SUBMITTAL DATA

for

LSSD New Middle Chillers

Prepared for

Henderson Engineers

Job Number: 6YEAMG	Customer PO#:

Prepared by

Jim Root

8/21/2020

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Technical Data Sheet for 450T 58-44 19.7 IPLV

Provide 2x
Air-Cooled Chillers

Job Information	*Technical Data Sheet*
Job Name	LSSD New Middle Chillers
Date	8/21/2020
Submitted By	Jim Root
Software Version	11.10
Unit Tag	450T 58-44 19.7 IPLV
FPA#	AUTO_RMT_PIPING

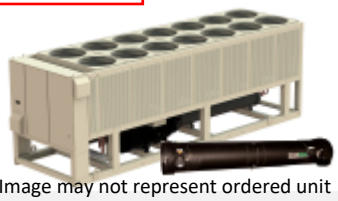


Image may not represent ordered unit

Unit Overview

Model Number	Capacity ton	Voltage	Unit Starter Type	ASHRAE 90.1	LEED Enhanced Refrigerant Management Credit
AWV026A	450.0	460 V / 60 Hz / 3 Ph	VFD	'07, '10, '13 & '16	None

Unit

Unit Type	Platform	Unit Revision
Air-Cooled Screw Compressor Chiller	Remote Evaporator	0A

Head Pressure	Tubing
DC Fan Motors / All Fan VFD	With Liquid Line Solenoid Valves & Suction Shut-off Valves

Display
On Controller only

Compressor	Refrigerant Economizer
RRN	TTN

Refrigerant Type	Refrigerant Weight
R134a	557 lb (per unit)

** Does not include refrigerant piping*

Approval
ETL/cETL & ASHRAE 90.1

Evaporator

Evaporator Model:	EV6633A1507
Water Volume:	224.8 gal
Connection Hand:	Grooved / Left Hand
Connection Size:	10.0 in
Insulation:	Single Layer Insulation on Evaporator

Entering Fluid Temperature	Leaving Fluid Temperature	Fluid Type	Fluid Flow	Fluid Flow Min / Max	Pressure Drop	Pressure Drop Min / Max	Fouling Factor
58.00 °F	44.00 °F	Water	769.7 gpm	336.4/ 1329.7 gpm	11.6 ft H_2O	2.70 / 30.4 ft H_2O	0.000100 °F.ft².h/Btu

Note: Evaporator Pressure Drop does not include a strainer. Minimum flow is based on a Variable Flow Pumping System Type and applies to part load conditions only.

Condenser

Number of Fans:	26
Coil Fins:	MicroChannel
Guards:	None

Design Ambient Air Temperature	Altitude	Fan Diameter	Minimum Design Ambient Temperature
105.0 °F	0.000 ft	31.5 in	32.0 °F

Technical Data Sheet for 450T 58-44 19.7 IPLV

Unit Performance

Design

Capacity	Input Power	Efficiency (EER)	DPLV.IP* (EER)
450.0 ton	624.5 kW	8.647 Btu/W.h	19.65 Btu/W.h

Performance Points rated at AHRI Ambient Relief

Unit							Evaporator				Condenser	
Point #	% Load	Capacity ton	Input Power kW	Efficiency (EER) Btu/W.h	Refrigerant Economizer Status #1; #2	Compressor RPS #1; #2	Fluid Flow gpm	Pressure Drop ft H_2O	Entering Fluid °F	Leaving Fluid °F	Ambient Air °F	Altitude ft
1	100.0	450.0	624.5	8.647	On; On	65; 64	769.7	11.6	58.00	44.00	105.0	0.000
2	75.0	337.5	293.1	13.82	On; On	41; 40	769.7	11.6	54.50	44.00	86.3	0.000
3	50.0	225.0	129.5	20.85	Off; Off	27; 26	769.7	11.6	51.00	44.00	67.5	0.000
4	25.0	112.5	48.91	27.60	Off; Off	25	769.7	11.6	47.50	44.00	55.0	0.000

**For Remote Evaporator units, DPLV is displayed in place of IPLV which does not apply. In this case, DPLV is calculated identically to IPLV at AHRI conditions with water, but does include remote piping losses.*

Sound Data (Internal Discharge Compressor Muffler)

Sound Pressure (*at 30 feet*)

% Load	63 Hz db	125 Hz db	250 Hz db	500 Hz db	1 kHz db	2 kHz db	4 kHz db	8 kHz db	Overall dBA
100	79	73	71	72	75	69	60	50	77
75	78	72	72	69	68	62	55	47	72
50	76	71	67	67	65	56	51	43	69
25	73	66	63	63	61	52	46	38	64

Sound Power

% Load	63 Hz db	125 Hz db	250 Hz db	500 Hz db	1 kHz db	2 kHz db	4 kHz db	8 kHz db	Overall dBA
100	106	100	98	99	102	96	87	77	104
75	105	99	100	96	95	89	82	74	99
50	104	98	94	94	92	83	78	70	96
25	100	93	90	90	88	79	73	65	91

One-third Octave Band Sound Power

% Load	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz	200 Hz	250 Hz	315 Hz	400 Hz	500 Hz	630 Hz	800 Hz	1 kHz	1.25 kHz	1.6 kHz	2 kHz	2.5 kHz	3.15 kHz	4 kHz	5 kHz	6.3 kHz	8 kHz	10 kHz
100	106	93	86	94	91	97	95	93	91	97	92	93	97	97	97	93	90	87	85	82	78	76	70	63
75	105	92	85	94	91	97	97	95	89	91	91	92	91	89	91	86	83	81	80	76	74	72	67	61
50	103	90	83	92	88	96	92	89	86	88	88	90	89	85	86	80	78	76	75	72	70	68	63	58
25	99	86	79	88	84	90	88	84	82	84	84	86	85	80	82	76	74	72	71	68	65	64	59	54

Octave band is non 'A' weighted and overall readings are 'A' weighted. Sound data rated in accordance with AHRI Standard-370.

Physical

Unit

Length*	Height	Width*	Shipping Weight*	Operating Weight*
523 in	100 in	88 in	21248 lb	23168 lb

* *Shipping and operating weights do not include the weights of any Options or Accessories. Contact Chiller Applications for additional information.*

Technical Data Sheet for 450T 58-44 19.7 IPLV

Remote Evaporator

Assumed Equivalent Distance to Evaporator		
Horizontal	Vertical Up	Vertical Down
10 ft	0 ft	0 ft

Assumed Piping Sizes**		
	Refrigerant Circuit #	
	1	2
Circuit Capacity:	229.3	220.7
Unit Refrigerant Quantity:	269 lb	289 lb
Suction Line:	5.125 in	5.125 in
Liquid Line:	2.125 in	2.125 in

** Vertical suction riser must not exceed 30 actual ft. Refrigerant quantity does not include remote field piping.*

**Final equivalent length and pipe size must be confirmed and approved before installing piping. Remote Evaporator Piping Design is required to be approved by the Chiller Products Technical Response Center (TRC) before installation, per Policies & Procedures- Chiller Sales and Installation Manual.

Electrical

Unit Electrical Data				
Voltage	Starter Type	Fan Motor Quantity	LRA Fan Motor (each)	FLA Fan Motors (each)
460 V / 60 Hz / 3 Ph	VFD	26	4 A	2.6 A

Power Connection Type:	Single Point Disconnect Switch with Circuit Protection
Short Circuit Current Rating:	10 kA
Drive Type(#1;#2):	CIMR-AU4A0675;CIMR-AU4A0675
Phase Voltage:	None (PVM included as part of Solid State / VFD)

Single Point Power Connection	
Minimum Circuit Ampacity (MCA):	1002 A
Recommended Overcurrent Protection Size:	1200 A
Maximum Overcurrent Protection Size(MOCP):	1200 A
Lug Connection Size:	(4) 4/0-500MCM

Compressor Electrical Data		
Compressor Type	Compressor Quantity	Starter Type
Screw	2	VFD

	Compressor #	
	1	2
Rated Load Amps (RLA):	405 A	416 A
Inrush Current:	405 A	416 A

Options

Basic Unit	
Motor Cooling:	With Additional Liquid Injection Cooling

Control	
RapidRestore®:	Included

Electrical	
Ground Fault:	Unit Ground Fault Protection
Unit Options:	115V Convenience Outlet

Warranty

Unit Startup	Domestic
Standard Warranty:	1st Year Entire Unit Parts & Labor
Extended Unit Warranty:	Entire Unit; Extended 4 years parts & labor (5 Years Total)
Refrigerant Warranty	5 Years Total

Technical Data Sheet for 450T 58-44 19.7 IPLV

AHRI Certification

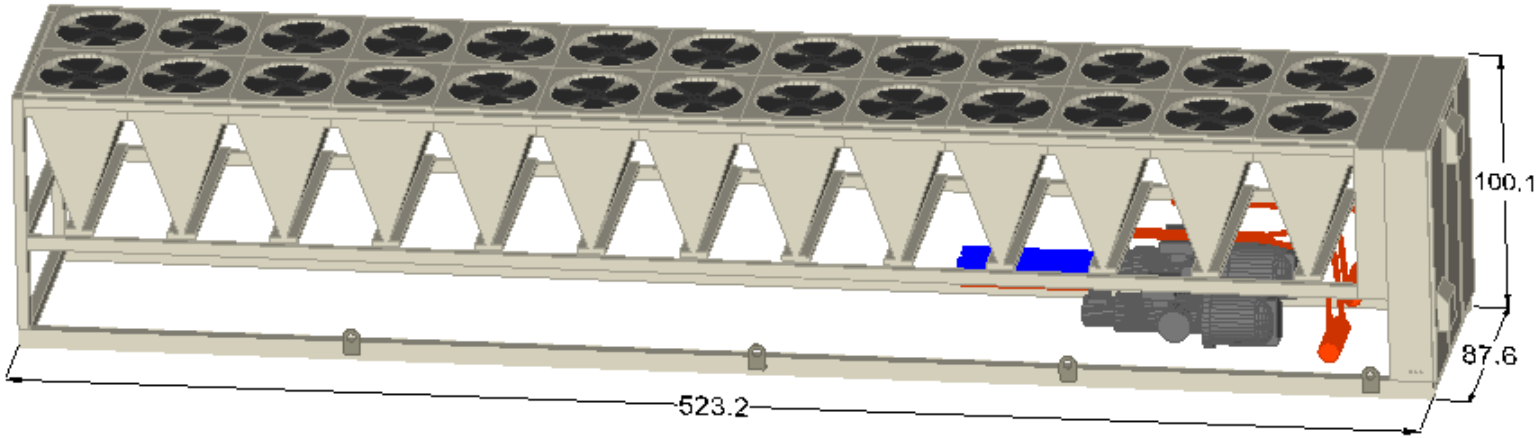
Outside the scope of AHRI Air-Cooled Water-Chilling Packages Certification Program or not optionally certified, but is rated in accordance with AHRI Standard 550/590 (I-P) and AHRI Standard 551/591 (SI).

Accessories

Mandatory

Part Number	Description
334043415	CDE Kit; LH Single Insulation; AWV: EV6633A1507
334043622	Refrigeration Specialties Kit; AWV with Compressors: RRN

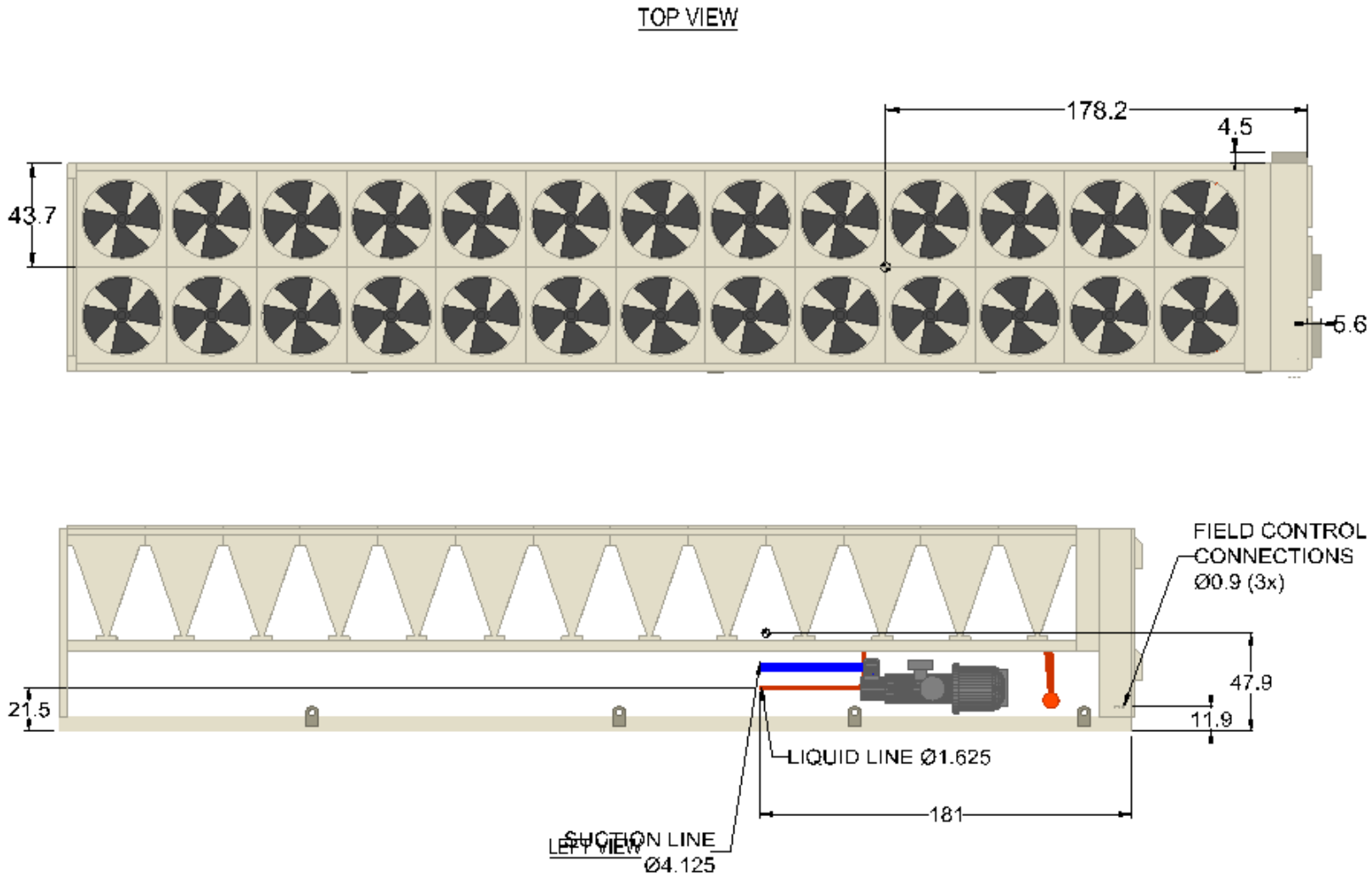
Drawings Unit Profile for 450T 56-42 19.7 IPLV



NOTE: A water strainer must be installed at the inlet of the evaporator to protect it from damage. Please refer to the IOM for additional details.

Product Drawing	Unit Tag: 450T 56-42 19.7 IPLV			Sales Office: Daikin TMI LLC (Kansas City)			DAIKIN
Product:	Project Name: LSSD New Middle Chillers			Sales Engineer:			13600 Industrial Park Blvd. Minneapolis, MN 55441
Model: AWV026A	Aug. 21, 2020	Ver/Rev:	Sheet: 1 of 1	Scale: NTS	Tolerance: +/- 0.25"	Dwg Units: (in)	www.DaikinApplied.com Software Version: 11.10

Drawings Top and Left for 450T 56-42 19.7 IPLV



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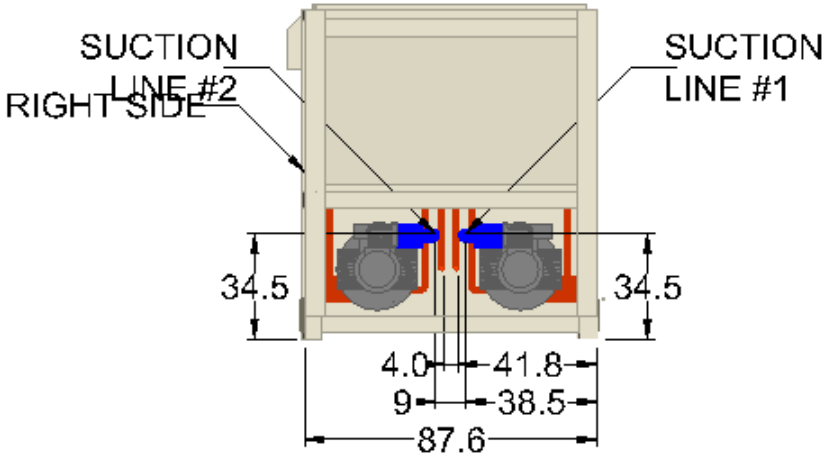
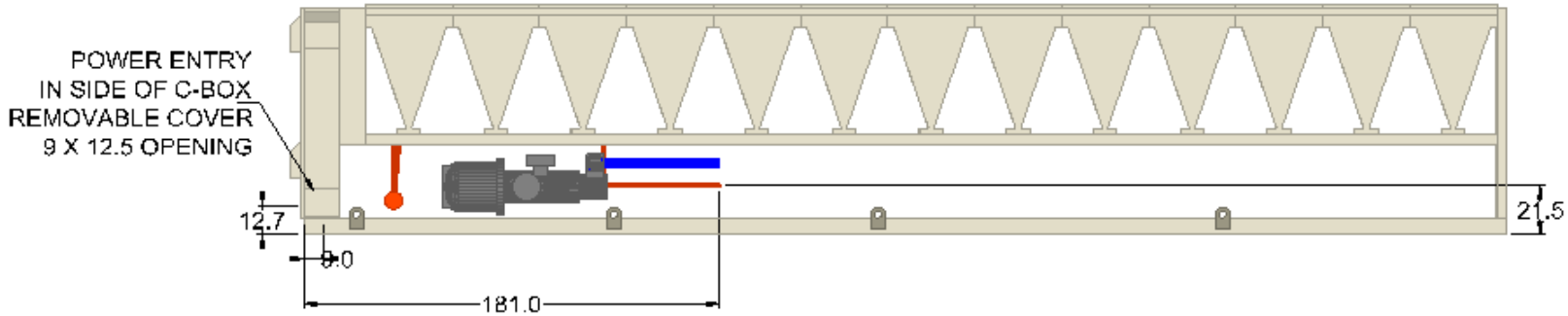
Product:	Project Name: LSSD New Middle Chillers			Sales Engineer:			13600 Industrial Park Blvd. Minneapolis, MN 55441
Model: AWV026A	Aug. 21, 2020	Ver/Rev:	Sheet: 1 of 1	Scale: NTS	Tolerance: +/- 0.25"	Dwg Units: (in)	www.DaikinApplied.com Software Version: 11.10

Drawings Rear and Right for 450T 56-42 19.7 IPLV

REAR VIEW





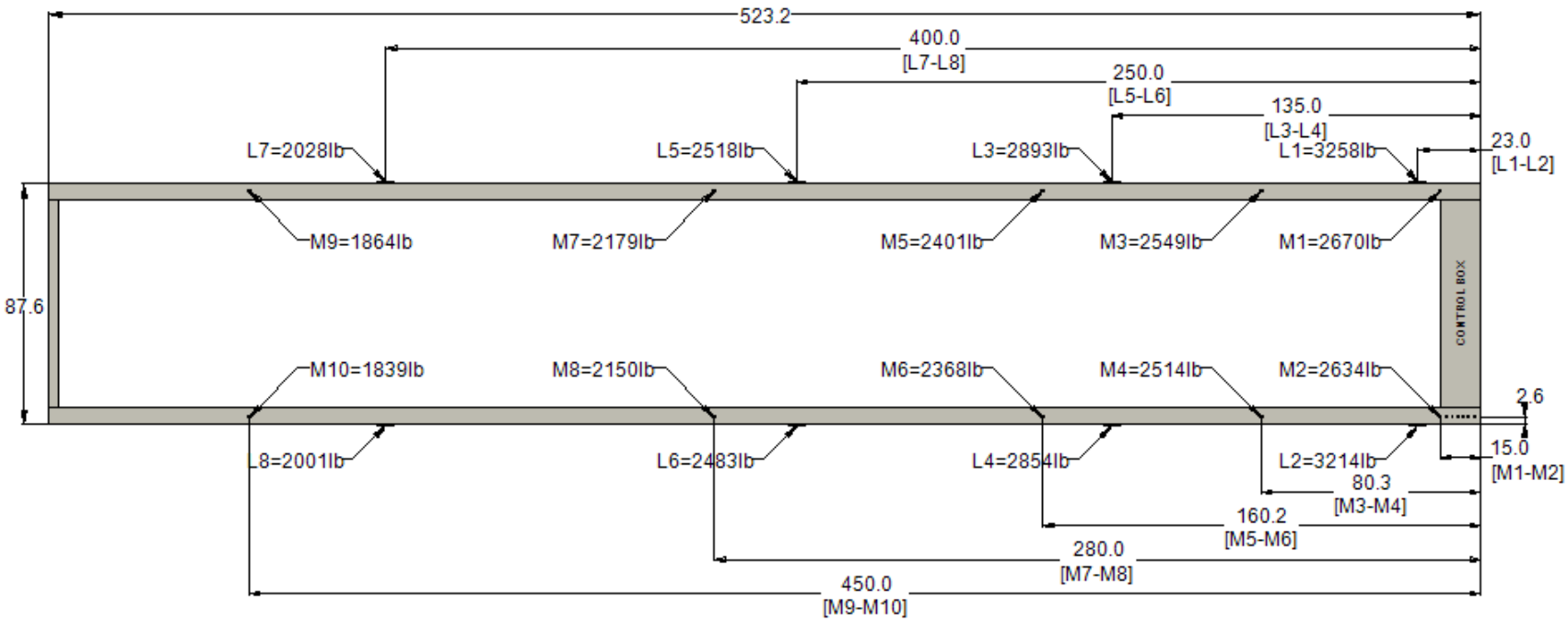
RIGHT VIEW

Product Drawing	Unit Tag: 450T 56-42 19.7 IPLV			Sales Office: Daikin TMI LLC (Kansas City)			DAIKIN
Product:	Project Name: LSSD New Middle Chillers			Sales Engineer:			13600 Industrial Park Blvd. Minneapolis, MN 55441
Model: AWV026A	Aug. 21, 2020	Ver/Rev:	Sheet: 1 of 1	Scale: NTS	Tolerance: +/- 0.25"	Dwg Units: (in)	www.DaikinApplied.com Software Version: 11.10

Drawings Mounting and Lifting for 450T 56-42 19.7 IPLV

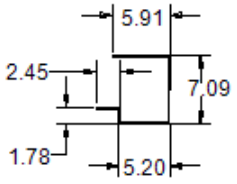
Mounting and Lifting

BASE FRAME TOP VIEW



NOTES:
1) L = LIFTING WEIGHT
2) M = MOUNTING LOAD
3) UNIT SHIPPING WEIGHT = 21248lb
4) UNIT OPERATING WEIGHT = 23168lb
5) MOUNTING HOLE SIZE = .75"
6) MOUNTING HOLES ONLY ON BOTTOM OF BASE

Base Rail
Cross Section

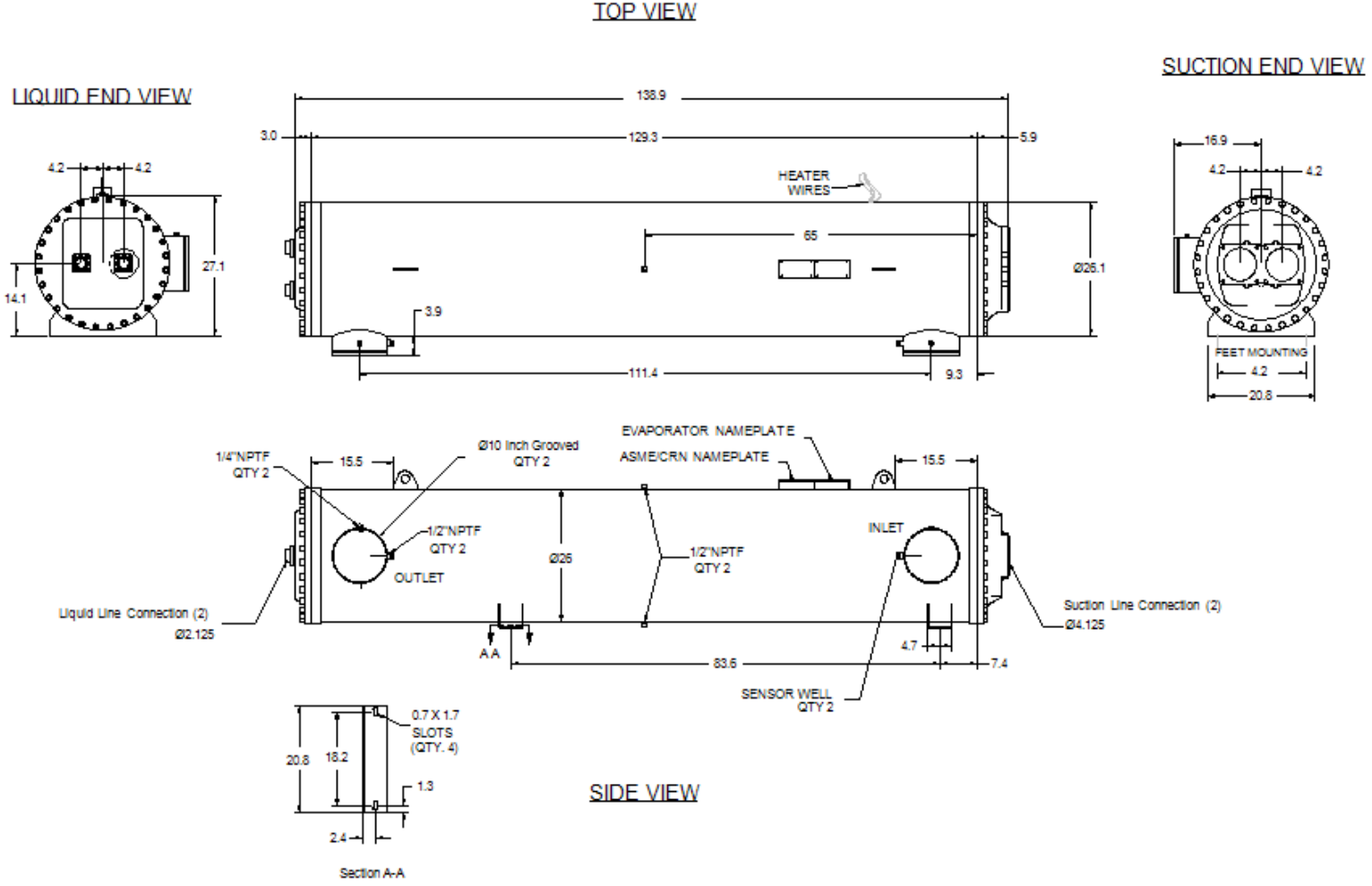


Product Drawing	Unit Tag: 450T 56-42 19.7 IPLV			Sales Office: Daikin TMI LLC (Kansas City)			DAIKIN
Product:	Project Name: LSSD New Middle Chillers			Sales Engineer:			13600 Industrial Park Blvd. Minneapolis, MN 55441
Model: AWV026A	Aug. 21, 2020	Ver/Rev:	Sheet: 1 of 1	Scale: NTS	Tolerance: +/- 0.25"	Dwg Units: (in)	www.DaikinApplied.com Software Version: 11.10

AWV Remote Evaporator

Evaporator Size	Dry Weight (lbs)
EV6633A1507	2593

NOTE
Left Hand Water Connection Shown



Product Drawing	Unit Tag: 450T 56-42 19.7 IPLV			Sales Office: Daikin TMI LLC (Kansas City)			DAIKIN
Product:	Project Name: LSSD New Middle Chillers			Sales Engineer:			13600 Industrial Park Blvd. Minneapolis, MN 55441
Model: AWV026A	Aug. 21, 2020	Ver/Rev:	Sheet: 1 of 1	Scale: NTS	Tolerance: +/- 0.25"	Dwg Units: (in)	www.DaikinApplied.com Software Version: 11.10

Document Summary Page

Model: G-099-VG

Direct Drive Centrifugal Roof Exhaust Fan

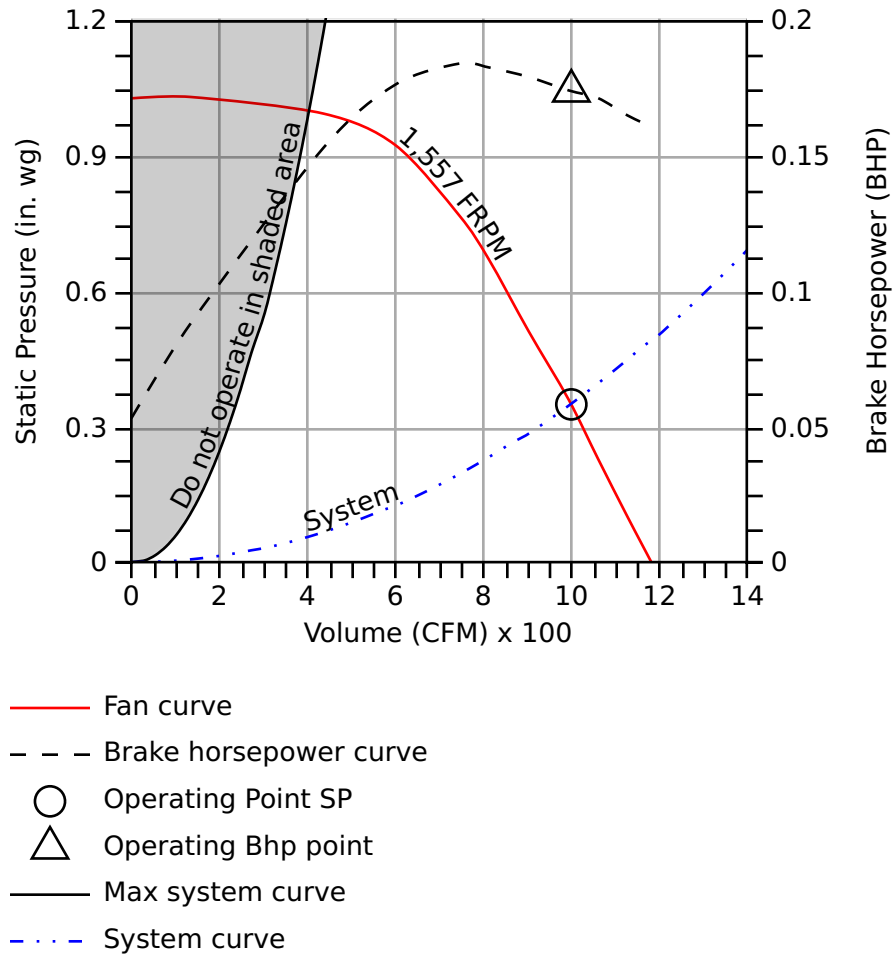
Standard Construction Features: Aluminum housing. Centrifugal backward inclined aluminum (composite for sizes 60-95) wheel. Direct driven motor mounted on vibration isolation.

Fan Configuration	
Drive type	Direct

Performance	
Requested Volume (CFM)	995
Actual Volume (CFM)	995
Total External SP (in. wg)	0.35
Fan RPM	1,557
Operating Power (bhp)	0.17
Startup Power (bhp)	0.17
Air Stream Temp (F)	70
Start-up Temp (F)	70
Air Density (lbs/ft^3)	0.072
Elevation (ft)	1000
Static Efficiency (%)	31
Outlet Velocity (ft/min)	1,036

Motor	
Size (hp)	1/4
V/C/P	115/60/1
NEC FLA (Amps)	2.85

FLA - based on tables 150 or 148 of National Electric Code 2002. Actual motor FLA may vary, for sizing thermal overload, consult factory.

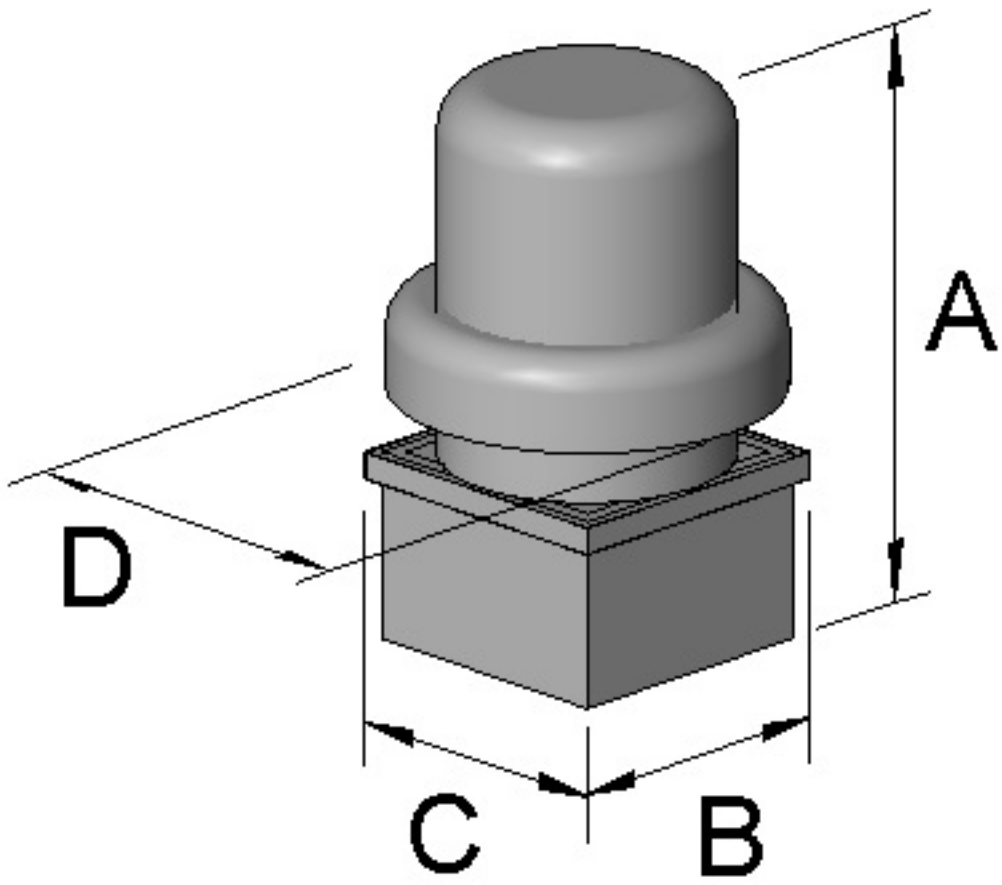


Sound

	Octave Bands (hz)								LwA	dBA	Sones
	62.5	125	250	500	1000	2000	4000	8000			
Inlet	73	76	77	69	65	64	59	52	73	62	11.3

Greenheck Fan Corporation certifies that the model shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 and AMCA Publication 311 and comply with the requirements of the AMCA Certified Ratings Program.The AMCA certified ratings seal applies to sound and air performance ratings only.Performance certified is for installation type A: Free inlet, free outlet.Power rating does not include transmission losses.Performance ratings include the effects of birdscreen.The sound ratings shown are loudness values in hemispherical sones at 1.5 m (5 ft) in a hemispherical free field calculated per ANSI/AMCA Standard 301.Values shown are for Installation Type A: free inlet hemispherical sone levels.dBA levels are not licensed by AMCA International. The AMCA Certified Ratings Seal for Sound applies to inlet sone ratings only.

Dimensions and Weights		
Label	**Value**	**Description**
-	38	Weight w/o accessories (lbs)
A	36	Overall Height (in)
D	24	Overall Width (in)
B	19	Curb Cap Width (in)
C	19	Curb Cap Length (in)
-	12	Duct / Damper Width (in)
-	12	Duct / Damper Length (in)
-	14.5	Roof Opening Width (in)
-	14.5	Roof Opening Length (in)



*All dimensions are in inches.

Job Name: G-103-VG Cut Sheet
Tag: MK-1
Quantity: 1
Printed Date: August 28, 2020

Model: G-103-VG

Direct Drive Centrifugal Roof Exhaust Fan

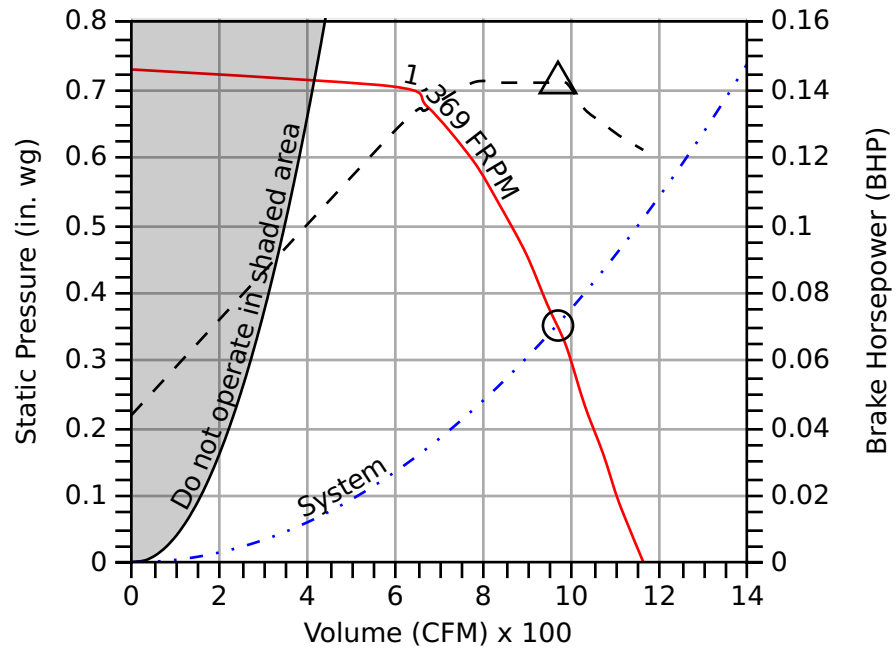
Standard Construction Features: Aluminum housing. Centrifugal backward inclined aluminum (composite for sizes 60-95) wheel. Direct driven motor mounted on vibration isolation.

Fan Configuration	
Drive type	Direct

Performance	
Requested Volume (CFM)	965
Actual Volume (CFM)	965
Total External SP (in. wg)	0.35
Fan RPM	1,369
Operating Power (bhp)	0.14
Startup Power (bhp)	0.14
Air Stream Temp (F)	70
Start-up Temp (F)	70
Air Density (lbs/ft^3)	0.072
Elevation (ft)	1000
Static Efficiency (%)	37
Outlet Velocity (ft/min)	1,072

Motor	
Size (hp)	1/4
V/C/P	115/60/1
NEC FLA (Amps)	3.7

FLA - based on tables 150 or 148 of National Electric Code 2002. Actual motor FLA may vary, for sizing thermal overload, consult factory.



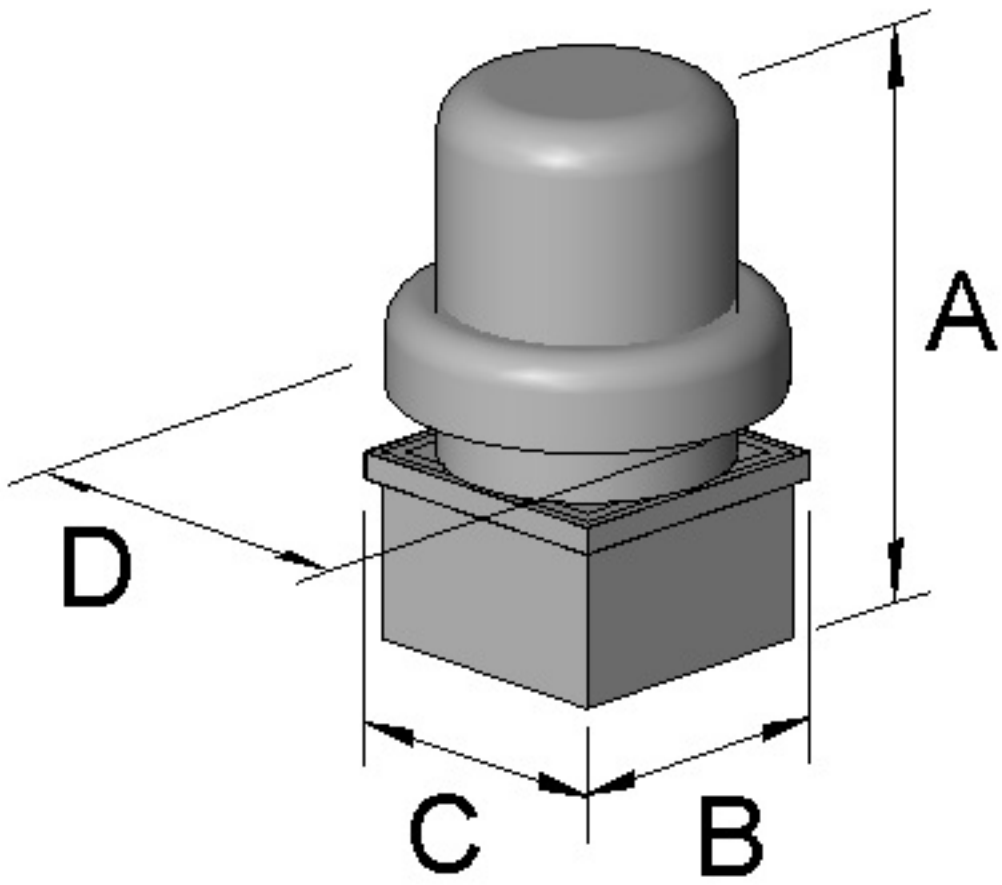
Fan curve
Brake horsepower curve
Operating Point SP
Operating Bhp point
Max system curve
System curve

Sound

	Octave Bands (hz)								LwA	dBA	Sones
	62.5	125	250	500	1000	2000	4000	8000			
Inlet	71	77	71	66	57	56	50	43	68	56	8.2

Greenheck Fan Corporation certifies that the model shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 and AMCA Publication 311 and comply with the requirements of the AMCA Certified Ratings Program.The AMCA certified ratings seal applies to sound and air performance ratings only.Performance certified is for installation type A: Free inlet, free outlet.Power rating does not include transmission losses.Performance ratings include the effects of birdscreen.The sound ratings shown are loudness values in hemispherical sones at 1.5 m (5 ft) in a hemispherical free field calculated per ANSI/AMCA Standard 301.Values shown are for Installation Type A: free inlet hemispherical sone levels.dBA levels are not licensed by AMCA International. The AMCA Certified Ratings Seal for Sound applies to inlet sone ratings only.

Dimensions and Weights		
Label	**Value**	**Description**
-	38	Weight w/o accessories (lbs)
A	36	Overall Height (in)
D	24	Overall Width (in)
B	19	Curb Cap Width (in)
C	19	Curb Cap Length (in)
-	12	Duct / Damper Width (in)
-	12	Duct / Damper Length (in)
-	14.5	Roof Opening Width (in)
-	14.5	Roof Opening Length (in)



*All dimensions are in inches.

Job Name: G-095-VG Cut Sheet
Tag: MK-1
Quantity: 1
Printed Date: August 28, 2020

Model: G-095-VG

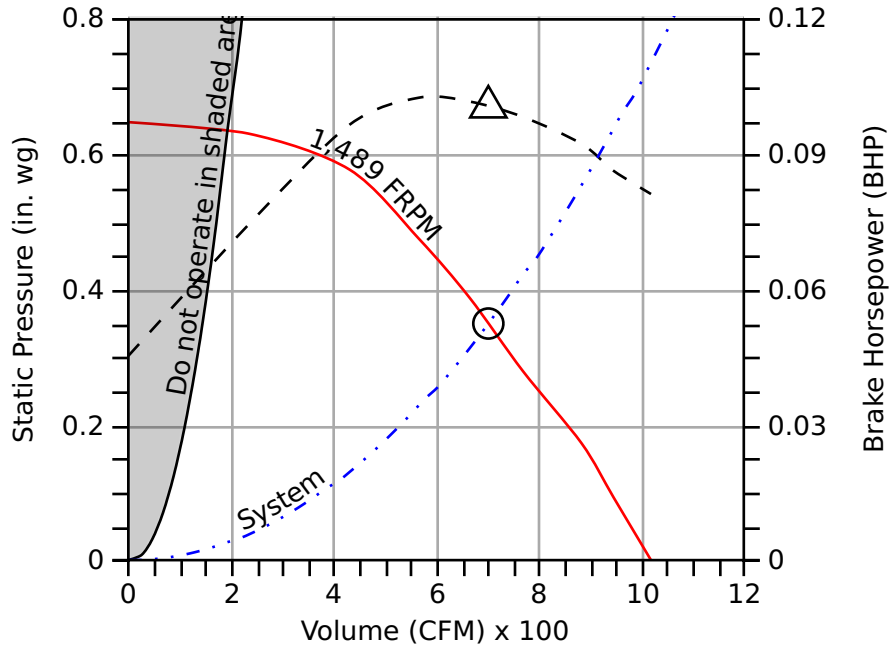
Direct Drive Centrifugal Roof Exhaust Fan

Standard Construction Features: Aluminum housing. Centrifugal backward inclined aluminum (composite for sizes 60-95) wheel. Direct driven motor mounted on vibration isolation.

Fan Configuration	
Drive type	Direct

Performance	
Requested Volume (CFM)	700
Actual Volume (CFM)	700
Total External SP (in. wg)	0.35
Fan RPM	1,489
Operating Power (bhp)	0.1
Startup Power (bhp)	0.1
Air Stream Temp (F)	70
Start-up Temp (F)	70
Air Density (lbs/ft^3)	0.072
Elevation (ft)	1000
Static Efficiency (%)	38
Outlet Velocity (ft/min)	603

Motor	
Size (hp)	1/6
V/C/P	115/60/1



Fan curve
Brake horsepower curve
Operating Point SP
Operating Bhp point
Max system curve
System curve

Sound

	Octave Bands (hz)								LwA	dBA	Sones
	62.5	125	250	500	1000	2000	4000	8000			
Inlet	79	76	71	63	58	57	49	39	67	56	8.1

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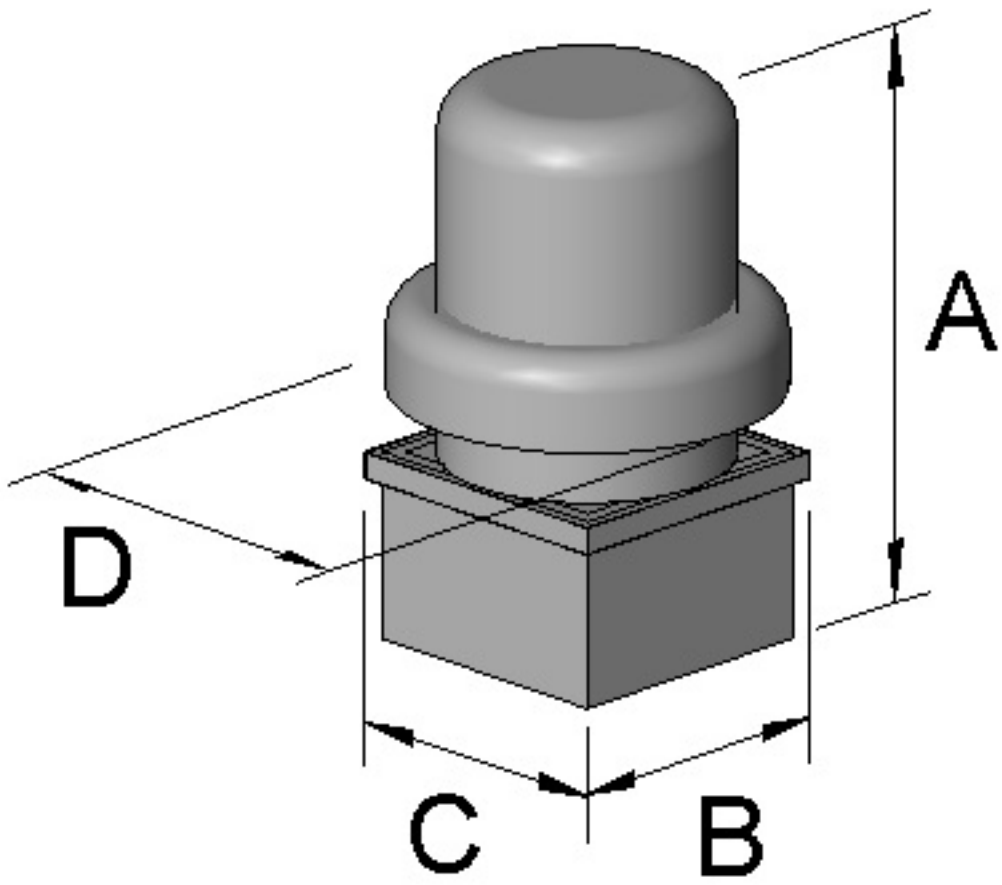
FLA - based on tables 150 or 148 of National Electric Code 2002. Actual motor FLA may vary, for sizing thermal overload, consult factory.

Dimensions and Weights		
Label	**Value**	**Description**
-	29	Weight w/o accessories (lbs)
A	27	Overall Height (in)
D	22	Overall Width (in)
B	17	Curb Cap Width (in)
C	17	Curb Cap Length (in)
-	10	Duct / Damper Width (in)
-	10	Duct / Damper Length (in)
-	12.5	Roof Opening Width (in)
-	12.5	Roof Opening Length (in)



*All dimensions are in inches.

Job Name: G-123-VG Cut Sheet
Tag: MK-1
Quantity: 1
Printed Date: August 28, 2020

Model: G-123-VG

Direct Drive Centrifugal Roof Exhaust Fan

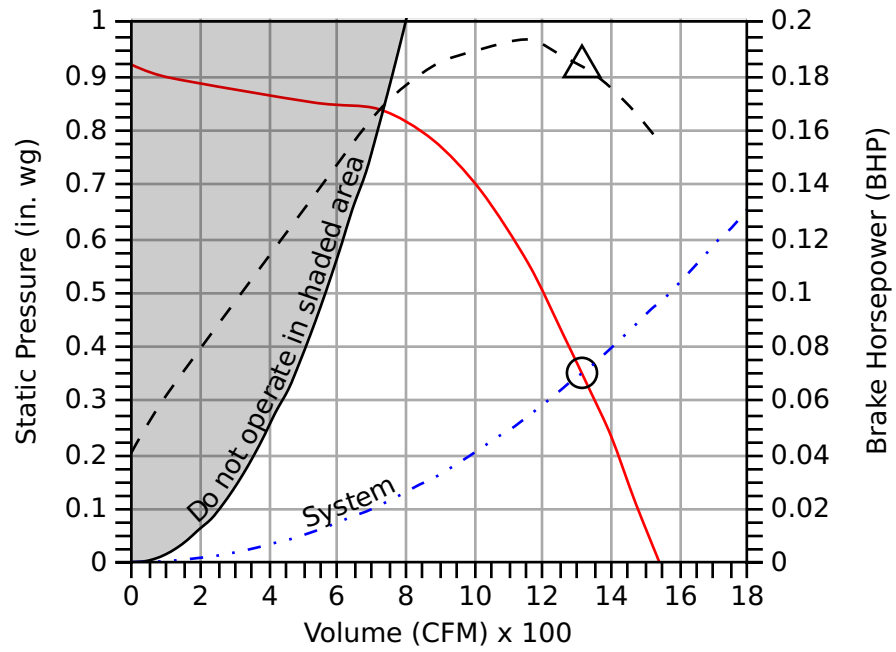
Standard Construction Features: Aluminum housing. Centrifugal backward inclined aluminum (composite for sizes 60-95) wheel. Direct driven motor mounted on vibration isolation.

Fan Configuration	
Drive type	Direct

Performance	
Requested Volume (CFM)	1,315
Actual Volume (CFM)	1,315
Total External SP (in. wg)	0.35
Fan RPM	1,270
Operating Power (bhp)	0.18
Startup Power (bhp)	0.18
Air Stream Temp (F)	70
Start-up Temp (F)	70
Air Density (lbs/ft^3)	0.072
Elevation (ft)	1000
Static Efficiency (%)	40
Outlet Velocity (ft/min)	1,414

Motor	
Size (hp)	1/2
V/C/P	115/60/1
NEC FLA (Amps)	6.2

FLA - based on tables 150 or 148 of National Electric Code 2002. Actual motor FLA may vary, for sizing thermal overload, consult factory.



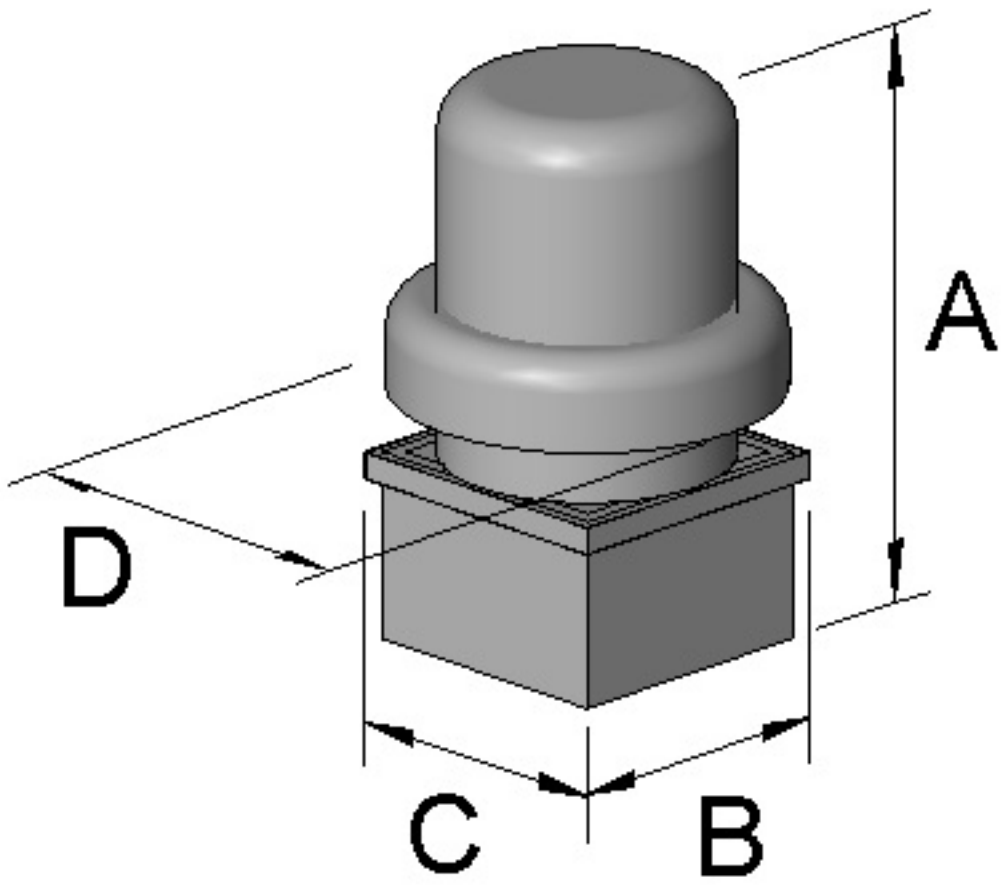
Fan curve
Brake horsepower curve
Operating Point SP
Operating Bhp point
Max system curve
System curve

Sound

	Octave Bands (hz)								LwA	dBA	Sones
	62.5	125	250	500	1000	2000	4000	8000			
Inlet	70	74	76	69	62	61	56	54	71	60	10.1

Greenheck Fan Corporation certifies that the model shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 and AMCA Publication 311 and comply with the requirements of the AMCA Certified Ratings Program.The AMCA certified ratings seal applies to sound and air performance ratings only.Performance certified is for installation type A: Free inlet, free outlet.Power rating does not include transmission losses.Performance ratings include the effects of birdscreen.The sound ratings shown are loudness values in hemispherical sones at 1.5 m (5 ft) in a hemispherical free field calculated per ANSI/AMCA Standard 301.Values shown are for Installation Type A: free inlet hemispherical sone levels.dBA levels are not licensed by AMCA International. The AMCA Certified Ratings Seal for Sound applies to inlet sone ratings only.

Dimensions and Weights		
Label	**Value**	**Description**
-	48	Weight w/o accessories (lbs)
A	36	Overall Height (in)
D	24	Overall Width (in)
B	19	Curb Cap Width (in)
C	19	Curb Cap Length (in)
-	12	Duct / Damper Width (in)
-	12	Duct / Damper Length (in)
-	14.5	Roof Opening Width (in)
-	14.5	Roof Opening Length (in)



*All dimensions are in inches.

Job Name: G-060-VG Cut Sheet
Tag: MK-1
Quantity: 1
Printed Date: August 28, 2020

Model: G-060-VG

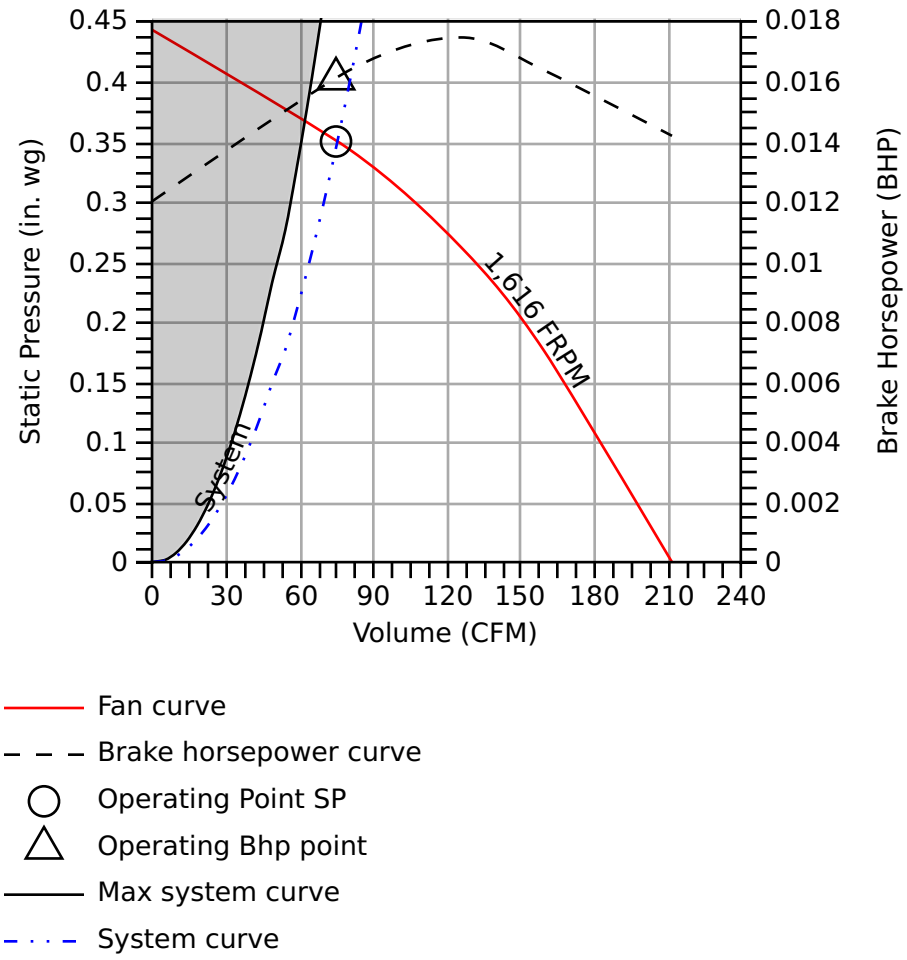
Direct Drive Centrifugal Roof Exhaust Fan

Standard Construction Features: Aluminum housing. Centrifugal backward inclined aluminum (composite for sizes 60-95) wheel. Direct driven motor mounted on vibration isolation.

Fan Configuration	
Drive type	Direct

Performance	
Requested Volume (CFM)	75
Actual Volume (CFM)	75
Total External SP (in. wg)	0.35
Fan RPM	1,616
Operating Power (bhp)	0.02
Startup Power (bhp)	0.02
Air Stream Temp (F)	70
Start-up Temp (F)	70
Air Density (lbs/ft^3)	0.072
Elevation (ft)	1000
Static Efficiency (%)	26
Outlet Velocity (ft/min)	395

Motor	
Size (hp)	1/15
V/C/P	115/60/1



Sound

	Octave Bands (hz)								LwA	dBA	Sones
	62.5	125	250	500	1000	2000	4000	8000			
Inlet	59	62	60	50	47	49	42	34	56	45	3.8

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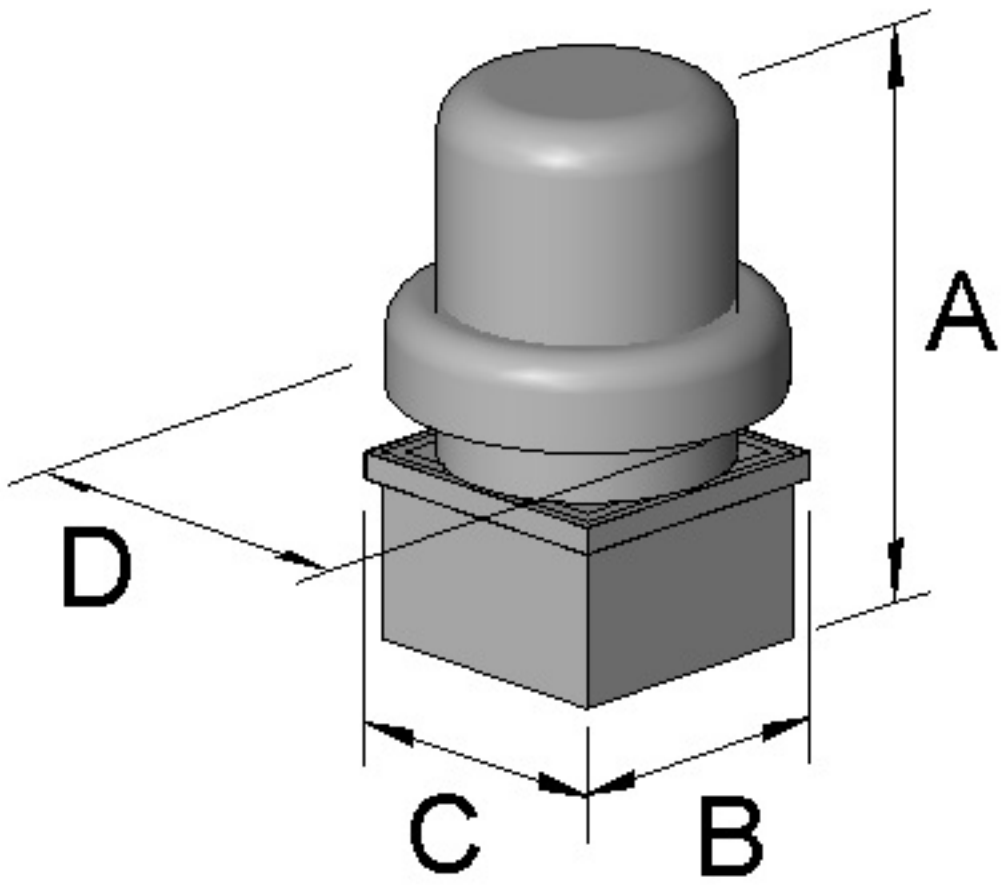
FLA - based on tables 150 or 148 of National Electric Code 2002. Actual motor FLA may vary, for sizing thermal overload, consult factory.

Dimensions and Weights		
Label	**Value**	**Description**
-	19	Weight w/o accessories (lbs)
A	24	Overall Height (in)
D	19	Overall Width (in)
B	17	Curb Cap Width (in)
C	17	Curb Cap Length (in)
-	8	Duct / Damper Width (in)
-	8	Duct / Damper Length (in)
-	10.5	Roof Opening Width (in)
-	10.5	Roof Opening Length (in)



*All dimensions are in inches.

Job Name: G-070-VG Cut Sheet
Tag: MK-1
Quantity: 1
Printed Date: August 28, 2020

Model: G-070-VG

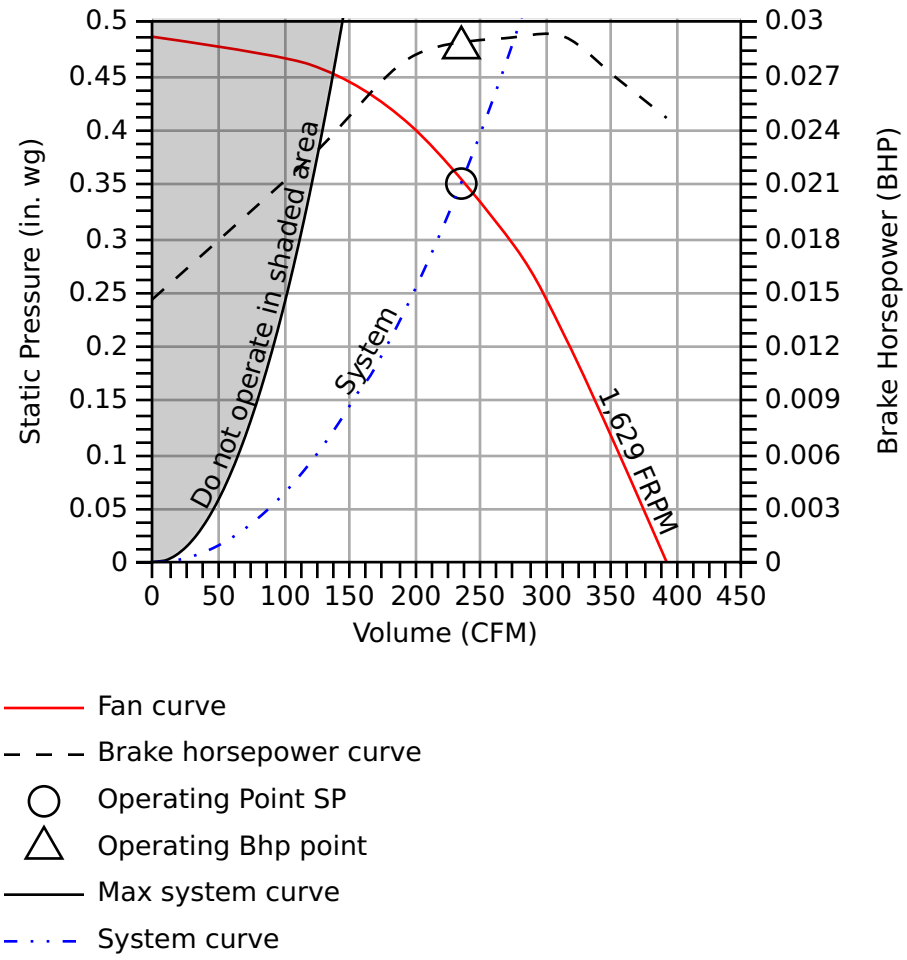
Direct Drive Centrifugal Roof Exhaust Fan

Standard Construction Features: Aluminum housing. Centrifugal backward inclined aluminum (composite for sizes 60-95) wheel. Direct driven motor mounted on vibration isolation.

Fan Configuration	
Drive type	Direct

Performance	
Requested Volume (CFM)	235
Actual Volume (CFM)	235
Total External SP (in. wg)	0.35
Fan RPM	1,629
Operating Power (bhp)	0.03
Startup Power (bhp)	0.03
Air Stream Temp (F)	70
Start-up Temp (F)	70
Air Density (lbs/ft^3)	0.072
Elevation (ft)	1000
Static Efficiency (%)	45
Outlet Velocity (ft/min)	603

Motor	
Size (hp)	1/15
V/C/P	115/60/1



Sound

	Octave Bands (hz)								LwA	dBA	Sones
	62.5	125	250	500	1000	2000	4000	8000			
Inlet	67	69	66	52	46	45	40	36	60	48	5.0

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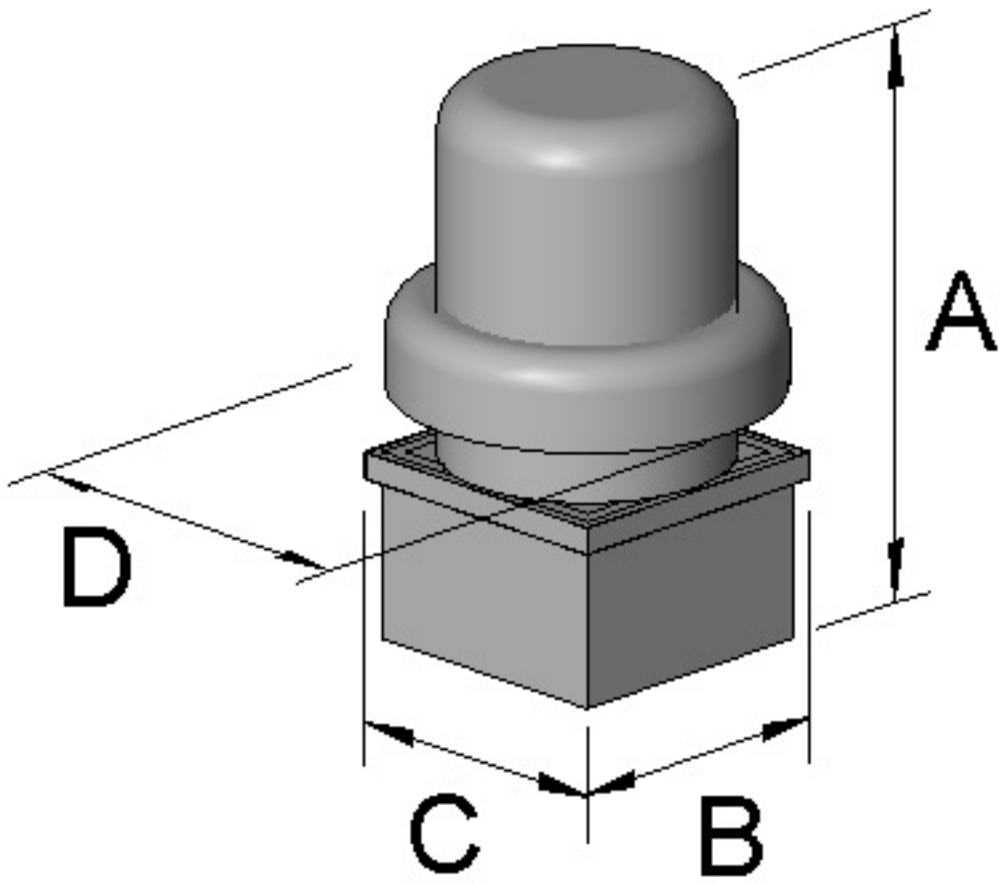
FLA - based on tables 150 or 148 of National Electric Code 2002. Actual motor FLA may vary, for sizing thermal overload, consult factory.

Dimensions and Weights		
Label	**Value**	**Description**
-	20	Weight w/o accessories (lbs)
A	24	Overall Height (in)
D	19	Overall Width (in)
B	17	Curb Cap Width (in)
C	17	Curb Cap Length (in)
-	8	Duct / Damper Width (in)
-	8	Duct / Damper Length (in)
-	10.5	Roof Opening Width (in)
-	10.5	Roof Opening Length (in)



*All dimensions are in inches.

Job Name: G-123-VG Cut Sheet
Tag: MK-1
Quantity: 1
Printed Date: August 28, 2020

Model: G-123-VG

Direct Drive Centrifugal Roof Exhaust Fan

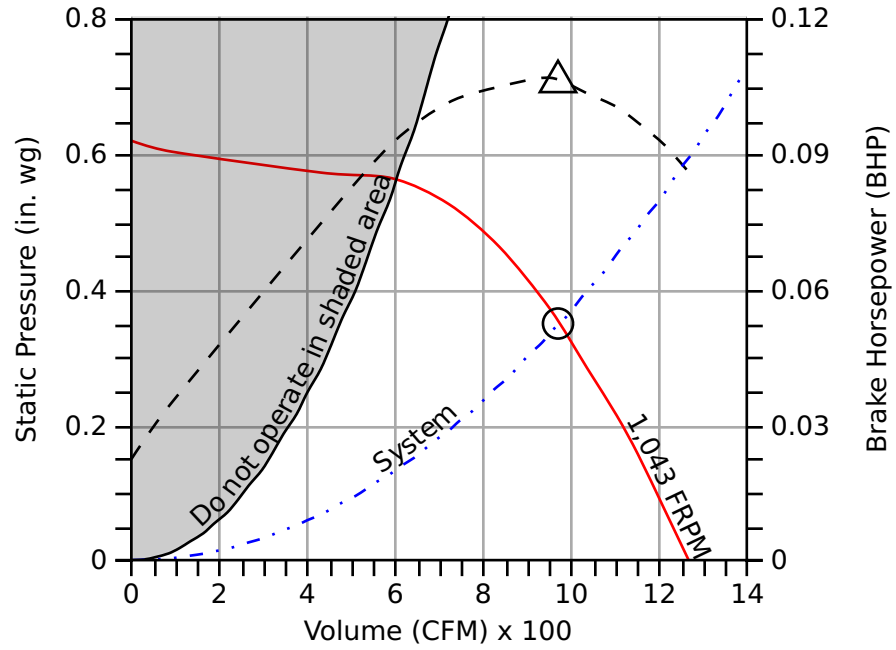
Standard Construction Features: Aluminum housing. Centrifugal backward inclined aluminum (composite for sizes 60-95) wheel. Direct driven motor mounted on vibration isolation.

Fan Configuration	
Drive type	Direct

Performance	
Requested Volume (CFM)	970
Actual Volume (CFM)	970
Total External SP (in. wg)	0.35
Fan RPM	1,043
Operating Power (bhp)	0.11
Startup Power (bhp)	0.11
Air Stream Temp (F)	70
Start-up Temp (F)	70
Air Density (lbs/ft^3)	0.072
Elevation (ft)	1000
Static Efficiency (%)	50
Outlet Velocity (ft/min)	1,043

Motor	
Size (hp)	1/4
V/C/P	115/60/1
NEC FLA (Amps)	3.7

FLA - based on tables 150 or 148 of National Electric Code 2002. Actual motor FLA may vary, for sizing thermal overload, consult factory.



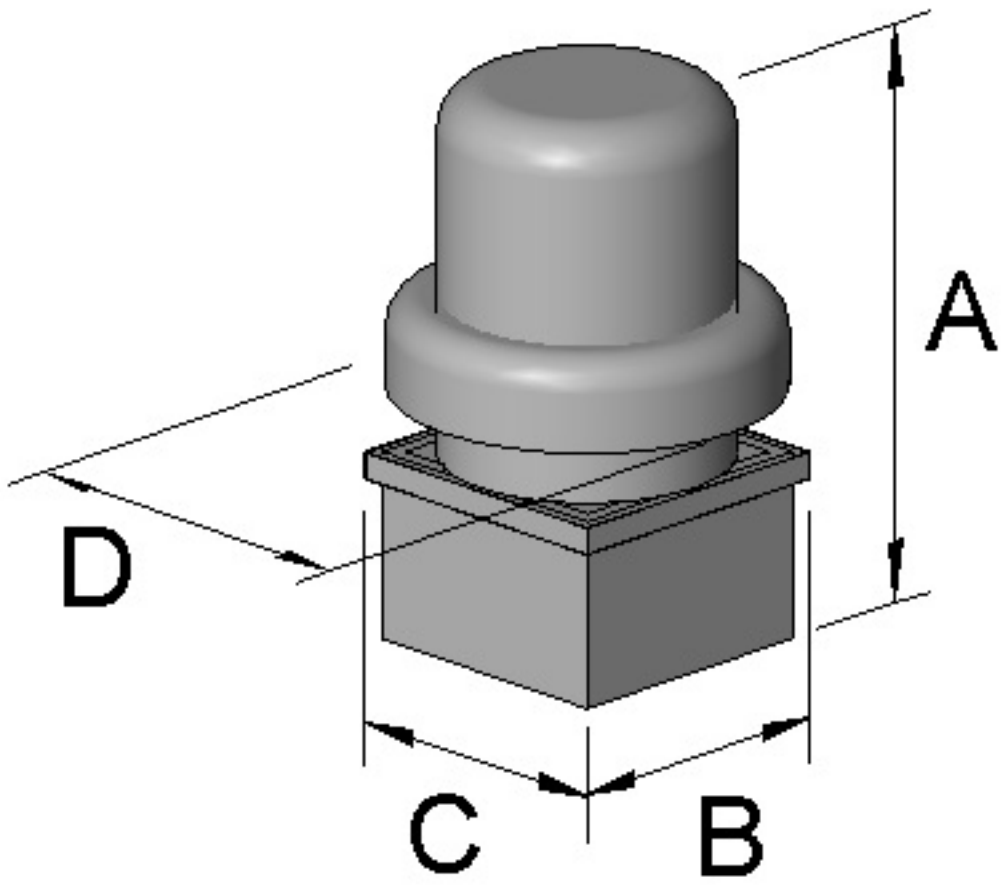
Fan curve
Brake horsepower curve
Operating Point SP
Operating Bhp point
Max system curve
System curve

Sound

	Octave Bands (hz)								LwA	dBA	Sones
	62.5	125	250	500	1000	2000	4000	8000			
Inlet	66	71	69	62	56	54	49	47	65	54	7.0

Greenheck Fan Corporation certifies that the model shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 and AMCA Publication 311 and comply with the requirements of the AMCA Certified Ratings Program.The AMCA certified ratings seal applies to sound and air performance ratings only.Performance certified is for installation type A: Free inlet, free outlet.Power rating does not include transmission losses.Performance ratings include the effects of birdscreen.The sound ratings shown are loudness values in hemispherical sones at 1.5 m (5 ft) in a hemispherical free field calculated per ANSI/AMCA Standard 301.Values shown are for Installation Type A: free inlet hemispherical sone levels.dBA levels are not licensed by AMCA International. The AMCA Certified Ratings Seal for Sound applies to inlet sone ratings only.

Dimensions and Weights		
Label	**Value**	**Description**
-	43	Weight w/o accessories (lbs)
A	36	Overall Height (in)
D	24	Overall Width (in)
B	19	Curb Cap Width (in)
C	19	Curb Cap Length (in)
-	12	Duct / Damper Width (in)
-	12	Duct / Damper Length (in)
-	14.5	Roof Opening Width (in)
-	14.5	Roof Opening Length (in)



*All dimensions are in inches.

Job Name: G-183-VG Cut Sheet
Tag: MK-1
Quantity: 1
Printed Date: August 28, 2020

Model: G-183-VG

Direct Drive Centrifugal Roof Exhaust Fan

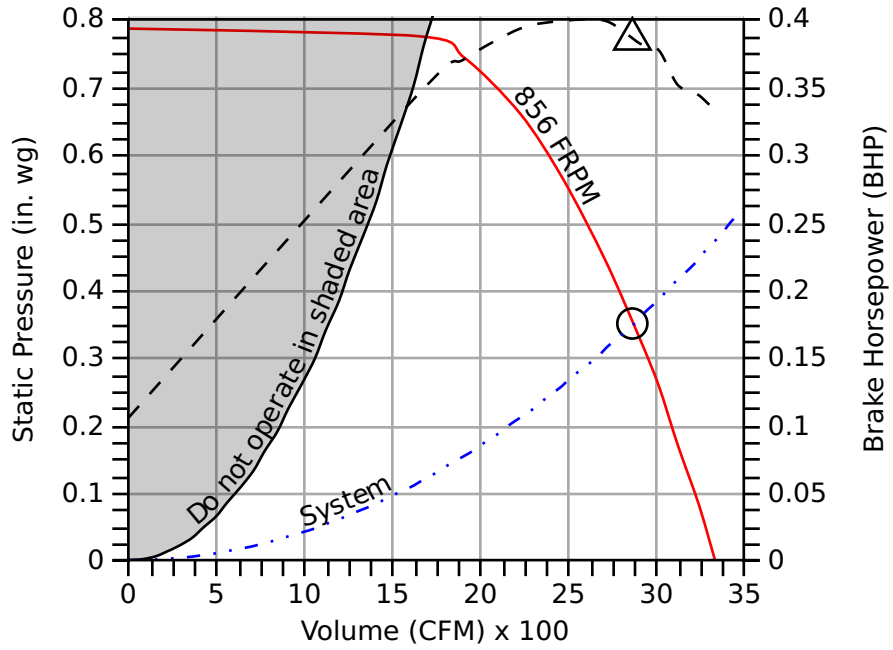
Standard Construction Features: Aluminum housing. Centrifugal backward inclined aluminum (composite for sizes 60-95) wheel. Direct driven motor mounted on vibration isolation.

Fan Configuration	
Drive type	Direct

Performance	
Requested Volume (CFM)	2,865
Actual Volume (CFM)	2,865
Total External SP (in. wg)	0.35
Fan RPM	856
Operating Power (bhp)	0.39
Startup Power (bhp)	0.39
Air Stream Temp (F)	70
Start-up Temp (F)	70
Air Density (lbs/ft^3)	0.072
Elevation (ft)	1000
Static Efficiency (%)	41
Outlet Velocity (ft/min)	1,384

Motor	
Size (hp)	3/4
V/C/P	115/60/1
NEC FLA (Amps)	10.6

FLA - based on tables 150 or 148 of National Electric Code 2002. Actual motor FLA may vary, for sizing thermal overload, consult factory.



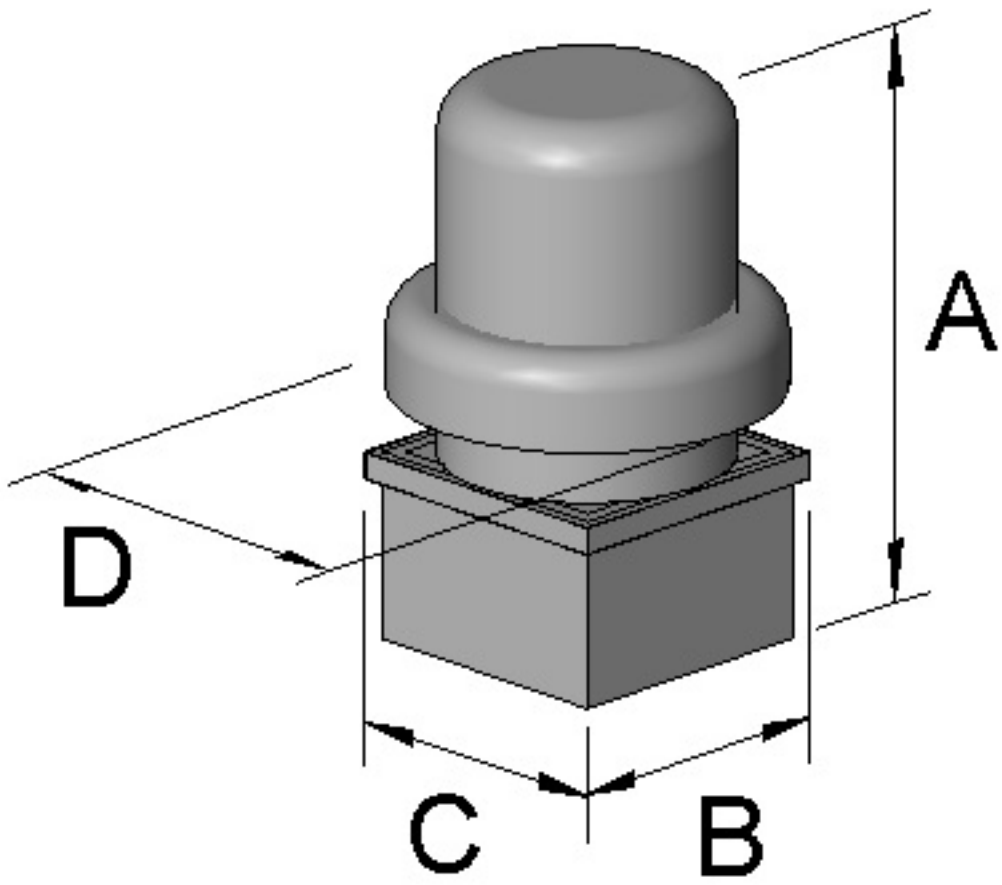
Fan curve
Brake horsepower curve
Operating Point SP
Operating Bhp point
Max system curve
System curve

Sound

	Octave Bands (hz)								LwA	dBA	Sones
	62.5	125	250	500	1000	2000	4000	8000			
Inlet	74	75	73	67	65	62	53	46	71	59	9.3

Greenheck Fan Corporation certifies that the model shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 and AMCA Publication 311 and comply with the requirements of the AMCA Certified Ratings Program.The AMCA certified ratings seal applies to sound and air performance ratings only.Performance certified is for installation type A: Free inlet, free outlet.Power rating does not include transmission losses.Performance ratings include the effects of birdscreen.The sound ratings shown are loudness values in hemispherical sones at 1.5 m (5 ft) in a hemispherical free field calculated per ANSI/AMCA Standard 301.Values shown are for Installation Type A: free inlet hemispherical sone levels.dBA levels are not licensed by AMCA International. The AMCA Certified Ratings Seal for Sound applies to inlet sone ratings only.

Dimensions and Weights		
Label	**Value**	**Description**
-	81	Weight w/o accessories (lbs)
A	40	Overall Height (in)
D	36	Overall Width (in)
B	30	Curb Cap Width (in)
C	30	Curb Cap Length (in)
-	18	Duct / Damper Width (in)
-	18	Duct / Damper Length (in)
-	20.5	Roof Opening Width (in)
-	20.5	Roof Opening Length (in)



*All dimensions are in inches.

Job Name: G-163-VG Cut Sheet
Tag: MK-1
Quantity: 1
Printed Date: August 28, 2020

Model: G-163-VG

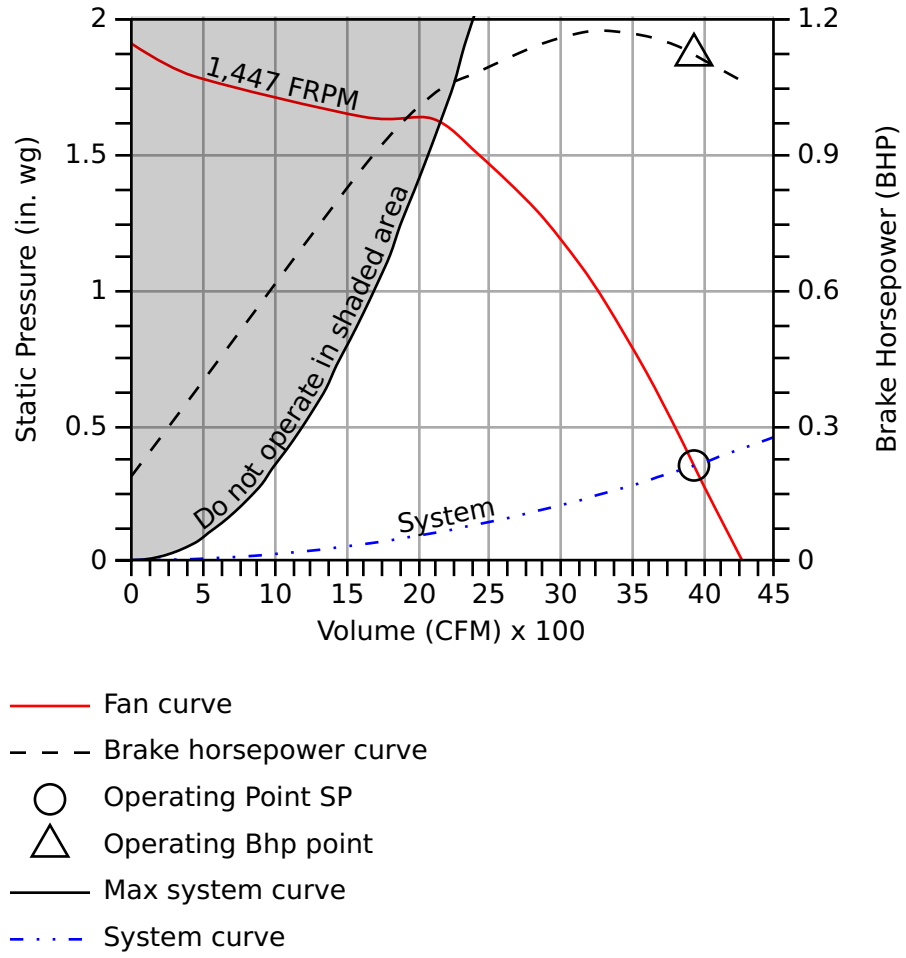
Direct Drive Centrifugal Roof Exhaust Fan

Standard Construction Features: Aluminum housing. Centrifugal backward inclined aluminum (composite for sizes 60-95) wheel. Direct driven motor mounted on vibration isolation.

Fan Configuration	
Drive type	Direct

Performance	
Requested Volume (CFM)	3,935
Actual Volume (CFM)	3,935
Total External SP (in. wg)	0.35
Fan RPM	1,447
Operating Power (bhp)	1.12
Startup Power (bhp)	1.12
Air Stream Temp (F)	70
Start-up Temp (F)	70
Air Density (lbs/ft^3)	0.072
Elevation (ft)	1000
Static Efficiency (%)	19
Outlet Velocity (ft/min)	2,139

Motor	
Size (hp)	2
V/C/P	208/60/1



Sound

	Octave Bands (hz)								LwA	dBA	Sones
	62.5	125	250	500	1000	2000	4000	8000			
Inlet	80	84	88	80	75	73	69	64	83	72	21

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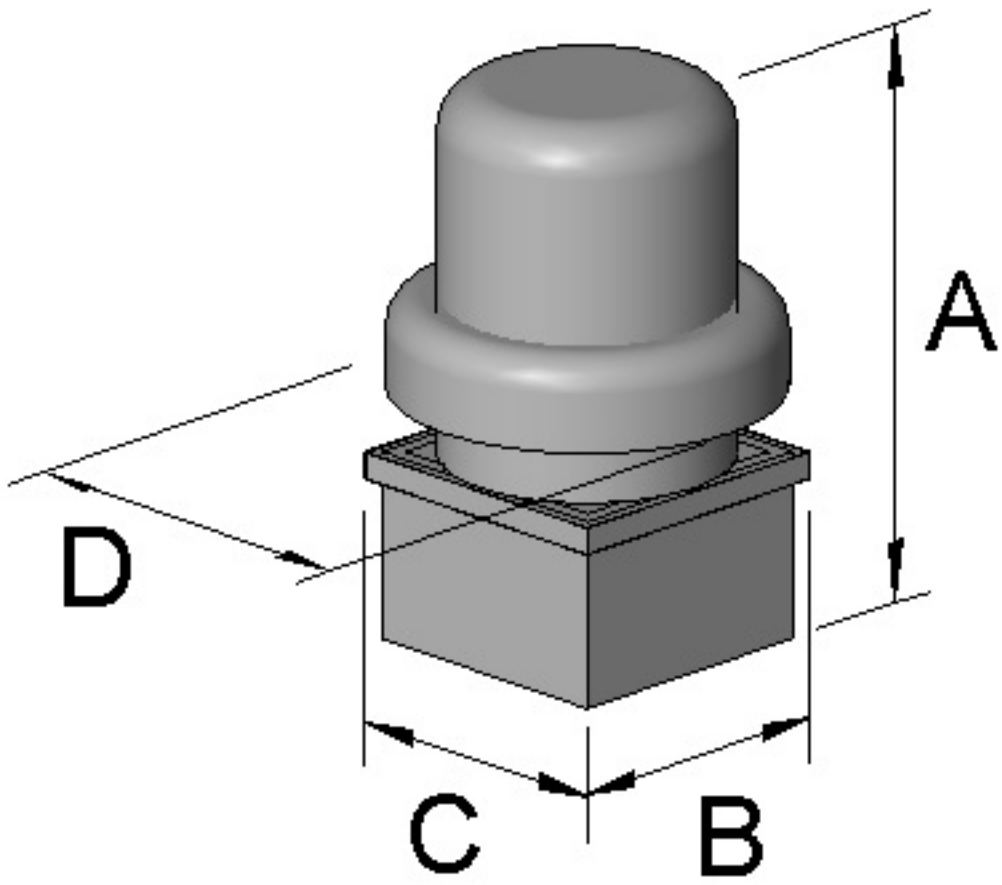
FLA - based on tables 150 or 148 of National Electric Code 2002. Actual motor FLA may vary, for sizing thermal overload, consult factory.

Dimensions and Weights		
Label	**Value**	**Description**
-	74	Weight w/o accessories (lbs)
A	36	Overall Height (in)
D	28	Overall Width (in)
B	22	Curb Cap Width (in)
C	22	Curb Cap Length (in)
-	16	Duct / Damper Width (in)
-	16	Duct / Damper Length (in)
-	18.5	Roof Opening Width (in)
-	18.5	Roof Opening Length (in)



*All dimensions are in inches.

Job Name: G-123-VG Cut Sheet
Tag: MK-1
Quantity: 1
Printed Date: August 28, 2020

Model: G-123-VG

Direct Drive Centrifugal Roof Exhaust Fan

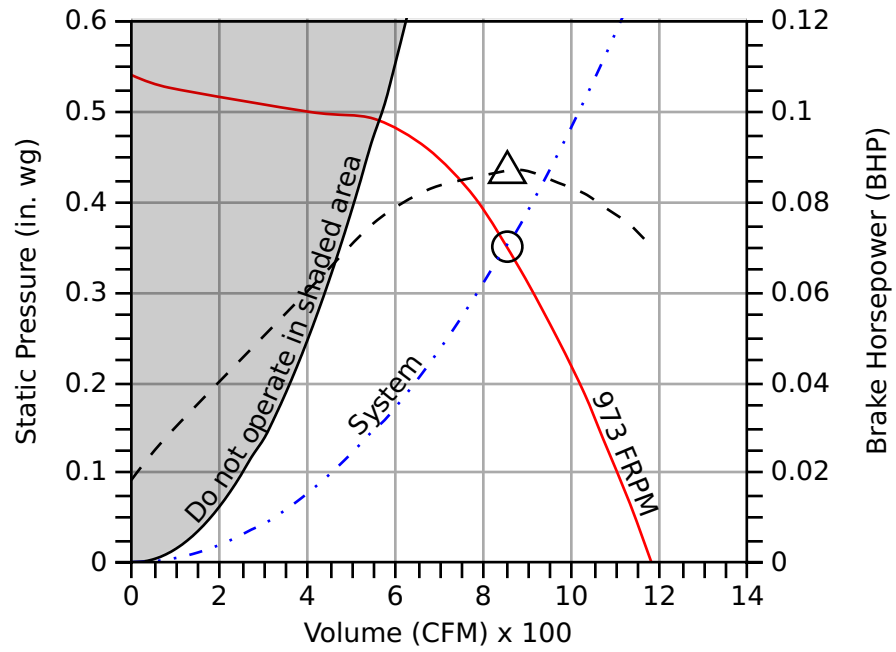
Standard Construction Features: Aluminum housing. Centrifugal backward inclined aluminum (composite for sizes 60-95) wheel. Direct driven motor mounted on vibration isolation.

Fan Configuration	
Drive type	Direct

Performance	
Requested Volume (CFM)	850
Actual Volume (CFM)	850
Total External SP (in. wg)	0.35
Fan RPM	973
Operating Power (bhp)	0.09
Startup Power (bhp)	0.09
Air Stream Temp (F)	70
Start-up Temp (F)	70
Air Density (lbs/ft^3)	0.072
Elevation (ft)	1000
Static Efficiency (%)	54
Outlet Velocity (ft/min)	914

Motor	
Size (hp)	1/4
V/C/P	115/60/1
NEC FLA (Amps)	3.7

FLA - based on tables 150 or 148 of National Electric Code 2002. Actual motor FLA may vary, for sizing thermal overload, consult factory.



Fan curve
Brake horsepower curve
Operating Point SP
Operating Bhp point
Max system curve
System curve

Sound

	Octave Bands (hz)								LwA	dBA	Sones
	62.5	125	250	500	1000	2000	4000	8000			
Inlet	65	70	67	60	55	51	47	45	63	52	6.2

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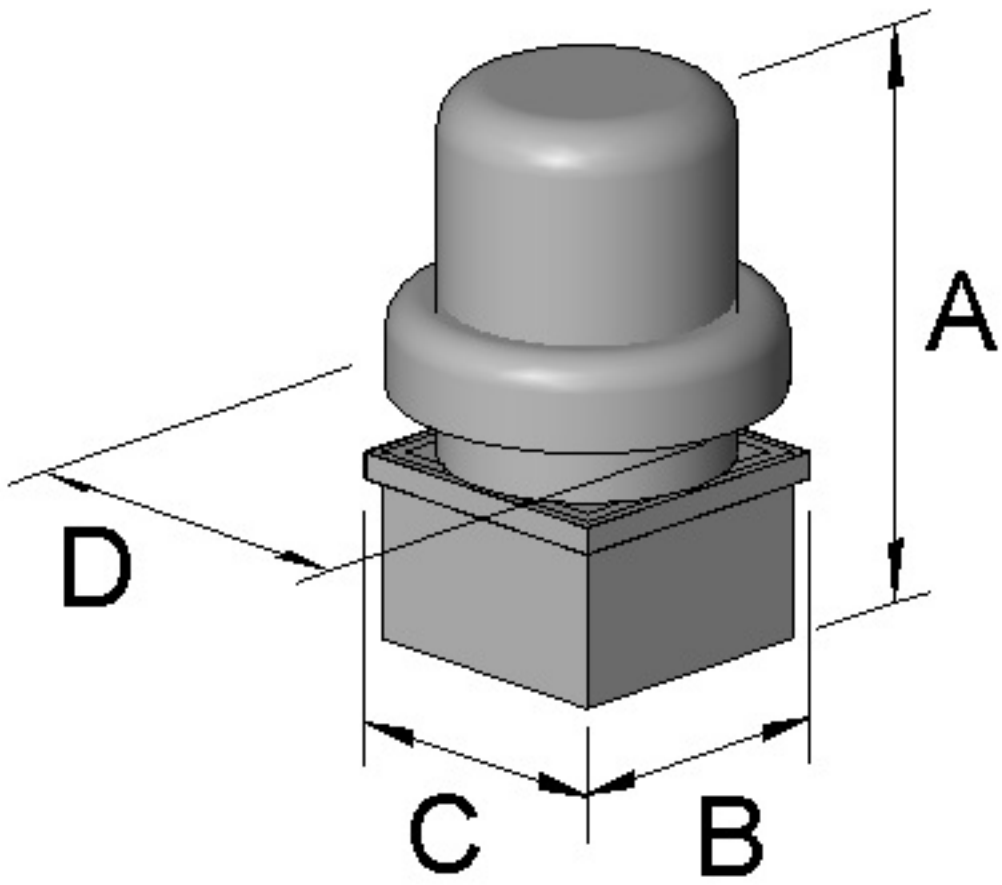
Dimensions and Weights		
Label	**Value**	**Description**
-	43	Weight w/o accessories (lbs)
A	36	Overall Height (in)
D	24	Overall Width (in)
B	19	Curb Cap Width (in)
C	19	Curb Cap Length (in)
-	12	Duct / Damper Width (in)
-	12	Duct / Damper Length (in)
-	14.5	Roof Opening Width (in)
-	14.5	Roof Opening Length (in)



*All dimensions are in inches.

Job Name: G-163-VG Cut Sheet
Tag: MK-1
Quantity: 1
Printed Date: August 28, 2020

Model: G-163-VG

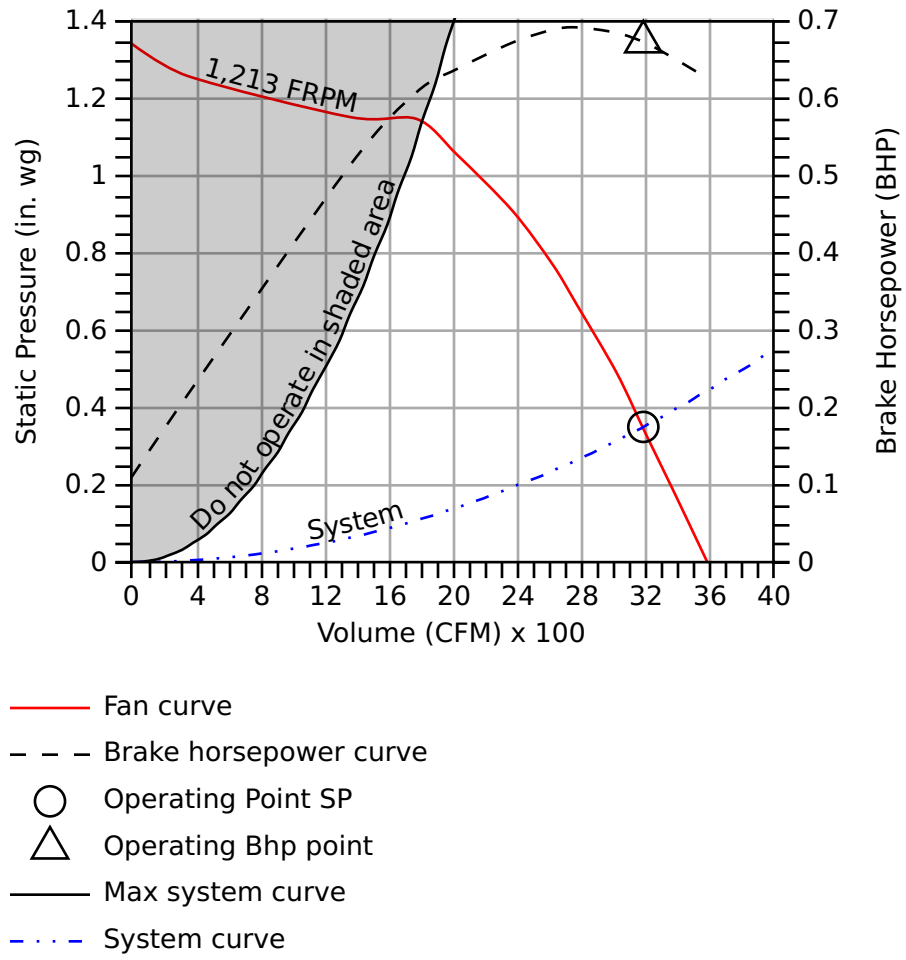
Direct Drive Centrifugal Roof Exhaust Fan

Standard Construction Features: Aluminum housing. Centrifugal backward inclined aluminum (composite for sizes 60-95) wheel. Direct driven motor mounted on vibration isolation.

Fan Configuration	
Drive type	Direct

Performance	
Requested Volume (CFM)	3,180
Actual Volume (CFM)	3,180
Total External SP (in. wg)	0.35
Fan RPM	1,213
Operating Power (bhp)	0.67
Startup Power (bhp)	0.67
Air Stream Temp (F)	70
Start-up Temp (F)	70
Air Density (lbs/ft^3)	0.072
Elevation (ft)	1000
Static Efficiency (%)	26
Outlet Velocity (ft/min)	1,728

Motor	
Size (hp)	2
V/C/P	208/60/1



Fan curve
Brake horsepower curve
Operating Point SP
Operating Bhp point
Max system curve
System curve

Sound

	Octave Bands (hz)								LwA	dBA	Sones
	62.5	125	250	500	1000	2000	4000	8000			
Inlet	77	80	84	74	70	68	64	58	79	67	15.9

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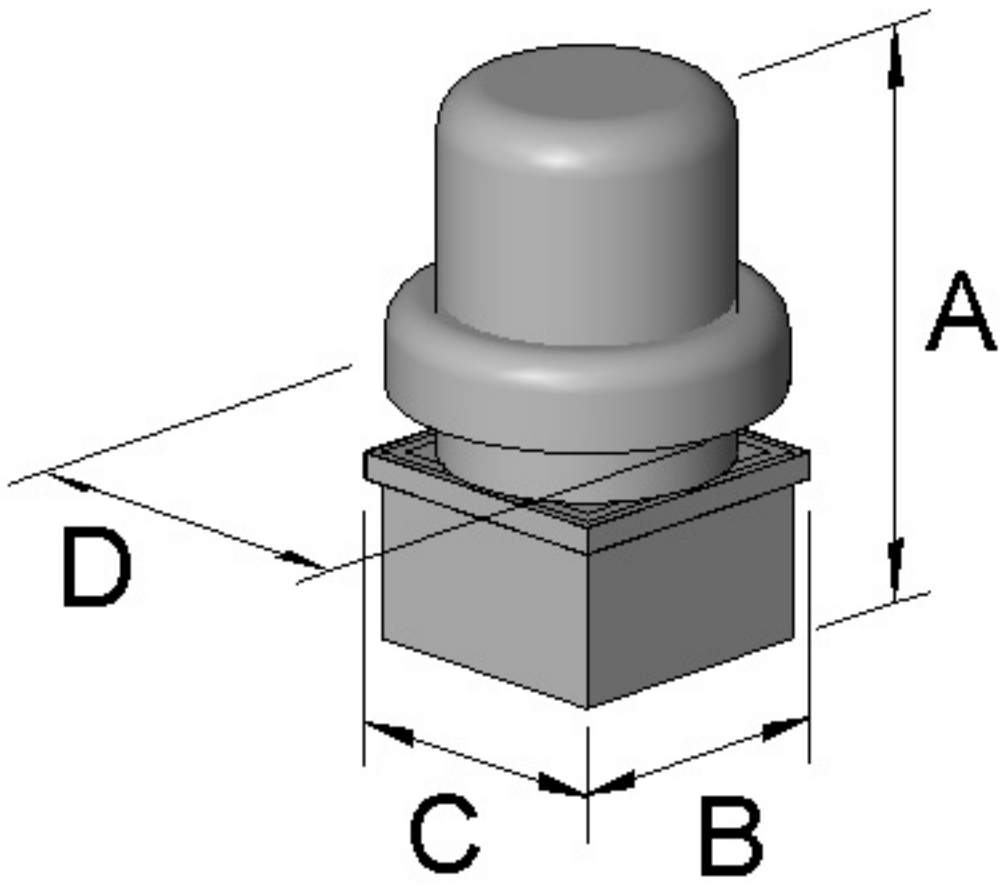
FLA - based on tables 150 or 148 of National Electric Code 2002. Actual motor FLA may vary, for sizing thermal overload, consult factory.

Dimensions and Weights		
Label	**Value**	**Description**
-	74	Weight w/o accessories (lbs)
A	36	Overall Height (in)
D	28	Overall Width (in)
B	22	Curb Cap Width (in)
C	22	Curb Cap Length (in)
-	16	Duct / Damper Width (in)
-	16	Duct / Damper Length (in)
-	18.5	Roof Opening Width (in)
-	18.5	Roof Opening Length (in)



*All dimensions are in inches.

Job Name: G-060-VG Cut Sheet
Tag: MK-1
Quantity: 1
Printed Date: August 28, 2020

Model: G-060-VG

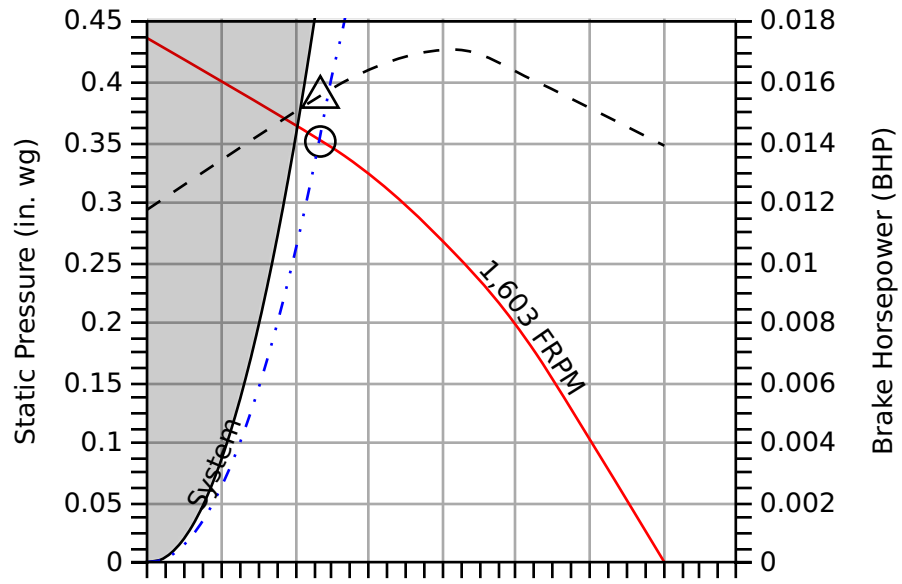
Direct Drive Centrifugal Roof Exhaust Fan

Standard Construction Features: Aluminum housing. Centrifugal backward inclined aluminum (composite for sizes 60-95) wheel. Direct driven motor mounted on vibration isolation.

Fan Configuration	
Drive type	Direct

Performance	
Requested Volume (CFM)	70
Actual Volume (CFM)	70
Total External SP (in. wg)	0.35
Fan RPM	1,603
Operating Power (bhp)	0.02
Startup Power (bhp)	0.02
Air Stream Temp (F)	70
Start-up Temp (F)	70
Air Density (lbs/ft^3)	0.072
Elevation (ft)	1000
Static Efficiency (%)	25
Outlet Velocity (ft/min)	368

Motor	
Size (hp)	1/15
V/C/P	115/60/1



Fan curve
Brake horsepower curve
Operating Point SP
Operating Bhp point
Max system curve
System curve

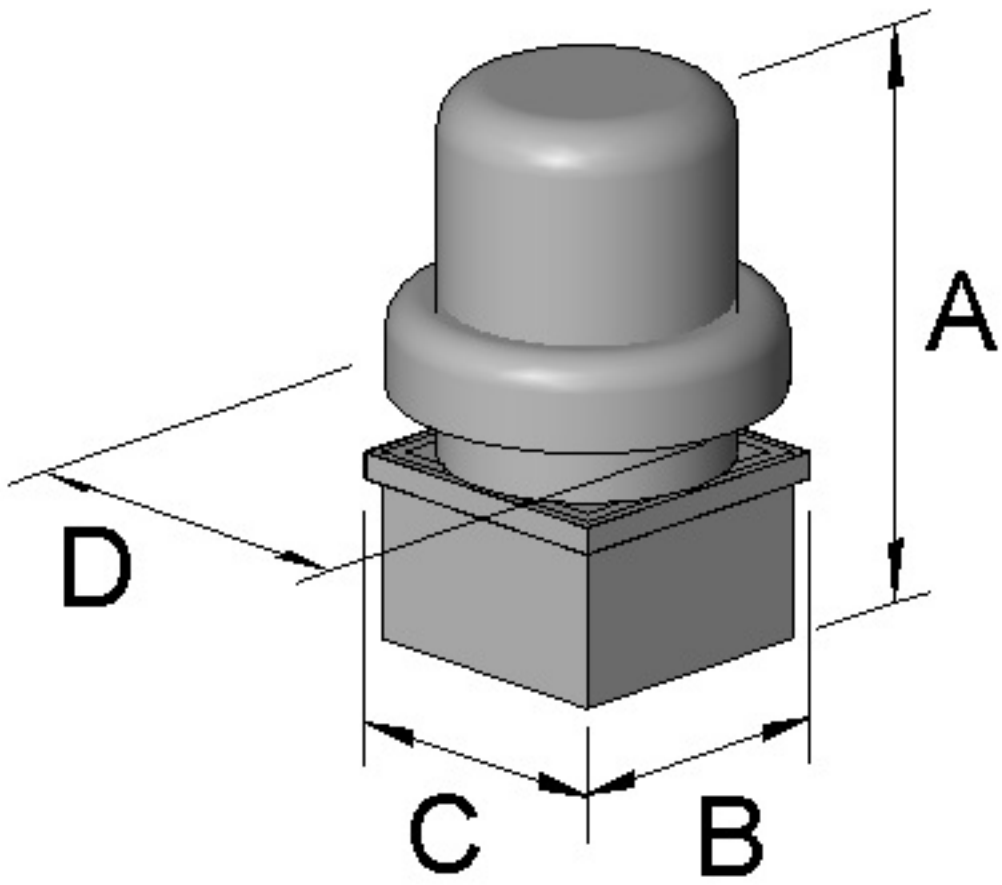
Sound

	Octave Bands (hz)								LwA	dBA	Sones
	62.5	125	250	500	1000	2000	4000	8000			
Inlet	59	62	60	50	47	49	42	34	56	45	3.7

Greenheck Fan Corporation certifies that the model shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 and AMCA Publication 311 and comply with the requirements of the AMCA Certified Ratings Program.The AMCA certified ratings seal applies to sound and air performance ratings only.Performance certified is for installation type A: Free inlet, free outlet.Power rating does not include transmission losses.Performance ratings include the effects of birdscreen.The sound ratings shown are loudness values in hemispherical sones at 1.5 m (5 ft) in a hemispherical free field calculated per ANSI/AMCA Standard 301.Values shown are for Installation Type A: free inlet hemispherical sone levels.dBA levels are not licensed by AMCA International. The AMCA Certified Ratings Seal for Sound applies to inlet sone ratings only.

FLA - based on tables 150 or 148 of National Electric Code 2002. Actual motor FLA may vary, for sizing thermal overload, consult factory.

Dimensions and Weights		
Label	**Value**	**Description**
-	19	Weight w/o accessories (lbs)
A	24	Overall Height (in)
D	19	Overall Width (in)
B	17	Curb Cap Width (in)
C	17	Curb Cap Length (in)
-	8	Duct / Damper Width (in)
-	8	Duct / Damper Length (in)
-	10.5	Roof Opening Width (in)
-	10.5	Roof Opening Length (in)



*All dimensions are in inches.

Job Name: G-090-VG Cut Sheet
Tag: MK-1
Quantity: 1
Printed Date: August 28, 2020

Model: G-090-VG

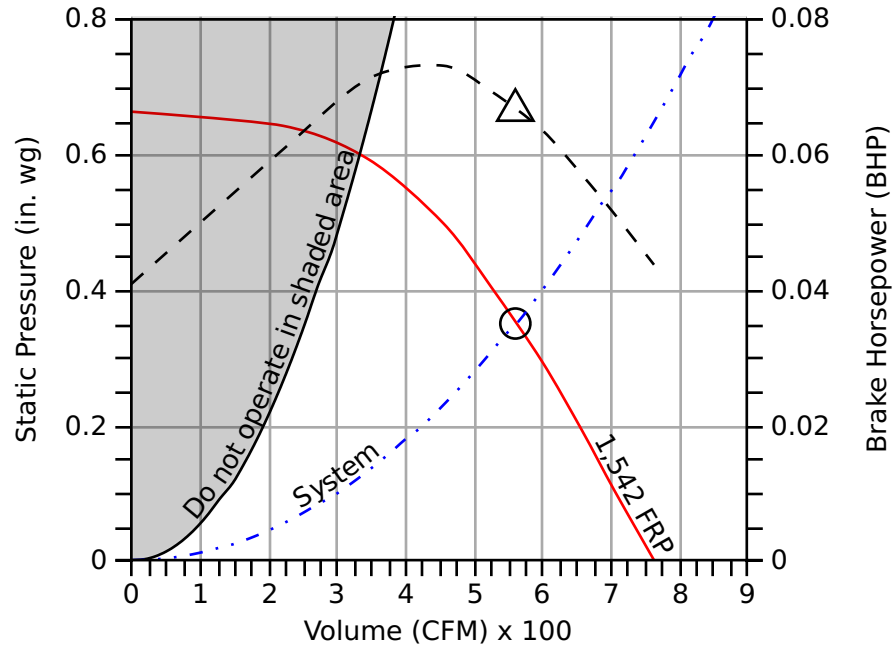
Direct Drive Centrifugal Roof Exhaust Fan

Standard Construction Features: Aluminum housing. Centrifugal backward inclined aluminum (composite for sizes 60-95) wheel. Direct driven motor mounted on vibration isolation.

Fan Configuration	
Drive type	Direct

Performance	
Requested Volume (CFM)	560
Actual Volume (CFM)	560
Total External SP (in. wg)	0.35
Fan RPM	1,542
Operating Power (bhp)	0.07
Startup Power (bhp)	0.07
Air Stream Temp (F)	70
Start-up Temp (F)	70
Air Density (lbs/ft^3)	0.072
Elevation (ft)	1000
Static Efficiency (%)	46
Outlet Velocity (ft/min)	800

Motor	
Size (hp)	1/10
V/C/P	115/60/1
NEC FLA (Amps)	1.38



Fan curve
Brake horsepower curve
Operating Point SP
Operating Bhp point
Max system curve
System curve

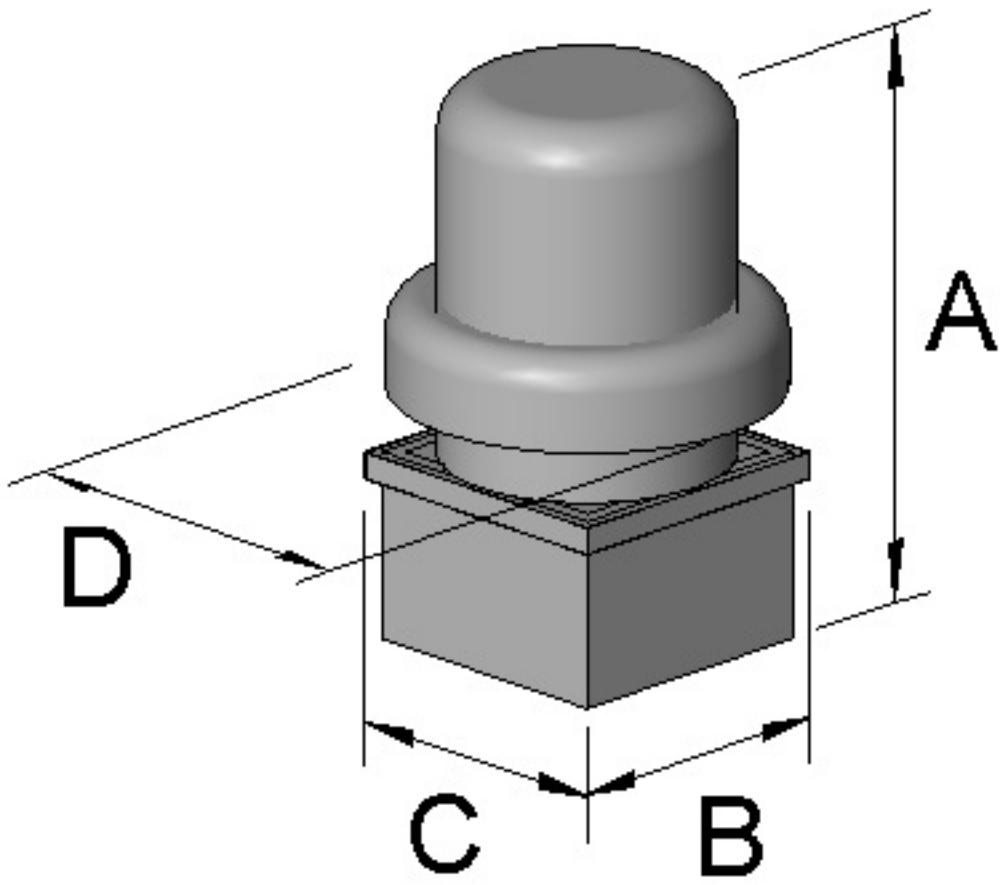
Sound

	Octave Bands (hz)								LwA	dBA	Sones
	62.5	125	250	500	1000	2000	4000	8000			
Inlet	72	72	69	61	58	55	53	45	65	54	7.3

Greenheck Fan Corporation certifies that the model shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 and AMCA Publication 311 and comply with the requirements of the AMCA Certified Ratings Program.The AMCA certified ratings seal applies to sound and air performance ratings only.Performance certified is for installation type A: Free inlet, free outlet.Power rating does not include transmission losses.Performance ratings include the effects of birdscreen.The sound ratings shown are loudness values in hemispherical sones at 1.5 m (5 ft) in a hemispherical free field calculated per ANSI/AMCA Standard 301.Values shown are for Installation Type A: free inlet hemispherical sone levels.dBA levels are not licensed by AMCA International. The AMCA Certified Ratings Seal for Sound applies to inlet sone ratings only.

FLA - based on tables 150 or 148 of National Electric Code 2002. Actual motor FLA may vary, for sizing thermal overload, consult factory.

Dimensions and Weights		
Label	**Value**	**Description**
-	29	Weight w/o accessories (lbs)
A	27	Overall Height (in)
D	22	Overall Width (in)
B	17	Curb Cap Width (in)
C	17	Curb Cap Length (in)
-	10	Duct / Damper Width (in)
-	10	Duct / Damper Length (in)
-	12.5	Roof Opening Width (in)
-	12.5	Roof Opening Length (in)



*All dimensions are in inches.

Job Name: G-183-VG Cut Sheet
Tag: MK-1
Quantity: 1
Printed Date: August 28, 2020

Model: G-183-VG

Direct Drive Centrifugal Roof Exhaust Fan

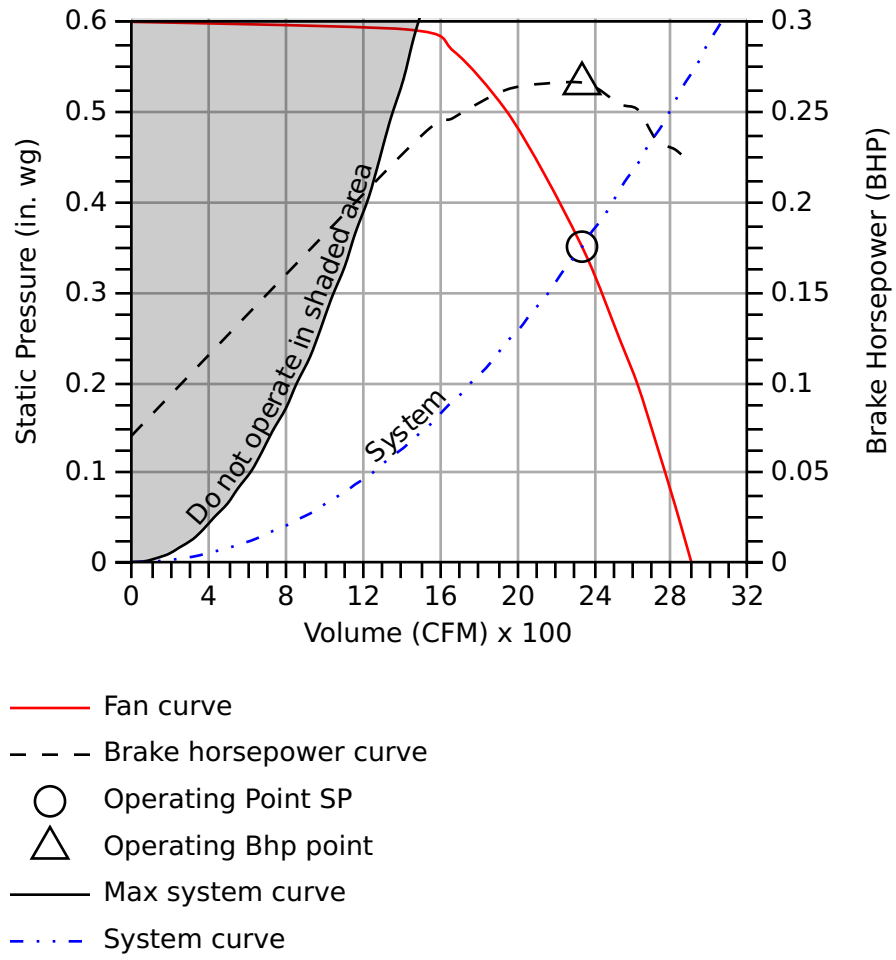
Standard Construction Features: Aluminum housing. Centrifugal backward inclined aluminum (composite for sizes 60-95) wheel. Direct driven motor mounted on vibration isolation.

Fan Configuration	
Drive type	Direct

Performance	
Requested Volume (CFM)	2,335
Actual Volume (CFM)	2,335
Total External SP (in. wg)	0.35
Fan RPM	748
Operating Power (bhp)	0.27
Startup Power (bhp)	0.27
Air Stream Temp (F)	70
Start-up Temp (F)	70
Air Density (lbs/ft^3)	0.072
Elevation (ft)	1000
Static Efficiency (%)	48
Outlet Velocity (ft/min)	1,128

Motor	
Size (hp)	3/4
V/C/P	115/60/1
NEC FLA (Amps)	10.6

FLA - based on tables 150 or 148 of National Electric Code 2002. Actual motor FLA may vary, for sizing thermal overload, consult factory.



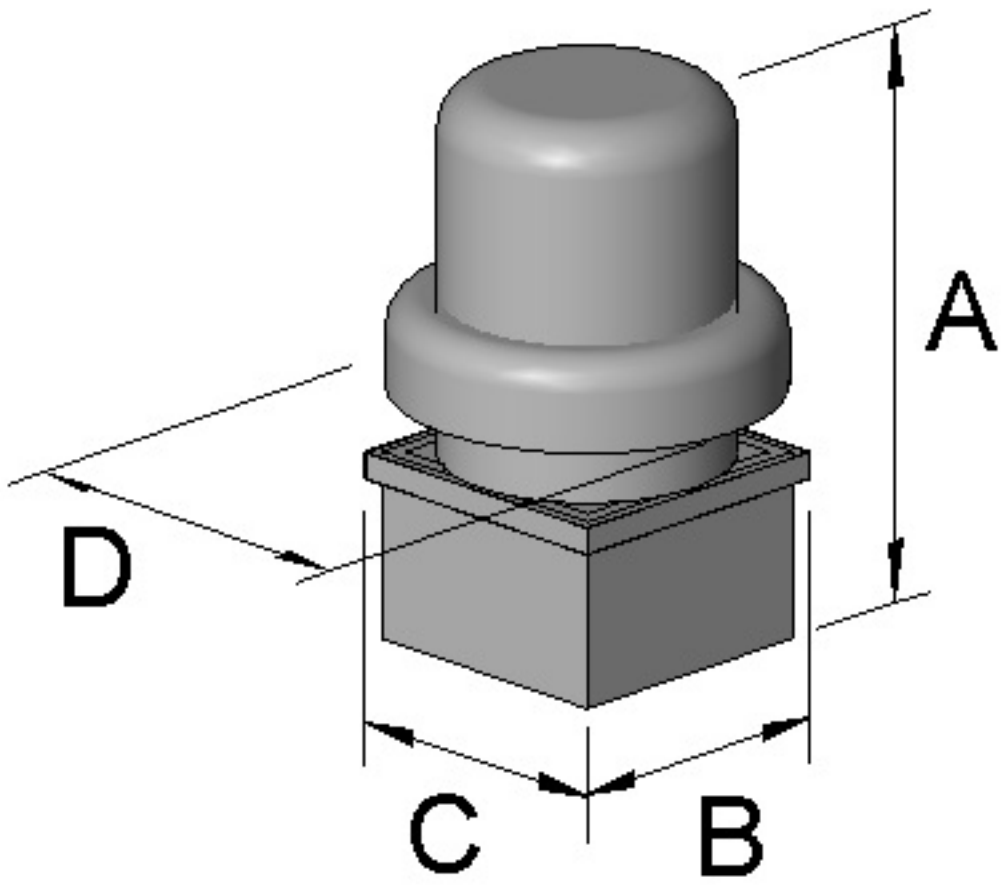
Fan curve
Brake horsepower curve
Operating Point SP
Operating Bhp point
Max system curve
System curve

Sound

	Octave Bands (hz)								LwA	dBA	Sones
	62.5	125	250	500	1000	2000	4000	8000			
Inlet	72	76	70	62	60	57	50	43	67	55	7.9

Greenheck Fan Corporation certifies that the model shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 and AMCA Publication 311 and comply with the requirements of the AMCA Certified Ratings Program.The AMCA certified ratings seal applies to sound and air performance ratings only.Performance certified is for installation type A: Free inlet, free outlet.Power rating does not include transmission losses.Performance ratings include the effects of birdscreen.The sound ratings shown are loudness values in hemispherical sones at 1.5 m (5 ft) in a hemispherical free field calculated per ANSI/AMCA Standard 301.Values shown are for Installation Type A: free inlet hemispherical sone levels.dBA levels are not licensed by AMCA International. The AMCA Certified Ratings Seal for Sound applies to inlet sone ratings only.

Dimensions and Weights		
Label	**Value**	**Description**
-	81	Weight w/o accessories (lbs)
A	40	Overall Height (in)
D	36	Overall Width (in)
B	30	Curb Cap Width (in)
C	30	Curb Cap Length (in)
-	18	Duct / Damper Width (in)
-	18	Duct / Damper Length (in)
-	20.5	Roof Opening Width (in)
-	20.5	Roof Opening Length (in)



*All dimensions are in inches.

SUBMITTAL DATA

for

Lees Summit SD New Middle School

Prepared for

Henderson Engineers

Job Number: D56Y74	Customer PO#:

Prepared by

David Duckworth

6/5/2020

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Technical Data Sheet for RTU-1 7ton

Job Information	*Technical Data Sheet*
Job Name	Lees Summit SD New Middle School
Date	6/5/2020
Submitted By	John Duckworth
Software Version	09.90
Unit Tag	RTU-1 7ton

Unit Overview

Model Number	Voltage	Design Cooling Capacity	AHRI 360 Standard Efficiency		ASHRAE 90.1
			EER	IEER	
MPSA07D	460/60/3	81962 Btu/hr	11.2	14.8	2016 Compliant

Unit

Model Number:	MPSA07D
Model Type:	Cooling, Standard Efficiency
Heat Type:	Electric heat
Application:	2 Speed SAF Control
Altitude:	0 ft
Approval	cULus

Physical

Unit Dimensions and Weights

Unit Length	Unit Height	Unit Width	Unit Weight
89.0 in	50.0 in	57.8 in	1058 lb

Unit Construction

Exterior:	Prepainted Galv Steel	**Doors:**	Removable Panels
Insulation:	3/4" foil face with mechanical fasteners, R value of 3.6	**Drain Pan Material**	Polymer
Liners:	Single wall construction		

Unit Electrical Data

Voltage	SCCR	MCA	MROPD
460/60/3 V	5 kAIC	71.0 A	80.0 A

Return/Outside/Exhaust Air

Outside Air Option

Type:	Field Installed Economizer, horizontal return

Draw Through Filters

Type	Quantity/Size	Face Area ft²	Face Velocity ft/min	Air Pressure Drop
2" Disposable	(4) 2x20x20	11.1	270	Included In Fan Performance

Technical Data Sheet for RTU-1 7ton

Cooling Coil

Fins per Inch	Rows	Face Area ft^2	Face Velocity ft/min	Condensate Connection Size	Air Pressure drop inH_2O
20	1	13.5	222	0.75 in. Male NPT	Included In Fan Performance

Cooling Performance

Total Capacity Btu/hr	Sensible Capacity Btu/hr	Entering Air Temperature		Leaving Air Temperature		Ambient Air Temp °F
		Dry Bulb °F	Wet Bulb °F	Dry Bulb °F	Wet Bulb °F	
81962	81962	84.0	63.2	56.1	53.7	105.0

Fan Section

Type	Fan Wheel Diameter	Quantity	Vibration Isolation
FC	15 in	1	Rigid

Fan Performance

Air Flow	External Static Pressure	Design Fan Speed	Drive Package Speed	Brake Horsepower	Altitude
3000 CFM	1.00 inH_2O	897 RPM	782-992	1.9 HP	0 ft

Motor

Horsepower	Type	Efficiency	Full Load Current
3.0 HP	Open drip proof, EPAct	86.0	7.0 A

Drives

Type	Service Factor
Adjustable Sheave	120%

Type	Material	Gas Type
0	None	0

Electric Heat Section

Type	Size	Air Pressure Drop	Heat Stages	FLA
Electric heat	40 KW Nominal	0.00 inH_2O	2 Stage	47.6 A

Heating Performance

Total Capacity	Heat Airflow	Entering Air Dry Bulb	Leaving Air Dry Bulb	Minimum Airflow
135120 Btu/hr	3000 CFM	51.9 °F	93.4 °F	2100 CFM

Unit Discharge Conditions

AirTemperature

Motor Heat Btu/hr	Moisture Removal lb/h	Unit Leaving Dry Bulb °F	Unit Leaving Wet Bulb °F	Unit Leaving Dewpoint °F
5492	0.0	57.8	54.3	51.8

Technical Data Sheet for RTU-1 7ton

Condensing Section

Compressor

Type	Quantity	Refrigerant Charge	Total Power	Capacity Control	Refrigerant Type
Scroll	1	6.25 lbs	8.5 kW	2 step	R410A

Compressor Amps:

Compressor 1	Fixed Speed	9.6 A

Compressor Options:	None

Condenser Coil

Type	Fins Per Inch	Rows	Fin Material	Refrigerant Valves
Aluminum tube micro channel	23	1	Aluminum	None

Condenser Coil Options:	None
Low Ambient Control:	None

Condenser Fan Motors

Number of Motors	Full Load Current
2	0.8 A

AHRI 360 Certified Data at AHRI 360 Standard Conditions

Net Capacity	Efficiency		ASHRAE 90.1
85000 Btu/hr	11.2 EER	14.8 IEER	2016 Compliant

Internal Static Pressure Drop Calculation

External Static Pressure:	1.00
Internal Static Pressure:	0.14
Total Static Pressure:	1.14 inH_2O

Options

Electrical

Field Connection:	Power Block, Field Powered GFI
Power Options:	None

Controls

Temperature Controls:	DDC Controls

Warranty

Parts Warranty:	Standard one year
Compressor Warranty:	Standard five year

AHRI Certification

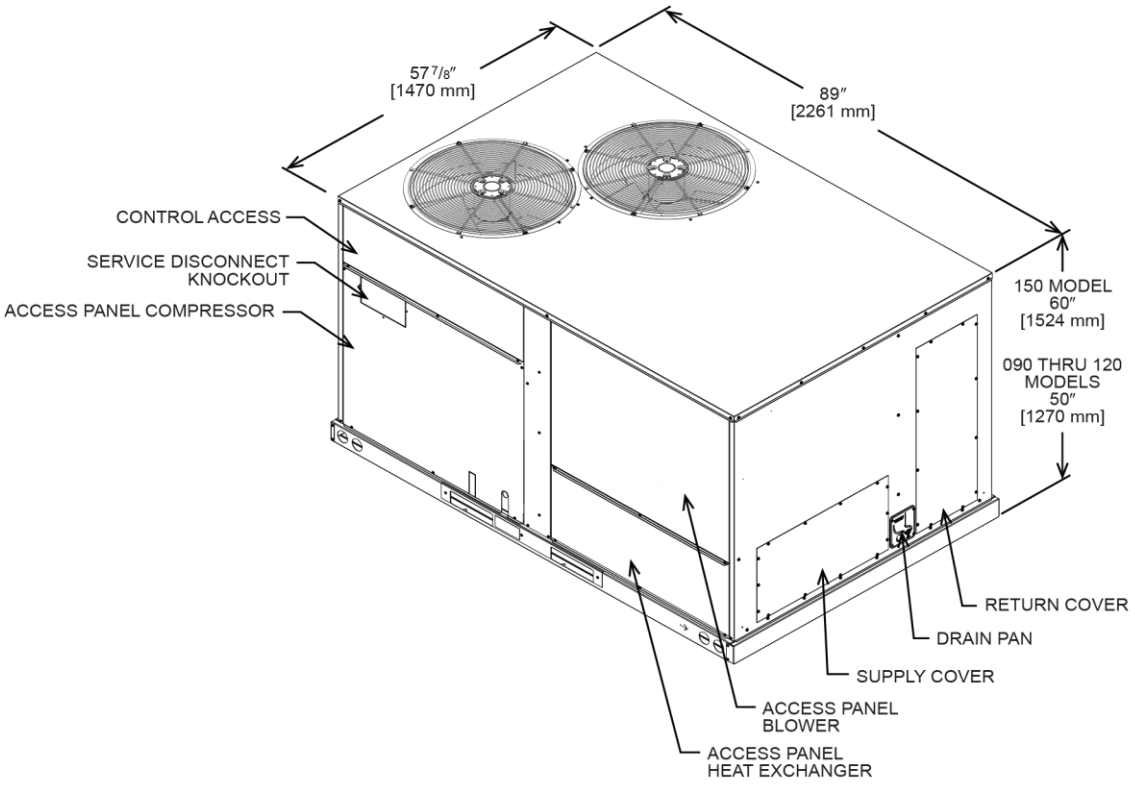
All equipment is rated and certified in accordance with AHRI 340/360

Notes

Accessories

Part Number	Description
Note:	
RXJX-AD0605	Cooling Only, Electric Heat Single Point Power Kit - 7, 8, & 10 tons 460V
RXRD-01MDHBM3	Economizer w/Single Enthalpy (Horizontal) DDC
RXJJ-DD40DNV	Electric heat - 40kW, 460/60/3, 7.5-12 tons

MPSA07-012D Cooling only_Drawing for RTU-1 7ton



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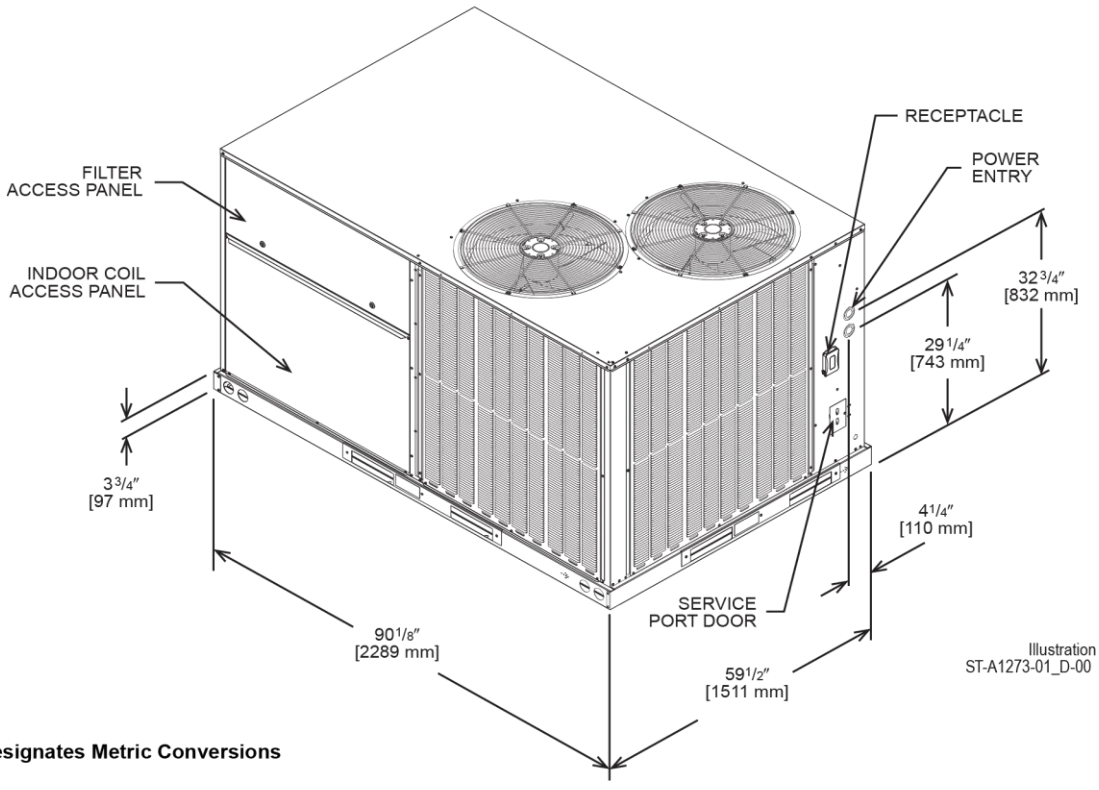


Illustration
ST-A1273-01_D-00

[ ] Designates Metric Conversions

Product Drawing	Unit Tag: RTU-1 7ton			DAIKIN		
Product:	Project Name: Lees Summit SD New			13600 Industrial Park Blvd. Minneapolis, MN 55441		
Model: MPSA07D	Sales Office: Daikin TMI LLC (Kansas City)			www.DaikinApplied.com		Software Version: 09.90
Sales Engineer:	June 05, 2020	Ver/Rev:	Sheet 1 of 1	Scale: NTS	Tolerance: +/-0.25″	Dwg Units: in [mm]

No change to this drawing may be made unless approved in writing by Daikin Applied. Purchaser must determine that the equipment is fit and sufficient for the job specifications.

Technical Data Sheet for RTU-1 8ton

Job Information	*Technical Data Sheet*
Job Name	Lees Summit SD New Middle School
Date	6/5/2020
Submitted By	John Duckworth
Software Version	09.90
Unit Tag	RTU-1 8ton

Unit Overview

Model Number	Voltage	Design Cooling Capacity	AHRI 360 Standard Efficiency		ASHRAE 90.1
			EER	IEER	
MPSA08D	460/60/3	88543 Btu/hr	11.2	14.8	2016 Compliant

Unit

Model Number:	MPSA08D
Model Type:	Cooling, Standard Efficiency
Heat Type:	Electric heat
Application:	2 Speed SAF Control
Altitude:	0 ft
Approval	cULus

Physical

Unit Dimensions and Weights

Unit Length	Unit Height	Unit Width	Unit Weight
89.0 in	50.0 in	57.8 in	1087 lb

Unit Construction

Exterior:	Prepainted Galv Steel	**Doors:**	Removable Panels
Insulation:	3/4" foil face with mechanical fasteners, R value of 3.6	**Drain Pan Material**	Polymer
Liners:	Single wall construction		

Unit Electrical Data

Voltage	SCCR	MCA	MROPD
460/60/3 V	5 kAIC	71.0 A	80.0 A

Return/Outside/Exhaust Air

Outside Air Option

Type:	Field Installed Economizer, horizontal return

Draw Through Filters

Type	Quantity/Size	Face Area ft²	Face Velocity ft/min	Air Pressure Drop
2" Disposable	(4) 2x20x20	11.1	270	Included In Fan Performance

Technical Data Sheet for RTU-1 8ton

Cooling Coil

Fins per Inch	Rows	Face Area ft^2	Face Velocity ft/min	Condensate Connection Size	Air Pressure drop inH_2O
20	1	13.5	222	0.75 in. Male NPT	Included In Fan Performance

Cooling Performance

Total Capacity Btu/hr	Sensible Capacity Btu/hr	Entering Air Temperature		Leaving Air Temperature		Ambient Air Temp °F
		Dry Bulb °F	Wet Bulb °F	Dry Bulb °F	Wet Bulb °F	
88543	88543	84.0	63.2	54.4	52.9	105.0

Fan Section

Type	Fan Wheel Diameter	Quantity	Vibration Isolation
FC	15 in	1	Rigid

Fan Performance

Air Flow	External Static Pressure	Design Fan Speed	Drive Package Speed	Brake Horsepower	Altitude
3000 CFM	1.00 inH_2O	897 RPM	826-1048	1.9 HP	0 ft

Motor

Horsepower	Type	Efficiency	Full Load Current
3.0 HP	Open drip proof, EPAct	86.0	7.0 A

Drives

Type	Service Factor
Adjustable Sheave	120%

Type	Material	Gas Type
0	None	0

Electric Heat Section

Type	Size	Air Pressure Drop	Heat Stages	FLA
Electric heat	40 KW Nominal	0.00 inH_2O	2 Stage	47.6 A

Heating Performance

Total Capacity	Heat Airflow	Entering Air Dry Bulb	Leaving Air Dry Bulb	Minimum Airflow
135120 Btu/hr	3000 CFM	51.9 °F	93.4 °F	2100 CFM

Unit Discharge Conditions

AirTemperature

Motor Heat Btu/hr	Moisture Removal lb/h	Unit Leaving Dry Bulb °F	Unit Leaving Wet Bulb °F	Unit Leaving Dewpoint °F
5492	0.0	56.1	53.5	51.5

Technical Data Sheet for RTU-1 8ton

Condensing Section

Compressor

Type	Quantity	Refrigerant Charge	Total Power	Capacity Control	Refrigerant Type
Scroll	1	7.63 lbs	8.5 kW	2 steps	R410A

Compressor Amps:

Compressor 1	Fixed Speed	12.5 A

Compressor Options:	None

Condenser Coil

Type	Fins Per Inch	Rows	Fin Material	Refrigerant Valves
Aluminum tube micro channel	23	1	Aluminum	None

Condenser Coil Options:	None
Low Ambient Control:	None

Condenser Fan Motors

Number of Motors	Full Load Current
2	0.8 A

AHRI 360 Certified Data at AHRI 360 Standard Conditions

Net Capacity	Efficiency		ASHRAE 90.1
86000 Btu/hr	11.2 EER	14.8 IEER	2016 Compliant

Internal Static Pressure Drop Calculation

External Static Pressure:	1.00
Internal Static Pressure:	0.14
Total Static Pressure:	1.14 inH_2O

Options

Electrical

Field Connection:	Power Block, Field Powered GFI
Power Options:	None

Controls

Temperature Controls:	DDC Controls

Warranty

Parts Warranty:	Standard one year
Compressor Warranty:	Standard five year

AHRI Certification

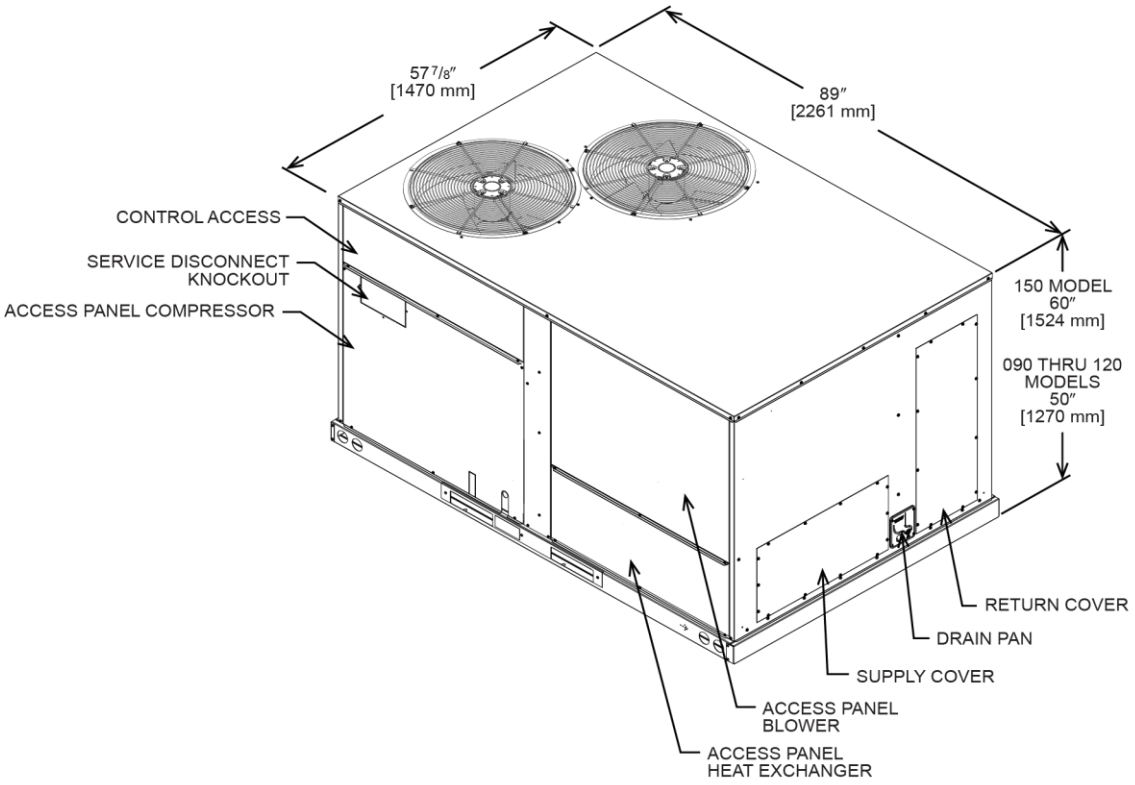
All equipment is rated and certified in accordance with AHRI 340/360

Notes

Accessories

Part Number	Description
Note:	
RXJX-AD0605	Cooling Only, Electric Heat Single Point Power Kit - 7, 8, & 10 tons 460V
RXRD-01MDHBM3	Economizer w/Single Enthalpy (Horizontal) DDC
RXJJ-DD40DNV	Electric heat - 40kW, 460/60/3, 7.5-12 tons

MPSA07-012D Cooling only_Drawing for RTU-1 8ton



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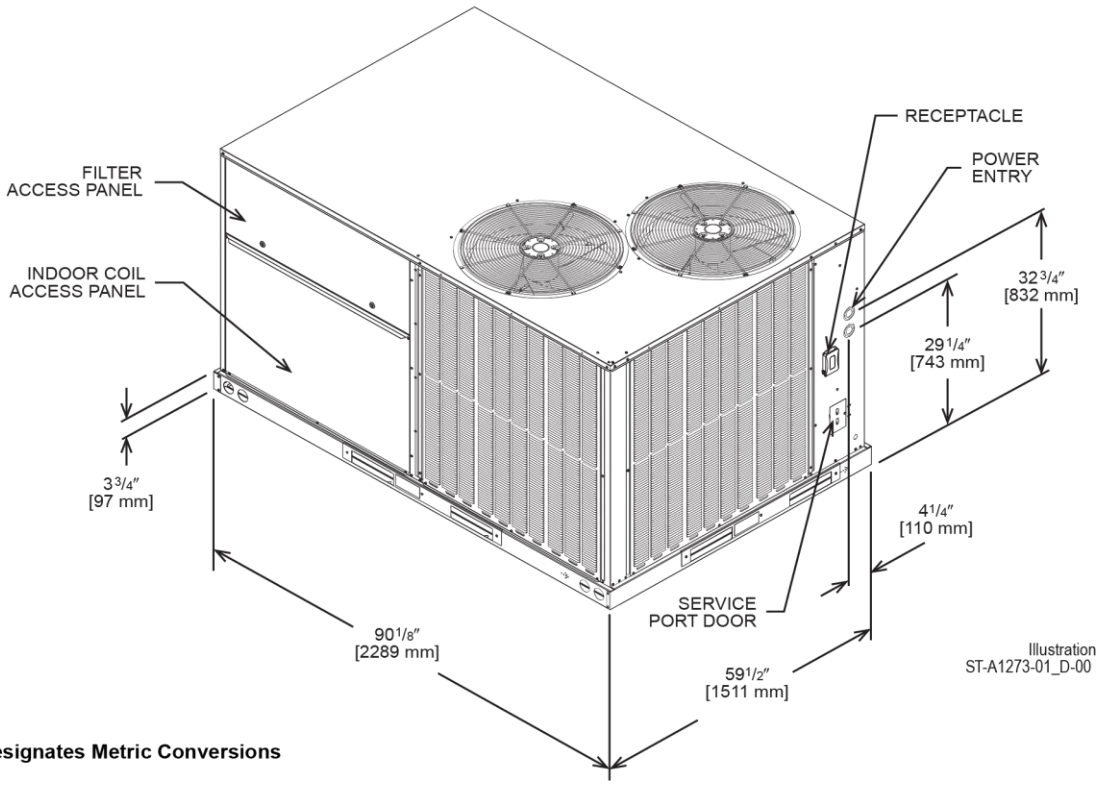


Illustration
ST-A1273-01_D-00

[ ] Designates Metric Conversions

Product Drawing	Unit Tag: RTU-1 8ton			DAIKIN		
Product:	Project Name: Lees Summit SD New			13600 Industrial Park Blvd. Minneapolis, MN 55441		
Model: MPSA08D	Sales Office: Daikin TMI LLC (Kansas City)			www.DaikinApplied.com		Software Version: 09.90
Sales Engineer:	June 05, 2020	Ver/Rev:	Sheet 1 of 1	Scale: NTS	Tolerance: +/-0.25″	Dwg Units: in [mm]

No change to this drawing may be made unless approved in writing by Daikin Applied. Purchaser must determine that the equipment is fit and sufficient for the job specifications.

Document Summary Page

IGX-P115-H12-MF-G

Unit Performance

Design Conditions

Elevation (ft)	Summer		Winter (°F)	Supply (CFM)	Outdoor Air (CFM)
	DB (°F)	WB (°F)			
751	96.4	74.7	4.7	2,362	2,362

Unit Specifications

Qty	Weight (lb)	Cooling Type	Heating Type	Unit Installation	Unit ETL Listing	Furnace ETL Listing
1	1,229 (+/- 5%)	None	Indirect Gas Furnace	Outdoor	UL / cUL 1995	ANSI Z83.8 / CSA 2.6

Configuration

Unit Orientation	Unit Configuration	Outdoor Air Intake	Return Air Intake	Supply Air Discharge
Horizontal	Constant Volume 100% OA	End	-	Bottom

Heating Specifications

Type	Gas Type	Gas Pressure		Capacity (MBH)		Temperature Rise		Turndown	Performance	
		Min (in. wg)	Max (PSI)	Input	Output	Min (°F)	Max (°F)		EAT (°F)	LAT (°F)
Indirect Gas Furnace	Natural	6	0.5	200.0	160.0	3.9	62.7	16:1	5.0	67.4

Air Performance

Type	Total Volume (CFM)	External SP (in. wg)	Total SP (in. wg)	RPM	Operating Power (hp)	Fan			
						Qty	Type	Size (in.)	Drive-Type
Supply	2,362	0.75	1.05	1477	0.7	1	Mixed Flow	18.3	Direct-Drive

Motor Specifications

Motor	Qty	Size (HP)	Enclosure	Efficiency	RPM
Supply Fan Motor	1	1	ODP	NEMA Premium	1725

Electrical Specifications

Power Supply	Rating (V/C/P)	MCA (A)	MOP (A)
Unit	460/60/3	3.3	15

CONSTRUCTION FEATURES AND ACCESSORIES

Unit	
Unit Installation - Indoor or Outdoor	Std
Unit Construction - Double Wall	X
Wall Insulation - 1in. fiberglass - Heat source on	X
Base Insulation - 1in. fiberglass - entire unit base pan	Std
Paneled Bottom - Sheet metal liner for base insulation	
Corrosion Resistant Fasteners	Std
Access and Connections - Right side when facing intake	X
Service Access - Hinged access doors	X
Unit Finish - G90 Galvanized	X
Finish Color	
Supply Fan - Direct-drive, mixed flow plenum	X
Supply Fan and Motor Vibration isolation - Neoprene	X
Controls	
Unit Controls - Microprocessor	X
Remote Panel	
BMS Communication - Monitoring and control	X
BMS Protocol - BACnet MSTP	X
Temperature Control - Discharge control	X
Supply Fan VFD - VFD by factory	X
Supply Fan Control - Constant Volume	X
Unoccupied Mode (Night Setback)	
Control Accessories	
Remote display - 10 ft cord	X
Heating Inlet Air Sensor	X
Cooling Inlet Air Sensor	
Dirty Filter Switch	
Fire Stat Type III (Ships loose)	
120V/24V Smoke Detector (Ships loose)	
Inlet Damper End Switch	
External Cooling Lockout Relay	
Freeze Protection (Supply Air Low Limit)	X
Auxiliary Supply Starter Contacts	
Auxiliary Exhaust Starter Contacts	
Airflow Proving Monitoring Contact	

Accessories	
Factory Installed, Lockable, NEMA 3R Disconnect	Std
Weatherhood - Aluminum Mesh filtered	X
Supply Air Filters - 2" aluminum, 16x20x2 - (4)	X
Outdoor Air Inlet Damper - Low leakage	X
Supply Air Outlet Damper	
Return Air Damper	
Diffuser	
Roof Curb - GPI	X
Combination Curb	
Electrofin Coil Coating	
Fan Bearing Extended Lube Lines	
Inlet Damper Module	
Spare Belts	
Spare Filters	
Motor with Shaft Grounding	
Service Outlet	
Service Lights	
Gas Heating Accessories	
Furnace Venting - Outdoor	X
Venting Type - Power vented	Std
Furnace Venting Method - Standard	X
Concentric Venting Adapter	
Direct Spark Ignition	Std
Flame Sensing - Flame rod	Std
Heat Exchanger Material - Aluminized	X
Furnace Controls - 16:1 Modulating	X
Agency Approval - ETL	Std
External Gas Pressure Regulator (Ships loose)	
DDC Assisted Furnace Commisioning	X
Warranty Options	
Unit Warranty - 1 Year	X
5 Year Compressor Warranty	
5 Year Heat Exchanger Warranty	
10 Year Heat Exchanger Warranty	

Standard Option	Std
Not Included	
Included	X

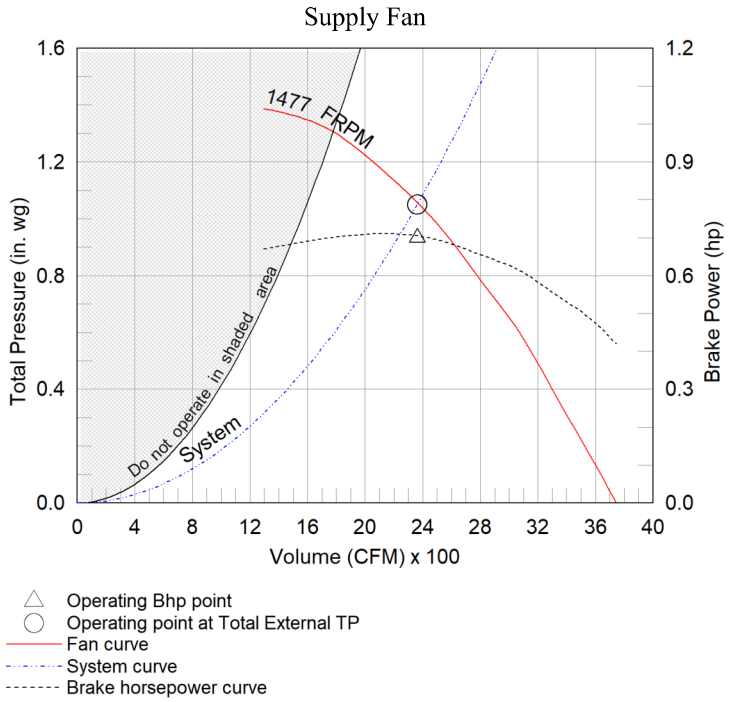
Notes
Damper(s) supplied are low leakage, motorized VCD-23 (leakage rate of 3 CFM/ft^2 @ 1 in.wg), Class 1A
Verify that the correct BMS Protocol has been selected before ordering.

Fan Charts And Performance

Supply Fan Performance									
Total Volume (CFM)	External SP (in. wg)	Total SP (in. wg)	RPM	Operating Power (hp)	Motor		Fan		
					Qty	Size (HP)	Qty	Type	Drive-Type
2,362	0.75	1.05	1477	0.7	1	1	1	Mixed Flow	Direct

Pressure Drop (in. wg)						
Weatherhood	Filter	Damper	Cooling	Heating	External	Total
0.069	0.061	0.046	-	0.123	0.75	1.05

Sound Performance in Accordance with AMCA										
Sound Power by Octave Band								Lwa	dBA	Sones
62.5	125	250	500	1000	2000	4000	8000			
84	89	77	73	72	66	60	54	78	67	15.0



Heating Specifications

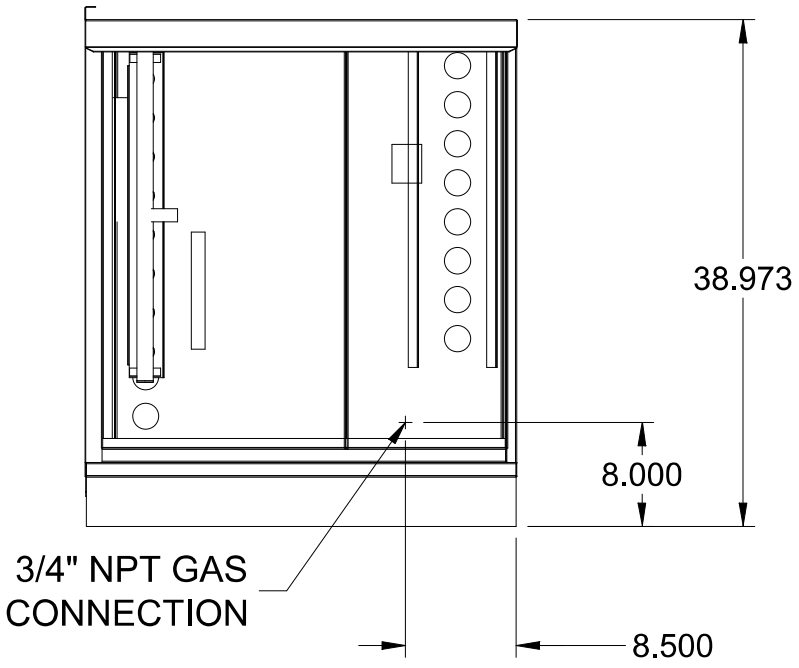
Heating Performance										
Type	Gas Type	Gas Pressure		Capacity (MBH)		Temperature Rise		Turndown	Performance	
		Min (in. wg)	Max (PSI)	Input	Output	Min (°F)	Max (°F)		EAT (°F)	LAT (°F)
Indirect Gas Furnace	Natural	6	0.5	200.0	160.0	3.9	62.7	16:1	5.0	67.4

Heating Information				
Heat Exch. Material	Venting	Venting Method	Gas Pressure Regulators	Heat Exchanger Warranty
Aluminized	Outdoor	Standard	-	-

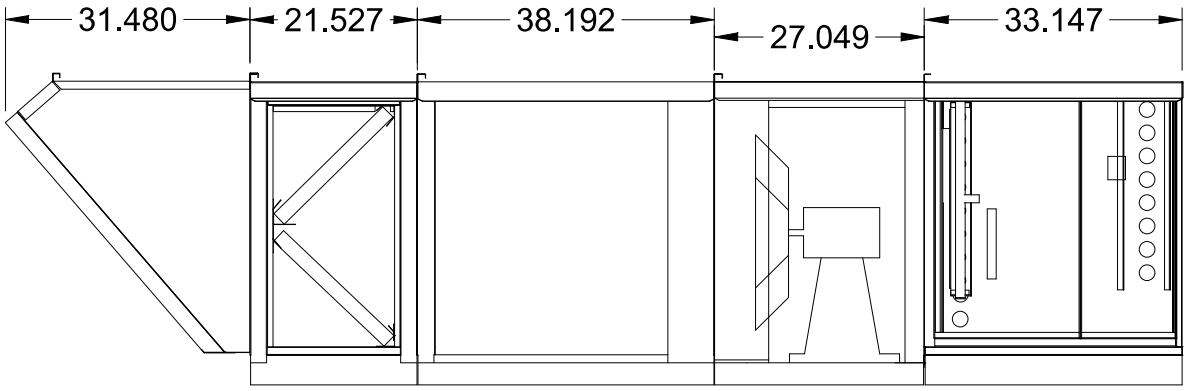
Unit Details
ANSI Standard Z83.8 and CSA 2.6
Direct Spark Ignition
Aluminized Heat Exchanger Tubes

Power Venting
24 Volt Control Power

Gas Connections

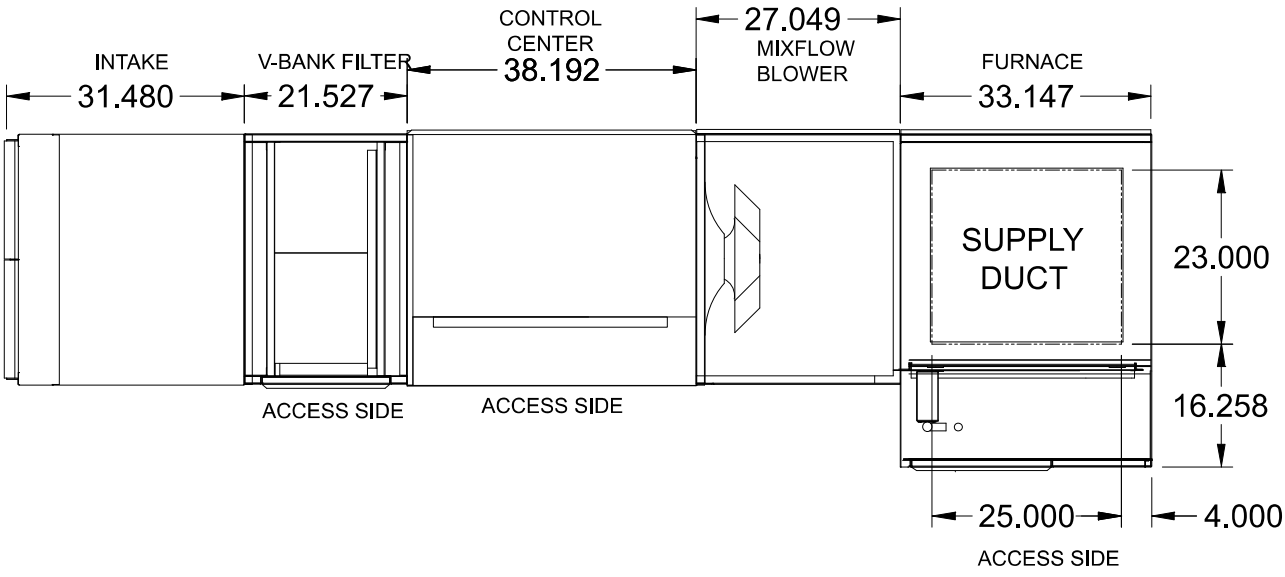


ELEVATION VIEW



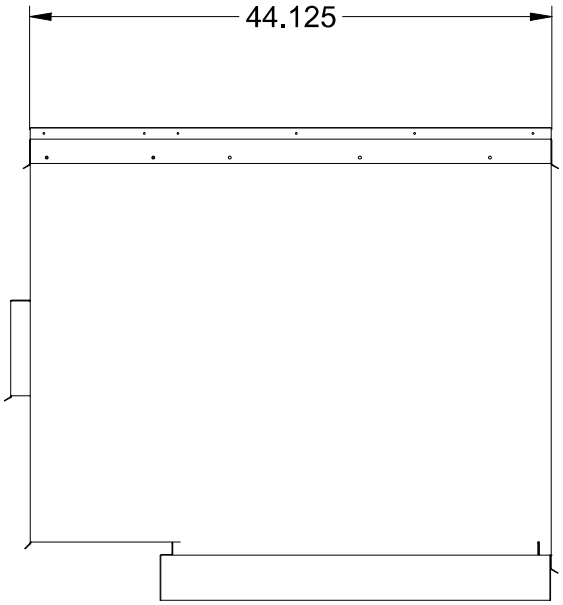
Notes - Elevation View
Standard configuration for unit access is on the right-hand side, when looking into the unit intake in the direction of airflow.
Order of unit sections is from intake of unit to discharge of unit.
Sections included on this unit: Weatherhood Section, Filter Section, Control Center Module Section, Blower Section, Furnace 1 Section
Insulation: Double Wall, from Furnace Section through end of unit.

PLAN VIEW

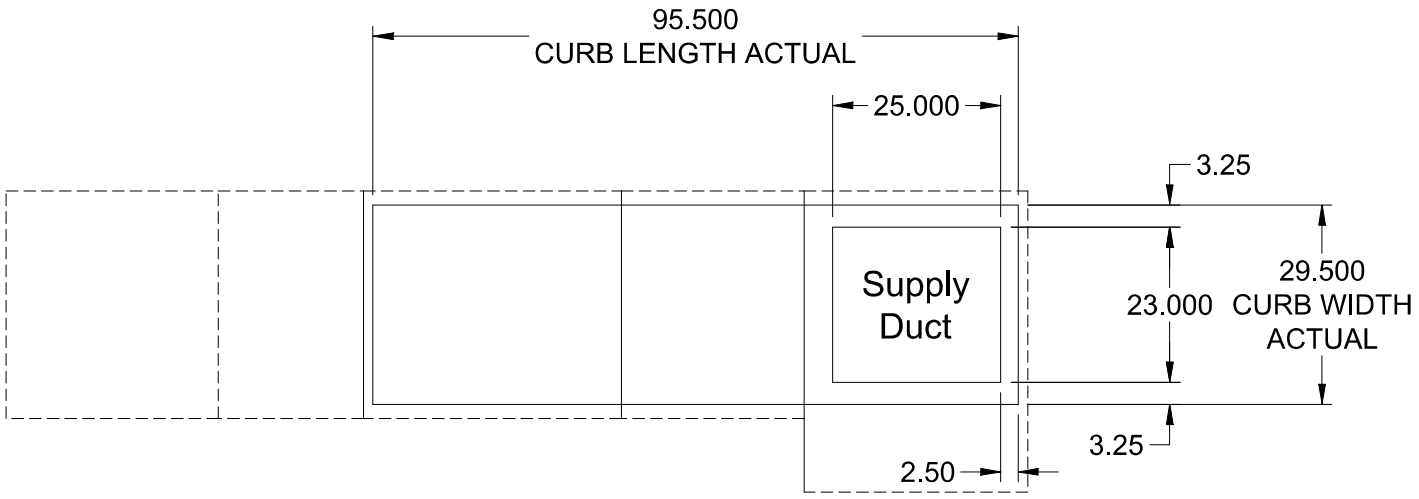


Notes - Plan View
Standard configuration for unit access is on the right-hand side, when looking into the unit intake in the direction of airflow.

END VIEW

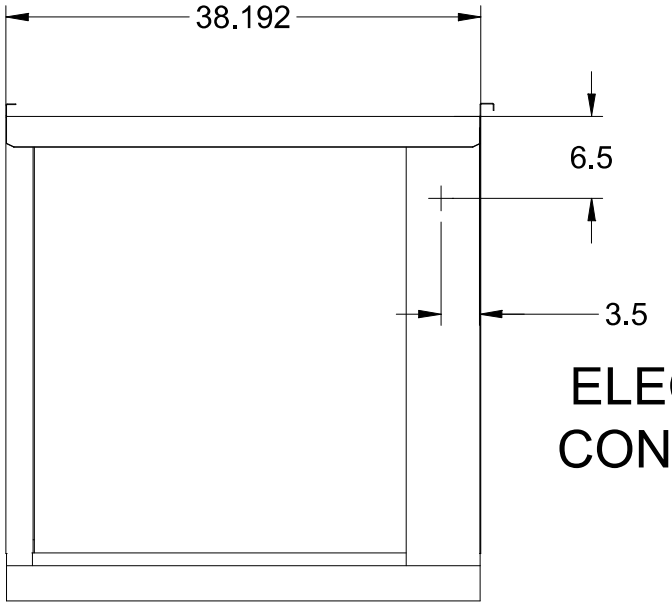


FOOTPRINT VIEW



Notes - Footprint View
Minimum Roof Opening: The minimum roof opening size is the illustrated duct diameter plus 0.25 in. on all sides. For example: If the duct size is 14 x 14 in. square, the minimum roof opening size is 14.5 x 14.5 in. square.
Maximum Roof Opening: There must be a minimum perimeter of 1.75 in. between the roof opening and the roof curb. For example: If the roof curb is 75 x 30 in. square, the maximum roof opening is 71.5 x 26.5 in. inches square.
The weatherhood and filter sections of the make-up air unit extend beyond the curb. This is by design, to prevent water infiltration.

Electrical Connections



Clearance Specifications

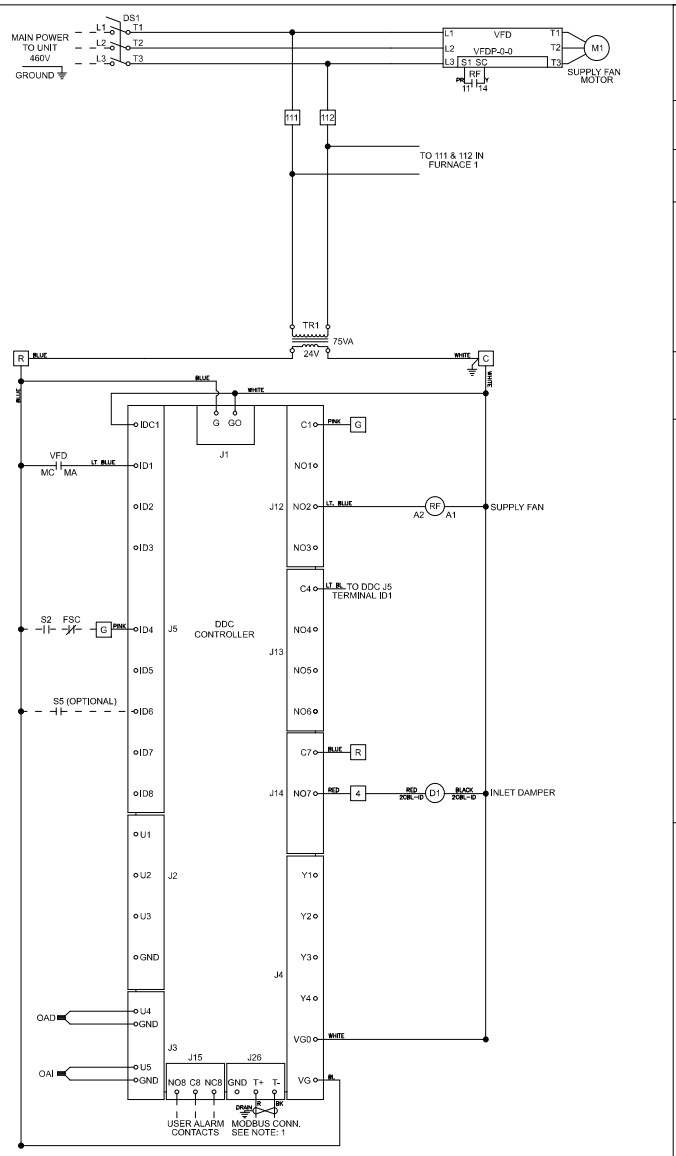
Recommended Minimum Combustible Clearances				
	Floor (in.)	**Top (in.)**	**Sides (in.)**	**Ends (in.)**
Indirect Fired Units	0	0	0	0

Notes - Combustible Clearances
Clearance to combustibles is defined as the minimum distance required between the heating source and the adjacent combustible surfaces to ensure the adjacent surface's temperature does not exceed 90 F above the ambient temperature.
Reference venting guidelines for combustion blower clearances.

Recommended Minimum Service Clearances	
Housing 32 and less (in.)	**Housing 35 and higher (in.)**
42 on the controls side of the unit	N/A

Notes - Service Clearances
To ensure ample space for component removal (evaporative cooling media, coils, filters, etc.), service clearances should be 6 in. wider than the width of the module itself.

Wiring Diagram



GREENHECK
Building Value in Air.

Wiring Diagram Code:

GR11N601B010NB0NQ05

CAUTION

UNIT SHALL BE GROUNDED IN ACCORDANCE WITH N.E.C.
POWER MUST BE OFF WHILE SERVICING.

NOTES

USE COPPER CONDUTORS ONLY
60° C FOR TERMINALS RATED LESS THAN 100 AMPS.
75° C FOR TERMINALS RATED 100 AMPS OR MORE.

FIELD CONTROL WIRING RESISTANCE SHOULD NOT EXCEED 0.75 OHM.

FIELD WIRED – – – – –
FACTORY SUPPLIED AND WIRED ————

NOTE: 1
MODBUS COMMUNCATION WIRING. DAISY CHAIN TO ALL MODBUS DEVICES.

WIRE COLOR CODE

BK	BLACK	BL	BLUE	BR	BROWN
GY	GRAY	LT BL	LIGHT BLUE	O	ORANGE
PK	PINK	PR	PURPLE	R	RED
W	WHITE	Y	YELLOW		

LEGEND

D1	INLET DAMPER
DS1	MAIN DISCONNECT SWITCH
FSC	FIRE SYSTEM CONTACT
M#	MOTOR
OAD	OUTDOOR AIR DISHCHARGE TEMP
OAI	OUTDOOR AIR INLET TEMP
OL#	MOTOR OVERLOAD
RF	SUPPLY FAN RELAY
RH	HEAT RELAY
S2	FAN SWITCH
S5	OCCUPIED/UNOCCUPIED SWITCH (OPTIONAL - REF. IOM) CLOSED=UNOCCUPIED - OPEN=OCCUPIED
ST#	MOTOR STARTER
TR#	TRANSFORMER
VFD	VARIABLE FREQUENCY DRIVE

POINTS LIST

TYPE	ADDRESS	NAME
Analog	1	Outside_Air_Temp
Analog	2	Supply_Air_Temp
Analog	11	Temp_Set_Point
Analog	12	Active_Temp_Set_Point
Integer	1001	Unit_Status_Index
Integer	1002	Heating_Control_Loop
Integer	1018	Occupied_Unoccupied
Integer	1019	IG_Alarm
Digital	1	On_Off_Stat
Digital	2	Supply_Fan_Status
Digital	4	Occupancy_Status
Digital	10	Unit_Start_Stop
Digital	11	Reset_Alarms
Digital	20	Global_Alarm
Digital	21	Supply_air_proving
Digital	27	Supply_air_low_limit
Digital	28	Sensor1_out_of_range
Digital	29	Sensor2_out_of_range

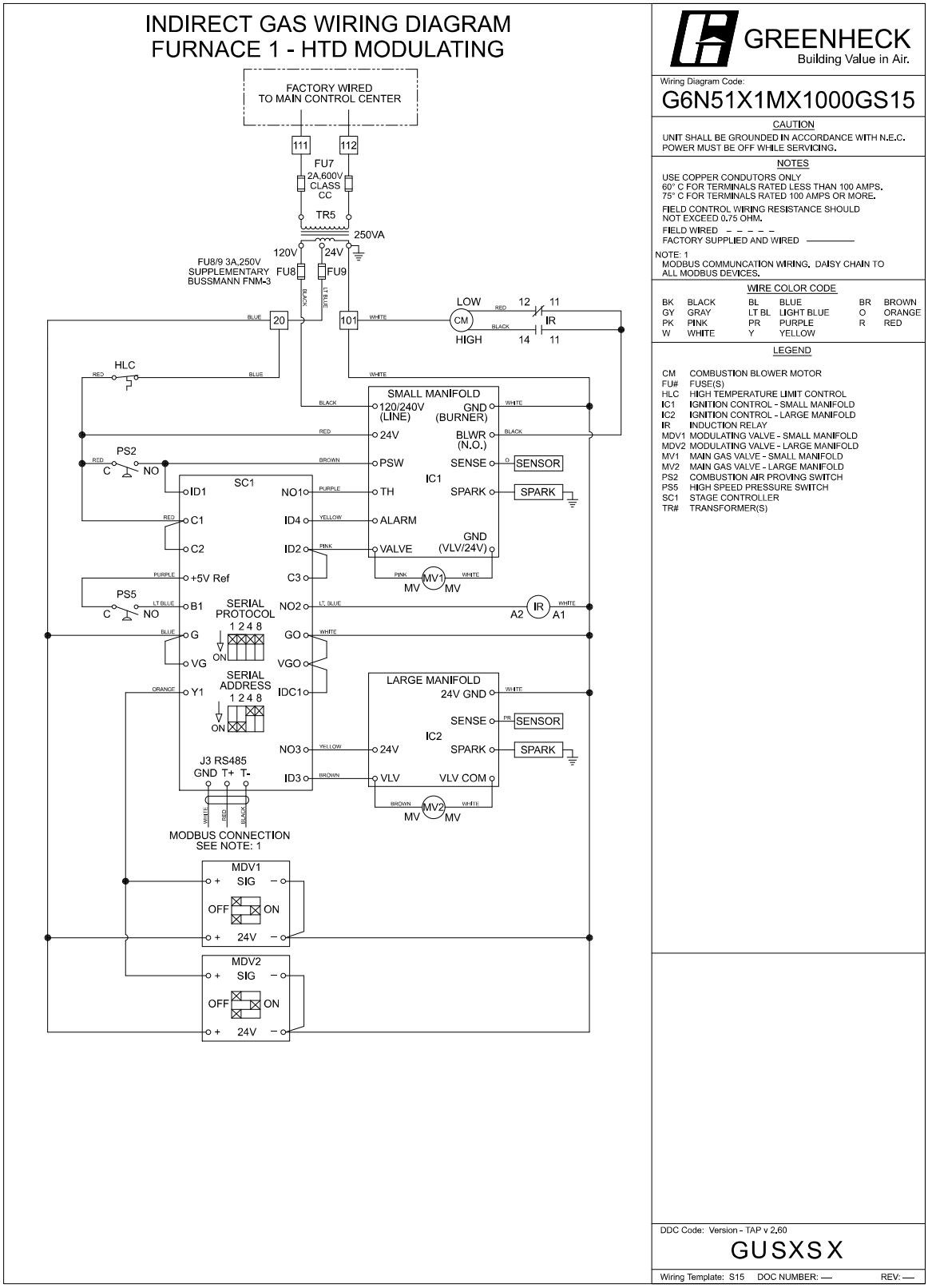
DDC Code: Version - TAPv2.60

GUKXX000bXXU

Wiring Template: Q05 DOC NUMBER: — REV: -—

Manufacturer reserves right to change, alter, or improve this product at any time.

Furnace Wiring Diagram



GREENHECK
Building Value in Air.

Wiring Diagram Code:

G6N51X1MX1000GS15

CAUTION

UNIT SHALL BE GROUNDED IN ACCORDANCE WITH N.E.C.
POWER MUST BE OFF WHILE SERVICING.

NOTES

USE COPPER CONDUTORS ONLY
60° C FOR TERMINALS RATED LESS THAN 100 AMPS.
75° C FOR TERMINALS RATED 100 AMPS OR MORE.

FIELD CONTROL WIRING RESISTANCE SHOULD NOT EXCEED 0.75 OHM.

FIELD WIRED – – – – –
FACTORY SUPPLIED AND WIRED ————

NOTE: 1
MODBUS COMMUNCATION WIRING. DAISY CHAIN TO ALL MODBUS DEVICES.

WIRE COLOR CODE

BK	BLACK	BL	BLUE	BR	BROWN
GY	GRAY	LT BL	LIGHT BLUE	O	ORANGE
PK	PINK	PR	PURPLE	R	RED
W	WHITE	Y	YELLOW		

LEGEND

CM	COMBUSTION BLOWER MOTOR
FU#	FUSE(S)
HLC	HIGH TEMPERATURE LIMIT CONTROL
IC1	IGNITION CONTROL - SMALL MANIFOLD
IC2	IGNITION CONTROL - LARGE MANIFOLD
IR	INDUCTION RELAY
MDV1	MODULATING VALVE - SMALL MANIFOLD
MDV2	MODULATING VALVE - LARGE MANIFOLD
MV1	MAIN GAS VALVE - SMALL MANIFOLD
MV2	MAIN GAS VALVE - LARGE MANIFOLD
PS2	COMBUSTION AIR PROVING SWITCH
PS5	HIGH SPEED PRESSURE SWITCH
SC1	STAGE CONTROLLER
TR#	TRANSFORMER(S)

DDC Code: Version - TAP v 2.60

GUSXSX

Wiring Template: S15 DOC NUMBER: — REV: —

Manufacturer reserves right to change, alter, or improve this product at any time.

BMS Protocol Points List

Greenheck Monitoring Interface v2.6 Modbus/BACnet Points List

Type	BACnet Device Instance: 77000 (Default) Analog/Integer = AV, Digital = BV				Modbus-RTU/TCP/IP Network Address: 1	Read (R) Write (W)	Description	Included
	Instance	Name	Units		Register			
Analog	1	Outside_Air_Temp	degree F		40002	R/W	Outdoor Air Temp (###.# F)	X
Analog	2	Supply_Air_Temp	degree F		40003	R	Supply Air Temp (###.# F)	X
Analog	4	Room_Air_Temp	degree F		40005	R/W	Room AirTemp (if installed) (###.# F)	
Analog	11	Temp_Set_Point	degree F		40012	R/W	Temp. Set Pt (###.# F) (See Controller IOM)	X
Analog	12	Active_Temp_Set_Point	degree F		40013	R	Active Temperature Set Point (###.# F)	X
Integer	1001	Unit_Status_Index	no-units		45003	R	Note 1 (See below)	X
Integer	1002	Heating_Control_Loop	percent		45004	R	Heater output (0-100%)	X
Integer	1003	Cooling_Control_Loop	percent		45005	R	Cooling output (0-100%)	
Integer	1006	CO2_Level	ppm		45008	R	CO2 Levels (ppm)	
Integer	1007	CO2_Set_Point	ppm		45009	R/W	CO2 Set Point (ppm)	
Integer	1008	Supply_VFD_Speed	percent		45010	R	Supply Fan VFD Speed (0-100%)	
Integer	1009	Supply_VFD_SetPt	percent		45011	R/W	Supply Fan VFD Set Point (0-100%)	
Integer	1012	OA_Damper_Position	percent		45014	R	Outdoor Damper Position (0-100%)	
Integer	1013	OA_Damper_SetPt	percent		45015	R/W	Minimum OA Damper Position (0-100%)	
Integer	1014	Duct_Pressure	no-units		45016	R	Supply Duct Pressure (#.##"WC)	
Integer	1015	Duct_Pressure_SetPt	no-units		45017	R/W	Supply Duct Pressure Set Point (value/100=#.##"WC)	
Integer	1016	Building_Pressure	no-units		45018	R	Building Pressure (value/1000 = 0.###"WC)	
Integer	1017	Building_Pressure_SetPt	no-units		45019	R/W	Building Pressure Set Point (value/1000 = 0.###"WC)	
Integer	1018	Occupied_Unoccupied	no-units		45020	R/W	Occupancy command (0=occupied, 1=unoccupied, 2=MWU)	X
Integer	1019	IG_Alarm	no-units		45021	R	IG Alarm - Convert to binary (See chart below)	X
			Inactive_Text	Active_Text				
Digital	1	On_Off_Stat	Off	On	10002	R	Unit ON/OFF Status	X
Digital	2	Supply_Fan_Status	Off	On	10003	R	Supply fan status	X
Digital	3	Exhaust_Fan_Status	Off	On	10004	R	Exhaust fan status	X
Digital	4	Occupancy_Status	Unoccupied	Occupied	10005	R	Occupancy Status (0=Unoccupied 1=Occupied)	X
Digital	5	Stage_Compressor1_Status	Off	On	10006	R	Stage Compressor #1 status	
Digital	6	Stage_Compressor2_Status	Off	On	10007	R	Stage Compressor #2 status	
Digital	10	Unit_Start_Stop	Stop	Start	10011	R/W	Unit start/stop command	X
Digital	11	Reset_Alarm	Don't Reset	Reset Alarms	10012	R/W	Reset alarms command	X
Digital	20	Global_Alarm	Off	Alarm	10021	R	Global Alarm Indication (active when there is at least one alarm)	X
Digital	21	Supply_air_proving	Off	Alarm	10022	R	Supply airflow proving alarm	X
Digital	24	Exhaust_air_proving	Off	Alarm	10025	R	Exhaust airflow proving alarm	
Digital	25	Dirty_filter	Off	Alarm	10026	R	Dirty filter alarm	
Digital	26	Compressor_trip	Off	Alarm	10027	R	Compressor trip alarm	
Digital	27	Supply_air_low_limit	Off	Alarm	10028	R	Supply air temperature low limit alarm	X
Digital	28	Sensor1_out_of_range	Off	Alarm	10029	R	Sensor #1 out of range (outside air temperature)	X
Digital	29	Sensor2_out_of_range	Off	Alarm	10030	R	Sensor #2 out of range (supply air temperature)	X
Digital	31	Sensor4_out_of_range	Off	Alarm	10032	R	Sensor #4 out of range (room temperature)	
Digital	34	Sensor7_out_of_range	Off	Alarm	10035	R	Sensor #7 out of range (building pressure sensor)	
Digital	35	Sensor8_out_of_range	Off	Alarm	10036	R	Sensor #8 out of range (duct pressure sensor)	
Digital	36	Sensor#9_out_of_range	Off	Alarm	10037	R	Sensor #9 out of range (CO2 sensor)	
Digital	37	Sensor10_out_of_range	Off	Alarm	10038	R	Sensor #10 out of range (auxiliary temp)	

Unit Status Index

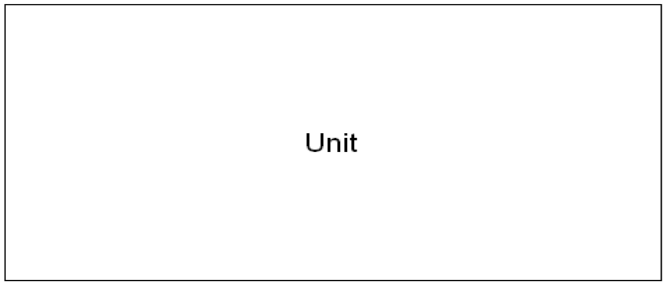
0	System Off	4	Supply Fan Starting	8	Sys On-Heating	12	Sys On-Dehumid & Reheat	16	Unocc-Cooling	20	Remote Off
1	Initial Delay	5	System On	9	Sys On-Cooling	13	Unocc-Unit Off	17	Unocc-Dehumid	21	Alarm
2	Opening Dampers	6	Defrost Mode Active	10	Sys On-Econ & Cooling	14	Unocc-Unit On	18	Unocc-Dehumid & Reheat		
3	Exhaust Fan Starting	7	Sys On-Economizer	11	Sys On-Dehumidifying	15	Unocc-Heating	19	Manual Override		

IG Alarm (REF.IG_Alarm Point 45)

BIT 0	BIT 1	BIT 2	BIT 3	BIT 4
No Flame	Ignition Controller	Max Retries	High Limit	IG Furnace Offline

Corner Weights

338 lb 344 lb



271 lb 276 lb

SEQUENCE OF OPERATIONS

Unit Controls
The unit shall be provided from the factory with:

- 24VAC Transformer
- Terminal Strip
- Supply Fan VFD
- Factory mounted and wired outdoor air inlet damper with actuator

Microprocessor Controller
The microprocessor control shall be factory programmed, mounted, wired and tested. Controller shall have a lighted LCD display and keypad for changing set points and monitoring unit operation. The controller shall be equipped with the following sensors:

- Outdoor air temperature sensor
- Supply discharge temperature sensor (must be field mounted in the supply ductwork)

Microprocessor Remote Display
The microprocessor remote display shall have a lighted LCD display and keypad that allows the user remote access to all menus within the microprocessor. Any parameter that can be adjusted locally at the controller can be accessed and modified with the remote display.

Building Management System (BMS) Communication
The microprocessor controller shall be capable of integrating into a building management system (bms) to allow the bms to remotely adjust set points, view unit status points and alarms. the microprocessor shall include the required bms card to communicate over the following protocol:

- BACnet® MSTP

Unit Start Command
A contact closure or jumper wire must be field wired between terminals R and G to enable the unit. When terminal G is energized the unit shall operate as described below. When terminal G is de-energized the unit is disabled.

Internal Time Clock (Schedule)
The microprocessor controller is equipped with an internal 7-day programmable time clock, allowing the user to add up to seven different occupancy schedules. The user may also add up to 15 holidays for additional energy savings.

Occupied/Unoccupied Modes
The microprocessor controller offers the following modes for determining occupancy:

- The internal time clock
- A remote contact (see wiring diagram for details)
- The Building Management System (BMS)

The unit can be temporarily overridden to the occupied mode via a dry contact or the keypad display. After the override time has expired (1 hr, adj) the unit will return to the scheduled occupied/unoccupied mode.

Occupied Mode Unit Start-Up Sequence

- Unit enable input must be closed (contact closure between R and G).
- Initial delay, microprocessor controller initialization sequence.
- Factory mounted and wired outdoor air inlet damper actuator is powered open.
- Supply fan starts after 10 second (adj.) delay.
- Tempering operation begins (see modes below).

Supply Fan Sequence (Occupied)
The unit has been provided with a factory mounted variable frequency drive (VFD). The variable frequency drive shall control the supply fan speed as indicated by the following sequence:

Constant Volume:
The VFD shall be programmed from the factory for a constant supply fan speed. This is to be adjusted for air

balancing only and is not to be modulated. The microprocessor controller has no control or monitoring of the supply fan speed.

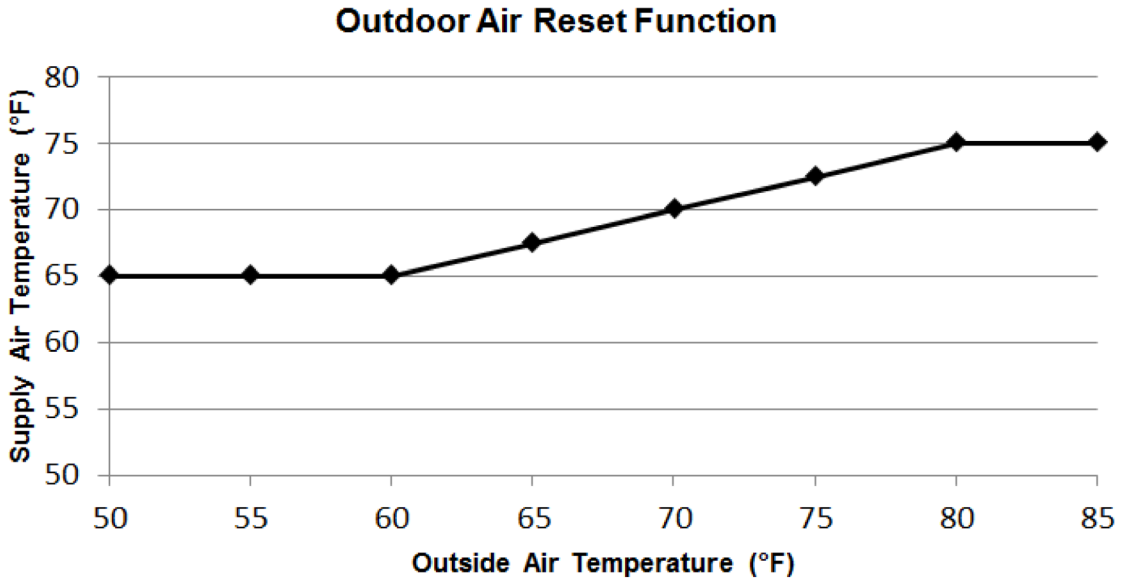
Heating Control
The heating will be locked out when the outside air is above the heating lockout set point (65 F adj.). When enabled heating will be controlled as follows:

Indirect Gas Fired Heating
The microprocessor controller will modulate the indirect gas furnace to maintain the active supply temperature set point.

Supply Temperature Set Point Control (Occupied)
The active supply temperature set point shall be adjusted (field selectable):

- Locally at the controller.
- Remotely by the BMS.
- Reset based upon outside air temperature (field selectable)

Outside Air Reset Sequence
The microprocessor controller monitors the outdoor air temperature and adjusts the desired supply temperature set point accordingly. For example, when the outdoor air is above 80 F, the controller will change the supply set point to 75 F. If the outdoor air is below 60 F, the controller will change the supply set point to 65 F. If the outdoor air temperature is between 60 F and 80 F the supply set point is changed according to the outdoor air reset function. The outside air reset function is field adjustable locally at the controller.



Unoccupied Mode (Disabled)

- Supply Fan Is OFF
- Factory mounted and wired outdoor air inlet damper actuator is de-energized and spring returns to the closed position.

Supply Air Low Limit
If the supply air temperature drops below 35 F (adj.) for 300 seconds (adj.), the controller will de-energize the unit and generate an alarm.

Alarm Management
The microprocessor controller will monitor the unit status for alarm conditions. Upon detecting an alarm, the controller will record the alarm description, time, date, available temperatures, and unit status for user review. A digital output is reserved for remote alarm indication.

Alarms are also communicated to the Building Management System (BMS).

Possible Alarms Include:

- **Global Alarm**
  Indication that one or more alarms are present.
- **Outdoor Air Inlet Temperature Sensor Alarm**
  Outdoor Air Inlet Temperature Sensor Alarm: Failure of the outdoor air inlet temperature sensor.
- **Supply Air Discharge Temperature Sensor Alarm**
  Failure of the supply air discharge temperature sensor. Unit is shut down.
- **Supply Air Low Limit Alarm**
  Supply air has fallen below 35 F (adj.) for 300 seconds (adj.). Unit is shut down.
- **Indirect Gas Furnace Alarms**
  The indirect gas furnace operation is monitored for a variety of alarm conditions.
- **Supply Fan Alarm**
  Indicates the supply fan failed to prove for a 30 second (adj.) period.

Warranty Statement for Make-Up Air

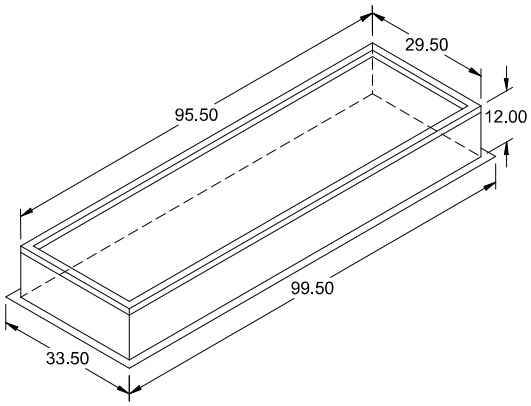
Unit Warranty

Greenheck warrants the equipment to be free from defects in material and workmanship for a period of 1 year (standard) from the shipment date.

Warranty Notes

Any component which proves defective during the warranty period will be repaired or replaced at Greenheck's sole option when returned to our factory, transportation prepaid. All warranties do not include labor costs associated with troubleshooting, removal, or installation. Greenheck will not be liable for any consequential, punitive, or incidental damages resulting from use, repair, or operation of any Greenheck product. These warranties are exclusive and are in lieu of all other warranties, whether written, oral, or implied, including the warranty of merchantability and the warranty of fitness for a particular purpose. No person (including any agent or salesperson) has authority to expand Seller's obligation beyond the terms of this warranty, or to state that the performance of the product is other than that published by Seller.

As a result of our commitment to continuous improvement, Greenheck reserves the right to change specifications without notice.



Model: GPI

Roof Curb

Standard Construction Features:

- Roof Curb fits between the building roof and the fan mounted directly to the roof support structure - Constructed of either 18 ga galvanized steel or 0.064 in. aluminum - Straight Sided without a cant - 2 in. mounting flange - 3 lb density insulation - Height - Available from 12 in. to 42 in. as specified in 0.5 in. increments. Notes: - The maximum roof opening dimension should not be greater than the "Actual" top outside dimension minus 2 in.. - The minimum roof opening dimension should be at least 2.5 in. more than the damper dimension or recommended duct size. - The Roof Opening Dimension may or may not be the same as the Structural Opening Dimension. - Damper Tray is optional and must be specified. Tray size is same as damper size. - Security bars are optional and must be specified. Frames and gridwork are all 12 ga steel. Gridwork is welded to the frame and the frame is welded to the curb.

General

Tag	Qty	Model	Sizing Method	Undersizing (in.)	Weight (lb)	Shipped Assembled
	1	GPI-31 x 97	Nominal	1.5	70	No

Dimensions

Curb Height (in.)	Nominal Outside Width (in.)	Nominal Outside Length (in.)	Actual Outside Width (in.)	Actual Outside Length (in.)	Flange Width (in.)	Flange Length (in.)
12	31	97	29.5	95.5	33.5	99.5

Accessories

Material	Security Bars	Liner	Insulation (in.)
Galvanized	No	No	1

EQUIPMENT SCHEDULE

Tempered Make-Up Air Unit — **Mark: MK-1**

Qty	Greenheck Model	Volume	External SP	Total SP	FRPM	Operating Power	Weight
1	ESX-PI 15-H13-MF-G	2,362 CFM	0.75 in. wg	1.05 in. wg	1477	0.7 hp	1,279 lb

Motor Information							
Size	V/C/P	Enclosure	Motor with Shaft Grounding	Motor RPM	Windings	MCA	MOP
1 hp	460/60/3	ODP	No	1725	1	3.3	15

Heating

Type	Gas Type	Temperature			Energy			Connection Gas	Building Gas Pressure	Control Access
		Winter DB	Max Δ	Max LAT	Input	Output	Efficiency			
Indirect Gas	Natural	4.2 F	62.4 F	67.4 F	200.0 MBH	160.0 MBH	80%	3/4"	5.0PSI	11o

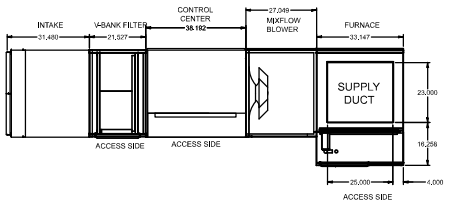
Outlet Sound Power By Octave Band

63-5	125	250	500	1000	2000	4000	8000	LwA	dBA	Sones
84	80.4	76.9	72.6	71.8	65.4	60.4	54.1	78	67	15

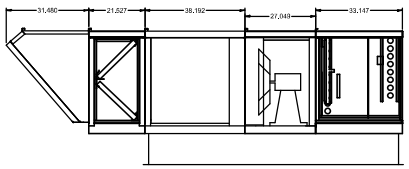
- LwP = weighted sound power level based on ANSI S1.4
- dBA = weighted sound pressure level from Table on 11.06 (for information purposes based on 5.0 ft
- Noise Criteria (NC) based on an average attenuation of 10.2 dB per octave band of 5/8

OPTIONS AND ACCESSORIES

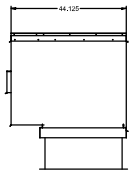
Air Flow Arrangement: Outdoor Air Only
Weatherhood: Aluminum Mesh, 16x20x2 - (4)
Filter Section: Aluminum, 16x20x2 - (4)
Damper: Inlet
Outdoor Air Intake Position: End
Discharge Position: Downblast
Casing: Galvanized
Insulation: Double Wall - Heat Source On
Supply Fan Control: VFD
VFD Control: Constant Volume
Hinged Access
Access Side: Right-Hand
Control Center
Freeze Protection
Heat Inlet Air Sensor
Unit Controls: Microprocessor
Temperature Control: Discharge
BMS Protocol: BACnet/MSTP
Remote Display with 10' Cord
Indirect Gas Options/Accessories
Outdoor Finish: Standard Vent.



PLAN VIEW



ELEVATION VIEW



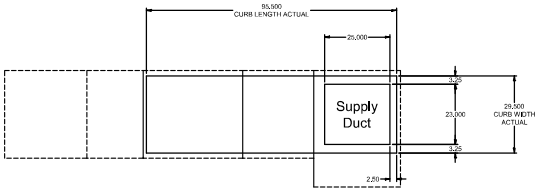
END VIEW

NOTE: Roof Opening Requirements:

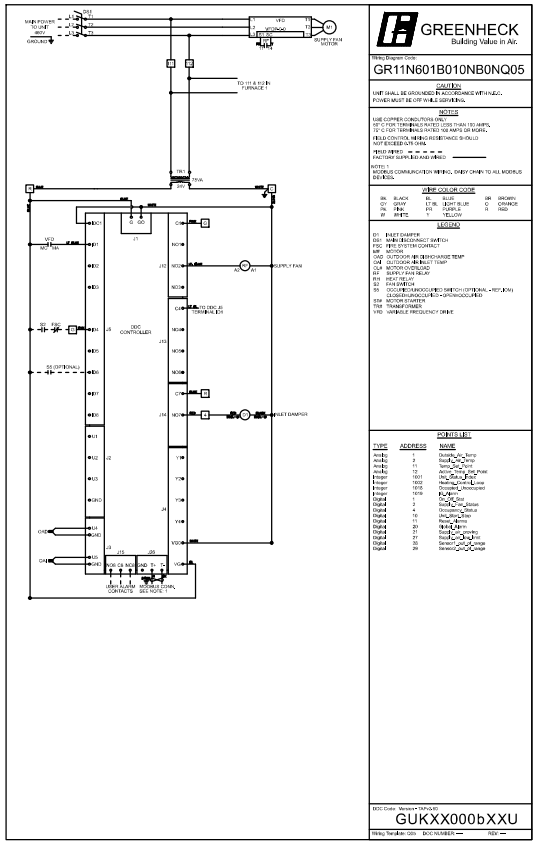
Minimum Roof Opening: The minimum roof opening size is the illustrated duct diameter plus 0.25 in. on all sides.
For example: If the duct size is 14 x 14 in. square, the minimum roof opening size is 14.5 x 14.5 in. square.

Maximum Roof Opening: There must be a minimum perimeter of 1.75 in. between the roof opening and the roof curb.
For example: If the roof curb is 75 x 30 in. square, the maximum roof opening is 71.5 x 26.5 in. inches square.

NOTE: The weatherhood and filter sections of the make-up air unit are not supported by the curb.
This is by design, in order to help alleviate water infiltration issues.



FOOTPRINT



GREENHECK
Building Value in Air.

Wiring Diagram Code:
GR11N601B010NB0NQ05

CAUTION
UNIT SHALL BE GROUNDED IN ACCORDANCE WITH N.E.C.
POWER MUST BE OFF WHILE SERVICING.

NOTES
USE COPPER CONDUCTORS ONLY
60° C FOR TERMINALS RATED LESS THAN 100 AMPS.
75° C FOR TERMINALS RATED 100 AMPS OR MORE.
FIELD CONTROL WIRING RESISTANCE SHALL NOT EXCEED 0.25 OHM.
FIELD WIRED
FACTORY SUPPLIED AND WIRED
NOTE 1:
MODBUS COMMUNICATION WIRING, DAISY CHAIN TO ALL MODBUS DEVICES.

WIRE COLOR CODE

BK	BLACK	BL	BLUE	BR	BROWN
GN	GREEN	LB	LIGHT BLUE	O	ORANGE
PK	PINK	PR	PURPLE	R	RED
W	WHITE	Y	YELLOW		

LEGEND

D1 INLET DAMPER
DISC MAIN DISCONNECT SWITCH
FC FAN CONTACTOR
MP MOTOR
OAS OUTDOOR AIR DESIGNATED TEMP
OAT OUTDOOR AIR INLET TEMP
OLR MOTOR OVERLOAD
R1 FAN CONTROL RELAY
R11 HEAT RELAY
S2 FAN SWITCH
SS OCCUPIED/UNOCCUPIED SWITCH (OPTIONAL - NOT SHOWN)
SW OCCUPIED/UNOCCUPIED - SAT/WOCCUPIED
STM MOTOR STARTER
TRF TRANSFORMER
VFD VARIABLE FREQUENCY DRIVE

POINTS LIST

TYPE	ADDRESS	NAME
Analog	1	Outside_Air_Temp
Analog	2	Supply_Air_Temp
Analog	11	Temp_Sensor_1
Analog	12	Temp_Sensor_2
Integer	1001	Supply_Fan_Speed
Integer	1002	Heating_Control_Loop
Integer	1015	Occupied_Unoccupied
Integer	1016	Fan_Mode
Digital	1	Fan_Status
Digital	2	Dirty_Filter_Status
Digital	4	Occupancy_Status
Digital	15	Heat_Relay_Enable
Digital	16	Heating_Alarm
Digital	17	Heat_Call_1
Digital	21	Heat_Call_2_Heating
Digital	27	Heat_Call_3_Heating
Digital	30	Sensor_Call_2_Heat
Digital	29	Sensor_Call_3_Heat

BOO Code: Version • TUYA-00
GUKXX000bXXU
Wiring Template Code BOO NUMBER — REV: —

PROJECT
8/27/2020

22849_LSSD MIDDLE SCHOOL
MAU

MARK

MK-1

JORBAN RISCOE ASSOCIATES INC
CONNER SWOPE
CONNERSWOPE@JORBAN-RISCOE.COM
(913)438-1244

GREENHECK

MITSUBISHI ELECTRIC
Changes for the Better

11 UNITS SERVING IDF MDF AND ELECTRICAL ROOMS

P-SERIES

SUBMITTAL DATA: PKA-A18HA7 & PUZ-A18NKA7

18,000 BTU/H WALL-MOUNTED HEAT PUMP SYSTEM

Job Name:	Engineer:
Purchaser:	Application:
Submitted To:	For: ☐ Reference ☐ Approval ☐ Construction
Submitted By:	Location:
System Designation:	Schedule No.:

Indoor Unit: PKA-A18HA7

Outdoor Unit: PUZ-A18NKA7 (-BS)

UNIT OPTION:

☐ Standard Model.....PUZ-A18NKA7
☐ Seacoast (BS) Model.....PUZ-A18NKA7-BS

ACCESSORIES:

Controls

☐ Wireless Controller (MHK1)
☐ Advanced Wired Controller (PAR-32MAA / PAR-33MAA)
☐ Simple Wired Controller (PAC-YT53CRAU)
☐ Wireless Remote Controller (PAR-FL32MA)
☐ Thermostat Interface (PAC-US444CN)
☐ M-NET Adapter (PAC-SJ19MA-E)

Outdoor Unit

☐ Front Wind Guard (PFR-12-18)
☐ Rear Wind Guard (PRE-12-18)
☐ Side Wind Guard (PSD-12-18)

Indoor

☐ External Heater Adaptor (PAC-SE59RA-E)

Note: Mitsubishi Electric (MESCA) supports the use of only MESCA supplied and approved Snow Guard / Wind Deflectors / Windscreens and accessories for proper functioning of the unit(s). Use of non-MESCA supported Snow Guard / Wind Deflectors / Windscreens and accessories will affect warranty coverage.

SPECIFICATIONS:

Rated Conditions (Capacity / Input)*		
Cooling	Btu/h / W	18,000 / 1,820
Heating at 47° F	Btu/h / W	19,000 / 1,300
Heating at 17° F	Btu/h / W	11,300 / 1,340

* Rating Conditions per AHRI Standard:
Cooling | Indoor: 80° F (27° C)DB / 67° F (19° C)WB; Outdoor: 95° F (35° C)DB / 75° F (24° C)WB
Heating at 47°F | Indoor: 70° F (21° C)DB / 60° F (16° C)WB; Outdoor: 47° F (8° C)DB / 43° F (6° C)WB
Heating at 17° F | Indoor: 70° F (21° C)DB / 60° F (16° C)WB; Outdoor: 17° F (-8° C)DB / 15° F (-9° C)WB

Capacity Range		
Cooling	Btu/h	8,000 - 18,000
Heating at 47° F	Btu/h	7,700 - 22,000

Operating Range	
Cooling	0°F** (-18°C) to 115°F (46°C) DB
Heating	12°F (-11°C) to 70°F (21°C) DB

** Windscreens required for cooling operation below 23°F (-5°C)

AHRI Efficiency Ratings	
EER	9.9
SEER	18.5
HSPF IV / V	10.2 / 7.5
COP at 47° F	4.28
COP at 17° F	2.47

Specifications are subject to change without notice.

Electrical Power Requirements	208 / 230V, 1-Phase, 60 Hz

Minimum Circuit Ampacity (MCA) *		Breaker Size	MOCP (Outdoor)
Indoor 1 AMP	Outdoor 11 AMP	15 AMP	28 AMP

***All electrical work shall comply with National (CEC) and local codes and regulations.**

Indoor Unit		
Fan Motor (ECM)	F.L.A.	0.33
Fan Motor Output	W	30
SHF / Moisture Removal		0.68 / 5.2 pt./h
Field Drainpipe Size O.D	in. (mm)	5/8 (16)

Outdoor Unit		
Compressor		DC INVERTER-driven Twin Rotary
Fan Motor (ECM)	F.L.A.	0.5
Fan Motor Power	W	46

Airflow Rate (Low-Mid-Hi)			
Indoor (Cooling)	DRY	CFM	320-370-425
	WET		290-335-380
Outdoor	DRY		1,590

Sound Pressure Level			
Indoor (Low-Mid-Hi)		dB(A)	36-40-43
Outdoor	Cooling		44
	Heating		46

External Dimensions		
Indoor (H x W x D)	In.(mm)	11-5/8 x 35-3/8 x 9-13/16 (295 x 898 x 249)
Outdoor (H x W x D)		24-13/16 x 31-13/16 + 7/16 x 11-3/16 (630 x 809 + 62 x 300)

Net Weight		
Indoor	Lbs.(kg)	29 (13)
Outdoor		100 (45)

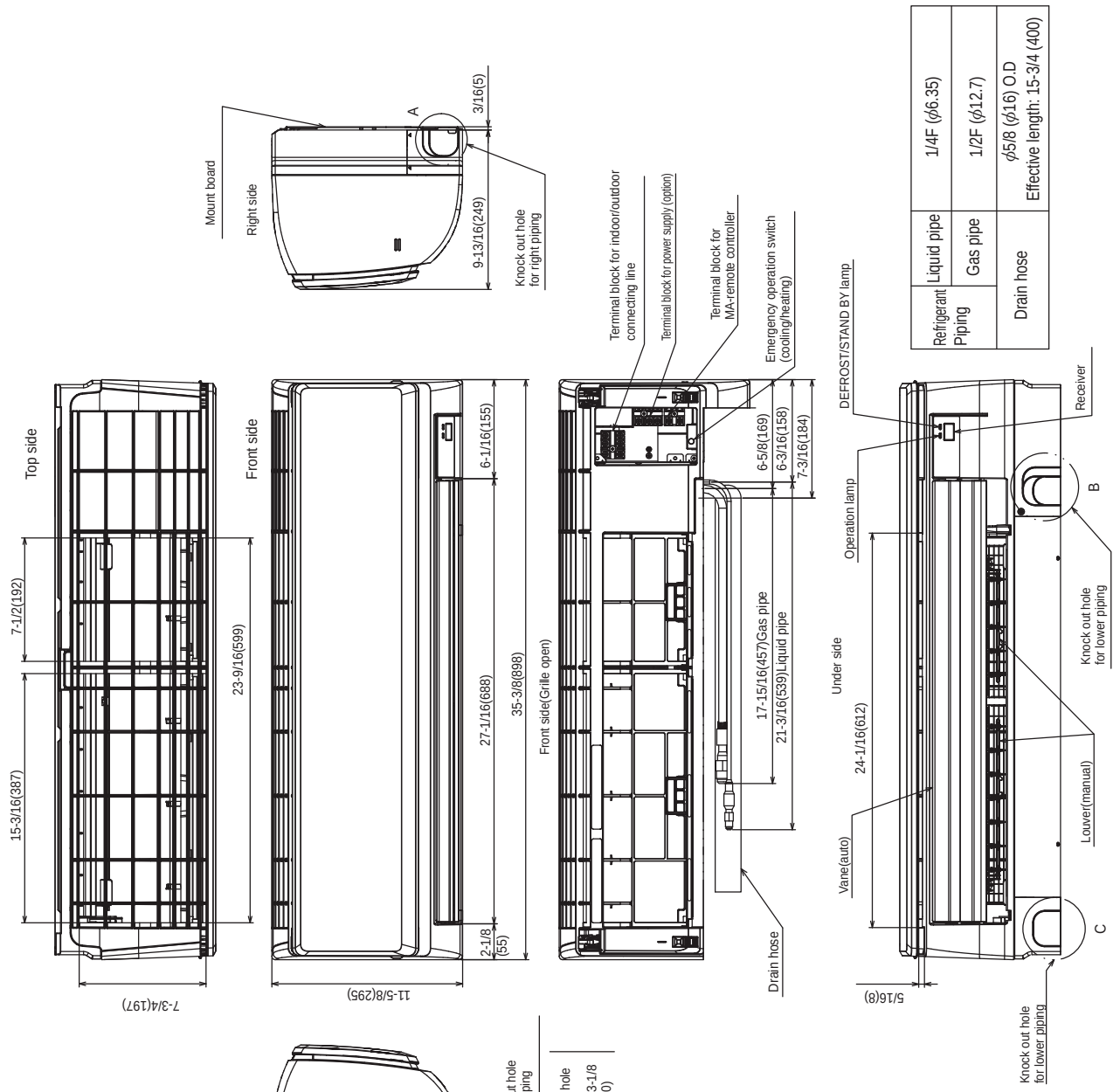
External Finish	
Indoor	White Munsel No. 1.0Y 9.2/0.2
Outdoor	Ivory Munsell No. 3Y 7.8 / 1.1

Refrigerant	R410A ; 4lbs., 14oz. (2.2kg)

Refrigerant Piping (Flared)		
Liquid (High Pressure)	In.(mm)	1/4 (6.35)
Gas (Low Pressure)		1/2 (12.7)
Maximum Total Refrigerant Pipe Length	Ft. (m)	100 (30)
Maximum Vertical Separation	Ft. (m)	100 (30)

DIMENSIONS: PKA-A18HA7

Unit: in. (mm)



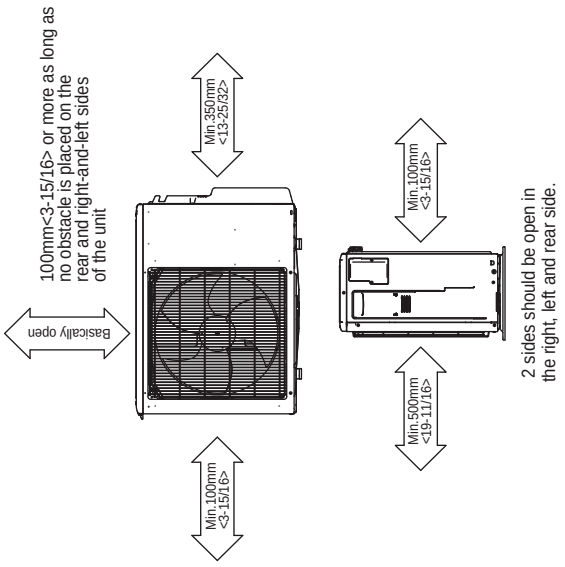
Specifications are subject to change without notice.

DIMENSIONS: PUZ-A18NKA7

Unit: mm (in.)

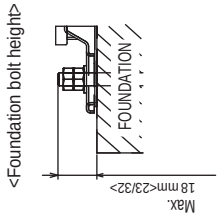
Free space around the outdoor unit

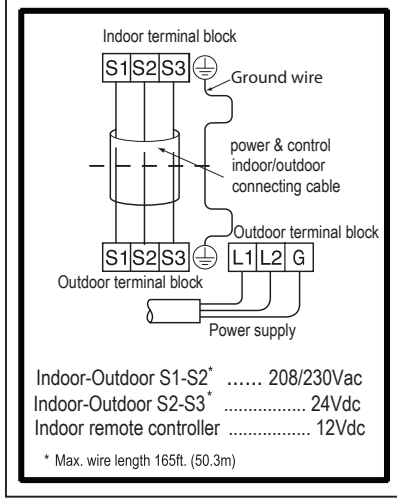
(basic example)

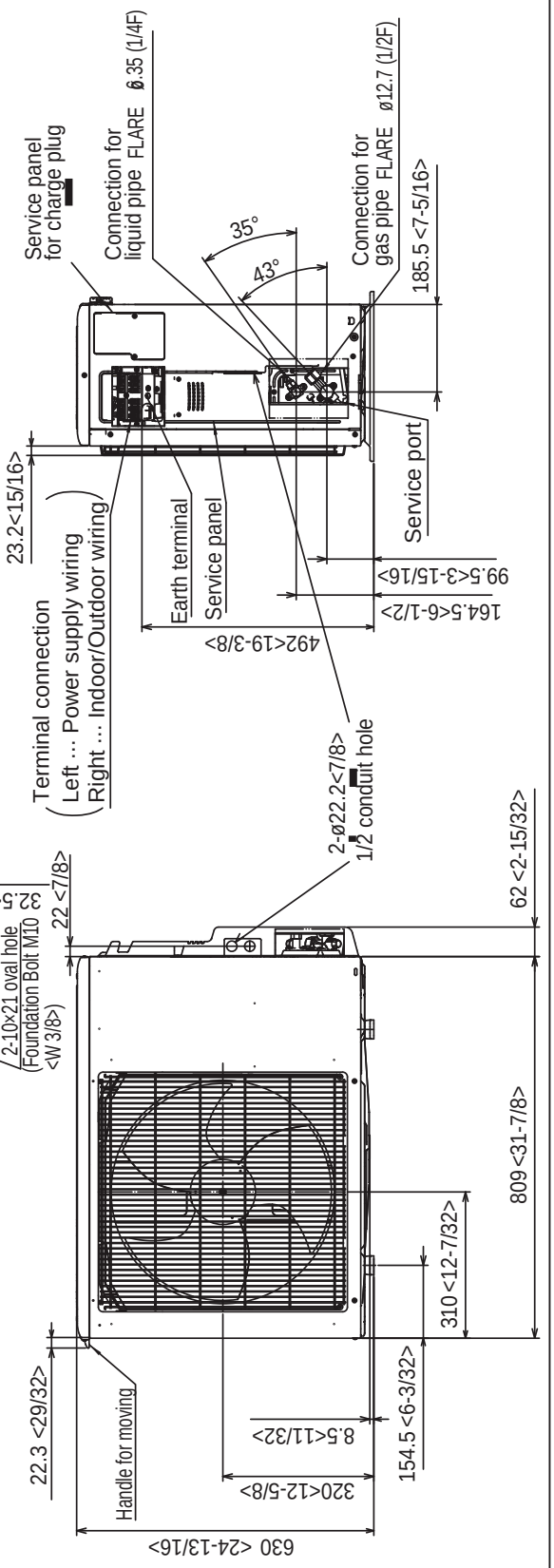


FOUNDATION BOLTS

Please secure the unit firmly with 4 foundation (M10<W3/8>) bolts. (Bolts, washers and nut must be purchased locally).







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www.MitsubishiElectric.ca

Form # SB_PKA-A18HA7_PUZ-A18NKA7_201803