8 35	1.00 0.45
		1/2 15	1 1/16 17	11/16 17	13/16 22	13/16 22	1 1/8 29	1 1/4 32	0.64 0.29
3/4 20	3/4 20	1/2 15	1 1/16 17	11/16 17	13/16 22	13/16 22	1 1/8 29	1 1/4 32	0.75 0.34
		3/4 20	1 3/16 22	13/16 22	13/16 22	15/16 24	1 1/4 32	15/16 24	0.75 0.34
		1 25	1 5/16 24	15/16 24	13/16 22	1 7/16 37	1 7/16 37	1 3/8 35	0.99 0.45
		1/2 15	1 1/16 17	11/16 17	13/16 22	13/16 22	1 1/8 29	1 1/4 32	0.76 0.34
		3/8 10	1 1/16 17	11/16 17	15/16 24	13/16 22	13/16 22	1 1/4 32	0.75 0.34
1 25	1 25	1 25	1 5/16 24	15/16 24	15/16 24	1 1/2 38	1 1/4 32	1 1/2 38	1.08 0.49
		1/2 15	1 1/16 17	11/16 17	13/16 22	1 1/4 32	13/16 22	1 3/8 35	0.90 0.41
		3/4 20	1 3/16 22	13/16 22	15/16 24	1 3/8 35	1 1/4 32	1 7/16 37	0.91 0.41
		1 25	1 5/16 24	15/16 24	15/16 24	1 1/2 38	1 3/8 35	1 1/2 38	1.08 0.49
		1/2 15	1 1/16 17	11/16 17	15/16 24	1 1/4 32	13/16 22	1 3/8 35	0.89 0.40
	3/4 20	3/4 20	1 3/16 22	13/16 22	15/16 24	1 3/8 35	15/16 24	1 7/16 37	1.00 0.45
		1 25	1 5/16 24	15/16 24	15/16 24	1 1/2 38	1 7/16 37	1 1/2 38	1.13 0.51

### Note:

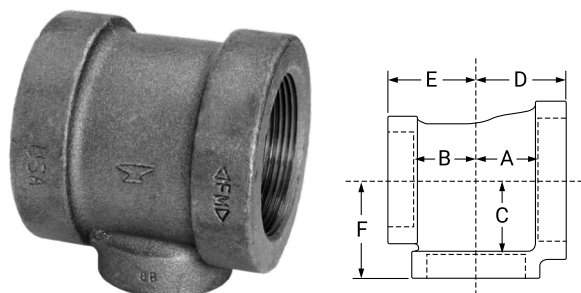
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## Reducing Tee (Class 125 Standard) Fig. 359



Size			A	B	C	D	E	F	Unit Weight Black
NPS/DN	NPS/DN	NPS/DN	ln./mm	ln./mm	ln./mm	ln./mm	ln./mm	ln./mm	Lbs./kg
1 25	1 25	1/4 8	1 1/16 17	11/16 17	1 1/8 29	1 1/8 29	1 1/4 32	1 3/8 35	1.01 0.46
		1/2 15	1 1/16 17	11/16 17	15/16 24	1 1/4 32	1 1/4 32	1 3/8 35	1.01 0.46
		3/4 20	1 3/16 22	13/16 22	15/16 24	1 3/8 35	1 3/8 35	1 7/16 37	1.11 0.50
		1 1/4 32	1 1/8 29	1 1/8 29	15/16 24	1 11/16 43	1 11/16 43	1 9/16 40	1.49 0.68
		1 1/2 40	1 1/4 32	1 1/4 32	1 25	1 13/16 47	1 13/16 47	1 5/8 41	1.84 0.83
		2 50	1 7/16 37	1 7/16 37	1 25	2 50	2 50	1 3/4 44	2.70 1.22
1 1/4 32	1/2 15	1/2 15	1 3/16 22	13/16 22	1 1/8 29	1 7/16 37	15/16 24	1 5/8 41	1.00 0.45
		1 25	1 5/16 24	15/16 24	1 1/8 29	1 9/16 40	1 3/8 35	1 11/16 43	1.38 0.63
		1 1/4 32	1 1/8 29	1 1/8 29	1 1/8 29	1 3/4 44	1 9/16 40	1 3/4 44	1.64 0.74
		3/4 20	1 3/16 22	13/16 22	1 1/8 29	1 7/16 37	15/16 24	1 5/8 41	1.27 0.58
	3/4 20	1 25	1 5/16 24	15/16 24	1 1/8 29	1 9/16 40	1 7/16 37	1 11/16 43	1.43 0.65
		1 1/4 32	1 1/8 29	1 1/8 29	1 1/8 29	1 3/4 44	1 5/8 41	1 3/4 44	1.73 0.78
	1 25	1/2 15	1 1/16 17	11/16 17	1 1/8 29	15/16 24	1 1/4 32	1 9/16 40	1.27 0.58
		3/4 20	1 3/16 22	13/16 22	1 1/8 29	1 7/16 37	1 3/8 35	1 5/8 41	1.36 0.62
		1 25	1 5/16 24	15/16 24	1 1/8 29	1 9/16 40	1 9/16 40	1 11/16 43	1.53 0.69
		1 1/4 32	1 1/8 29	1 1/8 29	1 1/8 29	1 3/4 44	1 11/16 43	1 3/4 44	1.79 0.81
		1 1/2 40	1 1/4 32	1 1/4 32	13/16 22	1 7/8 48	1 13/16 47	1 13/16 47	2.07 0.94

### Note:

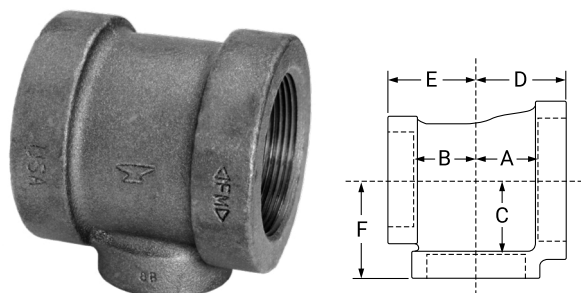
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## Reducing Tee (Class 125 Standard) Fig. 359



Size			A	B	C	D	E	F	Unit Weight Black
NPS/DN	NPS/DN	NPS/DN	ln./mm	ln./mm	ln./mm	ln./mm	ln./mm	ln./mm	Lbs./kg
1 1/4 32	1 25	2 50	1 7/16 37	1 7/16 37	1 3/16 22	2 1/16 52	2 50	1 7/8 48	2.66 1.21
		1/2 15	1 1/16 17	1 1/16 17	1 1/8 29	1 5/16 24	1 5/16 24	1 9/16 40	1.47 0.67
	1 1/4 32	3/4 20	1 3/16 22	1 3/16 22	1 1/8 29	1 7/16 37	1 7/16 37	1 5/8 41	1.57 0.71
		1 25	1 5/16 24	1 5/16 24	1 1/8 29	1 9/16 40	1 9/16 40	1 11/16 43	1.73 0.78
		1 1/2 40	1 1/4 32	1 1/4 32	1 3/16 22	1 7/8 48	1 7/8 48	1 13/16 47	2.29 1.04
		2 50	1 7/16 37	1 7/16 37	1 3/16 22	2 1/16 52	2 1/16 52	1 7/8 48	2.81 1.27
	1/2 15	1 1/4 32	1 3/16 22	1 1/8 29	1 1/4 32	1 13/16 47	1 9/16 40	1 7/8 48	1.93 0.88
		1 1/2 40	1 5/16 24	1 1/4 32	1 5/16 24	1 15/16 49	1 11/16 43	1 15/16 49	2.14 0.97
	3/4 20	1 1/2 40	1 5/16 24	1 1/4 32	1 5/16 24	1 15/16 49	1 3/4 44	1 15/16 49	2.18 0.99
		1/2 15	1 3/16 22	3/4 19	1 1/4 32	1 7/16 37	1 5/16 24	1 11/16 43	1.75 0.79
	1 1/2 40	3/4 20	7/8 22	1 3/16 22	1 1/4 32	1 1/2 38	1 3/8 35	1 3/4 44	1.70 0.77
1 1/2 40	1 25	1 25	1 25	1 5/16 24	1 1/4 32	1 5/8 41	1 1/2 38	1 13/16 47	1.72 0.78
		1 1/4 32	1 3/16 22	1 1/8 29	1 1/4 32	1 13/16 47	1 11/16 43	1 7/8 48	2.08 0.94
		1 1/2 40	1 5/16 24	1 1/4 32	1 5/16 24	1 15/16 49	1 13/16 47	1 15/16 49	2.29 1.04
		2 50	1 1/2 38	1 7/16 37	1 5/16 24	2 1/8 54	2 50	2 51	2.91 1.32
	1 1/4 32	1/2 15	1 3/16 22	1 1/16 17	1 1/4 32	1 7/16 37	1 5/16 24	1 11/16 43	1.67 0.76
		3/4 20	7/8 22	1 3/16 22	1 1/4 32	1 1/2 38	1 7/16 37	1 3/4 44	1.79 0.81

### Note:

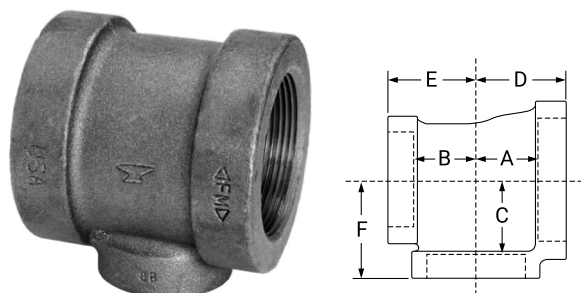
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## Reducing Tee (Class 125 Standard) Fig. 359



Size			A	B	C	D	E	F	Unit Weight Black
NPS/DN	NPS/DN	NPS/DN	ln./mm	ln./mm	ln./mm	ln./mm	ln./mm	ln./mm	Lbs./kg
1 1/2 40	1 1/4 32	1 25	1 25	15/16 24	1 1/4 32	1 5/8 41	1 9/16 40	1 13/16 47	1.97 0.89
		1 1/4 32	13/16 22	1 1/8 29	1 1/4 32	1 13/16 47	1 3/4 44	1 7/8 48	2.28 1.03
		1 1/2 40	15/16 24	1 1/4 32	15/16 24	1 15/16 49	1 7/8 48	1 15/16 49	2.50 1.13
		2 50	1 1/2 38	1 7/16 37	15/16 24	2 1/8 54	2 1/16 52	2 51	3.07 1.39
	1 1/2 40	1/2 15	13/16 22	13/16 22	1 1/4 32	1 7/16 37	1 7/16 37	1 11/16 43	1.84 0.83
		3/4 20	7/8 22	7/8 22	1 1/4 32	1 1/2 38	1 1/2 38	1 3/4 44	1.95 0.88
		1 25	1 25	1 25	1 1/4 32	1 5/8 41	1 5/8 41	1 13/16 47	2.13 0.97
		1 1/4 32	13/16 22	13/16 22	1 1/4 32	1 13/16 47	1 13/16 47	1 7/8 48	2.44 1.11
	1 1/2 40	2 50	1 1/2 38	1 1/2 38	15/16 24	2 1/8 54	2 1/8 54	2 51	3.23 1.46
		2 1/2 65	1 13/16 47	1 13/16 47	15/16 24	2 7/16 62	2 7/16 62	2 3/16 56	4.15 1.88
	1/2 15	1 1/2 40	15/16 24	1 3/8 35	1 1/2 38	2 51	1 13/16 47	2 1/8 54	2.95 1.34
		2 50	1 9/16 40	1 7/16 37	1 9/16 40	2 1/4 57	1 7/8 48	2 1/4 57	3.30 1.50
	3/4 20	1 1/4 32	1 3/16 22	1 1/8 29	1 7/16 37	1 7/8 48	1 3/4 44	2 1/16 52	2.50 1.13
		1 1/2 40	1 5/16 24	15/16 24	1 1/2 38	2 51	1 13/16 47	2 1/8 54	3.40 1.54
		2 50	1 9/16 40	1 7/16 37	1 9/16 40	2 1/4 57	1 15/16 49	2 1/4 57	3.31 1.50
		1 25	11/16 17	11/16 17	1 7/16 37	1 3/4 44	1 5/8 41	2 51	2.70 1.22
2 50	1 25	1 1/4 32	13/16 22	1 1/8 29	1 1/2 38	1 7/8 48	1 3/4 44	2 1/16 52	2.94 1.33

### Note:

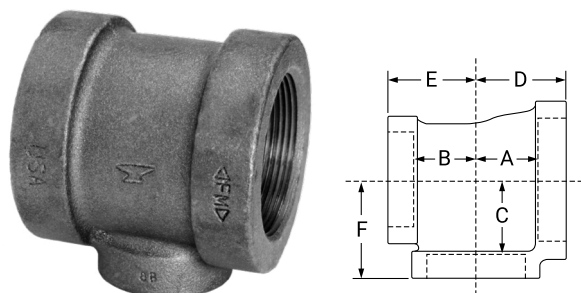
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## Reducing Tee (Class 125 Standard) Fig. 359



Size			A	B	C	D	E	F	Unit Weight Black
NPS/DN	NPS/DN	NPS/DN	ln./mm	ln./mm	ln./mm	ln./mm	ln./mm	ln./mm	Lbs./kg
2 50	1 25	1 1/2 40	15/16 24	1 1/4 32	1 1/2 38	2 51	1 13/16 47	2 1/8 54	2.85 1.29
		2 50	1 9/16 40	1 7/16 37	1 9/16 40	2 1/4 57	2 51	2 1/4 57	3.46 1.57
		2 1/2 65	1 7/8 48	1 13/16 47	1 9/16 40	2 9/16 65	2 3/8 60	2 7/16 62	4.88 2.21
	1 1/4 32	1/2 15	11/16 17	1 25	1 7/16 37	1 3/4 44	1 5/8 41	2 51	2.48 1.12
		3/4 20	7/8 22	7/8 22	1 7/16 37	1 9/16 40	1 1/2 38	1 15/16 49	2.50 1.13
		1 25	11/16 17	1 25	1 7/16 37	1 3/4 44	1 5/8 41	2 51	2.73 1.24
		1 1/4 32	13/16 22	1 1/8 29	1 7/16 37	1 7/8 48	1 3/4 44	2 1/16 52	2.90 1.32
		1 1/2 40	15/16 24	1 1/4 32	1 1/2 38	2 51	1 7/8 48	2 1/8 54	3.13 1.42
		2 50	1 9/16 40	1 7/16 37	1 9/16 40	2 1/4 57	2 1/16 52	2 1/4 57	3.71 1.68
	1 1/2 40	2 1/2 65	1 7/8 48	1 3/4 44	1 9/16 40	2 9/16 65	2 3/8 60	2 7/16 62	4.54 2.06
		1/2 15	13/16 22	13/16 22	1 7/16 37	1 1/2 38	1 7/16 37	1 7/8 48	2.34 1.06
		3/4 20	7/8 22	7/8 22	1 7/16 37	1 9/16 40	1 1/2 38	1 15/16 49	2.46 1.12
		1 25	11/16 17	1 25	1 7/16 37	1 3/4 44	1 5/8 41	2 51	2.66 1.21
		1 1/4 32	13/16 22	13/16 22	1 7/16 37	1 7/8 48	1 13/16 47	2 1/16 52	2.98 1.35
		1 1/2 40	15/16 24	15/16 24	1 1/2 38	2 51	1 15/16 49	2 1/8 54	3.24 1.47
		2 50	1 9/16 40	1 1/2 38	1 9/16 40	2 1/4 57	2 1/8 54	2 1/4 57	3.70 1.68
		2 1/2 65	1 7/8 48	1 15/16 49	1 9/16 40	2 9/16 65	2 9/16 65	2 7/16 62	5.46 2.48

### Note:

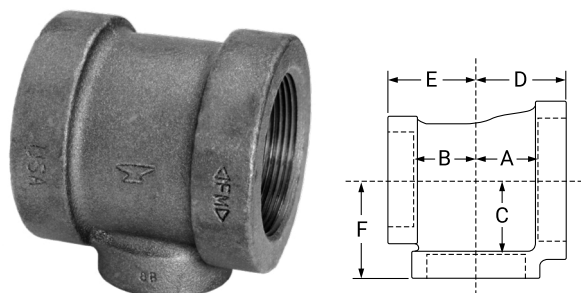
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## Reducing Tee (Class 125 Standard) Fig. 359



Size		A	B	C	D	E	F	Unit Weight		
NPS/DN	NPS/DN	NPS/DN	In./mm	In./mm	In./mm	In./mm	In./mm	Black Lbs./kg		
2 50	2 50	1/2	13/16	13/16	17/16	1 1/2	1 1/2	17/8	2.74	
		15	22	22	37	38	38	48	1.24	
		3/4	7/8	7/8	17/16	1 9/16	1 9/16	1 15/16	2.86	
		20	22	22	37	40	40	49	1.30	
		1	11/16	11/16	17/16	1 3/4	1 3/4	2	3.05	
		25	17	17	37	44	44	51	1.38	
		1 1/4	13/16	13/16	17/16	17/8	17/8	2 1/16	3.38	
		32	22	22	37	48	48	52	1.53	
		1 1/2	15/16	15/16	1 1/2	2	2	2 1/8	3.59	
		40	24	24	38	51	51	54	1.63	
		2 1/2	17/8	17/8	1 9/16	2 9/16	2 9/16	2 7/16	5.17	
		65	48	48	40	65	65	62	2.34	
2 1/2 65	1 1/4 32	3	3	3	2 7/16	3 11/16	3 11/16	3 1/2	7.87	
		100	76	76	62	94	94	89	3.57	
		1/2	2 13/16	2 13/16	2 13/16	2 11/16	2 1/4	2 11/16	5.20	
		15	65	47	47	68	57	68	2.36	
		3/4	2 1/2	1 13/16	1 3/4	1 13/16	2 11/16	2 1/4	2 11/16	5.10
		20	65	47	44	47	68	57	68	2.31
		2	1 9/16	1 9/16	1 7/8	2 7/16	2 1/8	2 9/16	5.03	
		25	40	40	48	62	54	65	2.28	
		2 1/2	1 13/16	1 3/4	1 13/16	2 11/16	2 5/16	2 11/16	5.36	
		65	47	44	47	68	59	68	2.43	
		2	1 9/16	1 1/2	1 7/8	2 7/16	2 1/8	2 9/16	4.96	
		50	40	38	48	62	54	65	2.25	
2 1/2 65	1 1/2 40	2 1/2	1 13/16	1 3/4	1 13/16	2 11/16	2 3/8	2 11/16	5.40	
		65	47	44	47	68	60	68	2.45	
		1 1/2	15/16	15/16	1 13/16	2 13/16	1 15/16	2 7/16	4.23	
		40	24	22	47	56	49	62	1.92	
		2	1 9/16	1 1/2	1 7/8	2 7/16	2 1/8	2 9/16	4.85	
		50	40	38	48	62	54	65	2.20	
		2 1/2	1 13/16	1 13/16	1 13/16	2 11/16	2 7/16	2 11/16	4.85	
		65	47	47	47	68	62	68	2.20	
		2	1/2	3/4	13/16	1 3/4	1 1/2	2 3/16	5.82	
		50	15	19	22	44	43	38	56	2.64

### Note:

See first page for pressure-temperature ratings.

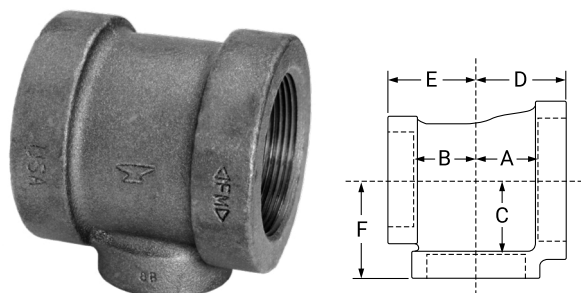


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## Reducing Tee (Class 125 Standard) Fig. 359



Size			A	B	C	D	E	F	Unit Weight Black
NPS/DN	NPS/DN	NPS/DN	ln./mm	ln./mm	ln./mm	ln./mm	ln./mm	ln./mm	Lbs./kg
2 1/2 65	2 50	3/4	7/8	7/8	1 3/4	1 3/4	1 9/16	2 1/4	3.62
		20	22	22	44	44	40	57	1.64
		1	1	1 1/16	1 3/4	1 15/16	1 3/4	2 5/16	3.92
		25	25	17	44	49	44	59	1.78
		1 1/4	1 3/16	1 3/16	1 3/4	2 1/16	1 7/8	2 3/8	4.26
		32	22	22	44	52	48	60	1.93
		1 1/2	1 5/16	1 5/16	1 13/16	2 3/16	2	2 7/16	4.42
		40	24	24	47	56	51	62	2.00
	2 1/2 65	2	1 9/16	1 9/16	1 7/8	2 7/16	2 1/4	2 9/16	5.17
		50	40	40	48	62	57	65	2.34
		2 1/2	1 13/16	1 7/8	1 13/16	2 11/16	2 9/16	2 11/16	6.00
		65	47	48	47	68	65	68	2.72
		3	2 1/16	2 1/8	1 7/8	3	2 7/8	2 13/16	7.35
		80	52	54	48	80	73	73	3.33
		1/2	3/4	3/4	1 3/4	1 11/16	1 11/16	2 3/16	4.00
		15	19	19	44	43	43	56	1.81
	2 1/2 65	3/4	7/8	7/8	1 3/4	1 3/4	1 3/4	2 1/4	4.29
		20	22	22	44	44	44	57	1.95
		1	1	1	1 3/4	1 15/16	1 15/16	2 5/16	4.48
		25	25	25	44	49	49	59	2.03
		1 1/4	1 3/16	1 3/16	1 3/4	2 1/16	2 1/16	2 3/8	4.83
		32	22	22	44	52	52	60	2.19
		1 1/2	1 5/16	1 5/16	1 13/16	2 3/16	2 3/16	2 7/16	5.14
		40	24	24	47	56	56	62	2.33
3 80	2 1/2 65	2	1 9/16	1 9/16	1 7/8	2 7/16	2 7/16	2 9/16	5.88
		50	40	40	48	62	62	65	2.67
		3	2 1/16	2 1/16	1 7/8	3	3	2 13/16	8.09
		80	52	52	48	80	80	73	3.67
		4	2 3/4	2 13/16	2 7/16	3 11/16	3 11/16	3 1/2	14.03
		100	70	73	62	94	94	89	6.36
3 80	3 80	3/4	2 1/8	2 1/8	2 1/8	3 1/8	2 11/16	3 1/8	8.25
		20	54	54	54	79	68	79	3.74
3 80	3 80	1	2 1/8	2 1/8	2 1/8	3 1/8	2 11/16	3 1/8	8.30
		25	54	54	54	79	68	79	3.76

### Note:

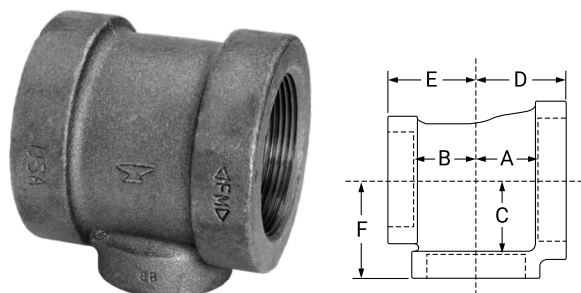
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## Reducing Tee (Class 125 Standard) Fig. 359



Size			A	B	C	D	E	F	Unit Weight Black
NPS/DN	NPS/DN	NPS/DN	ln./mm	ln./mm	ln./mm	ln./mm	ln./mm	ln./mm	Lbs./kg
3 80	1 1/4 32	3 80	2 1/8 54	2 1/8 54	2 1/8 54	3 1/8 79	2 13/16 73	3 1/8 79	8.46 3.84
	1 1/2 40	3 80	2 1/8 54	2 3/16 56	2 1/8 54	3 1/8 79	2 13/16 73	3 1/8 79	8.13 3.69
	2 50	1 1/2 40	1 3/8 35	1 1/2 38	2 3/16 56	2 5/16 59	2 3/16 56	2 13/16 73	6.83 3.10
		2 50	1 9/16 40	1 9/16 40	2 3/16 56	2 9/16 65	2 1/4 57	2 15/16 75	7.29 3.31
		2 1/2 65	1 7/8 48	1 15/16 49	2 1/8 54	2 13/16 73	2 9/16 65	3 1/16 78	7.10 3.22
		3 80	2 1/8 54	2 3/16 56	2 1/8 54	3 1/8 79	2 15/16 75	3 1/8 79	8.79 3.99
	2 1/2 65	1 25	1 25	15/16 24	2 1/8 54	2 1/16 52	1 15/16 49	2 11/16 68	5.51 2.50
		1 1/4 32	1 1/4 32	13/16 22	2 1/8 54	2 3/16 56	2 1/16 52	2 3/4 70	5.92 2.68
		1 1/2 40	1 3/8 35	15/16 24	2 3/16 56	2 5/16 59	2 3/16 56	2 13/16 73	6.23 2.83
		2 50	1 9/16 40	1 1/2 38	2 3/16 56	2 9/16 65	2 7/16 62	2 15/16 75	6.81 3.09
		2 1/2 65	1 7/8 48	1 13/16 47	2 1/8 54	2 13/16 73	2 11/16 68	3 1/16 78	7.66 3.47
		3 80	2 1/8 54	2 1/8 54	2 1/8 54	3 1/8 79	3 1/16 78	3 1/8 79	9.13 4.14
	3 80	1/2 15	15/16 24	15/16 24	2 3/16 56	1 7/8 48	1 7/8 48	2 5/8 67	6.08 2.76
		3/4 20	15/16 24	15/16 24	2 1/8 54	1 7/8 48	1 7/8 48	2 5/8 67	6.06 2.75
		1 25	1 25	1 25	2 1/8 54	2 1/16 52	2 1/16 52	2 11/16 68	6.27 2.84
		1 1/4 32	1 1/4 32	1 1/4 32	2 1/8 54	2 3/16 56	2 3/16 56	2 3/4 70	6.75 3.06
		1 1/2 40	1 3/8 35	1 3/8 35	2 3/16 56	2 5/16 59	2 5/16 59	2 15/16 75	7.10 3.22

### Note:

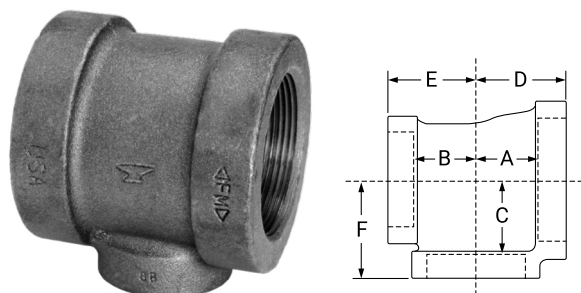
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## Reducing Tee (Class 125 Standard) Fig. 359



Size			A	B	C	D	E	F	Unit Weight Black
NPS/DN	NPS/DN	NPS/DN	ln./mm	ln./mm	ln./mm	ln./mm	ln./mm	ln./mm	Lbs./kg
3 80	3 80	2 50	1 <sup>9</sup> / <sub>16</sub> 40	1 <sup>9</sup> / <sub>16</sub> 40	2 <sup>3</sup> / <sub>16</sub> 56	2 <sup>9</sup> / <sub>16</sub> 65	2 <sup>9</sup> / <sub>16</sub> 65	2 <sup>7</sup> / <sub>8</sub> 73	7.75 3.51
		2 <sup>1</sup> / <sub>2</sub> 65	1 <sup>7</sup> / <sub>8</sub> 48	1 <sup>7</sup> / <sub>8</sub> 48	2 <sup>1</sup> / <sub>8</sub> 54	2 <sup>13</sup> / <sub>16</sub> 73	2 <sup>13</sup> / <sub>16</sub> 73	3 <sup>1</sup> / <sub>16</sub> 78	8.92 4.05
		4 100	2 <sup>11</sup> / <sub>16</sub> 68	2 <sup>11</sup> / <sub>16</sub> 68	2 <sup>7</sup> / <sub>16</sub> 62	3 <sup>11</sup> / <sub>16</sub> 94	3 <sup>11</sup> / <sub>16</sub> 94	3 <sup>1</sup> / <sub>2</sub> 89	12.80 5.80
3 <sup>1</sup> / <sub>2</sub> 90	3 <sup>1</sup> / <sub>2</sub> 90	1 <sup>1</sup> / <sub>2</sub> 40	1 <sup>3</sup> / <sub>8</sub> 35	1 <sup>3</sup> / <sub>8</sub> 35	2 <sup>7</sup> / <sub>16</sub> 62	2 <sup>3</sup> / <sub>8</sub> 60	2 <sup>3</sup> / <sub>8</sub> 60	3 <sup>1</sup> / <sub>16</sub> 78	8.87 4.02
		2 50	1 <sup>5</sup> / <sub>8</sub> 41	1 <sup>5</sup> / <sub>8</sub> 41	2 <sup>7</sup> / <sub>16</sub> 62	2 <sup>5</sup> / <sub>8</sub> 67	2 <sup>5</sup> / <sub>8</sub> 67	3 <sup>3</sup> / <sub>16</sub> 81	9.94 4.51
		4 100	2 <sup>3</sup> / <sub>4</sub> 70	2 <sup>15</sup> / <sub>16</sub> 75	2 <sup>3</sup> / <sub>4</sub> 70	3 <sup>3</sup> / <sub>4</sub> 95	3 <sup>1</sup> / <sub>2</sub> 89	3 <sup>3</sup> / <sub>4</sub> 95	13.52 6.13
4 100	1 25	4 100	2 <sup>3</sup> / <sub>4</sub> 70	2 <sup>15</sup> / <sub>16</sub> 75	2 <sup>3</sup> / <sub>4</sub> 70	3 <sup>3</sup> / <sub>4</sub> 95	3 <sup>1</sup> / <sub>2</sub> 89	3 <sup>3</sup> / <sub>4</sub> 95	13.47 6.11
		1 <sup>1</sup> / <sub>2</sub> 40	2 <sup>3</sup> / <sub>4</sub> 70	2 <sup>7</sup> / <sub>8</sub> 73	2 <sup>3</sup> / <sub>4</sub> 70	3 <sup>3</sup> / <sub>4</sub> 95	3 <sup>1</sup> / <sub>2</sub> 89	3 <sup>3</sup> / <sub>4</sub> 95	11.34 5.14
	2 50	2 50	1 <sup>11</sup> / <sub>16</sub> 43	1 <sup>7</sup> / <sub>8</sub> 48	2 <sup>3</sup> / <sub>4</sub> 70	2 <sup>11</sup> / <sub>16</sub> 68	2 <sup>9</sup> / <sub>16</sub> 65	3 <sup>1</sup> / <sub>2</sub> 89	13.89 6.30
		4 100	2 <sup>3</sup> / <sub>4</sub> 70	2 <sup>3</sup> / <sub>4</sub> 70	2 <sup>3</sup> / <sub>4</sub> 70	3 <sup>3</sup> / <sub>4</sub> 95	3 <sup>1</sup> / <sub>2</sub> 89	3 <sup>3</sup> / <sub>4</sub> 95	11.78 5.34
	2 <sup>1</sup> / <sub>2</sub> 65	2 <sup>1</sup> / <sub>2</sub> 65	1 <sup>7</sup> / <sub>8</sub> 48	1 <sup>13</sup> / <sub>16</sub> 47	2 <sup>5</sup> / <sub>8</sub> 67	2 <sup>15</sup> / <sub>16</sub> 75	2 <sup>13</sup> / <sub>16</sub> 73	3 <sup>9</sup> / <sub>16</sub> 90	15.75 7.14
		4 100	2 <sup>3</sup> / <sub>4</sub> 70	2 <sup>3</sup> / <sub>4</sub> 70	2 <sup>3</sup> / <sub>4</sub> 70	3 <sup>3</sup> / <sub>4</sub> 95	3 <sup>5</sup> / <sub>8</sub> 92	3 <sup>3</sup> / <sub>4</sub> 95	11.25 5.10
	3 80	2 <sup>1</sup> / <sub>2</sub> 65	1 <sup>7</sup> / <sub>8</sub> 48	1 <sup>7</sup> / <sub>8</sub> 48	2 <sup>5</sup> / <sub>8</sub> 67	2 <sup>15</sup> / <sub>16</sub> 75	2 <sup>13</sup> / <sub>16</sub> 73	3 <sup>9</sup> / <sub>16</sub> 90	12.50 5.67
		3 80	2 <sup>1</sup> / <sub>4</sub> 57	2 <sup>1</sup> / <sub>8</sub> 54	2 <sup>11</sup> / <sub>16</sub> 68	3 <sup>1</sup> / <sub>4</sub> 83	3 <sup>1</sup> / <sub>8</sub> 79	3 <sup>5</sup> / <sub>8</sub> 92	15.04 6.82
		4 100	2 <sup>3</sup> / <sub>4</sub> 70	2 <sup>11</sup> / <sub>16</sub> 68	2 <sup>3</sup> / <sub>4</sub> 70	3 <sup>3</sup> / <sub>4</sub> 95	3 <sup>5</sup> / <sub>8</sub> 92	3 <sup>3</sup> / <sub>4</sub> 95	10.40 4.72
	4 100	1 25	1 <sup>3</sup> / <sub>16</sub> 22	1 <sup>3</sup> / <sub>16</sub> 22	2 <sup>3</sup> / <sub>4</sub> 70	2 <sup>5</sup> / <sub>16</sub> 59	2 <sup>5</sup> / <sub>16</sub> 59	3 <sup>5</sup> / <sub>16</sub> 84	10.38 4.71
		1 <sup>1</sup> / <sub>4</sub> 32	1 <sup>5</sup> / <sub>16</sub> 24	1 <sup>5</sup> / <sub>16</sub> 24	2 <sup>5</sup> / <sub>8</sub> 67	2 <sup>5</sup> / <sub>16</sub> 59	2 <sup>5</sup> / <sub>16</sub> 59	3 <sup>5</sup> / <sub>16</sub> 84	10.75 4.88
		1 <sup>1</sup> / <sub>2</sub> 40	1 <sup>7</sup> / <sub>16</sub> 37	1 <sup>7</sup> / <sub>16</sub> 37	2 <sup>11</sup> / <sub>16</sub> 68	2 <sup>7</sup> / <sub>16</sub> 62	2 <sup>7</sup> / <sub>16</sub> 62	3 <sup>5</sup> / <sub>16</sub> 84	

### Note:

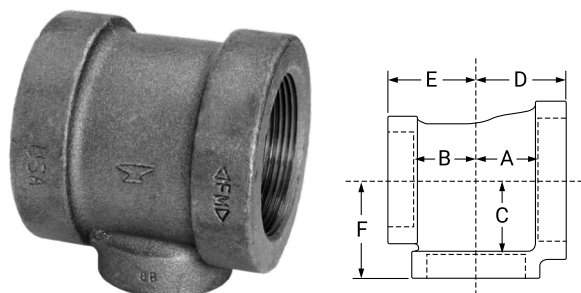
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## Reducing Tee (Class 125 Standard) Fig. 359



Size			A	B	C	D	E	F	Unit Weight Black
NPS/DN	NPS/DN	NPS/DN	ln./mm	ln./mm	ln./mm	ln./mm	ln./mm	ln./mm	Lbs./kg
4 100	4 100	2	1 <sup>11</sup> / <sub>16</sub>	1 <sup>11</sup> / <sub>16</sub>	2 <sup>3</sup> / <sub>4</sub>	2 <sup>11</sup> / <sub>16</sub>	2 <sup>11</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>2</sub>	11.63
		50	43	43	70	68	68	89	5.27
		2 <sup>1</sup> / <sub>2</sub>	2	2	2 <sup>5</sup> / <sub>8</sub>	2 <sup>15</sup> / <sub>16</sub>	2 <sup>15</sup> / <sub>16</sub>	3 <sup>9</sup> / <sub>16</sub>	12.85
		65	51	51	67	75	75	90	5.83
		3	2 <sup>1</sup> / <sub>4</sub>	2 <sup>1</sup> / <sub>4</sub>	2 <sup>11</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>4</sub>	3 <sup>5</sup> / <sub>8</sub>	14.12
		80	57	57	68	83	83	92	6.40
5 125	5 125	5	3 <sup>3</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>8</sub>	2 <sup>13</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>8</sub>	4	20.88
		125	86	86	73	111	111	102	9.47
		6	3 <sup>7</sup> / <sub>8</sub>	3 <sup>7</sup> / <sub>8</sub>	2 <sup>7</sup> / <sub>8</sub>	4 <sup>15</sup> / <sub>16</sub>	4 <sup>15</sup> / <sub>16</sub>	4 <sup>1</sup> / <sub>16</sub>	26.36
		150	98	98	73	125	125	103	11.95
		2	1 <sup>3</sup> / <sub>4</sub>	1 <sup>3</sup> / <sub>4</sub>	3 <sup>7</sup> / <sub>16</sub>	2 <sup>15</sup> / <sub>16</sub>	2 <sup>15</sup> / <sub>16</sub>	4 <sup>1</sup> / <sub>8</sub>	17.43
		50	44	44	87	75	75	105	7.90
6 150	6 150	3	2 <sup>5</sup> / <sub>16</sub>	2 <sup>5</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>2</sub>	3 <sup>1</sup> / <sub>2</sub>	4 <sup>1</sup> / <sub>4</sub>	20.00
		80	59	59	83	89	89	108	9.07
		4	2 <sup>13</sup> / <sub>16</sub>	2 <sup>13</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>8</sub>	4	4	4 <sup>3</sup> / <sub>8</sub>	23.83
		100	71	71	86	102	102	111	10.81
		4	2 <sup>7</sup> / <sub>8</sub>	2 <sup>13</sup> / <sub>16</sub>	3 <sup>7</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>16</sub>	4	4 <sup>15</sup> / <sub>16</sub>	30.00
		100	73	71	98	103	102	125	13.61
6 150	6 150	2 <sup>1</sup> / <sub>2</sub>	2	2	3 <sup>13</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>4</sub>	4 <sup>3</sup> / <sub>4</sub>	25.67
		65	51	51	97	83	83	121	11.64
		3	2 <sup>3</sup> / <sub>8</sub>	2 <sup>3</sup> / <sub>8</sub>	3 <sup>13</sup> / <sub>16</sub>	3 <sup>9</sup> / <sub>16</sub>	3 <sup>9</sup> / <sub>16</sub>	4 <sup>13</sup> / <sub>16</sub>	27.46
		80	60	60	97	90	90	122	12.45
		4	2 <sup>7</sup> / <sub>8</sub>	2 <sup>7</sup> / <sub>8</sub>	3 <sup>7</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>16</sub>	4 <sup>1</sup> / <sub>16</sub>	4 <sup>15</sup> / <sub>16</sub>	32.44
		100	73	73	98	103	103	125	14.71
6 150	6 150	5	3 <sup>3</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>8</sub>	3 <sup>13</sup> / <sub>16</sub>	4 <sup>5</sup> / <sub>8</sub>	4 <sup>5</sup> / <sub>8</sub>	5	37.00
		125	86	86	97	117	117	127	16.78

### Note:

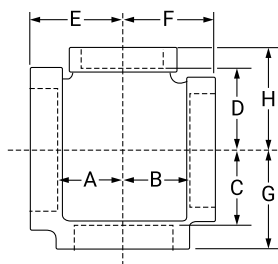
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## Reducing Cross (Class 125 Standard) Fig. 361



2 NPS  
3 NPS — 2 1/2 NPS  
1 1/4 NPS

Read as:  
3 x 2 1/2 x 2 x 1 1/4

50 DN  
80 DN — 65 DN  
32 DN

Read as:  
80 x 65 x 50 x 32

Size				A	B	C	D	E, F	G, H	Unit Weight
NPS/DN	NPS/DN	NPS/DN	NPS/DN	In./mm	In./mm	In./mm	In./mm	In./mm	In./mm	Lbs./kg
1 25	1 25	3/4 20	3/4 20	13/16 22	13/16 22	15/16 24	15/16 24	1 3/8 35	1 7/16 37	1.30 0.59
1 1/4 32	1 1/4 32	1 25	1 25	15/16 24	15/16 24	1 1/8 29	1 1/8 29	1 9/16 40	1 11/16 43	2.04 0.93
1 1/2 40	1 25	1 25	1 25	1 25	1 1/8 29	1 1/4 32	1 1/4 32	1 5/8 41	1 13/16 47	2.74 1.24
		1 1/4 32	1 25	1 25	1 25	1 1/4 32	1 1/4 32	1 5/8 41	1 13/16 47	2.67 1.21
	1 1/2 40	1 25	1 25	1 25	1 25	1 1/4 32	1 1/4 32	1 5/8 41	1 13/16 47	2.51 1.14
		1 1/4 32	1 25	1 1/8 29	1 1/8 29	1 3/16 22	15/16 24	1 13/16 47	1 7/8 48	3.90 1.77
			1 1/4 32	1 1/8 29	1 1/8 29	1 3/8 35	1 3/8 35	1 13/16 47	1 7/8 48	3.95 1.79
		1 25	1 25	11/16 17	1 1/8 29	1 7/16 37	1 7/16 37	1 3/4 44	2 51	3.57 1.62
2 50	1 1/2 40	1 25	1 25	1 1/8 29	13/16 22	1 1/2 38	1 7/16 37	1 7/8 48	2 1/8 54	4.25 1.93
		1 1/4 32	1 1/4 32	13/16 22	13/16 22	1 1/2 38	1 1/2 38	1 7/8 48	2 1/16 52	4.18 1.90
	2 50	1 25	1 25	11/16 17	11/16 17	1 7/16 37	1 7/16 37	1 3/4 44	2 51	3.22 1.46
		1 1/4 32	1 1/4 32	1 1/8 29	1 1/8 29	1 7/16 37	1 7/16 37	1 7/8 48	2 1/8 54	4.00 1.81
		1 25	1 25	11/16 17	11/16 17	1 7/16 37	1 7/16 37	1 3/4 44	2 51	3.22 1.46
		1 1/4 32	1 1/4 32	1 1/8 29	1 1/8 29	1 7/16 37	1 7/16 37	1 7/8 48	2 1/8 54	4.00 1.81

### Note:

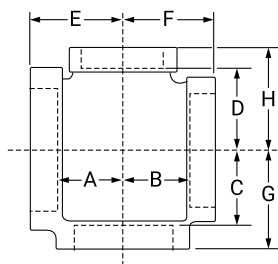
See first page for pressure-temperature ratings.



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## Reducing Cross (Class 125 Standard) Fig. 361



2 NPS  
3 NPS — 2 1/2 NPS  
1 1/4 NPS

Read as:  
3 x 2 1/2 x 2 x 1 1/4

50 DN  
80 DN — 65 DN  
32 DN

Read as:  
80 x 65 x 50 x 32

Size				A	B	C	D	E, F	G, H	Unit Weight
NPS/DN	NPS/DN	NPS/DN	NPS/DN	In./mm	In./mm	In./mm	In./mm	In./mm	In./mm	Lbs./kg
2 50	2 50	1 1/2 40	1 1/2 40	1 1/4 32	1 1/4 32	1 7/16 37	1 7/16 37	2 51	2 1/8 54	4.08 1.85
2 1/2 65	2 50	1 25	1 25	1 25	1 1/16 17	1 3/16 47	1 3/16 47	1 15/16 49	2 5/16 59	5.11 2.32
		1 1/2 40	1 1/2 40	1 1/4 32	1 5/16 24	1 7/8 48	1 7/8 48	2 3/16 56	2 7/16 62	6.13 2.78
		2 50	2 50	1 1/2 38	1 3/4 44	1 7/8 48	1 7/8 48	2 7/16 62	2 9/16 65	7.23 3.28
		1 1/4 32	1 25	1 3/16 22	1 3/16 22	1 3/4 44	1 13/16 47	2 1/16 52	2 3/8 60	5.39 2.44
	2 1/2 65	1 1/4 32	1 1/4 32	1 1/8 29	1 1/8 29	1 13/16 47	1 13/16 47	2 1/16 52	2 3/8 60	5.26 2.39
		1 1/2 40	1 1/2 40	1 1/4 32	1 1/4 32	1 7/8 48	1 7/8 48	2 3/16 56	2 7/16 62	5.68 2.58
		2 50	2 50	1 9/16 40	1 9/16 40	1 15/16 49	1 15/16 49	2 7/16 62	2 9/16 65	6.82 3.09
		1 1/2 40	1 1/2 40	1 3/8 35	1 3/8 35	2 3/16 56	2 3/16 56	2 5/16 59	2 13/16 73	7.91 3.59
3 80	3 80	2 50	2 50	1 5/8 41	1 5/8 41	2 3/16 56	2 3/16 56	2 9/16 65	2 15/16 75	8.85 4.01
4 100	4 100	2 50	2 50	2 50	2 50	2 11/16 68	2 11/16 68	2 3/4 70	3 7/16 87	12.00 5.44

### Note:

See first page for pressure-temperature ratings.

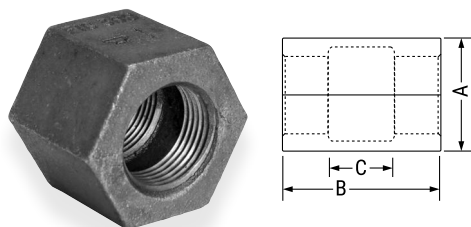


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## Screwed Hex Coupling (Class 125 Standard)

**Fig. 366**



Size	Across Flats A	B	C	Unit Weight
				Black
NPS/DN	In./mm	In./mm	In./mm	Lbs./kg
1	1 15/16	1 11/16	9/16	0.82
25	49	43	14	0.37

## Flanged Union Gasket Type (Class 125 Standard)

Assembled with gaskets

**Fig. 487**



Size	Diam. of Flanges	No. of Bolts	Unit Weight		Size	Diam. of Flanges	No. of Bolts	Unit Weight	
			Black	Galvanized				Black	Galvanized
NPS/DN	In./mm		Lbs./kg	Lbs./kg	NPS/DN	In./mm		Lbs./kg	Lbs./kg
3/4	3	3	2.00	2.00	3	6 3/8	4	11.00	11.00
20	76	3	0.91	0.91	80	162	4	4.99	4.99
1	3 1/4	3	2.25	2.25	3 1/2	6 7/8	4	12.75	—
25	83	3	1.02	1.02	90	175	4	5.78	—
1 1/4	4 3/16	4	4.75	4.75	4	7 11/16	5	18.00	18.00
32	106	4	2.15	2.15	100	195	5	8.16	8.16
1 1/2	4 3/8	4	5.00	5.00	5	8 15/16	5	22.00	—
40	111	4	2.27	2.27	125	227	5	9.98	—
2	5	4	6.50	6.50	6	10 1/4	6	30.00	30.00
50	127	4	2.95	2.95	150	260	6	13.61	13.61
2 1/2	5 5/8	4	8.50	8.50	8	12 15/16	8	51.00	51.00
65	143	4	3.85	3.85	200	329	8	23.13	23.13

**Note:**

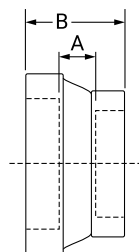
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## Concentric Reducer (Class 125 Standard) Fig. 367



Size		A	B*	Unit Weight Black					
NPS/DN	NPS/DN	In./mm	In./mm	Lbs./kg	NPS/DN	NPS/DN	In./mm	In./mm	Lbs./kg
3/4	1/2	5/8	1 9/16	0.40	2	1/2	5/8	2	2.00
20	15	16	40	0.18		15	16	51	0.91
1	1/2 (Hex)	11/16	1 11/16	0.54		3/4	3/4	2	1.90
	15	17	43	0.24		20	19	51	0.86
25	3/4 (Hex)	7/16	1 1/2	0.63	50	1	3/4	2	1.83
	20	11	38	0.29		25	19	51	0.83
1 1/4	1/2	9/16	1 5/8	0.84		1 1/4	13/16	2 1/8	1.78
	15	14	41	0.38		32	22	54	0.81
	3/4	1	2 1/8	0.90		1 1/2	7/8	2 3/16	1.98
	20	25	54	0.41		40	22	56	0.90
1 1/2	1	15/16	2 1/8	1.07	2 1/2	1 1/2	3/4	2	3.10
	25	24	54	0.49		40	19	51	1.41
40	1/2	1/2	1 5/8	1.00		2	1	2 9/16	2.98
	15	13	41	0.45		50	25	65	1.35
	3/4	1/2	1 5/8	1.20		3/4	15/16	2 1/2	4.31
	20	13	41	0.54		20	24	64	1.95
	1	1/2	1 3/4	1.50	3	2	1 1/16	2 3/4	3.96
1 1/2	25	13	44	0.68		50	27	70	1.80
	1 1/4	1	2 1/4	1.45		2 1/2	15/16	2 13/16	4.40
	32	25	57	0.66		65	24	73	2.00

### Note:

\* Dimension "B" does not conform to ASME standard.

See first page for pressure-temperature ratings.



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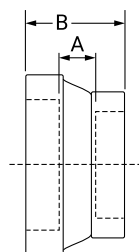
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## Concentric Reducer (Class 125 Standard)

### Fig. 367

(Continued)



Size		A	B*	Unit Weight Black	Size		A	B*	Unit Weight Black
NPS/DN	NPS/DN	In./mm	In./mm	Lbs./kg	NPS/DN	NPS/DN	In./mm	In./mm	Lbs./kg
4 100	2 50	1 <sup>3</sup> / <sub>16</sub> 30	2 <sup>15</sup> / <sub>16</sub> 75	6.50 2.95	6 150	4 100	1 <sup>1</sup> / <sub>8</sub> 29	3 <sup>7</sup> / <sub>16</sub> 87	13.83 6.27
	2½ 65	1 <sup>3</sup> / <sub>16</sub> 30	3 <sup>1</sup> / <sub>8</sub> 79	7.78 3.53		5 125	1 <sup>1</sup> / <sub>8</sub> 29	3 <sup>9</sup> / <sub>16</sub> 90	15.53 7.04
	3 80	1 <sup>1</sup> / <sub>16</sub> 27	3 <sup>1</sup> / <sub>8</sub> 79	7.01 3.18	8 200	6 150	1 <sup>1</sup> / <sub>4</sub> 32	3 <sup>7</sup> / <sub>8</sub> 98	29.10 13.20
5 125	4 100	1 <sup>1</sup> / <sub>16</sub> 27	3 <sup>5</sup> / <sub>16</sub> 84	10.48 4.75					

**Note:**

\* Dimension "B" does not conform to ASME standard.

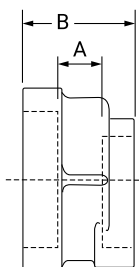
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## Eccentric Reducer (Class 125 Standard) Fig. 368



Size		A	B*	Unit Weight Black	Size		A	B*	Unit Weight Black
NPS/DN	NPS/DN	In./mm	In./mm	Lbs./kg	NPS/DN	NPS/DN	In./mm	In./mm	Lbs./kg
$\frac{3}{4}$ 20	$\frac{1}{2}$ 15	$\frac{9}{16}$ 14	$1\frac{1}{2}$ 38	0.45 0.20	2 50	$\frac{1}{2}$ 15	$\frac{3}{4}$ 19	$1\frac{15}{16}$ 49	1.80 0.82
	$\frac{1}{2}$ 15	$\frac{1}{2}$ 13	$1\frac{7}{16}$ 37	0.57 0.26		$\frac{3}{4}$ 20	$\frac{3}{4}$ 19	2 51	1.83 0.83
1 25	$\frac{3}{4}$ 20	$\frac{7}{16}$ 11	$1\frac{1}{2}$ 38	0.61 0.28		1 25	$1\frac{1}{16}$ 17	$2\frac{1}{16}$ 52	1.86 0.84
	$\frac{1}{2}$ 15	$\frac{9}{16}$ 14	$1\frac{5}{8}$ 41	1.00 0.45		$1\frac{1}{4}$ 32	$1\frac{3}{16}$ 22	$2\frac{1}{8}$ 54	1.87 0.85
$1\frac{1}{4}$ 32	$\frac{3}{4}$ 20	$\frac{1}{2}$ 13	$1\frac{5}{8}$ 41	0.90 0.41	$2\frac{1}{2}$ 65	$1\frac{1}{2}$ 40	$\frac{7}{8}$ 22	$2\frac{3}{16}$ 56	1.93 0.88
	1 25	$\frac{1}{2}$ 13	$1\frac{11}{16}$ 43	1.00 0.45		1 25	$1\frac{3}{16}$ 22	$2\frac{1}{4}$ 57	2.74 1.24
$1\frac{1}{2}$ 40	$\frac{1}{2}$ 15	$1\frac{1}{16}$ 17	$1\frac{3}{4}$ 44	1.11 0.50		$1\frac{1}{4}$ 32	$\frac{7}{8}$ 22	$2\frac{3}{8}$ 60	2.80 1.27
	$\frac{3}{4}$ 20	$\frac{9}{16}$ 14	$1\frac{11}{16}$ 43	1.17 0.53		$1\frac{1}{2}$ 40	$\frac{7}{8}$ 22	$2\frac{3}{8}$ 60	2.94 1.33
	1 25	$\frac{9}{16}$ 14	$1\frac{3}{4}$ 44	1.21 0.55		2 50	1 25	$2\frac{9}{16}$ 65	2.95 1.34
	$1\frac{1}{4}$ 32	$\frac{5}{8}$ 16	$1\frac{7}{8}$ 48	1.26 0.57	3 80	1 25	$\frac{7}{8}$ 22	$2\frac{7}{16}$ 62	3.95 1.79

### Note:

\* Dimension "B" does not conform to ASME standard.

See first page for pressure-temperature ratings.



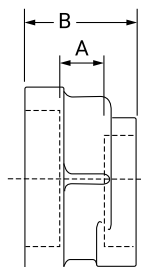
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## Eccentric Reducer (Class 125 Standard)

### Fig. 368

(Continued)



Size		A	B*	Unit Weight Black	Size		A	B*	Unit Weight Black
NPS/DN	NPS/DN	In./mm	In./mm	Lbs./kg	NPS/DN	NPS/DN	In./mm	In./mm	Lbs./kg
3 80	1 1/4 32	15/16 24	2 9/16 65	3.80 1.72	4 100	2 1/2 65	1 1/8 29	3 1/16 78	7.26 3.29
	1 1/2 40	15/16 24	2 9/16 65	4.16 1.89		3 80	1 1/16 27	3 1/8 79	7.64 3.46
	2 50	1 1/16 27	2 3/4 70	4.61 2.09		3 80	1 1/16 27	3 1/4 83	11.44 5.19
	2 1/2 65	15/16 24	2 13/16 73	4.80 2.18		4 100	1 1/16 27	3 5/16 84	11.19 5.07
4 100	1 1/4 32	1 1/16 27	2 3/4 70	6.58 2.98	6 150	3 80	1 1/16 27	3 5/16 84	14.66 6.65
	1 1/2 40	1 1/8 29	2 13/16 73	6.61 3.00		4 100	1 1/8 29	3 7/16 87	15.36 6.97
	2 50	1 3/16 30	2 15/16 75	6.91 3.13					

**Note:**

\* Dimension "B" does not conform to ASME standard.

See first page for pressure-temperature ratings.



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**Fig. 390CI**  
Countersunk Plugs  
(Class 125 Standard)



Size	Unit Weight		Size	Unit Weight	
	Black	Galvanized		Black	Galvanized
NPS/DN	Lbs./kg	Lbs./kg	NPS/DN	Lbs./kg	Lbs./kg
1 25	0.20 0.09	0.20 0.09	2 ½ 65	1.40 0.63	— —
1 ¼ 32	0.32 0.15	0.32 0.15	3 80	2.25 1.02	— —
1 ½ 40	0.47 0.21	0.47 0.21	3 ½ 90	3.02 1.37	— —
2 50	0.84 0.38	0.84 0.38	4 100	3.76 1.71	— —

**Note:**

See Fig. 390 in Malleable Iron for other available sizes.

**Fig. 381**  
Cap (Class 125 Standard)



Size	Unit Weight		Size	Unit Weight	
	Black	Galvanized		Black	Galvanized
NPS/DN	Lbs./kg	Lbs./kg	NPS/DN	Lbs./kg	Lbs./kg
2 ½ 65	2.55 1.16	— —	5 125	10.70 4.85	— —
3 80	4.10 1.86	— —	6 150	14.20 6.44	14.20 6.44
4 100	6.40 2.90	— —	8 200	27.23 12.35	27.23 12.35

**Fig. 370**  
Locknut (Class 125 Standard)



Size	Minimum Dimensions				Unit Weight
	A	B	C	D	Black
NPS/DN	In./mm	In./mm	In./mm	In./mm	Lbs./kg
2 ½ 65	3.500 89	3.180 81	.590 15	0.90 2	1.13 0.51
3 80	4.270 108	3.840 98	.670 17	0.90 2	1.60 0.73
4 100	5.380 137	5.000 127	.800 20	.130 3	1.10 0.50

**Note:**

For nominal sizes smaller than 2 ½" (65 DN), see Fig. 1134 in the Malleable Iron Section.

**Note:**

According to specifications, hex bushings and cored plugs should be used with 150# malleable iron and 125# cast iron. Solid plugs and face bushings are recommended for use with 250# and 300# fittings.

See first page for pressure-temperature ratings.



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## Malleable Iron Hex Bushing Fig. 383



Outside Hex  
Type A



Inside Hex  
Type B

Size					Unit Weight				
			Black		Galvanized				
NPS/DN	Hex Type	NPS/DN	Lbs./kg	Lbs./kg	NPS/DN	Hex Type	NPS/DN	Lbs./kg	Lbs./kg
3/4 10	A	1/8 6	0.12 0.05	0.12 0.05	1 1/4 32	B	1/4 8	0.33 0.15	0.33 0.15
	A	1/4 8	0.14 0.06	0.14 0.06		B	3/8 10	0.27 0.12	0.27 0.12
	A	3/8 10	0.11 0.05	0.11 0.05		B	1/2 15	0.34 0.15	0.34 0.15
	A	1/2 15	0.09 0.04	0.09 0.04		A	3/4 20	0.39 0.18	0.39 0.18
1 25	B	1/8 6	0.24 0.11	0.24 0.11	1 1/2 40	A	1 25	0.30 0.14	0.30 0.14
	B	1/4 8	0.18 0.08	0.18 0.08		A	1 1/4 32	0.30 0.14	0.30 0.14
	B	3/8 10	0.18 0.08	0.18 0.08	2 50	A	1 1/2 40	0.64 0.29	0.64 0.29
	A	1/2 15	0.20 0.09	0.20 0.09	2 1/2 65	A	2 50	1.02 0.46	1.02 0.46
	A	3/4 20	0.16 0.07	0.16 0.07					

### Note:

See Cast Iron section on next page for other available sizes.

Hexagon head or octagon head bushings 2 1/2 NPS (65 DN) and smaller reducing one size may be made of malleable iron, ductile iron or steel. Other sizes may be made of cast iron, ductile iron, malleable iron or steel. Face bushings 2 1/2 NPS (65 DN) and smaller may be made of malleable iron, ductile iron or steel. Face bushings 3NPS (80 DN) and larger reducing one size may be made of malleable iron, ductile iron or steel. Face bushings 3NPS (80 DN) and larger reducing two sizes or more may be made of cast or malleable iron, ductile iron, or steel. According to specifications, hex bushings and cored plugs should be used with 150# malleable iron and 125# cast iron. Solid plugs and face bushings are recommended for use with 250# and 300# fittings.

Cast Iron Hex Bushings on next page.



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## Cast Iron Hex Bushing Fig. 383



Outside Hex  
Type A



Inside Hex  
Type B

Size		Unit Weight			Size		Unit Weight		
		NPS/DN	Black	Galvanized			NPS/DN	Black	Galvanized
NPS/DN	Hex Type/All Cast Iron		Lbs./kg	Lbs./kg	NPS/DN	Hex Type/All Cast Iron		Lbs./kg	Lbs./kg
1 1/2 40	B	1/4	0.47	0.47	2 1/2 65	B	1	1.16	1.16
	C	8	0.21	0.21		C	25	0.53	0.53
	B	3/8	0.47	0.47		B	1 1/4	1.24	1.24
	C	10	0.21	0.21		C	32	0.56	0.56
	B	1/2	0.42	0.42		A	1 1/2	1.29	1.29
	C	15	0.19	0.19		C	40	0.59	0.59
	B	3/4	0.47	0.47		B	1/2	1.93	1.93
	C	20	0.21	0.21		C	15	0.88	0.88
	A	1	0.50	0.50		B	3/4	1.92	1.92
	C	25	0.23	0.23		C	20	0.87	0.87
2 50	B	1/4	0.75	0.75	3 80	B	1	1.90	1.90
	C	8	0.34	0.34		C	25	0.86	0.86
	B	3/8	0.75	0.75		B	1 1/4	1.77	1.77
	C	10	0.34	0.34		C	32	0.80	0.80
	B	1/2	0.70	0.70		B	1 1/2	1.79	1.79
	C	15	0.32	0.32		C	40	0.81	0.81
	B	3/4	0.71	0.71		A	2	1.90	1.90
	C	20	0.32	0.32		C	50	0.86	0.86
	B	1	0.73	0.73		A	2 1/2	1.63	1.63
	C	25	0.33	0.33		C	65	0.74	0.74
2 1/2 65	A	1 1/4	0.81	0.81	3 1/2 90	B	1	2.42	2.42
	C	32	0.37	0.37		C	25	1.10	1.10
	B	1/2	1.28	1.28		B	1 1/4	2.56	2.56
	C	15	0.58	0.58		C	32	1.16	1.16
	B	3/4	1.25	1.25		B	1 1/2	2.65	2.65
	C	20	0.57	0.57		C	40	1.20	1.20

### Note:

See Malleable Iron section on previous page for other available sizes.

According to specifications, hex bushings and cored plugs should be used with 150# malleable iron and 125# cast iron. Solid plugs and face bushings are recommended for use with 250# and 300# fittings.

Additional Cast Iron Hex Bushings on next page.



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## Cast Iron Hex Bushing Fig. 383

(Continued)



Outside Hex  
Type A



Inside Hex  
Type B

Size		Unit Weight			Size		Unit Weight		
NPS/DN	Hex Type/All Cast Iron	NPS/DN	Black Lbs./kg	Galvanized Lbs./kg	NPS/DN	Hex Type/All Cast Iron	NPS/DN	Black Lbs./kg	Galvanized Lbs./kg
3½ 80	B	2	2.54	2.54	5 125	A	3½	4.00	—
	C	50	1.15	1.15		C	90	1.81	—
	A	2½	3.23	3.23		A	4	3.94	3.94
	C	65	1.46	1.46		C	100	1.79	1.79
	A	3	1.96	1.96	6 150	B	2	8.00	8.00
	C	80	0.89	0.89		C	50	3.63	3.63
4 100	B	1	3.59	3.59		B	2½	7.72	—
	C	25	1.63	1.63		C	65	3.50	—
	B	1¼	3.54	3.54		B	3	7.75	7.75
	C	32	1.61	1.61		C	80	3.51	3.51
	B	1½	3.44	3.44		B	4	6.83	6.83
	C	40	1.56	1.56		C	100	3.10	3.10
	B	2	3.11	3.11		A	5	5.24	5.24
	C	50	1.41	1.41		C	125	2.38	2.38
	B	2½	3.29	3.29	8 200	B	3	15.50	—
	C	65	1.49	1.49		C	80	7.03	—
	A	3	3.15	3.15		B	4	13.93	—
5 125	C	80	1.43	1.43		C	100	6.32	—
	A	3½	2.50	2.50		B	5	13.65	—
	C	90	1.13	1.13		C	125	6.19	—
	B	2	5.12	5.12		A	6	13.19	13.19
	C	50	2.32	2.32		C	150	5.98	5.98
	B	2½	4.87	4.87	10 250	B	6	24.50	—
	C	65	2.21	2.21		C	150	11.11	—
	B	3	4.83	4.83		A	8	22.00	—
	C	80	2.19	2.19		C	200	9.98	—

### Note:

See Malleable Iron section on first page for other available sizes.

According to specifications, hex bushings and cored plugs should be used with 150# malleable iron and 125# cast iron. Solid plugs and face bushings are recommended for use with 250# and 300# fittings.

Additional Cast Iron Hex Bushings on previous page.



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**Fig. 380**

Bar Plugs, Solid  
(Class 125 Standard)



Unit Weight		Unit Weight	
Size	Black	Size	Black
NPS/DN	Lbs./kg	NPS/DN	Lbs./kg
4	5.68	6	14.78
100	2.58	150	6.70
5	9.60		
125	4.35		

**Fig. 387**

Square Head Plugs, Cored  
(Class 125 Standard)



Size	Unit Weight		Size	Unit Weight	
	Black	Galvanized		Black	Galvanized
NPS/DN	Lbs./kg	Lbs./kg	NPS/DN	Lbs./kg	Lbs./kg
3/4* 20	0.13 0.06	0.13 0.06	2 1/2 65	1.32 0.60	1.32 0.60
1 25	0.25 0.11	0.25 0.11	3 80	1.87 0.85	1.87 0.85
1 1/4 32	0.39 0.18	0.39 0.18	3 1/2 90	2.50 1.13	2.50 1.13
1 1/2 40	0.50 0.23	0.50 0.23	4 100	4.00 1.81	4.00 1.81
2 50	0.82 0.37	0.82 0.37			

**Note:**

\*Zinc Plated

**Note:**

According to specifications, hex bushings and cored plugs should be used with 150# malleable iron and 125# cast iron. Solid plugs and face bushings are recommended for use with 250# and 300# fittings.

See first page for pressure-temperature ratings.



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**Fig. 388**

Square Head Plugs, Solid  
(Class 125 Standard)



Size	Unit Weight		Size	Unit Weight	
	Black	Galvanized		Black	Galvanized
NPS/DN	Lbs./kg	Lbs./kg	NPS/DN	Lbs./kg	Lbs./kg
1/2	0.10	0.10	2	1.23	1.23
15	0.05	0.05	50	0.56	0.56
3/4	0.17	0.17	2 1/2	2.00	2.00
20	0.08	0.08	65	0.91	0.91
1	0.32	0.32	3	3.18	3.18
25	0.15	0.15	80	1.44	1.44
1 1/4	0.53	0.53	3 1/2	4.38	—
32	0.24	0.24	90	1.99	—
1 1/2	0.76	0.76			
40	0.34	0.34			

**Fig. 389**

Bar Plugs, Cored  
(Class 125 Standard)



Size	Unit Weight		Size	Unit Weight	
	Black	Galvanized		Black	Galvanized
NPS/DN	Lbs./kg	Lbs./kg	NPS/DN	Lbs./kg	Lbs./kg
4	3.82	3.82	6	9.94	9.94
100	1.73	1.73	150	4.51	4.51
5	6.50	6.50	8	20.26	20.26
125	2.95	2.95	200	9.19	9.19

**Note:**

According to specifications, hex bushings and cored plugs should be used with 150# malleable iron and 125# cast iron. Solid plugs and face bushings are recommended for use with 250# and 300# fittings.

See first page for pressure-temperature ratings.



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Cast Iron Threaded Fittings						
	Dimensions	Threads	Material	Coating*	Pressure Rating	Federal Spec
Class 125	ASME B16.4	ASME B1.20.1	ASTM A126	ASTM A153	ASME B16.3	WW-P-501
Class 250	ASME B16.4	ASME B1.20.1	ASTM A126	ASTM A153	ASME B16.3	WW-P-501

\* ASTM B633 Type I, SC 4 may be used as an alternate zinc coating per ASME B16.4

Cast Iron Threaded Fittings Pressure-Temperature Ratings		
Temperature (°F)	Working Pressure (psi)	
	Class 125	Class 250
-20 to 150	175	400
200	165	370
250	150	340
300	140	310
350	125 <sup>(1)</sup>	300
400		250 <sup>(2)</sup>

(1) Permissible for service temperature up to 360° F, reflecting the temperature of saturated steam at 125 psi.

(2) Permissible for service temperature up to 406° F, reflecting the temperature of saturated steam at 250 psi.

## 90° Elbow (Class 150 Standard) Fig. 1101



### Standards and Specifications

#### Malleable Iron Fittings

	Dimensions	Material	Galvanizing*	Thread	Pressure Rating
Class 150/PN 20	ASME B16.3	ASTM A197	ASTM A153	ASME B1 20.1	ASME B16.3
Class 300/PN 50	ASME B16.3	ASTM A197	ASTM A153	ASME B1 20.1	ASME B16.3

#### Malleable Iron Unions

	Dimensions	Material	Galvanizing*	Thread	Pressure Rating
Class 150/PN 20	ASME B16.39	ASTM A197	ASTM A153	ASME B1 20.1	ASME B16.39
Class 250	ASME B16.39	ASTM A197	ASTM A153	ASME B1 20.1	ASME B16.39
Class 300/PN 50	ASME B16.39	ASTM A197	ASTM A153	ASME B1 20.1	ASME B16.39

**Note:**

\* ASTM B633, Type I, SC 4, may be supplied as alternate zinc coating per applicable ASME B16 product standard.



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## 90° Elbow (Class 150 Standard) Fig. 1101



ASC Engineered Solutions™ offers the broadest line of malleable iron fitting sizes in both black and galvanized finishes. Every fitting is manufactured and tested to meet ASC's strict quality standards. All Anvil Class 150 Malleable Iron Fittings conform to ASME B16.3 and unions conform to ASME B16.39. All elbows and tees 3/8" (10 DN) and larger are 100% gas tested at a minimum of 100 PSI (6.9 bar).

For Listings/Approval Details and Limitations, visit our website at [www.asc-es.com](http://www.asc-es.com) or contact an ASC Engineered Solutions™ Representative.

See following page for standards and specifications.

Anvil Class 150/300 Malleable Iron Fittings conform to ASME B16.3 and Unions conform to ASME B16.39.

All elbows and tees 3/8" (10 DN) and larger are 100% gas tested at a minimum of 100 PSI (6.9 bar).

Malleable Iron Threaded Pipe Unions  
Pressure - Temperature Ratings

Temperature	Pressure		
	Class 150	Class 250	Class 300
°F/°C	PSI/bar	PSI/bar	PSI/bar
-20°–150° -28.9°–65.6°	300 20.7	500 34.5	600 41.4
200° 93.3°	265 18.3	455 31.4	550 37.9
250° 121.1°	225 15.5	405 27.9	505 34.8
300° 148.9°	185 12.8	360 24.8	460 31.7
350° 176.7°	150 10.3	315 21.7	415 28.6
400° 204.4°	110 7.6	270 18.6	370 25.5
450° 232.2°	75 5.2	225 15.5	325 22.4
500° 260.0°	— —	180 12.4	280 19.3
550° 287.8°	— —	130 9.0	230 15.9

Malleable Iron Threaded Fittings  
Pressure - Temperature Ratings

Temperature	Pressure Class 300			
	Class 150	Sizes 1/4"–1" (6-25mm)	Sizes 1 1/4"–2" (32-51mm)	Sizes 2 1/2"–3" (64-76mm)
°F/°C	PSI/bar	PSI/bar	PSI/bar	PSI/bar
-20°–150° -28.9°–65.6°	300 20.7	2000 137.9	1500 103.4	1000 68.9
200° 93.3°	265 18.3	1785 123.1	1350 93.1	910 62.7
250° 121.1°	225 15.5	1575 108.6	1200 82.7	825 56.9
300° 148.9°	185 12.8	1360 93.8	1050 72.4	735 50.7
350° 176.7°	150 10.3	1150 79.3	900 62.1	650 44.8
400° 204.4°	— —	935 64.5	750 51.7	560 38.6
450° 232.2°	— —	725 50.0	600 41.4	475 32.8
500° 260.0°	— —	510 35.2	450 31.0	385 26.5
550° 287.8°	— —	300 20.7	300 20.7	300 20.7

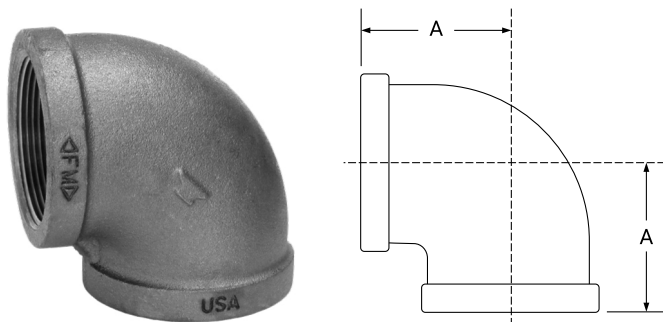
**Note:**

Unions with Copper or Copper Alloy seats are not intended for use where temperature exceeds 450°F.



PROJECT INFORMATION	APPROVAL STAMP
Project:	<input type="checkbox"/> Approved
Address:	<input type="checkbox"/> Approved as noted
Contractor:	<input type="checkbox"/> Not approved
Engineer:	Remarks:
Submittal Date:	
Notes 1:	
Notes 2:	

## 90° Elbow (Class 150 Standard) Fig. 1101



Size	A	Unit Weight		Size	A	Unit Weight	
		Black	Galvanized			Black	Galvanized
NPS/DN	In./mm	Lbs./kg	Lbs./kg	NPS/DN	In./mm	Lbs./kg	Lbs./kg
1/8 6	11/16 17	0.06 0.03	0.06 0.03	1 1/2 40	1 15/16 49	1.30 0.59	1.30 0.59
1/4 8	13/16 22	0.11 0.05	0.11 0.05	2 50	2 1/4 57	2.06 0.93	2.06 0.93
3/8 10	15/16 24	0.17 0.08	0.17 0.08	2 1/2 65	2 11/16 68	3.55 1.61	3.55 1.61
1/2 15	1 1/8 29	0.30 0.14	0.30 0.14	3 80	3 1/16 78	5.46 2.48	5.46 2.48
3/4 20	1 5/16 33	0.45 0.20	0.45 0.20	3 1/2 90	3 7/16 87	7.10 3.22	7.10 3.22
1 25	1 1/2 38	0.73 0.33	0.73 0.33	4 100	3 13/16 98	8.95 4.06	8.95 4.06
1 1/4 32	1 3/4 44	0.97 0.44	0.97 0.44	5 125	4 1/2 114	13.90 6.30	13.90 6.30
				6 150	5 1/8 130	23.00 10.43	23.00 10.43

**Note:**

See first page for pressure-temperature ratings. Galvanized weights may vary.  
Please contact your ASC Engineered Solutions™ Representative if you need verification.

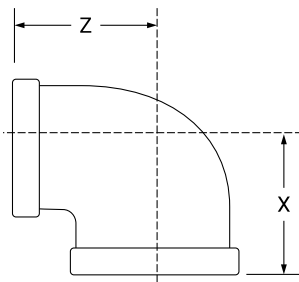
All elbows and tees 3/8" (10 DN) and larger are 100% gas tested at a minimum of 100 PSI (6.9 bar).



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## Reducing Elbow (Class 150 Standard) Fig. 1101R



Size		X	Z	Unit Weight	
				Black	Galvanized
NPS/DN	NPS/DN	In./mm	In./mm	Lbs./kg	Lbs./kg
1/4	1/8	3/4	3/4	0.10	0.10
8	6	19	19	0.05	0.05
3/8	1/8	13/16	7/8	0.12	0.12
	6	22	22	0.05	0.05
10	1/4	7/8	15/16	0.14	0.14
	8	22	24	0.06	0.06
1/2	1/4	1	1	0.19	0.19
	8	25	25	0.09	0.09
15	3/8	1 1/16	1 1/16	0.22	0.22
	10	27	27	0.10	0.10
3/4	1/4	1 1/8	1 1/8	0.26	0.26
	8	29	29	0.12	0.12
20	3/8	1 1/8	1 1/8	0.29	0.29
	10	29	29	0.13	0.13
1	1/2	1 3/16	1 1/4	0.38	0.38
	15	30	32	0.17	0.17
25	3/8	1 3/16	1 1/4	0.41	0.41
	10	30	32	0.19	0.19
1 1/4	1/2	1 1/4	1 3/8	0.46	0.46
	15	32	35	0.21	0.21
32	3/4	1 3/8	1 7/16	0.56	0.56
	20	35	37	0.25	0.25
1 1/2	1/2	1 3/8	1 9/16	0.61	0.61
	15	35	40	0.28	0.28
2	3/4	1 7/16	1 5/8	0.71	0.71
	20	37	41	0.32	0.32
1 1/4	1	1 9/16	1 11/16	0.87	0.87
32	25	40	43	0.39	0.39
1 1/2	3/4	1 1/2	1 3/4	0.83	0.83
	20	38	44	0.38	0.38
40	1	1 5/8	1 13/16	1.02	1.02
	25	41	47	0.46	0.46
2	1 1/4	1 13/16	1 7/8	1.17	1.17
	32	47	48	0.53	0.53
50	3/4	1 5/8	2	1.30	1.30
	20	41	51	0.59	0.59
2 1/2	1	1 3/4	2	1.35	1.35
	25	44	51	0.61	0.61
65	1 1/4	1 7/8	2 1/8	1.53	1.53
	32	48	54	0.69	0.69
3	1 1/2	2	2 1/8	1.75	1.75
	40	51	54	0.79	0.79
80	1 1/2	2 3/16	2 1/2	2.50	2.50
	40	56	64	1.13	1.13
100	2	2 7/16	2 5/8	2.98	2.98
	50	62	67	1.35	1.35
4	2	2 9/16	2 15/16	3.75	3.75
	50	65	75	1.70	1.70
8	2 1/2	2 13/16	3	4.30	4.30
	65	73	76	1.95	1.95
16	3	3 5/16	3 3/8	7.87	7.87
	80	84	92	3.57	3.57

### Notes:

See first page for pressure-temperature ratings. Galvanized weights may vary. Please contact your ASC Engineered Solutions™ Representative if you need verification.

All elbows and tees 3/8" (10 DN) and larger are 100% gas tested at a minimum of 100 PSI (6.9 bar).

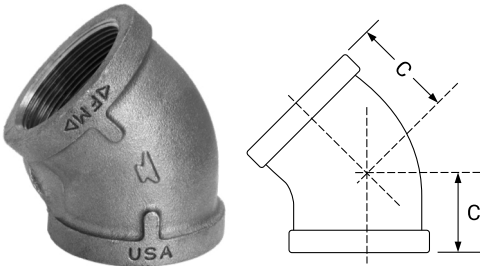


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**Fig. 1102**

45° Elbow (Class 150 Standard)

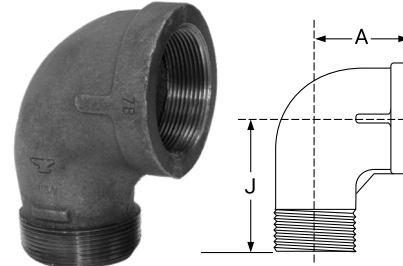


Size	C	Unit Weight	
		Black	Galvanized
NPS/DN	In./mm	Lbs./kg	Lbs./kg
1/8	1 1/16	0.07	0.07
6	17	0.03	0.03
1/4	3/4	0.11	0.11
8	19	0.05	0.05
3/8	1 3/16	0.16	0.16
10	22	0.07	0.07
1/2	7/8	0.22	0.22
15	22	0.10	0.10
3/4	1	0.37	0.37
20	25	0.17	0.17
1	1 1/8	0.54	0.54
25	29	0.24	0.24
1 1/4	1 5/16	0.86	0.86
32	33	0.39	0.39
1 1/2	1 7/16	1.13	1.13
40	37	0.51	0.51
2	1 11/16	1.79	1.79
50	43	0.81	0.81
2 1/2	1 15/16	3.60	3.60
65	49	1.63	1.63
3	2 3/16	4.48	4.48
80	56	2.03	2.03
4	2 5/8	7.40	7.40
100	67	3.36	3.36
5	3 1/16	11.46	11.46
125	78	5.20	5.20
6	3 7/16	19.93	19.93
150	87	9.04	9.04

**Fig. 1103, 1103R**

90° Straight Street Elbow (Class 150 Standard)

90° Reducing Street Elbow (Class 150 Standard)



Size	A	J	Unit Weight	
			Black	Galv.
NPS/DN	In./mm	In./mm	Lbs./kg	Lbs./kg
1/8	1 1/16	1	0.06	0.06
6	17	25	0.03	0.03
1/4	1 3/16	1 3/16	0.10	0.10
8	22	30	0.05	0.05
3/8	1 5/16	1 7/16	0.17	0.17
10	24	37	0.08	0.08
1/2	1 1/8	1 5/8	0.28	0.28
15	29	41	0.13	0.13
3/4	1 5/16	1 7/8	0.41	0.41
20	33	48	0.19	0.19
1	1 1/2	2 1/8	0.62	0.62
25	38	54	0.28	0.28
1 1/4	1 3/4	2 7/16	1.09	1.09
32	44	62	0.49	0.49
1 1/2	1 15/16	2 11/16	1.44	1.44
40	49	68	0.65	0.65
2	2 1/4	3 1/4	2.85	2.85
50	57	83	1.29	1.29
2 1/2	2 11/16	3 7/8	4.00	4.00
65	68	98	1.81	1.81
3	3 1/16	4 1/2	6.06	6.06
80	78	114	2.75	2.75
4	3 13/16	5 11/16	10.53	10.53
100	98	144	4.78	4.78

Size	A	J	Unit Weight	
			Black	Galv.
NPS/DN	In./mm	In./mm	Lbs./kg	Lbs./kg
1/2 x 3/8	1 1/16	1 9/16	0.23	0.23
15 x 10	27	40	0.10	0.10
3/4 x 1/2	1 3/16	1 3/4	0.32	0.32
20 x 15	30	44	0.15	0.15
1 x 3/4	1 3/8	2 1/16	0.54	0.54
25 x 20	35	52	0.24	0.24
1 1/4 x 1	1 9/16	2 5/16	0.86	0.86
32 x 25	40	59	0.39	0.39
1 1/4 x 3/4	1 7/16	2 1/4	0.75	0.75
32 x 20	37	57	0.34	0.34
1 1/2 x 1 1/4	1 13/16	2 9/16	1.18	1.18
40 x 32	47	65	0.54	0.54
1 1/2 x 1	1 5/8	2 1/2	1.08	1.08
40 x 25	41	64	0.49	0.49
2 x 1 1/2	2	2 15/16	1.85	1.85
50 x 40	51	75	0.84	0.84

**Note:**

First size denotes female end.

See first page for pressure-temperature ratings. Galvanized weights may vary. Please contact your ASC Engineered Solutions™ Representative if you need verification.

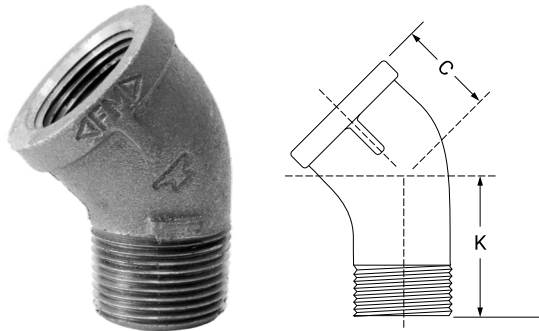
All elbows and tees 3/8" (10 DN) and larger are 100% gas tested at a minimum of 100 PSI (6.9 bar).



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**Fig. 1104**  
45° Street Elbow (Class 150 Standard)



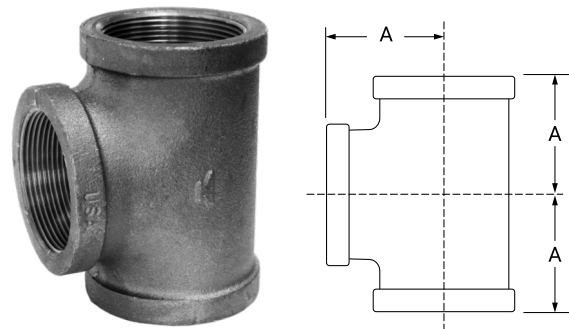
Size	C	K	Unit Weight	
			Black	Galvanized
NPS/DN	In./mm	In./mm	Lbs./kg	Lbs./kg
1/8	11/16	7/8	0.06	0.06
6	17	22	0.03	0.03
1/4	3/4	15/16	0.10	0.10
8	19	24	0.05	0.05
3/8	13/16	1	0.14	0.14
10	22	25	0.06	0.06
1/2	7/8	1 1/8	0.20	0.20
15	22	29	0.09	0.09
3/4	1	1 5/16	0.33	0.33
20	25	33	0.15	0.15
1	1 1/8	1 7/16	0.52	0.52
25	29	37	0.24	0.24
1 1/4	1 5/16	1 11/16	0.85	0.85
32	33	43	0.39	0.39
1 1/2	1 7/16	1 7/8	1.22	1.22
40	37	48	0.55	0.55
2	1 11/16	2 1/4	1.92	1.92
50	43	57	0.87	0.87

**Notes:**

See first page for pressure-temperature ratings. Galvanized weights may vary. Please contact your ASC Engineered Solutions™ Representative if you need verification.

All elbows and tees 3/8" (10 DN) and larger are 100% gas tested at a minimum of 100 PSI (6.9 bar).

**Fig. 1105**  
Straight Tee (Class 150 Standard)



Size	A	Unit Weight	
		Black	Galvanized
NPS/DN	In./mm	Lbs./kg	Lbs./kg
1/8	11/16	0.09	0.09
6	17	0.04	0.04
1/4	13/16	0.15	0.15
8	22	0.07	0.07
3/8	15/16	0.23	0.23
10	24	0.10	0.10
1/2	1 1/8	0.41	0.41
15	29	0.19	0.19
3/4	1 5/16	0.60	0.60
20	33	0.27	0.27
1	1 1/2	0.90	0.90
25	38	0.41	0.41
1 1/4	1 3/4	1.31	1.31
32	44	0.59	0.59
1 1/2	1 15/16	1.73	1.73
40	49	0.78	0.78
2	2 1/4	2.52	2.52
50	57	1.14	1.14
2 1/2	2 11/16	4.90	4.90
65	68	2.22	2.22
3	3 1/16	7.13	7.13
80	78	3.23	3.23
3 1/2	3 7/16	9.00	9.00
90	87	4.08	4.08
4	3 13/16	11.32	11.32
100	98	5.13	5.13
5	4 1/2	19.42	19.42
125	114	8.81	8.81
6	5 1/8	25.50	25.50
150	130	11.56	11.56

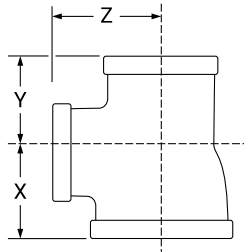


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## Reducing Tee (Class 150 Standard) Fig. 1105R



Size			X	Y	Z	Unit Weight	
NPS/DN	NPS/DN	NPS/DN				Black	Galv.
In./mm	In./mm	In./mm	Lbs./kg	Lbs./kg			
1/8 6	1/8 6	1/4 8	3/4 19	3/4 19	3/4 19	0.12 0.05	0.12 0.05
1/4 8	1/4 8	1/8 6	3/4 19	3/4 19	3/4 19	0.13 0.06	0.13 0.06
		3/8 10	15/16 24	15/16 24	7/8 22	0.19 0.09	0.19 0.09
3/8 10	1/4 8	1/4 8	7/8 22	13/16 22	15/16 24	0.19 0.09	0.19 0.09
		3/8 10	15/16 24	15/16 24	15/16 24	0.21 0.10	0.21 0.10
	3/8 10	1/4 8	7/8 22	7/8 22	15/16 24	0.21 0.10	0.21 0.10
		1/2 15	1 1/16 27	1 1/16 27	1 1/16 27	0.27 0.12	0.27 0.12
1/2 15	1/4 8	1/2 15	1 1/8 29	15/16 24	1 1/8 29	0.29 0.13	0.29 0.13
		3/8 10	1 1/16 27	1 25	1 1/16 27	0.28 0.13	0.28 0.13
	3/8 10	1/2 15	1 1/8 29	1 1/16 27	1 1/8 29	0.33 0.15	0.33 0.15
		1/4 8	1 25	1 25	1 25	0.27 0.12	0.27 0.12
1/2 15	1/2 15	3/8 10	1 1/16 27	1 1/16 27	1 1/16 27	0.30 0.14	0.3 0.14
		3/4 20	1 1/4 32	1 1/4 32	1 3/16 30	0.45 0.20	0.45 0.20
	1 25	1 25	1 3/8 35	1 3/8 35	1 1/4 32	0.55 0.25	0.55 0.25
		1/2 15	1 1/4 32	1 1/4 32	1 3/8 30	0.45 0.20	0.45 0.20
3/4 20	1/4 8	1/2 15	1 3/16 22	1 3/16 30	1 1/4 32	0.47 0.21	0.47 0.21
		1 25	1 7/16 37	1 7/16 37	1 3/8 35	0.62 0.28	0.62 0.28
	1/2 15	1 1/4 32	1 5/8 41	1 5/8 41	1 7/16 37	0.90 0.41	0.90 0.41
		1/4 8	1 1/2 38	1 5/16 33	1 1/2 38	0.69 0.31	0.69 0.31
1 25	1/2 15	1/2 15	1 1/4 32	1 1/8 29	1 3/8 35	0.70 0.32	0.70 0.32
		3/4 20	1 3/8 35	1 1/4 32	1 7/16 37	0.56 0.25	0.56 0.25
	1 25	1 25	1 1/2 38	1 3/8 35	1 1/2 38	0.76 0.34	0.76 0.34
		1/2 15	1 1/4 32	1 1/8 29	1 3/8 35	0.70 0.32	0.70 0.32

### Notes:

See first page for pressure-temperature ratings. Galvanized weights may vary. Please contact your ASC Engineered Solutions™ Representative if you need verification.

All elbows and tees 3/8" (10 DN) and larger are 100% gas tested at a minimum of 100 PSI (6.9 bar).

See additional sizes on following page.



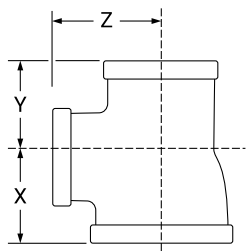
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### Reducing Tee (Class 150 Standard)

**Fig. 1105R**

(Continued)

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**Notes:**

See first page for pressure-temperature ratings. Galvanized weights may vary. Please contact your ASC Engineered Solutions™ Representative if you need verification.

All elbows and tees  $\frac{3}{8}$ " (10 DN) and larger are 100% gas tested at a minimum of 100 PSI (6.9 bar).

See additional sizes on previous and following page.



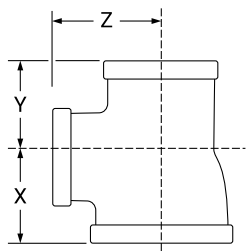
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Building connections that last™

## Reducing Tee (Class 150 Standard)

### Fig. 1105R

(Continued)



Size			X	Y	Z	Unit Weight	
NPS/DN	NPS/DN	NPS/DN				Black	Galv.
			In./mm	In./mm	In./mm	Lbs./kg	Lbs./kg
1 1/2 40	1 25	1	1 5/8	1 1/2	1 13/16	1.14	1.14
		25	41	38	47	0.52	0.52
		1 1/4	1 13/16	1 11/16	1 7/8	1.30	1.30
	25	32	47	43	48	0.59	0.59
		1 1/2	1 15/16	1 13/16	1 5/16	1.50	1.50
		40	49	47	49	0.68	0.68
	1 1/4 32	1/2	1 7/16	1 3/8	1 11/16	1.05	1.05
		15	37	35	43	0.48	0.48
		3/4	1 1/2	1 7/16	1 3/4	1.08	1.08
	20	20	38	37	44	0.49	0.49
		1	1 5/8	1 9/16	1 13/16	1.26	1.26
		25	41	40	47	0.57	0.57
2 50	1 1/2 40	1 1/4	1 13/16	1 3/4	1 7/8	1.52	1.52
		32	47	44	48	0.69	0.69
		1 1/2	1 15/16	1 7/8	1 5/16	1.50	1.50
	40	40	49	48	49	0.68	0.68
		1/2	1 7/16	1 7/16	1 11/16	1.19	1.19
		15	37	37	43	0.54	0.54
	20	3/4	1 1/2	1 1/2	1 3/4	1.60	1.60
		20	38	38	44	0.73	0.73
		1 1/2	1 5/8	1 5/8	1 13/16	1.45	1.45
	40	25	41	41	47	0.66	0.66
		1 1/4	1 13/16	1 13/16	1 7/8	1.45	1.45
		32	47	47	48	0.66	0.66
2 50	2 50	2	2 3/16	2 3/16	2	1.86	1.86
		50	56	56	51	0.84	0.84
		1/2	2 1/4	1 7/8	2 1/4	2.15	2.15
	15	50	57	48	57	0.98	0.98
		3/4	2 1/4	1 15/16	2 1/4	2.00	2.00
		20	50	57	57	0.91	0.91
	1	2	2 1/4	2	2 1/4	2.14	2.14
		25	50	51	57	0.97	0.97
		1 1/4	1 7/8	1 3/4	2 1/8	1.72	1.72
	32	32	48	44	54	0.78	0.78
		1 1/2	2	1 7/8	2 3/16	1.85	1.85
		40	51	48	56	0.84	0.84
2 50	2 50	2	2 1/4	2 1/8	2 1/4	2.20	2.20
		50	57	54	57	1.00	1.00
		1	1 3/4	1 5/8	2	1.57	1.57
	1 1/2 40	25	44	41	51	0.71	0.71
		1 1/4	1 7/8	1 13/16	2 1/8	1.76	1.76
		32	48	47	54	0.80	0.80
	40	1 1/2	2	1 15/16	2 3/16	1.95	1.95
		40	51	49	56	0.88	0.88
		2	2 1/4	2 3/16	2 1/4	2.24	2.24
	50	50	57	56	57	1.02	1.02
		1/2	1 1/2	1 1/2	1 7/8	1.65	1.65
		15	38	38	48	0.75	0.75
2 50	2 50	3/4	1 5/8	1 5/8	2	1.87	1.87
		20	41	41	51	0.85	0.85
		1	1 3/4	1 3/4	2	1.76	1.76
	25	25	44	44	51	0.80	0.80
		1 1/4	1 7/8	1 7/8	2 1/8	2.35	2.35
		32	48	48	54	1.07	1.07
	40	1 1/2	2	2	2 3/16	2.55	2.55
		40	51	51	56	1.16	1.16

#### Notes:

See first page for pressure-temperature ratings. Galvanized weights may vary. Please contact your ASC Engineered Solutions™ Representative if you need verification.

All elbows and tees 3/8" (10 DN) and larger are 100% gas tested at a minimum of 100 PSI (6.9 bar).

See additional sizes on previous and following page.



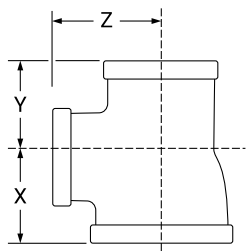
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## Reducing Tee (Class 150 Standard)

### Fig. 1105R

(Continued)



Size			X	Y	Z	Unit Weight		Size			X	Y	Z	Unit Weight		
						Black	Galv.							Black	Galv.	
NPS/DN	NPS/DN	NPS/DN	In./mm	In./mm	In./mm	Lbs./kg	Lbs./kg	NPS/DN	NPS/DN	NPS/DN	In./mm	In./mm	In./mm	Lbs./kg	Lbs./kg	
2	2	2½	2⅝	2⅝	2⅜	3.50	3.50			2	2½	2⅜	2⅞	4.80	4.80	
50	50	65	67	67	60	1.59	1.59		2½	50	64	60	73	2.18	2.18	
2½	1½	2	2⅜	2⅜	2⅝	3.43	3.43		65	2½	2⅜	2⅜	3	5.80	5.80	
		50	60	56	67	1.56	1.56	65		73	68	76	2.63	2.63		
		2½	2⅜	2½	2⅜	3.80	3.80			¾	1⅞	1⅞	2⅝	4.03	4.03	
		65	68	64	68	1.72	1.72	20		48	48	67	1.83	1.83		
	2	2	2⅜	2¼	2⅝	3.28	3.28		3	1	2	2	2⅝	4.13	4.13	
		50	60	57	67	1.49	1.49	80		25	51	51	67	1.87	1.87	
		2½	2⅜	2⅝	2⅜	4.10	4.10			3	1¼	2⅜	2⅜	2¾	4.50	4.50
		65	68	67	68	1.86	1.86	80			32	56	56	70	2.04	2.04
	2½	¾	1¾	1¾	2⅝	2.72	2.72		80		1½	2⅝	2⅝	2⅜	5.18	5.18
		20	44	44	59	1.23	1.23	40			59	59	73	2.35	2.35	
1		1⅞	1⅞	2⅜	2.85	2.85		2		2½	2½	2⅞	5.70	5.70		
25		48	48	60	1.29	1.29	50	64		64	73	2.59	2.59			
2½	1¼	2⅜	2⅜	2⅞	3.36	3.36		3	2½	2⅜	2⅜	3	6.09	6.09		
	32	52	52	62	1.52	1.52	65		73	73	76	2.76	2.76			
	1½	2⅜	2⅜	2½	3.46	3.46			80	4	3⅜	3⅝	3⅜	10.40	10.40	
	40	56	56	64	1.57	1.57	100			98	92	98	4.72	4.72		
2	2	2⅜	2⅜	2⅝	3.65	3.65		4		1½	2½	2½	3⅜	7.47	7.47	
	50	60	60	67	1.66	1.66	40			65	65	86	3.39	3.39		
	3	3	3	2⅜	5.82	5.82			100	2	2¾	2¾	3⅞	8.39	8.39	
	80	76	76	73	2.64	2.64	50			70	70	87	3.80	3.80		
3	2	2½	2¼	2⅞	4.50	4.50		100		2½	3⅜	3⅜	3½	9.60	9.60	
	50	64	57	73	2.04	2.04	65			78	78	89	4.35	4.35		
	3	3⅜	2⅞	3⅜	5.80	5.80			3	3⅜	3⅜	3⅜	11.02	11.02		
	80	79	73	79	2.63	2.63	80		84	84	92	5.00	5.00			

#### Notes:

See first page for pressure-temperature ratings. Galvanized weights may vary. Please contact your ASC Engineered Solutions™ Representative if you need verification.

All elbows and tees ¾" (10 DN) and larger are 100% gas tested at a minimum of 100 PSI (6.9 bar).

See additional sizes on previous page.

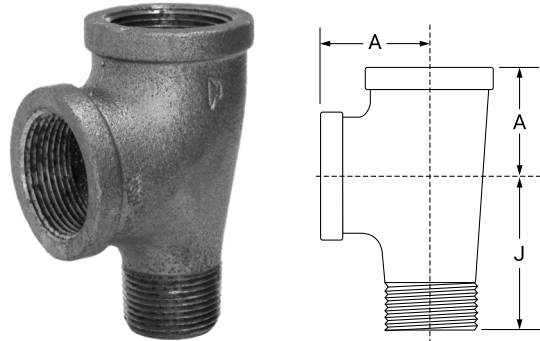


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**Fig. 1106, 1106R**

Straight Street or Service Tee (Class 150 Standard)  
Reducing Street or Service Tee (Class 150 Standard)



Size	A	J	Unit Weight	
			Black	Galvanized
NPS/DN	In./mm	In./mm	Lbs./kg	Lbs./kg
1/4	1 3/16	1 3/16	0.15	0.15
8	30	30	0.07	0.07
3/8	1 5/16	1 7/16	0.24	0.24
10	33	37	0.11	0.11
1/2	1 1/8	1 5/8	0.34	0.34
15	29	41	0.15	0.15
3/4	1 5/16	1 7/8	0.61	0.61
20	33	48	0.28	0.28
1	1 1/2	2 1/8	0.96	0.96
25	38	54	0.44	0.44
1 1/4	1 3/4	2 7/16	1.39	1.39
32	44	62	0.63	0.63
1 1/2	1 15/16	2 11/16	1.93	1.93
40	49	68	0.88	0.88
2	2 1/4	3 1/4	3.16	3.16
50	57	83	1.43	1.43

Size female run x male run x outlet	Run		Outlet A	Unit Weight	
	A	J		Black	Galvanized
NPS/DN	In./mm	In./mm	In./mm	Lbs./kg	Lbs./kg
1 1/4 x 1 x 1 1/4	1 3/4	2 5/16	1 3/4	1.34	1.34
32 x 25 x 32	44	59	44	0.61	0.61

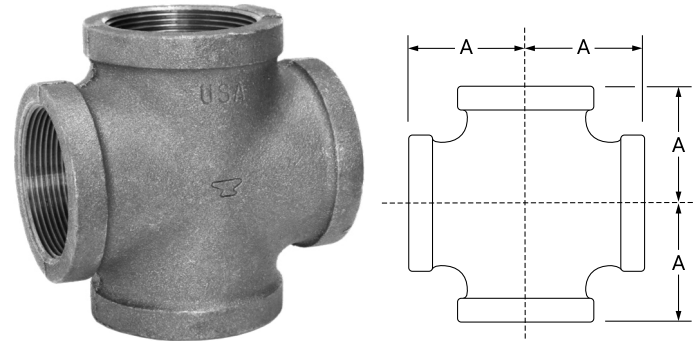
**Notes:**

See first page for pressure-temperature ratings. Galvanized weights may vary.  
Please contact your ASC Engineered Solutions™ Representative if you need verification.

All elbows and tees 3/8" (10 DN) and larger are 100% gas tested at a minimum of 100 PSI (6.9 bar).

**Fig. 1107**

Cross (Class 150 Standard)



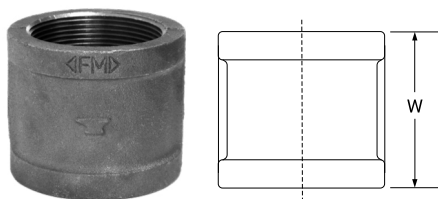
Size	A	Unit Weight	
		Black	Galvanized
NPS/DN	In./mm	Lbs./kg	Lbs./kg
1/8	1 1/16	0.12	0.12
6	17	0.05	0.05
1/4	1 3/16	0.18	0.18
8	22	0.08	0.08
3/8	1 5/16	0.28	0.28
10	24	0.13	0.13
1/2	1 1/8	0.42	0.42
15	29	0.19	0.19
3/4	1 5/16	0.69	0.69
20	33	0.31	0.31
1	1 1/2	1.12	1.12
25	38	0.51	0.51
1 1/4	1 3/4	1.44	1.44
32	44	0.65	0.65
1 1/2	1 15/16	1.98	1.98
40	49	0.90	0.90
2	2 1/4	3.30	3.30
50	57	1.50	1.50
2 1/2	2 11/16	5.90	5.90
65	68	2.68	2.68
3	3 1/16	7.94	7.94
80	78	3.60	3.60
4	3 13/16	13.50	13.50
100	98	6.12	6.12



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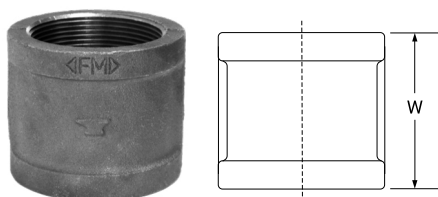
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**Fig. 1121**  
Coupling (Class 150 Standard)



Size	W	Unit Weight		Size	W	Unit Weight	
		Black	Galvanized			Black	Galvanized
NPS/DN	In./mm	Lbs./kg	Lbs./kg	NPS/DN	In./mm	Lbs./kg	Lbs./kg
1/8*	15/16	0.06	0.06	1 1/4	1 15/16	0.75	0.75
6	24	0.03	0.03	32	49	0.34	0.34
1/4	1 1/16	0.09	0.09	1 1/2	2 1/8	1.00	1.00
8	27	0.04	0.04	40	54	0.45	0.45
3/8	1 3/16	0.13	0.13	2	2 1/2	1.45	1.45
10	30	0.06	0.06	50	64	0.66	0.66
1/2	1 5/16	0.20	0.20	2 1/2	2 7/8	2.40	2.40
15	33	0.09	0.09	65	73	1.09	1.09
3/4	1 1/2	0.30	0.30	3	3 3/16	3.30	3.30
20	38	0.14	0.14	80	81	1.50	1.50
1	1 11/16	0.48	0.48	4	3 11/16	5.72	5.72
25	43	0.22	0.22	100	94	2.59	2.59

**Fig. 1122**  
Right & Left Coupling  
(Class 150 Standard)



Size	W	Unit Weight		Size	W	Unit Weight	
		Black	Galvanized			Black	Galvanized
NPS/DN	In./mm	Lbs./kg	Lbs./kg	NPS/DN	In./mm	Lbs./kg	Lbs./kg
1/2	1 5/16	0.20	0.20	1 1/4	1 15/16	0.75	0.75
15	33	0.09	0.09	32	49	0.34	0.34
3/4	1 1/2	0.30	0.30	1 1/2	2 1/8	1.00	1.00
20	38	0.14	0.14	40	54	0.45	0.45
1	1 11/16	0.48	0.48	2	2 1/2	1.45	1.45
25	43	0.22	0.22	50	64	0.66	0.66

**Note:**

\*Offered in steel only.

See first page for pressure-temperature ratings. Galvanized weights may vary. Please contact your ASC Engineered Solutions™ Representative if you need verification.

All Elbows & Tees 3/8" (10 DN) and Larger are 100% Gas Tested at a Minimum of 100 PSI. (6.9 bar)



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**Fig. 1124**  
Cap (Class 150 Standard)



Size	Unit Weight		Size	Unit Weight	
	Black	Galvanized		Black	Galvanized
NPS/DN	Lbs./kg	Lbs./kg	NPS/DN	Lbs./kg	Lbs./kg
1/2 15	0.12 0.05	0.12 0.05	2 1/2 65	1.75 0.79	1.75 0.79
3/4 20	0.22 0.10	0.22 0.10	3 80	2.62 1.19	2.62 1.19
1 25	0.38 0.17	0.38 0.17	3 1/2 90	3.19 1.45	3.19 1.45
1 1/4 32	0.58 0.26	0.58 0.26	4 100	4.54 2.06	4.54 2.06
1 1/2 40	0.73 0.33	0.73 0.33	5 125	6.45 2.93	6.45 2.93
2 50	1.13 0.51	1.13 0.51	6 150	10.00 4.54	10.00 4.54

**Note:**

See first page for pressure-temperature ratings. Galvanized weights may vary. Please contact your ASC Engineered Solutions™ Representative if you need verification.

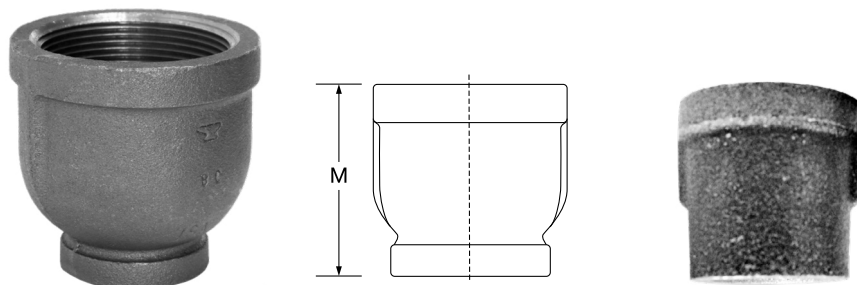
All Elbows & Tees 3/8" (10 DN) and Larger are 100% Gas Tested at a Minimum of 100 PSI. (6.9 bar)



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## Reducer (Class 150 Standard) Fig. 1125



Size		M	Unit Weight		Size	M	Unit Weight	
			Black	Galvanized			Black	Galvanized
NPS/DN	NPS/DN	In./mm	Lbs./kg	Lbs./kg	NPS/DN	NPS/DN	Lbs./kg	Lbs./kg
1/4	1/8	1	0.07	0.07	1	1/2	0.39	0.39
8	6	25	0.03	0.03		15	0.18	0.18
3/8	1/8	1 1/8	0.11	0.11		3/4*	0.43	0.43
	6		0.05	0.05		20	0.20	0.20
	1/4		0.11	0.11	1 1/4	1/2	0.61	0.61
	8		0.05	0.05		15	0.28	0.28
1/2	1/8	1 1/4	0.14	0.14		3/4	0.64	0.64
	6		0.06	0.06		20	0.29	0.29
	1/4*		0.15	0.15		1	0.68	0.68
	8		0.07	0.07	1 1/2	1/2	0.78	0.78
3/4	3/8	1 7/16	0.17	0.17		15	0.35	0.35
	10		0.08	0.08		3/4	0.88	0.88
	1/8		0.24	0.24		20	0.40	0.40
20	6		0.11	0.11		1	0.88	0.88
	1/4	2 5/16	0.22	0.22		25	0.40	0.40
	8		0.10	0.10	2	3/4	1.30	1.30
	3/8		0.25	0.25		20	0.59	0.59
1	10		0.11	0.11		1	1.34	1.34
	1/2*	2 13/16	0.27	0.27		25	0.61	0.61
	15		0.12	0.12	50	3/4	1.40	1.40
	1/4		0.35	0.35		20	0.63	0.63
25	8	1 11/16	0.16	0.16		1		
	3/8		0.35	0.35		25		
	10		0.16	0.16				

### Notes:

\*Sizes 1/2 x 1/4, 3/4 x 1/2 and 1 x 3/4 do not have bands at the reducing end.

See first page for pressure-temperature ratings. Galvanized weights may vary.  
Please contact your ASC Engineered Solutions™ Representative if you need verification.

All Elbows & Tees 3/8" (10 DN) and Larger are 100% Gas Tested at a Minimum of 100 PSI. (6.9 bar)



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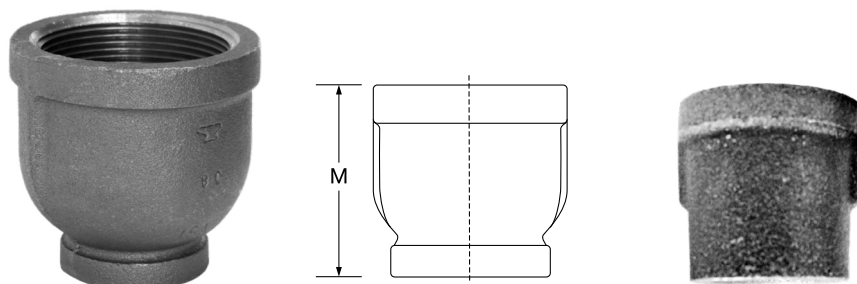
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## Reducer (Class 150 Standard)

### Fig. 1125

(Continued)



Size		M	Unit Weight		Size	M	Unit Weight	
			Black	Galvanized			Black	Galvanized
NPS/DN	NPS/DN	In./mm	Lbs./kg	Lbs./kg	NPS/DN	NPS/DN	Lbs./kg	Lbs./kg
2 50	1¼ 32	2 13/16 73	1.53 0.69	1.53 0.69	3½ 90	2 50	4.32 1.96	4.32 1.96
	1½ 40		1.55 0.70	1.55 0.70		2½ 65	4.72 2.14	4.72 2.14
2½ 65	1 25	3¼ 83	2.12 0.96	2.12 0.96	4 100	3 80	4.99 2.26	4.99 2.26
	1¼ 32		2.09 0.95	2.09 0.95		1½ 40	4.90 2.22	4.90 2.22
	1½ 40		2.09 0.95	2.09 0.95		2 50	5.10 2.31	5.10 2.31
	2 50		2.51 1.14	2.51 1.14		2½ 65	5.93 2.69	5.93 2.69
3 80	1 25	3 11/16 94	3.16 1.43	3.16 1.43	5 125	3 80	6.55 2.97	6.55 2.97
	1¼ 32		2.99 1.36	2.99 1.36		3½ 90	6.30 2.86	6.30 2.86
	1½ 40		3.30 1.50	3.30 1.50		4 100	9.57 4.34	9.57 4.34
	2 50		3.25 1.47	3.25 1.47		4 100	10.30 4.67	10.30 4.67
	2½ 65		3.31 1.50	3.31 1.50				

#### Notes:

\*Sizes ½ x ¼, ¾ x ½ and 1 x ¾ do not have bands at the reducing end.

See first page for pressure-temperature ratings. Galvanized weights may vary.

Please contact your ASC Engineered Solutions™ Representative if you need verification.

All Elbows & Tees ¾" (10 DN) and Larger are 100% Gas Tested at a Minimum of 100 PSI. (6.9 bar)



asc-es.com

Building connections that last™



Malleable Iron Threaded Fittings						
	Dimensions	Threads	Material	Coating*	Pressure	Federal Spec
Class 150	ASME B16.3	ASME B1.20.1	ASTM A197	ASTM A153	ASME B16.3	WW-P-521
Class 300	ASME B16.3	ASME B1.20.1	ASTM A197	ASTM A153	ASME B16.3	

\* ASTM B633 Type I, SC 4 can be used as an alternate zinc coating per ASME B16.3

Malleable Iron Threaded Fittings Pressure-Temperature Ratings				
Temperature (° F)	Working Pressure (psi)			
	Class 150	Class 300		
		NPS 1/4 to 1	NPS 1-1/4 to 2	NPS 2-1/2 to 3
-20 to 150	300	2,000	1,500	1,000
200	265	1,785	1,350	910
250	225	1,575	1,200	825
300	185	1,360	1,050	735
350	150 <sup>(1)</sup>	1,150	900	650
400		935	750	560
450		725	600	475
500		510	450	385
550		300	300	300

(1) Permissible for service temperature up to 366° F reflecting the temperature of saturated steam at 150 psi.

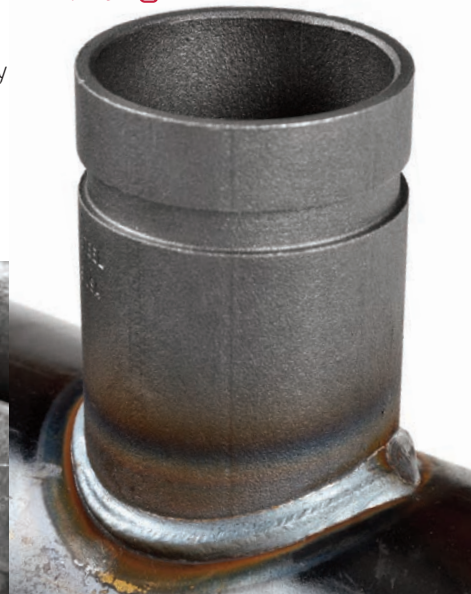
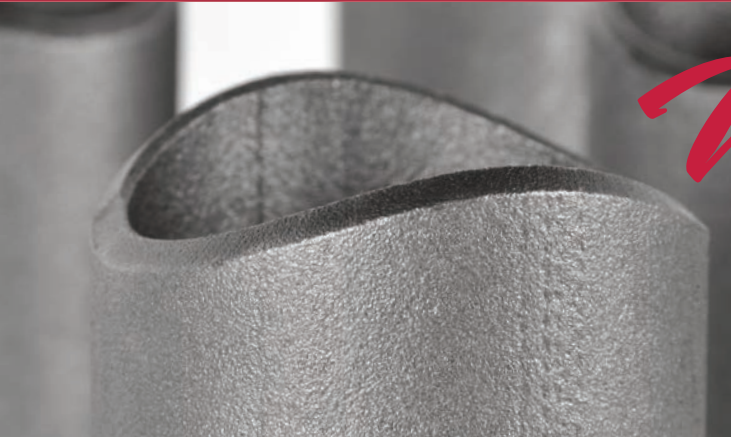
# Whizweld® BRANCHLET® WELDING OUTLET

- **A WELDING OUTLET FITTING RATED FOR 300 PSI** and up to 500 psi for non-fire sprinkler applications.
- **QUALIFIED** to be welded on various proprietary thin wall flow pipe as well as industry standard pipe schedules 10 and 40.
- **CLEANED & PROTECTED.** Shot blasted and/or washed to reduce weld porosity thereby improving job quality and lowering fabrication costs. Coated with a proprietary smokeless non-flash rust inhibitor for improved shelf life.
- **MATERIAL SAVING.** The Whizweld® bevel design reduces the amount of weld material needed.
- **UL LISTED** in accordance to UL 213B with qualifying tests up to 1500psi.
- **FM APPROVED** in accordance to FM Class 1920 with qualifying tests up to 1200psi.
- **PRECISION MANUFACTURED** from highly weldable carbon steel conforming to ASTM 1010, A-53, A135 or A795. The contour, threaded and/or grooved ends are produced on automated precision equipment for superior dimensional accuracy and quality consistency.
- **FULLY TRACEABLE** with complete identifying marks including a lot number for full material traceability and overall quality assurance.
- **THREADED OR GROOVED.** Outlets are available with ANSI B1.20.1 NPT threads, Victaulic® **IGS**®, or OGS cut and roll grooves.



## Whizweld®

The **Whizweld®** bevel design sits squarely on the header for unproblematic one pass welds on automatic welding equipment. Furthermore, the inside diameter is sized to insure the welding cone fits without obstruction.

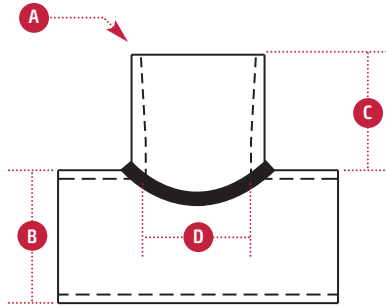


319 Circle of Progress  
Pottstown, Pennsylvania 19464-3811 USA  
Tel **(610)676.0300** Fax **(610)676.0383**

Additional details and installation instructions at [AegisTechnologiesInc.com/Branchlet](http://AegisTechnologiesInc.com/Branchlet)

AUTHORIZED DISTRIBUTOR

## TYPE 3F NPT THREADED OUTLET



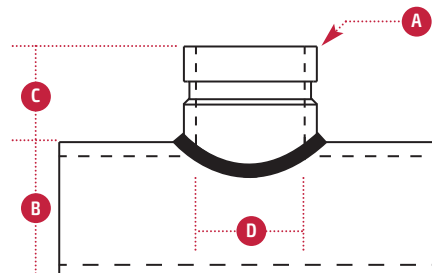
PART # TYPE 3F NPT THREADED	OUTLET A IN	HEADER B IN	OUTLET LENGTH C IN	INSIDE DIA. D IN	WEIGHT LBS	BOX QUANTITY
90300512	0.5 x	1.25 - 1.5	1.063	0.7	0.18	325
90300515		1.5 - 2	1.063	0.7	0.18	325
90300520		2 - 2.5	1.063	0.7	0.18	325
90300525		2.5 - 8	1.063	0.7	0.18	325
90300712	0.75 x	1.25 - 1.5	1.125	0.9	0.32	200
90300715		1.5 - 2	1.125	0.9	0.32	200
90300720		2 - 2.5	1.125	0.9	0.32	200
90300725		2.5 - 8	1.125	0.9	0.32	200
90301012	1 x	1.25 - 1.5	1.25	1.145	0.44	125
90301015		1.5 - 2	1.25	1.145	0.44	125
90301020		2 - 2.5	1.25	1.145	0.44	125
90301025		2.5 - 3	1.25	1.145	0.44	125
90301030		3 - 4	1.25	1.145	0.44	125
90301050		5 - 8	1.25	1.145	0.44	125

PART # TYPE 3F NPT THREADED	OUTLET A IN	HEADER B IN	OUTLET LENGTH C IN	INSIDE DIA. D IN	WEIGHT LBS	BOX QUANTITY
90301212	1.25 x	1.25	1.375	1.47	0.43	70
90301215		1.5 - 2	1.375	1.47	0.42	70
90301220		2 - 2.5	1.375	1.47	0.42	70
90301225		2.5 - 3	1.375	1.47	0.41	70
90301230		3 - 4	1.375	1.47	0.39	70
90301240		4	1.375	1.47	0.39	70
90301250		5 - 8	1.375	1.47	0.39	70
90301515	1.5 x	1.5	1.625	1.61	0.48	50
90301520		2	1.625	1.61	0.48	50
90301525		2.5	1.625	1.61	0.47	50
90301530		3 - 4	1.625	1.61	0.47	50
90301540		4	1.625	1.61	0.47	50
90301550		5 - 8	1.625	1.61	0.47	50
90302020	2 x	2	1.75	2.067	0.86	25
90302025		2.5	1.75	2.067	0.83	25
90302030		3	1.75	2.067	0.83	25
90302040		4	1.75	2.067	0.8	25
90302060		6	1.75	2.067	0.74	25
90302080		8	1.75	2.067	0.74	25
90302525	2.5 x	2.5	2.125	2.469	1.25	35
90302530		3	2.125	2.469	1.2	35
90302540		4	2.125	2.469	1.15	35
90302560		6	2.125	2.469	1.15	35
90302580		8	2.125	2.469	1.15	35
90303030	3 x	3	2.5	3.068	3.1	20
90303040		4	2.5	3.068	3.1	20
90303060		6	2.5	3.068	3.1	20
90303080		8	2.5	3.068	3.1	20
90304040	4 x	4	3	4.026	5	10
90304060		6	3	4.026	5	10
90304080		8	3	4.026	5	10

## TYPE 3V VICTAULIC® IGS™ GROOVED OUTLET

PART # TYPE 3V IGS GROOVED	OUTLET A IN	HEADER B IN	OUTLET LENGTH C IN	INSIDE DIA. D IN	WEIGHT LBS	BOX QUANTITY
90321012	1 x	1.25 - 1.5	1	1.05	0.15	200
90321015		1.5 - 2	1	1.05	0.15	200
90321020		2 - 2.5	1	1.05	0.15	200
90321025		2.5 - 3	1	1.05	0.15	200
90321030		3 - 4	1	1.05	0.15	200

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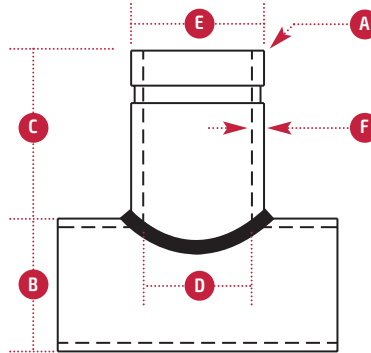
IGS™

# Whizweld® BRANCHLET®

WELDING OUTLET



## TYPE 3G & 3RG OGS GROOVED OUTLET



PART #		OUTLET		HEADER	OUTLET LENGTH	INSIDE DIAMETER		OUTSIDE DIAMETER	WALL THICKNESS		WEIGHT		BOX
SCH 40 TYPE 3G CUT GRVD	SCH 10 TYPE 3RG ROLL GRVD	A	NOMINAL	B	C	SCH 40 D	SCH 10	E	SCH 40 F	SCH 10	SCH 40 LBS	SCH 10 LBS	QUANTITY
90351012		1	x	1.25 - 1.5	3	1.05		1.315	0.133		0.4		
90351015				1.5 - 2	3	1.05		1.315	0.133		0.4		
90351020				2 - 2.5	3	1.05		1.315	0.133		0.4		
90351025				2.5 - 4	3	1.05		1.315	0.133		0.4		
90351050				5 - 8	3	1.05		1.315	0.133		0.4		
90351212		1.25	x	1.25	3	1.380		1.660	0.140		0.6		80
90351215				1.5	3	1.380		1.660	0.140		0.6		80
90351220				2 - 2.5	3	1.380		1.660	0.140		0.6		80
90351225				2.5	3	1.380		1.660	0.140		0.6		80
90351230				3 - 4	3	1.380		1.660	0.140		0.6		80
90351240				4	3	1.380		1.660	0.140		0.6		80
90351250				5 - 8	3	1.380		1.660	0.140		0.6		80
90351515		1.5	x	1.5	3	1.610		1.900	0.145		0.7		50
90351520				2	3	1.610		1.900	0.145		0.7		50
90351525				2.5	3	1.610		1.900	0.145		0.7		50
90351530				3 - 4	3	1.610		1.900	0.145		0.7		50
90351540				4	3	1.610		1.900	0.145		0.7		50
90351550				5 - 8	3	1.610		1.900	0.145		0.7		50
90352020		2	x	2	3	2.067		2.375	0.154		1.0		30
90352025				2.5	3	2.067		2.375	0.154		1.0		30
90352030				3	3	2.067		2.375	0.154		0.9		30
90352040				4	3	2.067		2.375	0.154		0.9		30
90352060				6	3	2.067		2.375	0.154		0.9		30
90352080				8	3	2.067		2.375	0.154		0.9		30
90352525	90372525	2.5	x	2.5	3	2.469	2.635	2.875	0.203	0.120	1.5	1.0	20
90352530	90372530			3	3	2.469	2.635	2.875	0.203	0.120	1.5	1.0	20
90352540	90372540			4	3	2.469	2.635	2.875	0.203	0.120	1.5	1.0	20
90352560	90372560			6	3	2.469	2.635	2.875	0.203	0.120	1.5	1.0	20
90352580	90372580			8	3	2.469	2.635	2.875	0.203	0.120	1.4	1.0	20
90353030	90373030	3	x	3	3	3.068	3.260	3.500	0.216	0.120	2.0	1.2	15
90353040	90373040			4	3	3.068	3.260	3.500	0.216	0.120	2.0	1.2	15
90353060	90373060			6	3	3.068	3.260	3.500	0.216	0.120	1.9	1.2	15
90353080	90373080			8	3	3.068	3.260	3.500	0.216	0.120	1.9	1.2	15
90354040	90374040	4	x	4	4	4.026	4.260	4.500	0.237	0.120	4.0	2.1	10
90354060	90374060			6	4	4.026	4.260	4.500	0.237	0.120	3.8	2.1	10
90354080	90374080			8	4	4.026	4.260	4.500	0.237	0.120	3.8	2.1	10
90356060	90376060	6	x	6	4	6.065	6.357	6.625	0.280	0.134	8.0	3.8	4
90356080	90376080			8	4	6.065	6.357	6.625	0.280	0.134	8.0	3.8	4
90358080	90378080	8	x	8	4	7.981	8.329	8.625	0.322	0.148	10.0	6.2	2

319 Circle of Progress, Pottstown, Pennsylvania 19464-3811 USA Tel (610)676.0300 Fax (610)676.0383 [AegisTechnologiesInc.com](http://AegisTechnologiesInc.com)

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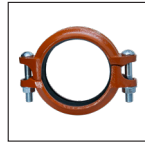
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## Grooved Connections Submittal Sheet

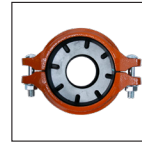
The selected products  
are being submitted  
for approval:



☐ RGD1 Rigid Angle  
Pad Coupling



☐ FLX1 Flexible  
Coupling



☐ RCD1 Reducing  
Coupling



☐ E901 Grooved  
Elbow 90°  
Standard Radius



☐ E90S1 Grooved  
Elbow Short Radius



☐ EOR1 End Elbow



☐ DR901 Grooved  
Drain Elbow



☐ E451 Grooved  
Elbow 45°  
Standard Radius



☐ E221 22.5° Elbow



☐ E111 11.25° Elbow



☐ TE1 Grooved Tee  
Standard Radius



☐ TESR1 Grooved  
Tee Short Radius



☐ CRS1 Grooved  
Cross Short Radius



☐ CRG1 Grooved  
Concentric Reducer



☐ GRTG1 Grooved  
Reducing Tee



☐ CP1 Cap



☐ ECP1 Cap w/  
Eccentric Hole NPT



☐ FA1 Grooved  
Flange



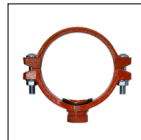
☐ GXFA1 Flange  
Adaptor



☐ 041 U Bolt  
Threaded Mech Tee



☐ MTT2 Threaded  
Mech Tee



☐ MTG1 Grooved  
Mech Tee

### Specifications

**Groove Specification:**  
AWWA-C606

**Approval Standards:**  
UL 213, FM 1920

**Fitting/Coupling Housing Material:**  
Ductile Iron per ASTM A536 Grade 65-45-12

**Gasket Material:**  
Pre-lubricated Grade E EPDM

**Bolts:**  
SAE J429, Grade 5, Zinc Electroplating

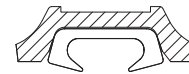
**Maximum Working Pressure:**  
Up to 300 psi (20.7 bar) (depending on  
specific model number and size)

**Operating Temperature:**  
-30 °F to 230 °F

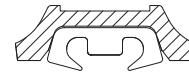
**Listings and Approvals:**  
cULus, FM Approved

**Finish:**  
☐ Standard Orange Paint  
☐ Hot-dipped Galvanized per ASTM A-153

**Gasket Style:**  
☐ Standard C-profile



☐ Flush Gap profile



☐ Not applicable

Approval	Project Information
<input type="checkbox"/> Approved <input type="checkbox"/> Approved as noted <input type="checkbox"/> Not approved	Project:
	Address:
	Contractor:
	Engineer:
	Submittal Date:
Remarks:	Notes 1:
	Notes 2:

# Reliable®

## Model RGD1 Angled Pad Coupling Rigid Grooved Coupling

cULus Listed, FM Approved  
300 psi (20.7 bar)

### RDG1 Angled Pad Coupling Technical Data

#### Operating Specifications

##### Maximum Working Pressure:

300 psi (20.7 bar)

##### Operating Temperature:

-30 °F to 230 °F (-34 °C to 110 °C)

#### Material Specifications

**Housings:** ASTM A536 Grade 65-45-12 Ductile Iron

**Gasket:** Pre-lubricated Grade E EPDM

#### Design Specification

**Groove:** AWWA-C606

#### Bolt Specification

SAE J429 Grade 5

#### Gasket Options

Standard

Flush Gap

#### Available Finishes

##### Housing:

Standard orange paint

Hot dipped galvanized (ASTM A-153)

##### Bolts:

Zinc Electroplating

#### Listings and Approvals

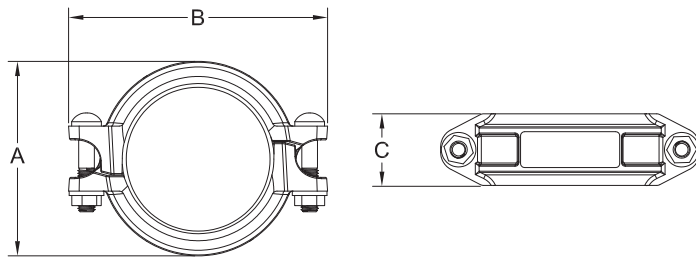
cULus Listed

FM Approved



### RGD1 Angled Pad Coupling Dimensions

Figure 1



### Gasket Options

Figure 2

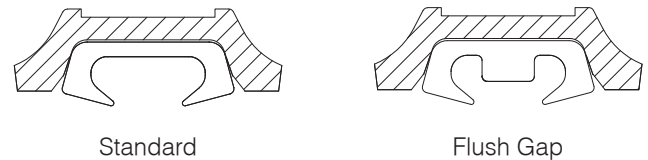


Table A

Nominal Size in (mm)	Pipe O.D. in (mm)	Max. End Load Lbs (KN)	Pipe End Gap in (mm)	Bolts Size x Length in (mm)	Dimensions			Weight lb (kg)
					A in (mm)	B in (mm)	C in (mm)	
1 (25)	1.315 (33.7)	405 (1.8)	1/16 (1.6)	3/8 x 2-1/8	2-1/4 (56)	3-3/4 (96)	1-7/8 (47)	0.99 (0.45)
1-1/4 (32)	1.660 (42.2)	656 (2.92)	1/16 (1.6)	3/8 x 2-3/8	2-1/2 (64)	4-3/16 (106)	1-7/8 (47)	1.37 (0.62)
1-1/2 (40)	1.900 (48.3)	852 (3.79)	1/16 (1.6)	3/8 x 2-3/8	2-3/4 (69)	4-7/16 (113)	1-7/8 (47)	1.43 (0.65)
2 (50)	2.375 (60.3)	1327 (5.91)	1/16 (1.6)	3/8 x 2-3/8	3-1/2 (88)	4-13/16 (122)	1-7/8 (47)	1.74 (0.79)
2-1/2 (65)	2.875 (73.0)	1945 (8.66)	1/16 (1.6)	3/8 x 2-3/4	3-15/16 (100)	5-3/8 (137)	1-7/8 (47)	1.96 (0.89)
3 (80)	3.500 (88.9)	2885 (12.84)	1/16 (1.6)	3/8 x 2-3/4	4-9/16 (116)	6-1/16 (154)	1-7/8 (47)	2.27 (1.03)
4 (100)	4.500 (114.3)	4769 (21.22)	5/32 (4.1)	1/2 x 3	5-5/8 (142)	7-3/8 (188)	2-1/16 (52)	2.93 (1.33)
6 (150)	6.625 (168.3)	10340 (46)	5/32 (4.1)	1/2 x 3-1/8	7-13/16 (199)	9-11/16 (246)	2-1/16 (52)	5 (2.27)
8 (200)	8.625 (219.1)	17524 (77.97)	5/32 (4.1)	5/8 x 4-3/4	10-5/16 (262)	12-11/16 (322)	2-5/8 (66)	9.92 (4.50)
10 (250)	10.750 (273.0)	27206 (121.05)	5/32 (4.1)	3/4 x 6-7/10	12-13/16 (325)	15-3/4 (400)	2-5/8 (66)	24.26 (11)
12 (300)	12.750 (323.9)	38297 (170.39)	5/32 (4.1)	7/8 x 7-1/4	14-13/16 (376)	18-7/16 (468)	2-5/8 (67)	28.67 (13)

Nominal Size in (mm)	Groove Type	Pipe	Approvals
1 (25)	Cut, Rolled	40	cULus, FM
	Rolled	10	cULus, FM
1-1/4 (32)	Cut, Rolled	40	cULus, FM
	Rolled	10	cULus, FM
		Mega-Flow Schedule 7	cULus, FM
		Eddy Flow Schedule 7	cULus, FM
1-1/2 (40)	Cut, Rolled	40	cULus, FM
	Rolled	10	cULus, FM
		Fire-Flo Schedule 7	cULus, FM
		Mega-Flow Schedule 7	cULus, FM
		Eddy Flow Schedule 7	cULus, FM
2 (50)	Cut, Rolled	40	cULus, FM
	Rolled	10	cULus, FM
		Fire-Flo Schedule 7	cULus, FM
		Mega-Flow Schedule 7	cULus, FM
		Eddy Flow Schedule 7	cULus, FM
		Hydroflow Schedule 7	cULus, FM
2-1/2 (65)	Cut, Rolled	40	cULus, FM
	Rolled	10	cULus, FM
		Fire-Flo Schedule 7	cULus, FM
		Mega-Flow Schedule 7	cULus, FM
		Eddy Flow Schedule 7	cULus, FM
		Hydroflow Schedule 7	cULus, FM
3 (80)	Cut, Rolled	40	cULus, FM
	Rolled	10	cULus, FM
		Fire-Flo Schedule 7	cULus, FM
		Mega-Flow Schedule 7	cULus, FM
		Eddy Flow Schedule 7	cULus, FM
		Hydroflow Schedule 7	cULus, FM
4 (100)	Cut, Rolled	40	cULus, FM
	Rolled	10	cULus, FM
		Fire-Flo Schedule 7	cULus, FM
		Mega-Flow Schedule 7	cULus, FM
		Eddy Flow Schedule 7	cULus, FM
		Hydroflow Schedule 7	cULus, FM
6 (150)	Cut, Rolled	40	cULus, FM
	Rolled	10	cULus, FM
		Mega-Flow Schedule 7	cULus, FM



**RGD1 Pipe Compatibility (cont.)**
**Table B**

Nominal Size in (mm)	Groove Type	Pipe	Approvals
8 (200)	Cut, Rolled	40	cULus, FM
	Rolled	10	cULus
		0.188 in. wall	FM
10 (250)	Cut, Rolled	40	cULus, FM
	Rolled	10	cULus
		0.188 in. wall	FM
12 (300)	Cut, Rolled	40	cULus, FM
	Rolled	0.188 in. wall	FM

**Notes:**

1. 10 refers to Schedule 10 steel pipe in accordance with NFPA 13.
2. 40 refers to Schedule 40 steel pipe in accordance with NFPA 13.
3. Fire-Flo Schedule 7 refers to Youngstown Tube Schedule 7 pipes.
4. Mega-Flow Schedule 7 refers to Listed Mega-Flow steel Pipe manufactured by Wheatland Tube Co.
5. Eddy Flow Schedule 7 refers to Listed Eddy Flow steel pipe manufactured by Bull Moose Tube Co.
6. Hydroflow Schedule 7 refers to Listed Nucor Hydroflow steel pipe manufactured by Nucor Tubular Products Inc.

# Reliable®

## Model FLX1 Flexible Coupling

cULus Listed, FM Approved  
300 psi (20.7 bar)

### FLX1 Flexible Coupling Technical Data

#### Operating Specifications

##### Maximum Working Pressure:

300 psi (20.7 bar)

##### Operating Temperature

-30 °F to 230 °F (-34 °C to 110 °C)

#### Material Specifications

**Housings:** ASTM A536 Grade 65-45-12 Ductile Iron

**Gasket:** Pre-lubricated Grade E EPDM

#### Design Specification

**Groove:** AWWA-C606

#### Bolt Specification:

SAE J429 Grade 5

#### Available Finishes

##### Housing:

Standard orange paint

Hot dipped galvanized (ASTM A-153)

##### Bolts:

Zinc Electroplating

#### Listings and Approvals

cULus Listed

FM Approved



### FLX1 Flexible Coupling Dimensions

Figure 1

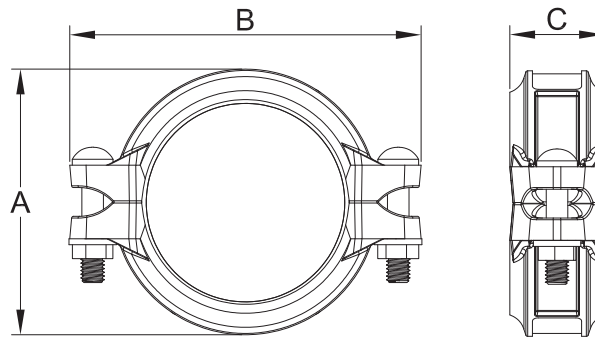


Table A

Nominal Size in (mm)	Pipe O.D. in (mm)	Max. End Load Lbs (KN)	Pipe End Gap in (mm)	Bolts Size x Length in	Angular Movement from Centerline		Dimensions			Weight lb (kg)
					Per Coupling Deg.	Per Pipe in/ft (mm/m)	A in (mm)	B in (mm)	C in (mm)	
1 (25)	1.315 (33.7)	405 (1.8)	1/16 (1.6)	3/8 x 1-1/2	2.75°	0.58 (48)	2-3/16 (55)	3-13/16 (97)	1-3/4 (45)	0.99 (0.45)
1-1/4 (32)	1.660 (42.2)	656 (2.92)	1/16 (1.6)	3/8 x 1-3/4	2.17°	0.46 (38)	2-1/2 (64)	4-1/4 (108)	1-3/4 (45)	1.10 (0.50)
1-1/2 (40)	1.900 (48.3)	852 (3.79)	1/16 (1.6)	3/8 x 1-3/4	1.9°	0.4 (33)	2-3/4 (69)	4-1/2 (114)	1-3/4 (45)	1.17 (0.53)
2 (50)	2.375 (60.3)	1327 (5.91)	1/16 (1.6)	3/8 x 2-1/8	1.52°	0.32 (27)	3-5/16 (84)	4-7/8 (124)	1-13/16 (46)	1.50 (0.68)
2-1/2 (65)	2.875 (73.0)	1945 (8.66)	1/16 (1.6)	3/8 x 2-1/8	1.25°	0.26 (22)	3-7/8 (98)	5-3/8 (137)	1-13/16 (46)	1.85 (0.84)
3 (80)	3.500 (88.9)	2885 (12.84)	1/16 (1.6)	3/8 x 2-1/8	1.03°	0.22 (18)	4-1/2 (114)	6-1/8 (156)	1-13/16 (46)	2.16 (0.98)
4 (100)	4.500 (114.3)	4769 (21.22)	1/8 (3.2)	1/2 x 2-5/8	1.6°	0.34 (28)	5-9/16 (142)	7-7/16 (189)	2 (50)	3.02 (1.37)
6 (150)	6.625 (168.3)	10340 (46)	1/8 (3.2)	1/2 x 2-5/8	1.08°	0.23 (19)	7-13/16 (198)	9-7/8 (251)	2 (50)	4.63 (2.10)
8 (200)	8.625 (219.1)	17524 (77.97)	1/8 (3.2)	5/8 x 3-1/8	0.83°	0.18 (15)	10-1/16 (256)	12-7/16 (316)	2-3/8 (60)	8.27 (3.75)
10 (250)	10.750 (273.0)	27206 (121.05)	1/8 (3.2)	3/4 x 3-1/2	0.83°	0.14 (12)	12-9/16 (319)	15-1/2 (393)	2-1/2 (64)	14.22 (6.45)
12 (300)	12.750 (323.9)	38297 (170.39)	1/8 (3.2)	3/4 x 4-1/3	0.83°	0.12 (10)	14-3/4 (374)	17-13/16 (453)	2-1/2 (65)	18.95 (8.55)

Nominal Size in (mm)	Groove Type	Pipe	Approvals
1 (25)	Cut, Rolled	40	cULus, FM
	Rolled	10	FM
1-1/4 (32)	Rolled	Cut, Rolled	cULus, FM
		10	cULus, FM
		Mega-Flow Schedule 7	cULus, FM
		Eddy Flow Schedule 7	cULus, FM
1-1/2 (40)	Rolled	Cut, Rolled	cULus, FM
		10	cULus, FM
		Fire-Flo Schedule 7	cULus, FM
		Mega-Flow Schedule 7	cULus, FM
		Eddy Flow Schedule 7	cULus, FM
2 (50)	Rolled	Cut, Rolled	cULus, FM
		10	cULus, FM
		Fire-Flo Schedule 7	cULus, FM
		Mega-Flow Schedule 7	cULus, FM
		Eddy Flow Schedule 7	cULus, FM
		Hydroflow Schedule 7	cULus, FM
2-1/2 (65)	Rolled	Cut, Rolled	cULus, FM
		10	cULus, FM
		Fire-Flo Schedule 7	cULus, FM
		Mega-Flow Schedule 7	cULus, FM
		Eddy Flow Schedule 7	cULus, FM
		Hydroflow Schedule 7	cULus, FM
3 (80)	Rolled	Cut, Rolled	cULus, FM
		10	cULus, FM
		Fire-Flo Schedule 7	cULus, FM
		Mega-Flow Schedule 7	cULus, FM
		Eddy Flow Schedule 7	cULus, FM
		Hydroflow Schedule 7	cULus, FM
4 (100)	Rolled	Cut, Rolled	cULus, FM
		10	cULus, FM
		Fire-Flo Schedule 7	cULus, FM
		Mega-Flow Schedule 7	cULus, FM
		Eddy Flow Schedule 7	cULus, FM
		Hydroflow Schedule 7	cULus, FM
6 (150)	Rolled	Cut, Rolled	cULus, FM
		10	cULus, FM
		Mega-Flow Schedule 7	cULus, FM

**FLX1 Pipe Compatibility (cont.)**
**Table B**

Nominal Size in (mm)	Groove Type	Pipe	Approvals
8 (200)	Cut, Rolled	40	cULus, FM
	Rolled	10	cULus
		0.188 in. wall	FM
10 (250)	Cut, Rolled	40	cULus, FM
	Rolled	10	cULus
		0.188 in. wall	FM
12 (300)	Cut, Rolled	40	cULus, FM
	Rolled	ASME B36.10M-10	cULus
		0.188 in. wall	FM

**Notes:**

1. 10 refers to Schedule 10 steel pipe in accordance with NFPA 13.
2. 40 refers to Schedule 40 steel pipe in accordance with NFPA 13.
3. Fire-Flo Schedule 7 refers to Youngstown Tube Schedule 7 pipes.
4. Mega-Flow Schedule 7 refers to Listed Mega-Flow steel Pipe manufactured by Wheatland Tube Co.
5. Eddy Flow Schedule 7 refers to Listed Eddy Flow steel pipe manufactured by Bull Moose Tube Co.
6. Hydroflow Schedule 7 refers to Listed Nucor Hydroflow steel pipe manufactured by Nucor Tubular Products Inc.

# Reliable®

## Model RCD1 Grooved Reducing Coupling with Steel Ring

cULus Listed, FM Approved  
300 psi (20.7 bar)

### RCD1 Grooved Reducing Coupling with Steel Ring Technical Data

**Operating Specifications**  
**Maximum Working Pressure:**  
300 psi (20.7 bar)

**Operating Temperature**  
-30 °F to 230 °F (-34 °C to 110 °C)

**Material Specifications**

**Housings:** ASTM A536 Grade 65-45-12 Ductile Iron

**Gasket:** Pre-lubricated Grade E EPDM

**Design Specification:**

**Groove:** AWWA-C606

**Bolt Specification:**  
SAE J429 Grade 5

**Available Finishes**

**Housing:**

Standard orange paint

Hot dipped galvanized (ASTM A-153)

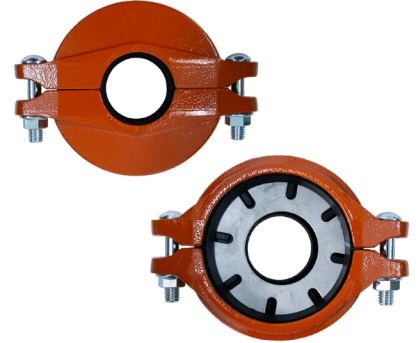
**Bolts:**

Zinc Electroplating

**Listings and Approvals**

cULus Listed

FM Approved



### RCD1 Grooved Reducing Coupling with Steel Ring Dimensions

Figure 1

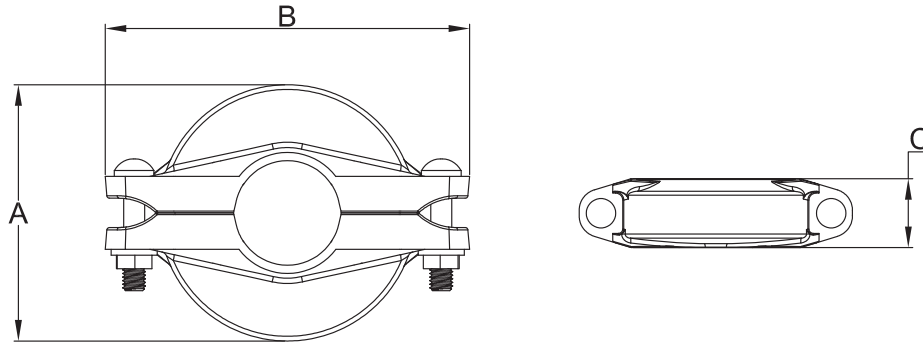


Table A

Nominal Size in (mm)	Pipe O.D. in (mm)	Max. End Load Lbs (KN)	Pipe End Gap in (mm)	Bolt Size x Length in	Deflection		Dimensions			Weight lb (kg)
					Per Coupling Deg.	Per Pipe in/ft (mm/m)	A in (mm)	B in (mm)	C in (mm)	
1-1/2 x 1-1/4 (40 x 32)	1.900 x 1.660 (48.3 x 42.2)	852 (3.79)	1/16 (1.6)	3/8 x 2	1.9°	3/8 (33)	2-3/4 (70)	4-7/16 (113)	1-3/4 (45)	1.54 (0.70)
2 x 1-1/2 (50 x 40)	2.375 x 1.900 (60.3 x 48.3)	1327 (5.91)	1/16 (1.6)	3/8 x 2-1/8	1.52°	5/16 (27)	3-1/4 (82)	5-1/8 (130)	1-13/16 (46)	1.83 (0.83)
2-1/2 x 1-1/4 (65 x 32)	2.875 x 1.660 (73.0 x 42.2)	1945 (8.66)	1/16 (1.6)	3/8 x 2-1/8	1.25°	1/4 (22)	3-13/16 (97)	6 (151)	1-13/16 (46)	2.54 (1.15)
2-1/2 x 1-1/2 (65 x 40)	2.875 x 1.900 (73.0 x 48.3)	1945 (8.66)	1/16 (1.6)	3/8 x 2-1/8	1.25°	1/4 (22)	3-13/16 (97)	6 (151)	1-13/16 (46)	2.65 (1.20)
2-1/2 x 2 (65 x 50)	2.875 x 2.375 (73.0 x 60.3)	1945 (8.66)	1/16 (1.6)	3/8 x 2-1/8	1.25°	1/4 (22)	3-13/16 (97)	6 (151)	1-13/16 (46)	2.31 (1.05)
3 x 2 (80 x 50)	3.500 x 2.375 (88.9 x 60.3)	2885 (12.84)	1/16 (1.6)	1/2 x 2-5/8	1.03°	1/4 (18)	4-7/16 (112)	6-9/16 (167)	1-13/16 (46)	3.09 (1.4)
3 x 2-1/2 (80 x 65)	3.500 x 2.875 (88.9 x 73.0)	2885 (12.84)	1/16 (1.6)	1/2 x 2-5/8	1.03°	1/4 (18)	4-7/16 (112)	6-9/16 (167)	1-13/16 (46)	2.78 (1.26)
4 x 2 (100 x 50)	4.500 x 2.375 (114.3 x 60.3)	4769 (21.22)	1/8 (3.2)	1/2 x 2-5/8	1.6°	5/16 (28)	5-9/16 (141)	8 (200)	2 (50)	5.40 (2.45)
4 x 2-1/2 (100 x 65)	4.500 x 2.875 (114.3 x 73.0)	4769 (21.22)	1/8 (3.2)	1/2 x 2-5/8	1.6°	5/16 (28)	5-9/16 (141)	8 (200)	2 (50)	4.68 (2.12)
4 x 3 (100 x 80)	4.500 x 3.500 (114.3 x 88.9)	4769 (21.22)	1/8 (3.2)	1/2 x 2-5/8	1.6°	5/16 (28)	5-9/16 (141)	8 (200)	2 (50)	4.63 (2.10)
6 x 4 (150 x 100)	6.625 x 4.500 (168.3 x 114.3)	10340 (46)	1/8 (3.2)	5/8 x 3-1/8	1.1°	1/4 (20)	8 (199)	10-13/16 (275)	2-1/16 (52)	9.26 (4.20)
8 x 6 (200 x 150)	8.625 x 6.625 (219.1 x 168.3)	17524 (77.97)	1/8 (3.2)	3/4 x 4-1/3	0.83°	3/16 (15)	10-1/16 (256)	13-1/4 (336)	2-1/4 (58)	15.66 (7.10)

Nominal Size in (mm)	Groove Type	Pipe	Approvals
1-1/2 x 1-1/4 (40 x 32)	Rolled	10	cULus, FM
		Mega-Flow Schedule 7	cULus, FM
		Eddy Flow Schedule 7	cULus, FM
		Fire-Flo Schedule 7	FM
	Cut, Rolled	40	cULus, FM
2 x 1-1/2 (50 x 40)	Rolled	10	cULus, FM
		Mega-Flow Schedule 7	cULus, FM
		Eddy Flow Schedule 7	cULus, FM
		Hydroflow Schedule 7	cULus, FM
		Fire-Flo Schedule 7	FM
	Cut, Rolled	40	cULus, FM
2-1/2 x 1-1/4 (65 x 32)	Rolled	10	cULus, FM
		Mega-Flow Schedule 7	cULus, FM
		Eddy Flow Schedule 7	cULus, FM
		Hydroflow Schedule 7	cULus, FM
		Fire-Flo Schedule 7	FM
	Cut, Rolled	40	cULus, FM
2-1/2 x 1-1/2 (65 x 40)	Rolled	10	cULus, FM
		Mega-Flow Schedule 7	cULus, FM
		Eddy Flow Schedule 7	cULus, FM
		Hydroflow Schedule 7	cULus, FM
		Fire-Flo Schedule 7	FM
	Cut, Rolled	40	cULus, FM
2-1/2 x 2 (65 x 50)	Rolled	10	cULus, FM
		Mega-Flow Schedule 7	cULus, FM
		Eddy Flow Schedule 7	cULus, FM
		Hydroflow Schedule 7	cULus, FM
		Fire-Flo Schedule 7	FM
	Cut, Rolled	40	cULus, FM
3 x 2 (80 x 50)	Rolled	10	cULus, FM
		Mega-Flow Schedule 7	cULus, FM
		Eddy Flow Schedule 7	cULus, FM
		Hydroflow Schedule 7	cULus, FM
		Fire-Flo Schedule 7	FM
	Cut, Rolled	40	cULus, FM
3 x 2-1/2 (80 x 65)	Rolled	10	cULus, FM
		Mega-Flow Schedule 7	cULus, FM
		Eddy Flow Schedule 7	cULus, FM
		Hydroflow Schedule 7	cULus, FM
		Fire-Flo Schedule 7	FM
	Cut, Rolled	40	cULus, FM

Nominal Size in (mm)	Groove Type	Pipe	Approvals
4 x 2 (100 x 50)	Rolled	10	cULus, FM
		Mega-Flow Schedule 7	cULus, FM
		Eddy Flow Schedule 7	cULus, FM
		Hydroflow Schedule 7	cULus, FM
		Fire-Flo Schedule 7	FM
	Cut, Rolled	40	cULus, FM
4 x 2-1/2 (100 x 65)	Rolled	10	cULus, FM
		Mega-Flow Schedule 7	cULus, FM
		Eddy Flow Schedule 7	cULus, FM
		Hydroflow Schedule 7	cULus, FM
		Fire-Flo Schedule 7	FM
	Cut, Rolled	40	cULus, FM
4 x 3 (100 x 80)	Rolled	10	cULus, FM
		Mega-Flow Schedule 7	cULus, FM
		Eddy Flow Schedule 7	cULus, FM
		Hydroflow Schedule 7	cULus, FM
		Fire-Flo Schedule 7	FM
	Cut, Rolled	40	cULus, FM
6 x 4 (150 x 100)	Rolled	10	cULus, FM
		Mega-Flow Schedule 7	cULus, FM
		Eddy Flow Schedule 7	cULus, FM
		Hydroflow Schedule 7	cULus, FM
		Fire-Flo Schedule 7	FM
	Cut, Rolled	40	cULus, FM
8 x 6 (200 x 150)	Rolled	10	cULus, FM
		Mega-Flow Schedule 7	cULus
	Cut, Rolled	40	cULus, FM

**Notes:**

1. 10 refers to Schedule 10 steel pipe in accordance with NFPA 13.
2. 40 refers to Schedule 40 steel pipe in accordance with NFPA 13.
3. Fire-Flo Schedule 7 refers to Youngstown Tube Schedule 7 pipes.
4. Mega-Flow Schedule 7 refers to Listed Mega-Flow steel Pipe manufactured by Wheatland Tube Co.
5. Eddy Flow Schedule 7 refers to Listed Eddy Flow steel pipe manufactured by Bull Moose Tube Co.
6. Hydroflow Schedule 7 refers to Listed Nucor Hydroflow steel pipe manufactured by Nucor Tubular Products Inc.
7. 1-1/4" x 1-1/2" RCD coupling does not use a steel reinforcing ring; the similarity in outlet sizing does not require one and all 3rd party qualification was performed without using a steel ring.

# Reliable®

## Model E901/E90X1 Grooved Elbow 90° Standard Radius

cULus Listed, FM Approved  
300 psi (20.7 bar)

### E901/E90X1 Grooved Elbow 90° Standard Radius Technical Data

**Operating Specifications**  
**Maximum Working Pressure**  
300 psi (20.7 bar)

**Material Specifications**

**Body:** ASTM A536 Grade 65-45-12 Ductile Iron

**Nominal Sizes**

**E90X1:** 1" (25 mm) - 1-1/2" (40 mm)

**E901:** 2" (50 mm) - 8" (200 mm)

**Design Specifications**

**Groove:** AWWA-C606

**Available Finishes**

**Housing:**

Standard orange paint

Hot dipped galvanized (ASTM A-153)

**Listings and Approvals**

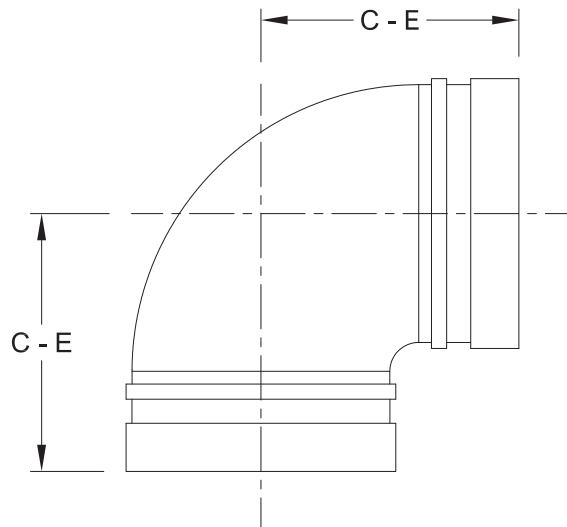
cULus Listed

FM Approved



### E901/E90X1 Grooved Elbow 90° Standard Radius Dimensions

**Figure 1**



**Table A**

Nominal Size in (mm)	Pipe O.D. in (mm)	Dimension in (mm)	Weight lb (kg)
		C - E	
1 (25)	1.315 (33.7)	2-1/4 (57)	0.66 (0.3)
1-1/4 (32)	1.660 (42.2)	2-3/4 (70)	0.95 (0.43)
1-1/2 (40)	1.900 (48.3)	2-3/4 (70)	1.06 (0.48)
2 (50)	2.375 (60.3)	3-1/4 (83)	1.65 (0.75)
2-1/2 (65)	2.875 (73.0)	3-3/4 (95)	2.47 (1.12)
3 (80)	3.500 (88.9)	4-1/4 (108)	3.31 (1.5)
4 (100)	4.500 (114.3)	5 (127)	5.20 (2.36)
6 (150)	6.625 (168.3)	6-1/2 (165)	13.89 (6.30)
8 (200)	8.625 (219.1)	7-3/4 (197)	22.27 (10.10)





## Model E90S1 Grooved Elbow 90° Short Radius

cULus Listed, FM Approved  
300 psi (20.7 bar)

### E90S1 Grooved Elbow 90° Short Radius Technical Data

#### Operating Specifications

**Maximum Working Pressure:**  
300 psi (20.7 bar)

#### Material Specifications

**Body:** ASTM A536 Grade 65-45-12 Ductile Iron

#### Design Specifications

**Groove:** AWWA-C606

#### Available Finishes

##### Housing:

Standard orange paint  
Hot dipped galvanized (ASTM A-153)

#### Listings and Approvals

cULus Listed  
FM Approved



### E90S1 Grooved Elbow 90° Short Radius Dimensions

Figure 1

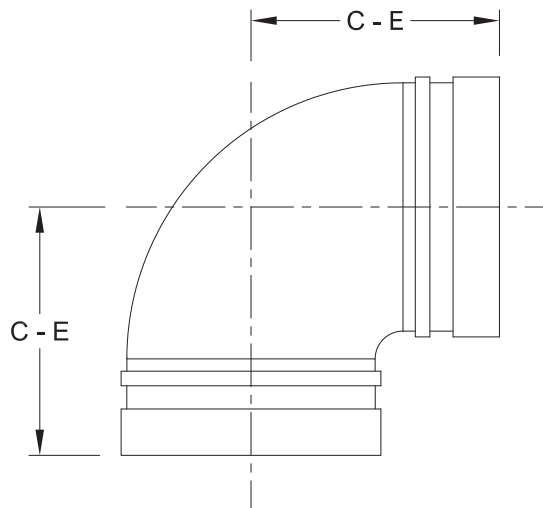


Table A

Nominal Size in (mm)	Pipe O.D. in (mm)	Dimension in (mm)	Weight lb (kg)	Fitting Friction Loss Eq Feet of Pipe (m)
		C - E		
2 (50)	2.375 (60.3)	2-3/4 (70)	1.41 (0.64)	3.6 (1.1)
2-1/2 (65)	2.875 (73.0)	3 (76)	1.94 (0.88)	4.3 (1.3)
3 (80)	3.500 (88.9)	3-3/8 (85)	2.56 (1.16)	4.9 (1.5)
4 (100)	4.500 (114.3)	4 (102)	4.06 (1.84)	6.9 (2.1)
6 (150)	6.625 (168.3)	5-1/2 (140)	10.14 (4.60)	9.8 (3)
8 (200)	8.625 (219.1)	6-7/8 (175)	16.64 (8)	13.1 (4)
10 (250)	10.750 (273.0)	8-7/16 (215)	32.63 (14.80)	17.1 (5.2)
12 (300)	12.750 (323.9)	8-11/16 (220)	35.06 (15.90)	20.0 (6.1)

P/N 9999970638



## Model EOR1 End Elbow 90° FNPT

cULus Listed, FM Approved  
300 psi (20.7 bar)

### EOR1 End Elbow 90° Technical Data

**Operating Specifications**  
**Maximum Working Pressure:**  
300 psi (20.7 bar)

**Material Specifications**

**Body:** ASTM A536 Grade 65-45-12 Ductile Iron

**Design Specifications**

**Thread:** ASME B1.20.1

**Groove:** AWWA-C606

**Available Finishes**

**Housing:**

Standard orange paint

Hot dipped galvanized (ASTM A-153)

**Listings and Approvals**

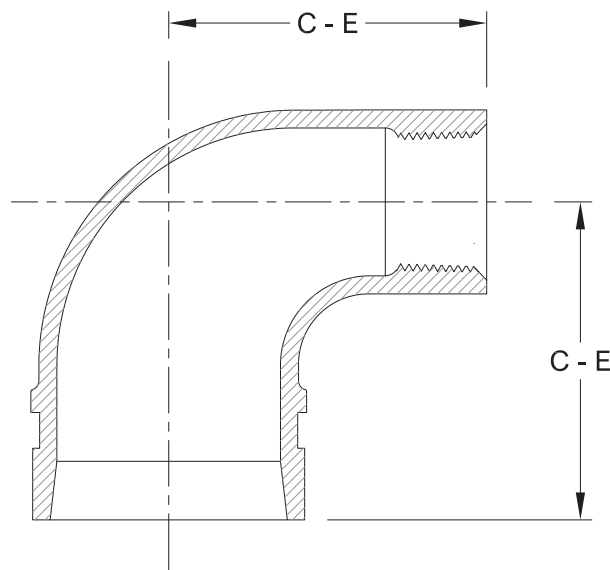
cULus Listed

FM Approved



### EOR1 End Elbow 90° Dimensions

**Figure 1**



**Table A**

Nominal Size in (mm)	Pipe O.D. in (mm)	Nominal Pipe Thread Size in (mm)	Dimension C - E in (mm)	Weight lb (kg)
1-1/4 (32)	1.660 (42.2)	1/2 (15)	2-3/8 (61)	0.77 (0.35)
1-1/4 (32)	1.660 (42.2)	3/4 (20)	2-3/8 (61)	0.88 (0.40)
1-1/4 (32)	1.660 (42.2)	1 (25)	2-3/8 (61)	0.88 (0.40)
1-1/2 (40)	1.900 (48.3)	1/2 (15)	2-1/2 (64)	0.88 (0.40)
1-1/2 (40)	1.900 (48.3)	3/4 (20)	2-1/2 (64)	0.93 (0.42)
1-1/2 (40)	1.900 (48.3)	1 (25)	2-1/2 (64)	1.06 (0.48)
2 (50)	2.375 (60.3)	1/2 (15)	2-3/4 (70)	0.84 (0.38)
2 (50)	2.375 (60.3)	3/4 (20)	2-3/4 (70)	0.90 (0.41)
2 (50)	2.375 (60.3)	1 (25)	2-3/4 (70)	1.32 (0.60)

P/N 9999970639



## Model DR901 Grooved Drain Elbow with 1" FNPT Outlet

cULus Listed, FM Approved  
300 psi (20.7 bar)

### DR901 Grooved Drain Elbow with 1" FNPT Outlet Technical Data

#### Operating Specifications

**Maximum Working Pressure:**  
300 psi (20.7 bar)

#### Material Specifications

**Body:** ASTM A536 Grade 65-45-12 Ductile Iron

#### Design Specifications

**Thread:** ASME B1.20.1

**Groove:** AWWA-C606

#### Available Finishes

##### Housing:

Standard orange paint  
Hot dipped galvanized (ASTM A-153)

#### Listings and Approvals

cULus Listed  
FM Approved



### DR901 Grooved Drain Elbow with 1" FNPT Outlet Dimensions

Figure 1

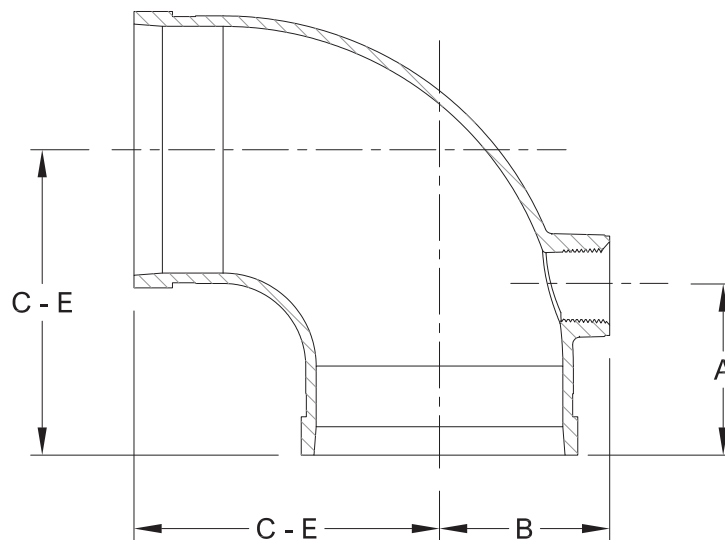


Table A

Nominal Size in (mm)	Pipe O.D. in/mm	Dimensions			Weight lb (kg)
		C - E in (mm)	A in (mm)	B in (mm)	
1-1/2 x 1 (40 x 25)	1.900 x 1.315 (48.3 x 33.7)	2-3/4 (70)	1-7/8 (48)	1-3/8 (36)	1.32 (0.60)
2 x 1 (50 x 25)	2.375 x 1.315 (60.3 x 33.7)	3-1/4 (83)	2-3/4 (70)	1-1/2 (38)	1.92 (0.87)
2-1/2 x 1 (65 x 25)	2.875 x 1.315 (73.0 x 33.7)	3-3/4 (95)	2-3/4 (70)	1-3/4 (45)	2.73 (1.24)
3 x 1 (80 x 25)	3.500 x 1.315 (88.9 x 33.7)	4-1/4 (108)	2-3/4 (70)	2-3/16 (55)	4.28 (1.94)
4 x 1 (100 x 25)	4.500 x 1.315 (114.3 x 33.7)	5 (127)	2-3/4 (70)	2-11/16 (69)	5.40 (2.45)
6 x 1 (150 x 25)	6.625 x 1.315 (168.3 x 33.7)	6-1/2 (165)	2-3/4 (70)	3-3/4 (96)	14.44 (6.55)

# Reliable®

## Model E451/E45X1 Grooved Elbow 45° Standard Radius

cULus Listed, FM Approved  
300 psi (20.7 bar)

### E451/E45X1 Grooved Elbow 45° Standard Radius Technical Data

**Operating Specifications**  
**Maximum Working Pressure:**  
300 psi (20.7 bar)

**Material Specifications**  
**Body:** ASTM A536 Grade 65-45-12 Ductile Iron

**Nominal Sizes**  
**E45X1:** 1" (25 mm) - 1-1/2" (40 mm)  
**E451:** 2" (50 mm) - 12" (300 mm)

**Design Specification**  
**Groove:** AWWA-C606

**Available Finishes**  
**Housing:**  
Standard orange paint  
Hot dipped galvanized (ASTM A-153)

**Listings and Approvals**  
cULus Listed  
FM Approved



### E451/E45X1 Grooved Elbow 45° Standard Radius Dimensions

Figure 1

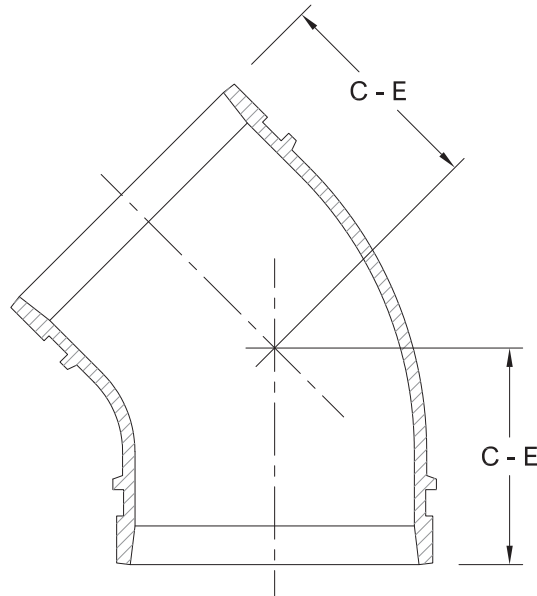


Table A

Nominal Size in (mm)	Pipe O.D. in (mm)	Dimension in (mm)	Weight lb (kg)
		C - E	
1 (25)	1.315 (33.7)	1-3/4 (45)	0.50 (0.22)
1-1/4 (32)	1.660 (42.2)	1-3/4 (45)	0.68 (0.30)
1-1/2 (40)	1.900 (48.3)	1-3/4 (45)	0.77 (0.34)
2 (50)	2.375 (60.3)	2 (51)	1.31 (0.58)
2-1/2 (65)	2.875 (73.0)	2-7/16 (62)	2.03 (0.90)
3 (80)	3.500 (88.9)	2-3/4 (70)	2.48 (1.10)
4 (100)	4.500 (114.3)	3 (76)	4.16 (1.85)
6 (150)	6.625 (168.3)	3-1/2 (89)	8.10 (3.60)
8 (200)	8.625 (219.1)	4-1/4 (108)	14.63 (6.50)
10 (250)	10.750 (273.0)	4-3/4 (121)	34.88 (15.50)
12 (300)	12.750 (323.9)	5-1/4 (133)	49.73 (22.10)



## Model E221 22.5° Elbow

cULus Listed, FM Approved  
300 psi (20.7 bar)

### E221 22.5° Elbow Technical Data

**Operating Specifications**  
**Maximum Working Pressure:**  
300 psi (20.7 bar)

**Material Specifications**  
**Body:** ASTM A536 Grade 65-45-12 Ductile Iron

**Design Specification**  
**Groove:** AWWA-C606

**Available Finishes**  
**Housing:**  
Standard orange paint  
Hot dipped galvanized (ASTM A-153)

**Listings and Approvals**  
cULus Listed  
FM Approved



### E221 22.5° Elbow Dimensions

Figure 1

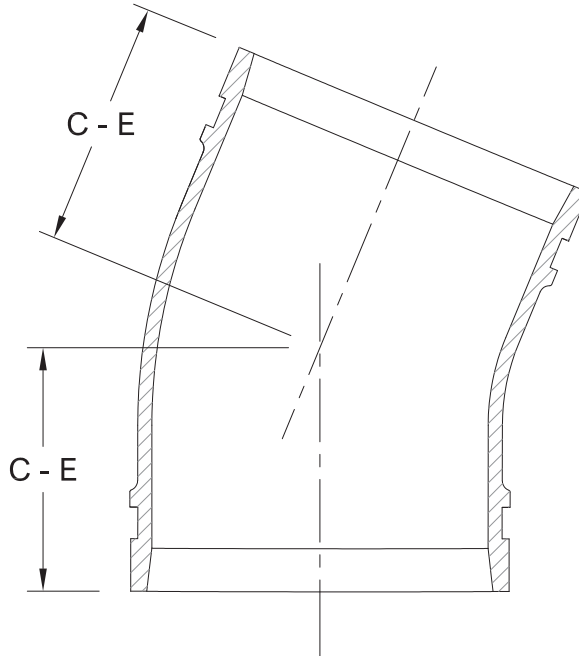


Table A

Nominal Size in (mm)	Pipe O.D. in (mm)	Dimension in (mm)	Weight lb (kg)
		C - E	
1-1/4 (32)	1.660 (42.2)	1-3/4 (45)	0.59 (0.26)
1-1/2 (40)	1.900 (48.3)	1-3/4 (45)	0.59 (0.26)
2 (50)	2.375 (60.3)	1-7/8 (48)	1.13 (0.50)
2-1/2 (65)	2.875 (73.0)	2 (51)	1.85 (0.82)
3 (80)	3.500 (88.9)	2-1/4 (57)	2.48 (1.10)
4 (100)	4.500 (114.3)	2-7/8 (73)	3.71 (1.65)
6 (150)	6.625 (168.3)	3-1/8 (79)	8.37 (3.72)
8 (200)	8.625 (219.1)	3-7/8 (98)	11.93 (5.30)



## Model E111 11.25° Elbow

cULus Listed, FM Approved  
300 psi (20.7 bar)

### E111 11.25° Elbow Technical Data

#### Operating Specifications

**Maximum Working Pressure:**  
300 psi (20.7 bar)

#### Material Specifications

**Body:** ASTM A536 Grade 65-45-12 Ductile Iron

#### Design Specification

**Groove:** AWWA-C606

#### Available Finishes

##### Housing:

Standard orange paint  
Hot dipped galvanized (ASTM A-153)

#### Listings and Approvals

cULus Listed  
FM Approved



### E111 11.25° Elbow Dimensions

Figure 1

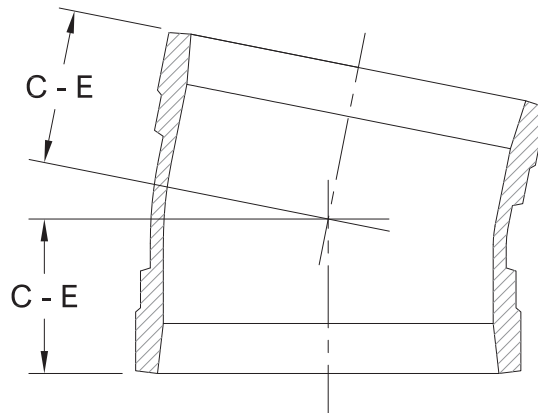


Table A

Nominal Size in (mm)	Pipe O.D. in (mm)	Dimension in (mm)	Weight lb (kg)
		C - E	
1-1/4 (32)	1.660 (42.2)	1-3/8 (35)	0.57 (0.26)
1-1/2 (40)	1.900 (48.3)	1-3/8 (35)	0.62 (0.28)
2 (50)	2.375 (60.3)	1-1/2 (38)	0.88 (0.40)
2-1/2 (65)	2.875 (73.0)	1-1/2 (38)	1.59 (0.72)
3 (80)	3.500 (88.9)	1-1/2 (38)	1.65 (0.75)
4 (100)	4.500 (114.3)	1-3/4 (45)	2.76 (1.25)
6 (150)	6.625 (168.3)	2 (51)	5.91 (2.68)
8 (200)	8.625 (219.1)	2 (51)	7.50 (3.40)



## Model TE1 Grooved Tee Standard Radius

cULus Listed, FM Approved  
300 psi (20.7 bar)

### TE1 Grooved Tee Standard Radius Technical Data

**Operating Specifications**  
**Maximum Working Pressure:**  
300 psi (20.7 bar)

**Material Specifications**

**Body:** ASTM A536 Grade 65-45-12 Ductile Iron

**Design Specification**

**Groove:** AWWA-C606

**Available Finishes**

**Housing:**

Standard orange paint  
Hot dipped galvanized (ASTM A-153)

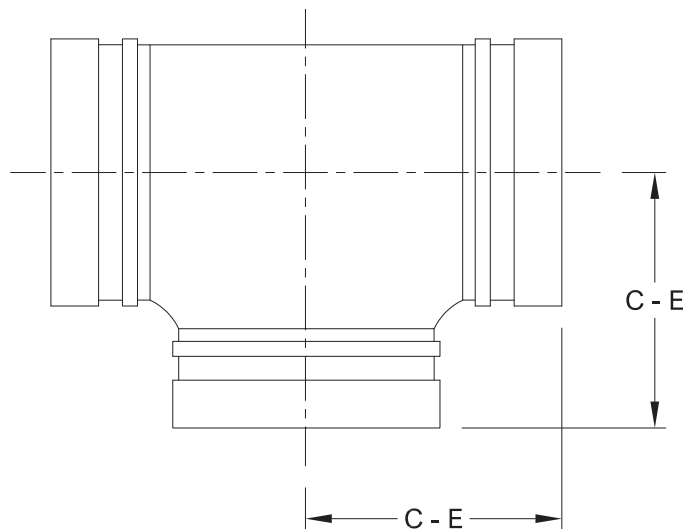
**Listings and Approvals**

cULus Listed  
FM Approved



### TE1 Grooved Tee Standard Radius Dimensions

**Figure 1**



**Table A**

Nominal Size in (mm)	Pipe O.D. in/mm	Dimension C - E in (mm)	Weight lb (kg)
1 (25)	1.315 (33.7)	2-1/4 (57)	0.93 (0.42)
1-1/4 (32)	1.660 (42.2)	2-3/4 (70)	1.32 (0.60)
1-1/2 (40)	1.900 (48.3)	2-3/4 (70)	1.65 (0.75)
2 (50)	2.375 (60.3)	3-5/16 (84)	2.62 (1.19)
2-1/2 (65)	2.875 (73.0)	3-3/4 (95)	3.66 (1.66)
3 (80)	3.500 (88.9)	4-1/4 (108)	5.18 (2.35)
4 (100)	4.500 (114.3)	5 (127)	8.05 (3.65)
6 (150)	6.625 (168.3)	6-1/2 (165)	19.40 (8.80)
8 (200)	8.625 (219.1)	7-3/4 (197)	30.30 (13.74)



## Model TESR1 Grooved Tee Short Radius

cULus Listed, FM Approved  
300 psi (20.7 bar)

### TESR1 Grooved Tee Short Radius Technical Data

#### Operating Specifications

**Maximum Working Pressure:**  
300 psi (20.7 bar)

#### Material Specifications

**Body:** ASTM A536 Grade 65-45-12 Ductile Iron

#### Design Specification

**Groove:** AWWA-C606

#### Available Finishes

##### Housing:

Standard orange paint  
Hot dipped galvanized (ASTM A-153)

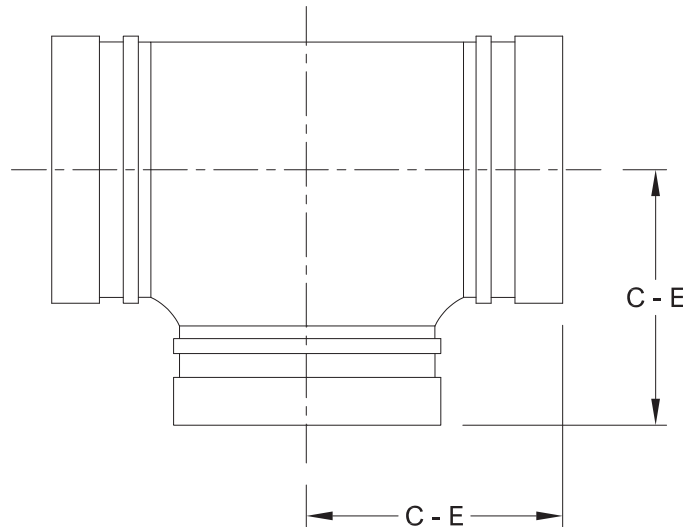
#### Listings and Approvals

cULus Listed  
FM Approved



### TESR1 Grooved Tee Short Radius Dimensions

**Figure 1**



**Table A**

Nominal Size in (mm)	Pipe O.D. in/mm	Dimension C - E in (mm)	Weight lb (kg)	Run Friction Loss Eq Feet of Pipe (m)	Branch Friction Loss Eq Feet of Pipe (m)
2 (50)	2.375 (60.3)	2-3/4 (70)	2.25 (1.02)	3.6 (1.1)	8.5 (2.6)
2-1/2 (65)	2.875 (73.0)	3 (76)	2.76 (1.25)	4.3 (1.3)	10.8 (3.3)
3 (80)	3.500 (88.9)	3-3/8 (85)	3.77 (1.71)	4.9 (1.5)	13.1 (4)
4 (100)	4.500 (114.3)	4 (102)	5.47 (2.48)	6.9 (2.1)	16.1 (4.9)
6 (150)	6.625 (168.3)	5-1/2 (140)	13.41 (6.08)	9.8 (3)	24.9 (7.6)
8 (200)	8.625 (219.1)	6-7/8 (175)	26.46 (12)	13.1 (4)	33.1 (10.1)
10 (250)	10.750 (273.0)	8-1/2 (215)	37.15 (16.85)	17.1 (5.2)	41 (12.5)
12 (300)	12.750 (323.9)	8-11/16 (220)	55.35 (25.10)	20 (6.1)	49.9 (15.2)





## Model CRS1 Grooved Cross Short Radius

cULus Listed, FM Approved  
300 psi (20.7 bar)

### CRS1 Grooved Cross Short Radius Technical Data

**Operating Specifications**  
**Maximum Working Pressure:**  
300 psi (20.7 bar)

**Material Specifications**  
**Body:** ASTM A536 Grade 65-45-12 Ductile Iron

**Design Specification**  
**Groove:** AWWA-C606

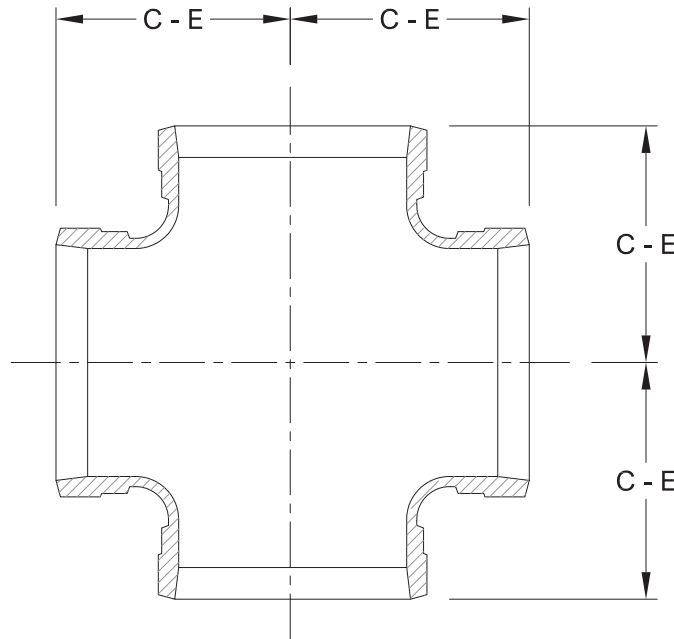
**Available Finishes**  
**Housing:**  
Standard orange paint  
Hot dipped galvanized (ASTM A-153)

**Listings and Approvals**  
cULus Listed  
FM Approved



### CRS1 Grooved Cross Short Radius Dimensions

**Figure 1**



**Table A**

Nominal Size in (mm)	Pipe O.D. in/mm	Dimension C - E in (mm)	Weight lb (kg)	Run Friction Loss Eq Feet of Pipe (m)	Branch Friction Loss Eq Feet of Pipe (m)
2 (50)	2.375 (60.3)	2-3/4 (70)	2.65 (1.2)	3.6 (1.1)	8.5 (2.6)
2-1/2 (65)	2.875 (73.0)	3 (76)	4.19 (1.9)	4.3 (1.3)	10.8 (3.3)
3 (80)	3.500 (88.9)	3-3/8 (86)	4.41 (2)	4.9 (1.5)	13.1 (4)
4 (100)	4.500 (114.3)	4 (102)	7.83 (3.55)	6.9 (2.1)	16.1 (4.9)
6 (150)	6.625 (168.3)	5-1/2 (140)	17.09 (7.75)	9.8 (3)	24.9 (7.6)
8 (200)	8.625 (219.1)	6-7/8 (174)	28.99 (13.15)	13.1 (4)	33.1 (10.1)

P/N 9999970646



## Model CRG1 Grooved Concentric Reducer

cULus Listed, FM Approved  
300 psi (20.7 bar)

### CRG1 Grooved Concentric Reducer Technical Data

**Operating Specifications**  
**Maximum Working Pressure:**  
300 psi (20.7 bar)

**Material Specifications**

**Body:** ASTM A536 Grade 65-45-12 Ductile Iron

**Design Specification**

**Groove:** AWWA-C606

**Available Finishes**

**Housing:**

Standard orange paint  
Hot dipped galvanized (ASTM A-153)

**Listings and Approvals**

cULus Listed  
FM Approved



### CRG1 Grooved Concentric Reducer Dimensions

Figure 1

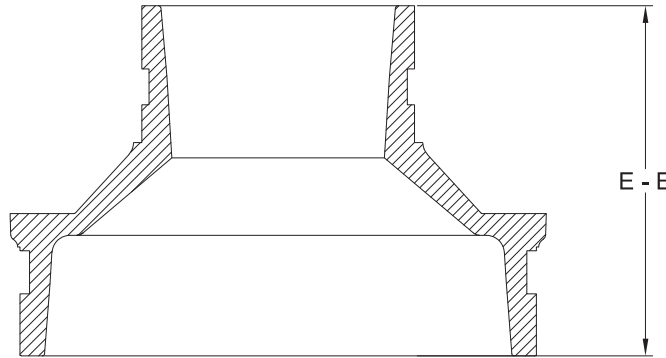


Table A

Nominal Size in (mm)	Pipe O.D. in/mm	Dimension E - E in (mm)	Weight lb (kg)
1-1/2 x 1-1/4 (40 x 32)	1.900 x 1.660 (48.3 x 42.2)	2-1/2 (64)	0.90 (0.41)
2 x 1-1/4 (50 x 32)	2.375 x 1.660 (60.3 x 42.2)	2-1/2 (64)	0.95 (0.43)
2 x 1-1/2 (50 x 40)	2.375 x 1.900 (60.3 x 48.3)	2-1/2 (64)	0.95 (0.43)
2-1/2 x 1-1/4 (65 x 32)	2.875 x 1.660 (73.0 x 42.2)	2-1/2 (64)	1.10 (0.50)
2-1/2 x 1-1/2 (65 x 40)	2.875 x 1.900 (73.0 x 48.3)	2-1/2 (64)	1.10 (0.50)
2-1/2 x 2 (65 x 50)	2.875 x 2.375 (73.0 x 60.3)	2-1/2 (64)	1.15 (0.52)
3 x 1-1/4 (80 x 32)	3.500 x 1.660 (88.9 x 42.2)	2-1/2 (64)	1.32 (0.60)
3 x 1-1/2 (80 x 40)	3.500 x 1.900 (88.9 x 48.3)	2-1/2 (64)	1.37 (0.62)
3 x 2 (80 x 50)	3.500 x 2.375 (88.9 x 60.3)	2-1/2 (64)	1.41 (0.64)
3 x 2-1/2 (80 x 65)	3.500 x 2.875 (88.9 x 73.0)	2-1/2 (64)	1.59 (0.72)
4 x 1-1/4 (100 x 32)	4.500 x 1.660 (114.3 x 42.2)	3 (76)	1.99 (0.90)
4 x 1-1/2 (100 x 40)	4.500 x 1.900 (114.3 x 48.3)	3 (76)	1.99 (0.90)
4 x 2 (100 x 50)	4.500 x 2.375 (114.3 x 60.3)	3 (76)	2.36 (1.07)
4 x 2-1/2 (100 x 65)	4.500 x 2.875 (114.3 x 73.0)	3 (76)	2.43 (1.10)
4 x 3 (100 x 80)	4.500 x 3.500 (114.3 x 88.9)	3 (76)	2.60 (1.18)
6 x 2 (150 x 50)	6.625 x 2.375 (168.3 x 60.3)	3-3/8 (85)	3.86 (1.75)
6 x 2-1/2 (150 x 65)	6.625 x 2.875 (168.3 x 73.0)	3-3/8 (85)	4.26 (1.93)
6 x 3 (150 x 80)	6.625 x 3.500 (168.3 x 88.9)	3-3/8 (85)	4.63 (2.10)
6 x 4 (150 x 100)	6.625 x 4.500 (168.3 x 114.3)	3-3/8 (85)	5.18 (2.35)
8 x 4 (200 x 100)	8.625 x 4.500 (219.1 x 114.3)	3-3/8 (85)	7.17 (3.25)
8 x 6 (200 x 150)	8.625 x 6.625 (219.1 x 168.3)	3-3/8 (85)	7.61 (3.45)



## Model GRTG1 Grooved Reducing Tee

cULus Listed, FM Approved  
300 psi (20.7 bar)

### GRTG1 Grooved Reducing Tee Technical Data

**Operating Specifications**  
**Maximum Working Pressure:**  
300 psi (20.7 bar)

**Material Specifications**  
**Body:** ASTM A536 Grade 65-45-12 Ductile Iron

**Design Specification**  
**Groove:** AWWA-C606

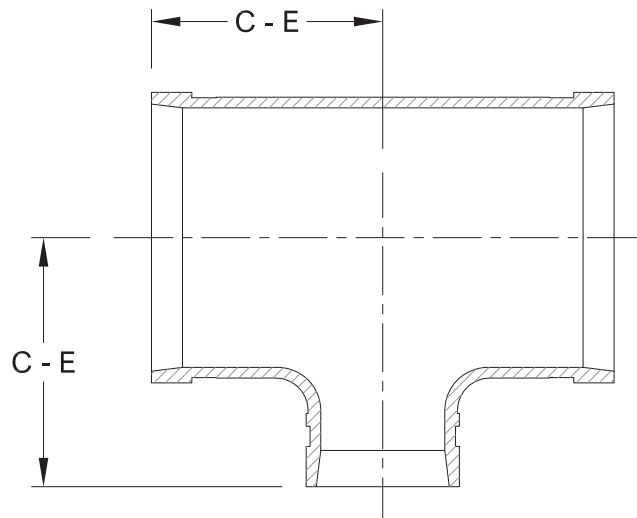
**Available Finishes**  
**Housing:**  
Standard orange paint  
Hot dipped galvanized (ASTM A-153)

**Listings and Approvals**  
cULus Listed  
FM Approved



### GRTG1 Grooved Reducing Tee Dimensions

**Figure 1**



**Table A**

Nominal Size in (mm)	Pipe O.D. in/mm	Dimensions	Weight lb (kg)	Run Friction Loss Eq Feet of Pipe ft (m)	Branch Friction Loss Eq Feet of Pipe ft (m)
		C - E in (mm)			
4 x 2 (100 x 50)	4.500 x 2.375 (114.3 x 60.3)	4 (102)	5.0 (2.30)	6.9 (2.1)	8.5 (2.6)
4 x 2-1/2 (100 x 65)	4.500 x 2.875 (114.3 x 73.0)	4 (102)	6.04 (2.74)	6.9 (2.1)	10.8 (3.3)
4 x 3 (100 x 80)	4.500 x 3.500 (114.3 x 88.9)	4 (102)	5.73 (2.60)	6.9 (2.1)	13.1 (4)
6 x 2 (150 x 50)	6.625 x 2.375 (168.3 x 60.3)	5-1/8 (130)	12.68 (5.75)	9.8 (3)	8.5 (2.6)
6 x 2-1/2 (150 x 65)	6.625 x 2.875 (168.3 x 73.0)	5-1/2 (140)	13.67 (6.20)	9.8 (3)	10.8 (3.3)
6 x 3 (150 x 80)	6.625 x 3.500 (168.3 x 88.9)	5-1/2 (140)	14.22 (6.45)	9.8 (3)	13.1 (4)
6 x 4 (150 x 100)	6.625 x 4.500 (168.3 x 114.3)	5-1/2 (140)	13.56 (6.15)	9.8 (3)	16.1 (4.9)
8 x 4 (200 x 100)	8.625 x 4.500 (219.1 x 114.3)	6-7/8 (174)	21.17 (9.60)	13.1 (4)	16.1 (4.9)
8 x 6 (200 x 150)	8.625 x 6.625 (219.1 x 168.3)	6-7/8 (174)	25.47 (11.55)	13.1 (4)	24.9 (7.6)



## Model CP1 Cap

cULus Listed, FM Approved  
300 psi (20.7 bar)

### CP1 Cap Technical Data

**Operating Specifications**  
**Maximum Working Pressure:**  
300 psi (20.7 bar)

**Material Specifications**

**Body:** ASTM A536 Grade 65-45-12 Ductile Iron

**Design Specification**

**Groove:** AWWA-C606

**Available Finishes**

**Housing:**

Standard orange paint  
Hot dipped galvanized (ASTM A-153)

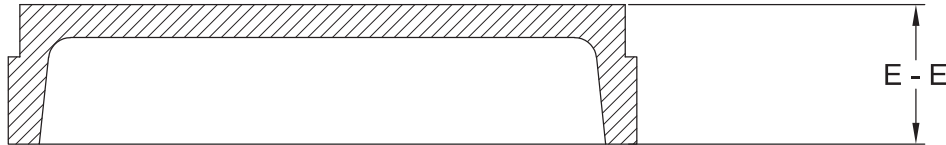
**Listings and Approvals**

cULus Listed  
FM Approved



### CP1 Cap Dimensions

**Figure 1**



**Table A**

Nominal Size in (mm)	Pipe O.D. in/mm	Dimension E - E in (mm)	Weight lb (kg)
1 (25)	1.315 (33.7)	15/16 (24)	0.22 (0.10)
1-1/4 (32)	1.660 (42.2)	15/16 (24)	0.29 (0.13)
1-1/2 (40)	1.900 (48.3)	15/16 (24)	0.35 (0.16)
2 (50)	2.375 (60.3)	15/16 (24)	0.55 (0.25)
2-1/2 (65)	2.875 (73.0)	15/16 (24)	0.77 (0.35)
3 (80)	3.500 (88.9)	15/16 (24)	0.93 (0.42)
4 (100)	4.500 (114.3)	1 (25)	1.54 (0.70)
6 (150)	6.625 (168.3)	1 (25)	3.42 (1.55)
8 (200)	8.625 (219.1)	1-3/16 (30)	6.62 (3)
10 (250)	10.750 (273.0)	1-1/4 (32)	13.12 (5.95)
12 (300)	12.750 (323.9)	1-1/4 (32)	18.48 (8.38)



## Model ECP1 Cap with Eccentric Hole NPT

cULus Listed, FM Approved  
300 psi (20.7 bar)

### ECP1 Cap with Eccentric Hole NPT Technical Data

**Operating Specifications**  
**Maximum Working Pressure:**  
300 psi (20.7 bar)

**Material Specifications**

**Body:** ASTM A536 Grade 65-45-12 Ductile Iron

**Design Specifications**

**Thread:** B1.20.1

**Groove:** AWWA-C606

**Available Finishes**

**Housing:**

Standard orange paint

Hot dipped galvanized (ASTM A-153)

**Listings and Approvals**

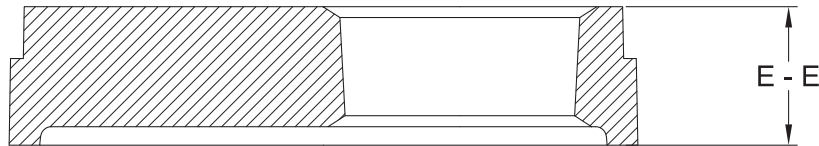
cULus Listed

FM Approved



### ECP1 Cap with Eccentric Hole NPT Dimensions

**Figure 1**



**Table A**

Grooved x Threaded Nominal Size in (mm)	Pipe O.D. in/mm	Dimension E - E in (mm)	Weight lb (kg)
2 x 1 (50 x 25)	2.375 x 1.315 (60.3 x 33.7)	15/16 (24)	0.68 (0.31)
2-1/2 x 1 (65 x 25)	2.875 x 1.315 (73.0 x 33.7)	15/16 (24)	0.84 (0.38)
3 x 1 (80 x 25)	3.500 x 1.315 (88.9 x 33.7)	15/16 (24)	1.28 (0.58)
4 x 1 (100 x 25)	4.500 x 1.315 (114.3 x 33.7)	1 (25)	1.87 (0.85)
6 x 1 (150 x 25)	6.625 x 1.315 (168.3 x 33.7)	1 (25)	4.19 (1.90)



## Model FA1 Grooved Flange ANSI125/150

cULus Listed, FM Approved

### FA1 Grooved Flange Technical Data

**Operating Specifications**
**Maximum Working Pressure:**

See Table B

**Operating Temperature**

-30 °F to 230 °F (-34 °C to 110 °C)

**Material Specifications**
**Body:** ASTM A536 Grade 65-45-12 Ductile Iron

**Design Specification**
**Groove:** AWWA-C606

**Flange:** ASME B16.5 Class 125/150

**Bolt Specification**

SAE J429 Grade 5

**Available Finishes**
**Housing:**

Standard orange paint

Hot dipped galvanized (ASTM A-153)

**Bolts:**

Zinc Electroplating

**Listings and Approvals**

cULus Listed

FM Approved



### FA1 Grooved Flange Dimensions

Figure 1

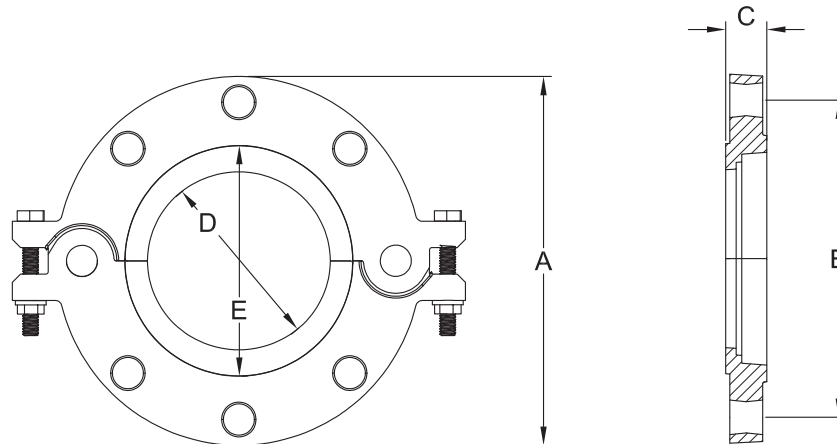


Table A

Nominal Size in (mm)	Pipe O.D. in (mm)	Max. End Load lbs (KN)	Bolts Size in	Number of Bolts	Dimensions					Weight lb (kg)
					A in (mm)	B in (mm)	C in (mm)	D in (mm)	E in (mm)	
2 (50)	2.375 (60.3)	1330 (5.71)	5/8	4	6-1/8 (155)	4-3/4 (121)	5/8 (16)	2-1/2 (65)	3-1/16 (78)	4.19 (1.90)
2-1/2 (65)	2.875 (73.0)	1950 (8.37)	5/8	4	7-1/8 (180)	5-1/2 (140)	5/8 (16)	2-1/2 (65)	3-11/16 (93)	4.87 (2.21)
3 (80)	3.500 (88.9)	2880 (12.41)	5/8	4	7-1/2 (190)	6 (153)	3/4 (18)	2-1/2 (65)	4-3/16 (107)	5.18 (2.35)
4 (100)	4.500 (114.3)	4770 (20.51)	5/8	8	9-1/16 (230)	7-1/2 (191)	7/8 (22)	2-3/4 (70)	5-3/16 (131)	7.28 (3.30)
6 (150)	6.625 (168.3)	10340 (44.47)	3/4	8	11 (280)	8-1/2 (241)	7/8 (22)	2-3/4 (70)	7-1/4 (185)	10.54 (4.78)
8 (200)	8.625 (219.1)	17520 (75.37)	3/4	8	13-11/16 (345)	11-3/4 (299)	1 (25)	3-1/8 (80)	9-1/4 (234)	6.58 (14.51)
10 (250)	10.750 (273.0)	27210 (164.71)	1	12	15-15/16 (405)	14-1/4 (362)	1-3/16 (30)	10-3/4 (273)	11-9/16 (294)	24.81 (11.25)
12 (300)	12.750 (323.9)	38280 (164.71)	1	12	19-1/8 (485)	17 (432)	1-1/4 (32)	12-3/4 (324)	13-7/16 (341)	36.93 (16.75)

**FA1 Pipe Compatibility**
**Table B**

Nominal Size in (mm)	Groove Type	Pipe	Approvals	Pressure Rating psi (bar)
2 (50)	Rolled	10	cULus, FM	300 (20.7)
	Cut, Rolled	40		
2-1/2 (65)	Rolled	10	cULus, FM	300 (20.7)
	Cut, Rolled	40		
3 (80)	Rolled	10	cULus, FM	300 (20.7)
	Cut, Rolled	40		
4 (100)	Rolled	10	cULus, FM	300 (20.7)
	Cut, Rolled	40		
6 (150)	Rolled	10	cULus, FM	300 (20.7)
	Cut, Rolled	40		
8 (200)	Rolled	10	cULus	300 (20.7)
	Cut, Rolled	40	cULus	300 (20.7)
			FM	250 (17.2)
10 (250)	Rolled	10	cULus	300 (20.7)
	Cut, Rolled	40	cULus	300 (20.7)
			FM	250 (17.2)
12 (300)	Rolled	10	cULus	300 (20.7)
	Cut, Rolled	40	cULus	300 (20.7)
			FM	250 (17.2)



## Model GXFA1 Flange Adaptor ANSI125/150

cULus Listed, FM Approved

### GXFA1 Flange Adaptor Technical Data

**Operating Specifications**  
**Maximum Working Pressure:**  
 300 psi (20.7 bar)

**Material Specifications**  
**Body:** ASTM A536 Grade 65-45-12 Ductile Iron

**Design Specifications**  
**Groove:** AWWA-C606  
**Flange:** ASME B16.5

**Available Finishes**  
**Housing:**  
 Standard orange paint  
 Hot dipped galvanized (ASTM A-153)  
**Bolts:**  
 Zinc Electroplating

**Listings and Approvals**  
 cULus Listed  
 FM Approved



### GXFA1 Flange Adaptor Dimensions

Figure 1

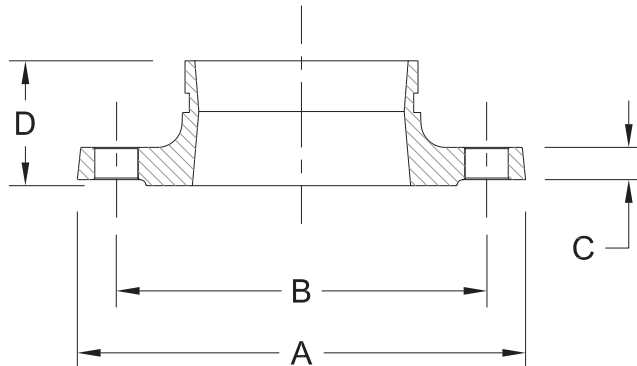


Table A

Nominal Size in (mm)	Pipe O.D. in (mm)	Bolts Size in	Number of Bolts	Dimensions				Weight lb (kg)
				A in (mm)	B in (mm)	C in (mm)	D in (mm)	
2 (50)	2.375 (60.3)	5/8	4	6-1/8 (155)	4-3/4 (121)	5/8 (16)	2-1/2 (65)	4.19 (1.90)
2-1/2 (65)	2.875 (73.0)	5/8	4	7-1/8 (180)	5-1/2 (140)	5/8 (16)	2-1/2 (65)	6.28 (2.85)
3 (80)	3.500 (88.9)	5/8	4	7-1/2 (190)	6 (153)	3/4 (18)	2-1/2 (65)	6.06 (2.75)
4 (100)	4.500 (114.3)	5/8	8	9-1/16 (230)	7-1/2 (191)	7/8 (22)	2-3/4 (70)	9.48 (4.30)
6 (150)	6.625 (168.3)	3/4	8	11 (280)	8-1/2 (241)	7/8 (22)	2-3/4 (70)	15.44 (7)
8 (200)	8.625 (219.1)	3/4	8	13-11/16 (345)	11-3/4 (299)	1 (25)	3-1/8 (80)	26.46 (12)





## Model 041 U Bolt Threaded Mechanical Tee FNPT

cULus Listed, FM Approved  
300 psi (20.7 bar)

### 041 U Bolt Threaded Mechanical Tee FNPT Technical Data

#### Operating Specifications

**Maximum Working Pressure:**  
300 psi (20.7 bar)

**Operating Temperature**  
-30 °F to 230 °F (-34 °C to 110 °C)

#### Material Specifications

**Housings:** ASTM A536 Grade 65-45-12 Ductile Iron

**Gasket:** Grade E EDPM

#### Bolt Specification:

SAE J429 Grade 5

#### Thread Specification:

ASME B1.20.1

#### Available Finishes

##### Housing:

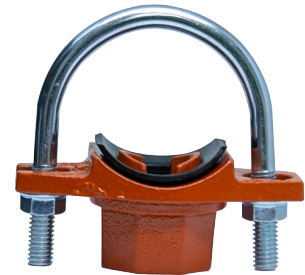
Standard orange paint

Hot dipped galvanized (ASTM A-153)

#### Listings and Approvals

cULus Listed

FM Approved



### 041 U Bolt Threaded Mechanical Tee FNPT Dimensions

Figure 1

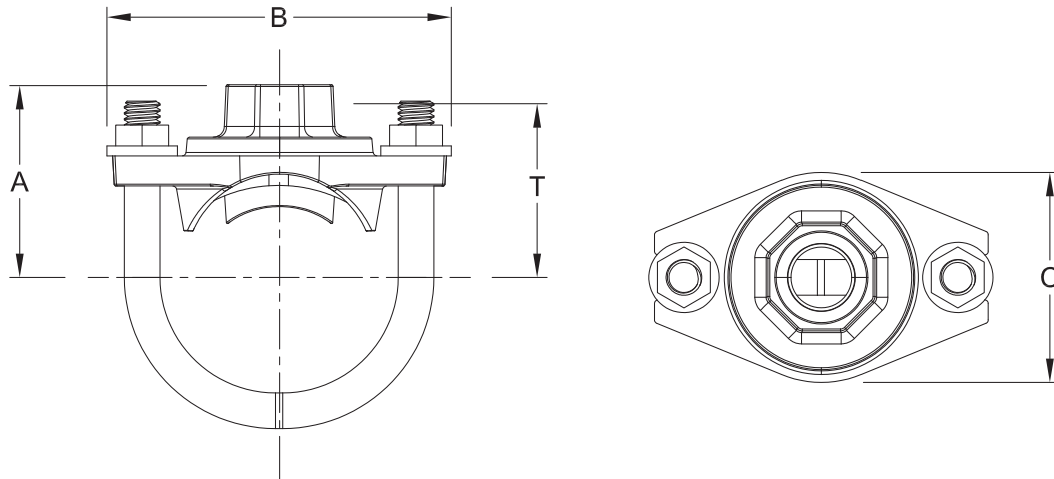


Table A

Nominal Size		Hole Saw Size in (mm)	Bolt Size in	Bolt Torque lbs-ft / N-M	Dimensions				Weight lb (kg)
Run Pipe in (mm)	Threaded Outlet in (mm)				A in/mm	B in/mm	C in/mm	Take Out T in/mm	
1-1/4 (32)	1/2 (15)	1-3/16 (30)	3/8	22-29 (30-40)	2-1/8 (53)	3-1/2 (89)	2-3/16 (56)	1-3/4 (44)	0.90 (0.41)
	3/4 (20)	1-3/16 (30)	3/8	22-29 (30-40)	2-1/8 (53)	3-1/2 (89)	2-3/16 (56)	1-3/4 (44)	0.95 (0.43)
	1 (25)	1-3/16 (30)	3/8	22-29 (30-40)	2-3/16 (56)	3-1/2 (89)	2-3/16 (56)	1-7/8 (47)	0.95 (0.43)
1-1/2 (40)	1/2 (15)	1-3/16 (30)	3/8	22-29 (30-40)	2-3/16 (55)	3-1/2 (89)	2-3/16 (56)	1-13/16 (46)	0.90 (0.41)
	3/4 (20)	1-3/16 (30)	3/8	22-29 (30-40)	2-3/16 (55)	3-1/2 (89)	2-3/16 (56)	1-13/16 (46)	0.93 (0.42)
	1 (25)	1-3/16 (30)	3/8	22-29 (30-40)	2-1/4 (58)	3-1/2 (89)	2-3/16 (56)	1-15/16 (49)	0.99 (0.45)
2 (50)	1/2 (15)	1-3/16 (30)	3/8	22-29 (30-40)	2-1/2 (64)	3-7/8 (98)	2-3/16 (56)	2-1/16 (53)	0.93 (0.42)
	3/4 (20)	1-3/16 (30)	3/8	22-29 (30-40)	2-1/2 (64)	3-7/8 (98)	2-3/16 (56)	2-1/16 (53)	0.97 (0.44)
	1 (25)	1-3/16 (30)	3/8	22-29 (30-40)	2-5/8 (67)	3-7/8 (98)	2-3/16 (56)	2-3/16 (56)	0.97 (0.44)
2-1/2 (65)	1/2 (15)	1-3/16 (30)	3/8	22-29 (30-40)	2-3/4 (69)	4-3/8 (111)	2-3/16 (56)	2-1/4 (58)	1.28 (0.58)
	3/4 (20)	1-3/16 (30)	3/8	22-29 (30-40)	2-3/4 (69)	4-3/8 (111)	2-3/16 (56)	2-1/4 (58)	1.28 (0.58)
	1 (25)	1-3/16 (30)	3/8	22-29 (30-40)	2-13/16 (72)	4-3/8 (111)	2-3/16 (56)	2-3/8 (61)	1.32 (0.60)
3 (80)	1 (25)	1-3/16 (30)	3/8	22-29 (30-40)	3-3/16 (81)	5-1/16 (128)	2-3/16 (56)	2-5/8 (67)	1.32 (0.60)

## 041 Pipe Compatibility

Table B

Nominal Size in (mm)	Pipe	Approvals
1-1/4 (32)	10	cULus, FM
	40	
1-1/2 (40)	10	cULus, FM
	40	
2 (50)	10	cULus, FM
	40	
2-1/2 (65)	10	cULus, FM
	40	
3 (80)	10	cULus, FM
	40	



## Model MTT2 Threaded Mechanical Tee FNPT

cULus Listed, FM Approved  
300 psi (20.7 bar)

### MTT2 Threaded Mechanical Tee FNPT Technical Data

#### Operating Specifications

**Maximum Working Pressure:**

300 psi (20.7 bar)

**Operating Temperature**

-30 °F to 230 °F (-34 °C to 110 °C)

#### Material Specifications

**Housings:** ASTM A536 Grade 65-45-12 Ductile Iron

**Gasket:** Grade E EDPM

#### Bolt Specification:

SAE J429 Grade 5

#### Thread Specification:

ASME B1.20.1

#### Available Finishes

##### Housing:

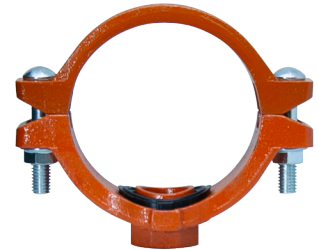
Standard orange paint

Hot dipped galvanized (ASTM A-153)

#### Listings and Approvals

cULus Listed

FM Approved



### MTT2 Threaded Mechanical Tee FNPT Dimensions

Figure 1

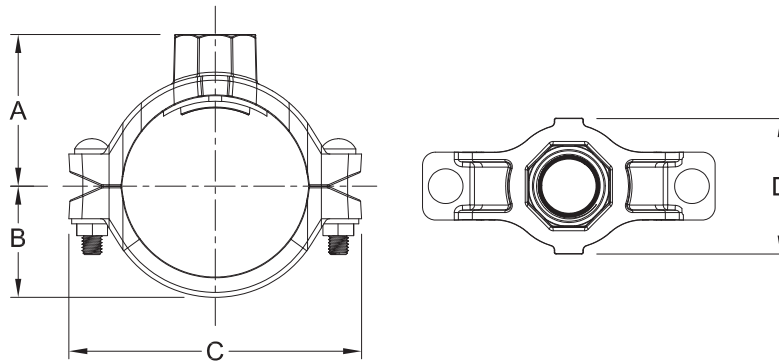


Table A

Nominal Size in (mm)	Pipe O.D. in (mm)	Nominal Branch Pipe Size NPS (DN)	Bolt Size x Length in	Dimensions				Weight lb (kg)	Hole Saw Size in (mm)
				A in (mm)	B in (mm)	C in (mm)	D in (mm)		
2 (50)	2.375 (60.3)	1 (25)	3/8 x 2-3/8	1-7/8 (47)	1-5/8 (42)	4-3/4 (120)	3 (76)	1.85 (0.84)	1-1/2 (38)
		1-1/4 (32)	3/8 x 2-3/8	2-5/8 (52)	1-5/8 (42)	4-3/4 (120)	3-5/16 (84)	2.25 (1.02)	1-3/4 (45)
		1-1/2 (40)	3/8 x 2-3/8	2-13/16 (71)	1-5/8 (42)	4-3/4 (120)	3-5/16 (84)	2.47 (1.12)	1-3/4 (45)
2-1/2 (65)	2.875 (73.0)	1 (25)	1/2 x 2-5/8	2-7/16 (62)	1-7/8 (47)	5-5/8 (143)	3 (76)	2.32 (1.05)	1-1/2 (38)
		1-1/4 (32)	1/2 x 2-5/8	2-7/8 (74)	1-7/8 (47)	5-5/8 (143)	3-5/16 (84)	2.56 (1.16)	1-3/4 (45)
		1-1/2 (40)	1/2 x 2-5/8	2-1/4 (58)	1-7/8 (47)	5-5/8 (143)	3-9/16 (90)	2.93 (1.33)	2 (51)
3 (80)	3.500 (88.9)	1 (25)	1/2 x 2-5/8	2-3/4 (70)	2-3/16 (55)	6-1/4 (158)	3 (76)	3 (1.36)	1-1/2 (38)
		1-1/4 (32)	1/2 x 2-5/8	3-3/16 (81)	2-3/16 (55)	6-1/4 (158)	3-5/16 (84)	3 (1.36)	1-3/4 (45)
		1-1/2 (40)	1/2 x 2-5/8	3-3/16 (81)	2-3/16 (55)	6-1/4 (158)	3-9/16 (90)	3.15 (1.43)	2 (51)
		2 (50)	1/2 x 2-5/8	3-3/16 (81)	2-3/16 (55)	6-1/4 (158)	4 (101)	3.42 (1.55)	2-1/2 (64)
4 (100)	4.500 (114.3)	1 (25)	1/2 x 2-3/4	3-1/4 (82)	2-3/16 (55)	7-1/8 (181)	3 (76)	2.87 (1.30)	1-1/2 (38)
		1-1/4 (32)	1/2 x 2-3/4	3-11/16 (94)	2-3/16 (55)	7-1/8 (181)	3-5/16 (84)	3.31 (1.50)	1-3/4 (45)
		1-1/2 (40)	1/2 x 2-3/4	3-11/16 (94)	2-3/16 (55)	7-1/8 (181)	3-9/16 (90)	3.37 (1.53)	2 (51)
		2 (50)	1/2 x 2-3/4	3-11/16 (94)	2-3/16 (55)	7-1/8 (181)	4 (101)	3.68 (1.67)	2-1/2 (64)
		2-1/2 (65)	1/2 x 2-3/4	3-11/16 (94)	2-3/16 (55)	7-1/8 (181)	4-5/8 (117)	4.48 (2.03)	2-3/4 (70)
6 (150)	6.625 (168.3)	1 (25)	5/8 x 3-5/16	4-1/4 (109)	3-3/16 (97)	9-3/4 (248)	3 (76)	5.18 (2.35)	1-1/2 (38)
		1-1/4 (32)	5/8 x 3-5/16	4-1/4 (109)	3-3/16 (97)	9-3/4 (248)	3-5/16 (84)	5.42 (2.46)	1-3/4 (45)
		1-1/2 (40)	5/8 x 3-5/16	4-1/4 (109)	3-3/16 (97)	9-3/4 (248)	3-9/16 (90)	5.40 (2.45)	2 (51)
		2 (50)	5/8 x 3-5/16	4-1/4 (109)	3-3/16 (97)	9-3/4 (248)	4 (101)	5.65 (2.56)	2-1/2 (64)
		2-1/2 (65)	5/8 x 3-5/16	4-1/4 (109)	3-3/16 (97)	9-3/4 (248)	4-5/8 (117)	6.28 (2.85)	2-3/4 (70)

**MTT2 Pipe Compatibility****Table B**

Nominal Size in (mm)	Pipe	Approvals
2 (50)	10	cULus, FM
	40	
2-1/2 (65)	10	cULus, FM
	40	
3 (80)	10	cULus, FM
	40	
4 (100)	10	cULus, FM
	40	
6 (150)	10	cULus, FM
	40	

# Reliable®

## Model MTG1 Grooved Mechanical Tee

cULus Listed, FM Approved  
300 psi (20.7 bar)

### MTG1 Grooved Mechanical Tee Technical Data

#### Operating Specifications

**Maximum Working Pressure:**  
See Table A

#### Operating Temperature

-30 °F to 230 °F (-34 °C - 110 °C)

#### Material Specifications

**Housings:** ASTM A536 Grade 65-45-12 Ductile Iron

**Gasket:** Grade E EDPM

#### Bolt Specification:

SAE J429 Grade 5

#### Thread Specification:

ASME B1.20.1

#### Available Finishes

##### Housing:

Standard orange paint

Hot dipped galvanized (ASTM A-153)

#### Listings and Approvals

cULus Listed

FM Approved



### MTG1 Grooved Mechanical Tee Dimensions

Figure 1

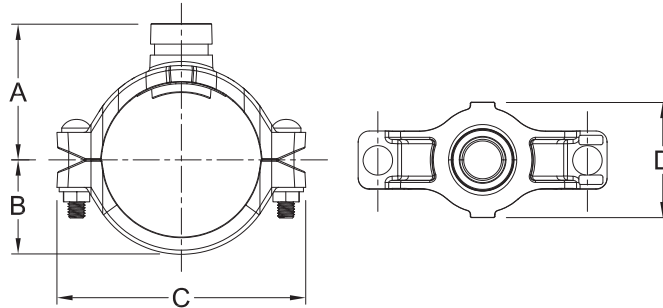


Table A

Nominal Size in (mm)	Pipe O.D. in (mm)	Nominal Branch Pipe Size NPS (DN)	Branch Pipe O.D. in (mm)	Bolt Size x Length in	Dimensions				Weight lb (kg)	Hole Saw Size in (mm)
					A in (mm)	B in (mm)	C in (mm)	D in (mm)		
2 (50)	2.375 (60.3)	1-1/4 (32)	1.660 (42.2)	3/8 x 2-3/8	2-7/8 (73)	1-5/8 (42)	4-3/4 (120)	3-5/16 (84)	2.12 (0.96)	1-3/4 (45)
		1-1/2 (40)	1.900 (48.3)					3-9/16 (90)	2.16 (0.98)	1-3/4 (45)
2-1/2 (65)	2.875 (73.0)	1-1/4 (32)	1.660 (42.2)	1/2 x 2-5/8	3-1/16 (79)	1-7/8 (47)	5-5/8 (143)	3-5/16 (84)	2.65 (1.20)	1-3/4 (45)
		1-1/2 (40)	1.900 (48.3)					3-9/16 (90)	2.80 (1.27)	2 (51)
3 (80)	3.500 (88.9)	1-1/4 (32)	1.660 (42.2)	1/2 x 2-5/8	3-3/8 (86)	2-3/16 (55)	6-1/4 (158)	3-5/16 (84)	2.80 (1.27)	1-3/4 (45)
		1-1/2 (40)	1.990 (48.3)		3-3/8 (86)			3-9/16 (90)	2.98 (1.35)	2 (51)
		2 (50)	2.375 (60.3)		3-7/16 (87)			4 (101)	3.31 (1.50)	2-1/2 (64)
4 (100)	4.500 (114.3)	1-1/4 (32)	1.660 (42.2)	1/2 x 2-3/4	3-7/8 (99)	2-9/16 (65)	7-1/8 (181)	3-5/16 (84)	4.15 (1.88)	1-3/4 (45)
		1-1/2 (40)	1.900 (48.3)					3-9/16 (90)	3.57 (1.62)	2 (51)
		2 (50)	2.375 (60.3)					4 (101)	3.90 (1.77)	2-1/2 (64)
		2-1/2 (65)	2.875 (73.0)					4-5/8 (117)	4.19 (1.90)	2-3/4 (70)
		3 (80)	3.500 (88.9)					5-3/8 (136)	4.63 (2.1)	3-1/2 (89)
6 (150)	6.625 (168.3)	1-1/4 (32)	1.660 (42.2)	5/8 x 3-5/16	4-15/16 (125)	3-13/16 (97)	9-3/4 (248)	3-5/16 (84)	5.31 (2.41)	1-3/4 (45)
		1-1/2 (40)	1.900 (48.3)		4-15/16 (125)			3-9/16 (90)	5.31 (2.41)	2 (51)
		2 (50)	2.375 (60.3)		4-15/16 (125)			4 (101)	5.58 (2.53)	2-1/2 (64)
		2-1/2 (65)	2.875 (73.0)		5 (127)			4-5/8 (117)	6.62 (3)	2-3/4 (70)
		3 (80)	3.500 (88.9)		5 (127)			5-3/8 (136)	6.79 (3.08)	3-1/2 (89)
		4 (100)	4.500 (114.3)		5-1/16 (129)			6-3/8 (162)	7.72 (3.50)	4-1/2 (114)
8 (200)	8.625 (219.1)	2 (50)	2.375 (60.3)	5/8 x 3-1/2	6 (152)	1-15/16 (125)	12-5/8 (322)	4 (101)	9.24 (4.19)	2-1/2 (64)
		2-1/2 (65)	2.875 (73.0)		6-1/16 (154)			4-5/8 (117)	10.06 (4.56)	2-3/4 (70)
		3 (80)	3.500 (88.9)		6-1/16 (154)			5-3/8 (136)	10.25 (4.65)	3-1/2 (89)
		4 (100)	4.500 (114.3)		6-3/16 (156)			6-3/8 (162)	11.69 (5.3)	4-1/2 (114)

**MTG1 Pipe Compatibility**
**Table B**

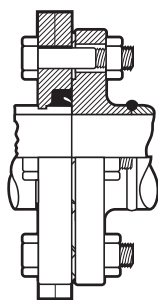
Nominal Size in (mm)	Nominal Branch Pipe Size in (mm)	Pipe	Approvals
2 (50)	1-1/4 (32)	10, 40	cULus, FM
	1-1/2 (40)		
2-1/2 (65)	1-1/4 (32)	10, 40	cULus, FM
	1-1/2 (40)		
3 (80)	1-1/4 (32)	10, 40	cULus, FM
	1-1/2 (40)		
	2 (50)		
4 (100)	1-1/4 (32)	10, 40	cULus, FM
	1-1/2 (40)		
	2 (50)		
	2-1/2 (65)		
	3 (80)		
6 (150)	1-1/4 (32)	10, 40	cULus, FM
	1-1/2 (40)		
	2 (50)		
	2-1/2 (65)		
	3 (80)		
	4 (100)		
8 (200)	2 (50)	10, 40	cULus, FM
	2-1/2 (65)		
	3 (80)		
	4 (100)		

# Victaulic® Vic-Flange Adapters

## Styles 741 and 743



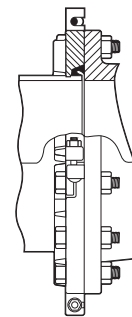
Style 741  
2 – 12"/DN50 – DN300



Exaggerated for clarity



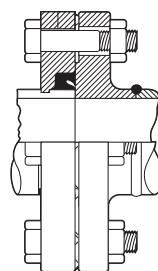
Style 741  
14 – 24"/DN350 – DN600



Exaggerated for clarity



Style 743  
2 – 12"/DN50 – DN300



Exaggerated for clarity

### 1.0 PRODUCT DESCRIPTION

#### Available Sizes

- **Style 741:** 2 – 24"/DN50 – DN600
- **Style 743:** 2 – 12"/DN50 – DN300

#### Maximum Working Pressure

- **Style 741:** Up to 300 psi/2068 kPa/20 Bar
- **Style 743:** Up to 720 psi/4964 kPa/49 Bar

#### Application

- Designed to transition from flanged to grooved piping systems

#### Pipe Material

- Carbon steel
- For use with stainless steel pipe, refer to Victaulic [publication 17.09](#) for pressure ratings and end loads.
- For use with PVC pipe, refer to Victaulic [publication 32.01](#) for pressure ratings.
- For use with aluminum pipe, refer to Victaulic [publication 21.04](#) for pressure ratings and end loads.

ALWAYS REFER TO ANY NOTIFICATIONS AT THE END OF THIS DOCUMENT REGARDING PRODUCT INSTALLATION, MAINTENANCE OR SUPPORT.

System No.		Location	
Submitted By		Date	

Spec Section		Paragraph	
Approved		Date	

## 2.0 CERTIFICATION/LISTINGS



### NOTE

- See Victaulic [publication 02.06](#): Victaulic Potable Water Approvals ANSI/NSF for potable water approvals if applicable.

## 3.0 SPECIFICATIONS - MATERIAL

**Housing:** Ductile iron conforming to ASTM A536, Grade 65-45-12. Ductile iron conforming to ASTM A395, Grade 65-45-15, is available upon special request.

### Housing Coating: (specify choice)

- ☐ Standard: Black enamel.
- ☐ Optional: Hot dipped galvanized.
- ☐ Optional: Contact Victaulic with your requirements for other coatings.

### Gasket: (specify choice<sup>1</sup>)

- ☐ **Victaulic Grade “E” EPDM**  
EPDM (Green stripe color code). Temperature range –30°F to +230°F/–34°C to +110°C. May be specified for hot water service within the specified temperature range plus a variety of dilute acids, oil-free air and many chemical services. UL Classified in accordance with ANSI/NSF 61 for cold +73°F/+23°C and hot +180°F/+82°C potable water service and ANSI/NSF 372. **NOT COMPATIBLE FOR USE WITH PETROLEUM SERVICES OR STEAM SERVICES.**
- ☐ **Victaulic Grade “T” Nitrile**  
Nitrile (Orange stripe color code). Temperature range 20°F to +180°F/29°C to +82°C. May be specified for oil related services, including air with oil vapor, this gasket may be specified for temperatures rated up to +180°F/+82°C. For water related services, this gasket may be specified for temperatures rated up to +150°F/+66°C. For oil free, dry air services, this gasket may be specified for temperatures rated up to +140°F/+60°C. **NOT COMPATIBLE FOR USE WITH HOT WATER SERVICES OR STEAM SERVICES.**
- ☐ **Others**  
For alternate gasket selection, reference [publication 05.01](#): Victaulic Seal Selection Guide.

<sup>1</sup> Services listed are General Service Guidelines only. It should be noted that there are services for which these gaskets are not compatible. Reference should always be made to the latest [Victaulic Seal Selection Guide](#) for specific gasket service guidelines and for a listing of services which are not compatible.

### Draw Bolts/Nuts (14 – 24”/DN350 – DN600 only):

- ☐ Carbon steel oval neck track bolts meeting the mechanical property requirements of ASTM A449 (imperial) and ISO 898-1 Class 9.8 (metric). Carbon steel hex flange nuts meeting the mechanical property requirements of ASTM A563 Grade B (imperial - heavy hex nuts) and ASTM A563M Class 9 (metric - hex nuts). Track bolts and hex flange nuts are zinc electroplated per ASTM B633 ZN/FE5, finish Type III (imperial) or Type II (metric).

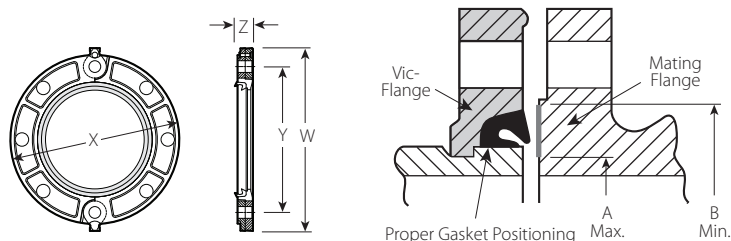


## 4.0 DIMENSIONS

### Style 741

2 – 12"/DN50 – DN300

ANSI Class 125 and 150 Flanges



Shaded area of mating face must be free from gouges, undulations or deformities of any type for effective sealing.

Exaggerated for clarity

Size		Assembly Bolt/Nut <sup>2</sup>		Sealing Surface		Dimensions				Weight
Nominal inches DN	Actual Outside Diameter inches mm	Qty.	Size inches	"A" Max. inches mm	"B" Min. inches mm	W inches mm	X inches mm	Y inches mm	Z inches mm	Approximate (Each) lb kg
2 DN50	2.375 60.3	4	5/8 x 2 3/4	2.38 60	3.41 87	6.75 172	6.00 152	4.75 121	0.75 19	3.1 1.4
2 1/2	2.875 73.0	4	5/8 x 3	2.88 73	3.91 99	7.88 200	7.00 178	5.50 140	0.88 22	4.8 2.1
3 DN80	3.500 88.9	4	5/8 x 3	3.50 89	4.53 115	8.50 216	7.50 191	6.00 152	1.00 25	5.3 2.4
4 DN100	4.500 114.3	8	5/8 x 3	4.50 114	5.53 141	10.00 254	9.00 229	7.50 191	1.00 25	7.4 3.4
5	5.563 141.3	8	3/4 x 3 1/2	5.56 141	6.71 171	11.00 279	10.00 254	8.50 216	1.00 25	8.6 3.9
6 DN150	6.625 168.3	8	3/4 x 3 1/2	6.63 168	7.78 198	12.00 305	11.00 279	9.50 241	1.00 25	9.9 4.5
8 DN200	8.625 219.1	8	3/4 x 3 1/2	8.63 219	9.94 252	14.75 375	13.50 343	11.75 298	1.13 29	16.6 7.5
10 DN250	10.750 273.0	12	7/8 x 4	10.75 273	12.31 313	17.25 438	16.00 406	14.25 362	1.25 32	24.2 11.0
12 DN300	12.750 323.9	12	7/8 x 4	12.75 324	14.31 364	20.25 514	19.00 483	17.00 432	1.25 32	46.8 21.2

<sup>2</sup> Total assembly bolts required to be supplied by installer.

#### NOTE

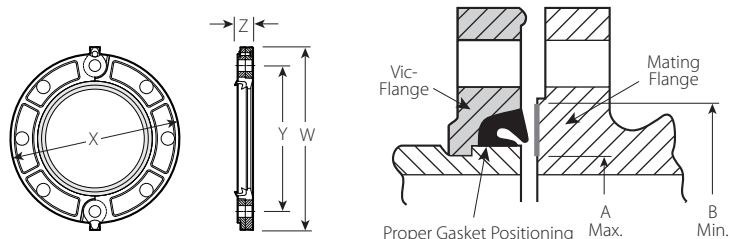
- IMPORTANT: Style 741 *Vic-Flange* adapters provide rigid joints when used on pipe with standard cut or roll groove dimensions and consequently allow no linear or angular movement at the joint. When used with Victaulic Series 700 butterfly valves, plastic pipe or light wall metallic pipe, small teeth in I.D. of key section should be removed and may be used on one side of the valve. Contact Victaulic for information on ISO 2084 (PN10); DIN 2532 (PN10) and JIS B-2210 (10K) flanges.

## 4.1 DIMENSIONS

### Style 741

DN50 – DN300/2 – 12"

PN10 and PN16 Flanges



Shaded area of mating face must be free from gouges, undulations or deformities of any type for effective sealing.

Exaggerated for clarity

Size		PN10 Flanges		PN16 Flanges		Sealing Surface		Dimensions				Weight
Nominal DN inches	Actual Outside Diameter mm inches	Assembly Bolt/Nut <sup>2</sup>		Assembly Bolt/Nut <sup>2</sup>		"A" Max. mm inches	"B" Min. mm inches	W mm inches	X mm inches	Y mm inches	Z mm inches	Approximate (Each) kg lb
		Qty.	Size mm	Qty.	Size mm							
DN50 2	60.3 2.375	4	16	4	16	60 2.38	87 3.41	178 7.00	165 6.50	127 5.00	22 0.88	1.4 3.1
DN65	76.1 3.000	4	16	4	16	76 3.00	103 4.05	210 8.25	187 7.38	146 5.75	22 0.88	2.1 4.7
DN80 3	88.9 3.500	8	16	8	16	89 3.50	115 4.53	219 8.63	200 7.88	162 6.38	22 0.88	2.4 5.4
DN100 4	114.3 4.500	8	16	8	16	114 4.50	141 5.55	251 9.88	229 9.00	181 7.13	25 1.00	3.5 7.7
DN125	139.7 5.500	8	16	8	16	141 5.55	171 6.73	276 10.88	251 9.88	213 8.38	29 1.13	4.2 9.3
	159.0 6.250	8	20	8	20	159 6.25	187 7.36	314 12.38	289 11.38	241 9.50	29 1.13	4.5 10.0
	165.1 6.500	8	¾ x 3 ½	8	¾ x 3 ½	165 6.50	192 7.56	305 12.00	279 11.00	241 9.50	25 1.00	5.0 11.0
DN150 6	168.3 6.625	8	20	8	20	168 6.63	198 7.78	302 11.88	279 11.00	241 9.50	25 1.00	4.5 10.0
DN200 8	219.1 8.625	8	20	12	20	219 8.63	252 9.94	368 <sup>3</sup> 14.50	343 <sup>3</sup> 13.50	295 <sup>3</sup> 11.63	29 <sup>3</sup> 1.13	7.5 16.6
DN250 10	273.0 10.750	12	20	12	24	273 10.75	313 12.31	438 <sup>4</sup> 17.25	397 <sup>4</sup> 15.63	352 <sup>4</sup> 13.88	29 <sup>4</sup> 1.13	11.0 24.2
DN300 12	323.9 12.750	12	20	12	24	324 12.75	365 14.31	479 <sup>5</sup> 18.88	460 <sup>5</sup> 18.13	400 <sup>5</sup> 15.75	32 <sup>5</sup> 1.25	17.4 38.4

<sup>2</sup> Total assembly bolts required to be supplied by installer.

<sup>3</sup> PN16 dimensions (mm/inches): W = 360/14.17; X = 340/13.38; Y = 295/11.63; Z = 32/1.25.

<sup>4</sup> PN16 dimensions (mm/inches): W = 438/17.24; X = 406/16.00; Y = 356/14.00; Z = 32/1.25.

<sup>5</sup> PN16 dimensions (mm/inches): W = 478/18.82; X = 445/17.50; Y = 410/16.13; Z = 32/1.25.

#### NOTES

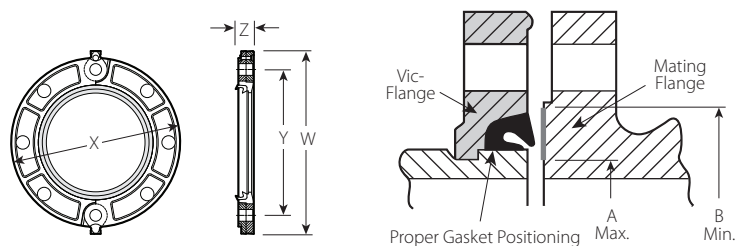
- Longer bolts required when flange utilized with wafer-type valves.
- IMPORTANT: Style 741 *Vic-Flange* adapters provide rigid joints when used on pipe with standard cut or roll groove dimensions and consequently allow no linear or angular movement at the joint. When used with Victaulic Series 700 butterfly valves, plastic pipe or light wall metallic pipe, small teeth in I.D. of key section should be removed and may be used on one side of the valve. Contact Victaulic for information on ISO 2084 (PN10); DIN 2532 (PN10) and JIS B-2210 (10K) flanges.

## 4.2 DIMENSIONS

### Style 741

DN50 – DN200/2 – 8"

Australian Standard Table "E" Flanges



Shaded area of mating face must be free from gouges, undulations or deformities of any type for effective sealing.

Exaggerated for clarity

Size		Assembly Bolt/Nut <sup>2</sup>		Sealing Surface		Dimensions				Weight
Nominal DN inches	Actual Outside Diameter mm inches	Qty.	Size inches	"A" Max. mm inches	"B" Min. mm inches	W mm inches	X mm inches	Y mm inches	Z mm inches	Approximate (Each) kg lb
DN50 <sup>6</sup> 2	60.3 2.375	4	5/8 x 2 3/4	60 2.38	84 3.31	165 6.50	152 6.00	114 4.50	19 0.75	1.9 4.1
DN80 3	88.9 3.500	4	5/8 x 3	89 3.50	113 4.44	200 7.88	191 7.50	146 5.75	25 1.00	2.4 5.4
DN100 4	114.3 4.500	8	5/8 x 3	114 4.50	131 5.16	251 9.88	229 9.00	178 7.00	25 1.00	3.3 7.2
DN150 6	168.3 6.625	8	3/4 x 3 1/2	168 6.63	192 7.56	286 11.25	279 11.00	235 9.25	25 1.00	4.5 9.9
DN200 8	219.1 8.625	8	3/4 x 3 1/2	219 8.63	247 9.72	368 14.50	343 13.50	292 11.50	29 1.13	5.7 12.5

<sup>2</sup> Total assembly bolts required to be supplied by installer.

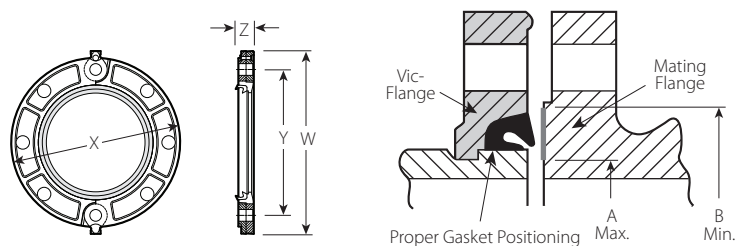
<sup>6</sup> Contact Victaulic for details.

## 4.2 DIMENSIONS

### Style 741

DN50 – DN200/2 – 8"

Chinese Standard Table "E" Flanges



Shaded area of mating face must be free from gouges, undulations or deformities of any type for effective sealing.

Exaggerated for clarity

Size		Assembly Bolt/Nut <sup>2</sup>		Sealing Surface		Dimensions				Weight
Nominal DN inches	Actual Outside Diameter mm inches	Qty.	Size mm	"A" Max. mm inches	"B" Min. mm inches	W mm inches	X mm inches	Y mm inches	Z mm inches	Approximate (Each) kg lb
DN50 2	60.3 2.375	4	M16 X 70	60 2.38	87 3.41	172 6.75	152 6.00	121 4.75	19 0.75	1.4 3.1
DN65	76.1 3.000	4	M16 X 70	78 3.07	94 3.68	210 8.25	187 7.38	146 5.75	22 0.88	2.1 4.7
DN80 3	88.9 3.500	8	M16 X 76	89 3.50	115 4.53	213 8.38	191 7.50	152.4 6.00	25 1.00	2.4 5.4
	108.0 4.250	8	M16 X 76	110 4.33	126 4.97	248 9.75	222 8.75	181 7.13	25 1.00	3.5 7.7
DN100 4	114.3 4.500	8	M16 X 76	114 4.50	141 5.55	251 9.88	229 9.00	191 7.50	25 1.00	3.5 7.7
	133.0 5.250	8	M16 X 76	135 5.33	153 6.02	276 10.88	251 9.88	213 8.38	29 1.13	3.9 8.6
DN125	139.7 5.500	8	M16 X 76	142 5.59	160 6.28	276 10.88	251 9.88	213 8.38	29 1.13	3.9 8.6
	159.0 6.250	8	M20 X 89	159 6.25	187 7.36	314 12.38	289 11.38	241 9.50	29 1.13	4.5 10.0
	165.1 6.500	8	M20 X 89	165 6.50	195 7.68	305 12.00	280 11.00	241 9.50	29 1.13	4.5 10.0
DN200 8	219.1 8.625	12	M20 X 89	219 8.63	252 9.94	368 14.50	343 13.50	298 11.75	29 1.13	7.5 16.6

<sup>2</sup> Total assembly bolts required to be supplied by installer.

#### NOTES

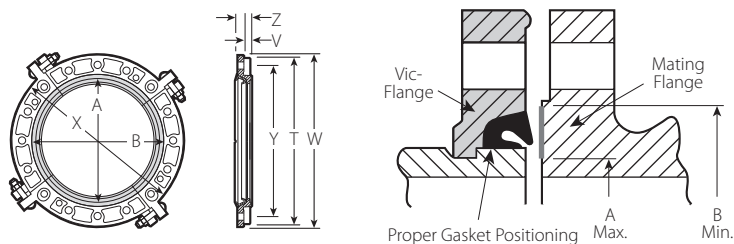
- IMPORTANT NOTE: Style 741 Vic-Flange adapters provide rigid joints when used on pipe with standard cut or roll groove dimensions and consequently allow no linear or angular movement at the joint. When used with Victaulic Series 700 butterfly valves, plastic pipe or light wall metallic pipe, small teeth in I.D. of key section should be removed and may be used on one side of the valve. Contact Victaulic for information on ISO 2084 (PN10); DIN 2532 (PN10) and JIS B-2210 (10K) flanges.

## 4.3 DIMENSIONS

### Style 741

14 – 24"/DN350 – DN600<sup>7</sup>

ANSI Class 125 and 150 Flanges



Shaded area of mating face must be free from gouges, undulations or deformities of any type for effective sealing.

Exaggerated for clarity

Size		Bolt/Nut				Sealing Surface		Dimensions						Weight
Nominal inches DN	Actual Outside Diameter inches mm	Assembly <sup>2</sup>		Draw <sup>8</sup>		"A" Max. inches mm	"B" Min. inches mm	T inches mm	V inches mm	W inches mm	X inches mm	Y inches mm	Z inches mm	Approximate (Each) lb kg
		Qty.	Size inches	Qty.	Size inches									
14 DN350	14.000 355.6	12	1 x 4½	4	⅝ x 3½	14.00 356	16.39 416	19.38 492	1.00 25	24.50 622	21.00 533	18.75 476	2.50 64	62.0 28.1
16 DN400	16.000 406.4	16	1 x 4 ½	4	⅝ x 3½	16.00 406	18.39 467	21.50 546	1.00 25	27.13 689	23.50 597	21.25 540	2.50 64	79.0 35.8
18 DN450	18.000 457.0	16	1 ⅛ x 4 ¾	4	¾ x 4¼	18.00 457	20.00 508	22.25 565	1.00 25	29.00 737	25.50 648	22.75 578	2.75 70	82.3 37.3
20 DN500	20.000 508.0	20	1 ⅛ x 5 ¼	4	¾ x 4¼	20.00 508	22.50 572	25.00 635	1.00 25	31.50 800	27.50 699	25.00 635	2.75 70	103.3 46.9
24 DN600	24.000 610.0	20	1 ¼ x 5 ¾	4	¾ x 4¼	24.00 610	27.75 705	29.00 737	1.00 25	36.00 914	32.00 813	29.50 749	3.00 76	142.0 64.4

<sup>2</sup> Total assembly bolts required to be supplied by installer.

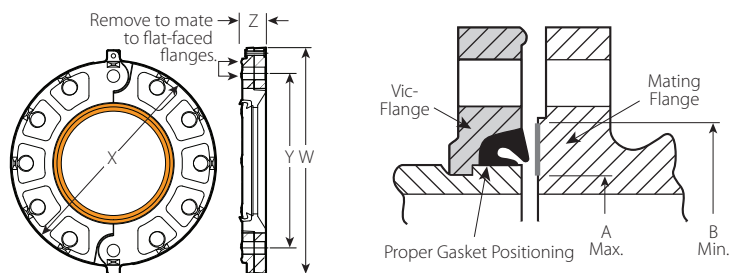
<sup>7</sup> For cut groove systems only. For 14 – 24"/DN350 – DN600 roll groove systems, AGS (Advanced Groove System) products are used. Style 741 is not compatible with the AGS system.

<sup>8</sup> Draw bolts supplied with 14 – 24"/DN350 – DN600 Vic-Flange adapters.

## 4.4 DIMENSIONS

### Style 743

Grooved pipe adapter to ANSI Class 300 flanges



Shaded area of mating face must be free from gouges, undulations or deformities of any type for effective sealing.

Exaggerated for clarity

Size		Assembly Bolt/Nut <sup>2</sup>		Sealing Surface		Dimensions				Weight
Nominal inches DN	Actual Outside Diameter inches mm	Qty.	Size inches	"A" Max. inches mm	"B" Min. inches mm	W inches mm	X inches mm	Y inches mm	Z inches mm	Approximate (Each) lb kg
2 DN50	2.375 60.3	8	5/8 x 3	2.38 60	3.41 87	7.75 197	6.50 165	5.00 127	1.00 25	4.8 2.2
2½	2.875 73.0	8	¾ x 3¼	2.88 73	3.91 99	8.63 219	7.50 191	5.88 149	1.13 29	7.4 3.4
3 DN80	3.500 88.9	8	¾ x 3½	3.50 89	4.53 115	9.50 241	8.25 210	6.63 168	1.25 32	9.1 4.1
4 DN100	4.500 114.3	8	¾ x 3¾	4.50 114	5.53 141	11.38 289	10.00 254	7.88 200	1.38 35	15.3 6.9
5	5.563 141.3	8	¾ x 4	5.56 141	6.72 171	12.38 314	11.00 279	9.25 235	1.50 38	17.7 8.0
6 DN150	6.625 168.3	12	¾ x 4½	6.63 168	7.78 198	13.88 352	12.50 318	10.63 270	1.50 38	23.4 10.6
8 DN200	8.625 219.1	12	7/8 x 4¾	8.63 219	9.94 252	16.75 425	15.00 381	13.00 330	1.75 44	34.3 15.6
10 DN250	10.750 273.0	16	1 x 5¼	10.75 273	12.31 313	19.25 489	17.50 445	15.25 387	2.00 51	48.3 21.9
12 DN300	12.750 323.9	16	1 1/8 x 5¾	12.75 324	14.31 363	22.25 565	20.50 521	17.75 451	2.13 54	70.5 32.0

<sup>2</sup> Total assembly bolts required to be supplied by installer.

## 5.0 PERFORMANCE

### Style 741

2 – 12"/DN50 – DN300

ANSI Class 125 and 150 Flanges

Size		Performance	
Nominal inches DN	Actual Outside Diameter inches mm	Maximum Working Pressure <sup>9</sup> psi kPa	Maximum End Load <sup>9</sup> lb N
2 DN50	2.375 60.3	300 2068	1330 5920
2 ½	2.875 73.0	300 2068	1950 8680
3 DN80	3.500 88.9	300 2068	2885 12840
4 DN100	4.500 114.3	300 2068	4770 21225
5	5.563 141.3	300 2068	7290 32440
6 DN150	6.625 168.3	300 2068	10350 46060
8 DN200	8.625 219.1	300 2068	17500 77875
10 DN250	10.750 273.0	300 2068	27215 121110
12 DN300	12.750 323.9	300 2068	38285 170270

<sup>9</sup> Working Pressure and End Load are total, from all internal and external loads, based on standard weight (ANSI) steel pipe, standard roll or cut grooved in accordance with Victaulic specifications. Contact Victaulic for performance on other pipe.

#### NOTE

- WARNING: FOR ONE TIME FIELD TEST ONLY, the Maximum Joint Working Pressure may be increased to 1½ times the figures shown.

### Style 741

DN50 – DN300/2 – 12"

PN10 and PN16 Flanges

Size		PN10 Flanges		PN16 Flanges	
Nominal DN inches	Actual Outside Diameter mm inches	Maximum Working Pressure <sup>9</sup> Bar psi	Maximum End Load <sup>9</sup> N lb	Maximum Working Pressure <sup>9</sup> Bar psi	Maximum End Load <sup>9</sup> N lb
DN50 2	60.3 2.375	10 145	2850 640	16 230	4561 1025
DN65	76.1 3.000	10 145	4540 1020	16 230	7275 1635
DN80 3	88.9 3.500	10 145	6210 1395	16 230	9925 2230
DN100 4	114.3 4.500	10 145	10260 2305	16 230	16420 3690
DN125	139.7 5.500	10 145	15330 3446	16 230	24520 5512
	159.0 6.250	10 145	19800 4450	16 230	31400 7056
DN150 6	168.3 6.625	10 145	22250 5000	16 230	35600 8000
DN200 8	219.1 8.625	10 145	37690 8470	16 230	60320 13555
DN250 10	273.0 10.750	10 145	58560 13160	16 230	93695 21055
DN300 12	323.9 12.750	10 145	82370 18510	16 230	131810 29620

<sup>9</sup> Working Pressure and End Load are total, from all internal and external loads, based on standard weight (ANSI) steel pipe, standard roll or cut grooved in accordance with Victaulic specifications. Contact Victaulic for performance on other pipe.

#### NOTE

- WARNING: FOR ONE TIME FIELD TEST ONLY, the Maximum Joint Working Pressure may be increased to 1½ times the figures shown.

## 5.0 PERFORMANCE (Continued)

### Style 741

DN50 – DN200/2 – 8"

Australian Standard Table "E" Flanges

Size		Performance	
Nominal DN inches	Actual Outside Diameter mm inches	Maximum Working Pressure <sup>9</sup> kPa psi	Maximum End Load <sup>9</sup> N lb
DN50 <sup>10</sup> 2	60.3 2.375	1400 203	3996 900
DN80 3	88.9 3.500	1400 203	8700 1955
DN100 4	114.3 4.500	1400 203	14374 3220
DN150 6	168.3 6.625	1400 203	31150 7000
DN200 8	219.1 8.625	1400 203	52777 11860

<sup>9</sup> Working Pressure and End Load are total, from all internal and external loads, based on standard weight (ANSI) steel pipe, standard roll or cut grooved in accordance with Victaulic specifications. Contact Victaulic for performance on other pipe.

<sup>10</sup> Contact Victaulic for details.

#### NOTE

- WARNING: FOR ONE TIME FIELD TEST ONLY, the Maximum Joint Working Pressure may be increased to 1½ times the figures shown.

### Style 741

DN50 – DN200/2 – 8"

Chinese Standard Table "E" Flanges

Size		Performance	
Nominal DN inches	Actual Outside Diameter mm inches	Maximum Working Pressure <sup>9</sup> kPa psi	Maximum End Load <sup>9</sup> N lb
DN50 2	60.3 2.375	1400 203	3996 900
DN65	76.1 3.000	1400 203	6365 1431
DN80 3	88.9 3.500	1400 203	8700 1955
	108.0 4.250	1400 203	12819 2882
DN100 4	114.3 4.500	1400 203	14374 3220
	133.0 5.250	1400 203	19440 4370
DN125	139.7 5.500	1400 203	21448 4822
	159.0 6.250	1400 203	27784 6246
	165.1 6.500	1400 203	29920 6726
DN200 8	219.1 8.625	1400 203	52777 11860

<sup>9</sup> Working Pressure and End Load are total, from all internal and external loads, based on standard weight (ANSI) steel pipe, standard roll or cut grooved in accordance with Victaulic specifications. Contact Victaulic for performance on other pipe.



## 5.0 PERFORMANCE (Continued)

### Style 741

14 – 24"/DN350 – DN600

ANSI Class 125 and 150 Flanges

Size		Performance	
Nominal inches DN	Actual Outside Diameter inches mm	Maximum Working Pressure <sup>9</sup> psi kPa	Maximum End Load <sup>9</sup> lb N
14 DN350	14.000 355.6	300 2068	46180 205500
16 DN400	16.000 406.4	300 2068	60300 268335
18 DN450	18.000 457.0	300 2068	76340 339700
20 DN500	20.000 508.0	300 2068	94250 419400
24 DN600	24.000 610.0	300 2068	135700 603865

<sup>9</sup> Working Pressure and End Load are total, from all internal and external loads, based on standard weight (ANSI) steel pipe, standard roll or cut grooved in accordance with Victaulic specifications. Contact Victaulic for performance on other pipe.

#### NOTE

- WARNING: FOR ONE TIME FIELD TEST ONLY, the Maximum Joint Working Pressure may be increased to 1½ times the figures shown.

### Style 743

Grooved pipe adapter to ANSI Class 300 flanges

Size		Performance	
Nominal inches DN	Actual Outside Diameter inches mm	Maximum Working Pressure <sup>9</sup> psi kPa	Maximum End Load <sup>9</sup> lb N
2 DN50	2.375 60.3	720 4964	3190 14200
2½	2.875 73.0	720 4964	4670 20780
3 DN80	3.500 88.9	720 4964	6925 30815
4 DN100	4.500 114.3	720 4964	11445 50930
5	5.563 141.3	720 4964	17500 77875
6 DN150	6.625 168.3	720 4964	24805 110380
8 DN200	8.625 219.1	720 4964	42045 187100
10 DN250	10.750 273.0	720 4964	65315 290650
12 DN300	12.750 323.9	720 4964	91880 408870

<sup>9</sup> Working Pressure and End Load are total, from all internal and external loads, based on standard weight (ANSI) steel pipe, standard roll or cut grooved in accordance with Victaulic specifications. Contact Victaulic for performance on other pipe.

#### NOTE

- WARNING: FOR ONE TIME FIELD TEST ONLY, the Maximum Joint Working Pressure may be increased to 1½ times the figures shown.

## 6.0 NOTIFICATIONS

- The Style 741 (2 – 12"/DN50 – DN300) design incorporates small teeth inside the key shoulder I.D. to prevent rotation. These teeth should be removed when *Vic-Flange* adapter is utilized with a Victaulic Series 700 grooved-end butterfly valve, Schedule 5 pipe or plastic pipe. *Vic-Flange* adapter Style 741 may only be used on one side of Victaulic Series 700 butterfly valve, sizes 2 – 4"/DN50 – DN100 fitted with standard or latch-lock handles.
- *Vic-Flange* adapter must be assembled so it does not interfere with handle operation. Because of the outside flange dimension, *Vic-Flange* adapter should not be used within 90° of one another on a standard fitting. When wafer or lug-type valves are used adjoining a Victaulic fitting, check disc dimensions to assure proper clearance.
- *Vic-Flange* adapters should not be used as anchor points for tie-rods across nonrestrained joints. Mating rubber faced flanges, valves, etc. requires the use of a *Vic-Flange* washer.
- Area A-B noted in the above drawing must be free from gouges, undulations or deformities of any type for effective sealing.
- *Vic-Flange* adapter gaskets must always be assembled with the color coded lip on the pipe and the other lip facing the mating flange.
- *Vic-Flange* hinge points must be oriented approximately 90° to each other when mated.
- Flange Washers: *Vic-Flange* adapters require a smooth hard surface at the mating flange face for effective sealing. Some applications for which the *Vic-Flange* adapter is otherwise well suited do not provide an adequate mating surface. In such cases, it is recommended that a metal (Type F phenolic for Style 641 with copper systems) Flange Washer be inserted between the *Vic-Flange* adapter and the mating flange to provide the necessary sealing surface.
- Typical applications where a Flange Washer should be used are:
  - A. When mating to a serrated flange: a flange gasket should be used adjacent to the serrated flange and then the Flange Washer is inserted between the *Vic-Flange* adapter and the flange gasket.
  - B. When mating to a wafer valve: where typical valves are rubber lined and partially rubber faced (smooth or not), the Flange Washer is placed between the valve and the *Vic-Flange* adapter.
  - C. When mating a rubber faced flange: the Flange Washer is placed between the *Vic-flanges* and the rubber faced flange.
  - D. When mating AWWA cast flanges to IPS flanges: the Flange Washer or Transition Ring is placed between two *Vic-Flange* adapters with the hinge points oriented 90° to each other. If one flange is not a *Vic-Flange* adapter (e.g., flanged valve), then a flange gasket must be placed adjacent to that flange and the Flange Washer inserted between the flange gasket and the *Vic-Flange* adapter. Transition rings rather than Flange Washers must be used when mating Style 741 to Style 341 Flange Adapters in sizes 14 – 24"/DN350 – DN600.
  - E. When mating to components (valves, strainers, etc.) where the component flange face has an insert: follow the same arrangement as in Application 1.
- When ordering Flange Washers, always specify product style (Style 741, 743, 341, 641, 994) and size to assure proper Flange Washer is supplied.

### NOTE

- Style 741 is compatible with ANSI CL 125 or CL150, PN10/16 and Australian Standard Table E bolt hole patterns.

## 6.0 NOTIFICATIONS (Continued)

### WARNING

- Victaulic RX roll sets must be used when grooving light-wall/thin-wall stainless steel pipe for use with Victaulic Couplings.

Failure to use Victaulic RX roll sets when grooving light-wall/thin-wall stainless steel pipe may cause joint failure, resulting in serious personal injury and/or property damage.

### NOTICE

- Victaulic RX grooving rolls must be ordered separately. They are identified by a silver color and the designation RX on the front of the roll sets.

## 7.0 REFERENCE MATERIALS

[02.06: Victaulic Potable Water Approvals](#)

[05.01: Victaulic Seal Selection Guide](#)

[10.01: Victaulic Regulatory Approval Reference Guide](#)

[17.01: Victaulic Pipe Preparation for Use on Stainless Steel Pipe With Victaulic Products](#)

[17.09: Victaulic Pressure Ratings and End Loads for Victaulic Ductile Iron Grooved Couplings on Stainless Steel Pipe](#)

[29.01: Victaulic Terms and Conditions/Warranty](#)

[1-100: Victaulic Field Installation Handbook](#)

### User Responsibility for Product Selection and Suitability

Each user bears final responsibility for making a determination as to the suitability of Victaulic products for a particular end-use application, in accordance with industry standards and project specifications, as well as Victaulic performance, maintenance, safety, and warning instructions. Nothing in this or any other document, nor any verbal recommendation, advice, or opinion from any Victaulic employee, shall be deemed to alter, vary, supersede, or waive any provision of Victaulic Company's standard conditions of sale, installation guide, or this disclaimer.

### Intellectual Property Rights

No statement contained herein concerning a possible or suggested use of any material, product, service, or design is intended, or should be construed, to grant any license under any patent or other intellectual property right of Victaulic or any of its subsidiaries or affiliates covering such use or design, or as a recommendation for the use of such material, product, service, or design in the infringement of any patent or other intellectual property right. The terms "Patented" or "Patent Pending" refer to design or utility patents or patent applications for articles and/or methods of use in the United States and/or other countries.

### Note

This product shall be manufactured by Victaulic or to Victaulic specifications. All products to be installed in accordance with current Victaulic installation/assembly instructions. Victaulic reserves the right to change product specifications, designs and standard equipment without notice and without incurring obligations.

### Installation

Reference should always be made to the Victaulic installation handbook or installation instructions of the product you are installing. Handbooks are included with each shipment of Victaulic products, providing complete installation and assembly data, and are available in PDF format on our website at [www.victaulic.com](http://www.victaulic.com).

### Warranty

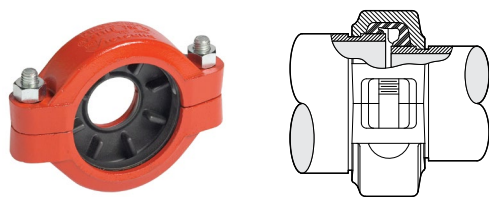
Refer to the Warranty section of the current Price List or contact Victaulic for details.

### Trademarks

Victaulic and all other Victaulic marks are the trademarks or registered trademarks of Victaulic Company, and/or its affiliated entities, in the U.S. and/or other countries.

# Victaulic® Reducing Coupling

## Style 750



### 1.0 PRODUCT DESCRIPTION

#### Available Sizes:

- 2 x 1" through 10 x 8"/DN50 x DN25 through DN250 x DN200

#### Pipe Material:

- Carbon steel

#### Maximum Working Pressure:

- Up to 500 psi/3447 kPa
- Working pressure dependent on material, wall thickness and size of pipe

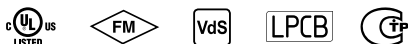
#### Application:

- Joins OGS roll grooved and cut grooved pipe, as well as OGS grooved fittings, valves and accessories
- Permits direct reduction on piping run
- Optional steel washer prevents telescoping of the smaller pipe inside the larger pipe during vertical system assembly

#### Pipe Preparation:

- Cut or roll grooved in accordance with [publication 25.01](#): Victaulic Standard Groove Specifications.

### 2.0 CERTIFICATION/LISTINGS



#### NOTES

- Download [publication 10.01](#) for Fire Protection Certifications/Listings Reference Guide.

ALWAYS REFER TO ANY NOTIFICATIONS AT THE END OF THIS DOCUMENT REGARDING PRODUCT INSTALLATION, MAINTENANCE OR SUPPORT.

System No.		Location	
Submitted By		Date	

Spec Section		Paragraph	
Approved		Date	

### 3.0 SPECIFICATIONS – MATERIAL

**Housing:** Ductile iron conforming to ASTM A536, Grade 65-45-12. Ductile iron conforming to ASTM A395, Grade 65-45-15, is available upon special request.

**Housing Coating: (specify choice)**

Standard: Orange enamel.

Optional: Hot dipped galvanized conforming to ASTM A153.

Optional: Contact Victaulic with your requirements.

**Gasket: (specify choice<sup>1</sup>)**

**Grade “E” EPDM**

EPDM (Green stripe color code). Temperature range –30°F to +230°F/–34°C to +110°C. May be specified for hot water service within the specified temperature range plus a variety of dilute acids, oil-free air and many chemical services. UL Classified in accordance with ANSI/NSF 61 for cold +73°F/+23°C and hot +180°F/+82°C potable water service and ANSI/NSF 372. **NOT COMPATIBLE FOR USE WITH PETROLEUM SERVICES OR STEAM SERVICES.**

**Grade “T” Nitrile**

Nitrile (Orange stripe color code). Temperature range –20°F to +180°F/–29°C to +82°C. May be specified for petroleum products, hydrocarbons, air with oil vapors, vegetable and mineral oils within the specified temperature range; not compatible for hot dry air over +140°F/+60°C and water over +150°F/+66°C. **NOT COMPATIBLE FOR USE WITH HOT WATER SERVICES OR STEAM SERVICES.**

**Others**

For alternate gasket selection, reference [publication 05.01](#): Victaulic Seal Selection Guide.

<sup>1</sup> Services listed are General Service Guidelines only. It should be noted that there are services for which these gaskets are not compatible. Reference should always be made to the latest [Victaulic Seal Selection Guide](#) for specific gasket service guidelines and for a listing of services which are not compatible.

**Bolts/Nuts (specify choice<sup>2</sup>):**

Standard: Carbon steel oval neck track bolts meeting the mechanical property requirements of ASTM A449 (imperial) and ISO 898-1 Class 9.8 (metric). Carbon steel hex nuts meeting the mechanical property requirements of ASTM A563 Grade B (imperial – heavy hex nuts) and ASTM A563M Class 9 (metric – hex nuts). Track bolts and hex nuts are zinc electroplated per ASTM B633 ZN/FE5, finish Type III (imperial) or Type II (metric).

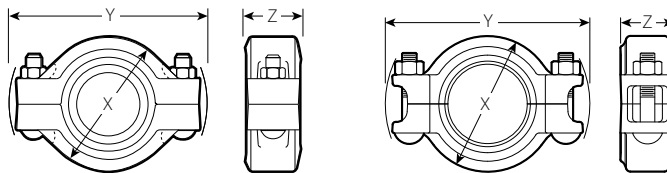
Optional (imperial): Stainless steel oval neck track bolts meeting the mechanical property requirements of ASTM F593, Group 2 (316 stainless steel), condition CW. Stainless steel heavy nuts meeting the mechanical property requirements of ASTM F594, Group 2 (316 stainless steel), condition CW, with galling reducing coating.

**Assembly Washer (optional):** Galvanized carbon steel.

<sup>2</sup> Optional bolts/nuts are available in imperial size only

## 4.0 DIMENSIONS

### Style 750



Size		Pipe End Separation <sup>2</sup>	Deflect. From CL <sup>3</sup>		Bolt/Nut		Dimensions			Weight
Nominal inches DN		Allowable inches mm	Per Cplg. Degrees	Pipe In./Ft. mm/m	Qty.	Size inches mm	X inches mm	Y inches mm	Z inches mm	Approximate (Each) lb kg
2	x	1	0° - 57'	0.20 17	2	3/8 x 2	3.38 85	5.28 134	1.88 48	2.7 1.2
DN50		DN25								
		1 1/2	0° - 57'	0.20 17	2	3/8 x 2	3.38 85	5.28 134	1.88 48	2.0 1.0
		DN40								
2 1/2	x	2	0° - 47'	0.16 14	2	3/8 x 2	4.00 102	5.93 151	1.88 48	3.1 1.4
		DN50								
DN65	x	2	0° - 47'	0.16 14	2	1/2 x 2 3/4	4.38 111	6.63 168	1.88 48	4.6 2.1
		DN50								
3	x	2	0° - 39'	0.13 11	2	1/2 x 2 3/4	4.75 121	7.13 181	1.88 48	4.9 2.2
DN80		DN50								
		2 1/2	0° - 39'	0.13 11	2	1/2 x 2 3/4	4.75 121	7.13 181	1.88 48	4.3 2.0
		DN65								
		3	0° - 39'	0.13 11	2	1/2 x 2 3/4	4.75 121	7.13 181	1.88 48	4.2 1.9
		DN65								
4	x	2	1° - 19'	0.28 25	2	5/8 x 3 1/4	6.25 159	8.90 226	2.25 57	8.1 3.7
DN100		DN50								
		2 1/2	1° - 19'	0.28 25	2	5/8 x 3 1/4	6.25 159	8.90 226	2.25 57	8.6 3.9
		DN65								
		3	1° - 19'	0.28 25	2	5/8 x 3 1/4	6.25 159	8.90 226	2.25 57	6.9 3.1
		DN80								
5	x	4	1° - 3'	0.22 19	2	3/4 x 4 1/4	7.18 182	10.70 272	2.13 54	11.2 5.1
		DN100								
165.1	x	4	0° - 55'	0.19 16	2	3/4 x 4 1/4	8.63 219	11.90 302	2.25 57	15.2 6.9
		DN100								
6	x	4	0° - 52'	0.18 15	2	3/4 x 4 1/4	8.63 219	11.90 302	2.25 57	16.7 7.6
DN150		DN100								
		5	0° - 52'	0.18 15	2	3/4 x 4 1/4	8.31 211	11.90 302	2.25 57	12.9 5.9
		DN150								
8	x	165.1	0° - 38'	0.13 11	2	7/8 x 5	10.75 273	14.88 378	2.50 64	23.2 10.5
DN200		DN150								
		6	0° - 38'	0.13 11	2	7/8 x 5	10.81 275	14.88 378	2.50 64	22.4 10.2
		DN150								
10	x	8	0° - 25'	0.90 8	2	1 x 5 1/2	13.12 333	17.26 438	2.62 67	31.4 14.2
DN250		DN200								

<sup>3</sup> Allowable Pipe End Separation and Deflection figures show the maximum nominal range of movement available at each joint for standard roll grooved pipe. Figures for standard cut grooved pipe may be doubled. These figures are maximums; for design and installation purposes, these figures should be reduced by: 50% for 3/4" - 3 1/2" DN20 - DN90; and 25% for 4" DN100 and larger.

#### NOTE

- Metric thread size bolts are available (color-coded gold) for all coupling sizes upon request. Contact Victaulic for details.

## 5.0 PERFORMANCE

### Style 750

Size		Maximum Working Pressure <sup>4</sup>	Maximum End Load <sup>4</sup>
Nominal	inches DN		
2 DN50	x 1 DN25	350 2413	500 2,225
	1 ½ DN40	350 2413	1000 4,450
	2 DN50	500 3447	2215 9,850
2 ½ DN65	x 2 DN50	350 2413	1550 6,900
	3 DN80	350 2413	1550 6,900
3 DN80	x 2 DN50	350 2413	1550 6,900
	2 ½	500 3447	3250 14,460
	DN65	350 2413	2475 11,010
	3 DN80	500 3447	4810 21,400
4 DN100	x 2 DN50	350 2413	1550 6,900
	2 ½	350 2413	2275 10,125
	DN65	350 2413	2475 11,014
	3 DN80	500 3447	4810 21,400
	4 DN100	350 2413	5565 24,765
5 DN150	x 4 DN100	350 2413	5565 24,765
	5	350 2413	8500 37,825
8 DN200	x 165.1	350 2413	11610 51,645
	6 DN150	350 2413	12060 53,645
	8 DN200	350 2413	20450 90,970

<sup>4</sup> Working Pressure and End Load are total, from all internal and external loads, based on standard weight (ANSI) steel pipe, standard roll or cut grooved in accordance with Victaulic specifications. Contact Victaulic for performance on other pipe and material. Maximum working pressure rating based on larger pipe size. Maximum end load rating based on smaller pipe size.

#### NOTES

- WARNING: FOR ONE-TIME FIELD USE ONLY, the Maximum Joint Working Pressure may be increased to 1 ½ times the figures shown.
- For joint pressure ratings on additional carbon steel wall thicknesses, see [publication 06.15](#).

## 5.1 PERFORMANCE

### Flow Data - Head Loss

- Equivalent lengths of standard weight steel pipe are shown in the tables. All data is based on water flowing at +60°F/+16°C.

#### Flow Reducing

Size		Equivalent Pipe Length
Nominal inches DN		Small Diameter ft m
2 DN50	x 1 DN25	5.9
		1.8
	1 ½ DN40	2.0
		0.6
2 ½	x 2 DN50	1.9
		0.6
DN65	x 2 DN50	1.9
		0.6
3 DN80	x 2 DN50	5.5
		1.7
	2 ½	3.8
		1.2
		3.8
		1.2
	DN65	3.8
		1.2
4 DN100	x 2 DN50	6.0
		1.8
	2 ½	6.0
		1.8
		6.0
		1.8
	DN65	6.0
		1.8
5	x 4 DN100	3.0
		0.9
165.1	x 4 DN100	6.0
		1.8
6 DN150	x 4 DN100	6.0
		1.8
	5	4.5
		1.4
8 DN200	x 165.1	7.3
		2.2
	6 DN150	7.3
		2.2
10 DN250	x 8 DN200	8.7
		2.7

#### Flow Expanding

Size		Equivalent Pipe Length
Nominal inches DN		Small Diameter ft m
1 DN25	x 2 DN50	2.7
		0.8
1 ½ DN40	x 2 DN50	1.9
		0.6
2 DN50	x 2 ½	1.0
		0.3
	DN65	1.0
		0.3
	3 DN80	3.5
		1.1
	4 DN100	3.0
		0.9
2 ½	x 3 DN80	2.5
		0.8
	4 DN100	3.0
		0.9
DN65	x 3 DN80	2.5
		0.8
	4 DN100	3.0
		0.9
3 DN80	x 4 DN100	2.5
		0.8
4 DN100	x 5	3.3
		1.0
	165.1	4.6
		1.4
	6 DN150	4.6
		1.4
5	x 6 DN150	2.3
		0.7
165.1	x 8 DN200	5.4
		1.7
6 DN150	x 8 DN200	6.0
		1.8
8 DN200	x 10 DN250	6.3
		1.9



## 6.0 NOTIFICATIONS

### ⚠ WARNING



- Read and understand all instructions before attempting to install, remove, adjust, or maintain any Victaulic piping products.
- Depressurize and drain the piping system before attempting to install, remove, adjust, or maintain any Victaulic piping products.
- Wear safety glasses, hardhat, and foot protection.
- Only No. 61 bull plugs shall be used with Style 750 reducing couplings in systems where a vacuum may develop.

Failure to follow these instructions could result in death or serious personal injury and property damage.

## 7.0 REFERENCE MATERIALS

[05.01: Victaulic® Seal Selection Guide](#)

[10.01: Victaulic® Products for Fire Protection Piping Systems - Regulatory Approval Reference Guide](#)

[25.01: Victaulic® Original Groove System \(OGS\) Groove Specifications](#)

[26.01: Victaulic® Design Data](#)

[29.01: Victaulic® Terms and Conditions of Sale](#)

[I-100: Victaulic® Field Installation Handbook](#)

### User Responsibility for Product Selection and Suitability

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### Installation

Reference should always be made to the Victaulic installation handbook or installation instructions of the product you are installing. Handbooks are included with each shipment of Victaulic products, providing complete installation and assembly data, and are available in PDF format on our website at [www.victaulic.com](http://www.victaulic.com).

### Warranty

Refer to the Warranty section of the current Price List or contact Victaulic for details.

### Trademarks

*Victaulic* and all other Victaulic marks are the trademarks or registered trademarks of Victaulic Company, and/or its affiliated entities, in the U.S. and/or other countries.



No. 20 Tee



No. 10 Elbow

## 1.0 PRODUCT DESCRIPTION

### Available Sizes

- ¾ – 60"/DN20 – DN1500

### Maximum Working Pressure

- Pressure ratings for Victaulic standard fittings conform to the ratings of Victaulic Style 177N couplings (refer to [publication 06.24](#) for more information).

### Application

- Connects pipe, provides change in direction and adapts sizes or components
- Supplied with Victaulic OGS grooves
- Exclusively for use with Victaulic couplings, valves, accessories and pipe which feature ends formed with the Victaulic OGS groove profile

### Pipe Materials

- Carbon steel or stainless steel

### NOTE

- These fittings are not intended for use with Victaulic plain end couplings. Intended for use only in grooved piping systems. When connecting wafer or lug type butterfly valves directly to Victaulic fittings using Style 741 or Style 743 flange adapters, be sure to check disc clearance dimensions with I.D. dimension of fitting.

ALWAYS REFER TO ANY NOTIFICATIONS AT THE END OF THIS DOCUMENT REGARDING PRODUCT INSTALLATION, MAINTENANCE OR SUPPORT.

System No.		Location	
Submitted By		Date	

Spec Section		Paragraph	
Approved		Date	

## 1.0 PRODUCT DESCRIPTION (Continued)

### Other Fitting Styles



AGS - Advanced Groove System  
from 14 – 60"/DN350 – DN1500  
[Publication 20.05](#)



Ductile Iron for AWWA size pipe  
[Publication 23.05](#)



Stainless Steel  
[Publication 17.16](#)



XL fittings for abrasive services  
[Publication 07.07](#)



Galvanized  
[Publication 07.01](#) for Original Groove Fittings  
[Publication 20.05](#) for AGS Fittings



Aluminum  
[Publication 21.03](#)



Extra Heavy EndSeal "ES"  
[Publication 07.03](#)



Shouldered Ends  
[Publication 07.06](#)



Copper  
[Publication 22.04](#)



Plain End  
[Publication 14.04](#)

## 2.0 CERTIFICATION/LISTINGS



### NOTES

- When supplied as "hot dip galvanized" the following fittings are UL Classified in accordance with ANSI/NSF 61 and for use on cold +86°F/+30°C potable water service and ANSI/NSF 372: No. 10 90° Elbow, No. 11 45° Elbow, No. 12 22 ½° Elbow, No. 13 11 ¼° Elbow, No. 100 90° Long Radius Elbow, No. 110 45° Long Radius Elbow, No. 20 Tee, No. 25 Tee with Grooved Branch, No. 30 45° Lateral, No. 60 Cap, No. 50 Concentric Reducers, No. 51 Eccentric Reducers.
- The following Victaulic fittings are VdS approved: No.10 90° Elbow, No.11 45° Elbow, No.20 Tee and No.60 Cap.
- The following Victaulic fittings are LPCB approved: No.10 90° Elbow, No.11 45° Elbow, No.12 22 ½° Elbow, No.13 11 ¼° Elbow, No.30 45° Lateral, No.30-R Reducing Lateral, No.100 Long Radius Elbow, No.110 Long Radius Elbow, No.20 Tee, No.35 Cross, No.60 Cap, No.25 Reducing Tee, No.33 True Wye, No.50 Concentric Reducer, No.51 Eccentric Reducer and No.29M Tee with Threaded Branch.
- The following Victaulic fittings are FM approved: No.10 90° Elbow, No.11 45° Elbow, No.12 22 ½° Elbow, No.13 11 ¼° Elbow, No.30 45° Lateral, No.100 Long Radius Elbow, No.20 Tee, No.35 Cross, No.60 Cap, No.25 Reducing Tee and No.50 Concentric Reducer.

## 3.0 SPECIFICATIONS - MATERIAL

### Fitting: (specify choice)

Standard: Ductile iron conforming to ASTM A536, Grade 65-45-12.

Optional: Segmentally welded steel as shown under nipples

### Nipples: (specify choice)

¾ – 4"/DN20 – DN100: Carbon steel, Schedule 40, conforming to ASTM A53, Type F

5 – 6"/DN125 – DN150: Carbon steel, Schedule 40, conforming to ASTM A53, Type E or S, Gr. B

8 – 12"/DN200 – DN300: Carbon steel, Schedule 30 or 40, conforming to ASTM A53, Type E or S, Gr. B

### Flanged Adapter Nipples: (specify choice)

Class 125 Flange: Cast iron conforming to ANSI B16.1

Class 150 Flange: Carbon steel conforming to ANSI B16.5, raised or flat face

Class 300 Flange: Carbon steel conforming to ANSI B16.5, raised or flat face

### Fitting Coating: (specify choice)

Standard: Orange enamel

Optional: Hot dip galvanized and others. Some fittings supplied electroplated as standard – see product specifications

### Flanged Adapter Nipple Coating: (specify choice)

Standard: None (Unfinished)

Optional: Orange enamel, hot dip galvanized and others

## 4.0 DIMENSIONS

### Elbows

**No. 10** 90° Elbow

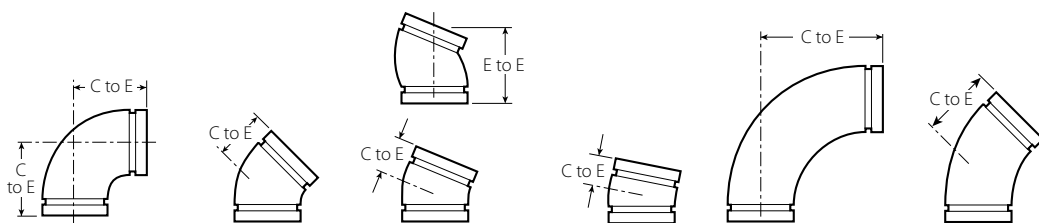
**No. 11** 45° Elbow

**No. 12** 22½° Elbow

**No. 13** 11¼° Elbow

**No. 100** 90° Long  
Radius Elbow

**No. 110** 45° Long  
Radius Elbow



Standard and  
GSNK

Size		No. 10 90° Elbow		No. 11 45° Elbow		No. 12 22½° Elbow		No. 13 11¼° Elbow		No. 100 90° Long Radius Elbow		No. 110 45° Long Radius Elbow	
Nominal	Actual Outside Diameter	C to E	Approx. Wgt. (Each)	C to E	Approx. Wgt. (Each)	C to E	Approx. Wgt. (Each)	C to E	Approx. Wgt. (Each)	C to E	Approx. Wgt. (Each)	C to E	Approx. Wgt. (Each)
inches DN	inches mm	inches mm	lb kg	inches mm	lb kg	inches mm	lb kg	inches mm	lb kg	inches mm	lb kg	inches mm	lb kg
¾ DN20	1.050 26.9	2.25 57	0.5 0.2	1.50 38	0.5 0.2	1.63 (sw) 41	—	1.38 (sw) 35	—	2.50 (sw) 64	0.4 0.2	1.88 (sw) 48	0.3 0.1
1 DN25	1.315 33.7	2.25 57	0.6 0.3	1.75 44	0.6 0.3	3.25 <sup>1</sup> 83	0.6 0.3	1.38 (sw) 35	0.3 0.1	2.88 (sw) 73	0.6 0.3	2.25 (sw) 57	0.5 0.2
1 ¼ DN32	1.660 42.4	2.75 70	1.0 0.5	1.75 44	0.9 0.4	1.75 44	0.8 0.4	1.38 (sw) 35	0.5 0.2	3.25 (sw) 83	1.1 0.5	2.38 (sw) 60	0.7 0.3
1 ½ DN40	1.900 48.3	2.75 70	1.2 0.5	1.75 44	0.9 0.4	1.75 44	0.8 0.4	1.38 (sw) 35	0.5 0.2	3.63 (sw) 92	2.2 1.0	2.50 (sw) 64	1.3 0.6
2 DN50	2.375 60.3	3.25 83	1.8 0.8	2.00 51	1.3 0.6	1.88 48	1.2 0.5	1.38 35	1.0 0.5	4.38 111	2.5 1.1	2.75 70	1.8 0.8
2 ½ DN65	2.875 73.0	3.75 95	3.2 1.5	2.25 57	2.2 1.0	4.00 <sup>1</sup> 102	2.3 1.0	1.50 38	1.1 0.5	5.13 130	3.4 1.5	3.00 76	2.8 1.3
3 DN80	3.000 76.1	3.75 95	3.7 1.7	2.25 57	3.4 1.5	2.25 57	—	1.50 38	—	—	—	—	—
3 ½ DN90	3.500 88.9	4.25 108	4.5 2.0	2.50 64	3.1 1.4	4.50 <sup>1</sup> 114	3.1 1.4	1.50 38	2.1 1.0	5.88 149	6.0 2.7	3.38 86	4.9 2.2
4 DN100	4.000 101.6	4.50 114	5.6 2.5	2.75 70	4.3 2.0	2.50 (sw) 64	4.0 1.8	1.75 (sw) 44	2.7 1.2	—	—	—	—
	4.500 114.3	5.00 127	7.1 3.2	3.00 76	5.6 2.5	2.88 73	5.6 2.5	1.75 44	3.6 1.6	7.50 191	12.3 5.6	4.00 102	7.3 3.3
	4.250 108.0	5.00 127	11.0 5.0	3.00 76	5.6 2.5	—	—	—	—	—	—	—	—
	5.000 127.0	5.25 (sw) 133	10.0 4.5	3.13 (sw) 79	6.0 2.7	3.50 (sw) 89	6.6 3.0	1.88 (sw) 48	4.2 1.9	—	—	—	—
5	5.563 141.3	5.50 140	11.7 5.3	3.25 83	8.3 3.8	2.88 (sw) 73	7.8 3.5	2.00 (sw) 51	5.0 2.2	9.25 (sw) 235	18.0 8.2	4.88 (sw) 124	14.8 6.7
	5.250 133.0	5.50 140	11.7 5.3	3.25 83	8.3 3.8	—	—	—	—	—	—	—	—
DN125	5.500 139.7	5.50 140	11.7 5.3	3.25 83	8.3 3.8	2.88 73	—	2.00 51	—	—	—	—	—
6 DN150	6.625 168.3	6.50 165	17.2 7.8	3.50 89	10.8 4.9	6.25 <sup>1</sup> 159	12.2 5.5	2.00 51	7.0 3.2	10.75 273	30.4 13.8	5.50 140	17.4 7.9
	6.250 159.0	6.50 165	18.6 8.4	3.50 89	10.8 4.9	—	—	—	—	—	—	—	—
	6.500 165.1	6.50 165	15.5 7.0	3.50 89	9.8 4.4	3.13 79	11.4 5.2	2.00 51	7.4 3.4	10.75 (sw) 273	29.0 13.2	5.50 (sw) 140	19.0 8.6

<sup>1</sup> Gooseneck design, end-to-end dimension fittings in this size, contact your nearest Victaulic sales representative.

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

### NOTE

- All fittings are ductile iron unless otherwise noted with an (sw) or (s).

## 4.0 DIMENSIONS (Continued)

### Elbows

**No. 10** 90° Elbow

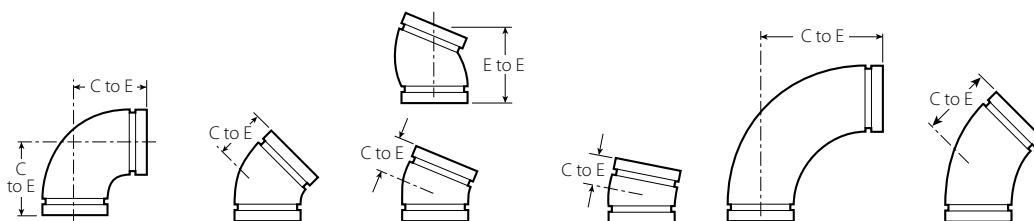
**No. 11** 45° Elbow

**No. 12** 22½° Elbow


**No. 13** 11¼° Elbow

**No. 100** 90° Long  
Radius Elbow

**No. 110** 45° Long  
Radius Elbow



Standard and  
GSNK

Size		No. 10 90° Elbow		No. 11 45° Elbow		No. 12 22½° Elbow		No. 13 11¼° Elbow		No. 100 90° Long Radius Elbow		No. 110 45° Long Radius Elbow	
Nominal inches DN	Actual Outside Diameter inches mm	C to E inches mm	Approx. Wgt. (Each) lb kg	C to E inches mm	Approx. Wgt. (Each) lb kg	C to E inches mm	Approx. Wgt. Each lb kg	C to E inches mm	Approx. Wgt. (Each) lb kg	C to E inches mm	Approx. Wgt. (Each) lb kg	C to E inches mm	Approx. Wgt. (Each) lb kg
8 DN200	8.625 219.1	7.75 197	29.9 13.6	4.25 108	20.4 9.3	7.75 <sup>1</sup> 197	20.0 9.1	2.00 51	10.1 4.6	14.25 362	66.0 30.0	7.25 184	36.0 16.3
10 DN250	10.750 273.0	9.00 229	63.3 28.7	4.75 121	37.5 17.0	4.38 (sw) 111	30.0 13.6	2.13 54	11.8 5.3	15.00 381	107.0 48.5	6.25 159	57.0 25.9
12 DN300	12.750 323.9	10.00 254	74.0 33.6	5.25 133	66.7 30.3	4.88 (sw) 124	40.0 18.1	2.25 57	29.3 13.3	18.00 457	156.0 70.8	7.50 191	90.0 40.8
14 <sup>2</sup> DN350	14.000 355.6	14.00 356	136.0 61.7	5.75 146	65.0 29.5	5.00 (sw) 127	46.0 20.9	3.50 (sw) 89	32.0 14.5	21.00 (s) 533	164.0 74.4	8.75 222	82.0 37.2
	14.843 377.0	14.84 377	149.3 67.7	6.13 156	82.0 37.2	—	—	—	—	—	—	—	—
16 <sup>2</sup> DN400	16.000 406.5	16.00 406	171.0 77.6	6.63 168	88.0 39.3	5.00 (sw) 127	58.0 26.3	4.00 (sw) 102	42.0 19.1	24.00 (s) 610	210.0 95.3	10.00 (s) 254	100.0 45.4
	16.773 426.0	16.75 425	198.6 90.1	7.00 178	101.3 45.9	—	—	—	—	—	—	—	—
18 <sup>2</sup> DN450	18.000 457.2	18.00 457	228.0 103.4	7.50 190	108.0 50.0	5.50 (sw) 140	65.0 29.5	4.50 (sw) 144	53.2 24.1	27.00 (s) 686	273.0 123.8	11.25 (s) 286	135.0 61.2
	18.898 480.0	18.88 480	291.0 132.0	7.83 200	141.7 64.3	—	—	—	—	—	—	—	—
20 <sup>2</sup> DN500	20.000 508.0	20.00 508	298.0 135.2	8.25 210	138.0 62.6	6.00 (sw) 152	78.6 36.0	5.00 (sw) 127	65.0 29.5	30.00 (s) 762	343.0 155.6	12.50 (s) 318	174.0 78.9
	20.866 530.0	20.88 530	355.0 161.0	8.63 219	179.0 81.2	—	—	—	—	—	—	—	—
24 <sup>2</sup> DN600	24.000 609.6	24.00 610	438.0 198.7	10.00 254	221.0 100.2	7.00 (sw) 178	140.0 63.5	6.00 (sw) 152	60.0 27.2	36.00 (s) 914	516.0 234.1	15.00 (s) 381	251.0 113.9
	24.803 630.0	24.80 630	545.0 247.2	10.25 261	255.2 115.7	—	—	—	—	—	—	—	—
14 – 60 DN350 – DN1500	For AGS fitting information, see <a href="#">publication 20.05</a> 												

<sup>1</sup> Gooseneck design, end-to-end dimension fittings in this size, contact your nearest Victaulic sales representative.

<sup>2</sup> For 14"/DN350 and larger roll grooved systems, Victaulic offers the Advanced Groove System (AGS). For pricing and availability of cut groove fittings in this size, contact your nearest Victaulic sales representative.

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

### NOTE

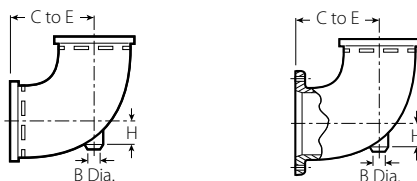
- All fittings are ductile iron unless otherwise noted with an (sw) or (s).

## 4.1 DIMENSIONS

### Reducing Base Support Elbow

No. R-10G Grv. x Grv.

No. R-10F Grv. x Flange



Size			No. R-10 Reducing Base Support Elbow			Approx. Weight Each	
Nominal inches DN			C to E inches mm	H inches mm	B Diameter inches mm	Grv. x Grv. lb kg	Grv. x Flange lb kg
6 DN150	x	4 DN100	9.00 229	1.25 32	1.50 38	19.0 8.6	33.0 15.0
		5	9.00 229	1.50 38	1.50 38	23.0 10.4	38.0 17.2
8 DN200	x	6 DN150	10.50 267	2.13 24	1.50 38	33.0 15.0	52.0 23.6
10 DN250	x	8 DN200	12.00 305	2.40 61	1.50 38	61.0 27.7	88.0 39.9

## 4.2 DIMENSIONS

### Adapter Elbow

No. 18 90° Adapter Elbow

No. 19 45° Adapter Elbow



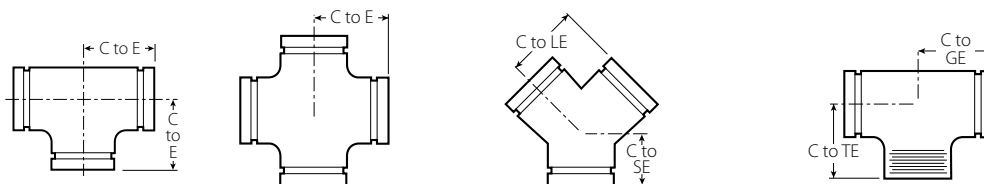
Size		No. 18 90° Adapter Elbow			No. 19 45° Adapter Elbow		
Nominal inches DN	Actual Outside Diameter inches mm	C to GE inches mm	C to TE inches mm	Approximate Weight (Each) lb kg	C to GE inches mm	C to TE inches mm	Approx. Weight (Each) lb kg
¾ DN20	1.050 26.9	2.25 57	2.25 57	0.5 0.2	1.50 38	1.50 38	0.5 0.2
1 DN25	1.315 33.7	2.25 57	2.25 57	0.5 0.2	—	—	—
1¼ DN32	1.660 42.4	2.75 70	2.75 70	0.9 0.4	—	—	—
1½ DN40	1.900 48.3	2.75 70	2.75 70	1.1 0.5	1.75 44	1.75 44	0.9 0.4
2 DN50	2.375 60.3	3.25 83	4.25 108	2.5 1.1	—	—	—
2½ DN65	2.875 73.0	3.75 95	3.75 95	3.0 1.4	2.25 57	2.25 57	2.3 1.0
3 DN80	3.500 88.9	4.25 108	6.00 152	5.8 2.6	2.50 64	4.25 108	5.0 2.3
3½ DN90	4.000 101.6	4.50 114	6.25 159	8.0 3.6	5.25 133	5.25 133	8.8 4.0
6 DN150	6.625 168.3	6.50 165	6.50 165	17.6 8.0	3.50 89	3.50 89	12.7 5.8

#### NOTE

- Available with British Standard Pipe Threads, specify "BSP" clearly on order.

## 4.3 DIMENSIONS

### Tees, Crosses and True Wyes



Size		No. 20 Tee		No. 35 Cross (sw)		No. 33 True Wye (sw)			No. 29M Tee with Threaded Branch		
Nominal inches DN	Actual Outside Diameter inches mm	C to E inches mm	Approx. Weight (Each) lb kg	C to E inches mm	Approx. Weight (Each) lb kg	C to LE inches mm	C to SE inches mm	Approx. Weight (Each) lb kg	C to GE inches mm	C to TE inches mm	Approx. Weight (Each) lb kg
3/4 DN20	1.050 26.9	2.25 57	0.6 0.3	2.25 57	0.9 0.4	2.25 57	2.00 51	0.7 0.3	2.25 57	2.25 (sw) 57	0.6 0.3
1 DN25	1.315 33.7	2.25 57	1.0 0.5	2.25 57	1.3 0.6	2.25 57	2.25 57	1.1 0.5	2.25 57	2.25 57	1.0 0.5
1 1/4 DN32	1.660 42.4	2.75 70	1.5 0.7	2.75 70	2.1 1.0	2.75 70	2.50 64	1.5 0.7	2.75 70	2.75 70	1.5 0.7
1 1/2 DN40	1.900 48.3	2.75 70	2.0 0.9	2.75 70	2.5 1.1	2.75 70	2.75 70	1.8 0.8	2.75 70	2.75 70	2.0 0.9
2 DN50	2.375 60.3	3.25 83	3.0 1.4	3.25 83	3.8 1.7	3.25 83	2.75 70	2.5 1.1	3.25 83	4.25 108	3.0 1.4
2 1/2	2.875 73.0	3.75 95	4.3 2.0	3.75 95	6.1 2.8	3.75 95	3.00 76	4.3 2.0	3.75 95	3.75 95	4.3 2.0
DN65	3.000 76.1	3.75 95	5.2 2.4	—	—	—	—	—	3.75 95	3.75 (sw) 95	5.2 2.4
3 DN80	3.500 88.9	4.25 108	6.8 3.0	4.25 108	10.5 4.8	4.25 108	3.25 83	6.1 2.8	4.25 108	6.00 152	6.8 3.1
3 1/2 DN90	4.000 101.6	4.50 (sw) 114	7.9 3.6	4.50 114	11.5 5.2	4.50 114	3.50 89	9.6 4.4	4.50 114	4.50 (sw) 114	7.9 3.6
	4.250 108.0	5.00 127	15.5 7.0	—	—	—	—	—	5.00 127	5.00 (sw) 127	15.5 7.0
4 DN100	4.500 114.3	5.00 127	11.9 5.4	5.00 127	15.8 7.2	5.00 127	3.75 95	9.8 4.4	5.00 127	7.25 184	11.9 5.4
	5.000 127.0	5.25 (sw) 133	15.0 6.8	5.25 133	18.5 8.4	—	—	—	5.25 133	5.25 (sw) 133	15.0 6.8
	5.250 133.0	5.50 140	17.8 8.1	—	—	—	—	—	5.50 140	5.50 (sw) 140	17.8 8.1
DN125	5.500 139.7	5.50 140	17.8 8.1	—	—	—	—	—	5.50 140	5.50 (sw) 140	17.8 8.1
5	5.563 141.3	5.50 140	17.8 8.1	5.50 140	20.0 9.1	5.50 140	4.00 102	15.0 6.8	5.50 140	5.50 (sw) 140	17.8 8.1
	6.250 159.0	6.50 165	27.1 12.3	—	—	—	—	—	6.50 165	6.50 (sw) 165	27.1 12.3
	6.500 165.1	6.50 165	22.0 10.0	6.50 165	28.0 12.7	—	—	—	6.50 165	6.50 (sw) 165	22.0 10.0
6 DN150	6.625 168.3	6.50 165	25.7 11.7	6.50 165	28.0 12.7	6.50 165	4.50 114	22.3 10.1	6.50 165	6.50 (sw) 165	25.7 11.7
8 DN200	8.625 219.1	7.75 197	47.6 21.6	7.75 197	48.0 21.8	7.75 197	6.00 152	36.0 16.3	7.75 197	7.75 197	47.6 21.6
10 DN250	10.750 273.0	9.00 229	99.0 44.9	9.00 229	121.5 55.1	9.00 229	6.50 155	69.9 31.7	9.00 229	9.00 229	99.0 44.9
12 DN300	12.750 323.9	10.00 254	133.0 60.3	10.00 254	110.0 49.9	10.00 254	7.00 178	80.0 36.3	10.00 254	10.00 254	133.0 60.3

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

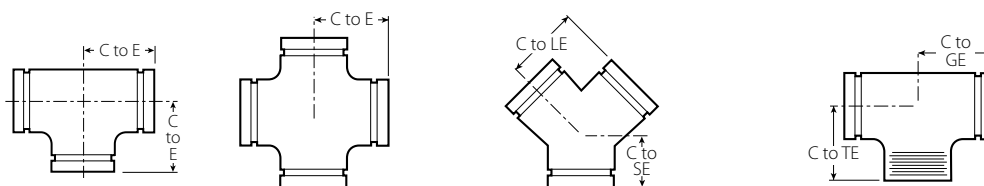
#### NOTE


- All fittings are ductile iron unless otherwise noted with an (sw) or (s).



### 4.3 DIMENSIONS (Continued)

#### Tees, Crosses and True Wyes



Size		No. 20 Tee		No. 35 Cross (sw)		No. 33 True Wye (sw)			No. 29M Tee with Threaded Branch		
Nominal inches DN	Actual Outside Diameter inches mm	C to E inches mm	Approx. Weight (Each) lb kg	C to E inches mm	Approx. Weight (Each) lb kg	C to LE inches mm	C to SE inches mm	Approx. Weight (Each) lb kg	C to GE inches mm	C to TE inches mm	Approx. Weight (Each) lb kg
14 <sup>2</sup> DN350	14.000 355.6	11.00 (sw) 279	145.0 65.8	11.00 279	198.0 89.8	11.00 279	7.50 191	134.2 60.8	—	—	—
	377.0	11.50 292	145.0 65.8	—	—	—	—	—	—	—	—
16 <sup>2</sup> DN400	16.000 406.4	12.00 (sw) 305	186.0 84.4	12.00 305	250.0 113.4	12.00 305	8.00 203	167.0 75.7	—	—	—
	426.0	13.00 300	186.0 84.4	—	—	—	—	—	—	—	—
18 <sup>2</sup> DN450	18.000 457.0	15.50 (sw) 394	260.0 117.9	15.50 394	350.0 158.8	15.50 394	8.50 216	234.0 106.1	—	—	—
	480.0	14.63 372	256.0 116.1	—	—	—	—	—	—	—	—
20 <sup>2</sup> DN500	20.000 508.0	17.25 (sw) 438	336.0 152.4	17.25 438	452.0 205.0	17.25 438	9.00 229	281.0 127.5	—	—	—
	530.0	15.38 (sw) 391	339.0 153.8	—	—	—	—	—	—	—	—
24 <sup>2</sup> DN600	24.000 610.0	20.00 (sw) 508	592.0 268.5	20.00 508	795.0 360.6	20.00 508	10.00 254	523.0 237.2	—	—	—
	630.0	17.38 (sw) 441	473.0 214.5	—	—	—	—	—	—	—	—
14 – 60 DN350 – DN1500		For AGS fitting information, see <a href="#">publication 20.05</a> 									

<sup>2</sup> For 14"/DN350 and larger roll grooved systems, Victaulic offers the Advanced Groove System (AGS). For pricing and availability of cut groove fittings in this size, contact your nearest Victaulic sales representative.

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

#### NOTE

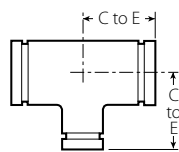
- All fittings are ductile iron unless otherwise noted with an (sw) or (s).

## 4.4 DIMENSIONS

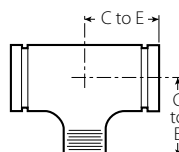
### Reducing Tee

No. 25 Grooved Branch

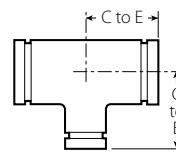
No. 29T Threaded Branch



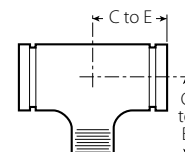
No. 25



No. 29T



No. 25



No. 29T

Size			No. 25 Std.	No. 29T w/ Thd. Branch	Approx. Weight (Each)
Nominal inches DN			C to E inches mm	C to E inches mm	
1 DN25	x	1 DN25	2.25 (sw) 57	2.25 (sw) 57	1.0 0.5
1 1/4 DN32	x	1 1/4 DN32	2.75 (sw) 70	2.75 (sw) 70	1.3 0.6
1 1/2 DN40	x	1 1/2 DN40	2.75 (sw) 70	2.75 (sw) 70	1.5 0.7
		1 DN25	2.75 (sw) 70	2.75 (sw) 70	1.5 0.7
		1 1/4 DN32	2.75 (sw) 70	2.75 (sw) 70	1.7 0.8
2 DN50	x	2 DN50	3.25 83	3.25 83	2.5 1.1
		1 DN25	3.25 83	3.25 83	2.7 1.2
		1 1/4 DN32	3.25 (sw) 83	3.25 (sw) 83	1.8 0.8
		1 1/2 DN40	3.25 83	3.25 (sw) 83	3.0 1.4
2 1/2	x	2 1/2	3.75 (sw) 95	3.75 (sw) 95	3.9 1.8
		1 DN25	3.75 95	3.75 (sw) 95	3.8 1.7
		1 1/4 DN32	3.75 95	3.75 95	4.2 1.7
		1 1/2 DN40	3.75 95	3.75 95	3.9 1.8
		2 DN50	3.75 95	3.75 (sw) 95	4.5 2.0
3 DN80	x	3 DN80	4.25 (sw) 108	4.25 (sw) 108	5.7 2.6
		1 DN25	4.25 108	4.25 108	6.1 2.8
		1 1/4 DN32	4.25 108	4.25 108	8.0 3.6
		1 1/2 DN40	4.25 108	4.25 (sw) 108	6.5 2.9
		2 DN50	4.25 108	4.25 (sw) 108	6.2 2.8
		2 1/2	4.25 108	4.25 (sw) 108	6.4 2.9

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

#### NOTE

- Cast fitting available. Contact Victaulic for details.

Size			No. 25 Std.	No. 29T w/ Thd. Branch	Approx. Weight (Each)
Nominal inches DN			C to E inches mm	C to E inches mm	
4 DN100	x	4 DN100	5.00 (sw) 127	5.00 (sw) 127	8.0 3.6
		1 DN25	5.00 127	5.00 127	7.8 3.5
		1 1/4 DN32	5.00 (sw) 127	5.00 (sw) 127	9.6 4.4
		1 1/2 DN40	5.00 127	5.00 127	10.2 4.6
		2 DN50	5.00 127	5.00 127	11.2 5.1
		2 1/2	5.00 127	5.00 127	11.4 5.2
		3 DN80	5.00 127	5.00 127	11.6 5.3
5	x	5	5.50 (sw) 140	5.50 (sw) 140	14.0 6.4
		1 1/2 DN40	5.50 (sw) 140	5.50 (sw) 140	14.3 6.5
		2 DN50	5.50 (sw) 140	5.50 (sw) 140	14.5 6.6
		2 1/2	5.50 140	5.50 (sw) 140	15.2 6.9
		3 DN80	5.50 140	5.50 (sw) 140	16.6 7.5
		4 DN100	5.50 140	5.50 (sw) 140	16.7 7.6
6 DN150	x	6 DN150	6.50 (sw) 165	6.50 (sw) 165	23.0 10.4
		1 1/2 DN40	6.50 (sw) 165	6.50 (sw) 165	24.0 10.9
		2 DN50	6.50 165	6.50 165	21.6 9.8
		2 1/2	6.50 165	6.50 165	21.4 11.7
		3 DN80	6.50 165	6.50 165	26.5 12.0
		4 DN100	6.50 165	6.50 165	25.0 11.3
		5	6.50 165	6.50 165	23.2 10.5
6 1/2	x	6 1/2	6.50 165	6.50 (sw) 165	24.0 10.9
		3 DN80	6.50 165	6.50 (sw) 165	25.0 11.3
		4 DN100	6.50 165	6.50 (sw) 165	25.0 11.3

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

#### NOTE

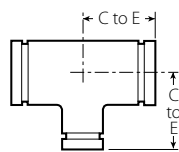
- Cast fitting available. Contact Victaulic for details.

## 4.4 DIMENSIONS (Continued)

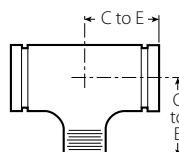
### Reducing Tee

**No. 25** Grooved Branch

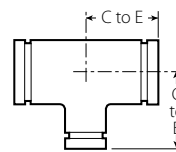
**No. 29T** Threaded Branch



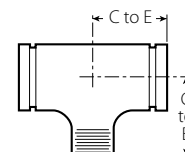
No. 25



No. 29T



No. 25



No. 29T

Size			No. 25 Std.	No. 29T w/ Thd. Branch	Approx. Weight (Each)
Nominal inches DN			C to E inches mm	C to E inches mm	lb kg
8 DN200	x	8 DN200	1 1/2 DN40	7.75 (sw)	33.0
				197	15.0
				7.75 (sw)	33.5
				197	15.2
				7.75 (sw)	39.0
				197	17.7
				7.75 (sw)	33.6
				197	15.2
				7.75	41.8
				197	19.0
10 DN250	x	10 DN250	2 DN50	7.75 (sw)	34.0
				197	15.4
				7.75	42.3
				197	19.2
				7.75	48.0
				197	21.8
				9.00	62.0
				229	28.1
				9.00 (sw)	62.0
				229	28.1
12 DN300	x	12 DN300	2 1/2 DN80	9.00 (sw)	62.4
				229	28.3
				9.00 (sw)	60.0
				229	27.2
				9.00 (sw)	61.0
				229	27.7
				9.00 (sw)	52.0
				229	23.6
				9.00 (sw)	59.0
				229	26.8
14 DN350	x	14 DN350	3 DN100	9.00 (sw)	64.7
				229	29.3
				12.00	130.0
				305	59.0
				12.00 (sw)	133.5
				305	60.6
				12.00	145.0
				305	65.8
				12.00	149.5
				305	67.8

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

#### NOTE

- Cast fitting available. Contact Victaulic for details.

Size			No. 25 Std.	No. 29T w/ Thd. Branch	Approx. Weight (Each)
Nominal inches DN			C to E inches mm	C to E inches mm	lb kg
12 DN300	x	1 DN25	10.00 (sw)	10.00 (sw)	77.0
			254	254	34.9
			10.00 (sw)	10.00 (sw)	80.0
			254	254	36.3
			10.00 (sw)	10.00 (sw)	78.0
			254	254	35.4
			10.00 (sw)	10.00 (sw)	82.0
			254	254	37.2
			10.00 (sw)	10.00 (sw)	80.0
			254	254	36.3
14 DN350	x	2 DN50	10.00 (sw)	10.00 (sw)	75.0
			254	254	34.0
			10.00 (sw)	10.00 (sw)	75.0
			254	254	34.0
			10.00 (sw)	10.00 (sw)	80.0
			254	254	36.3
			10.00 (sw)	10.00 (sw)	84.0
			254	254	38.1
			11.00 (sw)	11.00 (sw)	102.0
			279	279	46.3
16 DN400	x	3 DN80	11.00 (sw)	11.00 (sw)	108.2
			279	279	49.1
			11.00	11.00	112.0
			279	279	50.8
			11.00	11.00	120.0
			279	279	54.4
			11.00	11.00	129.1
			279	279	58.6
			12.00	12.00	130.0
			305	305	59.0
18 DN450	x	4 DN100	12.00 (sw)	12.00 (sw)	133.5
			305	305	60.6
			12.00	12.00	145.0
			305	305	65.8
			12.00	12.00	149.5
			305	305	67.8
			12.00	12.00	154.0
			305	305	69.9
			12.00 (sw)	—	167.0
			305	—	75.8

- <sup>2</sup> For 14"/DN350 and larger roll grooved systems, Victaulic offers the Advanced Groove System (AGS). For pricing and availability of cut groove fittings in this size, contact your nearest Victaulic sales representative.

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

#### NOTE

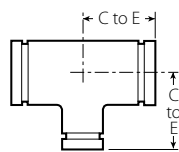
- Cast fitting available. Contact Victaulic for details.

## 4.4 DIMENSIONS (Continued)

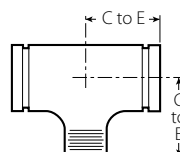
### Reducing Tee

No. 25 Grooved Branch

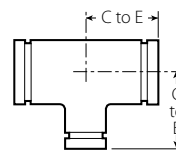
No. 29T Threaded Branch



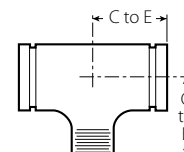
No. 25



No. 29T



No. 25



No. 29T

Size			No. 25 Std.	No. 29T w/ Thd. Branch	Approx. Weight (Each)
Nominal inches DN			C to E inches mm	C to E inches mm	lb kg
18 <sup>2</sup> DN450	x	18 DN450	4 DN100 15.50 (sw) 394	4 DN100 15.50 (sw) 394	194.0 88.0
		6 DN150			200.0 90.7
		8 DN200			202.0 91.6
		10 DN250			212.0 96.2
		12 DN300			222.6 101.0
		14 DN350			230.1 104.4
		16 DN400			247.6 112.3
		20 DN500			275.0 124.7
		24 DN600			340.0 154.2
		30 DN750			420.0 190.5
20 <sup>2</sup> DN500	x	20 DN500	6 DN150 17.25 438	6 DN150 17.25 438	240.0 108.9
		8 DN200			244.0 110.7
		10 DN250			256.0 116.1
		12 DN300			264.0 119.8
		14 DN350			275.0 124.7
		16 DN400			288.6 130.9
		18 DN450			297.0 134.7
		24 DN600			340.0 154.2
		30 DN750			420.0 190.5
		36 DN900			504.0 228.6


<sup>2</sup> For 14"/DN350 and larger roll grooved systems, Victaulic offers the Advanced Groove System (AGS). For pricing and availability of cut groove fittings in this size, contact your nearest Victaulic sales representative.

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

#### NOTE

- Cast fitting available. Contact Victaulic for details.

Size			No. 25 Std.	No. 29T w/ Thd. Branch	Approx. Weight (Each) lb kg		
Nominal inches DN			C to E inches mm	C to E inches mm			
24 <sup>2</sup> DN600	x	24 DN600	x	8 DN200	20.00 508	20.00 508	340.0 154.2
		10 DN250	20.00 508	20.00 508	343.9 156.0		
		12 DN300	20.00 508	20.00 508	352.8 160.0		
		14 DN350	20.00 508	—	360.0 163.3		
		16 DN400	20.00 508	—	378.0 171.5		
		18 DN450	20.00 508	—	380.0 172.4		
		20 DN500	20.00 508	—	373.0 169.2		
		14 – 60 DN350 – 1500			For AGS fitting information, see <a href="#">publication 20.05</a> 		

<sup>2</sup> For 14"/DN350 and larger roll grooved systems, Victaulic offers the Advanced Groove System (AGS). For pricing and availability of cut groove fittings in this size, contact your nearest Victaulic sales representative.

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

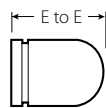
#### NOTES

- No. 29T Threaded Outlet Reducing Tees are supplied NPT and are available with British Standard threads. For British Standard specify "BSP" clearly on order.
- All fittings are ductile iron unless otherwise noted with an (sw) or (s).
- Cast fitting available. Contact Victaulic for details.

## 4.5 DIMENSIONS

### Bull Plug

#### No. 61



No. 61

Size		No. 61 Bull Plug (s)	
Nominal inches DN	Actual Outside Diameter inches mm	E to E inches mm	Approx. Weight (Each) lb kg
2 DN50	2.375 60.3	4.00 102	2.5 1.1
2 ½	2.875 73.0	5.00 127	3.0 1.4
3 DN80	3.500 88.9	6.00 152	4.5 2.0
4 DN100	4.500 114.3	7.00 178	7.5 3.4
5	5.563 141.3	8.00 203	12.0 5.4
6 DN150	6.625 168.5	10.00 254	17.0 7.7

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

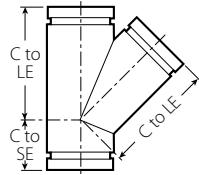
#### NOTES

- Steel dish caps available through 24"/DN600, contact Victaulic.
- No. 61 Bull Plugs should be used in vacuum service with Style 72 or 750 couplings.
- All fittings are ductile iron unless otherwise noted with an (sw) or (s).

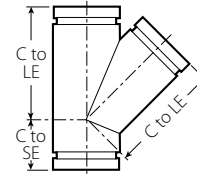
## 4.6 DIMENSIONS

### 45° Lateral

#### No. 30



No. 30



No. 30

Size		No. 30 45° Lateral		Weight
Nominal inches DN	Actual Outside Diameter inches mm	C to LE inches mm	C to SE inches mm	Approx. (Each) lb kg
¾ DN20	1.050 26.9	4.50 (sw) 114	2.00 (sw) 51	1.0 0.5
1 DN25	1.315 33.7	5.00 (sw) 127	2.25 (sw) 57	1.7 0.8
1¼ DN32	1.660 42.4	5.75 146	2.50 64	2.5 (d) 1.1
1½ DN40	1.900 48.3	6.25 (sw) 159	2.75 (sw) 70	3.5 1.6
2 DN50	2.375 60.3	7.00 (sw) 178	2.75 (sw) 70	5.0 2.3
2½	2.875 73.0	7.75 (sw) 197	3.00 (sw) 76	9.0 4.1
DN65	3.000 76.1	8.50 (sw) 216	3.25 (sw) 83	11.0 5.0
3 DN80	3.500 88.9	8.50 216	3.25 83	11.7 (d) 5.4
3½ DN90	4.000 101.6	10.00 (sw) 254	3.50 (sw) 89	17.8 8.1
4 DN100	4.500 114.3	10.50 267	3.75 95	22.2 (d) 10.1
5	5.563 141.3	12.50 (sw) 318	4.00 (sw) 102	21.8 9.9

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

Size		No. 30 45° Lateral		Weight
Nominal inches DN	Actual Outside Diameter inches mm	C to LE inches mm	C to SE inches mm	Approx. (Each) lb kg
	6.500 165.1	14.00 (sw) 356	4.50 (sw) 114	43.6 19.8
6 DN150	6.625 168.3	14.00 (sw) 356	4.50 (sw) 114	43.6 19.8
8 DN200	8.625 219.1	18.00 (sw) 457	6.00 (sw) 152	72.0 32.7
10 DN250	10.750 273.0	20.50 (sw) 521	6.50 (sw) 165	105.0 47.6
12 DN300	12.750 323.9	23.00 (sw) 584	7.00 (sw) 178	165.0 74.8
14² DN350	14.000 355.6	26.50 (sw) 673	7.50 (sw) 191	276.0 125.2
16² DN400	16.000 406.4	29.00 (sw) 737	8.00 (sw) 203	344.2 156.1
18² DN450	18.000 457.0	32.00 (sw) 813	8.50 (sw) 216	429.0 194.6
20² DN500	20.000 508.0	35.00 (sw) 889	9.00 (sw) 229	500.0 226.8
24² DN600	24.000 610.0	40.00 (sw) 1016	10.00 (sw) 254	715.0 324.3
14 – 60 DN350 – DN1500		For AGS fitting information, see <a href="#">publication 20.05</a>		



<sup>2</sup> For 14"/DN350 and larger roll grooved systems, Victaulic offers the Advanced Groove System (AGS). For pricing and availability of cut groove fittings in this size, contact your nearest Victaulic sales representative.

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

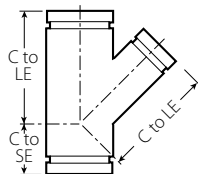
#### NOTE

- All fittings are ductile iron unless otherwise noted with an (sw) or (s).

## 4.7 DIMENSIONS

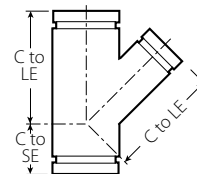
### 45° Reducing Lateral

#### No. 30-R



No. 30-R

Size				No 30-R 45° Reducing Lateral		
Nominal inches DN				C to LE inches mm	C to SE inches mm	Approx. Weight (Each) lb kg
3 DN80	x	3 DN80	2 DN50	8.50 216	3.25 83	9.8 4.4
			2½	8.50 216	3.25 83	9.8 4.4
4 DN100	x	4 DN100	2 DN50	10.50 267	3.75 95	10.0 4.5
			2½	10.50 267	3.75 95	10.0 4.5
			3 DN80	10.50 267	3.75 95	18.3 8.3
5	x	5	2 DN50	12.50 318	4.00 102	24.0 10.9
			3 DN80	12.50 318	4.00 102	27.0 12.2
			4 DN100	12.50 318	4.00 102	26.5 12.0
6 DN150	x	6 DN150	3 DN80	14.00 356	4.50 114	37.0 16.8
			4 DN100	14.00 356	4.50 114	36.0 16.3
			5	14.00 356	4.50 114	44.7 20.3
8 DN200	x	8 DN200	4 DN100	18.00 457	6.00 152	62.0 28.1
			5	18.00 457	6.00 152	75.5 34.2
			6 DN150	18.00 457	6.00 152	82.0 37.2
10 DN250	x	10 DN250	4 DN100	20.50 521	6.50 165	104.8 47.5
			5	20.50 521	6.50 165	99.0 44.9
			6 DN150	20.50 521	6.50 165	105.8 48.0
			8 DN200	20.50 521	6.50 165	118.0 53.5
12 DN300	x	12 DN300	5	23.00 584	7.00 178	122.0 55.3
			6 DN150	23.00 584	7.00 178	137.0 62.1
			8 DN200	23.00 584	7.00 178	147.0 66.7
			10 DN250	23.00 584	7.00 178	167.0 75.8



No. 30-R

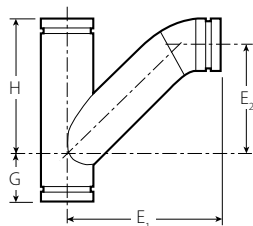
Size				No 30-R 45° Reducing Lateral			
Nominal inches DN				C to LE inches mm	C to SE inches mm	Approx. Weight (Each) lb kg	
14 <sup>2</sup> DN350	x	14 DN350	x	4 DN100	26.50 673	7.50 191	172.0 78.0
				6 DN150	26.50 673	7.50 191	187.0 84.8
				8 DN200	26.50 673	7.50 191	205.8 93.4
				10 DN250	26.20 673	7.50 191	235.0 106.6
				12 DN300	26.50 673	7.50 191	250.0 113.4
				16 <sup>2</sup> DN400	x	16 DN400	x
8 DN200	29.00 737	8.00 203	252.5 114.5				
10 DN250	29.00 737	8.00 203	265.0 120.2				
12 DN300	29.00 737	8.00 203	295.0 133.8				
14 DN350	29.00 737	8.00 203	305.0 138.3				
18 <sup>2</sup> DN450	x	18 DN450	x				
				8 DN200	32.00 813	8.50 216	275.0 124.7
				12 DN300	32.00 813	8.50 216	347.0 157.4
				14 DN350	32.00 813	8.50 216	350.0 158.8
				16 DN400	32.00 813	8.50 216	362.0 164.2
				20 <sup>2</sup> DN500	x	20 DN500	x
14 DN350	35.00 889	9.00 229	420.0 190.5				
16 DN400	35.00 899	10.00 229	425.0 192.8				
24 <sup>2</sup> DN600	x	24 DN600	x				
				20 DN600	40.00 1016	10.00 254	570.0 258.6
				14 – 60 DN350 – DN1500			

<sup>2</sup> For 14"/DN350 and larger roll grooved systems, Victaulic offers the Advanced Groove System (AGS). For pricing and availability of cut groove fittings in this size, contact your nearest Victaulic sales representative.

## 4.8 DIMENSIONS

### Tee Wye

#### No. 32



No. 32

Size			No. 32 Tee Wye (sw)					Approx. Weight (Each)
Nominal inches DN			G inches mm	H inches mm	E <sub>1</sub> inches mm	E <sub>2</sub> inches mm		
2 DN50	x	2 DN50	2.75 70	7.00 178	9.00 229	4.63 118	6.4 2.9	
2½	x	2½	3.00 76	7.75 197	10.50 267	5.75 146	11.5 5.2	
3 DN80	x	3 DN80	3.25 83	8.50 216	11.50 292	6.50 165	14.3 6.5	
3½ DN90	x	3½ DN90	3.25 89	10.00 254	13.00 330	7.75 197	22.9 10.4	
4 100	x	4 DN100	3.75 95	10.50 267	13.63 346	8.13 207	26.0 11.8	
5	x	5	4.00 102	12.50 318	16.13 410	10.00 254	48.0 21.8	
6 DN150	x	6 DN150	4.50 114	14.00 356	18.25 464	11.50 292	60.5 27.4	
8 DN200	x	8 DN200	6.00 152	18.00 457	23.25 591	15.25 387	127.1 57.7	
10 DN250	x	10 DN250	6.50 165	20.50 521	27.25 692	18.00 457	190.0 86.2	
12 DN300	x	12 DN300	7.00 178	23.00 584	31.00 787	20.50 521	240.0 108.9	

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

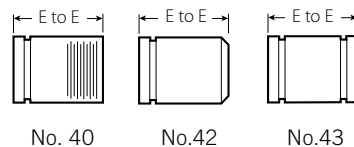
## 4.9 DIMENSIONS

### Adapter Nipple

No. 40<sup>12</sup> Grv. x Thd.

No. 42 Grv. x Bev.

No. 43 Grv. x Grv.



No. 40

No. 42

No. 43

Size		No. 40, 42, 43 Adapter Nipple (s)	
Nominal inches DN	Actual Outside Diameter inches mm	E to E inches mm	Approx. Weight (Each) lb kg
¾ DN20	1.050 26.9	3.00 76	0.3 0.1
1 25	1.315 33.7	3.00 76	0.4 0.2
1¼ DN32	1.660 42.4	4.00 102	0.8 0.4
1½ 40	1.900 48.3	4.00 102	0.9 0.4
2 DN50	2.375 60.3	4.00 102	1.2 0.5
2½	2.875 73.0	4.00 102	1.9 0.9
3 DN80	3.500 88.9	4.00 102	2.5 1.1
3½ DN90	4.000 101.6	4.00 102	2.1 0.9
4 DN100	4.500 114.3	6.00 152	5.5 2.5
5	5.563 141.3	6.00 152	7.4 3.4
6 DN150	6.625 168.3	6.00 152	9.5 4.3
8 DN200	8.625 219.1	6.00 152	14.2 6.4
10 DN250	10.750 273.0	8.00 203	27.0 12.2
12 DN300	12.750 323.9	8.00 203	33.0 15.0

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

### NOTES

- All fittings are ductile iron unless otherwise noted with an (sw) or (s).
- For pump package nipples with 1 ½/40 mm hole cut to receive Style 923 *Vic-Let* or Style 924 *Vic-O-Well* request special No. 40, 42 or 43 nipples and specify No. 40-H, 42-H or 43-H on order. NOTE: 4 – 12"/DN100 – DN300 diameter — 8"/200 mm minimum length required.
- For roll grooved systems, Victaulic offers the Advanced Groove System (AGS). For pricing and availability of cut groove fittings in this size, contact your nearest Victaulic sales representative.
- Available with British Standard Pipe Threads, specify "BSP" clearly on order.



## 4.10 DIMENSIONS

### Cap

#### No. 60




No. 60



No. 60

Size		No. 60 Cap	
Nominal inches DN	Actual Outside Diameter inches mm	"T" Thickness inches mm	Approx. Weight (Each) lb kg
¾ DN20	1.050 26.9	0.88 22	0.2 0.1
1 25	1.315 33.7	0.88 22	0.3 0.1
1¼ DN32	1.660 42.4	0.88 22	0.3 0.1
1½ DN40	1.900 48.3	0.88 22	0.5 0.2
2 DN50	2.375 60.3	0.88 22	0.6 0.3
2½	2.875 73.0	0.88 22	1.0 0.5
DN65	3.000 76.1	0.88 22	1.2 0.5
3 DN80	3.500 88.9	0.88 22	1.2 0.5
3½ DN90	4.000 101.6	0.88 22	2.5 1.1
	4.250 108.0	1.00 25	2.3 1.0
4 DN100	4.500 114.3	1.00 25	2.5 1.1
	5.250 133.0	1.00 25	4.5 2.0
DN125	5.500 139.7	1.00 25	4.5 2.0
5	5.563 141.3	1.00 25	4.6 2.1

Size		No. 60 Cap	
Nominal inches DN	Actual Outside Diameter inches mm	"T" Thickness inches mm	Approx. Weight (Each) lb kg
	6.250 159.0	1.00 25	6.8 3.1
	6.500 165.1	1.00 25	7.3 3.3
6 DN150	6.625 168.3	1.00 25	6.1 2.8
8 DN200	8.625 219.1	1.19 30	13.1 5.9
10 DN250	10.750 273.0	1.25 32	21.0 9.5
12 DN300	12.750 323.9	1.25 32	35.6 16.2
14 <sup>2</sup> DN350	14.000 355.6	9.50 (s) 241	+
16 <sup>2</sup> DN400	16.000 406.4	10.00 (s) 254	+
18 <sup>2</sup> DN450	18.000 457.0	11.00 (s) 279	+
20 <sup>2</sup> DN500	20.000 508.0	12.00 (s) 305	+
24 <sup>2</sup> DN600	24.000 610.0	13.50 (s) 343	+
14 – 60 DN350 – DN1500	For AGS fitting information, see <a href="#">publication 20.05</a> 		

<sup>2</sup> For 14"/DN350 and larger roll grooved systems, Victaulic offers the Advanced Groove System (AGS). For pricing and availability of cut groove fittings in this size, contact your nearest Victaulic sales representative.

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

+ Contact Victaulic for details.

#### NOTES

- No. 60 cap is not suitable for use in vacuum service with Style 72 or 750 couplings. No. 61 bull plugs should be used.
- All fittings are ductile iron unless otherwise noted with an (sw) or (s).

## 4.11 DIMENSIONS

### Flanged Adapter Nipple

**No. 41** ANSI Class 125

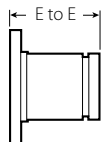
**No. 45F** ANSI Class 150 Flat Face

**No. 45R** ANSI Class 150 Raised Face

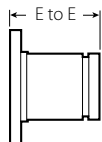
**No. 46F** ANSI Class 300 Flat Face

**No. 46R** ANSI Class 300 Raised Face

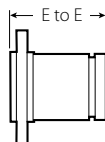
**No. 45RE** PN10/PN16 Raised Face



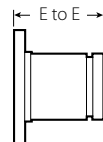
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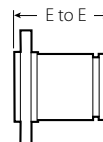
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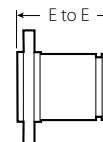
No. 45R



No. 46F



No. 46R



No. 45RE

Size		No. 41 ANSI 125 Flange Adapter Nipple		No. 45F and No. 45R ANSI 150 Flanged Adapter Nipple (s)		No. 46F and No. 46R ANSI 300 Flanged Adapter Nipple (s)		No. 45RE Flanged Adapter Nipple	
Nominal inches DN	Actual Outside Diameter inches mm	E to E inches mm	Approx. Weight (Each) lb kg	E to E inches mm	Approx. Weight (Each) lb kg	E to E inches mm	Approx. Weight (Each) lb kg	E to E inches mm	Approx. Weight (Each) lb kg
¾ DN20	1.050 26.9	3.00 76	—	3.00 76	2.3 1.0	3.00 76	3.3 1.5	—	—
1 DN25	1.315 33.7	3.00 76	2.5 1.1	3.00 76	2.7 1.2	3.00 76	3.9 1.8	—	—
1¼ DN32	1.660 42.4	4.00 102	3.0 1.4	4.00 102	3.3 1.5	4.00 102	4.8 2.2	—	—
1½ DN40	1.900 48.3	4.00 102	3.5 1.6	4.00 102	3.9 1.8	4.00 102	6.9 3.1	—	—
2 DN50	2.375 60.3	4.00 102	5.5 2.5	4.00 102	6.0 2.7	4.00 102	8.2 3.7	2.50 64	5.3 2.4
2½	2.875 73.0	4.00 102	8.0 3.6	4.00 102	9.9 4.5	4.00 102	11.9 5.4	—	—
DN65	3.000 76.1	—	—	—	—	—	—	2.50 64	6.5 2.9
3 DN80	3.500 88.9	4.00 102	9.5 4.3	4.00 102	11.7 5.3	4.00 102	16.5 7.5	2.50 64	8.2 3.7
3½ DN90	4.000 101.6	4.00 102	12.0 5.4	4.00 102	15.1 6.8	4.00 102	20.1 9.1	—	—
4 DN100	4.500 114.3	6.00 152	16.7 7.6	6.00 152	18.5 8.4	6.00 152	27.4 12.4	2.75 70	10.0 45
5	5.563 141.3	6.00 152	21.5 9.8	6.00 152	21.3 9.7	6.00 152	35.3 16.0	—	—
DN125	5.500 139.7	—	—	—	—	—	—	2.75 70	16.3 7.4
6 DN150	6.625 168.3	6.00 152	26.5 12.0	6.00 152	27.5 12.5	6.00 152	47.5 21.5	2.75 70	16.3 7.4
	6.500 165.1	—	—	—	—	—	—	—	—
8 DN200	8.625 219.1	6.00 152	39.0 17.7	6.00 152	41.3 18.8	6.00 152	70.3 31.9	—	—
10 DN250	10.750 273.0	8.00 203	57.0 25.9	8.00 203	59.3 27.1	8.00 203	100.8 45.7	—	—
12 DN300	12.750 323.9	8.00 203	41.0 18.6	8.00 203	40.0 40.0	8.00 203	146.2 66.3	—	—
14 <sup>2</sup> DN350	14.000 355.6	8.00 203	—	8.00 203	+	8.00 203	+	—	—
16 <sup>2</sup> DN400	16.000 406.4	8.00 203	—	8.00 203	+	8.00 203	+	—	—
18 <sup>2</sup> DN450	18.000 457.0	8.00 203	—	8.00 203	+	8.00 203	+	—	—

<sup>2</sup> For 14"/DN350 and larger roll grooved systems, Victaulic offers the Advanced Groove System (AGS). For pricing and availability of cut groove fittings in this size, contact your nearest Victaulic sales representative.

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

## 4.11 DIMENSIONS (Continued)

### Flanged Adapter Nipple

**No. 41** ANSI Class 125

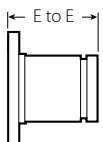
**No. 45F** ANSI Class 150 Flat Face

**No. 45R** ANSI Class 150 Raised Face

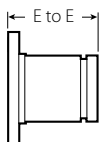
**No. 46F** ANSI Class 300 Flat Face

**No. 46R** ANSI Class 300 Raised Face

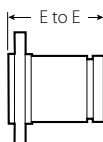
**No. 45RE** PN10/PN16 Raised Face



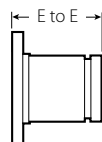
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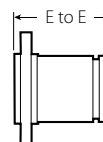
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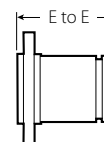
No. 45R




No. 46F



No. 46R



No. 45RE

Size		No. 41 ANSI 125 Flange Adapter Nipple		No. 45F and No. 45R ANSI 150 Flanged Adapter Nipple (s)		No. 46F and No. 46R ANSI 300 Flanged Adapter Nipple (s)		No. 45RE Flanged Adapter Nipple (s)	
Nominal inches DN	Actual Outside Diameter inches mm	E to E inches mm	Approx. Weight (Each) lb kg	E to E inches mm	Approx. Weight (Each) lb kg	E to E inches mm	Approx. Weight (Each) lb kg	E to E inches mm	Approx. Weight (Each) lb kg
20 <sup>2</sup> DN500	20.000 508.0	8.00 203	—	8.00 203	+	8.00 203	+	—	—
24 <sup>2</sup> DN600	24.000 610.0	8.00 203	—	8.00 203	+	8.00 203	+	—	—
14 – 60 DN350 – DN1500	For AGS fitting information, see <a href="#">publication 20.05</a> 								

<sup>2</sup> For 14"/DN350 and larger roll grooved systems, Victaulic offers the Advanced Groove System (AGS). For pricing and availability of cut groove fittings in this size, contact your nearest Victaulic sales representative.

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

+ Contact Victaulic for details

#### NOTE

- All fittings are ductile iron unless otherwise noted with an (sw) or (s).

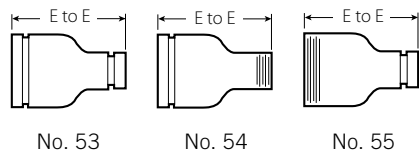
## 4.12 DIMENSIONS

### Swaged Nipple

No. 53 Grv. x Grv.

No. 54 Grv. x Thd.

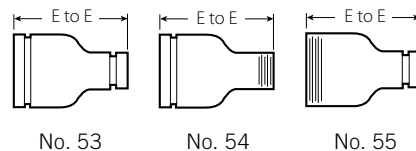
No. 55 Thd. x Grv.



No. 53

No. 54

No. 55



No. 53

No. 54

No. 55

Size			No. 53, 54, and 55 Swaged Nipples (s)	
Nominal inches DN			E to E inches mm	Approx. Weight (Each) lb kg
2 DN50	x	1 DN25	6.50 165	2.0 0.9
		1¼ DN32	6.50 165	2.0 0.9
		1½ DN40	6.50 165	2.0 0.9
2½	x	1 DN25	7.00 178	3.0 1.4
		1¼ DN32	7.00 178	3.0 1.4
		1½ DN40	7.00 178	3.0 1.4
		2 DN50	7.00 178	3.0 1.4
3 DN80	x	1 DN25	8.00 203	4.5 2.0
		1¼ DN32	8.00 203	4.5 2.0
		1½ DN40	8.00 203	4.5 2.0
		2 DN50	8.00 203	4.5 2.0
		2½	8.00 203	4.5 2.0
3½ DN90	x	3 DN80	8.00 203	6.8 3.1
4 DN100	x	1 DN25	9.00 229	7.5 3.4
		1¼ DN32	9.00 229	7.5 3.4
		1½ DN40	9.00 229	7.5 3.4
		2 DN50	9.00 229	7.5 3.4
		2½	9.00 229	7.5 3.4
		3 DN80	9.00 229	7.5 3.4
		3½ DN90	9.00 229	7.5 3.4

Size			No. 53, 54, and 55 Swaged Nipples (s)	
Nominal inches DN			E to E inches mm	Approx. Weight (Each) lb kg
5	x	2 DN50	11.00 279	11.5 5.2
		3 DN80	11.00 279	11.3 5.1
		4 DN100	11.00 279	11.5 5.2
6 DN150	x	1 DN25	12.00 305	17.0 7.7
		1¼ DN32	12.00 305	17.0 7.7
		1½ DN40	12.00 305	17.2 7.8
		2 DN50	12.00 305	17.4 7.9
		2½	12.00 305	17.4 7.9
		3 DN80	12.00 305	17.4 7.9
		3½ DN90	12.00 305	17.4 7.9
		4 DN100	12.00 305	17.5 7.9
		4½	12.00 305	17.5 7.9
		5	12.00 305	17.5 7.9
8 DN200	x	6 DN150	+	20.0 9.1

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

+ Contact Victaulic for details

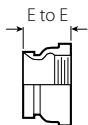
#### NOTE

- All fittings are ductile iron unless otherwise noted with an (sw) or (s).

## 4.13 DIMENSIONS

### Female Threaded Adapter

#### No. 80



No. 80

Size		No. 80 Female Threaded Adapter	
Nominal inches DN	Actual Outside Diameter inches mm	E to E inches mm	Approx. Weight (Each) lb kg
¾ DN20	1.050 26.9	2.00 51	1.0 0.5
1 DN25	1.315 33.7	2.06 52	1.0 0.5
1¼ DN32	1.660 42.4	2.31 (sw) 59	1.5 0.7
1½ DN40	1.900 48.3	2.31 (sw) 59	1.5 0.7
2 DN50	2.375 60.3	2.50 64	1.4 0.6
2½ DN65	2.875 73.0	2.75 70	1.5 0.7
3 DN80	3.500 88.9	2.75 70	2.9 1.3
4 DN100	4.500 114.3	3.25 83	4.5 2.0

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

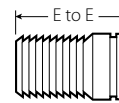
#### NOTES

- Available with British Standard Pipe Threads, specify "BSP" clearly on order.
- All fittings are ductile iron unless otherwise noted with an (sw) or (s).

## 4.14 DIMENSIONS

### Hose Nipple

#### No. 48



No. 48

Size		No. 48 Hose Nipple (s)	
Nominal inches DN	Actual Outside Diameter inches mm	E to E inches mm	Approx. Weight (Each) lb kg
¾ DN20	1.050 26.9	3.12 79	0.3 0.1
1 DN25	1.315 33.7	3.38 86	0.4 0.2
1¼ DN32	1.660 42.4	3.88 98	0.6 0.3
1½ DN40	1.900 48.3	3.88 98	0.8 0.4
2 DN50	2.375 60.3	4.50 114	1.1 0.5
2½ DN65	2.875 73.0	5.38 137	2.0 0.9
3 DN80	3.500 88.9	5.75 146	3.2 1.5
4 DN100	4.500 114.3	7.00 178	4.9 2.2
5 DN125	5.563 141.3	8.75 222	8.0 3.6
6 DN150	6.625 168.3	10.13 257	14.3 6.5
8 DN200	8.625 219.1	11.88 302	24.7 11.2
10 DN250	10.750 273.0	12.50 318	40.1 18.2
12 DN300	12.750 323.9	14.50 368	62.0 28.1

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

#### NOTE

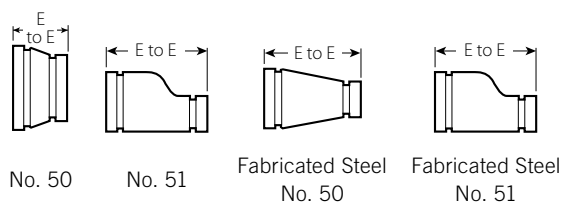
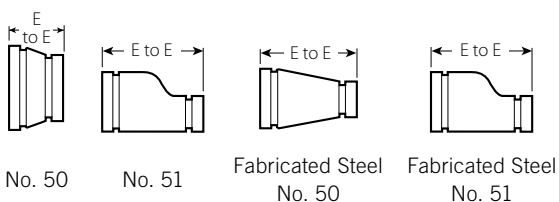
- All fittings are ductile iron unless otherwise noted with an (sw) or (s).

## 4.15 DIMENSIONS

### Concentric/Eccentric Reducer

No. 50 Concentric

No. 51 Eccentric



Size	No. 50 Concentric Reducer			No. 51 Eccentric Reducer		
Nominal inches DN	E to E inches mm	Approx. Weight (Each) lb kg	E to E inches mm	Approx. Weight (Each) lb kg		
1 1/4 DN32 x 3/4 DN20	+	1.9 0.9	—	—		
1 DN25	+	1.9 0.9	—	—		
1 1/2 DN40 x 3/4 DN20	+	1.4 0.6	—	—		
1 DN25	2.50 64	0.8 0.4	8.50 (sw) 216	4.5 2.0		
1 1/4 DN32	2.50 64	1.0 0.5	—	—		
2 DN50 x 3/4 DN20	2.50 64	0.9 0.3	9.00 (sw) 229	2.0 0.9		
1 DN25	2.50 64	0.7 0.3	9.00 (sw) 229	2.3 1.0		
1 1/4 DN32	2.50 64	1.2 0.5	9.00 (sw) 229	4.6 2.1		
1 1/2 DN40	2.50 64	1.0 0.5	3.50 89	1.1 0.5		
2 1/2 x 3/4 DN20	+	1.3 0.6	+	3.3 1.5		
1 DN25	2.50 64	1.1 0.5	9.50 241	3.5 1.6		
1 1/4 DN32	3.50 89	3.3 1.5	3.50 89	1.4 0.6		
1 1/2 DN40	2.50 64	3.6 1.6	9.50 (sw) 241	3.7 1.7		
2 DN50	2.50 64	3.9 1.8	3.50 89	4.3 2.0		
3 DN80 x 3/4 DN20	+	1.5 0.7	+	4.5 2.0		
1 DN25	2.50 64	1.3 0.6	9.50 (sw) 241	4.8 2.2		
1 1/4 DN32	2.50 64	1.4 0.6	+	4.8 2.2		
1 1/2 DN40	2.50 64	5.1 2.3	9.50 (sw) 241	5.1 2.3		
2 DN50	2.50 64	1.6 0.7	3.50 89	6.0 2.7		
2 1/2	2.50 64	1.8 0.8	3.50 89	7.0 3.2		
DN65	2.50 64	2.1 1.0	—	—		
3 1/2 DN90 x 3 DN80	2.50 64	2.0 0.9	9.50 (sw) 241	7.0 3.2		
4 DN100 x 1 DN25	3.00 76	3.0 1.4	13.00 (sw) 330	6.5 2.9		

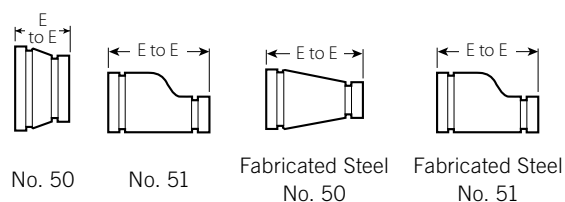
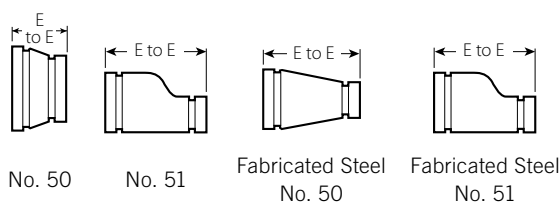
Size	No. 50 Concentric Reducer			No. 51 Eccentric Reducer		
Nominal inches DN	E to E inches mm	Approx. Weight (Each) lb kg	E to E inches mm	Approx. Weight (Each) lb kg		
1 1/4 DN32	+	4.6 2.1	—	—		
1 1/2 DN40	3.00 (sw) 76	2.6 1.2	10.00 (sw) 254	8.1 3.7		
2 DN50	3.00 76	2.4 1.1	4.00 102	3.3 1.5		
2 1/2	3.00 76	2.7 1.2	4.00 102	3.4 1.5		
3 DN80	3.00 76	3.2 1.4	4.00 102	3.5 1.6		
3 1/2 DN90	3.00 76	2.9 1.3	10.00 (sw) 254	8.0 3.6		
5 x 2 DN50	11.00 (sw) 279	9.0 4.1	11.00 (sw) 279	5.2 2.4		
2 1/2	4.00 102	4.3 2.0	11.00 (sw) 279	10.8 4.9		
3 DN80	4.00 102	5.5 2.5	11.00 (sw) 279	11.1 5.0		
4 DN100	3.50 89	4.3 1.9	5.00 127	12.0 5.4		
6 DN150 x 1 DN25	4.00 102	5.0 2.3	11.50 (sw) 292	14.5 6.6		
1 1/2 DN40	+	5.5 2.5	+	+		
2 DN50	4.00 102	6.6 3.0	11.50 (sw) 292	14.5 6.6		
2 1/2	4.00 102	6.4 2.9	11.50 (sw) 292	14.2 6.4		
3 DN80	4.00 102	6.4 2.9	5.50 140	15.0 6.8		
4 DN100	4.00 102	6.5 2.9	5.50 140	17.0 7.7		
5	4.00 102	6.4 2.9	5.50 140	17.0 7.7		
8 DN200 x 2 1/2	16.00 406	7.9 3.6	12.00 (sw) 305	26.1 11.8		
3 DN80	5.00 127	9.3 4.2	12.00 (sw) 305	22.0 10.0		
4 DN100	5.00 127	10.4 4.8	12.00 (sw) 305	23.0 10.4		
5	5.00 127	11.6 5.2	12.00 (sw) 305	23.0 10.4		
6 DN150	5.00 127	11.9 5.4	6.00 152	24.0 10.9		

## 4.15 DIMENSIONS (Continued)

### Concentric/Eccentric Reducer

No. 50 Concentric

No. 51 Eccentric



Size		No. 50 Concentric Reducer		No. 51 Eccentric Reducer	
Nominal inches DN		E to E inches mm	Approx. Weight (Each) lb kg	E to E inches mm	Approx. Weight (Each) lb kg
10 DN250	4 DN100	6.00 152	19.7 8.9	13.00 (sw) 330	32.0 14.5
	5	+	33.0 15.0	+	34.6 15.7
	6 DN150	6.00 152	20.0 9.1	13.00 (sw) 330	36.9 16.7
	8 DN200	6.00 152	22.0 10.0	7.00 178	21.6 9.8
12 DN300	4 DN100	+	44.0 20.0	14.00 (sw) 356	48.0 21.8
	6 DN150	7.00 178	24.6 11.2	14.00 (sw) 356	50.0 22.7
	8 DN200	7.00 178	52.0 23.6	14.00 (sw) 356	53.5 24.3
	10 DN250	7.00 178	39.0 17.7	14.00 (sw) 356	57.0 25.9
14 <sup>2</sup> DN350	6 DN150	13.00 330	65.0 29.5	13.00 330	60.0 27.2
	8 DN200	13.00 330	65.0 29.5	13.00 330	60.0 27.2
	10 DN250	13.00 330	66.0 29.9	13.00 330	65.0 29.5
	12 DN300	13.00 330	68.0 30.8	13.00 330	66.0 29.9
16 <sup>2</sup> DN400	8 DN200	14.00 356	73.0 33.1	14.00 355	73.0 33.1
	10 DN250	14.00 356	73.0 33.1	14.00 355	73.0 33.1
	12 DN300	14.00 356	73.0 33.1	14.00 355	73.0 33.1
	14 DN350	14.00 356	73.0 33.1	14.00 355	73.0 33.1
18 <sup>2</sup> DN450	10 DN250	15.00 381	91.0 41.3	15.00 381	91.0 41.3
	12 DN300	15.00 381	91.0 41.3	15.00 381	91.0 41.3
	14 DN350	15.00 381	91.0 41.3	15.00 381	91.0 41.3
	16 DN400	15.00 381	91.0 41.3	15.00 381	91.0 41.3

<sup>2</sup> For 14"/DN350 and larger roll grooved systems, Victaulic offers the Advanced Groove System (AGS). For pricing and availability of cut groove fittings in this size, contact your nearest Victaulic sales representative.

Size		No. 50 Concentric Reducer		No. 51 Eccentric Reducer	
Nominal inches DN		E to E inches mm	Approx. Weight (Each) lb kg	E to E inches mm	Approx. Weight (Each) lb kg
20 <sup>2</sup> DN500	10 DN250	20.00 508	110.0 49.9	20.00 508	177.0 80.3
	12 DN300	20.00 508	120.0 54.4	20.00 508	120.0 54.4
	14 DN350	20.00 508	149.0 67.9	20.00 508	149.0 67.9
	16 DN400	20.00 508	120.0 54.4	20.00 508	120.0 54.4
24 <sup>2</sup> DN600	18 DN450	20.00 508	136.0 61.7	20.00 508	136.0 61.7
	10 DN250	20.00 508	142.0 64.4	20.00 508	142.0 64.4
	12 DN300	20.00 508	150.0 68.0	20.00 508	150.0 68.0
	14 DN350	20.00 508	162.0 73.5	20.00 508	162.0 73.5
14 – 60 DN350 – DN1500	16 DN400	20.00 508	162.0 73.5	20.00 508	162.0 73.5
	18 DN450	20.00 508	162.0 73.5	20.00 508	162.0 73.5
	20 DN500	20.00 508	151.0 68.5	20.00 508	190.0 86.2
	For AGS fitting information, see <a href="#">publication 20.05</a>				



<sup>2</sup> For 14"/DN350 and larger roll grooved systems, Victaulic offers the Advanced Groove System (AGS). For pricing and availability of cut groove fittings in this size, contact your nearest Victaulic sales representative.

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

+ Contact Victaulic for details.

#### NOTES

- Available with male threaded small end No. 52.
- Cast fitting available for JIS size. Contact Victaulic for details.
- Steel eccentric reducers available through 30"/DN750, contact Victaulic for dimensions.
- All fittings are ductile iron unless otherwise noted with an (sw) or (s).

## 4.16 DIMENSIONS

### Small Threaded Reducer

No. 52

No. 52F



No. 52



No. 52F



No. 52



No. 52F

Size		No. 52 Small Threader Reducer		No. 52F Concentric Reducer with BSPT Female Threaded End	
Nominal inches DN		E to E inches mm	Approx. Weight (Each) lb kg	E to E mm	Approx. Weight (Each) kg
1½ DN40	x 1 DN25	2.50 64	0.8 0.4	—	—
	x 1¼ DN32	2.50 64	0.9 0.4	—	—
2 DN50	x ¾ DN20	2.50 64	0.9 0.4	—	—
	x 1 DN25	2.50 64	0.7 0.3	—	—
	x 1¼ DN32	2.50 64	1.2 0.5	—	—
	x 1½ DN40	2.50 64	1.0 0.5	—	—
	x 2 DN50	2.50 64	1.1 0.5	—	—
2½	x 1 DN25	2.50 64	1.1 0.5	—	—
	x 1¼ DN32	2.50 (sw) 64	1.2 0.5	—	—
	x 1½ DN40	2.50 (sw) 64	1.3 0.6	—	—
	x 2 DN50	2.50 64	1.4 0.6	—	—
DN65	x 1½ DN40	64	0.8	64	0.8
	x 2 DN50	—	—	64	0.9
3 DN80	x ¾ DN20	+(sw)	1.5 0.7	—	—
	x 1 DN25	2.50 64	1.3 0.6	—	—
	x 1¼ DN32	2.50 64	1.5 0.7	—	—
	x 1½ DN40	2.50 (sw) 64	1.5 0.7	—	—
	x 2 DN50	2.50 64	1.5 0.7	—	—
	x 2½ DN60	2.50 64	2.4 1.1	—	—
88.9mm	x 42.4mm	64	0.9	64	0.8
	x 48.3mm	64	0.9	64	0.9
	x 60mm	—	—	64	0.9

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

+ Contact Victaulic for details.

Size		No. 52 Small Threader Reducer		No. 52F Concentric Reducer with BSPT Female Threaded End	
Nominal inches DN		E to E inches mm	Approx. Weight (Each) lb kg	E to E mm	Approx. Weight (Each) kg
4 DN100	x 1 DN25	3.00 76	2.3 1.0	—	—
	x 1½ DN40	3.00 76	2.7 1.2	—	—
	x 2 DN50	3.00 76	2.6 1.2	—	—
	x 2½ DN60	3.00 76	2.6 1.2	—	—
	x 3 DN80	3.00 76	2.5 1.1	—	—
108.0mm	x 42.4mm	76	1.3	76	1.3
	x 48.3mm	76	1.3	76	1.4
	x 60mm	—	—	76	1.4
114.3mm	x 42.4mm	76	1.3	76	1.3
	x 48.3mm	76	1.3	76	1.3
	x 60mm	76	1.3	76	1.4
5	x 4 DN100	+	4.5 2.0	—	—
133.0mm	x 60mm	—	—	114	2.2
139.0mm	x 60mm	—	—	114	2.3
6 DN150	x 1 DN25	4.00 102	5.5 2.5	—	—
	x 2 DN50	4.00 102	5.7 2.6	—	—
	x 2½ DN60	4.00 102	5.8 2.6	—	—
	x 3 DN80	4.00 102	5.8 2.6	—	—
	x 4 DN100	+(sw)	6.5 2.9	—	—
	x 5 DN125	+(sw)	2.0 0.9	—	—
	x 6 DN150	—	—	—	—
159.0mm	x 42.4mm	114	2.2	144	2.5
	x 48.3mm	114	2.2	114	2.5
	x 60mm	—	—	114	2.6



## 4.16 DIMENSIONS (Continued)

### Small Threaded Reducer

No. 52

No. 52F



No. 52



No 52F

Size		No. 52 Small Threader Reducer		No. 52F Concentric Reducer with BSPT Female Threaded End	
Nominal inches DN		E to E inches mm	Approx. Weight (Each) lb kg	E to E mm	Approx. Weight (Each) kg
165.1mm x 42.4mm		102mm	2.4	102	2.9
	48.3mm	102mm	2.6	102	3.0
	60mm	—	—	102	3.0
8 DN200 x 2 DN50		16.00	1.5	—	—
		406	0.7	—	—
	2 ½	16.00	1.7	—	—
		406	0.8	—	—

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

#### NOTES


- Available with British Standard Pipe Threads, specify "BSP" clearly on order.
- All fittings are ductile iron unless otherwise noted with an (sw) or (s).

## 5.0 PERFORMANCE

### Flow Data

#### (Frictional Resistance)

The chart expresses the frictional resistance of various Victaulic fittings as equivalent feet of straight pipe. Fittings not listed can be estimated from the data given, for example, a 22½° elbow is approximately one-half the resistance of a 45° elbow. Values of mid-sizes can be interpolated.

Size		Dimensions					
Nominal inches DN	Actual Outside Diameter inches mm	90° Elbows		45° Elbows		Tees	
		No. 10 Std. Radius feet meters	No. 100 1 ½ D Long Radius feet meters	No. 11 Std. Radius feet meters	No. 110 1 ½ D Long Radius feet meters	Branch feet meters	Run feet meters
1 DN25	1.315 33.7	1.7 0.5	—	0.8 0.2	—	4.2 1.3	1.7 0.5
2 DN50	2.375 60.3	3.5 1.1	2.5 0.8	1.8 0.5	1.1 0.3	8.5 2.6	3.5 1.1
DN65	3.000 76.1	4.3 1.3	—	2.1 0.7	—	10.8 3.3	4.3 1.3
3 DN80	3.500 88.9	5.0 1.5	3.8 1.2	2.6 0.8	1.6 0.5	13.0 4.0	5.0 1.5
	4.250 108.0	6.4 2.0	—	3.2 0.9	—	15.3 4.7	6.4 2.0
4 DN100	4.500 114.3	6.8 2.1	5.0 1.5	3.4 1.0	2.1 0.6	16.0 4.9	6.8 2.1
	5.250 133.0	8.1 2.5	—	4.1 1.2	—	20.0 6.2	8.1 2.5
DN125	5.500 139.7	8.5 2.6	—	4.2 1.3	—	21.0 6.4	8.5 2.6
5	5.563 141.3	8.5 2.6	—	4.2 1.3	—	21.0 6.4	8.5 2.6
	6.250 159.0	9.4 2.9	—	4.9 1.5	—	25.0 7.6	9.6 2.9
	6.500 165.1	9.6 2.9	—	5.0 1.5	—	25.0 7.6	10.0 3.0
6 DN150	6.625 168.3	10.0 3.0	7.5 2.3	5.0 1.5	3.0 0.9	25.0 7.6	10.0 3.0
8 DN200	8.625 219.1	13.0 4.0	9.8 3.0	6.5 2.0	4.0 1.2	33.0 10.1	13.0 4.0
10 DN250	10.750 273.0	17.0 5.2	12.0 3.7	8.3 2.5	5.0 1.5	41.0 12.5	17.0 5.2
12 DN300	12.750 323.9	20.0 6.1	14.5 4.4	10.0 3.0	6.0 1.8	50.0 15.2	20.0 6.1
14 DN350	14.000 355.6	24.5 <sup>4</sup> 7.5	15.8 4.8	18.5 <sup>4</sup> 5.6	11.0 3.4	70.0 21.3	23.0 7.0
16 DN400	16.000 406.4	28.0 <sup>4</sup> 8.5	18.0 5.5	21.0 <sup>4</sup> 6.4	13.0 4.0	80.0 24.4	27.0 8.2
18 DN450	18.000 457.0	31.0 <sup>4</sup> 9.5	20.0 6.1	23.5 <sup>4</sup> 7.2	14.0 4.3	90.0 27.4	30.0 9.1
20 DN800	20.000 508.0	34.0 <sup>4</sup> 10.4	22.5 6.9	25.5 <sup>4</sup> 7.8	16.0 4.9	100.0 30.5	33.0 10.1
24 DN600	24.000 610.0	42.0 <sup>4</sup> 12.8	27.0 8.2	29.5 <sup>4</sup> 9.0	19.0 5.8	120.0 36.6	40.0 12.2
AGS fittings available up to 60"/DN1500. Contact Victaulic for details.							
							

<sup>4</sup> Fitting flow data for 14-24"/DN350-DN600 size No. 10 and No. 11 Elbows is based on fittings for Style 07 and 77 couplings. For flow data on AGS fittings (No. W10 and No. W11 Elbows), refer to [publication 20.05](#).

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**User Responsibility for Product Selection and Suitability**

Each user bears final responsibility for making a determination as to the suitability of Victaulic products for a particular end-use application, in accordance with industry standards and project specifications, and the applicable building codes and related regulations as well as Victaulic performance, maintenance, safety, and warning instructions. Nothing in this or any other document, nor any verbal recommendation, advice, or opinion from any Victaulic employee, shall be deemed to alter, vary, supersede, or waive any provision of Victaulic Company's standard conditions of sale, installation guide, or this disclaimer.

**Intellectual Property Rights**

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**Note**

This product shall be manufactured by Victaulic or to Victaulic specifications. All products to be installed in accordance with current Victaulic installation/assembly instructions. Victaulic reserves the right to change product specifications, designs and standard equipment without notice and without incurring obligations.

**Installation**

Reference should always be made to the Victaulic installation handbook or installation instructions of the product you are installing. Handbooks are included with each shipment of Victaulic products, providing complete installation and assembly data, and are available in PDF format on our website at [www.victaulic.com](http://www.victaulic.com).

**Warranty**

Refer to the Warranty section of the current Price List or contact Victaulic for details.

**Trademarks**

*Victaulic* and all other Victaulic marks are the trademarks or registered trademarks of Victaulic Company, and/or its affiliated entities, in the U.S. and/or other countries.



## Material Specifications:

### Fitting:

Ductile iron conforming to ASTM A-536, grade 65-45-12.

### Fitting Coating:

Orange enamel

Red enamel in Europe, Middle East, Africa, and India

Optional: Hot dipped galvanized

## Approvals/Listings:



## Product Description:

FireLock® products comprise a unique system specifically designed for fire protection services. FireLock full-flow elbows and tees feature CAD-developed, hydrodynamic design, affording a shorter center-to-end dimension than standard fittings. A noticeable bulge allows the water to make a smoother turn to maintain similar flow characteristics as standard full flow fittings.

FireLock fittings are designed for use exclusively with Victaulic couplings that have been Listed or Approved for Fire Protection Services. Use of other couplings or flange adapters may result in bolt pad interference.

Refer to the appropriate listing agency or approval body for pressure ratings. Pressure ratings vary by agency.

### Job/Owner

System No.	
Location	

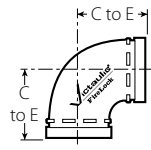
### Contractor

Submitted By	
Date	

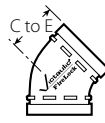
### Engineer

Spec Section	
Paragraph	
Approved	
Date	

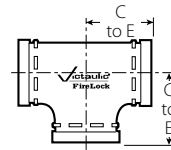
# Dimensions:



NO. 001



NO. 003



NO. 002



No. 006

Nominal Size inches mm	Actual Outside Diameter inches mm	No. 001 90° Elbow		No. 003 45° Elbow		No. 002 Straight Tee		No. 006 Cap	
		C to E inches mm	Approx. Weight Each Lbs. kg	C to E inches mm	Approx. Weight Each Lbs. kg	C to E inches mm	Approx. Weight Each Lbs. kg	C to E inches mm	Approx. Weight Each Lbs. kg
1 ¼ 32	1.660 42.4	—	—	—	—	—	—	0.82 21	0.3 0.1
1 ½ 40	1.900 48.3	—	—	—	—	—	—	0.82 21	0.4 0.2
2 50	2.375 60.3	2.75 70	1.7 0.8	2.00 51	1.8 0.8	2.75 70	2.4 1.1	0.88 22	0.6 0.3
2 ½ 65	2.875 73.0	3.00 76	3.1 1.4	2.25 57	2.2 1.0	3.00 76	3.6 1.6	0.88 22	1.0 0.5
76.1 mm	3.000 76.1	3.00 76	3.30 1.5	2.25 57	2.4 1.1	3.00 76.2	3.8 1.7	—	—
3 80	3.500 88.9	3.38 86	4.0 1.8	2.50 64	3.1 1.4	3.38 86	5.3 2.4	0.88 22	1.2 0.5
108 mm	4.250 108.0	4.00 102	5.7 2.6	3.00 76	5.1 2.3	4.00 102	7.5 3.4	—	—
4 100	4.500 114.3	4.00 102	6.7 3.0	3.00 76	5.6 2.5	4.00 102	8.7 3.9	1.00 25	2.4 1.1
5 125	5.563 141.3	4.88 124	12.6 5.7	3.25 83	8.3 3.8	4.88 124	15.7 7.1	1.00 25	4.1 1.9
139.7 mm	5.500 139.7	4.88 124.0	12.4 5.6	3.25 82.6	8.2 3.7	4.88 124.0	15.4 6.9	—	—
159 mm	6.250 158.8	5.50 140	12.6 5.7	3.50 89	9.2 4.2	5.50 140	17.9 8.0	—	—
6 150	6.625 168.3	5.50 140	18.3 8.3	3.50 89	11.7 5.3	5.50 140	22.7 10.3	1.00 25	5.9 2.7
165.1 mm	6.500 165.1	5.43 139.7	17.6 7.9	3.50 88.9	11.4 5.2	5.50 139.7	22.0 9.9	—	—
8 200	8.625 219.1	6.81 173	25.5 11.6	4.25 108	20.4 9.3	6.94 176	38.7 17.6	1.13 29	12.7 5.8

## Flow Data:

Nominal Size inches mm	Actual Outside Diameter inches mm	Frictional Resistance Equivalent Feet/meters of Straight Pipe <sup>1</sup>			
		Elbows		No. 002 Straight Tee	
		No. 001 90° Elbow	No. 003 45° Elbow	Branch	Run
1 ¼ 32	1.660 42.4	— —	— —	— —	— —
1 ½ 40	1.900 48.3	— —	— —	— —	— —
2 50	2.375 60.3	3.5 1.1	1.8 0.5	8.5 2.6	3.5 1.1
2 ½ 65	2.875 73.0	4.3 1.3	2.2 0.7	10.8 3.3	4.3 1.3
76.1 mm	3.000 76.1	4.5 1.4	2.3 0.7	11.0 3.4	4.5 1.4
3 80	3.500 88.9	5.0 1.5	2.6 0.8	13.0 4.0	5.0 1.5
108 mm	4.250 108.0	6.4 2.0	3.2 0.9	15.3 4.7	6.4 2.0
4 100	4.500 114.3	6.8 2.1	3.4 1.0	16.0 4.9	6.8 2.1
5 125	5.563 141.3	8.5 2.6	4.2 1.3	21.0 6.4	8.5 2.6
139.7 mm	5.500 139.7	8.3 2.5	4.1 1.3	20.6 6.3	8.3 2.5
159 mm	6.250 158.8	9.4 2.9	4.9 1.5	25.0 7.6	9.6 2.9
6 150	6.625 168.3	10.0 3.0	5.0 1.5	25.0 7.6	10.0 3.0
165.1 mm	6.500 165.1	9.8 3.0	4.9 1.5	24.5 7.5	9.8 3.0
8 200	8.625 219.1	13.0 4.0	5.0 1.5	33.0 10.1	13.0 4.0

<sup>1</sup> The flow data listed is based upon the pressure drop of Schedule 40 pipe.

## General Notes:

NOTE: When assembling FireLock EZ couplings onto end caps, take additional care to make certain the end cap is fully seated against the gasket end stop. For FireLock EZ Style 009N/009H couplings, use FireLock No. 006 end caps containing the “EZ” marking on the inside face or No. 60 end caps containing the “QV EZ” marking on the inside face. Non-Victaulic end cap products shall not be used with Style 009/009V/009H couplings.

### Installation

Reference should always be made to the [I-100 Victaulic Field Installation Handbook](#) for the product you are installing. Handbooks are included with each shipment of Victaulic products for complete installation and assembly data, and are available in PDF format on our website at [www.victaulic.com](http://www.victaulic.com).

### Warranty

Refer to the Warranty section of the current Price List or contact Victaulic for details.

### Note

This product shall be manufactured by Victaulic or to Victaulic specifications. All products to be installed in accordance with current Victaulic installation/assembly instructions. Victaulic reserves the right to change product specifications, designs and standard equipment without notice and without incurring obligations.

### Trademarks

Victaulic® is a registered trademark of Victaulic Company.

# Style 744 FireLock® Flange Adapter

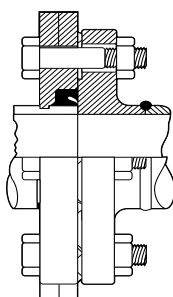
with Vic-Plus™ Gasket System



## PRODUCT DESCRIPTION



2 - 8" Sizes



(Exaggerated for clarity)

Style 744 FireLock Flange adapter is designed for directly incorporating flanged components with ANSI CL 125 or CL 150 bolt hole patterns into a grooved pipe system. Sizes 2 - 8" (50 - 200 mm) are hinged for easy handling with integral end tabs which facilitate assembly.

The design incorporates small teeth inside the key shoulder I.D. to prevent rotation.

Because of the outside flange dimension, FireLock Flange adapters should not be used on FireLock fittings. When wafer or lug-type valves are used adjoining a Victaulic fitting, check disc dimensions to assure proper clearance.

FireLock Flange adapters should not be used as anchor points for tie-rods across nonrestrained joints. Mating rubber faced flanges, valves, etc., require the use of a FireLock Flange washer.

FireLock Flange adapters with Vic-Plus gaskets do not require lubrication. The gasket must always be assembled with the color coded lip on the pipe and the other lip facing the mating flange.

**Style 744 FireLock Flange Adapters with the Vic-Plus™ Gasket System are designed and recommended for use ONLY on fire protection systems.**

### Vic-Plus Gasket System:

Victaulic® now offers a gasket system which requires no field lubrication on wet pipe systems. The Vic-Plus™ System (patented) is dry, clean, and non-toxic. It reduces assembly time substantially and eliminates the mess and chance of over-lubrication. Please refer to the latest copy of the Victaulic Field Installation Handbook (I-100) for supplemental lubrication requirements.

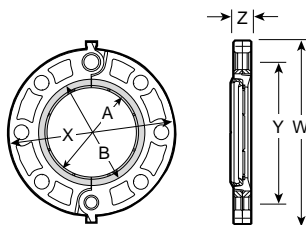


See Victaulic publication 10.01 for details.

## DIMENSIONS

### Style 744

Sizes 2 - 8" (50 - 200 mm)  
ANSI Class 125 and 150 Flange



**Note:** Gray area of mating face must be free from gouges, undulations or deformities of any type for effective sealing.

Pipe Size		Max. Work Press.* PSI kPa	Max. End Load* Lbs. N	No. Bolts † Req'd.	Bolt Size † Inches	Sealing Surface Inches/mm		Dimensions Inches/millimeters				Aprx. Wgt. Each Lbs. kg
Nominal Diameter In./mm	Actual Outside Diameter In./mm					"A" Max.	"B" Min.	W	X	Y	Z	
2 50	2.375 60.3	175 1200	775 3450	4	5/8 X 2 3/4	2.38 60	3.41 87	6.75 172	6.00 152	4.75 121	0.75 19	2.7 1.2
2 1/2 65	2.875 73.0	175 1200	1135 5050	4	5/8 X 3	2.88 73	3.91 99	7.88 200	7.00 178	5.50 140	0.88 22	4.2 1.9
3 80	3.500 88.9	175 1200	1685 7500	4	5/8 X 3	3.50 89	4.53 115	8.44 214	7.50 191	6.00 152	0.94 24	4.8 2.2
4 100	4.500 114.3	175 1200	2780 11045	8	5/8 X 3	4.50 114	5.53 141	9.94 252	9.00 229	7.50 191	0.94 24	7.1 3.2
5 125	5.563 141.3	175 1200	4250 18920	8	3/4 X 3 1/2	5.56 141	6.71 171	11.00 279	10.00 254	8.50 216	1.00 25	8.3 3.8
6# 150	6.625 168.3	175 1200	6030 26840	8	3/4 X 3 1/2	6.63 168	7.78 198	12.00 305	11.00 279	9.50 241	1.00 25	9.3 4.2
8# 200	8.625 219.1	175 1200	10219 45475	8	3/4 X 3 1/2	8.63 219	9.94 252	14.63 372	13.50 343	11.75 298	1.13 29	13.9 6.3

\*Refer to notes below.

†Total bolts required to be supplied by installer. Bolt sizes for conventional flange-to-flange connection. Larger bolts are required when Vic-Flange adapter is utilized with wafer-type valves.

# Not available with Vic-Plus gasket system. Lubrication is required.

## NOTES

\* Working Pressure and End Load are total, from all internal and external loads, based on standard weight steel pipe, standard roll or cut grooved in accordance with Victaulic specifications. Contact Victaulic for performance on other pipe.

WARNING: FOR ONE TIME FIELD TEST ONLY, the Maximum Joint Working Pressure may be increased to 1 1/2 times the figures shown.

Style 744 FireLock Flange adapters provide rigid joints when used on pipe with standard roll or cut groove dimensions and consequently allow no linear or angular movement at the joint.

WARNING: Depressurize and drain the piping system before attempting to install, remove, or adjust any Victaulic piping products.

## VIC-FLANGE ADAPTER NOTES

- 1 The Style 744 (2 - 8"/50 - 200 mm) design incorporates small teeth inside the key shoulder I.D. to prevent rotation.
- 2 FireLock Flange adapter should not be used on FireLock fittings. When wafer or lug-type valves are used adjoining a Victaulic fitting, check disc dimensions to assure proper clearance.
- 3 FireLock Flange adapters should not be used as anchor points for tie-rods across nonrestrained joints. Mating rubber faced flanges, valves, etc. require the use of a FireLock Flange washer.
- 4 Area A-B noted in the above drawing must be free from gouges, undulations or deformities of any type for effective sealing.
- 5 FireLock Flange adapter gaskets must always be assembled with the color coded lip on the pipe and the other lip facing the mating flange.
- 6 Flange Washers: FireLock Flange adapters require a smooth hard surface at the mating flange face for effective sealing. Some applications for which the Vic-Flange adapter is otherwise well suited do not provide an adequate mating surface. In such cases, it is recommended that a metal Flange Washer be inserted between the FireLock Flange adapter and the mating flange to provide the necessary sealing surface.

Typical applications where a Flange Washer should be used are:

- A When mating to a serrated flange: a standard flat flange gasket should be used adjacent to the serrated flange and then the Flange Washer is inserted between the FireLock Flange adapter and the flange gasket.
- B When mating to a wafer valve: where typical valves are rubber lined and partially rubber faced (smooth or not), the Flange Washer is placed between the valve and the FireLock Flange adapter.
- C When mating a rubber faced flange: the Flange Washer is placed between the FireLock Flange adapters and the rubber faced flange.
- D When mating AWWA cast flanges to IPS flanges: the Flange Washer is placed between two FireLock Flanges. The hinge points must be oriented approximately 90° to each other. If one flange is not a FireLock Flange adapter (e.g. flanged valve), then a standard flat flange gasket must be placed adjacent to that flange and the Flange Washer inserted between the flange gasket and the FireLock Flange adapter.
- E When mating to components (valves, strainers, etc.) where the component flange face has an insert: follow the same arrangement as in Application 1.
- F When mating to a Series 705-W Butterfly valve, Style 744 may only be used on one side of the connection.

*When ordering Flange Washers, always specify product style (Style 744) and size to assure proper Flange Washer is supplied.*

## MATERIAL SPECIFICATIONS

**Flange Housing:** Ductile iron conforming to ASTM A-536, grade 65-45-12. Ductile iron conforming to ASTM A-395, grade 65-45-15, is available upon special request.

**Coating:** Black enamel

- **Optional:** Hot dipped galvanized

**Bolts/Nuts:** Supplied by installer

**Gasket:**

- **Grade "E" EPDM - Type A Vic-Plus Gasket System Δ**  
(Violet color code). FireLock products have been Listed by Underwriters Laboratories Inc. and Approved by Factory Mutual Research for wet and dry (oil free air) sprinkler services up to the rated working pressure using the Grade "E" Type A Vic-Plus Gasket System, requiring no field lubrication for most installation conditions.

Δ Standard gasket approved for dry pipe systems to -40°F (-40°C). Based on "typical" pipe surface conditions, supplemental lubricant is recommended for services installed below 0°F (-18°C) and for all dry pipe systems or systems to be subjected to air tests prior to being filled with water. Supplemental lubrication may also be required on pipe with raised or undercut weld seams or pipe that has voids and/or cracks at the weld seams.



# Victaulic FireLock™ Innovative Groove System | IGS™ for 1"/DN25 Sprinkler Pipe



## 1.0 PRODUCT DESCRIPTION

### Pipe Material

- Carbon steel, Schedule 10, Schedule 40. For use with alternative materials please contact Victaulic.

### Maximum Working Pressure

- Up to 365 psi/2517 kPa/25 bar

### Pipe Preparation

- Cut (Sch. 40) or roll (Sch. 10 or Sch. 40) grooved in accordance with [publication 25.14](#): Victaulic /IGS Groove Specifications.

### RG2100 Grooving Capability

- 1"/DN25
- Workstation designed to cut, ream and form a roll groove on carbon steel, Sch. 10 or Sch. 40 pipe.
- This tool has a minimum pipe length requirement of 4 ½"/114 mm.

ALWAYS REFER TO ANY NOTIFICATIONS AT THE END OF THIS DOCUMENT REGARDING PRODUCT INSTALLATION, MAINTENANCE OR SUPPORT.

System No.		Location	
Submitted By		Date	

Spec Section		Paragraph	
Approved		Date	

## 2.0 CERTIFICATION/LISTINGS



### NOTES

- Approvals listed above do not apply to the RG2100 Roll Grooving Tool, and the WB-1 and NAP-1 IGS™ Weld Plunger Cones.

## 3.0 SPECIFICATIONS – MATERIAL

**Housing:** Ductile iron conforming to ASTM A536, Grade 65-45-12

### Housing Coating:

- Orange enamel
- Red enamel (Europe)
- Optional: Hot dipped galvanized

### Gasket:

#### **Victaulic Grade “E” EPDM (Type A) Vic-Plus™ Pre-lubricated Gasket**

EPDM (Violet Color Code). Applicable for wet and dry (oil-free air) fire protection systems only. Listed/Approved for continuous use in wet and dry systems. Listed/Approved for dry systems at -40°F/-40°C and above. NOT COMPATIBLE FOR USE WITH HOT WATER SERVICES OR STEAM SERVICES.

### NOTES:

- Reference should always be made to [publication I-100](#), Victaulic Field Installation Handbook for gasket lubrication instructions.
- Services listed are General Service Guidelines only. It should be noted that there are services for which these gaskets are not compatible. Reference should always be made to [publication 05\\_01](#), Victaulic Gasket Selection Guide for specific gasket service guidelines and for a listing of services which are not compatible.

### Bolts/Nuts:

Carbon steel oval neck track bolts meeting the mechanical property requirements of ASTM A449 (imperial) and ISO 898-1 Class 9.8 (M10-M16) Class 8.8 (M20 and greater). Carbon steel hex nuts meeting the mechanical property requirements of ASTM A563 Grade B (imperial - heavy hex nuts) and ASTM A563M Class 9 (metric - hex nuts). Track bolts and hex nuts are zinc electroplated per ASTM B633 Fe/Zn 5, finish Type III (imperial) or Type II (metric).

**Coupling Linkage:** High Strength Steel with comparable physical properties to that of the Track Bolt (ASTM A449). Linkage is zinc electroplated per ASTM B633 Fe/Zn 5, Type III Finish

**No. 140, 141, 142, 143, 144, 148:** Carbon steel meeting the chemical and mechanical property requirements of ASTM A53 Grade A, Type E or S

**No. 65, 145, 146, 147:** Ductile iron conforming to ASTM A536, Grade 65-45-12

**No. WB-1: Steel Alloy**

**No. NAP-1: Aluminum Alloy**

### RG2100 Roll Grooving Tool:

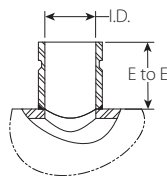
**Required Power Supply:** Power Drive with Foot Switch (½ HP, Universal reversible motor, single-phase, 25-60 HZ)

### Accessories/Components:

- Tool head assembly
- Carriage assembly - accepts RG2100 tool head assembly, Standard Cutter, Standard Reamer and Standard Lever

## 4.0 DIMENSIONS

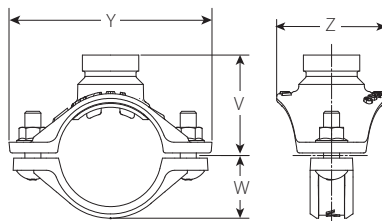
### No. 142 Welded Outlet



Nominal	Actual Outside Diameter	Inside Diameter		Weight
inches DN	inches mm	I.D. inches mm	E to E inches mm	Approximate (Each) lb kg
Run x Branch	Run x Branch			
1 ¼ – 1 ½ DN32 – DN40	1.660 – 1.900 42.4 – 48.3	1.049 26.6	1.00 25.4	0.2 0.1
1 ½ – 2 DN40 – DN50	1.900 – 2.375 48.3 – 60.3	1.049 26.6	1.00 25.4	0.2 0.1
2 – 2 ½ DN50 – DN65	2.375 – 3.000 60.3 – 76.1	1.049 26.6	1.00 25.4	0.2 0.1
2 ½ – 3 DN65 – DN80	2.875 – 3.500 73.0 – 88.9	1.049 26.6	1.00 25.4	0.2 0.1
3 – 4 DN80 – DN100	3.500 – 4.500 88.9 – 114.3	1.049 26.6	1.00 25.4	0.2 0.1

## 4.1 DIMENSIONS

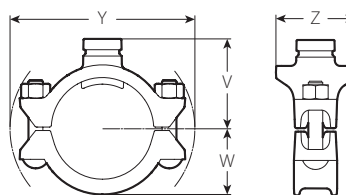
### Style 922 Outlet-T



Size		Bolt/Nut		Dimensions						Weight
Nominal inches DN	Actual Outside Diameter inches mm		Size	Minimum Hole Diameter/Hole Saw Size inches mm	Maximum Hole Diameter/ Hole Saw Size inches mm	Y inches mm	V inches mm	W inches mm	Z inches mm	Approximate (Each) lb kg
Run x Branch	Run x Branch	Qty.	inches mm							
1 ¼ DN32	1.660 42.4	2	¾ x 1 ¾	1 ⅜ 30.0	1 ¼ 32.0	4.13 105.0	1.98 50.3	1.10 27.9	2.70 68.6	1.1 0.5
1 ½ DN40	1.900 48.3	2	¾ x 1 ¾	1 ⅜ 30.0	1 ¼ 32.0	4.25 108.0	2.11 53.6	1.22 31.0	2.70 68.7	1.2 0.5
2 DN50	2.375 60.3	2	¾ x 1 ¾	1 ⅜ 30.0	1 ¼ 32.0	4.75 120.6	2.34 59.4	1.46 37.1	2.56 65.1	1.2 0.5
2 ½ DN65	2.875 73.0	2	¾ x 1 ¾	1 ⅜ 30.0	1 ¼ 32.0	5.50 139.7	2.67 67.8	1.71 43.4	2.56 65.1	1.6 0.7
	76.1	2	¾ x 1 ¾	1 ⅜ 30.0	1 ¼ 32.0	5.52 140.3	2.75 69.8	1.71 43.4	2.56 65.1	1.7 0.8

## 4.2 DIMENSIONS

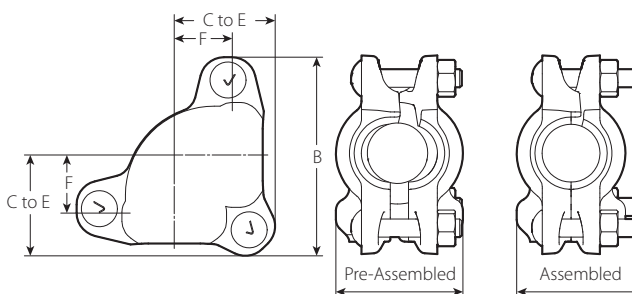
### Style 920N Mechanical-T Outlet



Size				Bolt/Nut		Dimensions						Weight
Nominal inches DN		Actual Outside Diameter inches mm				Minimum Hole Diameter/Hole Saw Size inches mm	Maximum Hole Diameter/ Hole Saw Size inches mm	Y inches mm	V inches mm	W inches mm	Z inches mm	Approximate (Each) lb kg
Run x Branch		Run x Branch		Qty.	Size inches mm							
3 DN80	1 DN25	3.500 88.9	1.315 33.7	2	½ x 2 ¾	1 ½ 38.1	1 ⅝ 41.0	6.42 163.0	3.12 79.2	2.28 57.9	2.75 69.9	2.7 1.2
4 DN100		4.500 114.3		2	½ x 2 ¾	1 ½ 38.1	1 ⅝ 41.0	186.6 7.35	3.62 91.9	2.69 68.3	2.75 69.10	3.0 1.4

## 4.3 DIMENSIONS

### No. 101 Installation-Ready 90° Elbow



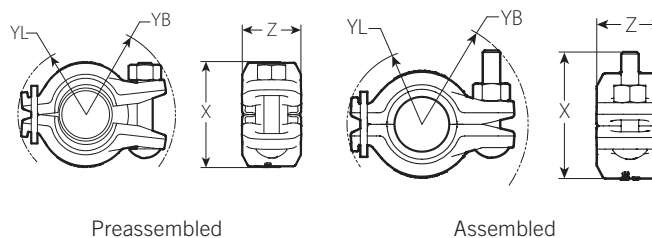
Size		Bolt/Nut		Dimensions					Weight
Nominal inches DN	Actual Outside Diameter inches mm	Qty.	Size inches mm	F Take Out inches mm	C to E inches mm	B inches mm	Pre-Assembled inches mm	Assembled inches mm	Approximate (Each) lb kg
1 DN25	1.315 33.7	3	3/8 x 2 M10 x 50	1.25 32	2.13 54	4.25 108	2.75 70	2.75 70	2.2 1.0

#### NOTE

- Not for use with grooved sprinklers, for grooved sprinkler connections please refer to [publication 10.65](#) for the Style V9 sprinkler coupling.

## 4.4 DIMENSIONS

### Style 108 Installation-Ready Rigid Coupling



Size		Pipe End Separation <sup>1</sup>	Bolt/Nut		Dimensions								Weight
Nominal inches DN	Actual Outside Diameter inches mm	Allowable inches mm	Qty.	Size inches mm	Pre-Assembled				Assembled				Approx (Each) lb kg
					YL inches mm	YB inches mm	X inches mm	Z inches mm	YL inches mm	YB inches mm	X inches mm	Z inches mm	
1	1.315	0.14	1	3/8 x 2	1.66	2.17	2.58	1.43	1.61	2.29	2.27	1.43	1.5
DN25	33.7	3.6		M10 x 50	42.2	55.2	65.5	36.3	41.0	58.2	57.5	36.3	0.7

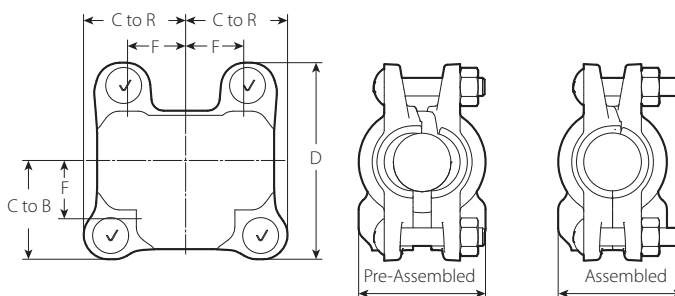
<sup>1</sup> The allowable pipe end separation dimension shown is for system layout purposes only. FireLock™ Style 108 rigid couplings are considered rigid connections and will not accommodate expansion or contraction of the piping system.

#### NOTE

- Not for use with grooved sprinklers, for grooved sprinkler connections please refer to [publication 10.65](#) for the Style V9 sprinkler coupling.

## 4.5 DIMENSIONS

### No. 102 Installation-Ready Tee



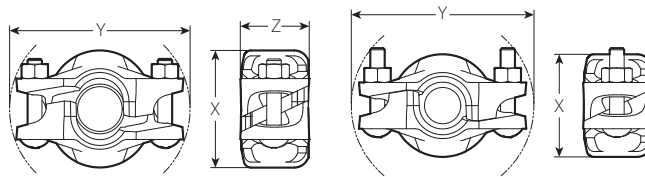
Size		Bolt/Nut		Dimensions						Weight
Nominal inches DN	Actual Outside Diameter inches mm	Qty.	Size inches mm	F Take Out inches mm	C to B inches mm	C to R inches mm	D inches mm	Pre-Assembled inches mm	Assembled inches mm	Approximate (Each) lb kg
1	1.315	4	3/8 x 2	1.25	2.13	2.13	4.13	2.75	2.75	3.0
DN25	33.7		M10 x 50	32	54	54	105	70	70	1.4

#### NOTE

- Not for use with grooved sprinklers, for grooved sprinkler connections please refer to [publication 10.65](#) for the Style V9 sprinkler coupling.

## 4.6 DIMENSIONS

### Style 115 OGS x /GS Reducing Coupling



Pre-Assembled

Assembled

Size				Pipe End Separation <sup>2</sup>	Bolt/Nut		Dimensions						Weight
							Pre-Assembled			Assembled			
Nominal inches DN		Actual Outside Diameter inches mm		Allowable inches mm	Qty.	Size inches mm	X inches mm	Y inches mm	Z inches mm	X inches mm	Y inches mm	Z inches mm	Approximate (Each) lb kg
1 ¼ DN32	x DN25	1.660 42.4	x 1.315 33.7	0.14 3.6	2	¾ x 2 M10 x 50	3.13 79	4.75 121	1.75 44	2.63 67	4.75 121	1.75 44	1.9 0.9
1 ½ DN40		1.900 48.3		0.14 3.6		2	¾ x 2 M10 x 50	3.25 83	4.88 124	1.75 44	2.88 73	4.88 124	1.75 44

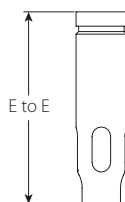
<sup>2</sup> The allowable pipe end separation dimension shown is for system layout purposes only. FireLock™ Style 115 rigid couplings are considered rigid connections and will not accommodate expansion or contraction of the piping system.

#### NOTE

- Not for use with grooved sprinklers, for grooved sprinkler connections please refer to [publication 10.65](#) for the Style V9 sprinkler coupling.

## 4.7 DIMENSIONS

### No. 148 Sprinkler Reducer



Length	Size		Threaded Outlet Size		Weight
E to E inches mm	Nominal inches DN	Actual Outside Diameter inches mm	inches DN	inches DN	Approximate (Each) lb kg
3 76	1 DN25	1.315 33.7	1/2 DN15	3/4 DN20	0.4 0.2
3.5 89	1 DN25	1.315 33.7	1/2 DN15	3/4 DN20	0.5 0.2
4 102	1 DN25	1.315 33.7	1/2 DN15	3/4 DN20	0.6 0.3
4.5 114	1 DN25	1.315 33.7	1/2 DN15	3/4 DN20	0.6 0.3
5 127	1 DN25	1.315 33.7	1/2 DN15	3/4 DN20	0.7 0.3
5.5 140	1 DN25	1.315 33.7	1/2 DN15	3/4 DN20	0.8 0.3
6 152	1 DN25	1.315 33.7	1/2 DN15	3/4 DN20	0.8 0.4
12 305	1 DN25	1.315 33.7	1/2 DN15	3/4 DN20	1.7 0.8
18 457	1 DN25	1.315 33.7	1/2 DN15	3/4 DN20	2.5 1.1
24 610	1 DN25	1.315 33.7	1/2 DN15	3/4 DN20	3.4 1.5
30 762	1 DN25	1.315 33.7	1/2 DN15	3/4 DN20	4.2 1.9

#### NOTE

- NPT or BSPT available
- It is acceptable to cut and groove any No. 148 longer than 6"/152mm. The minimum allowable cut length is 6"/152mm for a No. 148.

### No. 148 Double Ended Sprinkler Reducer



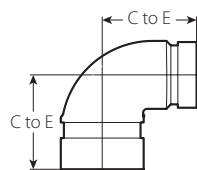
Length	Size		Threaded Outlet Size		Weight
E to E inches mm	Nominal inches DN	Actual Outside Diameter inches mm	inches DN	inches DN	Approximate (Each) lb kg
36 914	1 DN25	1.315 33.7	1/2 DN15	3/4 DN20	5.0 2.3

#### NOTE

- 36"/914mm size features sprinkler outlet on both ends for field fabrication.

## 4.8 DIMENSIONS

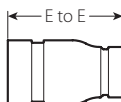
### No. 65 /GS Grooved End of Run Fitting



Size		Dimensions		Weight
Nominal inches DN	Actual Outside Diameter inches mm	C to E inches mm	Approximate (Each) lb kg	
1 ¼ DN32	1.660 42.4	1.88 48	0.7 0.3	
1 ½ DN40	1.900 48.3	2.00 51	0.8 0.4	
2 DN50	2.375 60.3	2.25 57	1.2 0.5	
2 ½	2.875 73.0	2.50 64	1.6 0.7	
3 DN80	3.500 88.9	2.75 70	2.6 1.2	

## 4.9 DIMENSIONS

### No. 144 OGS x /GS Grooved Concentric Reducer

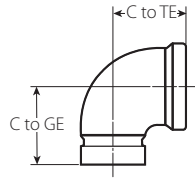


Size		Dimensions		Weight
Nominal inches DN	Actual Outside Diameter inches mm	E to E inches mm	Approximate (Each) lb kg	
1 ¼ DN32	1.660 42.4	3.00 76	0.5 0.2	
1 ½ DN40	1.900 48.3	3.00 76	0.6 0.2	



## 4.10 DIMENSIONS

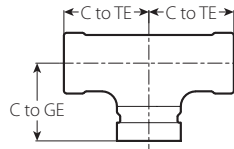
### No. 145 Female Threaded x Groove 90° Elbow



Size				Dimensions		Weight
Nominal inches DN		Actual Outside Diameter inches mm		C-TE inches mm	C-GE inches mm	Approximate (Each) lb kg
Threaded Outlet	Grooved Outlet	Threaded Outlet	Grooved Outlet			
1/2 DN15		0.840 21.3		1.45 36.8	1.60 40.6	0.5 0.2
3/4 DN20	x 1 DN25	1.050 26.9	x 1.315 33.7	1.45 36.8	1.60 40.6	0.5 0.2
1 DN25		1.315 33.7		1.50 38.1	1.60 40.6	0.5 0.2

## 4.11 DIMENSIONS

### No. 147 Back-To-Back Sprinkler Tee



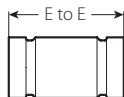
Size						Dimensions		Weight
Nominal inches DN			Actual Outside Diameter inches mm			C-TE inches mm	C-GE inches mm	Approximate (Each) lb kg
Threaded Outlet	Threaded Outlet	Grooved Outlet	Threaded Outlet	Threaded Outlet	Grooved Outlet			
1/2 DN15	x 1/2 DN15	x 1 DN25	0.840 21.3	x 0.840 21.3	x 1.315 33.7	1.75 44.5	1.60 40.6	0.7 0.3

#### NOTE:

- Approved for use with one or two 1/2" NPT Sprinklers threaded directly into outlet connection(s).

## 4.12 DIMENSIONS

### No. 143 Close Nipple

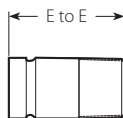


Size		Dimensions	Weight
Nominal inches DN	Actual Outside Diameter inches mm	E to E inches mm	Approximate (Each) lb kg
1 DN25	1.315 33.7	1.5 <sup>3</sup> 38	0.2 0.1
		2 51	0.3 0.1
		2.5 64	0.4 0.2
		3 76	0.4 0.2
		3.5 89	0.5 0.2
		4 102	0.6 0.3
		4.5 114	0.6 0.3
		5 127	0.7 0.3

<sup>3</sup> Bolt pad interferences may occur in some installation configurations.

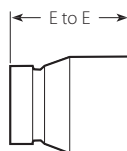
## 4.13 DIMENSIONS

### No. 140 Male Threaded x Groove Adapter



Size		Dimensions	Weight
Nominal inches DN	Actual Outside Diameter inches mm	E-E inches mm	Approximate (Each) lb kg
1 DN25	1.315 33.7	2.50 63.5	0.3 0.1

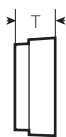
### No. 141 Female Threaded x Groove Adapter



Size		Dimensions	Weight
Nominal inches DN	Actual Outside Diameter inches mm	E-E inches mm	Approximate (Each) lb kg
1 DN25	1.315 33.7	2.00 50.8	0.5 0.2

## 4.14 DIMENSIONS

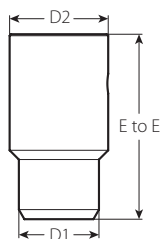
### No. 146 Cap



Size		Dimensions	Weight
Nominal inches DN	Actual Outside Diameter inches mm	T inches mm	Approximate (Each) lb kg
1 DN25	1.315 33.7	0.55 14.0	0.2 0.1

## 4.15 DIMENSIONS

### WB-1 Weld Plunger Cone



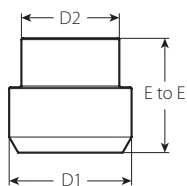
Dimensions			Weight
E to E inches mm	D1 inches mm	D2 inches mm	Approximate (Each) lb kg
3.75 95.3	1.63 41.3	2.00 50.8	2.2 51.0

#### NOTE

- WB-1 Weld Plunger Cones are for use with the No. 142 weld outlets and protect the groove during weld process.

## 4.16 DIMENSIONS

### NAP-1 Weld Plunger Cone



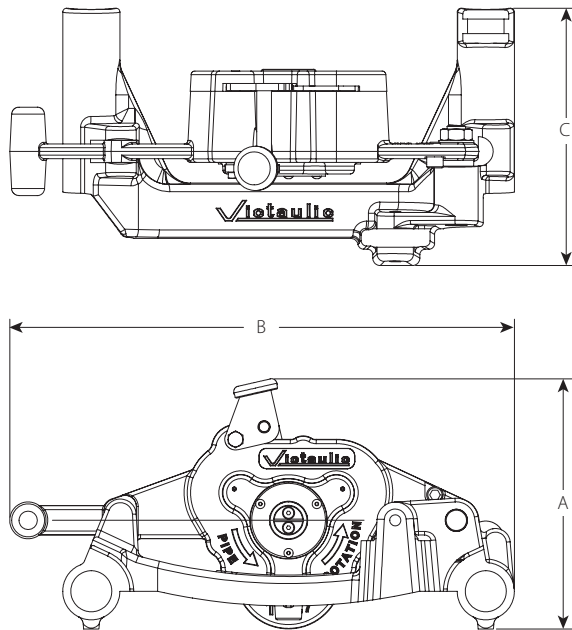
Dimensions			Weight
E to E inches mm	D1 inches mm	D2 inches mm	Approximate (Each) lb kg
1.75 44.5	1.88 47.6	1.50 38.0	0.3 0.2

#### NOTE

- NAP-1 Weld Plunger Cones are for use with the No. 142 weld outlets and protect the groove during weld process.

4.17 DIMENSIONS

RG2100 Roll Grooving Tool



A	B	C	Tool Weight
inches	inches	inches	lb
mm	mm	mm	kg
8.5	17.1	8.7	37.5
216	435	222	17.0

## 5.0 PERFORMANCE

### Friction Flow Data

Size		Equivalent Length of 1" Sch. 40 Pipe (C=120)							
Nominal inches DN	Actual Outside Diameter inches mm	Style 922	Style 920N	No. 101 feet meters	No. 102 (Branch) feet meters	No. 102 (Run) feet meters	Style 115 feet meters	No. 148 feet meters	No. 144 feet meters
1 DN25	1.315 33.7	See publication 10.52	See publication 11.02	2.0 0.61	5.0 1.52	2.7 0.82	–	See note	–
1 ¼ DN32	x 1 DN25	–	–	–	–	–	5.7 1.74	–	3.9 1.19
1 ½ DN40	x 1.315 33.7	–	–	–	–	–	5.0 1.52	–	4.3 1.31

#### NOTE

- In accordance with NFPA 13, friction loss shall be excluded for fittings directly connected to a sprinkler. For hydraulic calculations, Victaulic recommends using the installed length (E-E or cut length) of the No. 148 Sprinkler Reducer as the equivalent length of 1"/DN25 Sch. 40 pipe.

## 5.0 PERFORMANCE (CONTINUED)

### Maximum Working Pressure

Style/No.	cULus psi kPa bar	FM psi kPa bar	LPCB psi kPa bar	VdS psi kPa bar
142 <sup>4</sup>	365 2517 25	365 2517 25	365 2517 25	232 1600 16
922 <sup>4</sup>	300 2100 21	300 2100 21	365 2517 25	232 1600 16
920N <sup>4</sup>	365 2517 25	300 2100 21	365 2517 25	232 1600 16
101 <sup>5</sup>	365 2517 25	365 2517 25	365 2517 25	232 1600 16
108 <sup>5</sup>	365 2517 25	365 2517 25	365 2517 25	232 1600 16
102 <sup>5</sup>	365 2517 25	365 2517 25	365 2517 25	232 1600 16
115 <sup>4</sup>	365 2517 25	365 2517 25	365 2517 25	232 1600 16
148	365 2517 25	365 2517 25	365 2517 25	232 1600 16
65	365 2517 25	365 2517 25	365 2517 25	232 1600 16
144	365 2517 25	365 2517 25	365 2517 25	232 1600 16
145	365 2517 25	365 2517 25	365 2517 25	232 1600 16
147	365 2517 25	365 2517 25	N/A	N/A
143	365 2517 25	365 2517 25	365 2517 25	232 1600 16
140	365 2517 25	365 2517 25	365 2517 25	232 1600 16
141	365 2517 25	365 2517 25	365 2517 25	232 1600 16
146	365 2517 25	365 2517 25	365 2517 25	232 1600 16

- <sup>4</sup> Maximum pressure rating is 300 psi/21 bar when installed on lightwall steel pipe, as follows:  
 Mega-Flow and Mega-Flow-GF steel pipe manufactured by Wheatland Tube Co.  
 Mega-Thread steel pipe manufactured by Wheatland Tube Co.  
 MLT steel pipe manufactured by Wheatland Tube Co.  
 WLS steel pipe manufactured by Wheatland Tube Co.  
 Eddy Flow steel pipe manufactured by Bull Moose Tube Co.  
 Eddythread steel pipe manufactured by Bull Moose Tube Co.  
 EZ-Thread steel pipe manufactured by Youngstown Tube Co.  
 Fire-Flo steel pipe manufactured by Youngstown Tube Co.  
 Easy-Flow pipe manufactured by Borusan Mannesmann

- <sup>5</sup> Maximum pressure rating is 300 psi / 21 bar when installed on lightwall steel pipe, as follows:  
 Mega-Thread steel pipe manufactured by Wheatland Tube Co.  
 MLT steel pipe manufactured by Wheatland Tube Co.  
 WLS steel pipe manufactured by Wheatland Tube Co.  
 Eddythread steel pipe manufactured by Bull Moose Tube Co.  
 EZ-Thread steel pipe manufactured by Youngstown Tube Co.

## 6.0 NOTIFICATIONS

### WARNING



- Read and understand all instructions before attempting to install any Victaulic products.
- Always verify that the piping system has been completely depressurized and drained immediately prior to installation, removal, adjustment, or maintenance of any Victaulic products.
- Wear safety glasses, hardhat, and foot protection.

Failure to follow these instructions could result in death or serious personal injury and property damage.

- These products shall be used only in fire protection systems that are designed and installed in accordance with current, applicable National Fire Protection Association (NFPA 13, 13D, 13R, etc.) standards, or equivalent standards, and in accordance with applicable building and fire codes. These standards and codes contain important information regarding protection of systems from freezing temperatures, corrosion, mechanical damage, etc.
- The installer shall understand the use of this product and why it was specified for the particular application.
- The installer shall understand common industry safety standards and potential consequences of improper product installation.
- It is the system designer's responsibility to verify suitability of materials for use with the intended fluid media within the piping system and external environment.
- The material specifier shall evaluate the effect of chemical composition, pH level, operating temperature, chloride level, oxygen level, and flow rate on materials to confirm system life will be acceptable for the intended service.

Failure to follow installation requirements and local and national codes and standards could compromise system integrity or cause system failure, resulting in death or serious personal injury and property damage.

### WARNING



Failure to follow instructions and warnings could result in serious personal injury, property damage, and/or product damage.

- Before operating or servicing any grooving tools, read all instructions in the manual and all warning labels on the tool.
- Wear safety glasses, hardhat, foot protection, and hearing protection while working around the tool.
- Save the operating and maintenance manual in a place accessible to all operators of the tool

If you need additional copies of any literature, or if you have questions concerning the safe and proper operation of the tool, contact Victaulic, P.O. Box 31, Easton, PA 18044-0031, Phone: 1-800-PICK VIC, E-Mail: pickvic@victaulic.com.

## 7.0 REFERENCE MATERIALS

[10.06: FireLock Installation-Ready Fittings](#)

[10.52: Style 922 Outlet Tee](#)

[10.85: VicFlex Series AH2 ad AH2-CC Braided Hose](#)

[11.02 Mechanical-T Bolted Branch Outlets](#)

[25.14: Victaulic IGS Groove Specification](#)

[I-101-103: FireLock™ Installation-Ready™ Fittings Installation Instruction](#)

[I-102: FireLock™ Installation-Ready™ Fittings Installation Instruction](#)

[I-108: FireLock™ Installation-Ready™ Coupling](#)

[I-115: FireLock EZ™ Installation-Ready™ Reducing Coupling Installation Instruction](#)

[I-ENDCAP: Victaulic End Cap Installation Safety Instructions](#)

[I-V9: Style V9 Victaulic FireLock™ IGS™ Installation-Ready™ Sprinkler Coupling](#)

[TM-RG2100: Operating and Maintenance Instructions Manual](#)

Victaulic No. 148		
Length	½" DN15 outlet	¾" DN20 outlet
E to E inches mm	Equivalent Length of 1" Sched. 40 Pipe (C=120) feet meters	
≤6 152	6.6 2.0	3.8 1.2
6 – 12 152 – 305	5.5 1.7	3.8 1.2
12 – 18 305 – 457	6.2 1.9	4.3 1.3
18 – 24 457 – 610	6.7 2.0	4.7 1.4
24 – 30 610 – 762	7.1 2.2	5.2 1.6
30 – 36 762 – 914	7.4 2.3	5.4 1.6

### NOTE

- When installed in pipe to pipe connections or it is required by the authority having jurisdiction, the equivalent length data in the table above may apply.

### User Responsibility for Product Selection and Suitability

Each user bears final responsibility for making a determination as to the suitability of Victaulic products for a particular end-use application, in accordance with industry standards and project specifications, and the applicable building codes and related regulations as well as Victaulic performance, maintenance, safety, and warning instructions. Nothing in this or any other document, nor any verbal recommendation, advice, or opinion from any Victaulic employee, shall be deemed to alter, vary, supersede, or waive any provision of Victaulic Company's standard conditions of sale, installation guide, or this disclaimer.

### Intellectual Property Rights

No statement contained herein concerning a possible or suggested use of any material, product, service, or design is intended, or should be construed, to grant any license under any patent or other intellectual property right of Victaulic or any of its subsidiaries or affiliates covering such use or design, or as a recommendation for the use of such material, product, service, or design in the infringement of any patent or other intellectual property right. The terms "Patented" or "Patent Pending" refer to design or utility patents or patent applications for articles and/or methods of use in the United States and/or other countries.

### Note

This product shall be manufactured by Victaulic or to Victaulic specifications. All products to be installed in accordance with current Victaulic installation/assembly instructions. Victaulic reserves the right to change product specifications, designs and standard equipment without notice and without incurring obligations.

### Installation

Reference should always be made to the [Victaulic installation handbook](#) or installation instructions of the product you are installing. Handbooks are included with each shipment of Victaulic products, providing complete installation and assembly data, and are available in PDF format on our website at [www.victaulic.com](http://www.victaulic.com).

### Warranty

Refer to the Warranty section of the current Price List or contact Victaulic for details.

### Trademarks

*Victaulic* and all other Victaulic marks are the trademarks or registered trademarks of Victaulic Company, and/or its affiliated entities, in the U.S. and/or other countries.



# Victaulic® FireLock™ Installation-Ready™ Rigid Couplings

## Style 009N and Style 109



Patented



Patented

### 1.0 PRODUCT DESCRIPTION

#### Available Sizes

- Style 009N: 1 ¼ – 12"/DN32 – DN300
- Style 109: 1 ¼ – 2 ½"/DN32 – 73.0 mm

#### Pipe Material

- Schedule 10, Schedule 40 or specialty carbon steel pipe listed in Section 5. For use with alternative materials and wall thicknesses please contact Victaulic.

#### Maximum Working Pressure

- Up to 365 psi/2517 kPa.

#### Function

- Joins carbon steel pipe with grooved ends conforming to [publication 25.01](#).
- Provides a rigid pipe joint designed to restrict axial or angular movement.

### 2.0 CERTIFICATION/LISTINGS



C104-1a/36

EN 10311  
Regulation (EU)  
No. 305/2011

ALWAYS REFER TO ANY NOTIFICATIONS AT THE END OF THIS DOCUMENT REGARDING PRODUCT INSTALLATION, MAINTENANCE OR SUPPORT.

System No.		Location	
Submitted By		Date	

Spec Section		Paragraph	
Approved		Date	



### 3.0 SPECIFICATIONS – MATERIAL

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**Housing:** Ductile iron conforming to ASTM A 536, Grade 65-45-12. Ductile iron conforming to ASTM A 395, Grade 65-45-15, is available upon special request.

**Housing Coating: (specify choice)**

- Orange enamel (North America, Asia Pacific)
- Red enamel (Europe)
- Optional for Style 009N: Hot dipped galvanized

**Gasket: (specify choice)**

**Grade “E” EPDM (Type A) Vic-Plus™ Pre-lubricated Gasket**

EPDM (Violet Color Code). Applicable for wet and dry (oil-free air) fire protection systems only. Listed/Approved for continuous use in wet and dry systems. Listed/Approved for dry systems at -40°F/-40°C and above. Not compatible for use with hot water services or steam services.

**NOTES**

- Reference should always be made to [publication I-100](#), Victaulic Field Installation Handbook for gasket lubrication instructions.
- Services listed are General Service Guidelines only. It should be noted that there are services for which these gaskets are not compatible. Reference should always be made to [publication 05.01](#), Victaulic Gasket Selection Guide for specific gasket service guidelines and for a listing of services which are not compatible.

**Bolts/Nuts: (specify choice)**

Standard: Carbon steel oval neck track bolts meeting the mechanical property requirements of ASTM A449 (imperial) and ISO 898-1 Class 9.8 (M10-M16) Class 8.8 (M20 and greater). Carbon steel hex nuts meeting the mechanical property requirements of ASTM A563 Grade B (imperial) and ASTM A563M Class 9 (metric). Track bolts and hex nuts are zinc electroplated per ASTM B633 Fe/Zn 5, finish Type III (imperial) or Type II (metric).

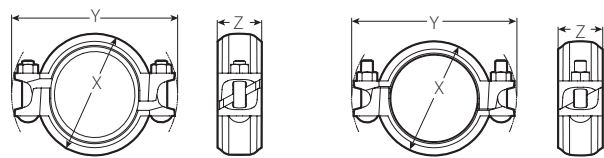
Optional for Style 009N: Stainless steel oval neck track bolts meeting the requirements of ASTM F593, Group 2 (316 stainless steel), condition CW. Stainless steel Heavy Hex nuts meeting the requirements of ASTM F594, Group 2 (316 stainless steel), condition CW, with galling-resistant coating.<sup>1</sup>

<sup>1</sup> Optional bolts/nuts are available in imperial size only.

**Coupling Linkage:** High Strength Steel with comparable physical properties to that of the Track Bolt (ASTM A449). Linkage is zinc electroplated per ASTM B633 Fe/Zn 5, Type III Finish.

## 4.0 DIMENSIONS

### Style 009N Two-Bolt Installation-Ready Coupling



Style 009N Pre-Assembled

Style 009N Joint Assembled

Size		Maximum Working Pressure <sup>2</sup>	Maximum End Load <sup>2</sup>	Allow. Pipe End Separation <sup>3</sup>	Bolt/Nut		Dimensions					Weight
Nominal	Actual Outside Diameter				Qty.	Size	Pre-assembled		Joint Assembled		Z	Approx. (Each)
							X	Y	X	Y		
inches DN	inches mm	psi kPa	lb N	inches mm		inches mm	inches mm	inches mm	inches mm	inches mm	lb kg	
1 ¼ DN32	1.660 42.4	365 2517	790 3514	0.10 2.54	2	⅜ × 2 M10 x 51	3.13 79	5.00 127	2.75 70	5.00 127	2.00 51	1.4 0.6
1 ½ DN40	1.900 48.3	365 2517	1035 4604	0.10 2.54	2	⅜ × 2 M10 x 51	3.38 86	5.13 130	3.00 76	5.13 130	2.00 51	1.5 0.7
2 DN50	2.375 60.3	365 2517	1617 7193	0.12 3.05	2	⅜ × 2 ½ M10 x 63	4.00 102	5.63 143	3.50 89	5.63 143	2.00 51	1.9 0.9
2 ½	2.875 73.0	365 2517	2370 10542	0.12 3.05	2	⅜ × 2 ½ M10 x 63	4.50 114	6.13 156	4.00 102	6.13 156	2.00 51	2.1 1.0
DN65	3.000 76.1	365 2517	2580 11476	0.12 3.05	2	⅜ × 2 ½ M10 x 63	4.63 118	6.00 152	4.13 105	6.13 156	2.00 51	2.1 1.0
3 DN80	3.500 88.9	365 2517	3512 15622	0.12 3.05	2	⅜ × 2 ½ M10 x 63	5.13 130	6.75 171	4.63 117	6.75 171	2.00 51	2.3 1.0
4 DN100	4.500 114.3	365 2517	5805 25822	0.17 4.32	2	⅜ × 2 ½ M10 x 63	6.00 152	7.88 200	5.63 143	7.50 191	2.13 54	2.9 1.3
	4.250 108.0	365 2517	5178 23020	0.17 4.32	2	⅜ × 2 ½ M10 x 63	5.63 152	7.38 187	5.38 137	7.38 187	2.13 54	3.1 1.4
5	5.563 141.3	365 2517	8872 39456	0.17 4.32	2	½ × 3 M12 x 76	7.25 184	9.25 235	6.75 171	9.13 232	2.25 57	5.0 2.3
	5.250 133.0	365 2517	7901 35106	0.17 4.32	2	½ × 3 M12 x 76	6.63 168	9.00 229	6.38 162	9.00 229	2.25 57	4.8 2.2
DN125	5.500 139.7	365 2517	8672 38529	0.17 4.32	2	½ × 3 M12 x 76	6.88 175	9.25 235	6.75 171	9.13 232	2.25 57	4.9 2.2
	6 DN150	6.625 168.3	365 2517	12582 44469	0.17 4.32	2	½ × 3 ¼ M12 x 83	8.38 213	10.38 264	7.88 200	10.13 257	2.25 57
	6.250 159.0	365 2517	11198 49753	0.17 4.32	2	½ × 3 ¼ M12 x 83	7.88 200	10.00 254	7.38 187	9.88 251	2.25 57	5.6 2.5
	6.500 165.1	365 2517	12112 53813	0.17 4.32	2	½ × 3 ¼ M12 x 83	8.00 203	10.25 260	7.75 197	10.13 257	2.25 57	6.0 2.7
8 DN200	8.625 219.1	365 2517	21326 94863	0.17 4.32	2	⅝ × 4 M16 x 101	10.88 276	13.38 340	10.25 260	13.13 333	2.50 64	11.4 5.2
	8.500 216.0	365 2517	20712 55968	0.17 4.32	2	⅝ × 4 M16 x 101	10.63 270	13.25 337	10.25 260	10.13 257	2.63 67	11.4 5.2
10 DN250	10.750 273.0	300 2068	27229 121121	0.25 6.4	2	⅞ × 6 ½ M22 x 165	13.75 349	17.00 432	13.25 337	17.13 435	2.75 70	22.6 10.3
	12 DN300	12.750 323.9	300 2068	38303 170380	0.25 6.4	2	⅞ × 6 ½ M22 x 165	16.00 406	19.00 483	15.50 394	19.13 486	2.75 70

<sup>2</sup> Working Pressure and End Load are total, from all internal and external loads, based on standard weight (ANSI) steel pipe, standard roll or cut grooved in accordance with Victaulic specifications. See the Listings/Approvals section of this publication for ratings on other pipe.

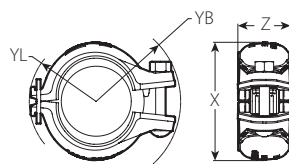
<sup>3</sup> The allowable pipe separation dimension shown is for system layout purposes only. Style 009N couplings are considered rigid connections and will not accommodate expansion or contraction of the piping system.

#### NOTES

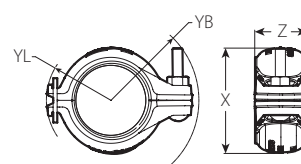
- When assembling Style 009N or Style 109 couplings onto end caps, take additional care to make certain the end cap is fully seated against the gasket end stop. For Style 009N or Style 109 couplings, use FireLock No. 006 end caps containing the "EZ" marking on the inside face or No. 60 end caps containing the "QV EZ" marking on the inside face. Non-Victaulic end cap products shall not be used with Style 009N or Style 109 couplings. IMPORTANT: Gaskets intended for the Style 009 or Style 009V couplings cannot be used with the Style 009N or Style 109 coupling. There is no interchanging of gaskets or housings between coupling styles.
- Use Of FlushSeal Gaskets For Dry Pipe Systems** Style 009N or Style 109 couplings are supplied with Grade "E" Type A gaskets. These gaskets include an integral pipe stop, that once installed provides the similar benefits as a FlushSeal gasket for dry pipe systems. It should be noted that standard Victaulic FlushSeal gaskets cannot be used with the Style 009N or Style 109 couplings.

## 4.1 DIMENSIONS

### Style 109 One-Bolt *Installation-Ready* Coupling



Style 109 Pre-Assembled



Style 109 Joint Assembled

Size		Maximum Working Pressure <sup>4</sup>	Maximum End Load <sup>4</sup>	Pipe End Separation Allowable <sup>5</sup>	Bolt/Nut		Dimensions								Weight
Nominal	Actual Outside Diameter				Qty.	Size	Pre-assembled				Joint Assembled				Approx. (Each)
							YL	YB	X	Z	YL	YB	X	Z	
inches mm	inches mm	psi kPa	lb N	inches mm		inches mm	inches mm	inches mm	inches mm	inches mm	inches mm	inches mm	inches mm	inches mm	lb kg
1 ¼ DN32	1.660 42.4	365 2517	790 3514	0.10 2.54	1	¾ x 2 ¼ M10 x 57	1.88 48	2.50 64	3.13 79	1.88 48	1.88 48	2.63 67	2.75 70	1.88 48	1.4 0.6
1 ½ DN40	1.900 48.3	365 2517	1035 4604	0.10 2.54	1	¾ x 2 ¼ M10 x 57	2.00 51	2.63 67	3.25 83	1.88 48	2.00 51	2.75 70	3.00 76	1.88 48	1.5 0.7
2 DN50	2.375 60.3	365 2517	1616 7193	0.12 3.05	1	¾ x 2 ½ M10 x 63	2.25 57	2.88 73	3.88 98	2.00 51	2.25 57	3.13 79	3.50 89	2.00 51	1.8 0.8
2 ½	2.875 73.0	365 2517	2370 10542	0.12 3.05	1	¾ x 2 ½ M10 x 63	2.50 64	3.13 79	4.38 111	2.00 51	2.50 64	3.38 86	3.88 98	2.00 51	2.1 0.9

<sup>4</sup> Working Pressure and End Load are total, from all internal and external loads, based on standard weight (ANSI) steel pipe, standard roll or cut grooved in accordance with Victaulic specifications. See the Listings/Approvals section of this publication for ratings on other pipe.

<sup>5</sup> The allowable pipe separation dimension shown is for system layout purposes only. Style 109 couplings are considered rigid connections and will not accommodate expansion or contraction of the piping system.

#### NOTES

- When assembling Style 009N or Style 109 couplings onto end caps, take additional care to make certain the end cap is fully seated against the gasket end stop. For Style 009N or Style 109 couplings, use FireLock No. 006 end caps containing the "EZ" marking on the inside face or No. 60 end caps containing the "QV EZ" marking on the inside face. Non-Victaulic end cap products shall not be used with Style 009N or Style 109 couplings. IMPORTANT: Gaskets intended for the Style 009 or Style 009V couplings cannot be used with the Style 009N or Style 109 coupling. There is no interchanging of gaskets or housings between coupling styles.
- Use Of FlushSeal Gaskets For Dry Pipe Systems** Style 009N or Style 109 couplings are supplied with Grade "E" Type A gaskets. These gaskets include an integral pipe stop, that once installed provides the similar benefits as a FlushSeal gasket for dry pipe systems. It should be noted that standard Victaulic FlushSeal gaskets and cannot be used with the Style 009N or Style 109 couplings.

## 5.0 PERFORMANCE

### Style 009N Two-Bolt *Installation-Ready Coupling Listings/Approvals*<sup>6</sup>

The information provided below is based on the latest listing and approval data at the time of publication. Listings/Approvals are subject to change and/or additions by the approval agencies. Contact Victaulic for performance on other pipe and the latest listings and approvals.

Size		cULus <sup>11</sup>		FM <sup>11</sup>		VdS	LPCB
Nominal inches DN	Actual Outside Diameter inches mm	Sch. 10 psi kPa bar	Sch. 40 psi kPa bar	Sch. 10 psi kPa bar	Sch. 40 psi kPa bar	psi kPa bar	psi kPa bar
1 ¼ DN32	1.660 42.4	365 2517 25	365 2517 25	363 2503 25	363 2503 25	363 2500 25	363 2500 25
1 ½ DN40	1.900 48.3	365 2517 25	365 2517 25	363 2503 25	363 2503 25	363 2500 25	363 2500 25
2 DN50	2.375 60.3	365 2517 25	365 2517 25	363 2503 25	363 2500 25	363 2500 25	363 2500 25
2 ½	2.875 73.0	365 2517 25	365 2517 25	363 2503 25	363 2500 25	363 2500 25	363 2500 25
DN65	3.000 76.1	365 <sup>7</sup> 2517 <sup>7</sup> 25 <sup>7</sup>	N/A	363 <sup>8</sup> 2503 <sup>8</sup> 25 <sup>8</sup>	N/A	363 2500 25	363 2500 25
3 DN80	3.500 88.9	365 2517 25	365 2517 25	363 2503 25	363 2503 25	363 2500 25	363 2500 25
4 DN100	4.500 114.3	365 2517 25	365 2517 25	363 2503 25	363 2503 25	363 2500 25	363 2500 25
	4.250 108.0	N/A	N/A	363 2503 25	363 2503 25	N/A	N/A
5	5.563 141.3	290 2000 20	365 2517 25	363 2503 25	363 2503 25	232 1600 16	363 2500 25
	5.250 133.0	N/A	N/A	363 <sup>8</sup> 2503 <sup>8</sup> 25	N/A	N/A	N/A
DN125	5.500 139.7	290 <sup>9</sup> 2000 <sup>9</sup> 20 <sup>9</sup>	N/A	363 <sup>8</sup> 2503 <sup>8</sup> 25 <sup>8</sup>	N/A	232 1600 25	363 2500 25
6 DN150	6.625 168.3	300 2068 20	365 2517 25	363 2503 25 <sup>7</sup>	363 2503 25	232 1600 16	363 2500 25
	6.250 159.0	N/A	N/A	363 <sup>8</sup> 2503 <sup>8</sup> 25	N/A	N/A	N/A
	6.500 165.1	290 <sup>10</sup> 2000 <sup>10</sup> 20	N/A	363 <sup>8</sup> 2503 <sup>8</sup> 25 <sup>8</sup>	N/A	N/A	363 2500 25

<sup>6</sup> Listed/Approved for continuous use in wet and dry systems. Listed/Approved for dry systems -40° F/C and above. Please see the Victaulic [Installation Manual I-009N](#) for details concerning when supplemental lubrication is required.

<sup>7</sup> cULus listed for DIN 2458 (EN 10220) 2.6 mm pipe wall.

<sup>8</sup> FM approved for BS 1387 (EN 10255) Medium 3.6 mm pipe wall.

<sup>9</sup> cULus listed for EN 10220 4.0 mm pipe wall.

<sup>10</sup> cULus listed for EN 10255 4.5 mm pipe wall.

<sup>11</sup> With optional stainless steel fasteners, cULus Listed to 175psi/1207 kPa/12 bar and FM Approved to the FM ratings shown in the above table. The stainless steel fasteners have a marking designation of "316" on the end face of the bolt.

<sup>12</sup> cUL listed to 250 psi/1720 kPa /17 bar.

## 5.0 PERFORMANCE (CONTINUED)

### Style 009N Two-Bolt *Installation-Ready Coupling Listings/Approvals*<sup>6</sup>

The information provided below is based on the latest listing and approval data at the time of publication. Listings/Approvals are subject to change and/or additions by the approval agencies. Contact Victaulic for performance on other pipe and the latest listings and approvals.

Size		cULus <sup>11</sup>		FM <sup>11</sup>		VdS	LPCB
Nominal inches DN	Actual Outside Diameter inches mm	Sch. 10 psi kPa bar	Sch. 40 psi kPa bar	Sch. 10 psi kPa bar	Sch. 40 psi kPa bar	psi kPa bar	psi kPa bar
8 DN200	8.625 219.1	300 2068 20	365 2517 25	363 2503 25	363 2503 25	232 1600 16	363 2500 25
	8.500 216.0	290 2000 20	N/A	363 <sup>8</sup> 2503 <sup>8</sup> 25 <sup>7</sup>	N/A	N/A	N/A
10 DN250	10.750 273.0	300 2068 20	300 2068 20	300 2068 20	300 2068 20	N/A	N/A
12 DN300	12.750 323.9	300 <sup>12</sup> 2068 <sup>12</sup> 20 <sup>12</sup>	300 2068 25	250 1720 17	300 2068 20	N/A	N/A

<sup>6</sup> Listed/Approved for continuous use in wet and dry systems. Listed/Approved for dry systems -40° F/C and above. Please see the Victaulic [Installation Manual I-009N](#) for details concerning when supplemental lubrication is required.

<sup>7</sup> cULus listed for DIN 2458 (EN 10220) 2.6 mm pipe wall.

<sup>8</sup> FM approved for BS 1387 (EN 10255) Medium 3.6 mm pipe wall.

<sup>9</sup> cULus listed for EN 10220 4.0 mm pipe wall.

<sup>10</sup> cULus listed for EN 10255 4.5 mm pipe wall.

<sup>11</sup> With optional stainless steel fasteners, cULus Listed to 175psi/1207 kPa/12 bar and FM Approved to the FM ratings shown in the above table. The stainless steel fasteners have a marking designation of "316" on the end face of the bolt.

<sup>12</sup> cUL listed to 250 psi/1720 kPa /17 bar.

## 5.1 PERFORMANCE

### Style 109 One-Bolt *Installation-Ready Coupling Listings/Approvals*<sup>13</sup>

The information provided below is based on the latest listing and approval data at the time of publication. Listings/Approvals are subject to change and/or additions by the approvals agencies. Contact Victaulic for performance on other pipe and the latest listings and approvals.

Size		cULus		FM	
Nominal inches DN	Actual Outside Diameter inches mm	Sch. 10 psi kPa bar	Sch. 40 psi kPa bar	Sch. 10 psi kPa bar	Sch. 40 psi kPa bar
1 ¼ DN32	1.660 42.4	365 2517 25	365 2517 25	365 2517 25	365 2517 25
1 ½ DN40	1.900 48.3	365 2517 25	365 2517 25	365 2517 25	365 2517 25
2 DN50	2.375 60.3	365 2517 25	365 2517 25	365 2517 25	365 2517 25
2 ½	2.875 73.0	365 2517 25	365 2517 25	365 2517 25	365 2517 25

<sup>13</sup> Listed/Approved for continuous use in wet and dry systems. Listed/Approved for dry systems -40° F/C and above. Please see the Victaulic [Installation Manual I-109](#) for details concerning when supplemental lubrication is required.

## 5.2 PERFORMANCE

### Specialty Pipe

#### Style 009N Two-Bolt *Installation-Ready* Coupling Listings/Approvals

Pipe Type	Size	Pressure Rating	
	inches DN	cULus psi kPa bar	FM psi kPa bar
EF	1 ¼ – 4 DN32 – DN100	300 2068 20	N/A
EL	1 ¼ – 2 DN32 – DN50	300 2068 20	300 2068 20
ET40	1 ¼ – 2 DN32 – DN50	300 2068 20	N/A
EZF	3 – 4 DN80 – DN100	300 2068 20	N/A
EZT	1 ¼ – 2 DN32 – DN50	300 2068 20	300 2068 20
FF	1 ½ – 4 DN40 – DN100	300 2068 20	N/A
GL	1 ¼ – 2 DN32 – DN50	300 2068 20	300 2068 20
MF	1 ¼ – 4 DN32 – DN100	300 2068 20	300 2068 20
	6 DN150	175 1205 12	175 1205 12
MT	1 ¼ – 2 DN32 – DN50	300 2068 20	300 2068 20
MLT	1 ¼ – 2 DN32 – DN50	N/A	300 2068 20
TF	2 ½ – 4 73.0 mm – DN100	N/A	300 2068 20
WG5, WG5E, WF5, WG7, WG7E, WL7	1 ¼ – 4 DN32 – DN100	175 1205 12	300 2068 20
WLS	1 ¼ – 2 DN32 – DN50	300 2068 20	300 2068 20

#### NOTES

- EF = EDDY FLOW steel pipe manufactured by Bull Moose Tube Co.
- EL = EDDYLITE steel pipe manufactured by Bull Moose Tube Co.
- ET40 = Eddythread 40 steel pipe manufactured by Bull Moose Tube Co.
- EZF = EZ-Flow steel pipe manufactured by Northwest Pipe Co.
- EZT = EZ-Thread steel pipe manufactured by Youngstown Tube Co.
- FF = Fire-Flo steel pipe manufactured by Youngstown Tube Co.
- GL = GL steel pipe manufactured by Wheatland Tube Co.
- MF = Mega-Flow steel pipe manufactured by Wheatland Tube Co.
- MT = Mega-Thread steel pipe manufactured by Wheatland Tube Co.
- MLT = MLT steel pipe manufactured by Wheatland Tube Co.
- TF = Tex-Flow steel pipe manufactured by Tex-Tube Co.
- WG5, WG5E, WF5 = WGalweld 5, WGalweld 5E, WFlow 5 steel pipe manufactured by Wuppermann Stahl GmbH.
- WG7, WG7E, WL7 = WGalweld 7, Wgalweld 7E, WLight 7 steel pipe manufactured by Wuppermann Stahl GmbH
- WLS = WLS steel pipe manufactured by Wheatland Tube Co.

## 5.3 PERFORMANCE

### Specialty Pipe

#### Style 109 One-Bolt *Installation-Ready* Coupling Listings/Approvals

Pipe Type	Size	Pressure Rating	
	inches	cULus psi kPa bar	FM psi kPa bar
	DN		
EF	1 ¼ – 2 ½ DN32 – 73.0 mm	N/A	300 2068 20
	1 ½ – 2 ½ DN40 – 73.0 mm	300 2068 20	N/A
Easy-Flow	1 ¼ – 2 DN32 – DN50	N/A	300 2068 20
EL	1 ¼ – 2 DN32 – DN50	N/A	300 2068 20
ET40	1 ¼ – 2 DN32 – DN50	300 2068 20	300 2068 20
EZT	1 ¼ – 2 DN32 – DN50	N/A	300 2068 20
	1 ½ – 2 DN40 – DN50	300 2068 20	N/A
FF	1 ½ – 2 ½ DN40 – 73.0 mm	300 2068 20	300 2068 20
GL	1 ¼ – 2 DN32 – DN50	N/A	300 2068
MF	1 ¼ – 2 ½ DN32 – 73.0 mm	300 2068 20	300 2068 20
MT	1 ¼ – 2 DN32 – DN50	300 2068 20	300 2068 20
MLT	1 ¼ – 2 DN32 – DN50	300 2068 20	300 2068 20
TF	2 ½ 73.0 mm	N/A	300 2068 20
WG7, WG7E	1 ¼ – 2 DN32 – DN50	N/A	300 2068 20
WLS	1 ¼ – 2 DN32 – DN50	N/A	300 2068 20

#### NOTES

- EF = EDDY FLOW steel pipe manufactured by Bull Moose Tube Co.
- Easy-Flow = Easy-Flow steel pipe manufactured by Borusan Mannesmann Boru.
- EL = EDDYLITE steel pipe manufactured by Bull Moose Tube Co.
- ET40 = Eddythread 40 steel pipe manufactured by Bull Moose Tube Co.
- EZT = EZ-Thread steel pipe manufactured by Youngstown Tube Co.
- FF = Fire-Flo steel pipe manufactured by Youngstown Tube Co.
- GL = GL steel pipe manufactured by Wheatland Tube Co.
- MF = Mega-Flow steel pipe manufactured by Wheatland Tube Co.
- MT = Mega-Thread steel pipe manufactured by Wheatland Tube Co.
- MLT = MLT steel pipe manufactured by Wheatland Tube Co.
- TF = Tex-Flow steel pipe manufactured by Tex-Tube Co.
- WG7, WG7E = WGalweld 7 and WGalweld 7E steel pipe manufactured by Wuppermann Stahl GmbH.
- WLS = WLS steel pipe manufactured by Wheatland Tube Co.



## 6.0 NOTIFICATIONS

### WARNING



- Read and understand all instructions before attempting to install any Victaulic products.
- Always verify that the piping system has been completely depressurized and drained immediately prior to installation, removal, adjustment, or maintenance of any Victaulic products.
- Wear safety glasses, hardhat, and foot protection.

Failure to follow these instructions could result in death or serious personal injury and property damage.

- These products shall be used only in fire protection systems that are designed and installed in accordance with current, applicable National Fire Protection Association (NFPA 13, 13D, 13R, etc.) standards, or equivalent standards, and in accordance with applicable building and fire codes. These standards and codes contain important information regarding protection of systems from freezing temperatures, corrosion, mechanical damage, etc.
- The installer shall understand the use of this product and why it was specified for the particular application.
- The installer shall understand common industry safety standards and potential consequences of improper product installation.
- It is the system designer's responsibility to verify suitability of materials for use with the intended fluid media within the piping system and external environment.
- The material specifier shall evaluate the effect of chemical composition, pH level, operating temperature, chloride level, oxygen level, and flow rate on materials to confirm system life will be acceptable for the intended service.

Failure to follow installation requirements and local and national codes and standards could compromise system integrity or cause system failure, resulting in death or serious personal injury and property damage.

## 7.0 REFERENCE MATERIALS

[05.01: Seal Selection Guide](#)

[25.01: Original Groove System \(OGS\) Groove Specifications](#)

[I-009N: Installation Instructions FireLock EZ™ Rigid Coupling Style 009N](#)

[I-100: Victaulic Field Installation Handbook](#)

[I-109: Installation Instructions FireLock™ One-Bolt Rigid Coupling Style 109](#)

[I-ENDCAP: Victaulic End Caps Installation Instructions](#)

### User Responsibility for Product Selection and Suitability

Each user bears final responsibility for making a determination as to the suitability of Victaulic products for a particular end-use application, in accordance with industry standards and project specifications, and the applicable building codes and related regulations as well as Victaulic performance, maintenance, safety, and warning instructions. Nothing in this or any other document, nor any verbal recommendation, advice, or opinion from any Victaulic employee, shall be deemed to alter, vary, supersede, or waive any provision of Victaulic Company's standard conditions of sale, installation guide, or this disclaimer.

### Intellectual Property Rights

No statement contained herein concerning a possible or suggested use of any material, product, service, or design is intended, or should be construed, to grant any license under any patent or other intellectual property right of Victaulic or any of its subsidiaries or affiliates covering such use or design, or as a recommendation for the use of such material, product, service, or design in the infringement of any patent or other intellectual property right. The terms "Patented" or "Patent Pending" refer to design or utility patents or patent applications for articles and/or methods of use in the United States and/or other countries.

### Note

This product shall be manufactured by Victaulic or to Victaulic specifications. All products to be installed in accordance with current Victaulic installation/assembly instructions. Victaulic reserves the right to change product specifications, designs and standard equipment without notice and without incurring obligations.

### Installation

Reference should always be made to the Victaulic installation handbook or installation instructions of the product you are installing. Handbooks are included with each shipment of Victaulic products, providing complete installation and assembly data, and are available in PDF format on our website at [www.victaulic.com](http://www.victaulic.com).

### Warranty

Refer to the Warranty section of the current Price List or contact Victaulic for details.

### Trademarks

*Victaulic* and all other Victaulic marks are the trademarks or registered trademarks of Victaulic Company, and/or its affiliated entities, in the U.S. and/or other countries.

# Mechanical-T® Bolted Branch Outlets

## STYLES 920 AND 920N



Victaulic Mechanical-T® Outlet provides a direct branch connection at any location a hole can be cut in pipe. The hole is cut oversize to receive a “holefinder” locating collar which secures the outlet in position permanently. A pressure responsive gasket seals on the pipe O.D.

Cross-type connections can be achieved by utilizing two upper housings of the same style and size, with the same or differing branch size connections. NOTE: Style 920 and Style 920N housings cannot be mated to each other to achieve a cross connection.

Style 920 and Style 920N Mechanical-T outlets are available with grooved or female threaded outlet. Specify choice on order. Units are supplied painted with plated bolts. Galvanized housings are available, supplied with plated bolts.

All sizes of Style 920 and 920N are rated at 500 psi/3450 kPa working pressure on Schedule 10 and 40 carbon steel pipe. They may also be used on high density polyethylene or polybutylene (HDPE) pipe. Pressure ratings on HDPE are dependent on the pipe rating. Contact Victaulic for ratings on other pipe. **Style 920 and 920N are not recommended for use on PVC plastic pipe.**

Standard piping practices dictate that the Mechanical-T Styles 920 and 920N must be installed so that the main and branch connections are a true 90° angle when permanently attached to the pipeline surface.

Additionally, the Vic-Tap II® hole cutting tool, which allows for hole cutting capabilities on pressurized systems, utilizes the Style 920 Mechanical-T in conjunction with the Series 726 Vic-Ball Valve to create the Style 931 Vic-Tap II Mechanical-T unit. See page 8 for further information.



STYLES 920 AND 920N

STYLE 920 CROSS

PATENTED

### MATERIAL SPECIFICATIONS

**Housing/Coating:** Ductile iron conforming to ASTM A-536, grade 65-45-12, with orange enamel coating. Ductile iron conforming to ASTM A-395, grade 65-45-15, is available upon special request.

- **Optional:** Hot dipped galvanized

**Gasket: (Specify choice\*)**

- **Grade “E” EPDM**

EPDM (Green color code). Temperature range –30°F to +230°F/–34°C to +110°C.

Recommended for cold and hot water service within the specified temperature range plus a variety of dilute acids, oil-free air and many chemical services. UL Classified in accordance with ANSI/NSF 61 for cold +86°F/+30°C and hot +180°F/+82°C. NOT RECOMMENDED FOR PETROLEUM SERVICES.

- **Grade “T” nitrile**

Nitrile (Orange color code). Temperature range –20°F to +180°F/–29°C to +82°C.

Recommended for petroleum products, air with oil vapors, vegetable and mineral oils within the specified temperature range. Not recommended for hot water services over +150°F/+66°C or for hot dry air over +140°F/+60°C.

\*Services listed are General Service Recommendations only. It should be noted that there are services for which these gaskets are not recommended. Reference should always be made to the latest Victaulic Gasket Selection Guide for specific gasket service recommendations and for a listing of services which are not recommended.

**Bolts/Nuts:** Heat-treated plated carbon steel, trackhead meeting the physical and chemical requirements of ASTM A-449 and physical requirements of ASTM A-183.

### JOB/OWNER

System No. \_\_\_\_\_

Location \_\_\_\_\_

### CONTRACTOR

Submitted By \_\_\_\_\_

Date \_\_\_\_\_

### ENGINEER

Spec Sect \_\_\_\_\_ Para \_\_\_\_\_

Approved \_\_\_\_\_

Date \_\_\_\_\_

[www.victaulic.com](http://www.victaulic.com)

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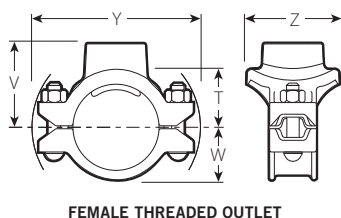
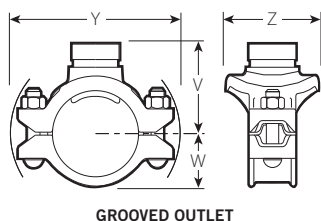


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# Mechanical-T® Bolted Branch Outlets

STYLES 920 AND 920N

## DIMENSIONS



- Provides a direct branch connection at any location where a hole can be cut in the pipe
- A pressure responsive gasket provides the seal
- Request Publication 11.03 for Mechanical-T cross assemblies
- Pressure rated up to 500 psi/3450 kPa on steel pipe; also available for use with HDPE pipe
- Sizes from 2 × ½"/50 × 15 mm through 8 × 4"/200 × 100 mm

### IMPORTANT NOTES:

Style 920 and Style 920N housings cannot be mated to one another to achieve cross connections.

Size Run × Branch Nominal Size Inches mm	Style No. 920 or 920N	Max. Work Pressure@ psi kPa	Dimensions							Approx. Weight Each	
			Hole Diameter +0.13 -0.00 Inches mm	T** Inches mm	V † # Thd. Inches mm	V † Grv. Inches mm	W Inches mm	Y Inches mm	Z Inches mm	Female Thd. Lbs. kg	Grv. Lbs. kg
2 50 × ½ (a) □	920N	500 3450	1.50 38.1	2.00 51	2.53 64	—	1.61 41	5.35 136	2.75 70	3.1 1.5	—
	920N	500 3450	1.50 38.1	1.97 50	2.53 64	—	1.61 41	5.35 136	2.75 70	3.1 1.5	—
	920N	500 3450	1.50 38.1	1.85 47	2.53 64	—	1.61 41	5.35 136	2.75 70	3.0 1.4	—
	920N	500 3450	1.75 44.5	2.05 52	2.75 70	3.00 76	1.61 41	5.35 136	3.00 76	3.5 1.7	3.2 1.5
	920N	500 3450	1.75 44.5	2.03 52	2.75 70	3.12 79	1.61 41	5.35 136	3.25 83	3.6 1.7	3.2 1.5
2½ 65 × ½ (a) §	920N	500 3450	1.50 38.1	2.21 56	2.74 70	—	1.82 46	5.64 143	2.75 70	3.0 1.4	—
	920N	500 3450	1.50 38.1	2.18 55	2.74 70	—	1.82 46	5.64 143	2.75 70	3.0 1.4	—
	920N	500 3450	1.50 38.1	2.06 52	2.74 70	—	1.82 46	5.64 143	2.75 70	2.9 1.4	—
	920N	500 3450	1.75 44.5	2.30 58	3.00 76	3.25 83	1.82 46	6.29 160	3.00 76	3.5 1.7	3.2 1.5
	920N	500 3450	2.00 50.8	2.28 58	3.00 76	3.25 83	1.82 46	6.26 159	3.25 83	3.6 1.7	3.3 1.6
76.1 × ½ (a) □	920N	300 2065	1.50 38.1	2.22 56	2.75 70	—	2.25 57	6.46 164	3.18 81	3.9 1.8	—
	920N	300 2065	1.50 38.1	2.19 56	2.75 70	—	2.25 57	6.46 164	3.18 81	3.9 1.8	—
	920N	300 2065	1.50 38.1	2.07 53	2.75 70	—	2.25 57	6.46 164	3.18 81	3.8 1.7	—
	920N	500 3450	1.75 44.5	2.30 58	3.00 76	3.31 84	1.92 49	6.29 160	3.00 76	3.5 1.6	3.2 1.5
	920N	500 3450	2.00 50.8	2.28 58	3.00 76	3.31 84	1.92 49	6.29 160	3.25 83	3.5 1.6	3.3 1.5
3 80 × ½ (a) □	920N	500 3450	1.50 38.1	2.52 64	3.05 78	—	2.28 58	6.15 156	2.75 70	3.4 1.6	—
	920N	500 3450	1.50 38.1	2.49 63	3.05 78	—	2.28 58	6.15 156	2.75 70	3.4 1.6	—
	920N	500 3450	1.50 38.1	2.38 61	3.06 78	—	2.28 58	6.15 156	2.75 70	3.3 1.6	—
	920N	500 3450	1.75 44.5	2.55 65	3.25 83	3.56 90	2.28 58	6.15 156	3.00 76	3.8 1.8	3.7 1.8
	920N	500 3450	2.00 50.8	2.78 71	3.50 89	3.56 90	2.28 58	6.15 156	3.25 83	4.1 1.9	3.8 1.8
	920N	500 3450	2.50 63.5	2.75 70	3.50 89	3.56 90	2.28 58	6.75 172	3.88 99	4.9 2.3	4.6 2.1
3½ 90 × 2 50	920N	500 3450	2.50 63.5	3.00 76	—	3.75 95	2.44 62	6.72 171	3.88 99	—	3.8 1.8

TABLE CONTINUED ON PG. 3

\*\* Center of run to engaged pipe end, female threaded outlet only (dimensions approximate).

† Available with grooved or female threaded outlet. Specify choice on order.

‡ Center of run to end of fitting.

# Female threaded outlets are available to NPT and BSPT specifications.

@ See page 7 for Fire Protection approvals and pressure ratings.

(a) British Standard female pipe threaded outlet is available as listed. Specify "BSPT" clearly on order.

(b) For 76.1 mm threaded outlet, specify 2½" BSPT clearly on order.

§ Vds approved for fire protection services

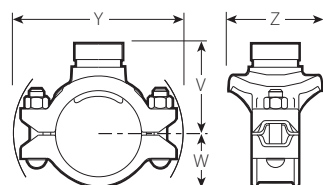
□ LPCB approved for fire protection services

Ø Approved for use in China by Tianjin Approvals Company.

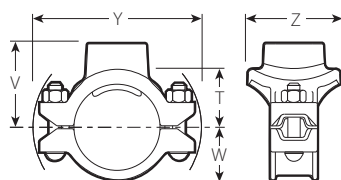
# Mechanical-T® Bolted Branch Outlets

STYLES 920 AND 920N

## DIMENSIONS



GROOVED OUTLET



FEMALE THREADED OUTLET

- Provides a direct branch connection at any location where a hole can be cut in the pipe
- A pressure responsive gasket provides the seal
- Request Publication 11.03 for Mechanical-T cross assemblies
- Pressure rated up to 500psi/3450kPa on steel pipe; also available for use with HDPE pipe
- Sizes from 2 × ½"/50 × 15mm through 8 × 4"/200 × 100mm

### IMPORTANT NOTES:

Style 920 and Style 920N housings cannot be mated to one another to achieve cross connections.

Size		Style No.	Max. Work Pressure@	Dimensions							Approx. Weight Each	
Run x Branch Nominal Size Inches mm	920 or 920N	psi kPa	Hole Diameter +0.13 -0.00	T** Inches mm	V ‡ # Thd. Inches mm	V ‡ Grv. Inches mm	W Inches mm	Y Inches mm	Z Inches mm	Female Thd. Lbs. kg	Grv. Lbs. kg	
TABLE CONTINUED FROM PAGE 2												
4 100	1/2 (a) □ 15	920N	500 3450	1.50 38.1	3.03 77	3.56 90	—	2.69 68	7.01 178	2.75 70	3.7 1.8	—
	3/4 (a) □ 20	920N	500 3450	1.50 38.1	3.00 76	3.56 90	—	2.69 68	7.01 178	2.75 70	3.7 1.8	—
	1 (a) □ 25	920N	500 3450	1.50 38.1	2.88 73	3.56 90	—	2.69 68	7.01 178	2.75 70	3.6 1.8	—
	1 1/4 (a) † 32 (b)	920N	500 3450	1.75 44.5	3.08 78	3.78 96	4.00 102	2.69 68	7.01 178	3.00 76	4.0 1.9	3.6 1.8
	1 1/2 (a) † 40 (b)	920N	500 3450	2.00 50.8	3.28 83	4.00 102	4.00 102	2.69 68	7.01 178	3.25 83	4.2 2.0	3.9 1.9
	2 (a) † 50	920N	500 3450	2.50 63.5	3.25 83	4.00 102	4.00 102	2.69 68	7.01 178	3.88 99	5.0 2.3	4.6 2.1
	2 1/2 (a) † 65	920	500 3450	2.75 69.9	2.88 73	4.00 102	4.00 102	2.69 68	7.34 186	4.63 118	5.8 2.6	5.0 2.3
	76.1 mm	920	500 3450	2.75 69.9	2.88 73	—	4.00 102	2.69 68	7.34 186	4.63 118	—	6.4 2.9
	3 (a) 80	920	500 3450	3.50 88.9	3.31 84	4.50 114	4.12 105	2.69 68	7.73 196	5.12 130	8.4 3.8	6.4 2.9
108.0	1 1/4 (a) □ 32	920N	500 3450	1.75 44.5	3.08 78	3.78 96	—	2.63 67	7.64 194	3.05 78	5.0 2.3	—
	1 1/2 (a) □ 40	920N	500 3450	2.00 50.8	3.28 83	4.00 102	—	2.63 67	7.64 194	3.25 83	5.0 2.3	—
	2 (a) 50	920N	500 3450	2.50 63.5	3.25 83	4.00 102	—	2.63 67	7.64 194	4.00 102	4.0 1.9	—
	76.1 mm	920	500 3450	2.75 69.9	2.88 73	4.00 102	4.00 102	2.63 67	7.64 194	4.29 109	8.0 3.6	7.8 3.5
	3 (a) 80	920	500 3450	3.50 88.9	3.31 84	4.50 114	4.50 114	2.63 67	7.63 194	4.88 124	6.8 3.1	6.5 3.0
5 125	1 1/2 (a) † 40	920	500 3450	2.00 50.8	4.03 102	4.75 121	4.75 121	3.16 80	9.70 246	3.69 94	7.4 3.4	7.6 3.4
	2 (a) † 50	920	500 3450	2.50 63.5	4.00 102	4.75 121	4.75 121	3.16 80	9.70 246	4.38 111	8.2 3.7	8.0 3.6
	2 1/2 (a) † 65	920	500 3450	2.75 69.9	3.63 92	4.75 121	4.75 121	3.16 80	9.70 246	4.63 118	8.3 3.8	7.9 3.6
	76.1 mm □	920	500 3450	2.75 69.9	3.75 95	—	4.75 121	3.16 80	9.70 246	4.63 118	—	8.0 3.6
	3 (a) † 80	920	500 3450	3.50 88.9	3.81 97	5.00 127	4.63 118	3.16 80	9.70 246	5.31 135	8.4 3.8	8.8 4.0
133.0	2 50	920N	500 3450	2.50 63.5	3.75 95	4.50 114	—	3.17 81	8.00 203	3.88 99	8.0 3.6	—
	3 80	920	500 3450	3.50 88.9	3.81 97	5.00 127	—	3.00 76	9.46 240	5.31 135	8.0 3.6	—
TABLE CONTINUED ON PG. 4												

\*\* Center of run to engaged pipe end, female threaded outlet only (dimensions approximate).

† Available with grooved or female threaded outlet. Specify choice on order.

‡ Center of run to end of fitting.

# Female threaded outlets are available to NPT and BSPT specifications.

@ See page 7 for Fire Protection approvals and pressure ratings.

(a) British Standard female pipe threaded outlet is available as listed. Specify "BSPT" clearly on order.

(b) For 76.1 mm threaded outlet, specify 2½" BSPT clearly on order.

§ Vds approved for fire protection services

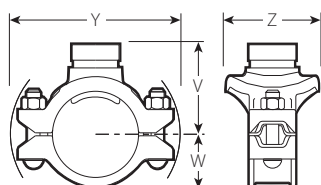
□ LPCB approved for fire protection services

∅ Approved for use in China by Tianjin Approvals Company.

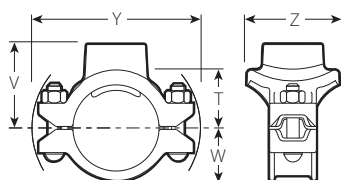
# Mechanical-T® Bolted Branch Outlets

STYLES 920 AND 920N

## DIMENSIONS



GROOVED OUTLET



FEMALE THREADED OUTLET

- Provides a direct branch connection at any location where a hole can be cut in the pipe
- A pressure responsive gasket provides the seal
- Request Publication 11.03 for Mechanical-T cross assemblies
- Pressure rated up to 500 psi/3450 kPa on steel pipe; also available for use with HDPE pipe
- Sizes from 2 × ½"/50 × 15 mm through 8 × 4"/200 × 100 mm

## IMPORTANT NOTES:

Style 920 and Style 920N housings cannot be mated to one another to achieve cross connections.

Size	Style No.	Max. Work Pressure@	Dimensions							Approx. Weight Each			
Run × Branch Nominal Size Inches mm	920 or 920N	psi kPa	Hole Diameter +0.13 -0.00	T** Inches mm	V † # Thd. Inches mm	V † Grv. Inches mm	W Inches mm	Y Inches mm	Z Inches mm	Female Thd. Lbs. kg	Grv. Lbs. kg		
TABLE CONTINUED FROM PAGE 3													
139.7 ×	1 ½ † 40	920N	500 3450	2.00 50.8	3.78 96	4.50 114	—	3.30 84	8.23 209	3.25 83	7.0 3.2	—	
	2 † 50	920N	500 3450	2.50 63.5	3.75 95	4.50 114	—	3.30 84	8.23 209	3.88 99	9.0 4.1	—	
6 150 ×	1 ¼ (a) 32 (b)	920N	500 3450	1.75 44.5	4.43 112	5.13 130	5.13 130	3.79 96	9.15 232	3.25 83	5.1 2.3	4.8 2.2	
	1 ½ (a) † 40 (b)	920N	500 3450	2.00 50.8	4.40 112	5.13 130	5.13 130	3.79 96	9.15 232	3.25 83	5.4 2.4	5.1 2.3	
	2 (a) † 50	920N	500 3450	2.50 63.5	4.38 111	5.13 130	5.13 130	3.79 96	9.15 232	3.88 99	6.0 2.7	5.6 2.5	
	2 ½ 65	920	500 3450	2.75 69.9	4.01 110	5.13 130	5.12 130	3.69 94	10.51 267	4.63 118	8.3 3.8	7.6 3.4	
	76.1 mm	920	500 3450	2.75 69.9	4.15 105	—	5.21 132	3.69 94	10.51 267	4.63 118	—	8.4 3.8	
	3 (a) † 80	920	500 3450	3.50 88.9	4.31 110	5.50 140	5.13 130	3.69 94	10.51 267	5.31 135	9.9 4.5	8.4 3.8	
	4 (a) † 100	920	500 3450	4.50 114.3	3.81 97	5.75 146	5.38 137	3.69 94	10.51 267	6.25 159	10.1 4.6	10.1 4.6	
	159.0 ×	1 ½ (a) 40	920N	500 3450	2.00 50.8	4.41 112	5.13 130	—	3.63 92	9.40 239	3.25 83	7.8 3.5	—
		2 (a) 50	920N	500 3450	2.50 63.5	4.38 111	5.13 130	—	3.63 92	9.40 239	3.88 99	8.0 3.6	—
76.1 mm		920	500 3450	2.75 69.9	4.38 111	5.50 140	5.13 130	3.63 92	9.40 239	4.63 118	9.5 4.3	9.5 4.3	
3 80		920	500 3450	3.50 88.9	4.31 110	5.50 140	5.13 130	3.63 92	9.40 239	5.31 135	8.1 3.7	14.0 6.4	
108.0 mm		920	500 3450	4.50 114.3	4.45 113	—	5.38 137	3.63 92	9.40 239	6.12 155	—	10.0 4.5	
4 100	920	500 3450	4.50 114.3	3.81 96.80	5.75 146	—	3.63 92	9.40 239	6.25 159	18.0 8.2	—		
TABLE CONTINUED ON PG. 5													

\*\* Center of run to engaged pipe end, female threaded outlet only (dimensions approximate).

† Available with grooved or female threaded outlet. Specify choice on order.

‡ Center of run to end of fitting.

# Female threaded outlets are available to NPT and BSPT specifications.

@ See page 7 for Fire Protection approvals and pressure ratings.

(a) British Standard female pipe threaded outlet is available as listed. Specify "BSPT" clearly on order.

(b) For 76.1 mm threaded outlet, specify 2 ½" BSPT clearly on order.

§ Vds approved for fire protection services

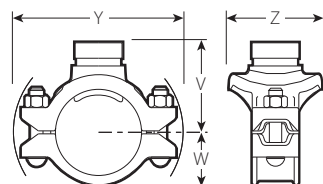
⌘ LPCB approved for fire protection services

⌘ Approved for use in China by Tianjin Approvals Company.

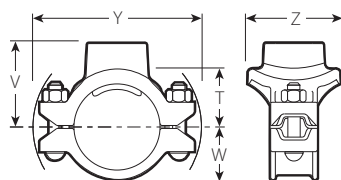
# Mechanical-T® Bolted Branch Outlets

STYLES 920 AND 920N

## DIMENSIONS



GROOVED OUTLET



FEMALE THREADED OUTLET

- Provides a direct branch connection at any location where a hole can be cut in the pipe
- A pressure responsive gasket provides the seal
- Request Publication 11.03 for Mechanical-T cross assemblies
- Pressure rated up to 500 psi/3450 kPa on steel pipe; also available for use with HDPE pipe
- Sizes from 2 × ½"/50 × 15 mm through 8 × 4"/200 × 100 mm

Size		Style No.	Max. Work Pressure@	Dimensions							Approx. Weight Each	
Run × Branch Nominal Size Inches mm	920 or 920N	psi kPa	Hole Diameter +0.13 -0.00	T** Inches mm	V ‡ # Thd. Inches mm	V ‡ Grv. Inches mm	W Inches mm	Y Inches mm	Z Inches mm	Female Thd. Lbs. kg	Grv. Lbs. kg	
TABLE CONTINUED FROM PAGE 4												
165.1 ×	1 25	920N	500 3450	1.50 38.1	3.88 99	4.56 116	—	3.79 96	9.34 237	2.75 70	8.0 3.6	—
	1 ¼ □ 32	920N	500 3450	1.75 44.5	4.43 113	5.13 130	—	3.79 96	9.34 237	3.25 83	8.4 3.8	—
	1 ½ (a) † □ 40	920N	500 3450	2.00 50.8	4.41 112	5.13 130	5.13 130	3.79 96	9.34 237	3.25 83	8.4 3.8	5.4 2.4
	2 (a) † 50	920N	500 3450	2.50 63.5	4.38 111	5.13 130	5.13 130	3.79 96	9.34 237	3.88 99	8.5 3.9	6.0 2.7
	76.1 mm	920	500 3450	2.75 69.9	4.01 110	5.13 130	5.21 132	3.63 92	10.51 267	4.63 118	8.6 3.9	7.6 3.4
	3 (a) † ∅ 80	920	500 3450	3.50 88.9	4.31 110	5.50 140	5.13 130	3.63 92	10.51 267	5.31 135	10.2 4.6	8.4 3.8
	4 (a) † □ 100	920	500 3450	4.50 114.3	3.81 97	5.75 146	5.38 137	3.63 92	10.51 267	6.25 159	10.5 4.8	8.4 3.8
	8 200 ×	2 (a) † 50	920	500 3450	2.75 69.9	5.44 138	6.19 157	6.25 159	4.81 122	12.42 316	4.50 114	11.6 5.3
2 ½ (a) † 65		920	500 3450	2.75 69.9	5.07 129	6.19 157	6.19 157	4.81 122	12.42 316	4.50 114	11.6 5.3	11.6 5.3
76.1 mm □		920	500 3450	2.75 69.9	5.25 133	—	6.25 159	4.81 122	12.42 316	4.56 116	—	11.6 5.3
3 (a) † □ 80		920	500 3450	3.50 88.9	5.31 135	6.50 165	6.50 165	4.81 122	12.42 316	5.31 135	12.6 5.7	11.6 5.3
4 (a) † □ 100		920	500 3450	4.50 114.3	4.81 122	6.75 171	6.38 162	4.81 122	12.42 316	6.25 159	15.3 6.9	12.5 5.7

\*\* Center of run to engaged pipe end, female threaded outlet only (dimensions approximate).

† Available with grooved or female threaded outlet. Specify choice on order.

‡ Center of run to end of fitting.

# Female threaded outlets are available to NPT and BSPT specifications.

@ See page 7 for Fire Protection approvals and pressure ratings.

(a) British Standard female pipe threaded outlet is available as listed. Specify "BSPT" clearly on order.

(b) For 76.1 mm threaded outlet, specify 2½" BSPT clearly on order.

§ Vds approved for fire protection services

▣ LPCB approved for fire protection services

Ø Approved for use in China by Tianjin Approvals Company.

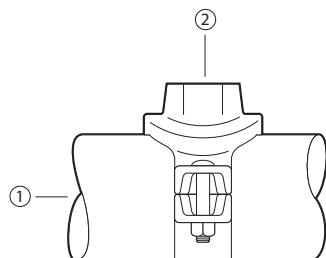
## IMPORTANT NOTES:

Style 920 and Style 920N housings cannot be mated to **each other** to achieve cross connections.

## Mechanical-T® Bolted Branch Outlets

STYLES 920 AND 920N

### FLOW DATA



Exaggerated for clarity

Flow test data has shown that the total head loss between point (1) and (2) for the Style 920, 920N and 929 Mechanical-T® fittings can best be expressed in terms of the pressure difference across the inlet and branch. The pressure difference can be obtained from the relationship below.

#### C<sub>v</sub> and K<sub>v</sub> Values

Values for flow of water at +60°F/+16°C are shown in the table below.

#### Formulas for C<sub>v</sub>/K<sub>v</sub> Values:

$$\Delta P = \frac{Q^2}{C_v^2}$$

$$Q = C_v \times \sqrt{\Delta P}$$

#### Where:

Q = Flow (GPM)

ΔP = Pressure Drop (psi)

C<sub>v</sub> = Flow Coefficient

$$\Delta P = \frac{Q^2}{K_v^2}$$

$$Q = K_v \times \sqrt{\Delta P}$$

#### Where:

Q = Flow (m³/hr)

ΔP = Pressure Drop (Bar)

K<sub>v</sub> = Flow Coefficient

OUTLET SIZE		Equivalent Length of Outlet Size Schedule 40 Carbon Steel Pipe (per UL 213, Sec. 16) (C = 120)† FT		C <sub>v</sub> /K <sub>v</sub> Values	
NOMINAL DIAMETER In/mm	ACTUAL O.D. In/mm	GROOVED	THREADED	GROOVED	THREADED
½	0.840	-	2	-	11
15	21.3	-		-	9.4
¾	1.050	-	4	-	16
20	26.7	-		-	13.7
1	1.315	3**	8	-	21
25	33.7			-	1.8
1 ¼	1.660	5 ½	6	50	48
32	42.7			42.9	41.1
1 ½	1.900	11	11	53	53
40	48.3			45.4	45.4
2	2.375	9	10 ½	112	104
50	60.3			96	89.1
2 ½	2.875	20	12 ½	119	150
65	73.0			102	128.5
76.1 mm	3.000	16*	-	161	-
	76.1			138.1	
3	3.500	14	15 ½	249	237
80	88.9			213.4	203.1
4	4.500	20	22	421	401
100	114.3			360.8	343.6

† Hazen-Williams coefficient of friction is 120.

\* Pipe with a wall thickness of 0.165in./4.2mm.

\*\* 1" FireLock™ Innovative Groove System (IGS) outlet

## Mechanical-T<sup>®</sup> Bolted Branch Outlets

STYLES 920 AND 920N

### FIRE PROTECTION APPROVALS AND PRESSURE RATINGS

The information provided below is based on the latest listing and approval data at the time of publication. Listings/Approvals are subject to change and/or additions by the approvals agencies. Contact Victaulic for performance on other pipe and the latest listings and approvals.

Run Size		Outlet Size	Pipe	Approval Agency Rated Working Pressures – psi/kPa					
Nominal Size Inches/mm	Actual Outside Diameter Inches/mm			UL	ULC	FM	LPCB	Vds	
		Inches/mm	Schedule					(Style 920)	(Style 920N)
2 1/2 - 6 65 - 150	2.875 - 6.625 73.0 - 168.3	All	10, 40	400 2755	400 2755	400 2755	290 1999	232 1599	362 2496
2 1/2 - 4 65 - 100	2.875 - 4.500 73.0 - 114.3	All	DF	300 2065	300 2065	300 2065	290 1999	232 1599	362 2496
2 1/2 - 4 65 - 100	2.875 - 4.500 73.0 - 114.3	All	SF	300 2065	300 2065	300 2065	290 1999	232 1599	362 2496
6 150	6.625 168.3	3, 4	10	300 2065	300 2065	250 1724	290 1999	232 1599	362 2496
6 150	6.625 168.3	3, 4	30, 40	300 2065	300 2065	300 2065	290 1999	232 1599	362 2496
8 200	8.625 219.1	2 1/2	10, 40	400 2755	—	—	—	145 1000	—
8 200	8.625 219.1	3, 4	10	300 2065	—	250 1724	—	145 1000	—
8 200	8.625 219.1	3, 4	30, 40	300 2065	—	300 2065	—	145 1000	—

#### NOTES:

10 refers to Listed/Approved Schedule 10 steel sprinkler pipe.

40 refers to Listed/Approved Schedule 40 steel sprinkler pipe.

DF refers to Listed/Approved Dyna-Flow steel sprinkler pipe manufactured by American Tube Company.

SF refers to Listed/Approved Super-Flo steel sprinkler pipe manufactured by Allied Tube and Conduit Corporation.

### VIC-TAP II HOLE CUTTING TOOL FOR 4 - 8"/100 - 200MM CARBON STEEL PIPE



The Vic-Tap II hole cutting tool is designed for use with the Style 931 Vic-Tap II Mechanical-T unit, which is a combination of the Style 920 Mechanical-T and Series 726 Vic-Ball Valve. The Vic-Tap II is capable of tapping into carbon steel pipe systems under pressures up to 500 psi/3450 kPa.

The Style 931 Vic-Tap II Mechanical-T unit is a full port ball valve which can be mounted on 4"/100mm, 5"/125mm, 6"/150mm and 8"/200mm diameter pipe. The Style 931 comes with a 2 1/2"/65mm grooved outlet.

The drill motor is an electric motor with ground fault circuit interrupter (GFCI) in accordance with safety codes.

For more information, refer to publication 24.01.



## Mechanical-T<sup>®</sup> Bolted Branch Outlets

STYLES 920 AND 920N

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### INSTALLATION

Reference should always be made to the I-100 Victaulic Field Installation Handbook for the product you are installing. Handbooks are included with each shipment of Victaulic products for complete installation and assembly data, and are available in PDF format on our website at [www.victaulic.com](http://www.victaulic.com).

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### WARRANTY

Refer to the Warranty section of the current Price List or contact Victaulic for details.

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### NOTE

This product shall be manufactured by Victaulic or to Victaulic specifications. All products to be installed in accordance with current Victaulic installation/assembly instructions. Victaulic reserves the right to change product specifications, designs and standard equipment without notice and without incurring obligations.

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For complete contact information, visit [www.victaulic.com](http://www.victaulic.com)

11.02 1480 REV 0 UPDATED 11/2018

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FlameGuard® Technical  
**FlameGuard® System Overview**



**Complete System of Pipe, Fittings & Solvent Cement**  
**Corrosion Resistant • Superior Flow • Ease of Installation**



Spears® **FlameGuard®** CPVC Fire Sprinkler Products provide a cost effective alternative to metal systems with advantages of high corrosion resistance, improved system hydraulics, ease of installation and quick assembly with readily available tools. CPVC Fire Sprinkler Systems are based on proven products that have been in continuous service for over 40 years. Spears® **FlameGuard®** products are approved by UL®, FM® Global, LPCB and Certified by NSF International for potable water use. Check local codes for restrictions and limitations.



Made in the U.S.A.

Suitable for Oil-Free air handling to 25 psi, not for distribution of compressed air or gas  
See Spears® Product Sourcebook for product Offerings



## Spears® FlameGuard® . . . The Leader in Innovative CPVC Fire Sprinkler System Products

### **Corrosion Resistant CPVC Material Does Not Sustain Biological Growth**

Unlike metal systems, **FlameGuard®** CPVC products never rust, scale or pit and do not sustain biological growth - a cause of Microbiologically Influenced Corrosion (MIC) which can destroy metal fire sprinkler systems from the inside out.

### **Superior Flow Characteristics for Lower Friction Losses**

The smooth-wall interior surfaces of **FlameGuard®** CPVC systems result in reduced friction loss over metal systems. The design flow characteristics remain constant throughout the life of the product because there is no interior corrosion in the system due to microbiological activity.

### **Pressure Rated to 175 psi (1200kpa) @ 150°F (65°C)**

**FlameGuard®** CPVC Products are produced in combinations of Schedule 40 and Schedule 80 Fitting configurations conforming to ASTM F 438 or F 439 standards and **FlameGuard®** SDR 13.5 CPVC Fire Sprinkler Pipe conforming to ASTM F 442 standards. UL® Rated working pressure is 175 psi (1200kpa) @ 150°F (65°C) (LPCB rated to 120°F) (49°C).

### **Easy Installation for Lower Costs**

**FlameGuard®** CPVC system installations significantly reduce costs over conventional metal piping by virtually eliminating prefabrication. Systems can be fully installed on site using solvent cement joining methods.

### **UL® Listed for U.S. and Canada in NFPA 13, 13R & 13D Systems**

**FlameGuard®** CPVC Fire Sprinkler Products are UL® listed for U.S. and Canada applications for Light Hazard occupancies as defined in NFPA 13, Residential occupancies up to and including 4-stories as defined in NFPA 13R, and Residential occupancies for one and two family dwellings and manufactured homes as defined in NFPA 13D. Consult Spears® **FlameGuard®** CPVC Fire Sprinkler Products Installation Instructions and NFPA Standards for additional applications including air plenum, system risers, concealed, exposed, underground, combustible attic, garage, basement and low pressure dry piping installations.

### **Full Limited Lifetime Warranty**

**FlameGuard®** CPVC Fire Sprinkler Products carry a limited lifetime warranty against defects in material or workmanship. Consult Spears® warranty for additional details.

### **Pioneer in Molded-in Metal Insert Head Adapters**

Spears® pioneered the development of the **FlameGuard®** molded-in-place metal thread insert for connection of sprinkler heads to CPVC fire sprinkler systems, plus Metal FIPT threaded female adapters for metal-to-plastic transitions.

### **Developed the Special Reinforced (SR) Head Adapters**

Spears® **FlameGuard®** continuous improvement program developed the technology to produce a superior patented plastic threaded fitting - the Special Reinforced (SR) Design. This unique design incorporates a patented thermoplastic compression process that equalizes stresses generated by tapered thread joint make-up. All CPVC plastic body and threads provide a more uniform construction and improved corrosion resistance.



### Now, the Revolutionary TorqueSafe™ Gasket Sealed Head Adapter

- Requires NO Thread Sealants • Eliminates Stress • Prevents Over Tightening • Provides Easy Frame Alignment •

Spears® revolutionary design features a special molded-in-place Brass Thread Insert fitted with an elastomer gasket seal at the base of the threads. The gasket seal allows a modified thread design that eliminates radial stress and associated problems typical with tapered thread joint make up. The insert is designed to rotate for easy sprinkler frame alignment without overtightening. Patent No. 7,458,613.

### Full Assortment of Specialty Products & Fitting Configurations

Spears® **FlameGuard®** provides the specialty fittings needed in today's fire sprinkler systems, Such as the adjustable drop nipple for fine-tuning to finished ceiling height, and ringed head adapter for ease of locating during installation. Plus, Spears® **FlameGuard®** line offers a full assortment of CPVC fire sprinkler fitting configurations including Tees, Elbows, Flanges, Couplings, Caps, Male Adapters, Grooved Coupling Adapters and Unions, sizes 3/4" through 3"; with new 3/4" and 1" Repair Couplings.

### Complete Size Range of CPVC Pipe

Spears® **FlameGuard®** CPVC Fire Sprinkler Pipe is available in sizes 3/4" to 3". Conforms to ASTM F 442 standard for SDR 13.5 CPVC pipe.



### Spears® Solvent Cements & Thread Sealant

**FlameGuard®** products should be installed using Spears® FS-5 One-Step Solvent Cement. For threaded joints, use Spears® **BLUE 75™** Thread Sealant that has been tested for compatibility with **FlameGuard®** CPVC Fire Sprinkler Products. Spears® **TorqueSafe™** Gasket Sealed Adapter requires no sealant. Consult sprinkler head manufacturer prior to use.





**SPEARS® MANUFACTURING COMPANY**  
CORPORATE OFFICE  
15853 OLDEN STREET • SYLMAR, CALIFORNIA 91342  
MAILING ADDRESS: P.O. BOX 9203 • SYLMAR, CALIFORNIA 91392  
Telephone (818) 364-1611 • Fax (818) 364-6945  
[www.spearsmfg.com](http://www.spearsmfg.com)

## **CERTIFICATE OF COMPLIANCE**

### **FLAMEGUARD® CPVC FIRE SPRINKLER PRODUCTS**

Spears® FlameGuard® CPVC Fire Sprinkler Products are fully tested and approved for use in wet pipe fire sprinkler systems by Underwriters Laboratories Inc., FM Global and the Loss Prevention Certification Board.

FlameGuard® CPVC Fire Sprinkler Products are approved for use in Low Pressure Dry Pipe and Pre-Action Systems by Underwriters Laboratories Inc.

FlameGuard® CPVC Fire Sprinkler Products are listed by NSF International for use in potable water systems.

FlameGuard® CPVC Fire Sprinkler Products may be used only in connection with UL®, FM and NSF® certified CPVC products of other manufacturers. Use of Spears® FlameGuard® CPVC Fire Sprinkler Products in connection with CPVC products of other manufacturers which are not UL®, FM and NSF® certified may result in inappropriate product application and inconsistent determinations in the event of warranty claims.

Spears® Manufacturing Company recommends that our FlameGuard® CPVC Fire Sprinkler Products be used in accordance with their listings and installed according to the manufacturer's installation instructions, NFPA Standards 13, 13R & 13D & local codes.

Alan Lunt  
Vice President, Technical Services  
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January 2016





# FlameGuard®, LabWaste® and EverTUFF® CTS CPVC Installer Protection Plan Approved Products List

Updated 10-05-2016

FGAPL-7

The following commercial products have been tested and evaluated by Spears® for acceptable use with Spears® CPVC Products:

## 1. Firestop Sealants, Caulks & Sleeves

- Boss Fire & Safety - FireMastic-HPE Firestop Sealant
- Boss Fire & Safety - FireMastic-300 Firestop Sealant
- Boss® Products - BOSS® 813 Firestop
- Boss® Products - BOSS® 816 Intumescent Firestop Sealant
- Boss® Products - BOSS® 333 Polyurethane Expanding Foam
- Hilti - FS-One High Performance Intumescent Firestop Sealant
- Hilti - FS-One Max High Performance Intumescent Firestop Sealant
- Hilti - CP 606 Flexible Firestop Sealant
- Hilti - CP 601S Elastomeric Firestop Sealant
- Hilti - CP 506 Smoke and Acoustic Sealant
- Hilti - CFS-S SIL GG Firestop Sealant
- Jayco Firestop™
- Specified Technologies (STI) – SpecSeal® SSS Sealant
- Specified Technologies (STI) – SpecSeal® LCI Sealant
- Specified Technologies (STI) – BlazeStop™ WF300 Intumescent Firestop Caulk
- Specified Technologies (STI) – SpecSeal® LC Sealant
- Specified Technologies (STI) – SpecSeal® SIL Sealant
- Specified Technologies (STI) – SpecSeal® SIL S/L Sealant
- Specified Technologies (STI) – SpecSeal® SNS Sealant
- Specified Technologies (STI) – SpecSeal® AS Spray
- Specified Technologies (STI) – SpecSeal® SNS Spray
- FPPI/Tremco® – Caulk & Walk Firestop Sealant
- 3M™ Fire Barrier Water Tight Sealant 1003 SL
- 3M™ Fire Barrier Water Tight Sealant 1000 NS
- 3M™ Fire Barrier Water Tight Sealant 3000 WT
- 3M™ Fire Barrier Sealant IC 15WB+
- 3M™ Ultra GS Wrap Strip GS-40 Firestop Wrap
- RectorSeal® Metacaulk® 1000 Firestop Sealant
- RectorSeal® Metacaulk® MC 150+ Firestop Sealant
- RectorSeal® Metacaulk® 350i Firestop Sealant
- Walraven BIS Pacifyre® MK II Fire Sleeve Insulation
- White Lightning® Flame Buster®
- Handi-Foam® Fireblock Sealant by Fomo Products, Inc.
- Dow® – Great Stuff “Gaps & Cracks” Foam Sealant (non-professional version)
- Dow Corning® 795 Silicone Building Sealant

## 2. Fire Barriers

- Flame Safe Fire Poly FPCC
- Contego Fire Barrier Latex Primer

FlameGuard<sup>®</sup>, LabWaste<sup>®</sup> and EverTUFF<sup>®</sup>  
CTS CPVC Installer Protection Plan  
Approved Products List  
Updated 10-05-2016

**3. Antifreeze**

- Follow NFPA Guidelines – DO NOT use Glycol antifreeze solutions.
- J. C. Whitlam Frost-Proof GL48

NOTE: Not a Listed Antifreeze per NFPA Requirements, contact local AHJ for approval

**4. Anti MIC Coated Antimicrobial Metal Pipe**

NOTE: Factory applied coatings only, after market coatings are NOT covered.

**Antimicrobial Internally Coated Steel Pipe on Hybrid Systems**

FM Approvals is one of several nationally recognized testing laboratories in the United States and offers information on the compatibility of antimicrobial internally coated steel pipe. FM's approval relates only to the acceptability of manufacturer's applied anti-mic coatings to steel pipe. [Click Here for FM Approvals](#) (Requires Website Registration)

**5. Thread Sealants**

- Spears<sup>®</sup> BLUE 75<sup>™</sup> Thread Sealant
- Generic: PTFE Tape Thread Sealant (3.5 mil minimum), or use Spears<sup>®</sup> Gasket Sealed SofTorque<sup>™</sup> and TorqueSafe<sup>™</sup> head adapters that require NO Tape or Paste.
- FPPI<sup>®</sup> PipeFit<sup>®</sup> Thread Sealant
- J.C. Whitlam Blue Magic Industrial Thread Compound
- J. C. Whitlam Talon PTFE Compound Zero V.O.C Thread Sealant
- Permabond<sup>®</sup> LH056 Thread Sealant - For metal threads only. Approved for use in combination with metal systems.
- Mill-Rose Blue Monster<sup>™</sup> Heavy-Duty Industrial Grade with PTFE
- Mill-Rose Blue Monster<sup>™</sup> Paste Thread Sealant
- RectorSeal<sup>®</sup> T Plus 2 Pipe Thread Sealant with PTFE
- Oatey Great White Pipe Joint Compound with PTFE
- LA-CO<sup>®</sup> Leak-Tite<sup>®</sup> Blue
- LA-CO<sup>®</sup> Slick-Tite<sup>®</sup> Paste with PTFE

**6. Thread Anti-Seize**

- IMS High Heat Copper Flake Thread Lube and Anti-Seize #103783
- LA-CO EZ Break<sup>®</sup> Copper Grade

**7. Cutting Oils**

- Fire Protection Products, Inc. (FPPI<sup>®</sup>) - ThreadFit<sup>®</sup> Clear Cutting Oil
- Ridgid<sup>®</sup> Company - Ridgid<sup>®</sup> NU Clear
- Lube-Tech<sup>®</sup> / Lubrication Technologies - Ace Transul-Kut 3200
- Walker industries - CL-Free Plus
- Brecco Brecoil

**8. Gasket Lubricant**

- FPPI<sup>®</sup> LubeFit Gasket Lubricant

**9. Foam Insulation**

- Nomaco<sup>®</sup> Imcolock<sup>®</sup> Foam Insulation
- Nomaco<sup>®</sup> Nomalock<sup>®</sup> Foam Insulation
- Hilti CF 810 CJ Insulating Foam
- Hilti CF-AS CJP Insulating Foam

FlameGuard<sup>®</sup>, LabWaste<sup>®</sup> and EverTUFF<sup>®</sup>  
CTS CPVC Installer Protection Plan  
Approved Products List  
Updated 10-05-2016

**10. Wood Protectant Coatings**

- Eco Building Products – Eco Red Shield™
- Anabec Systems newBUILD White
- Anabec Systems newBUILD Clear
- Anabec Systems newBUILD Blue
- Anabec Systems X70 Clear
- Anabec Systems X70 White
- Anabec Systems X70 Blue
- Anabec Systems X90

**11. Hangers/Supports\***

- Clic<sup>®</sup> (NOTE: Clic hangers are not approved for FlameGuard<sup>®</sup> applications)
- Tolco
- B-Line
- PHD Manufacturing<sup>®</sup>

\*It is the installing contractor's responsibility to ensure that the hangers & supports used are appropriate for the application and have any and all required listings and/or approvals

**12. Miscellaneous Ancillary Products**

- 3M™ Super 77™ Multipurpose Spray Adhesive
- Hart/Cooley F114 Residential Series Flexible Air Ducts
- Fiberlock AfterShock Fungicidal Coating
- InCide Technologies "Board Defense" Insecticide, Termiticide and Fungicide.
- FlexHead Flexible Drops (For FlameGuard<sup>®</sup> only)
- Erico Caddy Easy Snap Grommet
- Kolbi Wrap Around Pipe Marker
- Henkel OSI SC-175 Draft and Acoustical Sound Sealant
- Atco Flexible Duct System
- K-Flex<sup>®</sup> Isul-Tube<sup>®</sup>
- Skyline 5S105 Strapping Tape
- Abatix<sup>®</sup> Max<sup>®</sup> Heavy-Duty Spray Adhesive
- Ward Flex CSST Gas Tubing
- Raychem XL-Trace Heat Cable with Tape
- HDX Black 3.5 mil Plastic Sheeting
- Victaulic<sup>®</sup> Vic-Flex™ Sprinkler Fittings Series AH2 Braided Flexible Hose
- Victaulic<sup>®</sup> VicFlex™ Dry Sprinkler Style VS1



FlameGuard<sup>®</sup>, LabWaste<sup>®</sup> and EverTUFF<sup>®</sup>  
CTS CPVC Installer Protection Plan  
Approved Products List  
Updated 10-05-2016

**This Installer Protection Plan does NOT cover:**

- Pipe that has been allowed to freeze by homeowner or contractor.
- “Acts of God”, i.e., tornadoes, earthquakes, landslides, etc.
- Poor workmanship and installation errors.

Spears<sup>®</sup> laboratory testing has shown these products to be compatible with satisfactory performance in normal installation of CPVC products. However, the potential for compatibility problems can be present in installations where CPVC materials are highly stressed. Such situations include, but are not limited to, inadequate compensation for thermal expansion and contraction, excessive bending beyond specified limits, improper pipe hanger or anchor selection or installation, over tightening of threaded joints, and other improper CPVC installation practices yielding high stress loads. Proper installation of each product in accordance with the manufacturer’s published Installation Instructions, Spears<sup>®</sup> FlameGuard<sup>®</sup> CPVC Fire Sprinkler Products Installation Instructions, EverTUFF<sup>®</sup> CTS CPVC Installation Instruction, and LabWaste<sup>®</sup> CPVC Corrosive Waste Drainage System Installation Instructions is essential. PLEASE NOTE: Not all products listed are suitable for all applications. Check product requirements.



# **CPVC**

## **Fire Sprinkler Products**

### **INSTALLATION INSTRUCTIONS**



**Visit our website:**  
**[www.spearsmfg.com](http://www.spearsmfg.com)**

## **FlameGuard® LIMITED LIFETIME WARRANTY**

Except as otherwise mandated by law or herein provided, Spears® Manufacturing Company ("Company") warrants Standard Catalog Products ("Products") which have been directly manufactured by them to be free from defects in material and workmanship for as long as the original intended end user of the Products ("End User") retains ownership and possession of the Products and complies with this Warranty ("Warranty Period"). Products installed with pipe, fittings, valves, solvent cements, threads sealants or other related products, not manufactured by this company, are subject to review and may be exempt at the sole discretion of the Company. Each other person or entity acquiring or employing the Products, including buyers, contractors and installers ("Buyer") and End Users ("Buyer/End User") agrees that this Warranty shall be effective only during the Warranty Period so long as the Products are used solely for the normal purposes for which they are intended and in conformance with industry established standards, engineering, installation, operating, and maintenance specifications, recommendations and instructions including explicit instructions by the Company; the Products are properly installed, operated and used, and have not been modified; and all the other terms of this Warranty are complied with. Any violation thereof shall void this Warranty and relieve Company from all obligations arising from this Warranty and the Products.

Upon receipt or discovery of any Products that appear questionable or defective each Buyer/End User shall promptly inspect and return any such Product to the Company at 15853 Olden Street, Sylmar, California 91342, accompanied by a letter stating the nature of any problems. If the Products are determined by Company to be defective in materials or workmanship directly provided by Company, Company, at its sole option, may either repair or replace the defective Products, or reimburse applicable Buyer/End User for the cost of such Products. The applicable Buyer/End User shall bear all applicable shipping costs. THIS SHALL BE BUYERS/END USERS' SOLE REMEDY. EACH BUYER/END USER AGREES THAT COMPANY WILL NOT BE RESPONSIBLE FOR ANY OTHER OBLIGATIONS RELATING TO THE PRODUCTS, INCLUDING ANY OTHER MATERIALS OR LABOR COSTS, LOSS OF USE OR ANY OTHER ITEM OR FOR ANY DELAYS IN COMPLYING WITH THIS WARRANTY BEYOND COMPANY'S REASONABLE CONTROL.

**COMPANY SHALL NOT BE LIABLE FOR, DOES NOT ASSUME, AND EXPRESSLY DISCLAIMS, ANY LIABILITY, RESPONSIBILITY AND DAMAGES: DUE TO ANY BUYER/END USER'S FAILURE TO COMPLY WITH THIS WARRANTY, INCLUDING IMPROPER INSTALLATION, USE OR OPERATION; USE WITH PRODUCTS FROM OTHER MANUFACTURERS THAT DO NOT MEET ASTM OR OTHER APPLICABLE PRODUCT STANDARDS; IMPROPER CONTROL OF SYSTEM HYDRAULICS, IMPROPER WINTERIZATION PROCEDURES, IMPROPER VOLTAGE SUPPLY, CONTACT WITH INCOMPATIBLE MATERIALS OR CHEMICALS, EXCAVATION/ DIGGING, EXCESSIVE WEIGHT, AND VANDALISM; DUE TO REASONABLE WEAR AND TEAR AND DUE TO ANY ACTS OF NATURE, INCLUDING LIGHTNING, EARTHQUAKES, GROUND MOVEMENT, FROST HEAVE, OR FLOODS.**

**COMPANY EXTENDS ONLY THIS WARRANTY AND EXPLICITLY DISCLAIMS ALL OTHER WARRANTIES, WHETHER IMPLIED OR OTHERWISE EXPRESSED, WHETHER ORAL, STATUTORY OR OTHERWISE, INCLUDING ANY IMPLIED WARRANTIES OR AFFIRMATIONS FOR SUITABILITY, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. NO AFFIRMATION BY COMPANY OR ANY OF ITS REPRESENTATIVES, BY WORDS, CONDUCT OR OTHERWISE, SHALL CONSTITUTE A WARRANTY. THIS WARRANTY MAY NOT BE TRANSFERRED, EXTENDED, ALTERED OR OTHERWISE MODIFIED IN ANY MANNER, EXCEPT BY WRITTEN AGREEMENT SIGNED BY COMPANY.**

**BY ITS ACCEPTANCE OF THE PRODUCTS, EACH BUYER/END USER EXPRESSLY WAIVES ALL OTHER LIABILITY OR OBLIGATION OF ANY KIND OR CHARACTER OF COMPANY, INCLUDING LIABILITY PREDICATED UPON CONTRACT, TORT, STRICT LIABILITY OR OTHER LEGAL OR EQUITABLE GROUNDS, AND ALL, IF ANY, DAMAGES AND LOSSES AS A RESULT THEREOF, INCLUDING ALL, IF ANY, COMPENSATORY, GENERAL, SPECIAL, CONSEQUENTIAL, INCIDENTAL, OR PUNITIVE DAMAGES. WITH RESPECT TO SUCH WAIVERS, EACH BUYER/END USER EXPLICITLY WAIVES CALIFORNIA CIVIL CODE §1542 WHICH STATES "A GENERAL RELEASE DOES NOT EXTEND TO CLAIMS WHICH THE CREDITOR DOES NOT KNOW OR SUSPECT TO EXIST IN HIS FAVOR AT THE TIME OF EXECUTING THIS RELEASE, WHICH IF KNOWN BY HIM MUST HAVE MATERIALLY ADVERSELY AFFECTED HIS SETTLEMENT WITH DEBTOR" AND ALL OTHER SIMILAR STATUTORY, COMMON AND CASE LAW RIGHTS, DEFENSES AND LIMITATIONS.**

Having previously independently inspected the Products, or a sample, as fully as desired, or having the opportunity to and having not done so, upon acceptance of delivery of the Products, and except as otherwise herein explicitly provided, each Buyer/End User by acceptance or use of the Products accepts them in their "AS IS" and "WITH ALL FAULTS" condition without any other warranty, expressed, implied or otherwise, and accepts and assumes the entire risk and cost of all servicing, remediation and consequences thereof. This Warranty shall be governed by California law and any unenforceable provisions severed without affecting the remaining provisions. As used herein, "including" includes "without limitation."

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## IMPORTANT INFORMATION

*Please Read the Following Section Before Proceeding*

### Use of this Manual

Spears® FlameGuard® CPVC Fire Sprinkler Products are approved for use in combination with other listed manufacturers' products (see, "Use With Other Manufacturers' Pipes, Fittings, and Solvent Cements" section). However, specific application approvals may not be the same amongst manufacturers. **It is the installer's responsibility to verify suitability of products used in combination according to each manufacturer's installation instructions.** Engineering data related to the installation and use of CPVC Fire Sprinkler Pipe provided in this manual is based on product manufactured by Spears® Manufacturing Co. (Spears® FlameGuard®). If products other than Spears® are used, follow the appropriate manufacturer's installation instructions. Contact Spears® if questions on any application are not addressed in this manual.

This manual is intended for use by specifiers, installers, and users in the selection, design, installation, and inspection of Spears® FlameGuard® CPVC Fire Sprinkler Products for fire protection service. Due to the critical safety and loss prevention uses of such systems, all information contained herein is considered vital to obtain proper system performance and **must be read and understood carefully before starting the installation.** The information contained within this manual is accurate at the time of publication to the best of our knowledge. It is not meant as a replacement for formal installer training. We do not make any guarantees nor assume any liabilities arising out of its use. If you need additional copies, or if you have any questions about the safe installation and use of these products, contact Spears® Manufacturing Company, P.O. Box 9203, Sylmar, CA 91392 or call (800) 862-1499. Additional copies of this manual may be downloaded from our web site: [www.spearsmfg.com](http://www.spearsmfg.com).

### Hazards & Information Definitions

Definitions for identifying the various hazard levels are as follows:

- **WARNING** - The use of the word "WARNING" identifies the presence of hazards or unsafe practices that could result in severe personal injury if instructions, including recommended precautions, are not followed.
- **CAUTION** - The use of the word "CAUTION" identifies possible hazards or unsafe practices that could result in personal injury, product damage, and/ or property damage if instructions, including precautions, are not followed.
- **NOTICE** - The use of the word "NOTICE" identifies special instructions that are highly important but not related to hazards.
- Text information in bold print – **Text in bold print identifies additional important information that may or may not be related to a hazard, according to the topic and context.**

### System Engineering, Installation & Maintenance

CPVC Fire Sprinkler Systems must be engineered, installed and maintained in accordance with local codes, standards and Spears® FlameGuard® CPVC Fire Sprinkler Products Installation Instructions. Code requirements and field conditions may differ. It is the responsibility of the installing contractor to ensure that the product is suitable for the intended use and that all requirements have been satisfied.

## Installer Training

Spears® Manufacturing Company recommends that installers receive proper installation training and that training be renewed every two (2) years. Training will be provided at no charge by contacting an authorized Spears® FlameGuard® CPVC Fire Sprinkler Products distributor or your nearest Spears® Regional Distribution Center.

## General Installation Safety Instructions

- Use only recommended accessories. Use of improper accessories or unapproved system components in conjunction with Spears® FlameGuard® CPVC Fire Sprinkler Products will void the warranty and may result in improper operation of the system.
- **CAUTION:** Avoid dangerous environments. If utilizing electrically powered tools for installation, be sure that the area is free of moisture or wetness that could create an unsafe condition. Keep work area clean and well illuminated. Allow sufficient space for measuring and system dry-fit to accommodate proper installation.
- Prevent back injury. Always practice safe lifting and installation techniques.
- Use only tools specifically designed for plastic pipe and fittings.
- Inspect the products. Be sure that all parts are included and that you have all necessary tools available to properly install the system.

**CAUTION:** Follow all workplace safety requirements. Wear safety glasses, hardhat, and safety footwear. Always practice safety first.

- When solvent cementing, always work in a well-ventilated area. Avoid sources of heat or open flames. DO NOT smoke. Wear protective gloves. PVA-coated protective gloves are recommended for use while solvent cementing. If hands come in contact with solvent cement, use a waterless, abrasive soap.
- Wear ear protection. Protect your hearing if you are exposed to long periods of very noisy job-site operations.

## INTRODUCTION



Spears® FlameGuard® CPVC Fire Sprinkler Products are manufactured from high quality, Post-Chlorinated Poly Vinyl Chloride (CPVC), a specialty thermoplastic material tested and approved by certifying agencies for use in CPVC fire sprinkler systems. Spears® FlameGuard® CPVC Fire Sprinkler Products provide unique advantages over traditional metal fire sprinkler systems through superior hydraulics, ease of installation and handling and quick assembly using readily available, inexpensive tools.

## Handling & Storage

### Pipes & Fittings

Spears® FlameGuard® CPVC Fire Sprinkler Products resist attack from a large group of chemicals that are corrosive to metallic piping. However, care must be taken to avoid contact with chemicals that are harmful to CPVC including those found in some common construction products. Specific chemicals or chemical vapors that contact CPVC can weaken or severely damage the system. Consult with the chemical manufacturer or Spears® before use.

**WARNING: DO NOT expose Spears® FlameGuard® CPVC Fire Sprinkler Products to edible oils, esters, ketones, or petroleum-based products, such as cutting oils, packing oils, traditional pipe thread pastes or dopes, and some lubricants. Do not store or install CPVC products in direct contact with plasticizer containing materials such as electrical tape or certain wire and cable insulations. Consult with the chemical manufacturer for compatibility with CPVC or Spears® before use. Contact with incompatible chemicals could cause serious personal injury, property damage, and product damage.**

Spears® FlameGuard® CPVC Fire Sprinkler Pipe should be stored indoors with a maximum storage temperature of 110° F (43° C). If storing outdoors, the products must be covered with a non-transparent material to prevent extended exposure to sunlight. Brief exposure to direct sunlight on the job site may result in color fade, but it will not affect the physical properties. Spears® FlameGuard® CPVC Fire Sprinkler Fittings should be stored indoors in their original containers to keep them free from dirt and to help reduce the possibility of damage.

**WARNING: Spears® FlameGuard® CPVC Fire Sprinkler Products must not be subjected to prolonged sunlight exposure. The use of pipe and fittings that have been damaged due to improper storage could cause serious personal injury, property damage, and product damage.**

Reasonable care must be exercised in handling Spears® FlameGuard® CPVC Fire Sprinkler Products. DO NOT drop the products or drop anything on them.

**WARNING: DO NOT install Spears® FlameGuard® CPVC Fire Sprinkler Products that have been scratched, split, or gouged. The use of pipe and fittings that have been damaged due to improper handling could cause serious personal injury, property damage, and product. Damaged fittings or sections of pipe must be discarded**

### One-Step Solvent Cement

Spears® FS-5 One-Step Low VOC Solvent Cement must be stored out of direct sunlight in an ambient temperature between 40° F (4° C) and 90° F (32° C). The solvent cement may be used for a period of two years from the date stamped on the container. Expired solvent cement must be discarded in an environmentally friendly fashion, in accordance with local regulations. To prolong the life of the cement, the containers must be kept tightly closed when not in use and covered as much as possible when in use.

#### **WARNING:**

- **Spears® FS-5 One-Step Low VOC Solvent Cement is highly flammable. Eliminate all ignition sources.**
- **Avoid breathing vapors. Use only with adequate ventilation. Explosion-proof, general mechanical ventilation or local exhaust is recommended to maintain vapor concentrations below**

recommended exposure limits. In confined or partially enclosed areas, a NIOSH approved organic vapor cartridge respirator with a full face-piece is recommended. Avoid frequent contact with skin. It is recommended that you wear PVA coated gloves and an impervious apron.

- Avoid contact with eyes. Splash-proof chemical goggles are recommended.
- Review the Material Safety Data Sheet (MSDS) and the important product information provided on the label for Spears® FS-5 One-Step Low VOC Solvent Cement.
- Failure to follow the above recommendations could result in death or serious personal injury.

## **Listings, Approvals, Application & Use**

Spears® FlameGuard® CPVC Fire Sprinkler Products are fully tested and approved for use in wet pipe fire sprinkler systems by Underwriters Laboratories Inc., FM Global, and the Loss Prevention Certification Board. Spears® FlameGuard® CPVC Fire Sprinkler Products are approved for use in low pressure dry pipe or pre-action systems by Underwriters Laboratories Inc. Spears® FlameGuard® CPVC Fire Sprinkler Products are listed by NSF International for use in potable water systems, except where specifically stated otherwise. For specific listing information not covered in this manual concerning Factory Mutual, The Loss Prevention Certification Board or NSF International, please contact your nearest Spears® Regional Distribution Center.

**NOTICE:** National Fire Protection Association (NFPA) Standards 13, 13R, and 13D is the authority on fire sprinkler system design and installation and must be referenced in conjunction with this manual and all local codes. This manual is reviewed and approved by Underwriters Laboratories and all UL/ULC statements herein are considered an extension of Spears® FlameGuard® UL Listings

**CAUTION:** Spears® FlameGuard® CPVC Fire Sprinkler Products are NOT listed for outdoor applications. Outdoor installation could result in product failure and property damage and will not be covered under the Spears® FlameGuard® CPVC Fire Sprinkler Products warranty.

**CAUTION:** Spears® FlameGuard® CPVC Fire Sprinkler Products are to be used in wet pipe systems only, except as provided for dry pipe or pre-action systems in this manual. A wet pipe system is one that contains water and is connected to a water supply system so that the water will discharge immediately when the sprinkler is opened. A low pressure dry pipe or pre- action system is a piping system containing air or nitrogen under pressure that is released with the opening of a sprinkler which activates a special dry pipe valve allowing water to flow into the piping system and to the open sprinkler.

**WARNING:** Spears® FlameGuard® CPVC Fire Sprinkler Products must never be used for distribution of compressed air or other gases except as provided for under Low Pressure Dry Pipe and Pre-action Systems specified in this manual. Failure to follow this warning could result in product failure, property damage and severe personal injury or death.

### **Light Hazard Occupancies**

Spears® FlameGuard® CPVC Fire Sprinkler Products are UL Listed for use in Light Hazard Occupancies, as defined in the NFPA 13. In accordance with NFPA 13, 2016 Edition paragraph 6.3.9.6, "Non-Metallic pipe listed for light hazard occupancies shall be permitted to be installed



in ordinary hazard rooms of otherwise light hazard occupancies where the room does not exceed 400 square feet.” NOTICE: Local jurisdictions must approve of this exception.

**Residential Occupancies**

Spears® FlameGuard® CPVC Fire Sprinkler Products are UL Listed for use in: Residential occupancies up to and including four stories in height, as defined in NFPA 13R.

Residential occupancies, as defined in the Standard for the Installation of Sprinkler Systems in One and Two-Family Dwellings and Manufactured Homes, NFPA 13D.

**Low Pressure Dry Pipe and Pre-action Systems**

In accordance with the UL® Listing, Spears® FlameGuard® CPVC Fire Sprinkler Products may be used in Low Pressure Dry Pipe and Pre-action System applications in Light Hazard and Residential occupancies in accordance with NFPA 13, 13D and 13R when subject to the following additional limitations:

A CPVC Low Pressure Dry Pipe or Pre-action System is a piping system intended for use where piping could be subjected to freezing temperatures and water filled pipe cannot be utilized. The minimum rated temperature is -20° F (-29° C). Low Pressure Dry Pipe systems contain compressed air or nitrogen (gas) having an internal gage pressure of not more than 15 psig (105 kPa). These specially designed systems require separate control valve mechanisms for this application (supplied by others) that activate to release water into the dry piping section and to the sprinkler heads. The water-filled portion of the system control device must be in an area protected from freezing. It is the installer’s responsibility to be sure the system is installed in accordance with the limitations of this manual and specifications of a Dry Pipe or Pre-action Fire Sprinkler System Design Engineer for proper control devices, pipe sizing, and other important design and maintenance criteria applicable to each project. CPVC dry systems must be designed with the following maximum water delivery time delay.

Occupancy Hazard*	Remote Sprinklers Open	Water Delivery Delay, sec.
Residential	1	15
Light	1	60

\*As described in NFPA 13, Standard for the Installation of Sprinkler Systems.

Spears® FlameGuard® CPVC Fire Sprinkler Products are UL® Listed for use in Dry Pipe or Pre-action type systems when installed with UL® Listed Spears® FlameGuard®, or BlazeMaster® brands of CPVC Fire Sprinkler Products that are also Listed for this application.

CPVC installation in a Dry Pipe or Pre-action sprinkler system must be concealed (protected) by either:

- (1) A 3/8 in. thick or thicker gypsum wallboard;
- (2) A suspended membrane ceiling with lay-in panels or tiles having a weight of not less than 0.35 lb/ft2 when installed with metallic support grids; or
- (3) 1/2 in. plywood soffits.

CPVC pipe and fittings used in a Dry Pipe or Pre-action System are not for use in combustible concealed spaces where sprinklers are required by NFPA 13, 13D and 13R.

Pipe and fittings are for indoor use only, down to a minimum temperature of -20° F (-29° C).

CPVC pipe in Dry Pipe or Pre-action Systems must be installed with proper pitch to allow system drainage for removal of water. NFPA 13 requires a minimum pitch of 1/2 inch per 10 feet (4 mm/m) for main lines and branch lines in areas subject to freezing.

The following types of sprinklers and arrangements shall be permitted for dry pipe systems, current NFPA 13:

- (1) Upright sprinklers;
- (2) \*Listed dry sprinklers;
- (3) Pendent sprinklers and sidewall sprinklers installed on return bends, where the sprinklers, return bend, and branch line piping are in an area maintained at or above 40° F (4° C);
- (4) Horizontal sidewall sprinklers installed so that water is not trapped;
- (5) Pendent sprinklers and sidewall sprinklers, where the sprinklers and branch line piping are in an area maintained at or above 40° F (4° C), the water supply is potable, and the piping for the dry pipe system is copper or CPVC specifically listed for dry pipe applications.

Residential sprinklers used in CPVC Dry Pipe Systems shall be specifically listed for such use.

Low Pressure Dry Systems have a maximum installed air pressure of 15 psi (1 BAR). Air (or Nitrogen) supply for charging the system must be filtered, clean, oil-free, and must be pressure regulated to assure that the 15 psi (1 BAR) pressurization is not exceeded.

**WARNING – Oil in the air (or Nitrogen) supply can cause environmental stress cracking in CPVC materials.**

**WARNING – Over pressurization can result in system damage or serious injury.**

The system must be hydrostatically tested in accordance with System Acceptance Testing (Hydrostatic Pressure Test) as specified in this manual.

## **Concealed Installations**

In concealed installations, the minimum protection shall be one layer of 3/8-inch gypsum wallboard, 1/2-inch plywood soffits, or a suspended membrane ceiling with lay-in panels or tiles having a minimum weight of not less than 0.35 lbs/ft<sup>2</sup> when installed with metal support grids. The minimum protection for residential occupancies, defined in NFPA 13D and 13R, may consist of one layer of 1/2-inch plywood.

Spears® FlameGuard® CPVC Fire Sprinkler Products must be used in sprinkler systems employing sprinkler heads rated at 225° F (107° C) or lower.

### **NOTICE**

- Spears® FlameGuard® CPVC Fire Sprinkler Products CANNOT be installed
- in spaces designated by NFPA 13 as combustible, concealed spaces that require sprinklers, unless the space is protected by sprinklers that are specifically Listed for the application.
- NFPA 13D and NFPA 13R permit the omission of sprinklers in combustible, concealed spaces. Spears® FlameGuard® CPVC Fire Sprinkler Products can be installed in these areas when sprinkling residential occupancies in accordance with these standards.

## **Combustible Concealed Installations with Specific Use Sprinklers**

In accordance with UL Listing, Spears® FlameGuard® CPVC Fire Sprinkler Products can be used in specific light-hazard, combustible and noncombustible concealed spaces that require sprinkler protection when installed with UL Listed specific application sprinklers. The system must be installed in accordance with the applicable sprinkler manufacturer's information contained in their designated data sheets shown in parenthesis "( )". These include: Victaulic Model V2502 (Submittal 40.09, Rev D) Upright Quick Response Sprinkler; Tyco Fire Products Model CC1 – 2.8 K-Factor (TFP630, July 2015) or Model CC2 – 5.6 K-Factor (TFP632, August 2016) or Model CC3 – 4.2 and 5.6 K-Factor (TFP633, December 2016) Combustible Concealed Space Sprinklers, Specific Application Upright; Viking VK900 COIN™ (Form F\_110503 16.12.22 Rev 16.1) or VK901 COIN™ (Form F\_021607 16.12.22 Rev 16.1) or VK950 COIN™ (Form F\_081216 16.12.15 Rev 16.1) Quick Response Upright Sprinklers for Specific Application; Reliable Model KFR-CCS 5.6 K-Factor (Bulletin 044 Rev C) Combustible Concealed Space Upright Sprinkler; and Globe Model "IC" GL5608 (Bulletin GL5608, September 2015) Interstitial Combustible Specific Application Upright Sprinkler.

**NOTICE:** When installing Spears® FlameGuard® CPVC Fire Sprinkler Products in combustible concealed areas where sprinklers are required, the specific application sprinkler must be used in accordance with its UL Listing. Contact the local authority having jurisdiction with questions concerning code requirements.

## **Combustible Attic Spaces with Specific Use Sprinklers**

### **Product Description**

In accordance with the UL Listing, Spears® FlameGuard® CPVC Fire Sprinkler Products may be installed within the attic space provided the attic space is protected with UL Listed Specific Application Attic Sprinklers. Specific Application Attic Sprinklers are sprinklers designed to provide protection of specific light hazard combustible, as well as non-combustible, attic spaces requiring sprinkler protection.

### **Installation Requirements**

When using the Specific Application Attic Sprinklers, Spears® FlameGuard® CPVC Fire Sprinkler Products may be installed to feed the wet system sprinklers below the ceiling and exposed to feed wet system specific application attic sprinklers provided the system is installed in accordance with the applicable sprinkler manufacturer's information contained in their designated data sheets shown in parenthesis "( )". These include: Tyco Fire Products Models BB, SD, HIP and AP (TFP610, August 2014) Specific Application Sprinklers for Protecting Attics; Reliable Models DD56-6, DD26-27, DD80-6 and DD80-27 (Bulletin 056, December 2016) Specific Application, Attic Sprinklers; Viking Model VK696 (Form F\_042815 16.01.28 Rev 16.1) Attic Upright Specific Application Sprinkler or Model V-BB (Form F\_042915 16.08.04 Rev 16.2) Specific Application Attic Sprinkler or Model V-SD (Form F\_043015 16.02.19 Rev 16.1) Specific Application Attic Sprinkler.

### **Exposed Installations**

Spears® FlameGuard® CPVC Fire Sprinkler Products are UL Listed for use in installations without protection (exposed), with the following restrictions:

Exposed CPVC Fire Sprinkler piping is installed below a smooth, flat, horizontal ceiling construction utilizing UL Listed support devices.

- Listed, Quick-Response, ordinary temperature-rated pendent sprinklers having deflectors installed within 8 inches from the ceiling. Listed, Residential, ordinary temperature-rated, pendent sprinklers located in accordance with their Listing. The maximum distance between sprinklers must not exceed 15 feet. The piping must be mounted directly to the ceiling.
- Listed, Quick-Response, ordinary temperature-rated horizontal sidewall sprinklers having deflectors installed within 6 inches from the ceiling and within 4 inches from the sidewall. Listed, Residential, ordinary temperature rated horizontal sidewall sprinklers located in accordance with their Listing. The maximum distance between sprinklers must not exceed 14 feet. The piping must be mounted directly to the sidewall.
- Listed, Quick-Response, upright sprinklers having a maximum temperature rating of 155° F (68° C) must be installed so that the deflectors are a maximum of 4" from the ceiling. The maximum distance from the ceiling to the centerline of the main run of pipe must be 7-1/2". The distance between a hanger and the centerline of an upright sprinkler shall not be less than 3in. (75mm). Rigid pipe hangers secured to the ceiling must be used.

### **Expanded Use with Light Hazard Extended Coverage and Residential Sprinklers**

In accordance with the UL Listing, Spears® CPVC Fire Sprinkler products may be installed without protection (exposed) when subject to the following additional limitations.

The following installations shall be below a smooth, flat, horizontal ceiling construction and require the use of FS-5 one step solvent cement. The piping shall be mounted directly to the sidewall.

Listed quick response, 200° F (93° C) maximum temperature rated, horizontal sidewall sprinklers having deflectors installed within 12 inches (304 mm) from the ceiling and within 6 inches (152 mm) from the sidewall or Listed residential, 200° F (93° C) maximum temperature rated, horizontal sidewall sprinklers located in accordance with their Listing and a maximum distance between sprinklers not to exceed 14 feet (4.27 m).

The following installations shall be below a smooth, flat, horizontal ceiling construction, are limited to unobstructed construction, require the use of Schedule 80 fittings for sizes 1-1/2 in. and greater, and require the use of FS-5 one step solvent cement. The piping shall be mounted directly to the sidewall. • Listed light hazard, extended coverage, quick response, 175° F (79° C) maximum temperature rated, horizontal sidewall sprinklers having deflectors installed within 12 inches (304 mm) from the ceiling and within 6 inches (152 mm) from the sidewall, a maximum distance between sprinklers not to exceed 16 feet (4.87 m), and an application density not less than 0.10 gpm/ft<sup>2</sup> (4.08 mm/min).

- Listed residential, 165° F (74° C) maximum temperature rated, horizontal sidewall sprinklers having deflectors installed within 12 inches (304 mm) from the ceiling and within 6 inches (152 mm) from the sidewall, a maximum distance between sprinklers not to exceed 18 feet (5.48 m), and an application density not less than 0.10 gpm/ft<sup>2</sup> (4.08 mm/min).
- Listed light hazard, extended coverage, quick response 165° F (74° C) maximum temperature rated, horizontal sidewall sprinklers having deflectors installed within 12 inches (304 mm) from the ceiling and within 6 inches (152 mm) from the sidewall, a maximum distance

between sprinklers not to exceed 18 feet (5.48 m), and an application density not less than 0.10 gpm/ft<sup>2</sup> (4.08 mm/min).

- Listed light hazard, extended coverage, quick response, 155° F (68° C) maximum temperature rated, horizontal sidewall sprinklers (manufactured by Reliable Automatic Sprinkler Co. Inc. SIN RA0362) having deflectors installed within 12 inches (304 mm) from the ceiling and within 6 inches (152 mm) from the sidewall, a maximum distance between sprinklers not to exceed 24 feet (7.31 m), and a flow not less than 40 gpm (152 L/min) per sprinkler.

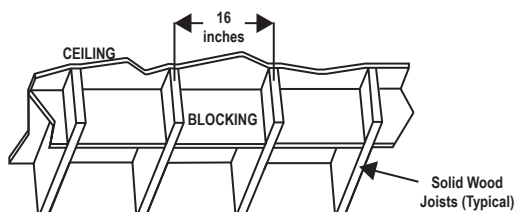
Spears® FG-3 installation instructions must be referenced for complete information regarding installation. Additional requirements may be listed in NFPA 13, 13D and 13R.

### **Unfinished Basements with Exposed Solid Wood Joist**

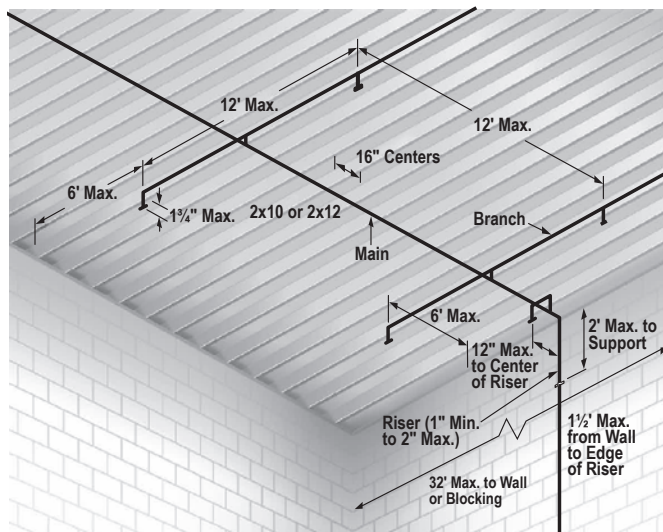
NOTICE: Use of Spears® FlameGuard® CPVC Fire Sprinkler Products is limited to basements where the quantity and combustibility of contents is low and fires with relatively low rates of heat release are expected. Refer to NFPA 13D, "Standard for Installation of Sprinkler Systems in One and Two Family Dwellings and Manufactured Homes", for more information regarding installation in unfinished basements with exposed, solid wood joists.

Spears® FlameGuard® CPVC Fire Sprinkler Products can be installed in unfinished basements with exposed, solid wood joists with the following limitations:

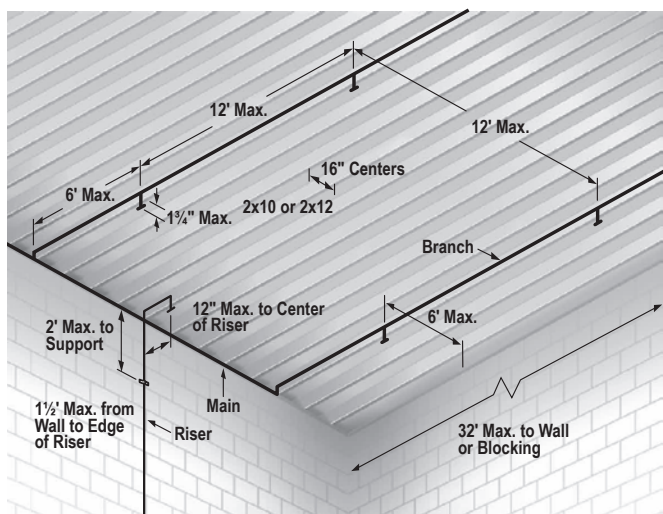
1. The ceiling shall be horizontal and constructed utilizing nominal 2 in. x 10 in. solid wood joists on 16 in. centers.  
- OR -  
The ceiling must be horizontal and constructed utilizing nominal 2 in. x 12 in. solid wood joists on 16 in. centers. When installing Spears® FlameGuard® CPVC Fire Sprinkler Products in conjunction with 2 in. x 12 in. solid wood joists, the maximum system working pressure under flowing conditions must not exceed 100 psi and the maximum system working pressure under non-flowing conditions must not exceed 175 psi.
2. Schedule 80 fittings are required for installations involving 1-1/2" through 3" piping.
3. The distance from the floor to the bottom of the solid wood joists must be between 7 ft and 8 ft.
4. All system mains shall be run perpendicular to the joists. All branch lines shall be run parallel to the joists.
5. When the total protected area exceeds 1,000 square feet, blocking shall be utilized to divide the area into individual compartments not exceeding 1,000 square feet.
6. The maximum length along the joist must not exceed 32 feet. When the length exceeds 32 feet, blocking must be utilized. The blocking must be constructed of minimum 1/2 in. plywood and shall be the full depth of the wood joists. Refer to drawing below.



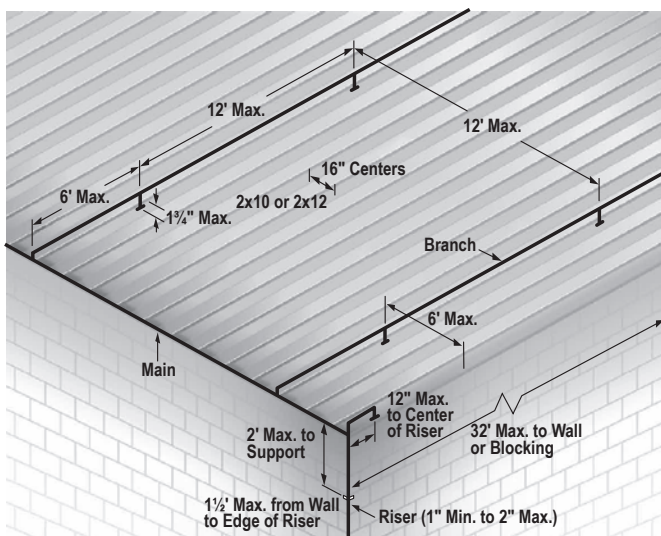
### Center Wall Riser with Center Room Main



### Center Wall Riser with Main at Wall



## Riser in Corner



7. Listed residential pendent sprinklers with a maximum temperature rating of 155° F and a minimum K-factor of 3.0 must be used for this type of installation. **NOTE:** The maximum sprinkler spacing shall not exceed 12 feet.
8. The system must be designed to UL Listed flows for the sprinklers being used. However, the flow must not be less than 11 gpm per sprinkler. Sprinklers must be installed with the deflectors below the solid wood joists for future installation of a finished ceiling. However, deflector placement must not exceed 1-3/4 inches below the solid wood joist (refer to following Figures "A" and "B"). For more information, refer to NFPA 13D, "Standard for Installation of Sprinkler Systems in One and Two Family Dwellings and Manufactured Homes".

Branches Supported with Blocking

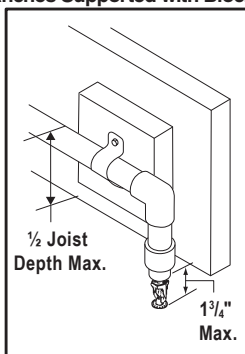


FIGURE "A"

Branches Supported with Hangers

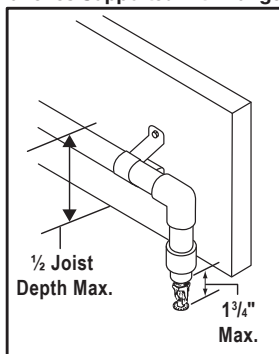


FIGURE "B"



9. When installing Spears® FlameGuard® CPVC Fire Sprinkler Products perpendicular (system mains) to the solid wood joists, UL Listed support devices for thermoplastic sprinkler piping or other UL Listed support devices shall be used which mount the piping directly to the bottom of the solid wood joists. In addition, it is acceptable to cut holes in the solid wood joists at or below the center of the depth of the solid wood joist for support. Holes must be oversized to allow for movement and must be located in an area that will not compromise joist integrity. Consult the authority having jurisdiction for more information regarding structural integrity.
10. When installing Spears® FlameGuard® CPVC Fire Sprinkler Products parallel (branch lines) to the solid wood joists, the pipe and fittings must be installed in the cavity below the bottom of the ceiling and above the bottom of the joist. Branch lines must be located at or below the center of the depth of the solid wood joist. UL Listed support devices must be used to mount piping directly to nominal 2 in. wood blocking. In addition, UL Listed support devices can be used that offset the pipe a nominal distance of 1-1/2 in. from the solid wood joists.

### **Unfinished Basements with Exposed Composite Wood I-Joists or Exposed Solid Wood Joists with Expanded Sprinkler Spacing in accordance with NFPA 13D**

In accordance with UL Listings, Spears® FlameGuard® CPVC Fire Sprinkler Products may be installed without protection (exposed) in unfinished basements in accordance with NFPA 13D when installed to the following additional limitations:

1. The ceiling shall be horizontal and constructed utilizing composite wood I-joists with a nominal depth of 11-7/8 inches on up to 24-inch centers, or utilizing solid wood joists with a nominal size of depth of 12 inches or less on up to 24-inch centers.
2. The distance from the floor to the bottom of the solid wood joist or composite wood I-joists shall be between 7 feet and 10 feet.
3. Listed residential pendent sprinklers with a maximum temperature rating of 155°F and a minimum K-factor of 4.9 are to be used for this installation. The maximum sprinkler spacing shall not exceed 16 feet. The maximum sprinkler coverage area is to be 16 feet by 14 feet spaced with the 16-foot dimension along the joists and the 14-foot dimension across the joists. Lesser areas are also permitted. The system is to be designed based upon the listed flows for the sprinkler selected except that the flow for a single sprinkler or for multiple sprinklers flowing is to be not less than 13 gpm per sprinkler. The sprinklers are to be installed with their deflectors a maximum of 1-3/4 inches below the bottom of the solid wood joist or composite wood I-joists in anticipation of future installation of a finished ceiling. (see NFPA 13D, Section 8.2.4, 2010 Edition)
4. All system mains shall be run perpendicular to the joists. All branch lines shall be run parallel to the joists. Schedule 80 fittings shall be used for sizes 1-1/2 inch and larger.
5. All solvent cement joints shall be made with FlameGuard® FS-5 One Step Solvent Cement (or with competitor TFP-500, BM-5, FP-1000.).
6. When the total protected area exceeds 1,000 square feet, blocking shall be utilized to divide the area into individual compartments not exceeding 1,000 square feet. The maximum length along the joist shall not exceed 32 feet. When the length exceeds 32 feet, blocking shall be utilized. The blocking shall be constructed of minimum 1/2 inch



plywood or batt insulation with a minimum thickness of 3-1/2 inches. These blocking materials shall be the full depth of the joists. When batt insulation is used as blocking, it must be a single piece secured in place with metal wire netting which must encase the insulation on both of the exposed sides. The metal wire netting is required to hold the insulation in place and prevent it from being dislodged or repositioned over time. It is acceptable for items such as piping, wires, ducts, etc. to penetrate the blocking. The gap between the item penetrating the blocking and the blocking should be minimized. For installations where the gap exceeds 1/4 inch, the gap shall be filled with insulation, caulking, or other suitable material.

7. When installing Spears® FlameGuard® CPVC Fire Sprinkler piping perpendicular (system mains) to the joists, listed support devices for thermoplastic sprinkler piping or other listed support devices shall be used which mount the piping directly to the bottom of the solid wood joist or composite wood I-joists. As an alternative to mounting the pipe and fittings below the solid wood joist or composite wood I-joists, it is also acceptable to cut holes in the joists at or below the center of the depth of the joist for support – the holes should be oversized to allow for movement and located to not impair the structural integrity of the joists. Refer to the composite wood I-joist manufacturer's product data for specific instructions concerning the placement of any holes in the joists.

**NOTICE:** When drilling holes in the solid wood joists or composite wood I-joists, the structural integrity must be maintained. Consult the Authority Having Jurisdiction (AHJ) or building code for requirements.

8. When installing Spears® FlameGuard® CPVC Fire Sprinkler piping parallel (branch lines) to the solid wood joist or composite wood I-joists, the pipe and fittings shall be installed in the cavity below the bottom of the ceiling and above the bottom of the joist. The branch lines shall be located at or below the center of the depth of the joist. The pipe shall be installed utilizing listed support devices for thermoplastic sprinkler piping or other listed support devices which mount the piping directly to nominal 2-inch wood blocking or listed support devices for thermoplastic sprinkler piping which offset the pipe a nominal distance of 1-1/2 in. from the joists.

This application for Spears® FlameGuard® CPVC Fire Sprinkler Products is limited to basements where the quantity and combustibility of contents is low and fires with relatively low rates of heat release are expected.

### **Extended Coverage Quick Response Sprinklers**

In accordance with the UL Listing, Spears® FlameGuard® CPVC Fire Sprinkler Products may be installed without protection (exposed) when subject to the following additional limitations:

1. Exposed piping is to be installed below a smooth, flat, horizontal ceiling construction.
2. Listed pendent, light hazard, quick response, extended coverage sprinklers, 155° F maximum temperature rating having deflectors installed within 8 in. from the ceiling and a maximum distance between sprinklers not to exceed 20 ft. with an application density of at least 0.10 gpm/sqft.
3. Listed pendent residential sprinklers, 155° F maximum temperature rating having deflectors installed within 8 in. from the ceiling and a maximum distance between sprinklers not to exceed 20 ft. with an application density of at least 0.10 gpm/sqft.

4. Listed horizontal sidewall, light hazard, quick response, extended coverage sprinklers, 165° F maximum temperature rating having deflectors installed within 6 in. from the ceiling and within 4 in. from the sidewall and a maximum distance between sprinklers not to exceed 18 ft. with an application density of at least 0.10 gpm/sqft.
5. Listed horizontal sidewall residential sprinklers, 165° F maximum temperature rating having deflectors installed within 6 in. from the ceiling and within 4 in. from the sidewall and a maximum distance between sprinklers and not to exceed 18 ft. with an application density of at least 0.10 gpm/sqft.
6. When using fittings in the 1-1/2 in. and greater size only Schedule 80 fittings may be used.
7. The end use application is limited to unobstructed construction.
8. All solvent cement joints shall be made with Spears® FS-5 One Step Solvent Cement, or any other cements referenced on page 23 of this manual.

### **Return Air Plenum Installation**

Spears® FlameGuard® CPVC Fire Sprinkler Products meet the combustibility requirements for thermoplastic sprinkler pipe, as described in the Standard for Installation of Air Conditioning and Ventilating Systems, NFPA 90A. Spears® FlameGuard® CPVC Fire Sprinkler Products may be installed in the plenum space adjacent to, but not over, an opening in the ceiling, such as a ventilation grill.

### **Garage Installations**

Spears® FlameGuard® CPVC Fire Sprinkler Products are suitable for use in garages requiring sprinklers, as defined in NFPA 13R, with the following requirements:

Minimum protection consisting of either one layer of 3/8-inch thick gypsum or 1/2-inch thick plywood must be provided.

Listed pendent or sidewall sprinklers with a maximum temperature rating of 225° F (107° C) must be used.

All sprinklers must be installed per the manufacturer's published installation instructions.

The system must be installed per the requirements of NFPA 13R and these installation instructions.

### **Ambient Temperature Limitations**

Spears® FlameGuard® CPVC Fire Sprinkler Products are suitable for use in areas where ambient temperatures are within the range of 35° F (2° C) to 150° F (65° C). The Loss Prevention Certification Board (LPCB) listing states the maximum ambient temperature shall not exceed 120° F (50° C).

### **High Temperature Areas**

Spears® FlameGuard® CPVC Fire Sprinkler Products can be installed in areas, such as an attic, where the ambient temperature exceeds 150° F (65° C) if ventilation is provided or if insulation is used around the product to maintain a cooler environment.

**WARNING: DO NOT install Spears® FlameGuard® CPVC Fire Sprinkler Products in areas where the ambient temperature exceeds 150° F (65° C) without adequate ventilation or insulation around the product to maintain a cooler environment.**

## Cold Temperature Areas

Spears® FlameGuard® CPVC Fire Sprinkler Products can be used in areas where the ambient temperature remains above 35° F (2° C). These products can also be used in an area subject to freezing temperatures if the sprinkler system installation is protected from freezing. Many standard cold weathers piping design and installation practices can be used to protect the system from freezing, including, but not limited to the use of low pressure dry pipe and pre-action systems (see titled section in this manual), the use of glycerin, insulation installation techniques, and pipe insulation. Contact the manufacturers for compatibility of their products with Spears® FlameGuard® CPVC Fire Sprinkler Products.

**NOTE:** Attention must be given to local insulating techniques and codes that require a particular method. Since very cold weather will make Spears® FlameGuard® CPVC Fire Sprinkler Products more susceptible to damage, extra care should be taken to avoid rough handling or impact to these products.

**WARNING: DO NOT allow a sprinkler system to freeze. A frozen system will deactivate and the pressures built up can cause the sprinkler heads to open or damage the pipe and fittings.**

Factory Pre-mixed antifreeze solutions of water and USP grade GLYCERIN are acceptable for use with Spears® FlameGuard® CPVC Fire Sprinkler Products. **Refer to NFPA 13, NFPA 13R, NFPA 13D and consult the local authority having jurisdiction before using glycerin solutions in fire sprinkler applications.**

**WARNING: DO NOT use glycol-based antifreeze solutions. Glycol solutions are not chemically compatible with the CPVC material and can cause damage to the CPVC Fire Sprinkler System.**

The following information can be used to determine the quantity of a pre-mixed glycerin based antifreeze solution needed to protect the piping system.

Nominal Pipe Size -inch	Actual mm Size	US Gallons of Water Per Foot
3/4 (DN20)	26,9	.0311
1 (DN25)	33,7	.0494
1-1/4 (DN32)	42,4	.0792
1-1/2 (DN40)	48,3	.1042
2 (DN50)	60,3	.1636
2-1/2 (DN65)	73,0	.2395
3 (DN80)	88,9	.3555

**NOTE:** The gallons per foot column can be used for calculations when adding pre-mixed glycerin antifreeze to the piping system for freeze protection. All fire protection systems winterized with glycerin solutions must conform to local, state, and NFPA requirements. Pre-mixed Glycerin based solutions are the only antifreeze solutions recommended for use. Glycol solutions are not chemically compatible with the CPVC material, and their use may result in damage to the CPVC Fire Sprinkler System.

### **Fire Sprinkler System Risers**

In accordance with the UL Listing, Spears® FlameGuard® CPVC Fire Sprinkler Products may be used as system risers in accordance with NFPA 13D and 13R when subject to the following additional limitations:

1. When installed protected (concealed), the minimum protection shall consist of either one-layer of 3/8 in. (9.5 mm) thick gypsum wallboard or 1/2 in. (12.7 mm) thick plywood.
2. When installed without protection (exposed), the following limitations shall apply:

a) The riser shall be installed below a smooth, flat, horizontal ceiling construction. A Listed residential pendent sprinkler is to be installed with its deflector at the distance from the ceiling specified in the sprinkler Listing.

OR

The riser shall be installed below a horizontal unfinished basement ceiling (in accordance with NFPA 13D) constructed utilizing nominal 2 in. x 10 in. or nominal 2 in. x 12 in. exposed solid wood joists on 16 in. centers. A Listed residential pendent sprinkler is to be installed with its deflector a maximum of 1-3/4 in. below the bottom of the solid wood joist in anticipation of future installation of a finished ceiling.

- When installing Spears® FlameGuard® CPVC Fire Sprinkler Products in conjunction with 2 in. x 12 in. solid wood joists, the maximum system working pressure under flowing conditions shall not exceed 100 psi and the maximum system working pressure under static (nonflowing) conditions shall not exceed 175 psi.

b) The Listed residential pendent sprinkler is to have a maximum temperature rating of 155° F and a minimum K-factor of 3.0 and is to be installed at a maximum horizontal distance of 12 inches from the centerline of the riser. The system is to be designed based upon the Listed flows for the sprinkler being used. However, the flow must not be less than 11 gpm per sprinkler.

c) The riser shall be supported vertically within 2 feet of the ceiling or bottom of the joist.

d) The minimum riser diameter shall be 1 in. and the maximum riser diameter shall be 2 in.

e) The maximum distance between the wall(s) and the outside surface of the riser pipe shall be 1-1/2 in.

f) All solvent cement joints shall be made with Spears® FS-5, or any of the solvent cements referenced on page 25 of this manual.

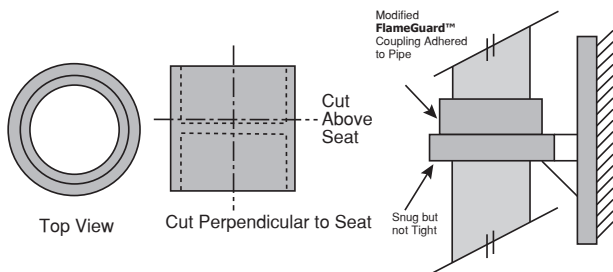
g) These installations require the use of Schedule 80 fittings for riser sizes 1-1/2 in. and larger.

3. The system shall be installed per the requirements of NFPA 13, Support of Risers. Sections 9.2.5 (2016 Edition).
4. Spears® FlameGuard® CPVC Fire Sprinkler Products shall be installed

per the manufacturer's installation and design manual and this addendum.

5. Risers shall be supported by pipe clamps or by hangers located on the horizontal connection close to the riser. Only Listed hangers and clamps shall be used.
6. Vertical lines must be supported at intervals, described in 7 & 8 below, to avoid placing excessive load on a fitting at the lower end. Do this by using riser clamps or double bolt pipe clamps Listed for this service. The clamps must not exert compressive stresses on the pipe. If possible, the clamps should be located just below a fitting so that the shoulder of the fitting rests against the clamp. If necessary, a coupling can be modified and adhered to the pipe as a bearing support such that the shoulder of the fitting rests on the clamp. Follow the manufacturer's recommended cure time.
7. Recommended method for securing CPVC fire sprinkler pipe vertically. Place clamp below shoulder of fitting.

**WARNING:** Modified riser collar shall only be used to provide support to the riser and shall not be used to join two pieces of pipe.



8. Do not use riser clamps that squeeze the pipe and depend on compression of the pipe to support the weight.
9. Hangers and straps shall not compress, distort, cut or abrade the piping and shall allow for free movement of the pipe to allow for thermal expansion and contraction.
10. Maintain vertical piping in straight alignment with supports at each floor level, or at 10 feet (3.05 m) intervals, whichever is less.
11. CPVC risers in vertical shafts or in buildings with ceilings over 25 feet (7.62 m), shall be aligned straight and supported at each floor level, or at 10 feet (3.05 m) intervals, whichever is less.

### Underground Fire Service

Spears® FlameGuard® CPVC Sprinkler Products are UL Listed for use in underground water service when installation is in accordance with:

- ASTM D 2774, "Standard Recommended Practice for Underground Installation of Thermoplastic Pressure Piping"
- ASTM F 645, "Standard Guide for Selection, Design and Installation of Thermoplastic Water Pressure Piping Systems"
- NFPA 24, "Standard for the Installation of Private Fire Service Mains and Their Appurtenances"

The installation procedures detailed in this manual apply to CPVC Fire Sprinkler Products with solvent cemented joints in sizes 3/4 inch

through 3 inches.

### **C-UL Listing Requirements**

Spears® FlameGuard® CPVC Fire Sprinkler Products are C-UL Listed in accordance with Canadian requirements for use in:

Light Hazard occupancies defined in the Standard for Installation of Sprinkler Systems, NFPA 13.

Residential occupancies as defined in the Standard for Installation of Sprinkler

Systems in Residential Occupancies up to Four Stories in Height, NFPA 13R.

Residential occupancies as defined in the Standard for Installation of Sprinkler Systems in One and Two-Family Dwelling and Manufactured Homes, NFPA 13D.

### **Protected Installations**

When used with standard response sprinklers, protection shall be provided for Spears® CPVC piping products by ceilings, walls or soffits consisting of the following minimum protection: lath and plaster, 9.5 mm thick gypsum wallboard, 13 mm thick plywood or a suspended membrane ceiling with lay-in panels or tiles, classified with respect to surface burning characteristics having mass of not less than 1.7 kg/sq m and installed in steel suspension grids. The effectiveness of this protection can be impaired if penetrated by openings such as ventilation grills, exhaust fans connected to metal ducts serving washrooms excepted. Where such penetration is present, individual openings exceeding 0.03 sq m but not exceeding 0.71 sq m in an area must be located so that the distance from the edge of the opening to the nearest sprinkler does not exceed 300 mm. This piping shall not be used where such openings exceed 0.71 sq m in area. The effect of the presence of non-rated recessed lighting fixtures, public address speakers and other interruptions of the protective membrane has not been investigated.

### **Exposed Installations**

As an alternative to the protection requirements, Spears® FlameGuard® CPVC Fire Sprinkler Products may be installed without protection (exposed) when subject to the following additional limitations:

- Exposed piping is to be installed below a smooth, flat, horizontal, fixed ceiling construction.
- Listed Quick-Response pendent sprinklers having deflectors installed within 8 inches from ceiling or Listed Residential pendent located in accordance with their Listing and a maximum distance between sprinklers not to exceed 15 feet.
- Listed Quick-Response horizontal sidewall sprinklers having deflectors installed within 6 inches from the ceiling and within 4 inches of the sidewall or Listed Residential horizontal sidewall sprinklers located in accordance with their Listing and a maximum distance between sprinklers not to exceed 14 feet.

During remodeling or repair, appropriate precautions shall be implemented to properly shield the piping from the protected occupancy.

Spears® FlameGuard® CPVC Fire Sprinkler Piping Products are to be installed in accordance with the requirements specified in NFPA 13, NFPA 13R or NFPA 13D and the National Building Code of Canada. Spears® FlameGuard® CPVC Fire Sprinkler Piping Products must be

installed in accordance with the other special installation and design criteria relative to handling, assembly, pipe hanger spacing, piping and sprinkler restraint, sprinkler temperature rating, piping location, testing procedures, friction loss characteristics and other applicable requirements specified in the manual. The use of Spears® FlameGuard® CPVC Fire Sprinkler Products in ceiling spaces above non-sprinklered areas has not been investigated.

Spears® FlameGuard® CPVC Fire Sprinkler Piping Products are Listed for use in wet pipe systems only, and are not Listed for outdoor use.

Spears® FlameGuard® CPVC Fire Sprinkler Products are C-UL Listed in accordance with Canadian requirements for use in combination with CPVC sprinkler products Listed in accordance with Canadian requirements and manufactured by GF Harvel (pipe), Ipex (pipe and fittings), TYCO Fire Products (pipe and fittings), Viking (pipe), or Nibco (fittings).

**NOTICE:** While Spears® FlameGuard® CPVC Fire Sprinkler Products are Listed for use in combination with other listed manufacturers' products, specific application approvals may not be the same amongst manufacturers. It is the installer's responsibility to verify suitability of products used in combination according to each manufacturer's installation instructions. Contact Spears® if you have questions on any application not addressed.

Spears® recommends the use of FS-5 One Step Low VOC Solvent Cement. However, Victaulic 899; Ipex BM-5; Central Sprinkler CSC-500; Nibco FP-1000 and TYCO Fire Products TFP-500 CPVC Solvent Cements can also be used in place of the FS-5 One Step Low VOC Solvent Cement, provided that the assembly and curing information referenced within this manual is used.

### Factory Mutual Approvals



Spears® FlameGuard® CPVC Fire Sprinkler Products have been approved by Factory Mutual for use in exposed environments in Light Hazard Occupancies as defined in:

NFPA 13, the Standard for "Installation of Sprinkler Systems."

Residential occupancies, as defined in NFPA 13R, the Standard for "Installation of Sprinkler Systems in Low-Rise Residential Occupancies."

Residential occupancies, as defined in NFPA 13D, the Standard for "Installation of Sprinkler Systems in One and Two-Family Dwellings and Manufactured Homes."

Spears® FlameGuard® CPVC Fire Sprinkler Products are FM Approved for use with Fire Resistant Barriers for CPVC Pipe and Fittings in Light Hazard Occupancies under FM Approval of the Soffi-Steel™ System manufactured by Grice Engineering, Inc. Installation is to be made in accordance with the FM Approval requirements for the Soffi-Steel™ System.

### Loss Prevention Certification Board LPCB



Spears® FlameGuard® CPVC Fire Sprinkler Products are approved for use as agreed between plastics suppliers, purchaser/installer, authority having jurisdiction and/or insurer in accordance with documented supplier Installation Instructions but subject to the following criteria taking precedence:

- Use of plastic pipe and fittings is subject to water authority agreement for the territory concerned.
- LPCB Approved quick response sprinklers shall be used with exposed (i.e., fire exposure) plastic pipe and fittings,
- Installation shall be made in accordance with Spears® publication FGUK-3, Design & Installation Manual for the UK.
- Plastic pipe and fittings are suitable for use only with wet pipe systems.
- Care should be exercised to ensure that joints are adequately cured, in accordance with the manufacturer's installation instructions prior to pressurization.
- Plastic pipe and fittings shall not be installed outdoor or used in underground water services.
- Where plastic pipe and fittings are exposed (i.e., fire exposure), the system shall be installed close to a flat ceiling construction.
- Sprinkler systems which employ plastic pipe and fittings shall be designed where possible to ensure no "no flow" sections of pipework in the event of sprinkler operation.

In addition, the maximum normal ambient temperature shall not exceed 120° F (50° C). The product shall only be installed in the UK by LPCB Certificated or Registered installing companies or by firms outside the UK who can provide evidence of personnel training in the installation of the product.

### **NSF International**

Spears® FlameGuard® CPVC Fire Sprinkler Products have been approved by NSF® for potable water applications (unless otherwise noted). These products meet all applicable performance standards for a pressure rated application, as required in ANSI/NSF® Standard 14, and they comply with ANSI/NSF® Standard 61 for health effects. Spears® FlameGuard® CPVC Fire Sprinkler Products are tested against ASTM Standards F 438 and F 439.



### **Penetrating Fire-rated Walls & Partitions**

Before beginning, consult the building codes and authorities having jurisdiction in your area. Several UL Classified, through-penetration firestop systems are approved for use with CPVC pipe. Consult the UL Building Materials Directory, the UL Fire Resistance Directory, and the system manufacturer for proper selection and application. Consult Spears® Manufacturing Company for further information.

### **Heat Sources & Open Ceiling Areas**

Piping systems using Spears® FlameGuard® CPVC Fire Sprinkler Products must be laid out so that the piping is not closely exposed to heat producing sources, such as light fixtures, ballasts, and steam lines. Pipe must not be positioned directly over open ventilation grills. During remodeling or ceiling repair, appropriate precautions must be implemented to properly protect the piping.



## Use With Other Manufacturers' Pipes, Fittings, & Solvent Cements

Spears® FlameGuard® CPVC Fire Sprinkler Products may be used only in connection with UL, FM and NSF certified CPVC products of other manufacturers. Use of Spears® FlameGuard® CPVC Fire Sprinkler Products in connection with CPVC products of other manufacturers which are not UL, FM and NSF certified may result in inappropriate product application and inconsistent determinations **in the event of warranty claims.**

Spears® FlameGuard® CPVC Fire Sprinkler Products are UL Listed for use in combination with UL Listed CPVC sprinkler products manufactured by GF Harvel (pipe), Ipex (pipe and fittings), TYCO Fire Products (pipe and fittings), Viking (pipe), or Nibco (fittings).

**NOTICE:** While Spears® FlameGuard® CPVC Fire Sprinkler Products are UL Listed for use in combination with other listed manufacturers' products, specific application approvals may not be the same amongst manufacturers. It is the installer's responsibility to verify suitability of products used in combination according to each manufacturer's installation instructions. Contact Spears® if you have questions on any application not addressed in this manual.

Spears® recommends the use of FS-5 One Step Low VOC Solvent Cement. However, Ipex BM-5; Nibco FP-1000 and TYCO Fire Products TFP-500 CPVC Solvent Cements can also be used in place of the FS-5 One Step Low VOC Solvent Cement, provided that the assembly and curing information referenced within this manual is used.

## Installation & Joining

Make sure you follow all assembly and curing information referenced within this manual when installing Spears® FlameGuard® CPVC Fire Sprinkler Products. Failure to follow this instruction could cause improper curing, resulting in serious personal injury, significant property damage, joint leakage, or joint failure.

Before assembling any Spears® FlameGuard® CPVC Fire Sprinkler Products, you must inspect all components for cuts, scratches, gouges, split ends, or any other irregularities that have occurred during shipping and handling.

### Solvent Cement Welded Joints

#### **STEP 1** Cut Pipe Square.

CPVC pipe can be easily cut with a ratchet cutter, a wheel-type plastic tubing cutter, a power saw or a fine-toothed saw. Tools used to cut CPVC must be designed for plastic use and must be in good condition in accordance with the tool manufacturer's recommendations. It is important to cut the pipe square. A square cut provides the surface of the pipe with maximum bonding area.



If any indication of damage or cracking is evident at the pipe end, cut off at least 2 inches (50 mm) beyond any visible crack.

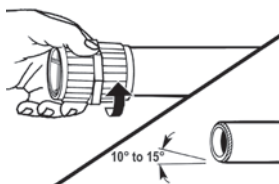
Notice: Avoid splitting the pipe when using ratchet cutters. Failure to do so may result in pipe failure or leakage.

- Only use ratchet cutters that contain a sharp blade (blades dull quickly).
- Only use ratchet cutters at temperatures of 50° F (10° C) or warmer.

- Only use well-maintained, good quality ratchet cutters capable of consistently cutting the pipe squarely.

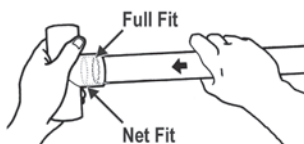
## **STEP 2 Deburr & Bevel Pipe.**

Burrs and filings can prevent proper contact between pipe and fitting during assembly, and must be removed from the outside and the inside of the pipe. A chamfering/reaming tool or a file is suitable for this purpose. A slight bevel (approximately 10° to 15°) shall be placed at the end of the pipe to ease entry of the pipe into the socket. This will minimize the chance that the edges of the pipe will wipe solvent cement from the fitting socket during the insertion of the pipe.



## **STEP 3 Fitting Preparation**

The pipe should enter the fitting socket easily one-third to two-thirds of the way (full interference fit). Contact between the pipe and fitting is essential in making a good joint. If the pipe bottoms with little interference (net fit), use extra solvent cement in making the joint. This contact allows the solvent cement (which is applied in the next step) to effectively join the pipe and fitting.



Using a clean, dry rag, wipe loose dirt and moisture from the fitting socket and pipe end. Moisture can slow the cure time and at this stage of assembly, excessive water can reduce joint strength.

## **STEP 4 Solvent Cement Application**

**CAUTION:** Prior to using Spears® FS-5 One-Step CPVC solvent cement, or other approved CPVC fire sprinkler cement, review and follow all precautions found on the container labels, material safety data sheet, and Standard Practice for Safe Handling ASTM F 402. Failure to follow precautions may result in injury.

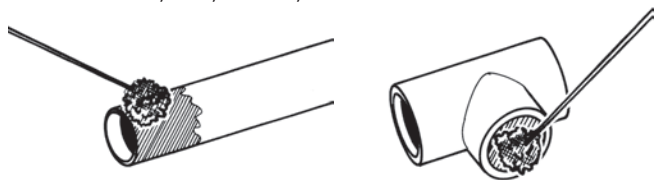
Special care shall be exercised when assembling CPVC fire sprinkler systems in temperatures below 40° F (4° C). In colder temperatures extra time must be allowed for the solvent cement to set and cure. Extra care should be taken to prevent damaging the pipe during handling. When solvent welding pipe and fittings in colder temperatures, make certain that the cement has not become lumpy or has "gelled". Gelled cement must be discarded.

At temperatures above 80° F (27° C) make sure both surfaces to be joined are still wet with cement during assembly. Higher temperatures and/or wind accelerate the evaporation of the volatile solvents in the cement. Pipe stored in direct sunlight may have surface temperatures 20° F to 30° F above the air temperature. If possible store the pipe and fittings, or, at least, the ends to be solvent welded, out of the direct sunlight prior to cementing. The solvents will penetrate hot surfaces more deeply. In conditions like this it is very important to avoid puddling the solvent cement inside the fitting socket.

Use a dauber that is properly sized for the pipe, no less than 1/2 the diameter of the pipe being assembled.

Only use solvent cements that have been specifically formulated and listed/approved for use with CPVC fire sprinkler systems and approved by the pipe and fitting manufacturers.

Vigorously apply a heavy, even coat of cement to the outside pipe end. Apply a medium coat to the fitting socket. Pipe sizes 1-1/4 inch (DN32, 32mm) and above shall always receive a second cement application on the pipe end. **FIRST APPLY CEMENT ON THE PIPE END, THEN IN THE FITTING SOCKET, AND, FINALLY, ON THE PIPE END AGAIN.**

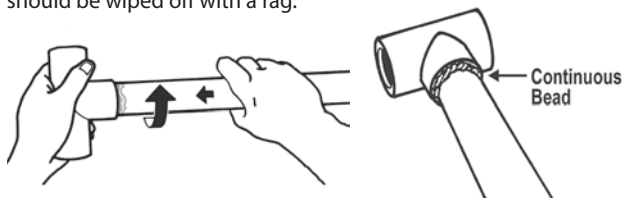


**Notice:** Too much solvent cement can cause clogged waterways or weaken the wall of the pipe or fitting and result in pipe failure or leakage.

- Do not allow excess cement to puddle in the pipe and fitting assembly. To prevent this puddling, apply a lighter coating of solvent cement to the inside of the fitting socket than the outside of the pipe.
- Wipe off excess cement on the outside of the joint. The solvents will evaporate, but the solvent cement inside the fitting will stay there.
- Take care to prevent cement from running into the threads of Sprinkler Head Adapters and Adjustable Sprinkler Head Adapters. Where possible, it is recommended to pre-install head adapters on to pre-cut Drops (section of pipe) and allow to achieve initial set in the inverted position. The head adapter and drop combination can then be installed into the system fitting.

### **STEP 5** Assembly

After applying cement, immediately insert the pipe into the fitting socket, while rotating the pipe one-quarter turn until the pipe bottoms out at the fitting stop. Rotate the pipe as it is inserted into the fitting not after it has bottomed out in the fitting. Properly align the fitting for the installation at this time. Pipe must bottom to the stop. Hold the assembly for 30 seconds to ensure initial bonding. A bead of solvent cement should be evident around the pipe and fitting juncture. If this bead is not continuous around the socket shoulder, it may indicate that insufficient cement was applied. If insufficient cement is applied, the fitting must be cut out and discarded. Cement in excess of the bead should be wiped off with a rag.



**Notice:** Failure to allow sprinkler head adapter fitting joints to cure before installing sprinklers may result in cement in the sprinkler waterway.

- Install sprinkler heads only after all the CPVC pipe and fittings, including the sprinkler head adapters, are solvent welded and allowed to cure for a minimum of 30 minutes.
- Do not install sprinklers in the fittings prior to the fittings being cemented in place.

- Prior to installing any sprinklers, Spears® recommends the entire system including drops must be thoroughly flushed to remove all pipe shavings, dirt and debris left from installation. Fill lines slowly and bleed air from the farthest and highest point, then flush with full flow.

Exercise care when installing sprinklers. Allow sprinkler head fittings and previously joined fittings to cure for a minimum of 30 minutes prior to installing the sprinkler. When installing sprinklers, be sure to anchor or hold the pipe drop securely to avoid rotating the pipe in previously cemented connections.

**Notice:** Too much solvent cement can cause clogged waterways.

- Visually inspect sprinkler fittings to ensure that the waterway and threads are clear of any excess cement.
- Once the installation is complete and cured per Table I, II or III, then test the system as described in the System Acceptance Testing (Hydrostatic Pressure Test) section of this manual.

## **STEP 6 Set and Cure Times**

**Notice:** Inadequate curing of solvent cement joints may cause pipe failure or leakage. Solvent cement set and cure times are a function of pipe size, temperature, relative humidity, and tightness of fit.

Cure times should be increased when moisture is present such as during cut- ins to live sprinkler lines. (NOTE: refer to Recommended Cut-In Procedures for System Modification or Repair section in this manual.) The assembly must be allowed to set, without any stress on the joint, for 5 minutes, depending on pipe size and temperature. Following the initial set period, the assembly can be handled carefully, avoiding significant stresses to the joint.

Refer to Tables I, II, and III for MINIMUM cure times prior to pressure testing.

<b>Table 1: Minimum Cure Time Table for Pressure Test up to 225 psi (15.5 bar) Ambient Temperature During Cure</b>			
Nominal Pipe Sizes	60° F to 120° F (16° C to 49° C)	40° F to 59° F (4° C to 15° C)	0° F to 39° F (-18° C to 3° C)
3/4" (DN20)	1 hour	4 hours	48 hours
1" (DN25)	1-1/2 hours	4 hours	48 hours
1-1/4" & 1-1/2" (DN32 & DN40)	3 hours	32 hours	10 days
2" (DN50)	8 hours	48 hours	Note 1
2-1/2" & 3" (DN65 & DN80)	24 hours	96 hours	Note 1

<b>Table 2: Minimum Cure Time Table for Pressure Test up to 200 psi (13.8 bar) Ambient Temperature During Cure</b>			
Nominal Pipe Sizes	60° F to 120° F (16° C to 49° C)	40° F to 59° F (4° C to 15° C)	0° F to 39° F (-18° C to 3° C)
3/4" (DN20)	45 minutes	1-1/2 hours	24 hr.
1" (DN25)	45 minutes	1-1/2 hours	24 hr.
1-1/4" & 1-1/2" (DN32 & DN40)	1-1/2 hours	16 hours	120 hours
2" (DN50)	6 hours	36 hours	Note 1
2-1/2" & 3" (DN65 & DN80)	8 hours	72 hours	Note 1

**Note 1:** For these sizes, the solvent cement can be applied at temperatures below 40° F (4° C). However, the sprinkler system temperature must be raised to a temperature of 40° F (4° C) or above and allowed to cure per the above recommendations prior to pressure testing.

<b>Table 3: Minimum Cure Time Table for Pressure Test up to 100 psi (6.9 bar) Ambient Temperature During Cure</b>			
Nominal Pipe Sizes	60° F to 120° F (16° C to 49° C)	40° F to 59° F (4° C to 15° C)	0° F to 39° F (-18° C to 3° C)
3/4" (DN20)	15 minutes	15 minutes	30 minutes
1" (DN25)	15 minutes	30 minutes	30 minutes
1-1/4" (DN32)	15 minutes	30 minutes	2 hours

**NOTICE:** 1-1/2-inch and larger must be tested ONLY in accordance with Table 1 and Table 2.

**WARNING:** Make sure you allow the cement to cure according to the times listed in the charts for the pipe size and ambient temperature. These cure times have been tested and approved for Spears® FlameGuard® CPVC Fire Sprinkler products. DO NOT install any sprinkler heads until the piping system has cured for a minimum of 30 minutes.

The following guidelines provide an estimate of the quantities of Spears® FS-5 Low VOC Solvent Cement that you will need to complete the assembly.

### Solvent Cement Requirements

Nominal Fitting Sizes	Solvent Cement Number of Joints Per Quart (estimated)
3/4" (DN20)	270
1" (DN25)	180
1-1/4" (DN32)	130
1-1/2" (DN40)	100
2" (DN50)	70
2-1/2" (DN65)	50
3" (DN80)	40

#### Threaded Connections

**WARNING:** Use only thread sealant recommended by Spears®. Other joint compounds or pastes may contain substances that could cause stress cracks in the CPVC. Cutting oils used in metal pipe threading cause stress cracking in CPVC materials. All cutting oils must be removed (Spears® recommends using a commercially available dishwashing soap). THE METAL PIPE MUST BE THOROUGHLY FLUSHED and degreased prior to assembly with CPVC systems. Some soap residues can damage CPVC piping.

#### STEP 1 APPLY SEALANT ONLY TO MALE THREAD

DO NOT use a combination of tape and paste sealants.

DO NOT clog waterway with excessive sealant.

DO NOT use any sealant on any Gasket Sealed Head Adapters.

RECOMMENDED SEALANT:

Spears® Manufacturing Company recommends the use of Spears® BLUE 75™ thread sealant, which has been tested for compatibility with Spears® products. Please follow the sealant Manufacturer's Application/Installation instructions. Choice of another appropriate thread sealant is at the discretion of the installer.

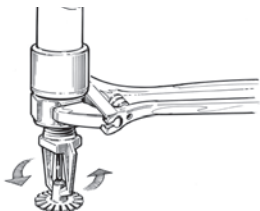


## **STEP 2** ASSEMBLE JOINT BY HAND

Thread Sprinkler Head in “finger tight” for initial assembly.

## **STEP 3** WRENCH MAKE-UP

Use an adjustable wrench on the flats of the Head Adapter and Wrench recommended by Sprinkler Manufacturer for the Head. Generally, wrench make-up of 1 to 2 turns beyond finger tight is sufficient. Avoid “backing up” the wrenched assembly.



**For Sprinkler Head Adapter connections:**

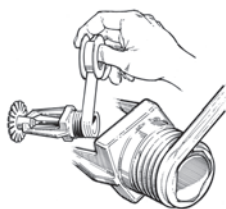
	<b>Standard Metal Thread</b>	<b>Special Reinforced (SR) Plastic Thread</b>
<b>Min. Torque:</b>	<b>15 ft.-lbs.</b>	<b>5 ft.-lbs.</b>
<b>Max. Torque:</b>	<b>20 ft.-lbs.</b>	<b>10 ft.-lbs.</b>

For Female Adapter transitions to metal pipe, tighten hand-tight plus 1-1/2 turns.

DO NOT over-tighten.

### **IF A TAPE SEALANT MUST BE USED:**

1. Use TFE tape no less than 3.5 mil thick.
2. **Initial wrap must fully cover the thread end.**
3. Wrap clockwise with standard pipe threads.
4. For Head Adapters, use **ONLY 2 - 3 wraps** of tape and tighten to specified torque.
5. For Female Adapter transition to metal pipe, use **ONLY 5 - 5-1/2 wraps** of tape and tighten hand-tight plus 1-1/2 turns.



**Do Not use any sealant on any Gasket Sealed Head Adapters**

**WARNING:** Always use commercially available strap wrenches. Do not use conventional pipe wrenches that can damage fitting.

**WARNING:** DO NOT over-torque any threaded connections. Generally, one to two turns beyond finger-tight are required to make a threaded connection. Factory testing has indicated that 15 - 20 ft.-lbs of torque on Metal Thread Head Adapters and 5 - 10 ft.-lbs on Special Reinforced (SR) Plastic Thread Head Adapters is adequate to obtain a leak free seal for Sprinkler Head Installations. Transitions to metal pipe using Female Adapters should be hand tight plus 1-1/2 turns.

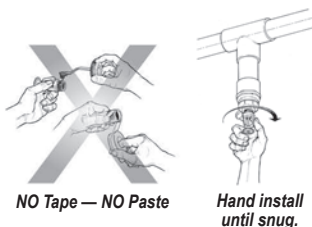
**NOTICE:** Sprinkler heads must be installed only after all fire sprinkler pipe fittings, including the sprinkler head adapters, are cemented to the piping and have been allowed to cure for a minimum of 30 minutes. Plastic, threaded plugs are available for use in pressure testing. Before installing the sprinkler head, the sprinkler head fittings must be visually inspected or probed with a wooden dowel to ensure that the waterway and threaded areas are free of any excess cement that may restrict the flow of water.

## TorqueSafe™ Gasket Sealed Thread Connections

This type of connection can only be made when using the FlameGuard® TorqueSafe™ Gasket Female Sprinkler Head Adapter. This special adapter has a special thread with gasket for sealing the sprinkler head. The adapter provides a special thread insert that can be rotated for proper frame alignment during installation. **Warning: DO NOT USE ANY TYPE OF THREAD SEALANT** when installing this adapter. Use of tape or paste sealant may impair proper sealing and function of the adapter.

### STEP 1 INSTALL SPRINKLER HEAD BY HAND

Check that elastomer gasket and threads are clean, dry and gasket is seated at the base of the adapter thread. Install sprinkler head hand tight into adapter. **DO NOT use any thread sealant!**

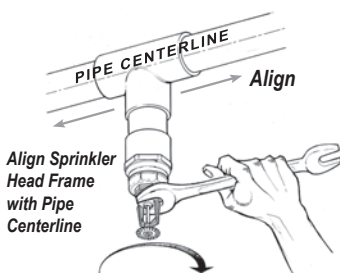


### STEP 2 WRENCH ALIGNMENT

With wrench on sprinkler head, rotate sprinkler head clockwise until frame is properly aligned (Brass insert and Sprinkler head will rotate together. This will require approximately 10 to 25 ft-lbs torque at final orientation). **Caution: DO NOT use back-up wrench on brass insert flats.**

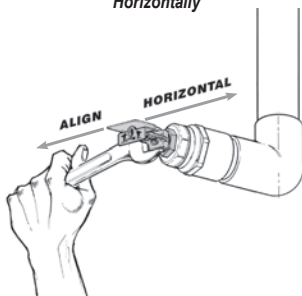
**NEVER Reverse or Back up Threaded Assembly. If over-adjusted, continue to rotate clockwise until properly aligned.**

**NOTE:** Back-up wrench may be applied to brass insert flats **ONLY** for removal of sprinkler head if required.



**NOTICE:** Sprinkler heads must be installed only after all fire sprinkler pipe fittings, including the sprinkler head adapters, are cemented to the piping and have been allowed to cure for a minimum of 30 minutes. Plastic, threaded plugs are available for use in pressure testing. Before installing the sprinkler head, the sprinkler head fittings must be visually inspected or probed with a wooden dowel to ensure that the waterway and threaded areas are free of any excess cement that may restrict the flow of water.

**Align Sidewall Sprinkler Head & Frame Horizontally**



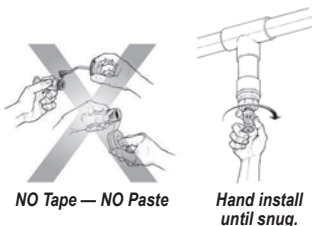


## QuickTorque & SofTorque™ Gasket Sealed Thread Connections

This type of connection can only be made when using the FlameGuard® QuickTorque™ or SofTorque™ Gasket Female Sprinkler Head Adapter. These adapters both install the same. The difference being that the QuickTorque™ has a metal thread and the SofTorque™ has the patented Special reinforced (SR) thread. These special adapters have a special compressible gasket for sealing the sprinkler head. The Gasket can be compressed as specified for installation and can be further compressed for proper frame alignment during installation. **Warning: DO NOT USE ANY TYPE OF THREAD SEALANT** when installing these adapters. Use of tape or paste sealant may impair proper sealing and function of the adapter.

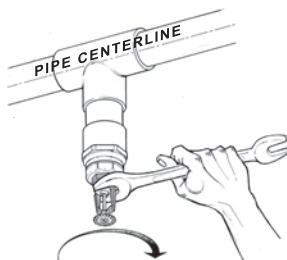
### STEP 1 INSTALL SPRINKLER HEAD BY HAND

Check that elastomer gasket and threads are clean, dry. Install sprinkler head finger tight into adapter. **DO NOT use any thread sealant!**



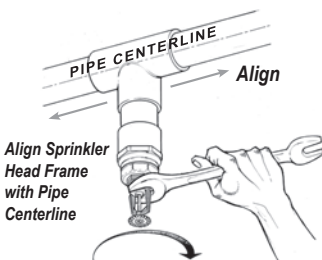
### STEP 2 WRENCH TIGHTEN 1-TURN

With wrench on sprinkler head, rotate sprinkler head clockwise 1-Turn.



### STEP 3 WRENCH ALIGNMENT

With wrench on sprinkler head, additionally rotate sprinkler head clockwise a maximum of 1 additional turn until frame is properly aligned. Follow this step for either vertical or horizontal head alignment.



**NOTICE** Back-up wrench may be applied to the Adapter flats for removal of sprinkler head if required.

## GripLoc™ Fitting Connections – Approved

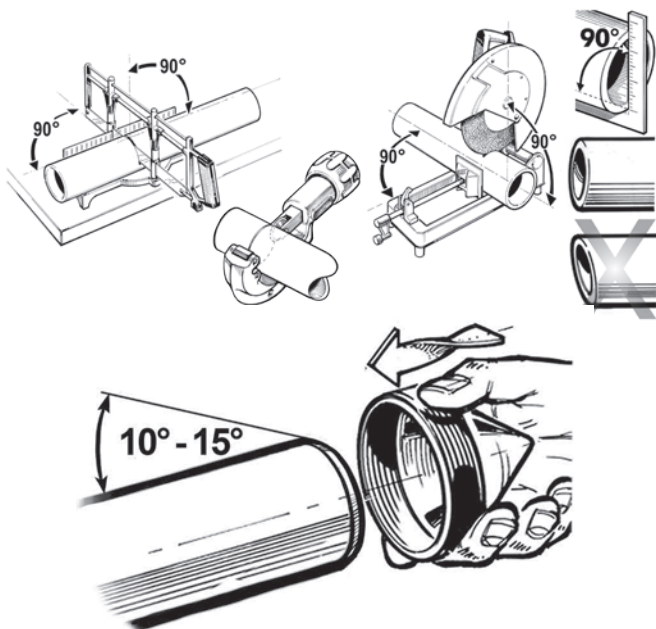
Spears® GripLoc™ fittings include a variety of configurations including head adapters, repair couplings, tees, elbows and caps. These use an engineered joint that incorporates a stainless steel gripper and gasket for direct connection to CPVC pipe using NO SOLVENT CEMENT. It is designed for quick fitting connections when adding or repairing system components.

**NOTE:** Spears® GripLoc™ fittings are not UL listed.

**WARNING:** DO NOT INSERT FINGERS INTO GRIPPER END. Gripper teeth are quite sharp

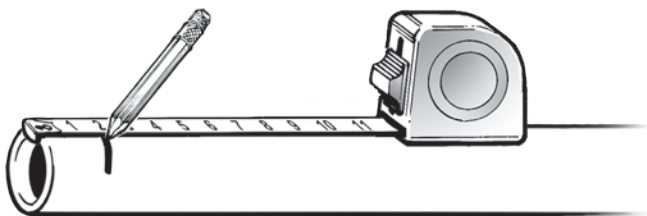
### **STEP 1** CUT, CLEAN & BEVEL PIPE END Clean

Cut pipe square at 90°. Remove all dirt and debris, deburr and bevel pipe end 10°-15°



### **STEP 2** MEASURE FITTING & MARK PIPE

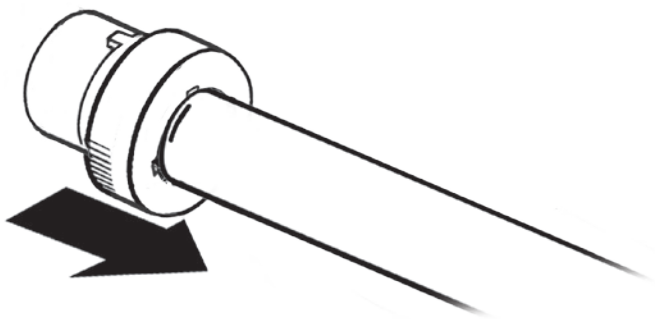
Measure depth of fitting to its pipe stop. Mark this distance on pipe end.



### STEP 3 INSTALL PIPE

Insert pipe and Push in all the way to mark on pipe end.

**NOTICE:** GripLoc™ Expansion Repair Couplings will require thrust blocking restraints to keep unit from expanding under pressure



### Painting Pipe & Fittings

**CAUTION:** The UL Listing DOES NOT cover painted CPVC fire sprinkler piping products. Use of certain paints, such as oil-based, can damage CPVC fire sprinkler piping products. **Use only a water-based latex or acrylic paint.** Before painting any CPVC fire sprinkler piping products, you must consult with your local authority having jurisdiction for restrictions.

### Cleaning

Spears® FlameGuard® CPVC Fire Sprinkler Products can be cleaned using clean water and a soft towel. DO NOT use ammonia or other harsh chemical cleaners.

### Transitions to Other Materials

Specifically designed female threaded adapters, grooved coupling adapters, and flanges are Listed for connecting systems incorporating Spears® FlameGuard® CPVC Fire Sprinkler Products to other materials, valves, and accessories. A special, reinforced female threaded adapter is available for connection to the sprinkler head.

### Flanged Connections

Piping runs joined to the flanges must be installed in a straight line in relation to the flange to avoid stress at the flange due to misalignment. In addition, piping must be secured and supported to prevent lateral movement, which can create stress and damage the flange. Use only full-faced, Grade E, EPDM, 1/8" thick flange gaskets.

### STEP 1 Attach Flange to Pipe.

The flange must be attached to UL Listed CPVC pipe following procedures for Solvent Cement Welded Joints in this manual.

**NOTICE:** When using “One-Piece” type flanges (fixed flange ring), care must be taken to align bolt holes with mating flange during solvent welding installation to pipe, or assure that pipe in system can be adequately rotated for correct hole alignment.

### STEP 2 Position Gasket & Align Flanges.

With gasket between flanges, align gasket and mating flange bolt holes by rotating flange ring (see notice above).

### STEP 3 Install Bolts, Nuts, & Washers.

Bolts should be lubricated with an acceptable anti-seize lubricant (such as IMS Copper Flake). Insert required bolts through flange bolt holes being sure to use two (2) flat washers per bolt, one at head and one below nut. Make sure that mating flanges are flush against gasket and properly aligned. Tighten nuts by hand until snug.

**WARNING:** Certain lubricants can cause stress cracking in CPVC materials.

### STEP 4 Tighten Flange Bolts.

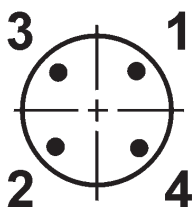
Establish uniform pressure over the flange face by tightening bolts in 5-ft. lbs. increments using the sequence shown in Figure 1 and specified torque values.

**CAUTION:** DO NOT use bolts to draw together improperly mated flanges. Care must be taken to avoid “bending” the flange ring when attached to a raised-face flange or wafer style valves.

## Flange Data & Bolt Torque

The following recommendations are based on the use of two standard flat washers, standard nuts, and 1/8-inch thick EPDM full-face gasket. Actual field conditions may require a variation in these recommendations.

FIG. 1



Flange Size Nominal In.	Recommended Torque ft-lbs (N-m)
3/4 to 1-1/2 (DN20 - DN40)	12 (16,3)
2 to 3 (DN50 - DN80)	25 (33,9)

Flange Size Nominal in.	Bolt Holes	Bolt Diameter inches (mm)	Minimum Bolt Length inches (mm)
3/4 (DN20)	4	1/2	2 (50,8)
		(12,7)	
1 (DN25)	4	1/2	2-1/4 (57,2)
		(12,7)	
1-1/4 (DN32)	4	1/2	2-1/4 (57,2)
		(12,7)	
1-1/2 (DN40)	4	1/2	2-1/2 (63,5)
		(12,7)	
2 (DN50)	4	5/8	3 (76,2)
		(15,9)	
2-1/2 & 3 (DN65 & DN80)	4	5/8	3-1/4 (85,6)
		(15,9)	

## Grooved Coupling Adapters

Spears® FlameGuard® CPVC Grooved Coupling Adapters are designed for use with Victaulic Style 75 and Style 77 Flexible Couplings. Other UL Listed couplings of similar flexible design may be used.

**CAUTION:** The use of rigid style couplings will damage the Grooved Coupling Adapter. Consult coupling manufacturer for proper selection.

### **STEP 1** Inspect Pipe & Adapter.

Check to ensure that both pipe and Grooved Coupling Adapter are free of indentations, projections, or roll marks on the gasket seating areas. Pipe end must be cut square and any loose scale, paint or dirt removed.

**NOTICE:** Use a standard grade "E" (EPDM) compound gasket with a green stripe or a grade "E," type "A" gasket with a purple stripe that is suitable for wet fire sprinkler service.

### **STEP 2** Inspect & Lubricate Gasket.

Be sure the gasket is clean and free of any cracks, cuts, or other defects that could cause leaks. DO NOT allow solvent cement to contact the sealing surface of the gasket. Lubricate the gasket with a compatible lubricant to prevent pinching and to assist in the seating and alignment process. Apply a thin layer of lubricant to the gasket lips and exterior surface. Pre-lubricated gaskets may be used. It is the installer's responsibility to determine both the gasket suitability and chemical compatibility of any lubricants. Consult gasket and lubricant manufacturers.

**WARNING:** Certain lubricants may contain petroleum based or other chemical that can damage the gasket or adapter. Verify the suitability of the lubricant with the manufacturer before use.

### **STEP 3** Align Components & Install Gasket.

Place the gasket over the pipe end making sure the gasket lip does not overhang the end of the pipe. Align the grooved coupling adapter with the end of the pipe and slide the gasket over the seating surface of the adapter, centering the gasket between the two grooves. Make sure the gasket is not pinched between the pipe and the adapter fitting. No portion of the gasket should extend into the grooves.

### **STEP 4** Install Coupling.

Place the coupling housings over the gasket, making sure the housing keys engage into the grooves of the pipe and the adapter fitting. Insert the bolts and apply the nuts finger-tight. Using a socket wrench or other appropriate tool, tighten the nuts alternately and equally until you achieve metal-to-metal contact at the housings' bolt pads.

**WARNING: You must tighten the bolts alternately and evenly to achieve metal-to-metal contact at the housings' bolt pads.**

Inspect the joints before and after pressure testing. Look for gaps between the bolt pads and for housing keys that are not inside the grooves. Ensure that the pipe alignment does not place undue stress on the grooved coupling adapters. The maximum recommended pipe hanger distance from the grooved coupling adapter fitting is shown in the following table.

Nominal Pipe Sizes	Maximum Recommended Hanger Spacing feet (meters)
1-1/4 (DN32)	6-1/2 (2,0)
1-1/2 (DN40)	7 (2,1)
2 (DN50)	8 (2,4)
2-1/2 (DN65)	9 (2,7)
3 (DN80)	10 (3,0)

As an added precaution to enhance the structural design of the system, it is suggested that a hanger or support be located at or near the grooved coupling adapter joint. This hanger or support can be on either side of the coupling. However, this is not a requirement, since the hanger spacing shown in the above table meets the minimum requirements established by UL.

## **Adjustable Sprinkler Head Adapter Installation**

Spears® FlameGuard® CPVC Adjustable Fire Sprinkler Head Adapter comes pre-assembled. There is no need for lubrication. It is recommended that the adjustable sprinkler head adapter be adjusted completely "in" by hand before beginning the installation process.

## **STEP 1** Install Adapter on Drop.

The Adjustable Sprinkler Head Adapter must be installed in accordance with the approved procedures for Solvent Cement Welded Joints, as outlined in this manual. It is recommended that the drop/riser pipe be solvent cemented into the adjustable sprinkler head adapter first, and then into the drop/riser tee or elbow.

**CAUTION:** Care must be taken to prevent solvent cement from coming in contact with the internal O-ring seal or sealing surface. All pipe shavings, dirt and debris must be flushed from the drop prior to adjustment. DO NOT over extend the adjustment barrel. Extend only to the point that free movement stops or damage to internal sealing components may result.

## **STEP 2** Install Sprinkler Head.

Sprinkler head installation must be in accordance with the approved procedures for Threaded Connections, as outlined in this manual. The Adjustable Sprinkler Head Adapter has multiple wrench flats provided to hold the adjustment barrel while installing the sprinkler head. These same wrench flats must be used to adjust the sprinkler head adapter to its required position.

**CAUTION:** Never use wrenches, pliers, or any other tool on the threaded portion of the adjustment barrel. DO NOT over extend the adjustment barrel.

## **STEP 3** Adjust Finished Height.

The maximum range of travel is 1-5/8". Always use multiple wrench flats for making adjustments. Make adjustments slowly if system is pressurized in order to avoid inadvertently over extending adjustment barrel.

**CAUTION:** Care must be taken not to extend or retract the adjustment barrel excessively, since this may result in damage to the adapter. Adjust only to the point that free movement stops.

For the purpose of hydraulic calculations, the adjustable sprinkler head equivalent length of pipe in feet are as follows: 3/4"x1/2" = 6-ft., 1"x1/2" = 9-ft.

## **System Flushing Recommendation**

Spears® recommends the entire system, including drops, be thoroughly flushed to remove all pipe shavings, dirt and debris left from installation prior to installing any sprinklers and testing. Fill lines slowly and bleed air from the farthest and highest point, then flush with full flow.

## **System Pre-Acceptance Air Test Provision**

Spears® FlameGuard® systems can be tested with Oil Free Air (OFA) at a maximum of 25psi. This is not a substitute for the NFPA hydrostatic test of the system (see System Acceptance Testing), which is still required. This is to help contractors quickly test the system to make sure all components are not leaking.

The following safety concerns must be practiced and followed:

1. Use eye protection and other appropriate safety equipment
2. Use only Oil-Free Air or Nitrogen
3. Use only regulated pressure with a 25 psi over-pressure relief valve

Follow NFPA requirements for System Acceptance Hydrostatic testing.

Warning: Compressed air use in PVC and CPVC plastic systems is potentially hazardous and in most jurisdictions is prohibited for use in transport, storage or distribution of compressed air or gasses. Air is a compressible gas that can store far more energy than water when put under pressure because it can release this energy so rapidly. This potentially explosive nature can result in serious injury. All safety practices above MUST be followed.

## **System Acceptance Testing (Hydrostatic Pressure Test)**

Once an installation is completed and joints are properly cured per the above recommendations, the system should be hydrostatically pressure tested with water at 200 psi (13.8 bar) for 2 hours. See Table II for curing conditions at 200 psi (13.8 bar).

The system should be pressure tested with water at 50 psi (3.4 bar) in excess of maximum pressure when the maximum system pressure is to be maintained in excess of 150 psi (10.3 bar). See Table I for curing conditions at 225 psi (15.5 bar).

Sprinkler systems in one- and two-family dwellings and mobile homes may be pressure tested with water at line pressure, after following Table III curing conditions.

When pressure testing, the sprinkler system shall be slowly filled with water and the air bled from the highest and farthest sprinkler heads before pressure testing is applied. Air must be removed from piping systems (plastic or metal) to prevent it from being locked in the system when pressure is applied. Entrapped air can generate excessive surge pressures that can result in bodily injury and/or property damage, regardless of the piping materials used.

If a leak is found, the fitting must be cut out and discarded. A new section can be installed using couplings or a union. Unions should be used in accessible areas only.

## **Recommended Cut-in Procedures for System Modification or Repair**

Existing system modifications or repairs can be made using Spears® FlameGuard® CPVC Fire Sprinkler Products. In order to maintain full system integrity, the following procedure must be followed when making a system tie-in or repair by cutting into an existing system line. A careful review of all Joining Procedures must be made prior to making a cut-in on an existing system and the Minimum Cut-in Cure Times schedule listed below must be followed. A variety of fitting combinations can be used to tie into an existing system or replace a section between fixed cut-in points. These include using a socket Tee for add-ons or a socket Coupling for repairs in combination with a mechanical joint such as a union, grooved coupling adapter, or flange. Regardless of the components selected, the following must be adhered to:

### **STEP 1**

System modification cut-ins should be made on the smallest diameter pipe section, in close proximity to the area of modification, capable of properly supplying the system change.



## STEP 2

Carefully plan and measure prior to cutting into existing system. Be sure to provide adequate space and insure that full insertion into fitting sockets can be made during assembly.

Note: Allowance must be made for making a 1/4-turn twist when inserting the pipe into the fitting during assembly of the tee (or other component), especially on 1-1/2" and larger pipe sizes. This may require assembly of components in combination with the cut-in tee to create a short spool piece for final connection using socket unions, flanges, or grooved coupling adapters.

## STEP 3

Review all Installation & Joining procedures prior to commencing cut-in (including square cutting, deburring & beveling, cleaning, dry fit checks).

## STEP 4

Depressurize and drain existing line prior to making the cut-in.

## STEP 5

Connect to the existing system prior to proceeding with the modification or repair.

## STEP 6

All pipe shavings, dirt, debris must be removed from the cut-in system and, water and residual moisture must be removed from all solvent cement areas. Vacuum lines and wipe dry with a clean dry rag. Moisture and dirt will slow the curing and can affect joint strength.

## STEP 7

Use only a new can of approved solvent cement when making cut-in connections. Verify cement expiration date on can prior to use.

## STEP 8

Cut-ins for modifications or system repairs are often made under less than ideal situations as compared to new installations. As a result, the following specified Minimum Cut-in Cure times must be used.

### Minimum Cut-in Cure Times

Ambient Temperature During Cure			
Pipe Size Nominal In.	60° F to 120° F (16° C to 49° C)	40° F to 59° F (4° C to 15° C)	0° F to 39° F (-18° C to 3° C)
3/4" (DN20)	1 hours	4 hours	48 hours
1" (DN25)	1-1/2 hours	4 hours	48 hours
1-1/4" & 1-1/2" (DN32 - DN40)	3 hours	32 hours	10 days
2" (DN50)	8 hours	48 hours	Note 1
2-1/2" & 3" (DN65 - DN80)	24 hours	96 hours	Note 1

**Note 1:** Solvent cement can be applied at temperatures below 40° F (4° C) in all sizes. For the 2-1/2" & larger, the temperature must be raised to 40° F (4° C) or above and allowed to cure for the recommended times before the system is filled and pressurized. Cement, pipe or fittings brought in from colder outside temperatures must be brought up to room temperature before using the 60° F to 120° F cure schedule.

## **STEP 9**

Following completion and proper cure, inspect for proper alignment and hanger placement prior to pressure testing.

**STEP 10** To pressure test the system, slowly fill the system with water and make sure that all air is bled from the farthest and highest point before test pressure is applied. The system **MUST** be pressure tested in accordance with NFPA 13, NFPA 24, or any other applicable NFPA standard requirements. The system must be tested with water. The purpose of the hydrostatic pressure test is to check for leakage, and it may not identify improperly assembled joints. This test **MUST NOT** be considered a substitute for full compliance to these published installation instructions.

It is recommended that the portion of the sprinkler system containing the cut-in tee be isolated for pressure test where possible. The applied test pressure should not exceed 50 psi over the system pressure in order to minimize water damage in the event that a leak occurs.

**WARNING: Spears® FlameGuard® CPVC Fire Sprinkler Products must never be used in a system for distribution of compressed air or other gases. Air must be removed from piping systems. Entrapped air can generate excessive surge pressures, regardless of the piping materials used. Failure to follow this warning could result in product failure, property damage and severe personal injury or death.**

## **Engineering Data**

### **Pipe and Fitting Specifications**

Spears® FlameGuard® CPVC Sprinkler Pipe is produced in SDR 13.5 dimensions, as specified in ASTM F 442. Engineering data on Material Properties and Expansion & Contraction are provided in this manual for Spears® FlameGuard® CPVC Fire Sprinkler Pipe. Consult other manufacturers for applicable variations

Spears® FlameGuard® CPVC Sprinkler Fittings are produced in Schedule 40 and Schedule 80 dimensions for sizes 3/4" through 1-1/4", and in Schedule 80 for sizes 1-1/2" through 3", in accordance with ASTM F 437, ASTM F 438, and ASTM F 439 as applicable. These products are UL Listed FM/Approved for a rated working pressure of 175 psi (1200kPa) at 150° F (65° C) for sprinkler service and LPCB listed for a rated working pressure of 175 psi (1200kPa) at 120° F (49° C).

## CPVC Fire Sprinkler Pipe Dimensions

SDR 13.5 (Ref. ASTM F442)			Weight lbs/ft (kg/m)
Size Nominal inches	Average OD inches (mm)	Average ID inches	
3/4 (DN20)	1.050 (26,7)	0.874 (22,5)	0.168 (0,2)
1 (DN25)	1.315 (33,4)	1.101 (28,2)	0.262 (0,4)
1-1/4 (DN32)	1.660 (42,2)	1.394 (35,6)	0.418 (0,6)
1-1/2 (DN40)	1.900 (48,3)	1.598 (40,7)	0.548 (0,7)
2 (DN50)	2.375 (60,3)	2.003 (50,9)	0.859 (1,2)
2-1/2 (DN65)	2.875 (73,0)	2.423 (61,5)	1.257 (1,2)
3 (DN80)	3.500 (88,9)	2.950 (75,0)	1.867 (1,2)

### Hydraulic Design

Hydraulic calculations for the sizing of systems incorporating Spears® FlameGuard® CPVC Fire Sprinkler Products must be calculated using a Hazen-Williams C value of 150. Pipe friction loss calculations must be made according to NFPA Standard 13. The following table shows the allowance for friction loss for fittings, expressed as equivalent length of pipe. For additional information regarding friction loss, contact Spears®.

### Allowance for Friction Loss in Fittings

#### Equivalent Feet (meters) of Pipe

	3/4" 26,7 mm	1" 33,7 mm	1-1/4" 42,4 mm	1-1/2" 48,3 mm	2" 60,3 mm	2-1/2" 73,0 mm	3" 88,9 mm
Tee Run	1 (0,3)	1 (0,3)	1 (0,3)	1 (0,3)	1 (0,3)	2 (0,6)	2 (0,6)
Tee Branch	3 (0,9)	5 (1,5)	6 (1,8)	8 (2,4)	10 (3,1)	12 (3,7)	15 (4,6)
90° Elbow	4 (1,2)	5 (1,5)	6 (1,8)	7 (2,1)	9 (2,7)	12 (3,7)	13 (4,0)
45° Elbow	1 (0,3)	1 (0,3)	2 (0,6)	2 (0,6)	2 (0,6)	3 (0,9)	4 (1,2)
Coupling	1 (0,3)	1 (0,3)	1 (0,3)	1 (0,3)	1 (0,3)	2 (0,6)	2 (0,6)

## Hangers & Supports

Since CPVC Fire Sprinkler pipe is rigid, it requires fewer supports than flexible, plastic systems. Spears® recommends use of hangers that are designed and listed for supporting the CPVC Fire Sprinkler pipe. However, some hangers designed for steel pipe may be used if their suitability is clearly established. These hangers must have a minimum 1/2-inch, load-bearing surface, and they must be selected to accommodate the specific pipe size. In addition, they cannot contain rough or sharp edges that contact the pipe, and they must not bind the pipe from axial movement. Vertical runs must be supported so that the weight of the run is not on a fitting or a joint.

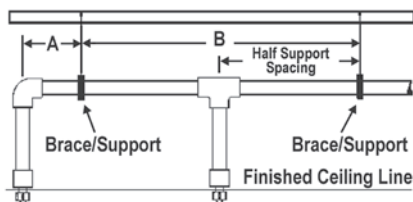
Horizontal runs must be braced so that the stress loads (caused by bending or snaking pipe) will not be placed on a fitting or a joint. Support spacing is shown in the following table. See “Snaking/Deflection of Pipe” in this manual for information regarding bending or snaking CPVC Fire Sprinkler Pipe.

Pipe Size Nominal inches	Maximum Support Spacing feet (meters)	Wt. Water Filled Pipe lbs/ft (kg/m)
3/4 (DN20)	5-1/2 (1,7)	0.427 (0,635)
1 (DN25)	6 (1,8)	0.674 (1,003)
1-1/4 (DN32)	6-1/2 (2,0)	1.078 (1,604)
1-1/2 (DN40)	7 (2,1)	1.412 (2,101)
2 (DN50)	8 (2,4)	2.223 (3,308)
2-1/2 (DN65)	9 (2,7)	3.254 (4,842)
3 (DN80)	10 (3,0)	4.831 (7,189)

NFPA 13D permits “support methods comparable to those required by local plumbing codes.” The above hanger/support requirements must also be followed on NFPA 13D systems.

**CAUTION:** DO NOT use hanger items such as plumber’s tape or “nail-on” devices. Pipe hanger must comply with NFPA 13, 13D and 13R.

When a sprinkler head activates, a significant reactive force can be exerted on the pipe. With a pendent head, this reactive force can cause the pipe to lift vertically if it is not secured properly, especially if the sprinkler drop is from small diameter pipe. The pipe must be braced against the vertical lift-up with the closest hanger. Refer to the following illustration and Table A & B.



**Table A - Maximum Support Spacing Distance**  
**End Line Sprinkler Head Drop Elbow**

Pipe Size Nominal inches	Line Pressure <100 psi (<689kPa)	Line Pressure >100 psi (>689kPa)
3/4 (DN20)	9 inches (228,6 mm)	6 inches (168,3 mm)
1 (DN25)	12 inches (304,8 mm)	9 inches (228,6 mm)
1-1/4 (DN32)	16 inches (406,4 mm)	12 inches (304,8 mm)
1-1/2 - 3 (DN40 - DN80)	24 inches (610,0 mm)	12 inches (304,8 mm)

**Note:** Support spacing can be increased by approximately 50% for lower pressures.

**Table B - Maximum Support Spacing Distance**  
**Inline Sprinkler Head Drop Tee**

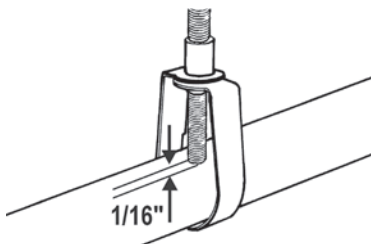
Pipe Size Nominal inches	Line Pressure <100 psi (<689kPa)	Line Pressure >100 psi (>689kPa)
3/4 (DN20)	4 feet (1,22 meters)	3 feet* (0,91 meters)
1 (DN25)	5 feet (1,52 meters)	4 feet* (1,22 meters)
1-1/4 (DN32)	6 feet (1,83 meters)	5 feet* (1,52 meters)
1-1/2 - 3 (DN40 - DN80)	7 feet (2,13 meters)	7 feet (2,13 meters)

**Note:** \*Support spacing can be increased by one foot for lower pressures.

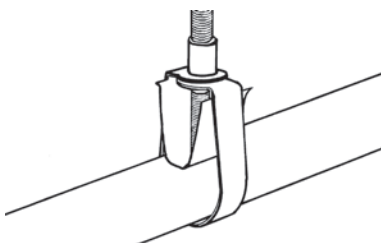
Numerous common methods are used to brace Fire Sprinkler Pipe. A few acceptable methods include: use of a standard band hanger by positioning the threaded support rod to 1/16-inch above the pipe (however, it is important that the rod does not contact the pipe), a wraparound U-hanger, a special escutcheon which prevents upward movement of the sprinkler through the ceiling or band hangers with Surge Restraints to provide surge protection for the system.

Pipe hangers are available that are tested and UL Listed for fire sprinkler service. These hangers comply with NFPA 13 requirements for use with CPVC fire sprinkler piping systems. The following illustrations depict several of these.

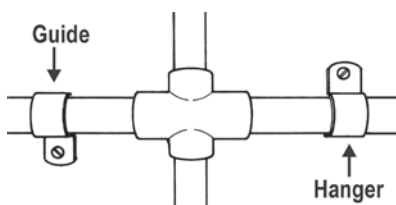
**Band Hanger** - designed to support CPVC piping systems when used in conjunction with a hanging steel threaded rod that is suspended from a ceiling or other flat, horizontal surface. The threaded rod must be leveled properly before installing the hanger and restraint.



**Surge Restraint** - when installed with the Band Hanger, as shown below, provides surge protection for the system.

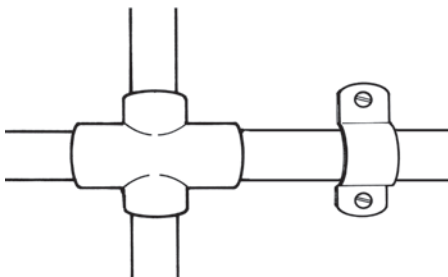


**One Hole Wrap-Around Strap** - designed to support CPVC piping systems only when the hanger tab is in the vertical position, and the screw-type fastener is in the horizontal position. The one-hole strap can be used as a pipe restrainer when the hanger tab is in the downward position, but it cannot be used as a hanger to hold any weight of the system. In addition, the one-hole strap can be used as a piping system guide when the system lies on top of the beam, and the beam supports the system's weight. The one-hole strap is not intended to support the CPVC piping system from under a ceiling or any other flat, horizontal surface. For this application, install two-hole strap.

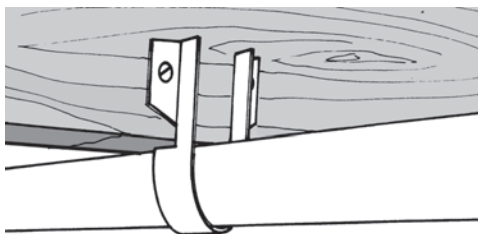


**Two-Hole Strap** - designed to support CPVC piping systems when attached to a flat, horizontal surface with the screw-type fasteners in the vertical position. In addition, the two-hole strap is designed to support CPVC piping systems when attached to a flat, vertical surface with one mounting tab in the vertical position and the screw-type fasteners in the horizontal position. The two-hole strap can be used as

a piping system guide when the system lies on top of a beam, and the beam supports the system's weight.



**Two-Hole 90° Side Mount Strap** - designed to support CPVC piping systems when attached to a horizontal beam with the screw-type fasteners in the horizontal position and the pipe hanging below the beam. The fastener's mounting edges are designed to allow the screws to be installed horizontally. This is a benefit when overhead clearance is limited. In addition, the 90° side mount strap can be used in a restrainer fashion when it is attached to the top of a beam, and the system lies on top of the beam.



## Riser Supports

Risers must be supported by pipe clamps or by hangers located on the horizontal connection close to the riser. Only Listed hangers and clamps can be used. Vertical lines must be supported at intervals to avoid placing excessive load on a fitting at the lower end. This can be done by using riser clamps or double-bolt pipe clamps listed for this service.

Hangers and supports must not compress, distort, cut, or abrade the piping, and they must allow free movement of the pipe for thermal expansion and contraction. DO NOT use riser clamps that squeeze the pipe and depend on compression of the pipe to support the weight.

Maintain vertical piping in straight alignment with supports at each floor level or 10-foot intervals, whichever is less. CPVC risers in vertical shafts or buildings with ceilings over 25 feet must be aligned straight and supported at each floor level or 10-foot intervals, whichever is less.

Clamps must not exert compressive stresses on the pipe. If possible, the clamps should be located directly below a coupling so that the shoulder of the coupling rests against the clamp. A coupling can be modified to achieve this by cutting a CPVC coupling just above the stop at the socket bottom. Then, cut this piece in half lengthwise to provide two halves that do not contain the stop. Follow the "Solvent

Cement Welding Instructions” to cement the two halves to the pipe at the required location, and make sure that the shoulder of the modified coupling rests on the clamp. Allow the assembly to cure before placing any stress on the joint.

**WARNING:** CPVC pipe and/or system components must not be used to provide structural support for the system. Care should be used when installing, hanging, or bracing to prevent unnecessary stress loads on the CPVC piping system.

**Exposed Installations**

For exposed installations that incorporate pendent or sidewall sprinklers, UL Listed support devices for thermoplastic sprinkler piping, or other listed support devices shall be used to mount the piping directly to the ceiling or sidewall.

**Earthquake Bracing**

Since CPVC fire sprinkler plastic piping is more ductile than metallic sprinkler pipe, it has a greater capacity to withstand earthquake damage. In areas subject to earthquakes, CPVC fire sprinkler systems should be designed and braced in accordance with local codes and NFPA Standard 13.

**Trenching**

The trench for underground fire service applications should be of adequate width to allow convenient installation, while at the same time being as narrow as possible. Minimum trench widths may be utilized by joining pipe outside of the trench and lowering it into the trench after adequate joint strength has been achieved.

**CAUTION** - Refer to the set and cure times listed in this manual for solvent cement joints. Failure to follow these cure times before installing piping systems in trenches could result in joint separation. Trench widths have to be wider where pipe is joined in the trench or where thermal expansion and contraction is a factor. Refer to the “Snaking/Deflection of Pipe” section.

Size		Trench Width	Light Traffic Ground Cover	Heavy Traffic Ground Cover
Nominal Diameter inches/mm	Actual Outside Diameter inches/mm	inches	Minimum inches	Minimum inches
3 and under 50 and under	3.500 and under 60.3 and under	8	12 to 18	30 to 36



- Water filled pipe should be buried at least 12 inches below the maximum expected frost line.
- It is recommended that thermoplastic piping be run within a metal or concrete casing when it is installed beneath surfaces that are subject to heavy weight or constant traffic, such as roadways and railroad tracks.

The trench bottom should be continuous, relatively smooth, and free of rocks. Where ledge rock, hardpan, or boulders are encountered, it is necessary to pad the trench bottom using a minimum of four inches of tamped earth or sand beneath the pipe as a cushion and for protection of the pipe from damage.

Sufficient cover must be maintained to keep external stress levels below acceptable design stress. Reliability and safety of service is of major importance in determining minimum cover. Local, state, and national codes may also apply.

## Snaking/Deflection of Pipe

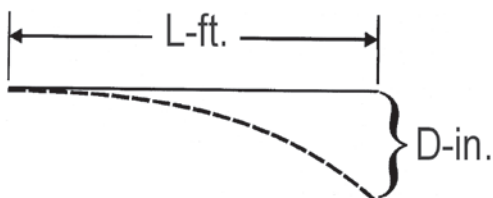
### NOTICE –

- After CPVC pipe has been solvent cemented, snake the pipe, according to the following recommendations, beside the trench during its required drying time.
- Be especially careful not to apply any stress that will disturb the undried joint.
- Snaking is necessary to allow for any anticipated thermal contraction that will take place in the newly joined pipeline.

Snaking is particularly necessary on the lengths that have been solvent cemented during the late afternoon or a hot summer's day because their drying time will extend through the cool of the night when thermal contraction of the pipe could stress the joints to the point of pull out. This snaking is especially necessary with pipe that is laid in its trench (necessitating wider trenches than recommended) and is back-filled with cool earth before the joints are thoroughly dry. The following information can be used in determining maximum deflection allowable for various run lengths and pipe sizes.

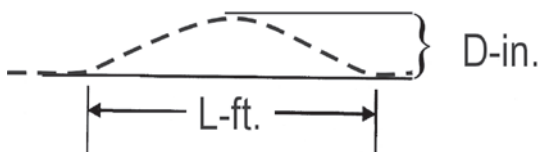
### Maximum Bending Deflections in Inches For Given Lengths of CPVC, SDR 13.5 (73° F)

Pipe Size SDR 13.5	Length of Run (L) in Feet													
	2	5	7	10	12	15	17	20	25	30	35	40	45	50
	Pipe Deflection (D) in Inches													
3/4	1.3	7.8	15.4	31.3	45.1	70.5	90.6	124.4	195.9	282.1	383.9	-	-	-
1	1.0	6.3	12.3	25.0	36.0	56.3	72.3	100.1	156.5	225.2	306.6	400.4	-	-
1-1/4	0.8	5.0	9.7	19.8	28.5	44.6	57.3	79.3	123.9	178.4	242.8	317.2	401.4	-
1-1/2	0.7	4.3	8.5	17.3	24.9	39.0	50.1	69.3	108.2	155.9	212.2	277.1	350.7	433.0
2	0.6	3.5	6.8	13.9	20.0	31.2	40.0	55.4	86.6	124.7	169.7	221.7	280.6	346.4
2-1/2	0.5	2.9	5.6	11.4	16.5	25.8	33.1	45.8	71.5	103.0	140.2	183.1	231.8	286.2
3	0.4	2.4	4.6	9.4	13.5	21.2	27.2	37.6	58.8	84.6	115.2	150.4	190.4	235.1



### Maximum Snaking Deflections in Inches For Given Lengths of CPVC, SDR 13.5 (73° F)

Pipe Size SDR 13.5	Length of Run (L) in Feet													
	2	5	7	10	12	15	17	20	25	30	35	40	45	50
	Pipe Deflection (D) in Inches													
3/4	0.3	2.0	3.8	7.8	11.3	17.6	22.6	31.3	49.0	70.5	96.0	125.4	158.7	195.9
1	0.3	1.6	3.1	6.3	9.0	14.1	18.1	25.0	39.1	56.3	76.6	100.1	126.7	156.4
1-1/4	0.2	1.2	2.4	5.0	7.1	11.2	14.3	19.8	31.0	44.5	60.7	79.3	100.4	123.9
1-1/2	0.2	1.1	2.1	4.3	6.2	9.7	12.5	17.3	27.1	39.0	53.0	69.3	87.7	108.2
2	0.1	0.9	1.7	3.5	5.0	7.8	10.0	13.9	21.6	31.2	42.4	55.4	70.1	86.6
2-1/2	0.1	0.7	1.4	2.9	4.1	6.4	8.3	11.4	17.9	25.8	35.1	45.8	57.9	71.5
3	0.1	0.6	1.2	2.4	3.4	5.3	6.8	9.4	14.7	21.2	28.8	37.6	47.6	58.8



## BACKFILLING

**CAUTION** - Underground pipe must be thoroughly inspected and tested for leaks prior to backfilling (refer to section on hydrostatic pressure testing). Failure to follow this instruction could result in system failure.

During periods of hot weather, backfilling should only be done early in the morning when the line is fully contracted, and there is no chance of insufficiently dried joints being subjected to contraction stresses.

The pipe should be uniformly and continuously supported over its entire length on a firm, stable material. Blocking should not be used to change pipe grade or to intermittently support pipe across excavated sections.

Pipe is installed in a wide range of sub-soils. These soils must be stable and applied in such a manner to physically shield the pipe from damage. Attention should be given to local pipe laying experience, which may indicate particular pipe bedding problems.

Backfill materials that are free of rocks with a particle size of 1/2-inch or less should be used to surround the pipe with 6 to 8 inches of cover. It should be placed in layers. Each soil layer should be sufficiently

compacted to uniformly develop lateral passive soil forces during the backfill operation. It may be advisable to have the pipe under pressure, 15 to 25 psi, during the backfilling.

Vibratory methods are preferred when compacting sand or gravels. Best results are obtained when the soils are in a nearly saturated condition. Where water-flooding is used, the initial backfill should be sufficient to ensure complete coverage of the pipe. Additional material should not be added until the water flooded backfill is firm enough to walk on. Care should be taken to avoid floating the pipe.

Sand and gravel containing a significant proportion of fine-grained material, such as silt and clay should be compacted by hand or, preferably, by mechanical tamper.

The remainder of the backfill should be spread in uniform layers to fill the trench completely so that there will be no unfilled spaces around rocks or lumps of earth in the backfill. Large or sharp rocks, frozen clods, and other debris, greater than 3 inches in diameter, should be removed. Rolling equipment or heavy tampers should be used only to consolidate the final backfill.

Maintenance shall be in accordance with the Standard for Inspection, Testing and

Maintenance of Water Based Extinguishing Systems, as defined by NFPA 25.

Material Properties

Table I  
Modulus of Elasticity & Stress vs. Temperature  
For Spears® FlameGuard®™ CPVC Fire Sprinkler Pipe

Property	Temperature ° F							
	73	80	90	100	110	120	140	150
Modulus of Elasticity "E" x 10 <sup>5</sup> psi	3.90	3.84	3.78	3.70	3.46	3.21	3.05	2.84
Working Stress "S" psi	1,900	1,785	1,630	1,485	1,345	1,270	950	875

**Table II**  
**Physical & Thermal Properties**

Property		A-Spears® FlameGuard® CPVC Pipe	ASTM
Specific Gravity	"Sp. Gr."	1.51	D 92
IZOD Impact Strength (ft. lbs/inch of notch)		5.0	D 256A
Modulus of Elasticity, psi	"E"	$3.9 \times 10^5$	D 638
Ultimate Tensile Strength, psi		8,000	D 638
Compressive Strength, psi		9,000	D 695
Poisson's Ratio		.35 - .38	-
Working Stress @ 73° F, psi		1,900	D 1598
Hazen-Williams "C" Factor		150	-
Coefficient of Linear Expansion in./in. ° F)	"e"	$3.2 \times 10^{-5}$	D 696
Thermal Conductivity BTU/(hr ° F Win')	"k"	0.95	C 177
Upper Temperature Limit	"° F"	205	-
Flammability		Flame Retardant	
Electrical Conductivity		Non Conductor	

## Expansion and Contraction

Spears® FlameGuard® CPVC Fire Sprinkler Products, like all piping materials, expand and contract with changes in temperature. If the coefficient of linear expansion is  $3.2 \times 10^{-5}$  inch/inch ° F. A 25° F change in temperature will cause an expansion of 1 inch for a 100-foot straight length. For most operating and installation conditions, expansion and contraction can be accommodated at changes of direction.

**Table III**  
**Thermal Expansion in Inches**  
**For Spears® FlameGuard® CPVC Fire Sprinkler Pipe**

Temp. Change $\Delta T$ ° F	Length of Run in Feet													
	5	10	15	20	25	30	35	40	45	50	70	90	120	160
	Thermal Expansion $\Delta L$ (in.)													
20	0.04	0.08	0.12	0.15	0.19	0.23	0.27	0.31	0.35	0.38	0.54	0.69	0.92	1.23
30	0.06	0.12	0.17	0.23	0.29	0.35	0.40	0.46	0.52	0.58	0.81	1.04	1.38	1.84
40	0.08	0.15	0.23	0.31	0.38	0.46	0.54	0.61	0.69	0.77	1.08	1.38	1.84	2.46
50	0.10	0.19	0.29	0.38	0.48	0.58	0.67	0.77	0.86	0.96	1.34	1.73	2.30	3.07
60	0.12	0.23	0.35	0.46	0.58	0.69	0.81	0.92	1.04	1.15	1.61	2.07	2.76	3.69
70	0.13	0.27	0.40	0.54	0.67	0.81	0.94	1.08	1.21	1.34	1.88	2.42	3.23	4.30
80	0.15	0.31	0.46	0.61	0.77	0.92	1.08	1.23	1.38	1.54	2.15	2.76	3.69	4.92
90	0.17	0.35	0.52	0.69	0.86	1.04	1.21	1.38	1.56	1.73	2.42	3.11	4.15	5.53
100	0.19	0.38	0.58	0.77	0.96	1.15	1.34	1.54	1.73	1.92	2.69	3.46	4.61	6.14

$$\Delta L = 12 e L (\Delta T)$$

$e = 3.2 \times 10^{-5}$  in./in. ° F (Coefficient of Linear Expansion for Spears® FlameGuard® CPVC Fire Sprinkler Pipe)  $L$  = Length of Run in Feet

$\Delta T$  = Temperature Change in ° F

Example:

How much will a 40 ft. run of 2" Spears® FlameGuard® CPVC Fire Sprinkler Pipe expand if the expected ambient temperature will range from 45° F to 85° F?

$$\Delta L = 12 e L (\Delta T)$$

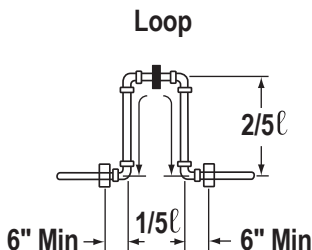
$$\Delta L = 12 (.000032) \times 40 \times 40$$

$$\Delta L = .61"$$

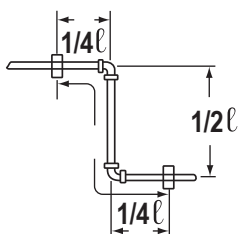
## Expansion Loop & Offset Configurations

Hangers or guides should only be placed in the loop, offset or change of direction as indicated below. Piping supports should restrict lateral movement and should direct axial movement into the expansion loop.

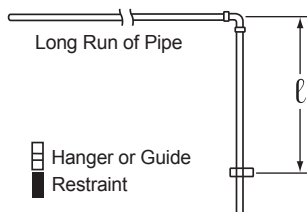
### Expansion Loop and Offset Configurations



## Offset



## Change of Direction



**Table IV**  
**Expansion Loop Length in Inches**  
**For Spears® FlameGuard® CPVC Fire Sprinkler Pipe**

Nominal Pipe Size	Avg. O.D.	Length of Run in Feet													
		5	10	15	20	25	30	35	40	45	50	70	90	120	160
		Length of Loop (in.) Temperature = 100° F - 30° F, ΔT = 70° F													
3/4	1.050	7	10	13	15	16	18	19	21	22	23	27	31	36	41
1	1.315	8	11	14	16	18	20	22	23	24	26	30	34	40	46
1-1/4	1.660	9	13	16	18	20	22	24	26	27	29	34	39	45	52
1-1/2	1.900	10	14	17	20	22	24	26	28	29	31	37	41	48	55
2	2.375	11	15	19	22	24	27	29	31	33	35	41	46	54	62
2-1/2	2.875	12	17	21	24	27	30	32	34	36	38	45	51	59	68
3	3.500	13	19	23	27	30	33	35	38	40	42	50	56	65	75

Note: Table IV is based on Stress & Modulus Elasticity at 100° F

$$I = \sqrt{\frac{3ED\Delta L}{2S}}$$

I = Length of Expansion Loop in Inches

E = Modulus of Elasticity (Table I)

D = Average O.D. of Pipe

$\Delta L$  = Change in Length of Pipe Due to Change in Temperature (Table III)

S = Working Stress (Table I)

Example: How much expansion can be expected in a 200 ft. run of 2" Spears® FlameGuard® CPVC Fire Sprinkler Pipe and how long should the expansion loop be to compensate for this expansion? (The expected temperature range will be from 40° F to 110° F).

#### First Find:

$\Delta T$  = (Change in Temperature)

$\Delta T$  =  $T_2 - T_1$

$\Delta T$  = 110° F – 40° F

$\Delta T$  = 70° F

#### To Find:

$\Delta L$  = (Amount of Expansion in inches from Table III)

$\Delta L$  =  $\Delta L$  of 160 ft. with a  $\Delta T$  of 70° F +  $\Delta L$  of 40 ft. with a  $\Delta T$  of 70° F

$\Delta L$  = 4.30" + 1.08"

$\Delta L$  = 5.38"

#### -OR-

$\Delta L$  =  $12eL(\Delta T)$

e =  $3.2 \times 10^{-5}$  (from Table II)

L = Length of Run in Feet

$\Delta T$  = Change in Temperature in ° F

$\Delta L$  =  $12 \times .000032 \times 200 \times 70$

$\Delta L$  = 5.38"

#### To find the length of the expansion loop or offset in inches:

$$I = \sqrt{\frac{3ED\Delta L}{2S}}$$

I = Length of Expansion Loop in Inches

E = Modulus of Elasticity at 110° F (Table I)

D = Average O.D. of Pipe

$\Delta L$  = Change in Length of Pipe Due to Change in Temperature (Table III-A)

S = Working Stress at 110° F (Table I)

$$I = \sqrt{\frac{3ED\Delta L}{2S}}$$

$$I = \sqrt{\frac{3 \times 346,000 \times 2.375 \times 5.38}{2 \times 1345}}$$

$$I = \sqrt{4931}$$

$$I = 70.2"$$

[illegible]



## Review – Do's & Don'ts

### Do's

- Read the manufacturer's installation instructions.
- Follow recommended safe work practices.
- Make certain that thread sealants, gasket lubricants, or fire stop materials are compatible with CPVC.
- Keep pipe and fittings in original packaging until needed.
- Cover pipe and fittings with an opaque tarp if stored outdoors.
- Follow proper handling procedures.
- Use tools specifically designed for use with plastic pipe and fittings.
- Use the proper solvent cement and follow application instructions.
- Use a drop cloth to protect interior finishes.
- Cut the pipe ends square.
- Deburr and bevel the pipe end with a chamfering tool.
- Rotate the pipe 1/4 turn when bottoming pipe in fitting socket.
- Avoid puddling of cement in fittings and pipe.
- Make certain no solvent cement is on sprinkler head and adapter threads.
- Make certain that solvent cement does not run and plug the sprinkler head orifice.
- Follow the manufacturer's recommended cure times prior to pressure testing.
- Fill lines slowly and bleed the air from the system prior to flushing and pressure testing.
- Support sprinkler head properly to prevent lift up of the head through the ceiling when activated.
- Keep threaded rod within 1/16" of the pipe or use a surge arrestor.
- Install Spears® FlameGuard® CPVC Fire Sprinkler Products in wet systems only.
- Use only factory mixed glycerin and water solutions for freeze protection.
- Allow for movement due to expansion and contraction.
- Renew your Spears® FlameGuard® CPVC Fire Sprinkler Products installation training every two years.

## Don'ts

- Do not use edible oils such as Crisco as a gasket lubricant.
- Do not use petroleum or solvent-based sealants, lubricants, or fire stop materials.
- Do not install tape, insulated wire or cable in direct contact with CPVC.
- Do not use any glycol-based solutions as an anti-freeze.
- Do not mix glycerin and water solutions in contaminated containers, only factory pre-mixed glycerin is permitted.
- Do not use solvent cement that exceeds its shelf life or has become discolored or jellied.
- Do not allow solvent cement to plug the sprinkler head orifice.
- Do not connect rigid metal couplers to CPVC grooved adapters.
- Do not thread, groove, or drill CPVC pipe.
- Do not use solvent cement near sources of heat, open flame, or when smoking.
- Do not perform System Acceptance Testing with air.
- Do not pressure test until recommended cure times are met.
- Do not use ratchet cutters below 50° F.
- Do not use CPVC pipe that has been stored outdoors, unprotected and is faded in color.
- Do not allow threaded rod to come in contact with the pipe.
- Do not install Spears® FlameGuard® CPVC Fire Sprinkler Products in cold weather without allowing for expansion.

## GHS LABEL:

<b>Signal Word: Danger</b>	<b>WHMIS CLASSIFICATION: CLASS B, DIVISION 2</b>
<b>Hazard Statements</b>	<b>Precautionary Statements</b>
H225: Highly flammable liquid and vapor	P210: Keep away from heat/sparks/open flames/hot surfaces - No smoking
H319: Causes serious eye irritation	P261: Avoid breathing dust/fume/gas/mist/vapors/spray
H332: Harmful if inhaled	P280: Wear protective gloves/protective clothing/eye protection/face protection
H335: May cause respiratory irritation	P337+P313: Get medical advice/attention
H336: May cause drowsiness or dizziness	P337+P313: Get medical advice/attention
H351: Suspected of causing cancer	P403+P233: Store in a well-ventilated place. keep container tightly closed
EUH019: May form explosive peroxides	P501: Dispose of contents/container in accordance with local regulation

## SECTION 3 - COMPOSITION/INFORMATION ON INGREDIENTS

	CAS#	EINECS #	REACH NUMBER	CONCENTRATION % by Weight
Tetrahydrofuran (THF)	109-99-9	203-726-8	05-2116297729-22-0000	30 - 60
Methyl Ethyl Ketone (MEK)	78-93-3	201-159-0	05-2116297728-24-0000	2 - 25
Cyclohexanone	108-94-1	203-631-1	05-2116297718-25-0000	5 - 15
Acetone	67-64-1	200-662-2	05-2116297713-35-0000	1 - 5

All of the constituents of this adhesive product are listed on the TSCA inventory of chemical substances maintained by the US EPA, or are exempt from that listing.

\* Indicates this chemical is subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 (40CFR372).

# indicates that this chemical is found on Proposition 65's List of chemicals known to the State of California to cause cancer or reproductive toxicity.

## SECTION 4 - FIRST AID MEASURES

**Contact with eyes:** Flush eyes immediately with plenty of water for 15 minutes and seek medical advice immediately.

**Skin contact:** Remove contaminated clothing and shoes. Wash skin thoroughly with soap and water. If irritation develops, seek medical advice.

**Inhalation:** Remove to fresh air. If breathing is stopped, give artificial respiration. If breathing is difficult, give oxygen. Seek medical advice.

**Ingestion:** Rinse mouth with water. Give 1 or 2 glasses of water or milk to dilute. Do not induce vomiting. Seek medical advice immediately.

**Likely Routes of Exposure:** Inhalation, Eye and Skin Contact

### Acute symptoms and effects:

**Inhalation:** Severe overexposure may result in nausea, dizziness, headache. Can cause drowsiness, irritation of eyes and nasal passages.

**Eye Contact:** Vapors slightly uncomfortable. Overexposure may result in severe eye injury with corneal or conjunctival inflammation on contact with the liquid.

**Skin Contact:** Liquid contact may remove natural skin oils resulting in skin irritation. Dermatitis may occur with prolonged contact.

**Ingestion:** May cause nausea, vomiting, diarrhea and mental sluggishness.

**Chronic (long-term) effects:** Category 2 Carcinogen

## SECTION 5 - FIREFIGHTING MEASURES

**Suitable Extinguishing Media:** Dry chemical powder, carbon dioxide gas, foam, Halon, water fog.

**Unsuitable Extinguishing Media:** Water spray or stream

**Exposure Hazards:** Inhalation and dermal contact.

**Combustion Products:** Oxides of carbon, hydrogen chloride and smoke.

**Protection for Firefighters:** Self-contained breathing apparatus or full-face positive pressure airline masks

	HMIS	NFPA	0-Minimal
Health	2	2	1-Slight
Flammability	3	3	2-Moderate
Reactivity	0	0	3-Serious
PPE	B		4-Severe

## SECTION 6 - ACCIDENTAL RELEASE MEASURES

### Personal precautions:

Keep away from heat, sparks and open flame

Provide sufficient ventilation, use explosion-proof exhaust ventilation equipment or wear suitable respiratory

protective equipment.

Prevent contact with skin or eyes (see section 8).

**Environmental Precautions:**

Prevent product or liquids contaminated with product from entering sewers, drains, soil or open water course.

**Methods for Cleaning up:**

Clean up with sand or other inert absorbent material. Transfer to a closable steel vessel.

**Materials not to be used for clean up:** Aluminum or plastic containers.

## SECTION 7 - HANDLING AND STORAGE

**Handling:** Avoid breathing of vapor, avoid contact with eyes, skin and clothing

Keep away from ignition sources, use only electrically grounded handling equipment and ensure adequate ventilation/fume exhaust hoods.

Do not eat, drink or smoke while handling.

**Storage:** Store in ventilated room or shade below 33 °C (90 °F) and away from direct sunlight.

Keep away from ignition sources and incompatible materials: caustics, ammonia, inorganic acids, chlorinated compounds, strong oxidizers and isocyanates.

Follow all precautionary information on container label, product bulletins and solvent cementing literature.

## SECTION 8 - PRECAUTIONS TO CONTROL EXPOSURE / PERSONAL PROTECTION

### EXPOSURE LIMITS

Component	ACGIH TLV	ACGIH STEL	OSHA PEL	OSHA STEL
Tetrahydrofuran (THF)	50 ppm	100 ppm	200 ppm	N/E
Methyl Ethyl Ketone (MEK)	200 ppm	300 ppm	200 ppm	N/E
Cyclohexanone	20 ppm	50 ppm	50 ppm	N/E
Acetone	500 ppm	750 ppm	1000 ppm	N/E

Component	OSHA PEL-Ceiling	CAL/OSHA PEL	CAL/OSHA Ceiling	CAL/OSHA STEL
Tetrahydrofuran (THF)	N/E	200 ppm	N/E	250 ppm
Methyl Ethyl Ketone (MEK)	N/E	200 ppm	N/E	300 ppm
Cyclohexanone	N/E	25 ppm	N/E	N/E
Acetone	N/E	500 ppm	3000 ppm	750 ppm

**Engineering Controls:** Use local exhaust as needed.

**Monitoring:** Maintain breathing zone airborne concentrations below exposure limits.

**Personal Protective Equipment (PPE):**

**Eye Protection:** Avoid contact with eyes, wear splash-proof chemical goggles, face shield, safety glasses (spectacles) with brow guards and side shields, etc. as may be appropriate for the exposure.

**Skin Protection:**

Prevent contact with the skin as much as possible. Butyl rubber gloves should be used for frequent immersion. Use of solvent-resistant gloves or solvent-resistant barrier cream should provide adequate protection when normal adhesive application practices and procedures are used for making structural bonds.

**Respiratory Protection:** Prevent inhalation of the solvents. Use in a well-ventilated room. Open doors and/or windows to ensure airflow and air changes. Use local exhaust ventilation to remove airborne contaminants from employee breathing zone and to keep contaminants below levels listed above. With normal use, the Exposure Limit Value will not usually be reached. When limits approach, use respiratory protection equipment

## **SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES**

**Appearance:** Red, heavy syrupy liquid

**Odor:** Ether-Like      **Odor Threshold:** 0.88 ppm (Cyclohexanone)

**pH:** Not Applicable

**Melting/Freezing Point:** -108.5 °C (-163.3 °F) Based on first melting component: THF

**Boiling Point:** 66 °C (151 °F) Based on first boiling component: THF

**Boiling Range:** 66°C (151°F) to 156°C (313°F)

**Flash Point:** -20 °C (-4 °F) TCC based on THF

**Specific Gravity:** 0.857 ± 0.01 @ 23°C ± 2° (73°F ± 3.6°)

**Solubility:** Solvent portion soluble in water. Resin portion separates out.

**Partition Coefficient n-octanol/water:** Not Available

**Auto-ignition Temperature:** 321 °C (610 °F) based on THF

**Decomposition Temperature:** Not Applicable

**VOC Content:** When applied as directed, per SCAQMD Rule 1168, Test Method 316A, VOC content is: < 490 g/l.

**Evaporation Rate:** > 1.0 (BUAC = 1)

**Flammability:** Category 2

**Flammability Limits:** LEL: 1.1% based on Cyclohexanone

UEL: 11.8% based on THF

**Vapor Pressure:** 129 mm Hg @ 20 °C (68 °F) based on THF

**Vapor Density:** >2.0 (Air = 1)

**Other Data:** Viscosity: Heavy bodied

## SECTION 10 - STABILITY AND REACTIVITY

**Stability:** Stable

**Hazardous decomposition products:** None in normal use. When forced to burn, this product gives off oxides of carbon, hydrogen chloride and smoke.

**Conditions to avoid:** Keep away from heat, sparks, open flame and other ignition sources.

**Incompatible Materials:** Oxidizers, strong acids and bases, amines, ammonia

## SECTION 11 - TOXICOLOGICAL INFORMATION

<b>Toxicity:</b>	<b>LD50</b>	<b>LC50</b>
Tetrahydrofuran (THF)	Oral: 2842 mg/kg (rat)	Inhalation 3 hrs. 21,000 mg/m3 (rat)
Methyl Ethyl Ketone (MEK)	Oral: 2737 mg/kg (rat), Dermal: 6480 mg/kg (rabbit)	Inhalation 8 hrs. 23,500 mg/m3 (rat)
Cyclohexanone	Oral 1535 mg/kg (rat), Dermal: 948 mg/kg (rabbit)	Inhalation 4 hrs. 8,000 PPM (rat)
Acetone	Oral: 5800 mg/kg (rat)	Inhalation 50,100 mg/m3 (rat)

### **Toxicity:** Target Organs

Tetrahydrofuran (THF) STOT SE3

Methyl Ethyl Ketone (MEK) STOT SE3

Cyclohexanone

Acetone STOT SE3

### **Reproductive Effects** Teratogenicity

Not Establish Not Established

### **Mutagenicity**

Not Established

### **Embryotoxicity** Sensitization to Product

Not Established Not Established

### **Synergistic Products**

Not Established

## SECTION 12 - ECOLOGICAL INFORMATION

**Ecotoxicity:** None Known

**Mobility:** In normal use, emission of volatile organic compounds (VOC's) to the air takes place, typically at a rate of < 490g/l.

**Degradability:** Biodegradable

**Bioaccumulation:** Minimal to none

## SECTION 13 - WASTE DISPOSAL CONSIDERATIONS

Follow local and national regulations. Consult disposal expert

## SECTION 14 - TRANSPORT INFORMATION

**Proper Shipping Name:** Adhesives

**Hazard Class:** 3

**Secondary Risk:** None

**Identification Number:** UN 1133

**Packing Group:** PG II

**Label Required:** Class 3 Flammable Liquid

**Marine Pollutant:** NO

**EXCEPTION for Ground Shipping**

**DOT Limited Quantity:** Up to 1L per inner packaging, 30 kg gross weight per package.

**Consumer Commodity:** Depending on packaging, these quantities may qualify under DOT as "ORM-D"

### TDG INFORMATION

TDG CLASS: FLAMMABLE LIQUID 3

SHIPPING NAME: ADHESIVES

UN NUMBER/PACKING GROUP: UN 1133, PG II

## SECTION 15 - REGULATORY INFORMATION

**Precautionary Label Information:** Highly Flammable, Irritant

**Symbols:** F, Xi

**Risk Phrases:** R11: Highly flammable; R36/37: Irritating to eyes and respiratory system; R66: Repeated exposure may cause skin dryness or cracking; R67: Vapors may cause drowsiness and dizziness

**Safety Phrases:** S2: Keep out of the reach of children; S9: Keep container in a well-ventilated place; S16: Keep away from sources of ignition - No smoking; S25: Avoid contact with eyes; S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice; S33: Take precautionary measures against static discharges.

**Ingredient Listings:** USA TSCA, Europe EINECS, Canada DSL, Australia AICS, Korea ECL/TCCL, Japan MITI (ENCS)



## SECTION 16 - OTHER INFORMATION

### Specification Information:

**Department issuing data sheet:** Environmental Health & Safety

All ingredients are compliant with the requirements of the European Directive on RoHS (Restriction of Hazardous Substances).

**E-mail address:** EHSInfo@SpearsMfg.net

**Training necessary:** Yes, training in practices and procedures contained in product literature.

**Reissue date / reason for reissue:** 09/01/15 / Updated GHS Standard Format

**Intended Use of Product:** Solvent Cement for CPVC Plastic Pipe

This product is intended for use by skilled individuals at their own risk. The information contained herein is based on data considered accurate based on current state of knowledge and experience.

However, no warranty is expressed or implied regarding the accuracy of this data or the results to be obtained from the use thereof.

[illegible]



## TorqueSafe™ Gasket Sealed Head Adapter

No Thread Sealant to be Used  
Hand Tight + 10 to 25 ft-lbs Torque to  
Rotate for Sprinkler Head Alignment

## QuickTorque™ & SoftTorque™

Gasket Sealed Head Adapter  
No Thread Sealant to be Used  
Finger Tight + 1-Turn, Up to  
1-Additional Turn to Align Head



## For Other Thread Connections:

1. Use a compatible paste sealant. Spears® recommends [BLUE 75™](#), tested for compatibility with CPVC products.
2. Apply sealant to male threads.
3. Install Sprinkler Heads or make metal pipe transitions, tighten as follows:



Adapter for  
Metal Pipe  
Transition



Hand tight  
+1.5 to 2  
Turns

SR Plastic  
Thread



Min. 5 ft-lbs  
Max. 10 ft-lbs  
Torque

Metal  
Thread



Min. 15 ft-lbs  
Max. 20 ft-lbs  
Torque

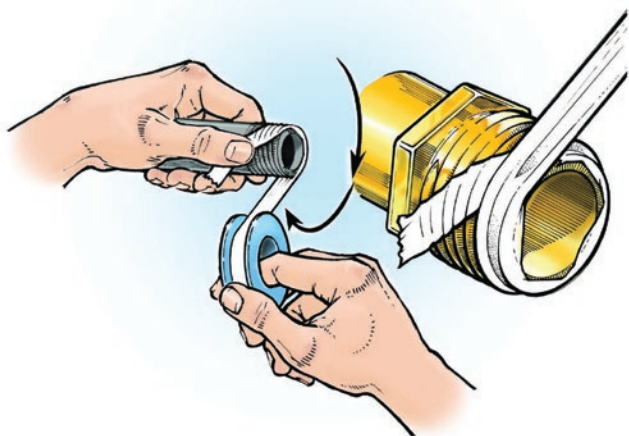
If You Feel You MUST Use Tape Sealant . . .

## ... DO IT CORRECTLY!

Failure to follow instructions can result in thread breaks from too much tape, difficult assembly from not enough, or leaks due to exposed starting threads.

### ***DO NOT USE TAPE & PASTE!***

- DO NOT USE with Gasket Sealed Head Adapters
- USE a TFE tape with a min. thickness of 3.5 mil.
- Cover male starting threads to prevent seizing.



- Wrap tape in direction of threads.
  - For Regular Head Adapters, use 2 to 3 wraps. Tighten to specified torque (see front cover).
  - For Female Adapter Transitions to metal pipe, use ONLY 5 to 5-1/2 wraps.
- Joint Assembly — tighten 1-2 turns beyond finger tight. DO NOT back up. DO NOT over tighten!

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SPEARS® MANUFACTURING COMPANY  
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Sylmar (Los Angeles), CA 91342  
(818) 364-1611 • (800) 862-1499  
Stockton, CA 95206  
(818) 364-1611 • (800) 862-1499

### **ROCKY MOUNTAIN**

Denver, CO 80238  
(303) 371-9430 • (800) 777-4154

### **NORTHEAST**

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## CPVC STRAPS



**FUNCTION:** Designed to support CPVC pipe horizontally from the side or bottom of beam. Fig. 070 can only be used as a guide on top of beam or on vertical piping. Fig. 070 also acts as a restrainer to prevent the thrust of a sprinkler head during activation when mounted on top of structure. Fig. 070 may be installed onto wood using supplied fasteners or into, minimum 20 gauge, steel using two 1/4" X 1" tek type screws. Features flared edges to protect piping as it slides through the installed fitting and retaining dimples to allow for easy installation onto pipe.

**SIZE:** 3/4" Through 2" CPVC pipe

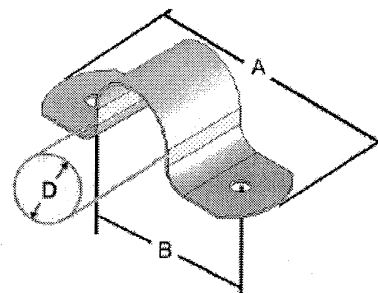
**FINISH:** Pre-galvanized

**MATERIAL:** Carbon Steel

**APPROVALS:** Underwriters Laboratories listed for US and Canada

**ORDERING:** Specify pipe size and model number.

**Fig. 070**  
**CPVC TWO-HOLE**  
**PIPE STRAP**



Pipe Size	A	B	D Nominal	Material Size	Box Qty.	Max Spacing	Appx. Wt. Per 100 (lbs.)
3/4	3 1/16	2 3/16	1.050	20 ga. X 1 1/8"	100	5'-6"	7.50
1	3 3/8	2 1/2	1.315	20 ga. X 1 1/8"	100	6'-0"	8.20
1 1/4	3 3/4	2 1/8	1.660	20 ga. X 1 1/8"	100	6'-6"	9.40
1 1/2	4 1/8	3 1/4	1.900	20 ga. X 1 1/8"	100	7'-0"	10.40
2	4 3/8	3 1/2	2.375	20 ga. X 1 1/8"	100	8'-0"	11.90

## CPVC STRAPS



**FUNCTION:** Designed to support CPVC pipe horizontally from the side of a beam. Fig. 075 must be installed with the mounting tab oriented over top of piping on the side of a beam as illustrated below. Fig. 075 can only be used as a guide on top of beam or on vertical piping. Fig. 075 may be installed onto wood using supplied fasteners or into, minimum 20 gauge, steel using one 1/4" X 1" tek type screw. Features flared edges to protect piping as it slides through the installed fitting.

**SIZE:** 3/4" Through 2" CPVC pipe

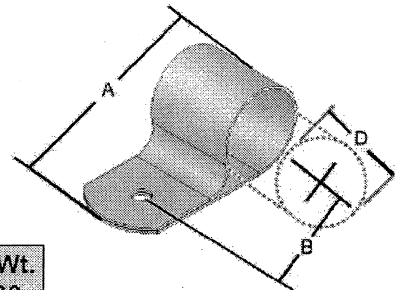
**FINISH:** Pre-galvanized

**MATERIAL:** Carbon Steel

**APPROVALS:** Underwriters Laboratories listed for US and Canada

**ORDERING:** Specify pipe size and model number.

**Fig. 075  
CPVC ONE-HOLE  
WRAP AROUND**



Pipe Size	A	B	D Nominal	Material Size	Box Qty.	Max Spacing	Appx. Wt. Per 100 (lbs.)
3/4	2 3/8	1 3/8	1.050	20 ga. X 1 1/8"	100	5'-6"	8.70
1	2 5/8	1 7/16	1.315	20 ga. X 1 1/8"	100	6'-0"	9.40
1 1/4	2 7/8	1 9/16	1.660	20 ga. X 1 1/8"	100	6'-6"	11.00
1 1/2	3 1/16	1 5/8	1.900	20 ga. X 1 1/8"	100	7'-0"	11.90
2	3 7/16	1 13/16	2.375	20 ga. X 1 1/8"	100	8'-0"	14.10

## CPVC STRAPS



**FUNCTION:** Designed to support CPVC pipe horizontally from the side or bottom of beam, or composite wood joists with a minimum of 3/8" web thickness. Fig. 076 can only be used as a guide on top of beam or on vertical piping. Fig. 076 may be installed onto wood using supplied fasteners or into, minimum 18 gauge, steel using two 1/4" X 1" tek type screws. Features flared edges to protect piping as it slides through the installed fitting.

**SIZE:** 3/4" Through 2" CPVC pipe

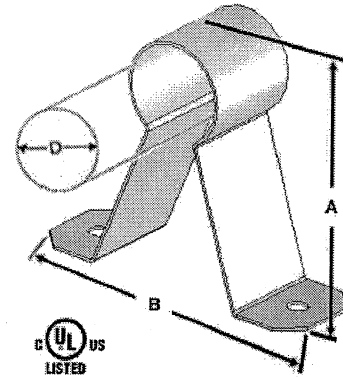
**FINISH:** Pre-galvanized

**MATERIAL:** Carbon Steel

**APPROVALS:** Underwriters Laboratories listed for US and Canada

**ORDERING:** Specify pipe size and model number.

**Fig. 076**  
**CPVC TWO-HOLE**  
**STAND OFF STRAP**



Pipe Size	A	B	D	Material Size	Box Qty.	Max Spacing	Appx. Wt. Per 100 (lbs.)
3/4	2 9/16	4 1/4	1.050	20 ga. X 1 1/8"	100	5'-6"	12.10
1	2 13/16	4 1/2	1.315	20 ga. X 1 1/8"	100	6'-0"	12.80
1 1/4	3 3/16	4 5/8	1.660	20 ga. X 1 1/8"	100	6'-6"	14.10
1 1/2	3 1/16	5	1.990	20 ga. X 1 1/8"	100	7'-0"	15.20
2	3 7/8	5	2.375	20 ga. X 1 1/8"	100	8'-0"	16.40



## CPVC STRAPS



**FUNCTION:** Designed to support CPVC pipe horizontally from the side or bottom of beam. Fig. 077 can only be used as a guide on top of beam or on vertical piping. Fig. 077 also acts as a restrainer to prevent the thrust of a sprinkler head during activation when mounted on top of structure. Fig. 077 may be installed onto wood using supplied fasteners or into, minimum 20 gauge, steel using two 1/4" X 1" tek type screws. Features flared edges to protect piping and retaining dimples to allow for easy installation onto pipe.

**SIZE:** 3/4" Through 2" CPVC pipe

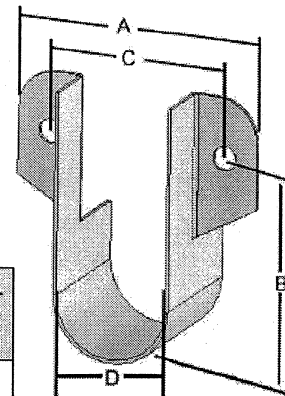
**FINISH:** Pre-galvanized

**MATERIAL:** Carbon Steel

**APPROVALS:** Underwriters Laboratories listed for US and Canada

**ORDERING:** Specify pipe size and model number.

**Fig. 077**  
**CPVC TWO-HOLE**  
**SIDE MOUNT STRAP**



Pipe Size	A	B	C	D	Material Size	Box Qty.	Max Spacing	Appx. Wt. Per 100 (lbs.)
3/4	2 5/16	1 7/8	1 11/16	1.050	20 ga. X 1 1/8"	100	5'-6"	8.50
1	2 9/16	2 3/16	1 15/16	1.315	20 ga. X 1 1/8"	100	6'-0"	9.40
1 1/4	2 15/16	2 1/2	2 5/16	1.660	20 ga. X 1 1/8"	100	6'-6"	10.40
1 1/2	3 1/4	2 13/16	2 5/8	1.990	20 ga. X 1 1/8"	100	7'-0"	11.30
2	3 5/8	3 1/4	3	2.375	20 ga. X 1 1/8"	100	8'-0"	13.20

# ADJUSTABLE SWIVEL RING HANGERS



**FUNCTION:** Designed for the suspension of non-insulated stationary pipe lines. The knurled insert nut that allows a vertical adjustment after installation, is tapped to NFPA reduced rod size standards. Fig. 141F has a layer of felt which separates the pipe from the hanger to reduce vibration and sound.

**APPROVALS:** Underwriters' Laboratories Listed in the U.S. (UL), Canada (CUL), for use with standard steel pipe sizes  $\frac{3}{4}$ " (20mm) to 8" (200MM) and CPVC pipe sizes  $\frac{3}{4}$ " (20mm) to 4" (100MM). Factory Mutual Approved for sizes  $\frac{3}{4}$ " (20mm) to 8" (200MM). Complies with Federal Specifications A-A-1192A (Type 10), and Manufacturers' Standardization Society ANSI/SP-69 and SP-58 (Type 10).

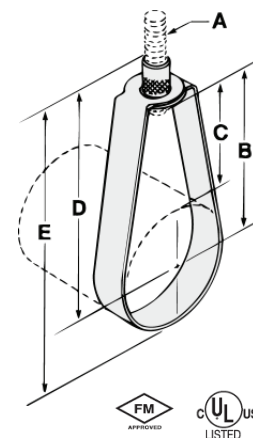
**ORDERING:** Specify pipe size and figure number.

Pipe Size	Rod Size	B		Adj. C	D		E		Max. Rec. Load		Wt. Per Inch	
									lbs.	Kn	lbs.	kg
$\frac{1}{2}$ (15)	$\frac{3}{8}$	$\frac{1}{8}$	(47.63)	$\frac{1}{16}$ (36.51)	$\frac{2}{32}$ (69.85)	$\frac{3}{16}$ (77.79)	300	(1.33)	.10	(.05)		
$\frac{3}{4}$ (20)	$\frac{3}{8}$	$\frac{1}{16}$	(42.86)	$\frac{1}{8}$ (28.58)	$\frac{2}{16}$ (63.50)	$\frac{3}{16}$ (77.79)	300	(1.33)	.10	(.05)		
1 (25)	$\frac{3}{8}$	$\frac{1}{8}$	(41.28)	1 (25.40)	$\frac{2}{16}$ (63.50)	$\frac{3}{16}$ (80.96)	300	(1.33)	.10	(.05)		
$\frac{1}{4}$ (32)	$\frac{3}{8}$	$\frac{1}{16}$	(49.21)	$\frac{1}{16}$ (26.99)	$\frac{2}{16}$ (71.44)	$\frac{3}{16}$ (90.49)	300	(1.33)	.11	(.05)		
$\frac{1}{2}$ (40)	$\frac{3}{8}$	$\frac{2}{8}$	(53.98)	$\frac{1}{16}$ (26.99)	$\frac{3}{8}$ (79.38)	$\frac{3}{8}$ (98.43)	300	(1.33)	.11	(.05)		
2 (50)	$\frac{3}{8}$	$\frac{2}{16}$	(61.91)	$\frac{1}{8}$ (28.58)	$\frac{3}{16}$ (84.14)	$\frac{4}{8}$ (111.13)	300	(1.33)	.14	(.06)		
$\frac{2}{2}$ (65)	$\frac{3}{8}$	$\frac{3}{16}$	(77.79)	$\frac{5}{8}$ (41.28)	$\frac{3}{16}$ (100.01)	$\frac{5}{8}$ (136.53)	525	(2.34)	.19	(.09)		
3 (80)	$\frac{3}{8}$	$\frac{3}{16}$	(93.66)	$\frac{1}{8}$ (47.63)	$\frac{4}{16}$ (115.89)	$\frac{6}{16}$ (160.34)	525	(2.34)	.23	(.10)		
$\frac{3}{2}$ (90)	$\frac{3}{8}$	$\frac{3}{4}$	(95.25)	$\frac{1}{8}$ (47.63)	$\frac{4}{8}$ (117.48)	$\frac{6}{8}$ (168.28)	525	(2.34)	.25	(.11)		
4 (100)	$\frac{3}{8}$	$\frac{4}{16}$	(106.36)	$\frac{1}{8}$ (47.63)	$\frac{5}{16}$ (128.59)	$\frac{7}{16}$ (185.74)	650	(2.89)	.30	(.14)		
5 (125)	$\frac{1}{2}$	$\frac{4}{8}$	(117.48)	$\frac{5}{8}$ (41.28)	$\frac{5}{8}$ (142.88)	$\frac{8}{8}$ (212.73)	1000	(4.45)	.50	(.23)		
6 (150)	$\frac{1}{2}$	$\frac{5}{8}$	(142.88)	$\frac{2}{4}$ (57.15)	$\frac{6}{2}$ (165.10)	$\frac{9}{16}$ (249.24)	1000	(4.45)	.58	(.26)		
8 (200)	$\frac{1}{2}$	$\frac{6}{16}$	(173.04)	$\frac{2}{16}$ (61.91)	$\frac{7}{16}$ (201.61)	$\frac{12}{4}$ (311.15)	1000	(4.45)	.90	(.41)		

**Note:** If ordering Fig. 141F felt lined hangers for pipe sizes of  $\frac{3}{16}$ " (90mm) or under, order the next largest size to allow for the thickness of the felt lining.

## Fig. 141 & 141F NFPA SWIVEL RING HANGER

**Fig. 141** PRE-GALVANIZED  
**Fig. 141F** PRE-GALVANIZED  
WITH FELT LINING



**MATERIAL:** Low carbon steel

**FUNCTION:** Designed for the suspension of non-insulated stationary pipe lines. The knurled insert nut, allows for vertical adjustment after installation. Fig. 151F has a layer of felt which separates the pipe from the hanger to reduce vibration and sound.

**APPROVALS:** Underwriters' Laboratories Listed in the U.S. (UL) and Factory Mutual Approved for all sizes. Complies with Federal Specification A-A-1192A (Type 10), and Manufacturers' Standardization Society ANSI/SP-69 and SP-58 (Type 10).

**ORDERING:** Specify pipe size and figure number.

**MATERIAL:** Low carbon steel

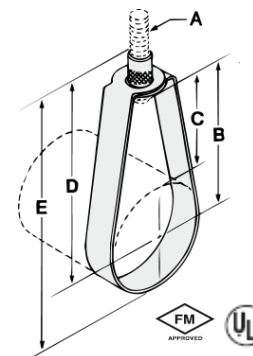
Pipe Size	Rod Size	B		Adj. C	D		E		Max. Rec. Load		Wt. Per Inch	
									lbs.	Kn	lbs.	kg
$\frac{2}{2}$ (65)	$\frac{1}{2}$	$\frac{2}{4}$	(69.85)	$\frac{1}{4}$ (31.75)	$\frac{3}{16}$ (93.66)	$\frac{5}{8}$ (130.18)	600	(2.67)	.33	(.15)		
3 (80)	$\frac{1}{2}$	$\frac{3}{8}$	(79.38)	$\frac{1}{8}$ (28.58)	4 (101.60)	$\frac{5}{8}$ (149.23)	600	(2.67)	.35	(.16)		
$\frac{3}{2}$ (90)	$\frac{1}{2}$	$\frac{3}{8}$	(92.08)	$\frac{1}{2}$ (38.10)	$\frac{4}{16}$ (109.54)	$\frac{6}{8}$ (168.28)	600	(2.67)	.37	(.17)		
4 (100)	$\frac{5}{8}$	$\frac{3}{8}$	(98.43)	$\frac{1}{4}$ (31.75)	$\frac{4}{16}$ (125.41)	$\frac{7}{8}$ (180.98)	1000	(4.45)	.48	(.22)		
5 (125)	$\frac{5}{8}$	$\frac{3}{8}$	(85.73)	$\frac{3}{8}$ (34.93)	$\frac{5}{8}$ (142.88)	$\frac{8}{2}$ (215.90)	1000	(4.45)	.57	(.26)		
6 (150)	$\frac{3}{4}$	$\frac{5}{16}$	(134.94)	2 (50.80)	$\frac{6}{16}$ (169.86)	$\frac{10}{8}$ (257.18)	1250	(5.56)	1.06	(.48)		
8 (200)	$\frac{3}{4}$	$\frac{6}{16}$	(176.21)	$\frac{2}{8}$ (66.68)	$\frac{8}{16}$ (211.14)	$\frac{12}{8}$ (327.03)	1250	(5.56)	1.32	(.60)		

**Note:** If ordering Fig. 151F felt lined hangers for pipe sizes of  $\frac{3}{16}$ " (90mm) or under, order the next largest size to allow for the thickness of the felt lining.

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

## Fig. 151 & 151F SWIVEL RING HANGER

**Fig. 151** PRE-GALVANIZED  
**Fig. 151F** PRE-GALVANIZED  
WITH FELT LINING





# THREADED ACCESSORIES

## Fig. 20 & 21 CONTINUOUS THREADED ROD

**FUNCTION:** Useful in applications where stud lengths cannot be predetermined.

**MATERIAL:** Low carbon steel

**ORDERING:** Specify rod size, length and figure number.

**Fig. 20\*** PLAIN

**Fig. 21** ELECTRO-GALVANIZED



\*Available in stainless steel. To order, specify 304 or 316 and add suffix SS to figure number.  
Price on request.

Rod Size	Packaging Feet Per Bundle						Max. Rec. Load				Wt. Per Foot	
							650°F (343°C)		750°F (399°C)			
	6ft.	(1.83)	10ft.	(3.05)	12ft.	(3.66)	lbs.	kN	lbs.	kN	lbs.	kg
1/4 -20	300	(91.44)	500	(152.4)	600	(182.88)	240	(1.07)	210	(.93)	.12	(.05)
3/8 -16	150	(45.72)	250	(76.2)	240	(73.15)	730	(3.25)	540	(2.40)	.29	(.13)
1/2 -13	72	(21.95)	120	(36.58)	144	(43.90)	1350	(6.01)	1010	(4.49)	.54	(.25)
5/8 -11	48	(14.63)	80	(24.38)	96	(29.26)	1810	(8.05)	1610	(7.16)	.83	(.38)
3/4 -10	30	(9.14)	50	(15.24)	60	(18.29)	2710	(12.05)	2420	(10.76)	1.25	(.57)
7/8 -9	24	(7.32)	40	(12.19)	48	(14.63)	3770	(16.77)	3360	(14.95)	1.65	(.75)
1-8	12	(3.66)	20	(6.10)	24	(7.32)	4960	(22.06)	4420	(19.66)	2.25	(1.02)

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.



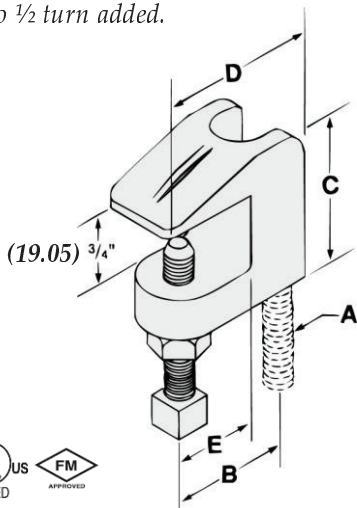
# BEAM CLAMPS

**Fig. 350**  
**BEAM CLAMP**

Set Screw Torque			
Nominal Thread Size	$\frac{3}{8}$	$\frac{1}{2}$	
Rec. Torque	in-lbs 60	125	
	N-m (6.8)	(14.1)	

Caution should be taken not to over tighten the set screw

**Note:** When a torque wrench is unavailable, the setscrew should be tightened so it contacts the I-beam and then an additional  $\frac{1}{4}$  to  $\frac{1}{2}$  turn added.



$\frac{3}{8}$  &  $\frac{1}{2}$  Available in stainless steel.  
To order, specify 304 or 316 and add suffix SS to figure number.  
Price on request.

**FUNCTION:** Designed for attaching hanger rod to the top flange of a beam or bar joist, where the flange thickness does not exceed  $\frac{3}{4}$  inch (19.05mm). The open U design permits rod adjustment. The universal design of the  $\frac{3}{8}$ " Fig. 350 allows it to be used in an inverted position on the bottom flange of a beam as well.

**APPROVALS:** Underwriters' Laboratories Listed in the U.S. (UL), Canada (CUL), for sizes  $\frac{3}{8}$ " to  $\frac{7}{8}$ " only. Factory Mutual Approved for rod sizes  $\frac{3}{8}$ " and  $\frac{1}{2}$ " only. Complies with Federal Specifications A-A-1192A (Type 19) and Manufacturers' Standardization Society ANSI/SP-69 and SP-58 (Type 19). Fig. 350 sized for  $\frac{3}{8}$ " rod can be used in an inverted position (bottom of beam) and follows the same U.S. (UL), Canada (CUL), and Factory Mutual Approvals. Used in this manner the  $\frac{3}{8}$ " Fig. 350 also complies with Federal Specifications A-A-1192A (Type 23) and Manufacturers' Standardization Society ANSI/SP-69 and SP-58 (Type 23) (Approvals are only for Fig. 350 with locknut).

**MATERIAL:** Malleable iron with hardened steel cup point set screw and locknut

**FINISH:** Plain or electro-galvanized

**ORDERING:** Specify rod size, finish and figure number.

Rod Size A	B		C		D		E		Max. Pipe Size		Max. Rec. Load		Wt. Each	
											lbs.	kN	lbs.	kg
* $\frac{1}{4}$	$\frac{7}{8}$	(22.23)	$1\frac{1}{2}$	(38.10)	$1\frac{5}{8}$	(41.28)	$\frac{1}{2}$	(12.70)	N/A	N/A	250	(1.11)	.34	(.15)
$\Delta \frac{3}{8}$	$\frac{7}{8}$	(22.23)	$1\frac{1}{2}$	(38.10)	$1\frac{5}{8}$	(41.28)	$\frac{1}{2}$	(12.70)	4	(100)	400	(1.78)	.33	(.15)
$\frac{1}{2}$	1	(25.40)	$1\frac{1}{2}$	(38.10)	$1\frac{11}{16}$	(42.86)	$\frac{1}{2}$	(12.70)	8	(200)	500	(2.22)	.34	(.15)
$\frac{5}{8}$	$1\frac{1}{16}$	(26.99)	$1\frac{1}{2}$	(38.10)	$1\frac{7}{8}$	(47.63)	$\frac{5}{8}$	(15.88)	8	(200)	600	(2.67)	.39	(.18)
$\frac{3}{4}$	$1\frac{5}{16}$	(33.34)	$1\frac{3}{4}$	(44.45)	$2\frac{3}{8}$	(60.33)	$\frac{5}{8}$	(15.88)	8	(200)	800	(3.56)	.63	(.29)
$\frac{7}{8}$	$1\frac{5}{16}$	(33.34)	$1\frac{3}{4}$	(44.45)	$2\frac{3}{8}$	(60.33)	$\frac{5}{8}$	(15.88)	8	(200)	1200	(5.34)	.60	(.27)

\*  $\frac{1}{4}$  Not UL or FM approved.

$\Delta \frac{3}{8}$  Reversible design approved for bottom beam

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

# RISER CLAMPS



**FUNCTION:** Designed for supporting and stabilizing vertical pipe runs. The PVC coating on Fig. 553 protects the pipe from the metal surface of the clamp. This product is not intended for use with hanger rods. Clamp is designed for standard iron pipe O.D. and must be considered when sizing other types of piping.

**APPROVALS:** Underwriters' Laboratories Listed in the U.S. (UL) and Factory Mutual Approved for sizes 3/4" (20mm) to 8" (200mm) only. Complies with Federal Specifications A-A-1192A (Type 8) and Manufacturers' Standardization Society ANSI/SP-69 and SP-58 (Type 8).

**MATERIAL:** Low carbon steel

**ORDERING:** Specify pipe size and figure number.

## Fig. 550, 551 & 553 RISER CLAMP

**Fig. 550\*** PLAIN

**Fig. 551** ELECTRO-GALVANIZED

**Fig. 553** PLAIN WITH PVC  
COATING

\*Available in stainless steel.

To order, specify 304 or 316 and add suffix SS to figure number.

Price on request.

Pipe Size		B		C		Bolt Size	Max. Rec. Load		Wt. Each	
							lbs.	kN	lbs.	kg
1/2	(15)	9	(228.60)	2 1/2	(63.50)	3/8 x 1 1/4	220	(0.98)	1.05	(.48)
3/4	(20)	8 7/8	(225.43)	2 3/8	(60.33)	3/8 x 1 1/4	220	(0.98)	1.05	(.48)
1	(25)	8 3/4	(222.25)	2 1/4	(57.15)	3/8 x 1 1/4	220	(0.98)	1.05	(.48)
1 1/4	(32)	9 1/4	(234.95)	2 3/4	(69.85)	3/8 x 1 1/4	250	(1.11)	1.10	(.50)
1 1/2	(40)	10	(254.00)	3 1/2	(88.90)	3/8 x 1 1/4	250	(1.11)	1.17	(.53)
2	(50)	10 1/4	(260.35)	3 3/4	(95.25)	3/8 x 1 1/4	300	(1.33)	1.20	(.54)
2 1/2	(65)	11 1/8	(282.58)	4 5/8	(117.48)	3/8 x 1 1/2	400	(1.78)	1.89	(.86)
3	(80)	11 3/4	(298.45)	5 1/4	(133.35)	3/8 x 1 1/2	500	(2.22)	1.99	(.90)
3 1/2	(90)	12 1/2	(317.50)	6	(152.40)	3/8 x 1 1/2	600	(2.67)	2.17	(.98)
4	(100)	13	(330.20)	6 1/2	(165.10)	1/2 x 1 3/4	750	(3.34)	2.21	(1.00)
5	(125)	14 1/4	(361.95)	7 3/4	(196.85)	1/2 x 1 3/4	1500	(6.67)	3.24	(1.47)
6	(150)	15 3/8	(390.53)	8 7/8	(225.43)	1/2 x 1 3/4	1600	(7.12)	3.89	(1.76)
8	(200)	18 1/2	(469.90)	12	(304.80)	5/8 x 2	2500	(11.12)	7.60	(3.45)
10	(250)	20 1/2	(520.70)	14	(355.60)	5/8 x 2	2500	(11.12)	11.10	(5.03)
12	(300)	22 1/2	(571.50)	16	(406.40)	5/8 x 2 1/2	2700	(12.01)	16.50	(7.48)
14	(350)	25 1/8	(638.18)	18 5/8	(473.08)	5/8 x 3	2700	(12.01)	17.70	(8.03)
16	(400)	26 1/4	(666.75)	20 3/4	(527.05)	3/4 x 3 1/2	2900	(12.90)	30.40	(13.79)
18	(450)	27 7/8	(708.03)	22 3/8	(568.33)	3/4 x 3 1/2	2900	(12.90)	33.30	(15.10)
20	(500)	30	(762.00)	24 1/2	(622.30)	3/4 x 3 1/2	2900	(12.90)	36.30	(16.47)
24	(600)	35	(889.00)	29 1/2	(749.30)	7/8 x 3 1/2	2900	(12.90)	48.68	(22.08)
30	(750)	42 3/8	(1076.33)	35 3/8	(898.52)	7/8 x 3 1/2	2900	(12.90)	60.16	(27.29)

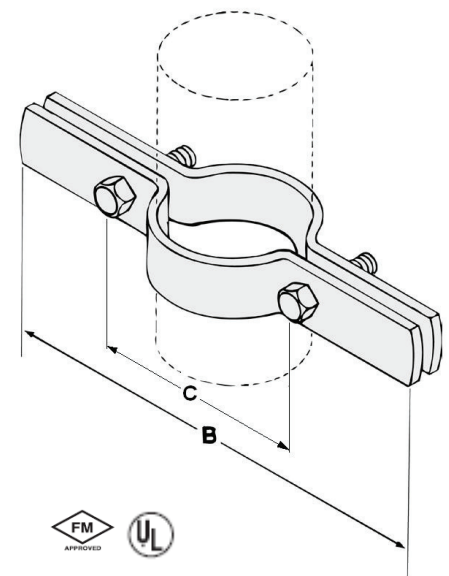


Fig. 553 only available up to 8" (200) pipe size.

## Installation practice for Model 550 Riser Clamps

When possible the clamp should be placed under a coupling, hub or welded lugs on steel pipe. Bolt torques should be per industry standards.

Recommended Torque For Pipe Clamp Hardware						
Bolt Size	1/4"-20	5/16"-18	3/8"-16	1/2"-13	5/8"-11	3/4"-10 & Larger
ft/lbs	6	11	19	50	65	75
N/m	(8)	(15)	(26)	(68)	(88)	(102)

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

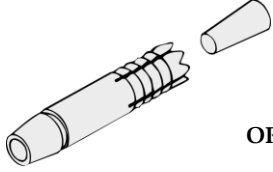


# THREADED ACCESSORIES

**Fig. 47**

## CONCRETE ANCHORS

**Fig. 47D SELF DRILLING  
SNAP-OFF FLUSH**



**MATERIAL:** Case hardened steel

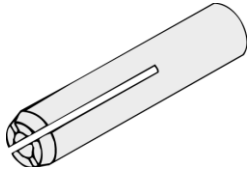
**FINISH:** Electro-galvanized

**ORDERING:** Specify rod size and figure number.

**FUNCTION:** Designed to function as a drill, drilling its own hole and as an anchor. The tapered chuck end of the anchor is attached to an air hammer, then after drilling is complete, the tapered end snaps off leaving the anchor flush with the wall. Useful when a large number of anchors are to be installed.

Rod Size	O.D.		Thread Depth		Hole Depth		Wt. Each	
							lbs.	kg
3/8	9/16	(14.29)	9/16	(14.29)	1 17/32	(38.89)	.10	(.05)
1/2	1 1/16	(17.46)	1 3/16	(20.64)	2 1/32	(51.59)	.18	(.08)
5/8	27/32	(21.43)	1 5/16	(23.81)	2 15/32	(62.71)	.36	(.16)

**Fig. 47S SELF DRILLING**



**FUNCTION:** Designed to be inserted into a pre-drilled hole and set into place by means of a setting tool.

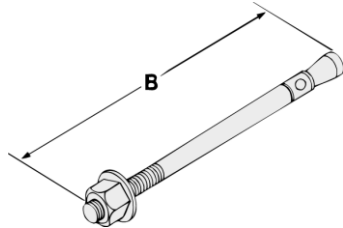
Rod Size	Hole Size		Anchor Length		Thread Length		Wt. Each	
							lbs.	kg
3/8	1/2	(12.70)	1 9/16	(39.69)	5/8	(15.88)	.07	(.03)
1/2	5/8	(15.88)	2	(50.80)	3/4	(19.05)	.13	(.06)
5/8	3/4	(19.05)	2 1/2	(63.50)	1	(25.40)	.28	(.13)

**MATERIAL:** Low carbon steel

**FINISH:** Electro-galvanized

**ORDERING:** Specify rod size and figure number.

**Fig. 47W WEDGE**



**FUNCTION:** Designed to be driven into a pre-drilled hole. The expansion of the case is controlled by the tightening of the nut, this eliminates the need for an exact hole size. Useful in applications where a high resistance to vibratory loads is desired.

Rod Size	Thread Length		Minimum Embedment		Wt. Each	
					lbs.	kg
3/8 x B	1 1/8	(28.58)	1 5/8	(41.28)	.03	(.01)
1/2 x B	1 1/4	(31.75)	2 1/4	(57.15)	.06	(.03)
5/8 x B	1 1/2	(38.10)	2 3/4	(69.85)	.11	(.05)

**MATERIAL:** Low carbon steel

**FINISH:** Electro-galvanized

**ORDERING:** Specify rod size, length (B) and figure number.

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

## ULTIMATE TENSION AND SHEAR VALUES (LBS/KN) IN CONCRETE

ANCHOR DIA In.(mm)	MIN. DEPTH OF EMBEDMENT In.(mm)	f' c = 2000 PSI (13.8 MPa)		f' c = 3000 PSI (20.7 MPa)		f' c = 4000 PSI (27.6 MPa)		f' c = 5000 PSI (34.5 MPa)	
		TENSION Lbs. (kN)	SHEAR Lbs. (kN)	TENSION Lbs. (kN)	SHEAR Lbs. (kN)	TENSION Lbs. (kN)	SHEAR Lbs. (kN)	TENSION Lbs. (kN)	SHEAR Lbs. (kN)
3/16 (4.8)	1 (25.4)	600 (2.7)	720 (3.2)	625 (2.8)	720 (3.2)	650 (2.9)	720 (3.2)	800 (3.6)	860 (3.8)
	1-1/4 (31.8)	845 (3.7)	720 (3.2)	858 (3.8)	720 (3.2)	870 (3.9)	720 (3.2)	1,010 (4.5)	860 (3.8)
	1-1/2 (38.1)	1,090 (4.8)	860 (3.8)	1,090 (4.8)	860 (3.8)	1,090 (4.8)	860 (3.8)	1,220 (4.8)	860 (3.8)
	1-3/4 (44.5)	1,450 (6.5)	870 (3.9)	1,455 (6.5)	870 (3.9)	1,460 (6.5)	990 (4.4)	1,730 (7.7)	990 (4.4)
1/4 (6.4)	1 (25.4)	750 (3.3)	900 (4.0)	775 (3.4)	900 (4.0)	800 (3.6)	1,360 (6.1)	950 (4.2)	1,440 (6.4)
	1-1/4 (31.8)	1,050 (4.7)	900 (4.0)	1,160 (5.2)	900 (4.0)	1,270 (5.6)	1,360 (6.1)	1,515 (6.7)	1,440 (6.4)
	1-1/2 (38.1)	1,380 (6.1)	1,200 (5.3)	1,600 (7.2)	1,200 (5.3)	1,820 (8.1)	1,380 (6.1)	2,170 (9.7)	1,670 (7.4)
	1-3/4 (44.5)	2,020 (9.0)	1,670 (7.4)	2,200 (9.8)	1,670 (7.4)	2,380 (10.6)	1,670 (7.4)	2,770 (12.3)	1,670 (7.4)

Safe working loads for single installation under static loading should not exceed 25% of the ultimate load capacity.

## ULTIMATE TENSION AND SHEAR VALUES (LBS/KN) IN HOLLOW BLOCK

ANCHOR DIA In.(mm)	ANCHOR EMBEDMENT In.(mm)	LIGHTWEIGHT BLOCK		MEDIUM WEIGHT BLOCK	
		TENSION Lbs. (kN)	SHEAR Lbs. (kN)	TENSION Lbs. (kN)	SHEAR Lbs. (kN)
3/16 (4.8)	1 (25.4)	220 (1.0)	400 (1.8)	340 (1.5)	730 (3.2)
1/4 (6.4)	1 (25.4)	250 (1.1)	620 (1.8)	500 (2.2)	1,000 (4.4)

Safe working loads for single installation under static loading should not exceed 25% of the ultimate load capacity.

**NOTE:** 3/16" Tapcon requires 5/32" bit, 1/4" Tapcon requires 3/16" bit.

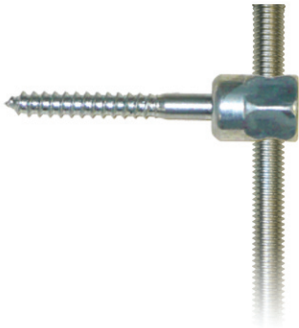
## ALLOWABLE EDGE AND SPACING DISTANCES

PARAMETER	ANCHOR DIA. In.(mm)	NORMAL WEIGHT CONCRETE			CONCRETE MASONRY UNITS (CMU)		
		FULL CAPACITY (Critical Distance Inches)	REDUCED CAPACITY (Minimal Distance Inches)	LOAD REDUCTION FACTOR	FULL CAPACITY (Critical Distance Inches)	REDUCED CAPACITY (Minimal Distance Inches)	LOAD REDUCTION FACTOR
Spacing Between Anchors - Tension	3/16	3	1-1/2	0.73	3	1-1/2	1.00
	1/4	4	2	0.66	4	2	0.84
Spacing Between Anchors - Shear	3/16	3	1-1/2	0.83	3	1-1/2	1.00
	1/4	4	2	0.82	4	2	0.81
Edge Distance - Tension	3/16	1-7/8	1	0.83	3	2	0.91
	1/4	2-1/2	1-1/4	0.82	4	2	0.81
Edge Distance - Shear	3/16	2-1/4	1-1/8	0.70	3	2	0.93
	1/4	3	1-1/2	0.59	4	2	0.80

For SI: 1 inch = 25.4 mm



## SIDEWINDER® FOR WOOD - Horizontal Application



### Application

Not less than 2" nominal width (1-1/2" up to 3-1/2" pipe; not less than 3" (2-1/2") nominal width 4" & 5" pipe

Minimum 2-1/2" from bottom for branch lines. Minimum 3" from bottom for main lines. Exception: This requirement shall not apply to 2" or thicker nailing strips resting on top of steel beams.

Floor Joist

### Product Features

- No pre-drilling required.
- Quick to install using the Sammy Nut Driver with an 18V cordless drill/driver.
- Saves time from traditional methods.
- Reduces installation costs.
- Made in the U.S.A.

### Composite / Truss

Consult truss manufacturer for recommended installation point.

\*Pre-drilling may be required for Model SWG 25-380. Tool available on page 11.

Watch a video demonstration at [www.itwbuildex.com](http://www.itwbuildex.com)



#14 SW Red Nut Driver  
Part # 8114910

\* May require pre-drilling; consult joist manufacturer.

Approvals	Rod Size	Part Number	Model	Screw Descriptions	Ultimate Pullout (lbs)	UL Test Load (lbs)	Box Qty	Case Qty
<b>HORIZONTAL MOUNT</b>								
	1/4"	8019957	SWG 200	1/4 x 2"	1725 (Fir)		25	125
	3/8"	8020957	SWG 10	1/4 x 1"	622 (Fir)	300	25	125
	3/8"	8021957	SWG 20	1/4 x 2"	1725 (Fir)	1050	25	125
	3/8"	8073925	SWG 20-SS	1/4 x 2"	1725 (Fir)	850	25	125
	3/8"	8022925	SWG 25-380	3/8 x 2-1/2"	2249 (Fir)	1500	25	125
	3/8"	8023925	SWG 30	1/4 x 3"	1884 (Fir)		25	125

## SAMMYS SWIVEL HEAD™ FOR WOOD - Swivel Application

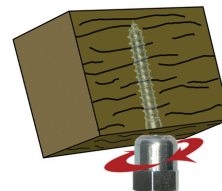
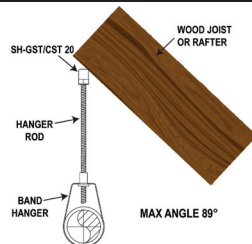


#14 Black Nut Driver  
Part # 8113910



#14 SH Orange Nut Driver  
Part # 8273910

### Application



### Product Features

- Eliminates distortion of threaded rod.
- Accommodates up to 3 1/2" x 12 pitch roof.
- Allows 17° deflection from vertical.
- Saves time from traditional methods.
- Reduces installation costs.
- Made in the U.S.A.

Approvals	Rod Size	Part Number	Model	Screw Descriptions	Ultimate Pullout (lbs)	UL Test Load (lbs)	FM Test Load (lbs)	Min Thickness	Box Qty	Case Qty
<b>SWIVEL MOUNT</b>										
	3/8"	8139957	SH-GST 20	1/4 x 2"	1257 (Fir)	1050	1475		25	125
	3/8"	8141957	SH-GST 30	1/4 x 3"	1720 (Fir)	1500	1475		25	125
	3/8"	8269957	SH-GST/CST 20	5/16 x 1-3/4"	1903 Dim. Lumber 1406 @ 45° off vertical Dim. Lumber	1500 850 @ 45°			25	125
	1/2"	8303957	SH-GST/CST 2.0	5/16 x 1-3/4"	903 Dim. Lumber 1406 @ 45° off vertical Dim. Lumber				25	125

\* May require pre-drilling; consult joist manufacturer.



# SAMMYS®

## Sammy X-Press®

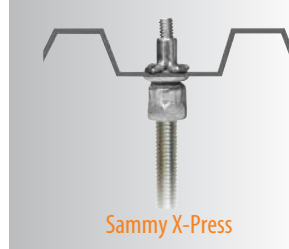
**Installs into  
Metal Deck,  
Purlin, or  
Tubular Steel**



### DESCRIPTION/SUGGESTED SPECIFICATIONS

#### **Sammy X-Press Revolutionizes The Pipe Hanging Trades—**

The Sammy X-Press® System is designed to provide direct attachment of threaded rod in metal deck (22-16 gauge) and thin gauge purlin (18-16 gauge), while providing reduced installation costs in terms of time and materials. The X-Press Anchors eliminate the need for costly "armovers" in pipe hanging installations. Current methods offered for thin gauge purlin require use of a time-consuming retaining



Sammy X-Press

nut on the threaded portion of the fastener to prevent pullout and are not designed for use in metal deck. In many instances, access to the backside of the installed fastener is prohibited by panel liner or roofing insulation. Sammy X-Press® anchors deliver the performance installers require without the use of a retaining nut!

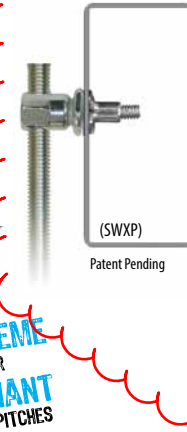
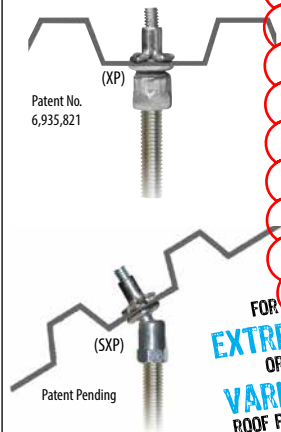
The patent-pending X-Press Anchors consist of a threaded fastener and expandable sleeve. The X-Press System features

an easy-to-install anchor with expanding anchoring strips that collapse to prevent pullout after installation. The Sammy X-Press® It Installation Tool assures a perfect installation every time offering the added convenience of one-tool efficiency – just drill and drive in seconds! SECONDS!

### ADVANTAGES

- Installs in seconds, saving time & installation costs.
- Use in applications where access to the back of the installed fastener is prohibited. ie. metal roof deck, tubular steel, or vapor barrier fabric.
- Less jobsite material needed.
- No retaining nut required.
- Provides design flexibility.

#### **Sammy's X-Press, Swivel and Sidewinder**



The **Sammy X-Press** expands to provide direct vertical attachment in:

- Metal Deck (22-16 gauge)
- Z-Purlin (18-16 gauge)

The **Sammy X-Press Swivel** allows you to hang plumb in extreme roof pitches:

- 89° in Z-Purlin
- 45° in metal deck for 12/12 pitch

The **Sammy X-Press Sidewinder** expands to provide horizontal attachment in:

- 16 ga - 3/16" steel - purlin, tubular steel.

APPLICATIONS



- Sprinkler Systems
- Pipes/Plumbing
- Electrical Lighting and Fixtures
- HVAC Equipment and Fixtures



INSTALLATION INSTRUCTIONS



1. Pre-Drill.



2. Insert Anchor.



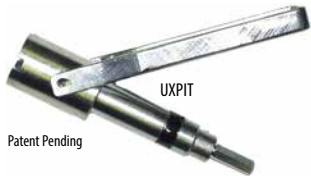
3. Install.

APPROVALS

The X-Press System has earned the 9R21 and 25ES UL Listing.

INSTALLATION TOOL

SAMMY X-PRESS IT® INSTALLATION TOOL

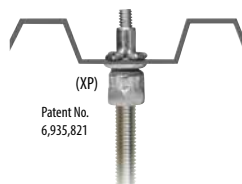


PART NUMBER	MODEL	DESCRIPTION	EACH QTY
8194910	UXPIT*	Universal X-Press It Tool	1
8152910	XPDB	25/64" Drill Bit	1

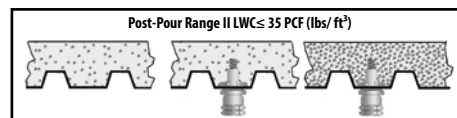
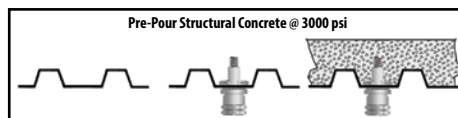
\*Tool Includes: Sleeve, Bit Receiver, Hex Wrench, and 25/64" Drill Bit.

## SELECTION CHART

### SAMMYS X-Press Vertical Mount



ROD SIZE	PART NUMBER	MODEL	DESCRIPTION	ULTIMATE PULLOUT (LBS)	UL LISTED	TEST LOAD (LBS)	UL MIN THICK	FM APPROVED	TEST LOAD (LBS)	FM MIN THICK	MAX THICK	BOX QTY	CASE QTY	APPLICATION
1/4"	8181922	XP 200	X-Press 200	1146 (22 ga)	185 (Luminaire) 250 (Luminaire)	.027" .056"					.125"	25	125	Metal Deck
3/8"	8150922	XP 20	X-Press 20	1146 (22 ga)	850 (2½" Pipe) 185 (Luminaire) 250 (Luminaire) 283 (Conduit & Cable)	.027" .027" .056" .029"		940 (2" Pipe) 1475 (4" Pipe)	.029" .104"		.125"	25	125	Metal Deck
3/8"	8153922	XP 35	X-Press 35	1783 (16 ga)	1500 (4" Pipe) 85 (Luminaire) 250 (Luminaire) 416 (Conduit & Cable)	.060" .029" .056" .059"		940 (2" Pipe) 1475 (4" Pipe)	.029" .104"		.125"	25	125	Purlin
3/8"	8150922	XP 20	X-Press 20	1146 (22 ga)	850 (2½" Pipe)			Pre-Pour Structural Concrete @ 3000 psi Post-Pour Range II LWC ≤ 35 PCF (lbs/ft³)				25	125	Metal Deck (Pre-Pour) Metal Deck (Post-Pour)

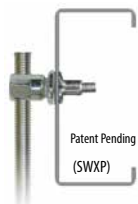


### SAMMYS X-Press Swivel Head®



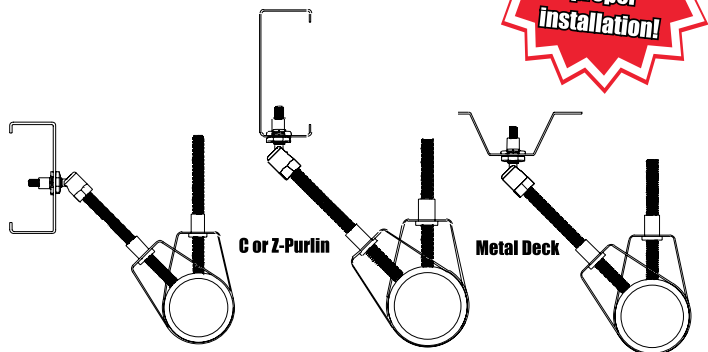
ROD SIZE	PART NUMBER	MODEL	DESCRIPTION	ULTIMATE PULLOUT (LBS)	UL LISTED	TEST LOAD (LBS)	UL MIN THICK	FM APPROVED	TEST LOAD (LBS)	FM MIN THICK	MAX THICK	BOX QTY	CASE QTY	APPLICATION
3/8"	8295922	SXP 35	Swivel X-Press 35	1675 (16 ga Vertical) 1558 (89° Off Vertical)	1250 (3-1/2" Pipe) 250 vertical (Luminaire) 80 @ 90° (Luminaire) 500 vertical (Conduit & Cable) 333 @ 89° (Conduit & Cable)	.059"		635 (2" Pipe)	.029"		.125"	25	125	Purlin

### SAMMYS X-Press Horizontal Mount



ROD SIZE	PART NUMBER	MODEL	DESCRIPTION	ULTIMATE PULLOUT (LBS)	UL LISTED	TEST LOAD (LBS)	FM APPROVED	TEST LOAD (LBS)	MIN THICK	MAX THICK	BOX QTY	CASE QTY	APPLICATION
3/8"	8293957	SWXP 35	Sidewinder X-Press 35	1798 (16 ga)	1250 (3½" Pipe) 80 (Luminaire) 416 (Conduit & Cable)				.060"	.125"	25	125	Purlin

# SAMMYS X-Press for Seismic Restraint



## FOR 3/8" AND 1/2" RODS

### SXP 35 FOR 3/8" ROD

Structural attachment for installation of branch/end of line restraint using 3/8" all thread (.299" OD) or end thread rod (.374" OD).

**SXP 35 for 3/8" Rod:** Designed for use in steel purlin ranging from 16 ga. through 1/8" in low slope or pitched roof designs (12/12).

The Swivels may be used to attach short length of rod to eliminate lateral sway bracing per NFPA 13, 9.3.5.3.8, (2007).

## DESCRIPTION

### FEATURES

- Structural attachment and restraint component combined; ready for selected rod.
- Access to the back of fastener not required.
- Does not require use of a retaining nut.
- Quick and easy installation.

### BENEFITS

- Reduced installation cost.
- Design flexibility.
- Less on site material (GO GREEN).
- Less material coordination.
- Aesthetically pleasing.

## SPECIFICATIONS

### FOR 3/8" ROD

**Restrained Pipe Size:** Up to Schedule 40 pipe 2" or less

**Max Length of**

**Restraint Material:** See Maximum Horizontal Load Tables below.

**Maximum Angle:** 45° from horizontal

**Material:** Carbon Steel

**Screw Description:** 1/4"-20 x 1-1/8" with expandable sleeve

**Finish:** Electro-Zinc

**Testing:** Tested to GR-63-CORE Standard for performance in structural steel in seismic restraint applications as outlined for use in NFPA 13 (2007), 9.3 at an independent test lab. The calculated force used for the testing was equal to that found in a Zone 4 and an 8.4 Richter scale seismic event.

**Listing for 3/8" Rod:** UL 203 listed as pipe hanger File EX 5098  
- SXP 35 (16 ga.) 0-90° from horizontal - 3-1/2" Schedule 40 pipe

UL 203A File EX 15565



## SELECTION CHART

### SAMMYS X-Press Swivels – Seismic Restraint

ROD SIZE	PART NUMBER	MODEL	MIN THICKNESS	MAX THICKNESS	APPLICATION	BOX QTY	CASE QTY	INSTALLATION TOOL
3/8"	8295922	SXP 35	16 ga	1/8"	Purlin	25	125	The SWXP 35 must be installed with UXFIT Tool (Part No. 8194910); pre-drilling required.

## PERFORMANCE TABLES

### Maximum Rod Length for I/r=100, 200, 300, and 400

RESTRAINT SHAPE AND SIZE	NOMINAL DIAMETER	AREA (in. <sup>2</sup> )	LEAST RADIUS OF GYRATION, r (in.)	MAXIMUM ROD LENGTH FOR I/r (ft)			
				I/r = 100	I/r = 200	I/r = 300	I/r = 400*
Rods (all thread)	3/8 in.	0.07	0.075	0.6	1.3	1.9	2.5
	1/2 in.	0.129	0.101	0.8	1.7	2.5	3.4
Rods (threaded at ends only)	3/8 in.	0.11	0.094	0.8	1.6	2.4	3.1
	1/2 in.	0.196	0.125	1.0	2.1	3.1	4.2

Reference: NFPA 13, (2007)

\* Reference: NFPA 13, (2010)

**SAMMYS®**

**ITW Construction Products**

Call our toll free number 800-387-9692 or visit [www.itwconstruction.ca](http://www.itwconstruction.ca) for general information.

## DESCRIPTION (SIDEWINDER)

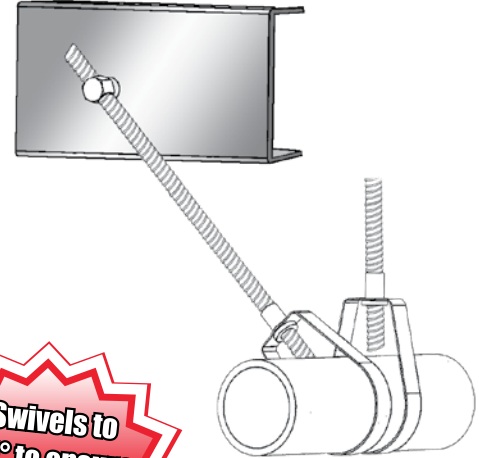
### SWXP 35 FOR 3/8" ROD

Structural attachment for installation of branch/end of line restraint using 3/8" threaded rod. Used primarily in purlin, bar joist, or other steel structural members. These fastening systems provide a secure and economical attachment to the structure.

The SWXP 35 model provides upper structural attachment in a range of steel thicknesses, from 16 ga. through 1/8". An expandable sleeve is included with each fastener, eliminating need for retaining nut.

## SPECIFICATIONS

<b>Restrained Pipe Size:</b>	Up to Schedule 40 pipe 2" or less
<b>Max Length of Restraint Material:</b>	See Maximum Horizontal Load Tables below.
<b>Maximum Angle:</b>	45° from horizontal
<b>Material:</b>	Carbon Steel
<b>Screw Description:</b>	1/4"-20 X 1-1/8" with expandable sleeve
<b>Finish:</b>	Electro-Zinc (cap & screw)
<b>Testing:</b>	BX Report # R-1362
<b>Listing:</b>	UL 203 as a pipe hanger UL 203A pending



## SELECTION CHART

### SAMMYS Sidewinders for Steel – Seismic Restraint

ROD SIZE	PART NUMBER	MODEL	MIN THICKNESS	MAX THICKNESS	APPLICATION	BOX QTY	CASE QTY	INSTALLATION TOOL
3/8"	8293957	SWXP 35	16 ga.	1/8"	Steel Purlin or Bar Joist	25	125	The SWXP 35 must be installed with UXFIT Tool (Part No. 8194910); pre-drilling required.

## PERFORMANCE TABLES

### Maximum Horizontal Loads for Restraint with $l/r=100, 200, 300, \text{ and } 400$

RESTRAINT SHAPE AND SIZE	NOMINAL DIAMETER	AREA (in. <sup>2</sup> )	LEAST RADIUS OF GYRATION, $r$ (in.)	MAXIMUM ROD LENGTH FOR $l/r$ (ft)			
				$l/r = 100$	$l/r = 200$	$l/r = 300$	$l/r = 400^*$
Rods (all thread)	3/8 in.	0.07	0.075	0.6	1.3	1.9	2.5
	1/2 in.	0.129	0.101	0.8	1.7	2.5	3.4
Rods (threaded at ends only)	3/8 in.	0.11	0.094	0.8	1.6	2.4	3.1
	1/2 in.	0.196	0.125	1.0	2.1	3.1	4.2

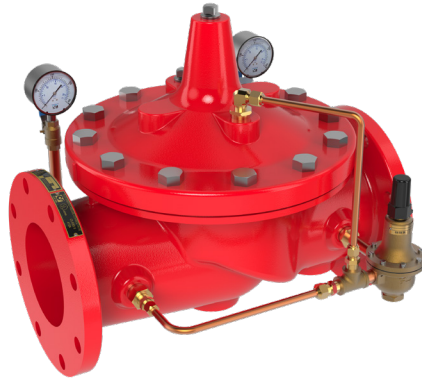
Reference: NFPA 13, (2007)

\* Reference: NFPA 13, (2010)



**MODELS** **90G-21**  
**90A-21**

## Fire Protection Pressure Reducing Valves



- **UL & ULC Listed**
- **Globe or Angle Pattern**
- **Proven Reliable Design**
- **In Line Service**
- **Grooved Ends (1-1/2" - 8")**

Cla-Val 90-21 Pressure Reducing Valves are indispensable in any fire protection system. Available in globe (90G-21) and angle patterns (90A-21), our diaphragm actuated design is proven to be highly reliable and easy to maintain. Our 90-21 valves feature a full range of adjustments and variety of material options.

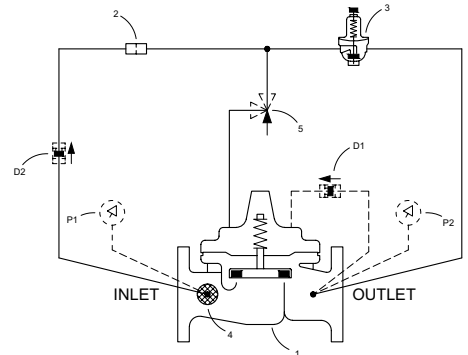
Special System Water Control Valves – Class II  
UL Product Category VLMT – File No. Ex 2534

### Function

Cla-Val 90G-21 (globe) and 90A-21 (angle) Pressure Reducing Valves automatically reduce a higher inlet pressure to a steady lower outlet pressure regardless of changing flow rate and/or varying inlet pressure. The valves pilot control system is very sensitive to slight downstream pressure fluctuations, and will automatically modulate to maintain the desired pressure setting. The downstream pressure can be set over a wide range by turning the adjustment screw clockwise (increase pressure) or counter clockwise (decrease pressure) on the CRD pilot control. The adjustment screw is protected by a screw-on cover, which can be sealed to discourage tampering.

### Schematic Diagram

Item	Description
1	100-01 Hytrol Main Valve
2	X58C Restriction Assembly
3	CRD Pressure Reducing Control
4	X46A Flow Clean Strainer
5	CV Flow Control (opening)
D	Check Valve Option
P	Gauge Option

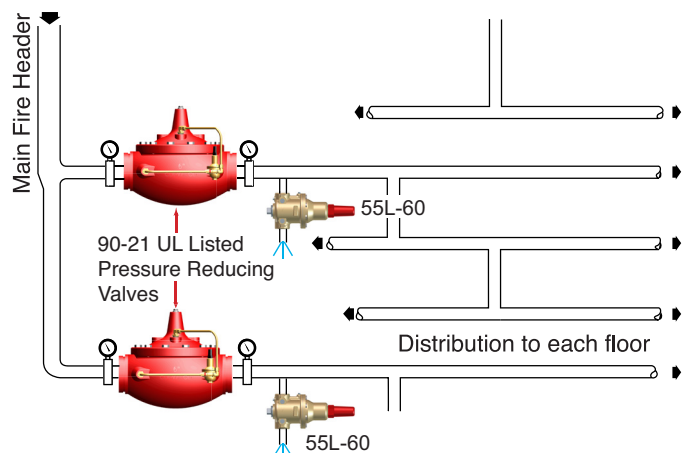


### Typical Application

Underwriters Laboratories requires the installation of pressure gauges upstream and downstream of the Pressure Reducing Valve.

A relief valve of not less than 1/2 inch in size must also be installed on the downstream side of the pressure control valve. Adequate drainage for the relief valve discharge must be provided.

**The valve may be installed in either vertical or horizontal positions.**





## Dimensions

Valve Size (Inches)	1 1/2	2	2 1/2	3	4	6	8	10	12
A Threaded	7.25	9.38	11.00	12.50	—	—	—	—	—
AA 150 ANSI	8.50	9.38	11.00	12.00	15.00	20.00	25.38	29.75	34.00
AAA 300 ANSI	9.00	10.00	11.62	13.25	15.62	21.00	26.38	31.12	35.50
AAAA Grooved End	8.50	9.00	11.00	12.50	15.00	20.00	25.38	—	—
B	1.12	1.50	1.69	2.06	3.19	4.31	5.31	9.25	10.75
BB Grooved End	2.00	2.50	2.88	3.12	4.25	6.00	7.56	—	—
C Max.	5.50	6.50	7.56	8.19	10.62	13.38	16.00	17.12	20.88
CC Max. Grooved End	4.75	5.75	6.88	7.25	9.31	12.12	14.62	—	—
E Threaded	3.25	4.75	5.50	6.25	—	—	—	—	—
EE 150 ANSI	4.00	4.75	5.50	6.00	7.50	10.00	12.69	14.88	17.00
EEE 300 ANSI	4.25	5.00	5.88	6.38	7.88	10.50	13.25	15.56	17.75
EEEE Grooved End	—	4.75	—	6.00	7.50	—	—	—	—
F Threaded	1.88	3.25	4.00	4.50	—	—	—	—	—
FF 150 ANSI	4.00	3.25	4.00	4.00	5.00	6.00	8.00	8.62	13.75
FFF 300 ANSI	4.25	3.50	4.31	4.38	5.31	6.50	8.50	9.31	14.50
FFFF Grooved End	—	3.25	—	4.25	5.00	—	—	—	—
Y	9	9	10	11	12	20	22	24	26
Z	9	9	10	11	12	20	22	24	26

Valve Size (mm)	40	50	65	80	100	150	200	250	300
A Threaded	184	238	279	318	—	—	—	—	—
AA 150 ANSI	216	238	279	305	381	508	645	756	864
AAA 300 ANSI	229	254	295	337	397	533	670	790	902
AAAA Grooved End	216	228	279	318	381	508	645	—	—
B	29	38	43	52	81	110	135	235	273
BB Grooved End	52	64	73	79	108	152	192	—	—
C Max.	140	165	192	208	270	340	406	435	530
CC Max. Grooved End	120	146	175	184	236	308	371	—	—
E Threaded	83	121	140	159	—	—	—	—	—
EE 150 ANSI	102	121	140	152	191	254	322	378	432
EEE 300 ANSI	108	127	149	162	200	267	337	395	451
EEEE Grooved End	—	121	—	152	191	—	—	—	—
F Threaded	48	83	102	114	—	—	—	—	—
FF 150 ANSI	102	83	102	102	127	152	203	219	349
FFF 300 ANSI	102	89	110	111	135	165	216	236	368
FFFF Grooved End	—	83	—	108	127	—	—	—	—
Y	229	229	254	280	305	508	559	610	661
Z	229	229	254	280	305	508	559	610	661

## Selection Guidelines

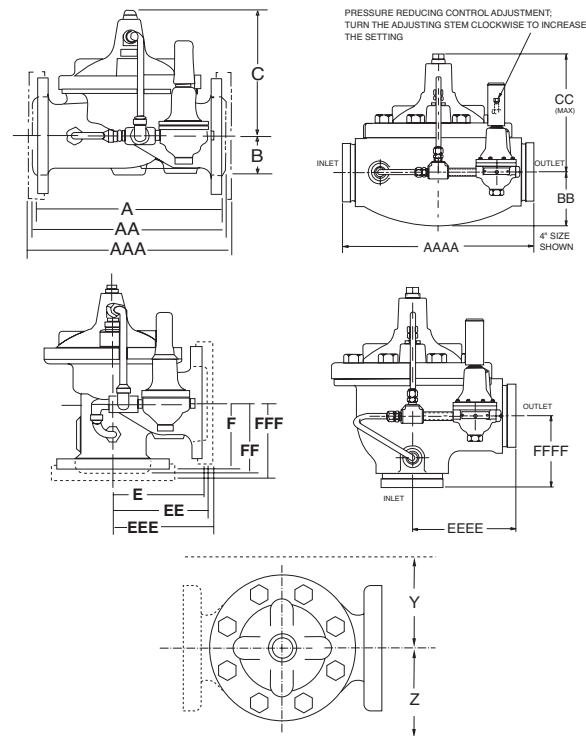
### Flow Capacity Table Flow Rate (GPM of Water)

Valve Size	Maximum
1 1/2"	110
2"	196
2 1/2"	306
3"	441
4"	783
6"	1763
8"	3133
10"	4896
12"	7050

### Optional UL Listed Materials for Seawater and Severe Service Applications:

- Nickel Aluminum Bronze (NAB) - ASTM B148 Alloy C95800
- Monel - QQ-N-288 Comp B - ASTM A494 Grade M30H
- Cast Steel - ASTM A216 Grade WCB
- 316 Stainless Steel - ASTM A743 Grades CF3M and CFM8
- Super Austenitic Stainless Steel - ASTM A351 Grade CK3MCuN (SMO 254)
- Super Duplex Stainless Steel - ASTM A890 Grade 5A (CE3MN)

**Note:** (1) Minimum Pressure Differential decreases as flow rates decrease.  
(2) All sizes are designed to meet minimum flow of system components.



<b>End Details</b>	150 and 300 ANSI B16.42
<b>Pressure Ratings</b>	Class 150 - 250 psi Max. Class 300 - 300 psi Max
<b>Standard Materials</b>	<b>Main Valve Body &amp; Cover:</b> Ductile Iron ASTM A536 Grade 65-45-12 <b>Standard Main Valve Trim:</b> Stainless Steel Seat Stainless Steel Stem <b>Standard Pilot Control System:</b> Cast Bronze with Stainless Steel Trim
<b>Pressure Adjustment Ranges</b>	<b>Size</b> <b>UL / ULC</b> 1-1/2"      50-175 2"          30-165 8"- 12"      50-175

**Minimum Pressure Differential (at Max Flow)** 1-1/2" - 12" 20 psid

**Temperature Range** Water to 180°F Maximum

The pressure rating of the components installed downstream of the valve shall not be exceeded.

### When Ordering, Specify:

- Model Number 90-21
- Size
- Globe or Angle Pattern
- Main Valve Body and Cover Material
- Threaded, Flanged or Grooved
- Pressure Class



## CLA-VAL

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E-mail: [info@cla-valpacific.com](mailto:info@cla-valpacific.com)



# Model ZW5004

## Pressure-Tru® Floor Control Valve

### Application

The Pressure-Tru® ZW5004 Series Pressure Reducing Valve is listed as a floor control valve, an indicating valve, and a check valve in automatic sprinkler systems as well as a standpipe valve for CLASS I and CLASS III systems. Regulates pressure under both flow and no-flow conditions. Ideal for applications where immediate field adjustments are needed. Can be factory set and adjusted or set in the field as needed. The valve has a listed supervisory switch built in. Suitable for indoor / outdoor use. Tamper resistant housing can be rotated for easy wiring switch rated 3 amps @ 125 VAC. Normally open contacts are standard.

### Standards Compliance

- UL® Listed
- C-UL® Listed

### Material

Main valve body	Cast bronze ASTM B806
Stem	Cast bronze ASTM B806
Flange	Cast bronze ASTM B806
Elastomers	Buna Nitrile EPDM
Springs	Chrome silicon, ASTM A401 powder coated

### Features

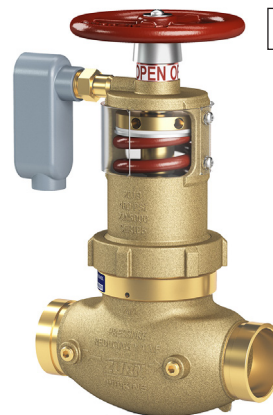
Sizes: 2 1/2"

Maximum inlet pressure	400 psi
End connection (FNPT)	ANSI B1.20.1
(Grooved)	AWWA C606

Factory or Field Set

Tapped and plugged inlet and outlet for pressure gauge (both sides).

Integral supervisory switch contact rating of 3 amps at 125VAC and a tamper resistant cover



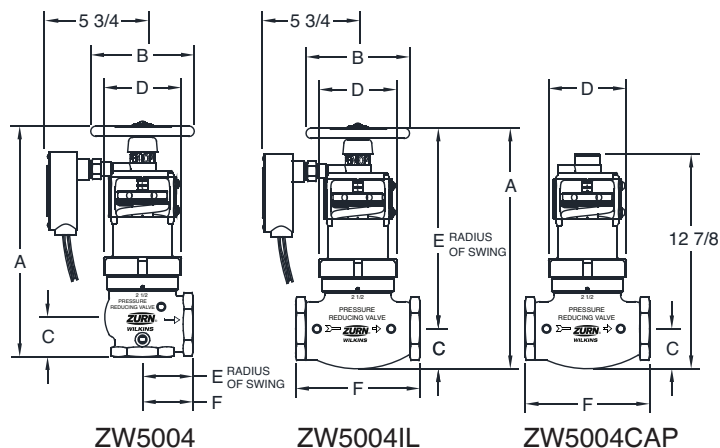
PATENT PENDING

ZW5004ILG

### Options

(Suffixes can be combined)

- ☐ - angle type valve
- ☐ IL - in-line (globe type) valve
- ☐ G - with grooved inlet
- ☐ CAP - with capped bonnet, no handwheel assembly and no supervisory switch



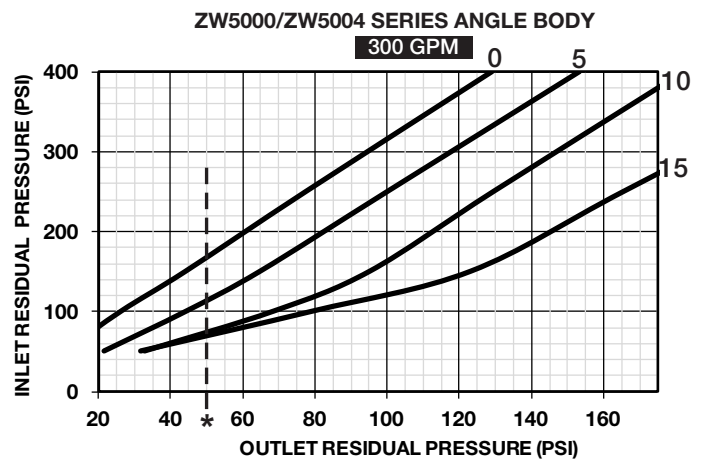
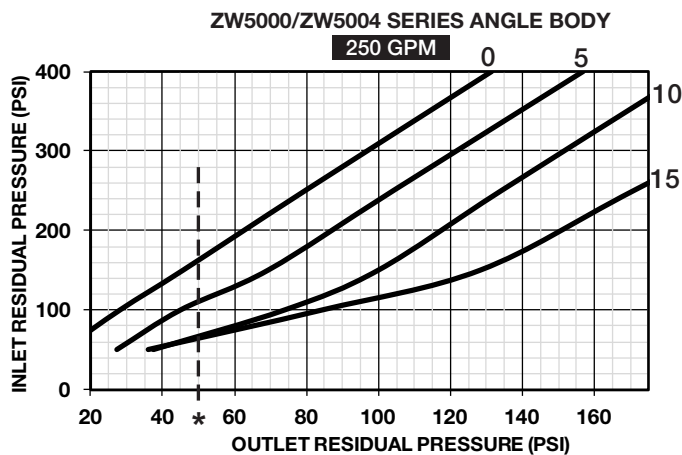
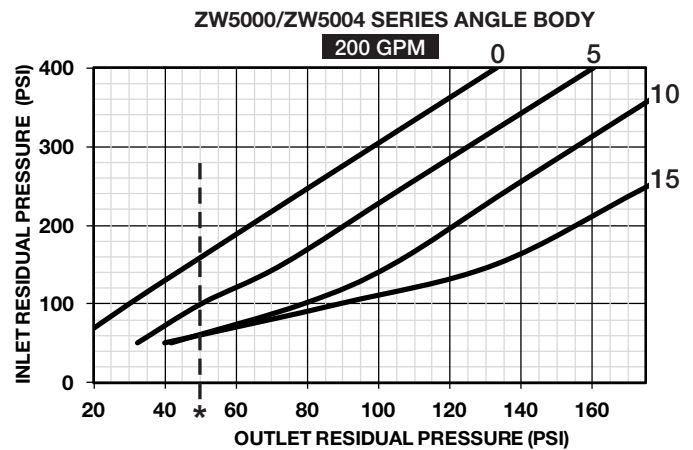
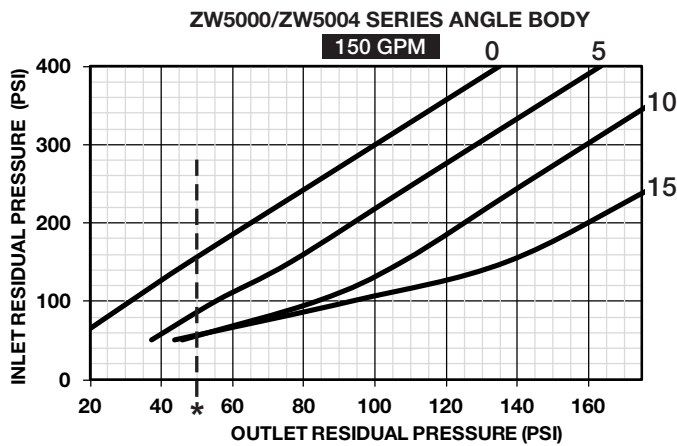
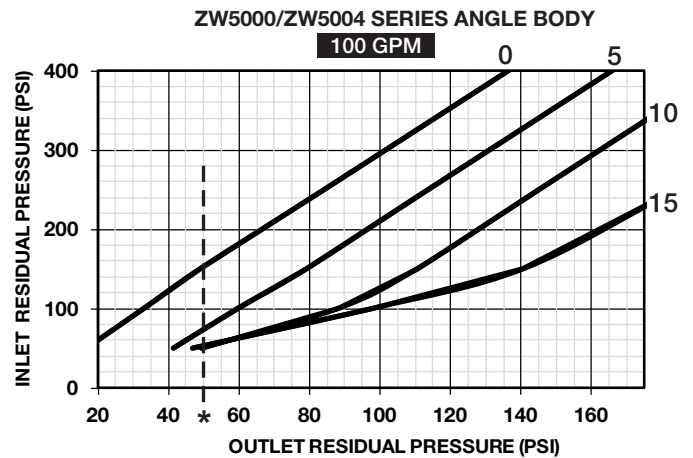
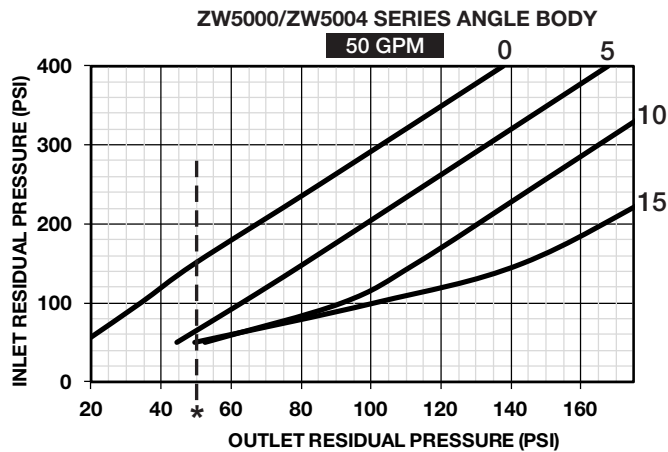
### Dimensions & Weights (do not include pkg.)

MODEL	DIMENSIONS (approximate)															
	A OPEN		A CLOSED		B		C		D		E		F		WEIGHT	
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	lbs	kg
ZW5004	13 7/8	352	13 3/8	340	6 1/4	159	2	51	5	127	3 1/2	89	3 1/4	83	23	10.2
ZW5004IL	14 1/2	368	14	356	6 1/4	159	2 1/2	64	5	127	12 7/16	316	7 1/2	191	27.25	12.4
ZW5004G	14 1/2	368	14	356	6 1/4	159	2 1/2	64	5	127	N/A	N/A	3 1/4	83	23	10.2
ZW5004ILG	14 1/2	368	14	356	6 1/4	159	2 1/2	64	5	127	N/A	N/A	8 3/4	222	27.25	12.4



# Residual Pressure Charts

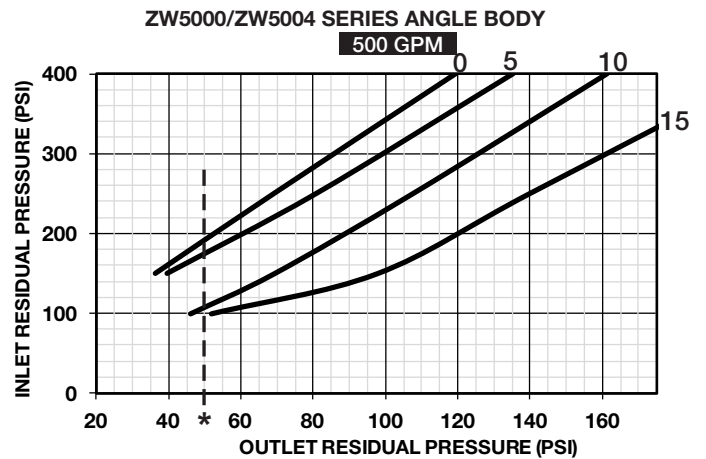
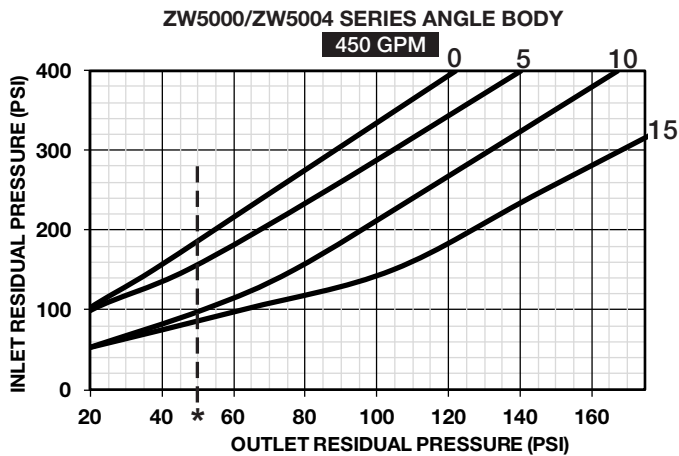
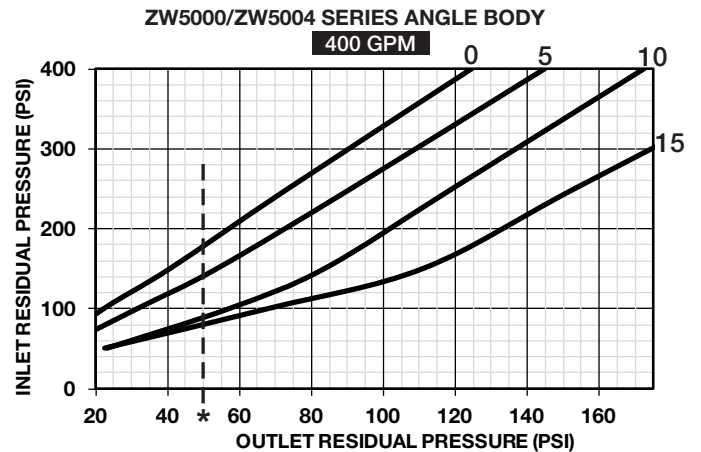
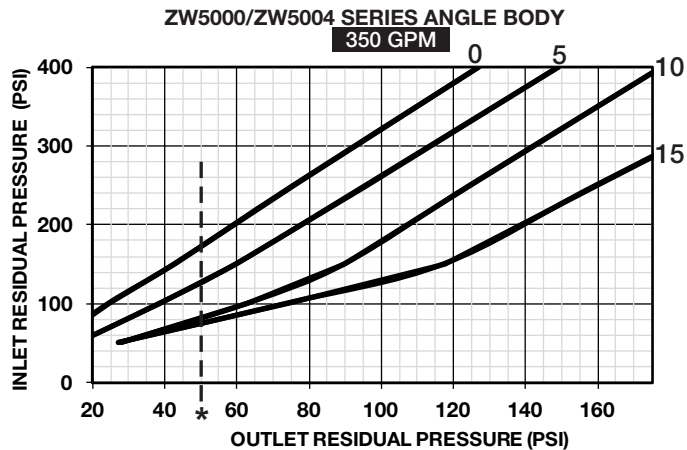
For Pressure-Tru® 2 1/2" Models



**Note: Curve accuracy=  $\pm 5$  PSIG \*50 PSI Minimum setting for sprinkler systems**

# Residual Pressure Charts

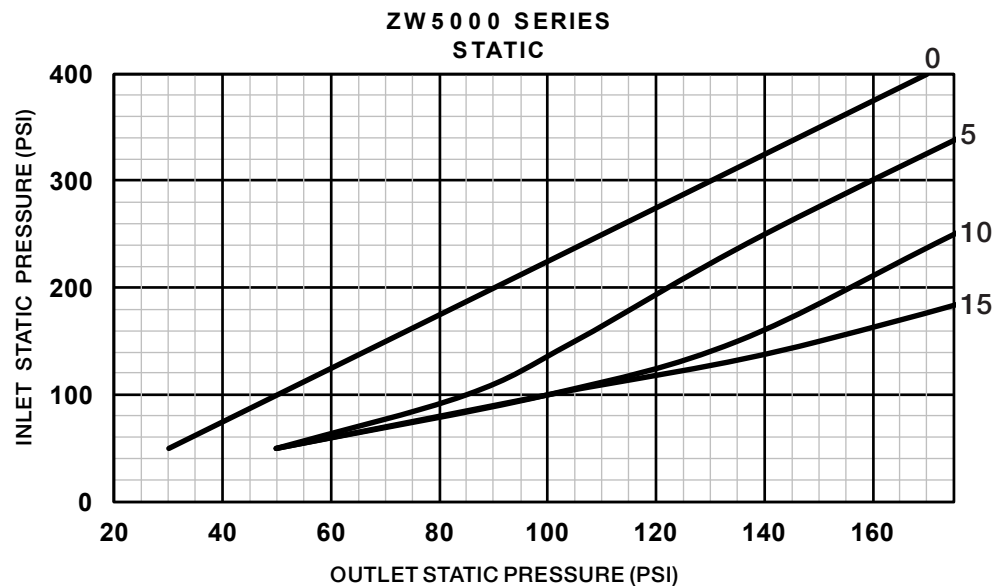
For Pressure-Tru® 2 1/2" Models



## STATIC PRESSURE CHART

For Pressure-Tru® Angle  
and In-line Valves  
(2-1/2" Inlet and Outlet)

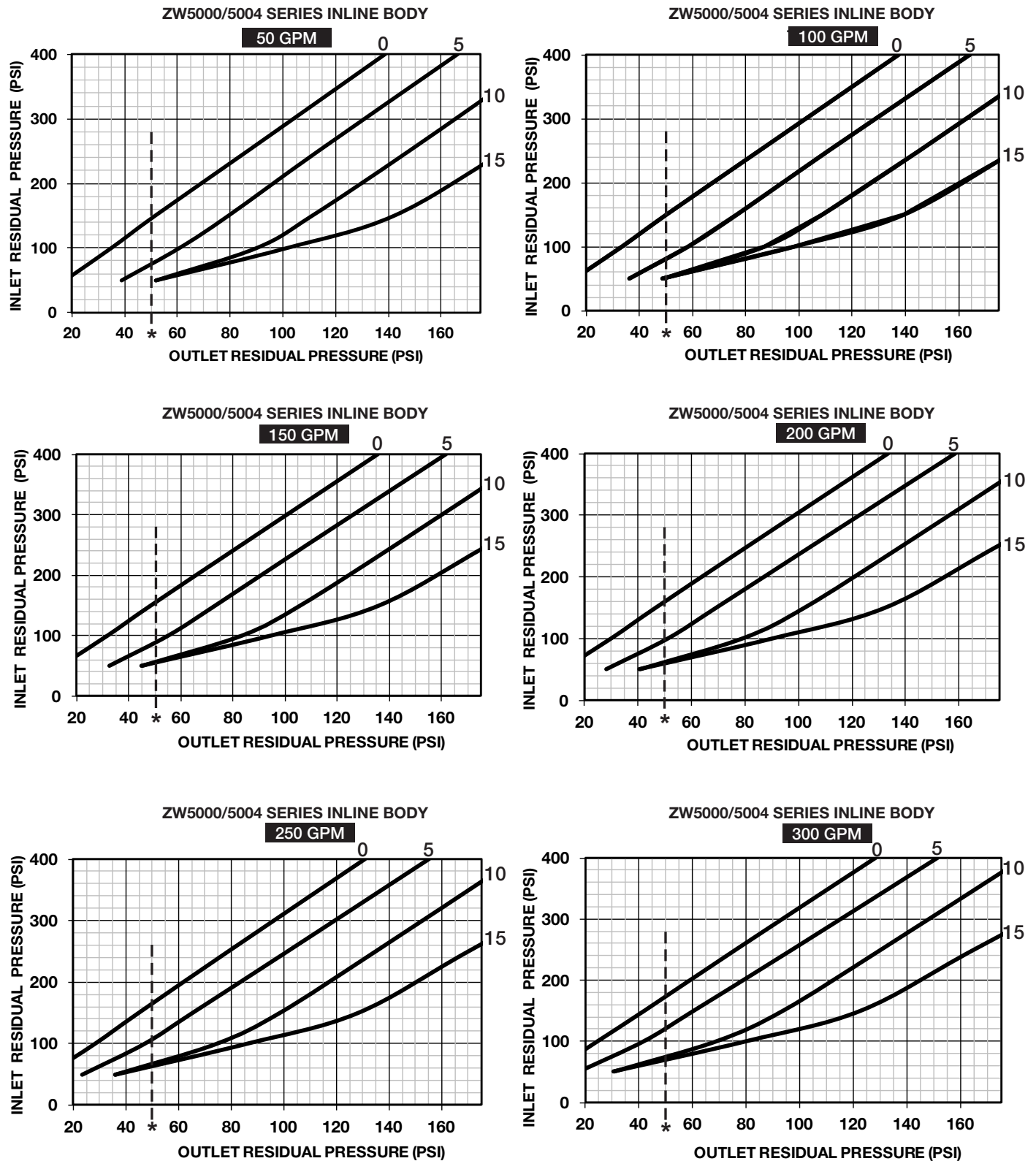
MODELS:  
ZW5000 and ZW5004 (ALL)



**Note: Curve accuracy=  $\pm 5$  PSIG \*50 PSI Minimum setting for sprinkler systems**

# Residual Pressure Charts

For Pressure-Tru® 2 1/2" Models



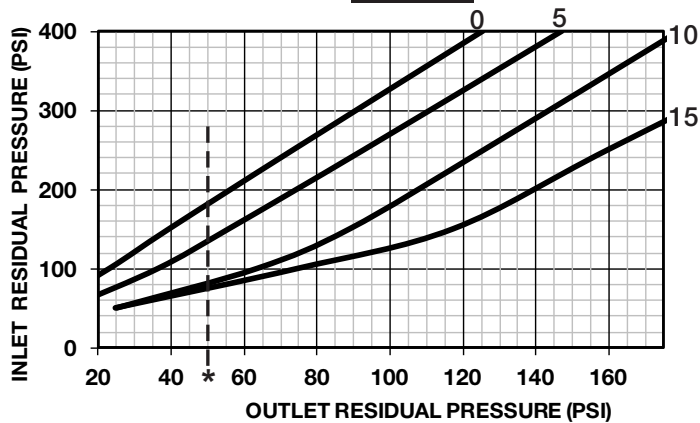
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# Residual Pressure Charts

For Pressure-Tru® 2 1/2"

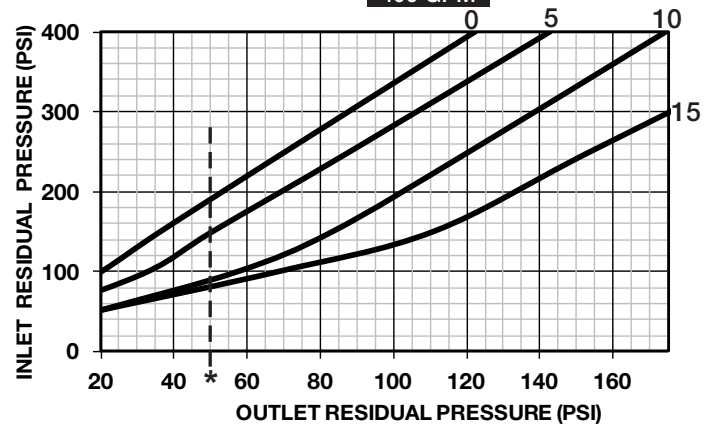
ZW5000/5004 SERIES INLINE BODY

350 GPM



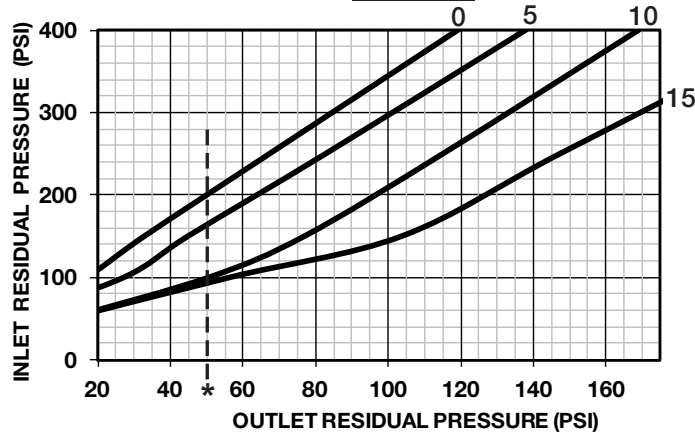
ZW5000/5004 SERIES INLINE BODY

400 GPM



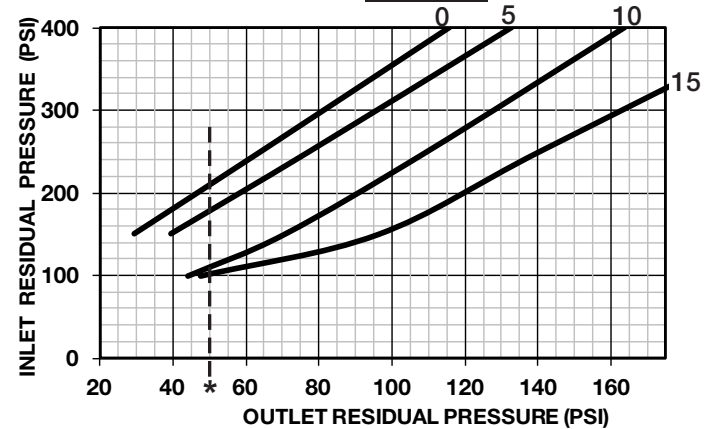
ZW5000/5004 SERIES INLINE BODY

450 GPM



ZW5000/5004 SERIES INLINE BODY

500 GPM



**Note: Curve accuracy=  $\pm 5$  PSIG \*50 PSI Minimum setting for sprinkler systems**

**GUARDIAN**FIRE EQUIPMENT, INC.  
MIAMI, FL

Ph. 800.327.6584 • Fax 800.827.3869

**DETAIL AND SUBMITTAL SHEET****5200 Series - Pressure Regulating Valves (Field Adjustable)**

Project/Location: \_\_\_\_\_

Date: \_\_\_\_\_

Architect/Engineer: \_\_\_\_\_

Qty: \_\_\_\_\_

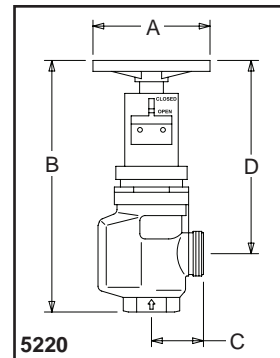
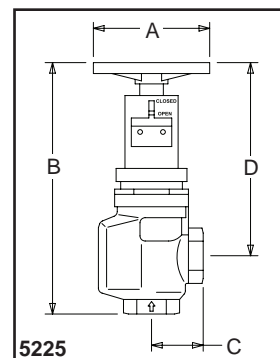
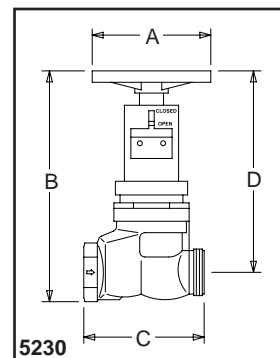
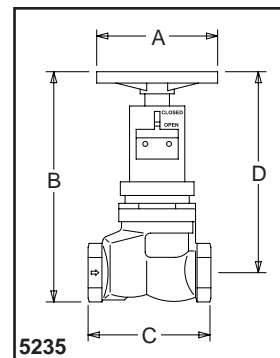
Contractor: \_\_\_\_\_

☒ *Appropriate Selection*

Used to regulate and control high pressures in standpipe and sprinkler systems. Constant pressure regulation under residual (flowing) and static (non-flowing) conditions. Tamper-resistant pressure adjustment setting (special tool and instructions provided with each valve for job-site adjustment). Bonnet tab indicates valve position as "open" or "closed".

Valve seat acts as checking device and closes when inlet pressures drop below selected static outlet pressures. Available as angle or in-line (straight) type, 2 1/2" size. Female pipe inlet x female pipe or male hose thread outlet. Large operating handwheel, cast brass body with brass and stainless steel internals. UL listed to 400 PSI pressure. Optional monitor switch adapter bracket permits valve supervision by electrical means.

Model No.	Size	Outlet	A	B	C	D
<input type="checkbox"/> 5220	2 1/2" x 2 1/2"	Male*	7 7/8"	17 7/8"	3 1/2"	14 1/8"
<input type="checkbox"/> 5225	2 1/2" x 2 1/2"	Female NPT	7 7/8"	17 7/8"	3 3/8"	14 1/8"
<input type="checkbox"/> 5230	2 1/2" x 2 1/2"	Male*	7 7/8"	16"	8"	14 3/4"
<input type="checkbox"/> 5235	2 1/2" x 2 1/2"	Female NPT	7 7/8"	16"	8"	14 3/4"

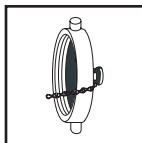
Optional Finish: ☐ -C Rough Chrome Plated\* Threads: ☐ NST ☐ Other \_\_\_\_\_**5220****5225****5230****5235**

**Caps with Chains** - Used to protect hose thread outlets on valves and hydrants.

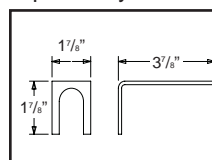
Cast brass caps (pin lugs)\* or red plastic caps (rocker lugs).

Model No.	Size	Type
<input type="checkbox"/> 5515	1 1/2"	Brass
<input type="checkbox"/> 5515P	1 1/2"	Plastic
<input type="checkbox"/> 5525	2 1/2"	Brass
<input type="checkbox"/> 5525P	2 1/2"	Plastic

Threads:

☐ NST  
☐ Other \_\_\_\_\_**Options**

☐ **-bkt1** - Bracket used for supervisory switch installation.



Optional Finish:

☐ -C Rough Chrome Plated\*Optional: ☐ -RL Rocker lugs

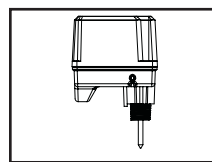
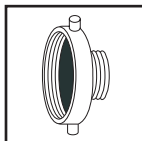
**Reducer** - Used to change outlet size. Rigid pin lug\*, female x male threads.

Model No.	Size
<input type="checkbox"/> 3315	2 1/2" x 1 1/2"

Optional Finish:

☐ -C Rough Chrome Plated\*Optional: ☐ -RL Rocker lugs

Threads:

☐ NST  
☐ Other \_\_\_\_\_

☐ **9391 Supervisory Switch**

- Used to detect tampering or setting changes on control valves.



## Model G Swing Check Valves

**2½" (65 mm), 76 mm**  
**3" (80 mm), 4" (100 mm),**  
**6" (150 mm), 165 mm & 8" (200 mm)**

### Features

1. Grooved end connections.
2. Compact, lightweight design.
3. Non-slamming, spring loaded clapper to minimize water hammer.
4. Approved for horizontal and vertical installation.
5. Streamlined body design provides very low friction loss.

### General

Reliable Model G Swing Check Valves are multiple purpose valves performing regular check valve duties with very low friction loss. All four sizes are approved for use in fire protection systems. Typical applications include connections between public water supplies and private fire systems, at the discharge from fire pumps, at gravity tank connections and at fire department pumper connections.

All Model G Check Valves are provided with a ½" NPT (R½) supply side connection (Item 12, Fig.2).

Grooved end connections provide fast and easy installation using listed or approved mechanical grooved couplings. Rigid style grooved couplings can be used for positive clamping to resist flexural and torsional loads.



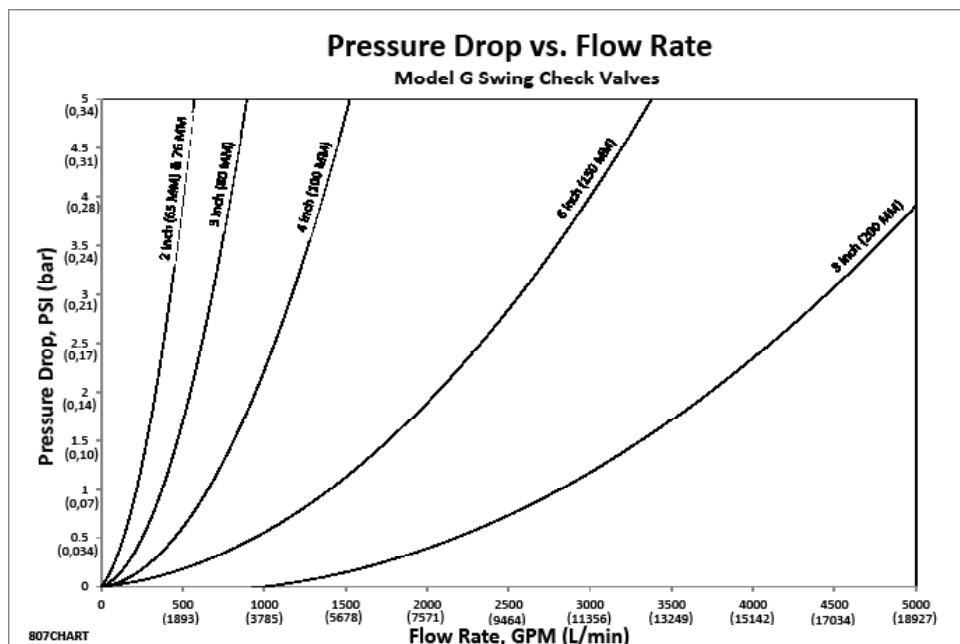
Figure 1

### Valve Description

1. Rated working pressure 250 psi (17,25 bar).
2. Factory hydrostatic test pressure 500 psi (34,5 bar).
3. Friction loss, expressed in equivalent length of Sch. 40 pipe with C = 120 (based on Hazen and Williams formula):  
 2½" (65 mm) & 76 mm - 7 ft (2.13 m)  
 3" (80 mm) - 7 ft (2.13 m)  
 4" (100 mm) - 10 ft (3.05 m)  
 6" (150 mm) & 165 mm - 16 ft (4.88 m)  
 8" (200 mm) - 15.9 ft (4.85 m)
4. Standard grooved end dimensions per ANSI/AWWA C606.

### Technical Data

Valve Size	Face-to-Face Dimensions	Shipping weight
2½" (65 mm) & 76 mm	7.12" (181 mm)	9 lbs. (4kg)
3" (80 mm)	7.62" (193 mm)	11 lbs. (5kg)
4" (100 mm)	8.44" (214 mm)	17 lbs. (7.7kg)
6" (150 mm) & 165 mm	10.25" (260 mm)	38 lbs. (17.25kg)
8" (200 mm)	12.5" (318 mm)	63 lbs. (28.58kg)



**Note:** Model G Check Valves may be damaged by excessively turbulent water flow. Model G Check Valves should be installed a reasonable distance from pipe transitions, such as pumps, elbows, expanders, reducers, or similar devices. Typical piping practices suggest a minimum distance of five times the pipe diameter for general use.

### Approvals

1. Listed by Underwriters Laboratories, Inc.
2. Underwriters' Laboratories certified for Canada.
3. Approved by Factory Mutual Research Corp.\*
4. NYC MEA 258-93-E

\* FM Approved as both a "Single" check valve and as an "Anti-Water Hammer" check valve.



Refer to figure 2.

Item No.	Part Name	Material	Qty.	Part Number						
				2½" (65 mm)	76 mm	3" (80 mm)	4" (100 mm)	6" (150 mm)	165 mm	8" (200 mm)
1*	Valve Body	Gray Iron, ASTM-A48 Class 30A	1	91005012	91005011	91005013	91005014	91005016	91006015	91005008
2*	Seat	Bronze C83600 or C93200, ASTM-B505	1	96020200	96020200	96020300	96020400	96020600	96020600	96020800
3	Clapper	Stainless Steel 304, ASTM-A240	1	91816112	91816112	91816113	91816114	91816116	91816116	91816118
4	Facing Seal **	EPDM Rubber	1	95520200	95520200	95520300	95520400	95520600	95520600	95520800
5	Clamping Ring	Stainless Steel 304, ASTM-A240	1	95290300	95290300	95290300	95290400	95290600	95290600	95290800
6	Gasket **	EPDM Rubber	1	93720604	93720604	93720604	93720604	93720604	93720604	93720804
7	Spring	Stainless Steel 302, ASTM-A313	1	96400300	96400300	96400300	96400400	96400600	96400600	96400800
8	Hinge Pin	Stainless Steel 303, ASTM-A582	1	95000280	95000280	95000300	95006824	95000600	95000600	95000800
9	Bolt	Stainless Steel 304, ASTM-F593	1	91090600	91090600	91090600	91090600	91090600	91090600	91090800
10	Locknut **	Stainless Steel 303, ASTM-F594	1	94913816	94913816	94913816	94913816	94913816	94913816	94913816
11	Plug, ¼" NPT	Steel	1	95201800	95201800	95201800	95201800	95201800	95201800	95201800
12	Plug, ½" NPT	Steel	1	98604402	98604402	98604402	98604402	98604402	98604402	98604402
13	Shoulder Eye	Steel	1	N/A	N/A	N/A	N/A	N/A	N/A	98020016
**	Replacement Seal Kit		1	6888040025	6888040025	6888040030	6888040040	6888040060	6888040060	6888040080

\* Not field replaceable.

## Valve Disassembly

1. Close the main water supply valve and drain the system.
2. Remove the check valve from the piping system.
3. Inspect the Seat (2) for any cuts, scrapes and dents. Replace the valve if any damage is found.
4. To replace the Facing Seal (4), remove the Clapper (3), unscrew the Locknut (10) and remove the Retention Bolt (9).

## Valve Reassembly

1. Thoroughly clean the Clapper (3). Insert the Retention Bolt (9) with a new Gasket (6).
2. Place the new Facing Seal (4) and the Clamping Ring (5) against the Clapper (3). Tighten the new Locknut (10) to 21 in.-lbs. (2.37 N•m) torque in 2½" (65 mm), 76 mm & 3" (80 mm) sizes and to 52 in.-lbs. (5.87 N•m) in 4" (100 mm), 6" (150 mm), 165 mm & 8" (200 mm) sizes.
3. Insert the clapper assembly into the valve through the downstream opening. Reinsert the Hinge Pin (8) while holding the coils of the properly oriented Spring (7) in place. Install the hinge pin Plug (11).
4. Reinstall the check valve in the system.
5. Place the system back in service.

## Ordering Information

Specify:

1. Model G Check Valve.
2. Size.

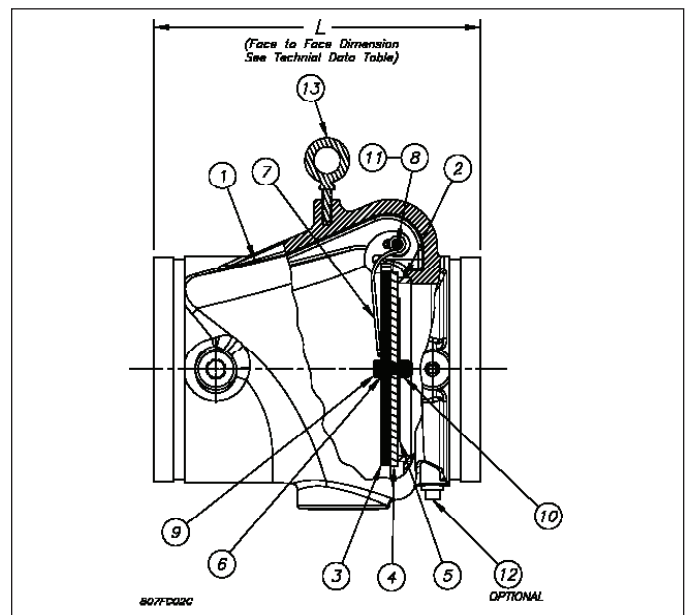


Figure 2

## Maintenance and Installation

Swing Check Valves and associated equipment should periodically be given a thorough inspection and test. NFPA 25 provides minimum maintenance requirements. Check valves should be inspected and operated at least annually. Parts should be replaced as required.

When Model G Swing Check Valves are installed vertically, the direction of the flow arrow must point upward. For horizontal installations, the hinge pin must be located at the top.

The equipment presented in this bulletin is to be installed in accordance with the latest published Standards of the National Fire Protection Association, Factory Mutual Research Corporation, or other similar organizations and also with the provisions of governmental codes or ordinances whenever applicable. Products manufactured and distributed by Reliable have been protecting life and property for over 90 years.

Manufactured by

**Reliable®**

**Reliable Automatic Sprinkler Co., Inc.**

(800) 431-1588

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## Model REL-CV Swing Check Valve

200 psi (13.8 bar)

### Product Description

Reliable Model REL-CV swing check valves have a rated working pressure of 200 psi (13.8 bar) and feature a brass valve body with FNPT end connections.

### Installation

The Reliable swing check valves shall be installed in accordance with NFPA 13, "Standard for the Installation of Sprinkler Systems," as well as the requirements of any authorities having jurisdiction. Verify compatibility of the valve materials with the water supply and the environment where the valve will be installed prior to installation.

**WARNING:** Model REL-BL ball valves contain lead and are not for use in systems carrying water intended for human consumption.

### Maintenance

The owner is responsible for maintaining the fire protection system in proper operating condition. Any system maintenance or testing that involves placing a control valve out of service will eliminate the fire protection that is provided by the fire protection system.

The Reliable swing check valve shall periodically be given a thorough inspection and test. NFPA 25, "Inspection, Testing and Maintenance of Water Based Fire Protection Systems," provides minimum maintenance requirements. Inspect the valve for corrosion, damage, and wear as required and replace as necessary. Increase the frequency of inspections when the valve is exposed to corrosive conditions or chemicals that could impact the valve materials.



Model REL-CV Swing Check Valve

### Guarantee

For Reliable Automatic Sprinkler Co., Inc. guarantee, terms, and conditions, visit [www.reliablesprinkler.com](http://www.reliablesprinkler.com).

### Ordering Information

Specify the following when ordering:

#### Reliable Model REL-CV Swing Check Valve Valve Size

- 3/8" (10 mm)
- 1/2" (15 mm)
- 3/4" (20 mm)
- 1" (25 mm)
- 1-1/4" (32 mm)
- 1-1/2" (40 mm)
- 2" (50 mm)



## Model REL-CV Swing Check Valves

### Technical Specifications

#### Pressure Rating:

200 psi (13.8 bar)

### Material Specifications

**Body:** C37700 Brass Alloy

**Bonnet:** C37700 Brass Alloy

**Check Plate:** C37700 Brass Alloy

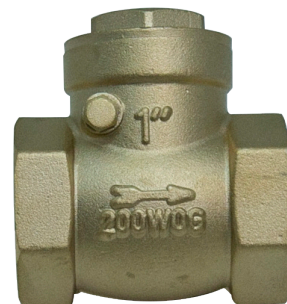
**Hinge Pin:** 304 Stainless Steel

**Plug:** C37700 Forged Brass Alloy

**Seal Ring:** NBR/Nitrile/Buna-N Rubber

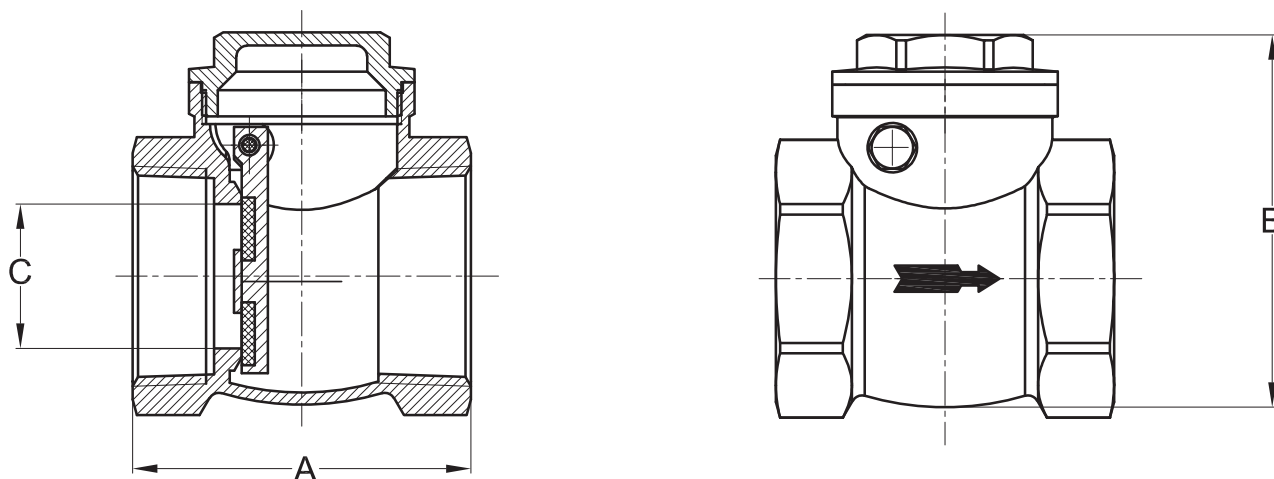
### End Connections

Female NPT



## Model REL-CV Swing Check Valve Dimensions

Figure 1



### Dimensions in. (mm)

Table A

Valve Size	A	B	C
3/8 (10)	1-13/16 (46)	1-3/4 (44)	1/2 (13)
1/2 (15)	1-13/16 (46)	1-7/8 (48)	1/2 (13)
3/4 (19)	2-1/8 (54)	2-1/16 (52)	5/8 (16)
1 (25)	2-3/8 (61)	2-9/16 (66)	7/8 (23)
1-1/4 (32)	2-9/16 (65)	2-13/16 (71)	1-1/16 (28)
1-1/2 (40)	2-13/16 (72)	3-1/16 (78)	1-1/4 (32)
2 (50)	3-1/4 (82)	3-11/16 (93)	1-5/8 (42)

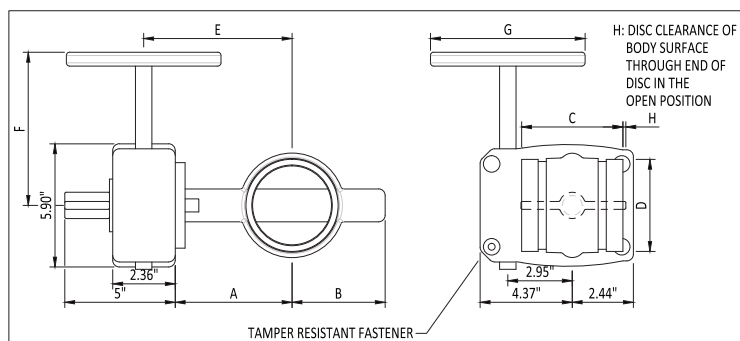
- High quality fire protection control Butterfly Valves in Grooved End connections.
- These valves are UL, ULC listed and FM approved and are available in sizes from 2½" up to 8".
- They are supplied from stock with factory installed UL listed double tamper switch for indoor and outdoor use.

### Grooved End 2 ½" - 8" (65mm up to 200mm)



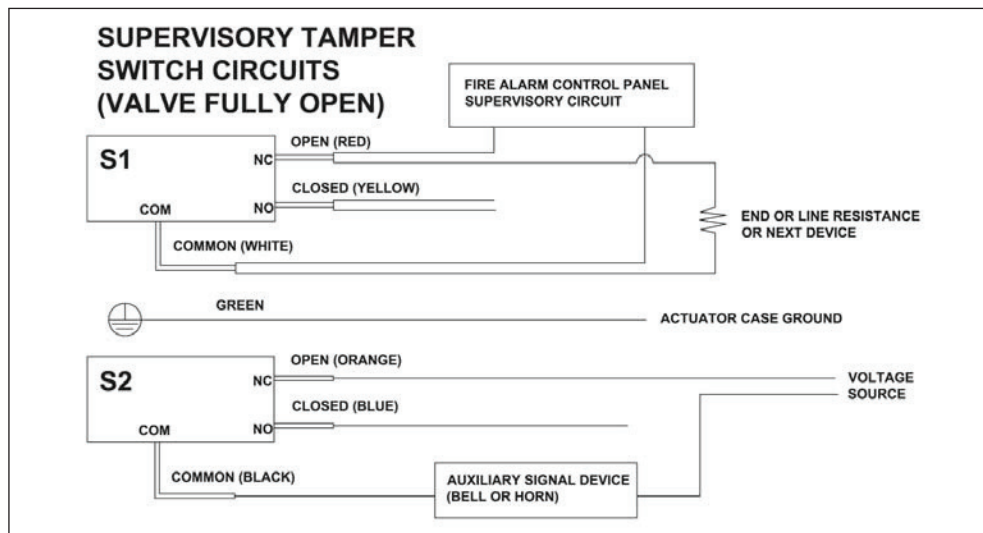
Working Pressure and Temperature	
Working Pressure	300 psi (21.4 bars)
Max. Test Pressure	600 psi (42.8 bars)
Max. Working Temperature	250°F (120°C)

Materials List	
Components	Material
Body	ASTM A-536 Nylon-11 Coated
Disc	ASTM A-536 EPDM Encapsulated
Upper & Lower Stems	AISI 420-SS
Housing	ASTM A-536
Hand Wheel	ASTM A-536
Flag Indicator	ASTM A-536
Shear Pin	ASTM A-510
Segment Gear	ASTM B-148 or B-584
Housing Gasket	EPDM Grade E
O-Rings (All)	EPDM Grade E



Size	A	B	C	D	E	F	G	H
2 ½"	4.13 (105)	3.30 (85)	3.80 (96.4)	2.87 (73.0)	5.31 (135)	5.04 (128)	5.04 (128)	----
3"	4.41 (112)	3.60 (92)	3.80 (96.4)	3.50 (88.9)	5.59 (142)	5.04 (128)	5.04 (128)	----
4"	5.71 (145)	4.30 (108)	4.54 (115.4)	4.50 (114.3)	6.89 (175)	5.04 (128)	5.04 (128)	----
6"	7.05 (179)	5.71 (145)	5.21 (132.4)	6.63 (168.3)	8.23 (209)	8.66 (220)	8.66 (220)	0.28 (7.10)
8"	8.03 (204)	6.70 (170)	5.80 (147.4)	8.63 (219.1)	9.21 (234)	8.66 (220)	8.66 (220)	0.95 (24.2)

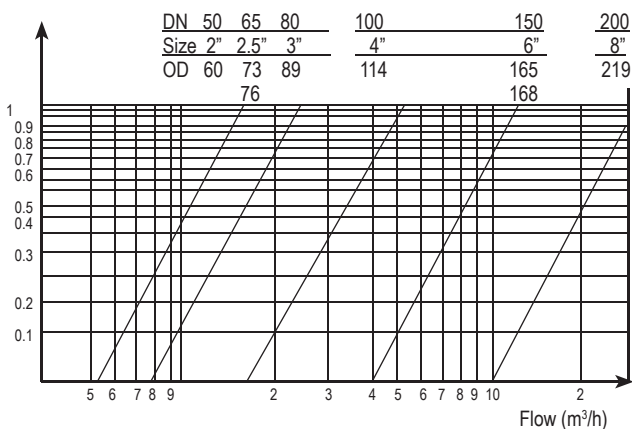
## Wiring Diagram



## Test Data: BUTTERFLY VALVE

### GROOVED END

#### Flow Characteristics



#### Flow Coefficient: Kv

Kv=M<sup>3</sup>/hour across valve at same standard condition (20°C, 1bar)

DW (mm)	Size (in)	OD	30*	40*	50*	60*	70*	80*	90*
65	2 1/2"	73	12	27.4	53.1	96	138	156	163
65	2 1/2"	76	12	27.4	53.1	96	138	156	163
80	3"	89	18.9	39.4	78.9	144	210	243	249
100	4"	114	30	65.1	129	226	377	488	514
150	6"	165	84	184	369	634	964	1196	1286
150	6"	168	84	184	369	634	964	1196	1286
200	8"	219	165	339	677	1230	2002	2850	3129

$$CV = \frac{Q}{Kv} \quad KV = \frac{Q}{CV} \quad Q = 31.6 KV \sqrt{\frac{\Delta P}{\rho_1}}$$

Q = flow in m<sup>3</sup>/h      ΔP = pressure loss in bar      ρ<sub>1</sub> = density in Kg/m<sup>3</sup>

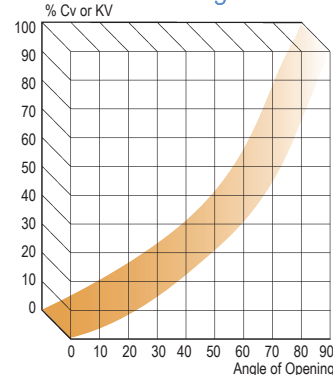
Size	Part #	Weight
2 1/2"	7M99002653	19.84
3"	7M99002654	21.6
4"	7M99002655	24.25
6"	7M99002656	38.36
8"	7M99002657	50.26

#### Flow Coefficients

The flow coefficient KV is the flow of water through the valve in m<sup>3</sup>/h, at an average temperature of 20°C, which produces a pressure loss of 1 bar. The relation between Cv and KV is:

$$Cv = \frac{Q}{KV}$$

#### Cv VS Disc Angle





## RBV Series Bronze Butterfly Valves

### Product Description

The Reliable Model RBV series bronze butterfly valves are indicating control valves for fire protection systems. Model RBVT valves have ANSI B1.20.1 NPT threaded end connections and are available in 1" (25 mm), 1-1/4" (32mm), 1-1/2" (38mm), 2" (51mm), and 2-1/2" (65mm) nominal sizes. The Model RBVG valves have ANSI/AWWA C606 grooved end connections and are available in 1-1/4" (32mm), 1-1/2" (38mm), 2" (51mm), and 2-1/2" (65mm) nominal sizes. The valves are listed for 300 psi (20.7 bar) working pressure.

The valves have an integral 10 Amp pre-wired supervisory tamper switch assembly for indoor and outdoor use. The tamper switch signals movement of the valve seal from the full open position.

### Installation

Model RBV series butterfly valves must be installed in accordance with NFPA 13, NFPA 72, FM Global Property Loss Prevention Data Sheets, and the requirements of any authorities having jurisdiction. Failure to follow installation instructions may void the warranty and listing of the valve. Verify compatibility of the valve materials with the water supply and the environment where the valve will be installed prior to installation.

The valve can be installed in any orientation on a piping system with standard ASME B1.20.1 NPT threaded (Model BFVT) or ANSI/AWWA C606 grooved (Model BFVG) connections. Install Model BFVT valves by applying PTFE-based thread sealant to the male pipe threads and tightening the threaded connection using a wrench on only the hexagonal wrench-flats of the valve. Over-tightening threaded connections may damage the valve body resulting in leakage. Attached Model BFVG valve using UL Listed or FM Approved grooved couplings.

The integral tamper switch assembly consistent of two switches. Switch 1 has dual leads on the terminals and is used for connection of the supervisory circuit of a listed fire alarm control panel.



Threaded end



Grooved end

Switch 2 has a single lead and is used for connection of the auxiliary equipment. A 14 ga. green wire is connected to the gearbox housing as a ground connection. All unused wires need to be capped with wire nuts and tucked into a junction box. All electrical connections must be in accordance with NFPA 72 and the requirements of any authorities having jurisdiction.

### End Configuration Options

Table A

Model	End Connections	Sizes in (mm)	Approvals
RBVT	Threaded	1" (25)	UL Listed, FM Approved
		1-1/4" (32), 1-1/2" (38), 2" (51), 2-1/2" (65)	cULus Listed, FM Approved
RBVG	Grooved	1-1/4" (32), 1-1/2" (38), 2" (51), 2-1/2" (65)	cULus Listed, FM Approved

## Model RBVT Bronze Butterfly Valve - Threaded End

### Technical Specifications

**Pressure Rating:**  
300 psi (20.7 bar)

### End Connections

ANSI B1.20.1 NPT Threads

### Material Specifications

**Body:** Bronze ASTM 584 C83600

**Disc:** SS304 Sheet Stamping

**Handwheel:** Ductile Iron ASTM A536

**Seat:** ASTM D2000 Viton

**Indicator:** Powder Metal FD0205 95HT

**Housing:** Forged Brass JIS C3771 (Ref. ASTM C37700)

**Cover:** Forged Brass JIS C3771 (Ref. ASTM C37700)

### Listings and Approvals

UL Listed - All Sizes

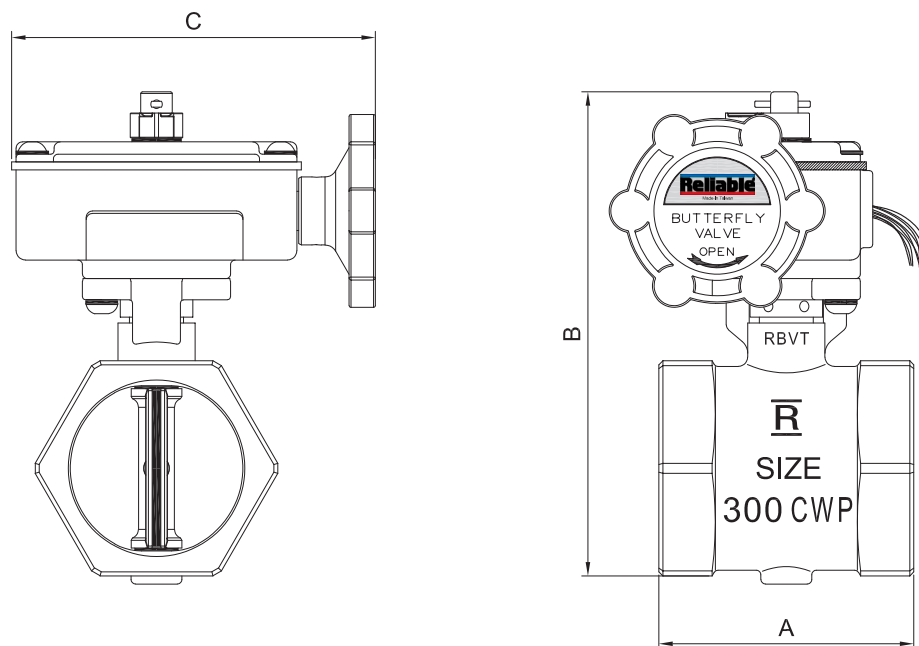
cULus Listed - 1-1/4" (32mm), 1-1/2" (38mm), 2" (51mm), 2-1/2" (65mm)

FM Approved - All Sizes



## Model RBVT Bronze Butterfly Valve - Threaded Components and Dimensions

Figure 1



## Model RBVT Bronze Butterfly Valve - Threaded Dimensions - in. (mm)

Table B

Valve Size	A	B	C
1"	2-1/8 (54)	4-15/16 (125)	4-5/8 (118)
1-1/4"	2-5/8 (67)	5-1/8 (130)	4-5/8 (118)
1-1/2"	2-7/8 (73)	5-5/8 (142)	4-5/8 (118)
2"	3-1/4 (83)	6-1/8 (156)	4-5/8 (118)
2-1/2"	4-1/2 (114)	6-5/8 (167)	4-5/8 (118)

## Model RBVG Bronze Butterfly Valve - Grooved End

### Technical Specifications

**Pressure Rating:**  
300 psi (20.7 bar)

### End Connections

ANSI/AWWA C606 grooves

### Material Specifications

**Body:** Bronze ASTM 584 C83600

**Disc:** SS304 Sheet Stamping

**Handwheel:** Ductile Iron ASTM A536

**Seat:** ASTM D2000 Viton

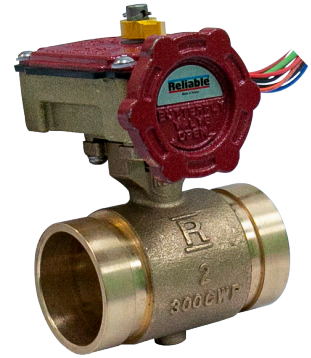
**Indicator:** Powder Metal FD0205 95HT

**Housing:** Forged Brass JIS C3771 (Ref. ASTM C37700)

**Cover:** Forged Brass JIS C3771 (Ref. ASTM C37700)

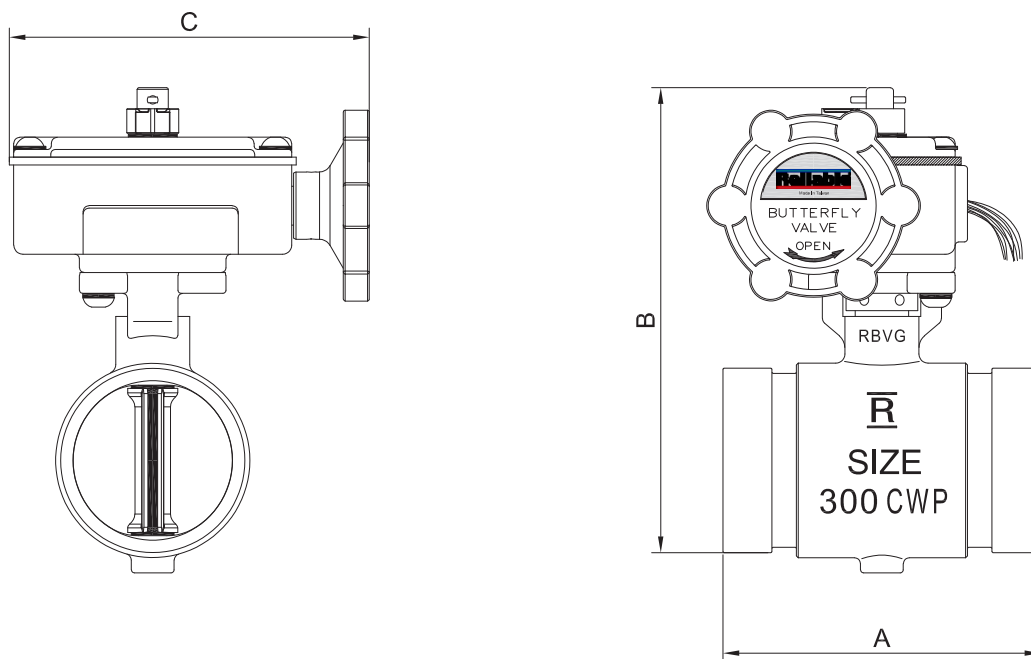
### Listings and Approvals

cULus Listed  
FM Approved



## Model RBVG Bronze Butterfly Valve - Grooved Components and Dimensions

Figure 2



Model RBVG Bronze Butterfly Valve - Grooved Dimensions - in. (mm)

Table C

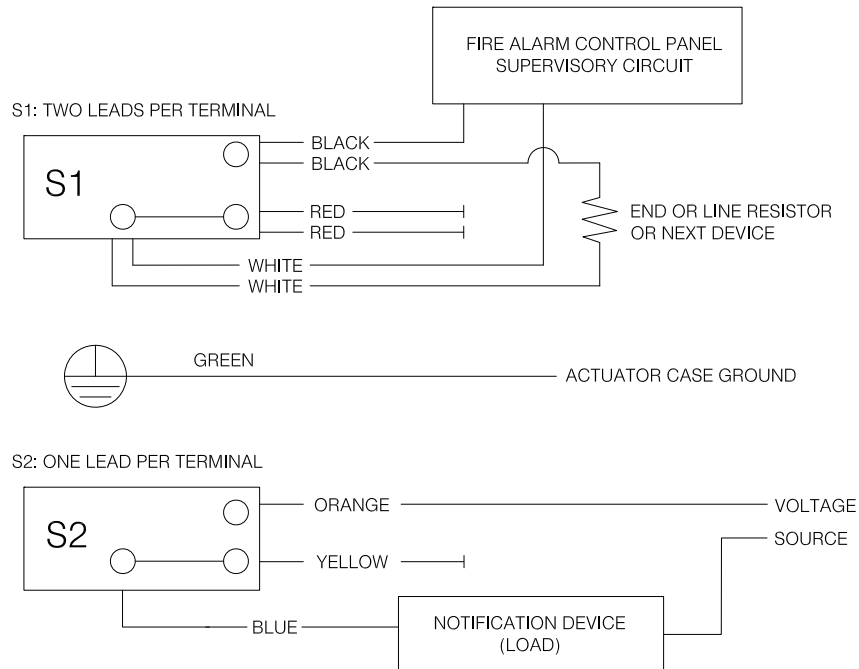
Valve Size	A	B	C
1-1/4"	3-7/8 (98)	5-3/16 (132)	4-5/8 (118)
1-1/2"	4 (102)	5-1/2 (139)	4-5/8 (118)
2"	4-1/8 (104)	6-1/16 (154)	4-5/8 (118)
2-1/2"	4-1/2 (114)	6-9/16 (167)	4-5/8 (118)

Switch conditions shown to indicate valve in fully open position.

Dual Leads Soldered to Switch Tabs

Figure 3

## Supervised Normally Open Valve



### Notes:

1. Green wire is provided as ground for the switch housing.
2. Switch rating: 10.1 Amps-125/250VAC-60Hz
3. Actual switch application rating: 10 Amps/115 VAC-60Hz, 0.5 Amps/28 VDC
4. Cap unused leads with wire nuts and tuck into a junction box (not provided).

## Maintenance

The owner is responsible for maintaining the fire protection system in proper operating condition. Any system maintenance or testing that involves placing a control valve out of service will eliminate the fire protection that is provided by the fire protection system.

The Reliable Bronze Butterfly valves and associated equipment shall periodically be given a thorough inspection and test. NFPA 25, "Inspection, Testing and Maintenance of Water Based Fire Protection Systems," provides minimum maintenance requirements.

## Guarantee

For Reliable Automatic Sprinkler Co., Inc. guarantee, terms, and conditions, visit [www.reliablesprinkler.com](http://www.reliablesprinkler.com).

## Ordering Information

Specify the following when ordering:

### Valve Model

- RBVT (threaded)
- RBVG (grooved)

### Valve Size

- 1" (25mm) (RBVT only)
- 1-1/4" (32mm)
- 1-1/2" (38mm)
- 2" (51mm)
- 2-1/2" (65mm)





## Model L399 OS&Y Gate Valves

cULus Listed, FM Approved

### Product Description

The Reliable Model L399 OS&Y Gate valves are UL Listed and FM Approved indicating control valves for fire protection systems. Reliable OS&Y Valves valves have AWWA C 606 grooved end connections or ANSI B 16.1 Class 150 flanged end connections. They are available in 2" (50mm), 2-1/2" (65mm), 3" (80mm), 4" (100mm), 6" (150mm), 8" (200mm), 10" (250mm), and 12" (300mm) nominal sizes. The valves are listed for 300 psi (20.7 bar) working pressure. Verify that appropriate end connections and fittings are used for the system pressure prior to installation.

### Maintenance

The owner is responsible for maintaining the fire protection system in proper operating condition. Any system maintenance or testing that involves placing a control valve out of service will eliminate the fire protection that is provided by the fire protection system.

The Reliable OS&Y Gate valves and associated equipment shall periodically be given a thorough inspection and test. NFPA 25, "Inspection, Testing and Maintenance of Water Based Fire Protection Systems," provides minimum maintenance requirements.

### Ordering Information

Specify the following when ordering:

#### Reliable Model L399 OS&Y Gate Valve End Connection

- Flange x Flange
- Flange x Groove
- Groove x Groove

#### Valve Size

- 2" (50mm)
- 2-1/2" (65mm)
- 3" (80mm)
- 4" (100mm)
- 6" (150mm)
- 8" (200mm)
- 10" (250mm)
- 12" (300mm)



Flange x Flange



Flange x Groove



Groove x Groove

### Guarantee

For Reliable Automatic Sprinkler Co., Inc. guarantee, terms, and conditions, visit [www.reliablesprinkler.com](http://www.reliablesprinkler.com).

### End Configuration Options

Table A

Model	End Connections	Sizes in (mm)	Approvals
REL-OSY-L399F	Flange x Flange	2" (50), 2-1/2" (65), 3" (80), 4" (100), 6" (150), 8" (200), 10" (250), 12" (300)	cULus Listed, FM Approved
REL-OSY-L399FG	Flange x Groove		
REL-OSY-L399GG	Groove x Groove		



## OS&Y Gate Valves

### Technical Specifications

#### Pressure Rating:

300 psi (20.7 bar)

### Material Specifications

**Body:** Ductile Iron A536 65-45-12

**Wedge:** Ductile Iron EPDM Coated

**Wedge Nut:** Stainless Steel AISI 304

**Stem:** Stainless Steel AISI 304

**Bonnet:** Ductile Iron A536 65-45-12

**Gasket:** EPDM Commercial

**Packing:** Graphite

**Stem Nut:** Bronze ASTM B62

**Handwheel:** Ductile Iron A536 65-45-12

### End Connections

Groove x Groove (REL-OSY-L399GG)

Flange x Groove (REL-OSY-L399FG)

Flange x Flange (REL-OSY-L399F)

### Specifications

Groove: AWWA C 606

Flange: ANSI B 16.1 Class 150

### Listings and Approvals

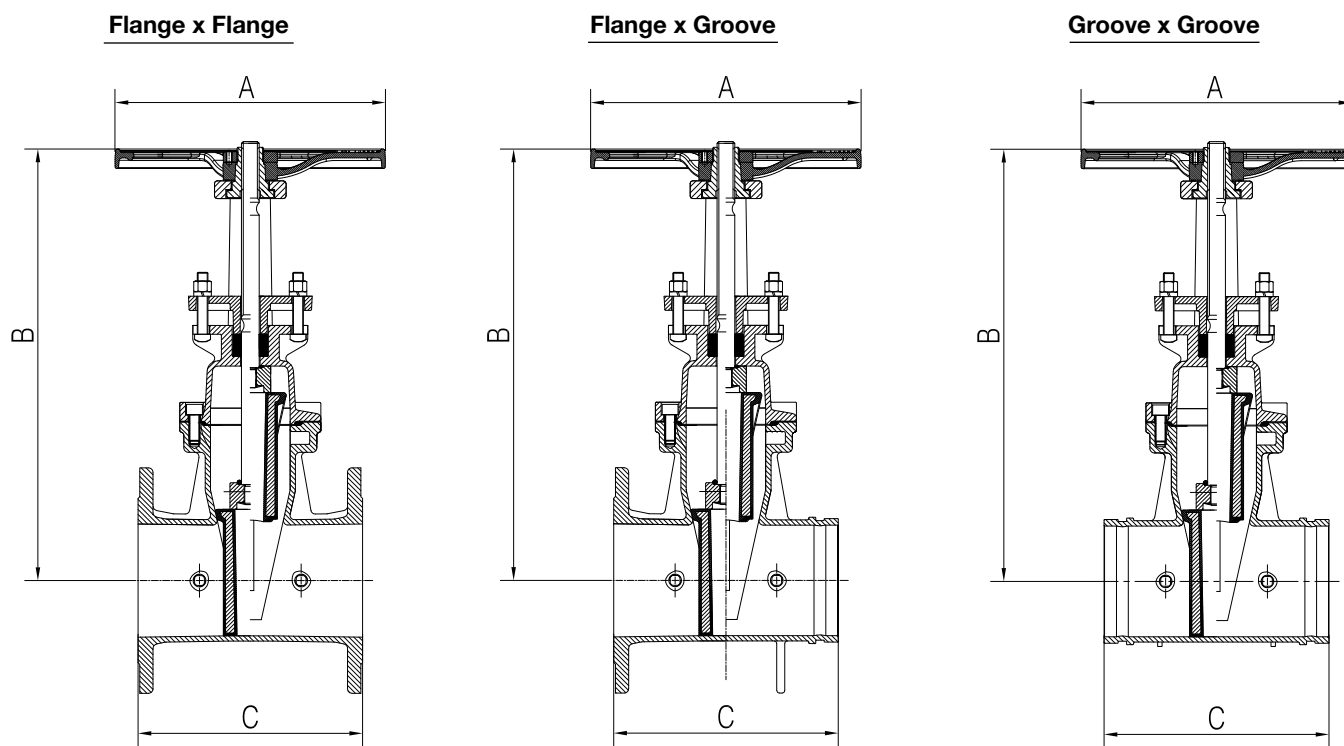
cULus Listed

FM Approved



## Reliable OS&Y Gate Valve Dimensions

Figure 1



## Reliable OS&Y Gate Valve Dimensions - in. (mm)

Table B

Valve Size	A	B	C
2" (50)	7-3/16" (183)	16-3/16" (411)	7" (178)
2-1/2" (65)	7-3/16" (183)	16-3/16" (411)	7-1/2" (191)
3" (80)	9-15/16" (253)	18-3/16" (462)	8" (203)
4" (100)	9-15/16" (253)	20-1/4" (514)	9" (229)
6" (150)	12-1/16" (306)	27-15/16" (709)	10-1/2" (267)
8" (200)	14" (355)	36-1/3" (922)	11-1/2" (292)
10" (250)	17-1/2" (445)	43-15/16" (1116)	13" (330)
12" (300)	17-1/2" (445)	51-3/16" (1300)	14" (356)



## Model REL-OSYT Threaded OS&Y Valve

175 psi (12 bar)  
cULus Listed, FM Approved

### Product Description

Reliable Model REL-OSYT threaded OS&Y valves are cULus Listed and FM Approved as trim and drain valves for fire protection systems. The valves have a rated working pressure of 175 psi (12 bar) and feature a brass valve body with FNPT end connections.

### Installation

The Reliable threaded OS&Y Valves shall be installed in accordance with NFPA 13, "Standard for the Installation of Sprinkler Systems," as well as the requirements of any authorities having jurisdiction. Verify compatibility of the valve materials with the water supply and the environment where the valve will be installed prior to installation.

**WARNING:** Model REL-OSYT valves contain lead and are not for use in systems carrying water intended for human consumption.

### Maintenance

The owner is responsible for maintaining the fire protection system in proper operating condition. Any system maintenance or testing that involves placing a control valve out of service will eliminate the fire protection that is provided by the fire protection system.

The Reliable threaded OS&Y Valve shall periodically be given a thorough inspection and test. NFPA 25, "Inspection, Testing and Maintenance of Water Based Fire Protection Systems," provides minimum maintenance requirements. Inspect the valve for corrosion, damage, and wear as required and replace as necessary. Increase the frequency of inspections when the valve is exposed to corrosive conditions or chemicals that could impact the valve materials.



Model REL-OSYT Threaded OS&Y Valve

### Guarantee

For Reliable Automatic Sprinkler Co., Inc. guarantee, terms, and conditions, visit [www.reliablesprinkler.com](http://www.reliablesprinkler.com).

### Ordering Information

Specify the following when ordering:

#### Reliable Model REL-OSYT threaded OS&Y valve Valve Size

- 3/4" (20 mm)
- 1" (25 mm)
- 1-1/4" (32 mm)
- 1-1/2" (40 mm)
- 2" (50 mm)

## Model REL-OSYT Threaded OS&Y Valves

### Technical Specifications

**Pressure Rating:**  
175 psi (12 bar)

### Material Specifications

**Body:** C83600 Brass Alloy  
**Bonnet:** C83600 Brass Alloy  
**Stem:** C37700 Brass Alloy  
**Gate/Stem Pin:** 304 Stainless Steel Alloy  
**Gate:** C83500 Bronze Alloy  
**Stem Packing:** Graphite  
**Handwheel:** Cast Iron

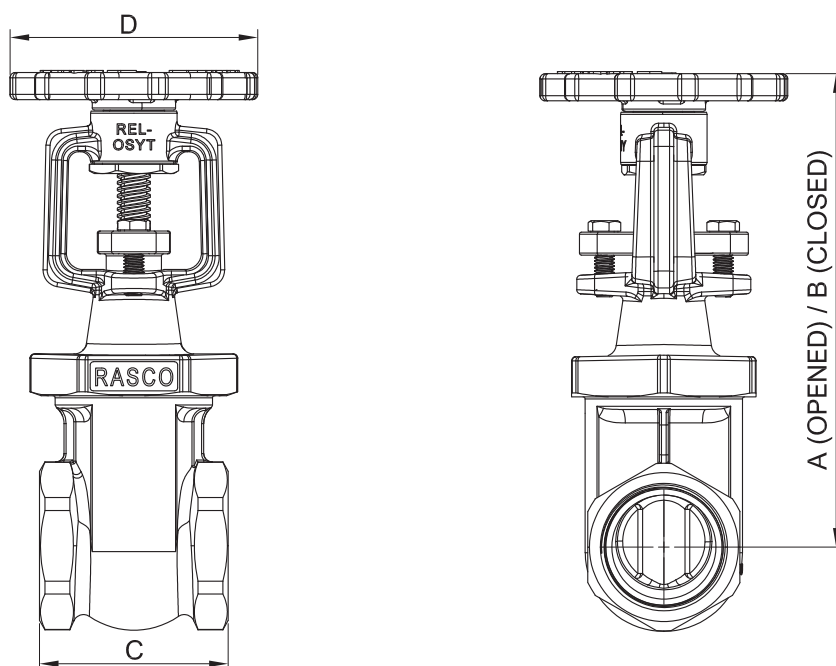
**End Connections**  
Female NPT

**Listings and Approvals**  
cULus Listed  
FM Approved



## Model REL-OSYT Threaded OS & Y Valve Dimensions

Figure 1



### Dimensions in. (mm)

Table A

Valve Size	A	B	C	D
3/4 (19 mm)	6-13/16 (173)	5-3/4 (146)	2-5/16 (59)	3-1/8 (80)
1 (25 mm)	7-3/4 (197)	6-7/16 (163)	2-3/4 (69)	3-1/8 (80)
1-1/4 (32 mm)	8-7/8 (221)	7-1/8 (182)	2-15/16 (75)	3-1/8 (80)
1-1/2 (40 mm)	9-9/16 (243)	7-3/4 (197)	3-1/4 (82)	3-15/16 (100)
2 (50 mm)	11-1/8 (282)	8-15/16 (227)	3-9/16 (91)	4-3/4 (120)



## Product Description

The Reliable Model L388 Non-Rising Stem Gate Valves are UL Listed and FM Approved indicating control valves for fire protection systems when equipped with a listed yard or wall indicator post. Reliable L388 NRS Gate Valves have AWWA C 606 grooved end connections or ANSI B 16.1 Class 150 flanged end connections. They are available in 2-1/2" (65 mm), 3" (80 mm), 4" (100 mm), 6" (150 mm), 8" (200 mm), 10" (250 mm), and 12" (300 mm) nominal sizes. The valves are listed for 300 psi (20.7 bar) working pressure. Verify that appropriate end connections and fittings are used for the system pressure prior to use.

## Maintenance

The owner is responsible for maintaining the fire protection system in proper operating condition. Any system maintenance or testing that involves placing a control valve out of service will eliminate the fire protection that is provided by the fire protection system.

The Reliable Non-Rising Stem Gate Valve shall periodically be given a thorough inspection and test. NFPA 25, "Inspection, Testing and Maintenance of Water Based Fire Protection Systems," provides minimum maintenance requirements. Inspect the valve for corrosion, damage, and wear as required and replace as necessary. Increase the frequency of inspections when the valve is exposed to corrosive conditions or chemicals that could impact the valve materials.

## Ordering Information

Specify the following when ordering:

### Reliable Model L388 Non-Rising Stem Gate Valve End Connection

- Flange x Flange
- Flange x Groove
- Groove x Groove

### Valve Size

- 2-1/2" (65 mm)
- 3" (80 mm)
- 4" (100 mm)
- 6" (150 mm)
- 8" (200 mm)
- 10" (250 mm)
- 12" (300 mm)

## Model L388 Non-Rising Stem Gate Valve

cULus Listed, FM Approved



Model REL-PIV-L388F  
Flange x Flange



Model REL-PIV-L388FG  
Flange x Groove



Model REL-PIV-L388GG  
Groove x Groove

## Guarantee

For Reliable Automatic Sprinkler Co., Inc. guarantee, terms, and conditions, visit [www.reliablesprinkler.com](http://www.reliablesprinkler.com).

## End Configuration Options

Table A

Model	End Connections	Sizes in (mm)	Approvals
REL-PIV-L388F	Flange x Flange	2-1/2" (65), 3" (80), 4" (100), 6" (150), 8" (200), 10" (250), 12" (300)	cULus Listed, FM Approved
REL-PIV-L388FG	Flange x Groove		
REL-PIV-L388GG	Groove x Groove		

## Model L388 Non-Rising Stem Gate Valve

### Technical Specifications

#### Pressure Rating:

300 psi (20.7 bar)

### Material Specifications

**Body:** ASTM A536 65-35-12 Ductile Iron

**Gate:** ASTM A536 65-45-12 + EPDM Ductile Iron

**Stem:** AISI SS304/SS302 Stainless Steel

**Bonnet:** ASTM A536 65-45-12 Ductile Iron

**Thrust Collar:** ASTM C51100 Bronze

**Gland:** ASTM A536 65-45-12 Ductile Iron

**Gate Nut:** ASTM B62 Bronze

**O-Ring:** EPDM

**Dustproof cover:** EPDM

**Post flange:** ASTM A536 65-45-12 Ductile Iron

**Wrench nut:** ASTM A536 65-45-12 Ductile Iron

**Plug:** ASTM B16 Bronze

**Washer:** ASTM SS316 Stainless Steel

**Hex Socket Cap Screw:** GR 8.8 Carbon Steel

**Gasket:** EPDM

**Nut:** ASTM SS316 Stainless Steel

**Studs:** ASTM SS316 Stainless Steel

**Spring Washer:** ASTM SS316 Stainless Steel

### End Connections

Groove x Groove (REL-PIV-L388GG)

Flange x Groove (REL-PIV-L388FG)

Flange x Flange (REL-PIV-L388F)

### Specifications

Flange: ANSI B16.1 Class 150

Groove: AWWA C606

### Listings and Approvals

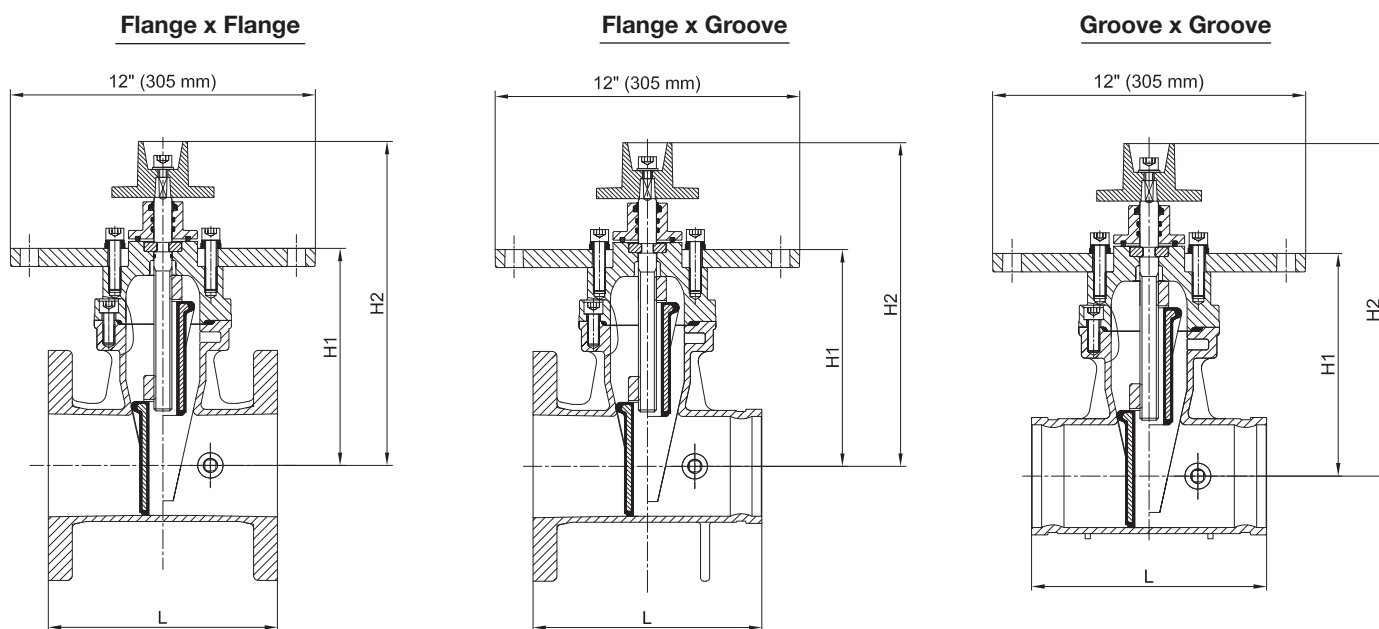
cULus Listed

FM Approved



## Model L388 Non-Rising Stem Gate Valve Dimensions

Figure 1



## Model L388 Non-Rising Stem Gate Valve Dimensions - in. (mm)

Table B

Size	L in (mm)	H1 in (mm)	H2 in (mm)	Weight
2-1/2" (65 mm)	7-1/2" (191)	6-13/16" (173)	11" (279)	56 lbs (25.3 kg)
3" (80 mm)	8" (203)	7-5/8" (193)	12" (305)	61 lbs (27.5 kg)
4" (100 mm)	9" (229)	8-9/16" (217)	12-3/4" (324)	77 lbs (35 kg)
6" (150 mm)	10-1/2" (267)	12-5/16" (312)	16-7/8" (428)	110 lbs (50 kg)
8" (200 mm)	11-1/2" (292)	15-5/8" (397)	21-1/8" (537)	183 lbs (83 kg)
10" (250 mm)	13" (330)	19-3/8" (492)	25-3/16" (640)	272 lbs (123.5 kg)
12" (300 mm)	14" (356)	22-3/4" (578)	28-1/2" (723)	387 lbs (175.5 kg)



## Model REL-PIW-388 Post Indicator, Wall-Type

cULus Listed, FM Approved

### Product Description

Reliable Model REL-PIW-388 Wall Post Indicators are cULus Listed and FM approved for use with NRS (Non-Rising Stem) gate valves equipped with a crane nut, to indicate valve position (open, shut, or in-between) for a water supply valve to a fire protection system. The Wall Post Indicator is suitable for valves sized 2-1/2" to 12". The Wall Post Indicator's critical internal components are manufactured from corrosion-resistant alloys and pre-lubricated with an anti-seizing compound for use in an outdoor environment.

### Maintenance

The owner is responsible for maintaining the fire protection system in proper operating condition. Any system maintenance or testing that involves placing a control valve out of service will eliminate the fire protection that is provided by the fire protection system.

The Reliable Wall Post Indicator shall be periodically given a thorough inspection and test. NFPA 25, "Inspection, Testing, and Maintenance of Water Based Fire Protection Systems" provides minimum maintenance requirements. Inspect the wall post indicator for corrosion, damage, and wear as required and repair or replace as necessary. Increase the frequency of inspections when the wall post indicator is exposed to corrosive environmental conditions or chemicals.

If the maintenance program determines that re-application of lubricant to the operator screw and carrier nut is required, a silver anti-seize compound such as Loctite® LB 8150 or equivalent should be used. This lubricant should be applied to both the external thread of the operator screw and the internal thread of the flag carrier nut. Anti-seize may also be used on fasteners at the discretion of the installer.

In the event the wall post indicator becomes inoperable, a repair kit that includes the cap, operator screw, and flag carrier nut with flags is available (see Figure 2). Removal of the non-functional assembly and replacement utilizes installation steps 4, 5, 7, 8, 9, and 10.

### Guarantee

For Reliable Automatic Sprinkler Co., Inc. guarantee, terms, and conditions, visit [www.reliablesprinkler.com](http://www.reliablesprinkler.com).

\*Loctite® is a registered trademark of Henkel Corporation.



### Ordering Information

Specify the following when ordering:

**Reliable Model REL-PIW-388 Post Indicator, Wall-Type**



## Model REL-PIW-388 Post Indicator, Wall-Type

### Technical Specifications

#### Valve Compatibility:

2-1/2" to 12" Reliable L388 NRS Gate Valves or equivalent equipped with a crane nut

### Material Specifications

**Body:** ASTM A536 Ductile Iron

**Cap:** ASTM A536 Ductile Iron

**Handwheel:** ASTM A536 Ductile Iron

**Operator Screw:** ASTM A351 Grade CF8

(equivalent to AISI 304 Stainless Steel)

**Carrier Nut for Valve Position Flags:** ASTM A351 Grade CF8

(equivalent to AISI 304 Stainless Steel)

**Valve Position Flags:** ASTM B108 Aluminum Alloy

**Body Lifting Ring:** ASTM 307B Carbon Steel for Fasteners

**Handwheel Lifting Eye Bolt:** Zinc-Plating ASTM A105

**Cap Retention Nuts/Bolts:** Zinc-PLated ASTM A105

**Window Glass Material:** Lexan-UM Polycarbonate

**Operating Rod:** ASTM A830 (equivalent to AISI 1045 Carbon Steel)

**Crane Coupling:** ASTM A536 Ductile Iron

### Listings and Approvals

cULus Listed

FM Approved

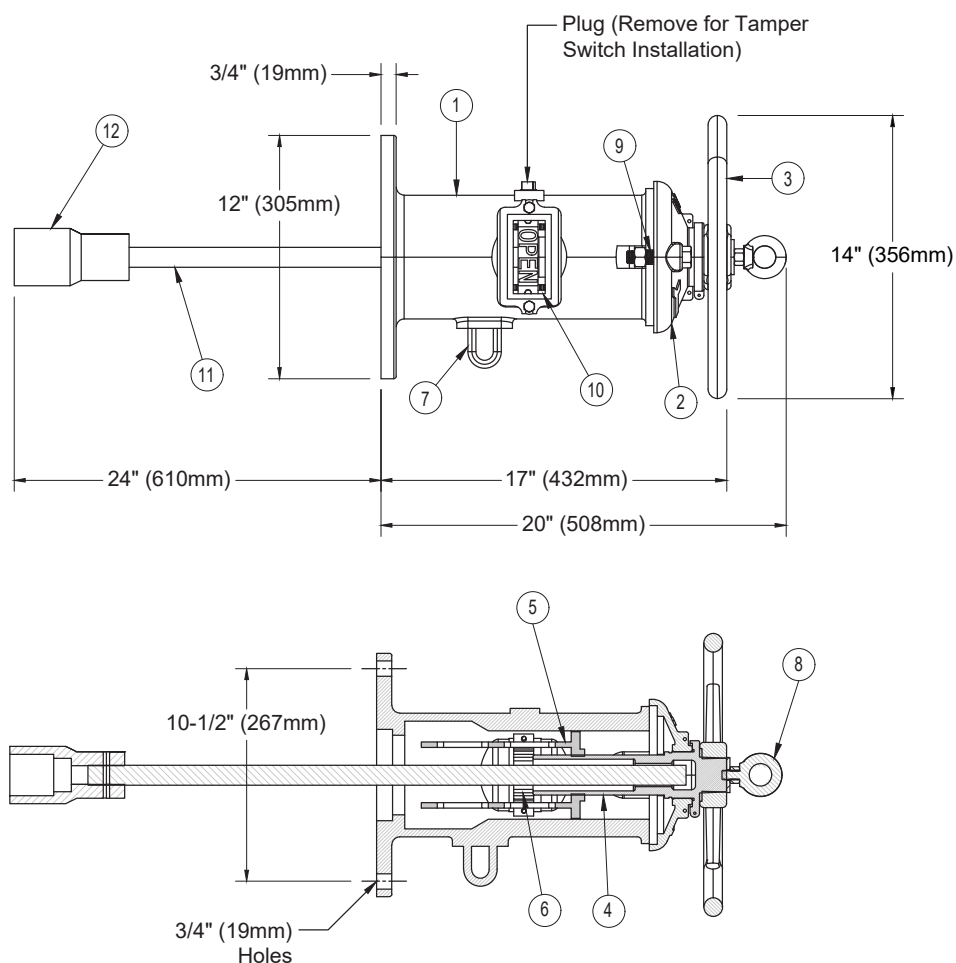
### Applications

Indoor and outdoor use



Model REL-PIW-388 Post Indicator, Wall-Type Dimensions and Components

Figure 1



Item Number	Item Description
1	Body
2	Cap
3	Handwheel
4	Operator Screw
5	Carrier Nut for Valve Position Flags
6	Valve Position Flags
7	Body Lifting Ring
8	Handwheel Lifting Eyebolt
9	Cap Retention Bolts/Nuts
10	Window Glass
11	Operating Rod
12	Crane Coupling

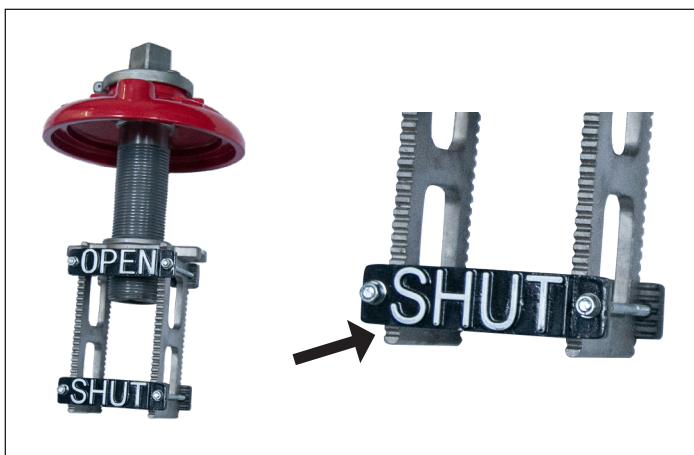
## Flag Position

Table A

Nominal Valve Size in (mm)	Center-to-Center Distance Between Flags in (mm)	Notches Visible Between Flags
2-1/2 (65)	1-9/16 (40)	3
3 (80)	1-15/16 (50)	5
4 (100)	2-3/8 (60)	7
6 (150)	3-9/16 (90)	13
8 (200)	2-3/8 (60)	7
10 (250)	2-3/4 (70)	9
12 (300)	3-9/16 (90)	13

## Proper “Shut” Flag Position

Figure 2



## Installation Instructions

1. Ensure the NRS valve is in the full open position. This must be verified visually to ensure that the gate is fully recessed into the valve body and not by opening the valve until the handwheel locks. Opening the valve until the handwheel locks will cause the flag positions to be incorrect when the wall post is installed.

2. Drill a hole in the wall at the mounting location, centered on NRS valve stem. Hole diameter must be between 4-3/4" (120 mm) and 7" (180 mm).

3. Insert the factory-assembled operating rod assembly (operating rod, cotter pin, and crane coupling) through the hole in the wall and fully engage with the operating nut on the NRS valve. With the crane coupling fully engaging the operating nut of the NRS valve, measure and mark the operating rod at a dimension of 11-1/2" to 12" from the face of the exterior wall where the post indicator will be installed.

4. Remove the two nuts and bolts that secure the cap assembly and remove the cap assembly (This may be done without removing the handwheel at the discretion of the installer). The cap assembly includes the cap, operator screw, carrier nut that holds the valve position flags, and the flags. Notice that the operator screw threads have been lubricated with a silver anti-seize compound (Loctite LB-8150 or equivalent). Place the cap assembly to the side taking care to prevent contamination of the lubricated operator screw.

5. Saw cut the operating rod at the mark made in step #3. Take care to remove any burrs created by the sawing process. Re-insert the operating rod through the hole in the wall and onto the NRS valve operating nut.

6. Place the body of the wall post indicator against the wall, passing the cavity in the middle of the body over the protruding operating rod. Center the wall post indicator body on the holes in the body on the wall in step 7.

7. The bolt holes for installing the wall post indicator should be marked on the wall in 4 places, equally spaced, on a bolt circle of 10-1/2" (267 mm) diameter that is centered on the stem clearance hole in the wall drilled in step #2. Once marked, bolt holes should be drilled using a 3/4" (19 mm) drill bit.

8. The correct position of "OPEN" and "SHUT" valve position flags depends on the size of the valve intended to be operated by the wall post indicator. From the factory, the "SHUT" flag is installed at the bottom of the flag and the bottom of the carrier nut as shown in Figure 2; the "OPEN" flag is similarly installed at the top of the carrier nut with a single notch between the top of the flag and the top of the carrier nut. For a given size of valve, there are numerous possible correct flag installations that will correctly display the position of the NRS valve operated by the wall-post indicator. The most critical part of the wall post indicator installation is ensuring that the space between the center of the two flags is correct for the size of valve being used with the wall-post indicator. For each valve size, Table A shows the required distance between the bolts on the flags in addition to the number of notches between the flags. The first flag to be adjusted is at the discretion of the installer, but when both flags are installed in their final position there must be the appropriate distance/number of notches visible as shown in Table 2, and there must be at least 1 notch visible above the "OPEN" flag and 1 notch visible below the "SHUT" flag. The nuts that retain the flags on the carrier nut may be loosened/tightened using a 5/16" (8 mm) size socket or wrench. When installing the flags in their final position, the nuts shall be tightened in an equal and alternating fashion to a torque of 16 to 22 ft-lb (22 to 20 N-M). **Note:** If the valve was opened by turning the hand wheel until it locks up, one additional notch may be required in flag spacing in addition to the number of notches shown in Table A.



## Installation Instructions (cont.)

**9.** With the wall-post indicator body sitting on the ground, re-install the cap assembly taking care to ensure that the alignment features on the flag carrier nut are properly aligned with internal guide features in the wall-post indicator body. At the installer's discretion, it may be helpful or necessary to remove the window glass to help align the operating rod to the square cavity in the operating screw of the cap assembly during the next step. Operate the handwheel until the "OPEN" flag is visible and centered in the window glass. Remove the cap assembly and set it to the side, ensuring that the handwheel and operator screw do not turn and misalign the "OPEN" flag position.

**10.** Safely install the body of the wall-post indicator without removing the operating rod from the wall by sliding the cavity in the middle of the body over the protruding portion of the stem assembly and lining up the bolt holes in the body with the corresponding bolt holes on the wall. Securely mount the wall-post indicator body to the wall with installer supplied fasteners using the four 3/4" (19mm) holes provided in the wall-connection side of the body using an appropriate installation procedure and torque values for the fasteners selected. At the installer's discretion, it may be helpful or necessary to remove one or both of the window glass pieces to help align the operating rod into the cap assembly.

**11.** During re-installation of the cap assembly, care should be taken to ensure that the alignment features on the flag carrier nut are properly aligned with internal guide features on the wall post indicator body (these features are a set of "tongues" on the interior of the body and a set of "grooves" on the exterior of the flag carrier nut) and that the operating rod is properly inserted into the share-shaped pocket in the bottom of the cap assembly's operator screw. A removed window glass will allow the operating rod to be aligned in the center of the body, to enable insertion of the operating rod into the square cavity in the operator screw that is part of the cap assembly as the cap assembly is installed. This may require a second person to position the operating rod in the center of the body.

**12.** When the cap assembly is fully engaged with the operating rod and the wall post indicator body, verify that the "OPEN" flag is visible through the window glass. If the "OPEN" flag is only partially visible through the window glass, it likely means that the handwheel has been turned slightly during installation or that another component is misaligned. Remove the cap assembly, check alignment of all mating features and flag positions, and reinstall (it may be helpful to remove the handwheel from the cap assembly to prevent accidental rotation of the operator screw). When the "OPEN" flag is fully visible through the window glass, reinstall and tighten the cap assembly bolts and nuts hand tight, less than 15 ft-lb (20 N-m).

**13.** Fully close and open the valve three times using the wall post handwheel to verify that the valve can be opened to full open and full close positions without any binding or seizing of the wall-post indicator and that the "OPEN" and "SHUT" flag positions visible in the window are correct at the corresponding positions of the valve gate. Make adjustments to the wall-post indicator flag positions if necessary.

**14.** Tighten cap assembly bolts and nuts equally to secure the cap assembly to the wall-post indicator body using a torque range of 47 to 52 ft-lb (63 to 71 N-m).

**15.** Re-install the window glass if it was previously removed. Install tamper switch (if required for this application) by removing the plug in the side of the wall-post indicator body as shown in Figure 1.



## Model DDX-LP Low Pressure Dry Pipe Valve System

### Features

- Low air or nitrogen pressure, 8 to 24 psi (0.6 to 1.7 bar)
- Lightweight ductile iron body with compact trim
- External reset reduces setup and commissioning time
- Does not require priming water
- Available fully assembled, with or without control valve

### Product Description

The Reliable Model DDX-LP Dry Pipe Valve System is a hydraulically operated, mechanical latching clapper-type valve designed for use as a primary control valve in a dry pipe system. The pneumatic system pressure when using the Model DDX-LP valve can be set substantially less than conventional differential style dry valves. The following benefits are a direct result of lower pneumatic pressure:

- Smaller, less expensive pneumatic sources
- Improved water transit times following operation of valve, and in some cases, elimination of quick opening devices
- Low pressure makes the use of nitrogen more practical

In addition to these benefits, mechanical type dry pipe valves are less susceptible to accidental tripping than conventional differential dry pipe valves.

All sizes of the Model DDX-LP valve may be equipped with the Reliable Model B1 Accelerator (P/N 6501200019; ordered separately). The accelerator operates as an exhaustor to hasten the operation of the dry pipe valve. Please refer to Reliable Technical Bulletin 323 for further information.



(Shown with optional Model B-1 Accelerator)

### Model DDX-LP Dry Pipe Valve System Listings and Approvals

Table A

Valve Size	End Connection*	Pressure Rating	Listings & Approvals
2" (50mm), 2-1/2" (65mm), & 3" (80mm)	Groove/Groove	250 psi (17,2 bar)	cULus, FM, CE, VdS, UKCA
76mm	Groove/Groove	250 psi (17,2 bar)	cULus, FM, CE, VdS, UKCA
4" (100mm)	Groove/Groove	300 psi (20,7 bar)	cULus, FM, CE, VdS, LPCB, UKCA
	Flange/Groove		
	Flange/Flange		
6" (150mm)	Groove/Groove	300 psi (20,7 bar)	cULus, FM, CE, VdS, LPCB, UKCA
	Flange/Groove		
	Flange/Flange		
165mm	Groove/Groove	300 psi (20,7 bar)	cULus, FM, CE, VdS, LPCB, UKCA
8" (200mm)	Groove/Groove	250 psi (17,2 bar)	cULus, FM, CE, VdS, LPCB, UKCA
	Flange/Flange		

\*Note: Grooved ends per ANSI/AWWA C606; flanged ends per ASME B16.5 Class 150 or ISO 7005-2 PN16 (specify).

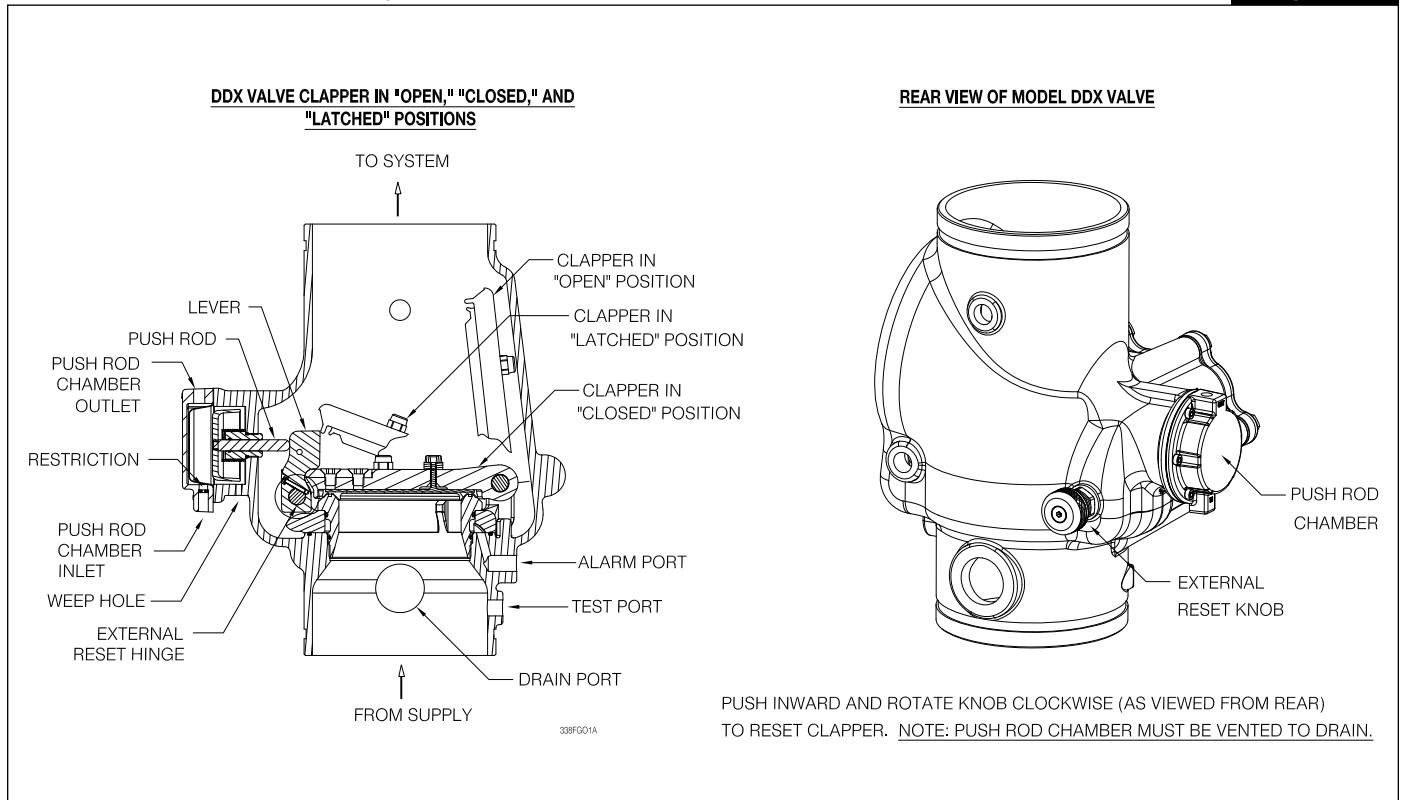
## Operation

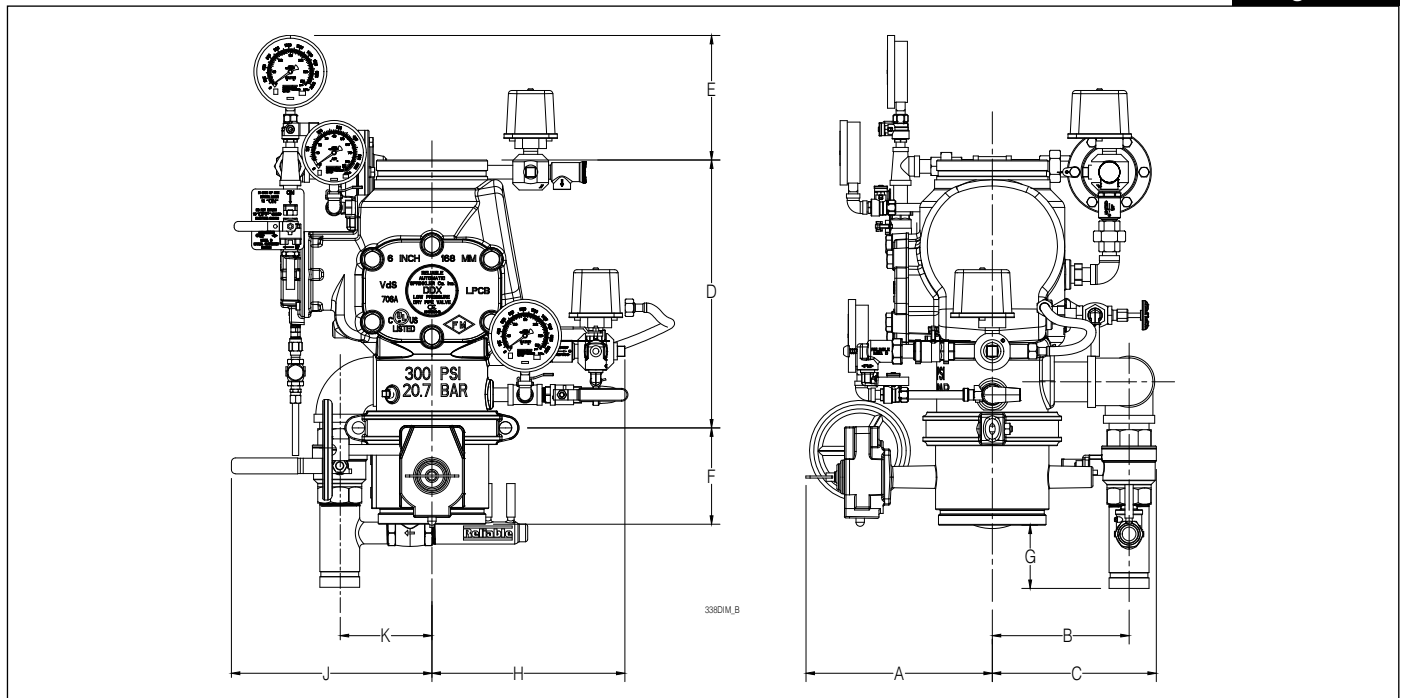
The Reliable Model DDX-LP Dry Pipe Valve System is shown in both the closed and open position in Figure 1. In the closed position, pneumatic pressure acts on the actuator preventing release of hydraulic pressure from the pushrod chamber. The supply water pressure acts simultaneously on the underside of the clapper and on the pushrod through the pushrod chamber restricted inlet. The resultant force on the pushrod is multiplied by the mechanical advantage of the lever and acts to hold the clapper closed against normal pressure surges in the water supply. When a sprinkler operates, the loss of pneumatic pressure in the sprinkler system causes the diaphragm and seal in the actuator to move away from the water seat allowing the release of water from the pushrod chamber. Since water cannot be replenished through the inlet restriction as rapidly as it is

vented, the pushrod chamber pressure falls instantaneously. When the pushrod chamber pressure approaches approximately one-third of the supply pressure, the upward force of the water pressure acting beneath the clapper overcomes the force applied to the lever, opening the clapper. Water then flows through the Model DDX-LP Dry Pipe Valve into the system piping and into the alarm outlet activating the alarm device(s). Once the clapper has opened, the lever acts as a latch preventing the clapper from returning to the closed position.

Section View of Model DDX-LP Dry Valve with Clapper in Open, Closed, and Latched Positions

Figure 1





Installation Dimensions in Inches (mm) (Refer to Figure 2)

Table B

Size	A	B	C	D <sup>(1)</sup>	D <sup>(2)</sup>	E	F <sup>(3)</sup>	G	H	J	K
2" (50 mm)	8-1/2 (216)	7-3/4 (197)	9-1/8 (232)	12-1/2 (318)	NA	8-3/8 (213)	9-5/8 <sup>(4)</sup> (244)	1-1/2 (38)	10 (254)	9-1/2 (241)	4 (102)
2-1/2" (65 mm), 3" (80 mm) & 76 mm	8-1/2 (216)	7-3/4 (197)	9-1/8 (232)	12-1/2 (318)	NA	8-3/8 (213)	3-7/8 (98)	1-3/8 (35)	9-7/8 (251)	9-1/2 (241)	3-7/8 (98)
4" (100 mm)	9-3/4 (248)	7-5/8 (194)	9-1/4 (235)	14 (356)	16 (406)	7-1/4 (184)	4-9/16 (116)	5-1/4 (133)	11 (279)	11-7/8 (301)	5-1/2 (140)
6" (150 mm) & 165 mm	11-1/8 (283)	8-1/8 (206)	9-3/4 (206)	16 (406)	19 (483)	6-7/8 (175)	5-7/8 (149)	3-3/4 (95)	11 (279)	12 (305)	5-1/2 (140)
8" (200 mm)	12-5/8 (321)	9 (229)	10-5/8 (270)	19-3/8 (492)	21-1/4 (540)	9-7/8 (251)	5-1/4 (134)	4-1/8 (105)	12-5/8 (321)	12 (305)	5-1/2 (140)

**Notes:**

- End to end take out of Model DDX valve with grooved inlet.
- End to end take out of Model DDX valve with flanged inlet where available (see page 1, table A).
- Not applicable to 76mm or 165mm systems, or systems using a flanged inlet Model DDX valve.
- 2" systems include valve and spool piece with outlet; dimension provided is total length of both components.

Valve Shipping Weight

Table C

Valve Size	End Connection	Weight
2" (50mm), 2½" (65mm), 76mm & 3" (80mm)	Groove/ Groove	34 lbs (15 kg)
4" (100mm)	Groove/ Groove	64 lbs (29 kg)
	Flange/ Groove	79 lbs (36 kg)
	Flange/ Flange	92 lbs (42 kg)
6" (150mm) & 165mm	Groove/ Groove	95 lbs (43 kg)
	Flange/ Groove	122 lbs (56 kg)
	Flange/ Flange	138 lbs (69 kg)
8" (200mm)	Groove/ Groove	148 lbs (67 kg)
	Flange/ Flange	197 lbs (90 kg)

Trim Shipping Weight

Table D

Valve Size	Weight
2" (50mm), 2½" (65mm), 76mm & 3" (80mm)	30 lbs (13.6 kg)
4" (100mm), 6" (150mm), 165mm & 8" (200mm)	34 lbs (15.5 kg)

Friction Loss

Table E

Valve Size	Equivalent Length		Cv
	C = 120	C = 100	
2" (50mm)	4.4 ft (1,3 m)	3.1 ft (1,0 m)	101
2½" (65mm)	6.0 ft (1,8 m)	4.3 ft (1,3 m)	236
76mm	7.7 ft (2,3 m)	5.5 ft (1,7 m)	241
3" (80mm)	12.6 ft (3,8 m)	9.0 ft (2,7 m)	254
4" (100mm)	14 ft (4,3 m)	10 ft (3,0 m)	469
165mm	29.4 ft (9,0 m)	20.9 ft (6,4 m)	886
6" (150mm)	29.4 ft (9,0 m)	20.9 ft (6,4 m)	886
8" (200mm)	53.5 ft (16,3 m)	38.1 ft (11,6 m)	1516

## Valve Trip Time Information

The actuator that operates the Model DDX-LP Low-Pressure Dry System has a variable differential trip ratio that limits the supervisory air/nitrogen pressure needed as the water supply pressure increases. The differential trip ratio is the ratio of the water supply pressure to the supervisory air/nitrogen pressure when the actuator fully opens. (Note: The actuator may partially open prior to reaching the differential trip ratio which could trip the valve; therefore, always provide the minimum supervisory pressure indicated in Table F of this bulletin, which includes an appropriate safety factor.)

For a valve without an accelerator, use the following differential ratio for valve trip time calculations:

Static Water Supply Pressure in psi (bar)	Differential Trip Ratio
50 (3.5)	7
100 (6.9)	10
175 (12.1)	14
250 (17.2)	18
300 (20.7)	21

For other static water pressures, the differential trip ratio may be calculated using the following equations:

- [psi] Differential Trip Ratio = 0.056 x Static Water Supply Pressure in PSI + 4
- [bar] Differential Trip Ratio = 0.811 x Static Water Supply Pressure in BAR + 4

For a valve using the Model B1 mechanical accelerator, use a differential trip ratio of 0 and a time delay of 10 seconds for the valve to trip.

For a valve using the Model C electronic accelerator, use a differential trip ratio of 0 and a time delay of 3 seconds for the valve to trip.

## Installation

The Model DDX-LP Dry Pipe Valve System shall be installed in accordance with NFPA 13, "Standard for the Installation of Sprinkler Systems," as well as the requirements of any authorities having jurisdiction. The direction of flow shall be up through the assembly. Failure to follow installation instructions may void the warranty and/or listing of the valve. Verify compatibility of the Model DDX-LP Dry Pipe Valve System materials with the water supply and the environment where the valve will be installed prior to installation.

The Model DDX-LP Dry Pipe Valve System must be installed in a readily visible and accessible location where a minimum temperature of 40°F (4°C) or above must be maintained. Heat tracing of the Model DDX-LP Dry Pipe Valve System and trim is not permitted. Heat tracing can result in the formation of hardened mineral deposits that can prevent proper operation of the dry pipe valve.

Whenever ambient temperature conditions are high, the water temperature in the Model DDX-LP Dry Pipe Valve System pushrod chamber may rise, thereby increasing the pressure in the chamber to values exceeding the rated pressure of the system. Where normal temperature and pressure is exceeded, a pressure relief kit (P/N 6503050003; ordered separately) can be installed into the pushrod chamber release line to limit the pressure to 250 psi (17.2 bar).

The valve and trim kit has been tested, approved, and listed in accordance with UL and FM standards. Hydrostatically testing the valve and trim to pressures higher than their rating is limited to the hydrostatic test as referenced by NFPA 13. The clapper can remain in the closed position and the trim kit need not be isolated.

Normal operation and hydrostatic testing does not address the occurrence of a water hammer which may damage the valve. A water hammer can create pressure greater than the rated pressure of the equipment and should be avoided by all necessary means. Water hammer may occur from (but is not limited to) improper fire pump settings, underground construction work, or improper venting of trapped air in piping.

**DO NOT** use bleeder valves for testing of the low-pressure switch on the trim. Release of pneumatic pressure from the actuator trim will result in operation of the system.

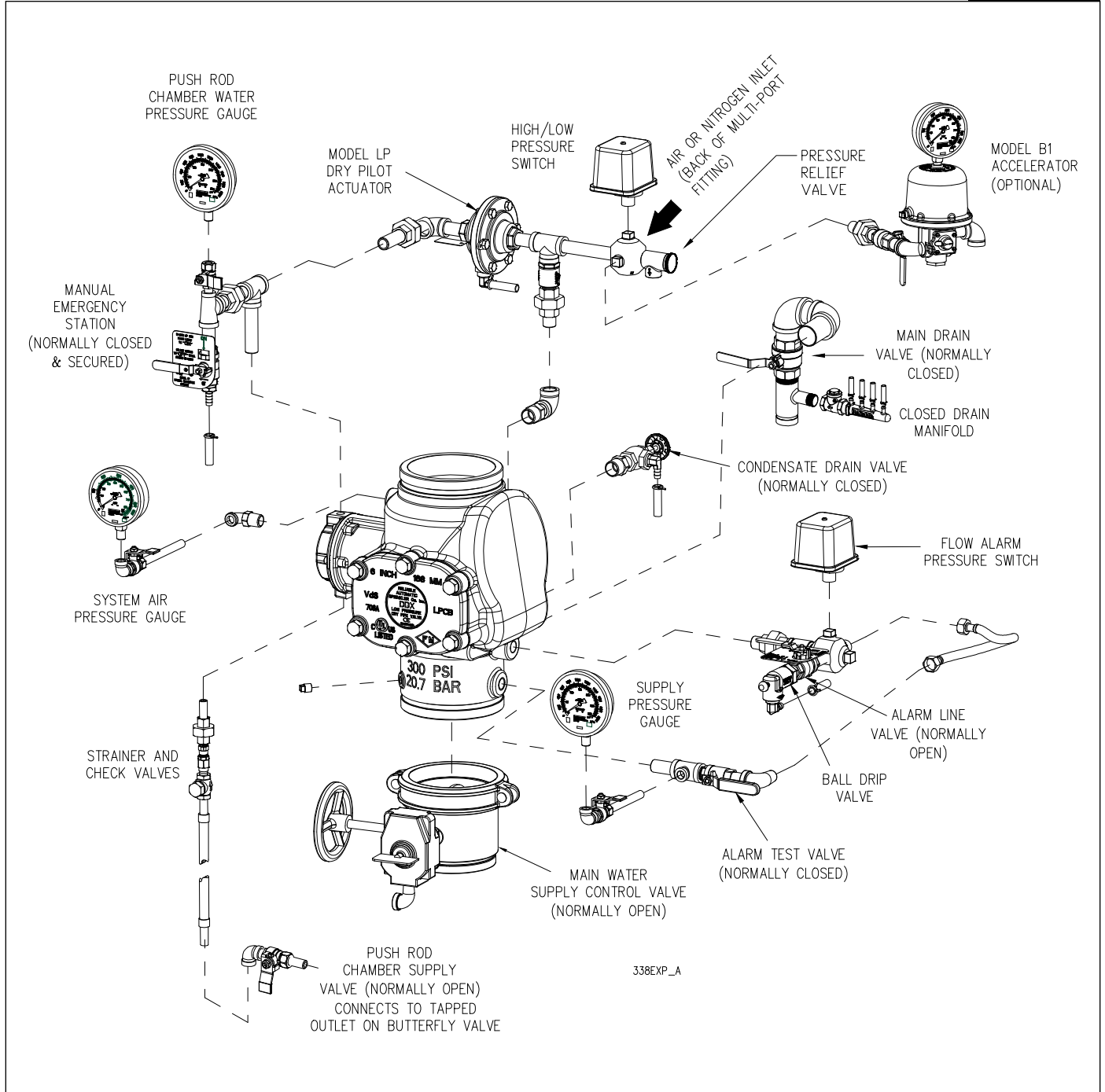
**Air/Nitrogen Pressure Requirement**

**Table F**

Water Pressure psi (bar)	System Air or Nitrogen Pressure psi (bar)
Maximum	Not Less Than
20 (1.4)	8 (0.6)
30 (2.1)	10 (0.7)
50 (3.4)	12 (.8)
75 (5.2)	13 (.9)
100 (6.9)	15 (1.)
125 (8.6)	16 (1.1)
150 (10.3)	17 (1.2)
175 (12.1)	18 (1.2)
200 (13.8)	19 (1.3)
225 (15.5)	21 (1.4)
250 (17.2)	22 (1.5)
275 (19.0)	23 (1.6)
300 (20.7)	24 (1.7)

### Notes:

1. Supervisory air or nitrogen pressure should not exceed 30 psi (2.1 bar). Excess pressure may result in damage to the actuator.
2. Fastest valve operation is achieved with supervisory air or nitrogen pressure indicated; however, pressure must never be less than the minimum specified in the table above.
3. Air maintenance devices that maintain a constant pressure are recommended; however, if a tank-less compressor is used, the "compressor on" setting of the pressure switch must never be lower than the minimum pressure in the table above.





## Valve Reset Procedure

1. Close the main water supply control valve to the DDX-LP valve.
2. Close the Pushrod Chamber Supply valve.
3. Close the valve(s) controlling air or nitrogen supply to the sprinkler system.
4. Open the Main Drain valve and allow system to fully drain. Leave Main Drain valve open.
5. Open all drain valves and vents at low points through-out the system, closing them when flow of water has stopped.
6. Inspect and replace any portion of the detection system and/or sprinkler system subjected to fire conditions.
7. Open the Model B Manual Emergency Station to relieve pressure in the pushrod chamber of the DDX-LP valve and leave open.
8. With the Alarm Line valve open, push in the plunger of Ball Drip valve, forcing the ball from its seat, and drain the alarm line. Close the Alarm Line valve.
9. Push in and rotate the external reset knob counterclockwise (when facing the valve) until you hear a distinct noise indicating that the clapper has reset. **Note:** The reset knob can be rotated only when pressure in the pushrod chamber is vented to atmospheric conditions (see step 7).
10. Open the Pushrod Chamber Supply valve and allow water to fill the pushrod chamber. Leave Pushrod Chamber Supply valve in the open position.
11. Close the Model B Manual Emergency Station valve when a steady stream of water is passing through the valve.
12. Allow water to flow through the Model LP Dry Pilot Actuator until all air is purged from the actuation piping.
13. Close the dry pilot actuator by opening the air or nitrogen supply quick fill valve. Allow the pressure to build to the level specified in Table F then set the pneumatic supply to automatic operation. **Note:** It may be necessary to temporarily close the main drain valve in order to build supervisory pressure to the recommended level.)
14. Open the Alarm Line valve and verify that the Main Drain valve is open. Slightly open the main valve controlling water supply to the Model DDX-LP Valve, closing the Main Drain valve fully when water flow is heard. Observe if air or water leaks through the Ball Drip valve. If no leak occurs, the DDX-LP clapper is sealed.
15. If there is an accelerator installed on the system, reset it now following the manufacturer's instructions. For the Reliable Model B1 Accelerator, please refer to Technical Bulletin 323. **Note:** The air or nitrogen system must be in automatic operation in order for the accelerator to set up properly.
16. Slowly open the main valve controlling water supply until fully opened, and verify that it is properly monitored.
17. Verify that the Pushrod Chamber Supply valve and Alarm Line valve are open. **Note:** The Pushrod Chamber supply valve must remain open to maintain hydraulic pressure in the pushrod chamber after the DDX-LP valve has been reset.
18. Verify that the Model B Manual Emergency Station is secured in the OFF position with the appropriate nylon tie.
19. Notify all concerned parties that the system has been placed into service.

## Inspection, Testing, and Maintenance

1. Notify all concerned parties that testing will be performed on system.
2. Water supply — Confirm that valves controlling water supply to the Deluge Valve are opened fully and properly monitored.
3. Alarm line — Confirm that the alarm line valve is open and remains in this position.
4. Other trim valves — Confirm that the pushrod chamber supply valve is open, as well as all pressure gauge valves. The main drain valve, condensate drain valve, and alarm test valve should be closed.
5. Ball drip valve — Push in on the plunger to be sure ball check is off its seat. If no water appears, the Deluge Valve water seat is tight. Inspect the bleed hole on the underside of the pushrod chamber for leakage.
6. Inspect air pressure for conformance to Table A.
7. Releasing device — Check outlet of the releasing device (i.e., hydraulic manual emergency station) for leakage. Also verify that tubing drain lines from releasing devices are not pinched or crushed which could prevent proper releasing of the DDX-LP valve.
8. Testing water flow alarm — Open the alarm test valve permitting water from the supply to flow to the electric sprinkler alarm switch and to the mechanical sprinkler alarm (water motor) if installed. After testing, close this valve securely. Push in on the plunger of ball drip valve until all water has drained from the alarm line.
9. Testing of supervisory pressure switch — Close the main water supply control valve. Decrease pneumatic pressure from normal and verify operation of low pressure alarm. Increase pressure form normal and verify operation of high pressure alarm. Reset pneumatic pressure to normal.
10. Operational test — Open the Model B Manual Emergency Station. Alternatively, deplete pneumatic pressure from the sprinkler system. **Note:** AN OPERATIONAL TEST WILL CAUSE THE DELUGE VALVE TO OPEN AND FLOW WATER INTO THE SPRINKLER SYSTEM.
11. Secure the Model B Manual Emergency Station in the OFF position with nylon tie after Deluge Valve is reset.
12. Notify all concerned parties that testing is complete and system has been returned to service.

### Testing System Without Operating Deluge Valve

1. Close the valve controlling water supply to the deluge valve and open the main drain valve.
2. Verify that valve supplying hydraulic pressure to the piston/pushrod chamber is open, allowing water to enter the pushrod chamber.
3. Deplete pneumatic pressure from the sprinkler system.
4. Loss of pneumatic pressure must result in a sudden drop of water pressure in the pushrod chamber, as indicated by the pressure gauge on the hydraulic release trim.
5. Reset the valve per the reset instructions.

## Draining Excess/Condensate Water

1. Notify all concerned parties that maintenance is being performed on the system.
2. Close the Main Water Supply Control valve to the system.
3. Open the Main Drain valve.
4. Open the Condensate Drain valve until all water has drained.
5. Close Condensate Drain valve.
6. Allow supervisory pressure to return to normal.
7. Partially open the Main Water Supply Control valve.
8. Slowly close the Main Drain valve.
9. Fully open the Main Water Supply Control valve.
10. Notify all concerned parties that the system has been returned to service.

**After fully resetting the Reliable Model DDX-LP Dry Pipe Valve System, confirm that all valves are in the correct position and properly monitored as required by NFPA 13:**

- Main Water Control Valve: Open
- Push Rod Chamber Supply Valve: Open
- Accelerator Inlet Valve (if present): Open
- Air or Nitrogen Supply Valve: Open
- Alarm Line Valve: Open
- Alarm Test Valve: Closed
- Main Drain Valve: Closed
- Emergency Manual Release Valve: Closed (Secured)

## Maintenance

The owner is responsible for maintaining the fire protection system in proper operating condition. Any system maintenance or testing that involves placing a control valve or detection/control system out of service may eliminate the fire protection that is provided by the fire protection system.

The Reliable Model DDX-LP valve and associated equipment shall periodically be given a thorough inspection and test. NFPA 25, "Inspection, Testing, and Maintenance of Water Based Fire Protection Systems," provides minimum maintenance requirements. System components shall be tested, operated, cleaned, and inspected at least annually, and parts replaced as required. Replace any components found to be corroded, damaged, worn, or non-operable. Increase the frequency of inspections when the valve is exposed to corrosive conditions or chemicals that could impact materials or operation of the assembly.

If face plate is removed during maintenance, torque face plate bolts to the following values during re-installation:

- 35 ft-lbs. (47 N-m) for 2" through 4" valves
- 70 ft-lbs. (95 N-m) for 6"-8" valves

## Guarantee

For Reliable Automatic Sprinkler, Co., Inc. guarantee, terms, and conditions, visit [www.reliablesprinkler.com](http://www.reliablesprinkler.com).

## Listings & Approvals

Reliable Model DDX-LP Dry Pipe Valves with trim that includes a Model LP Dry Pilot Actuator, when used as a complete system are:

- Listed by Underwriters Laboratories, Inc. and UL certified for Canada (cULus).
- FM Approved
- LPCB: 4" (100mm), 165mm, 6" (150mm) & 8" (200mm) only
- CE
- VdS Schadenverhütung GmbH
- UKCA: 0832-UKCA-S5044, -S5099, or -S5100

## Ordering Information

**Specify:**

**Valve** Model DDX-LP Dry Pipe Valve System

**Size** (See Table A)

**End Connections** (See Table A)

**Standard Trim**

- Fully assembled with control valve\*
- Fully assembled without control valve
- Segmentally assembled trim
- Loose trim (**Note:** Loose trim does not include low pressure switch [P/N 6990019313] or alarm switch [P/N 6990006382]; order separately)

**\*Note:** This trim assembly will include a spool piece with 1/4" outlet to accommodate push rod chamber supply piping. Not available for 76mm or 165mm systems, or systems using a flanged inlet Model DDX valve.

**Options**

- Model B1 Accelerator (P/N 6501200019)
- Pushrod Chamber Pressure Relief Kit (P/N 6503050001)

## Service Kits

Service kits are available for routine servicing of the valve (reference Assembly Drawings on website). Service kits for the Model DDX Deluge Valve include the following components:

- Clapper Seal Assembly (item 8)
- Cover Gasket (item 9)
- Bumpstop(s) (item 10)
- Push rod chamber diaphragm (item 18)
- Grease (item 42)

**2", 2-1/2", and 3" Model DDX Service Kit: PN 6501200R03**

**4" Model DDX Service Kit: PN 6501200R04**

**6" Model DDX Service Kit: PN 6501200R05**

**8" Model DDX Service Kit: PN 6501200R06**

**Note:** Early generation 4" and 6" Model DDX valves utilize a drop-in brass clapper. Service kits for early Model DDX valves are as follows:

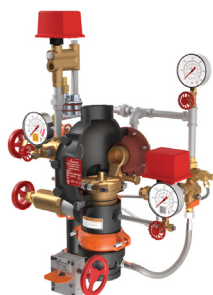
**4" Early generation DDX Deluge Valve Service Kit: PN 6501200R07**

**6" Early generation DDX Deluge Valve Service Kit: PN 6501200R08**



# Victaulic® FireLock NXT™ Dry Valve

## Series 768N



Patented

### 1.0 PRODUCT DESCRIPTION

#### Available Sizes:

- 1 ½ – 8" /40 – 200 mm

#### Pressure Class:

- Up to 300 psi/2068 kPa/20 Bar

#### Minimum Air Pressure:

- 13 psi/90 kPa/.90 Bar

#### Actuation Options:

- Series 776 Low Pressure Actuator
- Optional: Series 746-LPA Dry Accelerator

#### Valve Configurations:

- Bare
- Pre-trimmed: Completely assembled with all necessary trim components.
- Vic-Quick Riser: Pre-trimmed and includes:
  - Shut Off Valve (1 ½"/40 mm: Series 728 Ball Valve, 2" – 8"/50 – 200 mm: Series 705 FireLock Butterfly Valve)
  - Pre-set high or low air and alarm pressure switches
  - Drain kit
- Fire-Pac Series 745 (refer to Victaulic [submittal 30.23](#))

#### Pipe Preparation:

- Victaulic Original Groove System

#### Application/Media:

- For use on fire protection systems only.

### 2.0 CERTIFICATION/LISTINGS



#### NOTE

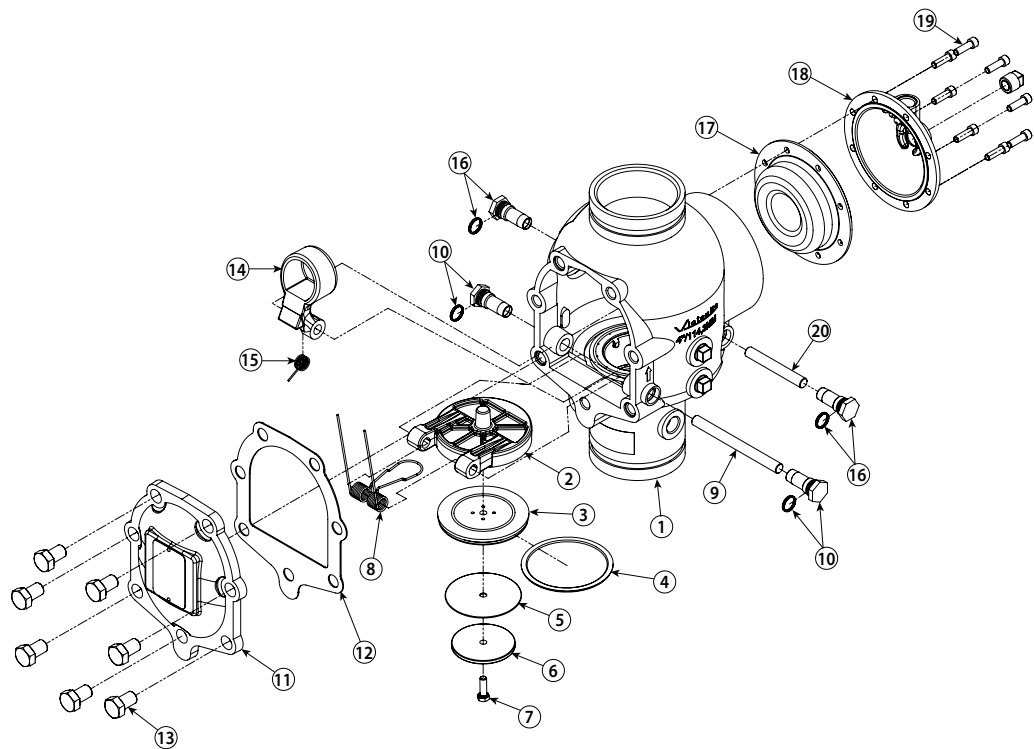
- CCC approval for DN80, DN100, DN150, DN200.

ALWAYS REFER TO ANY NOTIFICATIONS AT THE END OF THIS DOCUMENT REGARDING PRODUCT INSTALLATION, MAINTENANCE OR SUPPORT.



3.0 SPECIFICATIONS - MATERIAL

- Body:** Ductile iron conforming to ASTM A536, grade 65-45-12.
- Clapper:** Aluminum bronze UNS-C95500
- Latch:** Aluminum bronze UNS-C95500
- Shafts:** Stainless 17-4
- Clapper Seal:** Peroxide cured EPDM, ASTM D2000
- Bushings/Seat O-rings:** Nitrile
- Springs:** Stainless Steel (300 Series)
- Diaphragm:** Peroxide cured EPDM with fabric reinforcement



The 1½-inch/48.3-mm and 2-inch/60.3-mm valve sizes contain washers under the heads of the cover plate bolts.

Item	Description
1	Valve Body
2	Clapper
3	Clapper Seal
4	Seal Ring
5	Seal Washer
6	Seal Retaining Ring
7	Seal Assembly Bolt
8	Clapper Spring
9	Clapper Shaft
10	Clapper Shaft Bushing and O-Ring (Qty. 2)

Item	Description
11	Cover Plate
12	Cover Plate Gasket
13	Cover Plate Bolts
14	Latch
15	Latch Spring
16	Latch Spring Bushing and O-Ring (Qty. 2)
17	Diaphragm
18	Diaphragm Cover
19	Diaphragm Cover Cap Screws (Qty. 8)
20	Latch Shaft

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### 3.0 SPECIFICATIONS – MATERIAL (CONTINUED)

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#### **Standard Trim Package:**

- Series 776 Low Pressure Actuator – The Series 776 Low Pressure Actuator is pneumatically actuated and requires only 13 psi/90 kPa minimum air pressure, regardless of the system supply pressure. This actuator allows the system to operate with a low air or gas pressure of 7 psi/48 kPa.
- All required pipe nipples and fittings - standard galvanized finish
- All standard trim accessories
- All required gauges

**Optional Trim Package:** Black Trim for Foam Systems – If the valve is intended for use in a foam system, black trim must be ordered, per NFPA requirements. Specify this requirement on the order.

#### **Optional Accessories:**

**Alarm Pressure Switch** – Alarm Pressure Switches are designed to activate electrical alarms and control panels when a sustained flow of water occurs (such as with an open sprinkler). Included in VQR trim.

**Air Supervisory Pressure Switch** – Air Pressure Supervisory Switches are used to monitor low and high system air pressure and are factory pre-set. Included in VQR trim.

**Series 746-LPA Dry Accelerator** – The Series 746-LPA Dry Accelerator is required when the Series 768N Dry Valve is installed in large systems to improve response time. Refer to Victaulic submittal 30.64.

**Series 760 Water Motor Alarm** – The Series 760 Water Motor Alarm is a mechanical device that sounds when a sustained flow of water occurs (such as with an open sprinkler). Refer to Victaulic submittal 30.32.

**Series 75B Supplemental Alarm Device** – The Series 75B Supplemental Alarm Device is designed to provide a continuous alarm for systems equipped with a mechanical device. Refer to Victaulic submittal 30.33.

**Series 75D Water Column Kit** – The Series 75D Water Column Kit is designed to minimize residual water in the riser from collecting above the clapper. Refer to Victaulic submittal 30.34.

**Air Supply System** – The air supply system contains all components for establishing and maintaining air in the system. The compressor, low-pressure alarms, ball valves, and required trim are included in the air supply system.

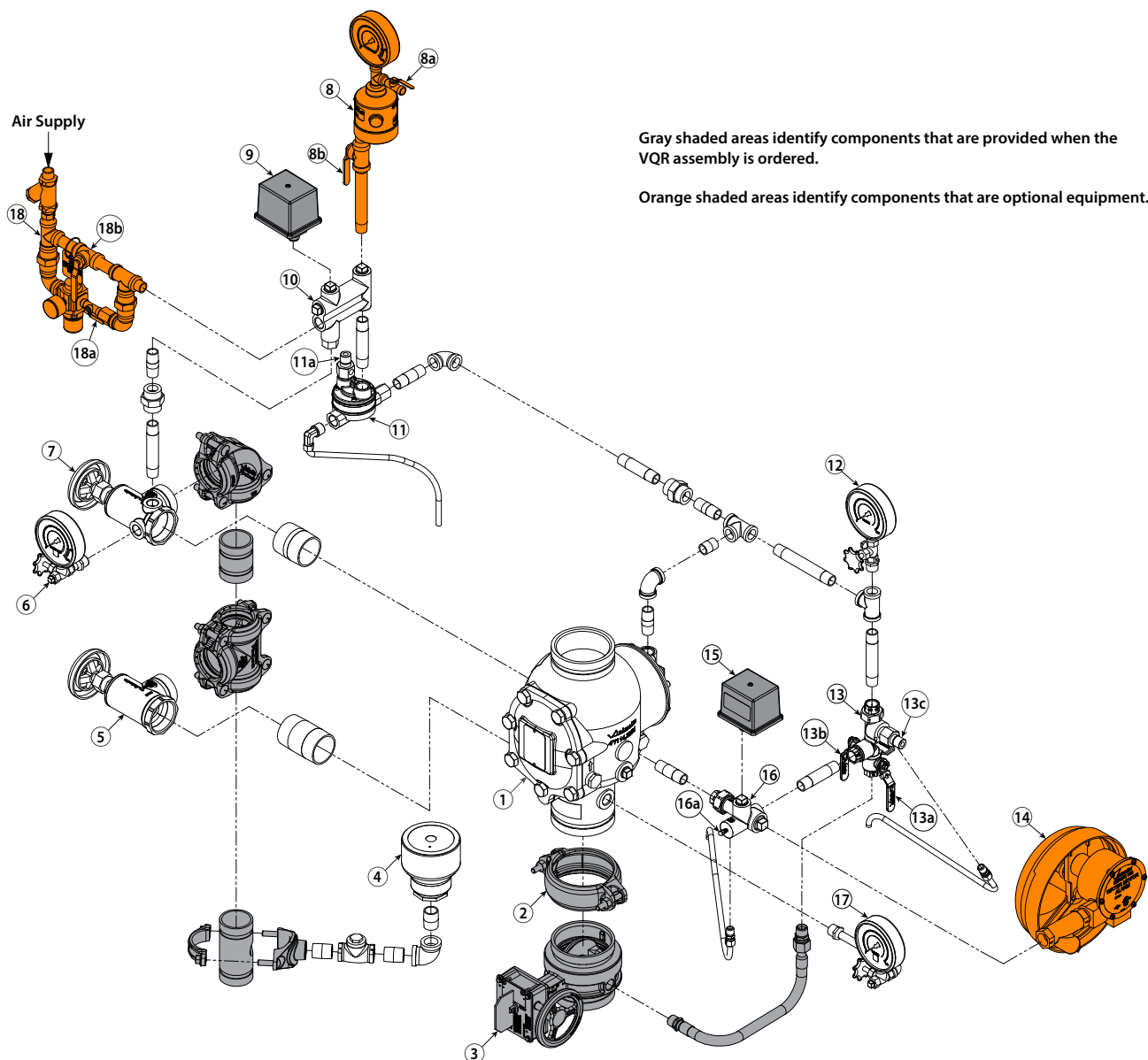
**Air Compressor** (See page 6 for more on the Victaulic Series 7C7 Compressor Package)

**Air Maintenance Trim Assembly**

**Fire Alarm Control Panels**

**Drain Connection Kit** – Included in VQR option.

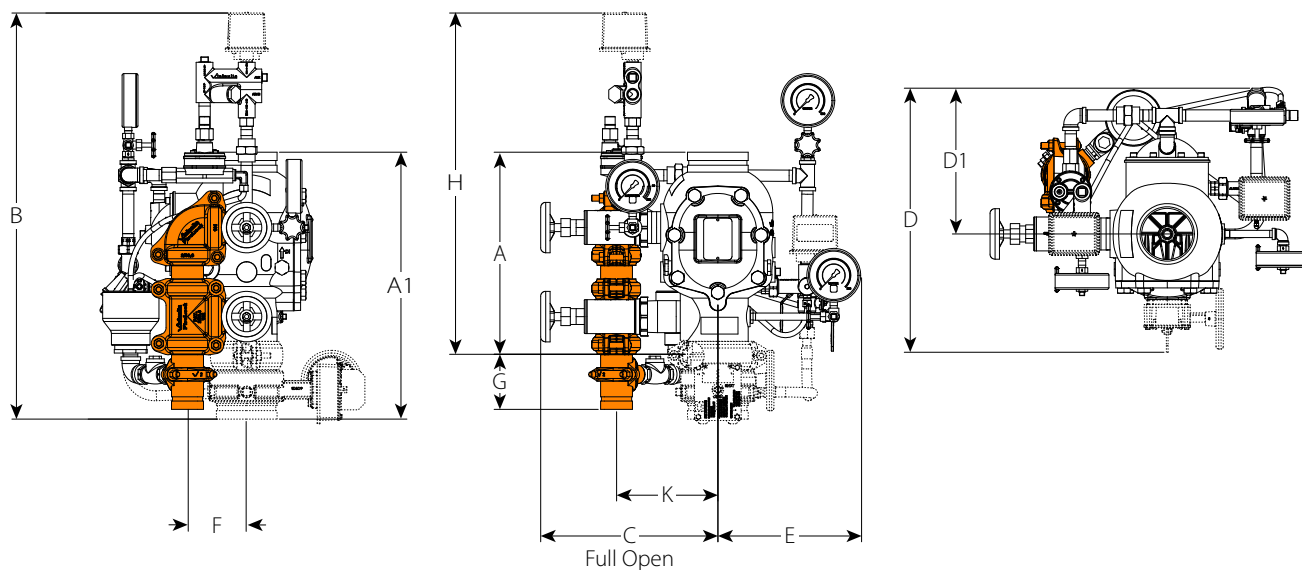
### 3.0 SPECIFICATIONS – MATERIAL (CONTINUED)



Item	Description
1	Series 768N FireLock NXT Dry Valve
2	FireLock Rigid Coupling
3	Water Supply Main Control Valve
4	Drip Cup
5	Water Supply Main Drain Valve – Flow Test
6	System Pressure Gauge/Gauge Valve Assembly
7	System Main Drain Valve
8	Series 746-LPA Dry Accelerator Assembly
8a	Series 746-LPA Dry Accelerator ¼-Turn Vent Ball Valve
8b	Series 746-LPA Dry Accelerator Isolation Ball Valve
9	Air Supervisory Pressure Switch
10	Air Manifold
11	Series 776 Low-Pressure Actuator
11a	Auto Vent Sleeve of Series 776 Low-Pressure Actuator

Item	Description
12	Charge Line Pressure Gauge/Gauge Valve Assembly
13	Priming Manifold Assembly
13a	Charge Line Ball Valve
13b	Alarm Test Ball Valve
13c	Auto Drain Sleeve
14	Series 760 Water Motor Alarm Assembly
15	Alarm Pressure Switch
16	Alarm Manifold Assembly
16a	Ball Drip Plunger
17	Water Supply Pressure Gauge/Gauge Valve Assembly
18	Victaulic Air Maintenance Trim Assembly (AMTA)
18a	Slow-Fill Ball Valve of the Victaulic AMTA
18b	Fast-Fill Ball Valve of the Victaulic AMTA

## 4.0 DIMENSIONS



Size	Dimensions											Weight	
												Approx. (Each)	
Nominal	A	A1	B	C	D	D1	E	F	G	H	K	Without Trim	With Trim
inches	inches	inches	inches	inches	inches	inches	inches	inches	inches	inches	inches	lbs	lbs
DN	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	kg	kg
1½	9.00	16.37	31.50	9.25	15.25	10.00	9.25	3.25	10.25	21.75	6.00	16.7	43.0
DN40	228.60	415.80	800	235	387	254	235	83	260	552	152	7.6	19.5
2	9.00	13.83	31.50	9.25	16.25	10.00	9.25	3.25	10.25	21.75	6.00	17.0	43.0
DN50	228.60	351.28	800	235	413	254	235	83	260	552	152	7.7	19.5
2½	12.61	16.51	29.75	11.25	17.25	9.75	9.75	4.00	6.25	23.75	6.50	41.0	65.0
	320.29	419.35	756	286	438	248	248	102	159	603	165	18.7	29.5
76.1 mm	12.61	16.51	29.75	11.25	17.25	9.75	9.75	4.00	6.25	23.75	6.50	41.0	65.0
	320.29	419.35	756	286	438	248	248	102	159	603	165	18.7	29.5
3	12.61	16.51	29.75	11.25	17.25	9.75	9.75	4.00	6.25	23.75	6.50	41.0	65.0
DN80	320.29	419.35	756	286	438	248	248	102	159	603	165	18.7	29.5
4	15.03	19.85	31.50	13.50	20.00	11.25	11.00	4.75	4.50	25.75	8.00	59.0	95.0
DN100	381.76	504.19	800	343	508	286	279	121	114	654	203	26.7	43.0
165.1 mm	16.00	22.13	31.00	14.00	23.25	11.75	11.25	4.50	4.25	27.00	8.25	80.0	116.0
	406.40	562.10	787	356	591	298	286	114	108	686	210	36.2	52.6
6	16.00	22.13	31.00	14.00	23.25	11.75	11.25	4.50	4.25	27.00	8.25	80.0	116.0
DN150	406.40	562.10	787	356	591	298	286	114	108	686	210	36.2	52.6
8	17.50	23.02	32.75	14.75	25.75	12.50	12.25	4.75	4.25	29.00	9.25	122.0	158.0
DN200	444.50	584.71	832	375	654	318	311	121	108	737	235	55.3	71.6

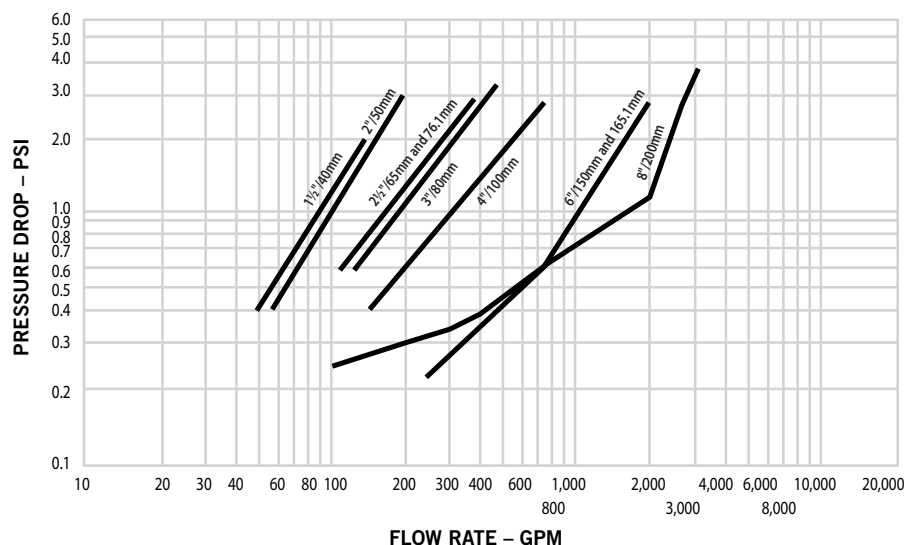
### NOTES

- The "A" dimension is the actual takeout dimension of the valve body.
- The "A1" dimension is the actual takeout dimension of the valve body with water supply main control valve.
- For systems with the optional Series 746-LPA Dry Accelerator, add 11.50 inches/292 mm to the "B" dimension to account for the additional height.
- The "D" and "D1" dimensions are not fixed measurements. The drip cup can be rotated to provide more clearance at the back of the trim.
- Components shown as dotted lines denote optional equipment.
- The recommended drain connection kit (shaded in orange) is for reference and takeout dimensions. This drain connection comes standard when the VQR assembly is ordered.

## 5.0 PERFORMANCE

### Hydraulic Friction Loss

The chart below expresses the flow of water at 65°F/18°C through an open valve.



### Frictional Resistance

The chart below expresses the frictional resistance of Victaulic Series 768N FireLock NXT.

Dry Valve in equivalent feet of straight pipe.

Nominal Size inches DN	Actual Outside Diameter inches mm	Equivalent Length of Pipe feet meters
1 1/2 DN40	1.900 48.3	3.00 0.914
2 DN50	2.375 60.3	9.00 2.743
2 1/2	2.875 73.0	8.00 2.438
76.1 mm	3.000 76.1	8.00 2.439
3 DN80	3.500 88.9	17.00 5.182
4 DN100	4.500 114.3	21.00 6.401
165.1 mm	6.500 165.1	22.00 6.706
6 DN150	6.625 168.3	22.00 6.706
8 DN200	8.625 219.1	50.00 15.240

### Cv Values:

Cv values for flow of water at +60°F/+16°C through a fully open valve are shown in the table below.

### Formulas for Cv values

$$\Delta P = Q^2 / C_v^2$$

$$Q = C_v \times \sqrt{\Delta P}$$

Where:

Flow Coefficient	Cv
Q (Flow)	GPM
ΔP (Pressure Drop)	psi

Valve Size		Full Open
Nominal Size inches DN	Actual Outside Diameter inches mm	Flow Coefficient Cv Kv
1 1/2 DN40	1.900 48.3	60 52.0
2 DN50	2.375 60.3	110 95.0
2 1/2	2.875 73.0	180 156.0
76.1 mm	3.000 76.1	180 156.0
3 DN80	3.500 88.9	200 173.0
4 DN100	4.500 114.3	350 302.8
165.1 mm	6.500 165.1	1000 865.0
6 DN150	6.625 168.3	1000 865.0
8 DN200	8.625 219.1	1500 1499.1

## 5.0 PERFORMANCE (CONTINUED)

### Air Supply Requirements

- Minimum: 13 psi/90 kPa/.9 Bar regardless of the system water pressure
- Maximum Recommended: 18 psi/124 kPa/1.24 Bar
- Multiple Series 768N FireLock NXT Dry Valves with a common air supply:
  - Isolate systems with a Victaulic spring –loaded, soft-seated ball check valve to ensure air integrity and serviceability of each system.
- Sizing the compressor:
  - Engineer/system designer is responsible
  - Entire system must be charged to the required air pressure within 30 minutes to meet NFPA requirements
  - An oversized compressor will slow down or possibly prevent valve operation
  - Compressor filling the system too fast:
    - May be necessary to restrict the air supply
    - Ensure that air exhausted from an open sprinkler or manual release valve is not replaced by the air supply system as fast as it is exhausted
- Compressor Requirements
  - Base or Riser Mounted Compressors:
    - “On” or “low” pressure setting: 13 psi/90 kPa/.9 Bar
    - “Off” or “high” pressure setting: 18 psi/124 kPa/1.24 Bar
    - Victaulic Series 7C7 riser mounted and pre-set for pressure requirements (refer to Victaulic [submittal 30.22](#)).
    - If the compressor is not equipped with a pressure switch, the Series 757P Air Maintenance Trim Assembly with pressure switch should be installed (refer to Victaulic [submittal 30.36](#)).
- Shop Air or Tank-Mounted Air Compressors:
  - Series 757 Regulated Air Maintenance Trim Assembly should be installed (refer to Victaulic [submittal 30.35](#))
  - 13 psi/90 kPa/.9 Bar should be used as the set point for the air regulator
  - The compressor cut-in (turn-on) pressure setting should be at least 5 psi/34kPa/34 Bar above the set point of the air regulator.
  - Exploded View Trim: Series 757 Regulated Air Maintenance Trim Assembly (refer to Victaulic [submittal 30.35](#))
- Compressor Requirements and settings for systems installed with series 746 or series 746-LPA dry accelerators
  - A tank-mounted air compressor with a Series 757 Regulated AMTA must be used to supply air to system installed with a Series 746 or Series 746-LPA Dry Accelerator.
  - In the event a compressor becomes inoperative, a properly sized tank-mounted air compressor provides the greatest protection, since air can be supplied continuously to the sprinkler system for an extended time period.

## 6.0 NOTIFICATIONS

### ⚠ WARNING



- Read and understand all instructions before attempting to install, remove, adjust, or maintain any Victaulic piping products.
- Depressurize and drain the piping system before attempting to install, remove, adjust, or maintain any Victaulic piping products.
- Wear safety glasses, hardhat, and foot protection.

Failure to follow these instructions could result in death or serious personal injury and property damage.

## 7.0 REFERENCE MATERIALS

- [30.35: FireLock™ Air Maintenance Trim Assembly Series 757 Submittal](#)
- [30.36: FireLock™ Air Maintenance Trim Assembly Series 757P Submittal](#)
- [30.22: FireLock® Compressor Package Series 7C7 Submittal](#)
- [30.32: FireLock™ Water Motor Alarm Series 760 Submittal](#)
- [30.64: FireLock™ Dry Accelerator Series 746-LPA](#)
- [30.65: FireLock™ Low Pressure Actuator Series 776 Submittal](#)
- [I-768N: FireLock NXT™ Dry Valve Series 768N Installation Manual](#)

### User Responsibility for Product Selection and Suitability

Each user bears final responsibility for making a determination as to the suitability of Victaulic products for a particular end-use application, in accordance with industry standards and project specifications, as well as Victaulic performance, maintenance, safety, and warning instructions. Nothing in this or any other document, nor any verbal recommendation, advice, or opinion from any Victaulic employee, shall be deemed to alter, vary, supersede, or waive any provision of Victaulic Company's standard conditions of sale, installation guide, or this disclaimer.

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### Note

This product shall be manufactured by Victaulic or to Victaulic specifications. All products to be installed in accordance with current Victaulic installation/assembly instructions. Victaulic reserves the right to change product specifications, designs and standard equipment without notice and without incurring obligations.

### Installation

Reference should always be made to the Victaulic installation handbook or installation instructions of the product you are installing. Handbooks are included with each shipment of Victaulic products, providing complete installation and assembly data, and are available in PDF format on our website at [www.victaulic.com](http://www.victaulic.com).

### Warranty

Refer to the Warranty section of the current Price List or contact Victaulic for details.

### Trademarks

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## Model B1 Accelerator with Integral Accelo-Check

### Features

- Quickens the operation of dry pipe valves
- Can potentially increase the number of automatic sprinklers controlled by one dry pipe valve
- Equalizes rapidly as dry system is being filled with air to required pressure
- Self-adjusts for small fluctuations in system air pressure
- Compact and light-weight construction
- Accelo-Check prevents water and debris from entering critical areas
- Tested and approved for use with Reliable dry pipe and preaction systems
- UL Listed, FM Approved

### Product Description

The Reliable Model B1 Accelerator with integral Accelo-Check (anti-flooding device) is used to speed the operation of both dry pipe valves (in dry-type automatic sprinkler systems) and deluge valves (in preaction sprinkler systems). Both of these systems utilize pressurized air or nitrogen in the piping, instead of water, to prevent freezing or to prevent the accidental release of water.

The accelerated operation of the dry pipe valve permits an increase in both the number of sprinklers that can be controlled by one dry pipe valve and the volume of the dry system that can be installed.

### Approvals

1. Listed by Underwriters Laboratories, Inc.
2. Underwriters Laboratories of Canada for up to 1500 gal. (5678 liters) systems.
3. Approved by Factory Mutual Research Corporation
4. Loss Prevention Council

### Accelerator Operation

The Model B1 Accelerator is a normally-closed valve with 1/2" NPT inlet and outlet ports, that is highly sensitive to the rate of air pressure change in a dry pipe sprinkler system. This device retains normal dry system air pressure in the top chamber even though pressure in the system may be dropping as a direct result from one or more sprinklers opening.

When a pressure difference of approximately 3 to 4 psi (21 to 28 kPa) occurs between the top and middle chambers, the Model B1 Accelerator opens and vents system pressure, thereby hastening the operation of the dry-pipe or preaction system.



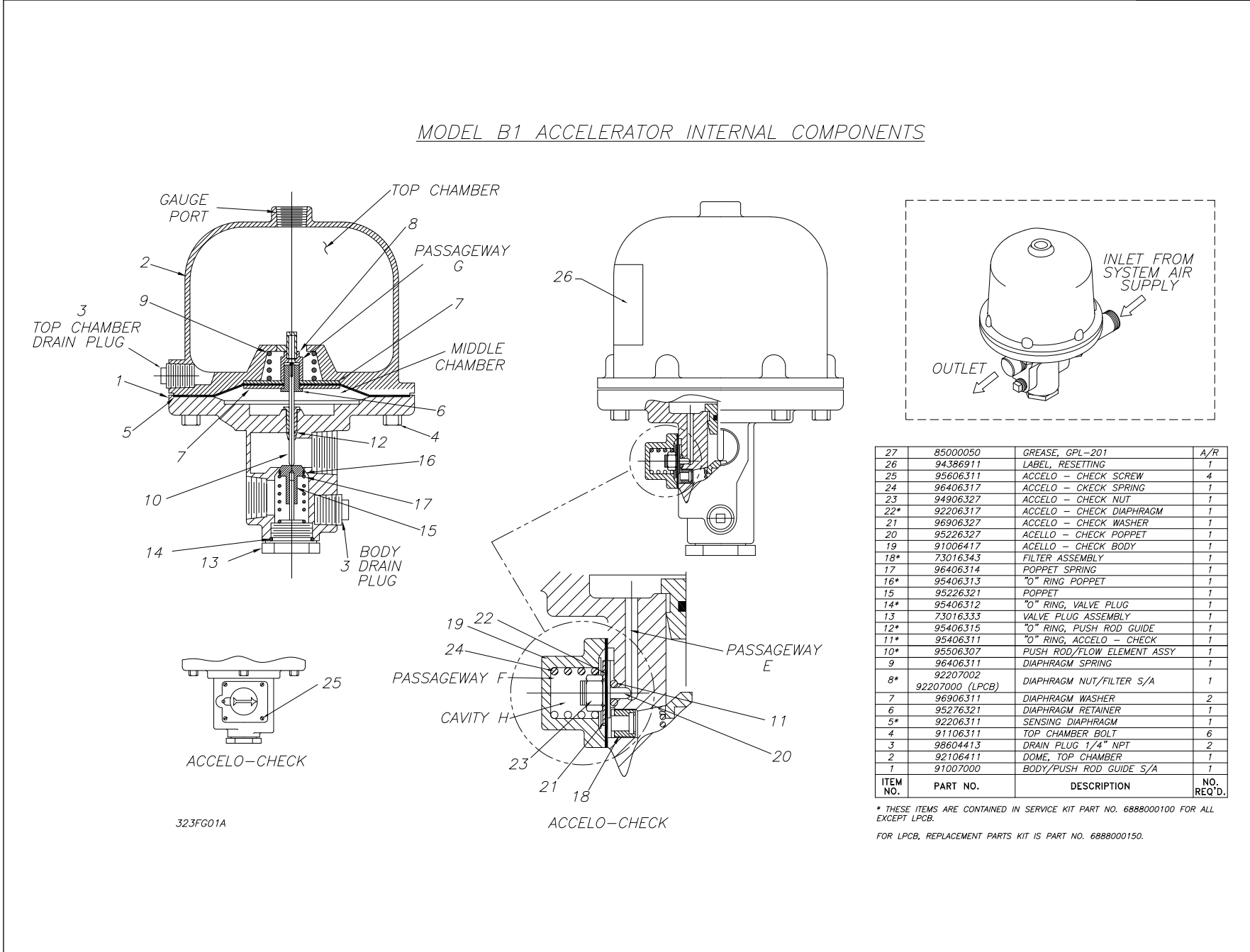
Model B1 Accelerator

Fig. 1 illustrates a cross-section of the Model B1 Accelerator in the "closed" position while being pressurized. Upon initial setup, the Accelerator is filled by air from the dry pipe system via a 1/2" NPT connection. Air passes through its filter assembly (item #18) and passageway E to the device's middle chamber. This air pressure also lifts the diaphragm assembly (Items #5 through #8) off of the push rod (item #10) thereby opening up passageway G. The air then completely fills the top chamber to the match the system pressure. When filled, the diaphragm assembly rests on the end of the push rod closing passageway G to all but very small amounts of air movement, thereby allowing slow changes in pressure between the top and middle chambers due to temperature change or small leaks.

Upon a significant air-pressure decay of the sprinkler system piping (such as sprinkler activation), the retained air pressure in the Accelerator top chamber exerts a net-downward force across the diaphragm assembly and pushrod (items 5-8 & 10). This forces the poppet (item #15) to open thereby allowing system air pressure to pass out of the Accelerator 1/2" outlet port and into the intermediate chamber of the dry pipe valve (or to atmosphere depending on the type of system to which it is installed). This in turn will activate the dry pipe valve. Simultaneously, pressurized air also passes through the Accelerator and closes the integral Accelo-Check (items #11, #19 through #25) by pressurizing cavity H, thereby preventing water and waterborne debris from entering the internal restriction area in passageway E. This increases the reliability of the Accelerator.

Model B1 Accelerator Internal Components

Figure 1



## Installation

The Reliable Model B1 Accelerator is quickly attached to various valves and systems manufactured by Reliable. Table 1 lists the appropriate part numbers as well as technical bulletins which include installation details.

When installed into the basic trim of a Reliable Model D or Model FX Dry Pipe Valve, the Accelerator ½" outlet port should be directly connected to the intermediate chamber of the dry pipe valve. In this application, the Model B1 Accelerator directly assists the clapper of the dry pipe valve to open.

For installations into all other Reliable-manufactured dry systems such as Models DDX, DDX-LP & EX, the Accelerator ½" outlet port should be vented to the atmosphere. These types of systems do not utilize differential-type clappers that require additional air pressure to operate. Instead, these systems utilize a pneumatic actuator to seal a push rod chamber and mechanically latch a valve closed. In this instance, the Model B1 Accelerator speeds up the purging of the air side of the Model LP Actuator which in turn vents the push-rod chamber pressure of the main fire control valve causing its clapper to open and fill the system piping with water.

**Note:** The Model B1 Accelerator may be capable of hastening the operation of non-Reliable manufactured valves, however, it has only been tested and approved with Reliable valves.

## System Requirements

NFPA 13 permits the installation of approved quick-opening devices on dry pipe and double-interlock preaction systems. When installed on systems with a capacity over 500 gallons but less than 750 gallons, a requirement to deliver water to a test connection in 60 seconds or less may be waived. When installed on systems with a capacity over 750 gallons, the quick-opening device may accelerate the operation of the dry pipe or preaction valve, allowing maximum time for water transit throughout the piping network. Systems with a capacity below 500 gallons do not generally utilize quick-opening devices.

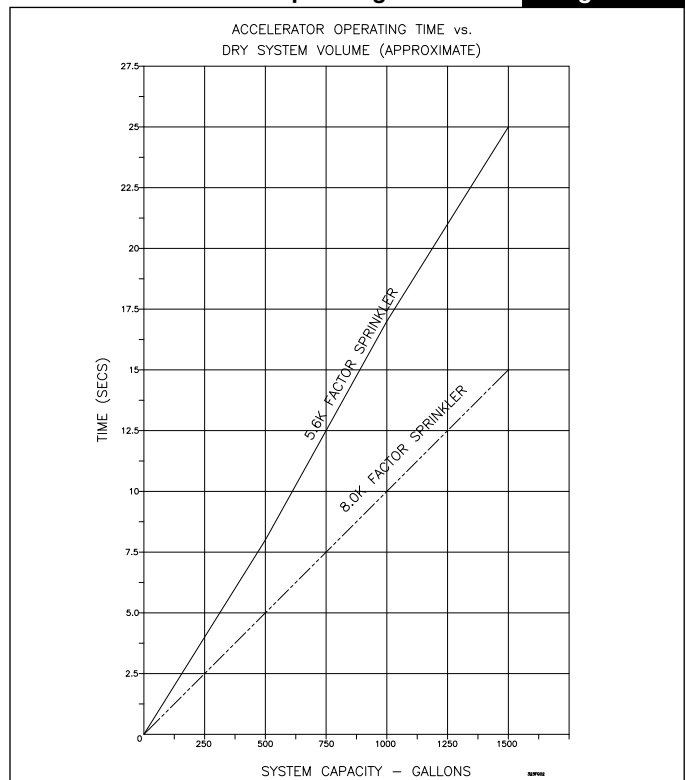
- Reliable's Accelerator is UL Listed for system volumes to 1500 gallons. This capability is also approved by FM.
- System pneumatic pressure must be maintained at a minimum of 15 psi in order for the Accelerator to operate.

It must be cautioned that accelerator operation and water delivery at the inspectors test connection does not occur at the same time. There is a delay while the air is being expelled through the inspectors test connection ahead of the water. This time delay depends on the piping configuration system size, available water supply and other factors which are beyond the control of the accelerator.

Figure 2 provides a graph of approximate Accelerator operating time versus system size when one sprinkler head opens. The time of operation of the Accelerator is relatively unaffected by inlet pressures so the graph applies for all normal dry system pressures from 25 psi to 50 psi (1.7 bar to 3.4 bar). As described above, water delivery time will significantly exceed the accelerator operating times shown in Figure 2.

**Model B-1 Accelerator Operating Time**

**Figure 2**



**Accelerator Compatibility**

**Table A**

Valve	System Type	Technical Bulletin	Accelerator Part Numbers	Trim Kit Part Number
Model D	Dry Pipe	350	6301000300	6516000002
Model EX	Dry Pipe	359	6516000013	(Included)
Model DDX-LP	Dry Pipe	338	6501200019	(Included)
Model DDX Type F	Double Interlock Preaction	751	6501200019	(Included)
Model DDX Type PL	Double Interlock Preaction	752	6501200019	(Included)
Model FX	Dry Pipe	360	650120001A	(Included)

## Resetting Procedure for Model D Dry Pipe Valve Systems

**Note:** These steps must be followed each and every time the system has operated or is tested.

1. Isolate the Accelerator by closing the inlet and outlet valves.
2. Close the air supply and main water supply valves to the dry pipe valve. Drain and fully reset the dry pipe valve in accordance with the manufacturer's instructions.
3. Close the main water supply control valve and open the system main drain. This step serves to prevent accidental operation of the system while resetting the Accelerator.
4. Remove the 1/2" drain plugs on the inlet and outlet piping.
5. Remove the 1/4" body drain plug from the lower section of the Accelerator.
6. Remove the 1/4" top chamber drain plug. If water is present in the top chamber, disassemble the Accelerator, clean and dry the top and middle chambers and diaphragm assembly using a clean lint free cloth. Reassemble the Accelerator. Replace the top chamber drain plug using new thread sealant.
7. Carefully remove the Accelo-Check Body and gently lift the Accelo-Check Diaphragm Assembly to verify venting of the middle chamber.
8. Partially open the Accelerator inlet valve, gently purging any water which may be in the trim lines. Close the inlet valve.
9. Replace the 1/2" drain plugs on the inlet and outlet piping.
10. Partially open inlet valve and gently purge the Accelerator. Close inlet valve and replace the 1/4" body drain plug on the lower section of the Accelerator.
11. Reopen inlet valve to purge the inlet filter assembly. Close the inlet valve.
12. Reinstall the Accelo-Check assembly to the accelerator.
13. Open the Accelerator outlet valve.
14. Pressurize the Accelerator by opening the inlet valve. When properly set, the top chamber pressure of the Accelerator should equal the system pressure.
15. Slightly open the main water supply control valve. Slowly close the main drain valve when water flows, then fully open the main supply valve.

## Resetting Procedure for Model FX Dry Pipe Valve Systems

**Note:** These steps must be followed each and every time the system has operated or is tested.

1. Isolate the Accelerator by closing the inlet and outlet valves.
2. Close the air supply and main water supply valves to the dry pipe valve. Drain and fully reset the dry pipe valve in accordance with the manufacturer's instructions.
3. Close the main water supply control valve and open the system main drain. This step serves to prevent accidental operation of the system while resetting the Accelerator.
4. Remove the 1/4" body drain plug from the lower section of the Accelerator.
5. Remove the 1/4" top chamber drain plug. If water is present in the top chamber, disassemble the Accelerator, clean and dry the top and middle chambers and diaphragm assembly using a clean lint free cloth. Reassemble the Accelerator. Replace the top chamber drain plug using new thread sealant.
6. Carefully remove the Accelo-Check Body and gently lift the Accelo-Check Diaphragm Assembly to verify venting of the middle chamber.
7. Partially open inlet valve and gently purge the Accelerator. Close inlet valve and replace the 1/4" body drain plug on the lower section of the Accelerator.
8. Reopen inlet valve to purge the inlet filter assembly. Close the inlet valve.
9. Reinstall the Accelo-Check assembly to the accelerator.
10. Open the Accelerator outlet valve.
11. Pressurize the Accelerator by opening the inlet valve. When properly set, the top chamber pressure of the Accelerator should equal the system pressure.
12. Slightly open the main water supply control valve. Slowly close the main drain valve when water flows, then fully open the main supply valve.

## Resetting Procedure for Model LDX, DDX-LP, and EX Dry Systems; and Model DDX Type F Preaction Systems

**Note:** These steps must be followed each and every time the system has operated or is tested.

1. Isolate the Accelerator by closing the inlet valve.
2. Close the air and water supply valves to the deluge valve. Drain and reset the system in accordance with the manufacturers instructions.
3. Close the main water supply control valve and open the system main drain. This step serves to prevent accidental operation of the system while resetting the Accelerator.
4. Remove the 1/4" body drain plug from the lower section of the Accelerator.
5. Remove the 1/4" top chamber drain plug. If water is present in the top chamber, disassemble the Accelerator, clean and dry the top and middle chambers and diaphragm assembly using a clean lint free cloth. Reassemble the Accelerator. Replace the top chamber drain plug using new thread sealant.
6. Carefully remove the Accelo-Check Body and gently lift the Accelo-Check Diaphragm Assembly to verify venting of the middle chamber.
7. Partially open inlet valve and gently purge the Accelerator. Close inlet valve and replace the 1/4" body drain plug on the lower section of the Accelerator.
8. Reopen inlet valve to purge the inlet filter assembly. Close the inlet valve.
9. Reinstall the Accelo-Check assembly to the accelerator.
10. Pressurize the Accelerator by opening the inlet valve. The top chamber pressure of the Accelerator should equal the system pressure.
11. Slightly open the main water supply control valve. Close the main drain valve when water flows, then fully open the main supply valve.

## Recommended Periodic Inspections

The following inspections should be performed on the Model B1 Accelerator on a weekly basis.

1. Check that the correct system air pressure is being maintained
2. Verify that Accelerator top chamber pressure and system air pressure are equal.
3. Verify that the valves located on both the Accelerator's inlet and outlet lines are in the open position. A valve located on the Accelerator outlet port should only be present if the Accelerator is connected into a dry pipe valve intermediate chamber. Otherwise, the Accelerator outlet port should vent to the atmosphere.
4. Check that the prime water level is correct (if applicable).

## Test

The following Accelerator tests should be performed semi-annually or whenever the Accelerator has been disassembled.

### **A) Accelerator test without operating the dry pipe valve.**

1. Isolate the Accelerator by closing the valves located on its inlet and/or outlet ports.
2. Loosen the 1/4" (lower) body drain plug in order to decay the pressure at the inlet of the Accelerator. This will simulate a system decay as when one or more sprinklers open. The Accelerator should operate.
3. Reset the Accelerator following the instructions described in the "Resetting Procedure" sections of this bulletin.

### **B) Sensitivity Test (Model D Dry Pipe Valves only)**

1. Close the main water supply control valve.
2. Bleed the system air pressure at a rate of 1 psi per minute.
3. After ten minutes (the air pressure should have decayed 10 psi) the Accelerator should not have tripped.
4. Restore the system air pressure and reopen the main water supply control valve.

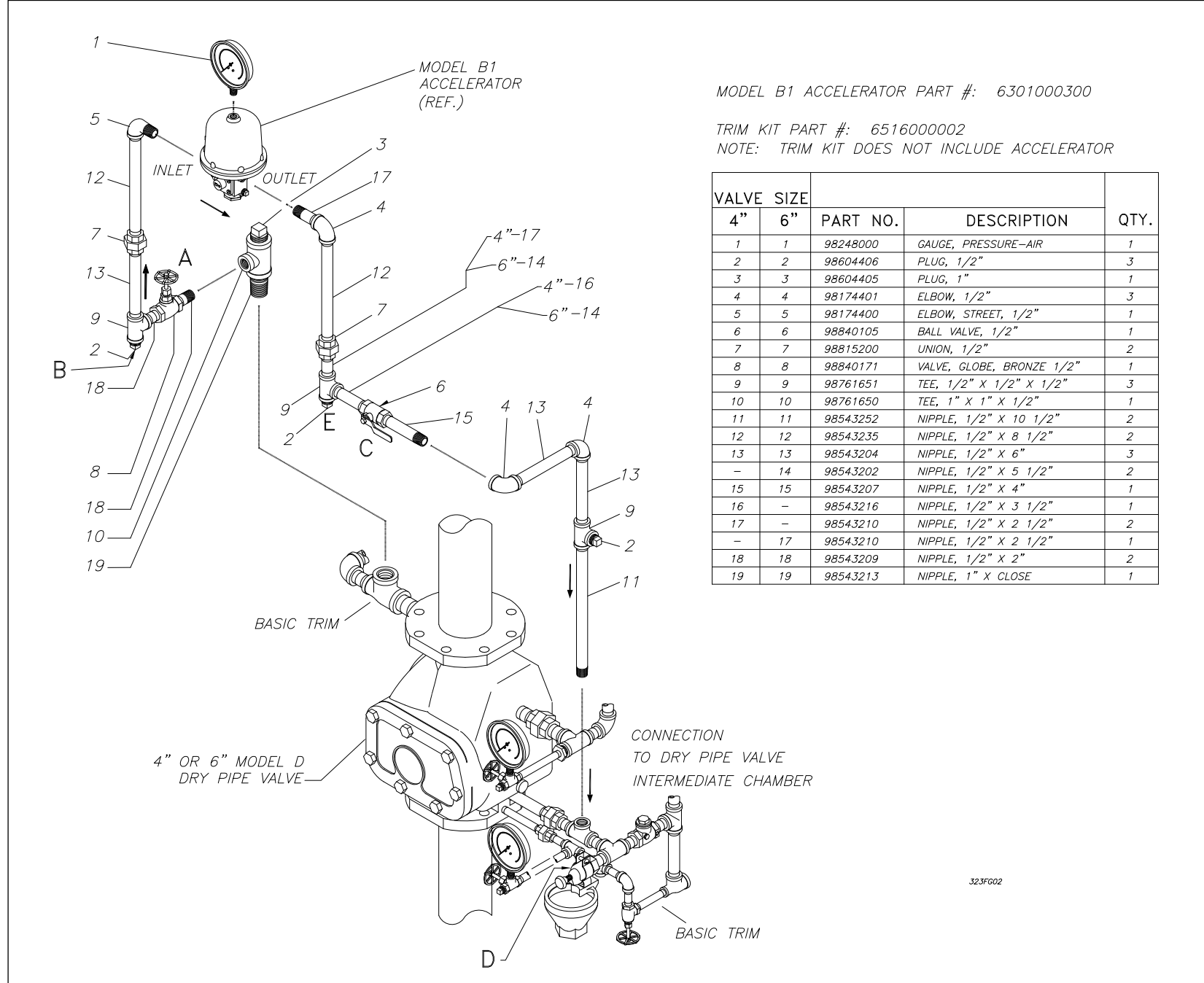
## Maintenance & Trouble Shooting (refer to Fig. 1)

The following table provides a simplified, trouble-shooting guide which indicates the necessary corrective maintenance for the more common problems, which may occur.

Symptom	Probable Cause	Correction
Air flows rapidly through the Accelerator and into the outlet port when resetting.	The Push-Rod is in the held down position by contamination, the Push-Rod is bent or the Push-Rod guide is too tight.	Clean or replace as needed.
Minor air flow or leakage through the Accelerator.	<ol style="list-style-type: none"> <li>1. Contamination in the poppet area.</li> <li>2. The Poppet "O"-Ring has blown off the Poppet, or is cut.</li> <li>3. The Accelo-Check diaphragm has a hole or rip allowing air to reach the outlet through passageway (F).</li> <li>4. Leakage past the Push-Rod Guide "O"-Ring.</li> <li>5. The Push Rod or Push-Rod Guides damaged causing leakage.</li> </ol>	<ol style="list-style-type: none"> <li>1. Clean.</li> <li>2. Install new "O"-Ring.</li> <li>3. Replace.</li> <li>4. Replace.</li> <li>5. Replace.</li> </ol>
No or low air pressure in the top chamber (gauge pressure does not increase, and no air pressure in the outlet).	<ol style="list-style-type: none"> <li>1. Filter assembly is clogged.</li> <li>2. Restriction area (Passageway G) is clogged or the filter on the diaphragm nut is clogged.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace</li> <li>2. Replace.</li> </ol>
Accelerator will not trip during a system test.	<ol style="list-style-type: none"> <li>1. The top chamber air pressure is bleeding back to the system too fast through restriction area.</li> <li>2. The top chamber air pressure is bleeding back to the system through the ripped diaphragm.</li> <li>3. External leak in top chamber.</li> <li>4. Filter assembly restricted.</li> </ol>	<ol style="list-style-type: none"> <li>1. Clean the top of the Push-Rod and mating surface in diaphragm nut, or replace.</li> <li>2. Replace</li> <li>3. Check the gauge and the drain plug for tightness-use new PTFE tape on the plug after each resetting.</li> <li>4. Replace.</li> </ol>
Accelerator floods with water.	<ol style="list-style-type: none"> <li>1. Inspect check valve for leakage when system is filled with water.</li> <li>2. The Accelo-Check "O"-Ring is missing or cut.</li> <li>3. Leakage past the Push-Rod Guide "O"-Ring.</li> <li>4. Push rod or Push-Rod Guide is damaged allowing leakage.</li> <li>5. Condensate from the compressor has not been drained.</li> </ol>	<ol style="list-style-type: none"> <li>1. Wipe off the clapper facing and seat clean.</li> <li>2. Replace if necessary.</li> <li>3. Replace.</li> <li>4. Replace.</li> <li>5. Drain water from compressor and air supply line.</li> </ol>
Accelerator operates prematurely.	<ol style="list-style-type: none"> <li>1. Water or dirt in the restriction area.</li> <li>2. Air is not bleeding back through the restriction area to compensate for minor pressure fluctuations.</li> <li>3. Dry pipe valve is operating prematurely - not the accelerator.</li> <li>4. On-Off is setting of the compressor's pressure switch allowing the system pressure to decay too far.</li> </ol>	<ol style="list-style-type: none"> <li>1. Clean top of the Push-Rod and mating surface-perform sensitivity test.</li> <li>2. Replace Push-Rod and / or diaphragm nut. In "Test" section of this Technical Bulletin - perform sensitivity test.</li> <li>3. Review the correct pressure settings from the corresponding system's technical bulletin.</li> <li>4. Readjust the differential of pressure switch to minimum (6-8 psi) when using an accelerator.</li> </ol>

# Model B1 Accelerator on Model D 4" & 6" Dry Pipe Systems

Figure 3

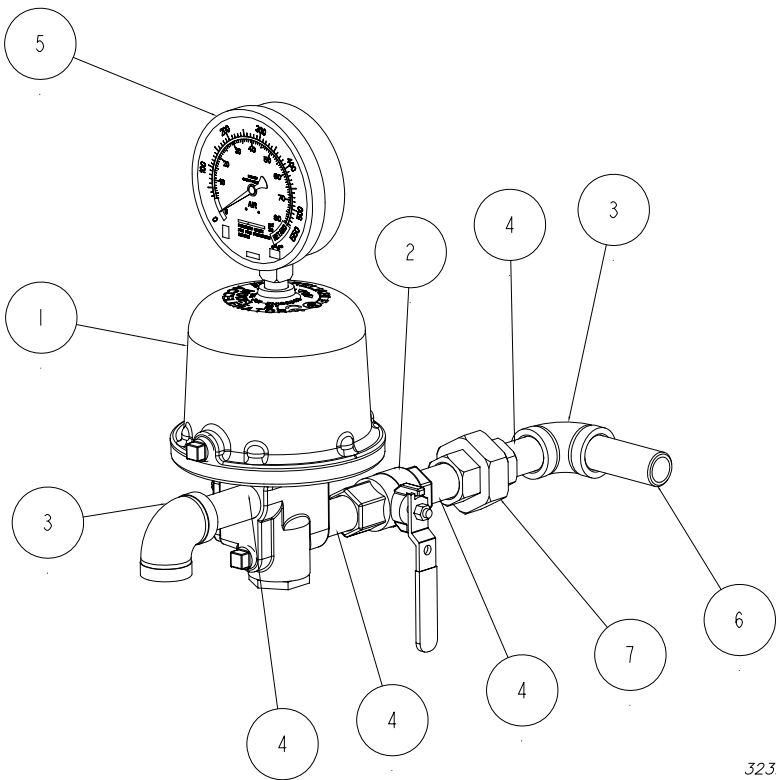


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Model B1 Accelerator on Model EX Systems

Figure 4

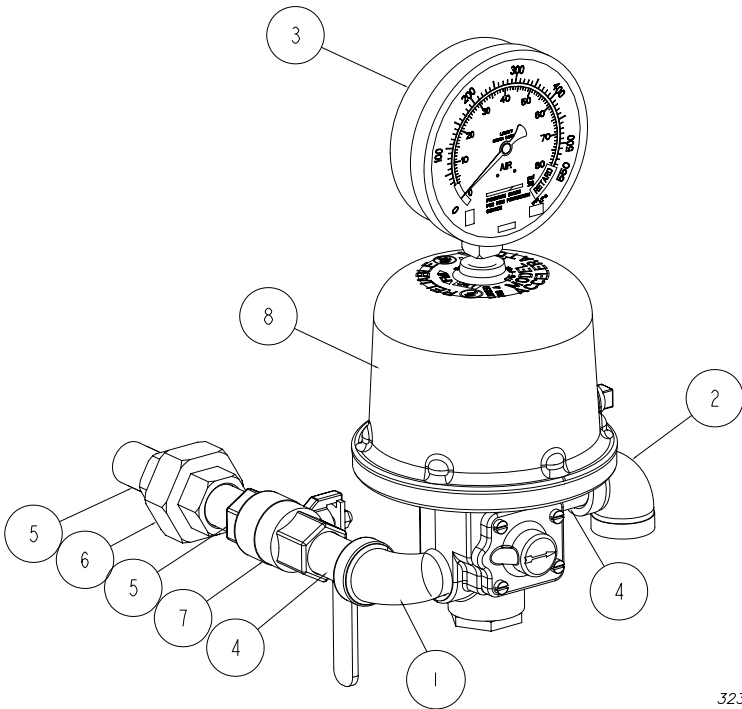


323FG04

ITEM NO.	PART NO.	DESCRIPTION
1	6301000300	ACCELERATOR, MODEL B1
2	98840109	VALVE, BALL, 1/2"
3	98174401	ELL, 1/2", MALL IRON, GALV.
4	98543209	NIPPLE, STEEL, GALV., 1/2" X 2"
5	98248000	GAUGE, AIR PRESSURE (0-80 PSI)
6	98543210	NIPPLE, STEEL, GALV., 1/2" X 2-1/2"
7	98815200	UNION, 1/2", IRON, G.J., GALV.

Model B1 Accelerator on Model DDX Systems

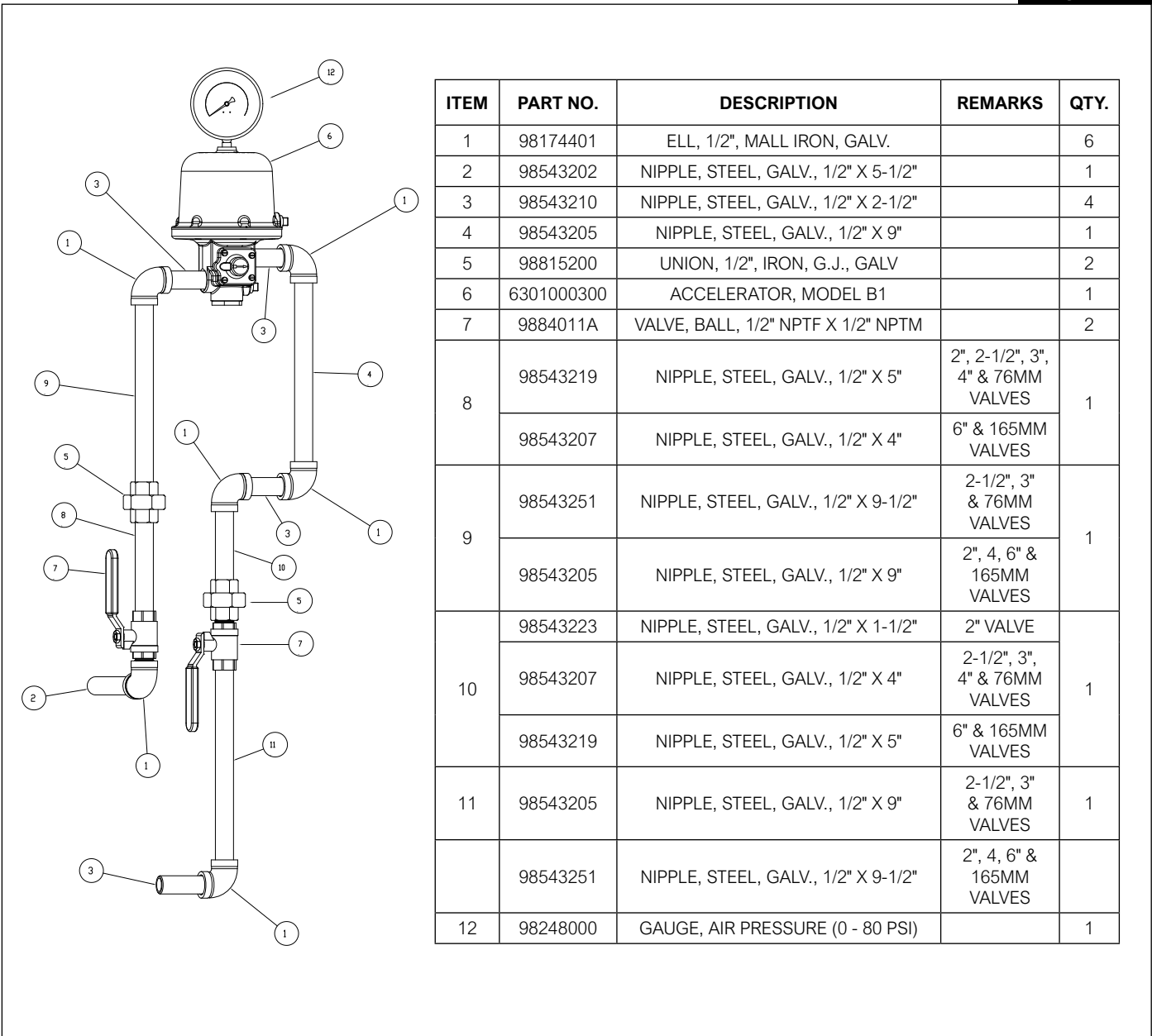
Figure 5



323FG05

ITEM NO.	PART NO.	DESCRIPTION
1	98174400	ELBOW, STREET, 1/2", GALV.
2	98174401	ELL, 1/2", MALL IRON, GALV.
3	98248000	GAUGE, AIR PRESSURE (0-80 PSI)
4	98543209	NIPPLE, STEEL, GALV., 1/2" X 2"
5	98543223	NIPPLE, STEEL, GALV., 1/2" X 1-1/2"
6	98815204	UNION, "O" RING SEAL, GALV., 1/2"
7	98840109	VALVE, BALL, 1/2"
8	6301000300	ACCELERATOR, MODEL B1





# FireLock® Dry Accelerator

## SERIES 746-LPA



See Victaulic publication 10.01 for details

The Victaulic Series 746-LPA Firelock Accelerator is a quick-opening device that can be added to the:

- Victaulic FireLock NXT™ Series 768 Dry and Series 769 Preaction Valve

in order to speed response time and/or accommodate larger systems.

**IMPORTANT:** The Series 746-LPA and the Series 746 provide unique functionality and are NOT interchangeable.

Series 746-LPA Firelock Dry Accelerators are compatible with the Victaulic Series 768, 769 valves and are recommended for system air pressures ranging from 13psi/90kPa to 18psi/124kPa.



## FUNCTIONALITY

The Series 746-LPA Firelock Dry Accelerator speeds the operation of the sprinkler's control valves by sensing the rapid decay of system pressure and exhausting air from the upper chamber of the actuating device. It attaches to the air supply's trim at the inlet of the dry actuator.

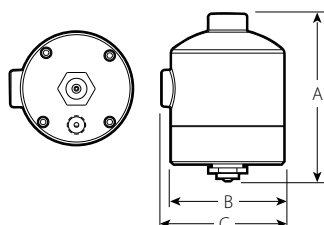
System air pressure in the upper and lower chambers sets the dry accelerator in the closed position, which holds pressure in the air chamber of the actuating device. When a sprinkler opens and system air pressure releases, the air evacuates from the lower chamber faster than it does from the upper air chamber. As the air pressure in the lower chamber decreases, the pressure in the upper air chamber remains relatively higher.

When a 3 – 5 psi/21 – 34 kPa differential occurs, the Series 746-LPA Firelock opens and vents the lower chamber's air into the atmosphere. This action also exhausts the air quickly from the actuator, which causes the sprinkler valve to operate.

The Series 746-LPA Firelock features a unique, built-in check valve that allows rapid pressure equalization of the dry accelerator during system charging, and fast response to variations in system air pressure.

The Series 746-LPA Firelock is equipped with all required parts, and is easily attached to the valve trim without additional modification. The Series 746-LPA Firelock Dry Accelerator is rated to 300psi/2065kPa working pressure, and is tested and UL Listed/FM Approved for use with all sizes of Victaulic Series 768, Series 769 Fire Safety Valves.

## DIMENSIONS



Dimensions – Inches/millimeters			Aprx. Wgt. Ea.
A	B	C	Lbs./kg
4.45 113	3.00 76	3.25 83	5.0 2.2

## JOB/OWNER

System No. \_\_\_\_\_

Location \_\_\_\_\_

## CONTRACTOR

Submitted By \_\_\_\_\_

Date \_\_\_\_\_

## ENGINEER

Spec Sect \_\_\_\_\_ Para \_\_\_\_\_

Approved \_\_\_\_\_

Date \_\_\_\_\_

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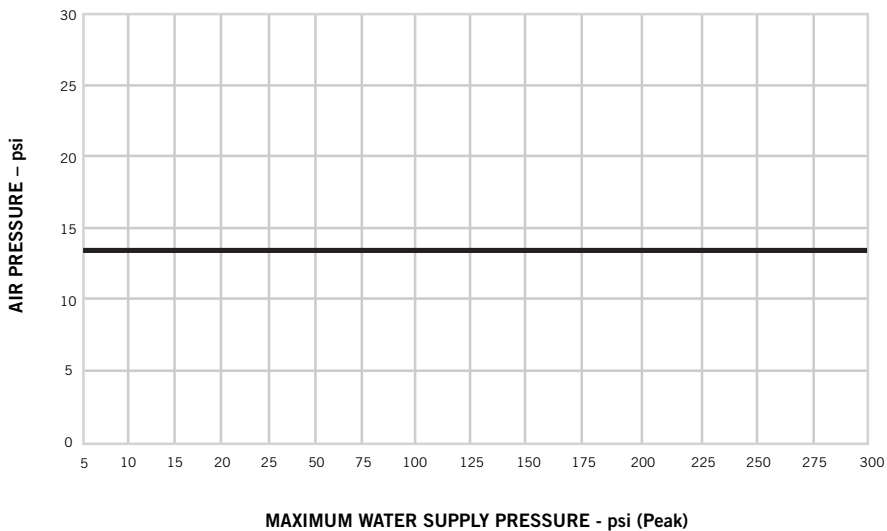
FireLock® Dry Accelerator

SERIES 746-LPA

RECOMMENDED MINIMUM AIR PRESSURES

Series 764-LPA FireLock Dry Accelerators

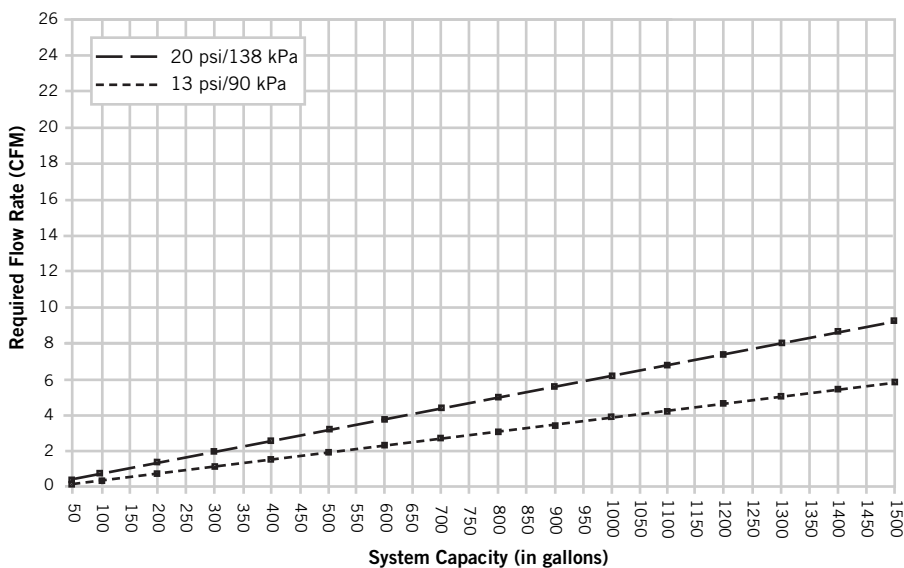
For Systems Containing Series 776 Low-Pressure Actuators, Series 767 Electric/Pneumatic Actuators, or Series 798 Double-Pneumatic Actuators



NOTES:

- 1 When a Series 746-LPA Dry Accelerator is used with a Series 776 Low-Pressure Actuator, Series 767 Electric/Pneumatic Actuator, or a Series 798 Double-Pneumatic Actuator, the air maintenance trim assembly MUST be used with the air regulator.
- 2 The recommended air pressures, shown in the chart above, apply to valves equipped with the Series 776 Low-Pressure Actuator, Series 767 Electric/Pneumatic or Series 798 Double-Pneumatic Actuator at 13 psi/90 kPa. When the system air pressure is higher than 18 psi/124 kPa, a series 746 LPA Dry Accelerator should be installed.
- 3 Systems operating at air pressures higher than 20 psi (138 kPa) should use the Series 746 Dry Accelerator.

COMPRESSOR AND AIR MAINTENANCE TRIM REQUIREMENTS



## FireLock® Dry Accelerator

### SERIES 746-LPA

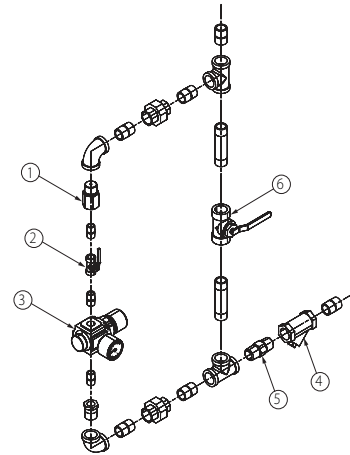
#### SERIES 757 REGULATED AIR MAINTENANCE TRIM ASSEMBLY

(For use with tank mounted air compressors or shop air systems)

When a Series 746-LPA Dry Accelerator is used with a Series 776 Low-Pressure Actuator, Series 767 electric/pneumatic actuator, or a Series 798 Double-Pneumatic Actuator, the air maintenance trim assembly **MUST** be used with the air regulator.

##### Bill of Materials

- 1 1/8" 3.2 mm Restrictor
- 2 Slow Fill Ball Valve (Normally Open)
- 3 Air Regulator
- 4 Strainer (100 Mesh)
- 5 Spring-Loaded, Soft-Seated Ball Check Valve
- 6 Fast Fill Ball Valve (Normally Closed)



1 In the event that a compressor becomes inoperative, a properly sized tank-mounted compressor provides the greatest protection for systems that contain a Series 746-LPA FireLock Dry Accelerator. In this situation, air can be supplied continuously to the sprinkler system for an extended time period.

2 If multiple valves are installed with a common air supply, isolate the system by using a spring-loaded, soft-seat check valve to ensure air integrity for each system.

3 Victaulic recommends using no more than two dry valves per air maintenance trim assembly.

**NOTE: The Series 757P Air Maintenance Trim Assembly with Pressure Switch MUST NOT BE USED in any system installed with a Series 746-LPA FireLock Dry Accelerator.**

# FireLock® Dry Accelerator

SERIES 746-LPA

## MATERIAL SPECIFICATIONS

**Body:** Bronze per CDA-836 (85-5-5-5)

**Diaphragm:** EPDM

**Seal:** EPDM

**Spring:** Type 316 Stainless Steel

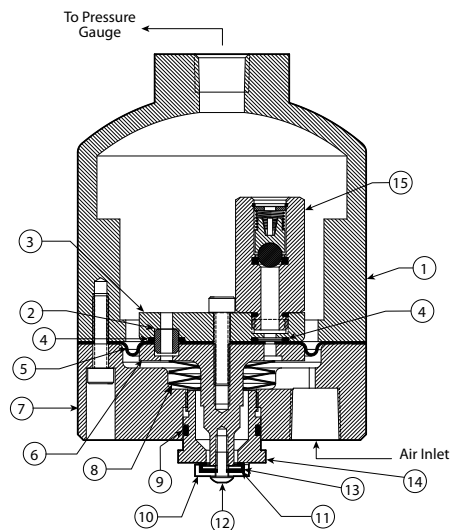
**Restrictor:** Porous Stainless Steel

**Bolts:** Type 316 Stainless Steel

**O-ring:** EPDM

### Bill of Materials

1	Opening/Air Chamber	9	O-Ring
2	Restrictor	10	Seal Support
3	Piston	11	Closing Chamber Seal
4	O-Ring	12	Button-Head Cap Screw
5	Diaphragm	13	Washer
6	Actuator Shaft	14	Adjustable Seat
7	Closing Chamber	15	Check Valve
8	Compression Spring		



## WARRANTY

Refer to the Warranty section of the current Price List or contact Victaulic for details.

## NOTE

This product shall be manufactured by Victaulic or to Victaulic specifications. All products to be installed in accordance with current Victaulic installation/assembly instructions. Victaulic reserves the right to change product specifications, designs and standard equipment without notice and without incurring obligations.



For complete contact information, visit [www.victaulic.com](http://www.victaulic.com)

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# Reliable®

## Models A & B Automatic Pressure Maintenance Devices

cULus Listed, FM Approved

### Product Description

#### Model A Pressure Maintenance Device

The Model A Pressure Maintenance Device (PMD) is designed for use where a source of compressed air (plant air system, tank-mounted compressor with a pressure control, etc.) or nitrogen cylinder (equipped with a high pressure regulating device) is available. The regulator in the Model A PMD reduces higher pressure air or nitrogen to a level required by a dry pipe valve, dry pilot line, or a deluge valve based preaction system. The Model A PMD will maintain a constant pressure in the system regardless of any pressure fluctuations from the compressed air or nitrogen source.

Basic functionality of components (refer to Fig. 1): The strainer prevents foreign matter that may be present in the air supply from traveling to the regulator and the check valve, thereby ensuring their normal operation. The check valve prevents the reverse flow of water resulting from a dry pipe or deluge valve operation, from reaching the regulator. Two 1/4" valves allow for the servicing (if needed) of the strainer and regulator without having to shut down the sprinkler system. The 1/2" ball valve permits the rapid restoration (quick-fill) of the required system air pressure during commissioning, or after service or operation. The 1/2" ball valve must be closed and the 1/4" valves must be open for proper automatic operation.

#### Model B Pressure Maintenance Device

The Model B Pressure Maintenance Device (PMD) is designed for use in conjunction with a tankless air compressor without a pressure control switch to maintain the correct air pressure in a dry pipe valve, dry pilot line, or a deluge valve based preaction system.

Basic functionality of components (refer to Figure 2): A drop in the sprinkler system air pressure causes the contacts of the pressure switch to close, thereby activating the air compressor. When the pre-adjusted level of air pressure is restored, the pressure switch contacts re-open, thereby deactivating the air compressor. The pressure switch is also equipped with an unloader valve that automatically bleeds off the air compressor outlet pressure each time the contacts of the pressure switch open. This protects the air compressor motor from overloading during startup. Like the Model A PMD, the Model B has a strainer for contamination control and a check valve to prevent reverse water flow. The 1/2" ball valve and 1/4" valves are also identical in configuration and function as with the Model A PMD. Likewise, the 1/2" ball valve must be closed and the 1/4" valves must be open for proper automatic operation.



Model A Pressure Maintenance Device



Model B Pressure Maintenance Device

## Model A Pressure Maintenance Device

**Outlet Pressure Range:** 5 - 75 psi (0.3 – 5.2 bar)

**Maximum Inlet Pressure:** 175 psi (12 bar)

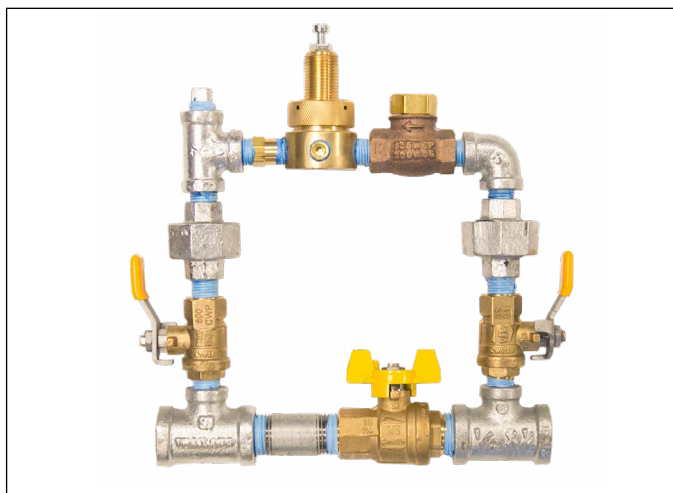
**Inlet/Outlet Threads:** 1/2" NPT (A)

The pressure regulator is factory set to maintain a nominal system air or nitrogen pressure of 23 psi (1.6 bar). In order to change the outlet pressure, loosen the locknut at the top of regulator and turn the adjustment screw clockwise to increase pressure. To decrease the pressure, turn the adjusting screw counter clockwise. The resulting pressure can be determined at the sprinkler system air gauge, or the optional gauge location provided on the device, once the flow or air or nitrogen through the device has ceased.

**Note:** The locknut of the regulator must be tightened after adjusting in order to prevent an accidental change in the pressure setting.

## Installation

Install the pressure maintenance device in the line between the compressed air or nitrogen supply and the dry pipe system, preaction system, or dry pilot line detection system. The supply for the Model A Pressure Maintenance Device can be a tank-mounted compressor (dedicated or plant air), a nitrogen generator with a tank, or bottled nitrogen with a high pressure regulator. Install the Model A as close as possible to the dry pipe valve, deluge valve, or preaction system. Please refer to the appropriate technical bulletin for additional information.

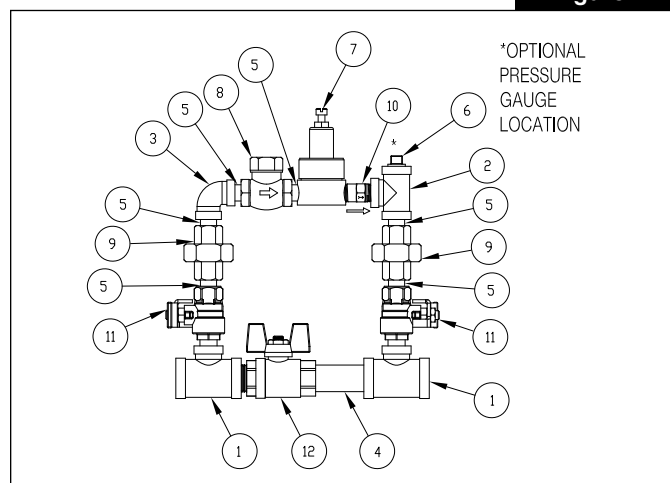


Model A Pressure Maintenance Device

**Note:** It is imperative that the entire air or nitrogen supply system be tested and made leak-free. Leaks in the supply system will result in excessive compressor operation, depletion of bottled nitrogen, and possible unintended release of the fire protection system.

## Model A Pressure Maintenance Device

Figure 1



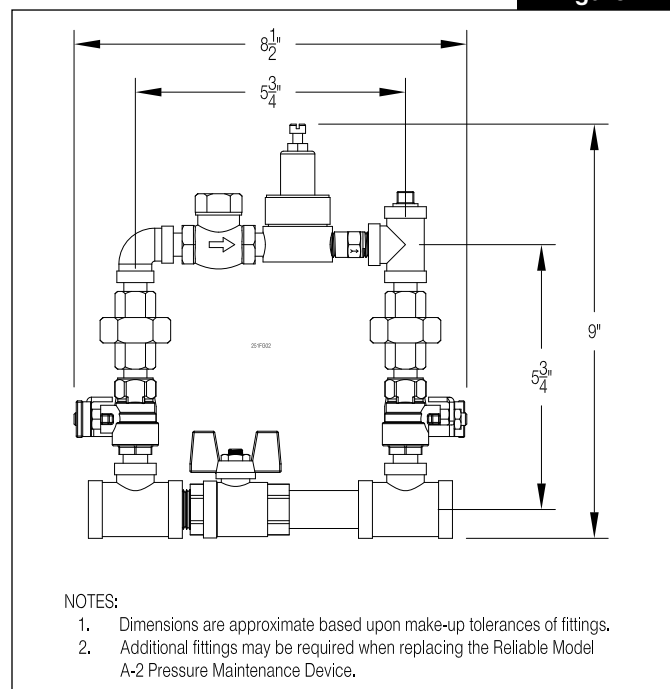
## Model A Pressure Maintenance Device

P/N 6304001123 (23 psi), (All steel pipe fittings are galvanized)

Item No.	Part No.	Description	Qty.
1	96606607	TEE, 1/2" X 1/2" X 1/4"	2
2	96606608	TEE, 1/4" X 1/4" X 1/4"	1
3	98174404	ELL, 1/4"	1
4	98543210	NIPPLE, 1/2" X 2-1/2"	1
5	98543227	NIPPLE, 1/4" X CLO	6
6	98614403	SQ. HEAD PLUG, 1/4"	1
7	98681630	REGULATOR, 1/4", 5 - 75 PSI	1
8	98727607	STRAINER, 1/4"	1
9	98815201	G.J. UNION, 1/4"	2
10	98840147	CHECK VALVE, 1/4" INLINE POPPET	1
11	98840237	BALL VALVE, 1/4" NPTM X NPTF	2
12	9884011E	BALL VALVE, 1/2" NPTM X NPTF	1

## Model A Dimensions

Figure 2



## Model B Pressure Maintenance Device

**Pressure Switch Adjustment Range:** 14 – 60 psi (1.0 – 4.1 bar)

**Maximum Inlet Pressure:** 175 psi (12 bar)

**Inlet/Outlet Threads:** 1/2" NPT (B)

**WARNING: Disconnect power to the Model B Pressure Maintenance Device prior to opening the pressure switch cover.**

The pressure switch is factory set (+/- 2 psi) to start the compressor at 29 psi (2.0 bar) and stop the compressor at 35 psi (2.4 bar). In order to change the setting, remove the pressure switch cover and follow the directions contained within the switch. Verify the start and stop pressures at the sprinkler system air gauge, or at the optional gauge location provided on the device.

**Note:** Adjustment of the differential between the start and stop pressures of the compressor is not recommended.

### Electrical Rating:

Single Phase: 120 Volts AC; 2 hp  
240 Volts AC; 3 hp  
600 Volts AC; 5 hp

Three Phase: 240 Volts AC; 5 hp  
600 Volts AC; 5 hp  
115-230 Volts DC; 3 hp

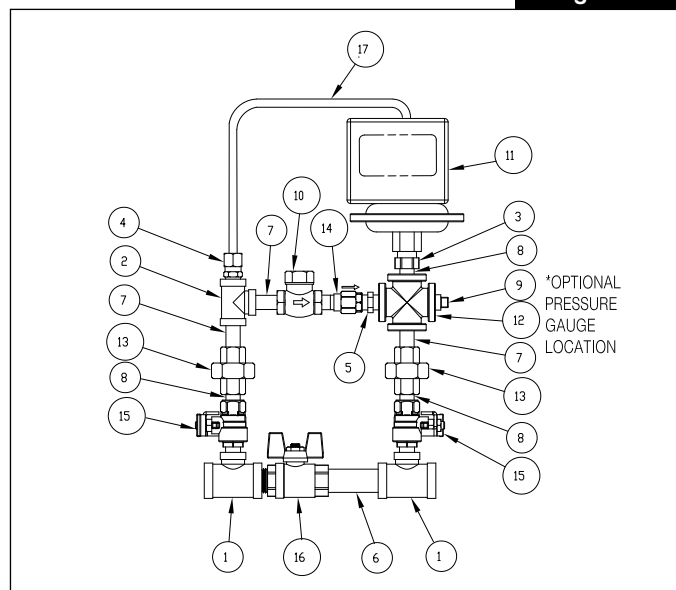
## Installation

Install the pressure maintenance device in the line between the air compressor and the dry pipe system, preaction system, or dry pilot line detection system. The supply for the Model B Pressure Maintenance Device is a tank-less compressor without a pressure switch. Install the Model B as close as possible to the dry pipe valve, deluge valve, or preaction system. Please refer to the appropriate technical bulletin for additional information.

**Note:** It is imperative that the entire air or nitrogen supply system be tested and made leak-free. Leaks in the supply system will result in excessive compressor operation, depletion of bottled nitrogen, and possible unintended release of the fire protection system.

### Model B Pressure Maintenance Device

Figure 3



Model B Pressure Maintenance Device

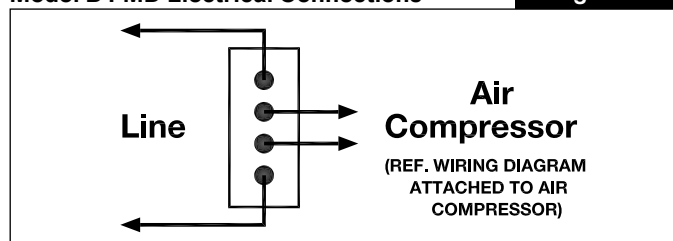
### Model B Pressure Maintenance Device Wiring:

Remove the pressure switch cover and connect the wiring in accordance with the National Electric Code or other appropriate standards. The connections should be as shown in Figure 4 for single phase wiring of thermally protected compressor motors.

For 3-phase wiring, a listed and/or approved, properly sized magnetic motor starter with appropriate NEMA enclosure must be provided. The wiring of the pressure switch, motor starter, and air compressor must be in accordance with the National Electrical Code, or other appropriate standards.

### Model B PMD Electrical Connections

Figure 4



### Model B Pressure Maintenance Device

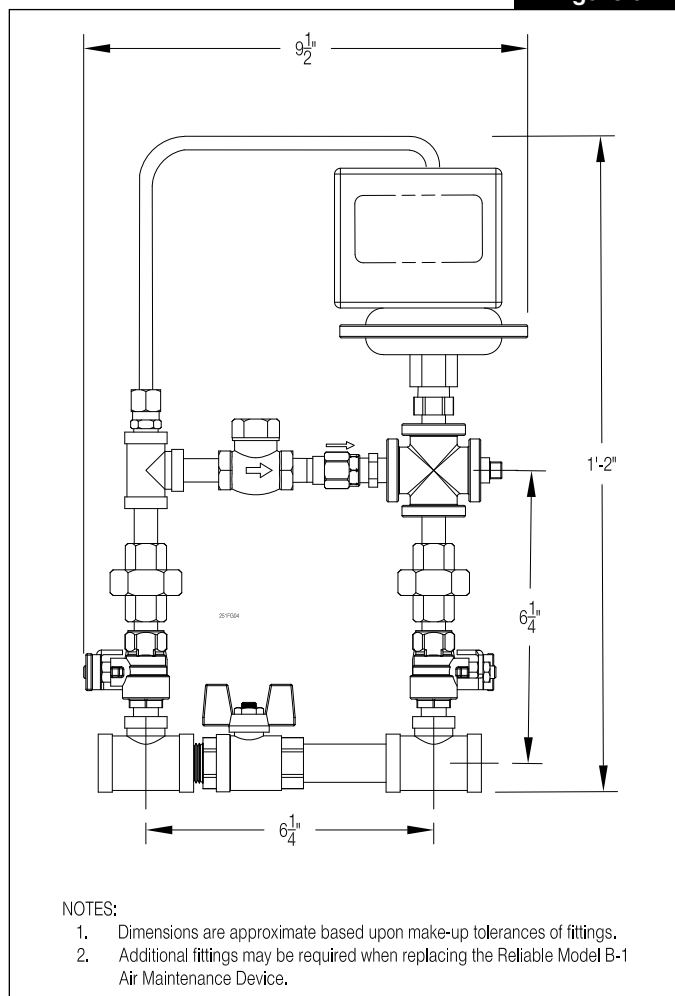
P/N 6304012100 (All steel pipe fittings are galvanized)

Item No.	Part No.	Description	Qty.
1	96606607	TEE, 1/2" X 1/2" X 1/4"	2
2	96606608	TEE, 1/4" X 1/4" X 1/4"	1
3	98048034	BUSHING, 3/8" X 1/4"	1
4	98085630	CONNECTOR, 1/4" TUBING X 1/4" NPT	1
5	98523100	RESTRICTION ORIFICE	1
6	98543230	NIPPLE, 1/2" X 3"	1
7	98543226	NIPPLE, 1/4" X 1-1/2"	3
8	98543227	NIPPLE, 1/4" X CLO	3
9	98614403	SQ. HEAD PLUG, 1/4"	1
10	98727607	STRAINER, 1/4"	1
11	98728801	PRESSURE SWITCH; 14 PSI TO 60 PSI	1
12	98750004	CROSS, 1/4"	1
13	98815201	G.J. UNION, 1/4"	2
14	98840188	CHECK VALVE, 1/4" NPTM x NPTF	1
15	98840237	BALL VALVE, 1/4" NPTM X NPTF	2
16	9884011E	BALL VALVE, 1/2" NPTM X NPTF	1
17	98768000	COPPER TUBING, 1/4"	18"



## Model B Dimensions

Figure 5



7. If the regulator in the Model A Pressure Maintenance Device is constantly leaking at the adjusting screw, the regulator may contain dirt keeping the poppet open and should be cleaned or replaced.
8. Check the inside housing of pressure switch of the Model B Pressure Maintenance Device for dirt or foreign matter and verify that the wiring is fastened securely and is wiring insulation is in good condition.

## Listings and Approvals

- Listed by Underwriters Laboratories, Inc. and Underwriters Laboratories of Canada. (cULus)
- FM Approved

## Guarantee

For Reliable Automatic Sprinkler Co., Inc. guarantee, terms, and conditions, visit [www.reliablesprinkler.com](http://www.reliablesprinkler.com).

## Ordering Information

### Specify:

Model: [A Pressure Maintenance Device]  
[B Pressure Maintenance Device]

## Maintenance

Refer to Figures 1 & 3.

1. Review the latest NFPA 13 and NFPA 25 Standards, any appropriate dry pipe or deluge valve installation bulletins, and the section in this bulletin titled "Installation" to ensure that the pressure maintenance device is installed properly.
2. Make sure that both 1/4" valves are open and that the 1/2" ball valve is closed.
3. Check the gas pressure in the dry pipe, deluge or preaction system at the pressure gauge located on those devices. See the section titled "Adjustment" if any are required.
4. If maintenance is to be performed on the strainer, regulator, or pressure switch of the pressure maintenance device, make sure that both 1/4" valves are closed and that pressure has been relieved from the section through the union. These 1/4" valves must be opened again in order to restore proper automatic operation.
5. The strainer should be cleaned periodically to prevent contamination from blocking air flow. This can be done by removing the strainer's cap and wiping or blowing off any collected debris.
6. Make sure the check valve is installed according to the schematic with the arrow on its hexagonal side pointing in the required direction of air flow.

## FireLock® Devices Air Maintenance Trim Assembly

FM c UL US  
LISTED  
SEE VICTAULIC PUBLICATION 10.01 FOR DETAILS

### SERIES 757

The FireLock Air Maintenance Trim Package is designed to control the system air pressure when using the Series 756 Dry Valves, Series 758 Actuated Valves, or the FireLock NXT 768 Dry and 769 Actuated Devices for dry sprinkler applications.

The Victaulic® Air Maintenance Trim Assembly should be used with a reliable source of continuous (24 hours/day, 7 days/week) air available, such as shop air or a tank mounted air compressor with an attached pressure control switch. The high pressure of the supply air is reduced by the integral regulator in the Air Maintenance Trim Assembly to the recommended air pressure based on the water supply pressure.

**Note:** The regulator must be manually set to the recommended air pressure based upon the guidelines given in the Installation and Maintenance Instructions for pneumatic systems. The air maintenance assembly will maintain the set air pressure as long as the supply air pressure is greater than the system air pressure.



### COMPONENTS

Included in the Air Maintenance Trim Assembly are the following components:

- High quality regulator which maintains the sprinkler piping air pressure
- Strainer – A 100 mesh strainer is used to prevent particles from entering the Air Maintenance System and the sprinkler system.
- Restrictor – A brass Restrictor is used in the maintenance loop in order to assure that air cannot enter the sprinkler system faster than air can be discharged through an open head.
- Spring Loaded In-line Check Valve – Bubble tight ball check used to isolate the valve air maintenance system from air leaks in the air supply system.
- Fast Fill Line – Used to rapidly restore system air pressure following operation or service.
- Recommend maximum of two systems per air maintenance trim.
- Regulator is a pressure reducing type.

### WARNING



### WARNING



- This product must be installed by an experienced, trained installer, in accordance with the instructions provided with each valve. These instructions contain important information.

Failure to follow these instructions may result in serious personal injury, property damage or valve leakage.

If you need additional copies of this product literature or the valve installation instructions or have any questions about the safe installation and use of this device, contact Victaulic Company, P.O. Box 31, Easton, PA 18044-0031 USA, Telephone: 001-610-559-3300.

### JOB/OWNER

System No. \_\_\_\_\_

Location \_\_\_\_\_

### CONTRACTOR

Submitted By \_\_\_\_\_

Date \_\_\_\_\_

### ENGINEER

Spec Sect \_\_\_\_\_ Para \_\_\_\_\_

Approved \_\_\_\_\_

Date \_\_\_\_\_

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## FireLock® Devices Air Maintenance Trim Assembly

SERIES 757

### INSTALLATION & ADJUSTMENT

Install the Air Maintenance Trim Assembly in the orientation shown on the appropriate trim drawing. The Air Maintenance Trim Assembly is intended to be used in systems that have a source of compressed air available such as shop air or a tank mounted air compressor.

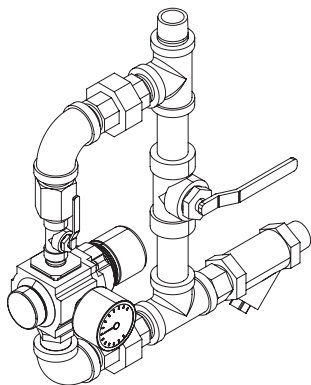
Refer to the Installation, Maintenance and Testing Manuals of the particular valve being installed for detailed setting information and procedures.

#### Adjustment

To increase the set pressure pull the knob of the regulator out and turn the knob clockwise until the desired pressure is read on the regulator gauge. More accurate adjustment of the system air pressure should then be made using the system pressure gauge. After final adjustment lock the regulator by pushing the knob in.

To decrease the set pressure pull the knob of the regulator out and turn the knob counterclockwise until the desired pressure is read on the regulator gauge. More accurate adjustment of the system air pressure should then be made using the system pressure gauge. After final adjustment lock the regulator by pushing the knob in.

### NOTES



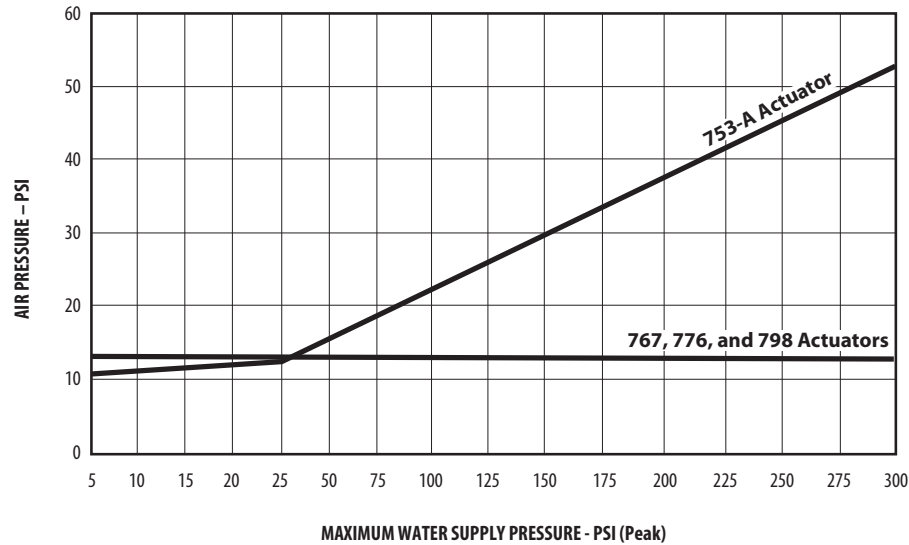
- 1 An air regulator must be used with Series 756/Series 758/Series 768/Series 769 Actuated Valves utilizing an Accelerator.
- 2 When supervisory air is required, such as in an electrically activated preaction system, the pressure should be set as low as the supervisory pressure switch installed will permit.
- 3 When installed with multiple pneumatic actuated valves, (two maximum) the systems must be isolated by using a spring loaded soft seat check valve to assure air integrity to each system.

# FireLock® Devices Air Maintenance Trim Assembly

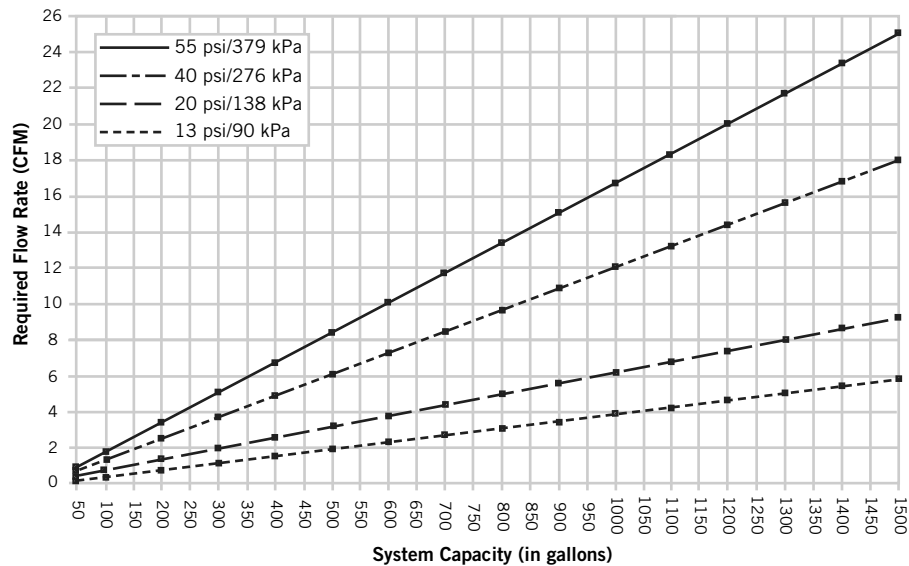
SERIES 757

RECOMMENDED AIR PRESSURE FOR DRY  
AND PNEUMATIC ACTUATED SYSTEMS

RECOMMENDED MINIMUM CUT-IN AIR PRESSURES



COMPRESSOR REQUIREMENTS



## FireLock® Devices Air Maintenance Trim Assembly

### SERIES 757

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#### PROPER AIR SUPPLIES FOR SERIES 756/SERIES 758/SERIES 768/SERIES 769 ACTUATED VALVES:

1. When a riser or base mounted air compressor is being used to supply air to a dry valve or preaction system it is not necessary to use the air maintenance trim assembly with the air regulator. In this circumstance the air line of the compressor is connected to the valve trim at the fitting into which the Air Maintenance Trim is normally installed.

When the valve is used with this setup it is the engineer/system designer's responsibility to size the compressor so that the compressor brings the entire system to the required pressure in 30 minutes. The compressor must not be oversized to provide more air flow as this will slow down or possibly prevent the operation of the valve. It must further be emphasized that the base mounted compressor does not provide any backup air to the system and that continuous service (24 hours per day, 7 days per week) must be maintained in order to prevent the potential of false tripping of the valve due to loss of air pressure.

Additionally, due to the large on/off differential available on pressure switches that control base mounted compressors, the compressor pressure switch must be adjusted so that the "ON" contact of the pressure switch is set a minimum of 5 psi higher than the set point of the regulator.

2. When shop air or a tank mounted air compressor is being used, the Air Maintenance Trim Assembly (AMTA) must be used. The AMTA is designed to provide the proper air regulation to the sprinkler system which will assure the proper operation of the Fire Safety Valve.

In the event of a compressor becoming inoperative the tank mounted air compressor provides the greatest protection. With a properly sized tank, air can be continuously supplied to the sprinkler system for an extended period of time even with a loss of compressor.

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#### WARRANTY

Refer to the Warranty section of the current Price List or contact Victaulic for details.

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#### NOTE

This product shall be manufactured by Victaulic or to Victaulic specifications. All products to be installed in accordance with current Victaulic installation/assembly instructions. Victaulic reserves the right to change product specifications, designs and standard equipment without notice and without incurring obligations.



WCAS-7MYM68

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For complete contact information, visit [www.victaulic.com](http://www.victaulic.com)

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# OILLESS PISTON AIR COMPRESSORS FOR DRY SPRINKLER SYSTEMS

*we move the air that you depend on*



# **GAST<sup>®</sup>**

## KEY BENEFITS



### COMPACT

Designed to be used in areas of limited space.



### ADAPTABILITY

Easily retrofits to existing systems. Flexibility to work with air maintenance components of your choosing.

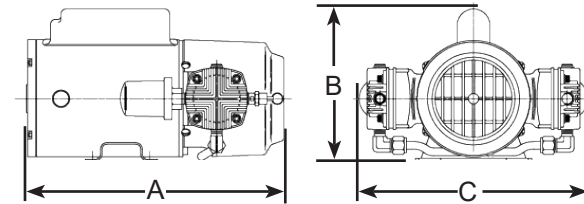


### CAPACITY

Ideal for 200 to 300 gallon systems. Product line covers systems up to 1,000 gallons.

# OILLESS AIR COMPRESSOR

Air compressor intended for use with air maintenance devices that include a pressure control switch to maintain correct air pressure in a dry sprinkler system.



3LBA-10-M200AX  
model shown

Twin Cylinder Model

## 50 PSI Oilless Piston Air Compressors

Max. Gallons in System to Pump to 40 PSI in 30 min. In support of NFPA Standard 13	Model Number	Free Air Flow at 40 PSI (CFM)	Power Rating (HP)	Operating Voltage Frequency (HZ)	Dimensions (Inches)			Pipe Size (In. NPT)	Shipping Weight (lbs)
					A	B	C		
90	1LAA-10-M100X	1.00	1/6	115-60-1	11.53	8.53	5.62	1/4	23
150	2LAF-10-M200X	1.6	1/4	115-60-1	12.49	8.61	5.62	1/4	25
180	3LBA-10-M300AX	2.0	1/3	115-60-1	12.45	7.33	11.07	1/4	24
300	4LCB-10-M450X	3.1	1/2	115/230-60-1	13.28	8.94	12.11	1/4	33
400	5LCA-10-M550NGX	4.7	3/4	115-60-1	15.18	8.57	12.73	1/4	39
600	6LCF-10-M616NEX	5.9	1	115/230-60-1	15.68	8.17	12.39	1/4	60
800	7LDE-10-M853	7.9	2	230/460-60-3; 240/440-50-3	21.64	8.4	12.04	3/8	66
1000	8LDF-10-M850X	10.5	2	110/220; 115/230-1	21.64	8.85	12.23	3/8	80

All Oilless Air Compressors listed above come with inlet filter and safety valve. The maximum pressure rating is 50 psi.

## 100 PSI Oilless Piston Air Compressors

Max. Gallons in System to Pump to 40 PSI in 30 min. In support of NFPA Standard 13	Model Number	Free Air Flow at 40 PSI (CFM)	Power Rating (HP)	Operating Voltage Frequency (HZ)	Dimensions (Inches)			Pipe Size (In. NPT)	Shipping Weight (lbs)
					A	B	C		
80	1HAB-10-M100X	0.75	1/6	115-60-1	11.96	8.78	18	1/4	23
120	2HAH-10-M200X	1.2	1/4	115/230-60-1	13.39	8.69	27	1/4	25
160	3HBB-10-M300AX	1.7	1/3	115-60-1	12.45	7.33	10.94	1/4	24
250	4HCC-10-M450X	2.6	1/2	115-60-1	14.86	8.9	12.41	1/4	33
340	5HCD-10-M550NGX	3.6	3/4	115-60-1	15.18	8.57	12.73	1/4	39
390	6HCA-10-M616NEX	4.2	1	115-60-1	15.68	8.42	12.29	1/4	60
660	7HDD-10-M750X	7.0	1 1/2	115-60-1	21	8.4	11.98	3/8	70
825	8HDM-10-M853	9.0	2	115-60-1	21.64	8.4	12.12	3/8	66

All Oilless Air Compressors listed above come with inlet filter and safety valve. The maximum pressure rating is 100 psi.

## System Air Capacity per 1' pipe (Based on actual internal diameter)

Diameter (Inches)	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	3 1/2"	4"	5"	6"	8"
Gallons	.016	.028	.045	.078	.106	.174	.248	.383	.513	.660	1.04	1.50	2.66

All air compressors shown have open motors. Single phase motors have internal thermal protection. Dual voltage motors are shipped pre-wired for the higher voltage. All tank units are wired for 115 volts.



## KEY BENEFITS



**LOW MAINTENANCE**  
No air maintenance device required. Comes with pressure switch and check valve.



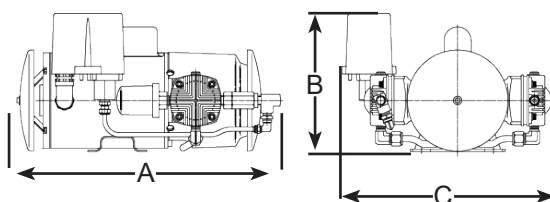
**READY FOR USE**  
Factory pre-set pressure switches available for both low and high pressure systems.



**COMPACT SIZE**  
Designed to be used in areas with limited space.

## RISER MOUNT

Tankless / Automatic air compressors have inlet filters, a safety valve, pressure switch, check valve, tubing, and fittings.



3LBA-32-M300AX  
model shown

Twin Cylinder  
Model - Riser Mount

## Oilless Piston Air Compressors For Low Pressure Air Maintenance Devices - UL 1450 Listed

Max. Gallons in System to Pump to 18 PSI in 30 min. In support of NFPA Standard 13	Model Number	Free Air Flow at 18 PSI (CFM)	Power Rating (HP)	Operating Voltage Frequency (HZ)	Dimensions (Inches)			Pipe Size (In. NPT)	Shipping Weight (lbs)
					A	B	C		
250	1LAA-55S-M100GX	1.25	1/6	115-60-1	13.75	9.54	9.17	1/4	23
480	3LBA-55S-M300AX	3.0	1/3	115-60-1	15.55	8.11	12.35	1/4	31
730	4LCB-55S-M450GX	3.8	1/2	115/230-60-1	16.02	8.62	13.14	1/4	35

Factory setting: cut-in 13 PSI  $\pm$  2 PSI / cut-out 18 PSI  $\pm$  2 PSI

## 50 PSI Oilless Piston Air Compressors For Dry Sprinkler Systems

Max. Gallons in System to Pump to 40 PSI in 30 min. In support of NFPA Standard 13	Model Number	Free Air Flow at 40 PSI (CFM)	Power Rating (HP)	Operating Voltage Frequency (HZ)	Dimensions (Inches)			Pipe Size (In. NPT)	Shipping Weight (lbs)
					A	B	C		
90	1LAA-32-M100X	1.0	1/6	115-60-1	14.07	6.03	8.31	1/4	23
150	2LAF-12-M200X	1.6	1/4	115-60-1	12.49	8.10	8.72	1/4	23
180	3LBA-32-M300AX	2.0	1/3	115-60-1	14.21	8.11	13.64	1/4	24
300	4LCB-21-M450X	3.1	1/2	115/230-60-1	15.10	8.94	13.14	1/4	33
400	5LCA-22-M550NGX	4.7	3/4	115/230-60-1	15.75	8.62	13.26	1/4	39
600	6LCF-13-M616NEX	5.9	1	115/230-60-1	19.04	8.38	12.30	1/4	60
800	7LDE-16-M750X	7.9	1 1/2	115/208-230-60-1	22.15	8.4	13.46	3/8	66
1000	8LDF-16-M850X	10.5	2	115/230-50-60-1	22.95	8.85	12.96	3/8	80

Factory setting: cut-in 40 PSI  $\pm$  2 PSI / cut-out 50 PSI  $\pm$  2 PSI.

## 50 PSI Oilless Piston Air Compressors For Dry Sprinkler Systems - UL 1450 Listed

Max. Gallons in System to Pump to 40 PSI in 30 min. In support of NFPA Standard 13	Model Number	Free Air Flow at 40 PSI (CFM)	Power Rating (HP)	Operating Voltage Frequency (HZ)	Dimensions (Inches)			Pipe Size (In. NPT)	Shipping Weight (lbs)
					A	B	C		
90	1LAA-46S-M100GX	1.0	1/6	115-60-1	15.25	8.11	8.72	1/4	23
150	2LAF-46S-M200EX	1.6	1/4	115-60-1	15.95	8.11	8.72	1/4	25
180	3LBA-46S-M300AX	2.0	1/3	115-60-1	15.55	8.11	12.35	1/4	31
300	4LCB-46S-M450GX	3.1	1/2	115/230-60-1	16.09	8.94	13.32	1/4	40
400	5LCA-46S-M550GX	4.7	3/4	115/230-60-1	16.96	8.94	13.37	1/4	48
600	6LCF-46S-M616NEX	5.9	1	115/230-60-1	18.91	8.79	13.43	1/4	56
800	7LDE-46S-M750X	7.9	1 1/2	115/208-230-60-1	25.25	9.80	12.50	3/8	73
1000	8LDF-46S-M850X	10.5	2	115/230-50-60-1	25.90	9.80	12.60	3/8	90

Factory setting: cut-in 40 PSI  $\pm$  2 PSI / cut-out 50 PSI  $\pm$  2 PSI.

Note: UL Fire Protection Listing UL File EX5324 Evaluated to UL1450 Motor-operated air compressors for use in sprinkler systems



## KEY BENEFITS



**AIR TANK LONGEVITY**  
Extended compressor life. On board tank means the compressor runs less and last longer.



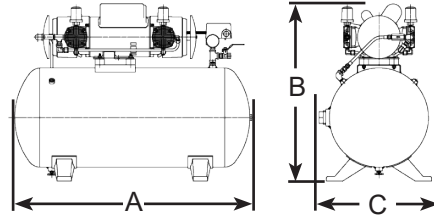
**MULTI-SYSTEM USE**  
Air receiver tank holds backup air pressure. Can supply multiple systems.



**HIGH CAPACITY**  
Ideal for systems 500 to 1,000 gallons.

# TANK SYSTEMS

Tank mounted compressors include gauge, pressure switch, shut off valve, drain valve, check valve, and safety valve. All tank units are wired for 115 volts.



Tank Model



8LDF-46T-M850X model shown

## 50 PSI Tank Systems

Max. Gallons in System to Pump to 40 PSI in 30 min. In support of NFPA Standard 13	Model Number	Free Air Flow at 40 PSI (CFM)	Power Rating (HP)	Operating Voltage Frequency (HZ)	Dimensions (Inches)			Pipe Size (In. NPT)	Shipping Weight (lbs)	Tank Size
					A	B	C			
90	1LAA-11T-M100X	1.0	1/6	115-60-1	19	17	9	1/4	44	2
150	2LAF-11T-M200X	1.6	1/4	115-60-1	26	24	13.5	1/4	78	12
180	3LBA-11T-M300AX	2.0	1/3	115-60-1	26	23	13.5	1/4	80	12
300	4LCB-11T-M450X	3.1	1/2	115/230-60-1	33	27	16	1/4	103	20
400	5LCA-11T-M550NGX	4.7	3/4	115/230-60-1	33	27	16	1/4	109	20
600	6LCF-11T-M616NEX	5.9	1	115/230-60-1	38	28.2	17	3/8	169	30
800	7LDE-11T-M750X	7.9	1 1/2	115/208-230-1	38	28.6	17	3/8	185	30
1000	8LDF-11TA-M850X	10.5	2	115/230-50-60-1	38	29.1	17	3/8	200	30

Factory setting: cut-in 30 PSI  $\pm$  2 PSI / cut-out 50 psi  $\pm$  2 psi

## 100 PSI Tank Systems

Max. Gallons in System to Pump to 40 PSI in 30 min. In support of NFPA Standard 13	Model Number	Free Air Flow at 40 PSI (CFM)	Power Rating (HP)	Operating Voltage Frequency (HZ)	Dimensions (Inches)			Pipe Size (In. NPT)	Shipping Weight (lbs)	Tank Size
					A	B	C			
80	1HAB-11T-M100X	0.75	1/6	115-60-1	17.53	16.66	8.30	1/4	44	2
80	1HAE-11T-M104X	0.75	1/6	220/230-50-1	18.27	16.71	7.64	1/4	44	2
160	3HBB-11T-M300AX	1.7	1/3	115-60-1	26	22.27	13.5	1/4	80	12
340	5HCD-11T-M550NGX	3.6	3/4	115/230-60-1	33	26.01	16	1/4	109	20
660	7HDD-11TA-M750X	7.0	1 1/2	115/208-230-1	38	28.62	18	3/8	185	30

Factory setting: cut-in 80 PSI  $\pm$  2 PSI / cut-out 100 psi  $\pm$  2 psi

Use with an air maintenance device for supervisory pressure settings. Air tank pressure will be maintained at 100 PSI and prolong compressor life.

## 50 PSI Tank Systems - UL 1450 Listed

Max. Gallons in System to Pump to 40 PSI in 30 min. In support of NFPA Standard 13	Model Number	Free Air Flow at 40 PSI (CFM)	Power Rating (HP)	Operating Voltage Frequency (HZ)	Dimensions (Inches)			Pipe Size (In. NPT)	Shipping Weight (lbs)	Tank Size
					A	B	C			
90	1LAA-46T-M100GX	1.0	1/6	115-60-1	19	17	9	1/4	44	2
150	2LAF-46T-M200EX	1.6	1/4	115-60-1	26	24	13.5	1/4	78	12
180	3LBA-46T-M300AX	2.0	1/3	115-60-1	26	23	13.5	1/4	80	12
300	4LCB-46T-M450GX	3.1	1/2	115/230-60-1	33	27	16	1/4	109	20
400	5LCA-46T-M550GX	4.7	3/4	115/230-60-1	33	27	16	1/4	115	20
600	6LCF-46T-M616NEX	5.9	1	115/230-60-1	38	28.2	17	3/8	169	30
800	7LDE-46T-M750X	7.9	1 1/2	115/208-230-60-1	38	28.6	17	3/8	185	30
1000	8LDF-46T-M850X	10.5	2	115/230-50-60-1	38	29.1	17	3/8	200	30

Factory setting: cut-in 30 PSI  $\pm$  2 PSI / cut-out 50 psi  $\pm$  2 psi

Note: UL Fire Protection Listing UL File EX5324 Evaluated to UL1450 Motor-operated air compressors for use in sprinkler systems

# GAST DRY SPRINKLER SYSTEMS

The rugged design of our Dry Sprinkler line of compressors offers oilless operation to ensure the discharge air remains free of contamination from lubricants. They produce minimal noise and offer high flow – making them ideal for dry sprinkler systems. Wear items are easy to replace, which allows for a long service life and maximizes uptime.



## TOUGH & RELIABLE

A trusted partner in fire protection for over 40 years, our Dry Sprinkler products have a long legacy of performing in harsh environments where other market players cannot; even in the dirtiest and extreme ambient conditions.



## WIDE PRODUCT RANGE

From bare compressor to riser mounted to full tank systems, we have you covered. Our large range of compressors have the solutions you need for systems up to 1,000 gallons.



## TESTED

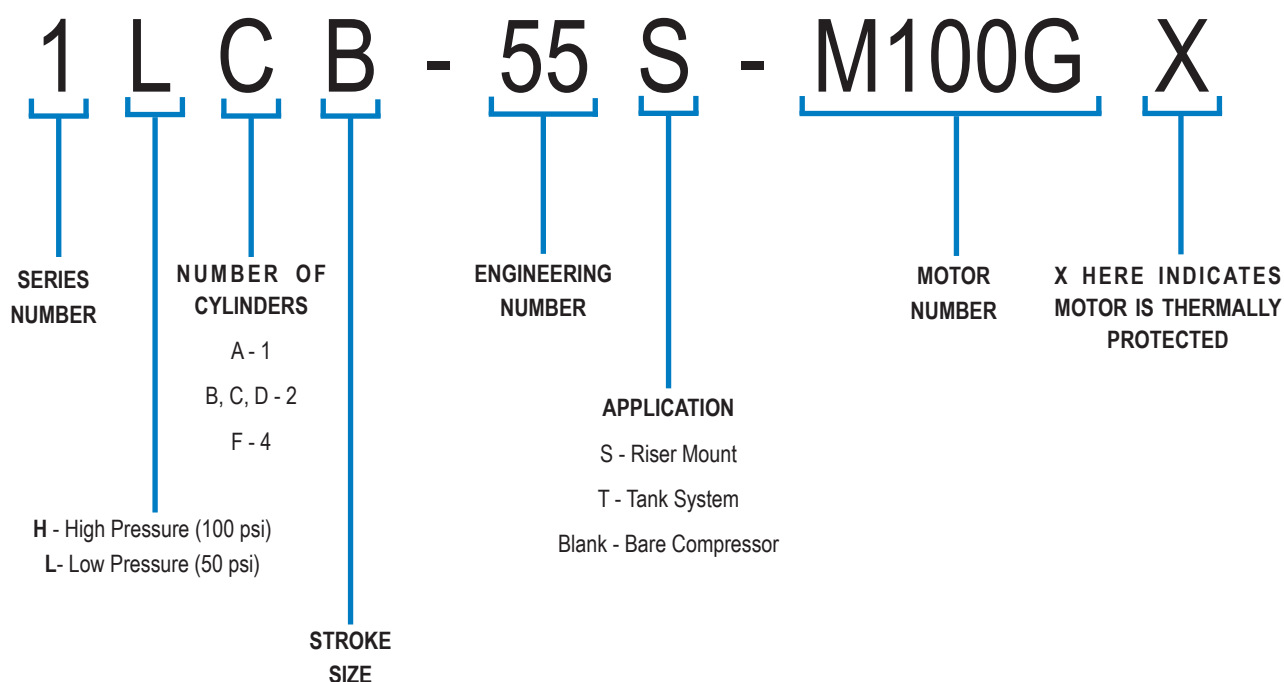
All GAST products are thoroughly tested and proven to meet the exact needs of the industries they perform in to ensure they work time and time again.



## READY TO INSTALL

All of our products come assembled and pre-set at the factory, meaning they are ready to go right out of the box.

## UNDERSTANDING YOUR PART NUMBER



## Parts & Accessories

Part Number	Description	Used On (See charts for full model number)		
		Riser Mount	Tank Systems	
AJ550	Check Valve 1/4" NPT female	1LAA 2LAF 3LBA 4LCB 5LCA 6LCF	1HAB 1HAE 1LAA 2LAF 3HBB 3LBA 4LCB	5HCD 5LCA 6LCF 7HDD 7LDE 8LDF
AJ550A	Check Valve 3/8" NPT female	7LDE 8LDF	6LCF 7LDE 8LDF	
AF631	Shock/isolation mounts 1/4" - 20 thread both ends	1LAA 2LAF 3LBA	1LAA 2LAF	
AF633	Shock/isolation mounts 5/16" - 18 thread both ends	4LCB 5LCA 6LCF 7LDE 8LDF	1HAB 1HAE 1LAA 2LAF 3HBB 3LBA 4LCB	5HCD 5LCA 6LCF 7HDD 7LDE 8LDF
AK620E	Pressure Switch (cut-in 13 PSI, cut-out 18 PSI)	All 55S tankless models		
AK620D	Pressure Switch (cut-in 40 PSI, cut-out 50 PSI)	All 46S tankless models		
AE163F	Pressure Switch (cut-in 30 PSI, cut-out 50 PSI)	All 46T tank models		
AF634	15" hose assembly 1/4" NPT Fittings (For connecting compressor to tank)	All models with 1/4" NPT Fittings		
AH332	16" hose assembly 3/8" NPT Fittings (For connecting compressor to tank)	All models with 3/8" NPT Fittings		
K264	Basic Service Kit	All 1H, 1L, 2H, 2L Models		
K260	Basic Service Kit	All 3H, 3L Models		
K263	Basic Service Kit	All 4H, 4L, 5H, 5L, 6H, 6L Models		
K303	Basic Service Kit	All 7H, 7L, 8H, 8L Models		
AT670	Compressor Mounting Bracket	1L/H - 6L/H Models		
AT670A	Compressor Mounting Bracket	7L/H and 8L/H Models		

### Compressor Mounting Bracket

Compressor mounting brackets for riser mount units sold separately. The mounting kit comes complete with all the hardware and adjustable stainless steel straps for mounting all 55S and 46S tankless models to all shapes and sizes of riser pipes.



AT670, AT670A  
Compressor Mounting Bracket



#### GAST MANUFACTURING, INC.

A Unit of IDEX Corporation  
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Office: 941-416-0252 | Tech: 269-252-9964  
[www.gastmfg.com](http://www.gastmfg.com)

## ANGLE VALVES 300LB. RATED



Fire Department Valves  
FEMALE X MALE

**STANDARD EQUIPMENT:** Female  
NPT inlet and male hose thread  
outlet cast brass valve with wheel  
handle.

Fire Hose Rack Assembly Valves  
DOUBLE FEMALE

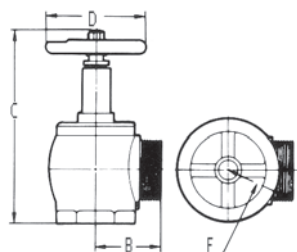
**STANDARD EQUIPMENT:** Female  
NPT inlet and outlet cast brass valve  
with wheel handle



Figure No. 5020-5025

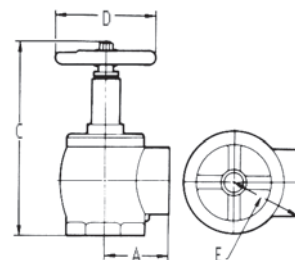
Figure No. 5010-5015

**SPECIFY  
THREAD**



**OPTIONAL FINISHES:**  
PB- Polished Brass  
RC- Rough Chrome Plated  
PC- Polished Chrome Plated  
**U/L LISTED**  
**NY BSA/MEA APPROVED**

Figure No.	5010 5020	5015 5025
Size	1 1/2"	2 1/2"
A	2 11/64	3 3/16
B	2 7/32	3 3/16
C-Closed	6 5/8	9 1/4
C-Open	7 21/22	11
D	3 3/4	5
E	2 7/16	3 19/32
F	2 13/16	3 19/32
U/L Listed	Yes	Yes
FM Approved	Yes	Yes
NYC Approved	Yes	Yes
	2 13/16	3 19/32



## ANGLE VALVES 300LB. RATED



Fire Department Valves  
FEMALE X MALE

**STANDARD EQUIPMENT:** Female  
NPT inlet and male hose thread  
outlet cast brass valve with wheel  
handle.

Fire Hose Rack Assembly Valves  
DOUBLE FEMALE

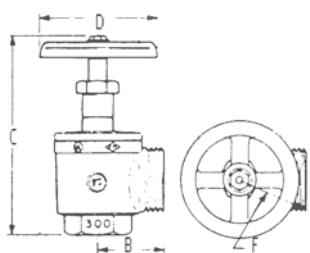
**STANDARD EQUIPMENT:** Female  
NPT inlet and outlet cast brass valve  
with wheel handle



Figure No. 5040-5045

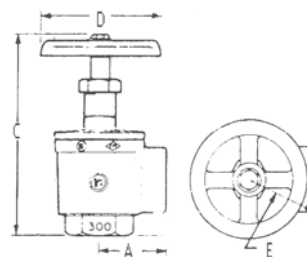
Figure No. 5030-5035

**SPECIFY  
THREAD**



**OPTIONAL FINISHES:**  
PB- Polished Brass  
RC- Rough Chrome Plated  
PC- Polished Chrome Plated  
**U/L LISTED**  
**NY BSA/MEA APPROVED**

Figure No.	5030 5040	5035 5045
Size	1 1/2"	2 1/2"
A	2 9/64	3 5/32
B	2 17/64	3 3/16
C-Closed	6 1/2	8 3/4
C-Open	7 11/16	10 9/16
D	4 1/64	5 1/8
E	2 7/10	3 1/2
F	2 3/8	3 3/8
U/L Listed	Yes	Yes



## PRESSURE RELIEF VALVE

For use on all closed systems to prevent damage in the event of a malfunction due to some foreign object or matter becoming lodged in an automatic regulating or control valve. Featuring a pop-type relief action for maximum performance.



Figure No. 5660

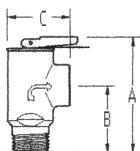


Figure No.	Press. Set (PSI)	Dimensional Data (Inches)				
		Inlet	Outlet	A	B	C
5660	15-175	3/4	3/4	3	3	1
5661	175	1/2	1/2	1 3/4	1	15/16

3/4 Available with 3/4 Male or 3/4 female inlet with 3/4" Female Outlet

## THREE WAY GAUGE VALVE

For use with Sprinkler System gauges.



Figure No. 5662

**Standard Equipment:**  
1/4" valve NPT Bronze three way globe valve with handwheel. Female inlets. 175 PSI.

Figure No. 5662    Size 1/4

## GLOBE VALVES RISING STEM

For use with Sprinkler System gauges.



Figure No. 5663-5670

**Standard Equipment:**  
Bronze with teflon seat. 125 WSP.

Figure No.	Size
5663	1/4
5664	3/8
5665	1/2
5666	3/4
5667	1
5668	1 1/4
5669	1 1/2
5670	2

**OPTIONAL FINISHES:**  
RC - Rough Chrome Plated

## CAPS AND CHAINS

Used to cover and protect male outlet threads on valves and hydrants. Prevents entry of foreign matter.

CAST BRASS WITH CHAIN

Fig. No. With Pin Lugs	Fig. No. With Rocker Lugs	Size
5709	5710	1 1/2
5713	5714	2 1/2
5715	5716	3
5717	5718	4



Figure No. 5709-5713

### OPTIONAL FINISHES:

PB - Polished Brass  
RC - Rough Chrome Plated  
PC - Polished Chrome Plated

**SPECIFY THREAD**

### CAST HARDCOATED ALUMINUM CAP WITH CHAIN

Fig. No. 5720    Size 2 1/2

NY BSA/MEA Approved

### PLASTIC CAP WITH CHAIN

Fig. No. 5721    Size 1 1/2  
5722    Size 2 1/2  
5723    Size 3

## VALVE ESCUTCHEONS



Used to trim pipe into cabinet.

Figure No.	Size	Material
5730	1 1/2	Stamped Steel Cadmium Plated
5735	2 1/2	Stamped Steel Cadmium Plated

Figure No.	Size	Material
5750	1 1/2	Cast Brass
5755	2 1/2	Cast Brass

### OPTIONAL FINISHES:

PB-- Polished brass  
RC-- Rough Chrome Plated  
PC-- Polished Chrome Plated

**SPECIFY FIGURE NO  
SIZE-FINISH**

### DOUBLE MALE



**Figure No. 7201 - Cast Brass**

Sizes: 1 1/2" X 1 1/2" 4" X 4"  
 2 1/2" X 1 1/2" 4 1/2" X 4"  
 2 1/2" X 2" 4 1/2" X 4 1/2"  
 2 1/2" X 2 1/2" 5" X 5"  
 3" X 2 1/2" 6" X 4 1/2"  
 6" X 6"

### HEX ADAPTERS DOUBLE FEMALE



**Figure No. 7215 - Cast Brass**

Sizes: 1 1/2" X 1 1/2"  
 2 1/2" X 2 1/2"

### FEMALE X MALE



**Figure No. 7220 - Cast Brass**

Sizes: 1 1/2" X 1 1/2" 3" X 2 1/2"  
 2 1/2" X 1 1/2" 4" X 4"  
 2 1/2" X 2" 4 1/2" X 4"  
 2 1/2" X 2 1/2" 6" X 4 1/2"  
 6" X 6"

## ADAPTERS PINLUG OR ROCKERLUG

### DOUBLE MALE



**Figure No. 7230 - Cast Brass**

Sizes: 1 1/2" X 1 1/2"  
 2 1/2" X 2 1/2"

### DOUBLE FEMALE SWIVEL



**Figure No. 7235 - Cast Brass**

Sizes: 1 1/2" X 1 1/2"  
 2 1/2" X 2 1/2"

### FEMALE X MALE



**Figure No. 7245**

Sizes: 2 1/2" X 3/4" 2 1/2" X 2"  
 2 1/2" X 1" 3" X 2 1/2"  
 2 1/2" X 1 1/2"

### FEMALE X MALE INCREASER PINLUG OR ROCKERLUG



**Figure No. 7255 - Cast Brass**

Sizes: 1 1/2" X 2 1/2"  
 2" X 2 1/2"  
 2 1/2" X 3"

### MALE X MALE ADAPTER NO LUGS



**Figure No. 7260 - Cast Brass**

Sizes: 2 1/2" X 2 1/2"  
 3" X 2 1/2"

### FEMALE X MALE BUSHING



**Figure No. 7280 - Cast Brass**

Sizes: 6" Female NPT X 4" Male NPT  
 8" Female NPT X 6" Male NPT

### NEW YORK CITY FLOW TEST NIPPLE MALE X MALE



**Figure No. 7285**

Sizes: 3" X 2 1/2"  
 (2" INTERNAL THREAD)

### STORZ X STORZ LIGHTWEIGHT ADAPTER



**Figure No. 7290 - Aluminum**

Sizes: 4" X 6"  
 5" X 6"

### STORZ X THREADED ADAPTER



**Figure No. 7295 - Aluminum**

Sizes: 3" X 2 1/2" 5" X 5"  
 2 1/2" X 2 1/2" 4" X 4" 6" X 6"

OPTIONAL FINISHES PB- POLISHED BRASS RC- ROUGH CHROME PC- POLISHED CHROME

**OTHER SIZES AVAILABLE UPON REQUEST**



## SPECIFICATIONS

22ga. box; 20ga. tubular steel door with 20ga. frame and a continuous steel hinge. All components are powder-coated with an electrostatically-applied, thermally-fused, recoatable white polyester finish. All glass door styles provided with clear tempered safety glass. Wall mounting and size of cabinet as selected by model number.

## REGULARLY FURNISHED

1810 Series - For use with 2-1/2" Fire Department Valve

*\*Note: To accommodate a single, 2-1/2" fire department valve with cap chain. For Valve, cap & chain and reducer, specify 10" deep box*

1830 Series - For use with 2-1/2" Pressure Regulating Valve

*\*Note: To accommodate a single, 2-1/2" 4005-4038 pressure regulating fire department valve with cap and chain. This cabinet may be used with other valves when spanner clearance is a factor, or when a 2-1/2" x 1-1/2" adapter is required.*

## MODEL SELECTION

- ☐ 1810 Recessed
- ☐ 1811 Trimless
- ☐ 1812 Semi-Recessed
- ☐ 1815 Surface
- ☐ 1830 Recessed
- ☐ 1831 Trimless
- ☐ 1832 Semi-Recessed
- ☐ 1835 Surface

## PRODUCT OPTIONS

### DOOR AND FRAME MATERIAL:

- ☐ -AL ALUMINUM: Clear Anodized Finish
- ☐ -SS STAINLESS STEEL: 304 w/ #4 Finish
- ☐ -PB BRASS: Polished Finish
- ☐ -BZ BRONZE: Call for Options

### FINISHES:

- ☐ -ALUMINUM: Duranodic Finish
  - ☐ Light ☐ Medium ☐ Dark
- ☐ -STAINLESS STEEL: Finish as Specified
  - ☐ 304 w/ #6 Dull Satin ☐ 304 w/ #8 Mirror
- ☐ -RED: Powder Coat
- ☐ -CUSTOMER COLORS \_\_\_\_\_ (Specify)



## PRODUCT OPTIONS (cont.)

### CABINET MODIFICATIONS:

- ☐ -DANA TYPE: Frameless Concealed Hinge and Handle Construction (recessed cabinet only)
- ☐ -DP Duplex Cabinet
- ☐ -10 10" Deep Box (1810-1812 models only)

### DOOR STYLES:

- ☐ -A Full Glass, w/ Tempered Safety Glass
- ☐ -B Break-Glass, w/ Lock & Break Rite® Handle
- ☐ -D Duo-Panel w/ Tempered Safety Glass
- ☐ -DV Duo-Vertical Panel w/ Tempered Safety Glass
- ☐ -DVL Duo-Vertical Panel w/ Lock, TSG & Break Rite® Handle
- ☐ -E Tempered Safety Glass (25 sq. in.) w/ Break Rite® Handle
- ☐ -F Flush Solid Metal
- ☐ -FS Flush Solid Metal w/ lock
- ☐ -J Insert Panel
- ☐ (Specify) Optional inserts for glass-style doors

**\*\*NOTE: DOOR STYLES -A, -D, -DV, -F, & -J PROVIDED w/ LEVER HANDLE/CAM LATCH**

**\*\*NOTE: ALL GLASS DOOR STYLES PROVIDED WITH CLEAR TEMPERED SAFETY GLASS IN COMPLIANCE WITH ANSI Z97-1-1984**

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**1810 SERIES**

Date: 03/27/14

**MEMBERSHIP**



FIRE EQUIPMENT  
MANUFACTURERS'  
ASSOCIATION



**ONFSA**  
NATIONAL FIRE SPRINKLER ASSOCIATION, INC.




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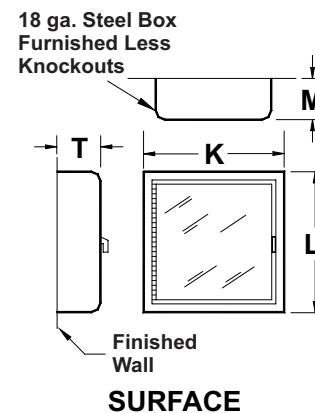
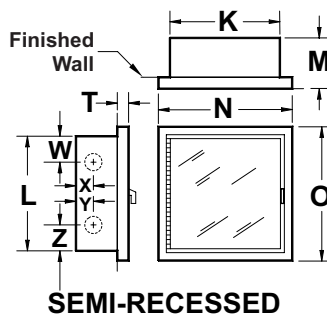
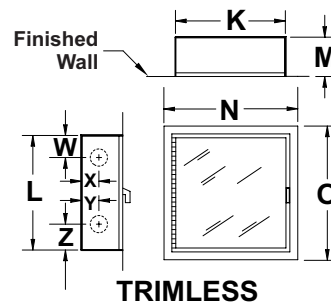
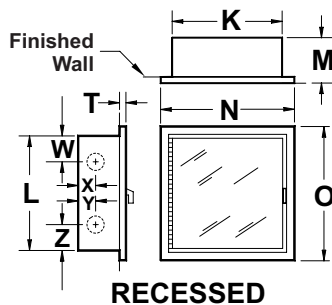
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**MODEL DIMENSIONS**

Model No.	Wall Mounting	Inside Box Dimensions			Overall Frame		Wall Opening Required			Trim	Inlet Location					ADA
		K	L	M	N	O	W I D T H	H E I G H T	D E P T H	T	W	X	Y	Z		
1810	Recessed	18	18	*8	21-3/4	21-3/4	19	19	*8-1/2	5/8	4	4	4	9	Yes	
1811	Trimless	18	18	*8-3/4	21	21	19	19	*9-1/4	-	4	4	4	9	Yes	
1812	Semi-Recessed	18	18	*8	21-1/2	21-1/2	19	19	*6-1/2	2	4	4	4	9	Yes	
1815	Surface	20	20	9-1/4	-	-	-	-	-	-	-	-	-	-	No	
1830	Recessed	24	24	10	27-3/4	27-3/4	25	25	10-1/2	5/8	12	4-3/4	-	-	Yes	
1831	Trimless	24	24	10-3/4	27	27	25	25	11-1/4	-	12	4-3/4	-	-	Yes	
1832	Semi-Recessed	24	24	10	27-3/4	27-3/4	25	25	8-1/2	2	12	4-3/4	-	-	Yes	
1835	Surface	26	26	11-1/4	-	-	-	-	-	-	-	-	-	-	No	
ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED																

ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED

NOTE: \* Add 2" for (-10 Option)



Call Potter Roemer - Fire Pro for current listings and approvals. Dimensions are subject to manufacturer's tolerance and may change without notice. Potter Roemer - Fire Pro assumes no responsibility for use of void or superseded data. © Copyright Potter Roemer - Fire Pro, Member of Morris Group International™ Please visit [potterroemer.com](http://potterroemer.com) for most current specifications.

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Date: 03/27/14

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## Storz Connections

### Function

- Used as auxiliary connections through which the fire department can pump water to supplement existing water supplies

### Features/Components

#### Straight and 30° Angle Pattern Adapters

- Locking Storz Inlet x Female NPT outlet, forged aluminum with powder coat finish

#### Optional Components:

- Identification plate - refer to Models 6454/6456 (page 64)
- Storz caps - refer below

#### Free-Standing Types

- Straight pattern Storz adapter with Storz cap, forged aluminum with powder coat finish and galvanized steel elbow.

#### Components:

- Brass identification plate lettered as required ("Auto Spkr", "Standpipe", or "Auto Spkr & Standpipe") and 18" high cover sleeve
- Rough chrome plated\* finish

\*Optional polished chrome plated finish, add suffix **-D** to model no.

Straight Model No.	30° Angle Model No.	Free-Standing	Size
6614	6624	6634	4" NPT x 4" Storz
6615	6625	6635	4" NPT x 5" Storz
6616	6626	6636	4" NPT x 6" Storz
6617	6627	6637	6" NPT x 4" Storz
6618	6628	6638	6" NPT x 5" Storz

### Storz Assemblies

- Adapter 30°, NPT x Storz with cap, aluminum cap lettered "AUTO SPKR". Includes drain with 1/2" ball drip and ball valve.

Model 6624R 4" Storz	Model 6625R 5" Storz	Model 6628R 6" Storz
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### Storz Caps

- Blind cap with securing wire or chain, forged aluminum with powder coat finish.

Model 6644 4" Storz	Model 6645 5" Storz	Model 6646 6" Storz
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## Dry Hydrants

### Function

- Provides a fire water supply in rural settings where pressurized water systems are insufficient or unavailable

### Features/Components

- Assemblies include hose thread adapter and strainer constructed of hard-coated aluminum and schedule 40 PVC 6" 90° elbow
- Caps (optional) are hard-coated aluminum

Assembly Model No.	Size	Assembly Model No.	Size
6664	6" PVC x 4½" male NST	6674	4½" NST
6665	6" PVC x 5" male NST	6675	5" NST
6666	6" PVC x 6" male NST	6676	6" NST

### PVC Suction Strainers

#### Horizontal

Model 6686 6" • Model 6687 8"

#### Straight Pattern



6614-6619

#### 30° Angle Pattern



6624-6629

#### Free-Standing Type



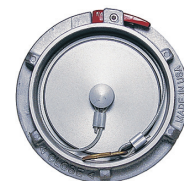
6634-6638

#### Storz Assembly



6624R-6628R

#### Storz Cap



6644-6646

#### Dry Hydrant



6664/6674

#### Strainer



6686/6687



## Model CR Commercial Riser Riser Manifold for Commercial Applications

### Available Sizes/Pressure Ratings:

**1½"(40mm) and 2"(50mm) Threaded - 250 psi (17.2 bar) Working Pressure**

**2"(50mm), 2½"(65mm), & 3"(80mm) Grooved - 300 psi (20.7 bar) Working Pressure**

**4"(100mm), 6"(150mm), & 8"(200mm) Grooved - 300 psi (20.7 bar) Working Pressure**

### Features

1. Cast stainless steel body construction for threaded manifolds.
2. Painted, cast ductile iron body construction for grooved manifolds.
3. Brass and galvanized Trim.
4. Factory assembled and pressure tested.
5. Available with Test and Drain Valves in various orifice sizes. Grooved end Test and Drain valves are available as MTO.
6. Optional Pressure Relief Valve Kit available for all sizes.
7. Same take-out dimensions for the 1½"(40mm) and 2"(50mm) threaded sizes.
8. Same end-to-end dimensions for the 2"(50mm) through 8"(200mm) grooved sizes.
9. Approved for installation in horizontal or vertical positions.
10. Built in drain port allows hydrostatic testing without draining the system.
11. ¼" three-way valve allows for easy testing and replacing of pressure gauge.
12. Dedicated cULus Listed, ULC Listed and FM Approved Waterflow Detector assures optimum sensitivity. See Table 3 for triggering flow rates.

### Product Description

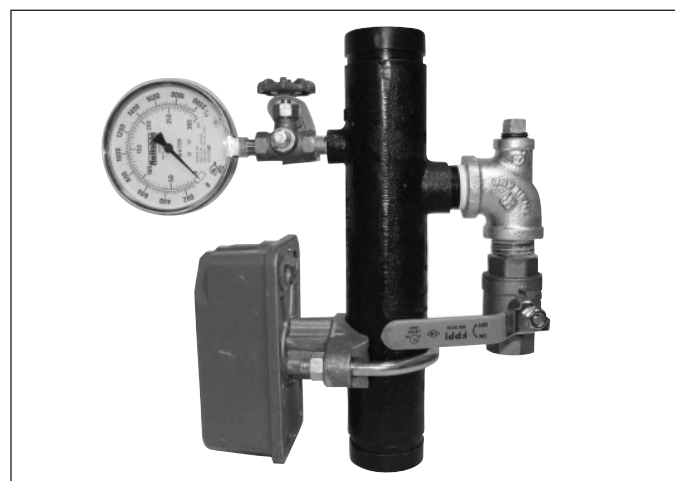
The Model CR Commercial Riser comes factory assembled with the necessary accessories for a cost effective, yet complete riser assembly. These assemblies are UL Listed, ULC Listed and FM Approved as a unit.

Cast-on lettering on the manifold identifies manifold pipe size, flow direction, gauge and drain outlets, and UL Listing and FM Approval markings.

The Model CR Commercial Riser is available in four configurations (see Figures 1 and 2):

- **Basic Trim**

Commercial riser manifold assembly includes a cULus Listed pressure gauge, a ¼" three-way valve, a drain (ball) valve, and a dedicated waterflow detector containing two sets of SPDT (Form C) contacts, having an electrical rating of 10A @ 125/250 VAC/2.5 A @



24 VDC. See Table 3 for triggering flow rates.

- **Basic Trim with Pressure Relief Kit**

Commercial riser manifold assembly includes a cULus Listed pressure gauge, a ¼" three-way valve, a drain (ball) valve, and a dedicated waterflow detector containing two sets of SPDT (Form C) contacts, having an electrical rating of 10A @ 125/250 VAC/2.5 A @ 24 VDC. See Table 3 for triggering flow rates. The non-adj (2) unstable Pressure Relief Kit will maintain system pressures below 175 psi (12.1 bar).

- **Basic Trim with Test and Drain Valves**

Commercial riser manifold assembly includes a cULus Listed pressure gauge, a ¼" three-way valve, a Test and Drain Valve, and a dedicated waterflow detector containing two sets of SPDT (Form C) contacts, having an electrical rating of 10A @ 125/250 VAC/2.5 A @ 24 VDC. See Table 3 for triggering flow rates. The available test orifice size inside the Test and Drain Valve are

**(Choose one):**

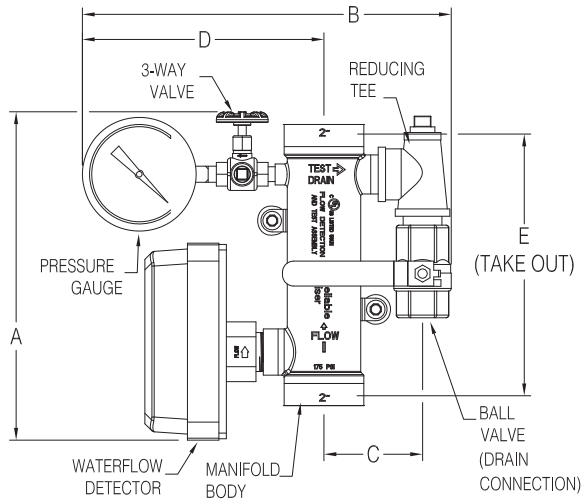
- ⅜" (K-2.8) <sup>(1)</sup>
- 7/16" (K-4.2)
- 1/2" (K-5.6)
- 17/32" (K-8.0)
- 5/8" (K-11.2) <sup>(3)</sup>
- 3/4" (K-14.0) <sup>(3)</sup>
- 15/16" (K-16.8) <sup>(2) (3)</sup>
- 15/64" (K-22.4) <sup>(2) (3)</sup>
- 19/64" (K-25.2) <sup>(2) (3)</sup>

<sup>(1)</sup> Not available for 4", 6" and 8" risers.

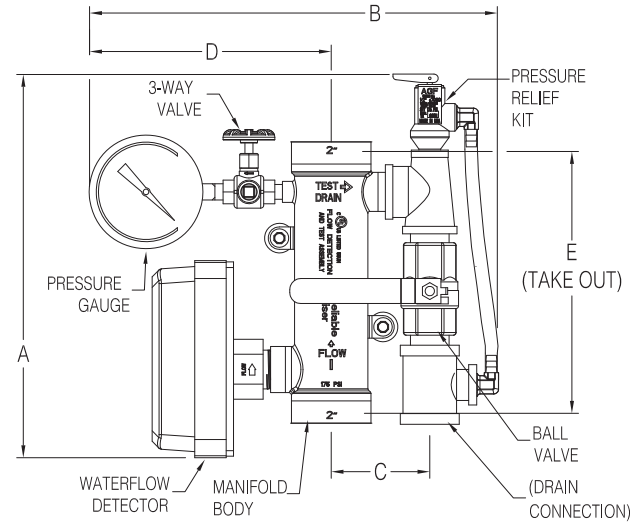
<sup>(2)</sup> Not available for 1½" to 3" risers.

<sup>(3)</sup> Not available for 1½" to 2" threaded & 2" grooved risers.

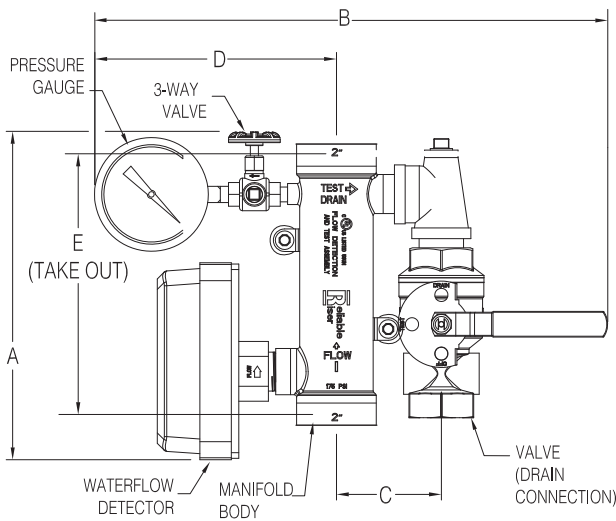
## THREADED ENDS ASSEMBLIES (1-1/2"(40MM) & 2"(50MM) ONLY)



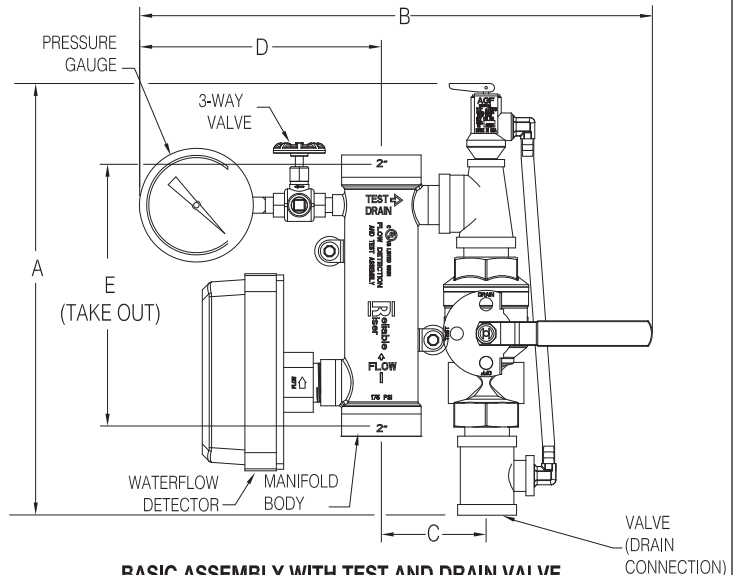
**BASIC ASSEMBLY (2" (50MM) VERSION SHOWN)  
SEE TABLE 1.**



**BASIC ASSEMBLY WITH PRESSURE RELIEF KIT  
(2" (50MM) VERSION SHOWN) SEE TABLE 1.**



**BASIC ASSEMBLY WITH TEST AND DRAIN VALVE  
(2" (50MM) VERSION SHOWN) SEE TABLE 2.  
(TEST AND DRAIN SHOWN IN "OFF" POSITION)**



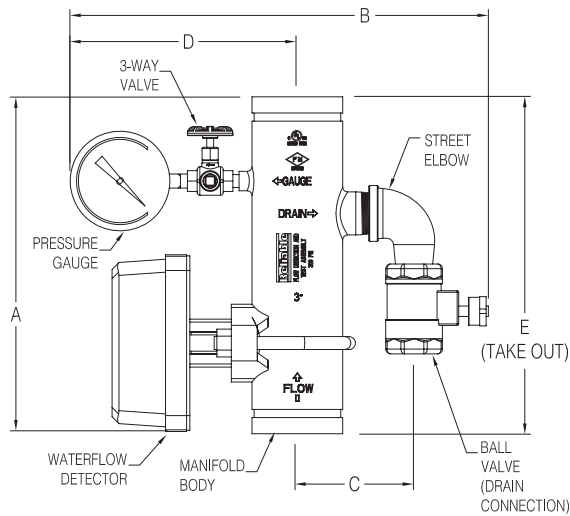
**BASIC ASSEMBLY WITH TEST AND DRAIN VALVE  
& PRESSURE RELIEF KIT  
(2" (50MM) VERSION SHOWN) SEE TABLE 2.  
(TEST AND DRAIN SHOWN IN "OFF" POSITION)**

615FG01D

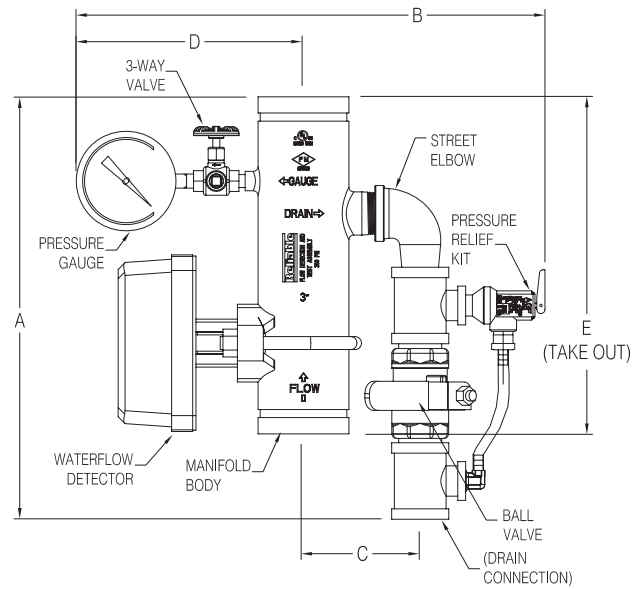
**Fig. 1**

**Note:** 1 1/4" Grooved end Test and Drain valves are available in various orifice size as Made To Order (MTO).

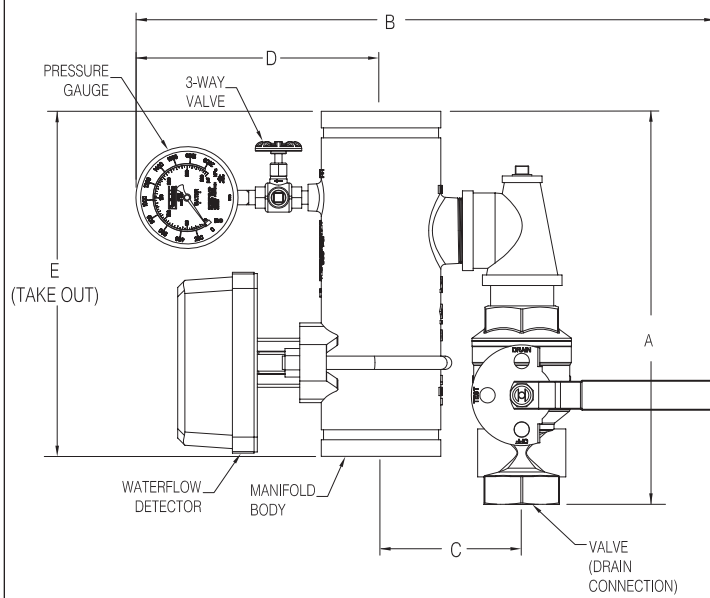
**GROOVED ENDS ASSEMBLIES (2"(50MM), 2-1/2"(65MM), 3"(80MM), 4"(100MM), 6"(150MM), & 8" (200MM))**



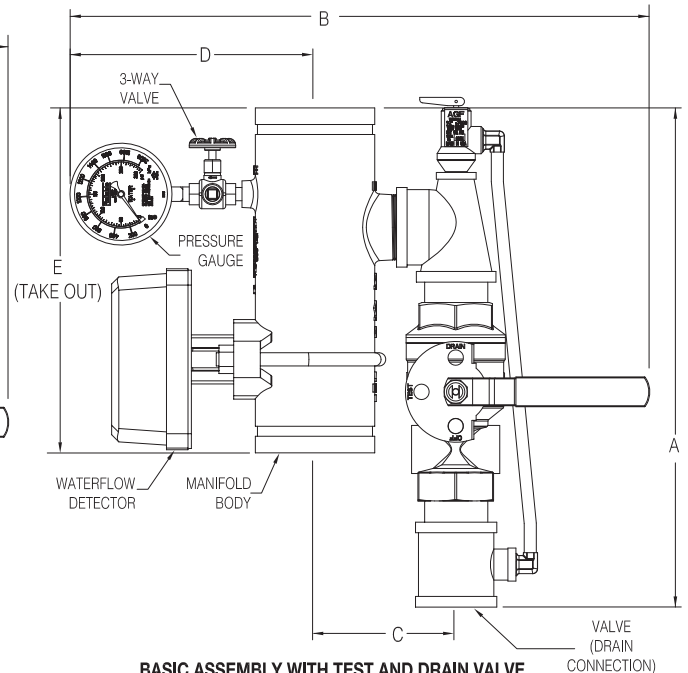
**BASIC ASSEMBLY (3" (80MM) VERSION SHOWN)**  
(SEE TABLE 1.)



**BASIC ASSEMBLY WITH PRESSURE RELIEF KIT**  
(3" (80MM) VERSION SHOWN) (SEE TABLE 1.)



**BASIC ASSEMBLY WITH TEST AND DRAIN VALVE**  
(4" (100MM) VERSION SHOWN) (SEE TABLE 2.)  
(TEST AND DRAIN SHOWN IN "OFF" POSITION)



**BASIC ASSEMBLY WITH TEST AND DRAIN VALVE**  
& PRESSURE RELIEF KIT  
(4" (100MM) VERSION SHOWN) (SEE TABLE 2.)  
(TEST AND DRAIN SHOWN IN "OFF" POSITION)

617FG02B

**Fig. 2**

**Note:** 1 1/4" Grooved end Test and Drain valves are available in various orifice size as Made To Order (MTO).

Table 1		Dimensions & Weights											
		Basic Assembly							Basic Assembly with Pressure Relief Kit				
	Manifold Pipe Size in (mm)	A in (mm)	B in (mm)	C in (mm)	D in (mm)	E in (mm)	Weight lbs (kg)	A in (mm)	B in (mm)	C in (mm)	D in (mm)	E in (mm)	Weight lbs (kg)
Threaded Ends (See Fig. 1)	1½ (40)	11 (279)	11½ (292)	3 (76)	7¾ (197)	8¼ (210)	8.3 (3.8)	13½ (343)	12¾ (324)	3 (76)	7¾ (197)	8¼ (210)	10.4 (4.7)
	2 (50)	11 (279)	12¼ (311)	3¼ (83)	8 (203)	8¼ (210)	9.1 (4.1)	13½ (343)	13½ (343)	3¼ (83)	8 (203)	8¼ (210)	11.2 (5.1)
Grooved Ends (See Fig. 2)	2 (50)	12¾ (324)	16 (406)	5¼ (133)	8 (203)	13 (330)	10.7 (4.9)	16¾ (425)	17¾ (451)	5¼ (133)	8 (203)	13 (330)	13.3 (6.0)
	2½ (65)	12¾ (324)	16½ (419)	5½ (140)	8¼ (210)	13 (330)	12.9 (5.9)	16¾ (425)	18¼ (464)	5½ (140)	8¼ (210)	13 (330)	16.7 (7.6)
	3 (80)	12¾ (324)	17 (432)	5¾ (146)	8½ (216)	13 (330)	17.6 (8.0)	16¾ (425)	18¾ (476)	5¾ (146)	8½ (216)	13 (330)	18.3 (8.3)
	4 (100)	12½ (318)	19 (483)	6¼ (159)	9 (229)	13 (330)	21.3 (9.7)	16¾ (425)	19½ (495)	7 (168)	9 (229)	13 (330)	26.7 (12)
	6 (150)	12½ (318)	20 (508)	6¼ (159)	10 (254)	13 (330)	26.3 (12)	16¾ (425)	20½ (521)	7 (178)	10 (254)	13 (330)	31.8 (14.4)
	8 (200)	12½ (318)	22 (559)	4¼ (184)	11 (280)	13 (330)	31.0 (14.1)	16¾ (425)	22½ (572)	8 (203)	11 (280)	13 (330)	36.5 (16.6)

Table 2		Dimensions & Weights											
		Basic Assembly with Test and Drain Valve						Basic Assembly with Test and Drain Valve & Pressure Relief Kit					
	Manifold Pipe Size in (mm)	A in (mm)	B in (mm)	C in (mm)	D in (mm)	E in (mm)	Weight lbs (kg)	A in (mm)	B in (mm)	C in (mm)	D in (mm)	E in (mm)	Weight lbs (kg)
Threaded Ends (See Fig. 1)	1½ (40)	11 (279)	16 (406)	3 (76)	7¾ (197)	8¼ (210)	10.0 (4.5)	14¾ (375)	16 (406)	3 (76)	7¾ (197)	8¼ (210)	10.8 (4.9)
	2 (50)	11 (279)	16½ (419)	3¼ (83)	8 (203)	8¼ (210)	10.8 (4.9)	14¾ (375)	16½ (419)	3¼ (83)	8 (203)	8¼ (210)	11.6 (5.3)
Grooved Ends (See Fig. 2)	2 (50)	12¾ (324)	18½ (470)	5¼ (133)	8 (203)	13 (330)	10.7 (4.9)	15¼ (387)	18½ (470)	5¼ (133)	8 (203)	13 (330)	13.3 (6.0)
	2½ (65)	12¾ (324)	19 (475)	5½ (140)	8¼ (210)	13 (330)	12.9 (5.9)	15¼ (387)	19 (475)	5½ (140)	8¼ (210)	13 (330)	16.1 (7.3)
	3 (80)	12¾ (324)	19¾ (502)	5¾ (146)	8½ (216)	13 (330)	17.6 (8.0)	15¼ (387)	19¾ (502)	5¾ (146)	8½ (216)	13 (330)	17.0 (7.7)
	4 (100)	14 (356)	23 (584)	6¾ (172)	9 (229)	13 (330)	25.8 (11.6)	18¼ (464)	23 (584)	6¾ (172)	9 (229)	13 (330)	26 (11.8)
	6 (150)	14 (356)	25½ (648)	8 (203)	10 (254)	13 (330)	30 (13.6)	18¼ (464)	25½ (648)	8 (203)	10 (254)	13 (330)	31 (14.1)
	8 (200)	14¼ (362)	27 (686)	9 (229)	11 (280)	13 (330)	35.3 (16)	18¼ (470)	27 (686)	9 (229)	11 (280)	13 (330)	36.3 (16.5)

- **Basic Trim with Test and Drain Valve & Pressure Relief Kit**  
Commercial riser manifold assembly includes a cULus Listed pressure gauge, a 1/4" three-way valve, a Test and Drain Valve, and a dedicated waterflow detector containing two sets of SPDT (Form C) contacts, having an electrical rating of 10A @ 125/250 VAC/2.5 A @ 24 VDC. See Table 3 for triggering flow rates. The non-adjustable Pressure Relief Kit will maintain system pressures below 175 psi (12.1 bar). The available test orifice size inside the Test and Drain Valve are

**(Choose one):**

- 3/8" (K-2.8)<sup>(1)</sup>
- 7/16" (K-4.2)
- 1/2" (K-5.6)
- 17/32" (K-8.0)
- 5/8" (K-11.2)<sup>(3)</sup>
- 3/4" (K-14.0)<sup>(3)</sup>
- 15/16" (K-16.8)<sup>(2) (3)</sup>
- 15/64" (K-22.4)<sup>(2) (3)</sup>
- 19/64" (K-25.2)<sup>(2) (3)</sup>

<sup>(1)</sup> Not available for 4", 6" and 8" risers.

<sup>(2)</sup> Not available for 1 1/2" to 3" risers.

<sup>(3)</sup> Not available for 1 1/2" to 2" threaded & 2" grooved risers.

## Installation

1. Attach the pressure gauge as shown in Figures 1-4.
2. Install the manifold with the flow arrow pointing towards the SYSTEM side using threaded fittings or grooved pipe couplings.
3. Connect the appropriately sized drain line.
4. Ensure that the drain valve is in the CLOSED position.
5. Place the sprinkler system in service.
6. Installation must comply with NFPA 13, Section 8.16.4.2

## Caution:

Automatic sprinkler systems having non-fire protection connection (permitting continual water flow) require dielectric fittings, according to NFPA 13 sect. 4-6, when dissimilar metal piping materials are joined.

## Note:

Use a non-hardening pipe joint compound, or teflon tape. Follow the manufacturer's instructions when using grooved pipe couplings.

## Listings and Approvals

1. Listed by Underwriters' Laboratories Inc. and ULC Listed.
2. Factory Mutual Approved.
3. NYC MEA 258-93-E

## Engineering Specification

[Model CR Commercial Riser Assembly] shall be [UL Listed][ULC Listed] [Factory Mutual (FM) Approved] for horizontal or vertical installation as a one-piece, fabricated assembled unit. The [Model CR Commercial Riser Assembly] shall consist of a (choose one):

- 1 1/2" (40 mm) cast, non-welded stainless steel body with threaded end connections
- 2" (50 mm) cast, non-welded, stainless steel body with threaded end connections
- 2" (50 mm) cast, non-welded, ductile iron body with grooved end connections
- 2 1/2" (65 mm) cast, non-welded, ductile iron body with grooved end connections
- 3" (80 mm) cast, non-welded, ductile iron body with grooved end connections
- 4" (100 mm) cast, non-welded, ductile iron body with grooved end connections
- 6" (150 mm) cast, non-welded, ductile iron body with grooved end connections
- 8" (200 mm) cast, non-welded, ductile iron body with grooved end connections

having all brass and galvanized trim. The manifold piping shall clearly identify the manifold's pipe size, flow direction, UL Listing/ ULC Listing/ FM Approval, drain, and gauge outlets. A built-in drain port shall be available to permit hydrostatic testing without draining the system. This drain port shall be sized per the following:

- 1"(25mm) for 1 1/2"(40mm) and 2"(50mm) sizes.
- 1 1/4"(32 mm) for 2 1/2"(65mm), and 3"(80mm) sizes.
- 2"(50mm) for 4"(100mm), 6"(150mm) and 8"(200mm) sizes.

Take-out dimensions shall be the same for the 1 1/2" (40mm) and 2" (50mm) threaded sizes. End-to-end dimensions shall be the same for the 2" (50mm) through 3" (80mm) grooved sizes. Assembly shall have a working pressure rating of [250 psi (17.2 bar) (for 1 1/2" (40mm) and 2" (50mm) threaded manifold assemblies)] [300 psi (20.7 bar) (for 2" through 3" grooved manifold assemblies)].

End-to-end dimensions shall be the same for the 4" (100mm) through 8" (200mm) grooved sizes. Assembly shall have a working pressure rating of [300 psi (20.7 bar) (for 4" (100mm) through 8" (200mm) grooved manifold assemblies)].

**Table 3**

Manifold Sizes	Triggering Flow Rate - GPM (LPM)
1 1/2"(40mm), 2"(50mm), 2 1/2"(65mm) & 3"(80mm)	4 (15) to 10 (38)
4" (100mm), 6"(150mm), & 8"(200mm)	4 (15) to 10 (38)



## Ordering Information:

### Model CR Commercial Riser Assembly Part Number Code Key

<b>1.5NT</b> <b>1.5MT</b> <b>2NT</b> <b>2MT</b> <b>2G</b> <b>2.5G</b> <b>3G</b> <b>4G</b> <b>6G</b> <b>8G</b>	<b>B</b> <b>T28 (K-2.8)<sup>(1)</sup></b> <b>T42 (K-4.2)</b> <b>T56 (K-5.6)</b> <b>T80 (K-8.0)</b> <b>T112 (K-11.2)<sup>(3)</sup></b> <b>T140 (K-14.0)<sup>(3)</sup></b> <b>T168 (K-16.8)<sup>(2) (3)</sup></b> <b>T224 (K-22.4)<sup>(2) (3)</sup></b> <b>T252 (K-25.2)<sup>(2) (3)</sup></b>	<b>0</b> <b>1</b> <b>2</b> <b>3</b>
1.5NT = 1½" (40 mm) NPT Threaded Ends Assembly  1.5MT = 1½" (40 mm) Metric Threaded Ends Assembly  2NT = 2" (50 mm) NPT Threaded Ends Assembly  2MT = 2" (50 mm) Metric Threaded Ends Assembly  2G = 2" (50 mm) Grooved Ends Assembly  2.5G = 2½" (65 mm) Grooved Ends Assembly  3G = 3" (80 mm) Grooved Ends Assembly  4G = 4" (100 mm) Grooved Ends Assembly  6G = 6" (150mm) Grooved Ends Assembly  8G = 8" (200 mm) Grooved Ends Assembly	B = Basic Assembly  T28 = W / K-2.8 Test & Drain Valve T42 = W / K-4.2 Test & Drain Valve T56 = W / K-5.6 Test & Drain Valve T80 = W / K-8.0 Test & Drain Valve T112 = W / K-11.2 Test & Drain Valve <sup>(3)</sup> T140 = W / K-14.0 Test & Drain Valve <sup>(3)</sup> T168 = W / K-16.8 Test & Drain Valve <sup>(2) (3)</sup> T224 = W / K-22.4 Test & Drain Valve <sup>(2) (3)</sup> T252 = W / K-25.2 Test & Drain Valve <sup>(2) (3)</sup>  <sup>(1)</sup> Not available for 4", 6" and 8" risers. <sup>(2)</sup> Not available for 1½" to 3" risers. <sup>(3)</sup> Not available for 1½" to 2" threaded & 2" grooved risers.  For Grooved end Test and Drain valves (See note 3)	0 = Assembly without Pressure Relief Kit Water Detector - cULus & FM  1 = Assembly with Pressure Relief Kit Water Detector - cULus & FM  2 = Assembly without Pressure Relief Kit Water Detector - ULC  3 = Assembly with Pressure Relief Kit Water Detector - ULC

#### Example #1: 1.5NT – B – 1

(1½" (40mm) Model CR Commercial Riser Assembly with NPT female inlet and outlet threads, basic trim with installed Pressure Relief Kit).

#### Example #2: 3G – T56 – 0

(3"(80mm) Model CR Commercial Riser Assembly with grooved ends, basic trim with Test and Drain Valve having a 5.6 K factor, without a Pressure Relief Kit)

#### Example #3: 6G – T80 – 0

(6"(150mm) Model CR Commercial Riser Assembly with grooved ends, basic trim with Test and Drain Valve having a 8.0 K factor, without a Pressure Relief Kit)

#### Notes:

1. All Model CR Commercial Riser Assemblies come with a 300 psi (20.7 bar) UL Listed and FM Approved pressure gauge for 175 psi (12.1 bar) applications. If the Model CR Commercial Riser Assembly is to be installed in a 300 psi (20.7 bar) application, please purchase a 600 psi (41.4 bar) (P/N 98248005) pressure gauge. This gauge may or may not be UL Listed and/or FM Approved at the time of purchase.
2. If required, Pressure Relief Kits may also be installed in the field. Please contact Reliable's Customer Service Department for details.
3. 1¼" and 2" Grooved end Test and Drain valves are available in various orifice size K factor as MTO. Please contact Reliable Service Department for details.

The equipment presented in this bulletin is to be installed in accordance with the latest published Standards of the National Fire Protection Association, Factory Mutual Research Corporation, or other similar organizations and also with the provisions of governmental codes or ordinances whenever applicable. Products manufactured and distributed by Reliable have been protecting life and property for almost 100 years.

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#### Reliable Automatic Sprinkler Co., Inc.

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E.G. Printed in U.S.A. 11/16

P/N 9999970349



Residential Riser

cULus Listed  
175psi (12 bar) rated

Features

- Stainless Steel body construction
- Factory assembled and tested
- Vertical or horizontal installation
- Optional mounting bracket

Approvals & Listings

- Listed by Underwriters Laboratories Inc. and Underwriters Laboratories of Canada (cULus)

Product Description

The Reliable Residential Riser is UL Listed wet-pipe sprinkler system riser assembly consisting of a stainless steel body, waterflow switch, pressure gage, and drain. Triggering flow for the waterflow switch is 10 gpm (38 LPM). The Residential Riser is intended for use in NFPA 13D and 13R systems, and is offered in 1", 1 1/2", and 2" sizes. The product is available with a variety of end configurations (see table A below), and a choice of drain trims including a three position (off/test/drain) valve with several orifice choices. Optional pressure relief valve kits are also available. The Residential Riser can be wall mounted using the cast-in lugs or stud mounted using the optional support bracket (See Fig. 2).

Installation

The Reliable Residential Riser should be installed in accordance with NFPA 13, NFPA 13D, or NFPA 13R, as well as the requirements of any authorities having jurisdiction. Failure to follow installation instructions may void the warranty and listing of the valve. Connect the riser manifold to the supply piping and system piping using a non-hardening pipe joint compound or joint sealant tape for threaded connections. Ensure proper direction of flow using the flow arrow cast into the manifold. The one-inch (1") drain should be piped to a location that will avoid damage to property and injury to personnel.



Shown: 2" threaded version with Model TD Test and Drain valve trim, optional Model A Pressure Relief valve kit, and optional locking handle kit (padlock not provided)

Maintenance

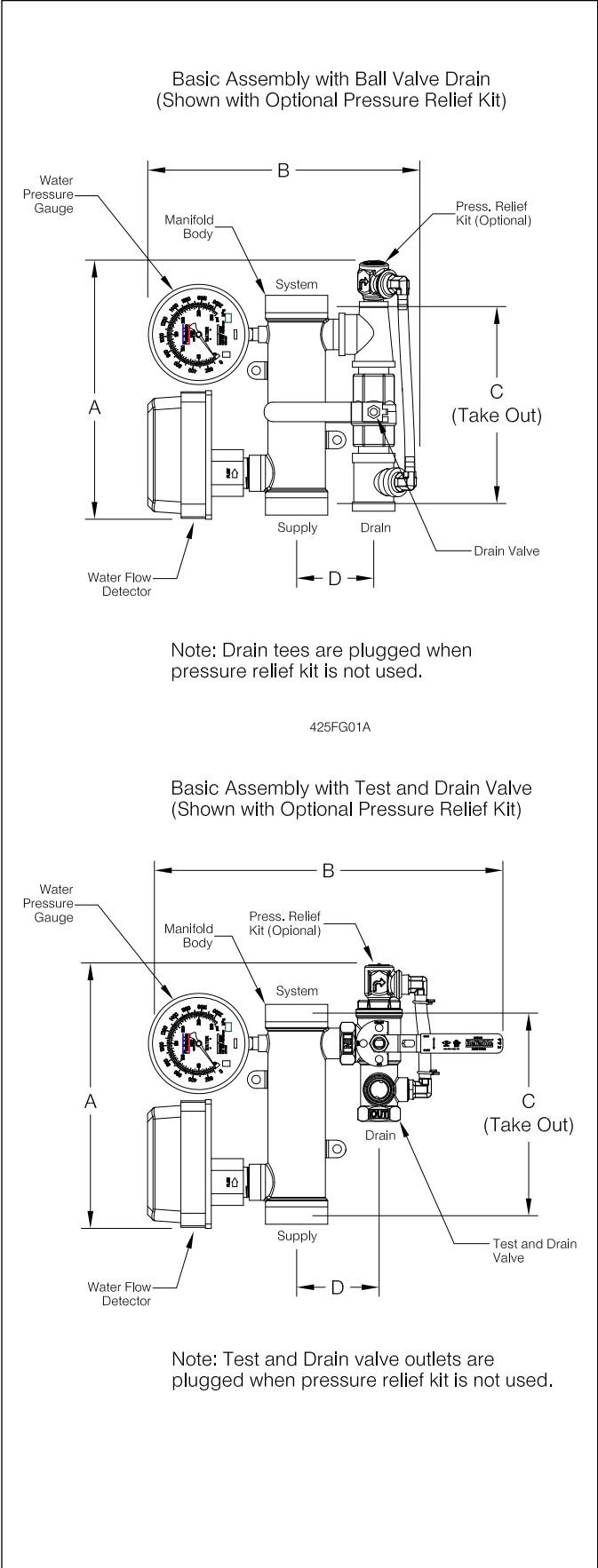
The owner is responsible for maintaining the fire protection system in proper operating condition. Any system maintenance or testing that involves placing a control valve or detection/control system out of service may eliminate the fire protection that is provided by the fire protection system. Notify any required authorities having jurisdiction and implement appropriate precautions prior to proceeding.

When required, the Reliable Residential Riser and associated equipment shall periodically be given a thorough inspection and test. NFPA 25, "Inspection, Testing and Maintenance of Water Based Fire Protection Systems," provides minimum maintenance requirements. Replace any components found to be corroded, damaged, or worn. Increase the frequency of inspections when the valve is exposed to corrosive conditions or chemicals that could impact the valve materials.

Table A

Nominal Size	Available End Connection
1" (25mm)	Male or Female NPT
1-1/2" (40mm)	Female NPT or Grooved Ends
2" (50mm)	Female NPT



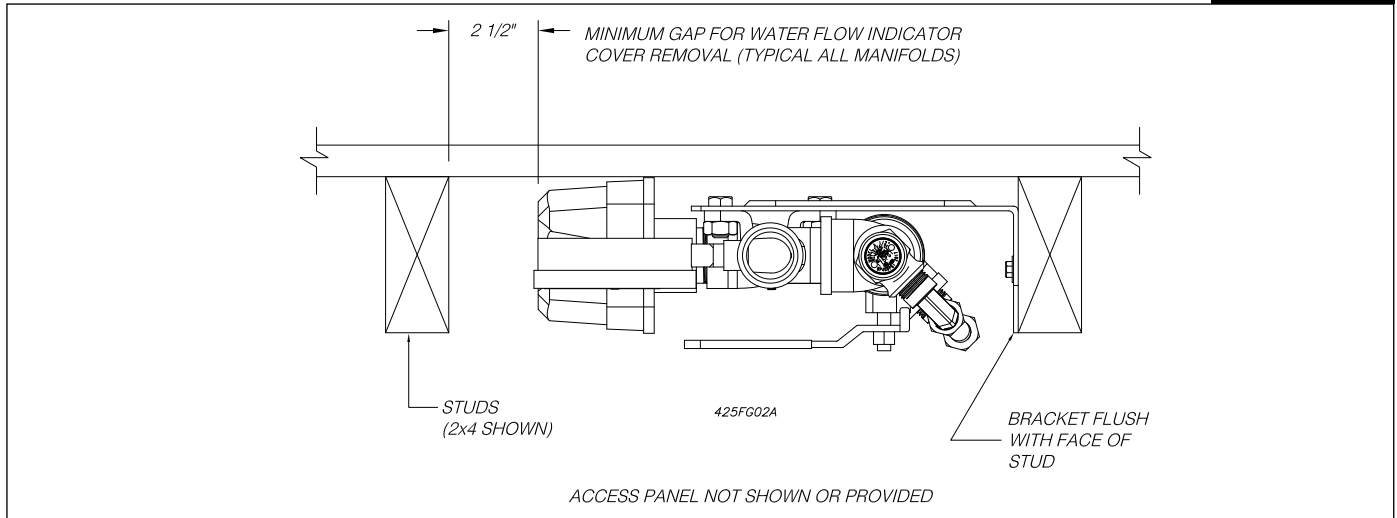


Dimensions and Weight					Table B
Manifold Size	Basic Assembly with Ball Drain Valve				
	A in (mm)	B in (mm)	C in (mm)	D in (mm)	Weight lbs (kg)
Threaded Female NPT 1 (25)	11-1/4 (286)	11 (279)	8-1/4 (210)	2-3/4 (70)	7.3 (3.32)
Threaded Male NPT 1 (25)		11 (279)	8-1/4 (210)	2-3/4 (70)	7.3 (3.32)
Threaded Female NPT 1-1/2 (40)		11-1/2 (292)	8-1/4 (210)	3 (76)	8.3 (3.77)
Threaded Female NPT 2 (50)		11-3/4 (298)	8-1/4 (210)	3-1/4 (83)	8.8 (4.00)
Grooved Ends 1-1/2 (40)		11-1/2 (292)	9-1/2 (241)	3 (76)	8.3 (3.77)

Dimensions and Weight					Table C
Manifold Size	Basic Assembly with Test & Drain Valve				
	A in (mm)	B in (mm)	C in (mm)	D in (mm)	Weight lbs (kg)
Threaded Female NPT 1 (25)	11-1/2 (292)	14-1/2 (368)	8-1/4 (210)	3-1/4 (83)	9.0 (4.09)
Threaded Male NPT 1 (25)		14-1/2 (368)	8-1/4 (210)	3-1/4 (83)	9.0 (4.09)
Threaded Female NPT 1-1/2 (40)		15 (381)	8-1/4 (210)	3-1/2 (89)	9.7 (4.41)
Threaded Female NPT 2 (50)		15-1/2 (394)	8-1/4 (210)	3-3/4 (95)	10.5 (477)
Grooved Ends 1-1/2 (40)		15 (381)	9-1/2 (241)	3-1/2 (89)	9.7 (4.41)

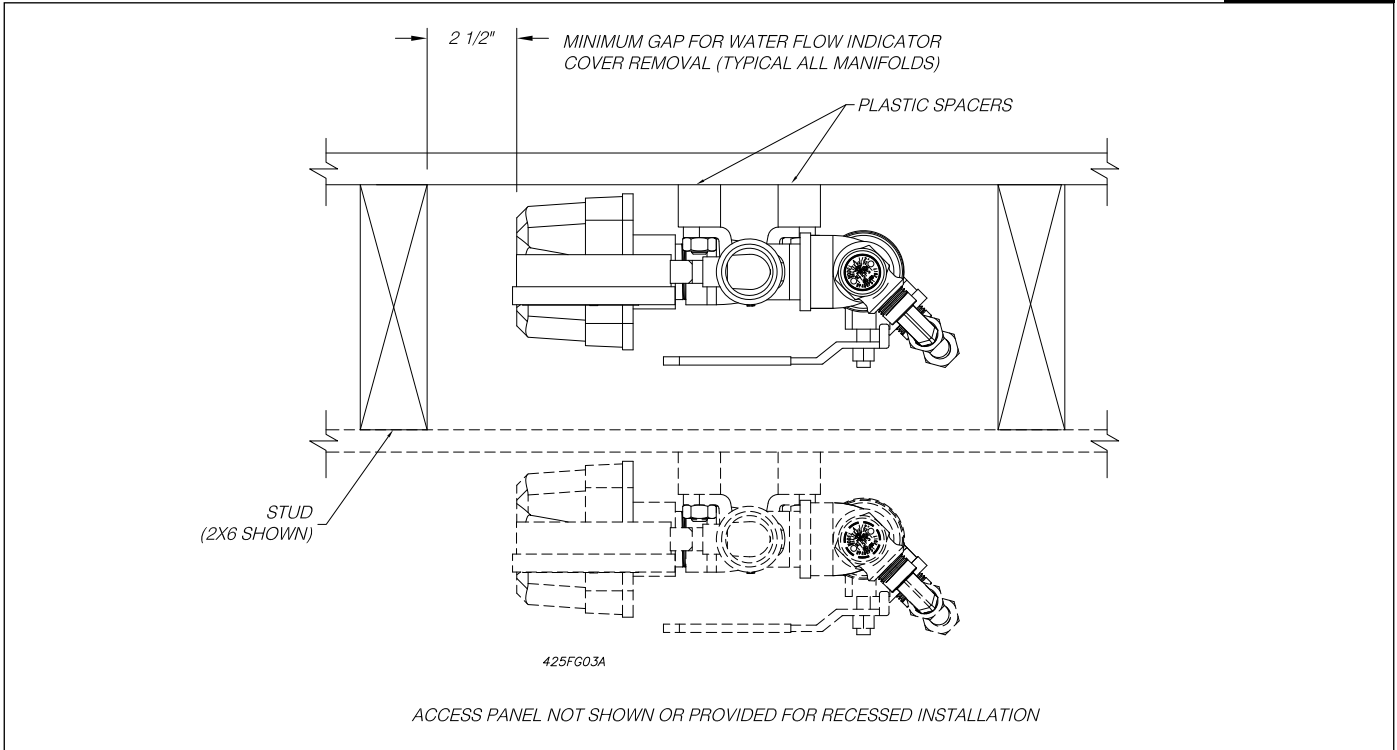
Support Bracket Mount

Figure 2



Recessed or Flush Mounted

Figure 3



Guarantee

For Reliable Automatic Sprinkler, Co., Inc. guarantee, terms, and conditions, visit [www.reliablesprinkler.com](http://www.reliablesprinkler.com)

Ordering Information

Specify:

Reliable Residential Riser

Size: [1"] [1-1/2"] [2"]

End Connections: See Table A

Drain: [Ball Valve] [K2.8 TD] [K4.2 TD] [K5.6 TD]

Relief Valve Kit: [175psi] [185psi]

Optional Support Bracket

Figure 4



Residential Riser Part Number

Figure 5

6A XX 0 R P YY Z

Riser Manifold Size & End Connections <u>XX</u>	Drain Valve <u>YY</u>	Pressure Relief Kit <u>Z</u>
00 = 1" Threaded Female NPT	00 = Ball Valve	0 = None
01 = 1" Threaded Female Metric	01 = RASCO Test & Drain (K2.8)	1 = 175 psi (12.1 bar)
02 = 1" Threaded Male NPT	02 = RASCO Test & Drain (K4.2)	2 = 185 psi (12.8 bar)
03 = 1-1/2" Threaded Female NPT	03 = RASCO Test & Drain (K5.6)	
04 = 1-1/2" Threaded Female Metric		
05 = 1-1/2" Grooved End		
06 = 2" Threaded Female NPT		
07 = 2" Threaded Female Metric		

**Example:** P/N 6A020RP031 = 1" Threaded Male NPT End Connection with RASCO Test & Drain (K5.6), and 175 psi Pressure Relief Kit.

**Note:** The water flow switch for the 1-1/2" and 2" stainless steel manifold uses a non-standard, special paddle. The water flow switch is only available from Reliable. When replacing water flow switch, order part number 96556923.

## Engineering Specification

Job Name \_\_\_\_\_  
 Job Location \_\_\_\_\_  
 Engineer \_\_\_\_\_  
 Approval \_\_\_\_\_

Contractor \_\_\_\_\_  
 Approval \_\_\_\_\_  
 Contractor's P.O. No. \_\_\_\_\_  
 Representative \_\_\_\_\_

# LEAD FREE\*

## Colt™ Series C200, C200N

### Double Check Valve Assemblies

Sizes: 2½" – 10"

The Colt C200 and C200N Double Check Valve Assemblies are used to prevent backflow of pollutants, objectionable but not toxic, from entering the potable water supply system. The Colt C200 and C200N may be installed under continuous pressure service and may be subjected to backpressure. Both assemblies consist of two independently operating check valves, two shutoff valves, and four test cocks, and are designed for use in non-health hazard applications. The Colt C200 and C200N feature Lead Free\* construction to comply with Lead Free\* installation requirements.

### Features

- Extremely compact design
- 70% Lighter than traditional designs
- 304 (Schedule 40) Stainless steel housing & sleeve
- Groove fittings allow integral pipeline adjustment
- Patented tri-link check provides lowest pressure loss
- Unmatched ease of serviceability
- Available with grooved butterfly valve shutoffs
- Available for horizontal, vertical or N pattern installations
- Replaceable check disc rubber
- Includes an integrated supervisory tamper switch on each gate valve of the OSY model

### NOTICE

The information contained herein is not intended to replace the full product installation and safety information available or the experience of a trained product installer. You are required to thoroughly read all installation instructions and product safety information before beginning the installation of this product.

\*The wetted surface of this product contacted by consumable water contains less than 0.25% of lead by weight.



### Specification

The Colt C200, C200N Double Check Valve Assembly shall consist of two independent Tri-Link Check modules within a single housing, sleeve access port, four test cocks and two drip tight shutoff valves. Tri-Link Checks shall be removable and serviceable, without the use of special tools. The housing shall be constructed of 304 (Schedule 40) stainless steel pipe with groove end connections. Tri-Link checks shall have reversible elastomer discs and in operation shall produce drip tight closure against the reverse flow of liquid caused by backpressure or backsiphonage.

The integrated supervisory tamper switch on the OSY model shall have continuity with the valve fully open and activate within two (2) turns from open. The device consists of two SPDT switches and is designed to send a tamper signal when the valve is closed and when the switch is removed from the valve. In the neutral position, the switch indicates the valve is fully open. Closing the valve causes the switch rod to come out of the valve stem groove, activating the switch. Removing the tamper switch also activates the switch.

Lead Free\* Double Check Valve Assembly shall be constructed using Lead Free\* materials. It shall comply with state codes and standards, where applicable, requiring reduced lead content. Assembly shall be an Ames Fire & Waterworks Colt C200, C200N.

Ames Fire & Waterworks product specifications in U.S. customary units and metric are approximate and are provided for reference only. For precise measurements, please contact Ames Fire & Waterworks Technical Service. Ames Fire & Waterworks reserves the right to change or modify product design, construction, specifications, or materials without prior notice and without incurring any obligation to make such changes and modifications on Ames Fire & Waterworks products previously or subsequently sold.



## Configurations

- Horizontal
- Vertical up
- “N” pattern horizontal

## Materials

- Housing & Sleeve: 304 (Schedule 40) stainless steel
- Elastomers: EPDM, silicone, and Buna ‘N’
- Tri-Link Checks: Noryl®, stainless steel
- Check Discs: Reversible silicone or EPDM
- Test Cocks: Lead Free\* bronze body
- Pins & Fasteners: 300 series stainless steel
- Springs: Stainless steel

## Available Models

### Suffix:

- NRS – Non-rising stem resilient seated gate valves
- OSY-TS – UL/FM outside stem and yoke, resilient seated gate valves with integrated tamper switch
- BFG – UL/FM grooved gear operated butterfly valves with tamper switch
- OSY FxG\*\* – Flanged inlet gate connection and grooved outlet gate connection
- OSY GxG\*\* – Grooved inlet gate connection and flanged outlet gate connection
- OSY GxG\*\* – Grooved inlet gate connection and grooved outlet gate connection

\*\* Consult factory for the following:

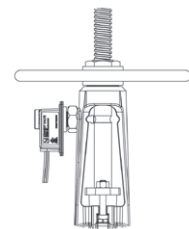
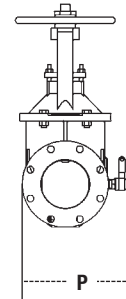
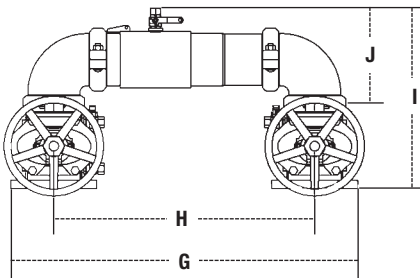
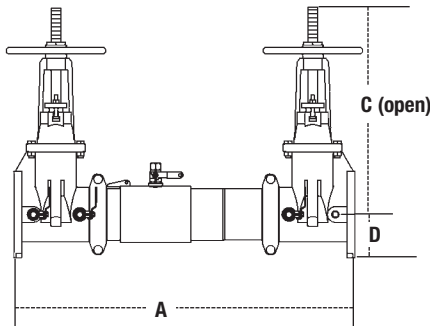
- Grooved NRS gate valves
- Post-indicator plate and operating nut
- Dimensions

## Pressure – Temperature

Temperature Range: 33°F – 140°F (0.5°C – 60°C)

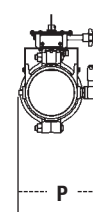
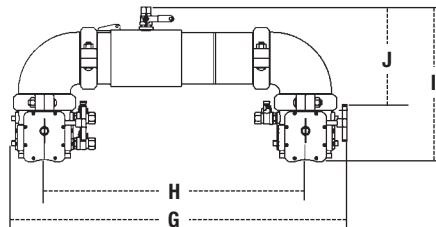
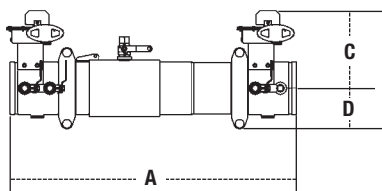
Maximum Working Pressure: 175 psi (12.1 bar)

## Dimensions – Weights



### C200, C200N

SIZE		DIMENSIONS										WEIGHT			
	A	C (OSY)	C (NRS)	D	G	H	I	J	P	C200NRS	C200OSY	C200N NRS	C200N OSY		
<i>in.</i>	<i>in.</i> <i>mm</i>	<i>in.</i> <i>mm</i>	<i>in.</i> <i>mm</i>	<i>in.</i> <i>mm</i>	<i>in.</i> <i>mm</i>	<i>in.</i> <i>mm</i>	<i>in.</i> <i>mm</i>	<i>in.</i> <i>mm</i>	<i>in.</i> <i>mm</i>	<i>in.</i> <i>mm</i>	<i>lb</i> <i>kg</i>	<i>lb</i> <i>kg</i>	<i>lb</i> <i>kg</i>	<i>lb</i> <i>kg</i>	
2½	30¾ 781	16¾ 416	9¾ 238	3½ 89	29⅞ 738	21½ 546	15½ 393	8⅜ 223	9⅞ 234	115 52	130 59	123 56	138 62		
3	31¾ 806	18¾ 479	10¼ 260	3⅞ 94	30¼ 768	22¼ 565	17⅞ 435	9⅞ 233	10½ 267	131 59	150 68	144 65	163 74		
4	33¾ 857	22¾ 578	12¾ 310	4 102	33 838	23½ 597	18½ 470	9⅞ 252	11⅞ 284	161 73	166 75	184 83	189 85		
6	43½ 1105	30¾ 765	16 406	5½ 140	44¾ 1137	33¼ 845	23¾ 589	13⅞ 332	15 381	273 124	300 136	314 142	341 154		
8	49¾ 1264	37¾ 959	19⅞ 506	6⅞ 170	54⅞ 1375	40⅞ 1019	27⅞ 697	15⅞ 399	17¾ 437	438 199	485 220	513 233	560 254		
10	57¾ 1467	45¾ 1162	23⅞ 605	8¾ 208	66 1676	49½ 1257	32½ 826	17¾ 440	20 508	721 327	786 356	891 404	956 433		



### C200BFG, C200NBFG

SIZE			DIMENSIONS										WEIGHT							
	A		C		D		G		H		I		J		P		C200BFG		C200NBFG	
<i>in.</i>	<i>in.</i>	<i>mm</i>	<i>in.</i>	<i>mm</i>	<i>in.</i>	<i>mm</i>	<i>in.</i>	<i>mm</i>	<i>in.</i>	<i>mm</i>	<i>in.</i>	<i>mm</i>	<i>in.</i>	<i>mm</i>	<i>in.</i>	<i>mm</i>	<i>lb</i>	<i>kg</i>	<i>lb</i>	<i>kg</i>
2½	27¾	705	8	203	3½	89	29⅞	759	21½	546	14⅞	379	8⅜	223	9	229	56	25	64	29
3	28¾	718	8⅞	211	3⅞	94	30⅞	779	22¼	565	15⅞	392	9⅞	233	9½	241	54	24	67	30
4	29	737	8⅞	227	3⅞	94	31⅞	811	23½	597	16¼	412	9⅞	252	10	254	61	28	84	38
6	36½	927	10	254	5	127	43⅞	1097	33¼	845	19⅞	500	13⅞	332	10½	267	117	53	157	71
8	42¾	1086	12¼	311	6½	165	51⅞	1297	40⅞	1019	23¾	592	15⅞	399	14¾	361	261	118	337	153

## Approvals

- Approved by the Foundation for Cross-Connection Control and Hydraulic Research at The University of Southern California (FCCCHR-USC)
- AWWA C510-97

For additional approval information, contact the factory or check Ames Fire & Waterworks at watts.com.

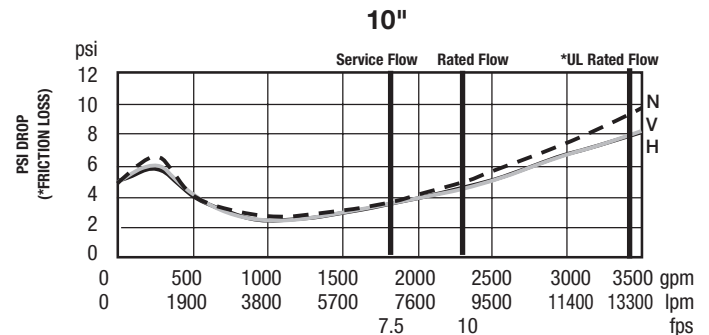
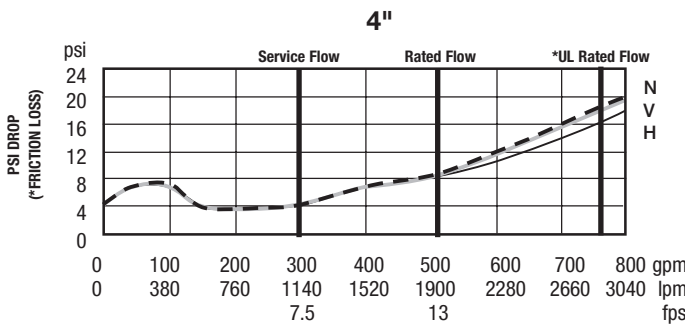
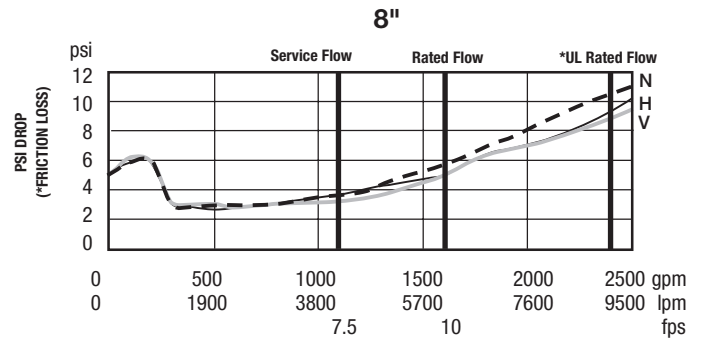
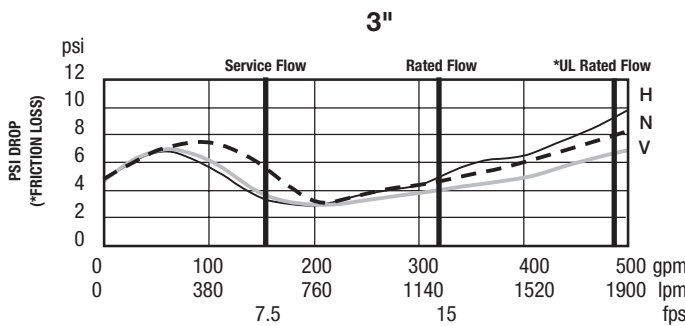
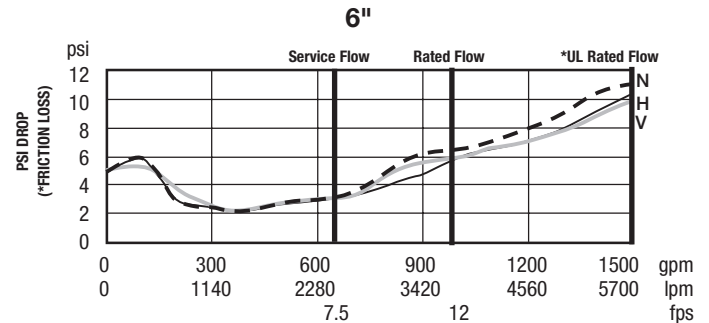
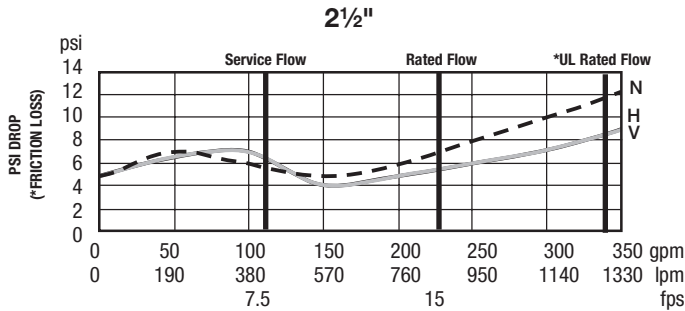


## Capacity

UL/FM Certified Flow Characteristics

Flow characteristics collected using butterfly shutoff valves

\_\_\_\_\_ Horizontal    \_\_\_\_\_ Vertical    ..... N - Pattern



### NOTICE

Inquire with governing authorities for local installation requirements.

**Flow capacity chart identifies valve performance based upon rated water velocity up to 25fps.**

- Service Flow is typically determined by a rated velocity of 7.5fps based upon schedule 40 pipe.
- Rated Flow identifies maximum continuous duty performance determined by AWWA.
- UL Flow Rate is 150% of Rated Flow and is not recommended for continuous duty.
- AWWA Manual M22 [Appendix C] recommends that the maximum water velocity in services be not more than 10fps.



**A WATTS Brand**



## F1FR56 Series Quick Response Sprinklers

K-factor 5.6 (80)

### Features

- Standard coverage quick-response sprinklers
- Upright, pendent, horizontal sidewall, and vertical sidewall defectors
- Low profile, compact design
- Available in a wide variety of finishes

### Product Description

Reliable Model F1FR56 series sprinklers are quick-response standard spray automatic fire sprinklers utilizing a sensitive 3.0 mm glass bulb thermal element.

Pendent and horizontal sidewall sprinklers may be installed exposed or surface mounted using escutcheons such as the Reliable Models B, C, or HB (reference Technical Bulletin 204). When installed recessed or concealed, the Model F1FR56 series sprinklers are specifically listed with and may only be installed with listed Reliable escutcheons and cover plates. Refer to the technical information on the following pages for specific listings for recessed and concealed installations and refer to Figures 5 and 6 for dimensional information.

When fitted with an approved water shield, these sprinklers may be considered intermediate sprinklers for use in racks, below grated walkways, and other areas where intermediate level sprinklers are required.

Table A provides a summary of the approvals and availability of specific Model F1FR series sprinkler configurations. Additional technical information for each sprinkler model is provided on the following pages.



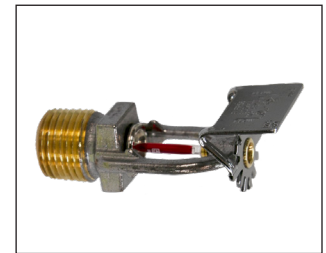
Model F1FR56 Pendent



Model F1FR56 Upright



Model F1FR56 Vertical Sidewall

Model F1FR56  
Horizontal Sidewall

**Note:** Not all versions of the product are shown.

**Note:** This bulletin may contain information on New and Legacy sprinklers that reflects a dimensional change only. Sprinkler Identification Number (SIN), application, performance, and listings/approval are not otherwise affected. Sprinklers with New frames will include the suffix "N" in the order.

**F1FR Series Sprinklers Summary**

**Table A**

Sprinkler Model	K-Factor gpm/psi <sup>1/2</sup> (lpm/bar <sup>1/2</sup> )	Orientation	Listings & Approvals	Max. Working Pressure psi (bar)	Sprinkler Identification Number (SIN)
F1FR56	5.6 (80)	Upright Intermediate Upright	cULus, FM, LPCB, VdS, EC, WM, UKCA	175 (12) 250 (17) (cULus only)	RA1425
		Pendent	cULus, FM, LPCB, VdS, EC, WM, UKCA	175 (12) 250 (17) (cULus only)	RA1414
		Concealed Pendent	cULus, VdS, EC, WM, UKCA	175 (12) 250 (17) (cULus only)	RA1414
		Horizontal Sidewall	cULus, FM	175 (12) 250 (17) (cULus only)	RA1435
		Vertical Sidewall	cULus, FM, LPCB, UKCA	175 (12)	RA1485



## Model F1FR56 Upright Sprinkler

SIN RA1425

### Technical Specifications

**Style:** Upright, Intermediate Upright

**Threads:** 1/2" NPT or ISO 7-R1/2

**Nominal K-Factor:** 5.6 (80 metric)

**Max. Working Pressure:**

175 psi (12 bar)

250 psi (17 bar) (cULus only)

### Material Specifications

**Thermal Sensor:** 3 mm Glass Bulb

**Sprinkler Frame:** Brass Alloy

**Cap:** Bronze Alloy

**Sealing Washer:** Nickel with PTFE

**Load Screw:** Copper Alloy

**Deflector:** Brass Alloy

### Sprinkler Finishes

(See Table B)

### Sensitivity

Quick response

### Temperature Ratings

135°F (57°C)

155°F (68°C)

175°F (79°C)

200°F (93°C)

286°F (141°C)

### Guards & Shields (New Frames)

Factory Water Shield (cULus, FM)

F-1 Guard (cULus, FM)

F-3 Guard with Shield (cULus, FM)

### Guards and Shields (Legacy Frames)

Factory Water Shield

C-1 Guard (FM)

C-3 Guard with Shield (cULus, FM)

D-1 Guard (cULus)

D-3 Guard with Shield (cULus)

### Sprinkler Wrench

Model W2

Model J (New frame with guard installed)

Model JD (Legacy frame with guard installed)

### Listings and Approvals

cULus Listed

FM Approved

LPCB

VdS

EC

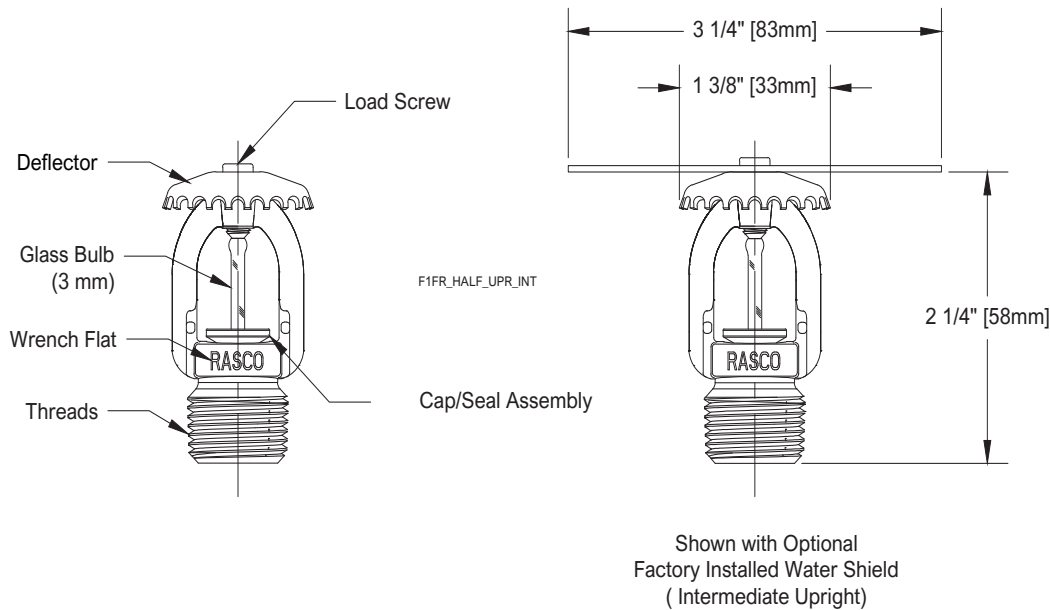
WM

UKCA: 0832-UKCA-CPR-S5045



## Model F1FR56 Upright Sprinkler Components and Dimensions

Figure 1



**Technical Specifications****Style:**

Pendent  
Recessed Pendent  
Concealed Pendent

**Threads:** 1/2" NPT or ISO 7-R1/2

**Nominal K-Factor:** 5.6 (80 metric)

**Max. Working Pressure:**

175 psi (12 bar)  
250 psi (17 bar) (cULus only)

**Material Specifications**

**Thermal Sensor:** 3 mm Glass Bulb

**Sprinkler Frame:** Brass Alloy

**Cap:** Bronze Alloy

**Sealing Washer:** Nickel with PTFE

**Load Screw:** Copper Alloy

**Deflector:** Brass Alloy

**Sprinkler Finishes**

(See Table B)

**Sensitivity**

Quick response

**Temperature Ratings<sup>(1)</sup>**

135°F (57°C)  
155°F (68°C)  
175°F (79°C)  
200°F (93°C)  
286°F (141°C)

**Recessed Escutcheons**

Model F1 (cULus, LPCB, VdS, CE, WM)  
Model F2 (cULus, FM, LPCB, VdS, CE, WM)  
Model FP (cULus, VdS, CE, WM)

**Cover Plate**

Model CCP (cULus, VdS<sup>(2)</sup>, CE<sup>(2)</sup>)

**Guards & Shields (New Frames)<sup>(3)</sup>**

F-1 Guard (FM)  
F-5 Guard/Shield Kit (FM)  
F-7 Guard (cULus)  
F-8 Guard/Shield Kit (cULus)  
S-1 Shield (cULus, FM)

**Guards & Shields (Legacy Frames)<sup>(3)</sup>**

C-1 Guard (FM)  
C-5 Guard/Shield Kit (FM)  
D-1 Guard (cULus, FM)  
D-4 Guard/Shield Kit (FM)  
D-5 Guard/Shield Kit (cULus, FM)  
S-1 Shield (cULus, FM)

**Sprinkler Wrenches**

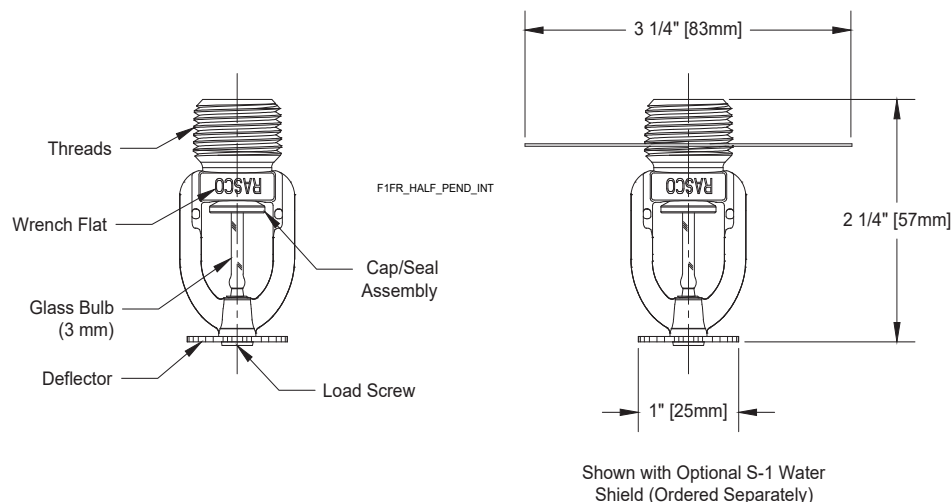
Model W2 (pendent)  
Model W4 (recessed or concealed)  
Model J (New frame with guard installed)  
Model JD (Legacy frame with guard installed)

**Listings and Approvals<sup>(4)</sup>**

cULus Listed  
FM Approved  
LPCB  
VdS  
EC  
WM  
UKCA: 0832-UKCA-CPR-S5045,  
0831-UKCA-CPR-5072 (CCP)

**Notes:**

1. 286°F (141°C) temperature rated sprinkler not listed for recessed or concealed use.
2. VdS and CE approval for CCP concealed use is for 155°C (68°C) sprinkler ONLY.
3. Not suitable for recessed or concealed installations.
4. When used surface mounted or exposed. See Recessed Escutcheon and Cover Plate section for specific approvals when installed recessed or concealed.

**Model F1FR56 Pendent Sprinkler Components and Dimensions****Figure 2**

**Note:** Please refer to Figure 8 for recessed and concealed installation.

**Technical Specifications****Style:**

Horizontal Sidewall  
Recessed Horizontal Sidewall

**Threads:** 1/2" NPT or ISO 7-R1/2**Nominal K-Factor:** 5.6 (80 metric)**Max. Working Pressure:**

175 psi (12 bar)  
250 psi (17 bar) (cULus only)

**Material Specifications****Thermal Sensor:** 3 mm Glass Bulb**Sprinkler Frame:** Brass Alloy**Cap:** Bronze Alloy**Sealing Washer:** Nickel with PTFE**Load Screw:** Copper Alloy**Deflector:** Brass Alloy**Sprinkler Finishes**

(See Table B)

**Sensitivity**

Quick response

**Temperature Ratings <sup>(1)</sup>**

135°F (57°C)  
155°F (68°C)  
175°F (79°C)  
200°F (93°C)  
286°F (141°C)

**Recessed Escutcheons<sup>(2)</sup>**

Model F1 (cULus)  
Model F2 (cULus, FM)  
Model FP (cULus)

**Guards & Shields (New Frames)<sup>(3)</sup>**

F-4 Guard (FM)  
F-7 Guard (cULus)

**Guards & Shields (Legacy Frames)<sup>(3)</sup>**

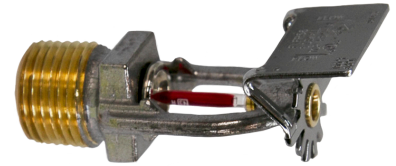
C1 Guard (FM)  
D1 Guard (cULus)

**Sprinkler Wrenches**

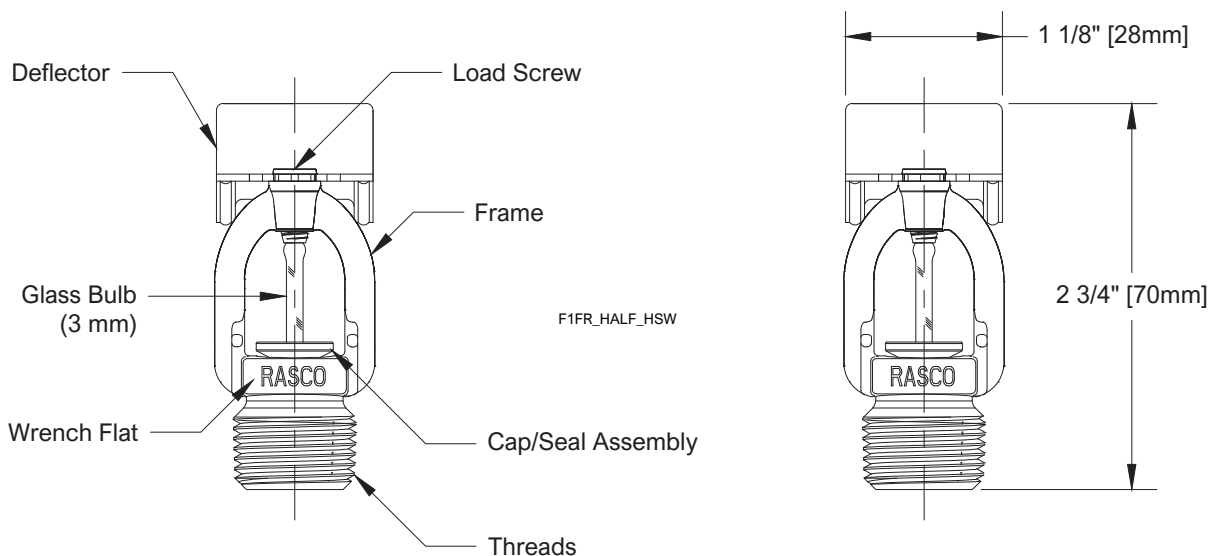
Model W2 (non-recessed)  
Model W4 (recessed)  
Model J (New frame with guard installed)  
Model JD (Legacy frame with guard installed)

**Listings and Approvals**

cULus Listed<sup>(4)</sup>  
FM Approved<sup>(5)</sup>

**Notes:**

1. 286°F (141°C) temperature rated sprinkler not listed for recessed use.
2. FM approved recessed installation when used with Model F2 escutcheon ONLY.
3. Not suitable for recessed horizontal sidewall installations.
4. cULus Listed for Light and Ordinary Hazard when installed exposed or surface mounted. Listed for Light Hazard ONLY when installed recessed.
5. FM Approved for Light Hazard ONLY.

**Model F1FR56 Horizontal Sidewall Sprinkler Components and Dimensions****Figure 3****Note:** Please refer to Figure 9 for recessed installation.

**Technical Specifications****Style:**

Upright Vertical Sidewall  
Pendent Vertical Sidewall

**Threads:** 1/2" NPT or ISO 7-R1/2

**Nominal K-Factor:** 5.6 (80 metric)

**Max. Working Pressure:** 175 psi (12 bar)

**Material Specifications**

**Thermal Sensor:** 3 mm Glass Bulb

**Sprinkler Frame:** Brass Alloy

**Cap:** Bronze Alloy

**Sealing Washer:** Nickel with PTFE

**Load Screw:** Copper Alloy

**Deflector:** Brass Alloy

**Sprinkler Finishes**

(See Table B)

**Sensitivity**

Quick response

**Temperature Ratings**

135°F (57°C)

155°F (68°C)

175°F (79°C)

200°F (93°C)

286°F (141°C)

**Guards & Shields (New Frames)**

F-2 Guard (FM)

**Guards & Shields (Legacy Frames)**

C1 Guard (FM)

**Sprinkler Wrenches**

Model W2

Model J (New frame with guard installed)

Model JD (Legacy frame with guard installed)

**Listings and Approvals<sup>(1)</sup>**

cULus Listed

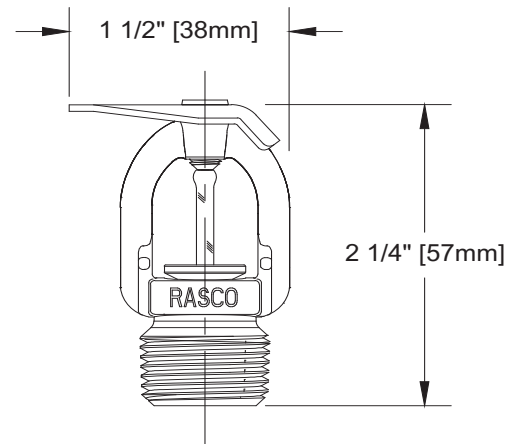
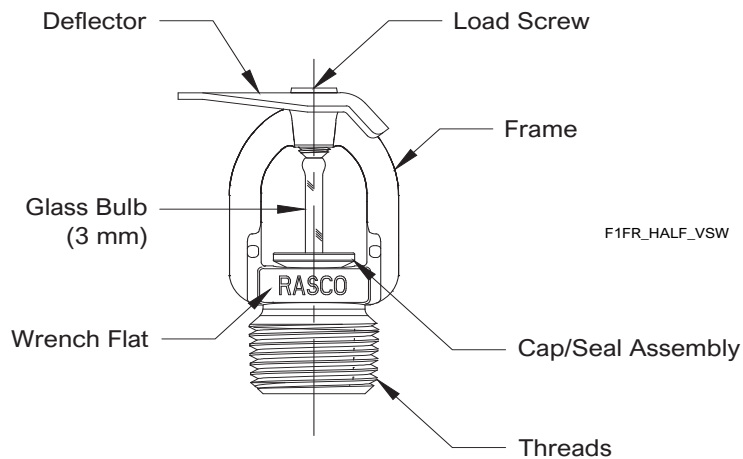
FM Approved

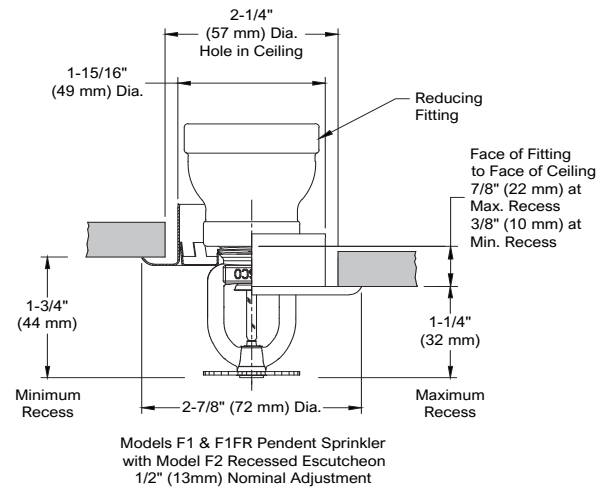
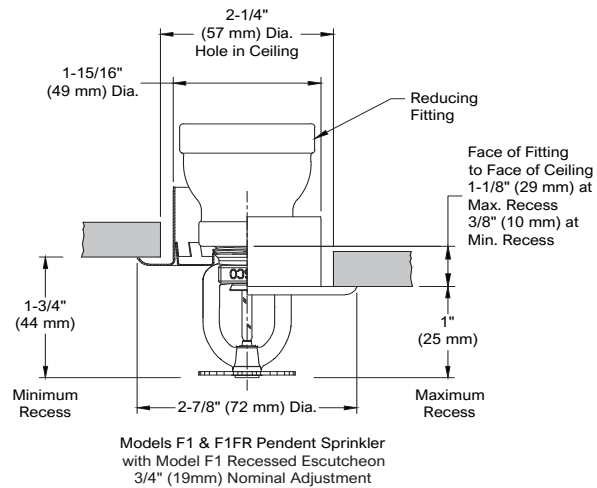
LPCB<sup>(2)</sup>

UKCA: 0832-UKCA-CPR-S5045

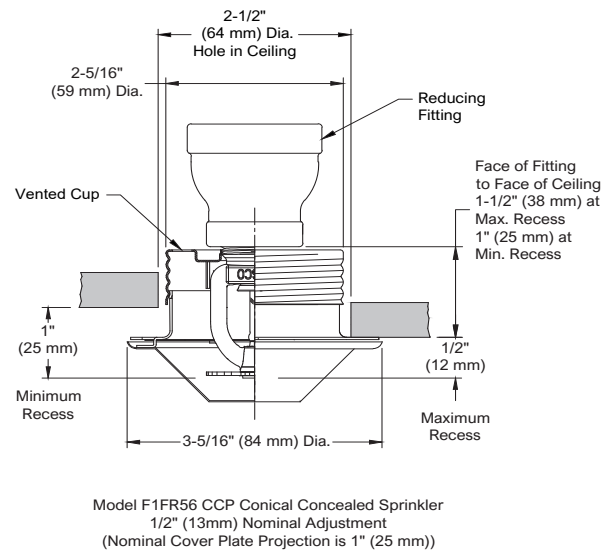
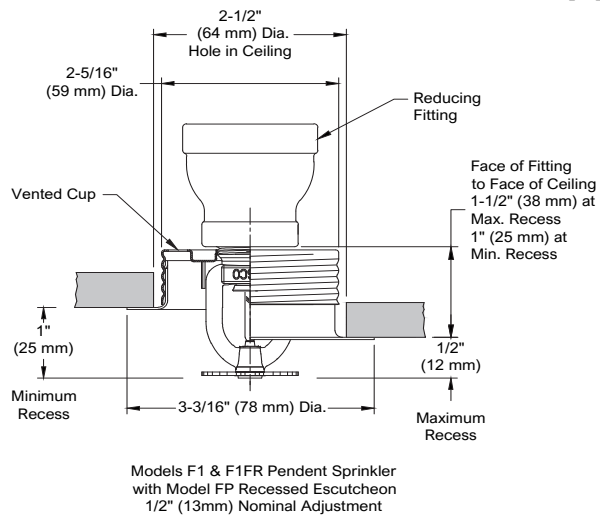
**Notes:**

1. Listed and approved for Light Hazard ONLY.
2. LPCB approved for use in pendent position ONLY.

**Model F1FR56 Vertical Sprinkler Components and Dimensions****Figure 4**



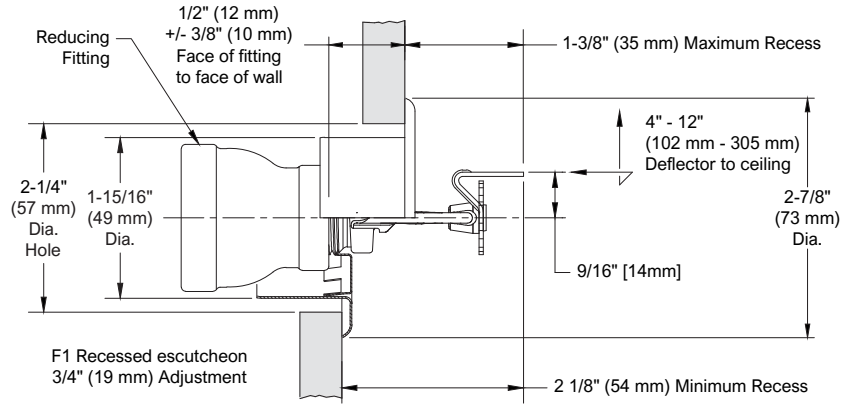
F1\_REC\_PEND\_CCP



Note: Model FP recessed assemblies may not be used where the pressure in the space above the ceiling is positive with respect to the protected area. Ensure that the openings in the Model FP cup are unobstructed following installation.

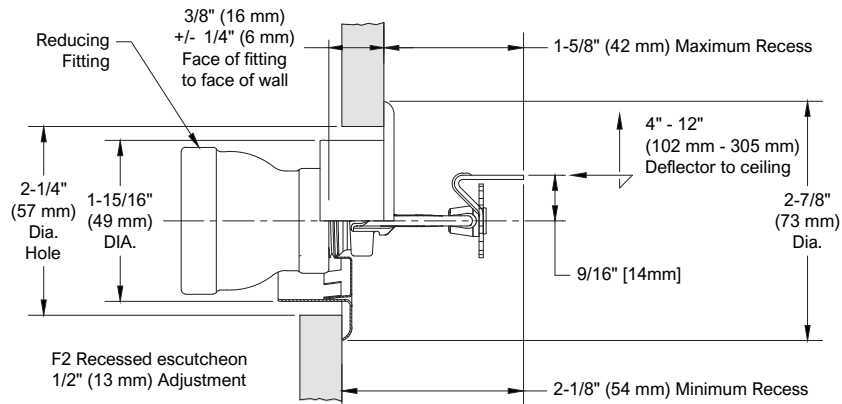
Note: Model CCP concealed assemblies may not be used where the pressure in the space above the ceiling is positive with respect to the protected area. Ensure that the openings in the Model CCP cup are unobstructed following installation.



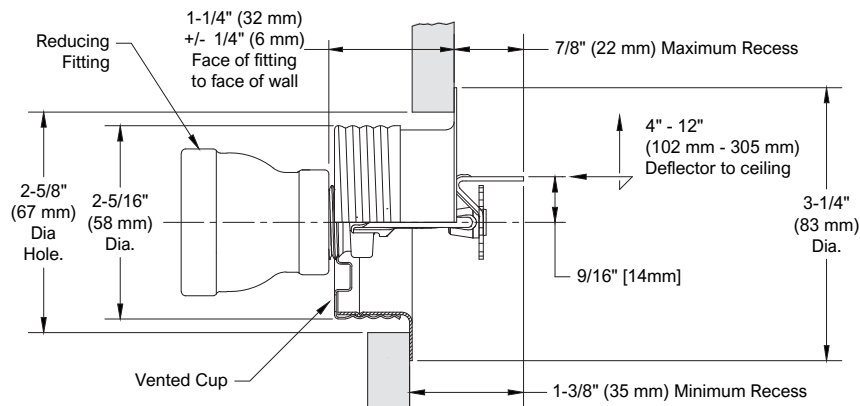


Model F1FR Horizontal Sidewall Sprinkler  
with Model F1 Recessed Escutcheon  
3/4" (19mm) Nominal Adjustment

F1FR\_REC\_HSW



Model F1FR Horizontal Sidewall Sprinkler  
with Model F2 Recessed Escutcheon  
1/2" (13mm) Nominal Adjustment



Model F1FR Horizontal Sidewall Sprinkler  
with Model FP Recessed Escutcheon  
1/2" (13mm) Nominal Adjustment

Note: Model FP recessed assemblies may not be used where the pressure in the space behind the sprinkler is positive with respect to the space in the protected area. Ensure that the openings in the Model FP cup are unobstructed following installation.

## Wrenches



Model W2 (upright, pendent)



Model J (New frame with guard installed)  
Model JD (Legacy frame with guard installed, similar but with zinc finish)



Model W4  
(recessed, concealed pendent)

## Finishes<sup>(1)</sup>

Table B

Standard Finishes			Special Application Finishes		
Sprinkler	F1, F2 and FP <sup>(2)</sup> Escutcheons	CCP Cover Plate <sup>(2)</sup>	Sprinkler	F1, F2 and FP <sup>(2)</sup> Escutcheons	CCP Cover Plate <sup>(2)</sup>
Bronze	Brass	Chrome	Electroless Nickel PTFE <sup>(3)(4)</sup>	Bright Brass	Bright Brass
Chrome	Chrome	White Paint	Bright Brass <sup>(5)</sup>	Satin Chrome	Satin Chrome
White Polyester <sup>(3)</sup>	White Polyester		Satin Chrome	Custom Color Polyester	Custom Color Paint
			Custom Color Polyester <sup>(3)</sup>		

### Notes:

1. Paint or any other coating applied over the factory finish will void all approvals and warranties.
2. Model FP escutcheons and Model CCP sprinklers utilize a galvanized steel cup with a finished trim ring or cover plate.
3. cULus Listed as corrosion resistant.
4. FM Approved as corrosion resistant.
5. For 200°F (93°C) maximum temperature rated sprinklers only.

## Installation

Model F1FR Series sprinklers must be installed in accordance with NFPA13 and the requirements of all applicable authorities having jurisdiction. Model F1FR Series sprinklers must be installed with the Reliable sprinkler installation wrench identified in this Bulletin. Any other wrench may damage the sprinkler. The Models W2 and W4 wrenches have two sets of jaws. Use the smallest set of jaws that fit on the wrench flats of the sprinkler. A leak tight sprinkler joint can be obtained with a torque of 8 to 18 lb-ft (11 to 24 N-m). Do not tighten sprinklers over the maximum recommended installation torque. Exceeding the maximum recommended installation torque may cause leakage or impairment of the sprinkler.

Glass bulb sprinklers have orange bulb protectors or protective caps to minimize bulb damage during shipping, handling and installation. Reliable sprinkler installation wrenches are designed to install sprinklers with bulb protectors in place. Remove the bulb protector at the time when the sprinkler system is placed in service for fire protection. Removal of the bulb protector before this time may leave the bulb vulnerable to damage. Remove bulb protectors by undoing the clasp by hand. Do not use tools to remove bulb protectors.

## Maintenance

Reliable Model F1FR series sprinklers should be inspected and the sprinkler system maintained in accordance with NFPA 25, as well as the requirements of any Authorities Having Jurisdiction.

Prior to installation, sprinklers should remain in the original cartons and packaging until used. This will minimize the potential for damage to sprinklers that could cause improper operation or non-operation.

Do not clean sprinklers with soap and water, ammonia liquid or any other cleaning fluids. Remove dust by gentle vacuuming without touching the sprinkler.

Replace any sprinkler which has been painted (other than factory applied). A stock of spare sprinklers should be maintained to allow quick replacement of damaged or operated sprinklers. Failure to properly maintain sprinklers may result in inadvertent operation or non-operation during a fire event.

## Guarantee

For the guarantee, terms, and conditions, visit [www.reliablesprinkler.com](http://www.reliablesprinkler.com).

## Ordering Information

**Specify the following when ordering:**

### Model

- F1FR56

### Deflector/Orientation

- Upright
- Intermediate Upright
- Pendent
- CCP Concealed Pendent
- Horizontal Sidewall
- Vertical Sidewall

### Temperature Rating

- See sprinkler technical specifications

### Sprinkler Finish

- See Table B

### Recessed Escutcheon<sup>(1)(2)</sup>

- F1
- F2
- FP

### Escutcheon Finish

- See Table B

### CCP Cover Plate Temperature Rating

- 135°F (57°C) [For use with 135°F (57°C) and 155°F (68°C) sprinklers.]
- 165°F (74°C) [For use with 175°F (79°C) and 200°F (93°C) sprinklers.]

### CCP Cover Plate Finish

- See Table B

### Sprinkler Wrench

- Model W2
- Model W4 (recessed, concealed)
- Model J (New frame with guard installed)
- Model JD (Legacy frame with guard installed)

### Notes:

1. 286°F (141°C) sprinklers are not listed to be used recessed or concealed.
2. For FM, recessed sprinklers must use the Model F2 escutcheon.





## Model F1Res Series Glass Bulb Residential Sprinklers

cULus Listed

### Features

- cULus Listed Residential Sprinklers
- Available in pendent and horizontal sidewall orientations
- Decorative finishes available, including recessed escutcheons and conical concealed cover plates

### Product Description

Model F1Res Series sprinklers are residential sprinklers with a 3 mm glass bulb operating element. A variety of K-Factors as well as recessed and conical concealed options are available as detailed in this Bulletin.

The F1Res Series sprinklers are specially engineered for fast thermal response to meet the requirements of UL 1626. They are intended for installation in accordance with NFPA 13, 13R, and 13D.

### Application

The Model F1Res Series sprinklers cULus Listed Residential sprinklers are intended for use in accordance with NFPA 13, NFPA 13R, or NFPA 13D. The Model F1Res residential sprinklers are cULus Listed for use in residential occupancies and residential portions of any occupancy, where permitted by NFPA 13, NFPA 13R, or NFPA 13D. For NFPA 13R and NFPA 13D applications, the design flow and pressure shall not be less than the minimum flow and pressure specified in the Listed Design Criteria tables in this Bulletin. For NFPA 13 applications,

**Important Note:** Model D wrench and Model GFR2 wrench are no longer compatible with this product. Model W2 (non-recessed) and Model W4 (recessed, concealed) are required.



the design density shall be a minimum of 0.1 gpm/sf (4.1 mm/min), but in no case shall the flow and pressure be less than the minimum flow and pressure specified in the Listed Design Criteria tables in this bulletin. Model F1Res Series sprinklers are listed for use in wet systems only.

### Residential Sprinkler Summary

Table A

Sprinkler Model	Sprinkler Identification Number (SIN)	Orientation	K-Factor gpm/psi <sup>1/2</sup> (lpm/bar <sup>1/2</sup> )	Thread Size NPT or ISO7-1	Installation Options	Max. Coverage Area ft x ft (m x m)
F1Res30	R3511	Pendent	3.0 (43)	1/2	Pendent or Recessed	16 x 16 (4.9 x 4.9)
F1Res49	R3516	Pendent	4.9 (71)	1/2	Pendent or Recessed	20 x 20 (6.1 x 6.1)
F1Res58	R3513	Pendent	5.8 (84)	1/2	Pendent or Recessed	20 x 20 (6.1 x 6.1)
F1Res76	R7618	Pendent	7.6 (109)	3/4	Pendent or Recessed	20 x 20 (6.1 x 6.1)
F1Res30 CCP	R3511	Pendent	3.0 (43)	1/2	Conical Concealed	14 x 14 (4.3 x 4.3)
F1Res49 CCP	R3516	Pendent	4.9 (71)	1/2	Conical Concealed	20 x 20 (6.1 x 6.1)
F1Res58 CCP	R3513	Pendent	5.8 (84)	1/2	Conical Concealed	20 x 20 (6.1 x 6.1)
F1Res76 CCP	R7618	Pendent	7.6 (109)	3/4	Conical Concealed	20 x 20 (6.1 x 6.1)
F1Res44 HSW	R3531	Horizontal Sidewall	4.4 (63)	1/2	Recessed	16 x 20 (4.9 x 6.1)
F1Res44 SWC	R3531	Horizontal Sidewall	4.4 (63)	1/2	Conical Concealed	16 x 20 (4.9 x 6.1)
F1Res58 HSW	R3533	Horizontal Sidewall	5.8 (84)	1/2	Recessed	16 x 20 (4.9 x 6.1)
F1Res 58 HSWX	RA3533	Horizontal Sidewall	5.8 (84)	1/2	Recessed	14 x 26 (4.3 x 7.9)

**Note:** Please note SIN difference between F1Res58 HSW (R3533) and F1Res58 HSWX (RA3533).

# Model F1Res30 Residential Pendent Sprinkler & Models F2 & FV Escutcheon

SIN R3511

## Technical Specifications

**Style:** Pendent and Recessed Pendent

**Threads:** 1/2" NPT or ISO7-1R1/2

**Nominal K-Factor:** 3.0 (43 metric)

**Max. Working Pressure:** 175 psi (12 bar)

## Material Specifications

**Thermal Sensor:** 3 mm glass bulb

**Sprinkler Frame:** Brass Alloy

**Button:** Copper Alloy

**Sealing Assembly:** Nickel Alloy with PTFE

**Load Screw:** Bronze Alloy

**Deflector:** Bronze Alloy

## Finishes

(See Table N)

## Sensitivity

Fast-response

## Temperature Ratings

155°F (68°C)

175°F (79°C)

## Recessed Escutcheons

F2 Recessed

FV Recessed\*

## Sprinkler Wrenches

Model W2

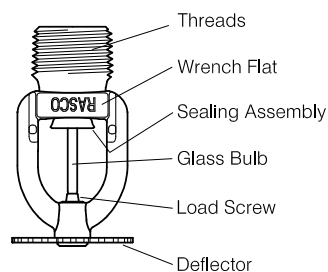
Model W4 (Recessed)



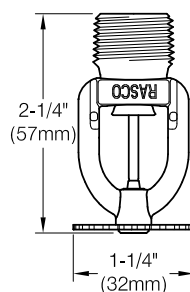
**\*Note:** Model FV escutcheons are not for use in positively pressurized ceiling plenums.

# Model F1Res30 Residential Pendent Sprinkler Components and Installation Dimensions

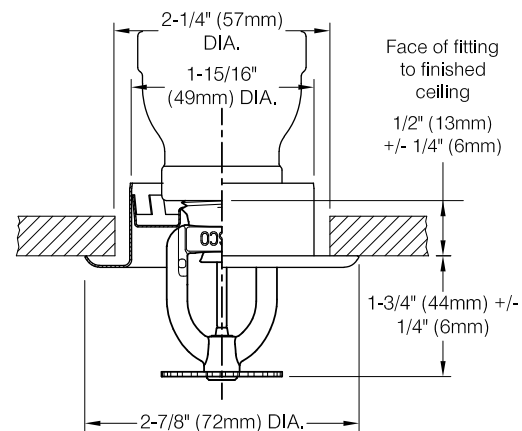
Figure 1



Components



Dimensions



F2 & FV Recessed Escutcheon Installation

# Model F1Res30 Residential Pendent Sprinkler Hydraulic Design Criteria

Table B

Minimum Flow and Residual Pressure in Wet Pipe Systems <sup>(1)</sup>			
Maximum Coverage Area <sup>(2)</sup> ft. x ft. (m x m)	Flow gpm (l/min)	Pressure psi (bar)	Deflector to Ceiling Distance
12 x 12 (3.7 x 3.7)	8 (30)	7.0 (0.48)	1 to 4 inches (25 to 100 mm)
14 x 14 (4.3 x 4.3)	10 (38)	11.0 (0.76)	
15 x 15 (4.6 x 4.6)	12 (45)	16.0 (1.1)	
16 x 16 (4.9 x 4.9)	13 (49)	18.8 (1.3)	

## Notes:

- For NFPA 13 installations the flow per sprinkler must be the greater of: (1) the flow listed in the table above or (2) the flow required to achieve a minimum design density of 0.1 gpm/sq ft over the design area of the sprinkler.
- For coverage area dimensions less than those listed above, use the minimum required flow for the next larger max. coverage area listed.

**Technical Specifications**

**Style:** Pendant and Recessed Pendant  
**Threads:** 1/2" NPT or ISO7-1R1/2  
**Nominal K-Factor:** 4.9 (71 metric)  
**Max. Working Pressure:** 175 psi (12 bar)

**Material Specifications**

**Thermal Sensor:** 3 mm glass-bulb  
**Sprinkler Frame:** Brass Alloy  
**Button:** Copper Alloy  
**Sealing Assembly:** Nickel Alloy with PTFE  
**Load Screw:** Bronze Alloy  
**Deflector:** Bronze Alloy

**Finishes**

(See Table N)

**Sensitivity**

Fast-response

**Temperature Ratings**

155°F (68°C)

175°F (79°C)

**Recessed Escutcheons**

F1 Recessed

F2 Recessed

FV Recessed\*

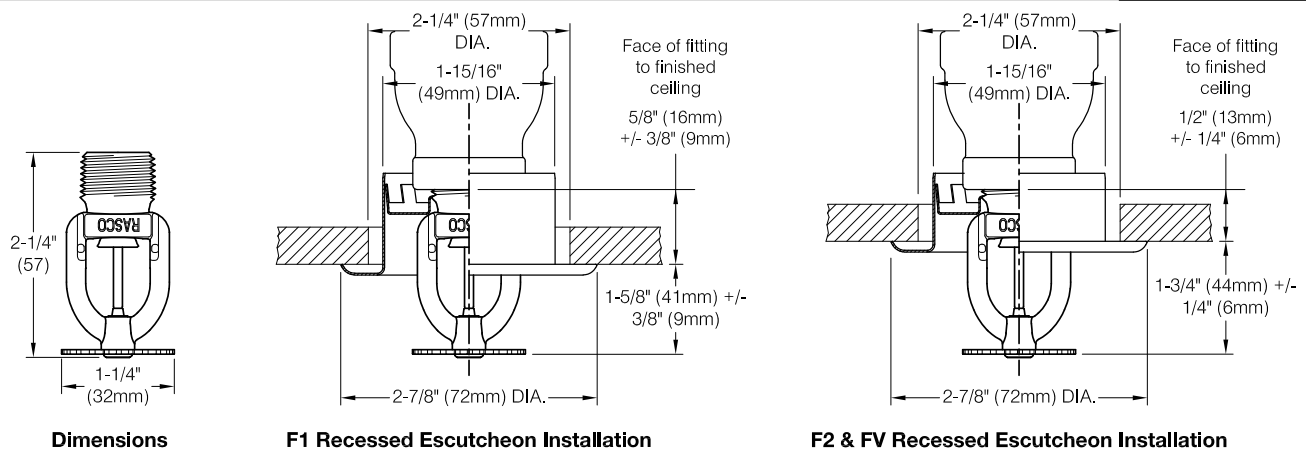
**Sprinkler Wrenches**

Model W2

Model W4 (Recessed)



**\*Note:** Model FV escutcheons are not for use in positively pressurized ceiling plenums.

**Model F1Res49 Residential Pendant Sprinkler Components and Installation Dimensions**
**Figure 2**

**Model F1Res49 Residential Pendant Sprinkler Hydraulic Design Criteria**
**Table C**

Minimum Flow and Residual Pressure in Wet Pipe Systems <sup>(1)</sup>			
Maximum Coverage Area <sup>(2)</sup> ft. x ft. (m x m)	Flow gpm (l/min)	Pressure psi (bar)	Deflector to Ceiling Distance
12 x 12 (3.7 x 3.7)	13 (49)	7.0 (0.48)	1 to 4 inches (25 to 100 mm)
14 x 14 (4.3 x 4.3)	13 (49)	7.0 (0.48)	
16 x 16 (4.9 x 4.9)	13 (49)	7.0 (0.48)	
18 x 18 (5.5 x 5.5)	17 (64)	12.0 (0.83)	
20 x 20 (6.1 x 6.1)	20 (76)	16.7 (1.15)	
12 x 12 (3.7 x 3.7)	15 (57)	9.4 (0.65)	4 to 8 inches (100 to 200 mm)
14 x 14 (4.3 x 4.3)	16 (61)	10.7 (0.74)	
16 x 16 (4.9 x 4.9)	17 (64)	12.0 (0.83)	
18 x 18 (5.5 x 5.5)	19 (72)	15.0 (1.03)	
20 x 20 (6.1 x 6.1)	22 (83)	20.2 (1.39)	

**Notes:**

- For NFPA 13 installations the flow per sprinkler must be the greater of: (1) the flow listed in the table above or (2) the flow required to achieve a minimum design density of 0.1 gpm/sq ft over the design area of the sprinkler.
- For coverage area dimensions less than those listed above, use the minimum required flow for the next larger max. coverage area listed.

### Technical Specifications

**Style:** Pendent and Recessed Pendent  
**Threads:** 1/2" NPT or ISO7-1R1/2  
**Nominal K-Factor:** 5.8 (84 metric)  
**Max. Working Pressure:** 175 psi (12 bar)

### Material Specifications

**Thermal Sensor:** 3 mm glass bulb  
**Sprinkler Frame:** Brass Alloy  
**Button:** Copper Alloy  
**Sealing Assembly:** Nickel Alloy with PTFE  
**Load Screw:** Bronze Alloy  
**Deflector:** Bronze Alloy

### Finishes

(See Table N)

### Sensitivity

Fast-response

### Temperature Ratings

155°F (68°C)

175°F (79°C)

### Recessed Escutcheons

F1 Recessed

F2 Recessed

FV Recessed\*

### Sprinkler Wrenches

Model W2

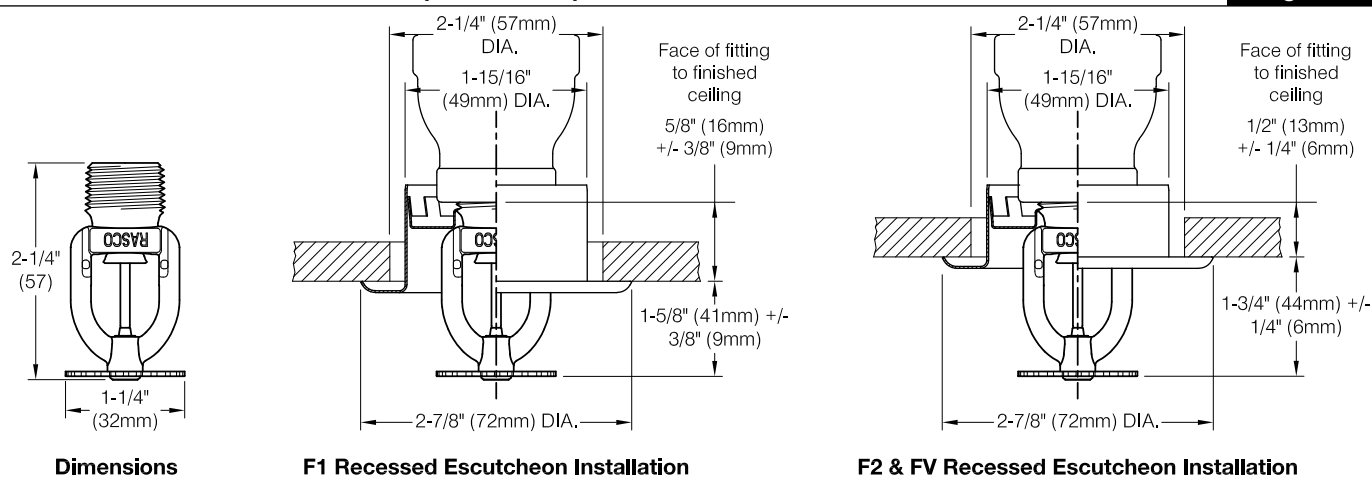
Model W4 (Recessed)



**\*Note:** Model FV escutcheons are not for use in positively pressurized ceiling plenums.

### Model F1Res58 Residential Pendent Sprinkler Components and Installation Dimensions

Figure 3



### Model F1Res58 Residential Pendent Sprinkler Hydraulic Design Criteria

Table D

Minimum Flow and Residual Pressure in Wet Pipe Systems <sup>(1)</sup>			
Maximum Coverage Area <sup>(2)</sup> ft. x ft. (m x m)	Flow gpm (l/min)	Pressure psi (bar)	Deflector to Ceiling Distance
16 x 16 (4.9 x 4.9)	16 (61)	7.6 (0.52)	1 to 4 inches (25 to 100 mm)
18 x 18 (5.5 x 5.5)	19 (72)	10.8 (0.75)	
20 x 20 (6.1 x 6.1)	22 (83)	14.4 (1.0)	

### Notes:

- For NFPA 13 installations the flow per sprinkler must be the greater of: (1) the flow listed in the table above or (2) the flow required to achieve a minimum design density of 0.1 gpm/sq ft over the design area of the sprinkler.
- For coverage area dimensions less than those listed above, use the minimum required flow for the next larger max. coverage area listed.

**Technical Specifications**

**Style:** Pendent and Recessed Pendent  
**Threads:** 3/4" NPT or ISO7-1R3/4  
**Nominal K-Factor:** 7.6 (109 metric)  
**Max. Working Pressure:** 175 psi (12 bar)

**Material Specifications**

**Thermal Sensor:** 3 mm glass bulb  
**Sprinkler Frame:** Brass Alloy  
**Button:** Copper Alloy  
**Sealing Assembly:** Nickel Alloy with PTFE  
**Load Screw:** Bronze Alloy  
**Deflector:** Bronze Alloy

**Finishes**

(See Table N)

**Sensitivity**

Fast-response

**Temperature Ratings**

155°F (68°C)

175°F (79°C)

**Recessed Escutcheons**

F1 Recessed

F2 Recessed

FV Recessed\*

**Sprinkler Wrenches**

Model W2

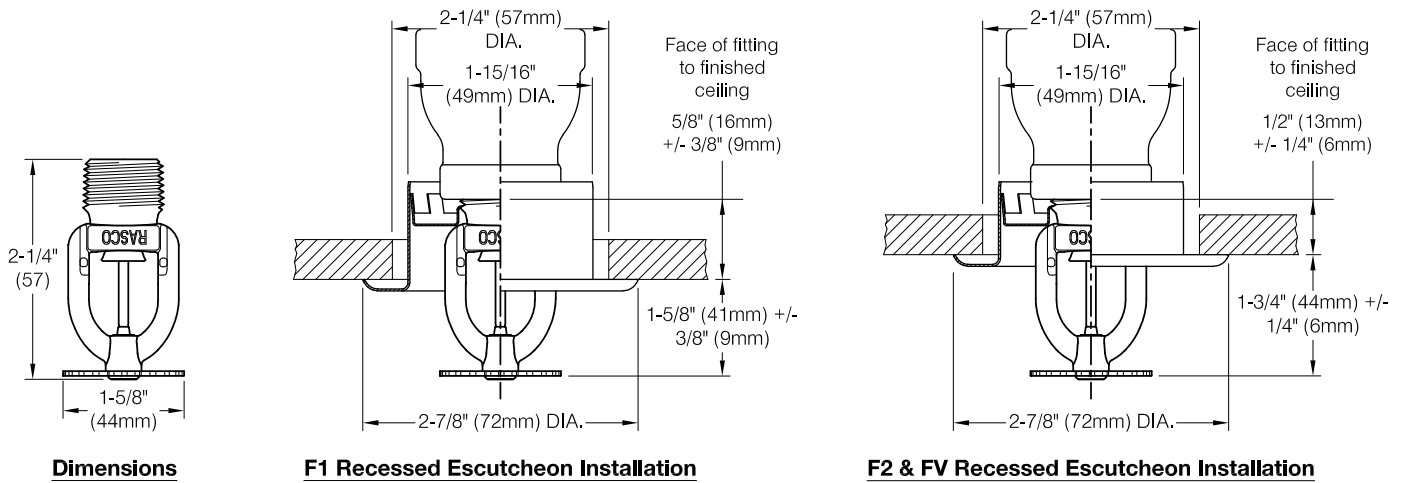
Model W4 (Recessed)



**\*Note:** Model FV escutcheons are not for use in positively pressurized ceiling plenums.

**Model F1Res76 Residential Pendent Sprinkler Components and Installation Dimensions**

**Figure 4**



**Model F1Res76 Residential Pendent Sprinkler Hydraulic Design Criteria**

**Table E**

Minimum Flow and Residual Pressure in Wet Pipe Systems <sup>(1)</sup>			
Maximum Coverage Area <sup>(2)</sup> ft. x ft. (m x m)	Flow gpm (l/min)	Pressure psi (bar)	Deflector to Ceiling Distance
18 x 18 (5.5 x 5.5)	21 (80)	7.6 (0.52)	1 to 4 inches (25 to 100 mm)
20 x 20 (6.1 x 6.1)	23 (87)	9.2 (0.63)	

**Notes:**

- For NFPA 13 installations the flow per sprinkler must be the greater of: (1) the flow listed in the table above or (2) the flow required to achieve a minimum design density of 0.1 gpm/sq ft over the design area of the sprinkler.
- For coverage area dimensions less than those listed above, use the minimum required flow for the next larger max. coverage area listed.

# Model F1Res30 CCP Conical Concealed Pendant & Model FP Recessed Escutcheon Pendant Sprinkler

SIN R3511

## Technical Specifications

**Style:** Conical Concealed Pendant and Recessed Pendant  
**Threads:** 1/2" NPT or ISO7-1R1/2  
**Nominal K-Factor:** 3.0 (43 metric)  
**Max. Working Pressure:** 175 psi (12 bar)

## Material Specifications

**Thermal Sensor:** 3 mm glass bulb  
**Sprinkler Frame:** Brass Alloy  
**Button:** Copper Alloy  
**Sealing Assembly:** Nickel Alloy with PTFE  
**Load Screw:** Bronze Alloy  
**Deflector:** Bronze Alloy

## Finishes

(See Table N)

## Sensitivity

Fast-response

## Temperature Ratings

155°F (68°C)

## Recessed Escutcheons/Cover Plates

CCP Conical Concealed Plate 135°F (57°C)\*  
 FP Recessed\*

## Sprinkler Wrenches

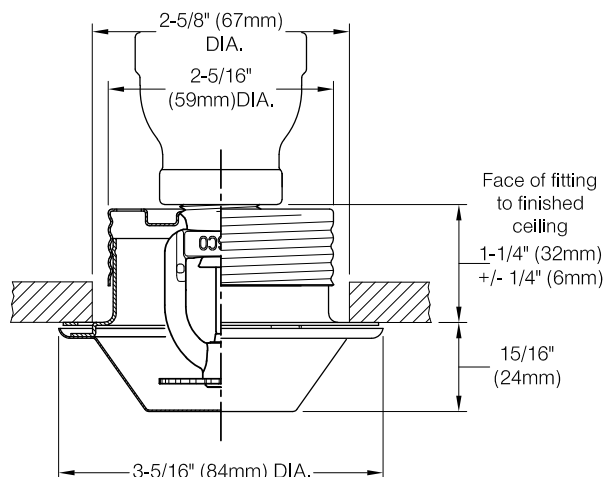
Model W4



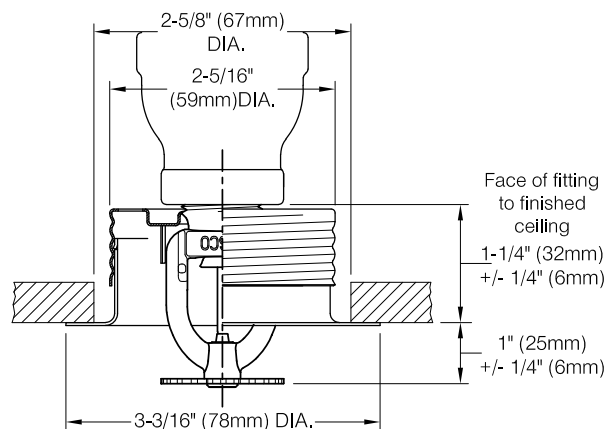
**\*Note:** Model FP escutcheons and CCP cover plates are not listed for use in positively pressurized ceiling plenums.

## Model F1Res30 CCP and FP Recessed Pendant Sprinkler Installation Dimensions

Figure 5



CCP Recessed Escutcheon Installation



FP Recessed Escutcheon Installation

## Model F1Res30 CCP Pendant & FP Recessed Pendant Sprinkler Hydraulic Design Criteria

Table F

Minimum Flow and Residual Pressure in Wet Pipe Systems <sup>(1)</sup>			
Maximum Coverage Area <sup>(2)</sup> ft. x ft. (m x m)	Flow gpm (l/min)	Pressure psi (bar)	Deflector to Ceiling Distance
12 x 12 (3.7 x 3.7)	8 (30)	7.0 (0.48)	1/2 to 1 inch (13 to 25 mm)
14 x 14 (4.3 x 4.3)	11 (38)	13.4 (0.92)	

### Notes:

- For NFPA 13 installations the flow per sprinkler must be the greater of: (1) the flow listed in the table above or (2) the flow required to achieve a minimum design density of 0.1 gpm/sq ft over the design area of the sprinkler.
- For coverage area dimensions less than those listed above, use the minimum required flow for the next larger max. coverage area listed.
- The sprinkler must be installed into a ceiling with the listed cover plate installed.

### Technical Specifications

**Style:** Conical Concealed Pendent and Recessed Pendent  
**Threads:** 1/2" NPT or ISO7-1R1/2  
**Nominal K-Factor:** 4.9 (71 metric)  
**Max. Working Pressure:** 175 psi (12 bar)

### Material Specifications

**Thermal Sensor:** 3 mm glass bulb  
**Sprinkler Frame:** Brass Alloy  
**Button:** Copper Alloy  
**Sealing Assembly:** Nickel Alloy with PTFE  
**Load Screw:** Bronze Alloy  
**Deflector:** Bronze Alloy

### Finishes

(See Table N)

### Sensitivity

Fast-response

### Temperature Ratings

155°F (68°C)

### Recessed Escutcheons/Cover Plates

CCP Conical Concealed Plate 135°F (57°C)\*  
 FP Recessed\*

### Sprinkler Wrenches

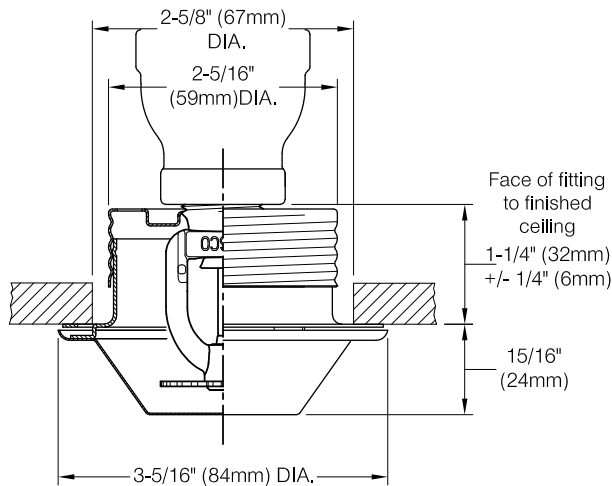
Model W4



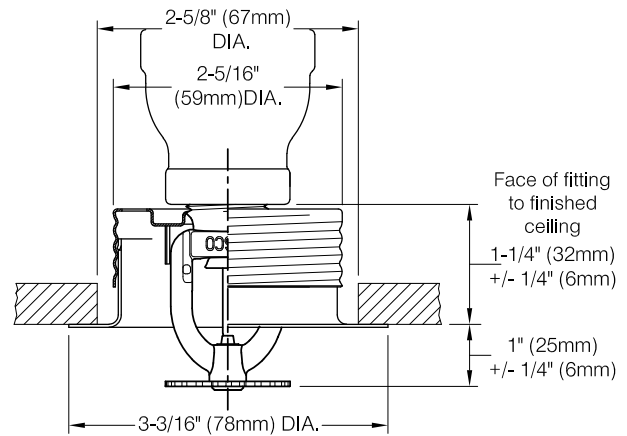
**\*Note:** Model FP escutcheons and CCP cover plates are not for use in positively pressurized ceiling plenums.

### Model F1Res49 CCP & FP Recessed Pendent Sprinkler Installation Dimensions

Figure 6



CCP Recessed Escutcheon Installation



FP Recessed Escutcheon Installation

### Model F1Res49 CCP Pendent and FP Recessed Pendent Hydraulic Design Criteria

Table G

Minimum Flow and Residual Pressure in Wet Pipe Systems <sup>(1)</sup>			
Maximum Coverage Area <sup>(2)</sup> ft. x ft. (m x m)	Flow gpm (l/min)	Pressure psi (bar)	Deflector to Ceiling Distance
14 x 14 (4.3 x 4.3)	13 (49)	7.0 (0.48)	1/2 to 1 inch (13 to 25 mm)
16 x 16 (4.9 x 4.9)	14 (53)	8.2 (0.57)	
18 x 18 (5.5 x 5.5)	18 (68)	13.5 (0.93)	
20 x 20 (6.1 x 6.1)	20 (76)	16.7 (1.15)	

### Notes:

- For NFPA 13 installations the flow per sprinkler must be the greater of: (1) the flow listed in the table above or (2) the flow required to achieve a minimum design density of 0.1 gpm/sq ft over the design area of the sprinkler.
- For coverage area dimensions less than those listed above, use the minimum required flow for the next larger max. coverage area listed.
- The sprinkler must be installed into a ceiling with the listed cover plate installed.

### Technical Specifications

**Style:** Conical Concealed Pendent and Recessed Pendent  
**Threads:** 1/2" NPT or ISO7-1R1/2  
**Nominal K-Factor:** 5.8 (84 metric)  
**Max. Working Pressure:** 175 psi (12 bar)

### Material Specifications

**Thermal Sensor:** 3 mm glass bulb  
**Sprinkler Frame:** Brass Alloy  
**Button:** Copper Alloy  
**Sealing Assembly:** Nickel Alloy with PTFE  
**Load Screw:** Bronze Alloy  
**Deflector:** Bronze Alloy

### Finishes

(See Table N)

### Sensitivity

Fast-response

### Temperature Ratings

155°F (68°C)

### Recessed Escutcheons/Cover Plates

CCP Conical Concealed Plate 135°F (57°C)\*  
 FP Recessed\*

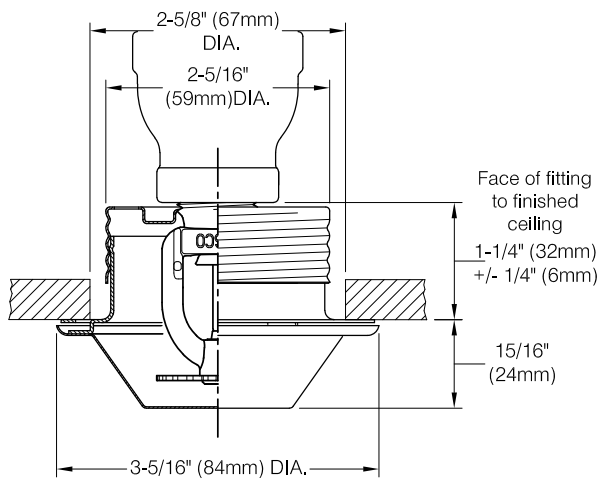
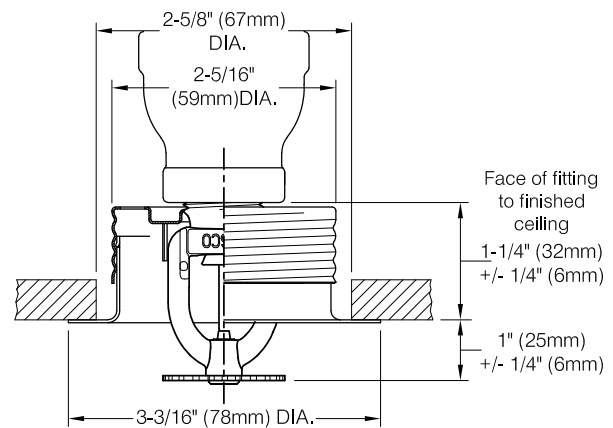
### Sprinkler Wrenches

Model W4



**\*Note:** Model FP escutcheons and CCP cover plates are not for use in positively pressurized ceiling plenums.

### Model F1Res58 CCP and FP Recessed Pendent Sprinkler Installation Dimensions

**Figure 7**

**CCP Recessed Escutcheon Installation**

**FP Recessed Escutcheon Installation**

### Model F1Res58 CCP Pendent & FP Recessed Pendent Hydraulic Design Criteria

**Table H**

Minimum Flow and Residual Pressure in Wet Pipe Systems <sup>(1)</sup>			
Maximum Coverage Area <sup>(2)</sup> ft. x ft. (m x m)	Flow gpm (l/min)	Pressure psi (bar)	Deflector to Ceiling Distance
16 x 16 (4.9 x 4.9)	16 (61)	7.6 (0.52)	1/2 to 1 inch (13 to 25 mm)
18 x 18 (5.5 x 5.5)	19 (72)	10.8 (0.75)	
20 x 20 (6.1 x 6.1)	22 (83)	14.4 (1.0)	

### Notes:

- For NFPA 13 installations the flow per sprinkler must be the greater of: (1) the flow listed in the table above or (2) the flow required to achieve a minimum design density of 0.1 gpm/sq ft over the design area of the sprinkler.
- For coverage area dimensions less than those listed above, use the minimum required flow for the next larger max. coverage area listed.
- The sprinkler must be installed into a ceiling with the listed cover plate installed.



### Technical Specifications

**Style:** Conical Concealed Pendent and Recessed Pendent  
**Threads:** 3/4" NPT or ISO7-1R3/4  
**Nominal K-Factor:** 7.6 (109 metric)  
**Max. Working Pressure:** 175 psi (12 bar)

### Material Specifications

**Thermal Sensor:** 3 mm glass bulb  
**Sprinkler Frame:** Brass Alloy  
**Button:** Copper Alloy  
**Sealing Assembly:** Nickel Alloy with PTFE  
**Load Screw:** Bronze Alloy  
**Deflector:** Bronze Alloy

### Finishes

(See Table N)

### Sensitivity

Fast-response

### Temperature Ratings

155°F (68°C)

### Recessed Escutcheons/Cover Plates

CCP Conical Concealed Plate 135°F (57°C)\*  
 FP Recessed\*

### Sprinkler Wrenches

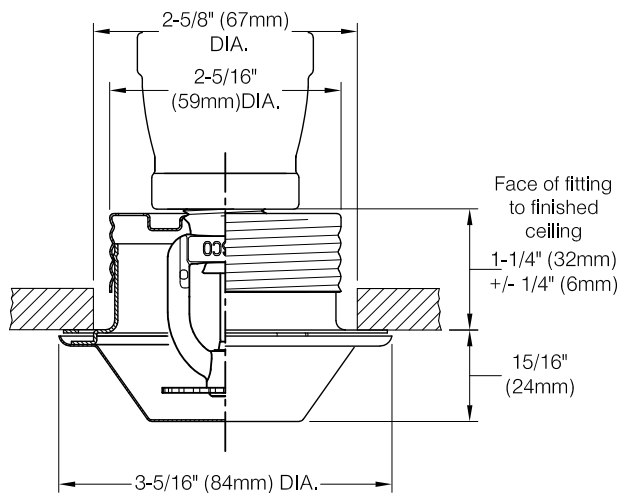
Model W4



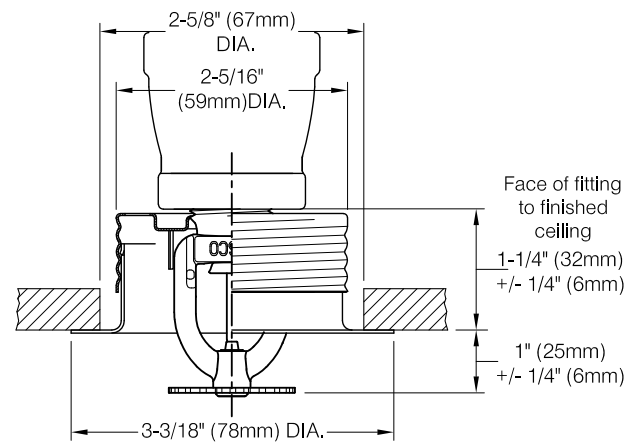
**\*Note:** Model FP escutcheons and CCP cover plates are not for use in positively pressurized ceiling plenums.

## Model F1Res76 CCP and FP Recessed Pendent Sprinkler Installation Dimensions

Figure 8



CCP Recessed Escutcheon Installation



FP Recessed Escutcheon Installation

## Model F1Res76 CCP Pendent & FP Recessed Pendent Hydraulic Design Criteria

Table I

Minimum Flow and Residual Pressure in Wet Pipe Systems <sup>(1)</sup>			
Maximum Coverage Area <sup>(2)</sup> ft. x ft. (m x m)	Flow gpm (l/min)	Pressure psi (bar)	Deflector to Ceiling Distance
16 x 16 (4.9 x 4.9)	21 (80)	7.6 (0.52)	1/2 to 1 inch (13 to 25 mm)
18 x 18 (5.5 x 5.5)	22 (83)	8.4 (0.58)	
20 x 20 (6.1 x 6.1)	25 (95)	10.8 (0.75)	

### Notes:

- For NFPA 13 installations the flow per sprinkler must be the greater of: (1) the flow listed in the table above or (2) the flow required to achieve a minimum design density of 0.1 gpm/sq ft over the design area of the sprinkler.
- For coverage area dimensions less than those listed above, use the minimum required flow for the next larger max. coverage area listed.
- The sprinkler must be installed into a ceiling with the listed cover plate installed.

### Technical Specifications

**Style:** Sidewall and Recessed Sidewall

**Threads:** 1/2" NPT or ISO7-1R1/2

**Nominal K-Factor:** 4.4 (63 metric)

**Max. Working Pressure:** 175 psi (12 bar)

### Material Specifications

**Thermal Sensor:** 3 mm glass bulb

**Sprinkler Frame:** Brass Alloy

**Button:** Copper Alloy

**Sealing Assembly:** Nickel Alloy with PTFE

**Load Screw:** Bronze Alloy

**Deflector:** Bronze Alloy

### Finishes

(See Table N)

### Sensitivity

Fast-response

### Temperature Ratings

155°F (68°C)

175°F (79°C)

### Recessed Escutcheons

F2 Recessed

FV Recessed

### Sprinkler Wrenches

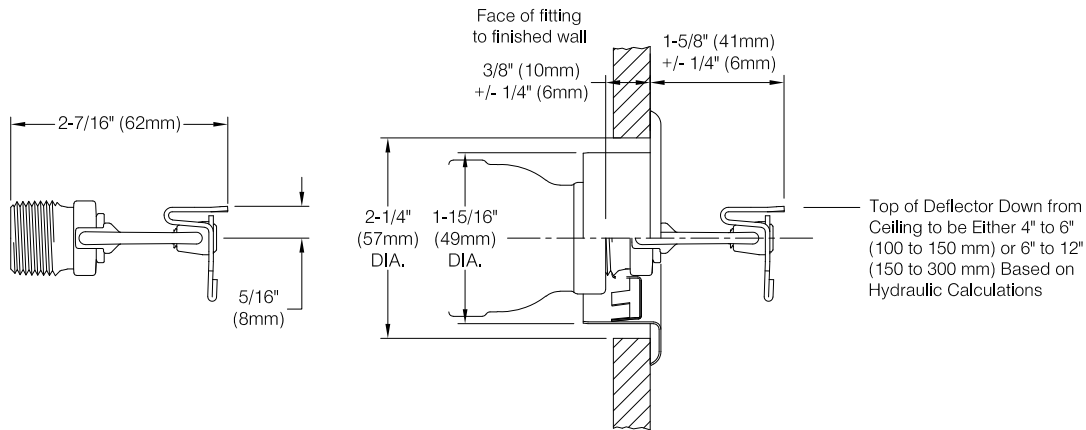
Model W2

Model W4 (Recessed)



### Model F1Res44 Horizontal Sidewall Sprinkler Installation Dimensions

Figure 9



Dimensions

F2 &amp; FV Recessed Escutcheon Installation

### Model F1Res44 Horizontal Sidewall Sprinkler Hydraulic Design Criteria

Table J

Minimum Flow and Residual Pressure in Wet Pipe Systems <sup>(1)</sup>			
Maximum Coverage Area <sup>(2)</sup> ft. x ft. (m x m)	Flow gpm (l/min)	Pressure psi (bar)	Deflector to Ceiling Distance
12 x 12 (3.7 x 3.7)	12 (45)	7.5 (0.52)	4 to 6 inches (100 to 150 mm)
14 x 14 (4.3 x 4.3)	14 (53)	10.2 (0.70)	
15 x 15 (4.6 x 4.6)	15 (57)	11.6 (0.80)	
16 x 16 (4.9 x 4.9)	16 (61)	13.3 (0.92)	
16 x 18 (4.9 x 5.5)	18 (68)	16.8 (1.16)	
16 x 20 (4.9 x 6.1)	23 (87)	27.4 (1.89)	
18 x 18 (5.5 x 5.5)	19 (72)	18.7 (1.29)	
12 x 12 (3.7 x 3.7)	14 (53)	10.2 (0.7)	6 to 12 inches (150 to 300 mm)
14 x 14 (4.3 x 4.3)	16 (61)	13.2 (0.91)	
15 x 15 (4.6 x 4.6)	16 (61)	13.2 (0.91)	
16 x 16 (4.9 x 4.9)	17 (64)	15.0 (1.03)	
16 x 18 (4.9 x 5.5)	20 (76)	20.7 (1.43)	
16 x 20 (4.9 x 6.1)	23 (87)	27.4 (1.89)	

### Notes:

- For NFPA 13 installations the flow per sprinkler must be the greater of: (1) the flow listed in the table above or (2) the flow required to achieve a minimum design density of 0.1 gpm/sq ft over the design area of the sprinkler.
- For coverage area dimensions less than those listed above, use the minimum required flow for the next larger max. coverage area listed.

# Model F1Res44 SWC Conical Concealed Horizontal Sidewall Sprinkler

SIN R3531

## Technical Specifications

**Style:** Conical Concealed Sidewall  
**Threads:** 1/2" NPT or ISO 7-1 R1/2  
**Nominal K-Factor:** 4.4 (63 metric)  
**Max. Working Pressure:** 175 psi (12 bar)

## Material Specifications

**Thermal Sensor:** 3 mm glass-bulb  
**Sprinkler Frame:** Brass Alloy  
**Button:** Copper Alloy  
**Sealing Assembly:** Nickel Alloy with PTFE  
**Load Screw:** Bronze Alloy  
**Deflector:** Bronze Alloy

## Finishes

(See Table N)

## Sensitivity

Fast-response

## Temperature Ratings

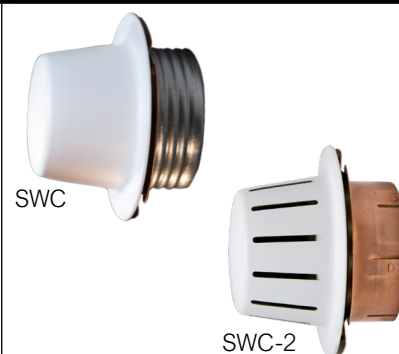
155°F (68°C)  
175°F (79°C) <sup>(1)</sup>

## Cover Plates

SWC Conical Concealed Plate<sup>(2)</sup>  
SWC-2 (Slotted) Conical Concealed Plate<sup>(3)</sup>

## Sprinkler Wrenches

Model W4



## Note:

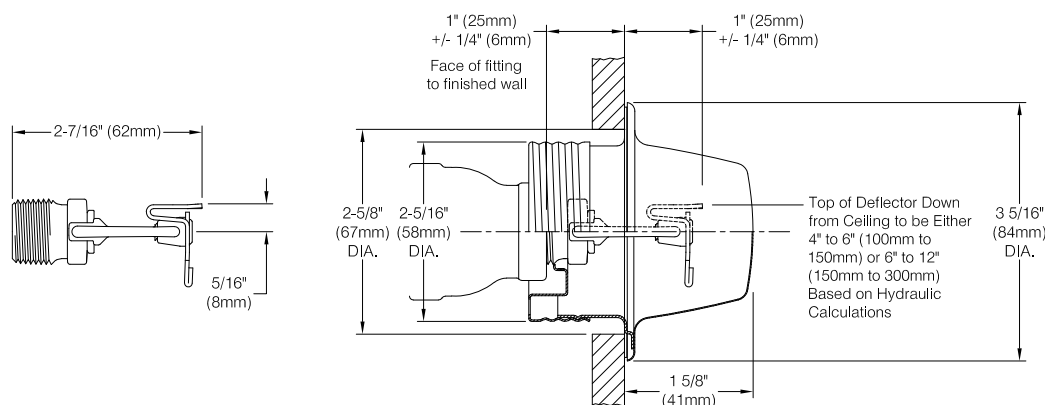
<sup>(1)</sup> Not for installation where the maximum ceiling temperature exceeds 100°F due to cover plate temperature rating.

<sup>(2)</sup> 135°F SWC Conical Concealed Plate for 155°F (68°C) sprinklers

<sup>(3)</sup> 135°F SWC-2 (Slotted) Conical Concealed Plate for 175°F (79°C) sprinklers

# Model F1Res44 SWC Conical Concealed Horizontal Sidewall Sprinkler and Installation Dimensions

Figure 10



Dimensions

SWC & SWC-2 Concealed Cover Plate Installation

# Model F1Res44 SWC Conical Concealed Horizontal Sidewall Sprinkler Hydraulic Design Criteria

Table K

Minimum Flow and Residual Pressure in Wet Pipe Systems <sup>(1)</sup>					
Maximum Coverage Area <sup>(2)</sup> ft. x ft. (m x m)	Ordinary Temperature Rating 155°F (68°C)		Intermediate Temperature Rating 175°F (79°C)		Deflector to Ceiling Distance
	Flow gpm (l/min)	Pressure psi (bar)	Flow gpm (l/min)	Pressure psi (bar)	
12 x 12 (3.7 x 3.7)	13 (49)	8.7 (0.60)	14 (53)	10.2 (0.7)	4 to 6 inches (100 to 150 mm)
14 x 14 (4.3 x 4.3)	14 (53)	10.2 (0.7)	14 (53)	10.2 (0.7)	
15 x 15 (4.6 x 4.6)	16 (61)	13.2 (0.91)	--	--	
16 x 16 (4.9 x 4.9)	17 (64)	15.0 (1.03)	--	--	
16 x 18 (5.5 x 5.5)	19 (72)	18.7 (1.31)	--	--	
16 x 20 (4.9 x 6.1)	23 (87)	27.4 (1.89)	--	--	
12 x 12 (3.7 x 3.7)	14 (53)	10.2 (0.7)	--	--	6 to 12 inches (150 to 300 mm)
14 x 14 (4.3 x 4.3)	15 (57)	11.7 (0.81)	--	--	
15 x 15 (4.6 x 4.6)	17 (64)	15.0 (1.03)	--	--	
16 x 16 (4.9 x 4.9)	18 (68)	16.8 (1.16)	--	--	
16 x 18 (4.9 x 5.5)	20 (76)	20.7 (1.43)	--	--	

## Notes:

- For NFPA 13 installations the flow per sprinkler must be the greater of: (1) the flow listed in the table above or (2) the flow required to achieve a minimum design density of 0.1 gpm/sq ft over the design area of the sprinkler.
- For coverage area dimensions less than those listed above, use the minimum required flow for the next larger max. coverage area listed.

**Technical Specifications**

**Style:** Sidewall and Recessed Sidewall  
**Threads:** 1/2" NPT or ISO7-1R1/2  
**Nominal K-Factor:** 5.8 (84 metric)  
**Max. Working Pressure:** 175 psi (12 bar)

**Material Specifications**

**Thermal Sensor:** 3 mm glass bulb  
**Sprinkler Frame:** Brass Alloy  
**Button:** Copper Alloy  
**Sealing Assembly:** Nickel Alloy with PTFE  
**Load Screw:** Bronze Alloy  
**Deflector:** Bronze Alloy

**Finishes**

(See Table N)

**Sensitivity**

Fast-response

**Temperature Ratings**

155°F (68°C)

175°F (79°C)

**Recessed Escutcheons**

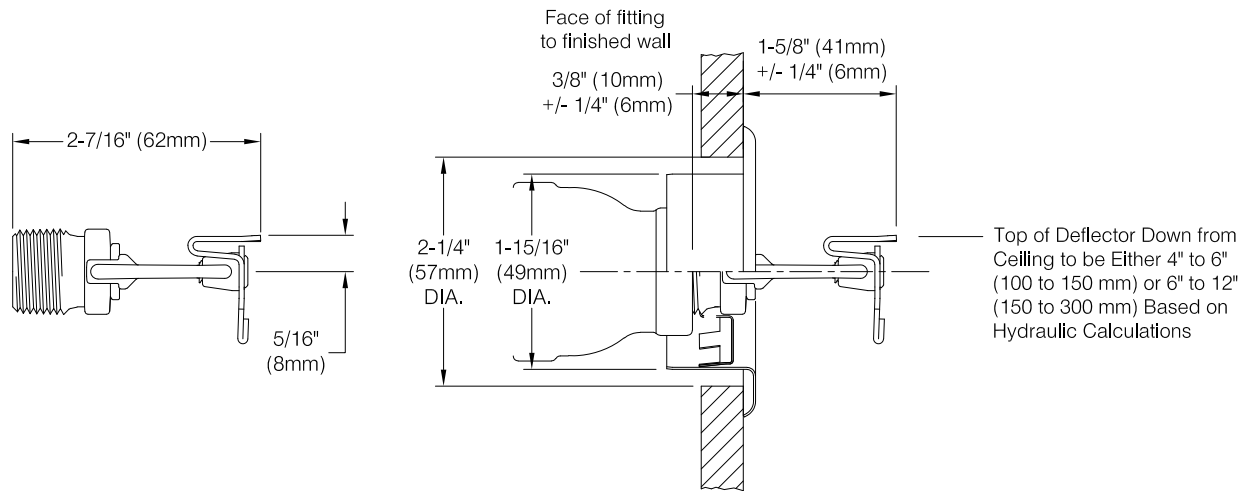
F2 Recessed

FV Recessed

**Sprinkler Wrenches**

Model W2

Model W4 (Recessed)

**Model F1Res58 Residential Horizontal Sidewall Sprinkler Installation Dimensions****Figure 11****Dimensions****F2 & FV Recessed Escutcheon Installation****Model F1Res58 Horizontal Sidewall Sprinkler Hydraulic Design Criteria****Table L**

Minimum Flow and Residual Pressure in Wet Pipe Systems <sup>(1)</sup>			
Maximum Coverage Area <sup>(2)</sup> ft. x ft. (m x m)	Flow gpm (l/min)	Pressure psi (bar)	Deflector to Ceiling Distance
12 x 12 (3.7 x 3.7)	16 (61)	7.6 (0.52)	4 to 6 inches (100 to 150 mm)
14 x 14 (4.3 x 4.3)	18 (68)	9.7 (0.66)	
15 x 15 (4.6 x 4.6)	19 (72)	10.7 (0.74)	
16 x 16 (4.9 x 4.9)	21 (80)	13.2 (0.91)	
16 x 18 (4.9 x 5.5)	25 (95)	18.6 (1.28)	
16 x 20 (4.9 x 6.1)	29 (110)	25.0 (1.72)	
12 x 12 (3.7 x 3.7)	22 (83)	14.4 (1.0)	6 to 12 inches (150 to 300 mm)
14 x 14 (4.3 x 4.3)	22 (83)	14.4 (1.0)	
15 x 15 (4.6 x 4.6)	24 (91)	17.1 (1.18)	
16 x 16 (4.9 x 4.9)	26 (98)	20.1 (1.39)	
16 x 18 (4.9 x 5.5)	31 (117)	28.6 (1.97)	

**Notes:**

- For NFPA 13 installations the flow per sprinkler must be the greater of: (1) the flow listed in the table above or (2) the flow required to achieve a minimum design density of 0.1 gpm/sq ft over the design area of the sprinkler.
- For coverage area dimensions less than those listed above, use the minimum required flow for the next larger max. coverage area listed.
- Please note SIN difference between F1Res58 HSW (R3533) and F1Res58 HSWX (RA3533).

**Technical Specifications**

**Style:** Sidewall and Recessed Sidewall  
**Threads:** 1/2" NPT or ISO7-1R1/2  
**Nominal K-Factor:** 5.8 (84 metric)  
**Max. Working Pressure:** 175 psi (12 bar)

**Material Specifications**

**Thermal Sensor:** 3 mm glass bulb  
**Sprinkler Frame:** Brass Alloy  
**Button:** Copper Alloy  
**Sealing Assembly:** Nickel Alloy with PTFE  
**Load Screw:** Bronze Alloy  
**Deflector:** Bronze Alloy

**Finishes**

(See Table N)

**Sensitivity**

Fast-response

**Temperature Ratings**

155°F (68°C)

175°F (79°C)

**Recessed Escutcheons**

F2 Recessed

FV Recessed

**Sprinkler Wrenches**

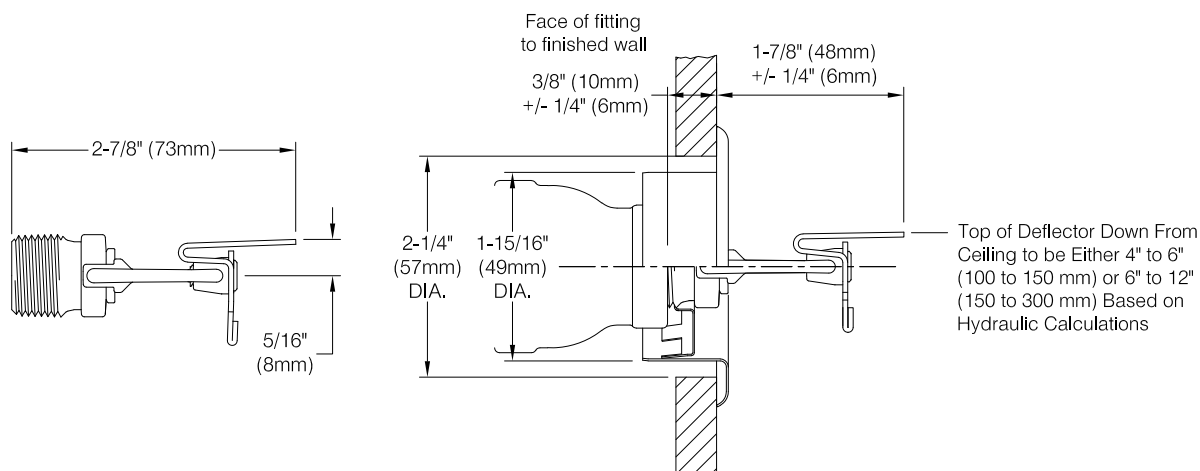
Model W2

Model W4 (Recessed)



**Model F1Res58 HSWX Residential Horizontal Sidewall Sprinkler Installation Dimensions**

**Figure 12**



**Dimensions**

**F2 & FV Recessed Escutcheon Installation**

**Model F1Res58 HSWX Horizontal Sidewall Sprinkler Hydraulic Design Criteria**

**Table M**

Minimum Flow and Residual Pressure in Wet Pipe Systems <sup>(1)</sup>			
Maximum Coverage Area <sup>(2)</sup> ft. x ft. (m x m)	Flow gpm (l/min)	Pressure psi (bar)	Deflector to Ceiling Distance
18 x 20 (5.5 x 6.1)	30 (114)	26.8 (1.85)	4 to 6 inches (100 to 150 mm)
20 x 20 (6.1 x 6.1)	30 (114)	26.8 (1.85)	
16 x 22 (4.9 x 6.7)	33 (125)	32.4 (2.23)	
16 x 24 (4.9 x 7.3)	38 (144)	42.9 (2.96)	
14 x 26 (4.3 x 7.9)	42 (160)	52.4 (3.63)	
18 x 20 (5.5 x 6.1)	35 (133)	36.4 (2.51)	6 to 12 inches (150 to 300 mm)
16 x 22 (4.9 x 6.7)	38 (144)	42.9 (2.96)	
16 x 24 (4.9 x 7.3)	42 (160)	52.4 (3.61)	
14 x 26 (4.3 x 7.9)	46 (174)	62.9 (4.34)	

**Notes:**

- For NFPA 13 installations the flow per sprinkler must be the greater of: (1) the flow listed in the table above or (2) the flow required to achieve a minimum design density of 0.1 gpm/sq ft over the design area of the sprinkler.
- For coverage area dimensions less than those listed above, use the minimum required flow for the next larger max. coverage area listed.
- Please note SIN difference between F1Res58 HSW (R3533) and F1Res58 HSWX (RA3533).

## Finishes

Table N

Standard Finishes			Special Application Finishes		
Sprinkler <sup>(1)</sup>	F1, F2, FV, FP <sup>(3)</sup> , Escutcheons	CCP, SWC (Conical) Cover Plates <sup>(1)</sup>	Sprinkler <sup>(1)</sup>	F1, F2, FV, FP <sup>(3)</sup> , Escutcheons	CCP, SWC (Conical) Cover Plates <sup>(1)</sup>
Bronze	Brass	--	Bright Brass	Bright Brass	Bright Brass
Chrome Plated	Chrome Plated	Chrome Plated	Satin Chrome	Satin Chrome	Satin Chrome
White Polyester <sup>(2)</sup>	White Polyester	White Paint	Black Polyester <sup>(2)</sup>	Black Polyester	Black Paint
--	--	--	Custom Color Polyester	Custom Color Polyester	Custom Color Paint
--	--	--	Electroless Nickel PTFE <sup>(2)</sup>	--	--

### Notes:

(1) Paint or any other coating applied over the factory finish will void all approvals and warranties.

(2) cULus Listed Corrosion Resistant.

(3) The Model FP escutcheon assembly consists of an unfinished galvanized cup with a finished escutcheon ring.

## Installation

Models F1Res sprinklers are to be installed as shown in this bulletin. Model F1, F2, FV, and FP recessed escutcheons are the only recessed escutcheons to be used with Model F1Res sprinklers. Not all F1Res sprinklers may be used with all recessed escutcheons offered. Confirm listing of escutcheon type for use with individual sprinklers. Use of any other recessed escutcheon will void all approvals and warranties.

For installing Model F1Res sprinklers, use only the Model W2 sprinkler Wrench; for installing Models F1Res Recessed Pendent, Sidewall, Conical Concealed Pendent (CCP), and Sidewall Concealed (SWC and SWC-2) sprinklers use only the Model W4 sprinkler wrench. Use of wrenches other than those specified may damage these sprinklers.

Installation of F1Res sprinklers in a wall or ceiling will require a hole diameter of 2-1/4" (57 mm) for F1 or F2 recessed escutcheons; or 2-5/8" (67 mm) for FP recessed escutcheons, CCP, SWC, and SWC-2 cover plates.

Install F1Res HSW sprinklers with a ceiling to deflector distance that complies with the hydraulic design criteria tables in this bulletin. The flow arrow on deflector must point away from near wall and "Top" marking must face the ceiling.

A "leak tight" sprinkler joint can be obtained with the following torque:

- 1/2" NPT and ISO7-1R1/2: 8-18 ft-lbs (11 – 24 N-m)
- 3/4" NPT and ISO7-1R3/4: 14-20 ft-lbs (19 – 27 N-m)

Do not tighten sprinklers over maximum recommended torque. This may cause leakage or impairment of the sprinklers. Do not install any glass bulb sprinklers where the bulb is cracked or there is a loss of liquid from the bulb.

Glass bulb sprinklers have orange bulb protectors to minimize bulb damage during shipping, handling and installation. Remove this protection at the time the sprinkler system is placed in service. Removal of the protectors before this time may leave the bulb vulnerable to damage. RASCO wrenches are designed to install sprinklers when protectors are in place. Remove protectors by undoing the clasp by hand. Do not use tools to remove the protectors.



Model W2



Model W4

### Model W4 Wrench Installation Example

Figure 13



The Model W4 wrench includes two sets of jaws. One set of jaws is equivalent to a Model GFR2 wrench and the other set of jaws is equivalent to a Model W1 wrench. Use the smallest of the two sets of jaws that will fit on the sprinkler's wrench flats. The Model W4 wrench is used in conjunction with the installer's nominal 1/2" square drive ratchet and nominal 5" (125mm) long extension (not provided) as shown in Figure 13.

## Maintenance

Reliable Model F1Res Sprinklers should be inspected and the sprinkler system maintained in accordance with NFPA 25, 13, 13D, and 13R, as well as the requirements of any Authorities Having Jurisdiction.

Prior to installation, sprinklers should remain in the original cartons and packaging until used. This will minimize the potential for damage to sprinklers that could cause improper operation or non-operation.

Do not clean sprinklers with soap and water, ammonia liquid or any other cleaning fluids. Remove dust by gentle vacuuming without touching the sprinkler.

Replace any sprinkler which has been painted (other than factory applied). Properly installed CCP, SWC, and SWC-2 cover plates will have an air gap that is required for proper operation, do not seal the gap or paint the cover plates.

Replace any sprinkler which has been damaged, where cracks are observed in the glass bulb, or when liquid has been lost from the glass bulb.

A stock of spare sprinklers should be maintained to allow quick replacement of damaged or operated sprinklers. Failure to properly maintain sprinklers may result in inadvertent operation or non-operation during a fire event.

## Listings & Approvals

Listed by Underwriters Laboratories Inc. and UL Certified for Canada (cULus)

## Guarantee

For Reliable Automatic Sprinkler Company guarantee, terms, and conditions, visit [www.reliablesprinkler.com](http://www.reliablesprinkler.com).

## Patents

For patents applicable to products contained in this technical bulletin, please visit [www.r-s.co](http://www.r-s.co)

## Ordering Information

Specify the following when ordering:

### Sprinkler

- Model (See Table A)
- Temperature Rating
- Threads (NPT or ISO7-1)
- Finish (See Table N)

### Escutcheon or Cover Plate

- Model
- Finish (See Table N)

### Sprinkler Wrench

- Model W2 (Pendent and HSW)
- W4 (Recessed and Concealed)

**Note:** Please note SIN difference between F1Res58 HSW (R3533) and F1Res58 HSWX (RA3533).



# Reliable®

## Model F3QR56 Dry K5.6 (80 metric) Quick-Response, Standard Spray Sprinklers

### Features

- Available in the following configurations:
  - Pendent with standard escutcheon
  - Pendent with Model HB extended escutcheon
  - Pendent with Model FP recessed escutcheon
  - Pendent with Model F1 recessed escutcheon
  - Concealed Pendent with Model CCP cover plate
  - Horizontal Sidewall with Standard escutcheon
  - Horizontal Sidewall with Model HB extended escutcheon
  - Horizontal Sidewall with Model FP recessed escutcheon (FM Standard Response)
  - Horizontal Sidewall with Model F1 recessed escutcheon (FM Standard Response)
  - Upright
- Available with 1" NPT, ISO7-1R1, 3/4" NPT, or ISO7-1R3/4 inlet fitting.
- 3/4" NPT inlet fittings permit replacement of older 3/4" inlet dry sprinklers without changing to a larger sprinkler fitting.
- Sprinklers, escutcheons, and cover plates are available in a wide variety of standard and special application finishes.
- White polyester, black polyester, and Electroless Nickel PTFE (ENT) finish sprinklers are cULus Listed as Corrosion Resistant.
- Available with cULus Listed 250 psi (17.2 bar) pressure rating for Dry Pendent and select HSW configurations. FM Approved for 175 psi (12 bar).

### Product Description

Model F3QR56 Dry sprinklers are quick-response, standard coverage sprinklers with a nominal K-Factor of 5.6 (80 metric). Available in Dry Pendent, Dry Horizontal Sidewall, and Dry Upright configurations, Model F3QR56 Dry sprinklers all use a 3 mm glass bulb operating element. See the Temperature Ratings table in this Bulletin for available temperature ratings. Model F3QR56 Dry sprinklers are intended for installation on wet-pipe, dry-pipe, or preaction sprinkler systems in accordance with NFPA 13, FM Property Loss Prevention Data Sheets, and other applicable installation standards.

Model F3QR56 Dry Pendent and Sidewall sprinklers are available with a variety of escutcheon options as illustrated in Figs. 1 through 3 and Figs. 5 through 9. In addition, Model F3QR56 Dry Pendent sprinklers are also available with the Model CCP conical concealed cover plate as illustrated in Fig. 4. Available sprinkler, escutcheon, and cover plate finishes are identified in the Finishes table in this Bulletin. The Model F1 escutcheon, Model FP escutcheon, and Model CCP cover plate are the only recessed escutcheons and cover plate listed for use with Model F3QR56 Dry sprinklers; the use of any other recessed escutcheon or cover plate with Model F3QR56 Dry sprinklers will void all guarantees, warranties, listings and approvals.



Pendent  
(See Fig. 1)



Pendent / HB  
(See Fig. 2)



Recessed FP Pendent  
(See Fig. 3)



Concealed  
(See Fig. 4)



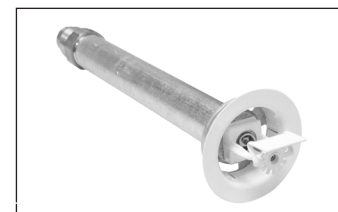
Recessed F1 Pendent  
(See Fig. 5)



Horizontal Sidewall  
(See Fig. 6)



Horizontal Sidewall / HB  
(See Fig. 7)



Recessed FP  
Horizontal Sidewall  
(See Fig. 8)



Recessed F1  
Horizontal Sidewall  
(See Fig. 9)



Upright  
(See Fig. 10)



Inlet fittings are available with 1" NPT, ISO 7-1R1, 3/4" NPT, or ISO7-1R3/4 threads. Sprinklers with 3/4" NPT and ISO7-1R3/4 inlet fittings are intended primarily for replacement of existing 3/4" or ISO7-1R3/4 inlet dry sprinklers, but may also be used in new installations.

See the Available Configurations, Listings, and Approvals table in this Bulletin for further information on Model F3QR56 Dry sprinklers.

### Available Configurations, Listings, and Approvals

Sprinkler Model	Escutcheon or Cover Plate	Available Length (See Figs. 1-9)	Listings and Approvals <sup>(1)</sup>	Inlet Threads	Sprinkler Identification Number (SIN)
F3QR56 Dry Pendent	Standard Escutcheon	2" to 36" (50 to 900 mm)	cULus, NYC	3/4" NPT or ISO7-1R3/4	R5714
	HB Extended Escutcheon	3-1/2" to 36" (90 to 900 mm)			
	F1 Recessed Escutcheon				
	FP Recessed Escutcheon				
	CCP Cover Plate				
	Standard Escutcheon	2" to 48" (50 to 1200 mm)	cULus, FM, NYC	1" NPT or ISO7-1R1	
	HB Extended Escutcheon	3-1/2" to 48" (90 to 1200 mm)			
	F1 Recessed Escutcheon				
	FP Recessed Escutcheon				
	CCP Cover Plate				
F3QR56 Dry Horizontal Sidewall	Standard Escutcheon	2" to 48" (50 to 1200 mm)	cULus <sup>(2)</sup> , NYC <sup>(2)</sup>	3/4" NPT or ISO7-1R3/4	R5734
	HB Extended Escutcheon	3-1/2" to 48" (90 to 1200 mm)			
	F1 Recessed Escutcheon				
	FP Recessed Escutcheon				
	Standard Escutcheon	2" to 48" (50 to 1200 mm)	cULus <sup>(2)</sup> , FM <sup>(3)</sup> , NYC <sup>(2)</sup>	1" NPT or ISO7-1R1	
	HB Extended Escutcheon	3-1/2" to 48" (90 to 1200 mm)			
	F1 Recessed Escutcheon	3-1/2" to 48" (90 to 1200 mm)	cULus <sup>(2)</sup> , FM <sup>(3)(4)</sup> , NYC <sup>(2)</sup>		
	FP Recessed Escutcheon				
F3QR56 Dry Upright	N/A	5" to 48" (127 to 1200 mm)	cULus <sup>(2)</sup>	1" NPT or ISO7-1R1	R5724

<sup>(1)</sup> For available temperature ratings and finishes see the Temperature Ratings and Finishes tables, respectively, in this Bulletin.

<sup>(2)</sup> cULus Listing and NYC for Light Hazard and Ordinary Hazard only.

<sup>(3)</sup> FM Approved for Light Hazard only.

<sup>(4)</sup> Model F3QR56 Dry Horizontal Sidewall with Model F1 or Model FP recessed escutcheon are FM Approved as Standard Response.

## Listing and Approval Agencies

See the Available Configurations, Listings, and Approvals table in this Bulletin for listings and approvals applicable to each available configuration.

1. Listed by Underwriters Laboratories, Inc. and UL Certified for Canada (cULus)
2. Certified by FM Approvals (FM)
3. Permitted in New York City based on UL Listing per Local Law 33/2007 (NYC)

## Technical Data

Nominal K-Factor: 5.6 gpm/psi<sup>1/2</sup> (80 L/min/bar<sup>1/2</sup>)

Sprinkler	Listing or Approval	Deflector to Ceiling Distance	Maximum Working Pressure
F3QR56 Dry Pendent	cULus, NYC	See note below	250 psi (17.2 bar)
	FM	See note below	175 psi (12 bar)
F3QR56 Dry Horizontal Sidewall	cULus, NYC	4" to 6 "	250 psi (17.2 bar)
		4" to 12"	175 psi (12 bar)
	FM	See note below	175 psi (12 bar)
F3QR56 Dry Upright	cULus	See note below	175 psi (12 bar)

**Note:** Deflector distance to be in accordance with applicable NFPA, FM, or other agency requirements. Information is provided only when additional clarification is necessary.

Temperature Classification	Glass Bulb Color	Sprinkler Temperature Rating	Cover Plate Temperature Rating	Maximum Ceiling Temperature	Listings and Approvals <sup>(1)</sup>
Ordinary	Orange	135°F (57°C)	135°F (57°C)	100°F (38°C)	cULus, FM, NYC
	Red	155°F (68°C)			
Intermediate	Yellow	175°F (79°C)	165°F (74°C)	150°F (66°C)	cULus, NYC
Intermediate	Green	200°F (93°C)	165°F (74°C)	150°F (66°C)	cULus, FM, NYC
High	Blue	286°F (141°C)	None	225°F (107°C)	cULus, FM <sup>(2)</sup> , NYC
			165°F (74°C)	150°F (66°C)	cULus, NYC

<sup>(1)</sup> For listed and approved sprinkler, escutcheon, and inlet configurations see the Available Configurations, Listings, and Approvals table in this Bulletin.

<sup>(2)</sup> High temperature classification is FM Approved with Standard and Model HB escutcheons only.

## Finish Notes

1. Finishes vary with type of trim selected. See table provided with each sprinkler detail for finish combinations.
2. Paint or any other coating applied over the factory finish will void all approvals and warranties.
3. Other finishes and colors may be available on special order. Consult your Reliable sales representative for details.
4. For Standard, Model HB, and Model F1 trims, both components of escutcheon are finished.
5. For Model FP and CCP trims, only the trim ring and cover plate are finished. The threaded sprinkler cup is unfinished.

Model F3QR56 Dry Pendent Sprinkler with Standard Escutcheon (SIN R5714)

"A" Dim.	2" to 48" (51mm to 1219mm) in 1/4" (6mm) increments for 1" connections or
	2" to 36" (51mm to 914mm) in 1/4" (6mm) increments for 3/4" connections

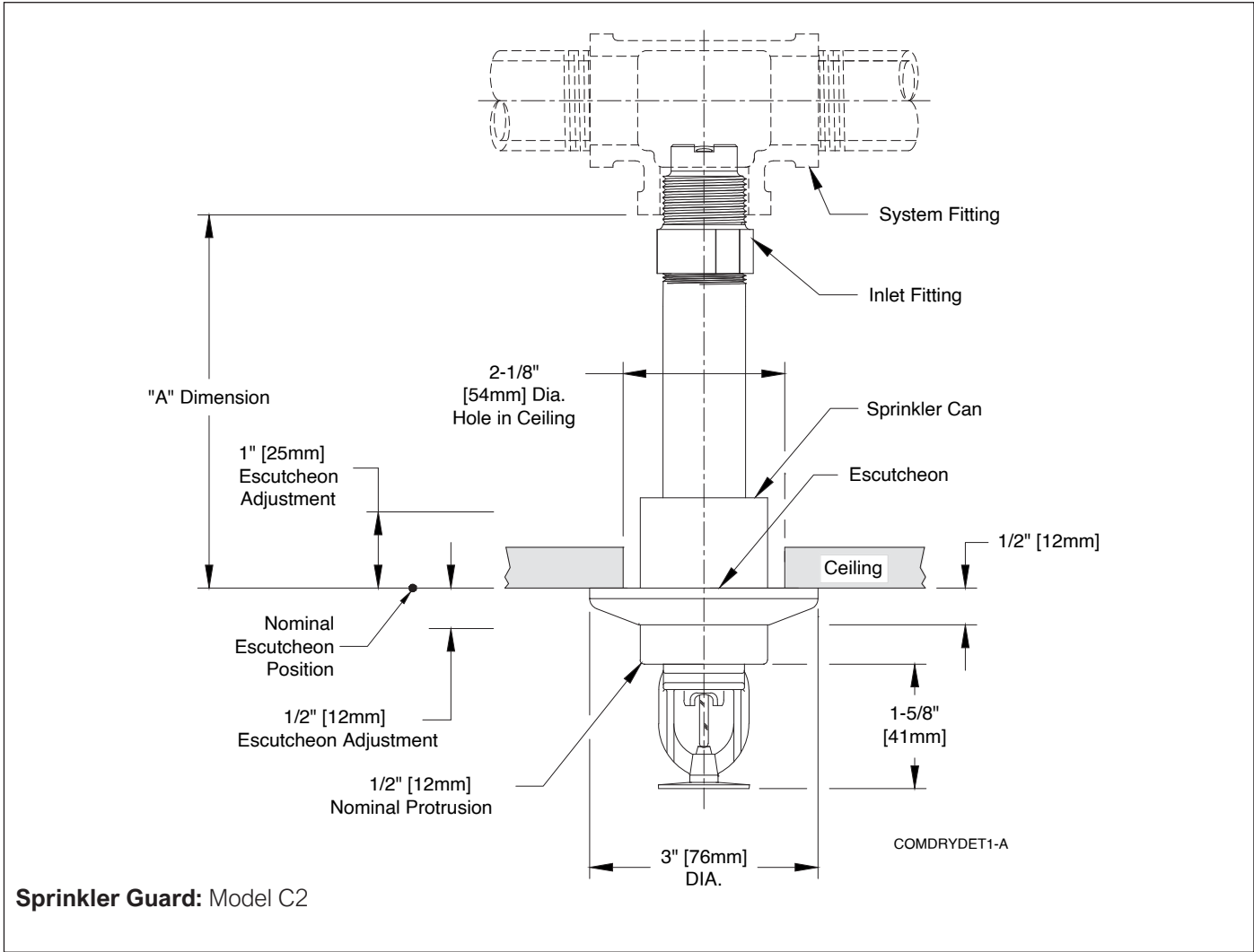


Fig. 1

**Note:** The sprinkler can protrudes 1/2" (12mm) when escutcheon is in nominal position. Escutcheon adjustment provides -1/2" (12mm) to +1" (25mm) "A" dimension adjustment range.

Finish Combinations: Standard Escutcheon	
Sprinkler	Escutcheon <sup>(2)(3)</sup>
Bronze	Polished Stainless
Bronze	Laquered Brass
Chrome	Polished Stainless
White Polyester <sup>(1)</sup>	White Polyester
Black Polyester <sup>(1)</sup>	Black Polyester
Custom Color Polyester <sup>(1)</sup>	Custom Color Polyester
Electroless Nickel PTFE <sup>(4)</sup>	Polished Stainless

- Notes:**
1. UL Listed as Corrosion Resistant.
  2. Escutcheons do not carry corrosion resistant listings.
  3. Base material is 316 stainless steel unless noted.
  4. FM Approved as Corrosion Resistant.

**Model F3QR56 Dry Pendent Sprinkler with Model HB Extended Escutcheon (SIN R5714)**

<b>"A" Dim.</b>	3½" to 48" (89mm to 1219mm) in 1/4" (6mm) increments for 1" connections or 3½" to 36" (89mm to 914mm) in 1/4" (6mm) increments for 3/4" connections
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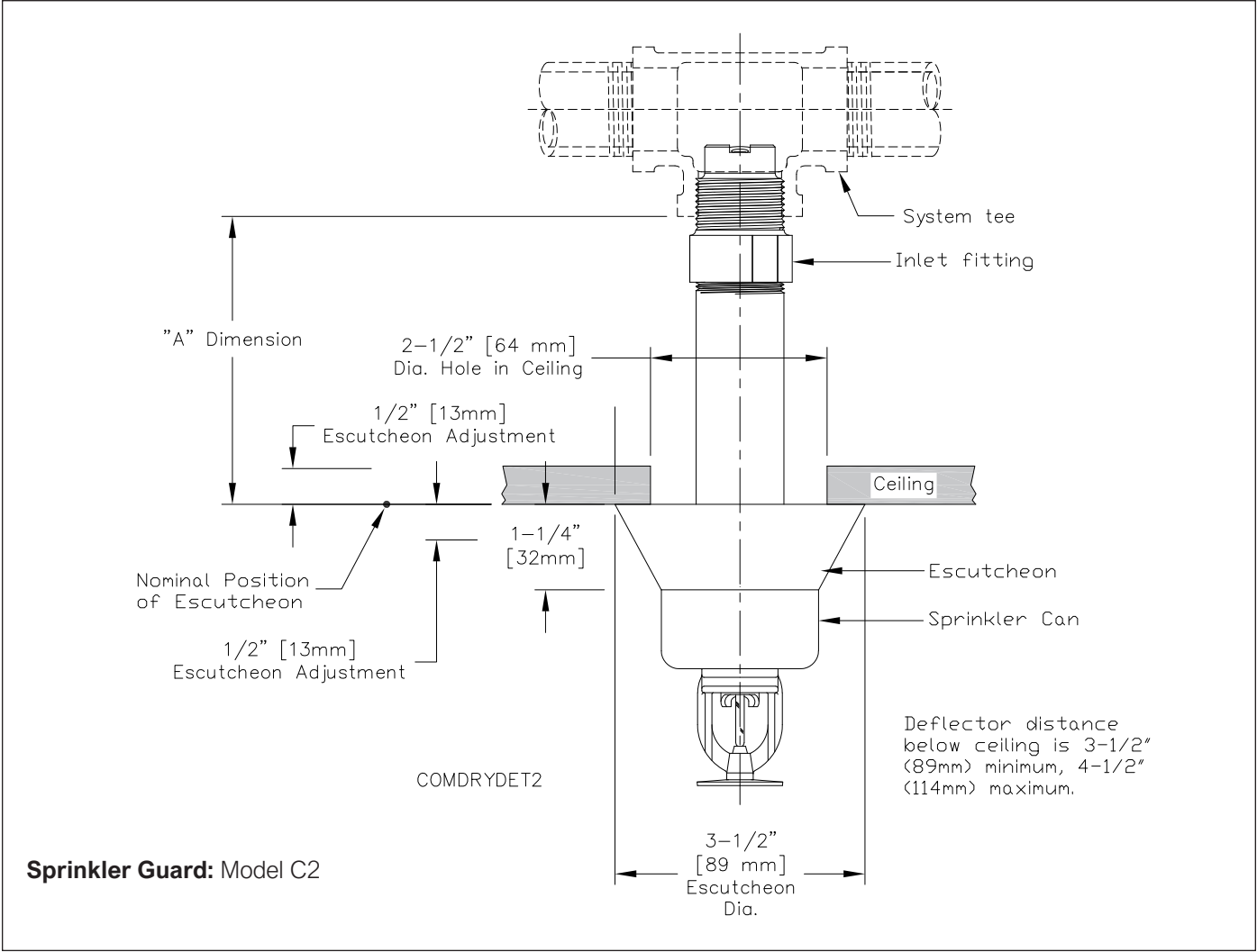


Fig. 2

**Note:** The sprinkler can protrudes 1¼" when escutcheon is in nominal position. Escutcheon adjustment provides -½" (-12.7mm) to +½" (+12.7mm) "A" dimension adjustment range.

Finish Combinations: HB Escutcheon	
Sprinkler	Escutcheon <sup>(2)(3)</sup>
Bronze	Chrome
Chrome	Chrome
White Polyester <sup>(1)</sup>	White Polyester
Black Polyester <sup>(1)</sup>	Black Polyester
Custom Color Polyester <sup>(1)</sup>	Custom Color Polyester
Electroless Nickel PTFE <sup>(1)(4)</sup>	Stainless Steel

- Notes:**
1. UL Listed as Corrosion Resistant.
  2. Escutcheons do not carry corrosion resistant listings.
  3. Base material is cold rolled steel unless noted.
  4. FM Approved as Corrosion Resistant.

**Model F3QR56 Dry Pendent Sprinkler with Model FP Recessed Escutcheon (SIN R5714)**

<b>"A" Dim.</b>	3 1/2" to 48" (89mm to 1219mm) in 1/4" (6mm) increments for 1" connections or
	3 1/2" to 36" (89mm to 914mm) in 1/4" (6mm) increments for 3/4" connections

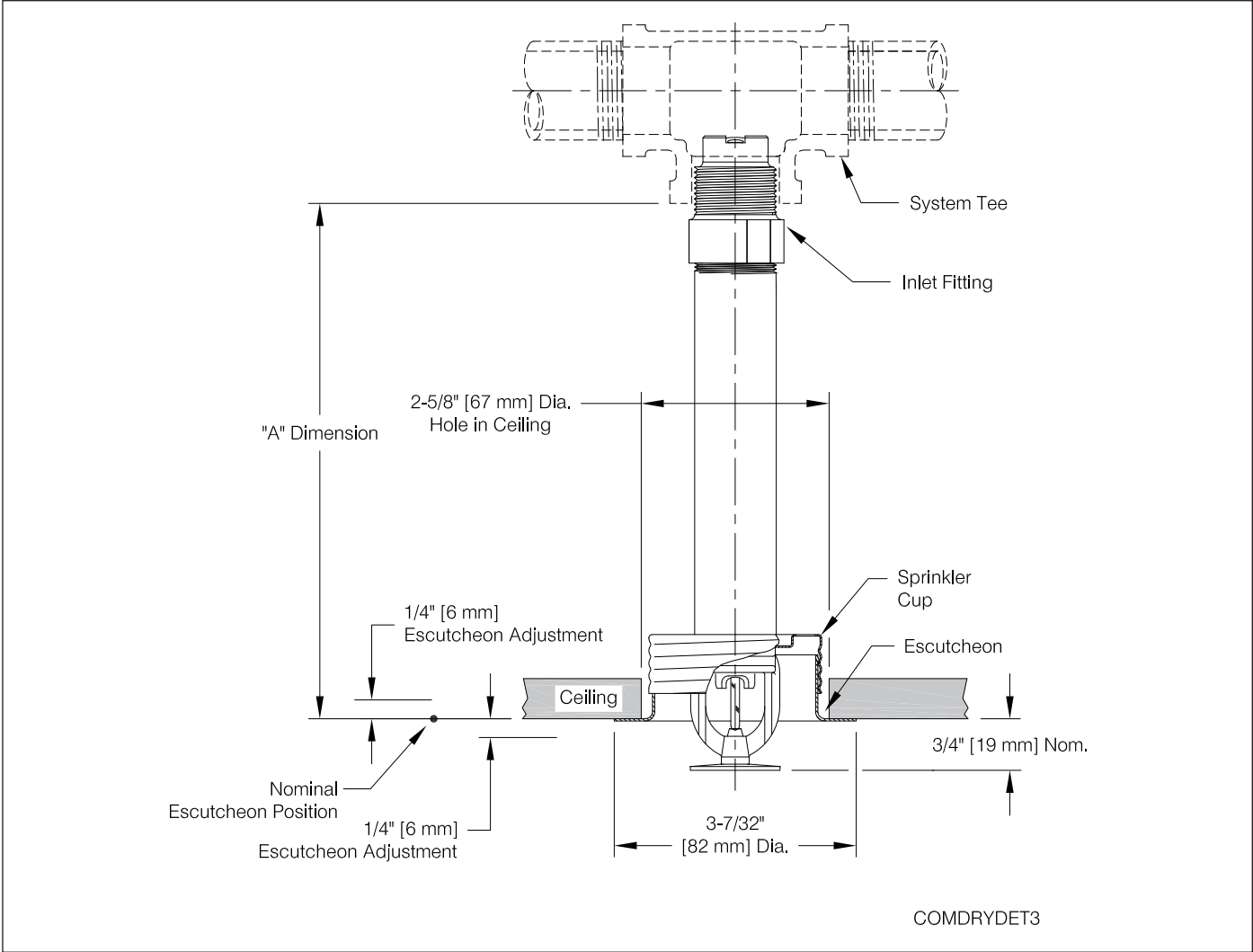


Fig. 3

**Note:** Do not install the Model F3QR56 Dry Pendent sprinkler with the Model FP escutcheon in ceilings which have positive pressure in the space above.

Finish Combinations: FP Recessed Escutcheon	
Sprinkler <sup>(1)</sup>	Escutcheon <sup>(3)(4)</sup>
Bronze	Chrome
Bronze	Brass
Chrome	Chrome
White Polyester <sup>(2)</sup>	White Polyester
Black Polyester <sup>(2)</sup>	Black Polyester
Custom Color Polyester <sup>(2)</sup>	Custom Color Polyester
Electroless Nickel PTFE <sup>(2)(5)</sup>	Stainless Steel

**Notes:**

1. Cup for FP Recessed is unfinished galvanized steel except electroless nickel PTFE sprinkler uses a stainless steel cup.
2. UL Listed as Corrosion Resistant.
3. Escutcheons do not carry corrosion resistant listings.
4. Base material is cold rolled steel unless noted.
5. FM Approved as Corrosion Resistant.

**Model F3QR56 Dry Pendent Sprinkler with Model CCP Cover Plate (SIN R5714)**

<b>"A" Dim.</b>	3 1/2" to 48" (89mm to 1219mm) in 1/4" (6mm) increments for 1" connections or
	3 1/2" to 36" (89mm to 914mm) in 1/4" (6mm) increments for 3/4" connections

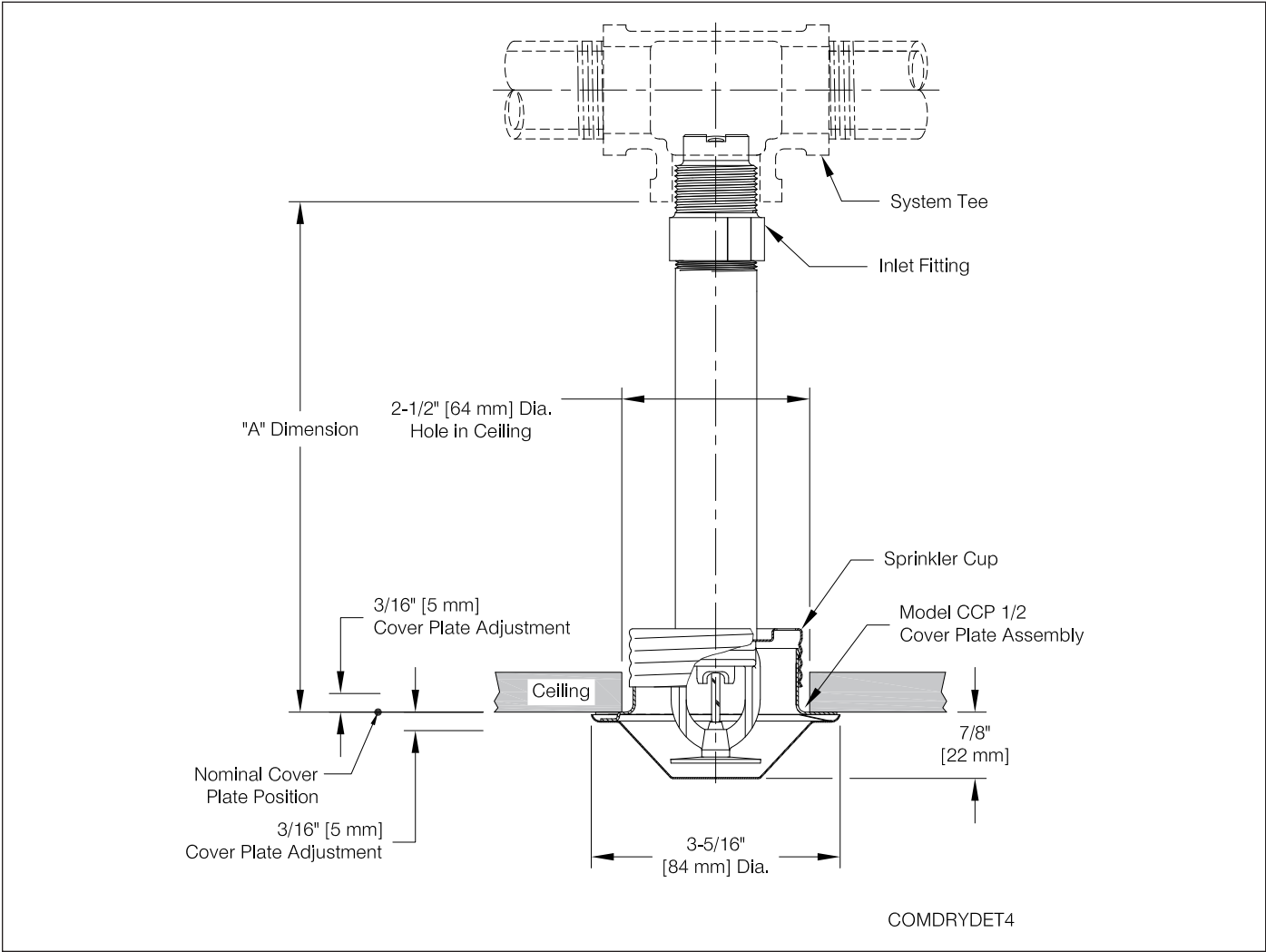


Fig. 4

**Note:** Do not install the Model F3QR56 Dry Pendent sprinkler with the Model CCP cover plate in ceilings which have positive pressure in the space above.

Finish Combinations: CCP Conical Cover Plate	
Sprinkler	Cover Plate <sup>(2)</sup>
Bronze	White Polyester
	Chrome Bright
	Chrome Dull
	Bright Brass
	Unfinished Bronze
	Custom Color

**Notes:**

1. Cup for CCP Concealed in unfinished galvanized steel.
2. Cover plates do not carry corrosion resistant listings.

## Model F3QR56 Dry Pendent Sprinkler with Model F1 Recessed Escutcheon (SIN R5714)

"A" Dim.	3½" to 48" (89mm to 1219mm) in ¼" (6mm) increments for 1" connections or
	3½" to 36" (89mm to 914mm) in ¼" (6mm) increments for ¾" connections.

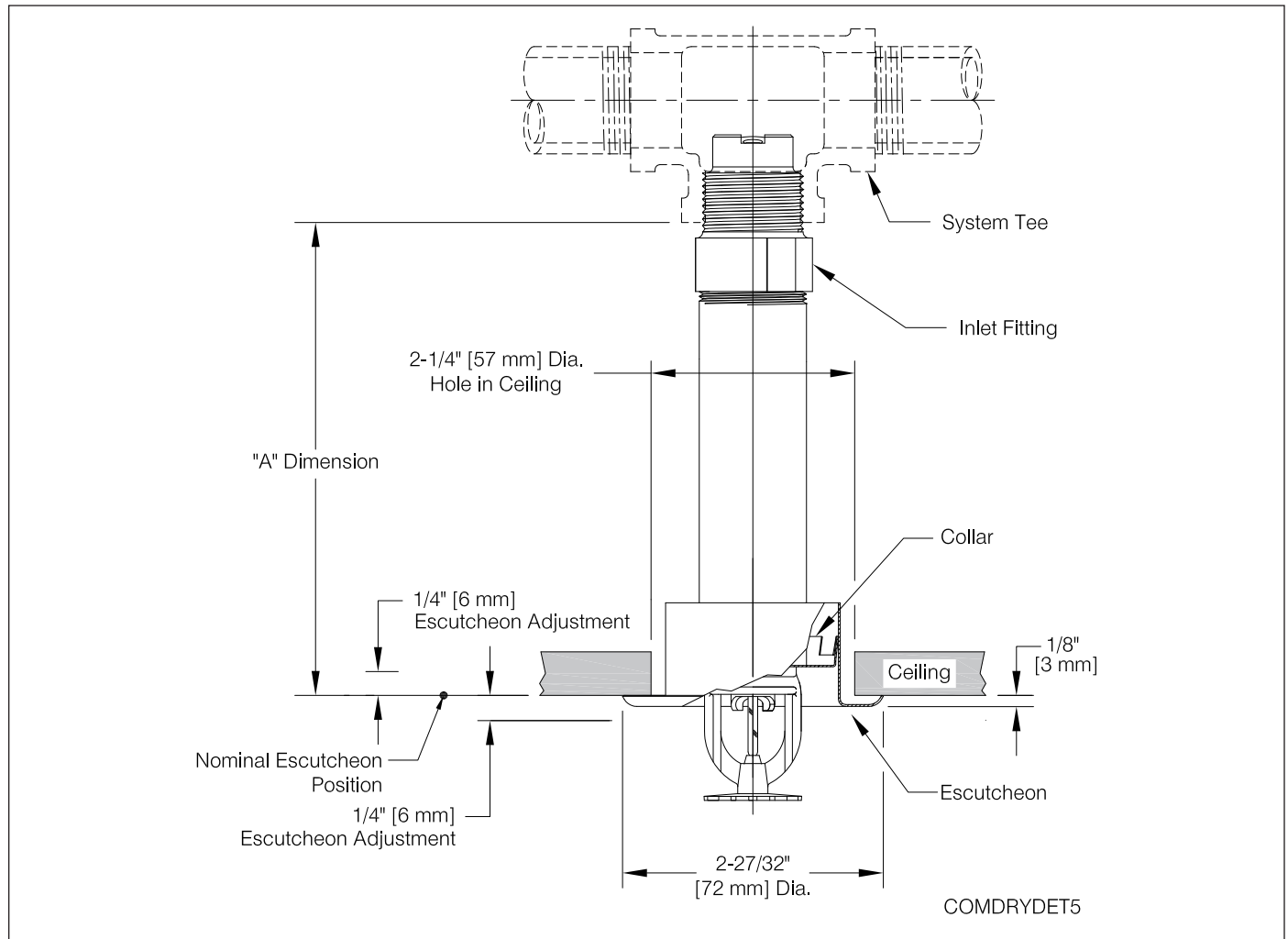


Fig. 5

Finish Combinations: F1 Recessed Escutcheon	
Sprinkler	Escutcheon <sup>(2)(3)</sup>
Bronze	Chrome
Bronze	Brass
Chrome	Chrome
White Polyester <sup>(1)</sup>	White Polyester
Black Polyester <sup>(1)</sup>	Black Polyester
Custom Color Polyester <sup>(1)</sup>	Custom Color Polyester
Electroless Nickel PTFE <sup>(1)(4)</sup>	Stainless Steel

### Notes:

1. UL Listed as Corrosion Resistant.
2. Escutcheons do not carry corrosion resistant listings.
3. Base material is cold rolled steel unless noted.
4. FM Approved as Corrosion Resistant.

**Model F3QR56 Dry Horizontal Sidewall Sprinkler with Standard Escutcheon (SIN R5734)**

<b>"A" Dim.</b>	2" to 48" (51mm to 1219mm) in 1/4" (6mm) increments for 1" connections or 2"
	to 36" (51mm to 914mm) in 1/4" (6mm) increments for 3/4" connections

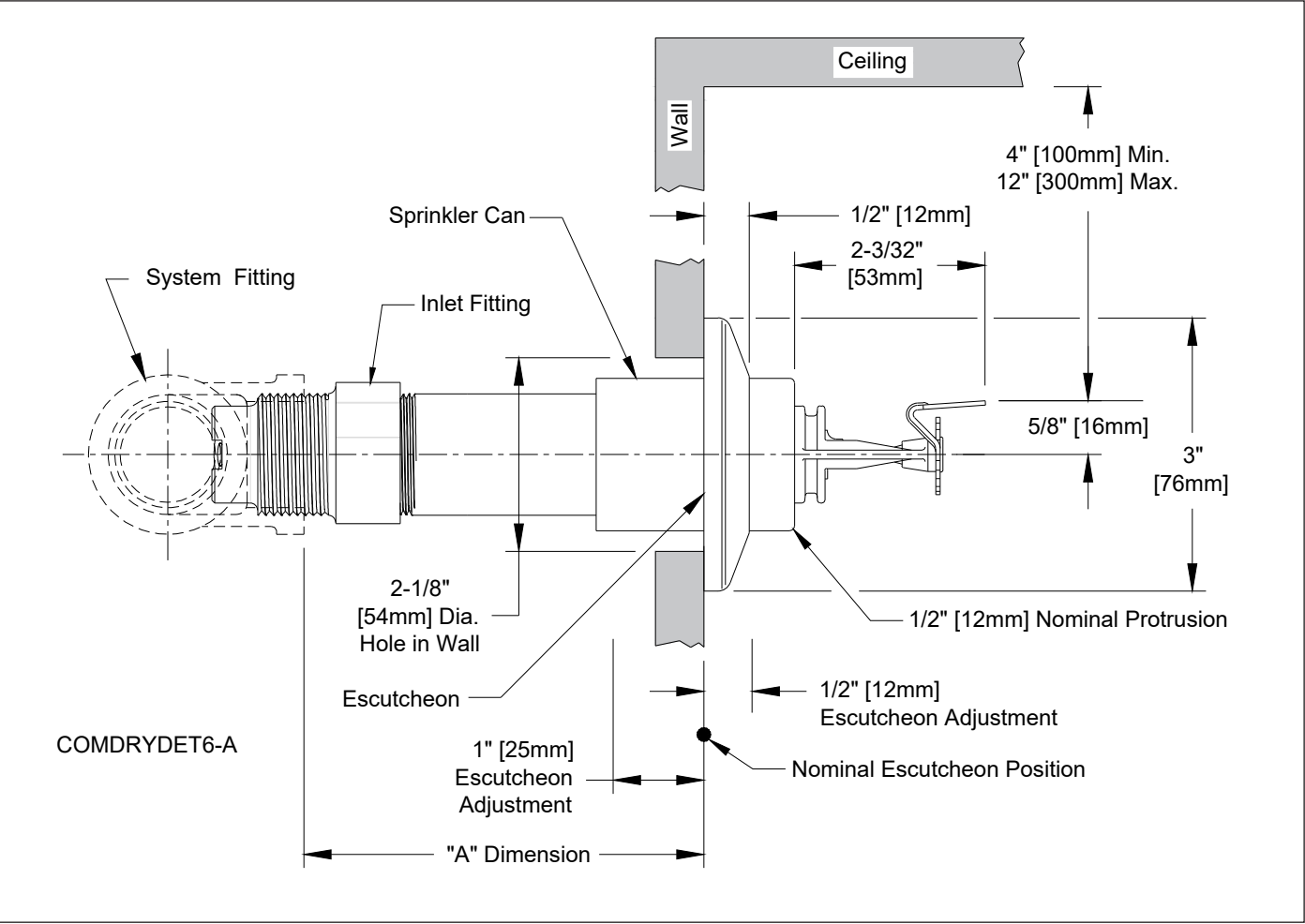


Fig. 6

**Note:** The sprinkler can protrudes 1/2" when escutcheon is in nominal position. Escutcheon adjustment provides -1/2" (-12mm) to +1" (25mm) "A" dimension adjustment range.

Finish Combinations: Standard Escutcheon	
Sprinkler	Escutcheon <sup>(2)(3)</sup>
Bronze	Polished Stainless
Bronze	Laquered Brass
Chrome	Polished Stainless
White Polyester <sup>(1)</sup>	White Polyester
Black Polyester <sup>(1)</sup>	Black Polyester
Custom Color Polyester <sup>(1)</sup>	Custom Color Polyester
Electroless Nickel PTFE <sup>(1)(4)</sup>	Polished Stainless

- Notes:**
1. UL Listed as Corrosion Resistant.
  2. Escutcheons do not carry corrosion resistant listings.
  3. Base material is 316 stainless steel unless noted.
  4. FM Approved as Corrosion Resistant.



**Model F3QR56 Dry Horizontal Sidewall Sprinkler with Model HB Escutcheon (SIN R5734)**

<b>"A" Dim.</b>	3 1/2" to 48" (89mm to 1219mm) in 1/4" (6mm) increments for 1" connections or 3 1/2" to 36" (89mm to 914mm) in 1/4" (6mm) increments for 3/4" connections
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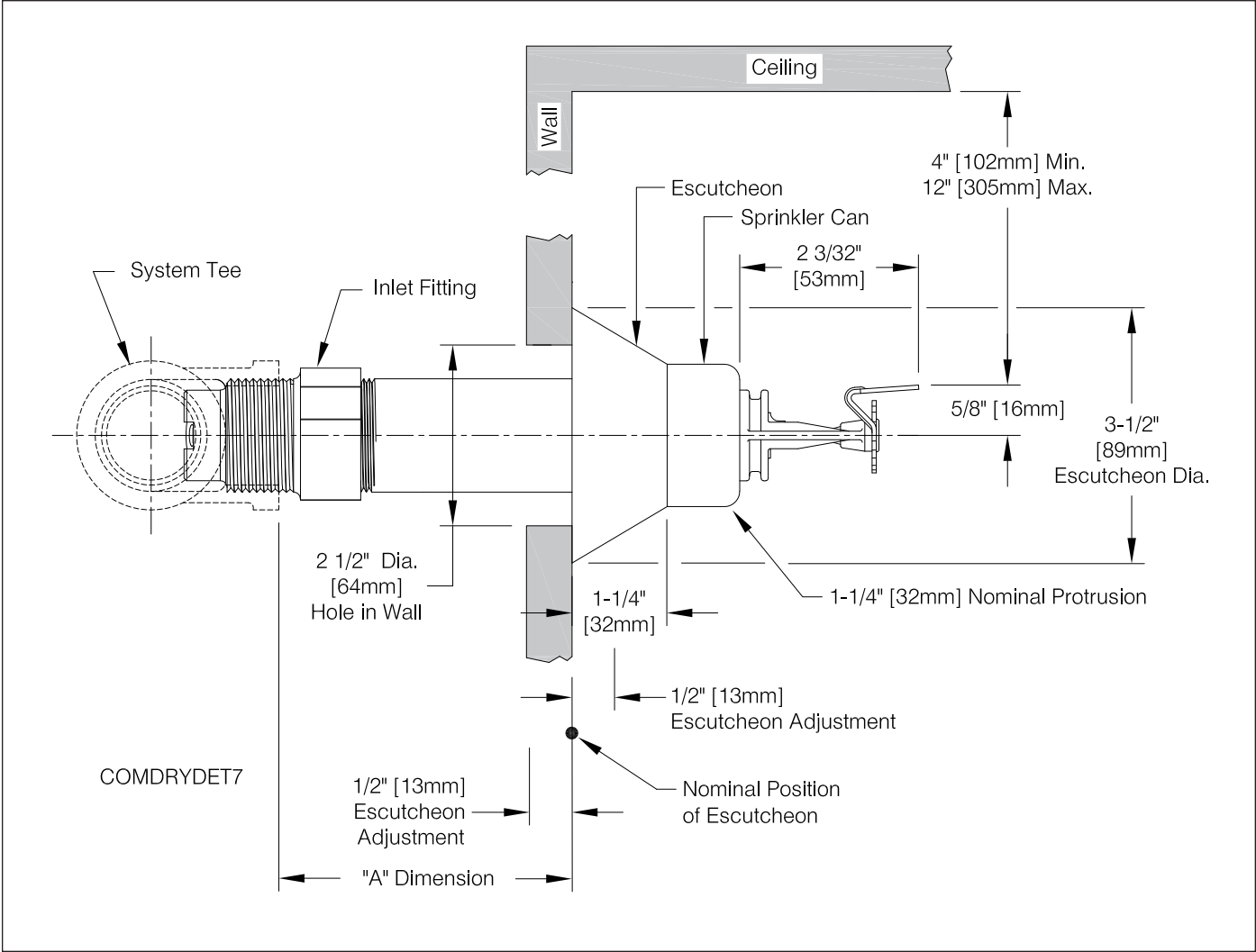


Fig. 7

**Note:** The sprinkler can protrudes 1 1/4" when escutcheon is in nominal position. Escutcheon adjustment provides -1/2" (-12.7mm) to +1/2" (+12.7mm) "A" dimension adjustment range.

Finish Combinations: HB Escutcheon	
Sprinkler	Escutcheon <sup>(2)(3)</sup>
Bronze	Chrome
Chrome	Chrome
White Polyester <sup>(1)</sup>	White Polyester
Black Polyester <sup>(1)</sup>	Black Polyester
Custom Color Polyester <sup>(1)</sup>	Custom Color Polyester
Electroless Nickel PTFE <sup>(1)(4)</sup>	Stainless Steel

- Notes:**
1. UL Listed as Corrosion Resistant.
  2. Escutcheons do not carry corrosion resistant listings.
  3. Base material is cold rolled steel unless noted.
  4. FM Approved as Corrosion Resistant.

## Model F3QR56 Dry Horizontal Sidewall Sprinkler with Model FP Recessed Escutcheon (SIN R5734)

<b>"A" Dim.</b>	3 1/2" to 48" (89mm to 1219mm) in 1/4" (6mm) increments for 1" connections or
	3 1/2" to 36" (89mm to 914mm) in 1/4" (6mm) increments for 3/4" connections

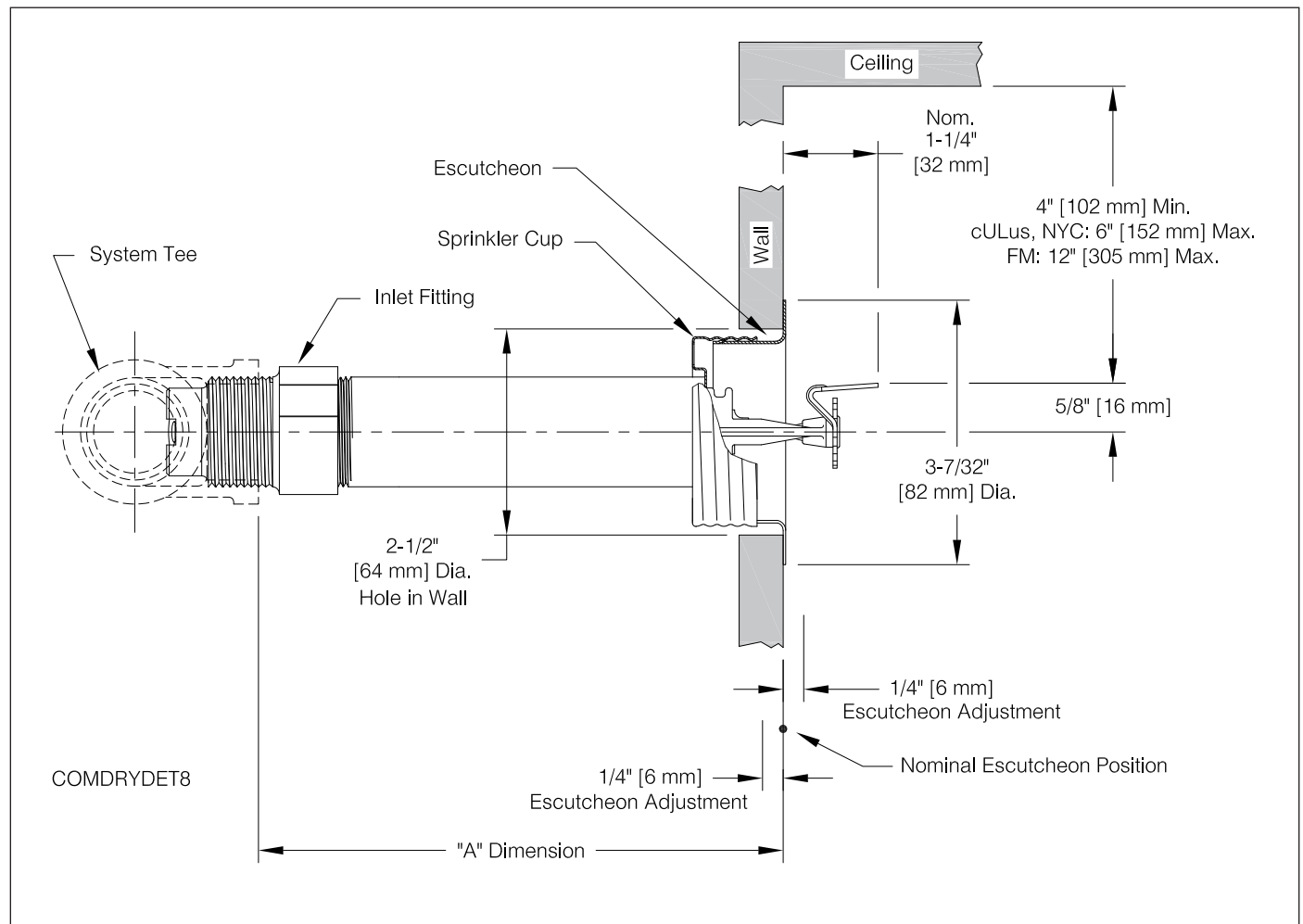


Fig. 8

**Note:** Do not install the Model F3QR56 Dry Horizontal Sidewall sprinkler with the Model FP escutcheon in walls which are positively pressurized with respect to the protected space.

Finish Combinations: FP Recessed Escutcheon	
Sprinkler <sup>(1)</sup>	Escutcheon <sup>(3)(4)</sup>
Bronze	Chrome
Bronze	Brass
Chrome	Chrome
White Polyester <sup>(2)</sup>	White Polyester
Black Polyester <sup>(2)</sup>	Black Polyester
Custom Color Polyester <sup>(2)</sup>	Custom Color Polyester
Electroless Nickel PTFE <sup>(2)(5)</sup>	Stainless Steel

### Notes:

1. Cup for FP Recessed is unfinished galvanized steel except electroless nickel PTFE sprinkler uses a stainless steel cup.
2. UL Listed as Corrosion Resistant.
3. Escutcheons do not carry corrosion resistant listings.
4. Base material is cold rolled steel unless noted.
5. FM Approved as Corrosion Resistant.

## Model F3QR56 Dry Horizontal Sidewall Sprinkler with Model F1 Recessed Escutcheon (SIN R5734)

"A" Dim.	3 1/2" to 48" (89mm to 1219mm) in 1/4" (6mm) increments for 1" connections or 3 1/2"
	to 36" (89mm to 914mm) in 1/4" (6mm) increments for 3/4" connections

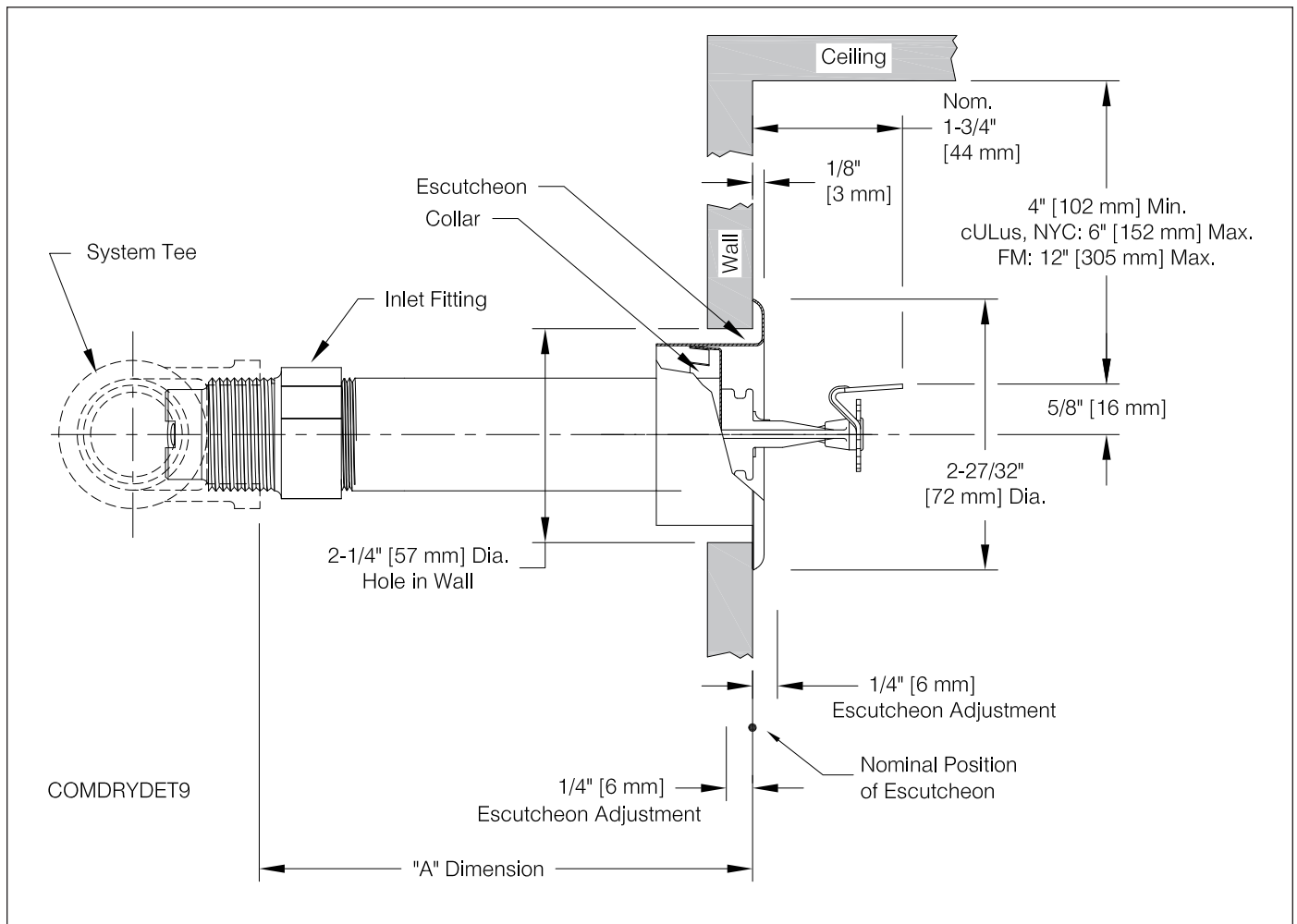


Fig. 9

Finish Combinations: F1 Recessed Escutcheon	
Sprinkler	Escutcheon <sup>(2)(3)</sup>
Bronze	Chrome
Bronze	Brass
Chrome	Chrome
White Polyester <sup>(1)</sup>	White Polyester
Black Polyester <sup>(1)</sup>	Black Polyester
Custom Color Polyester <sup>(1)</sup>	Custom Color Polyester
Electroless Nickel PTFE <sup>(1)(4)</sup>	Stainless Steel

### Notes:

1. UL Listed as Corrosion Resistant.
2. Escutcheons do not carry corrosion resistant listings.
3. Base material is cold rolled steel unless noted.
4. FM Approved as Corrosion Resistant.

**Model F3QR56 Dry Upright (SIN 5724)**  
Order Dimensions 5" to 48" (127 mm to 1219 mm)

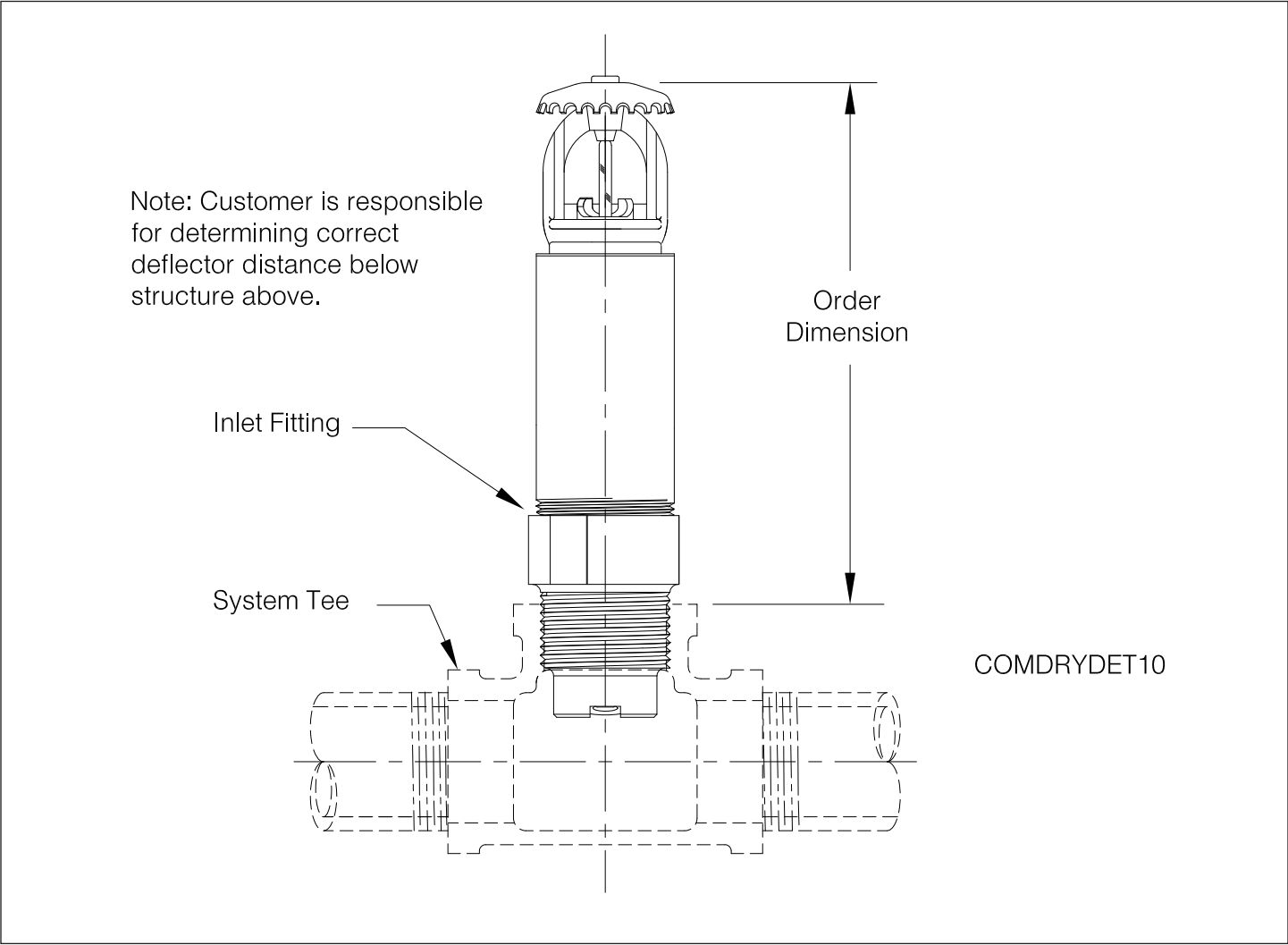


Fig. 10

Finish Combinations: Upright	
Sprinkler	Escutcheon
Bronze	NA
Electroless Nickel PTFE <sup>(1)</sup>	NA

- Notes:**
- 1. UL Listed as Corrosion Resistant.
  - 2. Escutcheons do not carry corrosion resistant listings.
  - 3. Base material is cold rolled steel unless noted.

## MINIMUM EXPOSED BARREL LENGTH WHEN CONNECTED TO WET PIPE SPRINKLER SYSTEM

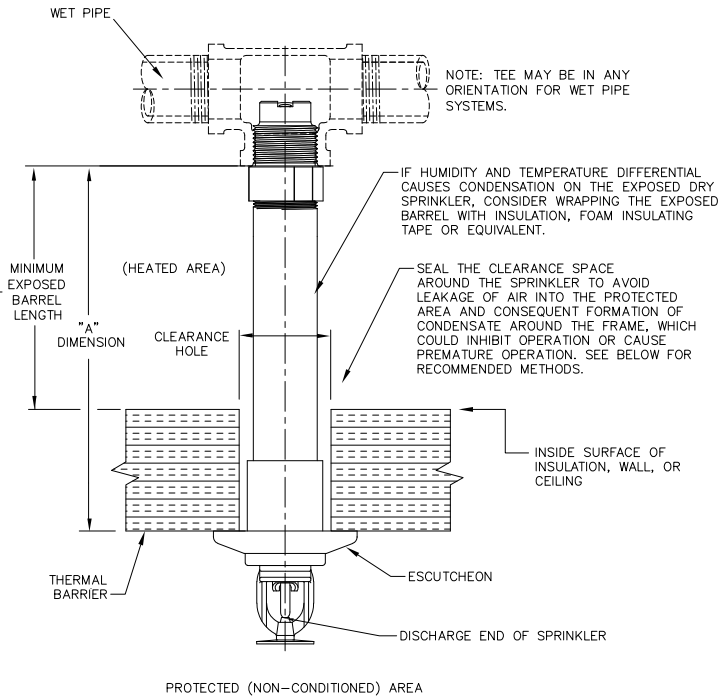
NOTE: STANDARD DRY PENDENT IS SHOWN, HOWEVER, MINIMUM EXPOSED BARREL LENGTH APPLIES TO ALL STYLES OF DRY SPRINKLERS CONNECTED TO A WET PIPE SYSTEM.

AMBIENT TEMPERATURE EXPOSED TO DISCHARGE END OF SPRINKLER*	EXPOSED BARREL AMBIENT TEMPERATURE		
	40°F/4°C	50°F/10°C	60°F/16°C
	EXPOSED MINIMUM BARREL LENGTH** (FACE OF FITTING TO TOP OF CEILING)***		
	IN. (MM)	IN. (MM)	IN. (MM)
40°F (4°C)	0	0	0
30°F (-1°C)	0	0	0
20°F (-7°C)	4 (100)	0	0
10°F (-12°C)	8 (200)	1 (25)	0
0°F (-18°C)	12 (300)	3 (75)	0
-10°F (-23°C)	14 (350)	4 (100)	1 (25)
-20°F (-29°C)	14 (350)	6 (150)	3 (75)
-30°F (-34°C)	16 (400)	8 (200)	4 (100)
-40°F (-40°C)	18 (450)	8 (200)	4 (100)
-50°F (-46°C)	20 (500)	10 (250)	6 (150)
-60°F (-51°C)	20 (500)	10 (250)	6 (150)

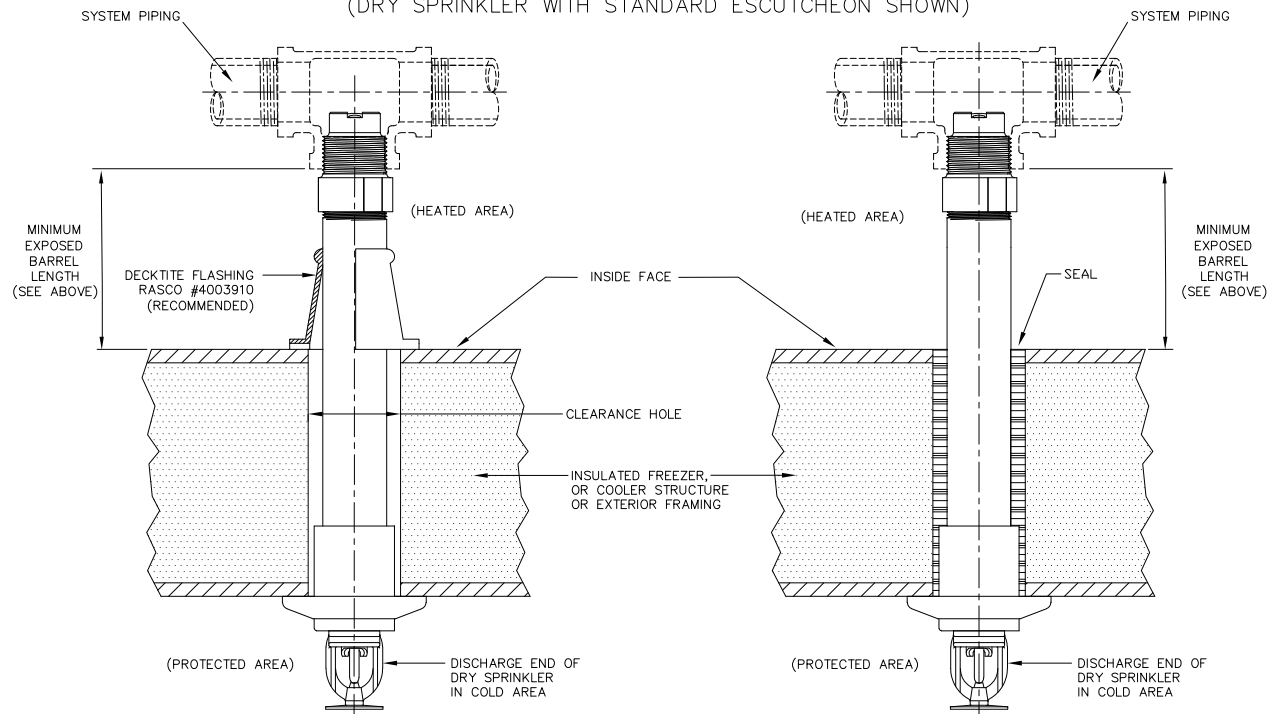
\* FOR AMBIENT TEMPERATURES EXPOSED TO THE DISCHARGE END OF THE SPRINKLER THAT OCCUR BETWEEN THE VALUES LISTED, USE THE NEXT COOLER TEMPERATURE.

\*\* THE MINIMUM EXPOSED BARREL LENGTH IS NOT THE SAME AS THE "A" DIMENSION. THE MINIMUM EXPOSED BARREL LENGTH IS BASED ON A PROPERLY SEALED PENETRATION WITH A MAXIMUM WIND VELOCITY ON THE EXPOSED SPRINKLER OF 30 MPH (48 KM/H). LONGER EXPOSED BARREL LENGTHS WILL HELP AVOID FREEZING OF THE WET PIPING WHERE HIGHER WIND VELOCITY IS EXPECTED.

\*\*\* THE MINIMUM EXPOSED BARREL LENGTH IS MEASURED FROM THE FACE OF THE FITTING TO THE INSIDE FACE OF THE INSULATION, WALL, OR CEILING LEADING TO THE COLD SPACE, WHICHEVER IS CLOSEST TO THE FITTING.



## RECOMMENDED DRY SPRINKLER SEAL ARRANGEMENTS (DRY SPRINKLER WITH STANDARD ESCUTCHEON SHOWN)



COMDRYDET11

Fig. 11

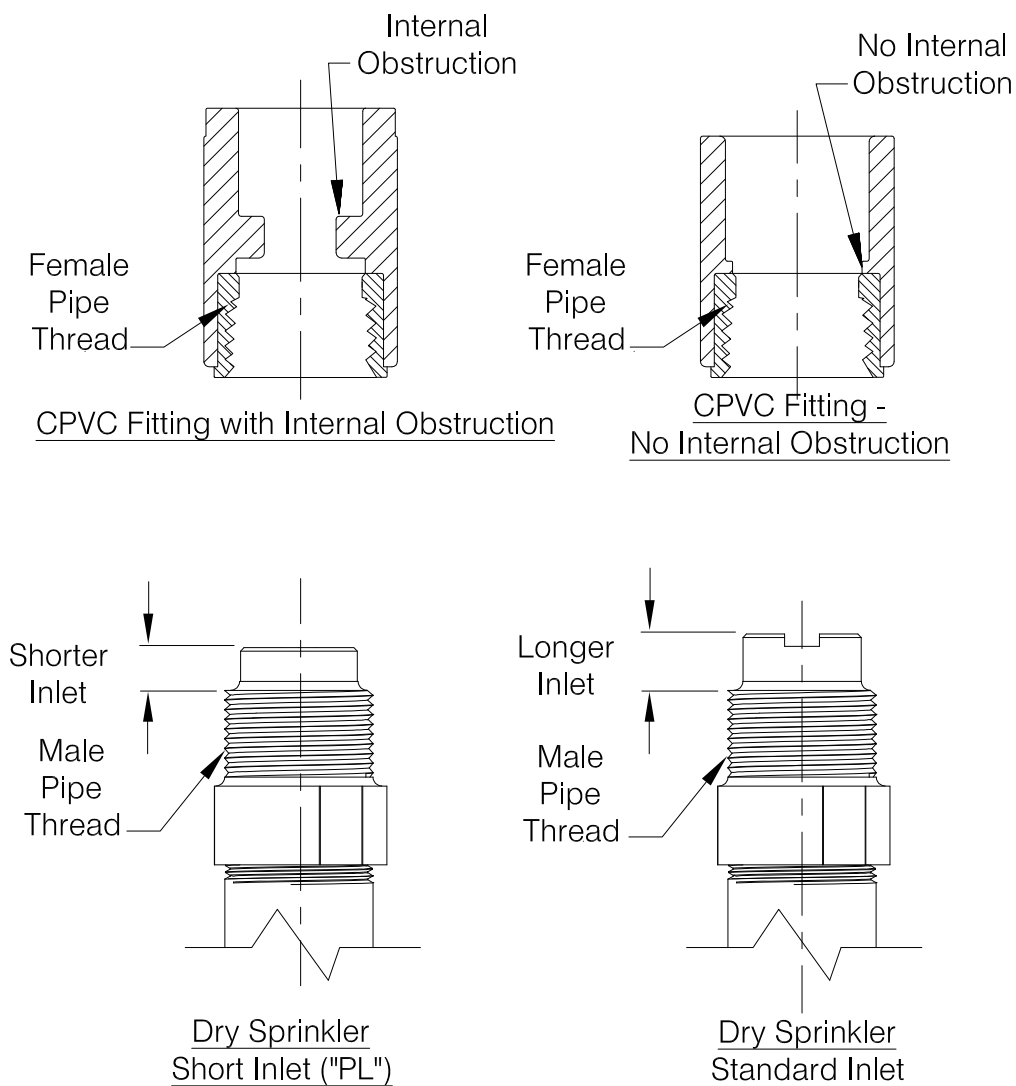
## **\*CAUTION\***

RELIABLE DRY SPRINKLERS MAY BE INSTALLED IN A LISTED CPVC SPRINKLER FITTING, ONLY UPON VERIFICATION THAT THE FITTING DOES NOT INTERFERE WITH THE SPRINKLER'S INLET.

Do not install dry sprinklers with standard inlets into CPVC fittings that have an internal obstruction; this will damage the sprinkler, the fitting, or both.

Short inlet ("PL") versions of Reliable dry sprinklers are available that may or may not be compatible with fittings having internal obstructions in existing installations. Sprinklers with the short inlet ("PL") should only be installed in CPVC fittings of wet-pipe systems.

In all cases, verify sprinkler and fitting dimensions prior to installation to avoid interference.



**BE SURE TO ORDER THE CORRECT SPRINKLERS FOR YOUR APPLICATION**

COMDRYDET2

Fig. 12

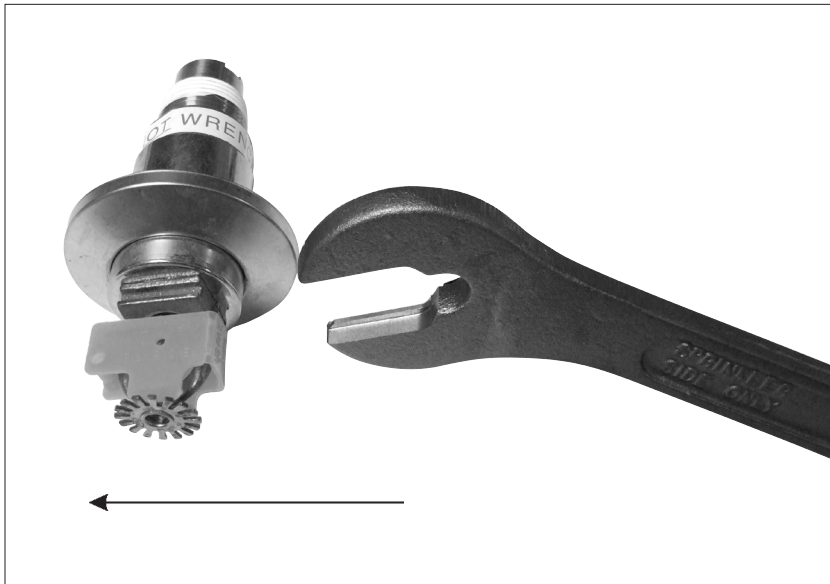


Fig. 13 - Model F3R Wrench

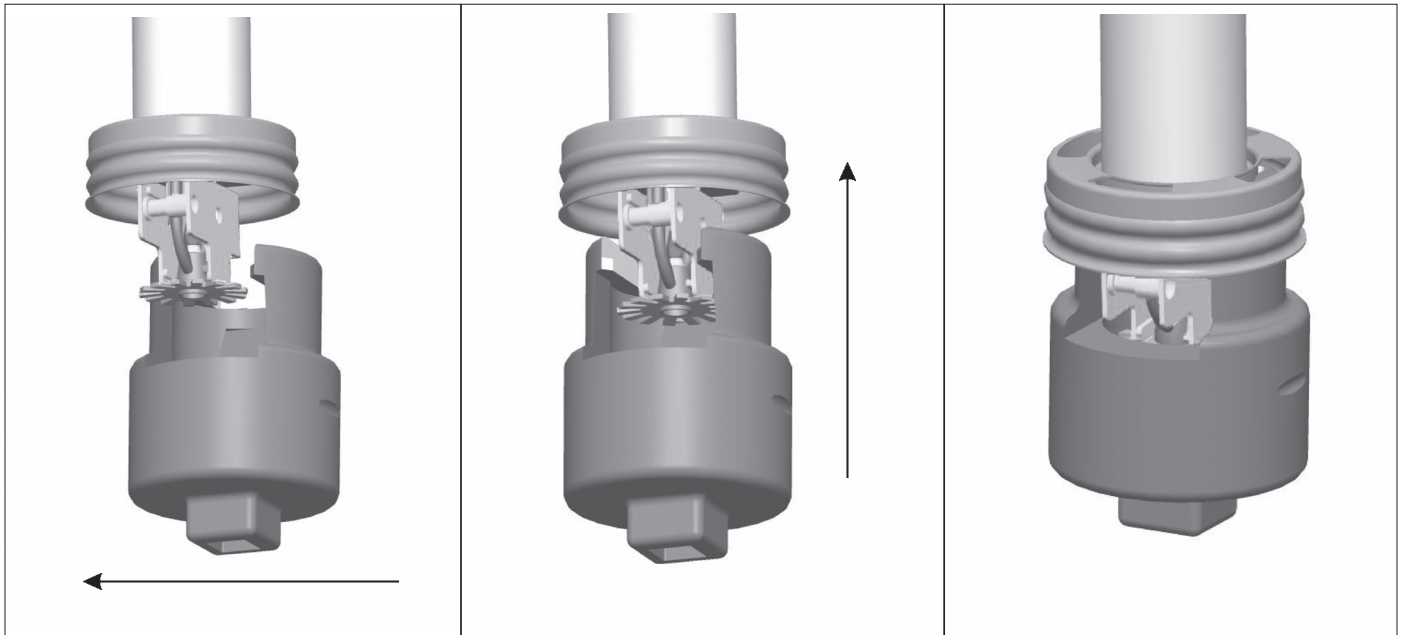
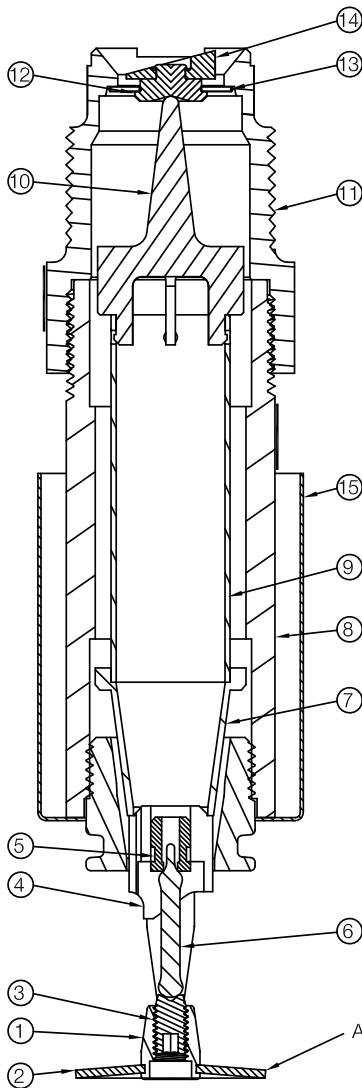


Fig. 14 - Model XLO2 Wrench

# MATERIAL SPECIFICATIONS



ITEM #	DESCRIPTION	MATERIAL SPECIFICATION
1	FRAME	BRASS PER UNS C83600
2	DEFLECTOR	BRONZE PER UNS C51000
3	LOAD SCREW	BRASS PER UNS C22000
4	SEAT ADAPTOR	BRASS ALLOY PER UNS C36000
5	BULB INSERT	COPPER ALLOY PER UNS C31400
6	GLASS BULB	GLASS W/GLYCERIN SOLUTION
7	ORIFICE ADAPTOR	BRASS ALLOY PER UNS C36000
8	OUTER TUBE	GALVANIZED STEEL
9	INNER TUBE	BRASS ALLOY PER UNS C23000
10	YOKE	BRASS ALLOY PER UNS C38000
11	INLET	BRASS ALLOY PER UNS C35330
12	CAP	BRASS ALLOY PER UNS C54400
13	SPRING WASHER/SEAL	PTFE COATED BERYLLIUM NICKEL
14	FLIP DISK	BRASS ALLOY PER UNS C54400
15	CAN/ESCUTCHEON	PAINTED OR PLATED MILD STEEL, EXCEPT FOR TYPE 316 STAINLESS STEEL FOR SPRINKLERS WITH ENT FINISH

(PIPE WRENCH MAY ONLY BE USED ON OUTER STEEL PIPE OF SPRINKLER)

COMDRYDET13

APPEARANCE OF DEFLECTOR MAY VARY DEPENDING ON MODEL

Fig. 15



## Installation Instructions

When used on wet pipe systems, Reliable Model F3QR56 dry sprinklers may be installed in ductile or malleable cast iron threaded tees, or CPVC tees and adapters upon verification that the sprinkler inlet fitting does not interfere with the interior of the fitting (see Figure 12).

When used on dry pipe systems, Reliable Model F3QR56 dry pendent sprinklers MUST ONLY BE installed in the outlets of ductile or malleable cast iron threaded tees on horizontal pipe such that the inlet of the sprinkler protrudes above the bottom level of the pipe.

When used on dry pipe systems, Reliable Model F3QR56 dry sidewall and dry upright sprinklers may be installed in ductile or malleable cast iron threaded tees, or CPVC tees and adapters upon verification that the sprinkler inlet fitting does not interfere with the interior of the fitting (see Figure 12).

DO NOT install Reliable dry sprinklers into elbows or couplings, welded outlets, mechanical tees, or gasket sealed CPVC fittings.

Dry sprinklers connected to wet pipe systems must be installed as indicated in Figure 11 and as required by NFPA 13 with the Exposed Minimum Barrel Length located in a heated area.

An orange protective clip is factory installed on the sprinkler to protect the glass bulb thermal element from damage. The clip should remain in place during installation of the sprinkler and be removed when the sprinkler system is placed in service. Sprinklers with 3/4" NPT and ISO7-1R3/4 inlets are supplied with a protective cap on the inlet that must be removed before installation.

### Use the following steps for installation:

1. Cut a hole in the wall or ceiling directly in-line with the outlet of the fitting. See the Installation Data table for the recommended hole diameter based on the escutcheon or cover plate option selected.
2. Apply pipe joint compound or PTFE tape to the male threads of the sprinkler's inlet fitting.
3. Install the sprinkler in the fitting using the installation wrench specified in the Installation Data table. The Model F3R wrench is designed to be inserted into the grooves in the sprinkler's wrench boss as shown in Fig. 13. The Model XLO2 wrench is designed to fit into the cup and engage the wrench boss as shown in Fig. 14. Do NOT wrench any part of the sprinkler assembly other than the wrench boss. When inserting or removing the wrench from the sprinkler, care should be taken to prevent damage to the sprinkler. The sprinkler is then tightened into the pipe fitting to achieve a leak free connection. The recommended minimum to maximum installation torque is 22 - 30 lb-ft (30 – 40 N-m) for 1" NPT and ISO7-1R1 sprinklers, and 14 - 20 lb-ft (19 – 27 N-m) for 3/4" NPT and ISO7-1R3/4 sprinklers.

- 3a. Alternatively, where access to the outer tube of the sprinkler is available, the Model F3QR56 Dry sprinkler may be installed using a pipe wrench. The pipe wrench shall only be permitted to interface with the galvanized steel outer tube portion of the sprinkler (Item #8 in Fig. 15). Do NOT wrench any other portion of the sprinkler assembly. A pipe wrench can install the sprinkler into the fitting with a large amount of torque; consideration should be given to the need for future removal of the sprinkler because the installation torque will have to be matched or exceeded to remove the sprinkler. The recommended minimum to maximum installation torque is 22 - 30 lb-ft (30 – 40 N-m) for 1" NPT and ISO7-1R1 sprinklers, and 14 - 20 lb-ft (19 – 27 N-m) for 3/4" NPT and ISO7-1R3/4 sprinklers.
4. Standard and Model HB escutcheons can be installed by slipping the escutcheon over the can until the escutcheon is seated against the ceiling or wall. Model F1 escutcheons are installed by pressing the escutcheon onto the collar until the escutcheon is seated against the ceiling or wall. The Model FP escutcheon is installed by pressing or threading the escutcheon into the cup by hand; the escutcheon can be tightened against the ceiling or wall by turning the escutcheon in a clockwise direction and removed by turning the escutcheon in a counter-clockwise direction. To install the Model CCP cover plate, first remove the protective clip. Install the Model CCP cover plate on the sprinkler by pressing or threading the cover plate into the cup by hand; the cover plate can be tightened against the ceiling by turning the cover plate in a clockwise direction and removed by turning the cover plate in a counter-clockwise direction.
5. Remove the orange protective clip when placing the sprinkler system in service.

## Installation Data

Sprinkler Model	Escutcheon or Cover Plate	Suggested Hole Diameter in Wall or Ceiling	Installation Wrench	Required Centerline of Sprinkler Tube/Inlet to Finished Ceiling Vertical Dimension*
<b>F3QR56 Dry Pendent</b>	Standard Escutcheon	2-1/8" (54 mm)	F3R	Not Applicable
	HB Extended Escutcheon	2-1/2" (64 mm)	F3R	
	F1 Recessed Escutcheon	2-1/4" (57 mm)	XLO2	
	FP Recessed Escutcheon	2-1/2" (64 mm)	XLO2	
	CCP Cover Plate		XLO2	
<b>F3QR56 Dry Horizontal Sidewall</b>	Standard Escutcheon	2-1/8" (54 mm)	F3R	4-5/8" to 12-5/8" (118 mm to 321 mm)
	HB Extended Escutcheon	2-1/2" (64 mm)	F3R	
	F1 Recessed Escutcheon	2-1/4" (57 mm)	XLO2	cULus, NYC 4-5/8" to 6-5/8" (118 mm to 168 mm)
	FP Recessed Escutcheon	2-1/2" (64 mm)	XLO2	
	F1 Recessed Escutcheon	2-1/4" (57 mm)	XLO2	FM 4-5/8" to 12-5/8" (118 mm to 321 mm)
	FP Recessed Escutcheon	2-1/2" (64 mm)	XLO2	
<b>F3QR56 Dry Upright</b>	N/A	1-1/2" (38mm)	F3R	Not Applicable

**\*Note:** Based on 5/8" (16 mm) centerline of sprinkler tube/inlet to deflector vertical distance.

## Maintenance

The Model F3QR56 Dry Sprinklers should be inspected and the sprinkler system maintained in accordance with NFPA 25. Do not remove the factory applied thermally sensitive wax fillet between the bulb supporting cup and the wrenching boss. Do not replace this wax with a substitute substance.

An Alternate substance may interfere with proper operation of the sprinkler. Do not clean sprinklers with soap and water, ammonia or any other cleaning fluids. Remove dust by using a soft brush or gently vacuuming. Replace any sprinkler which has been painted (other than factory applied) or damaged in any way. A stock of spare sprinklers should be maintained to allow quick replacement of damaged or operated sprinklers. Prior to installation, sprinklers should be maintained in the original cartons and packaging until used to minimize the potential for damage to sprinklers that would cause improper operation or non-operation.

## Ordering Information

Specify:

1. Sprinkler: [Model F3QR56 Dry Pendent SIN R5714]  
[Model F3QR56 Dry Horizontal Sidewall SIN R5734]  
[Model F2QR Dry Upright SIN R5724]
2. Escutcheon/Cover Plate: [None][Standard escutcheon]  
[Model HB extended escutcheon][Model F1 recessed escutcheon][Model FP recessed escutcheon][Model CCP cover plate – pendent only]
3. Inlet Threads: [1" NPT][ISO7-1R1][3/4" NPT][ISO7-1R3/4]

4. Inlet Fitting: [Long – Standard Inlet Fitting][Short "PL" – Wet Pipe Systems only]
5. Sprinkler Temperature Rating: See Temperature Ratings Table
6. Sprinkler Finish: See Finish Combinations Table
7. Escutcheon/Cover Plate Finish: See Finish Combinations Table
8. Length:

\*For dry pendants and dry sidewalls: "A" Dimension is from face of tee to face of finished ceiling or wall in 1/4" (6mm) increments. See Fig. 1 through Fig. 9.

\*For dry uprights: Order dimension is from face of tee to top of deflector in 1/4" (6mm) increments. See Fig. 10.

### Notes:

1. For Dry Upright, customer is responsible for determining the correct deflector distance from structure above.
2. Length is based on normally gauged pipe thread "make-up" of .600" (15mm) per ANSI B2.1 (approximately 7-1/2 threads).

## Installation Wrench

Model F3R Sprinkler Wrench (Standard and HB escutcheons)  
Model XLO2 Sprinkler Wrench (FP Recessed and CCP Concealed)

The equipment presented in this bulletin is to be installed in accordance with the latest published Standards of the National Fire Protection Association, Factory Mutual Research Corporation, or other similar organizations and also with the provisions of governmental codes or ordinances whenever applicable.

Products manufactured and distributed by Reliable have been protecting life and property for almost 100 years.

Manufactured by



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P/N 9999970175

# VicFlex™ Style VS1 Dry Sprinkler

## Models V3505, V3506, V3509, V3510, V3517, V3518



### 1.0 PRODUCT DESCRIPTION

#### Style

- Pendent, Concealed Pendent, Horizontal Sidewall

#### K Factor

- 5.6/8.1 S.I.  
For system design purposes, no equivalent length calculations are required.

#### Sprinkler Length

- 38"/965 mm, 50"/1270 mm, 58"/1475 mm

#### Nominal Orifice Size

- ½"/13 mm

#### Maximum Working Pressure

- 175 psi/1200 kPa

#### Factory Hydrostatic Test

- 100% @ 500 psi/3450 kPa

#### Minimum Operating Pressure

- 7 psi/48 kPa

#### Connections

- To branch line (inlet) via 1"/25 mm NPT or 1" BSPT

#### Minimum Bend Radius:

- **UL:** 2"/51 mm
- **FM:** 7"/178 mm

#### Maximum Number of 90° Bends:

- **UL:** 4
- **FM:** 2 bends for 38", 3 bends for 50", 4 bends for 58"

#### Hazard Classifications

- Light and Ordinary Hazard

#### NOTE

- The VS1 is classified as a dry sprinkler and has no equivalent length.

ALWAYS REFER TO ANY NOTIFICATIONS AT THE END OF THIS DOCUMENT REGARDING PRODUCT INSTALLATION, MAINTENANCE OR SUPPORT.

System No.		Location	
Submitted By		Date	

Spec Section		Paragraph	
Approved		Date	

## 2.0 CERTIFICATION/LISTINGS



Approvals/Listings	Model								
	V3505	V3505	V3506	V3506	V3509	V3509	V3510	V3517	V3518
Orifice Size (inches)	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"
Orifice Size (mm)	13	13	13	13	13	13	13	13	13
Nominal K Factor Imperial	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
Nominal K Factor S.I.	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1
Response	Standard	Standard	Quick	Quick	Standard	Standard	Quick	Standard	Quick <sup>1</sup>
Deflector Type	Pendent	Recessed	Pendent	Recessed	Hor. SW	Rec. Hor. SW	Hor. SW, Recessed Hor. Sidewall	Conc. Pend.	Conc. Pend. w/Clean room gasket
Approved Temperature Ratings	F°/C°								
FM	135/57	135/57	135/57	135/57	135/57	135/57	135/57	–	135/57
	155/68	155/68	155/68	155/68	155/68	155/68	155/68	–	155/68
	175/79	175/79	175/79	175/79	175/79	175/79	175/79	–	175/79
	200/93	200/93	200/93	200/93	200/93	200/93	200/93	–	200/93
	286/141	–	–	–	286/141	–	–	–	–
UL	135/57	135/57	135/57	135/57	135/57	135/57	135/57	135/57	135/57
	155/68	155/68	155/68	155/68	155/68	155/68	155/68	155/68	155/68
	175/79	175/79	175/79	175/79	175/79	175/79	175/79	175/79	175/79
	200/93	200/93	200/93	200/93	200/93	200/93	200/93	200/93	200/93
	286/141	286/141	286/141	286/141	286/141	–	286/141	–	–

<sup>1</sup> Model V3518 is a Standard Response FM sprinkler.

## 3.0 MATERIAL SPECIFICATIONS

**Deflector:** Brass

**Bulb:** Glass with glycerin solution

**Bulb Nominal Diameter:**

**Quick Response:** 3.0 mm

**Standard Response:** 5.0 mm

**Split Spacers:** Stainless steel

**Load Screw:** Brass

**Pip Cap:** Stainless steel

**Spring Seal Assembly:** PTFE tape coated beryllium nickel and stainless steel

**Frame:** Brass

**Flexible Hose:** Stainless steel

**Collar/Weld Fitting:** Stainless steel

**Gasket Seal:** Victaulic EPDM

**Isolation Ring:** Nylon

**Hose Fittings:** Carbon steel, zinc-plated

**Inlet Fitting:** Brass

**Outer Tube:** Stainless steel

**Concealed Cup:** Carbon steel, zinc-plated

**Brackets:** Carbon steel, zinc-plated

## 3.1 ACCESSORIES SPECIFICATIONS

**Sprinkler Finishes:**

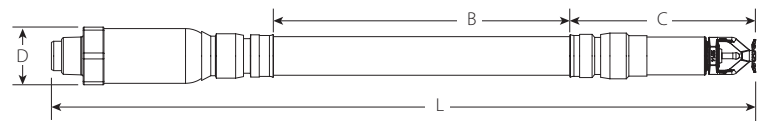
**Standard:** VC-250

White painted RAL 9010

4.0 DIMENSIONS

Product Details and Optional Components

Style VS1 Dry Sprinkler

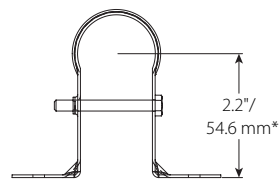
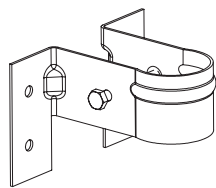


Sprinkler Length inches mm	Overall Length (pendent) L inches mm	Live Length B inches mm	Outlet End Length C inches mm	Maximum OD D inches mm
38 965	39.2 995	25.1 638	6.5 165	2.2 56
50 1270	51.2 1300	37.1 943	6.5 165	2.2 56
58 1475	59.2 1505	45.1 1145	6.5 165	2.2 56

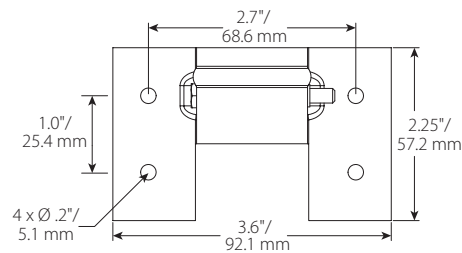
NOTE

- Add ½" to Overall Length and Outlet End Length for increased length of sidewall deflector

Style VB1 Bracket



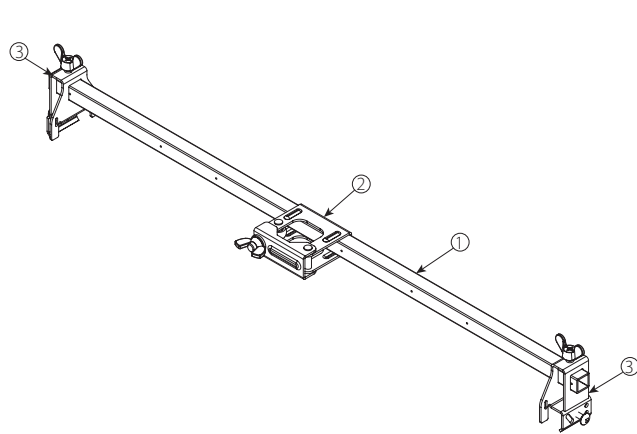
\*Note: Theoretical center point of sprinkler in bracket.



4.0 DIMENSIONS (CONTINUED)

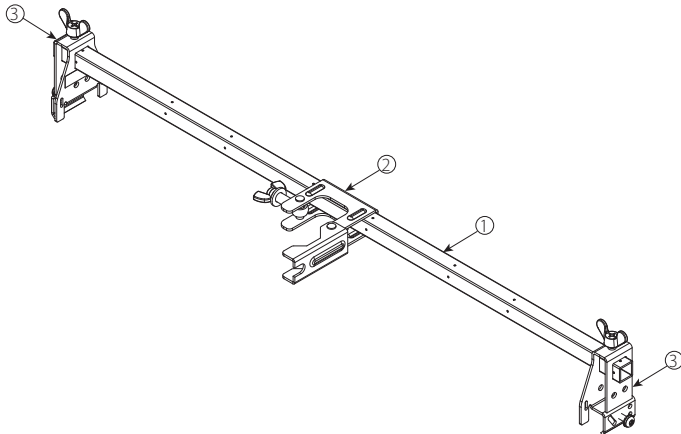
Style VB2 Bracket  
Recessed Pendent, Suspended Ceilings

Item	Description
1	24"/610 mm or 48"/1220 mm Square Bar
2	Patented 1-Bee Center Bracket
3	End Bracket



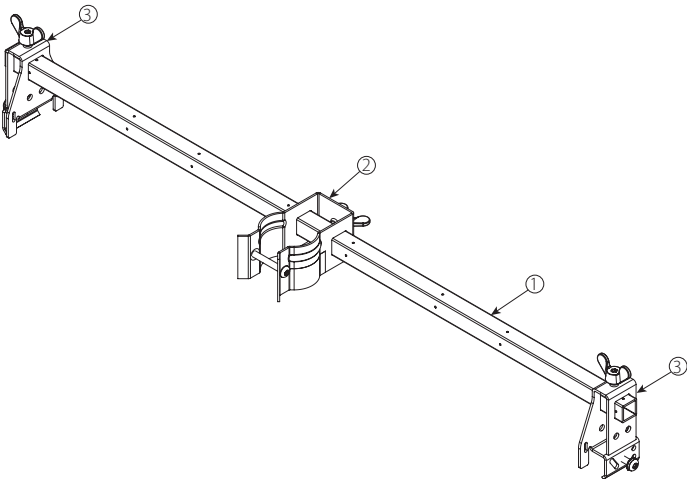
Style VB3 Bracket  
Concealed Pendent, Suspended Ceilings

Item	Description
1	24"/610 mm or 48"/1220 mm Square Bar
2	Patented 1-Bee Center Bracket
3	End Bracket



Style VB4 Bracket  
Sleeve and Skirt Pendent, Suspended Ceilings

Item	Description
1	24"/610 mm or 48"/1220 mm Square Bar
2	Center Bracket
3	End Bracket



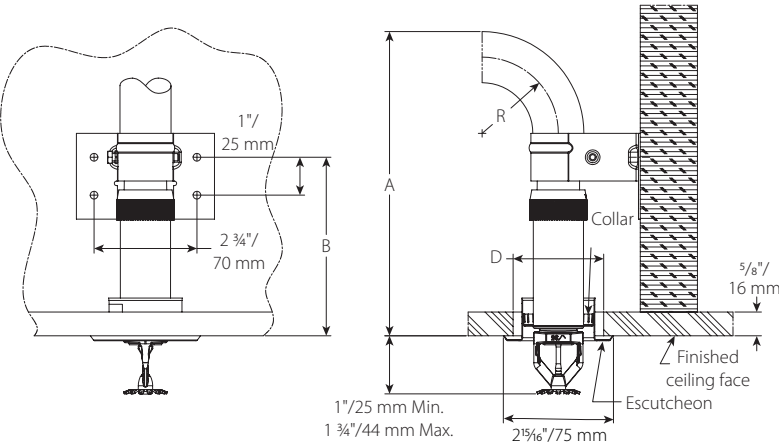
## 4.1 DIMENSIONS

### Sprinkler Finishes: Dimensions and Mounting Conditions

**NOTE**

- Drawings are shown with 5/8" finished ceiling thickness. Adjustments to "B" and "C" dimensions will be required if finished ceiling thickness deviate from drawing.

**Recessed Pendent:**



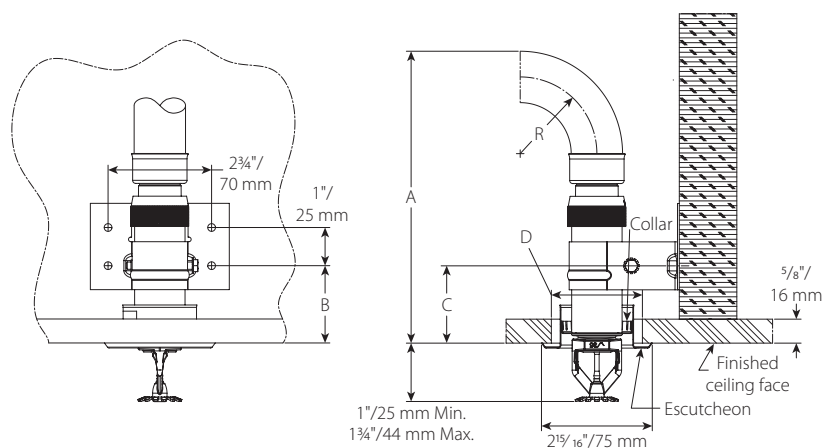
Clearance Chart		
Dimension	inches mm	
"R" Minimum Bend Radius	2 50	7 175
"A" Minimum Required Installation Space	7 5/8 193	12 5/8 320
"B" Mounting Screw Hole Location	4 3/4 119	
Ceiling Hole Diameter "D"	2 - 2 3/8 50 - 60	

**NOTE**

- Dimensions are shown with 3/4" escutcheon at middle of height adjustment range.

## 4.2 DIMENSIONS

### Recessed Pendant Alternative Bracket Location



Clearance Chart		
Dimension	inches mm	
"R" Minimum Bend Radius	2 50	7 175
"A" Minimum Required Installation Space	7 5/8 193	12 5/8 320
"B" Mounting Screw Hole Location	2 50	
Ceiling Hole Diameter "D"	2 – 2 3/8 50 – 60	

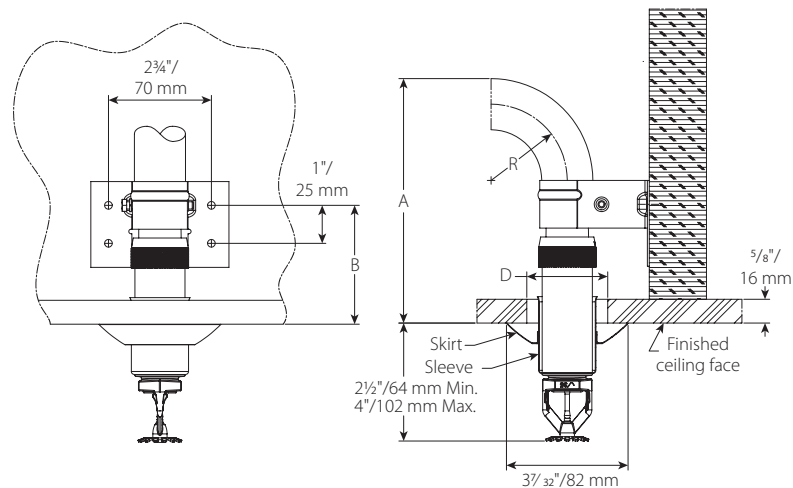
#### NOTE

- Dimensions are shown with 3/4" escutcheon at middle of height adjustment range.



4.3 DIMENSIONS

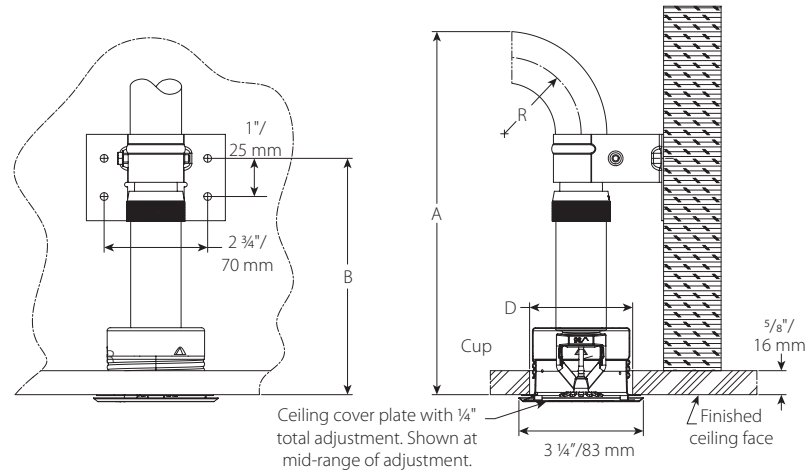
Sleeve and Skirt Pendent



Clearance Chart		
Dimension	inches mm	
"R" Minimum Bend Radius	2 50	7 175
"A" Minimum Required Installation Space	6 1/2 163	11 1/2 290
"B" Mounting Screw Hole Location	3 1/8 79	
Ceiling Hole Diameter "D"	1 3/4 – 2 1/8 44 – 54	

4.4 DIMENSIONS

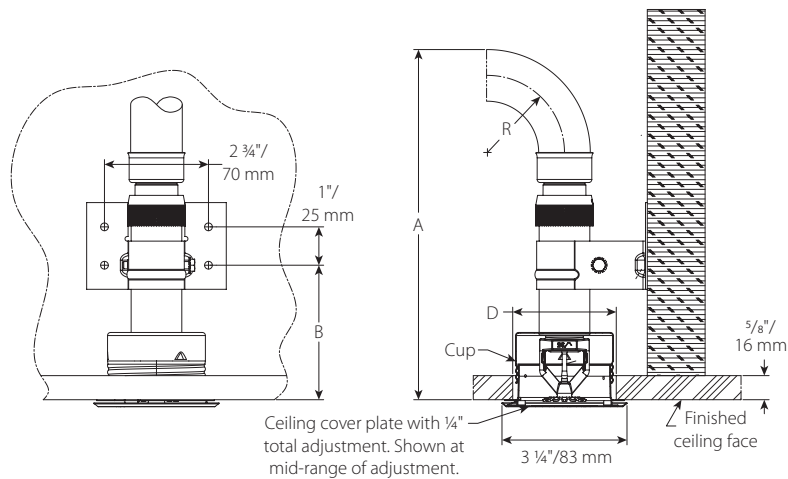
Concealed Pendent



Clearance Chart		
Dimension	inches mm	
"R" Minimum Bend Radius	2 50	7 175
"A" Minimum Required Installation Space	9 1/2 241	14 1/2 369
"B" Mounting Screw Hole Location	6 1/4 157	
Ceiling Hole Diameter "D"	2 5/8 – 2 3/4 67 – 70	

## 4.5 DIMENSIONS

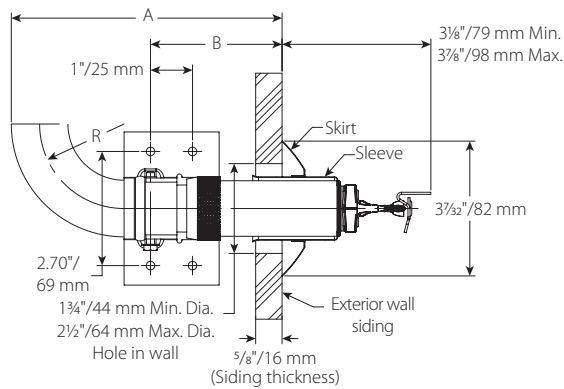
### Concealed Pendent Alternative Bracket Location



Clearance Chart		
Dimension	inches mm	
"R" Minimum Bend Radius	2 50	7 175
"A" Minimum Required Installation Space	9 1/8 231	14 1/8 358
"B" Mounting Screw Hole Location	3 1/2 89	
Ceiling Hole Diameter "D"	2 5/8 – 2 3/4 67 – 70	

## 4.6 DIMENSIONS

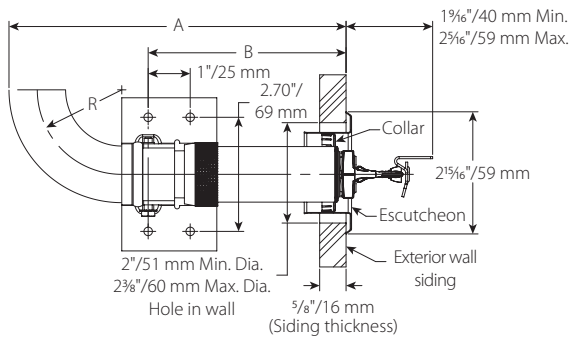
### Sleeve and Skirt Sidewall



Clearance Chart		
Dimension	inches mm	
"R" Minimum Bend Radius	2 50	7 175
"A" Minimum Required Installation Space	6 1/2 163	11 1/2 290
"B" Mounting Screw Hole Location	3 1/8 79	
Ceiling Hole Diameter "D"	1 3/4 – 2 1/8 44 – 54	

4.7 DIMENSIONS

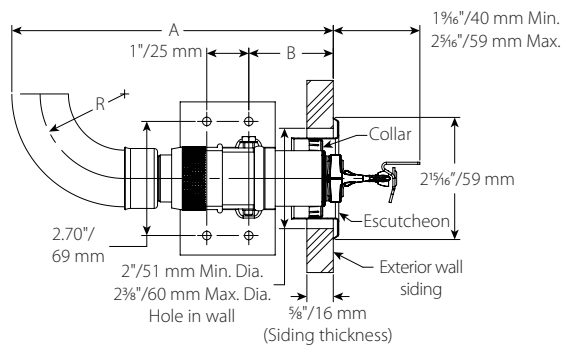
Recessed Sidewall



Clearance Chart		
Dimension	inches mm	
"R" Minimum Bend Radius	2 50	7 175
"A" Minimum Required Installation Space	8 203	13 330
"B" Mounting Screw Hole Location	4 3/4 119	
Ceiling Hole Diameter "D"	2 – 2 3/8 51 – 60	

4.8 DIMENSIONS

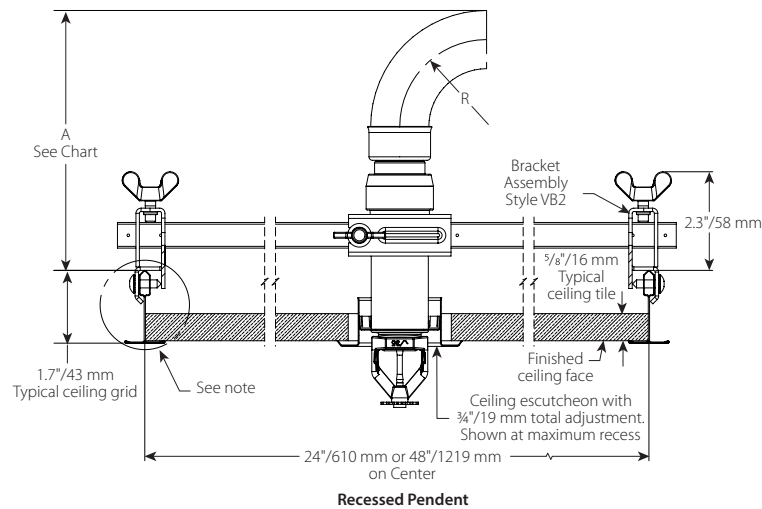
Recessed Sidewall Alternative Bracket Location



Clearance Chart		
Dimension	inches mm	
"R" Minimum Bend Radius	2 50	7 175
"A" Minimum Required Installation Space	8 203	13 330
"B" Mounting Screw Hole Location	2 51	
Ceiling Hole Diameter "D"	2 – 2 3/8 51 – 60	

## 4.9 DIMENSIONS

### VB2 Recessed Pendant



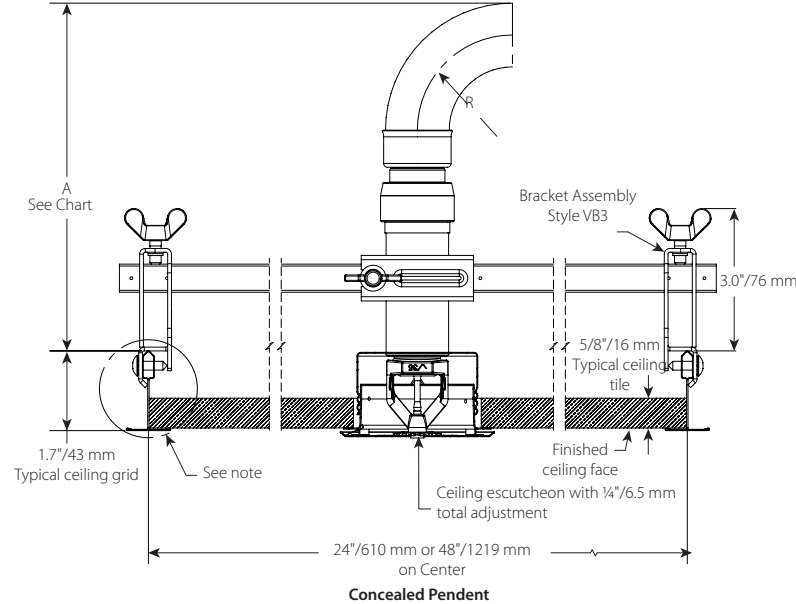
Clearance Chart		
Dimension	inches mm	
"R" Minimum Bend Radius	2	7
	50	175
"A" Minimum Required Installation Space	6 1/2	11 1/2
	163	290

**NOTE**

- Victaulic *VicFlex* Style VB2 Bracket assemblies shall be used only with Style VS1 recessed pendant sprinklers.

## 4.10 DIMENSIONS

### VB3 Concealed Pendant



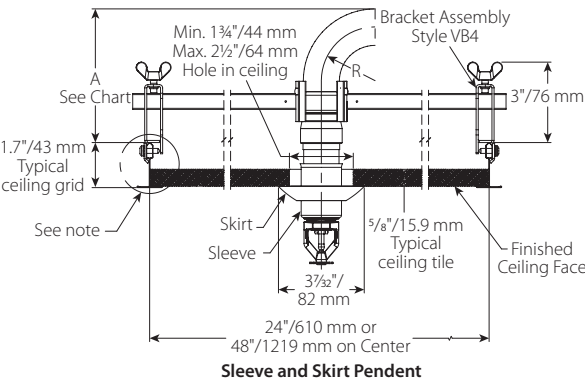
Clearance Chart		
Dimension	inches mm	
"R" Minimum Bend Radius	2	7
	50	175
"A" Minimum Required Installation Space	7 3/8	12 3/8
	193	320

**NOTE**

- Victaulic *VicFlex* Style VB3 Bracket assemblies shall be used only with Style VS1 concealed pendant sprinklers.

4.11 DIMENSIONS

VB4 Sleeve and Skirt Pendant



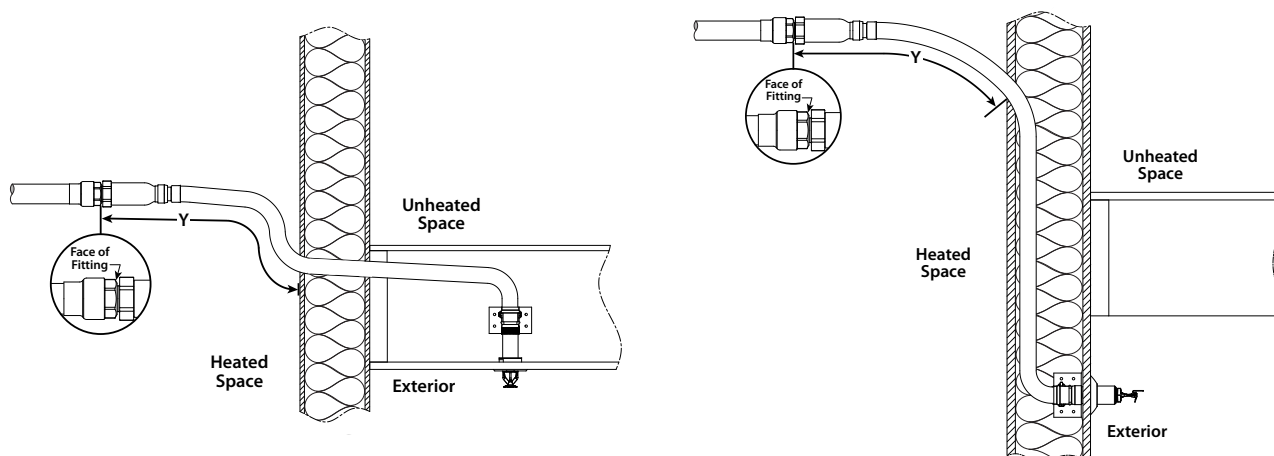
Clearance Chart		
Bend Radius		
	inches mm	inches mm
"R" Minimum Bend Radius	2 51	7 178
"A" Minimum Required Installation Space	5 127	10 254

**NOTE**

- Victaulic *VicFlex* Style VB2 Bracket assemblies shall be used only with Style VS1 recessed pendent sprinklers.

## 5.0 PERFORMANCE

### Freeze Protection



Ambient Temperature Exposed to Discharge End of Sprinkler °F °C	Exposed Minimum Barrel Length "Y"		
	40°F/4°C	50°F/10°C	60°F/16°C
40	0	0	0
4	0	0	0
30	0	0	0
-1	0	0	0
20	4	0	0
-7	100	0	0
10	8	1	0
-12	200	25	0
0	12	3	0
-18	300	75	0
-10	14	4	1
-23	350	100	25
-20	14	6	3
-29	350	150	75
-30	16	8	4
-34	400	200	100
-40	18	8	4
-40	450	200	100
-50	20	10	6
-46	500	250	150
-60	20	10	6
-51	500	250	150

#### NOTE

- Exposed minimum barrel lengths are inclusive up to 30-mph/48-kph wind velocities.

### Maximum Allowable Number of Bends

Sprinkler Length inches mm	Maximum Allowable Number of 90° Bends at 2"/51mm Bend Radius for UL Listing	Maximum Allowable Number of 90° Bends at 7"/178mm Bend Radius for FM Approval
38 965	4	2
50 1270	4	3
58 1475	4	4

## 6.0 NOTIFICATIONS

### WARNING



- Read and understand all instructions before attempting to install any Victaulic products.
- Always verify that the piping system has been completely depressurized and drained immediately prior to installation, removal, adjustment, or maintenance of any Victaulic products.
- Wear safety glasses, hardhat, and foot protection.

- These products shall be used only in fire protection systems that are designed and installed in accordance with current, applicable National Fire Protection Association (NFPA 13, 13D, 13R, etc.) standards, or equivalent standards, and in accordance with applicable building and fire codes. These standards and codes contain important information regarding protection of systems from freezing temperatures, corrosion, mechanical damage, etc.
- The installer shall understand the use of this product and why it was specified for the particular application.
- The installer shall understand common industry safety standards and potential consequences of improper product installation.

### WARNING

- It is the responsibility of the system designer to verify suitability of 300-series stainless steel flexible hose for use with the intended fluid media within the piping system and external environments.
- The effect of chemical composition, pH level, operating temperature, chloride level, oxygen level, and flow rate on 300-series stainless steel flexible hose must be evaluated by the material specifier to confirm system life will be acceptable for the intended service.
- It is the responsibility of the owner of a building or their authorized agent to provide the sprinkler system installer with any knowledge that the water supply might be contaminated with or conducive to the development of microbiologically influenced corrosion (MIC), including as required by NFPA 13. Failure to identify adverse water quality issues may affect the VicFlex product and void the manufacturer's warranty.

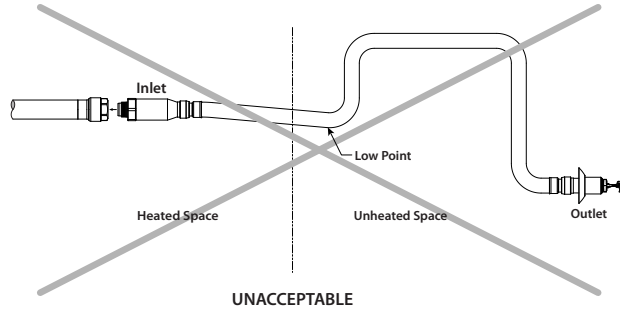
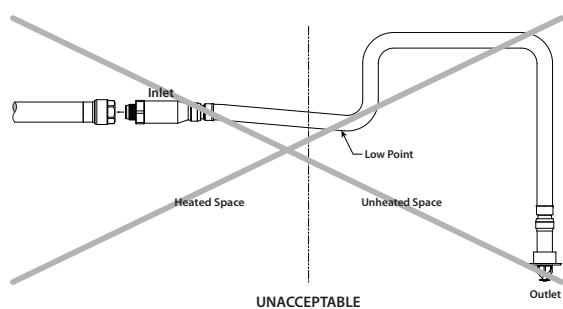
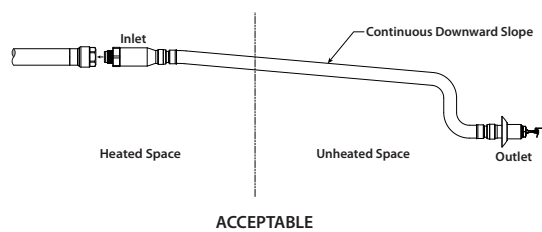
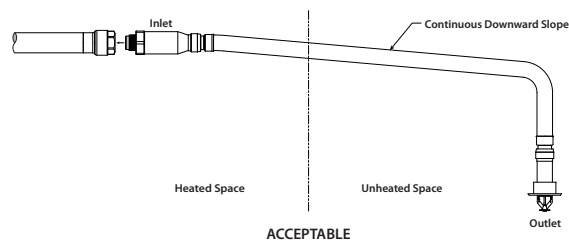
**Failure to follow these instructions could cause product failure, resulting in serious personal injury and/or property damage.**

DO NOT paint, coat, or firestop the outlet/inlet portion of the Style VS1 Dry Sprinkler. Braided hose and fitting portions of the Style VS1 Dry Sprinkler may be painted or coated, provided that the paint or coating is compatible with stainless steel material. This includes penetration through firestop-filled annular space of a firewall. The firestop material in direct contact with the flexible braided hose will not impede functionality of the Style VS1 Dry Sprinkler, provided that the components are installed in accordance with Victaulic's installation instructions.

## 6.0 NOTIFICATIONS (CONTINUED)

### Important Installation Notes:

1. Shall be installed only in accordance with NFPA 13 Standard for the the Installation of Sprinkler Systems and applicable FM Data Sheets.
2. Install and tighten swivel hex nut at inlet of sprinkler fitting only.
3. Do not remove deflector or inlet end of sprinkler.





## 6.0 NOTIFICATIONS (CONTINUED)

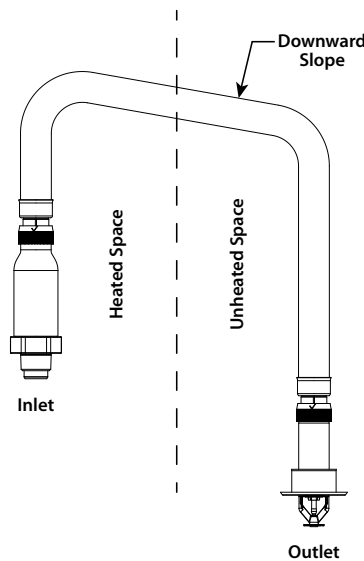
### FOR DRY SYSTEMS ONLY:

- The Style VS1 Dry Sprinkler's inlet shall be installed only into the outlet of a fitting (excluding elbows) or welded outlet that meets the dimensional requirements of ANSI B16.3 and ANSI B16.4, Class 125 and Class 150. Use a sample fitting to confirm proper engagement and to verify that there is no interference between the sprinkler and the fitting.

**Style VS1 Dry Sprinklers in an unheated space shall be installed with a continuous downward slope along its entire length from the branch line fitting to the sprinkler. No localized low points shall be present along the length of the Style VS1 Dry Sprinkler.**

**Style VS1 Dry Sprinklers in an unheated space are not permitted to be installed into the top of the branch line piping. Style VS1 Dry Sprinklers shall be installed into the side or from the bottom of the branch line piping.**

**In a heated space, if a portion of the Style VS1 Dry Sprinkler is installed from the top of a branch line and then extends into an unheated space, it shall be installed with a continuous downward slope along the entire length from the inside wall to the outlet of the sprinkler. No localized low points shall be present along the length of the sprinkler in the unheated space. Refer to the drawing below.**



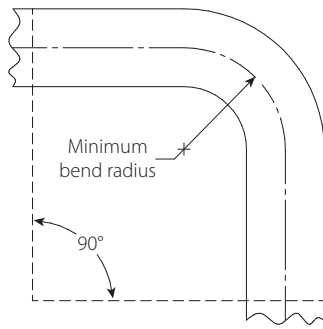
### FOR WET SYSTEMS ONLY:

- DO NOT** install Victaulic® VicFlex™ Style VS1 Dry Sprinklers into any threaded elbow, threaded-by-thread coupling, or fitting that interferes with thread penetration. The inlet of the Victaulic® VicFlex™ Style VS1 Dry Sprinkler **SHALL NOT** bottom out in the fitting. Use a sample fitting to confirm proper engagement.
- To ensure unobstructed flow during operation, the Victaulic® VicFlex™ Style VS1 Dry Sprinkler shall be installed into a fitting that will prevent water and debris from accumulating at the dry sprinkler's inlet.
- Verify that the exposed minimum barrel length in the heated space is measured and maintained in accordance with the table on page 1.

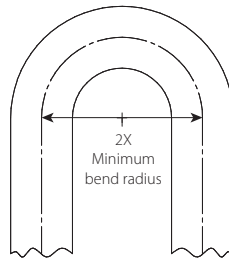
**In a heated space, if a portion of the Style VS1 Dry Sprinkler extends into an unheated space, it shall be installed with a continuous downward slope along the entire length from the inside wall to the outlet end of the dry sprinkler. No localized low points shall be present along the length of the sprinkler in the unheated space. Refer to the drawing above.**

## 7.0 REFERENCE MATERIALS

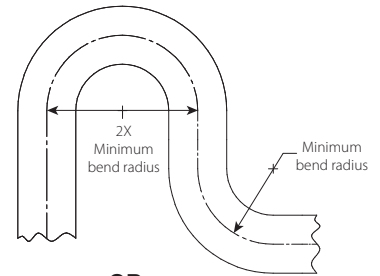
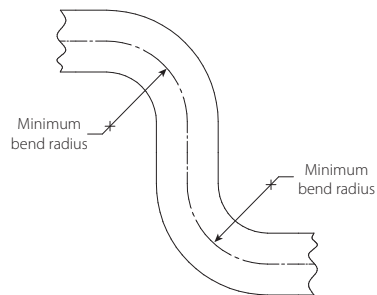
### ONE BEND



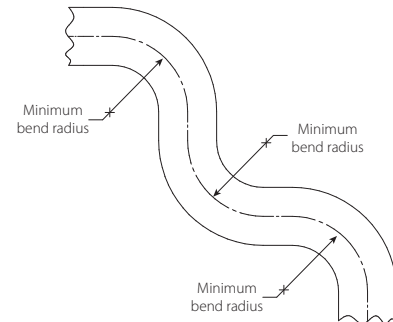
### TWO BENDS



OR



OR



#### NOTE

For out-of-plane (three-dimensional) bends, care must be taken to avoid imparting torsional stress on the sprinkler.

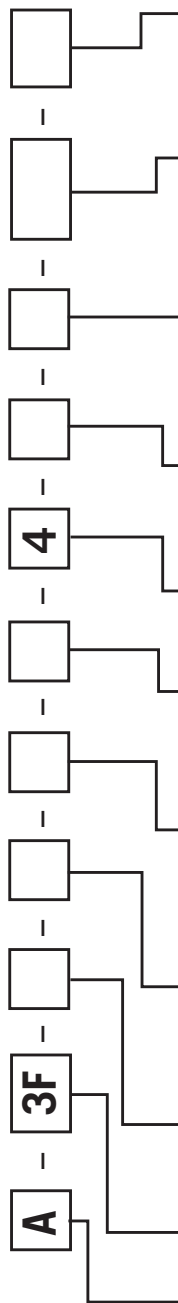
Company Name	
Address	
State/Province	Zip Code/Postal Code
Phone No.	Email
Fax No.	

Ship To:

If units of different size, type or other option are required, please attach additional form(s) with their specification(s) separately.

Quantity (as specified below):

# VicFlex™ Dry Sprinkler Model VS1



Class	Style	Thread	Deflector Style	Temperature	Response	K Factor	Finish	Recessed Escutcheon Material	Size		Escutcheon Style †
										Code	Inches
A	3F = V35	3 = 1" NPT 8 = 25 mm BSP	B = Pendent C = Horizontal Sidewall P - Concealed	A = 135°F/57°C C = 155°F/68°C E = 175°F/79°C F = 200°F/93°C J = 286°F/141°C	Q = Quick S = Std.	4 = K5.6	4 = White N = VC-250 ‡	W = White Stainless Steel X = Stainless Steel 0 = Concealed		380 = 38"	12 = Recessed
										500 = 50"	13 = Sleeve and Skirt
										580 = 58"	
											15 = Concealed

# VC-250 sprinkler finish sold standard on the VicFlex Dry Sprinkler Model VS1.

7.0 REFERENCE MATERIALS (CONTINUED)

- [29.01: Victaulic Terms and Conditions of Sale](#)
- [I-VICFLEX.VS1: Victaulic® VicFlex™ Style VS1 Dry Sprinkler Installation Instructions](#)

**User Responsibility for Product Selection and Suitability**

Each user bears final responsibility for making a determination as to the suitability of Victaulic products for a particular end-use application, in accordance with industry standards and project specifications, and the applicable building codes and related regulations as well as Victaulic performance, maintenance, safety, and warning instructions. Nothing in this or any other document, nor any verbal recommendation, advice, or opinion from any Victaulic employee, shall be deemed to alter, vary, supersede, or waive any provision of Victaulic Company's standard conditions of sale, installation guide, or this disclaimer.

**Intellectual Property Rights**

No statement contained herein concerning a possible or suggested use of any material, product, service, or design is intended, or should be construed, to grant any license under any patent or other intellectual property right of Victaulic or any of its subsidiaries or affiliates covering such use or design, or as a recommendation for the use of such material, product, service, or design in the infringement of any patent or other intellectual property right. The terms "Patented" or "Patent Pending" refer to design or utility patents or patent applications for articles and/or methods of use in the United States and/or other countries.

**Note**

This product shall be manufactured by Victaulic or to Victaulic specifications. All products to be installed in accordance with current Victaulic installation/assembly instructions. Victaulic reserves the right to change product specifications, designs and standard equipment without notice and without incurring obligations.

**Installation**

Reference should always be made to the Victaulic installation handbook or installation instructions of the product you are installing. Handbooks are included with each shipment of Victaulic products, providing complete installation and assembly data, and are available in PDF format on our website at [www.victaulic.com](http://www.victaulic.com).

**Warranty**

Refer to the Warranty section of the current Price List or contact Victaulic for details.

**Trademarks**

*Victaulic* and all other Victaulic marks are the trademarks or registered trademarks of Victaulic Company, and/or its affiliated entities, in the U.S. and/or other countries.

## Series LFII Residential Sprinklers 4.9 K-factor Recessed Pendent, Dry Type Wet Pipe and Dry Pipe Systems

### IMPORTANT

Refer to Technical Data Sheet TFP2300 for warnings pertaining to regulatory and health information. Always refer to Technical Data Sheet TFP700 for the "INSTALLER WARNING" that provides cautions with respect to handling and installation of sprinkler systems and components. Improper handling and installation can permanently damage a sprinkler system or its components and cause the sprinkler to fail to operate in a fire situation or cause it to operate prematurely.

Scan the QR code or enter the URL in a web browser to access the most up-to-date electronic version of this document. Data rates may apply.



[docs.jci.com/tycofire/tfp460](https://docs.jci.com/tycofire/tfp460)

### General Description

The TYCO Series LFII Dry Type Residential Recessed Pendent Sprinklers (TY2235) are dry type, decorative, fast response, frangible bulb sprinklers designed for use in residential occupancies such as homes, apartments, dormitories, and hotels.

The Series LFII Dry Type Residential Recessed Pendent Sprinklers (TY2235) are typically used for the following situations:

- where sprinklers are required on dry pipe systems that are exposed to freezing temperatures; for example,

sprinkler drops from unheated portions of buildings

- where sprinklers and/or a portion of the connecting piping are exposed to freezing temperatures; for example, sprinkler drops from wet systems into unheated areas
- where sprinklers are used on systems that are seasonally drained to avoid freezing; for example, vacation areas

The Series LFII Dry Type Residential Recessed Pendent Sprinklers are intended for use in residential sprinkler systems for one- and two-family dwellings and mobile homes per NFPA 13D; residential sprinkler systems for residential occupancies up to and including four stories in height per NFPA 13R; or, sprinkler systems for the residential portions of any occupancy per NFPA 13.

The Series LFII Dry Type Residential Recessed Pendent Sprinklers provide flexibility in adjusting sprinklers to the fixed pipe drops. The Recessed Escutcheon provides 1/4 in. (6,4 mm) of recessed adjustment or up to 1/2 in. (12,7 mm) of total adjustment from the flush mounting surface position.

The Series LFII Dry Type Residential Recessed Pendent Sprinklers are designed with heat sensitivity and water characteristics proven to help in controlling residential fires and improving the chance for occupants to escape or be evacuated.

Corrosion-resistant coatings, where applicable, are utilized to extend the life of copper alloy sprinklers beyond that which would otherwise be obtained when exposed to corrosive atmospheres. Although corrosion-resistant coated sprinklers have passed the standard corrosion tests of the applicable Approval agencies, the testing is not representative of all possible corrosive atmospheres. Consequently, it is recommended that the end user be consulted with respect to the suitability of these coatings for any given corrosive environment. The effects of ambient temperature, concentration of chemicals, and gas/chemical velocity should be considered, as a minimum,



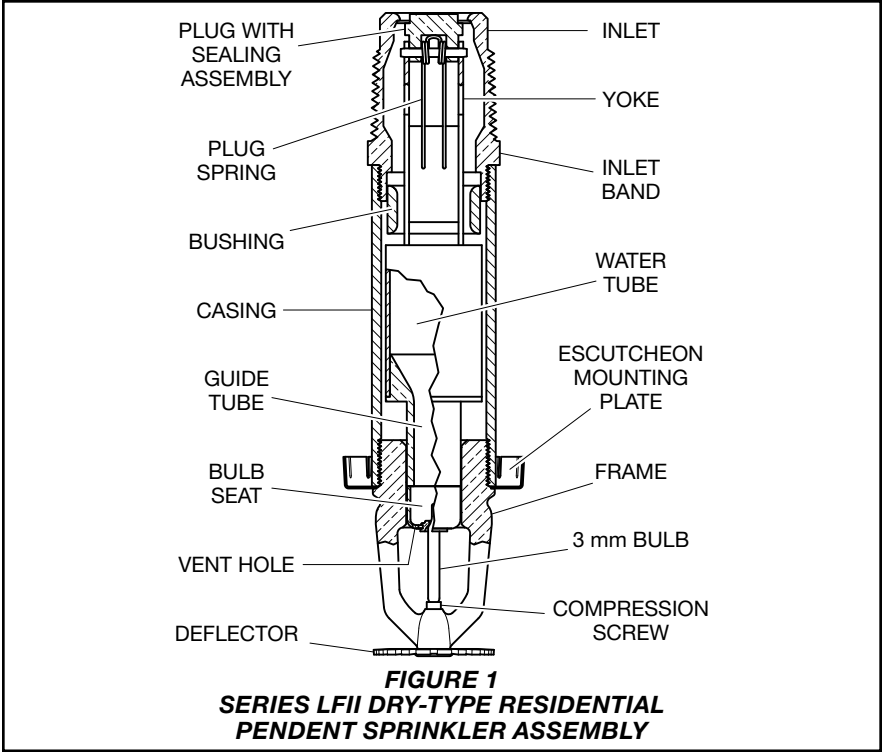
along with the corrosive nature of the chemical to which the sprinklers will be exposed.

### Dry Pipe System Application

The Series LFII Residential Pendent and Recessed Pendent Sprinklers offers a laboratory approved option for designing dry pipe residential sprinkler systems, whereas, most residential sprinklers are laboratory approved for wet systems only.

Through extensive testing, it has been determined that the number of design sprinklers (hydraulic design area) for the Series LFII Residential Recessed Pendent Sprinklers (TY2235) need not be increased over the number of design sprinklers (hydraulic design area) as specified for wet pipe sprinkler systems, as is accustomed for density/area sprinkler systems designed per NFPA 13.

Consequently, the Series LFII Residential Sprinklers offer the features of non-water filled pipe in addition to not having to increase the number of design sprinklers (hydraulic design area) for systems designed to NFPA 13, 13D, or 13R. Non-water filled pipe will permit options for areas sensitive to freezing.



**FIGURE 1**  
**SERIES LFII DRY-TYPE RESIDENTIAL**  
**PENDENT SPRINKLER ASSEMBLY**

**NOTICE**

The Series LFII Dry Type Residential Recessed Pendent Sprinklers (TY2235) described herein must be installed and maintained in compliance with this document and the applicable standards of the NATIONAL FIRE PROTECTION ASSOCIATION (NFPA), in addition to the standards of any authorities having jurisdiction. Failure to do so may impair the performance of these devices.

The owner is responsible for maintaining their fire protection system and devices in proper operating condition. Contact the installing contractor or product manufacturer with any questions.

# **Sprinkler Identification Number (SIN)**

TY2235

# **Technical Data**

**Approvals**

UL and C-UL Listed  
Certified to all requirements of NSF/ANSI 61

**Note:** Sprinklers with a polyester finish are UL and C-UL Listed as corrosion-resistant sprinklers.

See the Design Criteria section for details on these approvals.

**Maximum Working Pressure**

175 psi (12,1 bar)

**Discharge Coefficient**

$K = 4.9 \text{ GPM/psi}^{1/2} (70,6 \text{ LPM/bar}^{1/2})$

**Inlet Thread Connections**

1 in. NPT  
ISO 7-R1

**Sprinkler Temperature Ratings**

155°F (68°C)  
175°F (79°C) for wet pipe systems only

**Finishes**

Natural Brass, Signal White Polyester Coated, or Chrome Plated

**Order Lengths**

Minimum: 3-3/4 in. (95,3 mm)  
Maximum: 24 in. (609,6 mm)

**Physical Characteristics**

Inlet	Brass
Plug	Brass
Yoke	Stainless Steel
Casing	Galvanized Steel
Insert	Bronze
Bulb Seat	Stainless Steel
Bulb	Glass
Compression Screw	Brass
Deflector	Brass
Frame	Brass
Guide Tube	Brass
Water Tube	Stainless Steel
Bushing	Brass
Plug Spring	Stainless Steel
Sealing Assembly	Beryllium Nickel w/TEFLON
Escutcheon	Carbon Steel

# **Operation**

When the TYCO Series LFII Dry Type Residential Sprinkler (TY2235) is in service, water is prevented from entering the assembly by the Plug with

Sealing Assembly (Figure 1) in the Inlet of the Sprinkler.

The glass Bulb contains a fluid that expands when exposed to heat. When the rated temperature is reached, the fluid expands sufficiently to shatter the glass Bulb to release the Bulb Seat. The system's water or air pressure is then able to unseat the Plug with Sealing Assembly. The Plug Spring turns the Plug with Sealing Assembly aside, allowing the sprinkler to activate and flow water.

# **Design Criteria**

The TYCO Series LFII Dry Type Residential Recessed Pendent Sprinklers (TY2235) are UL and C-UL Listed for installation in accordance with this section:

**Residential Sprinkler Design Guide**

When conditions exist that are outside the scope of the criteria provided in this section, refer to the technical data sheet entitled Residential Sprinkler Design Guide (TFP490) for the manufacturer's recommendations that may be acceptable to the local authority having jurisdiction.

**System Types**

Wet pipe and dry pipe systems may be utilized. Refer to Technical Data Sheet TFP485 for the use of residential sprinklers in residential dry pipe systems.

**Ceiling Types**

Smooth flat horizontal, or beamed, or sloped, in accordance with the 2013 Edition of NFPA 13D, 13R, or 13 as applicable.

**Hydraulic Design (NFPA 13D and 13R)**

For systems designed to NFPA 13D or NFPA 13R, the minimum required sprinkler flow rate are given in Tables A or B as a function of temperature rating and the maximum allowable coverage areas. The sprinkler flow rate is the minimum required discharge from each of the total number of design sprinklers, as specified in NFPA 13D or NFPA 13R. The number of design sprinklers specified in NFPA 13D and 13R for wet pipe systems is to be applied when designing dry pipe systems.

**Hydraulic Design (NFPA 13)**

For systems designed to NFPA 13, the number of required design sprinklers is the four most hydraulically demanding sprinklers. The minimum required discharge from each of the four sprinklers is the greater of the following:

Maximum Coverage Area <sup>(a)</sup> ft x ft (m x m)	Maximum Spacing ft (m)	WET PIPE SYSTEM Minimum Flow and Residual Pressure <sup>(b,c)</sup>						
		Ordinary Temp Rating 155°F (68°C)		Intermediate Temp Rating 175°F (79°C)		Deflector to Ceiling	Installation Type	Minimum Spacing ft
		Flow GPM (L/min)	Pressure PSI (bar)	Flow GPM (L/min)	Pressure PSI (bar)			
12 x 12 (3,7 x 3,7)	12 (3,7)	13 (49,2)	7.0 (0,48)	13 (49,2)	7.0 (0,48)	Smooth Ceiling: 1-1/4 in. to 1-1/2 in.  Beamed Ceiling per NFPA 13D or 13R Installed in Beam: 1-1/4 in. to 1-1/2 in. below bottom of beam	Recessed	8 (2,4)
14 x 14 (4,3 x 4,3)	14 (4,3)	14 (52,9)	8.2 (0,57)	14 (52,9)	8.2 (0,57)			
16 x 16 (4,9 x 4,9)	16 (4,9)	15 (56,8)	9.4 (0,65)	15 (56,8)	9.4 (0,65)			
18 x 18 (5,5 x 5,5)	18 (5,5)	18 (68,1)	13.5 (0,93)	18 (68,1)	13.5 (0,93)			
20 x 20 (6,1 x 6,1)	20 (6,1)	21 (79,5)	18.4 (1,3)	21 (79,5)	18.4 (1,3)			

**Notes:**

a. For coverage area dimensions less than or between those indicated, use the minimum required flow for the next highest coverage area for which hydraulic design criteria are stated.

b. Requirement is based on minimum flow in GPM (LPM) from each sprinkler. The associated residual pressures are calculated using the nominal K-factor. See Hydraulic Design under the Design Criteria section.

c. For NFPA 13 residential applications, the greater of 0.1 gpm/ft² over the design area or the flow in accordance with the criteria in Table A must be used.

**TABLE A**  
**WET PIPE SYSTEM**  
**SERIES LFII RESIDENTIAL DRY-TYPE RECESSED PENDENT SPRINKLERS (TY2235)**  
**NFPA 13D, 13R, AND 13 HYDRAULIC DESIGN CRITERIA**  
**UL LISTED**

Maximum Coverage Area <sup>(a)</sup> ft x ft (m x m)	Maximum Spacing ft (m)	DRY PIPE SYSTEM Minimum Flow and Residual Pressure <sup>(b,c)</sup>				
		Ordinary Temp Rating 155°F (68°C)		Deflector to Ceiling	Installation Type	Minimum Spacing ft
		Flow GPM (L/min)	Pressure PSI (bar)			
12 x 12 (3,7 x 3,7)	12 (3,7)	13 (49,2)	7.0 (0,48)	Smooth Ceiling: 1-1/4 in. to 1-1/2 in.  Beamed Ceiling per NFPA 13D or 13R Installed in Beam: 1-1/4 in. to 1-1/2 in. below bottom of beam	Recessed	8 (2,4)
14 x 14 (4,3 x 4,3)	14 (4,3)	14 (52,9)	8.2 (0,57)			
16 x 16 (4,9 x 4,9)	16 (4,9)	15 (56,8)	9.4 (0,65)			
18 x 18 (5,5 x 5,5)	18 (5,5)	18 (68,1)	13.5 (0,93)			
20 x 20 (6,1 x 6,1)	20 (6,1)	21 (79,5)	18.3 (1,3)			

**Notes:**  
a. For coverage area dimensions less than or between those indicated, use the minimum required flow for the next highest coverage area for which hydraulic design criteria are stated.  
b. Requirement is based on minimum flow in GPM (LPM) from each sprinkler. The associated residual pressures are calculated using the nominal K-factor. See Hydraulic Design under the Design Criteria section.  
c. For NFPA 13 residential applications, the greater of 0.1 gpm/ft<sup>2</sup> over the design area or the flow in accordance with the criteria in Table B must be used.

**TABLE B**  
**DRY PIPE SYSTEM**  
**SERIES LFII RESIDENTIAL DRY-TYPE RECESSED PENDENT SPRINKLERS (TY2235)**  
**NFPA 13D, 13R, AND 13 HYDRAULIC DESIGN CRITERIA**  
**UL LISTED**

Ambient Temperature Exposed to Discharge End of Sprinkler	Temperatures for Heated Area <sup>(1)</sup>		
	40°F (4°C)	50°F (10°C)	60°F (16°C)
	Minimum Exposed Barrel Length <sup>(2)</sup> , in. (mm)		
40°F (4°C)	0	0	0
30°F (-1°C)	0	0	0
20°F (-7°C)	4 (100)	0	0
10°F (-12°C)	8 (200)	1 (25)	0
0°F (-18°C)	12 (305)	3 (75)	0
-10°F (-23°C)	14 (355)	4 (100)	1 (25)
-20°F (-29°C)	14 (355)	6 (150)	3 (75)
-30°F (-34°C)	16 (405)	8 (200)	4 (100)
-40°F (-40°C)	18 (455)	8 (200)	4 (100)
-50°F (-46°C)	20 (510)	10 (255)	6 (150)
-60°F (-51°C)	20 (510)	10 (255)	6 (150)

**Notes:**

- For protected area temperatures that occur between values listed above, use the next cooler temperature.
- These lengths are inclusive of wind velocities up to 30 mph (18,6 kph).

**TABLE C**  
**MINIMUM RECOMMENDED LENGTHS OF EXPOSED SPRINKLER BARRELS IN WET PIPE SYSTEMS**

- flow rates listed in Table A or B as a function of temperature rating and the maximum allowable coverage area.
- minimum discharge of 0.1 gpm/ft<sup>2</sup> over the design area comprised of the four most hydraulically demanding sprinklers for the actual coverage areas protected by four sprinklers.

The number of design sprinklers specified in NFPA 13 for wet pipe systems is to be applied when designing dry pipe systems.

#### Dry Pipe System Water Delivery

When using the Series LFII Residential Sprinklers (TY2235) in dry pipe sprinkler systems, the time for water delivery must not exceed 15 seconds for the most remote operating sprinkler.

#### Obstruction to Water Distribution

Sprinklers are to be located in accordance with the obstruction rules of

NFPA 13D, 13R, and 13 as applicable for residential sprinklers as well as with the obstruction criteria described within the TYCO Technical Data Sheet TFP490.

#### Operational Sensitivity

The sprinkler must be located relative to the mounting surface as shown in Figure 2.

#### Sprinkler Spacing

The minimum spacing between sprinklers is 8 ft (2,4 m). The maximum spacing between sprinklers cannot exceed the length of the coverage area (Table A) being hydraulically calculated (for example, a maximum of 12 ft for a 12 ft x 12 ft coverage area or 20 ft for a 20 ft x 20 ft coverage area.)

#### Sprinkler Fittings

The following fittings may be used:

- The 1 in. NPT outlet or run of a malleable or ductile iron threaded tee fittings that meet the dimensional requirements of ANSI B16.3 (Class 150)
- The 1 in. NPT outlet or run of a cast iron threaded tee fittings that meet the dimensional requirements of ANSI B16.4 (Class 125).

For dry pipe systems, only use the side outlet of maximum 2-1/2 in. size reducing tees when locating the Series LFII Dry Type Residential Recessed Pendent Sprinklers directly below the branch line. Otherwise, use the configuration shown in Figure 5 to assure complete drainage from above the Series LFII Sprinklers and the branch line.

Do not install the Series LFII Dry Type Residential Recessed Pendent Sprinklers into elbow fittings. The Inlet of the sprinkler can contact the interior of the elbow, potentially damaging the Inlet seal.

Only use the configuration in Figure 4 where the sprinkler fitting and water-filled pipe above the sprinkler fitting are not subject to freezing and where the length of the Series LFII Sprinkler has the minimum exposure length per Figure 6. See the Exposure Length section and Table C.

- The 1 in. NPT outlet of a GRINNELL Figure 730 Mechanical Tee in wet pipe systems only
- The 1 in. NPT CPVC outlet of a 1 in. x 1 in. x 1 in. NPT Sprinkler Head Adapter Tee (P/N 80249) in wet pipe systems only
- The 1 in. NPT CPVC outlet of a 1 in. x 1 in. NPT Female Adapter (P/N 80145) in wet pipe systems only

- The 1 in. NPT outlet of a 1 in. x 1 in. x 1 in. NPT CPVC Sprinkler Head Adapter Tee (P/N 80259) in either wet or dry pipe systems

#### NOTICE

*Do not install the Series LFII Dry Type Residential Recessed Pendent Sprinklers into any other type fitting without first consulting the Technical Services Department. Failure to use the appropriate fitting may result in the following:*

- *failure of the sprinkler to operate properly due to formation of ice over the Inlet Plug or binding of the Inlet Plug.*
- *insufficient engagement of the inlet pipe threads with consequent leakage.*

#### Drainage

Branch, cross, and feed-main piping connected to Series LFII Dry Type Residential Recessed Pendent Sprinklers and subject to freezing temperatures must be pitched to allow proper drainage, in accordance with the minimum requirements of the NATIONAL FIRE PROTECTION ASSOCIATION for dry pipe sprinkler systems.

#### Exposure Length

When using Series LFII Dry Type Residential Recessed Pendent Sprinklers in wet pipe sprinkler systems to protect areas subject to freezing temperatures, use Table C to determine a sprinkler's appropriate exposed barrel length to prevent water from freezing in the connecting pipes due to conduction. The exposed barrel length measurement must be taken from the face of the sprinkler fitting to the surface of the structure or insulation that is exposed to the heated area. See Figure 6 for an example.

#### Clearance Space

When connecting an area subject to freezing and an area containing a wet pipe sprinkler system, the clearance space around the sprinkler barrel of Dry Type Residential Recessed Pendent Sprinklers must be sealed, in accordance with the NATIONAL FIRE PROTECTION ASSOCIATION. Due to temperature differences between two areas, the potential for the formation of condensation in the sprinkler and subsequent ice build-up is increased. If this condensation is not controlled, ice build-up can occur that might damage the dry type sprinkler and/or prevent proper operation in a fire situation.

Use of the Model DSB-2 Dry Sprinkler Boot, described in Technical Data Sheet TFP591 and shown in Figures 4 through 6, can provide the recommended seal.



## Installation

The TYCO Series LFII Dry Type Residential Recessed Pendent Sprinklers must be installed in accordance with this section:

### General Instructions

The Series LFII Dry Type Residential Recessed Pendent Sprinklers must only be installed in fittings that meet the requirements of the Design Criteria section. For other important requirements regarding piping design and sealing of the clearance space around the Sprinkler Casing, see the Design Criteria section.

Do not install any bulb type sprinkler if the Bulb is cracked or there is a loss of liquid from the Bulb. With the sprinkler held horizontally, a small air bubble should be present. The diameter of the air bubble is approximately 1/16 in. (1,6 mm).

A leak-tight 1 in. NPT sprinkler joint should be obtained by applying a minimum-to-maximum torque of 20 to 30 lb-ft (26,8 to 40,2 N-m). Higher levels of torque can distort the sprinkler Inlet or Frame with consequent leakage or impairment of the sprinkler.

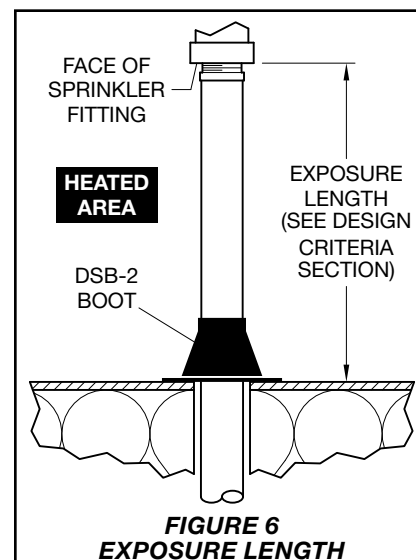
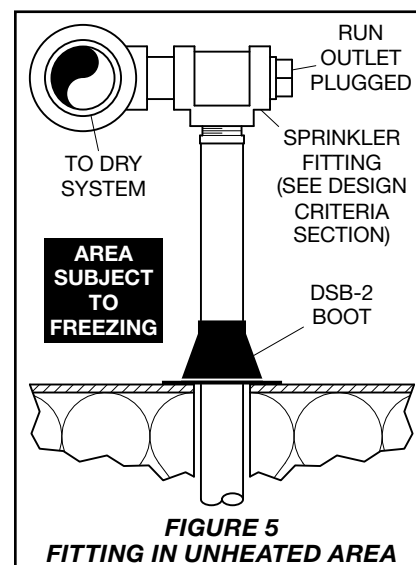
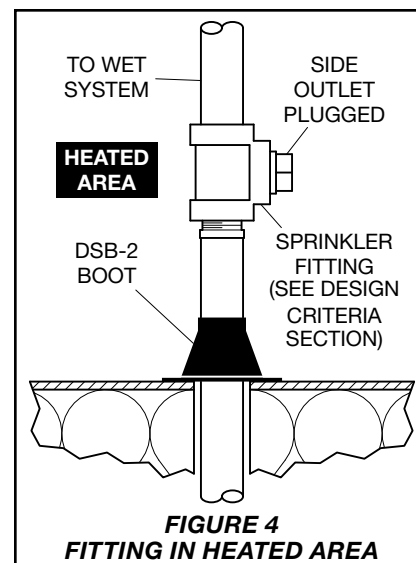
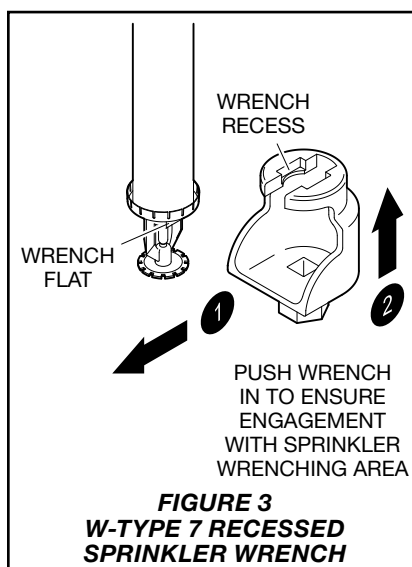
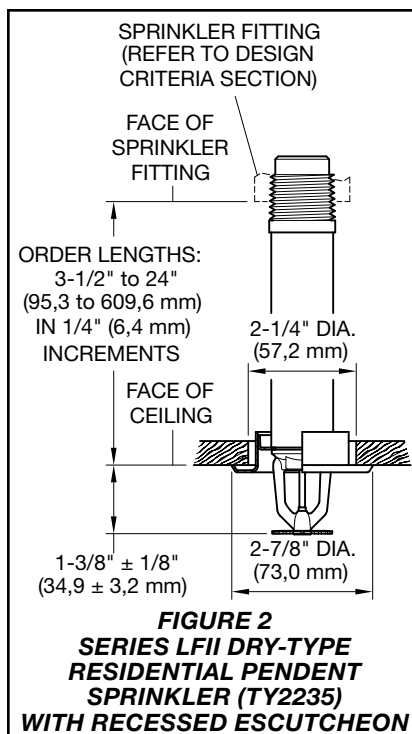
Do not attempt to compensate for insufficient adjustment in an Escutcheon Plate or Cover-Retainer Assembly by under- or over-tightening the Sprinkler. Re-adjust the position of the sprinkler fitting to suit.

**Step 1.** Install pendent sprinklers only in the pendent position with the deflector parallel to the ceiling.

**Step 2.** With a non-hardening pipe-thread sealant such as Teflon tape applied to the inlet threads, hand-tighten the sprinkler into the sprinkler fitting.

**Step 3.** Wrench-tighten the sprinkler using a pipe wrench on the Inlet Band or the Casing (Figure 1) or using the W-Type 7 Sprinkler Wrench on the Wrench Flat (Figure 3). Apply the Wrench Recess of the W-Type 7 Sprinkler Wrench to the Wrench Flat.

If sprinkler removal is necessary, remove the sprinkler using the same wrenching method noted above. Sprinkler removal is easier when a non-hardening sealant was used and torque guidelines were followed. After removal, inspect the sprinkler for damage.



P/N <sup>1</sup> 63 — XXX — X — XXX										
SIN			TEMPERATURE RATING		SPRINKLER FINISH		ESCUTCHEON FINISH		ORDER LENGTH (EXAMPLES)	
10	PENDENT WITH RECESSED ESCUTCHEON	TY2235	1	155°F (68°C)	2	NATURAL BRASS	BRASS PLATED		055	5.50 in.
			2	175°F (79°C) <sup>2</sup>	4	SIGNAL WHITE (RAL9003) POLYESTER <sup>3</sup>			SIGNAL WHITE (RAL9003) POLYESTER	082
					9	CHROME PLATED	CHROME PLATED		180	18.00 in.
									187	18.75 in.
									240	24.00 in.

**Notes:**

1. Use Prefix "I" for ISO 7-R 1 Inlet Thread Connection (e.g., I-63-101-9-180)

2. Wet pipe system only

3. UL and C-UL Listed as corrosion-resistant

**TABLE D**

**SERIES LFII DRY-TYPE RESIDENTIAL RECESSED PENDENT SPRINKLERS (TY2235)**

**PART NUMBER SELECTION**

# Care and Maintenance

The TYCO Series LFII Dry Type Residential Recessed Pendent Sprinklers (TY2235) must be maintained and serviced in accordance with this section:

Before closing a fire protection system main control valve for maintenance work on the fire protection system that it controls, obtain permission to shut down the affected fire protection systems from the proper authorities and notify all personnel who may be affected by this action.

Absence of a Recessed Escutcheon Plate to cover a clearance hole can delay sprinkler operation in a fire situation.

The owner must assure that the sprinklers are not used for hanging any objects and that the sprinklers are only cleaned by means of gently dusting with a feather duster; otherwise, non-operation in the event of a fire or inadvertent operation may result.

A Vent Hole is provided in the Bulb Seat (Figure 1) to indicate if the Series LFII Dry Type Residential Sprinkler is remaining dry. Evidence of leakage from the Vent Hole indicates potential leakage past the Plug with Sealing Assembly and the need to remove the sprinkler to determine the cause of leakage (for example, an improper installation or an ice plug). Close the fire protection system control valve and drain the system before removing the sprinkler.

Sprinklers which are found to be leaking or exhibiting visible signs of corrosion must be replaced.

Automatic sprinklers must never be painted, plated, coated, or otherwise altered after leaving the factory. Modified sprinklers must be replaced. Sprinklers that have been exposed to corrosive products of combustion, but have not operated, should be replaced if they cannot be completely cleaned by wiping the sprinkler with a cloth or by brushing it with a soft bristle brush.

Care must be exercised to avoid damage to the sprinklers - before, during, and after installation. Sprinklers damaged by dropping, striking, wrench twist/slippage, or the like, must be replaced. Also, replace any sprinkler that has a cracked bulb or that has lost liquid from its bulb. See the Installation section for additional information.

The owner is responsible for the inspection, testing, and maintenance of their fire protection system and devices in compliance with this document, as well as with the applicable standards of the NATIONAL FIRE PROTECTION ASSOCIATION, for example, NFPA 25, in addition to the standards of any authorities having jurisdiction. Contact the installing contractor or product manufacturer with any questions.

Automatic sprinkler systems are recommended to be inspected, tested, and maintained by a qualified Inspection Service in accordance with local requirements and/or national codes.

# Limited Warranty

For warranty terms and conditions, visit [www.tyco-fire.com](http://www.tyco-fire.com).

# Ordering Procedure

Contact your local distributor for availability. When placing an order, indicate the full product name and Part Number (P/N).

## Pendent Sprinkler with Recessed Escutcheon

**Note:** Unless otherwise indicated, see Table D.

Specify: Series LFII Dry Type Residential Recessed Pendent Sprinkler, SIN TY2235, Recessed Escutcheon, 4.9 K-factor, Temperature Rating (specify), Sprinkler Finish (specify), Escutcheon Finish (specify), Order Length (specify value per Figure 2), Inlet Thread Size (1 in. NPT or ISO 7-R 1), P/N (specify)

## Separately Ordered Sprinkler Wrench

Specify: W-Type 7 Sprinkler Wrench, P/N 56-850-4-001

## Separately Ordered Escutcheon

Specify: Style 20 Recessed Escutcheon with (specify\*) finish, P/N (specify\*)

\*Refer to Technical Data Sheet TFP770



Worldwide  
Contacts | [www.tyco-fire.com](http://www.tyco-fire.com)

## TFP460 Change History Appendix

ISSUE DATE	NOTES
08-22	Page 1, updated QR code and URL; Page 6, changed corporate address and telephone number to 1467 Elmwood Avenue, Cranston, RI 02910   Telephone +1-401-781-8220, formerly 1400 Pennbrook Parkway, Lansdale, PA 19446   Telephone +1-215-362-0700.
04-22	Removed RAPID RESPONSE branding throughout; Page 1, added QR code and URL to allow convenient access to electronic version from printed document; Page 2, Approvals and Design Criteria sections, Page 6, Table D, footnote 3, added C-UL Listed.
12-18	Added note indicating sprinklers with polyester finish are UL Listed as corrosion resistant sprinklers.
08-18	Updated Tyco® branding and document format; Added Johnson Controls copyright; Added disclaimer stating specifications and information subject to change without notice; Added reference to Regulatory and Health Warning Technical Data Sheet TFP2300.
12-15	Added NSF/ANSI 61 certification mark.
11-15	Added NSF/ANSI 61 certification.
04-13	Updated and standardized RAL color finishes; Removed sloped and beamed ceiling design criteria per UL requirement.
04-12	Clarified allowance for use of horizontal ceiling hydraulic design criteria for certain slope ceiling configurations in accordance with NFPA 13D 2010 Technical Interim Amendment (TIA) 1028R; Clarified dry pipe system application.
08-11	Added information for sloped ceiling installations based on NFPA 13D 2010 Technical Interim Amendment (TIA) 1028R; Updated references in Obstruction to Water Distribution section.
05-11	Added ISO Inlet Thread Connection.
04-11	Updated patent information.
12-10	Added 175°F (79°C) Temperature Rating to Wet-Pipe column in Table A Hydraulic Design Criteria; Removed TY2535 Domed Concealed Pendent variant.
09-10	Changed minimum flow and residual pressure rates.
06-10	New Technical Data Sheet TFP460 describes Series LFII Dry-Type Residential Pendent and Domed Concealed Pendent Sprinklers.

# Reliable®

## Spare Sprinkler Cabinets

### Features

- Red enamel finish
- Constructed of lightweight steel
- Mounting holes provided
- Five models available

### Product Description

Reliable Spare Sprinkler Cabinets are designed to meet the requirements of NFPA 13 and NFPA 13R that state: "A supply of at least six spare sprinklers shall be maintained on the premises so that any sprinklers that have operated or been damaged in any way can be promptly replaced." These lightweight steel, red enamel finished cabinets are quickly mounted using the holes provided.

**Table 1**

Part Number	Capacity	Max. Sprinkler Thread Size (inches)	Size of Cabinet inches (mm)		
			Width	Depth	Height
6803200000	12	1	16-3/4 (425)	4 (101)	14-1/4 (361)
6999991473	3	3/4	7-3/8 (187)	2-3/8 (60)	5-1/4 (133)
6999991470	6	3/4	14-1/4 (361)	2-3/8 (60)	5-1/4 (133)
6999991472	6	1	14-1/4 (361)	3-1/8 (79)	6-1/2 (165)
6999991471	12	3/4	14-1/4 (361)	4 (101)	5-1/4 (133)
6990015802	24	3/4	14-1/4 (361)	4 (101)	8-7/16 (214)
6990015201	36	3/4	12-5/16 (313)	4 (101)	11-3/4 (298)

### Installation

Location must be coordinated with, and installation made in accordance with, the requirements of NFPA 13 or NFPA 13R, and all authorities having jurisdiction.

### Guarantee

For Reliable Automatic Sprinkler, Co., Inc. guarantee, terms, and conditions, visit [www.reliablesprinkler.com](http://www.reliablesprinkler.com).

### Ordering Information

#### Specify:

- Part Number



**Note:** Not all versions of the product are shown.



Specifications subject to change without notice.

Ordering Information			
Nominal Pipe Size		Model	Part Number
2"	DN50	VSR-2	1144402
2 1/2"	DN65	VSR-2 1/2	1144425
3"	DN80	VSR-3	1144403
3 1/2"	-	VSR-3 1/2	1144435
4"	DN100	VSR-4	1144404
5"	-	VSR-5	1144405
6"	DN150	VSR-6	1144406
8"	DN200	VSR-8	1144408

**Optional:** Cover Tamper Switch Kit, stock no. 0090148

**Replaceable Components:** Retard/Switch Assembly, stock no. 1029030

**UL, CUL and CSFM Listed, FM Approved, LPCB Approved, For CE Marked (EN12259-5) / VdS Approved model use VSR-EU**

**Service Pressure:** 450 PSI (31 BAR) - UL

**Flow Sensitivity Range for Signal:**

4-10 GPM (15-38 LPM) - UL

**Maximum Surge:** 18 FPS (5.5 m/s)

**Contact Ratings:** Two sets of SPDT (Form C)  
10.0 Amps at 125/250VAC  
2.0 Amps at 30VDC Resistive  
10 mAmps min. at 24VDC

**Conduit Entrances:** Two knockouts provided for 1/2" conduit.  
Individual switch compartments suitable for dissimilar voltages.

**Environmental Specifications:**

- NEMA 4/IP54 Rated Enclosure suitable for indoor or outdoor use with factory installed gasket and die-cast housing when used with appropriate conduit fitting.
- Temperature Range: 40°F - 120°F, (4.5°C - 49°C) - UL
- Non-corrosive sleeve factory installed in saddle.

**Service Use:**

Automatic Sprinkler	NFPA-13
One or two family dwelling	NFPA-13D
Residential occupancy up to four stories	NFPA-13R
National Fire Alarm Code	NFPA-72

### WARNING

- Installation must be performed by qualified personnel and in accordance with all national and local codes and ordinances.
- Shock hazard. Disconnect power source before servicing. Serious injury or death could result.
- Risk of explosion. Not for use in hazardous locations. Serious injury or death could result.

### CAUTION

Waterflow switches that are monitoring wet pipe sprinkler systems shall not be used as the sole initiating device to discharge AFFF, deluge, or chemical suppression systems. Waterflow switches used for this application may result in unintended discharges caused by surges, trapped air, or short retard times.

**Important:** This document contains important information on the installation and operation of the VSR waterflow switches. Please read all instructions carefully before beginning installation. A copy of this document is required by NFPA 72 to be maintained on site.

#### General Information

The Model VSR is a vane type waterflow switch for use on wet sprinkler systems. It is UL Listed for use on a steel pipe; schedules 5 through 40, sizes 2" - 6" and is UL Listed and FM Approved for use on steel pipe; schedules 10 through 40, sizes 2" thru 8" (50 mm thru 200 mm). LPC approved sizes are 2" thru 8" (50 mm thru 200 mm). See Ordering Information chart.

The VSR may also be used as a sectional waterflow detector on large systems. The VSR contains two single pole, double throw, snap action switches and an adjustable, instantly recycling pneumatic retard. The switches are actuated when a flow of 10 GPM (38 LPM) or more occurs downstream of the device. The flow condition must exist for a period of time necessary to overcome the selected retard period.

#### Enclosure

The VSR switches and retard device are enclosed in a general purpose, die-cast housing. The cover is held in place with two tamper resistant screws which require a special key for removal. A field installable cover tamper switch is available as an option which may be used to indicate unauthorized removal of the cover. See bulletin number 5401103 for installation instructions of this switch.

Potter Electric Signal Company, LLC • St. Louis, MO • Phone: 866-956-1211/Canada 888-882-1833 • www.pottersignal.com

**Installation** (see Fig. 1)

These devices may be mounted on horizontal or vertical pipe. On horizontal pipe they shall be installed on the top side of the pipe where they will be accessible. The device should not be installed within 6" (15 cm) of a fitting which changes the direction of the waterflow or within 24" (60 cm) of a valve or drain.

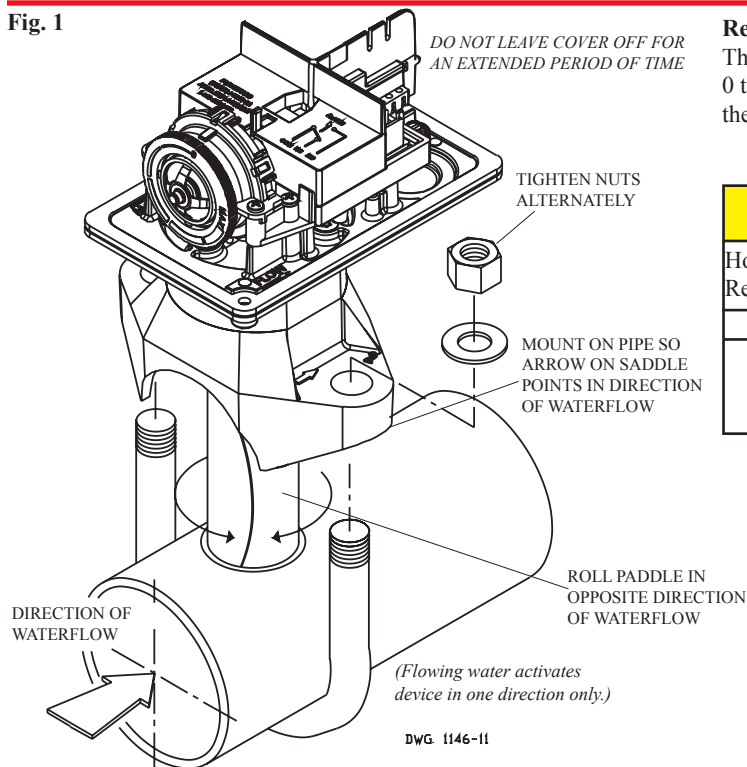
**NOTE:** Do not leave cover off for an extended period of time.

Drain the system and drill a hole in the pipe using a hole saw in a slow speed drill (see Fig. 1). Clean the inside pipe of all growth or other material for a distance equal to the pipe diameter on either side of the hole. Roll the vane so that it may be inserted into the hole; do not bend or crease it. Insert the vane so that the arrow on the saddle points in the direction of the waterflow. Take care not to damage the non-corrosive bushing in the saddle. The bushing should fit inside the hole in the pipe. Install the saddle strap and tighten nuts alternately to required torque (see the chart in Fig. 1). The vane must not rub the inside of the pipe or bind in any way.

**CAUTION**

Do not trim the paddle. Failure to follow these instructions may prevent the device from operating and will void the warranty. Do not obstruct or otherwise prevent the trip stem of the flow switch from moving when water flows as this could damage the flow switch and prevent an alarm. If an alarm is not desired, a qualified technician should disable the alarm system.

**Fig. 1**

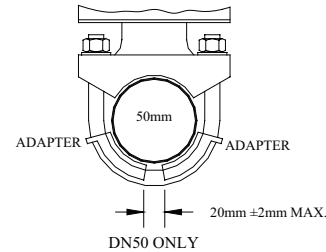


**Retard Adjustment**

The delay can be adjusted by rotating the retard adjustment knob from 0 to the max setting (60-90 seconds). The time delay should be set at the minimum required to prevent false alarms

**CAUTION**

Hole must be drilled perpendicular to the pipe and vertically centered. Refer to the Compatible Pipe/Installation Requirements chart for size.



USE (2) 5180162 ADAPTERS AS SHOWN ABOVE

DWG# 1146-1F

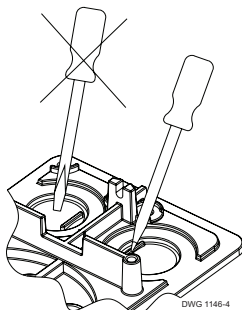
**Compatible Pipe/ Installation Requirements**

Model	Nominal Pipe Size		Nominal Pipe O.D.		Pipe Wall Thickness										Hole Size		U-Bolt Nuts Torque			
					Lightwall		Schedule 10 (UL)		Schedule 40 (UL)		BS-1387 (LPC)		DN (VDS)							
	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	ft-lb	n-m		
VSR-2	2	DN50	2.375	60.3	.065	1.651	0.109	2.77	0.154	3.91	0.142	3.6	0.091	2.3	1.25 ± .125/- .062	33.0 ± 2.0	20	27		
VSR-2 1/2	2.5	-	2.875	73.0	.084	2.134	0.120	3.05	0.203	5.16	-	-	-	-						
VSR-2 1/2	-	DN65	3.000	76.1	-	-	-	-	-	-	0.142	3.6	0.102	2.6						
VSR-3	3	DN80	3.500	88.9	.083	2.108	0.120	3.05	0.216	5.49	0.157	4.0	0.114	2.9	2.00 ± .125	50.8 ± 2.0				
VSR-3 1/2	3.5	-	4.000	101.6	-	-	0.120	3.05	0.226	5.74	-	-	-	-						
VSR-4	4	DN100	4.500	114.3	.084	2.134	0.120	3.05	0.237	6.02	0.177	4.5	0.126	3.2						
VSR-5	5	-	5.563	141.3	-	-	0.134	3.40	0.258	6.55	-	-	-	-						
VSR-6	6	DN150	6.625	168.3	.115	2.921	0.134	3.40	0.280	7.11	0.197	5.0	0.157	4.0						
VSR-8	8	DN200	8.625	219.1	-	-	0.148	3.76	0.322	8.18	0.248	6.3	0.177	4.5						

**NOTE:** For copper or plastic pipe use Model VSR-CF.

**Fig. 2**

To remove knockouts: Place screwdriver at inside edge of knockouts, not in the center.



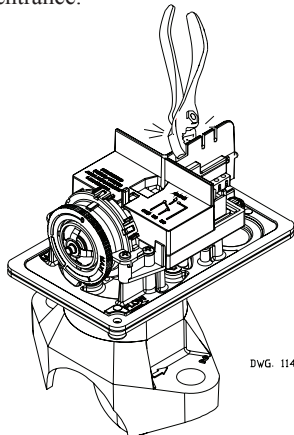
DWG. 1146-4

**NOTICE**

Do not drill into the base as this creates metal shavings which can create electrical hazards and damage the device. Drilling voids the warranty.

**Fig. 3**

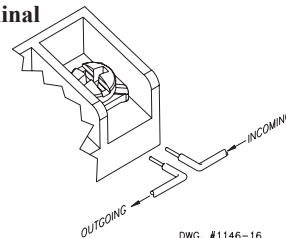
Break out thin section of cover when wiring both switches from one conduit entrance.



DWG. 1146-13

**Fig. 4**

**Switch Terminal Connections Clamping Plate Terminal**



DWG. #1146-16

**WARNING**

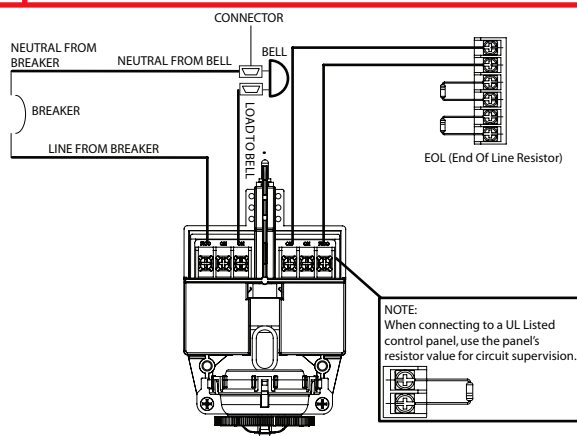
An uninsulated section of a single conductor should not be looped around the terminal and serve as two separate connections. The wire must be severed, thereby providing supervision of the connection in the event that the wire become dislodged from under the terminal. Failure to sever the wire may render the device inoperable risking severe property damage and loss of life.

Do not strip wire beyond 3/8" of length or expose an uninsulated conductor beyond the edge of the terminal block. When using stranded wire, capture all strands under the clamping plate.

**Fig. 5 Typical Electrical Connections**

**Notes:**

1. The Model VSR has two switches, one can be used to operate a central station, proprietary or remote signaling unit, while the other contact is used to operate a local audible or visual annunciator.
2. For supervised circuits, see "Switch Terminal Connections" drawing and warning note (Fig. 4).



NOTE:  
When connecting to a UL Listed control panel, use the panel's resistor value for circuit supervision.

**Testing**

The frequency of inspection and testing for the Model VSR and its associated protective monitoring system shall be in accordance with applicable NFPA Codes and Standards and/or the authority having jurisdiction (manufacturer recommends quarterly or more frequently).

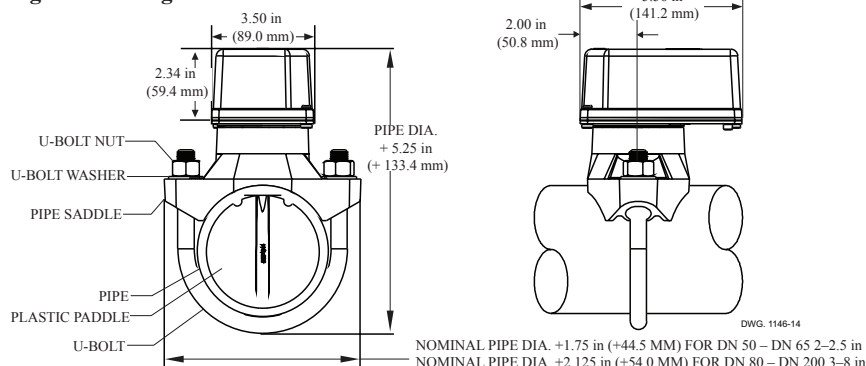
If provided, the inspector's test valve shall always be used for test purposes. If there are no provisions for testing the operation of the flow detection device on the system, application of the VSR is not recommended or advisable.

A minimum flow of 10 GPM (38 LPM) is required to activate this device.

**NOTICE**

Advise the person responsible for testing of the fire protection system that this system must be tested in accordance with the testing instructions.

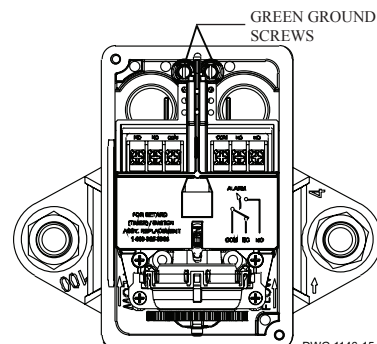
**Fig. 6 Mounting Dimensions**



DWG. 1146-14

NOMINAL PIPE DIA. +1.75 in (+44.5 MM) FOR DN 50 - DN 65 2-2.5 in  
NOMINAL PIPE DIA. +2.125 in (+54.0 MM) FOR DN 80 - DN 200 3-8 in

**Fig. 7**



DWG. 1146-15



### Maintenance

Inspect detectors monthly. If leaks are found, replace the detector. The VSR waterflow switch should provide years of trouble-free service. The retard and switch assembly are easily field replaceable. In the unlikely event that either component does not perform properly, please order replacement retard switch assembly stock #1029030 (see Fig. 8). There is no maintenance required, only periodic testing and inspection.

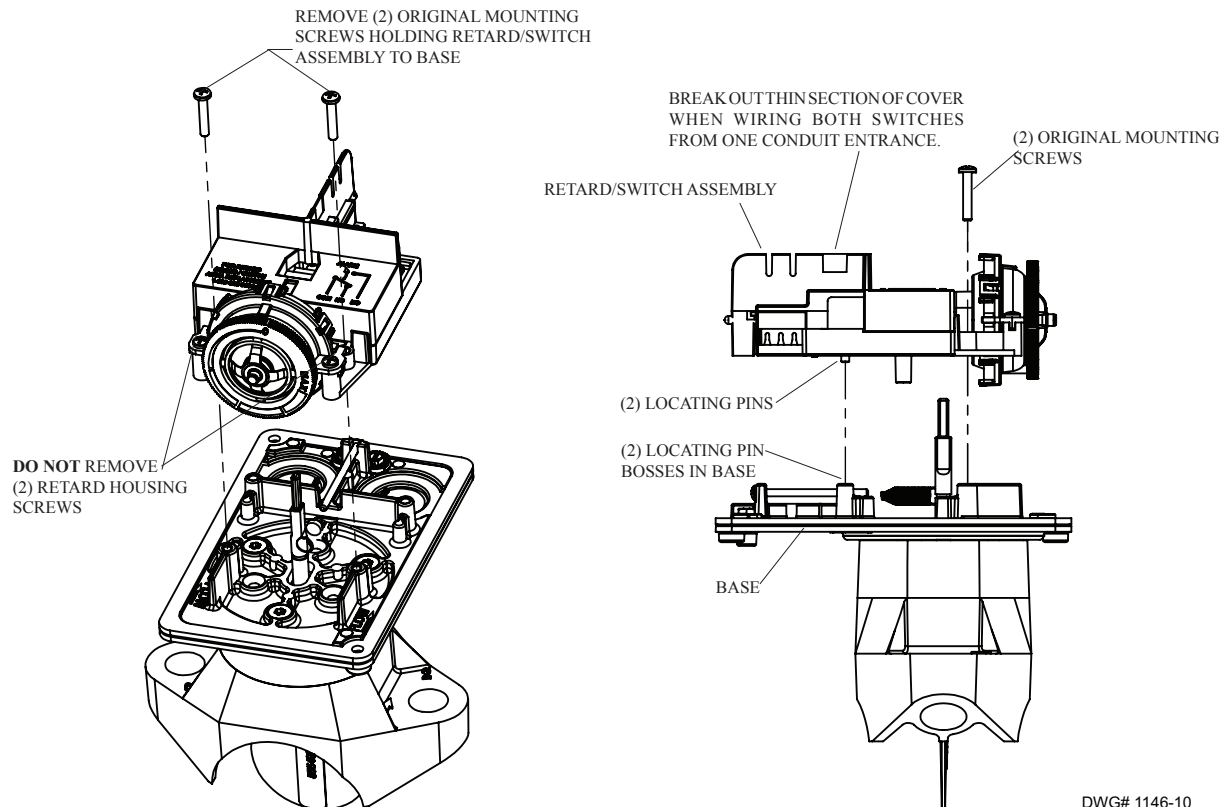
### Retard/Switch Assembly Replacement (See Fig. 8)

#### NOTICE

The Retard/Switch Assembly is field-replaceable without draining the system or removing the waterflow switch from the pipe.

1. Make sure the fire alarm zone or circuit connected to the waterflow switch is bypassed or otherwise taken out of service.
2. Disconnect the power source for local bell (if applicable).
3. Identify and remove all wires from the waterflow switch.
4. Remove the (2) mounting screws holding retard/switch assembly to the base. **Do not** remove the (2) retard housing screws.
5. Remove the retard assembly by lifting it straight up over the tripstem.
6. Install the new retard assembly. Make sure the locating pins on the retard/switch assembly fit into the locating pin bosses on the base.
7. Re-install the (2) original mounting screws.
8. Reconnect all wires. Perform a flow test and place the system back in service.

Fig. 8



DWG# 1146-10

### Removal of Waterflow Switch

- To prevent accidental water damage, all control valves should be shut tight and the system completely drained before waterflow detectors are removed or replaced.
- Turn off electrical power to the detector, then disconnect wiring.
- Loosen nuts and remove U-bolts.
- Gently lift the saddle far enough to get your fingers under it. With your fingers, roll the vane so it will fit through the hole while continuing to lift the waterflow detector saddle.
- Lift detector clear of pipe.





## EPS10-1 and EPS10-2 Alarm Pressure Switches

*System Sensor EPS10 Series switches are designed for use in wet, dry, deluge, and pre-action automatic sprinkler systems to indicate a discharge from a sprinkler.*



### Features

- Sensitivity adjustment wheel, no special tools required
- Reinforced diaphragm resists pressure spikes
- Two conduit entrances
- Both one- and two-switch models available

The EPS10-1 has a single SPDT switch while the EPS10-2 model contains two SPDT switches. The EPS10 Series features field adjustable pressure sensitivity to provide an alarm response between 4 and 20 psi. It is factory set to respond at 4 – 8 psi on rising or falling pressure. The pressure adjustment wheel requires no special tools and does not affect switch synchronization on the EPS10-2. The EPS10 Series switches are NEMA 4 rated.

### Agency Listings



7770-1209;147



G4020028-27

### Specifications, EPS10-1 and EPS10-2

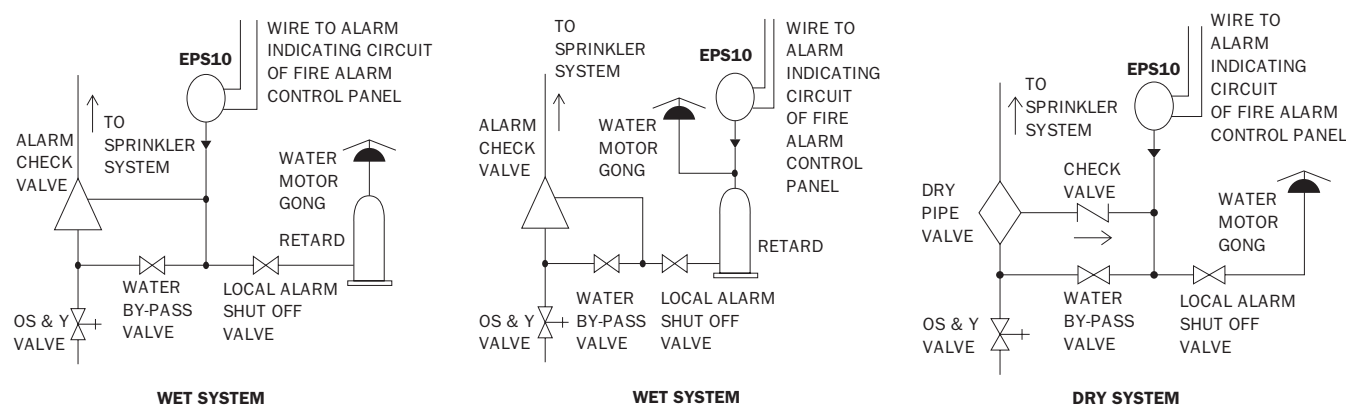
#### Architectural/Engineering Specifications EPS10-1 (SPDT), EPS10-2 (2/SPDT)

Model shall be an EPS10-1 or EPS10-2 pressure type waterflow switch as manufactured by System Sensor of St. Charles, IL. They shall be installed on the sprinkler system with connection as shown on the drawings and/or as specified herein. Pressure switches shall be of the bellows-activated type. Switches shall have a maximum service pressure rating of 300 psi and shall be factory adjusted to operate at a pressure of 4 – 8 psi. There shall be one (1) or two (2) SPDT contacts rated at 10.0 Amp @ 125/250 VAC and 2.5 Amp @ 6/12/24 VDC. The contractor shall furnish and install, where indicated on the plans, pressure switches according to appropriate NFPA standards. Switches shall be provided with a ½" NPT male pressure connection to be connected to the alarm check valve of a "wet" sprinkler system, into the intermediate chamber of a "dry" system, or to a pre-action or deluge valve. They shall be activated by any flow of water equal to or in excess of the discharge from one sprinkler head. Switches shall provide 1 knockout type and 1 open hole for ½" conduit fitting attachment and a ground screw provision for electrical grounding. The switch enclosure shall be weatherproof and carry a UL 4x/NEMA 4 rating when used with proper electrical fittings and conduit. The cover shall incorporate tamper-resistant screws. The unit shall be listed by Underwriters Laboratories, Inc. and approved by Factory Mutual.

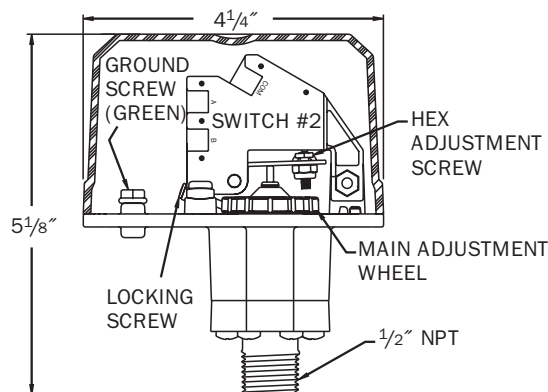
## Specifications, EPS10-1 and EPS10-2 (continued)

Physical/Operating Specifications			
<b>Maximum Operating Pressure</b>	300 psi	<b>Operating Temperature Range</b>	Indoor or outdoor use: -40°F to 160°F (-40°C to 71°C)
<b>Maximum Adjustment Pressure Range</b>	4 to 20 psi	<b>Cover Tamper Switch</b>	UL Models: Optional P/N 546-8000 ULC Models: Factory Installed
<b>Differential</b>	Approximately 3 psi throughout range	<b>Enclosure</b>	Rated UL 4x, NEMA 4 for indoor or outdoor use
<b>Factory Setting</b>	Operates at rising pressure 4 to 8 psi	<b>Shipping Weight</b>	1.2 lbs. (.54 Kg)
<b>Switch Contact Ratings</b>	EPS10-1: One set SPDT (Form C) EPS10-2: Two sets SPDT (Form C) 10.0 A, ½ HP @ 125/250 VAC 2.5 A @ 6/12/24 VDC	<b>Service Use</b>	Automatic Sprinkler: NFPA 13 One or Two Family Dwelling: NFPA 13D Residential Occupancies up to 4 Stories: NFPA 13R National Fire Alarm Code: NFPA 72
<b>Pressure Connection</b>	½" NPT male glass reinforced nylon	<b>Warranty</b>	3 years
<b>Dimensions</b>	5.12" H × 3.325" W × 4.250" L (13.0 cm × 8.4 cm × 10.8 cm)		

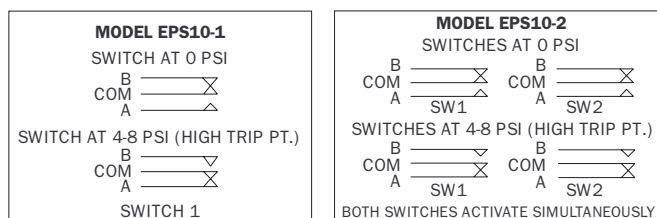
## Typical Sprinkler Applications



## Pressure Switch Basic Dimensions



## Electrical Connections



## Ordering Information

Part No.	Description
EPS10-1	Alarm Waterflow Pressure Switch, One SPDT, 4-20 PSI
EPS10-2	Alarm Waterflow Pressure Switch, Two SPDT, 4-20 PSI
EPSA10-1	ULC/Canadian Version
EPSA10-2	ULC/Canadian Version
<b>Replacement Parts</b>	
S07-66-02	Replacement Tamper Screws for Cover of EPS
WFDW	Replacement Tamper Proof Wrench for Cover of EPS
546-8000	Cover Tamper Switch for EPS Series



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WFD51702 • 12/14



## EPS40-1 and EPS40-2 Supervisory Pressure Switches

*System Sensor EPS40 Series switches are designed for use in dry pipe systems or pressure tanks and water pressure supplies of automatic water control valves.*



### Features

- Sensitivity adjustment wheel, no special tools required
- Reinforced diaphragm resists pressure spikes
- Two conduit entrances
- Both one- and two-switch models available

### Agency Listings



The EPS40-1 has a single SPDT switch while the EPS40-2 model contains two SPDT switches. The EPS40 Series features field adjustable pressure sensitivity to provide an alarm response between 10 and 100 psi. All models are factory set for use in a nominal 40 psi system. The EPS40-1 is factory set to respond at 30 psi at decreasing pressure while the EPS40-2 is factory set to respond at 50 psi on rising pressure and 30 psi at decreasing pressure. The pressure adjustment wheel requires no special tools and does not affect switch synchronization on the EPS40-2. The EPS40-1 and EPS40-2 supervisory pressure switches are NEMA 4 rated.

### Specifications, EPS40-1 and EPS40-2

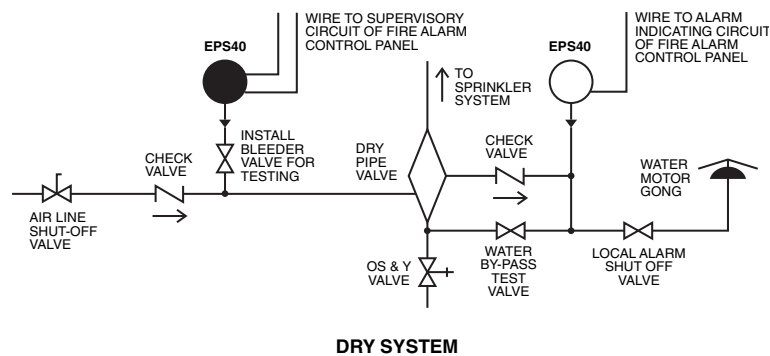
#### Architectural/Engineering Specifications EPS40-1 (SPDT), EPS40-2 (2/SPDT)

Model shall be an EPS40-1 or EPS40-2 pressure type waterflow switch as manufactured by System Sensor of St. Charles, IL. They shall be installed on the sprinkler system with connection as shown on the drawings and/or as specified herein. Pressure switches shall be of the bellows-activated type. Switches shall have a maximum service pressure rating of 300 psi and shall be adjustable from 10 – 100 psi. There shall be one (1) or two (2) SPDT contacts rated at 10.0 Amp @ 125/250 VAC and 2.5 Amp @ 6/12/24 VDC. The contractor shall furnish and install, where indicated on the plans, pressure switches according to appropriate NFPA standards. Switches shall be provided with a 1/2" NPT male pressure connection to be connected into the air supply line on the system side of any shut-off valve. Switches shall provide 1 knockout type and 1 open hole for 1/2" conduit fitting attachment and a ground screw provision for electrical grounding. The switch enclosure shall be weatherproof and carry a UL 4x/NEMA 4 rating when used with proper electrical fittings and conduit. The cover shall incorporate tamper-resistant screws. The unit shall be listed by Underwriters Laboratories, Inc., the California State Fire Marshal, MEA, CSFM, LPCB, VdS and approved by Factory Mutual.

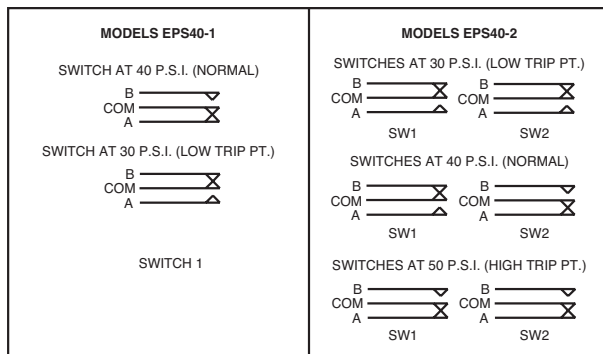
## Specifications, EPS40-1 and EPS40-2 (continued)

Physical/Operating Specifications			
<b>Maximum Operating Pressure</b>	300 psi	<b>Operating Temperature Range</b>	Indoor or outdoor use: -40°F to 160°F (-40°C to 71°C)
<b>Maximum Adjustment Pressure Range</b>	10 to 100 psi	<b>Cover Tamper Switch</b>	UL Models: Optional P/N 546-8000 ULC Models: Factory Installed
<b>Differential</b>	Approximately 3 psi @ 10 psi, 6 psi @ 100 psi	<b>Enclosure</b>	Rated UL 4x, NEMA 4 for indoor or outdoor use
<b>Factory Setting</b>	EPS40-1 operates at decreasing pressure at 30 psi EPS40-2 operates at increasing pressure at 50 psi and decreasing pressure at 30 psi	<b>Shipping Weight</b>	1.2 lbs. (.54 Kg)
<b>Switch Contact Ratings</b>	EPS10-1: One set SPDT (Form C) EPS10-2: Two sets SPDT (Form C) 10.0 A, ½ HP @ 125/250 VAC 2.5 A @ 6/12/24 VDC	<b>Service Use</b>	Automatic Sprinkler: NFPA 13 One or Two Family Dwelling: NFPA 13D Residential Occupancies up to 4 Stories: NFPA 13R National Fire Alarm Code: NFPA 72
<b>Pressure Connection</b>	½" NPT male	<b>Warranty</b>	3 years
<b>Dimensions</b>	5.12" H x 3.325" W x 4.250" L (13.0 cm x 8.4 cm x 10.8 cm)		

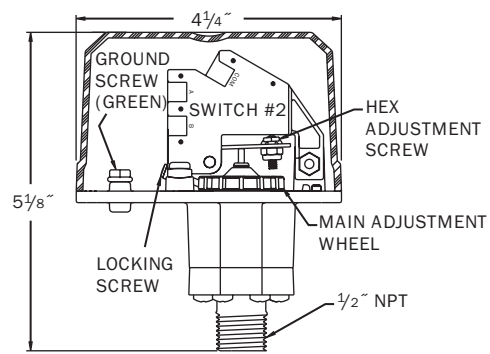
## Typical Sprinkler Applications



## Electrical Connections



## Pressure Switch Basic Dimensions



## Ordering Information

Part No.	Description
EPS40-1	Low Pressure Supervisory Switch, One SPDT, 10-100 PSI
EPS40-2	High/Low Pressure Supervisory Switch, Two SPDT, 10-100 PSI
EPSA40-1	Low Pressure Supervisory Switch, One SPDT, 10-100 PSI (ULC Model)
EPSA40-2	High/Low Pressure Supervisory Switch, Two SPDT, 10-100 PSI (ULC Model)
<b>Replacement Parts</b>	
S07-66-XX	Replacement Tamper Screws for Cover of EPS
WFDW	Replacement Tamper Proof Wrench for Cover of EPS
546-8000	Cover Tamper Switch for EPS Series



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WFDS51801 • 5/14



# OSY2 Supervisory Switch

*The System Sensor OSY2 is used to monitor the open position of an Outside Screw and Yoke (OS&Y) type gate valve.*

## Features

- NEMA 3R-rated enclosure
- User-friendly mounting bracket fits newer valve yokes
- Single side conduit entry does not require right angle fittings
- Adjustable length actuator eliminates the need for cutting the shaft
- Accommodates up to 12 AWG wire
- Three position switch monitors vandal and valve close signals
- Two SPDT contacts are enclosed in a durable terminal block for added strength
- 100 percent synchronization activates both alarm panel and local bell simultaneously



**Robust Construction.** The OSY2 consists of a rugged housing, intended for indoor and outdoor use. When installed with the actuator in the vertical position, the OSY2 is NEMA 3R rated per UL.

**Application Flexibility.** The OSY2 features a user-friendly mounting bracket and adjustable shaft to permit mounting to most OS&Y valves, ranging in size from 1" to 12". Its right angle design and wide bracket span provides maximum clearance for valve components, to accommodate troublesome valves. Removing the OSY2's gate valve bracket allows the unit to monitor side-bracket-style pressure reducing valves.

**Simplified Operation.** Installation is made easier with the OSY2's single side conduit entrance. By providing a direct conduit pathway to the electrical source, right angle fittings are not required. Installation is further simplified by the OSY2's adjustable length actuator, which eliminates the need for cutting the shaft.

**Reliable Performance.** The OSY2 is equipped with tamper-resistant cover screws to prevent unauthorized entry. Inside, two sets of SPDT (Form C) synchronized switches are enclosed in a durable terminal block to assure reliable performance.

## Agency Listings



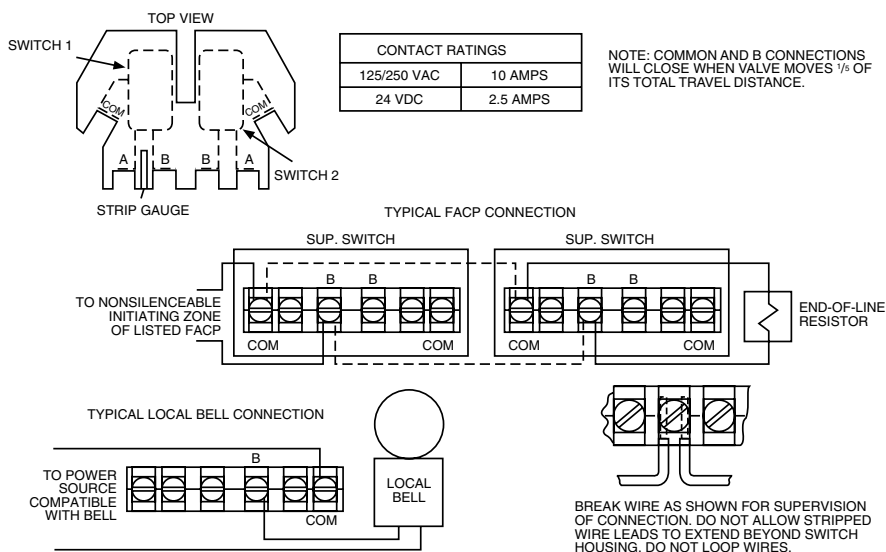
## OSY2 Specifications

### Architectural/Engineering Specifications

Model shall be model number OSY2 supervisory switch as manufactured by System Sensor. OSY2 shall be installed on each valve as designated on the drawings and/or as specified herein. Switches shall be mounted so as not to interfere with the normal operation of the valve and shall be adjusted to operate within two revolutions of the valve control or when the stem has moved no more than one-fifth of the distance from its normal position. The mechanism shall be contained in a weatherproof die cast metal housing that provides a side entrance for 1/2" conduit and incorporates the necessary facilities for attachment to the valve. A grounding provision is provided. The switch assembly shall include two switches each with a rated capacity of 10 Amp @ 125/250VAC and 2.5 Amp @ 24VDC. The cover shall contain tamper-resistant screws for which a security wrench will be provided with each switch. The OSY2 shall be Underwriters Laboratories listed for indoor or outdoor use. The OSY2 shall be Factory Mutual, CSFM, and MEA approved.

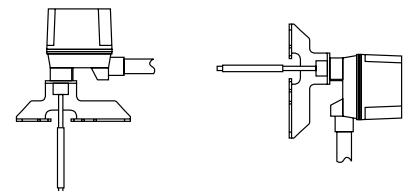
Physical Specifications		Operating Specifications	
<b>Overall Switch Dimensions</b>	5 3/4"H x 3 1/2"W x 3 1/4"D (14.6cm x 8.9cm x 8.2cm)	<b>Contact Ratings</b>	Two sets of SPDT (Form C) 10.0 A @ 125/250VAC; 2.5 @ 6/12/24VDC
<b>Shipping Weight</b>	2.8 lbs. (1.3 kg)	<b>Enclosure Rating</b>	UL indoor/outdoor NEMA 3R when mounted with the actuator vertical
<b>Operating Temperature Range</b>	32°F to 120°F (0°C to 49°C) NOTE: The OSY2 will operate from -40°F to 120°F (-40°C to 49°C); however UL does not test control valve supervisory switches below 32°F (0°C).	<b>Cover Tamper Switch</b>	Standard with ULC model Optional for UL model, part no. 546-7000
<b>Maximum Stem Extension</b>	2 5/8" (6.7cm)	<b>Service Use</b>	Automatic Sprinkler: NFPA 13 One or Two Family Dwelling: NFPA 13D Residential Occupancies up to 4 stories: NFPA 13R National Fire Alarm code: NFPA 72
<b>Bracket Span</b>	1/4"H x 6 3/4"W x 1"D (5.7cm x 17.1cm x 2.5cm)	<b>Warranty</b>	3 years
<b>Conduit Entrances</b>	One single side open for 1/2" conduit	<b>U.S. Patent Nos.</b>	5,478,038; 5,213,205

## Electrical Connections for OSY2



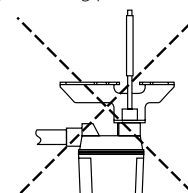
## OSY2 Mounting

The following are examples of acceptable mounting positions:



Actuator Vertical (Down) Actuator Horizontal

The following mounting position is not acceptable:



Actuator Vertical (Pointing Up)

## Ordering Information

Part No.	Description		
OSY2	Outside Screw and Yoke valve supervisory switch		
OSY2A	Outside Screw and Yoke valve supervisory switch (ULC model)		
<b>Accessories</b>			
OSYRK	Replacement hardware kit (wrenches, screw pack and J-hooks)	WFDW	Replacement tamper-proof wrench for cover
546-7000	Cover tamper switch kit	HEXW	Replacement hex wrench
S07-66-XX	Tamper screws for cover		



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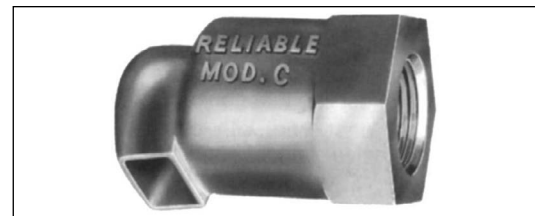
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A05-0196-010 • 1/09 • #1960



**Ball Drip**  
**Sight Drain**  
**Drum Drip**  
**Control Valve Seal**  
**Fill Cup**  
**Inspectors Test Connections**  
**Pressure Gauges**

### Model C — Automatic Ball Drip

An automatic drain valve horizontally installed at the low point in the fire department connection piping of automatic sprinkler systems. Water pressure from a fire department pumper automatically closes this valve. It automatically re-opens when pressure ceases, permitting this piping to drain and thereby preventing freezing. Made of bronze and available with  $\frac{3}{4}$ " (R $\frac{3}{4}$ ) or  $\frac{1}{2}$ " NPT (R $\frac{1}{2}$ ) female inlet connection. FM approved. Length:  $2\frac{9}{16}$ ". Maximum working pressure: 175psi (12bar).



### Model C - Mechanical Ball Drip Valve

The Model C Mechanical Ball Drip Valve is a listed trim component used in the alarm line of Reliable Model A & D dry valves, Model DDX deluge and DDX preaction valves. The mechanical ball drip valve is designed to close upon activation of the dry or deluge valve when sufficient flow is present in the alarm line. In the normal or open position the mechanical ball drip allows for the relieving of pressure in the alarm chamber of the valve. After valve activation, push in the plunger of the mechanical ball drip valve to manually release the water pressure and to drain the alarm line of the valve. Made of bronze and available with  $\frac{1}{2}$ " NPT (R $\frac{1}{2}$ ) female inlet connection. FM approved. Length:  $3\frac{1}{2}$ ". Maximum working pressure: 175 psi (12 bar).



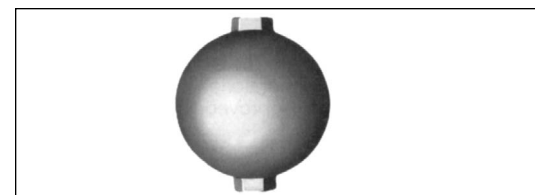
### Model C — 2" (50 mm) Sight Drain

Designed for installation in drain lines of sprinkler systems that connect with closed drains. Made of cast iron with clear plastic tube. Has 2" NPT (50mm) female pipe connection. Length: 6" (152mm).



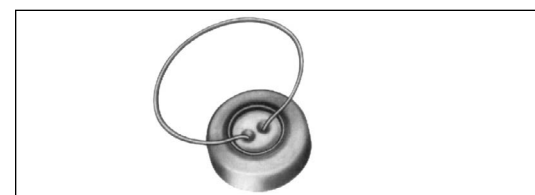
### Model B — Drum Drip

Permits draining the low points of dry pipe systems without tripping the system. Made of cast iron with  $\frac{3}{4}$ " NPT (R $\frac{3}{4}$ ) female pipe connection at each end. Diameter:  $6\frac{1}{2}$ " (165mm). Length:  $7\frac{3}{4}$ " (197mm).



### Model A — Control Valve Seal

Made of tin-plated steel. Two piece, snap type construction. Outer piece holes are sized for use with standard sealing wire (wire not included). Diameter:  $\frac{7}{8}$ " (22mm).



### Model A — Fill Cup

Made of cast iron. Available with  $\frac{1}{2}$ " or  $\frac{3}{4}$ " NPT (R $\frac{1}{2}$  or R $\frac{3}{4}$ ) female pipe connection. Cup Diameter:  $3\frac{3}{4}$ " (95mm). Length:  $2\frac{1}{4}$ " (57mm).





## Inspectors Test Connections

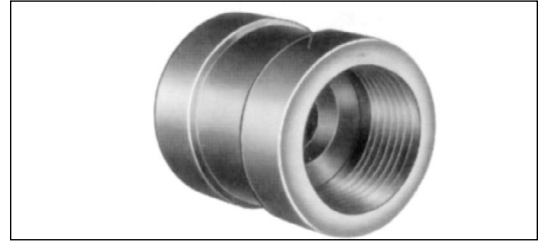
Installed in the test line of sprinkler systems to test alarms by simulating the flow of water through a sprinkler.

- **Model A — Blind Test Connection**

Designed for installation in test lines of sprinkler systems that connect to open drains. Made of bronze with 1" NPT female pipe connections. Orifice gives flow equivalent to one nominal 1/2" (15mm) orifice sprinkler.

Length: 1 7/8" (48mm).

Maximum working pressure: 175psi (12bar).

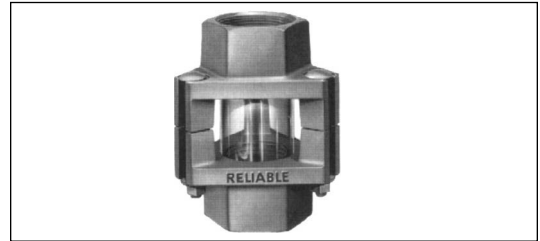


- **Model B — Sight Test Connection**

Designed for installation on the drain side of the test valve in a test line that connects to a closed drain.

Made of cast iron with clear tube. Smooth bore non-corrosive orifice gives flow equivalent to one nominal 1/2" (15mm) orifice sprinkler. Has 1" NPT pipe connections.

Length: 5 1/16" (129mm).



- **Model UA — Water Pressure Gauge**

Range 0 to 300psi in 5psi increments, and 0 to 2000 kPa in 50kPa increments. 1/4" NPT (R 1/4) male pipe connection. Case: 3 3/4" diameter (95mm). Height: 4 3/4" (121mm). Also available (not shown) with a range of 0 to 600psi (4000kPa) with 10psi (100kPa) increments.

Accuracy: ANSI B40.1 Grade B (3–2–3%)

Underwriters Laboratories Listed, UL file EX26795

Factory Mutual Approved



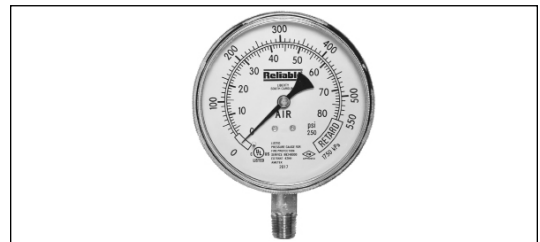
- **Model UA — Air Pressure Gauge**

Range 0 to 80psi in 1psi increments, and 0 to 550kPa in 10kPa increments. Retard to 250psi and 1750kPa. 1/4" NPT (R 1/4) male pipe connection. Case: 3 3/4" diameter (95mm). Height: 4 3/4" (121mm).

Accuracy: ANSI B40.1 Grade B (3–2–3%)

Underwriters Laboratories Listed, UL file EX26795

Factory Mutual Approved



- **Low Air Pressure Diaphragm Gauge**

Range 0 to 60 oz. in 1 oz. increments, and 1/4" NPT (R 1/4) male pipe connection. Case: 1/2" diameter (63.5mm). Height: 3 1/2" (88.9mm).



The equipment presented in this bulletin is to be installed in accordance with the latest published Standards of the National Fire Protection Association, Factory Mutual Research Corporation, or other similar organizations and also with the provisions of governmental codes or ordinances whenever applicable.

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## Model TD Test and Drain Valve

300 psi (20.7 bar) pressure rated

cULus Listed, FM Approved

### Product Description

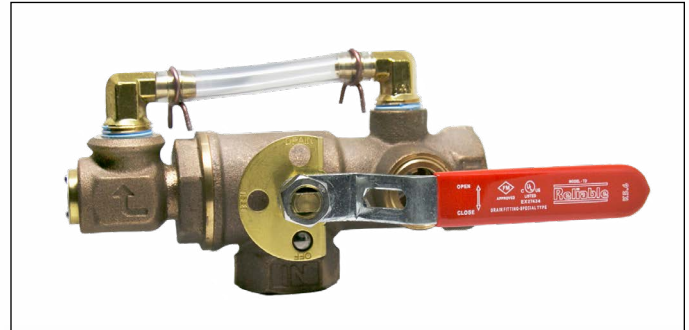
The Reliable Model TD Test and Drain Valve is a single-handle, tri-position ball valve allowing both testing of the waterflow alarm and draining of a wet-pipe fire protection system. The valves are cULus Listed and FM Approved. The Model TD Valve has a pressure rating of 300 psi (20.7 bar), and is factory tested at 600 psi (41.1 bar).

Model TD Test and Drain Valves have a restricted orifice with the available K-factors listed in Table A. Nominal valve sizes are 1", 1-1/4", and 2" with either NPT or ISO7-1 female threaded connections. 1-1/4" and 2" versions are also available with ANSI/AWWA C606 grooved inlet connections. Table C identifies the materials used in the Model TD valve.

The Model TD valve is available with an optional relief valve kit. The relief valve kit includes a Reliable Model A relief valve along with a hose and all fittings needed to connect the relief valve to the Model TD valve. The Model A relief valve is UL Listed and FM Approved for use on fire protection systems. The Model A relief valve is available with a nominal pressure rating of 175 psi (12 bar), 185 psi (13 bar), 210 psi (14 bar), 260 psi (18 bar), or 310 psi (21 bar). See Reliable Technical Bulletin 257 for additional information on the Model A relief valve. An optional locking handle kit is available for use with customer supplied padlocks.

### Installation

Connect the "IN" port of the Model TD valve to the wet-pipe sprinkler system. Connect the "OUT" port to a properly sized drain. The optional relief valve kit is installed as shown in the photographs in this bulletin after removing the plugs in the cap and body of the Model TD valve. The relief valve is commonly installed after hydrostatic testing.



Model TD Test & Drain Valve 1" with optional relief valve kit; threaded inlet



Model TD Test & Drain Valve 2" with optional relief valve kit; grooved inlet

### Operation

To run a test, rotate the handle counter-clockwise until the "Test" position is aligned with the ball detent. Note that rotating the valve to the "test" position is intended to operate the sprinkler system's waterflow alarm. To drain, rotate the handle further until the "Drain" position is aligned with the ball detent. Return the handle to the "Off" position when all testing and draining functions have been completed.

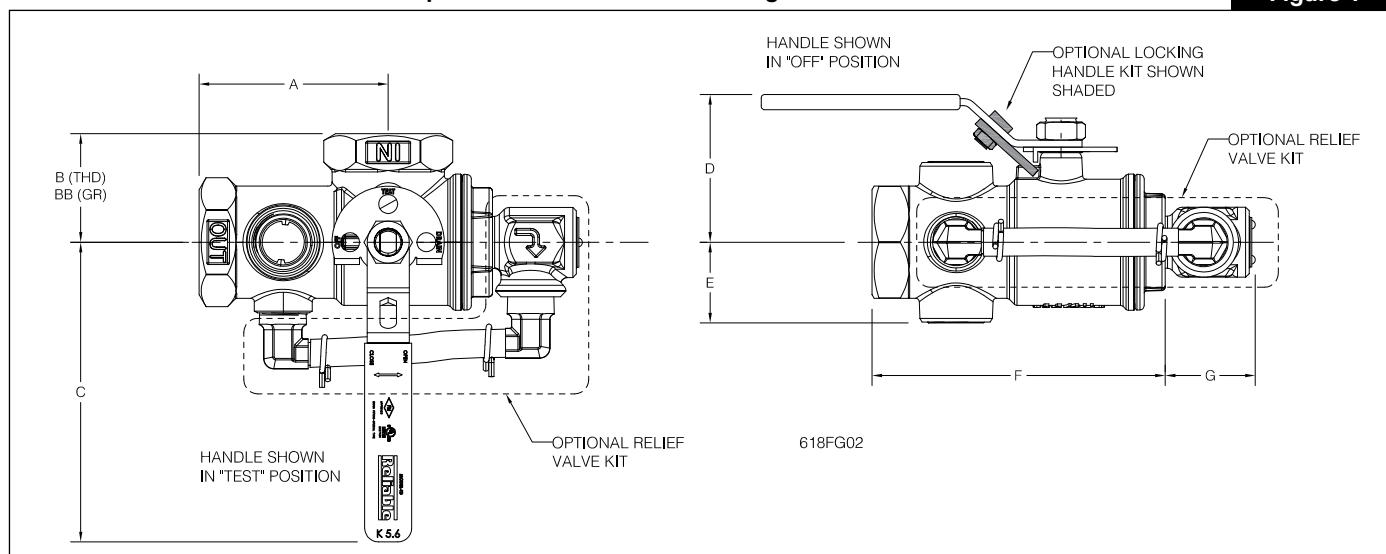
Table A

Nominal Valve Size	Available K-factors* gpm/psi <sup>1/2</sup> (L/min/bar <sup>1/2</sup> )	Inlet Connection	Outlet Connection
1"	2.8 (40), 4.2 (60), 5.6 (80)	NPT, ISO7-1 Threaded	NPT, ISO7-1 Threaded
1 1/4"	2.8 (40), 4.2 (60), 5.6 (80), 8.0 (115), 11.2 (160)	NPT, ISO7-1 Threaded	
2"	2.8 (40), 4.2 (60), 5.6 (80), 8.0 (115), 11.2 (160), 16.8 (240)	C606 Grooved	

**\*Note:** Valve K-factor must be equal to or less than the K-factor of the smallest K-factor sprinkler installed on the sprinkler system. For sprinkler systems where the smallest K-factor sprinkler on the system is greater than the largest available valve K-factor, use any valve K-factor that will provide a min. flow of 10 gpm (38 lpm) as required to operate a UL Listed Waterflow Switch.

## Model TD Test and Drain Valve with optional relief valve kit & locking handle kit

Figure 1



Component Dimensions (refer to Figure 1)

Table B

Valve Size	A	B	BB	C	D	E	F	G
Model TD Test and Drain 1" Valve	3-3/8" (86mm)	1-11/16" (43mm)	N/A	5-1/2" (140mm)	2-9/16" (65mm)	1-7/16" (37mm)	5-1/4" (133mm)	1-3/4" (44mm)
Model TD Test and Drain 1-1/4" Valve	3-3/8" (86mm)	1-15/16" (49mm)	2-5/16" (59mm)	5-1/2" (140mm)	2-5/8" (67mm)	1-7/16" (37mm)	5-1/4" (133mm)	1-3/4" (44mm)
Model TD Test and Drain 2" Valve	4-1/16" (103mm)	2-7/8" (73mm)	2-7/8" (73mm)	7-5/8" (194mm)	3-1/2" (89mm)	1-15/16" (49mm)	6-3/4" (171mm)	1-3/4" (44mm)

## Materials

Table C

Component	Material
Body	Brass alloy
Stem seal	Nitrile
End cap seal	Nitrile
Stem washer	PTFE
Nest	PTFE
Stem	Brass alloy
Ball	Chrome plated brass alloy
End cap	Brass alloy
Spring detent	Stainless steel
Ball detent	Stainless steel
Plate washer	Delrin
Function plate	Brass alloy
Handle	Plated carbon steel
Nut, handle	Stainless steel
Sight glass seal	EPDM
Sight glass	Glass
Sight glass gasket	PTFE
Sight glass retainer	Brass alloy
Pipe plug	Brass alloy

## Maintenance

Reliable Model TD valve should be inspected and the sprinkler system maintained in accordance with NFPA 25, as well as the requirements of any Authorities Having Jurisdiction.

## Guarantee

For the Reliable Automatic Sprinkler Co., Inc. guarantee, terms, and conditions, visit [www.reliablesprinkler.com](http://www.reliablesprinkler.com).

## Ordering Information

Specify the following when ordering:

### Model TD Test and Drain Valve

**Valve Size** (1", 1-1/4", 2")

**K-factor** (See Table A)

**Inlet/Outlet Connection** (Thd x Thd [all sizes], Gr x Thd [1-1/4" & 2" sizes only])

**Threads** (NPT, ISO7-1)

### Optional Accessories:

**Relief Valve Kit** [175 psi (12 bar), 185 psi (13 bar), 210 psi (14 bar), 260 psi (18 bar), or 310 psi (21 bar)]

### Locking Handle Kit

1" & 1-1/4" Valve size P/N 6990021646

2" Valve size P/N 6990021647



## Model A Relief Valve

UL Listed, FM Approved

### Product Description

The Model A relief valve is UL Listed and FM Approved as a fire protection system pressure relief valve for installation in accordance with NFPA 13 and FM Property Loss Prevention Data Sheets. The Model A relief valve is available factory-set at the following nominal operating pressures: 175 psi (12 bar), 185 psi (13 bar), 210 psi (14 bar), 260 psi (18 bar), or 310 psi (21 bar).

### Application

The Model A relief valve is intended for use to relieve excess pressure in fire protection systems due to thermal expansion and is also intended for installation downstream of pressure reducing valves. The Model A relief valve is UL Listed and FM Approved to operate between 95% and 105% of the nominal operating pressure. Select a relief valve with a nominal operating pressure up to 10 psi (0.7 bar) in excess of the maximum system pressure to avoid operation under normal system pressures.

### Installation

The Model A relief valve must be installed in accordance with NFPA 13, NFPA 20, and FM Property Loss Prevention Data Sheets as well as the requirements of any authorities having jurisdiction. PTFE-based thread seal tape should be applied to the male pipe threads of the Model A relief valve; the Model A relief valve should then be installed in a 1/2-inch NPT or ISO 7-1 R1/2 threaded outlet or fitting on the sprinkler system. Tighten the Model A relief valve using a smooth jaw wrench applied to the flat sides of the relief valve. Recommended installation torque is 8 to 18 lb-ft (11 to 24 n-m). The 1/2-inch NPT or ISO 7-1 R1/2 outlet from the Model A relief valve should be piped to a location where high pressure water flow will not cause injury or damage.

**Note:** In most cases where system components are rated to 175 psi (12 bar), a 185 psi (13 bar) relief valve is recommended. Do not use 175 psi (12 bar) relief valves where the system pressure is expected to exceed 165 psi (11.4 bar).

### Maintenance

Model A relief valve must be maintained in accordance with the requirements of NFPA 25.

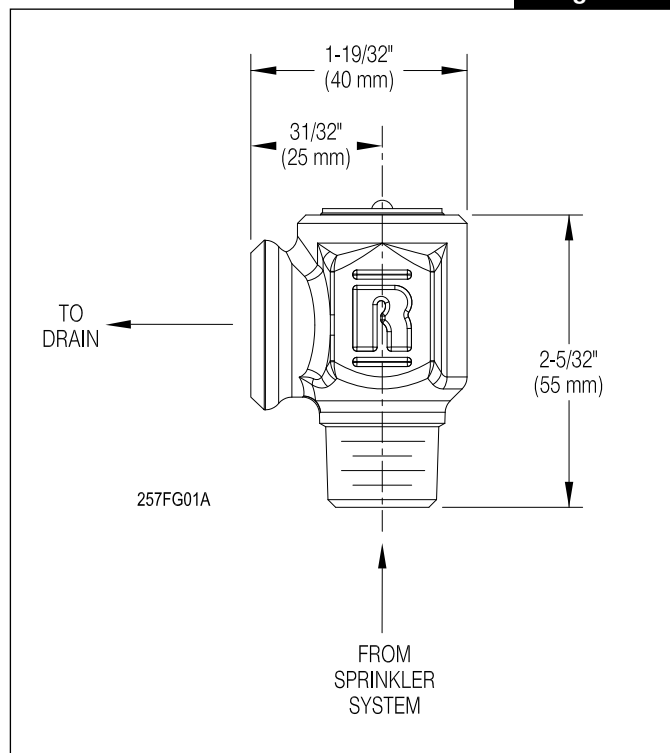
### Listings and Approvals

UL Listed to ANSI/UL1478A Pressure Relief Valves for Sprinkler Systems

FM Approved to Approval Standard for Trim Water Pressure Relief Valves, Class No. 1359



Model A Relief Valve Ports and Dimensions **Figure 1**



### Ordering Information

Specify:

#### Model A Relief Valve Nominal Operating Pressure

- 175 psi (12 bar)
- 185 psi (13 bar)
- 210 psi (14 bar)
- 260 psi (18 bar)
- 310 psi (21 bar)

#### Threads

- 1/2" NPT
- ISO 7-1 R1/2



## Model REL-GV Globe Valve

300 psi (20.7 bar)

### Product Description

Reliable Model REL-GV globe valves have a rated working pressure of 300 psi (20.7 bar) and feature a brass valve body with FNPT end connections.

### Installation

The Reliable globe valves shall be installed in accordance with NFPA 13, "Standard for the Installation of Sprinkler Systems," as well as the requirements of any authorities having jurisdiction. Verify compatibility of the valve materials with the water supply and the environment where the valve will be installed prior to installation.

**WARNING:** Model REL-GV globe valves contain lead and are not for use in systems carrying water intended for human consumption.

### Maintenance

The owner is responsible for maintaining the fire protection system in proper operating condition. Any system maintenance or testing that involves placing a control valve out of service will eliminate the fire protection that is provided by the fire protection system.

The Reliable globe valve shall periodically be given a thorough inspection and test. NFPA 25, "Inspection, Testing and Maintenance of Water Based Fire Protection Systems," provides minimum maintenance requirements. Inspect the valve for corrosion, damage, and wear as required and replace as necessary. Increase the frequency of inspections when the valve is exposed to corrosive conditions or chemicals that could impact the valve materials.



Model REL-GV Globe Valve

### Guarantee

For Reliable Automatic Sprinkler Co., Inc. guarantee, terms, and conditions, visit [www.reliablesprinkler.com](http://www.reliablesprinkler.com).

### Ordering Information

Specify the following when ordering:

#### Reliable Model REL-GV Globe Valve Valve Size

- 3/8" (10 mm)
- 1/2" (15 mm)
- 3/4" (20 mm)
- 1" (25 mm)
- 1-1/4" (32 mm)
- 1-1/2" (40 mm)
- 2" (50 mm)

## Model REL-GV Globe Valves

### Technical Specifications

#### Pressure Rating:

300 psi (20.7 bar)

### Material Specifications

**Body:** C37700 Brass Alloy

**Bonnet:** C37700 Brass Alloy

**Seat:** C37700 Brass Alloy

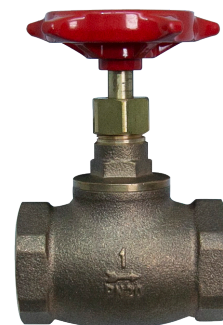
**Stem:** C37700 Brass Alloy

**Stem Packing:** PTFE

**Seat Seal:** EPDM Rubber

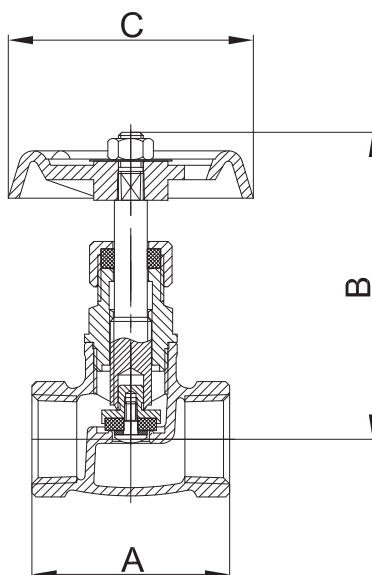
### End Connections

Female NPT



## Model REL-GV Globe Valve Dimensions

Figure 1



### Dimensions in. (mm)

Table A

Valve Size	A	B	C
1/2 (15)	1-7/8 (48)	2-15/16 (75)	2-3/8 (60)
3/4 (19)	2-1/16 (53)	2-15/16 (75)	2-3/8 (60)
1 (25)	2-1/2 (63)	3-3/16 (80)	2-9/16 (65)
1-1/4 (32)	3 (77)	3-5/8 (92)	2-9/16 (65)
1-1/2 (40)	3-9/16 (84)	4-1/2 (114)	3-1/8 (80)
2 (50)	3-7/8 (99)	5-1/8 (130)	3-15/16 (100)



## Model REL-AGV Angle Globe Valve

300 psi (20.7 bar)

### Product Description

Reliable Model REL-AGV angle globe valves have a rated working pressure of 300 psi (20.7 bar) and feature a brass valve body with FNPT end connections.

### Installation

The Reliable angle globe valves shall be installed in accordance with NFPA 13, "Standard for the Installation of Sprinkler Systems," as well as the requirements of any authorities having jurisdiction. Verify compatibility of the valve materials with the water supply and the environment where the valve will be installed prior to installation.

**WARNING:** Model REL-AGV angle globe valves contain lead and are not for use in systems carrying water intended for human consumption.

### Maintenance

The owner is responsible for maintaining the fire protection system in proper operating condition. Any system maintenance or testing that involves placing a control valve out of service will eliminate the fire protection that is provided by the fire protection system.

The Reliable angle globe valve shall periodically be given a thorough inspection and test. NFPA 25, "Inspection, Testing and Maintenance of Water Based Fire Protection Systems," provides minimum maintenance requirements. Inspect the valve for corrosion, damage, and wear as required and replace as necessary. Increase the frequency of inspections when the valve is exposed to corrosive conditions or chemicals that could impact the valve materials.



Model REL-AGV Angle Globe Valve

### Guarantee

For Reliable Automatic Sprinkler Co., Inc. guarantee, terms, and conditions, visit [www.reliablesprinkler.com](http://www.reliablesprinkler.com).

### Ordering Information

Specify the following when ordering:

#### Reliable Model REL-AGV Angle Globe Valve Valve Size

- 1/2" (15 mm)
- 3/4" (20 mm)
- 1" (25 mm)
- 1-1/4" (32 mm)
- 1-1/2" (40 mm)
- 2" (50 mm)

## Model REL-AGV Globe Valves

### Technical Specifications

#### Pressure Rating:

200 psi (13.8 bar)

### Material Specifications

**Body:** C37700 Brass Alloy

**Bonnet:** C37700 Brass Alloy

**Seat:** C37700 Brass Alloy

**Stem:** C37700 Brass Alloy

**Stem Packing:** PTFE

**Seat Seal:** EPDM Rubber

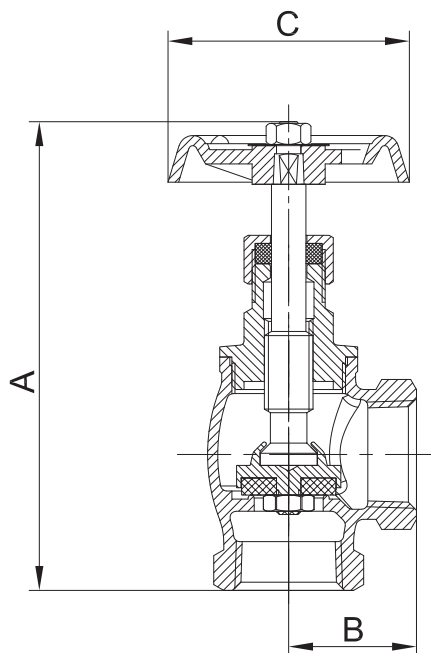
### End Connections

Female NPT



## Model REL-AGV Angle Globe Valve Dimensions

Figure 1



### Dimensions in. (mm)

Table A

Valve Size	A	B	C
1/2 (15)	3-5/16 (84)	1-1/16 (27)	2-3/8 (60)
3/4 (19)	4-9/16 (116)	1-1/4 (32)	2-3/8 (60)
1 (25)	5-1/8 (131)	1-9/16 (40)	2-9/16 (65)
1-1/4 (32)	5-5/8 (142)	1-3/4 (46)	2-9/16 (65)
1-1/2 (40)	6-1/2 (165)	2 (50)	3-1/8 (80)
2 (50)	7-15/16 (202)	2-7/16 (61)	3-15/16 (100)





## Model REL-BL Full Port Ball Valves

### Product Description

Reliable Model REL-BL full port ball valves are cULus Listed and FM Approved as trim and drain valves for fire protection systems. Table A indicates the rated working pressures. The valves feature a forged brass valve body with FNPT end connections.

### Installation

The Reliable Full Port Ball Valve shall be installed in accordance with NFPA 13, "Standard for the Installation of Sprinkler Systems," as well as the requirements of any authorities having jurisdiction. Verify compatibility of the Full Port Ball Valve materials with the water supply and the environment where the valve will be installed prior to installation.

**WARNING:** Model REL-BL ball valves contain lead and are not for use in systems carrying water intended for human consumption.

### Maintenance

The owner is responsible for maintaining the fire protection system in proper operating condition. Any system maintenance or testing that involves placing a control valve out of service will eliminate the fire protection that is provided by the fire protection system.

The Reliable Full Port Ball Valve shall periodically be given a thorough inspection and test. NFPA 25, "Inspection, Testing and Maintenance of Water Based Fire Protection Systems," provides minimum maintenance requirements. Inspect the valve for corrosion, damage, and wear as required and replace as necessary. Increase the frequency of inspections when the valve is exposed to corrosive conditions or chemicals that could impact the valve materials.



Model REL-BL Full Port Ball

### Guarantee

For Reliable Automatic Sprinkler Co., Inc. guarantee, terms, and conditions, visit [www.reliablesprinkler.com](http://www.reliablesprinkler.com).

### Ordering Information

Specify the following when ordering:

#### Reliable Model REL-BL Full Port Ball Valve Valve Size

- 1/4" (8 mm)
- 1/2" (15 mm)
- 3/4" (20 mm)
- 1" (25 mm)
- 1-1/4" (32 mm)
- 1-1/2" (40 mm)
- 2" (50 mm)

Table A

Valve Size	Pressure Rating	Approvals
1/4" (8 mm)	600 psi (41.4 bar)	cULus Listed
1/2" (15 mm)	600 psi (41.4 bar)	cULus Listed
	300 psi (20.7 bar)	FM Approved
3/4" (20 mm)	600 psi (41.4 bar)	cULus Listed
	300 psi (20.7 bar)	FM Approved
1" (25 mm)	600 psi (41.4 bar)	cULus Listed
	300 psi (20.7 bar)	FM Approved
1-1/4" (32 mm)	600 psi (41.4 bar)	cULus Listed
	300 psi (20.7 bar)	FM Approved
1-1/2" (40 mm)	600 psi (41.4 bar)	cULus Listed
	300 psi (20.7 bar)	FM Approved
2" (50 mm)	300 psi (20.7 bar)	cULus Listed, FM Approved



## Model REL-BL Full Port Ball Valves

### Technical Specifications

#### Pressure Rating:

See Table A

### Material Specifications

**Body:** C37700 Brass Alloy

**Bonnet:** C37700 Brass Alloy

**Seat:** PTFE

**Ball:** C37700 Brass Alloy

**Stem:** HPb59-1 Brass Alloy

**Packing:** PTFE

**Gland:** C37700 Brass Alloy

**Handle:** Q235A Steel Alloy

**Nut:** Q235A Steel Alloy

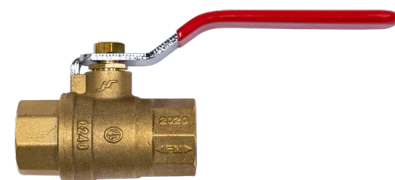
### End Connections

Female NPT

### Listings and Approvals

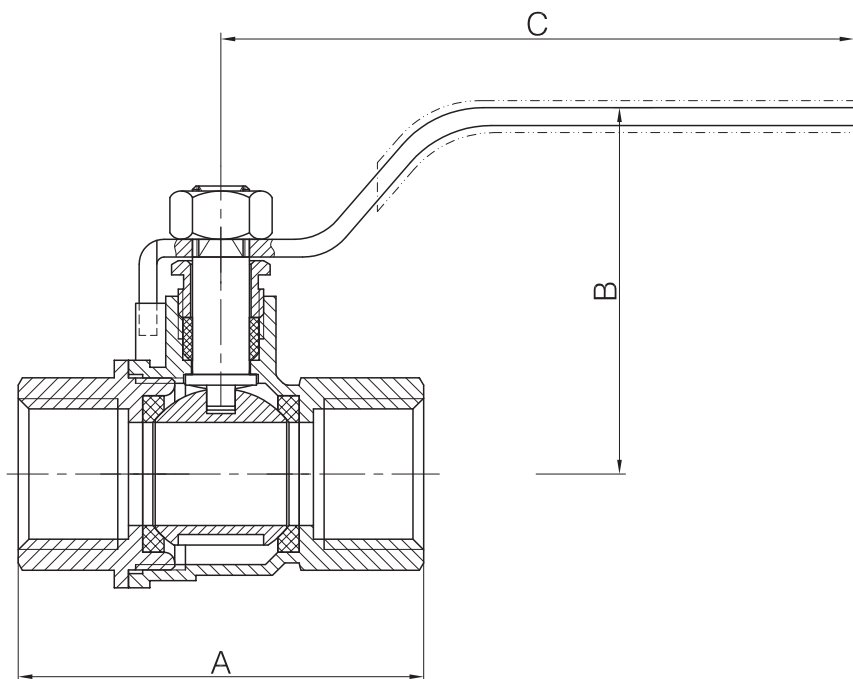
cULus Listed (1/4" - 2")

FM Approved (1/2" - 2")



## Model REL-BL Full Port Ball Valve Dimensions

Figure 1



### Dimensions in. (mm)

Table B

Valve Size	A	B	C
1/4" (8 mm)	1-3/4" (44)	1-13/16" (46)	3-1/2" (89)
1/2" (15 mm)	2-1/4" (57)	2" (51.5)	3-1/2" (89)
3/4" (20 mm)	2-1/2" (63)	2-3/8" (61)	4-1/8" (104)
1" (25 mm)	3" (75.5)	2-1/2" (63.5)	4-5/8" (117.5)
1-1/4" (32 mm)	3-7/16" (86.5)	2-13/16" (71)	4-5/8" (117.5)
1-1/2" (40 mm)	3-11/16" (94.2)	3-3/4" (94.5)	5-11/16" (145)
2" (50 mm)	4-1/4" (108)	4" (102)	5-11/16" (145)

# Reliable®

## Model REL-3W 3-Way Valves

cULus Listed  
600 psi

### Product Description

The Reliable REL-3W 1/4" NPT female threaded 3-Way Valve is intended to be installed in conjunction with fire protection system pressure gauges. When installed properly, the valve satisfies NFPA #13, which requires that each gauge connection shall be equipped with a shutoff valve and provisions for draining. Each valve has one inlet and two outlets. The valve body is equipped with a directional flow arrow to facilitate proper installation orientation. Typically one discharge outlet is used for pressure gauge installation and the second discharge outlet is normally plugged. The plugged outlet can either be used as an auxiliary drain or it can be used as an additional pressure gauge port to allow for calibration of the system pressure gauge.

### Installation

The Reliable REL-3W 3-Way Valve shall be installed in accordance with NFPA 13, "Standard for the Installation of Sprinkler Systems," as well as the requirements of any authorities having jurisdiction. Verify compatibility of the 3-Way Valve materials with the water supply and the environment where the valve will be installed prior to installation.

### Maintenance

The owner is responsible for maintaining the fire protection system in proper operating condition. Any system maintenance or testing that involves placing a control valve out of service will eliminate the fire protection that is provided by the fire protection system.

The Reliable REL-3W 3-Way Valve shall periodically be given a thorough inspection and test. NFPA 25, "Inspection, Testing and Maintenance of Water Based Fire Protection Systems," provides minimum maintenance requirements. Inspect the valve for corrosion, damage, and wear as required and replace the valve when necessary. Increase the frequency of inspections when the valve is exposed to corrosive conditions or chemicals that could impact the valve materials.

### Guarantee

For Reliable Automatic Sprinkler Co., Inc. guarantee, terms, and conditions, visit [www.reliablesprinkler.com](http://www.reliablesprinkler.com).

### Ordering Information

Specify the following when ordering:

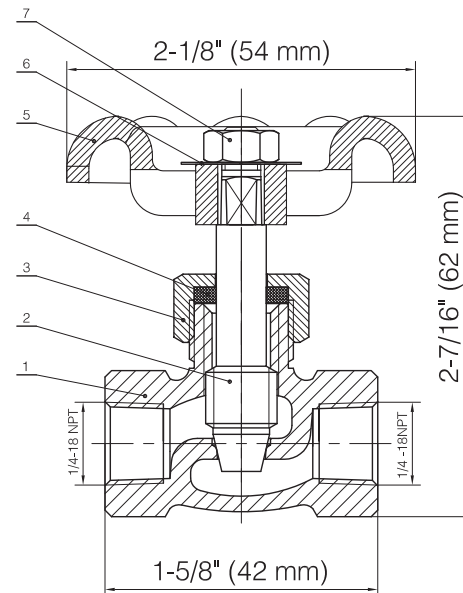
**Model REL-3W 3-Way Valve**



3-Way Valve

### 3-Way Valve Dimensions

Figure 1



### Materials

Table 1

1	Body	C84400 Brass Alloy
2	Spindle	HPb59-1 Brass Alloy
3	Gland nut	C37700 Brass Alloy
4	Wash seal	PTFE
5	Handle wheel	HT 200 Cast Iron
6	Name Plate	Aluminum
7	Screw Nut	Q235A Steel Alloys

P/N 9999970611



## SERIES LCI INTUMESCENT SEALANT

### APPLICATIONS

SpecSeal® LCI Sealant has a broad application base designed to seal a wide variety of common penetrations in light commercial and grouped residential construction. Penetrant types include insulated and non-insulated metallic pipes and tubes, non-metallic pipes and tubes, and common electrical service and power distribution, telephone, data, and TV cabling. This product is also used in conjunction with other SpecSeal® Products such as SpecSeal® Firestop Collars and Wrap Strips to protect larger plastic pipes.

See Table A for a summary application list.



### PRODUCT DESCRIPTION

SpecSeal® LCI Sealant is a versatile and economical intumescent product intended for firestopping a wide array of applications in small commercial or grouped residential construction and other structures with similar applications. SpecSeal® LCI Sealant is available in a single grade that has excellent caulking properties as well as high build properties on vertical or overhead surfaces. This single grade may be caulked (standard cartridge or bulk loaded), knifed or troweled. In addition, SpecSeal® LCI Sealant does not contain PCB's or asbestos.

SpecSeal® LCI Sealant is storage stable (when stored according to the manufacturer's recommendations), and will not separate or shrink when dried. SpecSeal® Series LCI Sealant will adhere to all common construction and penetrant materials and contains no solvents that might adversely effect plastic pipes or cable jackets.

#### FEATURES

- **Economical:** High performance without the high price!
- **Highly Intumescent:** Expands up to 8 times.
- **Excellent Smoke Seal**
- **Water Resistant:** Will not re-emulsify when dry.
- **Water-Based** for easy installation, cleanup, and disposal.
- **Acoustically Tested:** Reduces noise transmission
- **Safe...**Low VOC's, No Solvents, Non-Halogenated
- **Paintable**

### PERFORMANCE

SpecSeal® LCI Sealant is the basis for systems that meet the exacting criteria of ASTM E814 (UL1479) and ASTM E1966 (UL2079) as well as to the time-temperature requirements of ASTM E119 (UL263). LCI provides up to a 2-hour fire rating for typical service penetrations through concrete or wood floors, concrete or masonry walls, as well as gypsum board walls (3-hour for metallic pipe, conduit and tubing). SpecSeal® LCI Sealant meets Class A finish requirements for Flame Spread and Smoke Development when tested in accordance with ASTM E84 (UL723). SpecSeal® LCI Sealant is also acoustically tested, demonstrating excellent sound attenuation properties.

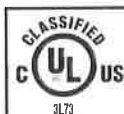


### SYSTEM COMPATIBLE

### PHYSICAL PROPERTIES

Properties	Series LCI
Color	Red
Odor	Mild Latex
Density	9.0 lb/gal (1.08 kg/L)
pH	9.0
In Service Temperature	≤ 130°F (54°C)
Flame Spread	0*
Smoke Developed	5*
STC Rating (ASTM E90/ASTM C919)	62
VOC Content (EPA Method 24/ASTM D3960)	0.29 lbs/gal (35.0 g/L)
Shelf Life	2 yrs
Volume Expansion	10X Free Expansion
Storage Temp.	≤ 130°F (54°C)

\* Tested to ASTM E84 (UL723) at 14% surface coverage (modified test for sealants and caulks)



FILL, VOID OR CAVITY MATERIALS FOR USE IN JOINT SYSTEMS AND THROUGH-PENETRATION FIRESTOP SYSTEMS. SEE UL DIRECTORY OF PRODUCTS CERTIFIED FOR CANADA AND UL FIRE RESISTANCE DIRECTORY.



### SPECIFICATIONS

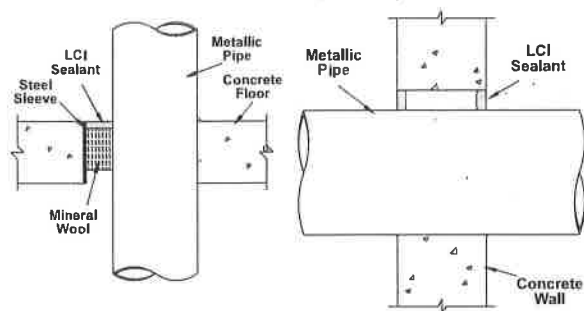
The firestopping sealant shall be a water-resistant, intumescent latex sealant. The sealant when exposed to high heat or flame shall exhibit a free expansion of up to 8 times its original volume. The firestopping sealant shall contain no water soluble nor hygroscopic ingredients and shall be acoustically tested. The sealant shall be UL Classified and/or FM approved and tested to the requirements of ASTM E814 (UL1479) and shall meet Class A finish requirements when tested in accordance with ASTM E84 (UL723).

### SPECIFIED DIVISIONS

DIV. 7	07840	Through-Penetration Firestopping
DIV. 13	13900	Special Construction Fire Suppression & Supervisory Systems
DIV. 15	15250	Mechanical Insulation - Fire Protection
DIV. 16	16050	Basic Electrical Materials & Methods



Fig 1: METALLIC PIPES - Concrete/Masonry Floors &amp; Walls

**UL System No. C-AJ-1353**

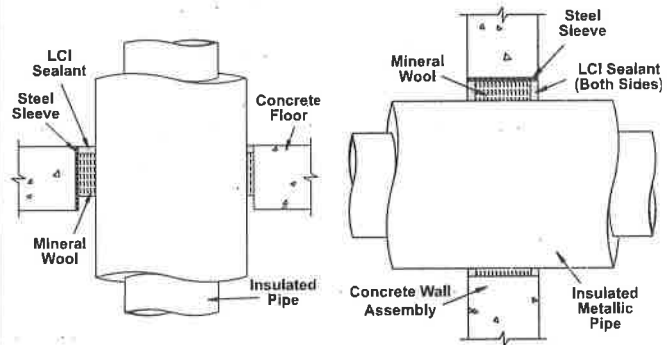
F Rating: 3 Hr • T Rating: 0 Hr  
 Steel or Iron Pipe: <12", Copper Pipe: <4"  
 Annulus: 0" to 2"  
 Sealant Depth: 1/4"

Forming Material: Nom 4 pcf mineral wool (2 1/4" Depth)

**UL System No. W-J-1098**

F Rating: 2 Hr • T Rating: 1/4, 3/4 & 1 Hr  
 Steel or Iron Pipe: <8", Copper Pipe: <4"  
 Annulus: 0" to 2"  
 Sealant Depth: 5/8"

Fig 2: INSULATED METALLIC PIPES - Concrete/Masonry Floors &amp; Walls

**UL System No. C-AJ-5138**

F Rating: 2 Hr • T Rating: 3/4 or 1 Hr  
 Steel or Iron Pipe: 6", Copper Pipe: 4"  
 Pipe Covering: Max. 2" fiber glass or mineral wool pipe insulation.  
 Annulus: 1/4" to 1-5/8" • Sealant: 1/2"  
 Forming: Nom. 4 pcf mineral wool (3" depth)

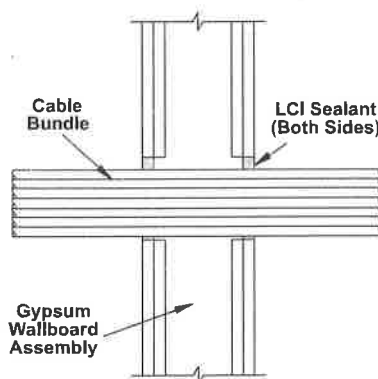
**SEALANT REQUIREMENTS IN CUBIC INCHES PER 1/4 INCH OF INSTALLED DEPTH\***

Pipe Size		Diameter of Opening (In.)											
Trade Size	Pipe O.D.	1.5	2.0	3.0	4.0	5.0	6.0	7.0	8.0	10	12	14	26
0.5"	0.840	0.3	0.6	1.6	3.0	4.8	6.9	9.5	12.4	19.5	28.1	38.3	132.6
1"	1.315	0.1	0.4	1.4	2.8	4.6	6.7	9.3	12.2	19.3	27.9	38.1	132.4
1.5"	1.900			1.1	2.4	4.2	6.4	8.9	11.9	18.9	27.6	37.8	132.0
2"	2.375			0.7	2.0	3.8	6.0	8.5	11.5	18.5	27.2	37.4	131.6
2.5"	2.875			0.1	1.5	3.3	5.4	8.0	10.9	18.0	26.7	36.9	131.1
3"	3.500				0.7	2.5	4.7	7.2	10.2	17.2	25.9	36.1	130.3
3.5"	4.000					1.8	3.9	6.5	9.4	16.5	25.1	35.3	129.6
4"	4.500					0.8	3.0	5.6	8.5	15.6	24.2	34.4	128.7
6"	6.625							1.1	4.0	11.1	19.7	29.9	124.2
8"	8.625									4.9	13.6	23.8	118.0
10"	10.750										5.6	15.8	110.0
12"	12.750											6.6	100.8
24"	24.000												19.6

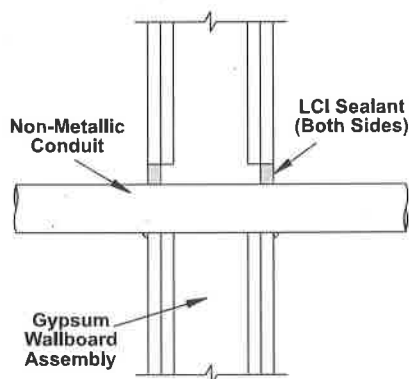
\*Different Sealant Depth?  
 1/2" Multiply by 2  
 5/8" Multiply by 2.5  
 1" Multiply by 4  
 1-1/4" Multiply by 5

IMPORTANT NOTE: This table is for estimation purposes only. Consult UL Fire Resistance Directory or STI Product & Application Guide for specific installation requirements and limitations  
 Metric Estimation Table available upon request.

Fig. 3: ELECTRICAL, DATA OR COMMUNICATIONS - Gypsum Walls

**UL System No. W-L-3169**

F Rating: 1, 2 Hr • T Rating: 1/4 and 3/4  
 Up to 4-1/2" cable bundle  
 Annulus: 0" to 1/2" • Sealant: 5/8"

**UL System No. W-L-2241**

F Rating: 1, 2 Hr • T Rating: 0, 1/4, 1, 1-3/4  
 <2" Rigid PVC or ENMT, CPVC, ABS  
 Annulus: 0-1" • Sealant 5/8"

**TABLE A: APPLICATIONS****TESTED AND CLASSIFIED FOR FIRE RESISTANCE**

- **Metallic Pipes** including steel, iron, or copper pipe and tubing.
- **Nonmetallic Pipes, Conduits & Tubing** including PVC, CPVC, ABS, and PEX.
- **Electrical & Electronic Cabling** including service entrance, power distribution, computer, telephone, and television.
- **Metal Ductwork** including HVAC, bath and dryer vents.
- **Insulated Pipes** including heating, cooling, and condensation applications.
- **Complete Wood Floor firestopping package** for electrical, plumbing, HVAC, telephone, and television.

## INSTALLATION INSTRUCTIONS

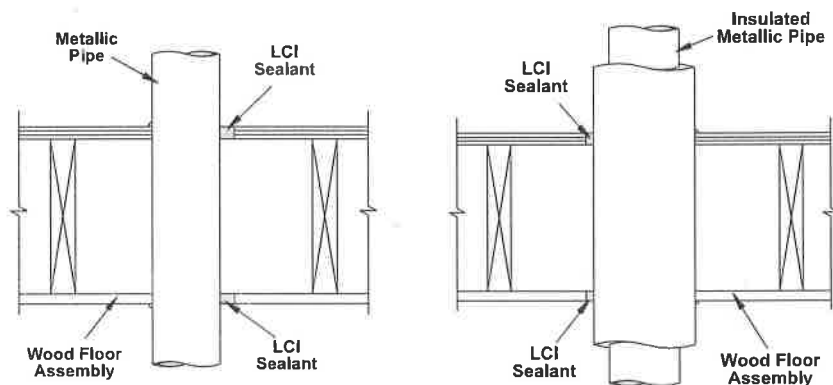
**GENERAL:** Areas to be protected must be clean and free of oil, loose dirt, rust or scale. Installation temperatures must be between 35°F (2°C) and 100°F (38°C). Allow product to dry a minimum of 24 hours before exposure to moisture.

**SYSTEM SELECTION:** Selection of an appropriate firestop system design is critical to the fire protection process. Space limitations preclude highly detailed information pertaining to individual application systems. Please consult the Product & Application Guide as well as the UL® Fire Resistance Directory for additional information.

**FORMING:** Some installations may require forming as either an integral part of the system or as an option to facilitate installation. In systems where forming is required, mineral wool batts with a minimum nominal density of 4 PCF (64 kg/m³) are generally required. Cut forming material oversize to allow for tight packing. Position forming material to allow for the proper depth of fill material.

**FILL MATERIAL:** SpecSeal® LCI Sealant may be installed by caulking using a standard caulking gun or from bulk containers using a bulk loading caulk gun, or by manually troweling using a mason's trowel or putty knife. If the sealant tends to pull back from a surface, clean the surface with a damp rag or sponge and reapply. Work sealant into all areas exercising care to eliminate voids or seams. The surface of the sealant can be smoothed using a putty knife dipped in water. Adding water to the sealant itself is not recommended. Sealant (when dry) may be painted using most non-solvent based paints.

**Fig. 4: BARE & INSULATED METALLIC PIPES - Wood Floor Assemblies**



**UL System No. F-C-1074**  
F Rating: 1 & 2 Hr • T Rating: ¼, ½ and 1 Hr  
Steel, Iron or Copper: 4" • Chase wall optional.  
Annulus: 0" to 1" • Sealant: 5/8" bottom, ¾" top

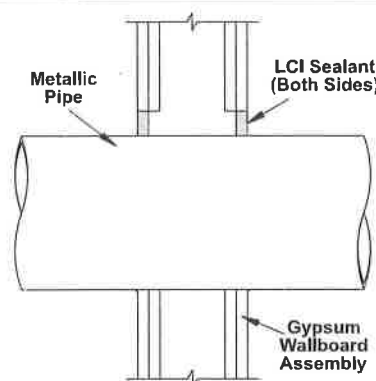
**UL System No. F-C-5043**  
F Rating: 1 & 2 Hr • T Rating: ¾ and 1 Hr  
Steel, Iron or Copper: 4"  
Pipe covering: 1" Fiber Glass, Mineral fiber  
or AB/PVC • Chase wall optional.  
Annulus: 0" to 1" • Sealant: 5/8" bottom, ¾" top.

In gypsum wallboard penetrations, apply a minimum cove bead of 1/4" (6 mm) at the interface of the penetrant with both exterior wall surfaces.

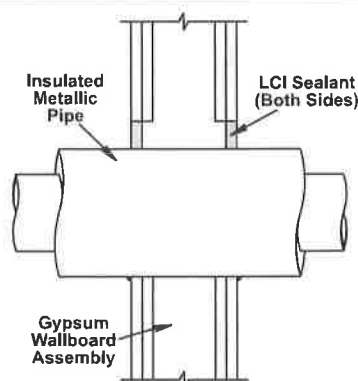
**SMOKE SEALING:** In some applications including firestop collars, SpecSeal® LCI Sealant is recommended as a smoke seal. It is suggested in these applications that the sealant be applied to both sides of walls. In floor applications, a sealing bead is suggested top and bottom.

**LIMITATIONS:** SpecSeal® LCI Sealant is water-based and cures through the evaporation of water. Low temperatures as well as high humidity may retard drying. Non-porous or impermeable backing materials, plates, or coatings may retard the drying process. Do not paint or seal in any way that prevents contact with air until sealant has dried through completely. This product has been designed to be safe with plastics and has been used extensively and successfully with a variety of different types of plastic pipes, tubes, and plastic cable insulations. Variations in these materials however, make it impossible to guarantee compatibility. STI strongly recommends that the user consult with the manufacturer of the pipe, tubing, or cable in question regarding any known sensitivities or potential restrictions before applying this product.

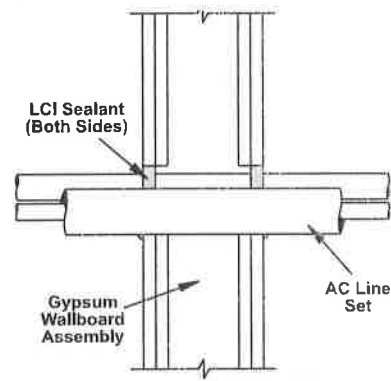
**Fig. 5: BARE & INSULATED METALLIC PIPES - Gypsum Walls**



**UL System No. W-L-1222**  
F Rating: 1, 2 Hr • T Rating: ¼, ¾, 1 Hr  
Steel or Iron pipe: 8", Copper pipe: 4"  
Annulus: 0" to 2" • Sealant: 5/8"



**UL System Nos. W-L-5121, W-L-5122**  
F Rating: 1, 2 Hr • T Rating: 1 Hr & 1/4 Hr  
Steel or Iron pipe: 6", Copper pipe: 4"  
Pipe covering: Max. 2" fiber glass,  
¾" AB/PVC or 2" mineral fiber  
Annulus: 0" to 1-1/2" • Sealant: 5/8"



**UL System No. W-L-8025**  
F Rating: 1, 2 Hr • T Rating: ¼ Hr  
AC Line Set: Two copper tubes,  
one with ¾" AB/PVC and thermostat wire  
Annulus: 0" to 1" • Sealant: 5/8"



## MAINTENANCE

No maintenance is normally required, however a periodic inspection of rated barriers is recommended to make sure that any new openings, modifications of previously installed firestops, or areas exhibiting physical damage, have been properly sealed or repaired. Subsequent sealing or repairs should be accomplished using SpecSeal® products per the original approved design.

**RETROFIT:** When adding or removing penetrants, care should be taken to minimize damage to the seal. Reseal using SpecSeal® products per the approved design. **NOTE:** New penetrants of a different nature than the original design may require a totally new firestop design or extensive modifications to the existing design. Reseal all openings as per the requirements of the modified design.

## TECHNICAL SERVICE

Specified Technologies Inc. provides toll free technical support to assist in product selection and appropriate installation design. UL Systems, Material Safety Data Sheets and other technical information is available through the Technical Library at [www.stifiirestop.com](http://www.stifiirestop.com).

## PRECAUTIONARY INFORMATION

Consult Material Safety Data Sheet for additional information on the safe handling and disposal of this material.

## AVAILABILITY

SpecSeal® Series LCI Sealant is available from authorized STI distributors. Consult factory or website for the names and locations of the nearest sales representatives or distributors.

## ORDERING INFORMATION

CAT. NO.	DESCRIPTION	
LCI300	Sealant 10.1 oz Tube	18.2 Cu In (300 ml)
LCI305	Sealant 5 Gal Pail	1,155 Cu In (19.0 Liters)
LCI320	Sealant 20 oz Sausage	36 Cu in. (592 ml)
LCI329	Sealant 29 oz Quart Tube	52 Cu in. (858 ml)



### Additional SpecSeal Products...

#### Series SSS Sealant

The industry's most versatile sealant provides the firestopping solutions for a wide range of combustible and noncombustible applications. Water-based intumescent sealant expands up to 8X!

#### Intumescent Wrap Strips

Three grades of intumescent wrap strips provide an unmatched combination of flexibility, economy, and expansion (up to 30X). Systems for plastic pipes including FR Polypropylene up to 8" trade size!

#### SSC & LCC Firestop Collars

Easy to install, economical protection for ABS and PVC pipes (both solid and foam core) as well as CPVC, PVDF, and FRPP. LCC Collars are available up to 4" and SSC Collars are available up to 6" trade size.

#### Firestop Mortar

Lightweight, versatile and economical! The best choice for large or complex installations.

#### SSP Firestop Putty

Available both in bar form and in pads, putty provides easy retrofit for through-penetrations and economical protection for electrical boxes.

#### Pensil® Silicones

Sealants and foam for through-penetrations and construction joints. Unexcelled aging characteristics and flexibility.

#### Elastomeric Joint Seals

New economical products for sealing construction joints. Choose caulk or spray applied products tested to UL2079.

## CITY OF NEW YORK MEA 211-01-M

**IMPORTANT NOTICE:** All statements, technical information, and recommendations contained herein are based upon testing believed to be reliable, but the accuracy and completeness thereof is not guaranteed.

### WARRANTY

Specified Technologies Inc. manufactures its goods in a manner to be free of defects. Should any defect occur in its goods (within one year), Specified Technologies Inc., upon prompt notification, will at its option, exchange or repair the goods or refund the purchase price.

### LIMITATIONS AND EXCLUSIONS:

THIS WARRANTY IS IN LIEU OF ALL OTHER REPRESENTATIONS EXPRESSED OR IMPLIED (INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR USE) AND UNDER NO CIRCUMSTANCES SHALL SPECIFIED TECHNOLOGIES INC. BE RESPONSIBLE FOR ANY INCIDENTAL OR CONSEQUENTIAL PROPERTY DAMAGE OR LOSSES. PRIOR TO USE, THE USER SHALL DETERMINE THE SUITABILITY OF THE PRODUCT FOR ITS INTENDED USE, AND THE USER ASSUMES ALL RISKS AND LIABILITY FOR SUBSEQUENT USE. No statement or recommendation not contained herein shall have any force or effect unless in an agreement signed by officers of seller and manufacturer.



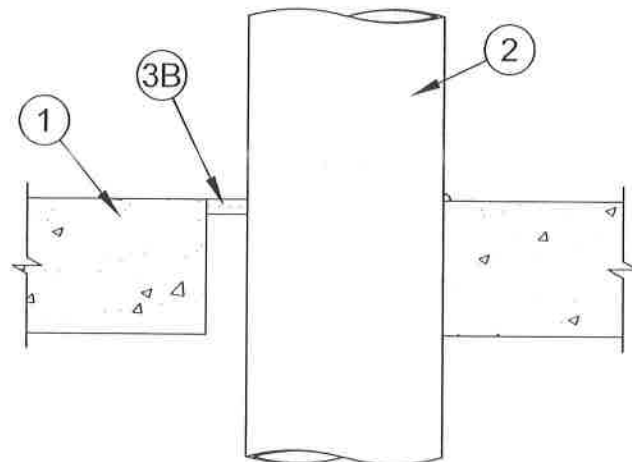
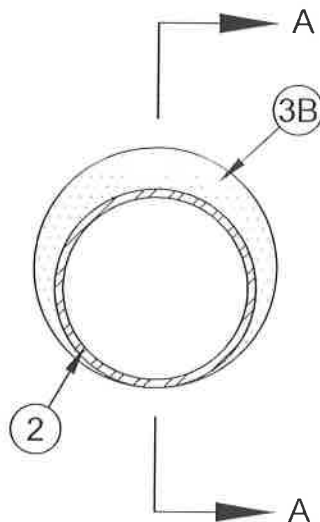
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ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating - 3 Hr	F Rating - 3 Hr
T Rating - 0 Hr	FT Rating - 0 Hr
L Rating At Ambient - Less Than 1 CFM/sq ft	FH Rating - 3 Hr
L Rating At 400 F - Less Than 1 CFM/sq ft	FTH Rating - 0 Hr
	L Rating At Ambient - Less Than 1 CFM/sq ft
	L Rating At 400 F - Less Than 1 CFM/sq ft



Section A-A

- Floor or Wall Assembly** - Min 4-1/2 in. thick reinforced lightweight or normal weight (100-150 pcf) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks\***. Max diam of opening is 32 in.

See **Concrete Block** (CAZT) category in the Fire Resistance Directory for names of manufacturers.

- Through Penetrants** - One metallic pipe, conduit or tubing to be centered within the firestop system. The annular space shall range from min 0 in. (point contact) to max 2 in. Pipe, conduit or tubing to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of metallic pipes, conduits or tubing may be used:
  - Steel Pipe** - Nom 30 in. diam (or smaller) Schedule 5 (or heavier) steel pipe.
  - Iron Pipe** - Nom 30 in. diam (or smaller) cast or ductile iron pipe.
  - Conduit** - Nom 4 in. diam (or smaller) electrical metallic tubing or nom 6 in. diam (or smaller) rigid galv steel conduit.
  - Copper Tubing** - Nom 6 in. diam (or smaller) Type M (or heavier) copper tubing.
  - Copper Pipe** - Nom 6 in. diam (or smaller) Regular (or heavier) copper pipe.
- Firestop System** - The firestop system shall consist of the following:
  - Packing Material** - (Optional, Not Shown) - Mineral wool batt insulation, polyethylene backer rod or glass fiber batt insulation friction fitted into annular space. Packing material to be recessed from top surface of floor or both surfaces of wall as required to accommodate the required thickness of fill material.
  - Fill, Void or Cavity Material\* - Caulk** - Min 1/2 in. thickness of fill material applied within the annulus, flush with top surface of floor or with both surfaces of wall. At point contact location, apply min 1/4 in. diam bead of sealant at the pipe/concrete interface on the top surface of the floor or both surfaces of wall.

**SPECIFIED TECHNOLOGIES INC** - SpecSeal Series SSS Sealant or SpecSeal LCI Sealant

\* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.(such



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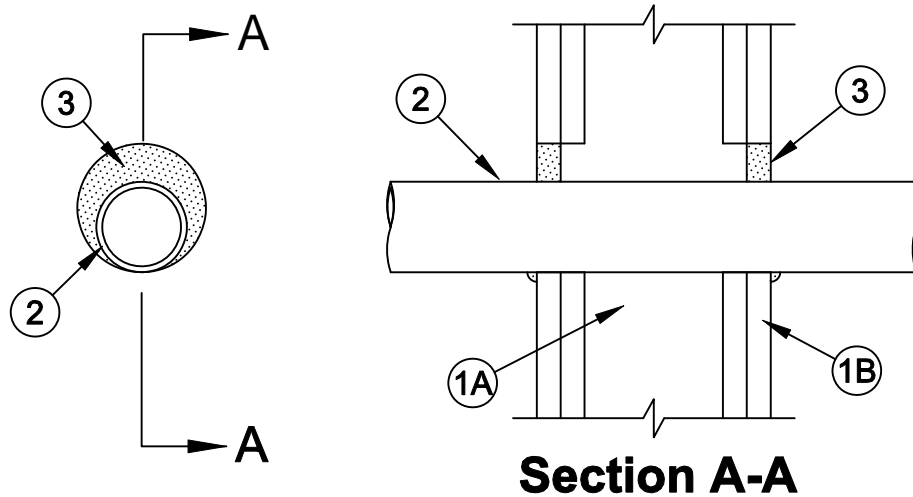
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C-AJ-1080  
PAGE 1 OF 1

## System No. W-L-2241

F Ratings - 1 and 2 Hr (See Item 1)  
T Ratings - 0, 1/4, 1 and 1-3/4 Hr (See Item 2)  
L Rating At Ambient - Less Than 1 CFM/sq ft  
L Rating At 400 F - Less Than 1 CFM/sq ft



1. **Wall Assembly** - The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300 or U400 Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:

- A. **Studs** - Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced max 16 in. (406 mm) OC. Steel studs to be min 3-1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC.
- B. **Gypsum Board\*** - Thickness, type, number of layers and fasteners as specified in the individual Wall and Partition Design. Diam of opening to be 1 in. to 1-1/8 in. (25 to 29 mm) larger than outside diam of pipe.

**The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed. When Item 2G or 2H is used, the hourly F Rating is 1 hr.**

2. **Through Penetrant** - One nonmetallic pipe, conduit or tube to be installed eccentrically or concentrically within the firestop system. Pipe, conduit or tube to be rigidly supported on both sides of the wall assembly. The following types and sizes of nonmetallic pipes, conduits and tubes may be used:
- A. **Polyvinyl Chloride (PVC) Pipe** - Nom 2 in. (51 mm) diam (or smaller) Schedule 40 solid or cellular core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems. Annular space shall be min 0 in. (0 mm, point contact) to max 1 in. (25 mm).
- B. **Chlorinated Polyvinyl Chloride (CPVC) Pipe** - Nom 2 in. (51 mm) diam (or smaller) SDR 13.5 or Schedule 80 CPVC pipe for use in closed (process or supply) piping systems. Annular space shall be min 0 in. (0 mm, point contact) to max 1 in. (25 mm).
- C. **Rigid Nonmetallic Conduit+** - Nom 2 in. (51 mm) diam (or smaller) Schedule 40 PVC conduit installed in accordance with Article 347 of the National Electrical Code (NFPA 70). Annular space shall be min 0 in. (0 mm, point contact) to max 1 in. (25 mm).
- D. **Electrical Nonmetallic Tubing+** - Nom 2 in. (51 mm) diam (or smaller) PVC tubing installed in accordance with Article 331 of the National Electrical Code (NFPA 70). Annular space shall be min 0 in. (0 mm, point contact) to max 1 in. (25 mm).
- E. **Cross Linked Polyethylene (PEX) Tubing** - Nom 1 in. (25 mm) diam (or smaller) SDR9 PEX tubing for use in closed (process or supply) piping systems. Annular space shall be min 0 in. (0 mm, point contact) to max 1 in. (25 mm).



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W-L-2241  
PAGE 1 OF 2



F. **Acrylonitrile Butadiene Styrene (ABS) pipe** - Nom 1-1/2 in. (38 mm) diam (or smaller) Schedule 40 solid-core or cellular core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems. Annular space shall be min 1/4 in. (6 mm) to max 3/4 in. (19 mm).

G. **Polyvinyl Chloride (PVC) Pipe** - Nom 3 in. (76 mm) diam (or smaller) Schedule 40 solid or cellular core PVC pipe for use in closed (process or supply) piping systems. Annular space shall be min 0 in. (0 mm, point contact) to max 1 in. (25 mm).

H. **Chlorinated Polyvinyl Chloride (CPVC) Pipe** - Nom 3 in. (76 mm) diam (or smaller) SDR 17 CPVC pipe for use in closed (process or supply) piping systems. Annular space shall be min 0 in. (0 mm, point contact) to max 1 in. (25 mm).

**When Item 2A or 2B is used, the T Rating is 1/4 hr. When Item 2C, 2D, or 2E is used, the T Rating is 1 hr and 1-3/4 hr for 1 hr and 2 hr fire rated walls, respectively. When Item 2F, 2G, or 2H is used, T Rating is 0 hr.**

3. **Fill, Void or Cavity Material\* - Sealant** - Min 5/8 in. (16 mm) thickness of fill material applied within annulus, flush with both surfaces of wall assembly. At point contact location, min 1/4 in. (6 mm) diam bead of fill material applied at nonmetallic pipe/gypsum board interface on both surfaces of wall.

**SPECIFIED TECHNOLOGIES INC** - SpecSeal LCI Sealant or Type WF300 Firestop Caulk (for wood studs only)

\* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.



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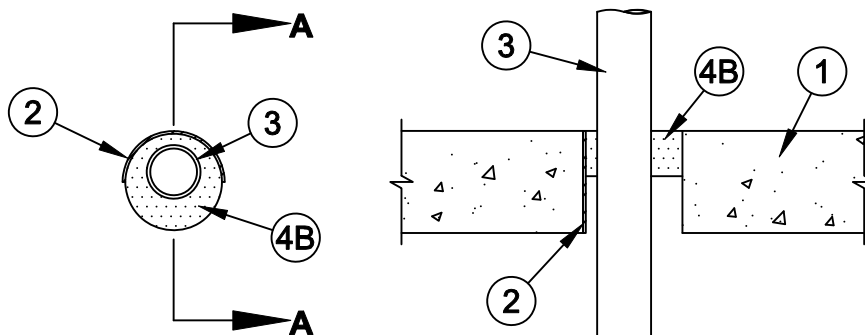
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W-L-2241  
PAGE 2 OF 2

## System No. C-AJ-2290

F Rating - 2 Hr  
T Rating - 0 Hr



**Section A-A**

1. **Floor or Wall Assembly** - Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m<sup>3</sup>) concrete floor. Floor may also be constructed of any min 6 in. (152 mm) thick hollow-core **Precast Concrete Units\***. Wall may also be constructed of any UL Classified **Concrete Blocks\***. Max diam of opening is 4 in. (102 mm).  
See **Concrete Blocks** (CAZT) or **Precast Concrete Units** (CFTV) categories in the Fire Resistance Directory for names of manufacturers.
2. **Steel Sleeve** - (Optional) - Nom 4 in. (102 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe cast or grouted into floor or wall assembly, flush with floor or wall surfaces.
3. **Through Penetrant** - One nonmetallic pipe, conduit or tube to be installed eccentrically or concentrically within the firestop system. The annular space between the pipe, conduit or tube and the periphery of the opening shall be nom 1/2 in. (13 mm) to max 1-1/8 in. (29 mm). Pipe, conduit or tube to be rigidly supported on both sides of the floor or wall assembly. The following types and sizes of nonmetallic pipes, conduits and tubes may be used:
  - A. **Polyvinyl Chloride (PVC) Pipe** - Nom 2 in. (51 mm) diam (or smaller) Schedule 40 polyvinyl chloride (PVC) pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
  - B. **Chlorinated Polyvinyl Chloride (CPVC) Pipe** - Nom 2 in. (51 mm) diam (or smaller) SDR13.5 chlorinated polyvinyl chloride (CPVC) pipe for use in closed (process or supply) piping systems.
  - C. **Rigid Nonmetallic Conduit+** - Nom 2 in. (51 mm) diam (or smaller) Schedule 40 PVC conduit installed in accordance with Article 347 of the National Electrical Code (NFPA 70).
  - D. **Electrical Nonmetallic Tubing+** - Nom 2 in. (51 mm) diam (or smaller) PVC tubing installed in accordance with Article 331 of the National Electrical Code (NFPA 70).
  - E. **Optical Fiber Raceway (OFR)+** - Nom 2 in. (51 mm) diam (or smaller) optical fiber raceway formed from either polyvinylidene fluoride (PVDF) or polyvinyl chloride (PVC). Raceway to be installed in accordance with Article 770 of the National Electrical Code (NFPA 70). Multiple 62.5/48 micron fiber optical cables with PE or PVC jacket to be installed within each raceway.
4. **Firestop System** - The firestop system shall consist of the following:
  - A. **Packing Material** - (Optional, Not Shown) - Polyethylene backer rod, mineral wool batt insulation or glass fiber batt insulation friction fit into opening as a permanent form to facilitate installation of fill material (Item 4B).
  - B. **Fill, Void or Cavity Material\* - Sealant** - Min 2 in. (51 mm) thickness of fill material installed within annulus, flush with top surface of floor or both surfaces of wall assembly. In floors constructed of precast hollow core units, fill material installed to min 1 in. (25 mm) depth, flush with each surface of the floor.

**SPECIFIED TECHNOLOGIES INC** - SpecSeal LCI Sealant

\* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

+Bearing the UL Listing Mark



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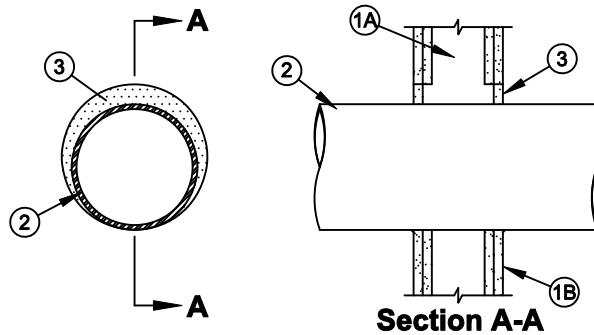
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PAGE 1 OF 1

## System No. W-L-1222

F Ratings - 1 and 2 Hr (See Item 1)  
T Ratings - 1/4, 3/4 and 1 Hr (See Item 2)



1. **Wall Assembly** - The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300 or U400 Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
  - A. **Studs** - Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced 16 in. (406 mm) OC. Steel studs to be min 3-1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC.
  - B. **Gypsum Board\*** - Thickness, type, number of layers and fasteners as specified in the individual Wall and Partition Design. Max diam of opening is 10-5/8 in. (270 mm).

**The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed.**

2. **Through Penetrant** - One metallic pipe, conduit or tube to be installed eccentrically or concentrically within the firestop system. Pipe, conduit or tubing may be installed at an angle not greater than 45 degrees from perpendicular. The annular space between the pipe, conduit or tube and the periphery of the opening shall be min 0 in. (0 mm, point contact) to max 2 in. (51 mm). Pipe, conduit or tube to be rigidly supported on both sides of the wall assembly. The following types and sizes of metallic pipes, conduits and tubes may be used:
  - A. **Steel Pipe** - Nom 8 in. (203 mm) diam (or smaller) Schedule 5 (or heavier) steel pipe.
  - B. **Iron Pipe** - Nom 8 in. (203 mm) diam (or smaller) cast or ductile iron pipe.
  - C. **Conduit** - Nom 6 in. (152 mm) diam (or smaller) rigid steel conduit, nom 4 in. (102 mm) diam (or smaller) steel electrical metallic tubing (EMT) or nom 4 in. (102 mm) diam (or smaller) flexible steel conduit.
  - D. **Copper Pipe** - Nom 4 in. (102 mm) diam (or smaller) Regular (or heavier) copper pipe.
  - E. **Copper Tube** - Nom 4 in. (102 mm) diam (or smaller) Type L (or heavier) copper tube.

Type of Penetrant	Max Diam	T Rating
Steel or iron pipe, steel conduit or EMT	2 in. (51 mm)	1 hr
Steel or iron pipe, steel conduit or EMT	8 in. (203 mm)	3/4 hr
Copper pipe or tube	4 in. (102 mm)	1/4 hr

- 2A. **Through Penetrating Product\* - Flexible Metal Piping** - As an alternate to Item 2, one nom 1-1/4 in. (32 mm) diam (or smaller) steel flexible metal pipe to be installed either concentrically or eccentrically within the firestop system. The annular space between the pipe and the periphery of the opening shall be min 0 in. (0 mm, point contact) to max 2 in. (51 mm). Pipe to be rigidly supported on both sides of the wall assembly.

**OMEGA FLEX INC**

**GASTITE, DIV OF TITEFLEX**

**WARD MFG L L C**

3. **Fill, Void or Cavity Material\* - Sealant** - Min 5/8 in. (16 mm) thickness of fill material applied within annulus, flush with both surfaces of wall assembly. At point contact location, min 1/4 in. (6 mm) diam bead of fill material applied at metallic pipe/gypsum board interface on both surfaces of wall.

**SPECIFIED TECHNOLOGIES INC** - SpecSeal LCI Sealant

\* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.



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W-L-1222  
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**DW Series****Dry Wall Access Doors**

**Doors** are ideally suited for new installations or for remodeling in masonry, tile, wood or other wall and ceiling surfaces. Door features rounded safety corners.

**Door and Frame** are fabricated from 16 gage, galvanized steel with a white prime coat finish.

**Frame** is one piece construction, 1" wide and provides perfect concealment of the rough wall opening. Wall frame is provided with 1/4" mounting holes for fastening within the furred spaces allowing faster installation and fixing maximum clearance.

**Concealed Pivoting Rod Hinge** prevents distortion and closes door squarely. Doors 24" or larger are provided with a continuous piano hinge.

**Latch** is screwdriver operated.

**Finish** is a white prime coat suitable for painting.

**Guide Specification**

Provide Elmdor® DW Series, Dry Wall Access Doors (Specify model number and options.) Access door and frame shall be fabricated from 16 gage, galvanized steel with a white prime coat finish. The door shall have rounded safety corners and a concealed pivoting rod hinge. Frame shall be one piece construction with no miters or welds on the face. Latch shall be screwdriver operated. Finish shall be a white prime coat suitable for painting.



Member of U.S. Green  
Building Council

**DW**

Revised: 08/31/18

Recyclable  
Product



## MODEL NUMBER AND OPTIONS SELECTION

## BASE MODEL NUMBER

☐ DW Dry Wall Access Door  
(16 Gage Steel)

## Suffix Options

- ☐ - AKL Allen Key Latch  
☐ - CL Cylinder Lock (one per door)  
☐ - CLD Cylinder Lock with Dust Shutter  
(one per door)  
☐ - MAS Masonry Anchor Straps  
☐ - MLP Mortise Cylinder Lock (Prep)  
☐ - SS Stainless Steel Construction  
(Type 304 No. 4 Satin Finish)  
☐ - TH 'T' Handle

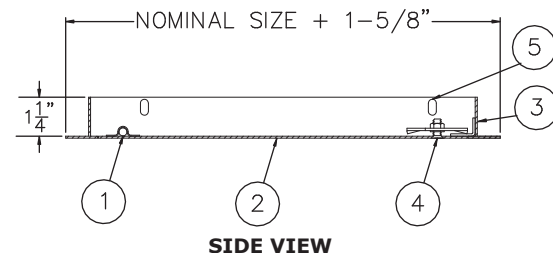
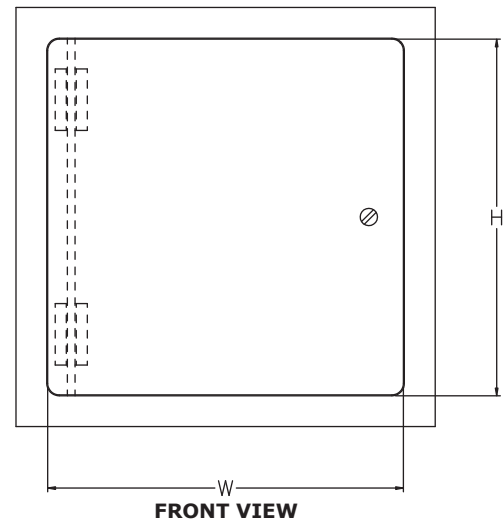
## STANDARD AVAILABLE SIZES

Special sizes available upon request.

## NOMINAL

## DOOR SIZE

(W X H)	WALL OPENING	LATCHES	WEIGHT
DW 6" x 6"	6-1/2" x 6-1/2"	1	3 lbs.
DW 8" x 8"	8-1/2" x 8-1/2"	1	3 lbs.
DW 8" x 12"	8-1/2" x 12-1/2"	1	4 lbs.
DW 10" x 10"	10-1/2" x 10-1/2"	1	4 lbs.
DW 12" x 12"	12-1/2" x 12-1/2"	1	5.5 lbs.
DW 12" x 16"	12-1/2" x 16-1/2"	1	6 lbs.
DW 12" x 18"	12-1/2" x 18-1/2"	2	6.5 lbs.
DW 12" x 24"	12-1/2" x 24-1/2"	3	9.5 lbs.
DW 14" x 14"	14-1/2" x 14-1/2"	1	6 lbs.
DW 14" x 20"	14-1/2" x 20-1/2"	3	8 lbs.
DW 14" x 24"	14-1/2" x 24-1/2"	3	15 lbs.
DW 15" x 15"	15-1/2" x 15-1/2"	1	6.5 lbs.
DW 16" x 16"	16-1/2" x 16-1/2"	1	7.5 lbs.
DW 16" x 20"	16-1/2" x 20-1/2"	3	8.5 lbs.
DW 16" x 24"	16-1/2" x 24-1/2"	3	10 lbs.
DW 18" x 18"	18-1/2" x 18-1/2"	3	9 lbs.
DW 18" x 24"	18-1/2" x 24-1/2"	5	12 lbs.
DW 18" x 36"	18-1/2" x 36-1/2"	6	16 lbs.
DW 20" x 20"	20-1/2" x 20-1/2"	3	11 lbs.
DW 20" x 24"	20-1/2" x 24-1/2"	5	13 lbs.
DW 20" x 30"	20-1/2" x 30-1/2"	5	15 lbs.
DW 22" x 22"	22-1/2" x 22-1/2"	3	12 lbs.
DW 22" x 30"	22-1/2" x 30-1/2"	5	16 lbs.
DW 22" x 36"	22-1/2" x 36-1/2"	6	22 lbs.
DW 24" x 24"	24-1/2" x 24-1/2"	3	15 lbs.
DW 24" x 30"	24-1/2" x 30-1/2"	5	17 lbs.
DW 24" x 36"	24-1/2" x 36-1/2"	6	20.5 lbs.
DW 24" x 48"	24-1/2" x 48-1/2"	7	28 lbs.
DW 30" x 30"	30-1/2" x 30-1/2"	7	21.5 lbs.
DW 30" x 36"	30-1/2" x 36-1/2"	8	29 lbs.
DW 32" x 32"	32-1/2" x 32-1/2"	7	23 lbs.
DW 36" x 36"	36-1/2" x 36-1/2"	8	31.5 lbs.
DW 36" x 48"	36-1/2" x 48-1/2"	9	42 lbs.
DW 48" x 48"	48-1/2" x 48-1/2"	11	58 lbs.



## NOTES:

1. CONCEALED PIVOTING ROD HINGE
2. DOOR
3. FRAME
4. SCREWDRIVER OPERATED LATCH
5. MOUNTING HOLES

**WARNING:** Cancer and Reproductive Harm - [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

Dimensions are subject to manufacturer's tolerance of plus or minus 1/4". Elmdor/Stoneman assumes no responsibility for use of void or suspended data. Please visit [www.elmdorstoneman.com](http://www.elmdorstoneman.com) for most current specifications. © Copyright 2009 Elmdor/Stoneman, City of Industry, CA, A Division of Acorn Engineering Company.

## SELECTION SUMMARY &amp; APPROVAL FOR MANUFACTURING

Model Number & Options	Quantity
Company	Date
Contact	Title
Approval for Manufacturing/Signature	

**DW**

Revised: 08/31/18

**ED Series****Exterior Door for Walls and Ceilings**

Elmdor® Exterior Access Doors are manufactured and engineered to provide access to exterior applications ensuring years of protection against outdoor elements. Our new technology helps to manifest resistance to water and vapor. Our Exterior Door includes foam insulation and neoprene gasket on four sides.

**Door** is fabricated from 16 gage, galvanized steel with a prime coat finish and 1" thick rigid foam insulation.

**Frame** is fabricated from 16 gage, galvanized steel with a prime coat finish and provided with bolt holes.

**Hinge** is concealed and operates completely out of sight, so that only the door and frame are visible.

**Exterior latch** is a cylinder lock that features a knurled knob or key operation.

**Finish** is a prime coat suitable for painting.

**Guide Specification**

Provide Elmdor® ED Series, Exterior Access Doors (specify model number and options). Access door frame shall be fabricated from 16 gage galvanized steel with a prime coat finish and provided with bolt holes. Access door panel shall be fabricated from 16 gage galvanized steel with a prime coat finish. Door shall be filled with 1" thick, rigid foam insulation and neoprene gasket on four sides. Access door shall have a concealed hinge with exterior latching cylinder lock that features a knurled knob or key operation. Finish shall be prime coat suitable for painting



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Building Council

**ED**

Revised: 11/01/11

Recyclable  
Product

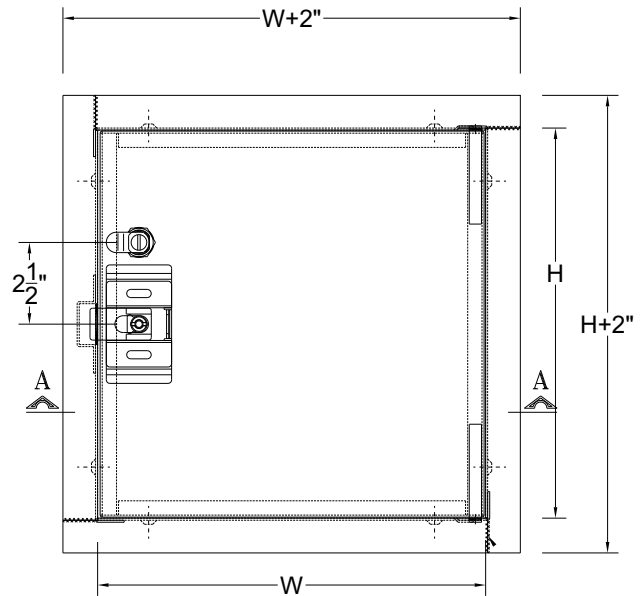
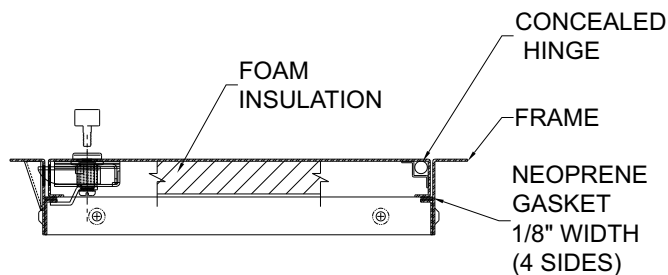
**MODEL NUMBER AND OPTIONS SELECTION**
**BASE MODEL NUMBER**
☐ ED Exterior Door for Walls and Ceilings

**Suffix Options**
☐ - GB Galvanized Drywall Bead  
☐ - SS Stainless Steel Construction.  
 (Type 304 No 4 Finish Satin Finish)

**STANDARD AVAILABLE SIZES**

Special sizes available upon request.

NOMINAL DOOR SIZE (W x H)	WALL OPENING	LOCK QNTY	WEIGHT
ED 12" x 12"	12-3/8" x 12-3/8"	1	15 lbs.
ED 14" x 14"	14-3/8" x 14-3/8"	1	17 lbs.
ED 18" x 18"	18-3/8" x 18-3/8"	1	20 lbs.
ED 24" x 24"	24-3/8" x 24-3/8"	1	28 lbs.
ED 22" x 30"	22-3/8" x 30-3/8"	2	32 lbs.
ED 30" x 30"	30-3/8" x 30-3/8"	2	38 lbs.
ED 24" x 36"	24-3/8" x 36-3/8"	2	40 lbs.
ED 36" x 36"	36-3/8" x 36-3/8"	2	50 lbs.
ED 36" x 48"	36-3/8" x 48-3/8"	2	81 lbs.


**FRONT VIEW**

**SECTION A-A**

 KEY SHIPPED LOOSE  
 TAPE TO BACK OF  
 DOOR.

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**SELECTION SUMMARY & APPROVAL FOR MANUFACTURING**

Model Number & Options	Quantity
Company	Date
Contact	Title
Approval for Manufacturing/Signature	

**ED**

Revised: 11/01/11

**FR Series**MEMBER OF  
  
MORRIS GROUP  
INTERNATIONAL**Fire Rated Wall Access Doors**

**Doors** are Fire Rated by Underwriters Laboratories Inc., for 1-1/2 hours, "B" Label, ANSI-UL 10B standard, and CAN/ULC S104 for 2 hours in walls. Door has a heavy duty spring closer to assure positive latching when panel closes. ***This door is for wall installation only.***

**Door and Frame** are fabricated from 16 gage, galvanized steel with a white prime coat finish.

**Door** has a heavy duty spring to assure positive latching.

**Frame** is equipped with both masonry anchors and bolt holes to facilitate installation in all types of wall construction.

**Concealed Hinge** operates completely out of sight so that only the door and frame is visible.

**Exterior Latch** is recessed and is operated using a ring attached to the sliding bolt.

**Interior Latch Release Slide** is included enabling door to be opened from the inside.

**Finish** is a white prime coat suitable for painting.

**Guide Specification**

Provide Elmdor® FR Series, Fire Rated Access Doors (specify model number and options). Access door and frame shall be fabricated from 16 gage, galvanized steel with a white prime coat finish. Hinge shall be concealed type. Door shall have a heavy duty spring to provide positive latching when closed and an interior latch release slide enabling door to be opened from the inside. Exterior latch shall be recessed and operated using ring attached to the sliding bolt. Finish shall be a white prime coat suitable for painting.

Member of U.S. Green  
Building Council**FR**

Revised: 12/04/19

Recyclable  
Product



**MODEL NUMBER AND OPTIONS SELECTION**
**BASE MODEL NUMBER**
☐ FR Fire Rated Access Door

**Suffix Options**
☐ -CL Cylinder Lock (one per door)  
☐ -SS Stainless Steel Construction  
 (Type 304 No. 4 Satin Finish)

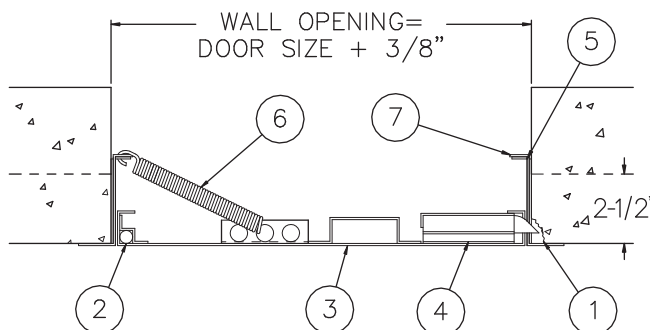
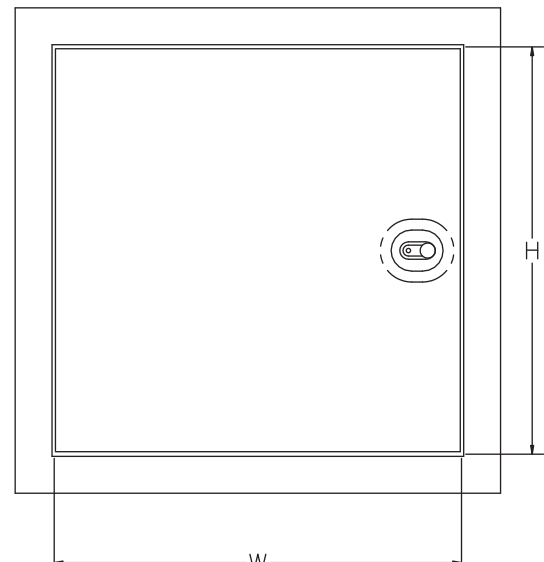
**STANDARD AVAILABLE SIZES**

Special sizes available upon request.

NOMINAL DOOR SIZE (W X H)	WALL OPENING (minimum required)	LATCHES	WEIGHT
FR 8" x 8"	8-3/8" x 8-3/8"	1	6 lbs.
FR 10" x 10"	10-3/8" x 10-3/8"	1	7.5 lbs.
FR 12" x 12"	12-3/8" x 12-3/8"	1	9 lbs.
FR 12" x 18"	12-3/8" x 18-3/8"	1	10.5 lbs.
FR 12" x 24"	12-3/8" x 24-3/8"	1	13 lbs.
FR 14" x 14"	14-3/8" x 14-3/8"	1	10 lbs.
FR 16" x 16"	16-3/8" x 16-3/8"	1	12.5 lbs.
FR 18" x 18"	18-3/8" x 18-3/8"	1	15 lbs.
FR 20" x 20"	20-3/8" x 20-3/8"	1	18 lbs.
FR 22" x 22"	22-3/8" x 22-3/8"	1	22 lbs.
FR 22" x 30"	22-3/8" x 30-3/8"	2	28 lbs.
FR 24" x 24"	24-3/8" x 24-3/8"	2	24.5 lbs.
FR 24" x 36"	24-3/8" x 36-3/8"	2	33 lbs.
FR 24" x 48"	24-3/8" x 48-3/8"	2	42 lbs.
FR 30" x 30"	30-3/8" x 30-3/8"	2	33.5 lbs.
FR 32" x 32"	32-3/8" x 32-3/8"	2	35 lbs.
FR 36" x 36"	36-3/8" x 36-3/8"	2	43 lbs.
FR 36" x 48"	36-3/8" x 48-3/8"	2	74 lbs.

**NOTES:**

1. CHIP OUT MASONRY TO CLEAR BOLT COVER
2. CONCEALED HINGE
3. DOOR
4. RECESSED LATCH
5. INTERIOR LATCH RELEASE SLIDE
6. CLOSING SPRING
7. FRAME


**SIDE VIEW**

**FRONT VIEW**

**WARNING:** Cancer and Reproductive Harm - [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

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**SELECTION SUMMARY & APPROVAL FOR MANUFACTURING**

Model Number & Options \_\_\_\_\_ Quantity \_\_\_\_\_  
 Company \_\_\_\_\_ Date \_\_\_\_\_  
 Contact \_\_\_\_\_ Title \_\_\_\_\_  
 Approval for Manufacturing/Signature \_\_\_\_\_

**FR**

Revised: 12/04/19

**FRC Series****Fire Rated Ceiling Access Doors**

**FRC Series access doors** are rated by Underwriters Laboratories for 1-1/2 hours, "B" label in walls, Warnock Hersey for 3 hours in ceilings and 2 hours in walls, CAN/ULC S104 for 2 hours in walls. The FRC Series Doors should be utilized when providing access in fire rated walls and ceilings. FRC Series Doors have heavy-duty spring closures to ensure positive latching when panel closes. An interior latch release is also included on all doors to enable unlocking from inside.

**Door** is fabricated from 20 gage, galvanized steel with a white prime coat finish. Door panel is provided with 2" of insulation in a sandwich type construction.

**Frame** is fabricated from 16 gage, galvanized steel with a white prime coat finish and provided with masonry anchors and bolt holes.

**Hinge** is fully concealed and mounted on the long side of the rectangular door panel.

**Exterior latch** is a dual purpose lock that features a knurled knob and key operation. Both are provided at time of shipping.

**Interior latch release slide** is included enabling door to be opened from the inside.

**Guide Specification**

Provide Elmdor® FRC Series, Fire Rated Ceiling Access Doors (specify model number and options). Access door frame shall be fabricated from 16 gage galvanized steel with a white prime coat finish and provided with masonry anchors and bolt holes. Access door panel shall be fabricated from 20 gage, galvanized steel with a white prime coat finish. Door shall be filled with 2" thick, fire rated insulation, and be welded pan type. Access door shall have automatic closer, be self-latching and contain interior latch release. Exterior latching shall be recessed and universal self-latching bolt, operated by either a knurled knob or flush key. Finish shall be a white prime coat suitable for painting.

Underwriters Laboratories classification shall be: Classified access frame and fire door assembly 1-1/2 hours, "B" Label. Meets ANSI-UL 10B standard. Finish shall be a white prime coat suitable for painting.



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Building Council

**FRC**

Revised: 07/18/16

Recyclable  
Product

**MODEL NUMBER AND OPTIONS SELECTION**
**BASE MODEL NUMBER**
☐ FRC Fire Rated Ceiling Access Door

**Suffix Options**

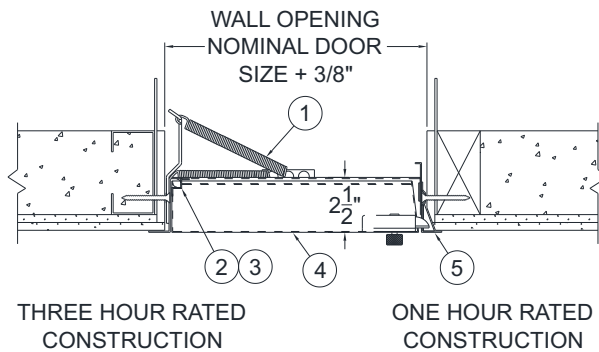
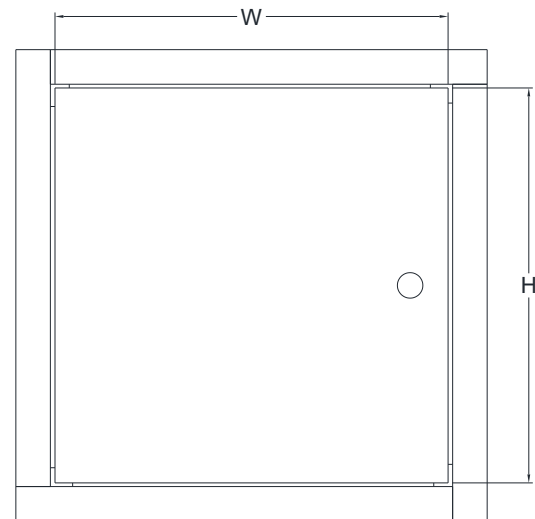
☐ -GB Galvanized Drywall Bead  
☐ -MLP Mortise Cylinder Lock (Prep)  
☐ -SS Stainless Steel Construction  
 (Type 304 No. 4 Satin Finish)

**STANDARD AVAILABLE SIZES**

Special sizes available upon request.

NOMINAL DOOR SIZE (W X H)	CEILING OPENING	WALL OPENING	LATCHES	WEIGHT
FRC 8" x 8"	9-5/8" x 9-5/8"	8-3/8" x 8-3/8"	1	11 lbs.
FRC 10" x 10"	11-5/8" x 11-5/8"	10-3/8" x 10-3/8"	1	12 lbs.
FRC 12" x 12"	13-5/8" x 13-5/8"	12-3/8" x 12-3/8"	1	15 lbs.
FRC 14" x 14"	15-5/8" x 15-5/8"	14-3/8" x 14-3/8"	1	17 lbs.
FRC 16" x 16"	17-5/8" x 17-5/8"	16-3/8" x 16-3/8"	1	18 lbs.
FRC 18" x 18"	19-5/8" x 19-5/8"	18-3/8" x 18-3/8"	1	20 lbs.
FRC 18" x 24"	19-5/8" x 25-5/8"	18-3/8" x 24-3/8"	1	26 lbs.
FRC 20" x 20"	21-5/8" x 21-5/8"	20-3/8" x 20-3/8"	1	24 lbs.
FRC 22" x 30"	23-5/8" x 31-5/8"	22-3/8" x 30-3/8"	2	32 lbs.
FRC 22" x 36"	23-5/8" x 37-5/8"	22-3/8" x 36-3/8"	2	40 lbs.
FRC 24" x 24"	25-5/8" x 25-5/8"	24-3/8" x 24-3/8"	1	28 lbs.
FRC 24" x 36"	25-5/8" x 37-5/8"	24-3/8" x 36-3/8"	2	40 lbs.

Note: On sizes 16" x 16" and larger, an extra spring is supplied with the door and must be attached from back of door pan to framing, or floor above, in such a manner to ensure that door is self closing.


**SIDE VIEW**

**FRONT VIEW**

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**WARNING:** Cancer and Reproductive Harm - [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

**SELECTION SUMMARY & APPROVAL FOR MANUFACTURING**

Model Number & Options \_\_\_\_\_ Quantity \_\_\_\_\_  
 Company \_\_\_\_\_ Date \_\_\_\_\_  
 Contact \_\_\_\_\_ Title \_\_\_\_\_  
 Approval for Manufacturing/Signature \_\_\_\_\_

**FRC**

Revised: 08/31/18