BLUE OX AIR CLEANERS

(866) 455-2135 / info@blueoxaircleaners.com

View Quote Online
More Pictures, Videos & Literature
www.blueoxaircleaners.com/quote/Q044603

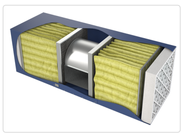
Quote #: Q044603
Customer #: DLR6408

Prepared for DLR Group
Attn: Cody Campbell | Quoted: 01/17/24

Item / Description	Price Ea.	Qty	Total

Collision Lab Air Filtration

6647 X 18 = 119,646 Cubic Feet
119646 X 10 (Air Changes Per Hour) = 1,196,460 Total Cubic Feet Of Air In Need Of Filtration Per Hour
1,196,460/60 = 19,941 CFM Needed
19,941/ 3000 = 6.65
7 Units Needed



OX3000-CF Air Cleaner

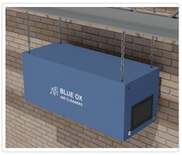
2,960.80 x 7 20,725.60

Blue Ox Model OX3000-CF, 3,000 CFM Media Filtration System W/ 2" Charcoal After Filter.
Cabinet: 24"W X 24"T X 72" Long - 16GA CRS
Power: 115V 60Hz Single Phase 10.2 Amps
Filter Stage 1: (2) Pleated Pre Filters 24" X 24" X 4" 35%
Filter Stage 2: (2) 24" X 24" X 15" 95% 12 Pocket Bag Filter
Filter Stage 3: (2) Charcoal After Filter 24" X 24" X 2" 18 Lbs. Of Carbon (9 Lbs. Per Filter)

SKU: OX3000-CF

Download Literature | More Pictures | Video

Mounting Options



Eyebolts (Optional)

70.00 Not Included

Eyebolts 4 Eyebolts (Installed On Unit At The Factory)
Used In OX1100 / OX2500 / OX3000

SKU: BOP-EYEBLTS

Download Literature | Video

Mounting Kit (Optional)

162.00 Not Included

Mounting Kit Chain, Q-Links, & Installed Eyebolts
(4ea. 5' Lengths Of Chain)
Used In OX1100 / OX2500 / OX3000

SKU: BOP-MTGKIT

Video

"L" Mounting Brackets (Optional)

162.00 Not Included

"L" Mounting Brackets (Set Of 2)
Used In OX1100 / OX2500 / OX3000

SKU: BOP-LBRKTS

Download Literature | Video

Unit Options

Silencer (Non-Directional Grill) (Optional)

231.00 Not Included

Silencer W/Grill Reduces Noise By 10-12 Decibels (Non-Directional Grill)
Used In OX2500 / OX3000 / OX3500C, & Robot Hoods

SKU: BOP-2530SIL-WG

Download Literature | Video

Replacement Filters

FIRST SET OF FILTERS PROVIDED WITH UNITS. COSTS BELOW ARE FOR REPLACEMENTS.

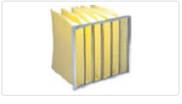
Replacement Pleated Pre-Filters (Optional)

12.70 Not Included

24 X 24 X 4 Pleated Prefilter, MERV 10
(Priced Each / Sold In Cartons Of 6)

SKU: BOF-4404

Video



Replacement Bag Filters - MERV 15 (Optional)

92.38 Not Included

Fiberglass Bag, 24" X 24" X 15" MERV 15 (95%)
12.0 Pockets, Gasket None, Loops None, Std Header, Nom Size
(Priced Each / Sold In Cartons Of 4)
Used In OX2500-CFP/ -HE, CL2500-CFP/ -HE, OX2500D-CC/ -HE, CL2500D-CC, OX3000-HE, CL3000-HE

SKU: BOF-4415912

Video

Replacement Charcoal After-Filter (Optional)

83.26 Not Included

24 X 24 X 2 Carbon Afterfilter, 75% Fill, 10lbs. Of Carbon.

Actual Size 23.5 X 23.5 X 2

88-BOF-4402-CF

SKU: BOF-4402-CF

Video

ALL QUOTES ARE VALID FOR 30 DAYS OF QUOTED DATE

Lead Time: 5-6 Weeks, depending on stock and availability. plus transit.

Payment Terms: Check, eCheck (ACH/EFT) or Credit Card*
* NOTE: All Cards Accepted. For payments of more than $5,000, a 3% fee will be added.
For payment via P.O., please contact your rep to establish terms.

*** Freight Note:**
Price does not include freight. Freight to be invoiced separately. Confirm ship to address for freight estimate.

Sub Total :	20,725.60
Tax :	1,707.37
Freight :	See Freight Note *
Total	$22,432.97

Financing Available, Contact Your Rep for Details.

HF SERIES
FXMQ96 Preheat
Insert Type

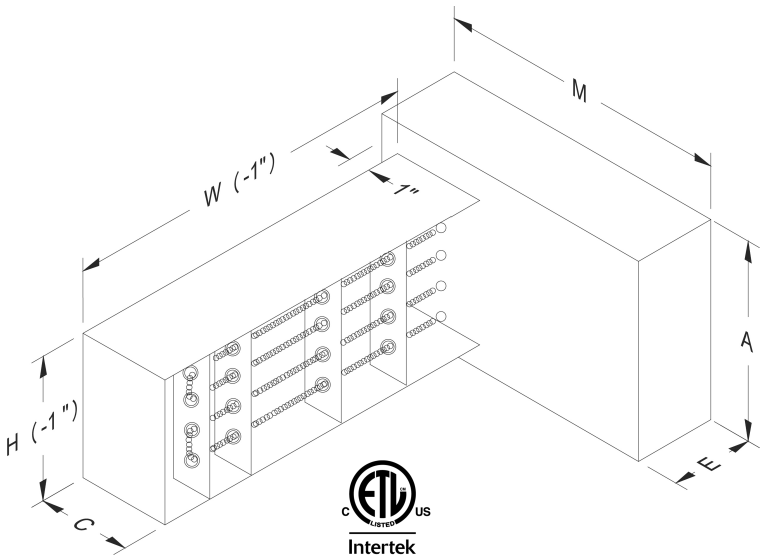
Made in the USA

Sales Order # / Item # / QTY.	/ 10 / 2 EA
Company	DAIKIN TMI LLC
Contractor	

Quote	57PRV	Date	02/06/2024
Job Name	MCC Automotive Institute		
PO Number			

STANDARD CONTROLS

- 24 VOLT CONTROL TRANSFORMER
- DOOR INTERLOCK DISCONNECT
- DISCONNECTING MAGNETIC CONTACTORS
- DIFFERENTIAL PRESSURE AIR FLOW SWITCH
- PRIMARY AND SECONDARY OVER TEMPERATURE PROTECTION
- FUSING IF HEATER EXCEEDS 48 AMPS (PER NEC)
- LINE AND CONTROL TERMINAL BLOCKS
- GALVANIZED STEEL CONTROL BOX WITH 1/2 INSULATION AND HINGED COVER
- ETL LISTED



Division	Markel Mechanic
Kilowatts	7.00
Tagging	VAM PREHEAT
Volts	480.00
Phase	Three Phase
Heater Amps	8.43
Control Volts	24.00
Duct Width (inches)	16.00
Duct Height (inches)	16.00
Duct Liner	None
Rack Width (W-1)	15.00
Rack Height (H-1)	15.00
Heater Type	Insert
Airflow Direction	1 Right to Left (HL)
Door Interlock Disconnect Swit	Yes, Included in Base List
Controls	SCR
*** Please Note:	SCR Will Add 3" - 6" to M Dim
Number of Stages	1.00

Amps per Stage	8.43
Amps per Circuit	8.43
MOP	12.64
Label MOP	15.00
MCA	10.54
Label MCA	15.00
Thermostat	None
Field Supply Control Signal	4-20 MA, 0-135 OHM, 0-10 VDC
80/20 Alloy Wire	No
Fusing	None
Remotel Panel	No
NEMA Class	NEMA 1
Wiring Diagram	WD3-820-1D-HF
****CONTROL BOX****	.
Control Box E Dim	7.50
Control Box A Dim	16.00
Control Box M Dim	19.00
Control Box C Dim	4.75

HF SERIES
FXMQ96 Reheat
Insert Type

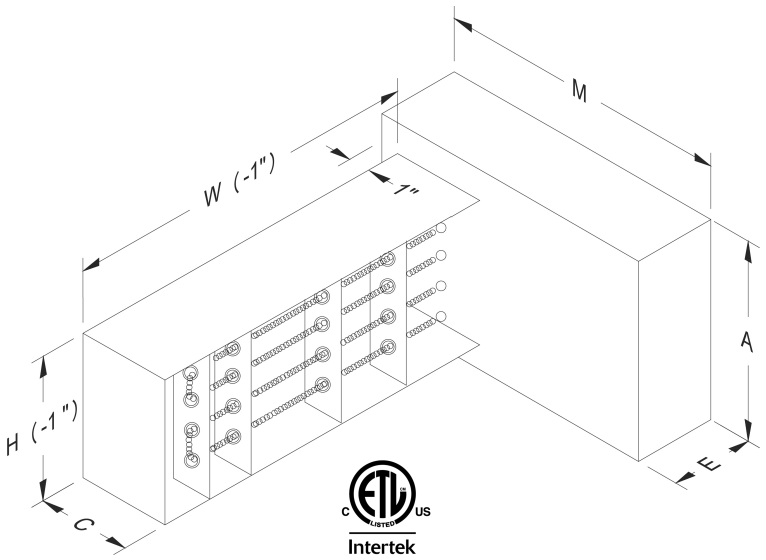
Made in the USA

Sales Order # / Item # / QTY.	/ 20 / 2 EA
Company	DAIKIN TMI LLC
Contractor	

Quote	57PRV	Date	02/06/2024
Job Name	MCC Automotive Institute		
PO Number			

STANDARD CONTROLS

- 24 VOLT CONTROL TRANSFORMER
- DOOR INTERLOCK DISCONNECT
- DISCONNECTING MAGNETIC CONTACTORS
- DIFFERENTIAL PRESSURE AIR FLOW SWITCH
- PRIMARY AND SECONDARY OVER TEMPERATURE PROTECTION
- FUSING IF HEATER EXCEEDS 48 AMPS (PER NEC)
- LINE AND CONTROL TERMINAL BLOCKS
- GALVANIZED STEEL CONTROL BOX WITH 1/2 INSULATION AND HINGED COVER
- ETL LISTED



Division	Markel Mechanic
Kilowatts	8.00
Tagging	OAP96 REHEAT
Volts	480.00
Phase	Three Phase
Heater Amps	9.63
Control Volts	24.00
Duct Width (inches)	20.00
Duct Height (inches)	10.00
Duct Liner	None
Rack Width (W-1)	19.00
Rack Height (H-1)	9.00
Heater Type	Insert
Airflow Direction	1DS Rt to Lt Ext Dwnstrm Pnl
Door Interlock Disconnect Swit	Yes, Included in Base List
Controls	SCR
*** Please Note:	SCR Will Add 3" - 6" to M Dim
Number of Stages	1.00

Amps per Stage	9.63
Amps per Circuit	9.63
MOP	14.45
Label MOP	15.00
MCA	12.04
Label MCA	15.00
Thermostat	None
Field Supply Control Signal	4-20 MA, 0-135 OHM, 0-10 VDC
80/20 Alloy Wire	No
Fusing	None
Remotel Panel	No
NEMA Class	NEMA 1
Wiring Diagram	WD3-820-1D-HF
****CONTROL BOX****	.
Control Box E Dim	7.50
Control Box A Dim	10.00
Control Box M Dim	28.00
Control Box C Dim	4.75

HF SERIES
HF Series Open Coil Duct Heater
Insert Type

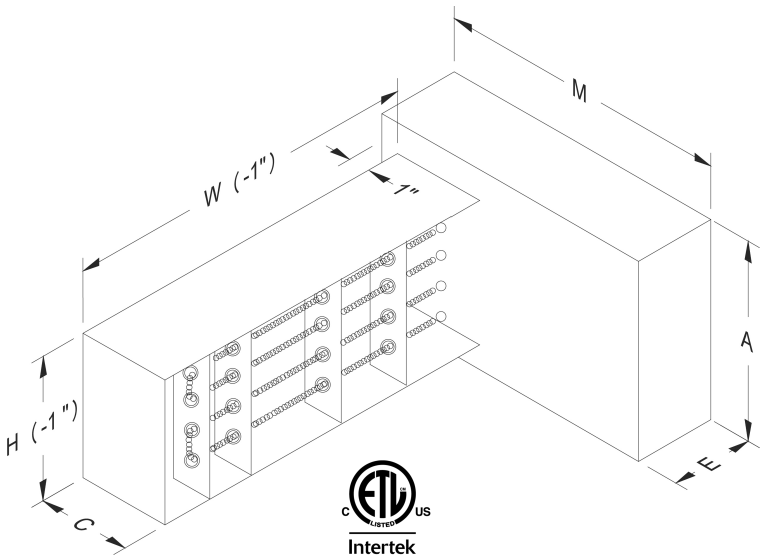
Made in the USA

Sales Order # / Item # / QTY.	/ 30 / 1 EA
Company	DAIKIN TMI LLC
Contractor	

Quote	57PRV	Date	02/06/2024
Job Name	MCC Automotive Institute		
PO Number			

STANDARD CONTROLS

- 24 VOLT CONTROL TRANSFORMER
- DOOR INTERLOCK DISCONNECT
- DISCONNECTING MAGNETIC CONTACTORS
- DIFFERENTIAL PRESSURE AIR FLOW SWITCH
- PRIMARY AND SECONDARY OVER TEMPERATURE PROTECTION
- FUSING IF HEATER EXCEEDS 48 AMPS (PER NEC)
- LINE AND CONTROL TERMINAL BLOCKS
- GALVANIZED STEEL CONTROL BOX WITH 1/2 INSULATION AND HINGED COVER
- ETL LISTED



Division	Markel Mechanic
Kilowatts	36.00
Tagging	EDC-125
Volts	480.00
Phase	Three Phase
Heater Amps	43.35
Control Volts	24.00
Duct Width (inches)	30.00
Duct Height (inches)	24.00
Duct Liner	None
Rack Width (W-1)	29.00
Rack Height (H-1)	23.00
Heater Type	Insert
Airflow Direction	1 Right to Left (HL)
Door Interlock Disconnect Swit	Yes, Included in Base List
Controls	SCR
*** Please Note:	SCR Will Add 3" - 6" to M Dim
Number of Stages	1.00

Amps per Stage	43.35
Amps per Circuit	43.35
MOP	65.03
Label MOP	70.00
MCA	54.19
Label MCA	60.00
Thermostat	None
Field Supply Control Signal	4-20 MA, 0-135 OHM, 0-10 VDC
80/20 Alloy Wire	No
Fusing	None
Remotel Panel	No
NEMA Class	NEMA 1
Wiring Diagram	WD3-820-1D-HF
****CONTROL BOX****	.
Control Box E Dim	7.50
Control Box A Dim	24.00
Control Box M Dim	16.00
Control Box C Dim	4.75

HF SERIES
HF Series Open Coil Duct Heater
Insert Type

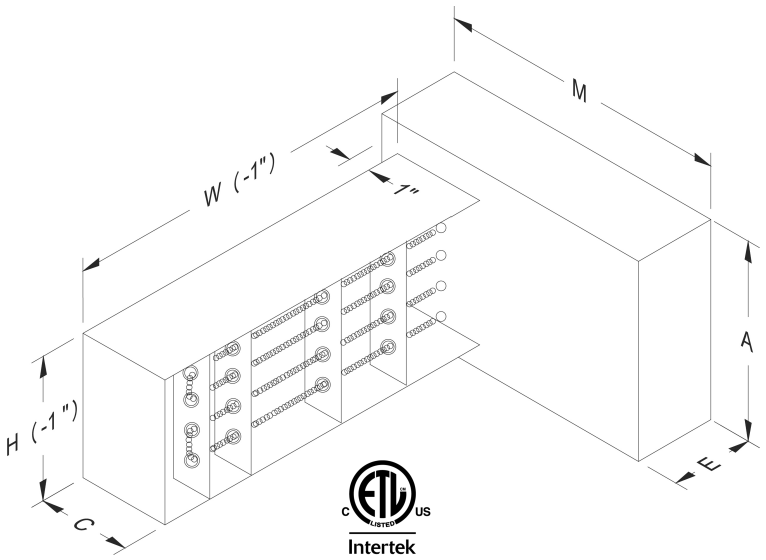
Made in the USA

Sales Order # / Item # / QTY.	/ 40 / 1 EA
Company	DAIKIN TMI LLC
Contractor	

Quote	57PRV	Date	02/06/2024
Job Name	MCC Automotive Institute		
PO Number			

STANDARD CONTROLS

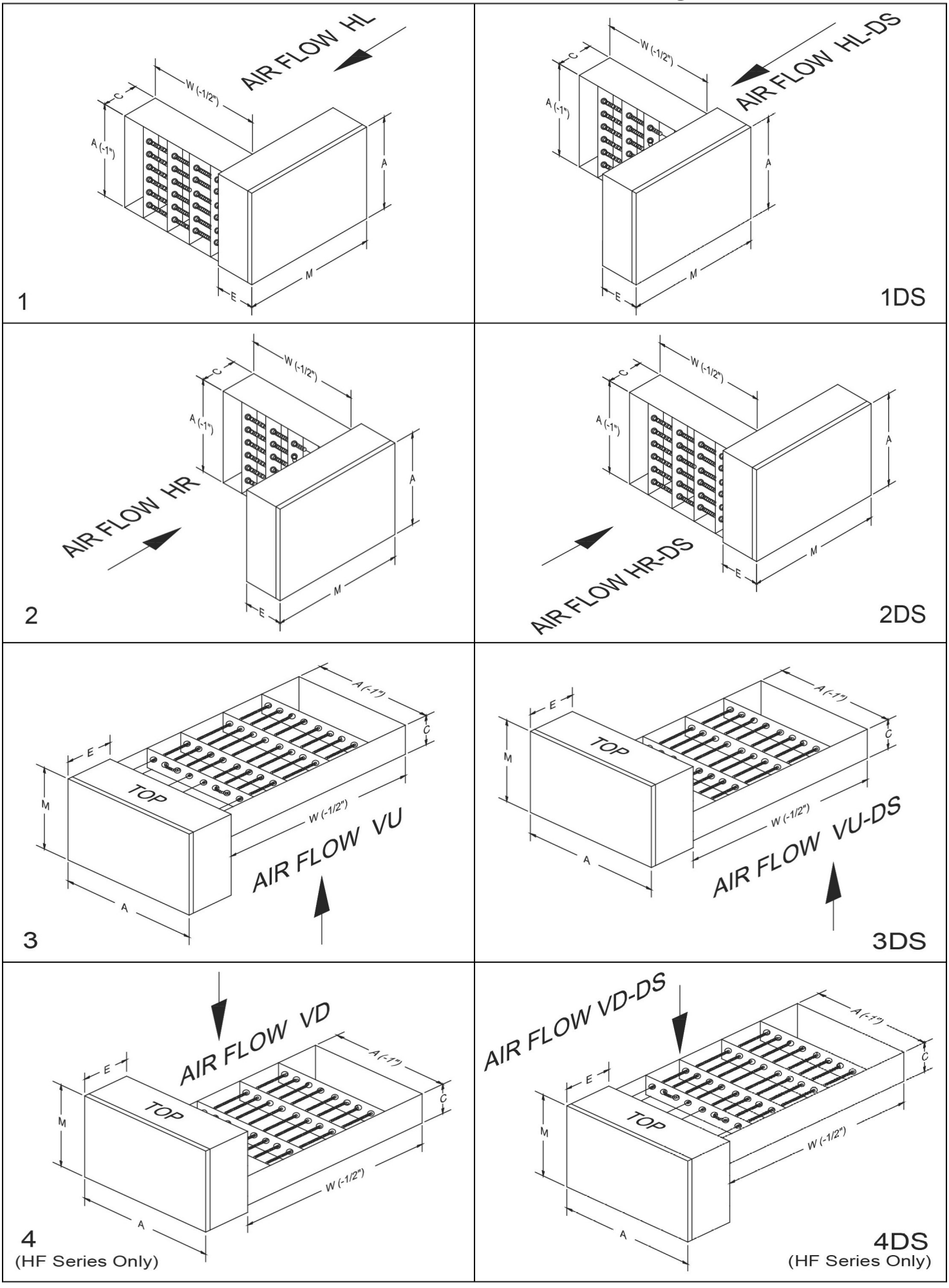
- 24 VOLT CONTROL TRANSFORMER
- DOOR INTERLOCK DISCONNECT
- DISCONNECTING MAGNETIC CONTACTORS
- DIFFERENTIAL PRESSURE AIR FLOW SWITCH
- PRIMARY AND SECONDARY OVER TEMPERATURE PROTECTION
- FUSING IF HEATER EXCEEDS 48 AMPS (PER NEC)
- LINE AND CONTROL TERMINAL BLOCKS
- GALVANIZED STEEL CONTROL BOX WITH 1/2 INSULATION AND HINGED COVER
- ETL LISTED



Division	Markel Mechanic
Kilowatts	72.00
Tagging	EDC-A108E
Volts	480.00
Phase	Three Phase
Heater Amps	86.71
Control Volts	24.00
Duct Width (inches)	24.00
Duct Height (inches)	22.00
Duct Liner	None
Rack Width (W-1)	23.00
Rack Height (H-1)	21.00
Heater Type	Insert
Airflow Direction	1 Right to Left (HL)
Door Interlock Disconnect Swit	Yes, Included in Base List
Controls	SCR
*** Please Note:	SCR Will Add 3" - 6" to M Dim
Number of Stages	2.00

Amps per Stage	43.35
Amps per Circuit	43.35
MOP	130.06
Label MOP	150.00
MCA	108.38
Label MCA	110.00
Thermostat	None
Field Supply Control Signal	4-20 MA, 0-135 OHM, 0-10 VDC
80/20 Alloy Wire	No
Fusing	Fusing Per Stage
Remotel Panel	No
NEMA Class	NEMA 1
Wiring Diagram	WD3-820-2D2F-HF(150A)
****CONTROL BOX****	.
Control Box E Dim	7.50
Control Box A Dim	22.00
Control Box M Dim	38.00
Control Box C Dim	9.13

HF & CHMS Series Air Flow Configurations



HF SERIES
FXMQ96 Preheat
Insert Type

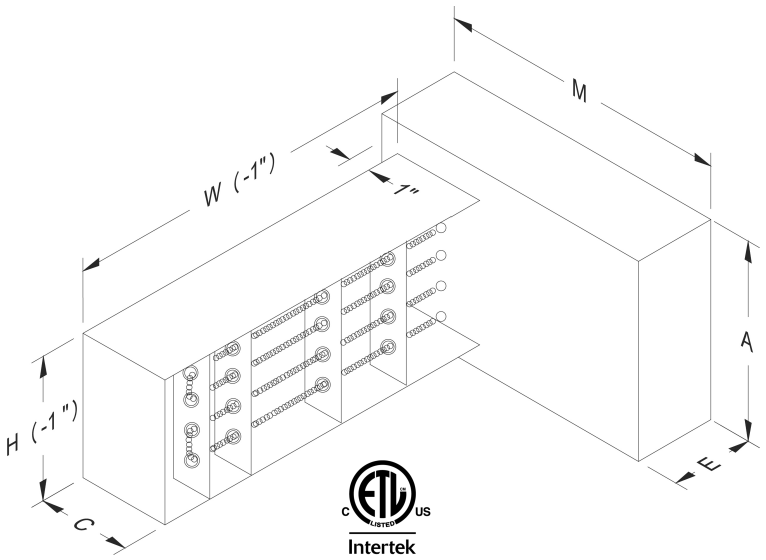
Made in the USA

Sales Order # / Item # / QTY.	/ 10 / 2 EA
Company	DAIKIN TMI LLC
Contractor	

Quote	57PRV	Date	11/10/2023
Job Name	MCC Automotive Institute		
PO Number			

STANDARD CONTROLS

- 24 VOLT CONTROL TRANSFORMER
- DOOR INTERLOCK DISCONNECT
- DISCONNECTING MAGNETIC CONTACTORS
- DIFFERENTIAL PRESSURE AIR FLOW SWITCH
- PRIMARY AND SECONDARY OVER TEMPERATURE PROTECTION
- FUSING IF HEATER EXCEEDS 48 AMPS (PER NEC)
- LINE AND CONTROL TERMINAL BLOCKS
- GALVANIZED STEEL CONTROL BOX WITH 1/2 INSULATION AND HINGED COVER
- ETL LISTED



Division	Markel Mechanic
Kilowatts	7.00
Tagging	VAM PREHEAT
Volts	480.00
Phase	Three Phase
Heater Amps	8.43
Control Volts	24.00
Duct Width (inches)	16.00
Duct Height (inches)	16.00
Duct Liner	None
Rack Width (W-1)	15.00
Rack Height (H-1)	15.00
Heater Type	Insert
Airflow Direction	1 Right to Left (HL)
Door Interlock Disconnect Swit	Yes, Included in Base List
Controls	SCR
*** Please Note:	SCR Will Add 3" - 6" to M Dim
Number of Stages	1.00
Amps per Stage	8.43

Amps per Circuit	8.43
MOP	12.64
Label MOP	15.00
MCA	10.54
Label MCA	15.00
Thermostat	None
Field Supply Control Signal	4-20 MA, 0-135 OHM, 0-10 VDC
80/20 Alloy Wire	No
Fusing	None
Remotel Panel	No
NEMA Class	NEMA 1
Wiring Diagram	WD3-820-1D-HF
Wiring	Delta
****CONTROL BOX****	.
Control Box E Dim	7.50
Control Box A Dim	16.00
Control Box M Dim	19.00
Control Box C Dim	4.75

HF SERIES
FXMQ96 Reheat
Insert Type

Made in the USA

Sales Order # / Item # / QTY.	/ 20 / 2 EA
Company	DAIKIN TMI LLC
Contractor	

Quote	57PRV	Date	11/10/2023
Job Name	MCC Automotive Institute		
PO Number			

STANDARD CONTROLS

- 24 VOLT CONTROL TRANSFORMER
- DOOR INTERLOCK DISCONNECT
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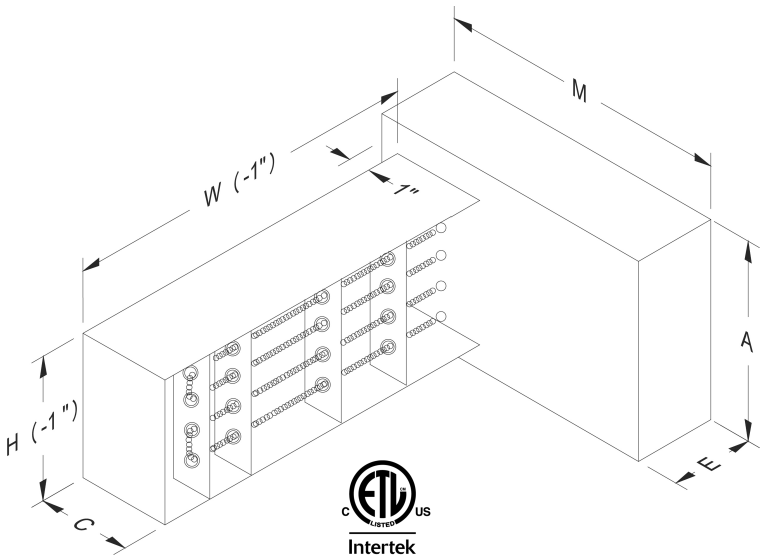
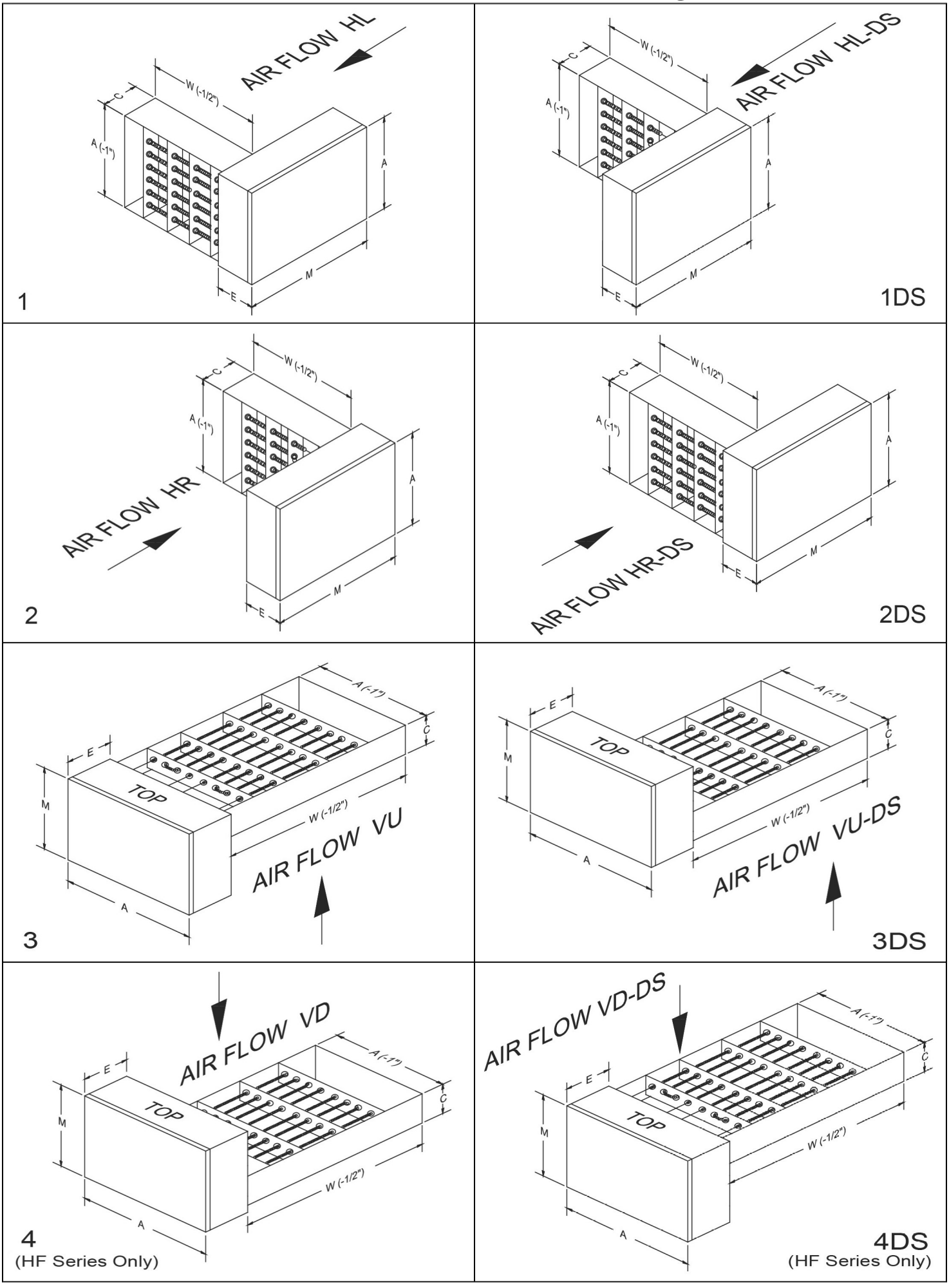


Division	Markel Mechanic
Kilowatts	8.00
Tagging	OAP96 REHEAT
Volts	480.00
Phase	Three Phase
Heater Amps	9.63
Control Volts	24.00
Duct Width (inches)	20.00
Duct Height (inches)	10.00
Duct Liner	None
Rack Width (W-1)	19.00
Rack Height (H-1)	9.00
Heater Type	Insert
Airflow Direction	1DS Rt to Lt Ext Dwnstrm Pnl
Door Interlock Disconnect Swit	Yes, Included in Base List
Controls	SCR
*** Please Note:	SCR Will Add 3" - 6" to M Dim
Number of Stages	1.00
Amps per Stage	9.63

Amps per Circuit	9.63
MOP	14.45
Label MOP	15.00
MCA	12.04
Label MCA	15.00
Thermostat	None
Field Supply Control Signal	4-20 MA, 0-135 OHM, 0-10 VDC
80/20 Alloy Wire	No
Fusing	None
Remotel Panel	No
NEMA Class	NEMA 1
Wiring Diagram	WD3-820-1D-HF
Wiring	Delta
****CONTROL BOX****	.
Control Box E Dim	7.50
Control Box A Dim	10.00
Control Box M Dim	28.00
Control Box C Dim	4.75

HF & CHMS Series Air Flow Configurations



HF SERIES
HF Series Open Coil Duct Heater
Insert Type

Made in the USA

Sales Order # / Item # / QTY.	/ 10 / 1 EA
Company	DAIKIN TMI LLC
Contractor	

Quote	MPM3P	Date	12/11/2023
Job Name	New Job		
PO Number			

STANDARD CONTROLS

- 24 VOLT CONTROL TRANSFORMER
- DOOR INTERLOCK DISCONNECT
- DISCONNECTING MAGNETIC CONTACTORS
- DIFFERENTIAL PRESSURE AIR FLOW SWITCH
- PRIMARY AND SECONDARY OVER TEMPERATURE PROTECTION
- FUSING IF HEATER EXCEEDS 48 AMPS (PER NEC)
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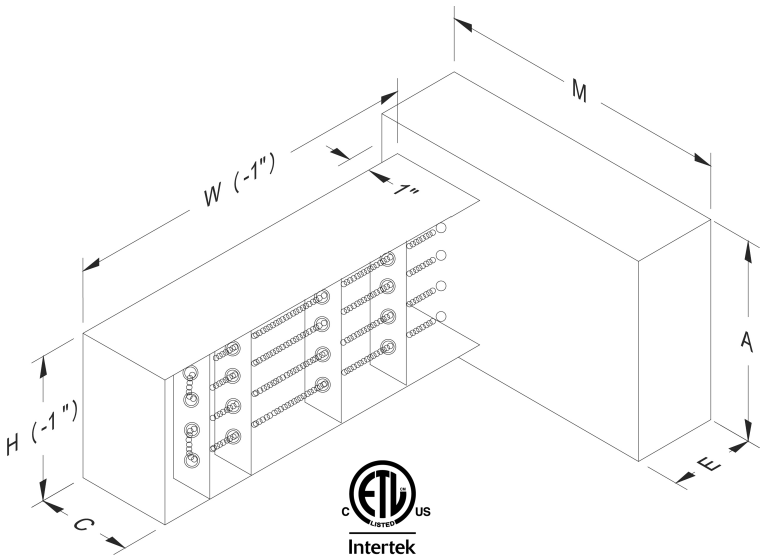
- GALVANIZED STEEL CONTROL BOX WITH 1/2 INSULATION AND HINGED COVER
- ETL LISTED



Kilowatts	18.00
Tagging	AUTOMOTIVE BAY
Volts	480.00
Phase	Three Phase
Heater Amps	21.68
Control Volts	24.00
Duct Width (inches)	14.00
Duct Height (inches)	14.00
Duct Liner	None
Rack Width (W-1)	13.00
Rack Height (H-1)	13.00
Heater Type	Insert
Airflow Direction	1 Right to Left (HL)
Door Interlock Disconnect Swit	Yes, Included in Base List
Controls	SCR
*** Please Note:	SCR Will Add 3" - 6" to M Dim
Number of Stages	1.00
Amps per Stage	21.68

Amps per Circuit	21.68
MOP	32.51
Label MOP	35.00
MCA	27.10
Label MCA	30.00
Thermostat	None
Field Supply Control Signal	4-20 MA, 0-135 OHM, 0-10 VDC
80/20 Alloy Wire	No
Fusing	None
Remotel Panel	No
NEMA Class	NEMA 1
Wiring Diagram	WD3-820-1D-HF
Wiring	Delta
****CONTROL BOX****	.
Control Box E Dim	7.50
Control Box A Dim	14.00
Control Box M Dim	26.00
Control Box C Dim	9.13

HF SERIES
HF Series Open Coil Duct Heater
Insert Type

Made in the USA

Sales Order # / Item # / QTY.	/ 20 / 1 EA
Company	DAIKIN TMI LLC
Contractor	

Quote	MPM3P	Date	12/11/2023
Job Name	New Job		
PO Number			

STANDARD CONTROLS

- 24 VOLT CONTROL TRANSFORMER
- DOOR INTERLOCK DISCONNECT
- DISCONNECTING MAGNETIC CONTACTORS
- DIFFERENTIAL PRESSURE AIR FLOW SWITCH
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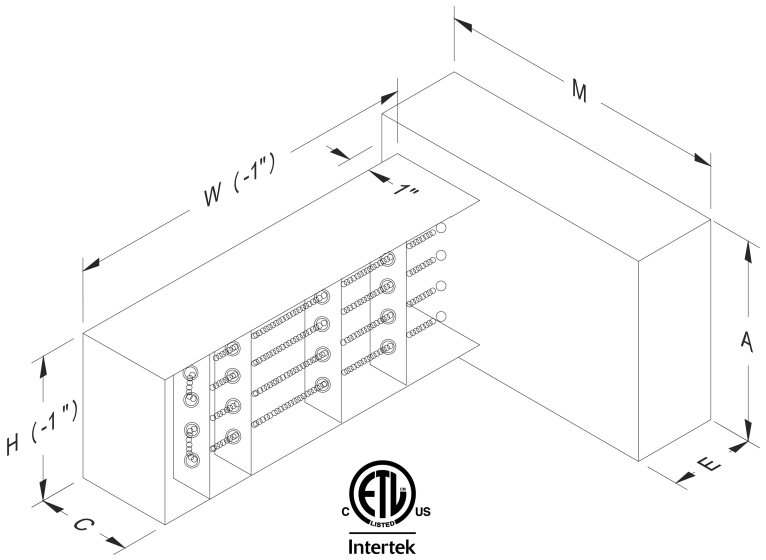
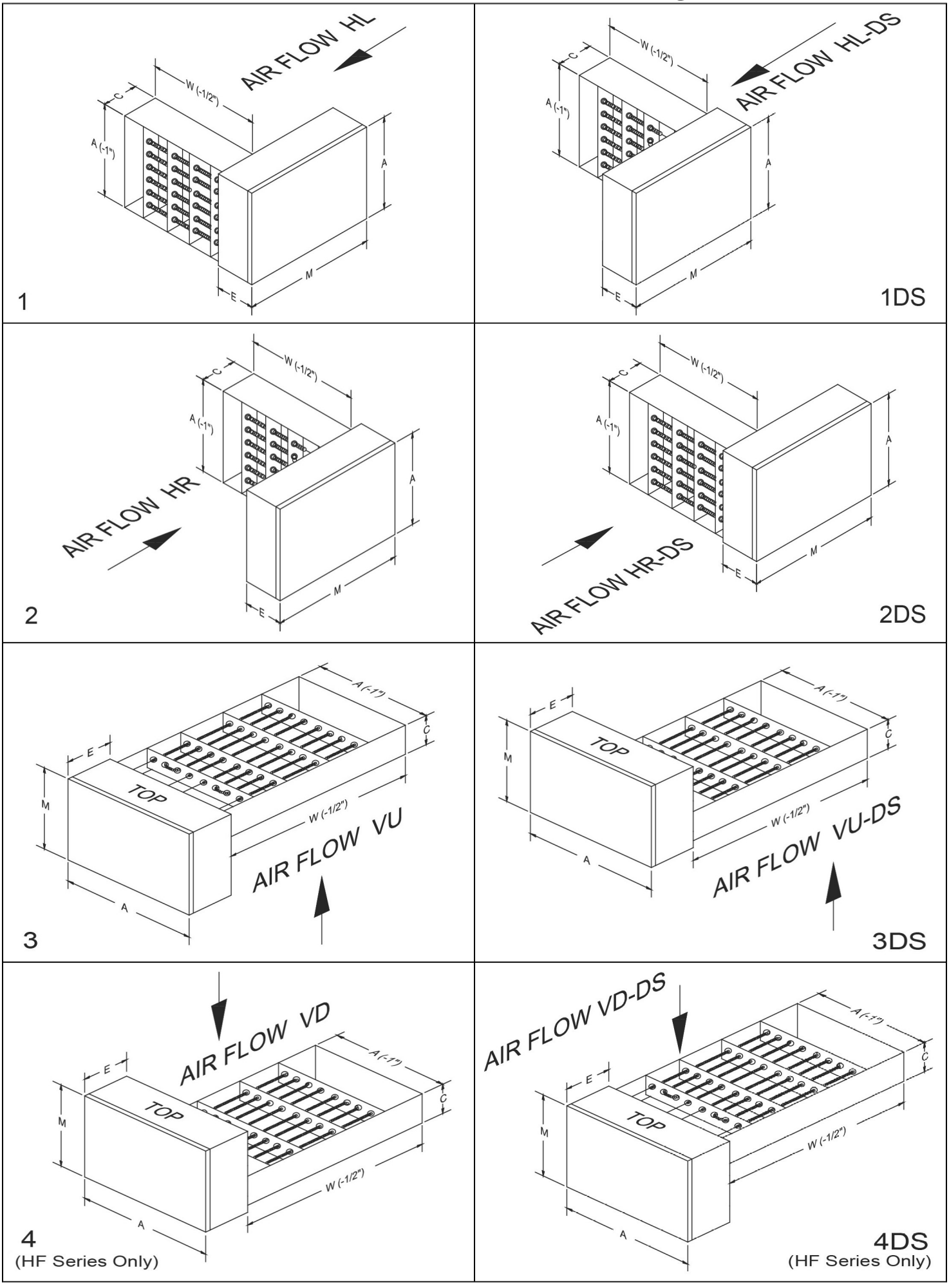
- ETL LISTED



Kilowatts	48.00
Tagging	DIESEL BAY
Volts	480.00
Phase	Three Phase
Heater Amps	57.80
Control Volts	24.00
Duct Width (inches)	20.00
Duct Height (inches)	20.00
Duct Liner	None
Rack Width (W-1)	19.00
Rack Height (H-1)	19.00
Heater Type	Insert
Airflow Direction	1 Right to Left (HL)
Door Interlock Disconnect Swit	Yes, Included in Base List
Controls	SCR
*** Please Note:	SCR Will Add 3" - 6" to M Dim
Number of Stages	2.00
Amps per Stage	28.90

Amps per Circuit	28.90
MOP	86.71
Label MOP	90.00
MCA	72.25
Label MCA	80.00
Thermostat	None
Field Supply Control Signal	4-20 MA, 0-135 OHM, 0-10 VDC
80/20 Alloy Wire	No
Fusing	Fusing Per Stage
Remotel Panel	No
NEMA Class	NEMA 1
Wiring Diagram	WD3-820-2D2F-HF
Wiring	Delta
****CONTROL BOX****	.
Control Box E Dim	7.50
Control Box A Dim	20.00
Control Box M Dim	41.00
Control Box C Dim	9.13

HF & CHMS Series Air Flow Configurations



Submittal Data Sheet

Energy Recovery Ventilator 1200
VAM1200GVJU

FEATURES

- Superior performance with a high efficiency fan and the capability for use in a wide range of climates (5°F DB ~ 122°F DB and 80% RH or less) *
- Interlocked simultaneous operation with VRV indoor units
- Pre-cooling/heating control function to delay the start of ventilation during air conditioner start-up for higher energy savings
- Unique functions such as independent operation, interlock with other HVAC systems and automatic night purge to reduce cooling loads and increase energy savings
- Standard Limited Warranty: 10-year warranty on compressor and all parts

** Performance characteristics certified to AHRI Standard 1060 are only applicable to the cooling and heating operating conditions specified in the performance table of this document.*

- The cooling effectiveness shall be based on 95°F DB / 78°F WB for the entering supply air and 75°F DB / 63°F WB for the entering exhaust air, at a leaving supply airflow of both 100% and 75% of the rated airflow.
- The heating effectiveness shall be based on 35°F DB / 33°F WB for the entering supply air and 70°F DB / 58°F WB for the entering exhaust air, at a leaving supply airflow of both 100% and 75% of the rated airflow.

Submittal Data Sheet

Energy Recovery Ventilator 1200
VAM1200GVJU

PERFORMANCE

Indoor Unit Model No.	VAM1200GVJU	Indoor Unit Name	Energy Recovery Ventilator 1200
Cooling Input Power (KW):	1.72	Heating Input Power (KW):	1.72
Rated Cooling Supply Air Condition (°F DB / WB):	95 / 78	Rated Heating Supply Air Condition (°F DB / WB):	35 / 33
Rated Cooling Exhaust Air Condition (°F DB / WB):	75 / 63	Rated Heating Exhaust Air Condition (°F DB / WB):	70 / 58
Rated Cooling Sensible Effectiveness (100% Airflow):	68	Rated Heating Sensible Effectiveness (100% Airflow):	68
Rated Cooling Latent Effectiveness (100% Airflow):	34	Rated Heating Latent Effectiveness (100% Airflow):	42
Rated Cooling Sensible Effectiveness (75% Airflow):	72	Rated Heating Sensible Effectiveness (75% Airflow):	72
Rated Cooling Latent Effectiveness (75% Airflow):	37	Rated Heating Latent Effectiveness (75% Airflow):	47

** Certified in accordance with the AHRI ERV Certification Program, which is based on AHRI Standard 1060. Certified units may be found in the AHRI Directory at www.ahridirectory.org.*

Submittal Data Sheet

Energy Recovery Ventilator 1200
VAM1200GVJU

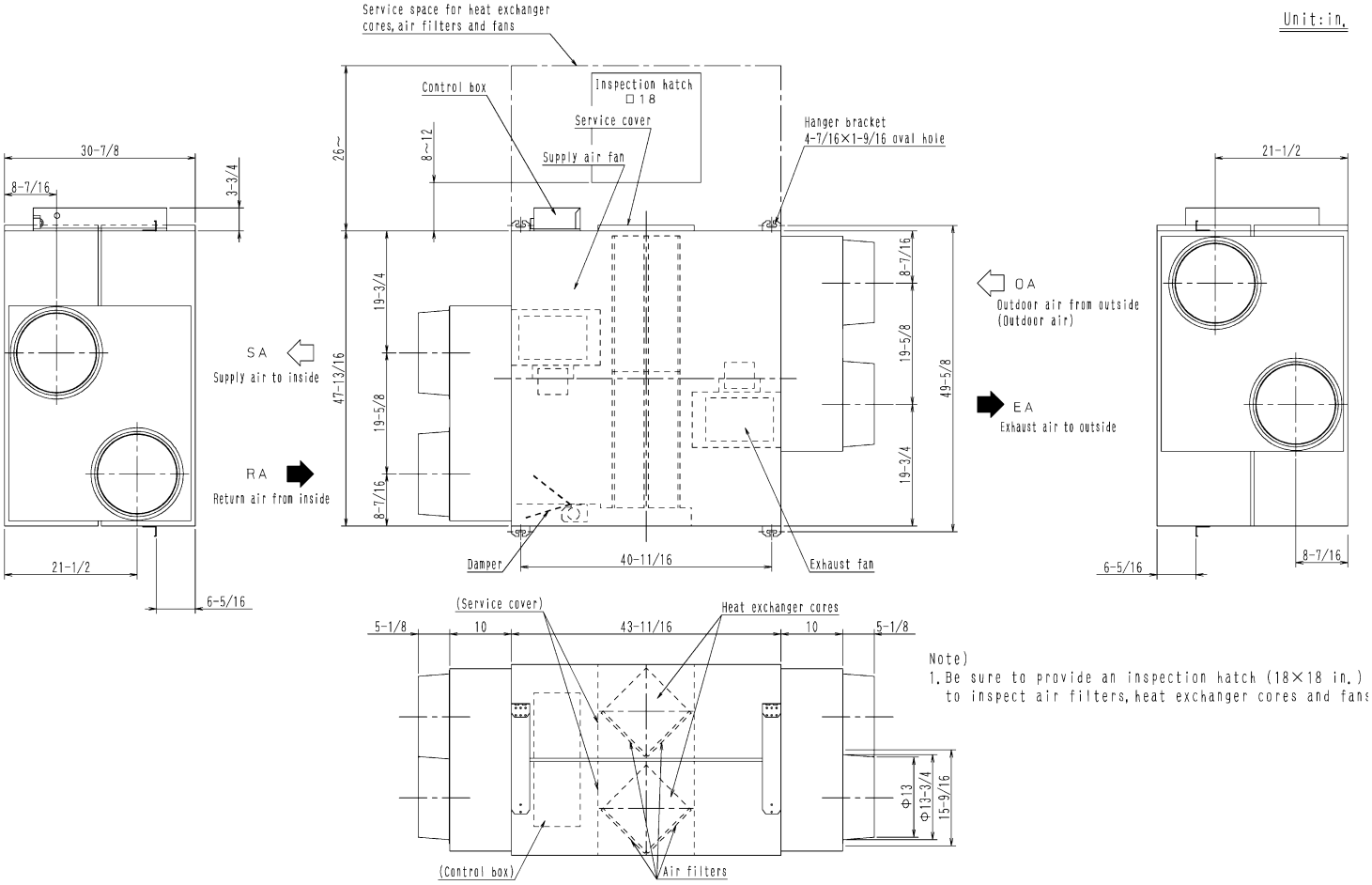
INDOOR UNIT DETAILS

Power Supply (V/Hz/Ph):	208-230/60/1	Airflow Rate (HH/H/L) (CFM):	1200/1200/930
Power Supply Connections:	L1, L2, Ground	Connection Duct Diameter (in):	14
Min Circuit Amps MCA (A):	8.1	Gas Pipe Connection (in):	NA
Max Overcurrent Protection MOP (A):	15	Liquid Pipe Connection (in):	NA
Dimensions (HxWxD) (in):	30-7/8 x 63-3/4 x 47-13/16	Condensate Pipe Connection (in):	NA
Net Weight (lb):	346	Sound Pressure @ 208V (HH/H/L) (dBA):	43/39/35
Ext Static Pressure (HH/H/L) (in W.C.)	0.56/0.16/0.24	Sound Power @ 208V (HH/H/L) (dB):	62.2/58.8/51.4

Submittal Data Sheet

Energy Recovery Ventilator 1200
VAM1200GVJU

DIMENSIONAL DRAWING



Note)
1. Be sure to provide an inspection hatch (18×18 in.) to inspect air filters, heat exchanger cores and fans

SINCE 1908
wessels company

SUBMITTAL

NLAP-SERIES

Models: NLAP-40 to NLAP-1100
Submittal Sheet No. A-1005B **Rev.** 1 12/27/2018

Job Name	_____	Submitted By	_____	Date	_____
Location	_____	Approved By	_____	Date	_____
	_____	Order No.	_____	Date	_____
Engineer	_____	Notes	_____		
Contractor	_____		_____		
Sales Rep.	_____		_____		

Description:
Wessels NLAP Tanks are ASME removable bladder type pre-charged expansion tanks. They are designed to absorb the expansion forces and control the pressure in heating / cooling systems. The system's expanded water (fully compatible with water/glycol mixtures) is contained in a full acceptance heavy-duty butyl bladder that prevents tank corrosion and waterlogging problems. All NLAP expansion tanks can be installed vertically or horizontally.

Construction:
Shell: Carbon Steel
Bladder: Heavy Duty Butyl
System Connection: Carbon Steel

Performance Limitations:
Maximum Design Temperature: 240°F
Maximum Design Pressure: 125 PSIG*

*200 & 250 PSIG available

MODEL NUMBER	PART NUMBER	TANK VOLUME (GALLONS)	TAGGING INFORMATION	QUANTITY
NLAP-40	22510040	11		
NLAP-60	22510060	15		
NLAP-100	22510100	25		
NLAP-150	22510150	39		
NLAP-220	22510220	58		
NLAP-325	22510325	85		
NLAP-400	22510400	104		
NLAP-560	22510560	147		
NLAP-600	22510600	158		
NLAP-700	22510700	185		
NLAP-815	22510815	215		
NLAP-950	22510950	250		
NLAP-1100	22511100	290		

Typical Specification:
Furnish and install, as shown on plans, a _____ gallon _____" diameter X _____" (high) pre-charged steel expansion tank with heavy-duty butyl bladder. The tank shall have NPT system connections and a 0.302"-32 charging valve connection (standard tire valve) to facilitate the on-site charging of the tank to meet system requirements. The tank shall be fitted with lifting rings and a floor mounting skirt for vertical installation. The tank must be constructed in accordance with most recent addendum of Section VIII Division 1 of the ASME Boiler and Pressure Vessel Code.

Each tank shall be Wessels model number NLAP-_____ or approved equal.

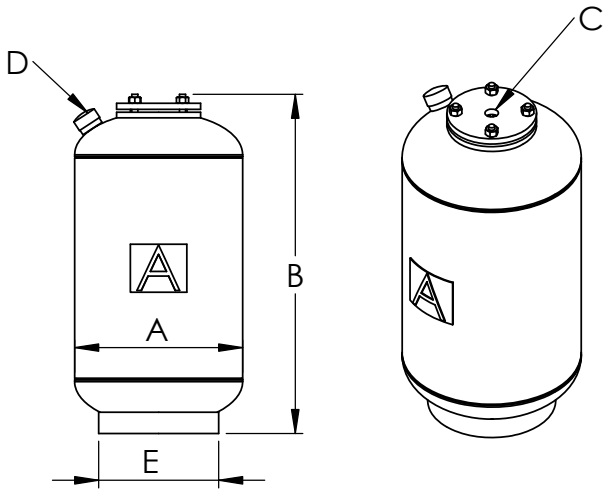
SINCE 1908 wessels company
101 Tank Street Greenwood, IN 46143
P: 317-888-9800 F: 317-865-7411
www.westank.com

SINCE 1908 wessels company

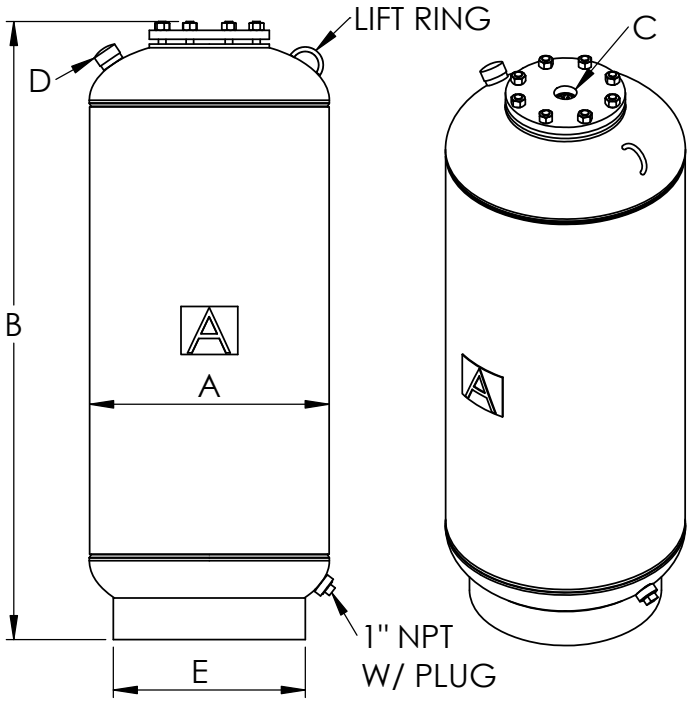
SUBMITTAL

NLAP-SERIES

Models: NLAP-40 to NLAP-1100
Submittal Sheet No. A-1005B **Rev.** 1 12/27/2018



NLAP 40 & NLAP 60



NLAP 100 THROUGH NLAP 1100

Dimensions & Weights:

Model Number	Dimensions in Inches							Approx. Shipping Weight (lbs)
	A	B	C	D	E	F	G	
NLAP-40	12	27	3/4	0.302"-32NC	10	9 1/2	1 1/4	42
NLAP-60	14	26			10			52
NLAP-100	16	32	1		11			77
NLAP-150		48 1/2				11 1/2	1 1/2	115
NLAP-220	20		1 1/2		16			170
NLAP-325	24	50 1/2			20	18	2	225
NLAP-400		57 1/2						250
NLAP-560	30	53			24	24		325
NLAP-600		58						350
NLAP-700		66				30		400
NLAP-815	36	58			30	38		475
NLAP-950		66				44		540
NLAP-1100		75				50		625

Notes:

- Tanks are factory pre-charged at 12 psi and field adjustable.
- California code-sight glass is available upon request.
- Available with mounting clips.
- Drain plug is on air side of tank. Remove only if bladder is compromised.

SINCE 1908 wessels company
101 Tank Street Greenwood, IN 46143
P: 317-888-9800 F: 317-865-7411
www.westank.com

Job Name: ESD-635-26x26 Cut Sheet
Tag: MK-1
Quantity: 1
Printed Date: January 2, 2024

Model: ESD-635-26x26

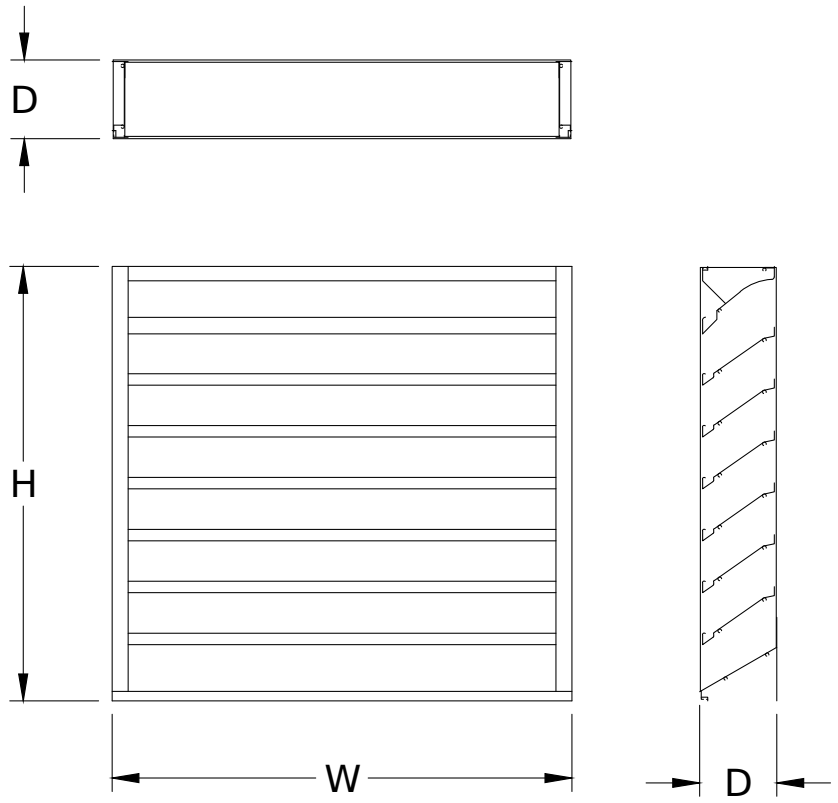
6 in. Drainable Blade Louver

Certifications/special requirements: AMCA-500-L (Air), AMCA-500-L (Water)

Construction	
Material	Aluminum
Blade Type	All
Blade Orientation	Horizontal
Weight (lbs)	18
Mullion Type	No Preference

Dimensional	
Nominal Width (in)	26
Nominal Height (in)	26
Actual Width (in)	25.75
Actual Height (in)	25.75
Blade Depth (in)	6
Sections Wide	1
Sections High	1

Performance	
Application	Intake
Volume (CFM)	1,800
Pressure Drop (in. wg)	0.1
Free Area Velocity (ft/min)	835
Free Area (ft^2)	2.2
Air Density (lbs/ft^3)	0.075



*Louvers are tested to figure 5.5-6.5
*Sections wide x high are as configured with a base mill finish channel frame product and may vary depending on options selected.

Greenheck Fan Corporation certifies that the louver shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Program. The AMCA Certified Ratings Seal applies to air performance and water penetration ratings.

Job Name: ESD-635-84x60 Cut Sheet
Tag: MK-1
Quantity: 1
Printed Date: January 2, 2024

Model: ESD-635-84x60

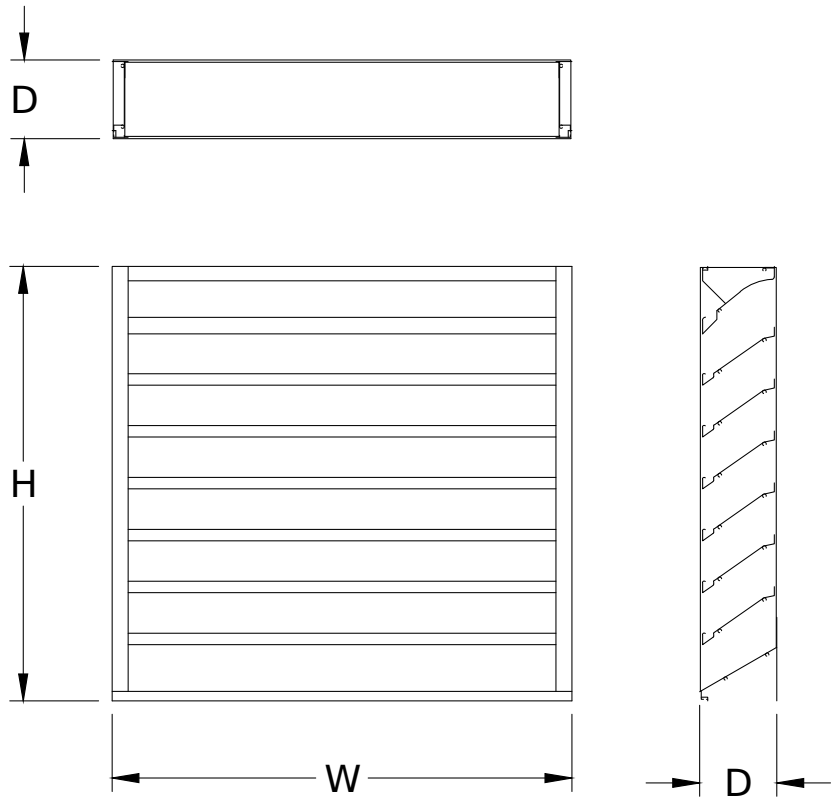
6 in. Drainable Blade Louver

Certifications/special requirements: AMCA-500-L (Air), AMCA-500-L (Water)

Construction	
Material	Aluminum
Blade Type	All
Blade Orientation	Horizontal
Weight (lbs)	137
Mullion Type	No Preference

Dimensional	
Nominal Width (in)	84
Nominal Height (in)	60
Actual Width (in)	83.75
Actual Height (in)	59.75
Blade Depth (in)	6
Sections Wide	1
Sections High	1

Performance	
Application	Intake
Volume (CFM)	20,000
Pressure Drop (in. wg)	0.13
Free Area Velocity (ft/min)	931
Free Area (ft^2)	21.5
Air Density (lbs/ft^3)	0.075



*Louvers are tested to figure 5.5-6.5
*Sections wide x high are as configured with a base mill finish channel frame product and may vary depending on options selected.

Greenheck Fan Corporation certifies that the louver shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Program. The AMCA Certified Ratings Seal applies to air performance and water penetration ratings.

Job Name: ESD-635-20x20 Cut Sheet
Tag: MK-1
Quantity: 1
Printed Date: January 2, 2024

Model: ESD-635-20x20

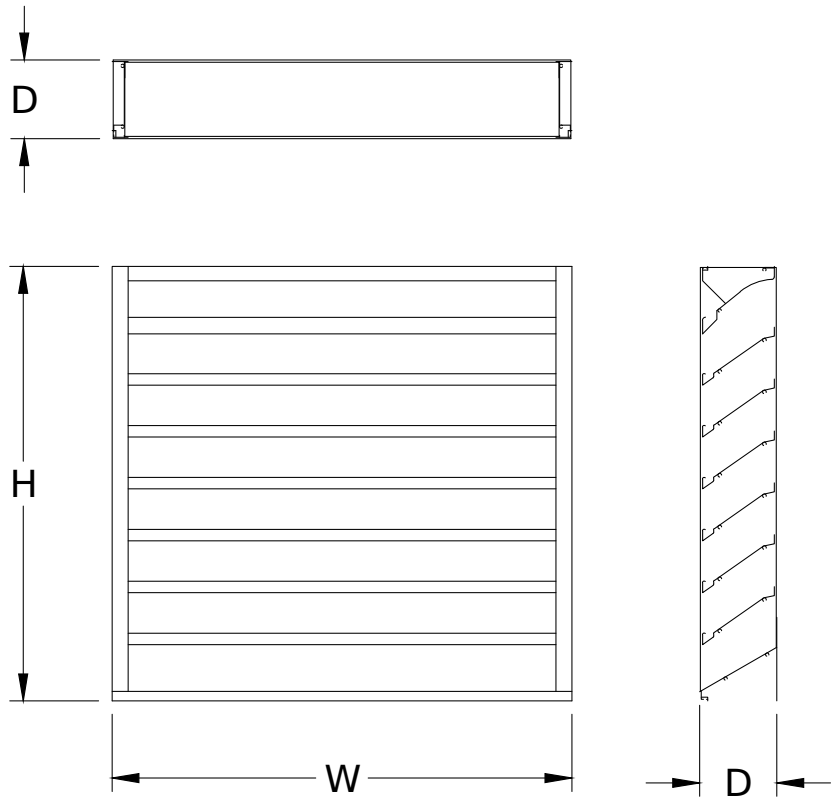
6 in. Drainable Blade Louver

Certifications/special requirements: AMCA-500-L (Air), AMCA-500-L (Water)

Construction	
Material	Aluminum
Blade Type	All
Blade Orientation	Horizontal
Weight (lbs)	11
Mullion Type	No Preference

Dimensional	
Nominal Width (in)	20
Nominal Height (in)	20
Actual Width (in)	19.75
Actual Height (in)	19.75
Blade Depth (in)	6
Sections Wide	1
Sections High	1

Performance	
Application	Intake
Volume (CFM)	900
Pressure Drop (in. wg)	0.1
Free Area Velocity (ft/min)	811
Free Area (ft^2)	1.1
Air Density (lbs/ft^3)	0.075



*Louvers are tested to figure 5.5-6.5
*Sections wide x high are as configured with a base mill finish channel frame product and may vary depending on options selected.

Greenheck Fan Corporation certifies that the louver shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Program. The AMCA Certified Ratings Seal applies to air performance and water penetration ratings.

Job Name: ESD-635-24x24 Cut Sheet
Tag: MK-1
Quantity: 1
Printed Date: February 22, 2024

Model: ESD-635-24x24

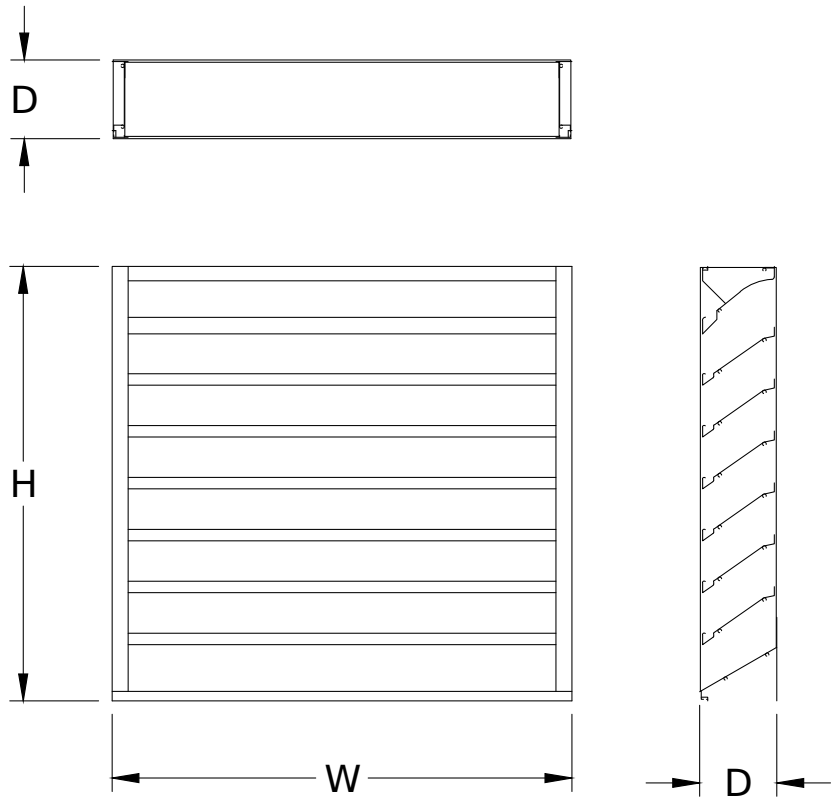
6 in. Drainable Blade Louver

Certifications/special requirements: AMCA-500-L (Air), AMCA-500-L (Water)

Construction	
Material	Aluminum
Blade Type	All
Blade Orientation	Horizontal
Weight (lbs)	15
Mullion Type	No Preference

Dimensional	
Nominal Width (in)	24
Nominal Height (in)	24
Actual Width (in)	23.75
Actual Height (in)	23.75
Blade Depth (in)	6
Sections Wide	1
Sections High	1

Performance	
Application	Intake
Volume (CFM)	1,200
Pressure Drop (in. wg)	0.06
Free Area Velocity (ft/min)	659
Free Area (ft^2)	1.8
Air Density (lbs/ft^3)	0.075



*Louvers are tested to figure 5.5-6.5
*Sections wide x high are as configured with a base mill finish channel frame product and may vary depending on options selected.

Greenheck Fan Corporation certifies that the louver shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Program. The AMCA Certified Ratings Seal applies to air performance and water penetration ratings.

Job Name: ESD-635-30x30 Cut Sheet
Tag: MK-1
Quantity: 1
Printed Date: January 12, 2024

Model: ESD-635-30x30

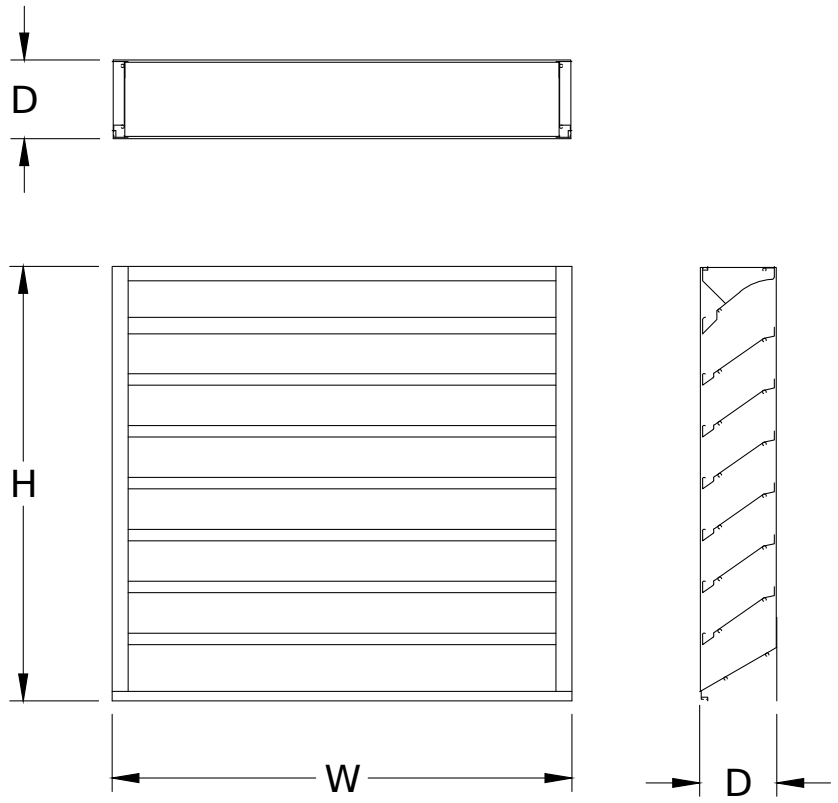
6 in. Drainable Blade Louver

Certifications/special requirements: AMCA-500-L (Air), AMCA-500-L (Water)

Construction	
Material	Aluminum
Blade Type	Drainable
Blade Orientation	Horizontal
Weight (lbs)	24
Mullion Type	No Preference

Dimensional	
Nominal Width (in)	30
Nominal Height (in)	30
Actual Width (in)	29.75
Actual Height (in)	29.75
Blade Depth (in)	6
Sections Wide	1
Sections High	1

Performance	
Application	Intake
Volume (CFM)	2,400
Pressure Drop (in. wg)	0.09
Free Area Velocity (ft/min)	778
Free Area (ft^2)	3.1
Air Density (lbs/ft^3)	0.075



*Louvers are tested to figure 5.5-6.5
*Sections wide x high are as configured with a base mill finish channel frame product and may vary depending on options selected.

Greenheck Fan Corporation certifies that the louver shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Program. The AMCA Certified Ratings Seal applies to air performance and water penetration ratings.

Job Name: ESD-635-40x40 Cut Sheet
Tag: MK-1
Quantity: 1
Printed Date: January 4, 2024

Model: ESD-635-40x40

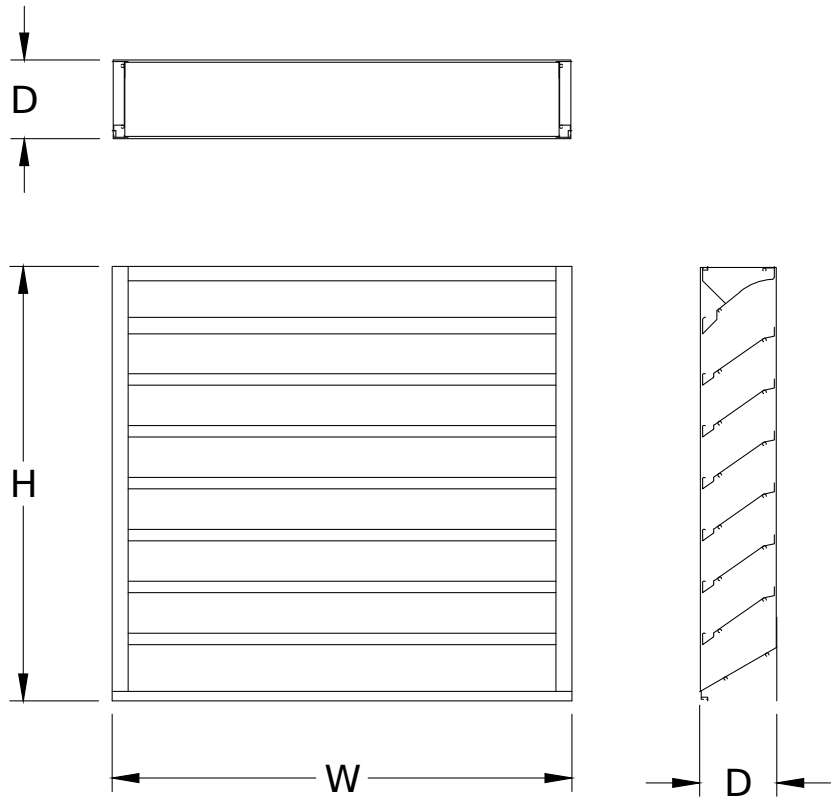
6 in. Drainable Blade Louver

Certifications/special requirements: AMCA-500-L (Air), AMCA-500-L (Water)

Construction	
Material	Aluminum
Blade Type	All
Blade Orientation	Horizontal
Weight (lbs)	43
Mullion Type	No Preference

Dimensional	
Nominal Width (in)	40
Nominal Height (in)	40
Actual Width (in)	39.75
Actual Height (in)	39.75
Blade Depth (in)	6
Sections Wide	1
Sections High	1

Performance	
Application	Intake
Volume (CFM)	4,800
Pressure Drop (in. wg)	0.08
Free Area Velocity (ft/min)	754
Free Area (ft^2)	6.4
Air Density (lbs/ft^3)	0.075



*Louvers are tested to figure 5.5-6.5
*Sections wide x high are as configured with a base mill finish channel frame product and may vary depending on options selected.

Greenheck Fan Corporation certifies that the louver shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Program. The AMCA Certified Ratings Seal applies to air performance and water penetration ratings.

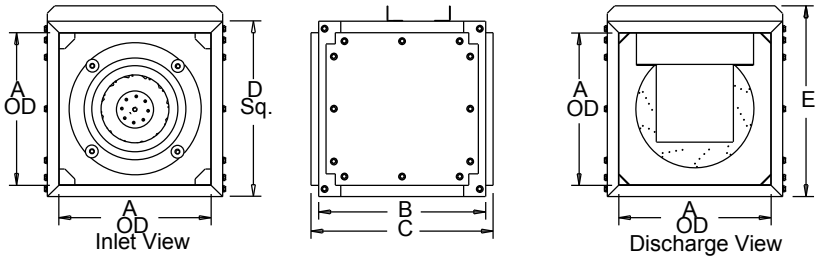
COOK

MARK: EF-A110	
PROJECT: MCC Automotive	
DATE: 02/5/2024	

SQN-D VF

Centrifugal Square Inline
Direct Drive
Preprogrammed EC
Electronically Commutated Vari-Flow® Motor

STANDARD CONSTRUCTION FEATURES:
All aluminum wheel - Galvanized 18 gauge steel housing - Three removable access doors - Closed cell neoprene gasketing - Inlet and discharge duct collars - Universal mounting feet - Preprogrammed EC electronically commutated Vari-Flow® motor/drive package - Transit tested packaging.



Performance

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power (HP)	FEG	Speed Control
1	135SQN17DO91VF	900	.600	1624	.327	n/a(<1HP)	EC

Altitude (ft): 1024 Temperature (F): 70

Motor Information

HP	RPM*	Volts/Ph/Hz	Enclosure	RLA
1/2	1725	115/1/60	OPEN -EC	6.4

Vari-Flow

*Motor programmed to max speed of 1725 RPM.
RLA based on motor manufacturer's data at programmed HP and max RPM.
Motor is electronically/thermally protected.

Sound Data Sound Power by Octave Band

	1	2	3	4	5	6	7	8	LwA	dBA	Sones
Inlet	82	80	74	75	70	64	58	51	76	64	12.9
Outlet	86	79	78	78	74	73	64	55	80	68	16.2

- Distance from Sound source 5 ft

Accessories:
EXTERNAL SIGNAL SPEED CONTROL
CTL & XFMR BY OTHERS
91 ORIFICE PLATE

Dimensions (inches)

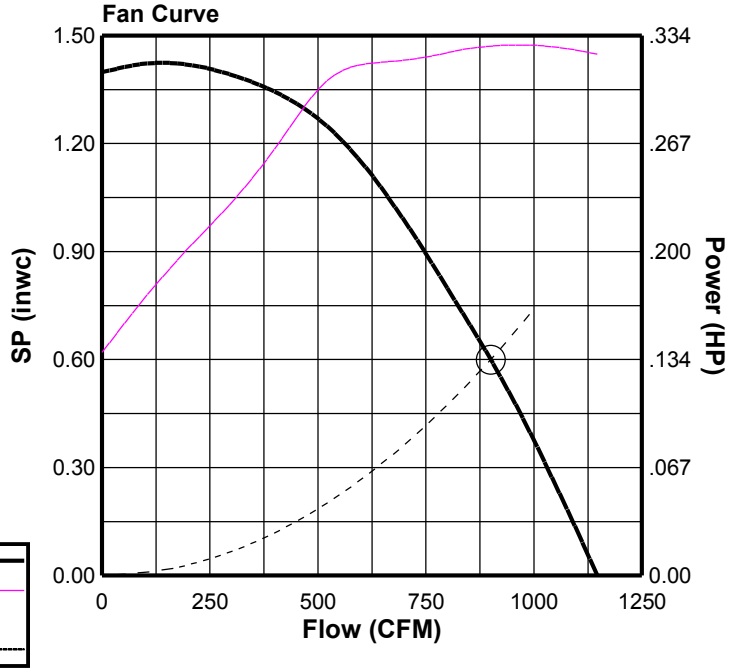
A	18
B	20-1/4
C	22-1/4
D Sq	20-3/4
E	22-5/16
Housing Gauge	18

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	163	Unit	91

***Includes fan, motor & accessories.

Fan Curve



Fan Curve Legend

CFM vs SP	———
CFM vs HP	———
Point of Operation	◯
System Curve	- - - - - -

MARK: EF-A110
PROJECT: MCC Automotive
DATE: 02/5/2024

SQN-D VF

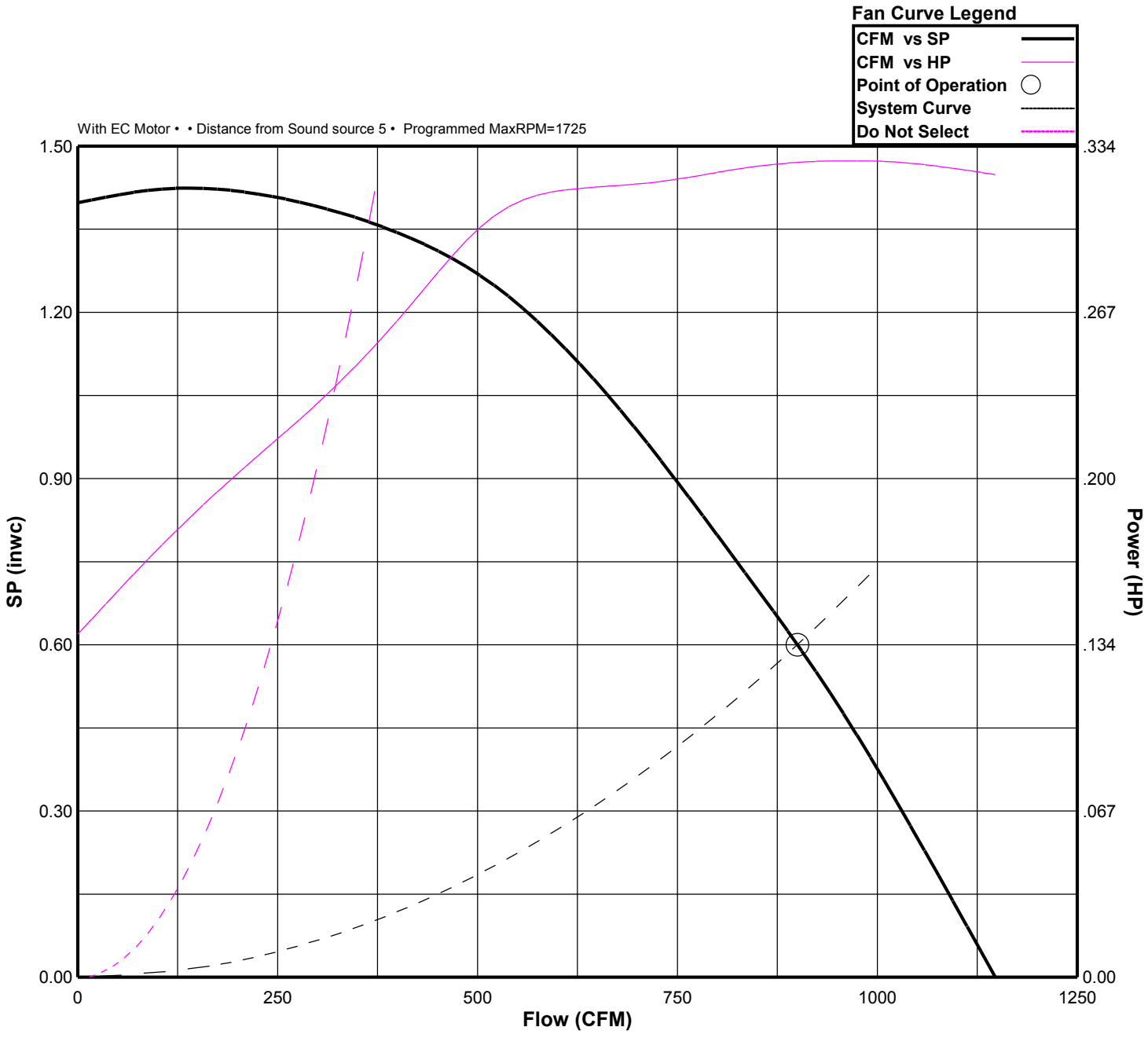
Performance

Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power (HP)	FEG	OVEL (fpm)	TSPD (fpm)	SE	Temp (°F)	ALT (ft)
135SQN17DO91VF	900	.600	1624	.327	n/a(<1HP)	400	5740	26%	70	1024

Motor Information

HP	RPM*	Volts/Ph/Hz	Enclosure	RLA
1/2	1725	115/1/60	OPEN -EC	6.4

*Motor programmed to max speed of 1725 RPM.
RLA based on motor manufacturer's data at programmed HP and max RPM.
Motor is electronically/thermally protected.



COOK

SQN-D VF

MARK: EF-A110
PROJECT: MCC Automotive
DATE: 02/5/2024

AMCA License Information

Loren Cook Company certifies that the 135SQN17DO91VF 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.

Performance certified is for installation type B: free inlet, ducted outlet. Power rating (BHP/kW) does not include transmission losses. Performance ratings do not include the effects of appurtenances (accessories). The sound power level ratings shown are in decibels, referred to 10(-12) watts calculated per AMCA Standard 301. Values shown are for inlet Lwi, LwiA and outlet Lwo, LwoA sound power levels for installation type B: free inlet, ducted outlet. Outlet ratings include the effects of duct end correction. The A-weighted sound ratings shown have been calculated per AMCA Standard 301. The AMCA International licensed air and/or sound performance data has been modified for installation, appurtenances or accessories, etc. not included in the certified data. The modified performance is not AMCA licensed but is provided to aid in selection and applications of the product.

The sound ratings shown are loudness values in hemispherical sones at 5 ft. in a hemispherical free field calculated per AMCA Standard 301. Values shown are for Installation type B: free inlet, ducted outlet hemispherical sone levels. Outlet ratings do not include the effect of duct end correction. The dBA levels shown have been calculated for a distance of 5 ft in a hemispherical free field. The AMCA Certified Ratings Seal applies to Octave Bands and LwA only. Sone ratings and dBA levels are not AMCA International licensed.

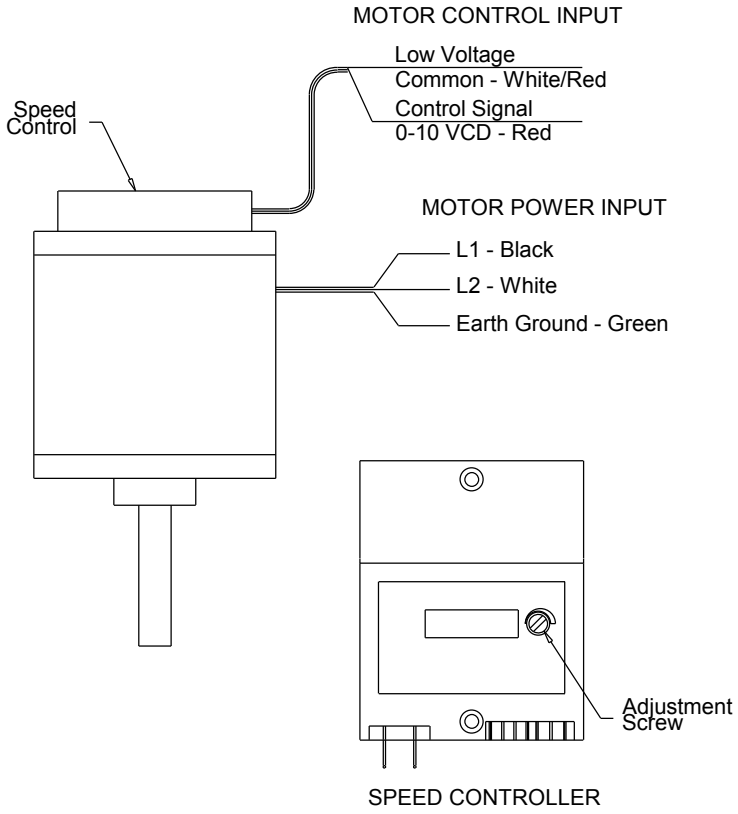
PROJECT: MCC Automotive
DATE: 02/5/2024

Speed Control

External Speed Control Electronically Commutated (EC) Motor Type N

STANDARD CONSTRUCTION FEATURES:

Vari-Flow EC Motors are available in 1/8 to 1 HP for 120V or 208-230V -Single phase applications have a adjustable speed range of 500 to 1725 or 500 to 2800 - Some motors come with a factory programmed maximum RPM for specific applications - External signal speed control requires a 0-10 VDC control signal to adjust speed of the motor - The motor will operate from 2-10 VDC and turns off when the control signal is below 1.9 VDC - Dial on speed control must be set to 0 for proper external speed control operation.



Dimensions (inches)

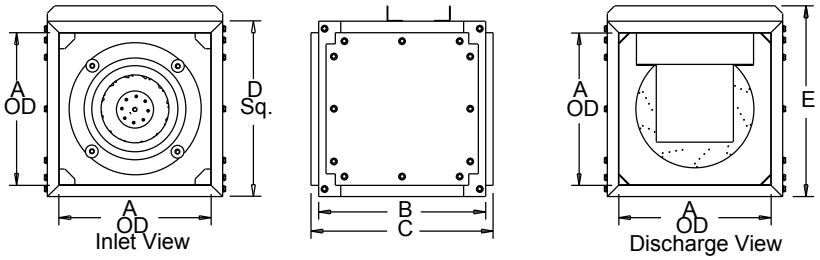
Mark	Qty	Description
EF-A110	1	OPEN -1/2HP - 115V/1 PH/ 60 1725/0000-EC

MARK: EF-B125
PROJECT: MCC Automotive
DATE: 01/18/2024

SQN-D VF

Centrifugal Square Inline
Direct Drive
Preprogrammed EC
Electronically Commutated Vari-Flow® Motor

STANDARD CONSTRUCTION FEATURES:
All aluminum wheel - Galvanized 18 gauge steel housing - Three removable access doors - Closed cell neoprene gasketing - Inlet and discharge duct collars - Universal mounting feet - Preprogrammed EC electronically commutated Vari-Flow® motor/drive package - Transit tested packaging.



Performance

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power (HP)	FEG	Speed Control
1	135SQN17D (VF)	1740	.500	1483	.380	n/a(<1HP)	EC

Altitude (ft): 1024 Temperature (F): 70

Motor Information

HP	RPM*	Volts/Ph/Hz	Enclosure	RLA
1/2	1725	115/1/60	OPEN -EC	6.4

*Motor programmed to max speed of 1599 RPM.
RLA based on motor manufacturer's data at programmed HP and max RPM.
Motor is electronically/thermally protected.

Dimensions (inches)

A	18
B	20-1/4
C	22-1/4
D Sq	20-3/4
E	22-5/16
Housing Gauge	18

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	162	Unit	90

***Includes fan, motor & accessories.

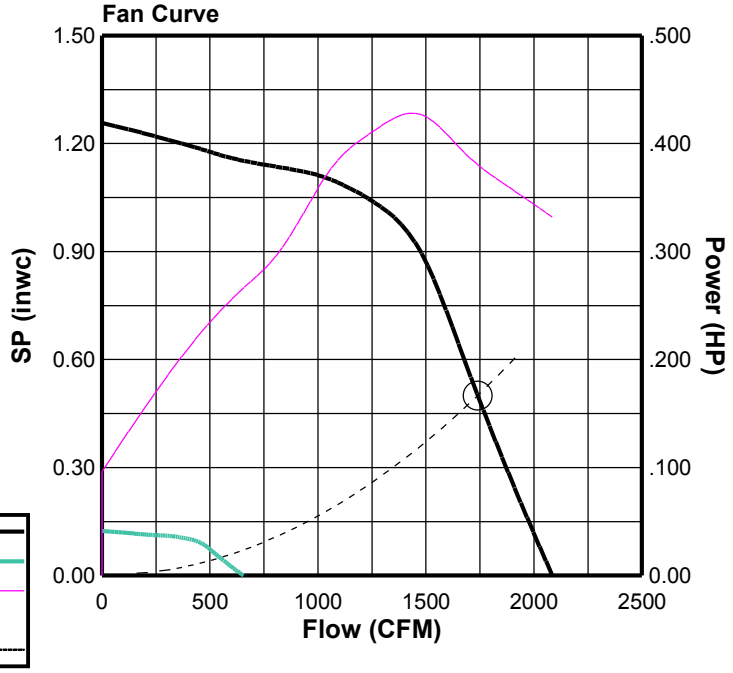
Sound Data **Sound Power by Octave Band**

	1	2	3	4	5	6	7	8	LwA	dBA	Sones
Inlet	65	72	78	76	70	69	63	53	77	66	13.0
Outlet	72	75	70	68	70	69	62	53	75	63	11.9

- Distance from Sound source 5 ft

Accessories:
EXTERNAL SIGNAL SPEED CONTROL
CTL & XFMR BY OTHERS

Fan Curve



Fan Curve Legend

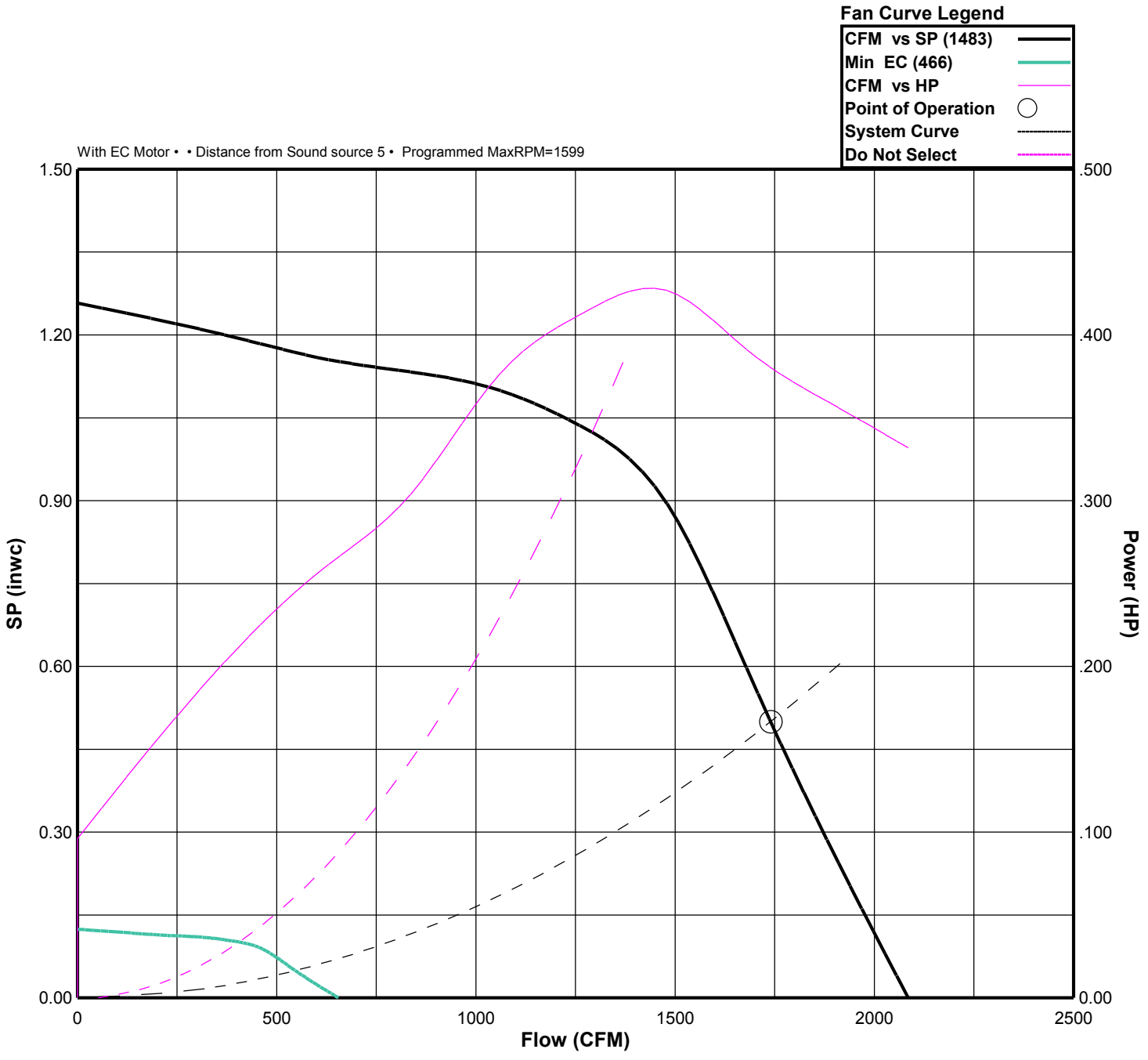
CFM vs SP (1483)
Min EC (466)
CFM vs HP
Point of Operation
System Curve

MARK: EF-B125
PROJECT: MCC Automotive
DATE: 01/18/2024

SQN-D VF

Performance

Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power (HP)	FEG	OVEL (fpm)	TSPD (fpm)	SE	Temp (°F)	ALT (ft)
135SQN17D (VF)	1740	.500	1483	.380	n/a(<1HP)	773	5241	36%	70	1024



COOK

SQN-D VF

MARK: EF-B125
PROJECT: MCC Automotive
DATE: 01/18/2024

AMCA License Information

Loren Cook Company certifies that the 135SQN17D 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.

Performance certified is for installation type B: free inlet, ducted outlet. Power rating (BHP/kW) does not include transmission losses. Performance ratings do not include the effects of appurtenances (accessories). The sound power level ratings shown are in decibels, referred to 10(-12) watts calculated per AMCA Standard 301. Values shown are for inlet Lwi, LwiA and outlet Lwo, LwoA sound power levels for installation type B: free inlet, ducted outlet. Outlet ratings include the effects of duct end correction. The A-weighted sound ratings shown have been calculated per AMCA Standard 301.

The sound ratings shown are loudness values in hemispherical sones at 5 ft. in a hemispherical free field calculated per AMCA Standard 301. Values shown are for Installation type B: free inlet, ducted outlet hemispherical sone levels. Outlet ratings do not include the effect of duct end correction. The dBA levels shown have been calculated for a distance of 5 ft in a hemispherical free field. The AMCA Certified Ratings Seal applies to Octave Bands and LwA only. Sone ratings and dBA levels are not AMCA International licensed.

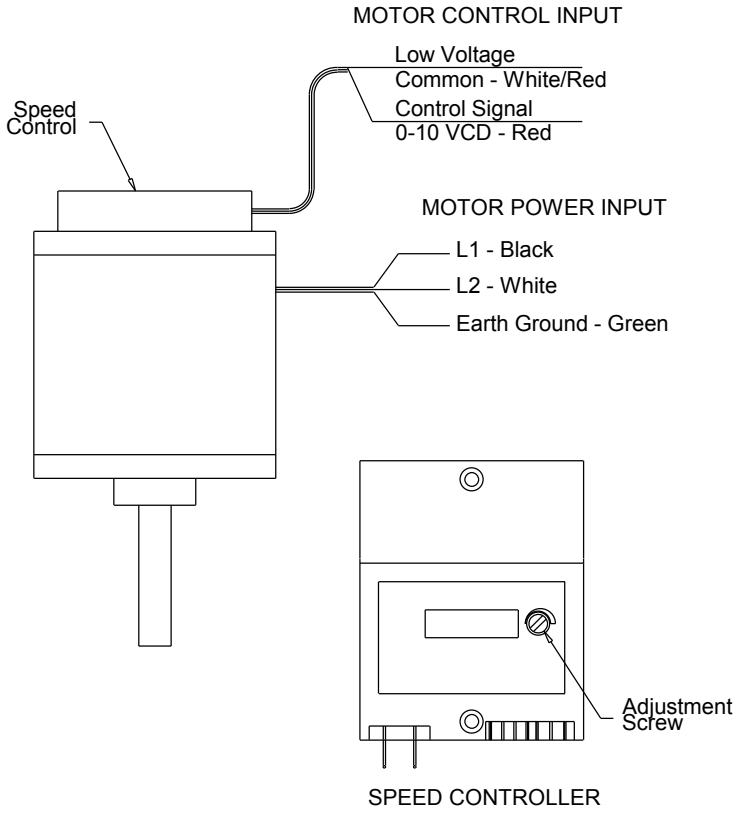
PROJECT: MCC Automotive
DATE: 01/18/2024

Speed Control

External Speed Control Electronically Commutated (EC) Motor Type N

STANDARD CONSTRUCTION FEATURES:

Vari-Flow EC Motors are available in 1/8 to 1 HP for 120V or 208-230V -Single phase applications have a adjustable speed range of 500 to 1725 or 500 to 2800 - Some motors come with a factory programmed maximum RPM for specific applications - External signal speed control requires a 0-10 VDC control signal to adjust speed of the motor - The motor will operate from 2-10 VDC and turns off when the control signal is below 1.9 VDC - Dial on speed control must be set to 0 for proper external speed control operation.



Dimensions (inches)

Mark	Qty	Description
EF-B125	1	OPEN -1/2HP - 115V/1 PH/ 60 1725/0000-EC

ROOF MOUNTED
EXHAUST FAN

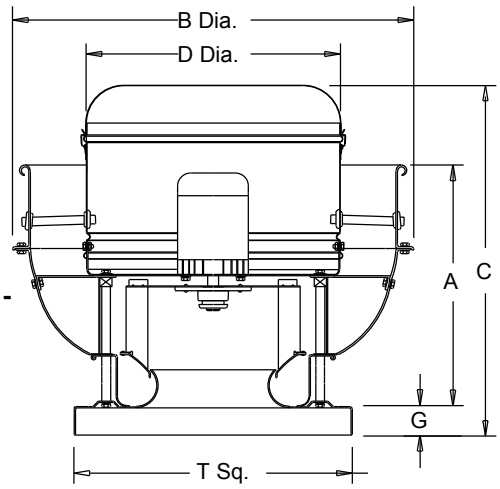
MARK: EF-B203
PROJECT: MCC Automotive
DATE: 01/25/2024

ACRU-D VF

Upblast Centrifugal Exhaust Ventilator Roof Mounted/Direct Drive Electronically Commutated Vari-Flow® Motor

STANDARD CONSTRUCTION FEATURES:

All aluminum housing - Backward inclined all aluminum wheel - Two piece top cap with stainless steel quick release latches - (size 120 - 300) - Welded curb cap corners - Birdscreen - Permanently lubricated ball bearing motors - Corrosion resistant fasteners - Transit tested packaging.



Performance

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power (HP)	FEG	Speed Control
1	101R17DOR70VF	200	.250	1238	.047	n/a(<1HP)	EC

Altitude (ft): 1024 Temperature (F): 70

Motor Information

HP	RPM*	Volts/Ph/Hz	Enclosure	RLA
1/8	1725	115/1/60	OPEN -EC	1.9

*Motor programmed to max speed of 1688 RPM.
RLA based on motor manufacturer's data at programmed HP and max RPM.
Motor is electronically/thermally protected.

Sound Data Inlet Sound Power by Octave Band

1	2	3	4	5	6	7	8	LwA	dBA	Sones
72	75	76	59	50	51	41	34	69	57	8.0

- Distance from Sound source 5 ft

Accessories:

EXTERNAL SIGNAL SPEED CONTROL
CTL & XFMR BY OTHERS
70 ORIFICE PLATE

Dimensions (inches)

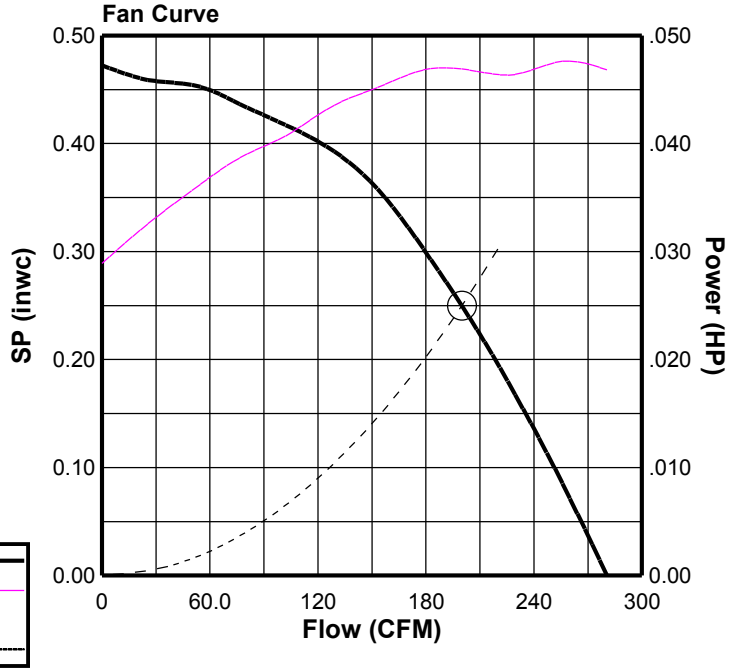
A	12-1/2
B	24-1/4
C	20-3/16
D	16-3/4
G	2
T Sq.	18
Roof Open. Sq.*	13-1/2

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	35	Unit	25

* Roof opening size for curbs supplied by Cook only.
***Includes fan, motor & accessories.

Fan Curve



Fan Curve Legend

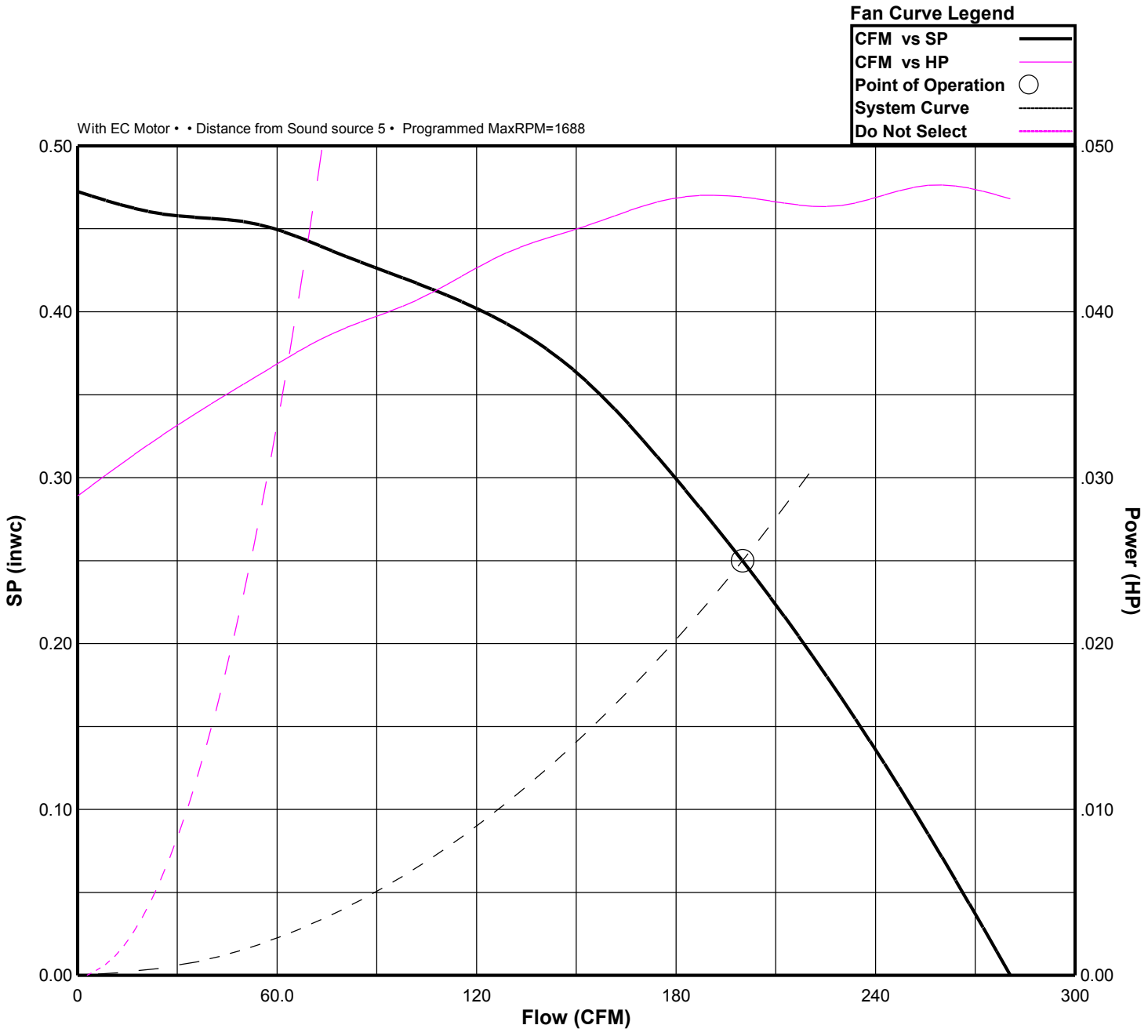
CFM vs SP	———
CFM vs HP	———
Point of Operation	◯
System Curve	- - - - - -

MARK: EF-B203
PROJECT: MCC Automotive
DATE: 01/25/2024

ACRU-D VF

Performance

Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power (HP)	FEG	OVEL (fpm)	TSPD (fpm)	SE	Temp (°F)	ALT (ft)
101R17DOR70VF	200	.250	1238	.047	n/a(<1HP)	146	3241	16%	70	1024



AMCA License Information

Loren Cook Company certifies that the 101R17DOR70VF 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.

Performance certified is for installation type B: free inlet, ducted outlet. Power rating (BHP/kW) does not include transmission losses. Performance ratings do not include the effects of appurtenances (accessories). The sound ratings shown are loudness values in hemispherical sones at 5 ft. in a hemispherical free field calculated per AMCA Standard 301. Values shown are for Installation type B: free inlet hemispherical sone levels. The AMCA International licensed air and/or sound performance data has been modified for installation, appurtenances or accessories, etc. not included in the certified data. The modified performance is not AMCA licensed but is provided to aid in selection and applications of the product.

The sound power level ratings shown are in decibels, referred to 10(-12) watts calculated per AMCA Standard 301. Values shown are for inlet Lwi and LwiA sound power levels for installation type B: free inlet, ducted outlet. Ratings do not include the effects of duct end correction. The A-weighted sound ratings shown have been calculated per AMCA Standard 301. The dBA levels shown have been calculated for a distance of 5 ft in a hemispherical free field. The AMCA Certified Ratings Seal applies to sone ratings only. Octave Band, LwA and dBA levels are not AMCA International licensed.

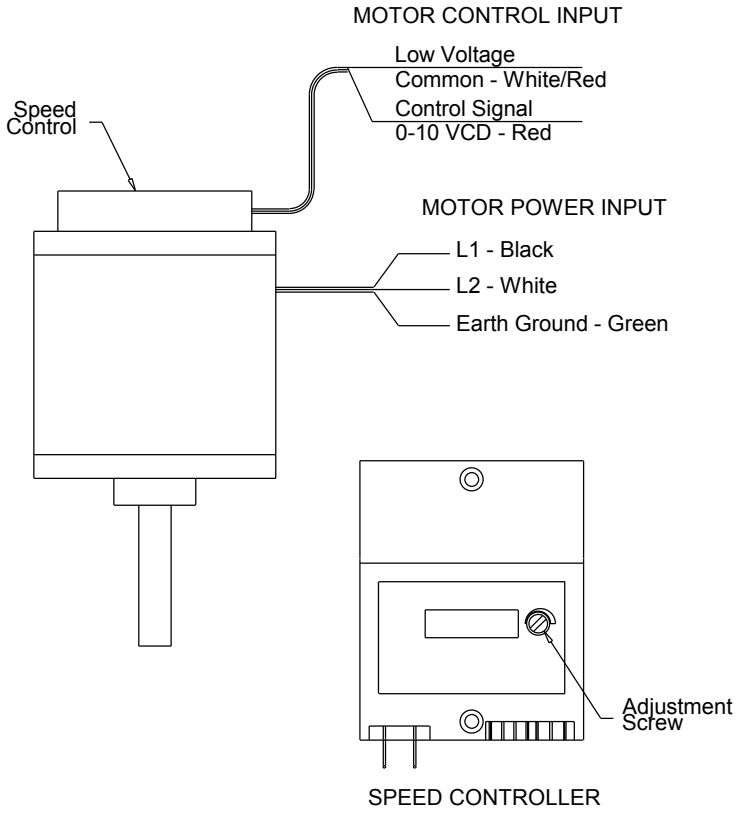
PROJECT: MCC Automotive
DATE: 01/25/2024

Speed Control

External Speed Control Electronically Commutated (EC) Motor Type N

STANDARD CONSTRUCTION FEATURES:

Vari-Flow EC Motors are available in 1/8 to 1 HP for 120V or 208-230V -Single phase applications have a adjustable speed range of 500 to 1725 or 500 to 2800 - Some motors come with a factory programmed maximum RPM for specific applications - External signal speed control requires a 0-10 VDC control signal to adjust speed of the motor - The motor will operate from 2-10 VDC and turns off when the control signal is below 1.9 VDC - Dial on speed control must be set to 0 for proper external speed control operation.



Dimensions (inches)

Mark	Qty	Description
EF-B203	1	OPEN -1/8HP - 115V/1 PH/ 60 1725/0000-EC

COOK

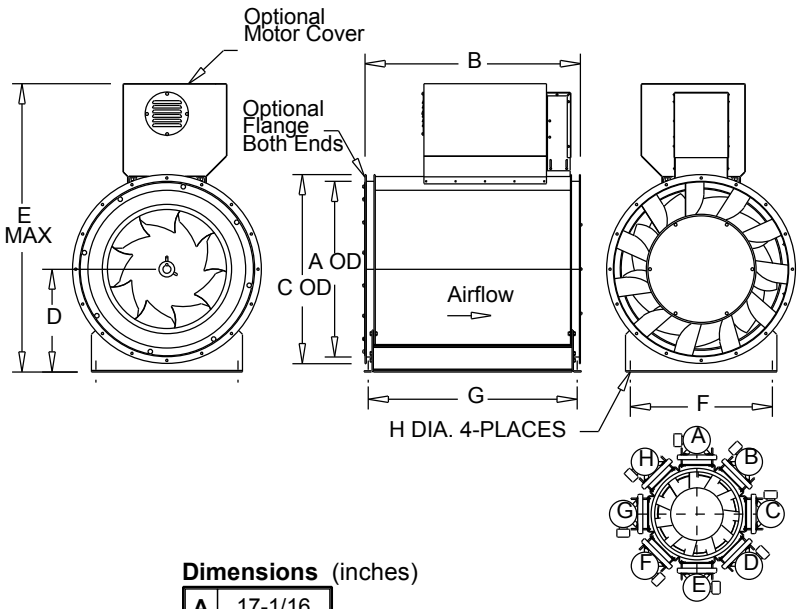
MARK: EF-A108H
PROJECT: MCC Automotive
DATE: 02/1/2024

QMX

Mixed Flow Inline
Horizontal Mount
Belt Drive
Arrangement 9
Level 2

STANDARD CONSTRUCTION FEATURES:

High efficiency mixed flow wheel - Continuously welded steel housing with Lorenized powder coating - Welded aerodynamic straightening vanes - Integral inlet and outlet collars for slip fit duct connections - Adjustable motor plate utilizing threaded studs for positive belt tensioning - L10/40K Concentric locking regreasable bearings with extended lube lines - Belt guard - Lifting lugs - Adjustable mounting feet.



MOTOR POSITION CHART
(View Facing Outlet)
Mounting positions are
field adjustable.

Performance (*Bhp includes 6% drive loss)

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power* (HP)	FEG	FEI
1	120QMX	3600	4.00	3662	4.28	71	1.04

Altitude (ft): 1024 Temperature (F): 70

Motor Information

HP	RPM	Volts/Ph/Hz	Enclosure	FLA	Position	Mounted
5	3450	460/3/60	ODP -PE	7.6	C	Yes

NEMA Premium® efficiency motor per MG-1 (2014) Table 12-12
FLA based on NEC (2017) Table 430.250

Fan Information

Level	OVel(fpm)	Fan Mount
2	2304	Horz. Ceiling

Dimensions (inches)

A	17-1/16
B	24
C	20-1/16
D	10-1/2
E	36-11/16
F	15-1/2
G	22-1/2
H	1/2

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	364	Unit	239

***Includes fan, motor & accessories.

Sound Data Sound Power by Octave Band

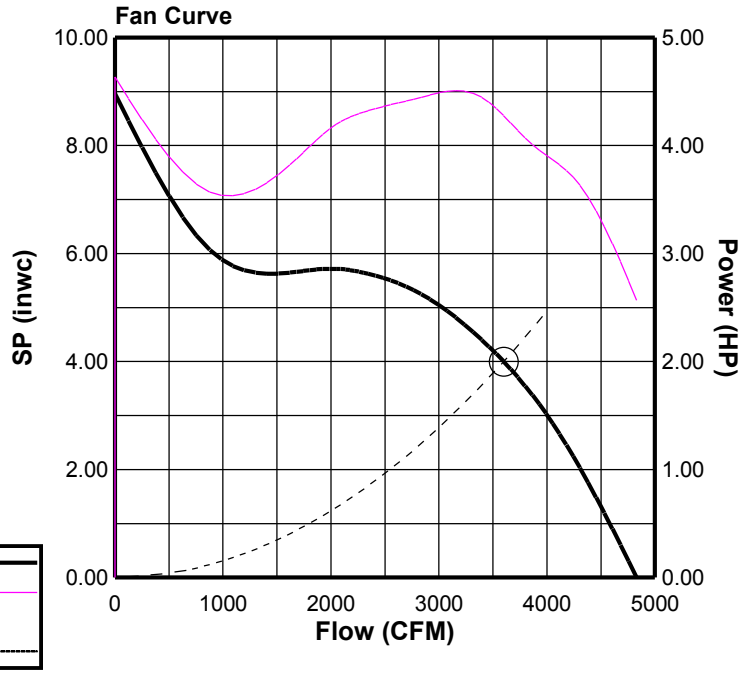
	1	2	3	4	5	6	7	8	LwA	dBA
Inlet	94	100	93	89	84	84	83	78	93	81
Outlet	102	102	87	89	83	83	82	77	92	80

- Distance from Sound source 5 ft

Accessories:

Premium Efficiency Motor (Min. 89.5%)

Fan Curve



Fan Curve Legend

CFM vs SP	———
CFM vs HP	———
Point of Operation	◯
System Curve	- - - - - -

MARK: EF-A108H
PROJECT: MCC Automotive
DATE: 02/1/2024

QMX

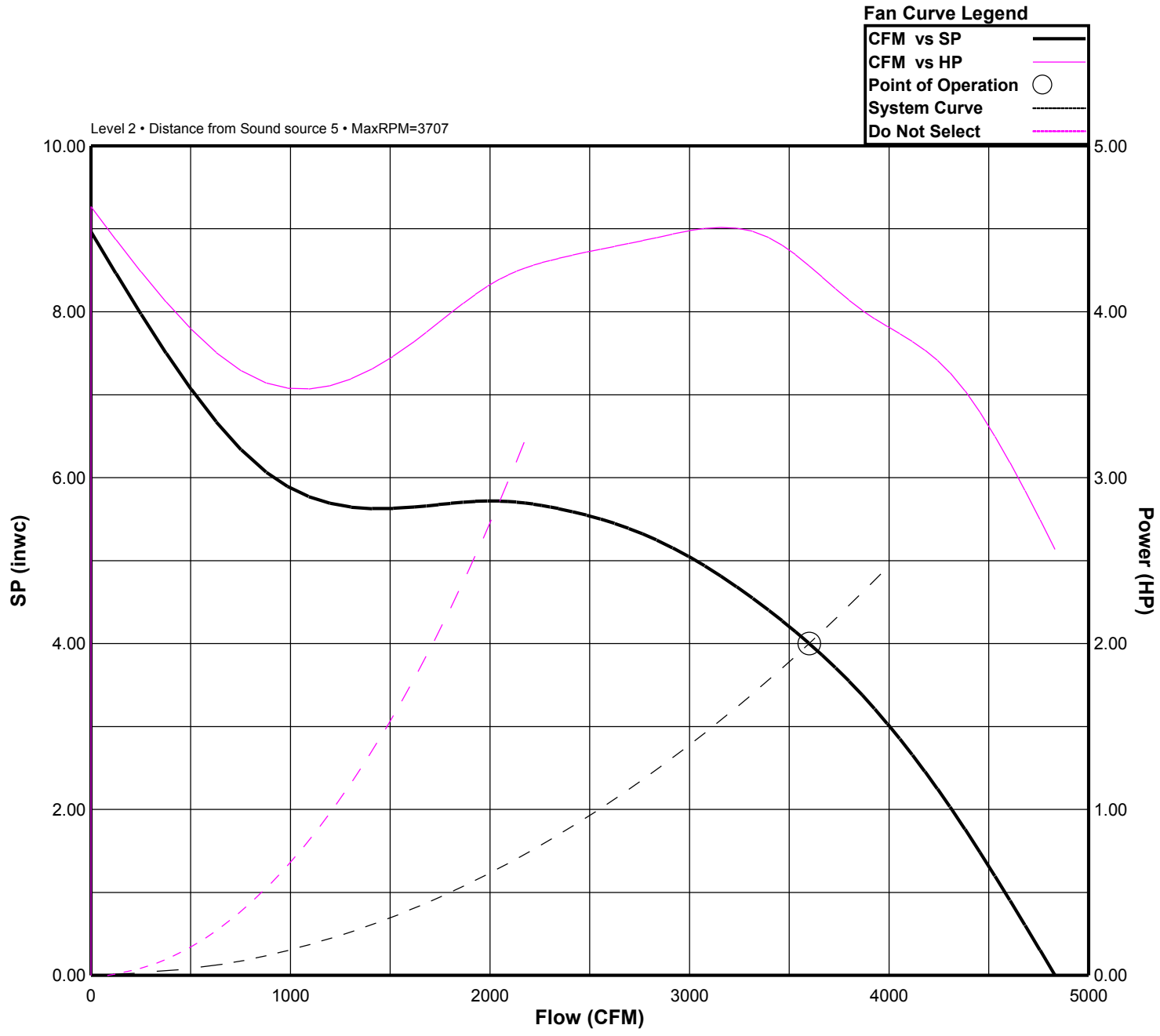
Performance (*Bhp includes 6% drive loss)

Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power* (HP)	FEG	FEI	OVEL (fpm)	TSPD (fpm)	SE	Temp (°F)	ALT (ft)
120QMX	3600	4.00	3662	4.28	71	1.04	2304	11505	56%	70	1024

Motor Information

HP	RPM	Volts/Ph/Hz	Enclosure	FLA	Position	Mounted
5	3450	460/3/60	ODP -PE	7.6	C	Yes

FLA based on NEC (2017) Table 430.250



COOK

QMX

MARK: EF-A108H
PROJECT: MCC Automotive
DATE: 02/1/2024

AMCA License Information

Loren Cook Company certifies that the 120QMX 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.

Performance certified is for installation type B: free inlet, ducted outlet. Power rating (BHP/kW) does not include transmission losses. Performance ratings do not include the effects of appurtenances (accessories). The sound power level ratings shown are in decibels, referred to 10(-12) watts calculated per AMCA Standard 301. Values shown are for inlet Lwi, LwiA and outlet Lwo, LwoA sound power levels for installation type B: free inlet, ducted outlet. Outlet ratings include the effects of duct end correction. The A-weighted sound ratings shown have been calculated per AMCA Standard 301. The AMCA International licensed air and/or sound performance data has been modified for installation, appurtenances or accessories, etc. not included in the certified data. The modified performance is not AMCA licensed but is provided to aid in selection and applications of the product. The dBA levels shown have been calculated for a distance of 5 ft in a hemispherical free field.

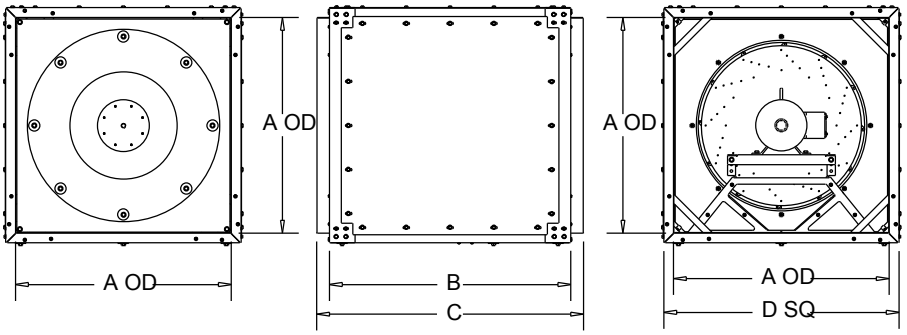
COOK

MARK: SF-A108E
PROJECT: MCC Automotive
DATE: 02/8/2024

SQND-HP VF

Centrifugal Square Inline
Direct Drive
Electronically Commutated Vari-Flow® Motor

STANDARD CONSTRUCTION FEATURES:
All aluminum wheel - Galvanized steel housing - Two removable access doors - Closed cell neoprene gasketing - Inlet and discharge duct collars - Universal mounting feet - Permanently lubricated motor - Transit tested packaging.



Inlet View

Discharge View

Performance

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power (HP)	FEG	FEI	Speed Control
1	225SQNH17D VF2	3600	.500	859	.661	n/a(<1HP)	1.36	EC

Altitude (ft): 1024 Temperature (F): 70

Motor Information

HP	RPM*	Volts/Ph/Hz	Enclosure	FLA
1-1/2	1725	460/3/60	TEFC -PM	3

Vari-Flow

FLA based on NEC (2017) Table 430.250
*Motor programmed to max speed of 913 RPM.

Dimensions (inches)

A O.D.	30
B	34-1/4
C	37-1/4
D Sq.	33-1/2

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	363	Unit	233

***Includes fan, motor & accessories.

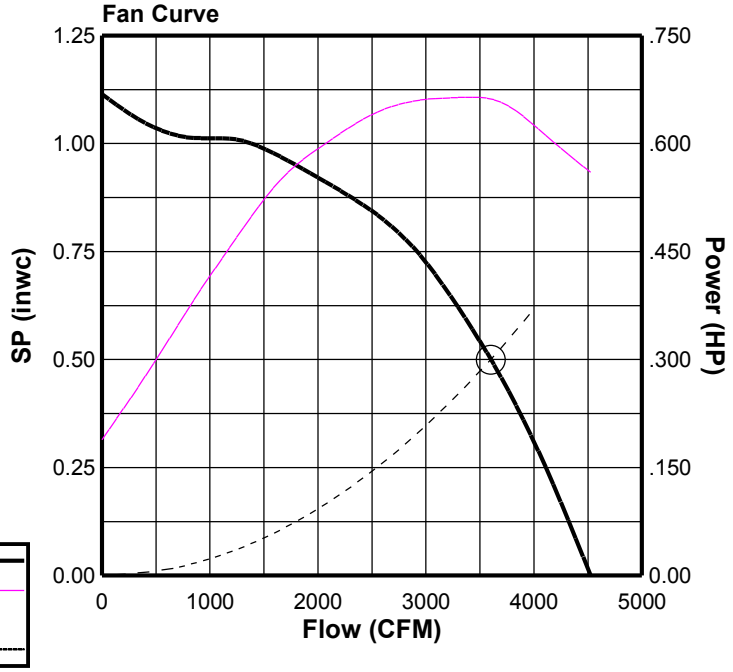
Sound Data Sound Power by Octave Band

	1	2	3	4	5	6	7	8	LwA	dBA	Sones
Inlet	64	68	69	68	65	63	58	54	70	59	8.9
Outlet	70	69	69	71	70	66	60	53	74	62	10.6

- Distance from Sound source 5 ft

Accessories:
EXTERNAL SIGNAL SPEED CONTROL
CTL & XFMR BY OTHERS

Fan Curve



Fan Curve Legend

CFM vs SP	———
CFM vs HP	———
Point of Operation	◯
System Curve	- - - - - -

COOK

MARK: SF-A108E
PROJECT: MCC Automotive
DATE: 02/8/2024

SQND-HP VF

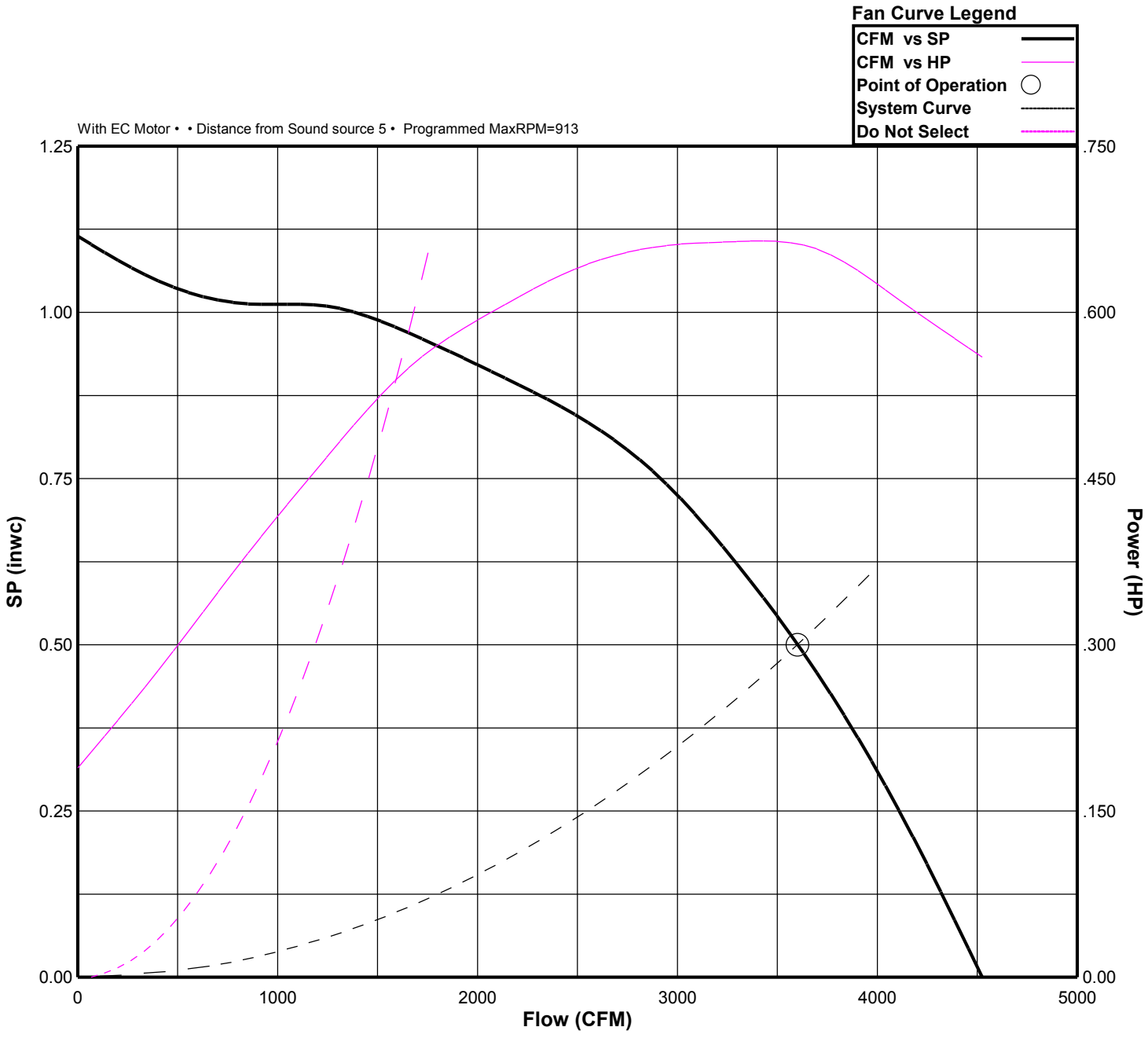
Performance

Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power (HP)	FEG	FEI	OVEL (fpm)	TSPD (fpm)	SE	Temp (°F)	ALT (ft)
225SQNH17D VF2	3600	.500	859	.661	n/a(<1HP)	1.36	576	5060	42%	70	1024

Motor Information

HP	RPM*	Volts/Ph/Hz	Enclosure	FLA
1-1/2	1725	460/3/60	TEFC -PM	3

FLA based on NEC (2017) Table 430.250
*Motor programmed to max speed of 913 RPM.



COOK

SQND-HP VF

MARK: SF-A108E
PROJECT: MCC Automotive
DATE: 02/8/2024

AMCA License Information

Loren Cook Company certifies that the 225SQNH17D VF2 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.

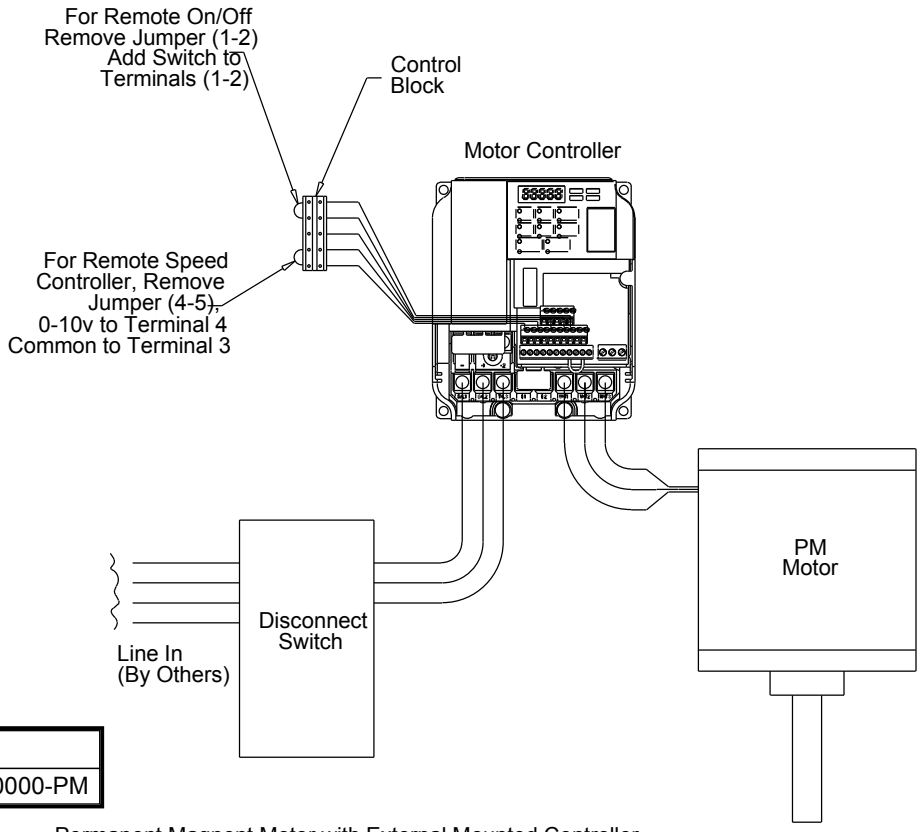
Performance certified is for installation type B: free inlet, ducted outlet. Power rating (BHP/kW) does not include transmission losses. Performance ratings do not include the effects of appurtenances (accessories). The sound power level ratings shown are in decibels, referred to 10(-12) watts calculated per AMCA Standard 301. Values shown are for inlet Lwi, LwiA and outlet Lwo, LwoA sound power levels for installation type B: free inlet, ducted outlet. Outlet ratings include the effects of duct end correction. The A-weighted sound ratings shown have been calculated per AMCA Standard 301.

The sound ratings shown are loudness values in hemispherical sones at 5 ft. in a hemispherical free field calculated per AMCA Standard 301. Values shown are for Installation type B: free inlet, ducted outlet hemispherical sone levels. Outlet ratings do not include the effect of duct end correction. The dBA levels shown have been calculated for a distance of 5 ft in a hemispherical free field. The AMCA Certified Ratings Seal applies to Octave Bands and LwA only. Sone ratings and dBA levels are not AMCA International licensed.

PROJECT: MCC Automotive
DATE: 02/8/2024

PM Motor Control

Permanent Magnet Motor
Electronically Commutated
External Signal Speed Control



Permanent Magnent Motor with External Mounted Controller.
For AC units the controller and disconnect are mounted under the unit top cap.

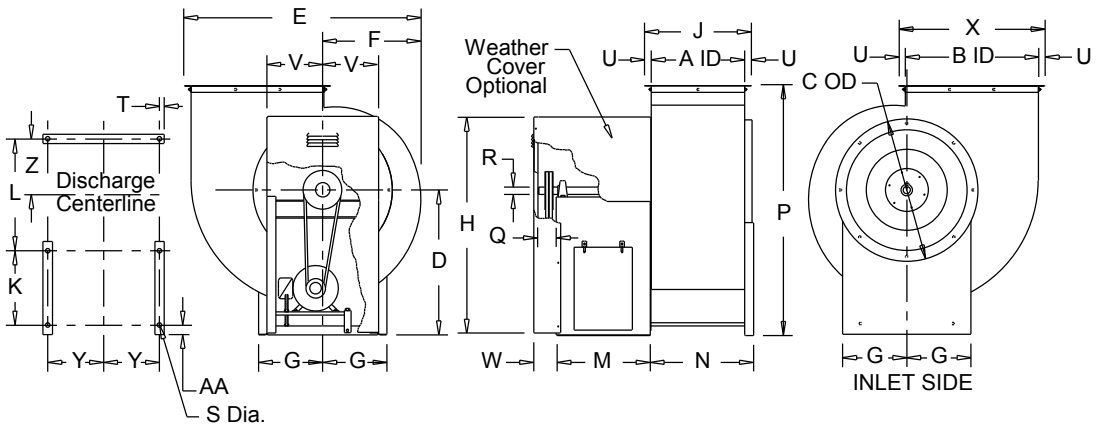
Dimensions (inches)

Mark	Qty	Description
SF-A108E	1	TEFC -1 1/2HP - 460V/3 PH/ 60 1725/0000-PM

MARK: EF-A108D, E, F, G
PROJECT: MCC Automotive
DATE: 01/28/2024

CPS

Flat Blade Centrifugal Blower
Clockwise Up-Blast
Arrangement 10, Class I



Performance (*Bhp includes 9% drive loss)

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power* (HP)	FEG	FEI	Speed Control
4	80CPS	900	4.50	3580	1.24	75	1.25	VSD

Altitude (ft): 1024 Temperature (F): 70

Motor Information

HP	RPM	Volts/Ph/Hz	Enclosure	FLA	Mounted	VFD Rated
1-1/2	3450	460/3/60	ODP -PE	3	Yes	Yes

NEMA Premium® efficiency motor per MG-1 (2014) Table 12-12
FLA based on NEC (2017) Table 430.250

Fan Information

Class	OVel(fpm)	Rotation	Discharge
I	1567	CW	Upblast

Dimensions (inches)

A	7-9/16	L	10-1/4	W	4
B	10-15/16	M	13-1/8	X	14-1/16
C	14-1/8	N	9-3/8	Y	8-5/8
D	18	P	30-3/4	Z	4-5/8
E	20-11/16	Q	3	AA	1-1/2
F	8-3/16	R	1		
G	9-3/8	S	9/16		
H	25-1/4	T	3/4		
J	10-3/4	U	1-5/8		
K	10	V	8		

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	208	Unit	130

***Includes fan, motor & accessories.

Sound Data Sound Power by Octave Band

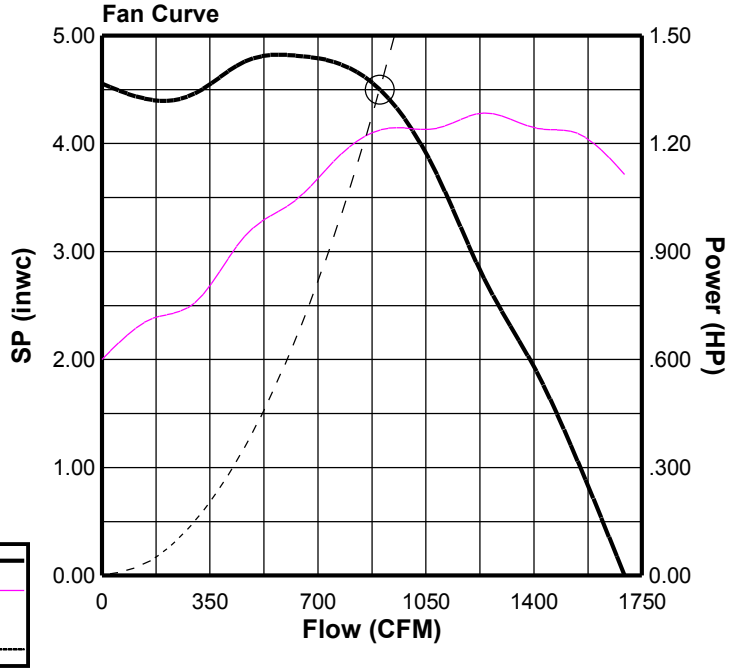
	1	2	3	4	5	6	7	8	LwA	dBA
Inlet	85	89	87	83	79	74	70	65	85	73
Outlet	99	94	88	87	83	79	75	68	89	77

- Distance from Sound source 5 ft

Accessories:

Premium Efficiency Motor (Min. 86.5%)
VSD 1.5 HP 380-480/3 EXTNL SIGNAL SPEED CTRL
CTL & XFMR BY OTHERS
DISCONNECT NEMA 1 PRE-WIRED
LORENIZED STANDARD COATING

Fan Curve



Fan Curve Legend

CFM vs SP	———
CFM vs HP	———
Point of Operation	◯
System Curve	- - - - - -

MARK: EF-A108D, E, F, G
PROJECT: MCC Automotive
DATE: 01/28/2024

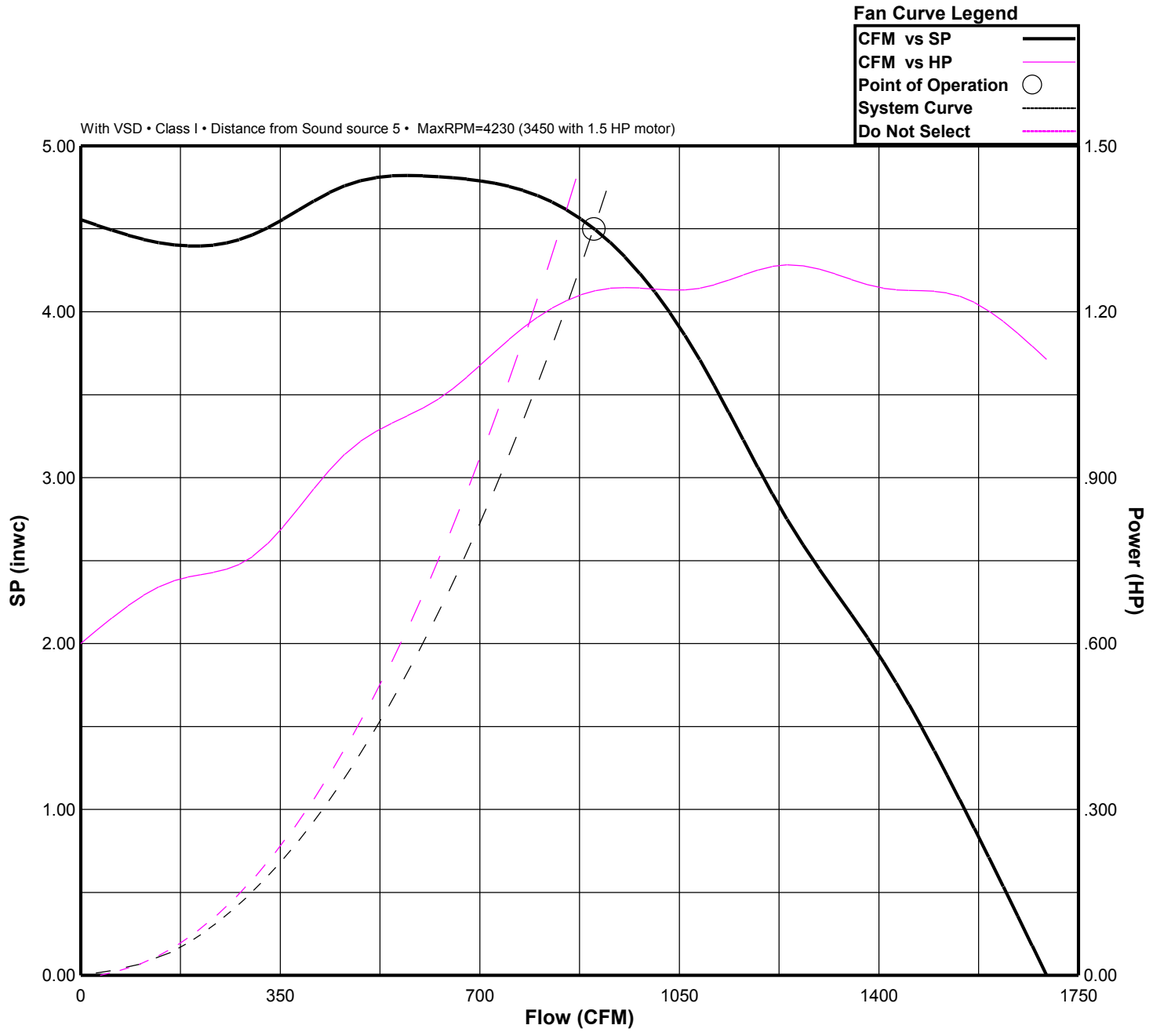
CPS

Performance (*Bhp includes 9% drive loss)

Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power* (HP)	FEG	FEI	OVEL (fpm)	TSPD (fpm)	SE	Temp (°F)	ALT (ft)
80CPS	900	4.50	3580	1.24	75	1.25	1567	9372	56%	70	1024

Sound Data Sound Power by Octave Band

	1	2	3	4	5	6	7	8	LwA	dBA
Inlet	85	89	87	83	79	74	70	65	85	73
Outlet	99	94	88	87	83	79	75	68	89	77



COOK

CPS

MARK: EF-A108D, E, F, G
PROJECT: MCC Automotive
DATE: 01/28/2024

AMCA License Information

Loren Cook Company certifies that the 80CPS 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.

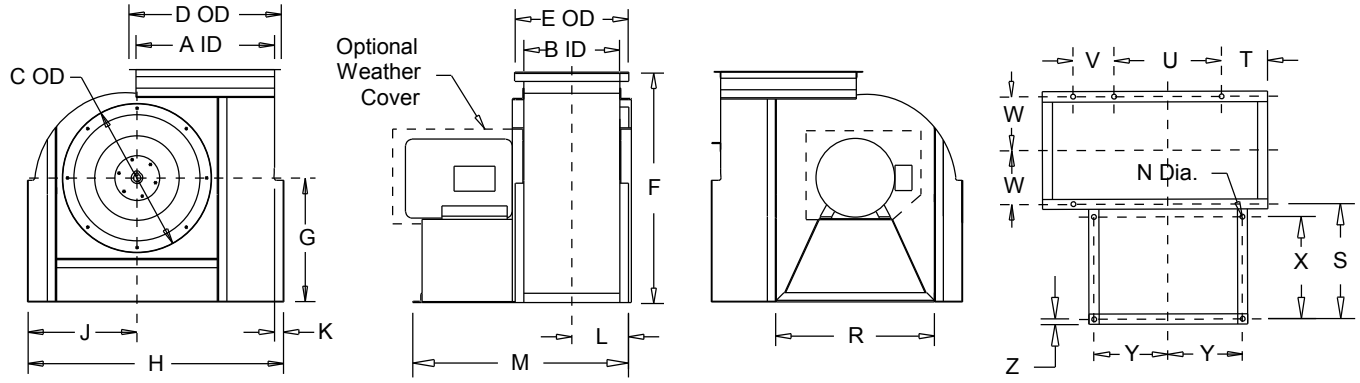
Performance certified is for installation type B: free inlet, ducted outlet. Power rating (BHP/kW) does not include transmission losses. Performance ratings do not include the effects of appurtenances (accessories). The sound power level ratings shown are in decibels, referred to 10(-12) watts calculated per AMCA Standard 301. Values shown are for inlet Lwi, LwiA and outlet Lwo, LwoA sound power levels for installation type B: free inlet, ducted outlet. Outlet ratings include the effects of duct end correction. The A-weighted sound ratings shown have been calculated per AMCA Standard 301. The AMCA International licensed air and/or sound performance data has been modified for installation, appurtenances or accessories, etc. not included in the certified data. The modified performance is not AMCA licensed but is provided to aid in selection and applications of the product. The dBA levels shown have been calculated for a distance of 5 ft in a hemispherical free field.

ROOF MOUNTED
EXHAUST FAN

MARK: EF-B102D, E
PROJECT: MCC Automotive
DATE: 01/28/2024

CA-SWSI

Centrifugal Airfoil Blower
Clockwise Upblast
Arrangement 4



Performance

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power (HP)	FEG	FEI
2	135CA-SWSI	2400	5.00	3249	2.74	90	1.36

Altitude (ft): 1024 Temperature (F): 70

Motor Information

HP	RPM	Volts/Ph/Hz	Enclosure	FLA	VFD Rated
5	3450	460/3/60	ODP -PE	7.6	Yes

NEMA Premium® efficiency motor per MG-1 (2014) Table 12-12
FLA based on NEC (2017) Table 430.250

Fan Information

Class	OVel(fpm)	Rotation	Discharge	Wheel Width
II	2272	CW	Upblast	80%

Sound Data Sound Power by Octave Band

	1	2	3	4	5	6	7	8	LwA	dBA
Inlet	89	90	88	88	82	76	74	73	88	77
Outlet	103	94	90	88	84	81	75	74	90	79

- Distance from Sound source 5 ft

Accessories:

Premium Efficiency Motor (Min. 89.5%)
LORENIZED STANDARD COATING
WHL/HOUSE WDTH REDUC

Dimensions (inches)

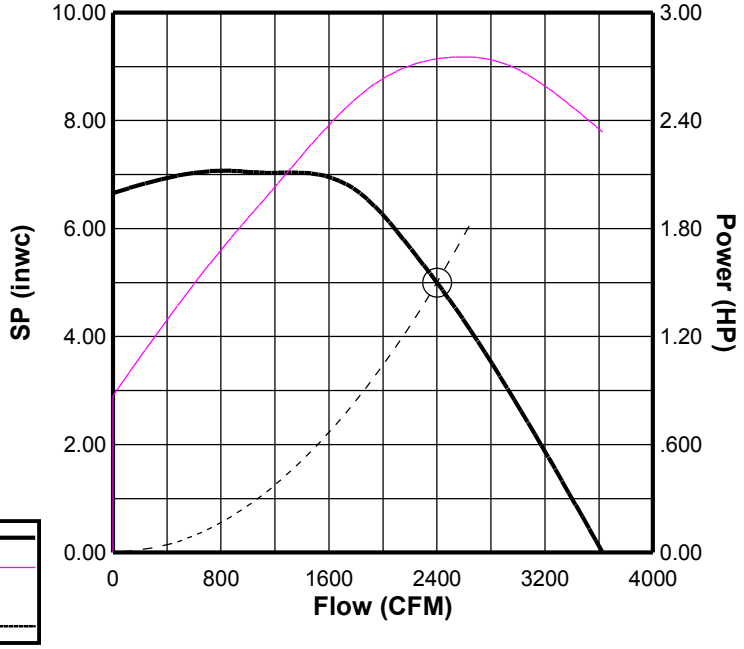
A	14-3/4	**L**	6-13/16	**X**	8-1/4
B	9-1/2	**M**	24-1/16	**Y**	9-3/16
C	17-5/8	**N**	11/16	**Z**	3/4
D	17-15/16	**O**	-		
E	12-11/16	**R**	19-7/8		
F	27-5/8	**S**	10-5/8		
G	14	**T**	3-9/16		
H	28-3/4	**U**	17		
J	12-1/16	**V**	-		
K	2	**W**	5-15/16		

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	189	Unit	189

***Includes fan, motor & accessories.

Fan Curve



Fan Curve Legend

CFM vs SP	———
CFM vs HP	———
Point of Operation	◯
System Curve	- - - - - -

MARK: EF-B102D, E
PROJECT: MCC Automotive
DATE: 01/28/2024

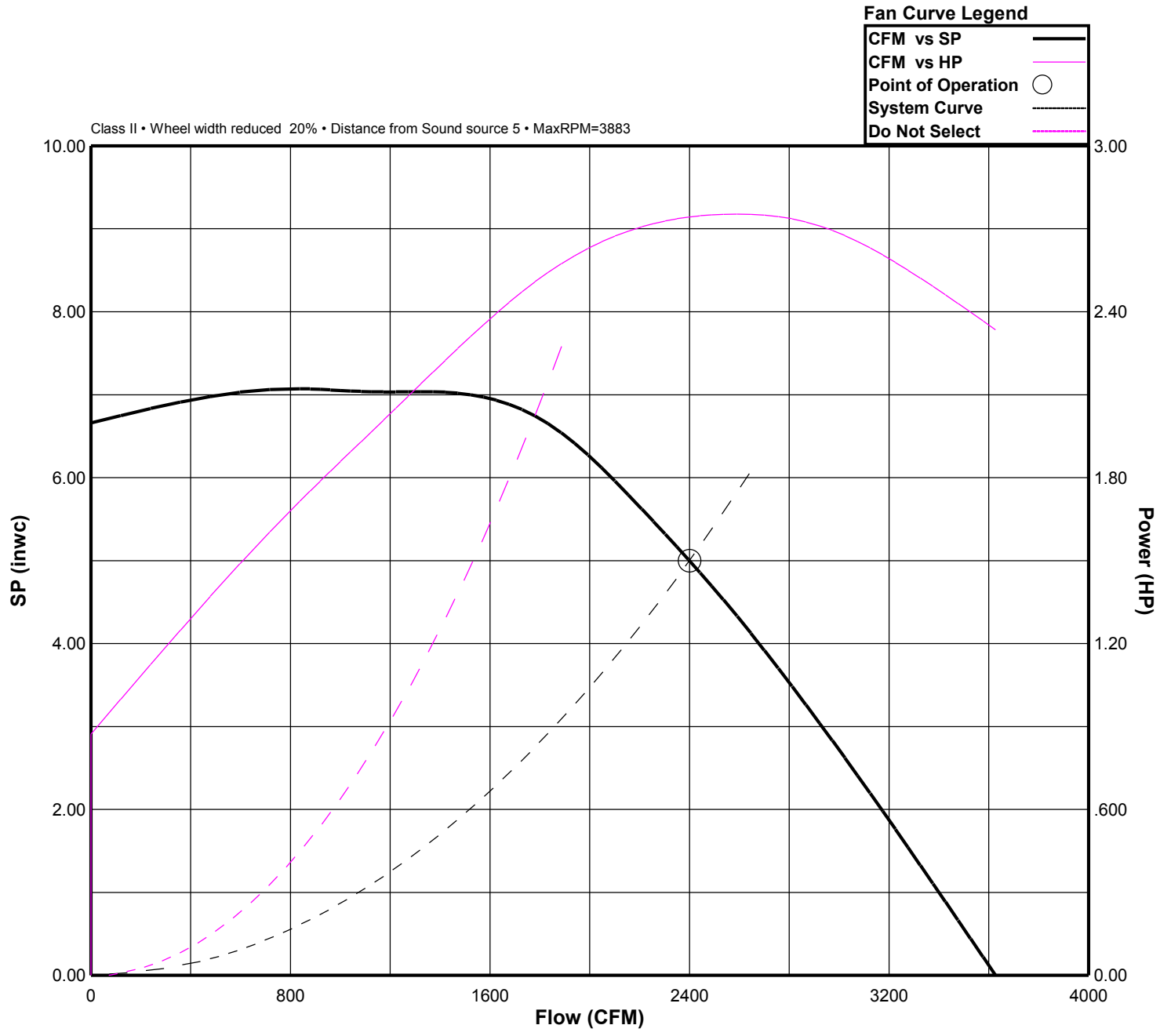
CA-SWSI

Performance

Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power (HP)	FEG	FEI	OVEL (fpm)	TSPD (fpm)	SE	Temp (°F)	ALT (ft)
135CA-SWSI	2400	5.00	3249	2.74	90	1.36	2272	11483	68%	70	1024

Sound Data Sound Power by Octave Band

	1	2	3	4	5	6	7	8	LwA	dBA
Inlet	89	90	88	88	82	76	74	73	88	77
Outlet	103	94	90	88	84	81	75	74	90	79



AMCA License Information

Loren Cook Company certifies that the 135CA-SWSI 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.

Performance certified is for installation type B: free inlet, ducted outlet. Power rating (BHP/kW) does not include transmission losses. Performance ratings do not include the effects of appurtenances (accessories). The sound power level ratings shown are in decibels, referred to 10(-12) watts calculated per AMCA Standard 301. Values shown are for inlet Lwi, LwiA and outlet Lwo, LwoA sound power levels for installation type B: free inlet, ducted outlet. Outlet ratings include the effects of duct end correction. The A-weighted sound ratings shown have been calculated per AMCA Standard 301. The AMCA International licensed air and/or sound performance data has been modified for installation, appurtenances or accessories, etc. not included in the certified data. The modified performance is not AMCA licensed but is provided to aid in selection and applications of the product. The dBA levels shown have been calculated for a distance of 5 ft in a hemispherical free field.

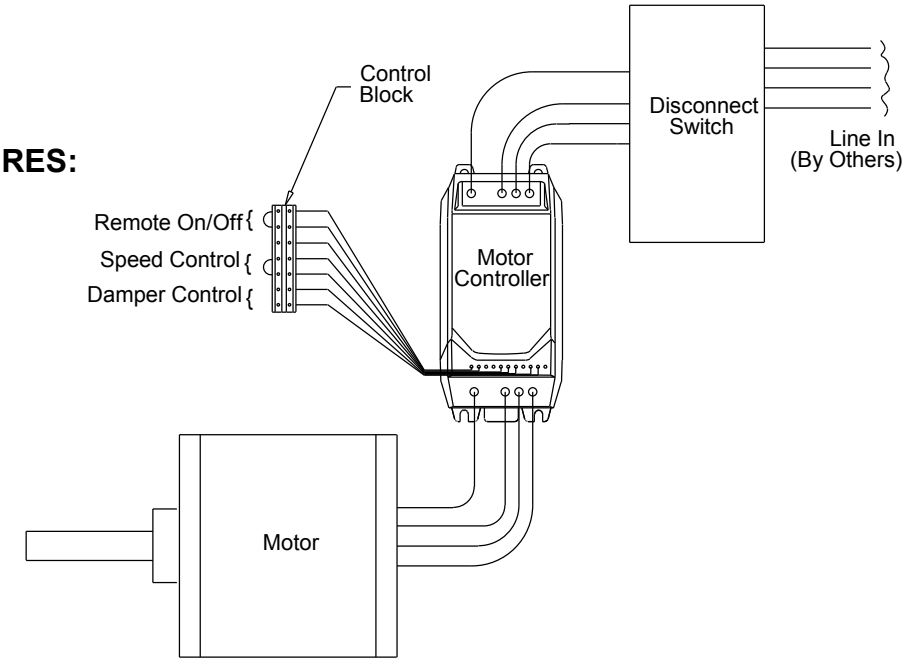
PROJECT: MCC Automotive
DATE: 01/28/2024

SimpliDrive

Vari-Flow® Motor Control
External Signal Speed Control

STANDARD CONSTRUCTION FEATURES:

- **Factory Installed**
- **Pre-wired Motor and Disconnect**
- **Compatible with Vari-Flow Controllers**
- **IP20 Controller Enclosure**
- **Digital Display**
- **Single Point Control Connections**
  - **-Remote On/Off**
  - **-Analog 0-10VDC Speed Control**
  - **-Damper Control**
- **Factory Programmed to Include**
  - **-Motor Characteristics**
  - **-Min/Max Speed**
  - **-Motor Protection**
  - **-Soft Start**
  - **-Damper Control**
- **No Field Commissioning Required**



Dimensions (inches)

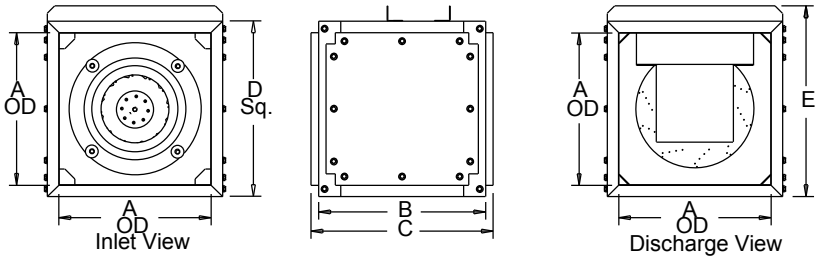
Mark	Qty	Description
EF-A108D, E, F, G	4	VSD 1.5 HP 380-480/3

MARK: SF-A108A, B, C, D
PROJECT: MCC Automotive
DATE: 01/12/2024

SQN-D VF

Centrifugal Square Inline
Direct Drive
Preprogrammed EC
Electronically Commutated Vari-Flow® Motor

STANDARD CONSTRUCTION FEATURES:
All aluminum wheel - Galvanized 18 gauge steel housing - Three removable access doors - Closed cell neoprene gasketing - Inlet and discharge duct collars - Universal mounting feet - Preprogrammed EC electronically commutated Vari-Flow® motor/drive package - Transit tested packaging.



Performance

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power (HP)	FEG	Speed Control
4	100SQN28D (VF)	900	.500	2002	.242	n/a(<1HP)	EC

Altitude (ft): 950 Temperature (F): 70

Motor Information

HP	RPM*	Volts/Ph/Hz	Enclosure	RLA
1/3	2800	115/1/60	OPEN -EC	4.4

*Motor programmed to max speed of 2191 RPM.
RLA based on motor manufacturer's data at programmed HP and max RPM.
Motor is electronically/thermally protected.

Sound Data Sound Power by Octave Band

	1	2	3	4	5	6	7	8	LwA	dBA	Sones
Inlet	68	70	73	73	66	60	57	52	73	61	10.2
Outlet	84	74	72	70	67	65	60	53	73	61	11.2

- Distance from Sound source 5 ft

Accessories:
EXTERNAL SIGNAL SPEED CONTROL
CTL & XFMR BY OTHERS

Dimensions (inches)

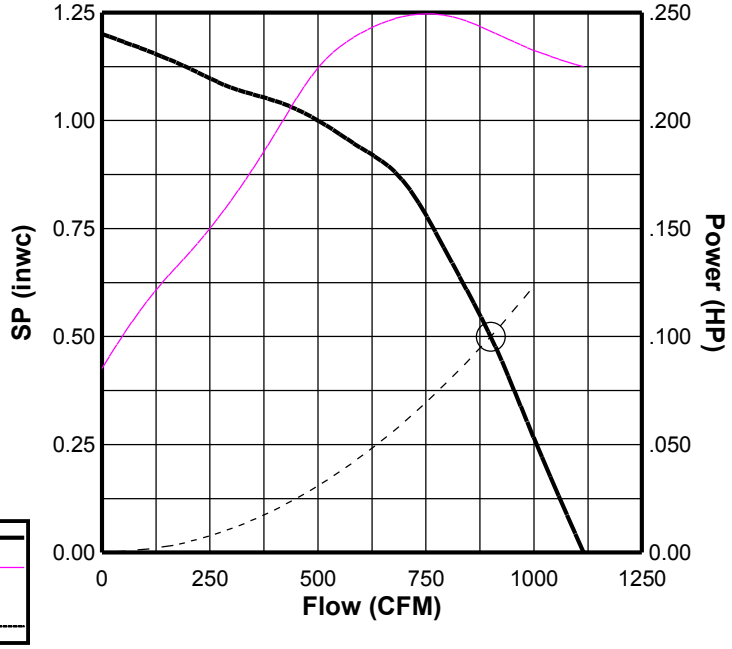
A	12
B	20
C	22
D Sq	14
E	15-9/16
Housing Gauge	18

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	70	Unit	67

***Includes fan, motor & accessories.

Fan Curve



Fan Curve Legend

CFM vs SP	———
CFM vs HP	———
Point of Operation	◯
System Curve	- - - - - -

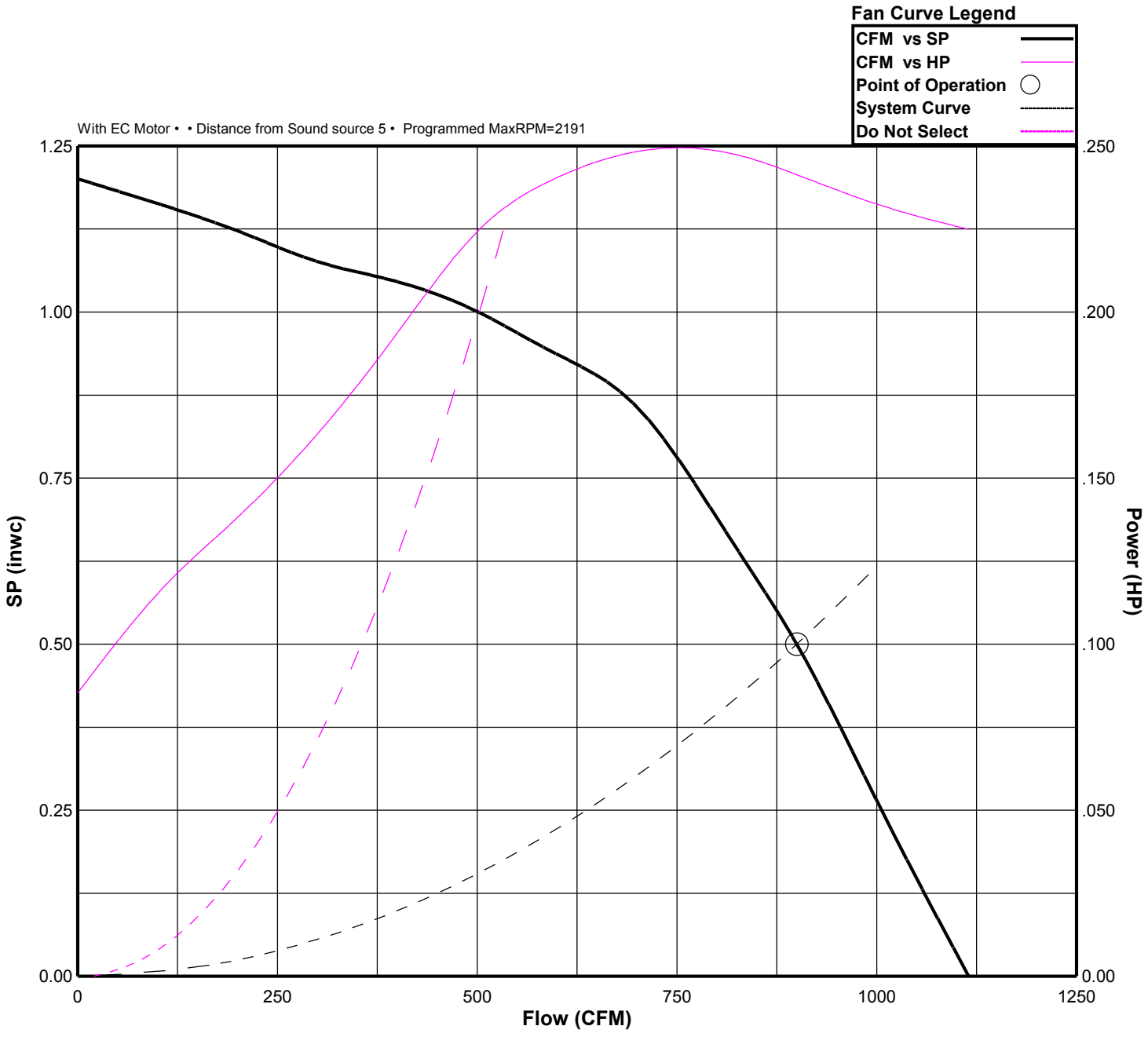
COOK

MARK: SF-A108A, B, C, D
PROJECT: MCC Automotive
DATE: 01/12/2024

SQN-D VF

Performance

Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power (HP)	FEG	OVEL (fpm)	TSPD (fpm)	SE	Temp (°F)	ALT (ft)
100SQN28D (VF)	900	.500	2002	.242	n/a(<1HP)	900	5241	29%	70	950



AMCA License Information

Loren Cook Company certifies that the 100SQN28D 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.

Performance certified is for installation type B: free inlet, ducted outlet. Power rating (BHP/kW) does not include transmission losses. Performance ratings do not include the effects of appurtenances (accessories). The sound power level ratings shown are in decibels, referred to 10(-12) watts calculated per AMCA Standard 301. Values shown are for inlet Lwi, LwiA and outlet Lwo, LwoA sound power levels for installation type B: free inlet, ducted outlet. Outlet ratings include the effects of duct end correction. The A-weighted sound ratings shown have been calculated per AMCA Standard 301.

The sound ratings shown are loudness values in hemispherical sones at 5 ft. in a hemispherical free field calculated per AMCA Standard 301. Values shown are for Installation type B: free inlet, ducted outlet hemispherical sone levels. Outlet ratings do not include the effect of duct end correction. The dBA levels shown have been calculated for a distance of 5 ft in a hemispherical free field. The AMCA Certified Ratings Seal applies to Octave Bands and LwA only. Sone ratings and dBA levels are not AMCA International licensed.

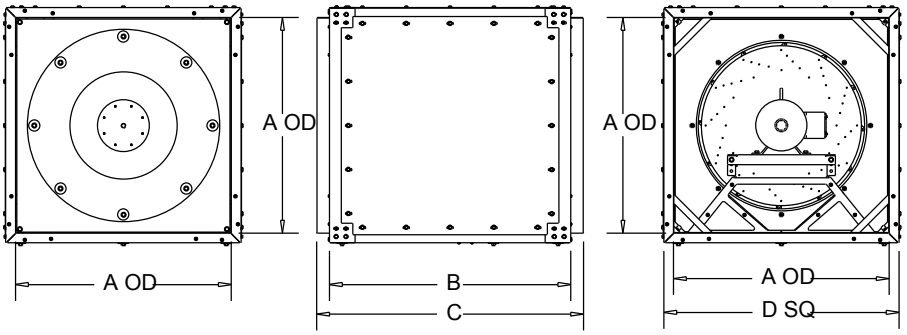
COOK

MARK: SF-B102A, B
PROJECT: MCC Automotive
DATE: 01/12/2024

SQND-HP VF

Centrifugal Square Inline
Direct Drive
Electronically Commutated Vari-Flow® Motor

STANDARD CONSTRUCTION FEATURES:
All aluminum wheel - Galvanized steel housing - Two removable access doors - Closed cell neoprene gasketing - Inlet and discharge duct collars - Universal mounting feet - Permanently lubricated motor - Transit tested packaging.



Inlet View

Discharge View

Performance

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power (HP)	FEG	FEI	Speed Control
2	195SQNH17D VF2	2400	.500	932	.422	n/a(<1HP)	1.50	EC

Altitude (ft): 950 Temperature (F): 70

Motor Information

HP	RPM*	Volts/Ph/Hz	Enclosure	FLA
1	1725	460/3/60	TEFC -PM	2.1

Vari-Flow

FLA based on NEC (2017) Table 430.250
*Motor programmed to max speed of 1055 RPM.

Dimensions (inches)

A O.D.	26
B	30-1/4
C	32-1/4
D Sq.	27-5/8

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	311	Unit	172

***Includes fan, motor & accessories.

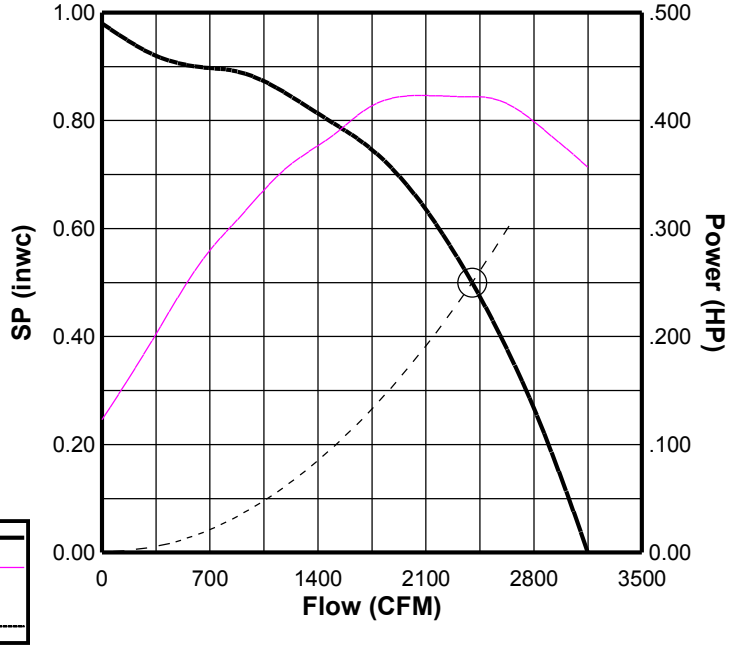
Sound Data Sound Power by Octave Band

	1	2	3	4	5	6	7	8	LwA	dBA	Sones
Inlet	61	60	65	66	70	68	56	47	73	62	9.7
Outlet	69	63	63	65	68	66	57	49	72	60	9.2

- Distance from Sound source 5 ft

Accessories:
EXTERNAL SIGNAL SPEED CONTROL
CTL & XFMR BY OTHERS

Fan Curve



Fan Curve Legend

CFM vs SP	———
CFM vs HP	———
Point of Operation	◯
System Curve	- - - - - -

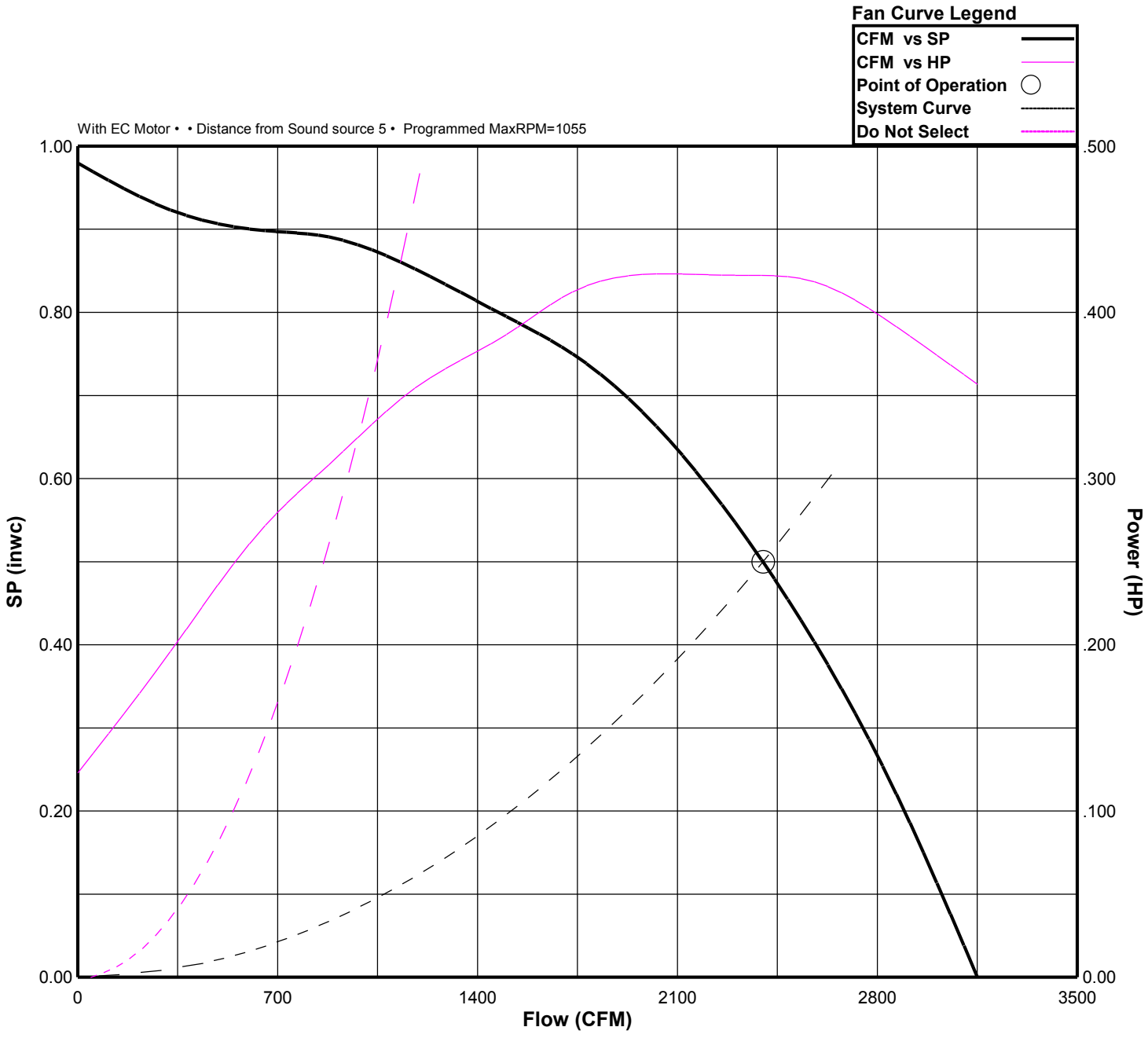
COOK

MARK: SF-B102A, B
PROJECT: MCC Automotive
DATE: 01/12/2024

SQND-HP VF

Performance

Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power (HP)	FEG	FEI	OVEL (fpm)	TSPD (fpm)	SE	Temp (°F)	ALT (ft)
195SQNH17D VF2	2400	.500	932	.422	n/a(<1HP)	1.50	512	4758	44%	70	950



AMCA License Information

Loren Cook Company certifies that the 195SQNH17D VF2 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.

Performance certified is for installation type B: free inlet, ducted outlet. Power rating (BHP/kW) does not include transmission losses. Performance ratings do not include the effects of appurtenances (accessories). The sound power level ratings shown are in decibels, referred to 10(-12) watts calculated per AMCA Standard 301. Values shown are for inlet Lwi, LwiA and outlet Lwo, LwoA sound power levels for installation type B: free inlet, ducted outlet. Outlet ratings include the effects of duct end correction. The A-weighted sound ratings shown have been calculated per AMCA Standard 301.

The sound ratings shown are loudness values in hemispherical sones at 5 ft. in a hemispherical free field calculated per AMCA Standard 301. Values shown are for Installation type B: free inlet, ducted outlet hemispherical sone levels. Outlet ratings do not include the effect of duct end correction. The dBA levels shown have been calculated for a distance of 5 ft in a hemispherical free field. The AMCA Certified Ratings Seal applies to Octave Bands and LwA only. Sone ratings and dBA levels are not AMCA International licensed.

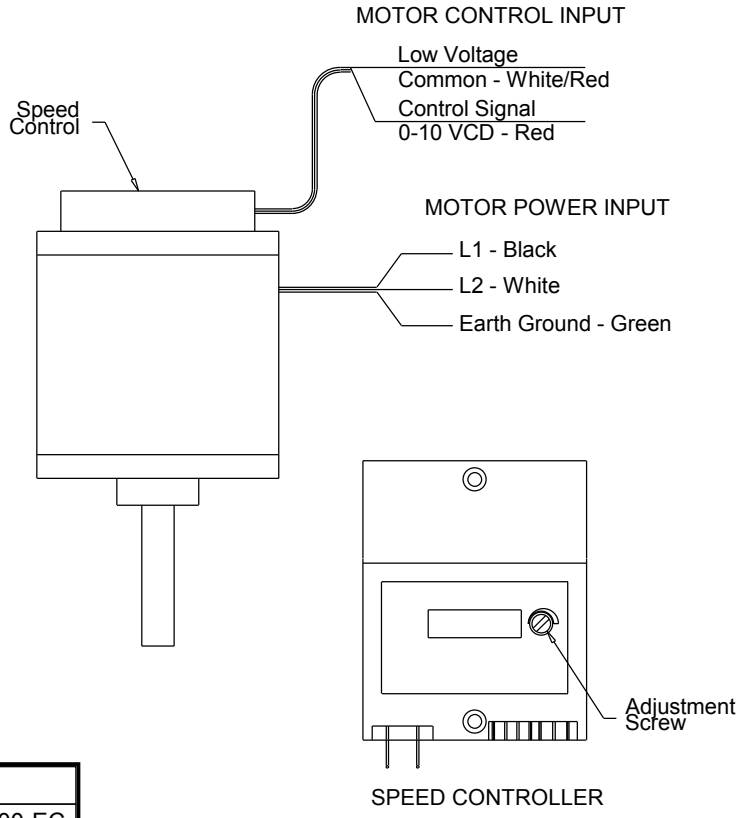
PROJECT: MCC Automotive
DATE: 01/12/2024

Speed Control

External Speed Control Electronically Commutated (EC) Motor Type N

STANDARD CONSTRUCTION FEATURES:

Vari-Flow EC Motors are available in 1/8 to 1 HP for 120V or 208-230V -Single phase applications have a adjustable speed range of 500 to 1725 or 500 to 2800 - Some motors come with a factory programmed maximum RPM for specific applications - External signal speed control requires a 0-10 VDC control signal to adjust speed of the motor - The motor will operate from 2-10 VDC and turns off when the control signal is below 1.9 VDC - Dial on speed control must be set to 0 for proper external speed control operation.



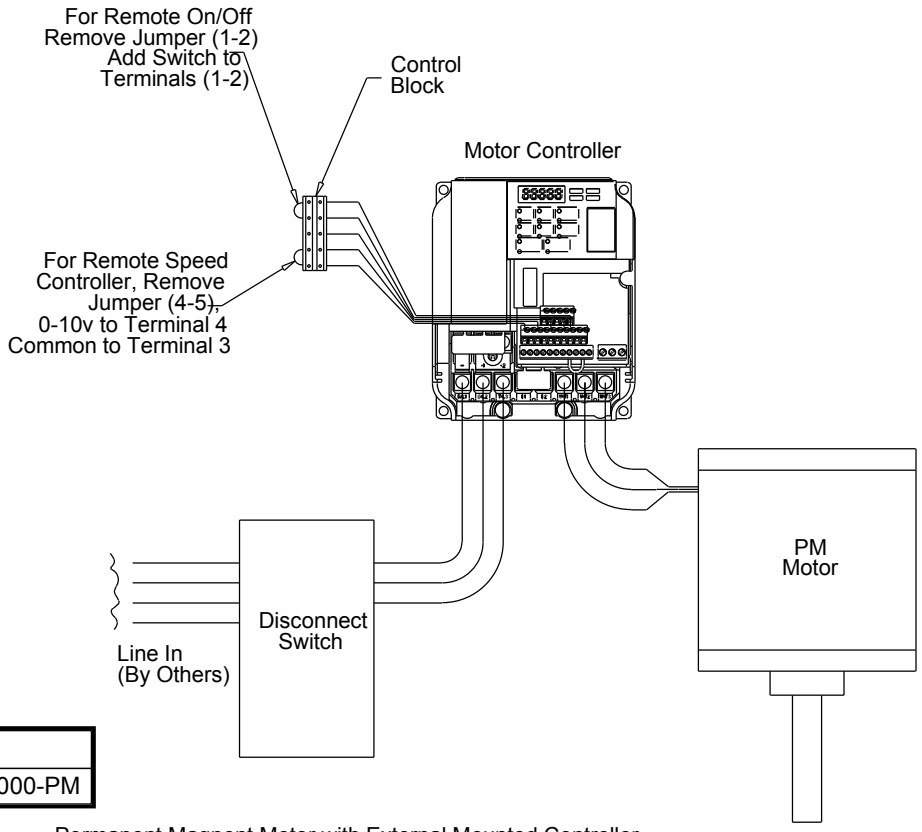
Dimensions (inches)

Mark	Qty	Description
EF-A125	1	OPEN -1/2HP - 115V/1 PH/ 60 1725/0000-EC
SF-A108A, B, C, D	4	OPEN -1/3HP - 115V/1 PH/ 60 2800/0000-EC

PROJECT: MCC Automotive
DATE: 01/12/2024

PM Motor Control

Permanent Magnet Motor Electronically Commutated External Signal Speed Control



Permanent Magnent Motor with External Mounted Controller.
For AC units the controller and disconnect are mounted under the unit top cap.

Dimensions (inches)

Mark	Qty	Description
SF-B102A, B	2	TEFC -1HP - 460V/3 PH/ 60 1725/0000-PM

A108

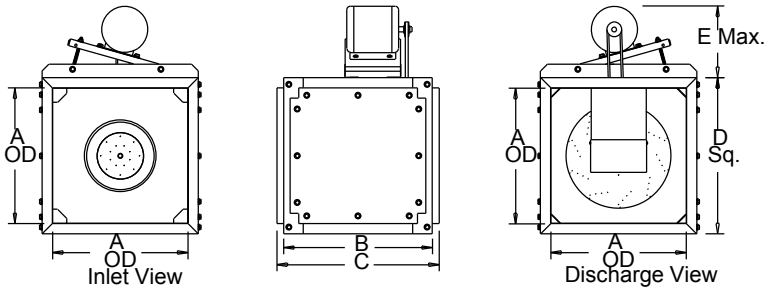
MARK: EF-~~A106~~-A
PROJECT: MCC Automotive
DATE: 12/8/2023

SQN-B

Centrifugal Square Inline
Belt Drive

STANDARD CONSTRUCTION FEATURES:

All aluminum wheel - Galvanized steel housing - Three removable access doors - Closed cell neoprene gasketing - Inlet and discharge duct collars - Universal mounting feet - Regreasable bearings in a cast housing rated at 200,000 hours average life - Permanently lubricated ball bearing motor - Adjustable pitch drives through 5 HP - All fans factory adjusted to specified fan RPM - Transit tested packaging.



Performance (*Bhp includes 6% drive loss)

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power* (HP)	FEG	FEI
1	402SQN-B	20000	.500	522	5.31	53	.94

Altitude (ft): 1000 Temperature (F): 70

Motor Information

HP	RPM	Volts/Ph/Hz	Enclosure	FLA	Mounted
7-1/2	1725	460/3/60	ODP -PE	11	Yes

NEMA Premium® efficiency motor per MG-1 (2014) Table 12-12
FLA based on NEC (2017) Table 430.250

Sound Data Sound Power by Octave Band

	1	2	3	4	5	6	7	8	LwA	dBA	Sones
Inlet	84	93	85	77	75	71	65	58	82	71	21.4
Outlet	82	83	81	81	78	73	68	60	82	71	18.7

- Distance from Sound source 5 ft

Accessories:

Premium Efficiency Motor (Min. 91.0%)
DRIVES (1.5 SF) @ 522 RPM

Dimensions (inches)

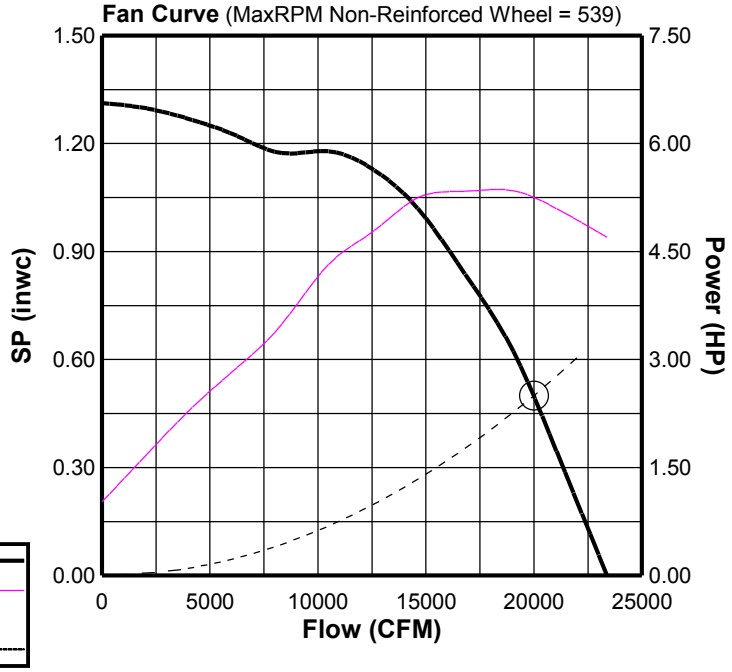
A	50-3/4
B	46-1/4
C	50-1/4
D	55-1/8
E	17-1/4

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	812	Unit	588

***Includes fan, motor & accessories.

Fan Curve (MaxRPM Non-Reinforced Wheel = 539)



Fan Curve Legend

CFM vs SP	———
CFM vs HP	———
Point of Operation	◯
System Curve	- - - - - -

A108

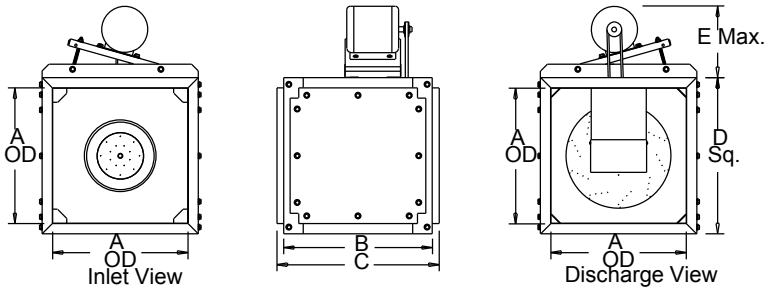
MARK: ~~EF-A106-B~~	
PROJECT: MCC Automotive	
DATE: 12/8/2023	

SQN-B

Centrifugal Square Inline
Belt Drive

STANDARD CONSTRUCTION FEATURES:

All aluminum wheel - Galvanized steel housing - Three removable access doors - Closed cell neoprene gasketing - Inlet and discharge duct collars - Universal mounting feet - Regreasable bearings in a cast housing rated at 200,000 hours average life - Permanently lubricated ball bearing motor - Adjustable pitch drives through 5 HP - All fans factory adjusted to specified fan RPM - Transit tested packaging.



Performance (*Bhp includes 6% drive loss)

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power* (HP)	FEG	FEI
1	402SQN-B	20000	.500	522	5.31	53	.94

Altitude (ft): 1000 Temperature (F): 70

Motor Information

HP	RPM	Volts/Ph/Hz	Enclosure	FLA	Mounted
7-1/2	1725	460/3/60	ODP -PE	11	Yes

NEMA Premium® efficiency motor per MG-1 (2014) Table 12-12
FLA based on NEC (2017) Table 430.250

Sound Data Sound Power by Octave Band

	1	2	3	4	5	6	7	8	LwA	dBA	Sones
Inlet	84	93	85	77	75	71	65	58	82	71	21.4
Outlet	82	83	81	81	78	73	68	60	82	71	18.7

- Distance from Sound source 5 ft

Accessories:

Premium Efficiency Motor (Min. 91.0%)
DRIVES (1.5 SF) @ 522 RPM

Dimensions (inches)

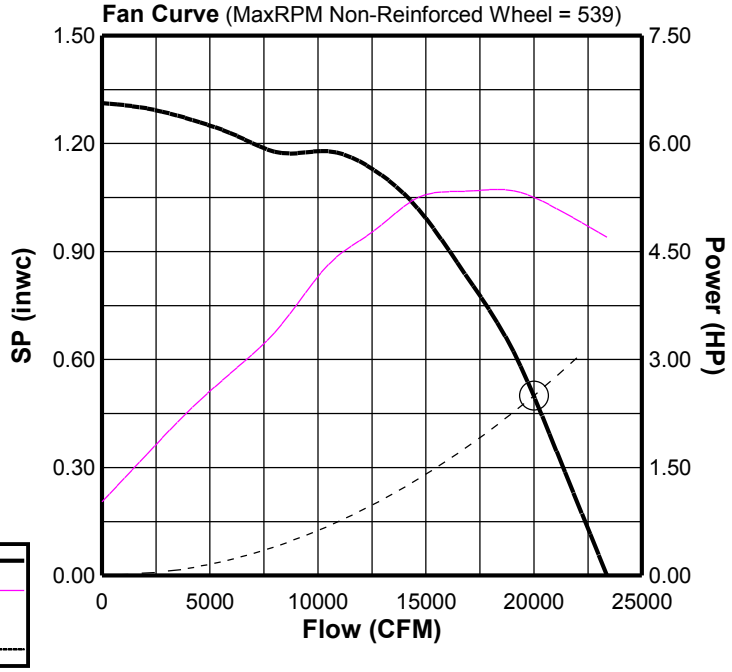
A	50-3/4
B	46-1/4
C	50-1/4
D	55-1/8
E	17-1/4

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	812	Unit	588

***Includes fan, motor & accessories.

Fan Curve (MaxRPM Non-Reinforced Wheel = 539)



Fan Curve Legend

CFM vs SP	———
CFM vs HP	———
Point of Operation	◯
System Curve	- - - - - -

A108

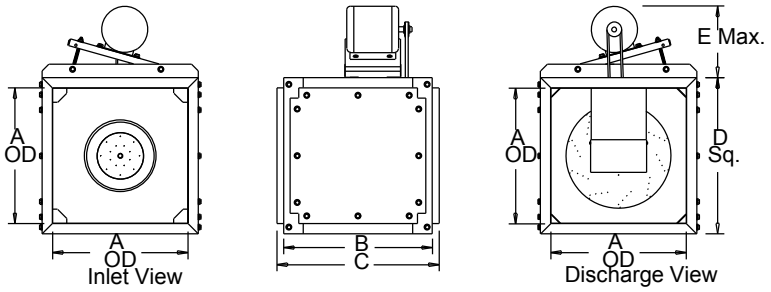
MARK: EF-~~A106~~-C
PROJECT: MCC Automotive
DATE: 12/8/2023

SQN-B

Centrifugal Square Inline
Belt Drive

STANDARD CONSTRUCTION FEATURES:

All aluminum wheel - Galvanized steel housing - Three removable access doors - Closed cell neoprene gasketing - Inlet and discharge duct collars - Universal mounting feet - Regreasable bearings in a cast housing rated at 200,000 hours average life - Permanently lubricated ball bearing motor - Adjustable pitch drives through 5 HP - All fans factory adjusted to specified fan RPM - Transit tested packaging.



Performance (*Bhp includes 6% drive loss)

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power* (HP)	FEG	FEI
1	402SQN-B	20000	.500	522	5.31	53	.94

Altitude (ft): 1000 Temperature (F): 70

Motor Information

HP	RPM	Volts/Ph/Hz	Enclosure	FLA	Mounted
7-1/2	1725	460/3/60	ODP -PE	11	Yes

NEMA Premium® efficiency motor per MG-1 (2014) Table 12-12
FLA based on NEC (2017) Table 430.250

Sound Data Sound Power by Octave Band

	1	2	3	4	5	6	7	8	LwA	dBA	Sones
Inlet	84	93	85	77	75	71	65	58	82	71	21.4
Outlet	82	83	81	81	78	73	68	60	82	71	18.7

- Distance from Sound source 5 ft

Accessories:

Premium Efficiency Motor (Min. 91.0%)
DRIVES (1.5 SF) @ 522 RPM

Dimensions (inches)

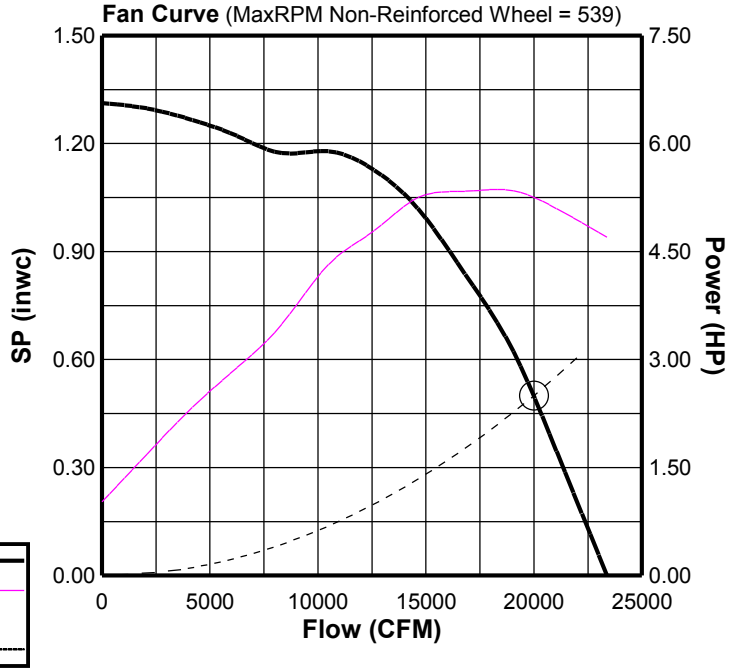
A	50-3/4
B	46-1/4
C	50-1/4
D	55-1/8
E	17-1/4

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	812	Unit	588

***Includes fan, motor & accessories.

Fan Curve (MaxRPM Non-Reinforced Wheel = 539)



Fan Curve Legend

CFM vs SP	———
CFM vs HP	———
Point of Operation	◯
System Curve	- - - - - -

EF-B102A, B, C

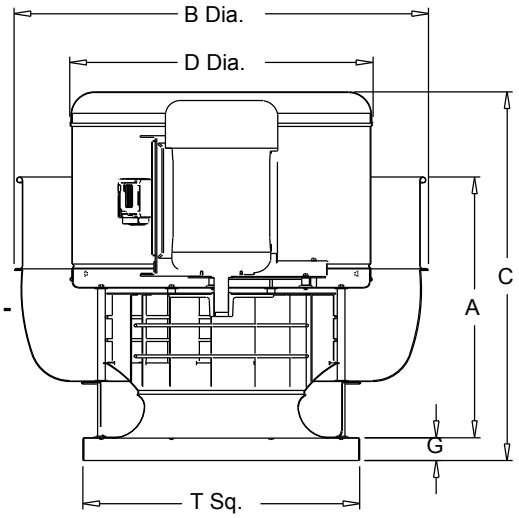
ROOF MOUNTED
EXHAUST FAN

MARK: ~~EF-B102-A~~	
PROJECT: MCC Automotive	
DATE: 12/8/2023	

ACRU-D VF

Upblast Centrifugal
Exhaust Ventilator
Roof Mounted/Direct Drive
Electronically Commutated Vari-Flow® Motor

STANDARD CONSTRUCTION FEATURES:
All aluminum housing - Backward inclined all aluminum wheel - Two piece top cap with stainless steel quick release latches - (size 120 - 300) - Welded curb cap corners - Birdscreen - Permanently lubricated ball bearing motors - Corrosion resistant fasteners - Transit tested packaging.



Performance

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power (HP)	FEG	FEI	Speed Control
1	225R17D (VF)	5500	.500	922	1.17	63	1.24	EC

Altitude (ft): 1000 Temperature (F): 70

Motor Information

HP	RPM*	Volts/Ph/Hz	Enclosure
3	1725	460/3/60	TEFC -PM

*Motor programmed to max speed of 1081 RPM.

Sound Data Inlet Sound Power by Octave Band

1	2	3	4	5	6	7	8	LwA	dBA	Sones
88	91	86	82	76	71	66	59	84	72	22

- Distance from Sound source 5 ft

Accessories:
EXTERNAL SIGNAL SPEED CONTROL
CTL & XFMR BY OTHERS

Dimensions (inches)

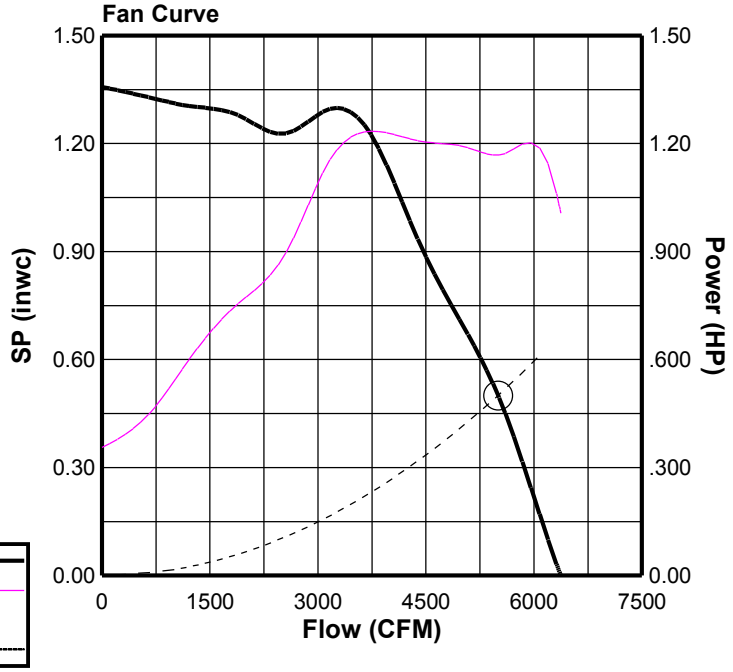
A	25-15/16
B	45-1/4
C	38-1/8
D	29-7/8
G	3
T Sq.	30
Roof Open. Sq.*	25-1/2

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	312	Unit	181

* Roof opening size for curbs supplied by Cook only.
***Includes fan, motor & accessories.

Fan Curve



Fan Curve Legend

CFM vs SP	———
CFM vs HP	———
Point of Operation	◯
System Curve	- - - - - -

ROOF MOUNTED
EXHAUST FAN

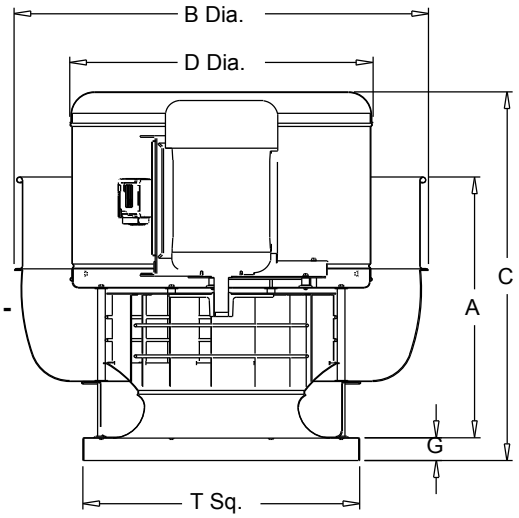
MARK: EF-B112-A
PROJECT: MCC Automotive
DATE: 12/8/2023

ACRU-D VF

Upblast Centrifugal Exhaust Ventilator Roof Mounted/Direct Drive Electronically Commutated Vari-Flow® Motor

STANDARD CONSTRUCTION FEATURES:

All aluminum housing - Backward inclined all aluminum wheel - Two piece top cap with stainless steel quick release latches - (size 120 - 300) - Welded curb cap corners - Birdscreen - Permanently lubricated ball bearing motors - Corrosion resistant fasteners - Transit tested packaging.



Performance

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power (HP)	FEG	FEI	Speed Control
1	210R17D (VF2)	4500	.500	909	.823	n/a(<1HP)	1.41	EC

Altitude (ft): 1000 Temperature (F): 70

Motor Information

HP	RPM*	Volts/Ph/Hz	Enclosure	FLA
2	1725	460/3/60	TEFC -PM	3.4

Vari-Flow

FLA based on NEC (2017) Table 430.250
*Motor programmed to max speed of 1029 RPM.

Sound Data Inlet Sound Power by Octave Band

1	2	3	4	5	6	7	8	LwA	dBA	Sones
74	81	81	71	68	65	60	54	76	64	13.4

- Distance from Sound source 5 ft

Accessories:

EXTERNAL SIGNAL SPEED CONTROL
CTL & XFMR BY OTHERS

Dimensions (inches)

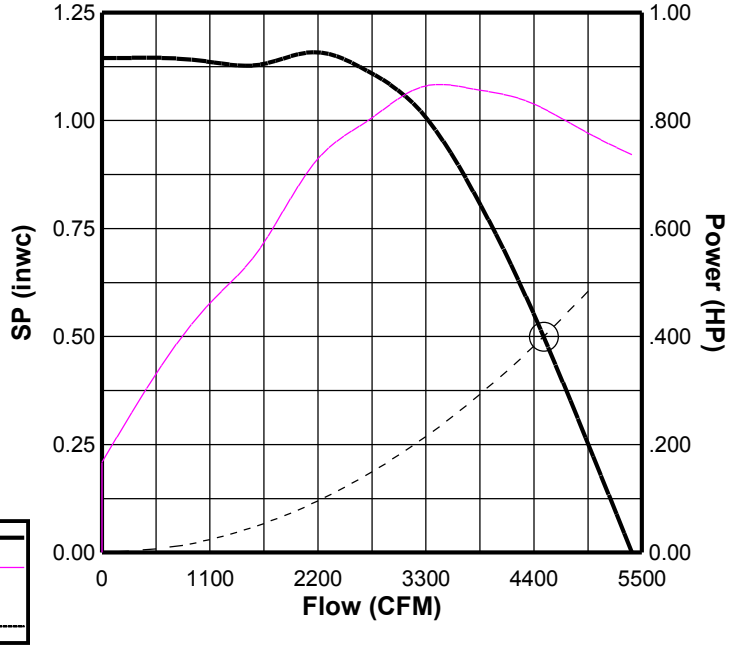
A	25-15/16
B	45-1/4
C	38-3/8
D	29-7/8
G	3
T Sq.	30
Roof Open. Sq.*	25-1/2

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	235	Unit	104

* Roof opening size for curbs supplied by Cook only.
***Includes fan, motor & accessories.

Fan Curve



Fan Curve Legend

CFM vs SP	———
CFM vs HP	———
Point of Operation	◯
System Curve	- - - - - -

ROOF MOUNTED
EXHAUST FAN

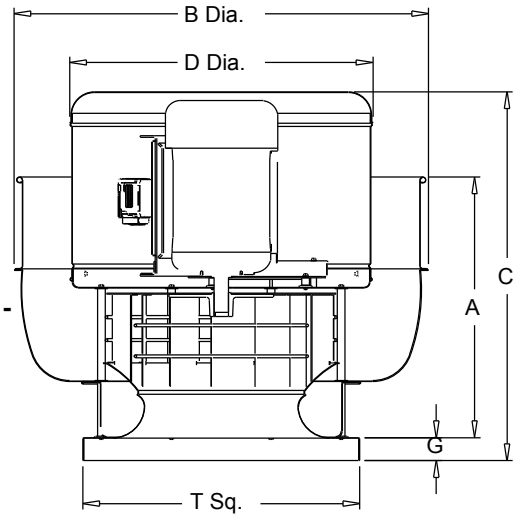
MARK: EF-B112-B	
PROJECT: MCC Automotive	
DATE: 12/8/2023	

ACRU-D VF

Upblast Centrifugal Exhaust Ventilator Roof Mounted/Direct Drive Electronically Commutated Vari-Flow® Motor

STANDARD CONSTRUCTION FEATURES:

All aluminum housing - Backward inclined all aluminum wheel - Two piece top cap with stainless steel quick release latches - (size 120 - 300) - Welded curb cap corners - Birdscreen - Permanently lubricated ball bearing motors - Corrosion resistant fasteners - Transit tested packaging.



Performance

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power (HP)	FEG	FEI	Speed Control
1	210R17D (VF2)	4500	.500	909	.823	n/a(<1HP)	1.41	EC

Altitude (ft): 1000 Temperature (F): 70

Motor Information

HP	RPM*	Volts/Ph/Hz	Enclosure	FLA
2	1725	460/3/60	TEFC -PM	3.4

Vari-Flow

FLA based on NEC (2017) Table 430.250
*Motor programmed to max speed of 1029 RPM.

Sound Data Inlet Sound Power by Octave Band

1	2	3	4	5	6	7	8	LwA	dBA	Sones
74	81	81	71	68	65	60	54	76	64	13.4

- Distance from Sound source 5 ft

Accessories:

EXTERNAL SIGNAL SPEED CONTROL
CTL & XFMR BY OTHERS

Dimensions (inches)

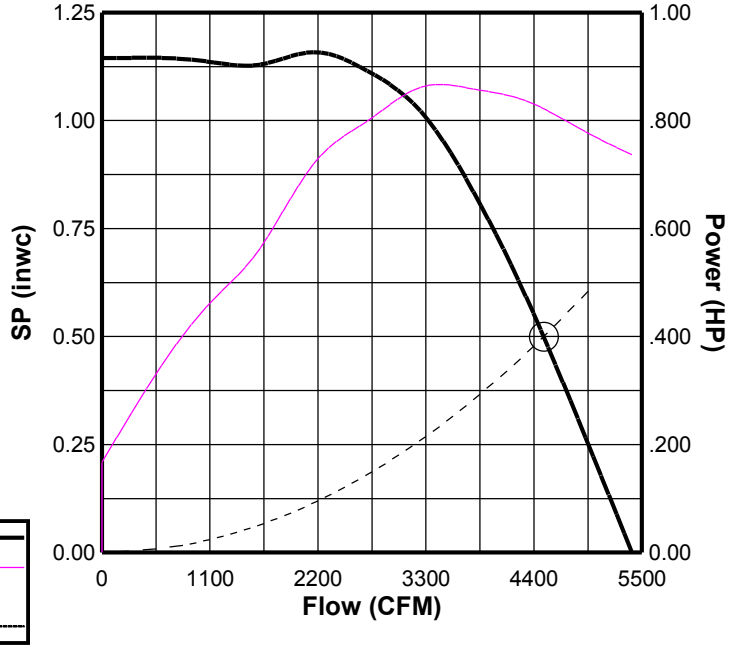
A	25-15/16
B	45-1/4
C	38-3/8
D	29-7/8
G	3
T Sq.	30
Roof Open. Sq.*	25-1/2

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	235	Unit	104

* Roof opening size for curbs supplied by Cook only.
***Includes fan, motor & accessories.

Fan Curve



Fan Curve Legend

CFM vs SP	———
CFM vs HP	———
Point of Operation	◯
System Curve	- - - - - -

ROOF MOUNTED
EXHAUST FAN

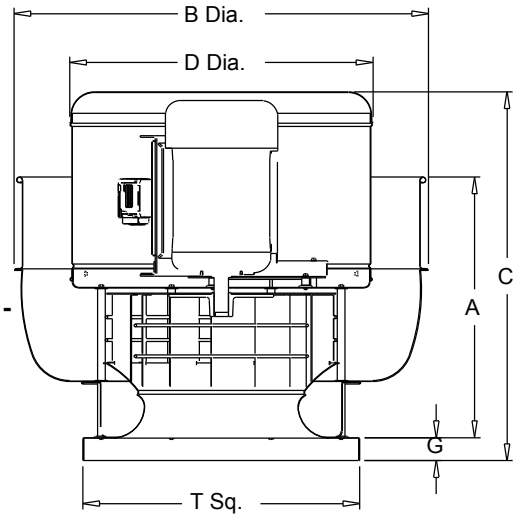
MARK: EF-B112-C
PROJECT: MCC Automotive
DATE: 12/8/2023

ACRU-D VF

Upblast Centrifugal
Exhaust Ventilator
Roof Mounted/Direct Drive
Electronically Commutated Vari-Flow® Motor

STANDARD CONSTRUCTION FEATURES:

All aluminum housing - Backward inclined all aluminum wheel - Two piece top cap with stainless steel quick release latches - (size 120 - 300) - Welded curb cap corners - Birdscreen - Permanently lubricated ball bearing motors - Corrosion resistant fasteners - Transit tested packaging.



Performance

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power (HP)	FEG	FEI	Speed Control
1	210R17D (VF2)	4500	.500	909	.823	n/a(<1HP)	1.41	EC

Altitude (ft): 1000 Temperature (F): 70

Motor Information

HP	RPM*	Volts/Ph/Hz	Enclosure	FLA
2	1725	460/3/60	TEFC -PM	3.4

Vari-Flow

FLA based on NEC (2017) Table 430.250
*Motor programmed to max speed of 1029 RPM.

Sound Data Inlet Sound Power by Octave Band

1	2	3	4	5	6	7	8	LwA	dBA	Sones
74	81	81	71	68	65	60	54	76	64	13.4

- Distance from Sound source 5 ft

Accessories:

EXTERNAL SIGNAL SPEED CONTROL
CTL & XFMR BY OTHERS

Dimensions (inches)

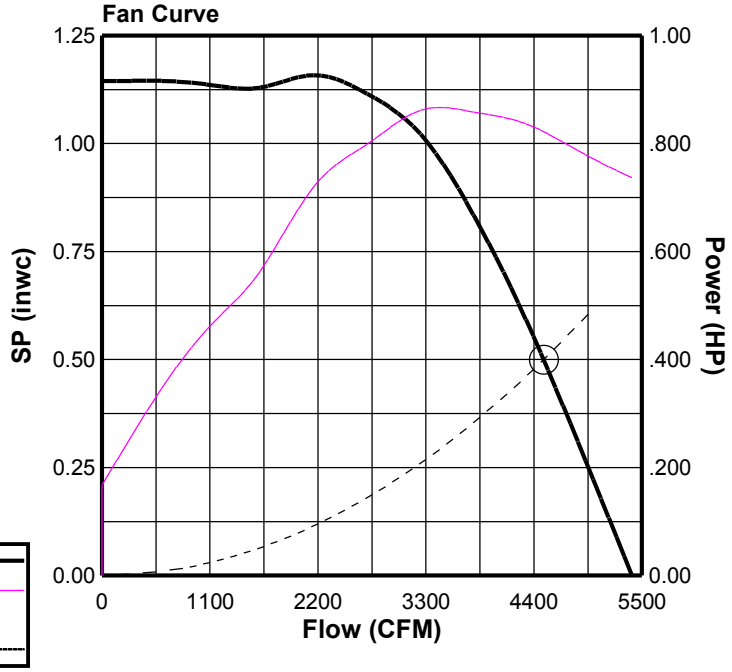
A	25-15/16
B	45-1/4
C	38-3/8
D	29-7/8
G	3
T Sq.	30
Roof Open. Sq.*	25-1/2

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	235	Unit	104

* Roof opening size for curbs supplied by Cook only.
***Includes fan, motor & accessories.

Fan Curve



Fan Curve Legend

CFM vs SP	———
CFM vs HP	———
Point of Operation	◯
System Curve	- - - - - -

ROOF MOUNTED
EXHAUST FAN

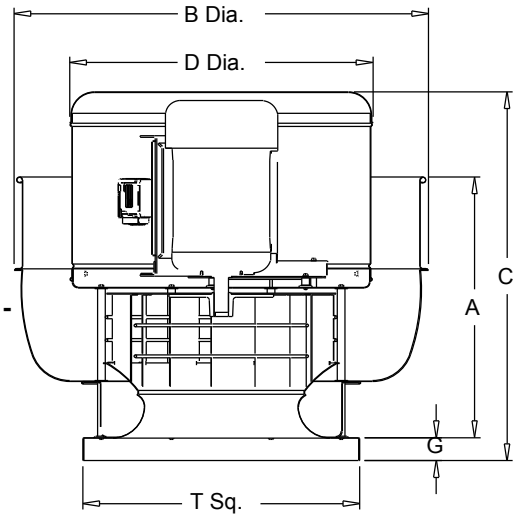
MARK: EF-B112-D	
PROJECT: MCC Automotive	
DATE: 12/8/2023	

ACRU-D VF

Upblast Centrifugal Exhaust Ventilator Roof Mounted/Direct Drive Electronically Commutated Vari-Flow® Motor

STANDARD CONSTRUCTION FEATURES:

All aluminum housing - Backward inclined all aluminum wheel - Two piece top cap with stainless steel quick release latches - (size 120 - 300) - Welded curb cap corners - Birdscreen - Permanently lubricated ball bearing motors - Corrosion resistant fasteners - Transit tested packaging.



Performance

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power (HP)	FEG	FEI	Speed Control
1	210R17D (VF2)	4500	.500	909	.823	n/a(<1HP)	1.41	EC

Altitude (ft): 1000 Temperature (F): 70

Motor Information

HP	RPM*	Volts/Ph/Hz	Enclosure	FLA
2	1725	460/3/60	TEFC -PM	3.4

Vari-Flow

FLA based on NEC (2017) Table 430.250
*Motor programmed to max speed of 1029 RPM.

Sound Data Inlet Sound Power by Octave Band

1	2	3	4	5	6	7	8	LwA	dBA	Sones
74	81	81	71	68	65	60	54	76	64	13.4

- Distance from Sound source 5 ft

Accessories:

EXTERNAL SIGNAL SPEED CONTROL
CTL & XFMR BY OTHERS

Dimensions (inches)

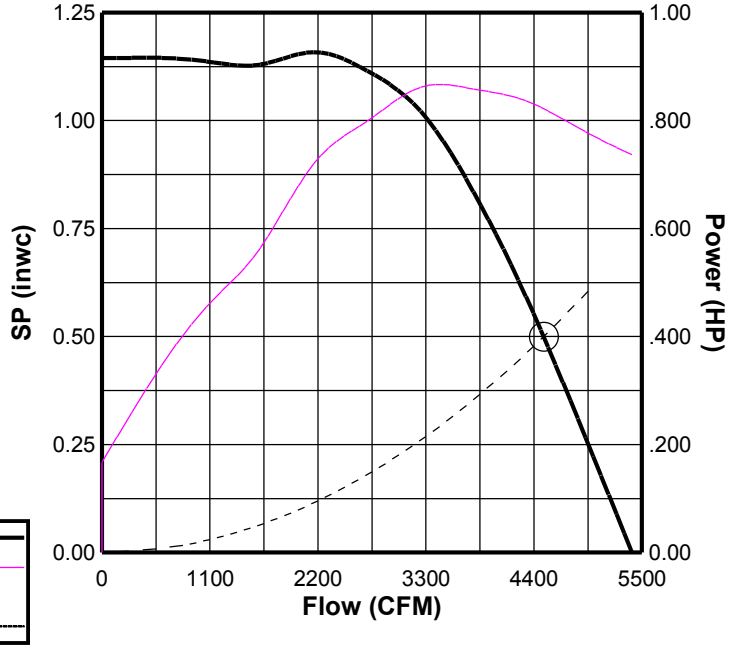
A	25-15/16
B	45-1/4
C	38-3/8
D	29-7/8
G	3
T Sq.	30
Roof Open. Sq.*	25-1/2

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	235	Unit	104

* Roof opening size for curbs supplied by Cook only.
***Includes fan, motor & accessories.

Fan Curve



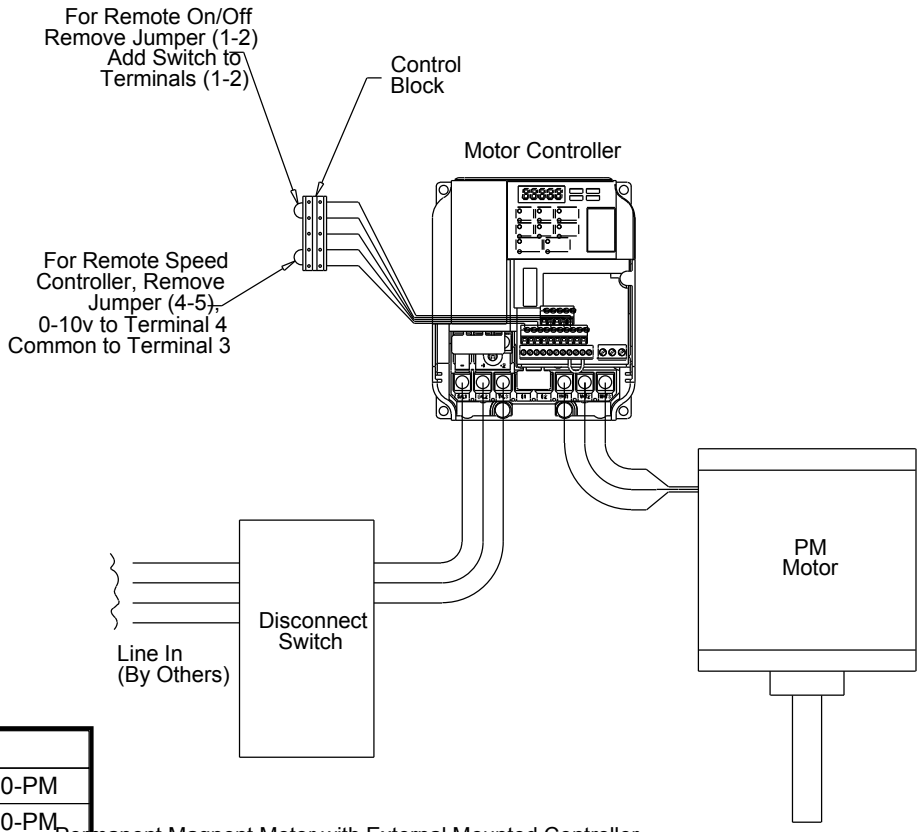
Fan Curve Legend

CFM vs SP	———
CFM vs HP	———
Point of Operation	◯
System Curve	- - - - - -

PROJECT: MCC Automotive
DATE: 12/8/2023

PM Motor Control

Permanent Magnet Motor Electronically Commutated External Signal Speed Control



Permanent Magnent Motor with External Mounted Controller.
For AC units the controller and disconnect are mounted under the unit top cap.

Dimensions (inches)

Mark	Qty	Description
EF-B102-A	1	TEFC -3HP - 460V/3 PH/ 60 1725/0000-PM
EF-B102-B	1	TEFC -3HP - 460V/3 PH/ 60 1725/0000-PM
EF-B102-C	1	TEFC -3HP - 460V/3 PH/ 60 1725/0000-PM
EF-B102-D	1	TEFC -3HP - 460V/3 PH/ 60 1725/0000-PM
EF-B102-E	1	TEFC -3HP - 460V/3 PH/ 60 1725/0000-PM
EF-B112-A	1	TEFC -2HP - 460V/3 PH/ 60 1725/0000-PM
EF-B112-B	1	TEFC -2HP - 460V/3 PH/ 60 1725/0000-PM
EF-B112-C	1	TEFC -2HP - 460V/3 PH/ 60 1725/0000-PM
EF-B112-D	1	TEFC -2HP - 460V/3 PH/ 60 1725/0000-PM
SF-A106-A	1	TEFC -3/4HP - 460V/3 PH/ 60 1725/0000-PM
SF-A106-B	1	TEFC -3/4HP - 460V/3 PH/ 60 1725/0000-PM
SF-A106-C	1	TEFC -3/4HP - 460V/3 PH/ 60 1725/0000-PM
SF-B102	1	TEFC -2HP - 460V/3 PH/ 60 1725/0000-PM

REZNOR®

Revision: UDZ-TSL (10-23) REV-C

Supersedes: UDZ-TSL (08-23) REV-B

TECHNICAL SPECIFICATIONS FOR MODEL UDZ

GAS-FIRED, SEPARATED-COMBUSTION, LOW-STATIC AXIAL FAN, COMMERCIAL/INDUSTRIAL/RESIDENTIAL, 82–83% THERMAL EFFICIENT UNIT HEATER

TABLE OF CONTENTS

In keeping with our policy of continuous product improvement, we reserve the right to alter, at any time, the design, construction, dimensions, weights, etc., of equipment information shown here.

TECHNICAL SPECIFICATIONS—CONTINUED

Unit Sizes

These heaters are available in fourteen unit sizes based on 30,000–400,000 BTUh input.

Features

- 115/1/60 supply
- Integrated circuit board with seven-segment display
- Easily-viewed status-indicating LED
- Hinged access door panel with quarter-turn latch
- Improved cabinet design with removable front face
- Two-toned black and white glossy, scratch-resistant paint scheme
- Patented single-burner combustion system
- Natural gas or propane
- 50–60°F temperature rise
- TCORE²® titanium-stabilized aluminized-steel heat exchanger
- External terminal strip for 24V wiring
- Built in disconnect switch
- Four-point suspension standard on all unit sizes (two-point suspension available on unit sizes 030–125 when installed without downturn nozzle or stepdown transformer)

Factory-Installed Options

Option	Description
AA1	Natural gas
AA2	Propane
AC1	Aluminized-steel heat exchanger
AC2	409 SST heat exchanger
AC4	316 SST heat exchanger
AG1	Single-stage combination gas valve
AG2	Two-stage combination gas valve
AK1	115/1/60 voltage
AL1	Open drip-proof motor
AL14	Totally-enclosed motor

Field-Installed Options

Option	Description
CC2	Vertical vent terminal/combustion air kit
CC6	Horizontal vent terminal/combustion air kit
CD1	Vertical louvers, direct discharge air to provide wider throw pattern
CD2	Downturn nozzle, 25- to 65-degree variable air deflection range
CD3	Downturn nozzle, 50- to 90-degree variable air deflection range
CD4	Downturn nozzle, 25- to 65-degree variable air deflection range with vertical louvers
CE1	Manual shutoff valve, natural gas or propane
CG1	208V–115V stepdown transformer
CG2	230V–115V stepdown transformer
CG4	460V–115V stepdown transformer
CK8	Adapts 3/8-inch hangers for two-point suspension from 1-inch threaded pipe
CK10	Adapts 3/8-inch hangers for four-point suspension from 1-inch threaded pipe
CK22	Angle brackets for low ceiling mounting (does not include hanger rods)
CL1	Single-stage thermostat
CL22	Two-stage thermostat

Option	Description
CL31, CL32	Multiple fan control: option CL31 includes components for one control unit and one additional unit—option CL32 includes components for each additional non-control unit
CM1	Locking cover for CL1 thermostat
CM1B	Locking cover for CL22 thermostat
CM3	Bracket assembly for mounting thermostat on unit
DJ20	High-elevation conversion
DL2	Propane conversion

Technical Data

Parameter	Unit of Measure	Unit Size					
		030	045	060	075	100	125
Input heating capacity	BTUh	30,000	45,000	60,000	75,000	105,000	120,000
	kW	8.8	13.2	17.6	22.0	30.8	35.2
Thermal efficiency	%	82	83	83		83	
Output heating capacity*	BTUh	24,600	37,350	49,800	62,250	87,150	99,600
	kW	7.2	10.9	14.6	18.2	25.5	29.2
Gas connection, natural gas**	inch	1/2					
Gas connection, propane**							
Vent connection diameter***		4					
Combustion air inlet diameter***							
Control, 24V	amp	1.0					
Full load amps, 115V		1.9	2.4	2.4	3.7	4.3	5.6
Maximum overcurrent protection, 115V†		15					
Normal power consumption	watt	109	155	155	228	292	370
Discharge air temperature rise	°F	50	55	60		60	
Air volume	CFM	456	629	769	961	1345	1537
	meter^3/minute	12.9	17.8	21.8	27.5	36.7	45.9
Discharge air opening area	feet^2	0.96		1.25		2.01	
	meter^2	0.09		0.12		0.19	
Output velocity	FPM	475	656	616	770	668	763
	meter/minute	145	200	188	235	204	233
Open fan motor size	HP	0.02	0.03	0.03	0.06	1/30	1/20
Totally-enclosed fan motor size		0.06		0.06		1/4	
Fan motor speed	RPM	1550		1550		1050	
Fan diameter	inch	10		12		16	
Sound level @ 15 feet	dBa	40		40	49	54	55
*ETL ratings for elevations up to 2,000 feet.							
**Size shown is for gas connection to a single-stage gas valve—not supply line size.							
***Smaller and/or larger vent and combustion air pipe diameters may be permissible (refer to appropriate venting instructions).							
†MOCP = 2.25 × (largest motor FLA) + smallest motor FLA. Answer is rounded to the next lower standard circuit breaker size.							

Parameter	Unit of Measure	Unit Size							
		150	175	200	225	250	300	350	400
Input heating capacity	BTUh	150,000	175,000	200,000	225,000	250,000	300,000	350,000	400,000
	kW	44.0	51.3	58.6	65.9	73.3	87.9	102.6	117.2
Thermal efficiency	%	83							
Output heating capacity*	BTUh	124,500	145,250	166,000	186,750	207,500	249,000	290,500	332,000
	kW	36.5	42.6	48.7	54.7	60.8	73.0	85.1	97.3
Gas connection, natural gas**	inch	1/2			3/4	3/4			
Gas connection, propane**									
Vent connection diameter***		5				5	6		
Combustion air inlet diameter***		6				6			
*ETL ratings for elevations up to 2,000 feet.									
**Size shown is for gas connection to a single-stage gas valve—not supply line size.									
***Smaller and/or larger vent and combustion air pipe diameters may be permissible (refer to appropriate venting instructions).									

Technical Data—Continued

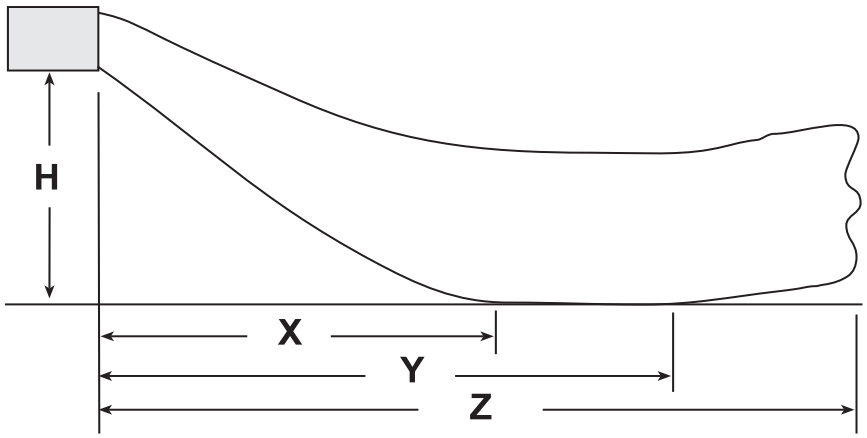
Parameter	Unit of Measure	Unit Size							
		150	175	200	225	250	300	350	400
Control, 24V	amp	1.0							
Full load amps, 115V		3.8		4.6	7.5	7.5	11.0		
Maximum overcurrent protection, 115V†		15				15	20		
Normal power consumption	watt	392		491	747	747	1086		
Discharge air temperature rise	°F	60							
Air volume	CFM	1921	2242	2562	2882	3202	3843	4483	5123
	meter^3/minute	54.4	63.5	72.5	81.6	90.7	108.8	126.9	145.1
Discharge air opening area	feet^2	2.56			3.51	3.51	4.79		
	meter^2	0.24			0.33	0.33	0.45		
Output velocity	FPM	752	877	1003	820	911	802	936	1069
	meter/minute	229	267	306	250	278	244	285	326
Open fan motor size	HP	1/6			1/4	1/4	1/2		
Totally-enclosed fan motor size		1/4							
Fan motor speed	RPM	1050							
Fan diameter	inch	18			20	20	24		
Sound level @ 15 feet	dBa	51	52	53	56	56	59	61	62
†MOCP = 2.25 × (largest motor FLA) + smallest motor FLA. Answer is rounded to the next lower standard circuit breaker size.									

Certification

These unit heaters are listed by Intertek for use in industrial and commercial installations in the United States and Canada. In addition, unit sizes 030, 045, 060, 075, 100, and 125 are listed in the United States and Canada as utility heaters for use in non-living spaces that are attached to, adjacent to, or part of a structure that contains space for family living quarters.

Heater Throw Distances with Standard Horizontal Louvers

The graphic shows throw patterns and the table lists throw distances for heaters suspended at varying mounting heights. The louver angles listed are relative to the top of the heater.



H = Distance from bottom of heater to the floor
X = Distance from heater to start of floor coverage
Y = Distance to end of floor coverage
Z = Distance at which air velocity drops below 50 feet (15.2 meters) per minute

H* (Feet (Meters))	Distance* or Angle	Unit Size						
		030	045	060	075	100	125	150
		Feet (Meters)						
5 (1.5)	X	6 (1.8)	7 (2.1)	8 (2.4)	9 (2.7)	9 (2.7)	10 (3.0)	—
	Y	14 (4.3)	16 (4.9)	18 (5.5)	20 (6.1)	20 (6.1)	22 (6.7)	
	Z	30 (9.1)	40 (12.2)	45 (13.8)	57 (17.4)	59 (18.0)	65 (19.9)	
	Downward louver angle	21°	20°	16°	14°	18°	14°	
8 (2.4)	X	7 (2.1)	9 (2.7)	10 (3.0)	12 (3.7)	11 (3.4)	12 (3.7)	13 (4.0)
	Y	13 (4.0)	16 (4.9)	18 (5.5)	22 (6.7)	21 (6.4)	23 (7.0)	24 (7.3)
	Z	26 (7.9)	37 (11.3)	42 (12.8)	54 (16.5)	56 (17.1)	63 (19.2)	73 (22.3)
	Downward louver angle	39°	34°	29°	25°	28°	24°	26°
10 (3.0)	X	6 (1.8)	9 (2.7)	10 (3.0)	12 (3.7)	12 (3.7)	13 (4.0)	14 (4.3)
	Y	11 (3.4)	15 (4.6)	17 (5.2)	22 (6.7)	20 (6.1)	24 (7.3)	24 (7.3)
	Z	22 (6.7)	33 (10.0)	39 (11.9)	52 (15.8)	52 (15.8)	60 (18.3)	69 (21.0)
	Downward louver angle	52°	43°	37°	32°	36°	30°	32°
12 (3.7)	X	—	8 (2.4)	10 (3.0)	12 (3.7)	11 (3.4)	14 (4.3)	14 (4.3)
	Y		12 (3.7)	16 (4.9)	21 (6.4)	19 (5.8)	23 (7.0)	24 (7.3)
	Z		27 (8.2)	34 (10.4)	48 (14.6)	47 (14.3)	57 (17.4)	64 (19.5)
	Downward louver angle		55°	46°	39°	44°	36°	39°
14 (4.3)	X	—		9 (2.7)	12 (3.7)	11 (3.4)	14 (4.3)	14 (4.3)
	Y			14 (4.3)	19 (5.8)	17 (5.2)	22 (6.7)	22 (6.7)
	Z			29 (8.8)	44 (13.4)	42 (12.8)	53 (16.1)	59 (18.0)
	Downward louver angle			56°	46°	51°	43°	45°
16 (4.9)	X	—			11 (3.4)	10 (3.0)	13 (4.0)	13 (4.0)
	Y				17 (5.2)	14 (4.3)	20 (6.1)	20 (6.1)
	Z				38 (11.6)	34 (10.4)	47 (14.3)	53 (16.2)
	Downward louver angle				54°	58°	50°	51°
18 (5.5)	X	—					11 (3.4)	11 (3.4)
	Y						17 (5.2)	17 (5.2)
	Z						40 (12.2)	44 (13.4)
	Downward louver angle						57°	58°

H* (Feet (Meters))	Distance* or Angle	Unit Size						
		175	200	225	250	300	350	400
		Feet (Meters)						
8 (2.4)	X	15 (4.6)	16 (4.9)	14 (4.3)	16 (4.9)	15 (4.6)	17 (5.2)	18 (5.5)
	Y	28 (8.5)	30 (9.1)	27 (8.2)	29 (8.8)	28 (8.5)	31 (9.4)	34 (11.3)
	Z	90 (27.4)	93 (28.0)	86 (26.2)	93 28.3	94 (28.7)	105 (32.0)	113 (34.4)
	Downward louver angle	22°	20°	24°	21°	24°	20°	17°
10 (3.0)	X	17 (5.2)	17 (5.2)	15 (4.6)	17 (5.2)	16 (4.9)	18 (5.5)	20 (6.1)
	Y	29 (8.8)	31 (9.4)	27 (8.2)	30 (9.1)	28 (8.5)	32 (9.8)	35 (10.7)
	Z	87 (26.6)	91 (27.7)	82 (25.0)	90 27.4	89 (27.1)	103 (31.4)	110 (33.5)
	Downward louver angle	27°	25°	30°	26°	29°	25°	21°
12 (3.7)	X	18 (5.5)	18 (5.5)	16 (4.9)	18 (5.5)	17 (5.2)	19 (5.8)	21 (6.4)
	Y	29 (8.8)	31 (9.4)	27 (8.2)	30 (9.1)	28 (8.5)	32 (9.8)	36 (11.0)
	Z	84 (25.6)	88 (26.8)	78 (23.8)	87 26.5	85 (25.9)	98 (29.9)	108 (32.9)
	Downward louver angle	32°	30°	35°	31°	34°	30°	25°
14 (4.3)	X	18 (5.5)	19 (5.8)	16 (4.9)	18 (5.5)	17 (5.2)	20 (6.1)	23 (7.0)
	Y	28 (8.5)	30 (9.1)	26 (7.9)	30 (9.1)	27 (8.2)	32 (9.8)	35 (10.7)
	Z	79 (24.1)	84 (25.6)	73 (22.3)	83 25.3	80 (24.4)	95 (29.0)	105 (32.0)
	Downward louver angle	37°	34°	41°	36°	40°	34°	29°
16 (4.9)	X	18 (5.5)	19 (5.8)	16 (4.9)	19 (5.8)	17 (5.2)	21 (6.4)	23 (7.0)
	Y	27 (8.2)	29 (8.8)	24 (7.3)	28 (8.5)	25 (7.6)	31 (9.4)	35 (10.7)
	Z	74 (22.6)	79 (24.1)	67 (20.4)	78 23.8	74 (22.6)	90 (27.4)	101 (30.8)
	Downward louver angle	42°	39°	47°	41°	45°	38°	33°
18 (5.5)	X	17 (5.2)	19 (5.8)	14 (4.3)	18 (5.5)	16 (4.9)	20 (6.1)	23 (7.0)
	Y	26 (7.9)	28 (8.5)	22 (6.7)	27 (8.2)	24 (7.3)	30 (9.1)	35 (10.7)
	Z	68 (20.7)	74 (22.6)	60 (18.3)	72 (21.9)	66 (20.1)	85 (25.9)	97 (26.9)
	Downward louver angle	48°	44°	53°	46°	51°	43°	37°

*See graphic above.

Hazards of Chlorine

The presence of chlorine vapors in the combustion air of gas-fired heating equipment presents a potential corrosion hazard for separated-combustion heaters with regard to the combustion air inlet. Chlorine is usually found in the form of freon or degreaser vapors. When chlorine is exposed to flame, it will precipitate from the compound and go into solution with any condensation that is present in the heat exchanger or associated parts. The result is hydrochloric acid, which readily attacks all metals including 300 grade stainless steel. Care should be taken to separate these vapors from the combustion process. This may be done by wise location of the unit vent and combustion air terminals with regard to exhausters or prevailing wind directions. Chlorine is heavier than air. Keep these facts in mind when determining installation location of the heater in relation to building exhaust systems.

Installation Codes

- These units must be installed in accordance with local building codes. In the absence of local codes, in the United States, the unit must be installed in accordance with the *National Fuel Gas Code*, ANSI Z223.1. A Canadian installation must be in accordance with the CSA B149 *Natural Gas and Propane Installation Code*. This code is available from CSA Information Services, 1-800-463-6727. Local authorities having jurisdiction should be consulted before installation is made to verify local codes and installation procedure requirements.
- Installations in aircraft hangars should be in accordance with ANSI/NFPA No. 409 (latest edition), *Standard for Aircraft Hangars*. Installations in public garages should be in accordance with ANSI/NFPA No. 88A (latest edition), *Standard for Parking Structures*. Installations in repair garages should be in accordance with ANSI/NFPA No. 88B (latest edition), *Standard for Repair Garages*. In Canada, installations in aircraft hangars should be in accordance with the requirements of the enforcing authorities, and in public garages, in accordance with the CSA B149 code.
- If the heater is being installed in the Commonwealth of Massachusetts, installation must be performed by a licensed plumber or licensed gas fitter.

Clearances

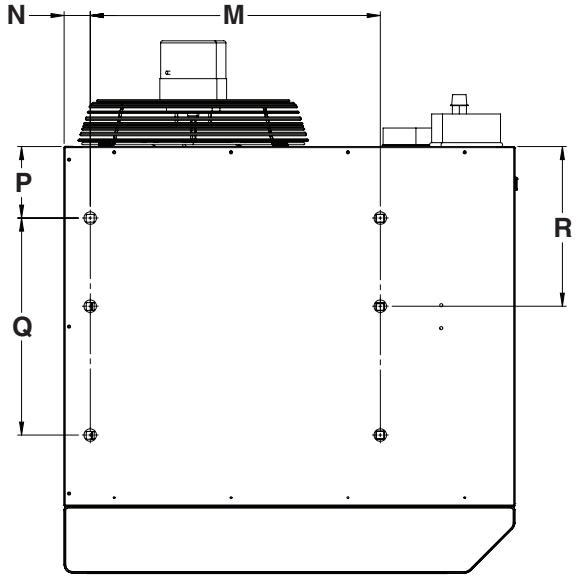
Units must be located so that clearances are provided for with regards to combustion air space, inspection, and service and for proper spacing from combustible construction. Clearance to combustibles is defined as the minimum distance from the heater to a surface or object for which it is necessary to ensure that a surface temperature of 90°F (50°C) above the surrounding ambient temperature is not exceeded.

Heater Surface	Unit Size	
	030–125	150–400
	Minimum Clearance (Inches (mm))	
Top	1 (25)	4 (102)
Flue connector	6 (152)	6 (152)
Access panel	18 (457)	18 (457)
Non-access side	1 (25)	2 (51)
Bottom*	1 (25)	1 (25)
Rear**	18 (457)	18 (457)
Front	Refer to values for variable X (distance from heater to start of floor coverage) in **Heater Throw Distances with Standard Horizontal Louvers** section	
*Suspend the heater so that the bottom is a minimum of 5 feet (1.5 meters) above the floor.		
**Measure rear clearance from the fan motor.		

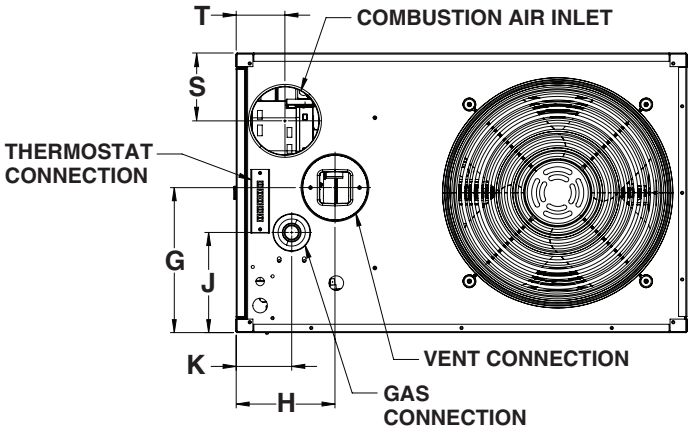
Weights

Type	Unit Size												
	030	045	060	075	100	125	150	175, 200	225	250	300	350	400
	Pounds (kg)												
Unit	58 (26)	63 (29)	71 (32)	77 (35)	102 (46)	107 (49)	179 (81)	194 (88)	212 (96)	224 (102)	278 (126)	304 (138)	317 (144)
Shipping	66 (30)	71 (32)	79 (36)	85 (39)	125 (57)	130 (59)	212 (96)	227 (103)	255 (116)	267 (121)	331 (150)	357 (162)	370 (168)

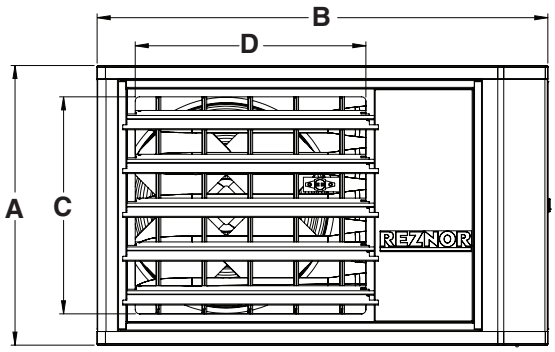
Dimensions



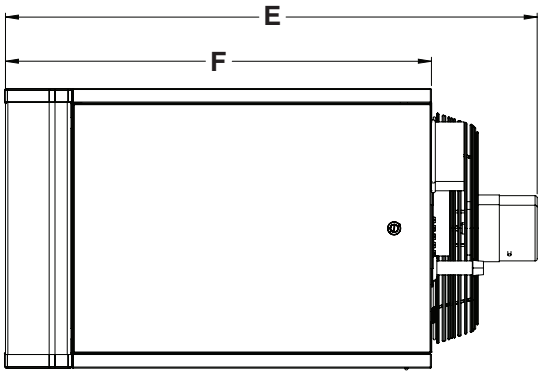
TOP VIEW



REAR VIEW



FRONT VIEW



SIDE VIEW

Dimension (See Graphic Above)	Unit Size							
	030, 045	060	075	100	125	150, 175, 200	225, 250	300, 350, 400
	Inches (mm)							
A	13-3/4 (349)	16-3/4 (425)		24-3/4 (629)		20-1/8 (511)	26-1/8 (664)	34-1/8 (867)
B	27 (686)					38-3/16 (970)		41 (1041)
C	10 (254)	13 (330)		21 (533)		16 (406)	22 (559)	30 (762)
D	13-13/16 (351)					23 (584)		
E	29-3/4 (756)	32-23/32 (831)	31-29/32 (810)	34-9/32 (871)	34-9/32 (871)	48-7/16 (1230)		48-29/32 (1243)
F	25-9/16 (649)					40 (1016)		
G	6 (152)	8-11/16 (221)		15-5/16 (389)		9-5/8 (244)	13-1/16 (332)	17-1/16 (433)
H	5-15/16 (151)					8-5/16 (211)		8-1/2 (216)
J	3-1/2 (89)	6 (152)		8-29/32 (226)		5-3/8 (137)	9 (229)	11-13/16 (300)
K	3-11/32 (85)					6-1/2 (165)		7-5/16 (186)
M*	17-3/8 (441)					25-11/16 (652)		27-11/16 (703)
N*	1-9/16 (40)					1-13/32 (36)		
P*	4-9/32 (109)					8-1/8 (206)		
Q*	13 (330)					22-3/16 (564)		
R**	11-9/16 (294)					16-3/8 (416)	15-5/8 (397)	16-1/4 (413)
S	3-3/4 (95)	4-1/16 (103)		5-15/32 (139)		5-1/2 (140)	8-1/16 (205)	11-9/16 (294)
T	2-15/16 (75)					4-1/4 (108)	4-5/16 (110)	4-1/2 (114)

*Heater suspension points for four-point suspension (3/8-16 FEM).

**Heater suspension points for two-point suspension (3/8-16 FEM).

Gas Supply Pressure

The unit is equipped for a maximum gas supply pressure of 1/2 psi, 3.5 kPa, or 14 IN WC.

NOTES:

Supply pressure higher than 1/2 psi requires the installation of an additional service regulator external to the unit.

PRESSURE TESTING SUPPLY PIPING

- **Test pressures above 1/2 psi—disconnect the heater and manual valve from the gas supply line to be tested. Cap or plug the supply line.**
- **Test pressures below 1/2 psi—before testing, close the manual valve on the heater.**

Gas Supply Piping

- All piping must be in accordance with requirements outlined in the *National Fuel Gas Code* (ANSI/Z223.1, latest edition) or the *Natural Gas and Propane Installation Code* (CSA-B149.1).
- The heater is orificed for operation with natural gas having a heating value of 1,050 (±50) BTU per cubic foot or with propane gas having a heating value of 2,550 (±100) BTU per cubic foot. Sizing of gas supply lines depends on piping capacity and is based on cubic feet per hour based on a 0.3 IN WC pressure drop, a 0.6 specific gravity for natural gas at 1,050 BTU per cubic feet, and a 1.6 specific gravity for propane at 2,550 BTU per cubic feet. If the gas at the installation does not meet this specification, consult the factory for proper orificing.
- Variables for sizing gas supply lines are listed in the table below. When sizing supply lines, consider possibilities of future expansion and increased requirements. Refer to the *National Fuel Gas Code* for additional information on line sizing.

Length of Pipe (Feet)	Diameter of Pipe (Inches)											
	1/2		3/4		1		1-1/4		1-1/2		2	
	Natural Gas	Propane	Natural Gas	Propane	Natural Gas	Propane	Natural Gas	Propane	Natural Gas	Propane	Natural Gas	Propane
	Cubic Feet per Hour											
20	92	56	190	116	350	214	730	445	1100	671	2100	1281
30	73	45	152	93	285	174	590	360	890	543	1650	1007
40	63	38	130	79	245	149	500	305	760	464	1450	885
50	56	34	115	70	215	131	440	268	670	409	1270	775
60	50	31	105	64	195	119	400	244	610	372	1105	674
70	46	28	96	59	180	110	370	226	560	342	1050	641
80	43	26	90	55	170	104	350	214	530	323	990	604
90	40	24	84	51	160	98	320	195	490	299	930	567
100	38	23	79	48	150	92	305	186	460	281	870	531
125	34	21	72	44	130	79	275	168	410	250	780	476
150	31	19	64	39	120	73	250	153	380	232	710	433
175	28	17	59	36	110	67	225	137	350	214	650	397
200	26	16	55	34	100	61	210	128	320	195	610	372

NOTES

⚠ DANGER ⚠

FIRE OR EXPLOSION HAZARD

- **Failure to follow safety warnings exactly could result in serious injury, death, or property damage.**
- **Improper installation, adjustment, alteration, service, or maintenance can cause serious injury, death, or property damage.**
- **Installation and service must be performed by a qualified installer, service agency, or the gas supplier.**
- **Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.**

WHAT TO DO IF YOU SMELL GAS

- **Do not try to light any appliance.**
- **Do not touch any electrical switch; do not use any phone in your building.**
- **Leave the building immediately.**
- **Immediately call your gas supplier from a phone remote from the building. Follow the gas supplier's instructions.**
- **If you cannot reach your gas supplier, call the fire department.**

For more information on Reznor HVAC products:

- **Contact your local Reznor representative at 1-800-695-1901**
- **Refer to the manuals and additional consumer materials found at www.reznorhvac.com**

UDZ-TSL (10-23) REV-C

EXTERNAL HELIX HOSE FOR TEMPERATURES UP TO 2010°F

SERIES 7210

Material

Hose wall: Three-layer construction, asbestos-free, high-temperature fabrics, special coated with heat-stabilizers
External helix: Stainless steel

Applications

- Extremely high temperatures
- Exhaust fume extraction from large engines and high performance test beds in the motor vehicle industries
- Extraction under stray sparks
- Shipbuilding industry
- Vehicle and engine construction
- Diesel exhaust

- Extremely high temperatures
- Exhaust fume extraction from large engines and high performance test beds in the motor vehicle industries
- Extraction under stray sparks
- Shipbuilding industry
- Vehicle and engine construction
- Diesel exhaust

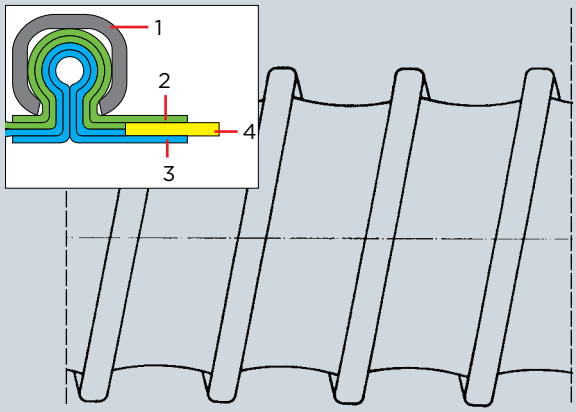
Properties

- Flame-resistant
- Very high temperature resistance
- Silicone-free
- Flexible
- Compressibility 1:2
- Small bend radius
- External steel helix protects against abrasion
- Special clamping method guarantees high tensile strength between hose material and external helix
- To maximize life of duct and exhaust system effectiveness, it is recommended to utilize a negative pressure exhaust system and introduce ambient air at the inlet.

*** Larger sizes available, consult factory for pricing.**

Construction

1. External helix
2. Outer layer: special coated high temperature fabric with heat stabilizers
3. Inner layer: Fine stainless steel mesh
4. Middle layer: Special insulating fabric



Temperature Range*

- -75ºF up to +2010ºF
- Intermittent to +2370ºF
- Small amounts of smoke maybe given off when used under positive pressure or with low extraction rates.

*Hoses used for vehicle exhaust extraction, or operating near maximum temperature, must be used within a properly designed fan system to avoid damaging the hose.

Dia (in.)	Positive (in. w.c.)	Negative (in. w.c.)	*Bending radius (in.)	Weight (lbs./ft.)
3.00	201	122	1.80	1.00
4.00	141	81	2.40	1.29
5.00	109	50	3.00	1.60
6.00	69	37	3.60	1.93
8.00	49	20	4.80	2.57
10.00	39	14	7.00	3.20
12.00	33	9	8.40	3.85
14.00	20	7	9.80	4.49
16.00	16	6	11.20	5.25
18.00	12	4	14.40	6.15

* Referring to the inner side of the elbow of hose.

The above mentioned data refers to an average and ambient temperature of 68°F. Subject to technical changes and color variations.

SKYBLADE® FAN CO.

GHOST SERIES

SUBMITTAL DATA - HVLS CEILING FANS & ACCESSORIES

SUBMITTED BY: DATE:

JOB TITLE: CONTRACTOR:

ADDRESS: PHONE #:

CITY: ADDRESS:

STATE: ZIP: CITY:

STATE: ZIP:

ENGINEER:

LOCAL REPRESENTATIVE:

QTY.	MODEL #	FAN DIA.	VOLTAGE RANGE[1]	MOTOR FLA[2]	PHASE	HP	AREA COVERED	MAX EFFECTIVE DIAMETER[3]	MAX SPEED[4]	INSTALLED WEIGHT
	GHOST-0824-612-1	8 Ft. (2.4 m)	110-115 VAC	1.7	1	1.35 HP (1.0 kW)	5,024 Ft² (467 m²)	80 Ft. (24 m)	130 RPM	147 lbs (67 kg)
	GHOST-0824-623-1		220-240 VAC		1					
	GHOST-0824-623-3		220-240 VAC		3					
	GHOST-0824-646-3		400-480 VAC		3					
	GHOST-1030-612-1	10 Ft. (3.0 m)	110-115 VAC	4.7	1	1.35 HP (1.0 kW)	7,850 Ft² (730 m²)	100 Ft. (30 m)	113 RPM	173 lbs (79 kg)
	GHOST-1030-623-1		220-240 VAC		1					
	GHOST-1030-623-3		220-240 VAC		3					
	GHOST-1030-646-3		400-480 VAC		3					
	GHOST-1236-612-1	12 Ft. (3.6 m)	110-115 VAC	4.7	1	1.35 HP (1.0 kW)	11,304 Ft² (1050 m²)	120 Ft. (36 m)	92 RPM	195 lbs (89 kg)
	GHOST-1236-623-1		220-240 VAC		1					
	GHOST-1236-623-3		220-240 VAC		3					
	GHOST-1236-646-3		400-480 VAC		3					
	GHOST-1443-612-1	14 Ft. (4.3 m)	110-115 VAC	4.1	1	1.35 HP (1.0 kW)	15,386 Ft² (1430 m²)	140 Ft. (43 m)	70 RPM	217 lbs (99 kg)
	GHOST-1443-623-1		220-240 VAC		1					
	GHOST-1443-623-3		220-240 VAC		3					
	GHOST-1443-646-3		400-480 VAC		3					

[1]277v Power source is not accepted.

[2]Motor FLA is calculated at 110v supply. Installation must comply with specifications from National Electrical Codes and standards regarding wire types, conductor sizes, branch circuit protection, and disconnecting devices.

[3]Estimated values based on typical conditions.

[4]Max. Speed RPM has been recorded using 460v power source. Other voltages may affect performance.

Rated voltage for the appliance is 460V. Steady voltages in the high 490's and spikes above this can damage the onboard electronics.

Intertek

GHOST SPECIFICATIONS

BLADES
- Equipped with 6 blades
- Extruded aluminum
- High performance E420 design with STOL technology

CONSTRUCTION
- Mounting is to be 1/4" powder-coated steel and aluminum
- All construction is to be protected from the elements
- Stainless steel safety brackets

VFD
- Onboard, IP65 rating
- Factory assembled & programmed
- Minimum start/stop torque loads

WINGTIPS
- Equipped with 6 Wingtips
- Constructed of nylon 66
- Redirect outward airflow into downward airflow

MOTOR
- Direct drive ECM motor
- Totally enclosed
- IP65 rating
- Class F insulation
- 1.35HP (1.0 kW) nominal horsepower

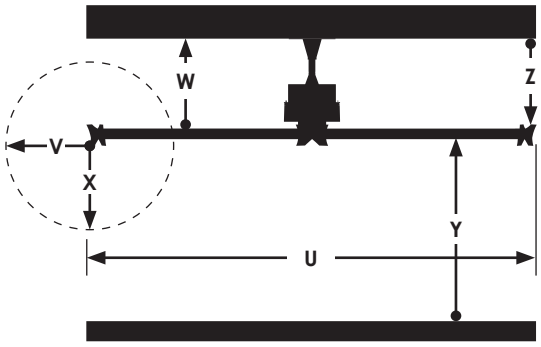
STANDARD LIMITED WARRANTY
- 5 year: Motor
- 1 year: Electronics
- Lifetime: Blades, chassis,& hub.
- Extended warranties available

GHOST SERIES SAFETY CLEARANCES & DROP HEIGHT

MODEL #	DIAMETER [U]	SIDE [V]	ABOVE [W]	BELOW [X]	MIN. BLADE HEIGHT [Y]	BLADE DROP HEIGHT [Z]
GHOST-0824	8 Ft (2.4 m)	15"	28"	15"	10'	30.4"
GHOST-1030	10 Ft (3.0 m)	18"	28"	18"	10'	31.4"
GHOST-1236	12 Ft (3.6 m)	22"	28"	22"	10'	31.4"
GHOST-1443	14 Ft (4.3 m)	22"	28"	22"	10'	31.4"

All dimensions are based on a standard 1 ft. extension bar.

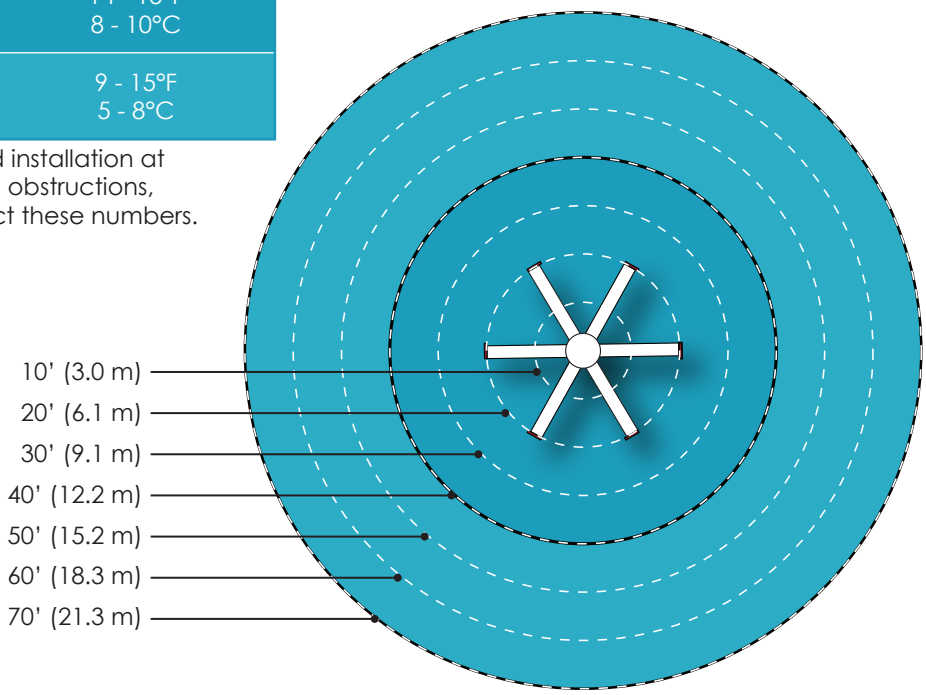
SAFETY CLEARANCES & DROP HEIGHT



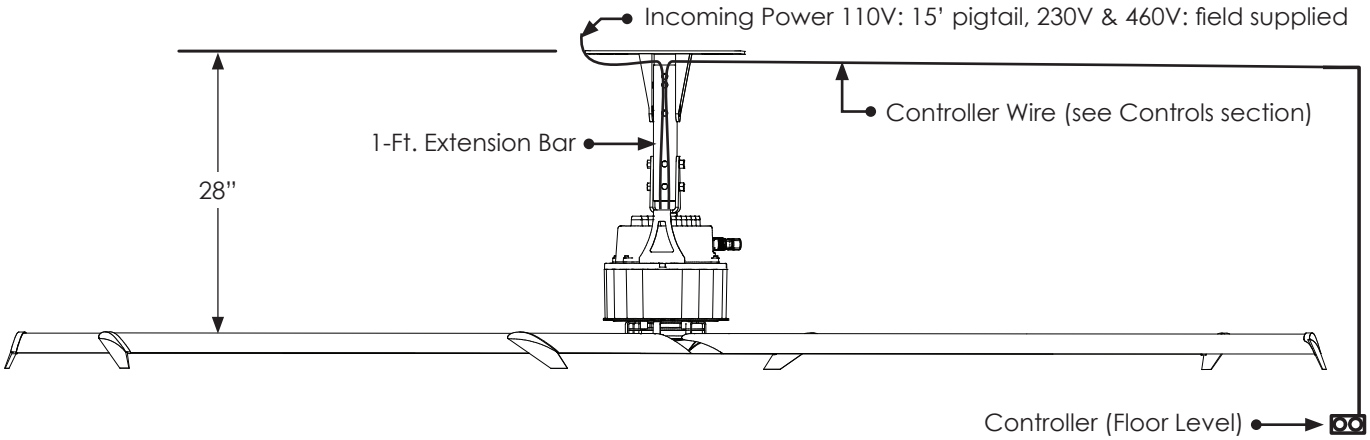
GHOST SERIES MAX EFFECTIVE DIAMETER

DISTANCE FROM CENTER	AIR VELOCITY	COOLING SENSATION
0' - 40' (0 - 12.2 m)	620 - 900 fpm 3 - 4.5 m/s	14 - 15°F 8 - 10°C
40' - 70' (12.2 - 21.3 m)	340 - 620 fpm 1.7 - 3 m/s	9 - 15°F 5 - 8°C

Stated values are estimations based on standard installation at maximum power. Values such as building layout, obstructions, ceiling height, and drop ceiling height may effect these numbers.



GHOST SERIES INSTALLATION



GHOST SERIES OPTIONAL ACCESSORIES & UPGRADES

QTY.	PART #	DESCRIPTION	NOTES
EXTENSION BARS			
	1002-X	**Extension Bar**	Lowers assembly in 1 ft increments. All models come standard with a 1 ft. extension. Custom lengths up to 10 ft. are available.
QTY.	**1'** **2'** **3'** **4'** **5'** **6'** **7'** **8'** **9'** **10'**		
CONTROLLER TYPES			
12	**DP-767.10**	**Ground Control**	Wall mounted control for BACnet & BMS integration. Control multiple fans in groups or individually. Standard offering controls up to 2 fans. Expandable up to 50 fans. Contact factory for expanded options.
	BP-769.XX	**7" AutoPilot 2.0 Controller**	7" touchscreen controller supports multiple fans as a stand alone controller or through bacnet & BMS integration. Schedule start & stop run times **[XX]** = 1-10 fans [10], 1-25 fans [25], 1-35 fans [35].
	BP-770.XX	**10" AutoPilot 2.0 Controller**	10" touchscreen controller with temperature control module upgrade. Supports multiple fans as a stand alone controller or through BACnet & BMS integration. Schedule start & stop run times. Includes upgraded module with two (2) temperature probes per controller to allow for automatic summer & winter mode programs. **[XX]** = 1-10 fans [10], 1-25 fans [25], 1-35 fans [35].
	DP-779	**Single Yoke Controller**	Includes Fwd/Rev switch and 0-10 speed pot to control fan speed. NEMA 4x enclosure. (qty. 1) 100 Ft. wire factory supplied. One per fan required.
	DP-783	**Double Yoke Controller**	Includes Fwd/Rev switch and 0-10 speed pot to control fan speed. NEMA 4x enclosure. (qty 2) 100 Ft. wire factory supplied. One per two fans required.
	DP-787	**Triple Yoke Controller**	Includes Fwd/Rev switch and 0-10 speed pot to control fan speed. NEMA 4x enclosure. (qty 3) 100 Ft. wire factory supplied. One per three fans required.
	BP-773-XX	**Touch 'N' Go Premier Multi-Fan Controller**	Operate 1-10 fans in forward/reverse with 0-100% speed control. Mounts to wall or electric gang box. Fully digital interface with password lockout capability. **[XX]** = 1 fan [01], 2 fans [02], 3-4 fans [04], 5-6 fans [06], 7-8 fans [08], 9-10 fans [10]
	BP-789	**UltraLite Controller**	Control each fan individually in the forward direction. Allows operation of the fan for cooling & destratification. Wire to be field supplied One per fan required.
	BP-775	**VLD Controller**	Control each fan individually via an economic digital interface. Wire to be field supplied.
	DP-793	**IDFC**	Easily mounts to electrical box for controlling each fan individually. Allows operation of the fans in either forward (cooling) or reverse (destratification). Manually control each fan's speed.
OPTIONAL ACCESSORIES			
	BP-913	**Purlin Mounting System**	Mounting system for hanging SkyBlade Fans along purlin ceiling braces (hardware included).
	BP-901	**230v Line Reactor**	Cleans dirty voltage by reducing harmonic current and transient voltages. Includes one Nema 1 enclosure.
	BP-902	**460v Line Reactor**	
	BP-326	**Single Yoke Control Cover**	Add-on for the yoke controller to allow them to be padlocked. Includes two (2) shrouds (Lock not included).
OPTIONAL UPGRADES			
	BP-929	**Black or Blue Wing Tips**	Optional upgrade to black or blue wingtips to compliment your space.
LIMITED WARRANTY UPGRADES			
	1061	**Standard Level Warranty**	Standard limited warranty 5 years-motor/1 year-electronic controls/lifetime-blades, chassis & hub.
	1062	**Bronze Level Warranty**	Upgrade warranty to 7 years-motor/3 years-electronic controls/lifetime-blades, chassis & hub.
	1063	**Silver Level Warranty**	Upgrade warranty to 10 years-motor/3 years-electronic controls/lifetime-blades, chassis & hub.
	1064	**Gold Level Warranty**	Upgrade warranty to 12 years-motor/7 years-electronic controls/lifetime-blades, chassis & hub.
	1076	**Platinum Level Warranty**	Upgrade warranty to 12 years-motor/12 years-electronic controls/lifetime-blades, chassis & hub.

NOTE: Refer to the Accessory List for detailed specifications and limitations on any of the above options.

GHOST SERIES WRITTEN SPECIFICATIONS

HIGH VOLUME LOW SPEED FANS

A. Basis-of-design product: Subject to compliance with requirements, provide WD Industries, dba SkyBlade Fan Company; **GHOST Series** high volume low speed ceiling fans.

B. Complete Unit: The fan shall be designed to move an effective amount of air for cooling and Destratification in large industrial/commercial applications over an extended life. The fan and components shall be designed specifically for high volume, low speed fans to ensure lower noise operation. The sound levels from the fan operating at maximum speed shall not exceed <35 dBA (measured 20' or 6.1 m below the blades and 20' or 6.1 m horizontally from the center of the fan).

C. Blades: The fan shall be equipped with six (6) high volume, low speed blades of precision 6005-T5 extruded aluminum alloy. Each blade shall be of the high performance STOL (Short Take-Off and Landing) design. The blades shall be connected by means of two (2) locking bolts per blade. The blades shall be connected to "H-Strut" which is connected to the hub and interlocked with two sets of six stainless steel retainers.

D. Wingtips: The fan shall be equipped with six (6) wingtips designed to redirect outward airflow into downward airflow, thereby enhancing the efficiency and effectiveness of the fan. The wingtips shall be molded of Nylon 66. The wingtips shall be attached at the tip of each blade by means of a single screw. The standard color of the wingtips shall be "SkyBlade Red," but may also be offered in black.

E. Motor: The fan motor shall be an ECM (Electronically Commutated Motor), BLDC (Brushless DC), gearless direct drive 115V 1 Ph, 230V 1-3 Ph, and 460V 3 Ph. The motor shall be totally enclosed with an IP65 NEMA classification. The motor shall be manufactured with Class F insulation. The output shaft of the motor shall be no less than a 3" keyless shaft with bearings that are lubed for life.

F. Extension Bar: The fan shall be equipped with an extension bar that provides a structural connection between the fan assembly and upper mounting system. The extension bar shall be steel 2" x 2" (5.08 cm x 5.08 cm) square tubing and powder-coated for corrosion resistance and appearance. Standard length of extension bar is 1-Ft. available in 1-Ft. increments up to 10-Ft. as specified by the architect or owner.

G. Hub: The fan hub shall be minimum 1/4" steel for high strength and rigidity. The hub shall be secured to the output shaft of the motor by means of a precision cut steel cylinder & interlocking bushing system. Both hub and steel bushing shall be precision machined to achieve a factory balanced and solid rotating assembly. The hub shall incorporate six (6) safety retaining brackets no less than 1/8"made of stainless steel that shall restrain the hub/blade assembly in case of motor output shaft failure.

H. Mounting System: The fan mounting system shall be designed for quick and secure installation from a structural support beam. All components in the mounting system shall be of welded construction using 1/4" powder-coated steel. All mounting bolts shall be Grade 5 or Grade 8 SAE.

I. Guy Wire: The fan shall be equipped with a safety cable that provides an additional means of securing the fan assembly to the building structure. The safety cable shall be a four point restraint 1/8" (0.32 cm) diameter and fabricated out of 7 x 7 stranded galvanized steel with each cable having a breaking strength of 1,000 lbs. The cable is to be secured with supplied wire rope clips or fasteners. Field construction of safety cables is not permitted.

J. Safety Cable: The fan shall be equipped with a safety cable that provides an additional means of securing the fan assembly to the building structure. The safety cable shall be 1/8" (0.32 cm) diameter and fabricated out of 7 x 7 stranded galvanized steel a break strength of 1,000 lbs. The cable is to be secured with supplied wire rope clips or fasteners. Field construction of safety cables is not permitted.

K. VFD Enclosure: The fan controller shall be constructed using a Variable Frequency Drive (VFD) that is pre-assembled and factory programmed to communicate a 60 second ramp up/down to the fan, to minimize the starting and braking torques and for smooth and efficient operation. The VFD enclosure shall be pre-assembled and internally wired for ease of installation. The controller shall be onboard with IP65 rating.

L. Warranty: The Manufacturer shall replace any products or components defective in material or workmanship, free of charge to the customer (including transportation charges within the USA, F.O.B. Warren, MI), pursuant to the complete terms and conditions of the SkyBlade Fan Company Non-Prorated Warranty in accordance to the following schedule:

- Blades - Lifetime (Parts)
- Hub - Lifetime (Parts)
- Motor - 5 years (Parts)*
- Controller - 1 year (Parts)*

*If factory supplied installation methods are shown not to be valid, SkyBlade Fan Company has right to void warranty. Further Information on the terms and conditions of the standard & purchased warranties can be found in Warranty Card.

SkyBlade is not liable for any voltage disturbances with explicit reference to electronic magnetic interference (EMI). Voltage disturbance refers to transient overvoltage, voltage unbalance, voltage swells, rapid voltage change, flicker, superimposed signals, harmonic voltages, supply voltage variations, voltage dips and frequency/time deviation.

Tech Data

Viega® Barrier PEX Tubing

This document is subject to updates. For the most current Viega technical literature please visit www.viega.us.

Viega products are designed to be installed by licensed and trained plumbing and mechanical professionals who are familiar with Viega products and their installation. **Installation by non-professionals may void Viega LLC's warranty.**

Description

This specification designates the requirements for Viega Barrier cross-linked polyethylene (PEX) tubing for use in hydronic heating and cooling systems. Viega Barrier PEX includes an oxygen barrier layer that helps restrict the passage of oxygen through the wall of the tubing. All ViegaPEX is manufactured and tested to the requirements of ASTM F876, F877, CSA B137.5 and is CTS-OD (copper tube size outer dimension controlled) with an SDR - (standard dimension ratio) 9 wall thickness. Viega Barrier PEX is compatible with both ViegaPEX Press fittings and F1807 PEX Crimp fittings. Viega has no control over the quality of other manufacturers, therefore, we do not extend any warranty to those components that are not supplied by Viega.

Materials

Viega Barrier PEX tubing is produced from cross-linkable, high density polyethylene resin. This cross-linkable resin is produced by grafting organo-silane molecules onto a base polyethylene chain. A catalyst that initiates the cross-linking process is blended with the resin before extrusion. Cross-linking is conducted after extrusion by exposing the tubing to heat and moisture (steam). Viega Barrier PEX includes four (4) layers. The first layer is cross-linked, high density polyethylene. The second layer is an adhesive for the third layer, the ethylene vinyl alcohol layer (EVOH oxygen barrier). The fourth layer is another thin layer of polyethylene, applied on the outside to protect the EVOH layer from damage. EVOH is highly resistant to the passage of oxygen.

Marking and Certification

Tubing is marked with manufacturer, Viega Barrier, nominal size, rating, codes and standards, approvals, date, material code and location of production (i.e., xxxxFT Viega Barrier ½" SDR-9 CTS PEX5306 100 PSI @ 180F [cNSF®us-pw-rfh ASTM F876/F877 CSA B137.5] FS/SD 25/50 CAN/ULC S102.2 ICC ES-PMG™-1015/1038 HUD MR 1276 Date Code Material Code MADE IN THE USA 0005FT. Tubing is third party tested to the requirements of the stated ASTM and CSA standards. Tubing includes incremental footage markings to assist with loop layout. Viega Barrier PEX tubing is certified to NSF 61 and 14 for use as part of, or connected to a potable water system.

Recommended Uses

Install Viega Barrier PEX in accordance with installation manuals provided by manufacturer and applicable code requirements. Water or air can be used to pressure test the system. Please follow manufacturer's requirements on pressure and length of time. Viega Barrier PEX is rated for 6 months UV protection. For information on the suitability for other applications, contact your Viega representative.

Handling and Installation

Viega Barrier PEX tubing is recommended for hydronic heating, cooling and snow melting systems using water or a water/glycol mix as the heat transfer media. The tubing is also NSF rated safe for potable water. Tubing may be installed in concrete, gypsum based lightweight concrete, sand, asphalt (in accordance with special guidelines) in or under wood flooring or behind wallboard or plaster. Viega Barrier PEX may also be used as transfer lines for baseboard heating systems with a maximum operating temperature of 200˚F @ 80 psi.

Property	ASTM Test Method	Typical Values	
		English Unit	SI Units
Density	D 792	–	0.952 g/cc
Melt Index[1]	D 1238	–	0.7g/10 min
Flexural Modulus[2]	D 638	150,000 psi	1000 MN/m2
Tensile Strength @ Yield (2 in/min)	D 638	3,900 psi	26 MN/m2
Coefficient of Linear Thermal Expansion @ 68° F	D 696	9.2 x 10-5/°F	1.4 x 10-4/°C
Hydrostatic Design Basis @ 73°F (23°C)	D 2837	1,250 psi	8.6 MPA
Hydrostatic Design Basis @ 180°F (82°C)	D 2837	800 psi	5.5 MPA
Vicat Softening Point	D 1525	255°F	124°C
Thermal Conductivity	D 177	2.7 Btu/hr/ft^2/°F	1.1 x 10^{-3} cal/sec/cm/°C

[1] Before Cross-linking
[2] 73°F

Hanger Spacing

Slab Applications
Where Viega Barrier PEX tubing is installed horizontally in slab applications, the tubing shall be fastened every 2' and 3 times at each U-turn.

Hydronic Piping Applications
Where Viega Barrier PEX tubing is used for fluid transfer piping outside of a slab, the tubing shall be fastened horizontally at intervals of 32" and vertically at intervals of 48".

Fastener Makeup
In situations where the fastener will attach directly to the tubing, plastic or plastic coated fasteners that allow the tubing to move slightly as it expands and contracts shall be used.

These are manufacturers suggestions, local code should be followed in areas where something different is specified.

Quality Assurance

Viega Barrier PEX tubing is manufactured and tested to the requirements of ASTM F876, F877 and CSA B137.5. The degree of cross-linking of finished tubing is determined by method ASTM D2765.

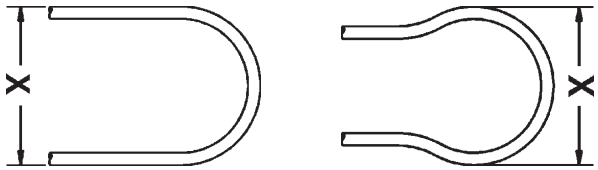
Certifications

NSF-pw
- Tested for health effects to ANSI/NSF standard 61 and performance to ANSI/NSF standard 14.
- Products meet all applicable performance requirements for a pressure rated floor heating application specified in NSF/ANSI Standard 14.
- PEX 5306 - Tested and listed to the NSF-pw (CL5) Chlorine resistance rating for an end use condition of 100% @ 140°F per ASTM F876, which is the highest Chlorine resistance rating available through ASTM. When the product is marked with the PEX 5306 NSF-pw (CL5) designation, it affirms the product is approved for use in continuous domestic hot water circulation systems with up to 140°F water temperatures.

- IAPMO Certified
- ICC ES-PMG™ 1015 Hydronic Piping
- NSF certified to CSA B137.5 (Canadian Standards Association)
- Certified to UL 263 & CAN/ULC S101 (US & Canadian fire resistance ratings)
- Certified to ASTM E84 and CAN/ULC S102.2 FS/SD (25/50) (U.S. & Canadian plenum rating)

Tube Spacing

When the tube spacing is less than the minimum recommended bending dimension, the loops ends should be swept out to at least the dimensions shown. Otherwise, if tube spacing is equal or greater than "X", a standard loop may be used.



Dimension X	
Tubing Size (in)	**With the Coil**
5/16	7
3/8	8
1/2	10
5/8	12
3/4	14
1	18
1 1/4	22
1 1/2	26
2	34

Minimum Bend Radius: 8 x O.D.

Viega Barrier PEX Oxygen Permeation

All sizes have less than 0.1 gram/m^3/day

Viega Barrier PEX tubing meets DIN 4726 requirements for oxygen tight pipes.

SDR-9 PEX Tubing ASTM F876/F877/CTS-OD SDR-9					
Tubing Size (in)	**O.D. (in)**	**Wall Thickness (in)**	**Nom. I.D. (in)**	**Weight Per Ft (lb.)**	**Volume Per 100 Ft (Gal.)**
5/16	.430±.003	.064+.010	0.292	.0340	0.34
3/8	.500±.003	.070+.010	0.350	.0413	0.50
1/2	.625±.004	.070+.010	0.475	.0535	0.92
5/8	.750±.004	.083+.010	0.574	.0752	1.34
3/4	.875±.004	.097+.010	0.671	.1023	1.82
1	1.125±.005	.125+.010	0.862	.1689	3.04
1 1/4	1.375±.005	.153+.015	1.053	.2523	4.52
1 1/2	1.625±.006	.181+.019	1.243	.3536	6.30
2	2.125±.006	.236+.024	1.629	.6026	10.8

Dimensions are in English units. Tolerances shown are ASTM requirements. ViegaPEX is manufactured within these specifications. Viega Barrier PEX tubing is available in both straight lengths and coils.

Pressure Drop Table Expressed as psi/ft.

	Size								
GPM	5/16"	3/8"	1/2"	5/8"	3/4	1	1 1/4	1 1/2	2
0.1	.002	.001							
0.2	.009	.004	.001						
0.3	.018	.008	.002	.001					
0.4	.031	.013	.003	.001					
0.5	.047	.020	.004	.002					
0.6	.066	.027	.006	.003	.001				
0.7	.088	.036	.008	.003	.002				
0.8		.047	.011	.004	.002				
0.9		.058	.013	.005	.002				
1.0		.070	.016	.007	.003	.001			
1.5			.034	.014	.006	.002			
2.0			.058	.024	.011	.003			
3.0				.050	.023	.007			
4.0				.085	.039	.011			
6.0				.181	.082	.024			
8.0					.140	.041			
10.0					.211	.062	.023		
12.0					.296	.087	.032		
14.0							.041		
16.0							.053	.022	
18.0							.065	.027	
20.0							.078	.033	
22.0							.093	.039	
24.0							.108	.045	
26.0								.052	
28.0								.060	
30.0								.067	
32.0								.075	.021
34.0									.023
36.0									.026
38.0									.028
40.0									.031
45.0									.038
50.0									.046
55.0									.055
60.0									.064
65.0									.075
70.0									.085
75.0									.097

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Tech Data

Viega PureFlow® Press Zero Lead Bronze Fittings

Description

PureFlow Press zero lead bronze fittings with attached stainless steel press sleeves are for use with Viega PureFlow PEX, Barrier and FostaPEX SDR-9 cross-linked polyethylene (PEX) tubing.

Scope

This document designates the requirements for Viega PureFlow Press Zero Lead Bronze fittings with attached stainless steel press sleeves and tool locater ring to be used as connections for Viega PureFlow PEX, Barrier PEX, and FostaPEX tubing in 5/16", ⅜", ½", ⅝", ¾", 1", 1¼ ", 1½", and 2" sizes as available. The connections are to be completed with the aid of a PureFlow Press hand tool or PureFlow Press power tool.

Materials

Viega PureFlow Press Zero Lead Bronze fittings are cast and machined from extruded (C87700) or forged (C87710) Zero Lead Bronze. This gives the fitting high-corrosion and stress-crack resistance. All Viega PureFlow Press Zero Lead Bronze fittings are precision-made to tight tolerances for a consistent fit with Viega PureFlow PEX tubing. All PureFlow Press Zero Lead Bronze fittings meet the rigorous requirements of ANSI/NSF-61 Annex G for lead extraction and meet California AB 1953 no lead requirements. “Zero Lead” identifies Viega products meeting the lead free requirements of California and Vermont law, effective January 1, 2010, as tested and listed against NSF-61, Annex G.

The stainless steel press sleeves incorporate three (3) view holes and are manufactured from 304 stainless steel that will not corrode, maintaining a clean appearance for the lifetime of the system. The tool locater rings are color-coded to match their appropriately-sized PureFlow Press hand tool and are manufactured out of recycled plastic. (Stainless steel locater rings are used for solder adapters.)

Markings

Viega PureFlow Press Zero Lead Bronze fittings with attached stainless steel sleeves are manufactured and certified to the requirements of ASTM F877. Viega PureFlow Press Zero Lead Bronze fittings and sleeves are marked with the size, manufacturer’s mark, and required marking(s) of third-party certification organizations. Fittings also meet the requirements of ANSI/NSF-61 Annex G for health effects and are suitable for contact with potable water. NSF International and other certification organizations conduct random on-site inspections of manufacturing facilities and independently test Viega PureFlow Press Zero Lead Bronze fittings for compliance with physical, performance, and toxicological standards.

Quality Assurance

When the product is marked with the ASTM F877 designation, it affirms that the product was manufactured, inspected, sampled, and tested in accordance with these specifications and has been found to meet the specified requirements.

This document is subject to updates. For the most current Viega technical literature please visit www.viega.us.

Viega products are designed to be installed by licensed and trained plumbing and mechanical professionals who are familiar with Viega products and their installation.
Installation by non-professionals may void Viega LLC’s warranty.

Zero Lead identifies Viega products meeting the lead free requirements of NSF 61-G through testing under NSF/ANSI 372 (0.25% or less maximum weighted average lead content.)

Listings and Certificates

- cNSF®us pw-G
  - Zero lead listing meeting California AB 1953 and Vermont ACT 193
  - NSF International Performance and Health Effects (Standards 14 & 61)
  - NSF certified to CSA B137.5 (Canadian Standards Association)
- NSF Certified to NSF-U.P. Code
  - Approved for Uniform Plumbing Code, listed to ASTM F877
- IAPMO Certified
- ANSI/NSF 61-G
- ICC ES-PMG™ 1038/1015 plumbing and heating systems
- UL certified to UL 1821 listing (130 psi @ 120°F) for use in residential fire sprinkler systems per NFPA 13D.1

All fittings may not be listed with each organization shown.

Recommended Uses

Viega PureFlow Press Zero Lead Bronze fittings with attached stainless steel press sleeves are intended and recommended for use in:

- Potable water distribution systems with Viega PureFlow PEX and FostaPEX tubing
- Hydronic heating, snow melt, and cooling systems
- Viega PureFlow PEX, Barrier PEX, and FostaPEX tubing meet the requirements of ASTM F876 and residential fire sprinkler systems per NFPA 13D. Viega PureFlow PEX Black (sizes ¾" to 2") meet the requirements of ASTM F876 and UL 1821 (130 psi @ 120°F).

Viega PureFlow Press Zero Lead Bronze fitting system components are available only from Viega and are not interchangeable with components and tubing from other suppliers. For information on other hot and cold applications not listed here, consult with your Viega representative.

Operating Parameters

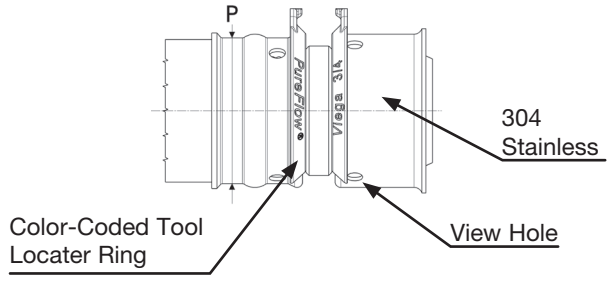
Maximum design temperature and pressure ratings are:

- 160 psi @ 73° F
- 100 psi @ 180° F
- 80 psi @ 200° F

Handling and Installation

Viega PureFlow Press Zero Lead Bronze fittings are cast and machined from a solid bronze alloy and precision-made to tight tolerances. Use of these materials in hot and cold water distribution systems must be in accordance with good plumbing practices, applicable code requirements, and current installation practices available from Viega. Contact a Viega representative or the applicable code enforcement bureau for information about approvals for specific applications.

A pressed fitting has jaw witness marks (P) indicating the connection has been properly made.



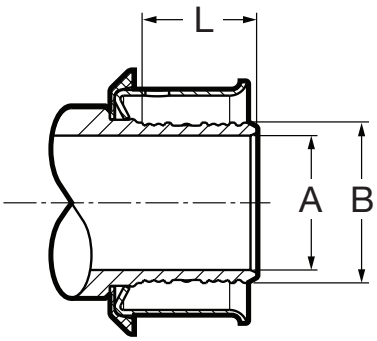
Attached Stainless Sleeve, Pressed

Friction Loss for Viega PureFlow Press Zero Lead Bronze Fittings

Size (inches)	Coupling	90° Elbow	Tee Run	Tee Branch
	Equivalent length of PEX tubing in feet			
⅜	2.9	9.2	2.9	9.4
½	2	9.4	2.2	10.4
¾	1	8	1	9
1	1	10	2	10
1¼	2	11	2	11
1½	2	13	2	12
2	1	19	2	18

This information is based on tubing nominal flow rate (@ 8 fps flow velocity).

Typical Fitting Insert Dimensions for Viega PureFlow Press Zero Lead Bronze Fittings



Size (inches)	A	B	L
5/16	0.169	0.281±.002	0.496
3/8	0.236	0.344±.002	0.496
1/2	0.362	0.473±.002	0.496
5/8	0.457	0.571±.002	0.496
3/4	0.559	0.667±.003	0.496
1	0.728	0.858±.004	0.618
1 1/4	0.957	1.047±.004	0.866
1 1/2	1.083	1.232±.004	0.866
2	1.417	1.606±.004	1.260

Dimensions are in English units. Tolerances shown are Viega requirements.
Viega PureFlow Press Zero Lead Bronze fittings are manufactured within these specifications.

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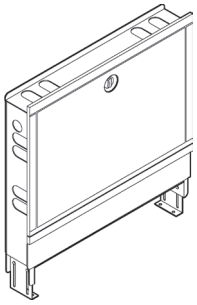
Tech Data

Viega Manifold Cabinet

This document is subject to updates. For the most current Viega technical literature please visit www.viega.us.

Viega products are designed to be installed by licensed and trained plumbing and mechanical professionals who are familiar with Viega products and their installation. **Installation by non-professionals may void Viega LLC's warranty.**



Description

Viega's manifold cabinet is designed to house our 1¼" stainless steel manifolds and 1" copper manifolds. The Viega manifold cabinet may also be used with zone controls and powerheads in some applications. See the charts below for dimensional information.

Features

- Recess mount
- Adjustable wall depth (4½" - 6")
- 20 Gauge galvanized sheet metal construction (1mm)
- Epoxy polyester powder coating
- Open bottom makes tubing connections easy
- Available with standard knob or optional lock and key (lock and key Part No. 15217)
- Adjustable legs (0 - 7")
- When using Part No. 15802 the use of two locks is necessary

Manifold Cabinet Dimensions		
Part Number	Outside Dimension W x H x D (in)	Inside Dimension W x H x D (in)
15800	22⅝ x 28 x 4½	21 x 28 x 4½
15801	28⅝ x 28 x 4½	27 x 28 x 4½
15802	46 x 28 x 4½	45 x 28 x 4½

Legs are adjustable up to 7". Heights above are figured with no leg extension.

1¼" Stainless Steel Manifold Dimensional Information

Part No.	Interior Box Width (in)	Exterior Box Width (in)	Manifold With No Accessories	Manifold With Ball Valve Set	Manifold With Ball Valve Set and Adapters For Flow Through	Manifold With No Accessories and Zone Control	Manifold With Ball Valve Set And Zone Control
15800	21	22⅝	2-6 outlet manifold	2-5 outlet manifold	2-4 outlet manifold	2 outlet manifold	N/A
15801	27	28⅜	2-9 outlet manifold	2-8 outlet manifold	2-7 outlet manifold	2-4 outlet manifold	2-3 outlet manifold
15802	45	46	2-12 outlet manifold	2-12 outlet manifold	2-12 outlet manifold	2-12 outlet manifold	2-12 outlet manifold

If use of a zone control is necessary, hold the manifold to one side and install the zone control vertically on the other side of the manifold cabinet. Use of a zone control in the manifold cabinet is not compatible with flow through applications.

1" Copper Manifold Dimensional Information

Part Number	Interior Box Width (in)	Exterior Box Width (in)	Manifold With No Accessories	Manifold With ProPress Ball Valve and End Cap
15800	21	22⅝	2, 3, 4 outlet manifold	N/A
15801	27	28⅜	2, 3, 4 outlet manifold	2, 3, 4 outlet manifold
15802	45	46	2, 3, 4 and 12 outlet manifold	2, 3, 4 and 12 outlet manifold

Copper manifolds are available in 2,3,4, and 12 outlet configurations. Manifold brackets are sold separately for copper manifolds.

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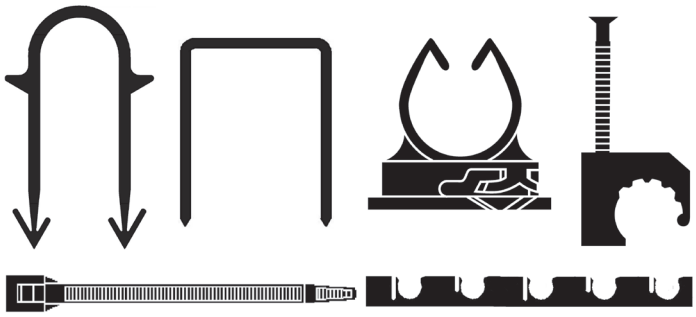
www.viega.us

Tech Data

Viega PureFlow® PEX Tubing Fasteners



This document is subject to updates. For the most current Viega technical literature please visit www.viega.us.

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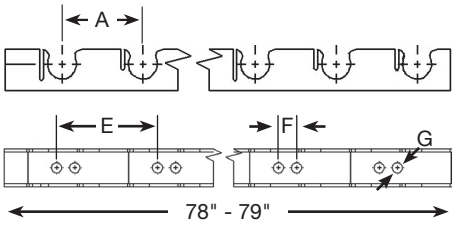
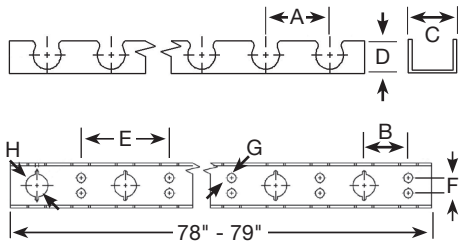
Description

Viega offers several different types of fasteners for attaching Viega Barrier PEX tubing to different surfaces. Whether attaching to foam board, rebar, wire mesh, concrete, or wood, Viega has the needed fastener. Below is the technical information relating to each.

Viega U-Channel Plastic - Model 2864US



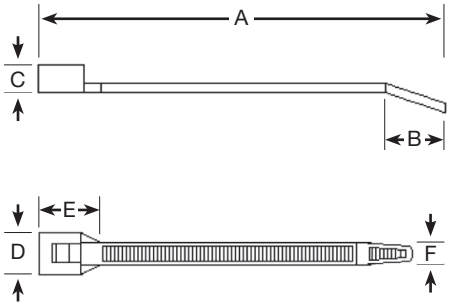
Part No.	Length of strip	Barrier Tube Dimension	A	B	C	D	E	F	G
	(ft)	(in)	(in)	(in)	(in)	(in)	(in)	(in)	(in)
15310	6.5	½	2.0	2.0	1.50	1.0	4.0	.71	.39
15311	6.5	⅝	2.0	2.0	1.50	1.0	4.0	.71	.39



Part No.	Length of strip	Barrier Tube Dimension	A	B	C	D	E	F	G	H
	(ft)	(in)	(in)	(in)	(in)	(in)	(in)	(in)	(in)	(in)
15314	6.5	¾	2.0	2.0	2.0	1.0	4.0	.67	.39	.98

Normal Uses: Attaching Viega Barrier PEX tubing to concrete or other flat surfaces
Tubing Compatibilities: ½", ⅝", ¾" Viega PEX tubing
Material Makeup: Plastic
Package Quantity: 16 U-channel strips

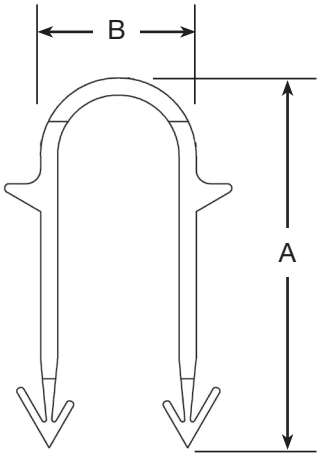
Viega Zip Ties Plastic - Model 2866US



Part No.	A (in)	B (in)	C (in)	D (in)	E (in)	F (in)
15304	8.0	0.7	0.22	0.31	0.40	0.17

Normal Uses: Attaching Viega Barrier PEX tubing to rebar and wire mesh.
Tubing Compatibilities: All sizes of Viega Barrier PEX tubing
Material Makeup: Nylon
Tensile Strength: 75 lbs.
Package Quantity: 100 zip ties

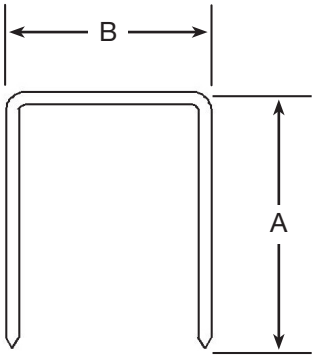
Viega Foam Staples Plastic - Model 2890.0US, 2890.3US



Part No.	A (in)	B (in)	Use With
15313	1½	1	1" thick foam panels
15312	2½	1	1½" thick or thicker foam panels

Normal Uses: Attaching Viega Barrier PEX tubing to rigid foam board insulation
Tubing Compatibilities: ⅜", ½", ⅝" Viega Barrier PEX tubing
Material Makeup: Plastic
Package Quantity: 300 staples
Associated Tools: Foam Staple Gun part number 21432. Also compatible with older straight handle foam staple gun.

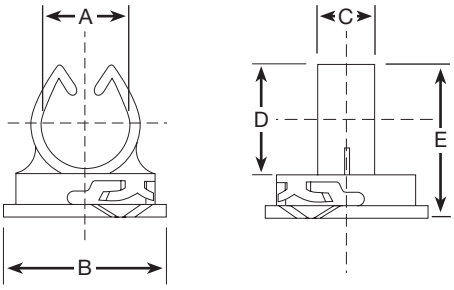
Viega Pneumatic Staples Galvanized Steel - Model 2889.8US



Part No.	A (in)	B (in)
21431	1.0	1.25

Normal Uses: Tubing Compatibilities: ⅜", ½", ⅝" Viega Barrier PEX tubing.
Tubing Compatibilities: 16 Ga. Galvanized staple
Material Makeup: Plastic
Package Quantity: 10,000 staples
Associated Tools: Pneumatic Staple gun part number 21430

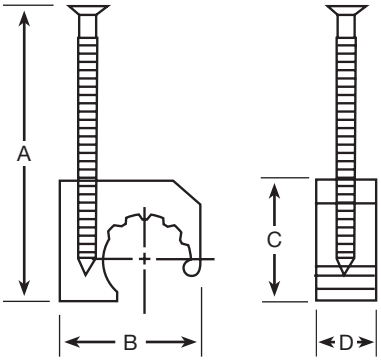
Viega Wire Mesh Clip Plastic - Model 2865.1US



Part No.	A (in)	B (in)	C (in)	D (in)	E (in)
15301	0.75	1.625	0.56	1.0	1.5

Normal Uses: Attaching Viega Barrier PEX tubing to wire mesh
Tubing Compatibilities: ½", ⅝" Viega Barrier PEX tubing
Material Makeup: Plastic
For Wire Diameter: ⅛" to 3⁄16"
Package Quantity: 100 clips

Viega J-clamp Plastic - Model 2860US



Part No.	PEX Tubing Size (in)	A (in)	B (in)	C (in)	D (in)
52000	⅜	1.60	0.90	0.80	0.40
52020	½	1.60	1.10	0.90	0.40
52040	¾	2.13	1.30	1.20	0.42
52060	1	2.38	1.70	1.50	0.50

Normal Uses: Attaching Viega Barrier PEX tubing to wood surfaces
Tubing Compatibilities: ⅜", ½", ¾", 1"
Material Makeup: Plastic clip with ring shank steel nail
Package Quantity: 100 J-clamps

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Tech Data

Viega Bend Supports

This document is subject to updates. For the most current Viega technical literature please visit www.viega.us.

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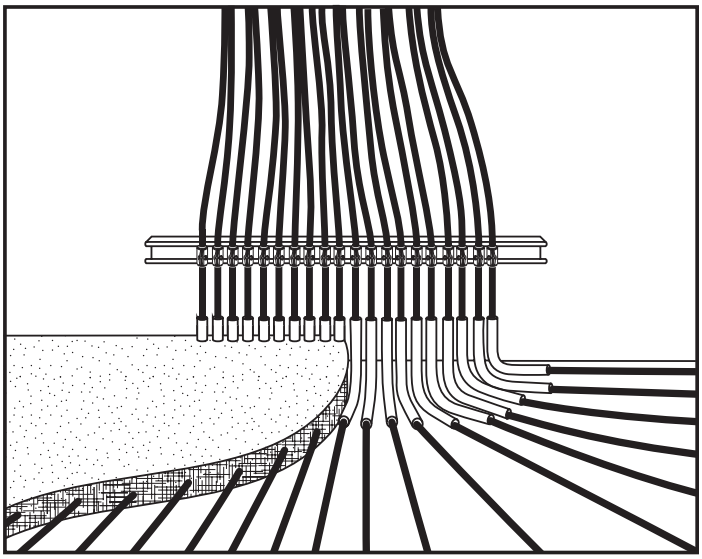
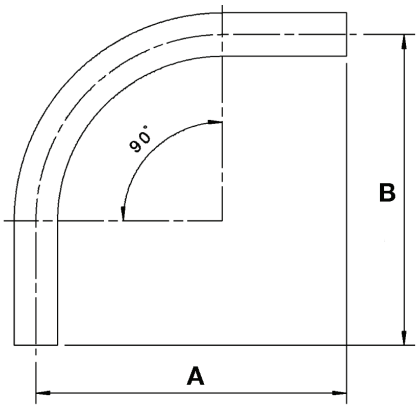
Description

Viega's plastic slab bend supports are used to provide protection and support to PEX tubing as it transitions from a thermal mass.

Plastic bend supports are made from hard PVC and are available in the sizes outlined in the chart below.



Viega Bend Support Plastic - Model 2851US



Part No	PEX Size (in)	A (in)	B (in)	I.D. (in)	O.D. (in)
15106	⅜	6.4	6.4	0.8	0.9
15107	½	7.9	7.9	1.0	1.1
15108	⅝, ¾	7.5	7.5	1.5	1.6
15111	1	10	10	1.6	1.9

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Tech Data

Viega PureFlow® Press Zero Lead Bronze Fittings

Description

PureFlow Press zero lead bronze fittings with attached stainless steel press sleeves are for use with Viega PureFlow PEX, Barrier and FostaPEX SDR-9 cross-linked polyethylene (PEX) tubing.

Scope

This document designates the requirements for Viega PureFlow Press Zero Lead Bronze fittings with attached stainless steel press sleeves and tool locater ring to be used as connections for Viega PureFlow PEX, Barrier PEX, and FostaPEX tubing in 5/16", ⅜", ½", ⅝", ¾", 1", 1¼ ", 1½", and 2" sizes as available. The connections are to be completed with the aid of a PureFlow Press hand tool or PureFlow Press power tool.

Materials

Viega PureFlow Press Zero Lead Bronze fittings are cast and machined from extruded (C87700) or forged (C87710) Zero Lead Bronze. This gives the fitting high-corrosion and stress-crack resistance. All Viega PureFlow Press Zero Lead Bronze fittings are precision-made to tight tolerances for a consistent fit with Viega PureFlow PEX tubing. All PureFlow Press Zero Lead Bronze fittings meet the rigorous requirements of ANSI/NSF-61 Annex G for lead extraction and meet California AB 1953 no lead requirements. “Zero Lead” identifies Viega products meeting the lead free requirements of California and Vermont law, effective January 1, 2010, as tested and listed against NSF-61, Annex G.

The stainless steel press sleeves incorporate three (3) view holes and are manufactured from 304 stainless steel that will not corrode, maintaining a clean appearance for the lifetime of the system. The tool locater rings are color-coded to match their appropriately-sized PureFlow Press hand tool and are manufactured out of recycled plastic. (Stainless steel locater rings are used for solder adapters.)

Markings

Viega PureFlow Press Zero Lead Bronze fittings with attached stainless steel sleeves are manufactured and certified to the requirements of ASTM F877. Viega PureFlow Press Zero Lead Bronze fittings and sleeves are marked with the size, manufacturer’s mark, and required marking(s) of third-party certification organizations. Fittings also meet the requirements of ANSI/NSF-61 Annex G for health effects and are suitable for contact with potable water. NSF International and other certification organizations conduct random on-site inspections of manufacturing facilities and independently test Viega PureFlow Press Zero Lead Bronze fittings for compliance with physical, performance, and toxicological standards.

Quality Assurance

When the product is marked with the ASTM F877 designation, it affirms that the product was manufactured, inspected, sampled, and tested in accordance with these specifications and has been found to meet the specified requirements.

This document is subject to updates. For the most current Viega technical literature please visit www.viega.us.

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Zero Lead identifies Viega products meeting the lead free requirements of NSF 61-G through testing under NSF/ANSI 372 (0.25% or less maximum weighted average lead content.)

Listings and Certificates

- cNSF®us pw-G
  - Zero lead listing meeting California AB 1953 and Vermont ACT 193
  - NSF International Performance and Health Effects (Standards 14 & 61)
  - NSF certified to CSA B137.5 (Canadian Standards Association)
- NSF Certified to NSF-U.P. Code
  - Approved for Uniform Plumbing Code, listed to ASTM F877
- IAPMO Certified
- ANSI/NSF 61-G
- ICC ES-PMG™ 1038/1015 plumbing and heating systems
- UL certified to UL 1821 listing (130 psi @ 120°F) for use in residential fire sprinkler systems per NFPA 13D.1

All fittings may not be listed with each organization shown.

Recommended Uses

Viega PureFlow Press Zero Lead Bronze fittings with attached stainless steel press sleeves are intended and recommended for use in:

- Potable water distribution systems with Viega PureFlow PEX and FostaPEX tubing
- Hydronic heating, snow melt, and cooling systems
- Viega PureFlow PEX, Barrier PEX, and FostaPEX tubing meet the requirements of ASTM F876 and residential fire sprinkler systems per NFPA 13D. Viega PureFlow PEX Black (sizes ¾" to 2") meet the requirements of ASTM F876 and UL 1821 (130 psi @ 120°F).

Viega PureFlow Press Zero Lead Bronze fitting system components are available only from Viega and are not interchangeable with components and tubing from other suppliers. For information on other hot and cold applications not listed here, consult with your Viega representative.

Operating Parameters

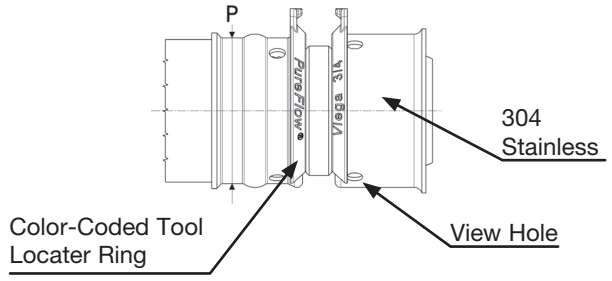
Maximum design temperature and pressure ratings are:

- 160 psi @ 73° F
- 100 psi @ 180° F
- 80 psi @ 200° F

Handling and Installation

Viega PureFlow Press Zero Lead Bronze fittings are cast and machined from a solid bronze alloy and precision-made to tight tolerances. Use of these materials in hot and cold water distribution systems must be in accordance with good plumbing practices, applicable code requirements, and current installation practices available from Viega. Contact a Viega representative or the applicable code enforcement bureau for information about approvals for specific applications.

A pressed fitting has jaw witness marks (P) indicating the connection has been properly made.



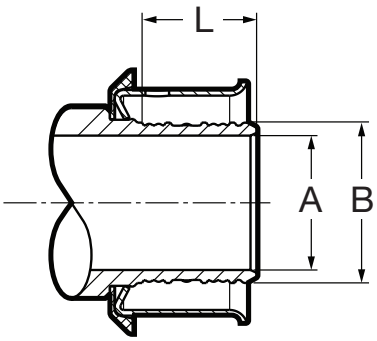
Attached Stainless Sleeve, Pressed

Friction Loss for Viega PureFlow Press Zero Lead Bronze Fittings

Size (inches)	Coupling	90° Elbow	Tee Run	Tee Branch
	Equivalent length of PEX tubing in feet			
⅜	2.9	9.2	2.9	9.4
½	2	9.4	2.2	10.4
¾	1	8	1	9
1	1	10	2	10
1¼	2	11	2	11
1½	2	13	2	12
2	1	19	2	18

This information is based on tubing nominal flow rate (@ 8 fps flow velocity).

Typical Fitting Insert Dimensions for Viega PureFlow Press Zero Lead Bronze Fittings



Size (inches)	A	B	L
5/16	0.169	0.281±.002	0.496
3/8	0.236	0.344±.002	0.496
1/2	0.362	0.473±.002	0.496
5/8	0.457	0.571±.002	0.496
3/4	0.559	0.667±.003	0.496
1	0.728	0.858±.004	0.618
1 1/4	0.957	1.047±.004	0.866
1 1/2	1.083	1.232±.004	0.866
2	1.417	1.606±.004	1.260

Dimensions are in English units. Tolerances shown are Viega requirements.
Viega PureFlow Press Zero Lead Bronze fittings are manufactured within these specifications.

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Tech Data

Viega Stainless Manifold Shut-Off / Balancing / Flow Meters

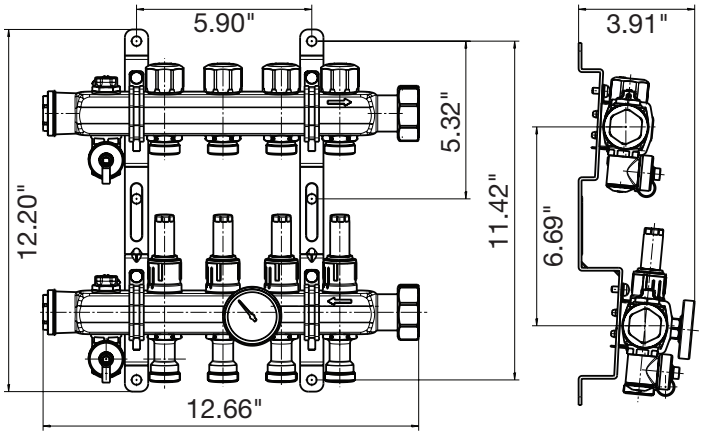
Description

Stainless manifolds are to be used in closed loop hydronic heating, cooling, and snow melting systems. These preassembled 1¼" diameter stainless supply and return manifolds come attached to two 6⅝" spacing brackets for compact remote mounting. This stainless manifold provides shut-off and balancing valves with flow meters for each circuit. Each flow meter/balancing valve allows graduated flow setting up to 2 gpm, maximum 18 gpm per manifold. The air bleeder and purge valves are connected and factory tested. The manifold has 1¼" union connections and 1" NPT removable end caps. SVC circuit connection fittings are sold separately.

Specifications

- 1¼" 304 stainless header stock
- Factory installed air bleeder
- Mounting brackets
- Max. Operating Temperature: 180° F (short periods of 200° F)
- Max. Operating Pressure: 100 psi
- Return Valve C_V: 2.98
- Supply Valve C_V: 1.30

The return manifold is fitted with shut-off valves which are suitable to receive optional 24V (part number 15070, 15069) or 0-10V (part number 15068) powerheads for control over each circuit via thermostat.



** When extending the manifold, Viega requires using thread sealant paste on the 1" NPT manifold end connection.*

Dimensions

Manifold	Width Just Manifold (in)	Width With Ball Valve Set and Adapter Fitting (in)	Width With Ball Valve Set and Fittings For Flow Through (in)
2 outlets	10.7	12.96	16.95
3 outlets	10.7	12.96	16.95
4 outlets	12.7	16.95	18.95
5 outlets	14.6	18.85	20.85
6 outlets	16.6	20.85	22.85
7 outlets	18.6	22.85	24.85
8 outlets	20.5	24.75	26.75
9 outlets	22.5	26.75	28.75
10 outlets	24.5	28.75	30.75
11 outlets	26.4	30.65	32.65
12 outlets	28.4	32.65	34.65
Height	12.1		
Depth	3.6		
Depth with ball valve set handles	4.26		

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Tech Data

Viega® Manifold Ball Valve Set

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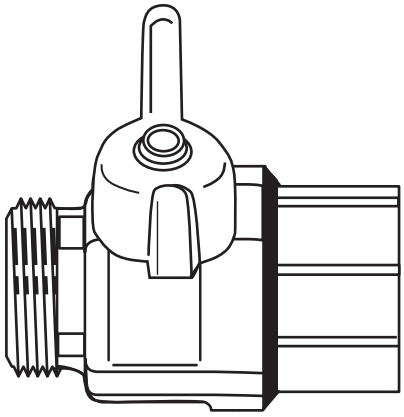


Part No. 15056

Description

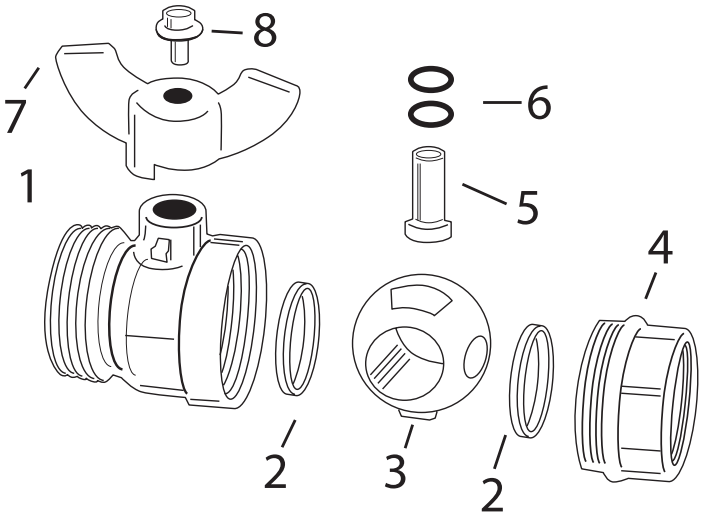
Viega's manifold ball valve sets are typically installed in conjunction with 1¼" stainless manifolds. These valve sets offer a fast and effective way to isolate manifolds from boiler piping.

Features

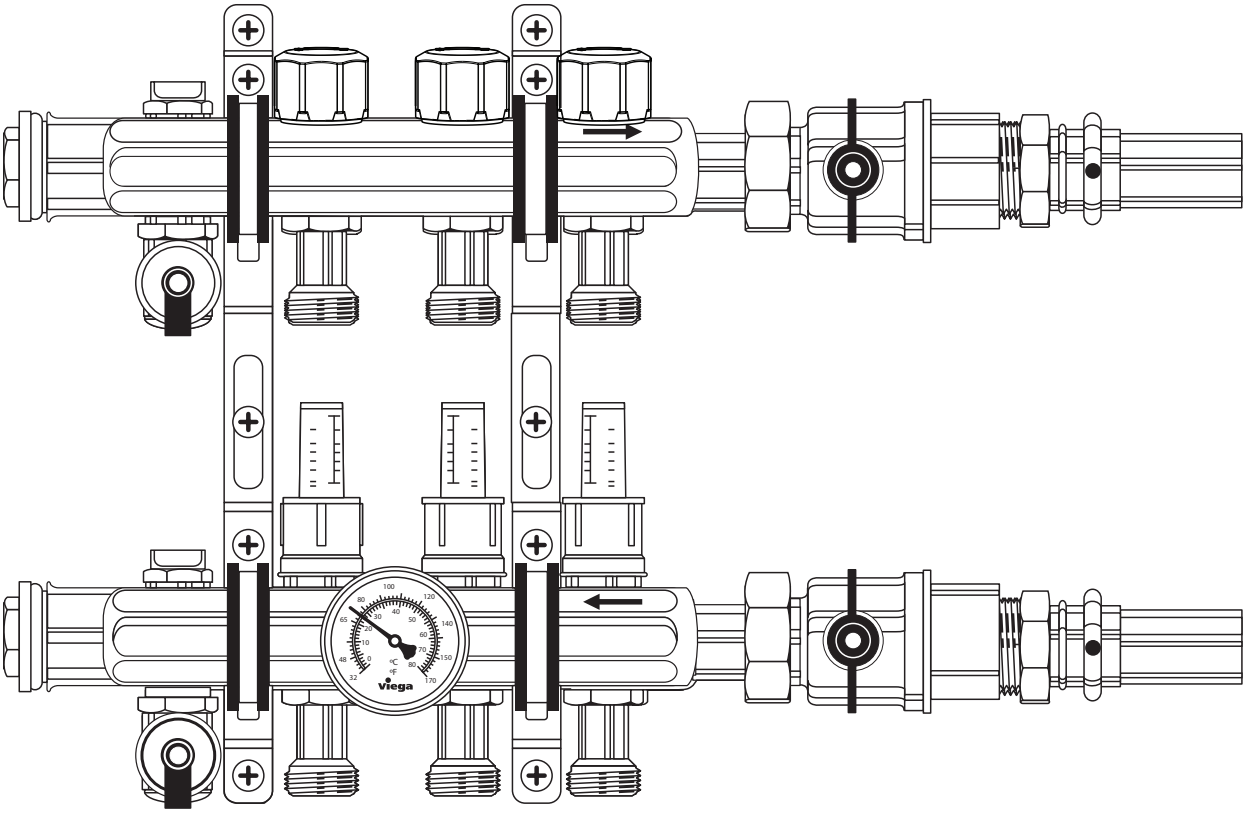
- Flat sealing face for use with 1¼" stainless steel manifolds
- Chrome plated ball
- Blow out proof stem
- Full port valve
- Max pressure 100 psi
- Max temp 200˚F
- 1¼" BSPP x 1" FPT
- Double O-ring Stem Seal
- Each set includes two valves, one with red handle, one with blue handle

Expanded View Key

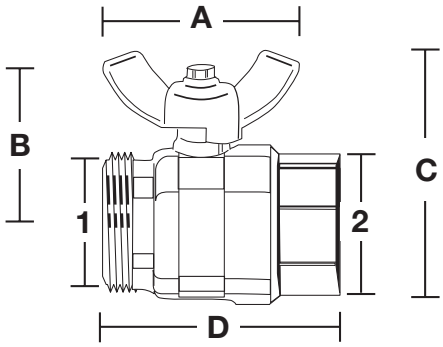
1. Forged brass nickel plated body
2. PTFE Seat Ring
3. Chrome Plated Ball
4. Forged Brass Nickel Plated Body End
5. Brass Stem
6. Buna Nitrile O-rings
7. Painted Aluminum Handle
8. Zinc plated Handle Screw



Typical Installation with 1¼" Stainless Manifold



Dimensional Information



Size 1 2	A (in)z	B (in)	C (in)	D (in)
1¼" BSPP x 1" FPT	2.21	1.93	2.75	2.68

Viega LLC
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SUBMITTAL DATA

Schwank
INNOVATIVE HEATING SOLUTIONS

SCHWANK GAS FIRED
INFRA-RED HEATERS

SERIES

SUPRASCHWANK

HIGH EFFICIENCY
COMBINED INTENSITY

PROJECT:	
ENGINEER:	
CONTRACTOR:	
DISTRIBUTOR:	
SCHWANK MODEL #:	
FUEL:	☐ N.G. ☐ L.P.G.
APPROVED BY:	
DATE:	
APPROVAL #:	

NOTICE:

Schwank reserves the right to make changes to equipment and specifications without obligation or notification.

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USA, 30830

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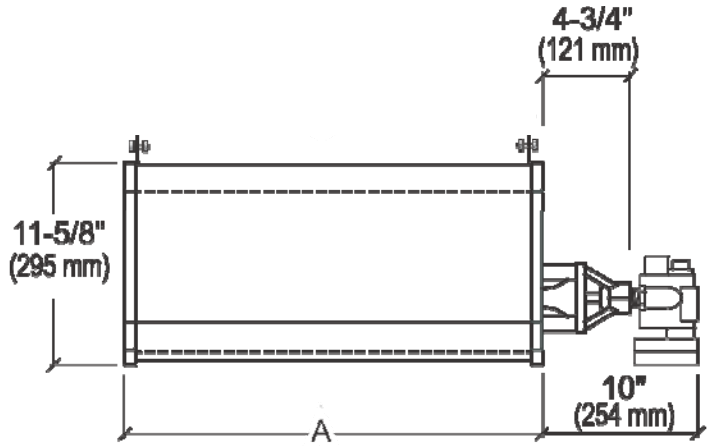
e-mail: csr@schwankgroup.com

www.schwankgroup.com

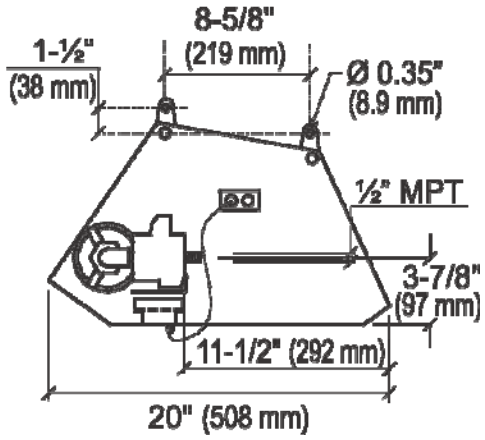
DIAGRAMS AND SPECIFICATIONS:

SUPRASCHWANK COMBINED INTENSITY HEATER

DIMENSIONS



Common End Dimensions
Supra 10 to 30



SPECIFICATIONS

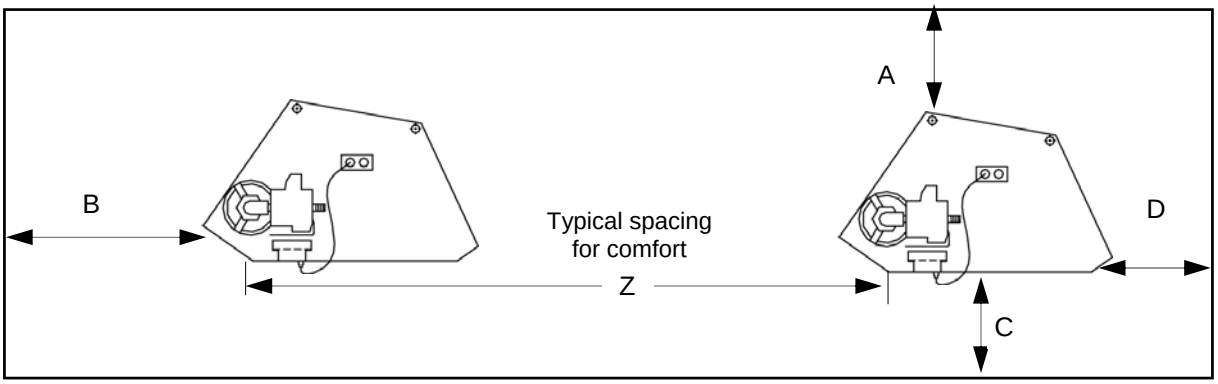
QTY THIS PROJECT	MODEL	DIMENSION		INPUT		OUTPUT		WEIGHT	
		A (inches)	A (mm)	Btuh	kW	Btuh	kW	LB	KG
	Supra 10	23.87	606	29,500	8.6	22,800	6.7	37	16.8
	Supra 15	34.50	876	44,000	12.9	35,600	10.4	53	24.0
	Supra 20	45.75	1162	59,000	17.3	47,800	14.0	62	28.1
	Supra 30	67.50	1715	88,500	25.9	71,700	21.0	82	37.2

GAS SUPPLY

	GAS TYPE	PRESSURE			GAS INLET
☐	NATURAL	MINIMUM LINE MAXIMUM LINE MANIFOLD	6" w.c. 14" w.c. 5" w.c.	1.5 kPa 3.5 kPa 1.25 kPa	1/2" MPT
☐	PROPANE	MINIMUM LINE MAXIMUM LINE MANIFOLD	11" w.c. 14" w.c. 10" w.c.	2.8 kPa 3.5 kPa 2.5 kPa	

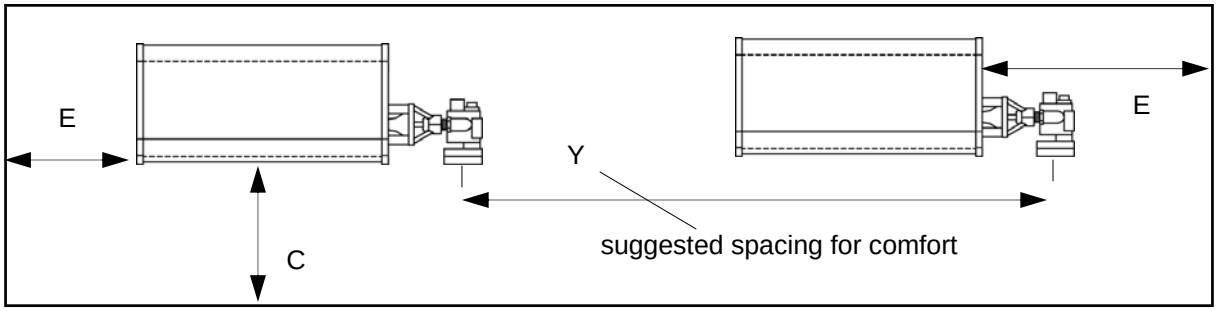
ELECTRICAL: 24V AC, 60 HZ, 0.8 AMPS, 20 VA

HORIZONTAL MOUNTING SUPRASCHWANK HEATERS: *See Angle Mount specifications next*



CERTIFIED MINIMUM CLEARANCE TO COMBUSTIBLES

	MODEL	HTR BOTTOM < C >	HTR FRONT < B >	HTR ENDS < E >	HTR TOP < A >	HTR REAR < D >
	Supra 10	90” (2285 mm)	30” (760 mm)	48” (1220 mm)	16” (405 mm)	30” (760 mm)
	Supra 15	96” (2440 mm)	30” (760 mm)	48” (1220 mm)	16” (405 mm)	30” (760 mm)
	Supra 20	100” (2540 mm)	33” (840 mm)	48” (1220 mm)	16” (405 mm)	33” (840 mm)
	Supra 30	105” (2670mm)	36” (915 mm)	48” (1220 mm)	16” (405 mm)	36” (915 mm)

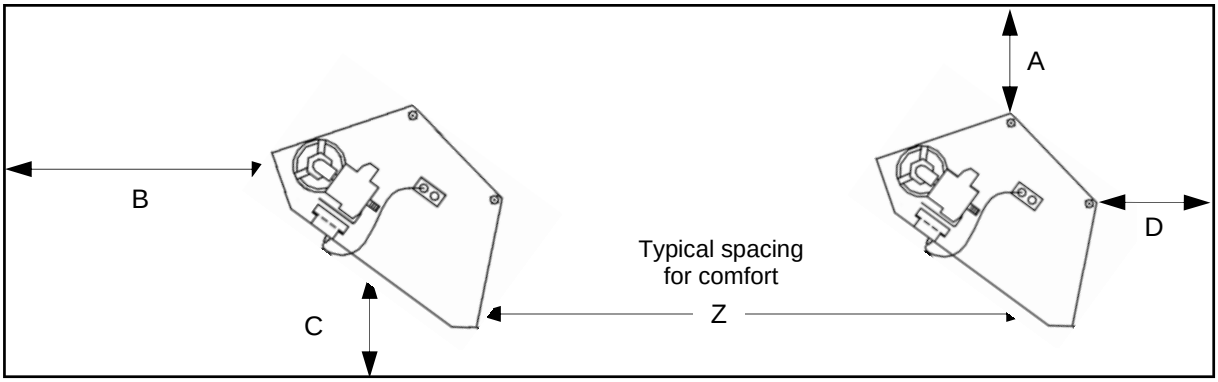


SUGGESTED MOUNTING DISTANCES FOR COMFORT*

	MODEL	MINIMUM HEIGHT ABOVE FLOOR < C >	MAXIMUM DISTANCE BETWEEN HEATERS < Z >	MAXIMUM DISTANCE BETWEEN ROWS < Y >
	Supra 10	15’ (4600 mm)	25’ (7600 mm)	30’ (9000 mm)
	Supra 15	18’ (5500 mm)	30’ (9200 mm)	40’ (12000 mm)
	Supra 20	20’ (6100 mm)	35’ (11000 mm)	50’ (15000 mm)
	Supra 30	24’ (7300 mm)	45’ (14000 mm)	70’ (21000 mm)

*These Mounting distances are suggested and are subject to on site conditions. If in doubt, please contact your Schwank distributor.

ANGLE MOUNTING SUPRASCHWANK HEATERS: *See Horizontal Mount specifications previous page*

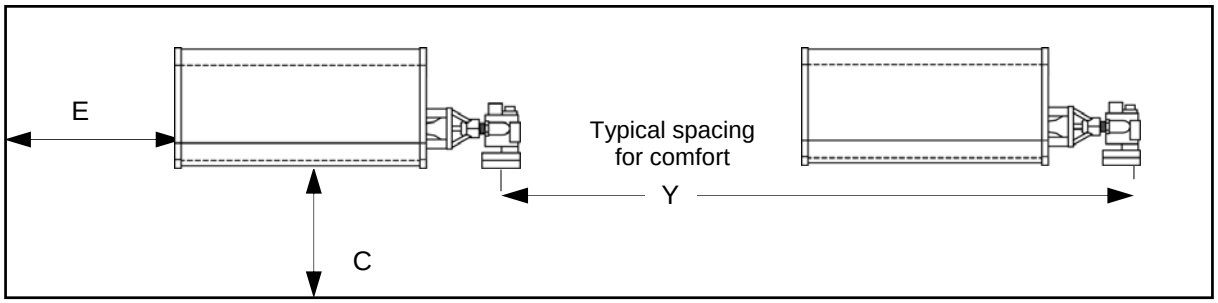


CSA APPROVED MINIMUM CLEARANCE TO COMBUSTIBLES

	MODEL	REAR OF HEATER < D >	TOP OF HEATER < A >	FRONT OF HEATER < B >	ENDS OF HEATER < E >	BOTTOM OF HEATER < C >
☐	Supra 10	8” (205 mm)	24” (610 mm)	66” (1680 mm)	48” (1220 mm)	36” (915 mm)
☐	Supra 15	8” (205 mm)	24” (610 mm)	66” (1680 mm)	48” (1220 mm)	36” (915 mm)
☐	Supra 20	8” (205 mm)	24” (610 mm)	69” (1750)	48” (1220 mm)	36” (915 mm)
☐	Supra 30	8” (205 mm)	24” (610 mm)	72” (1830)	48” (1220 mm)	36” (915 mm)

* Reflector with venturi must be in upper position

SUGGESTED MOUNTING DISTANCE FROM BURNER FOR COMFORT**



	MODEL	MINIMUM HEIGHT TO FLOOR < C >	FRONT OF HEATER < B >	MAXIMUM DISTANCE BETWEEN HEATERS < Y >	MAXIMUM DISTANCE BETWEEN ROWS < Z >
☐	Supra 10	13’ (4000 mm)	13’ (4000 mm)	25’ (7600 mm)	50’ (15000 mm)
☐	Supra 15	16’ (4900 mm)	16’ (4900 mm)	30’ (9200 mm)	75’ (23000 mm)
☐	Supra 20	18’ (5500 mm)	18’ (5500 mm)	35’ (11000 mm)	100’ (30000 mm)
☐	Supra 30	21’ (6400 mm)	21’ (6400 mm)	45’ (14000 mm)	145’ (44000 mm)

** These mounting distances are suggested and are subject to site conditions. If in doubt, please contact your Schwank distributor.

COMPONENT DESCRIPTION:

THERMOSTAT	☐ SCHWANK TRU-TEMP SET BACK STAT - WITH RADIANT & AMBIENT SENSORS AND AUTOMATIC UNOCCUPIED MODE SETBACK ☐ SCHWANK THERMOCONTROL PLUS CONTROLLER ☐ 120 VOLT LINE VOLTAGE THERMOSTAT ☐ 24 VOLT THERMOSTAT ☐ OTHER FIELD SUPPLIED CONTROL
IGNITION:	FENWAL DIRECT SPARK MODULE; 3 TRIAL OTHER_____
COMBINATION GAS VALVE: 24 VOLT	☐ NATURAL GAS: 5" W.C. (1.25 kPA) MANIFOLD PRESSURE ☐ PROPANE GAS: 10" W.C. (2.5 kPA) MANIFOLD PRESSURE
REFLECTORS	ALUMINUM, COLD BONDED CLAD STEEL
VENTURI TUBE:	ALUMINIZED STEEL BUILT INTO DOUBLE WALL REFLECTOR TO SUPPLY PRE-HEATED COMBUSTION AIR.
INSULATION:	CERAMIC HIGH TEMPERATURE INSULATION COVERED WITH ALUMINIZED STEEL TO MINIMIZE LOSSES TO CONVECTION HEAT.
BURNER	SINGLE WITH COMPLETE IGNITION / SENSING SYSTEM
CERAMIC TILE	SCHWANK EFFECT TILE 14/4 WITH INCREASED SURFACE INDENTATIONS AND HARD FINISHED EDGES
TILE RETAINERS	STAINLESS STEEL WITH SLIDE OPENING FOR SERVICING.

Job Name: ESD-635-56x48 Cut Sheet
Tag: MK-1
Quantity: 1
Printed Date: January 2, 2024

Model: ESD-635-56x48

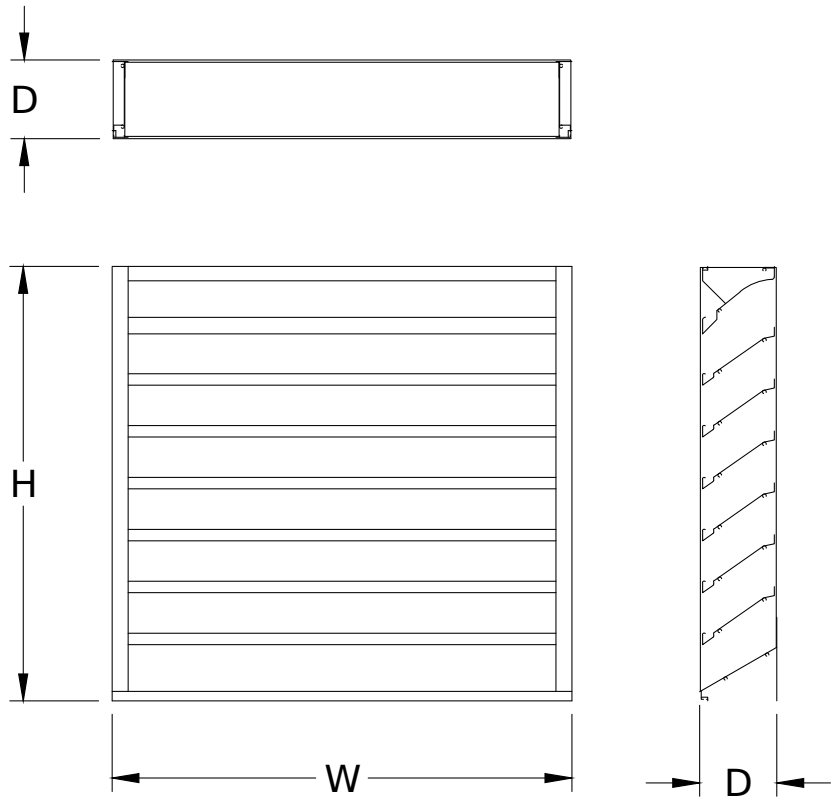
6 in. Drainable Blade Louver

Certifications/special requirements: AMCA-500-L (Air), AMCA-500-L (Water)

Construction	
Material	Aluminum
Blade Type	All
Blade Orientation	Horizontal
Weight (lbs)	73
Mullion Type	No Preference

Dimensional	
Nominal Width (in)	56
Nominal Height (in)	48
Actual Width (in)	55.75
Actual Height (in)	47.75
Blade Depth (in)	6
Sections Wide	1
Sections High	1

Performance	
Application	Intake
Volume (CFM)	9,000
Pressure Drop (in. wg)	0.1
Free Area Velocity (ft/min)	836
Free Area (ft^2)	10.8
Air Density (lbs/ft^3)	0.075



*Louvers are tested to figure 5.5-6.5
*Sections wide x high are as configured with a base mill finish channel frame product and may vary depending on options selected.

Greenheck Fan Corporation certifies that the louver shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Program. The AMCA Certified Ratings Seal applies to air performance and water penetration ratings.

Job Name: ESD-635-48x48 Cut Sheet
Tag: MK-1
Quantity: 1
Printed Date: January 2, 2024

Model: ESD-635-48x48

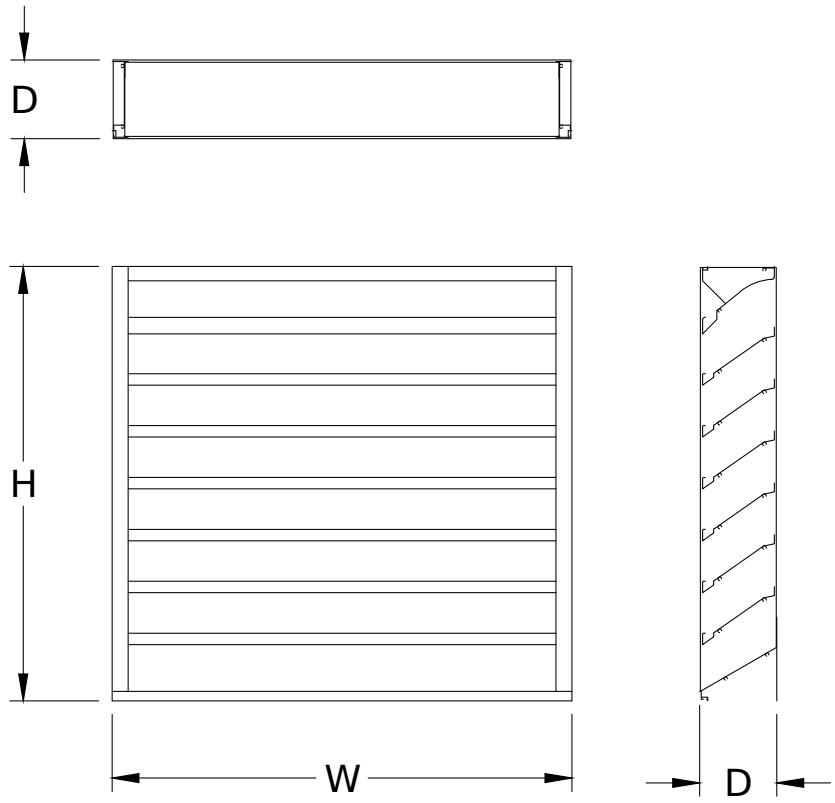
6 in. Drainable Blade Louver

Certifications/special requirements: AMCA-500-L (Air), AMCA-500-L (Water)

Construction	
Material	Aluminum
Blade Type	All
Blade Orientation	Horizontal
Weight (lbs)	63
Mullion Type	No Preference

Dimensional	
Nominal Width (in)	48
Nominal Height (in)	48
Actual Width (in)	47.75
Actual Height (in)	47.75
Blade Depth (in)	6
Sections Wide	1
Sections High	1

Performance	
Application	Intake
Volume (CFM)	8,250
Pressure Drop (in. wg)	0.11
Free Area Velocity (ft/min)	877
Free Area (ft^2)	9.4
Air Density (lbs/ft^3)	0.075



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Job Name: ESD-635-32x22 Cut Sheet
Tag: MK-1
Quantity: 1
Printed Date: February 6, 2024

Model: ESD-635-32x22

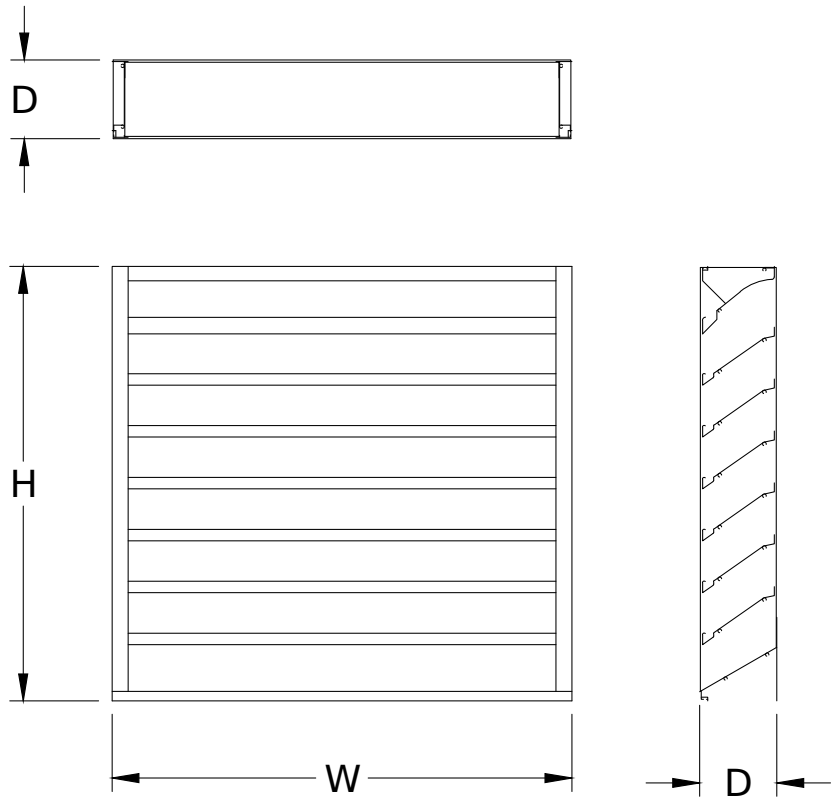
6 in. Drainable Blade Louver

Certifications/special requirements: AMCA-500-L (Air), AMCA-500-L (Water)

Construction	
Material	Aluminum
Blade Type	All
Blade Orientation	Horizontal
Weight (lbs)	19
Mullion Type	No Preference

Dimensional	
Nominal Width (in)	32
Nominal Height (in)	22
Actual Width (in)	31.75
Actual Height (in)	21.75
Blade Depth (in)	6
Sections Wide	1
Sections High	1

Performance	
Application	Intake
Volume (CFM)	1,200
Pressure Drop (in. wg)	0.05
Free Area Velocity (ft/min)	568
Free Area (ft^2)	2.1
Air Density (lbs/ft^3)	0.075



*Louvers are tested to figure 5.5-6.5
*Sections wide x high are as configured with a base mill finish channel frame product and may vary depending on options selected.

Greenheck Fan Corporation certifies that the louver shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Program. The AMCA Certified Ratings Seal applies to air performance and water penetration ratings.

Job Name: ESD-635-36x22 Cut Sheet
Tag: MK-1
Quantity: 1
Printed Date: February 6, 2024

Model: ESD-635-36x22

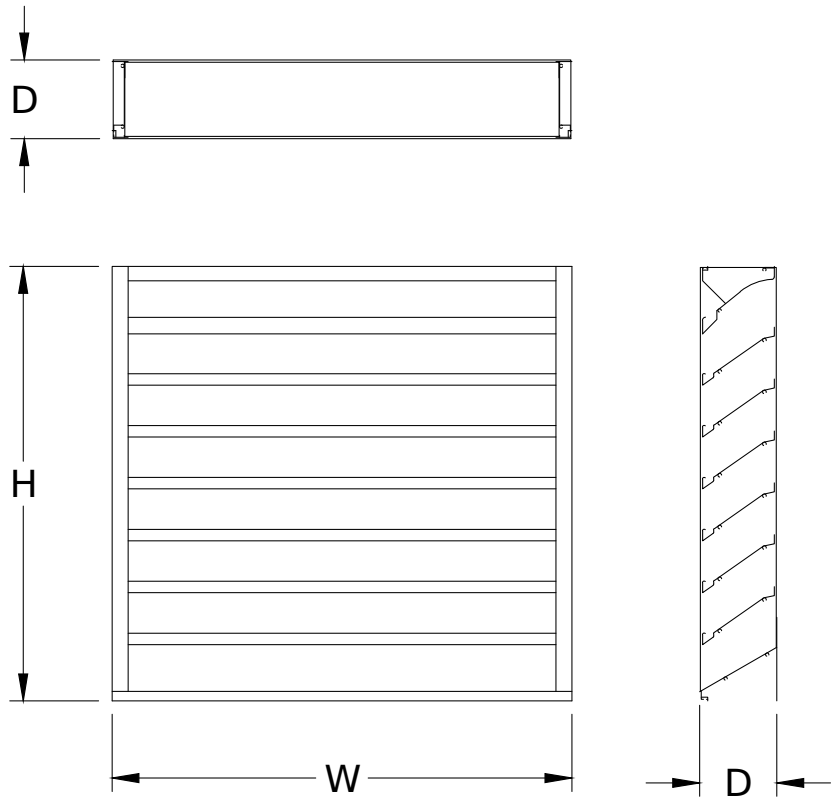
6 in. Drainable Blade Louver

Certifications/special requirements: AMCA-500-L (Air), AMCA-500-L (Water)

Construction	
Material	Aluminum
Blade Type	All
Blade Orientation	Horizontal
Weight (lbs)	21
Mullion Type	No Preference

Dimensional	
Nominal Width (in)	36
Nominal Height (in)	22
Actual Width (in)	35.75
Actual Height (in)	21.75
Blade Depth (in)	6
Sections Wide	1
Sections High	1

Performance	
Application	Exhaust
Volume (CFM)	1,200
Pressure Drop (in. wg)	0.03
Free Area Velocity (ft/min)	500
Free Area (ft^2)	2.4
Air Density (lbs/ft^3)	0.075



*Louvers are tested to figure 5.5-6.5
*Sections wide x high are as configured with a base mill finish channel frame product and may vary depending on options selected.

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Job Name: ESD-635-30x36 Cut Sheet
Tag: MK-1
Quantity: 1
Printed Date: February 6, 2024

Model: ESD-635-30x36

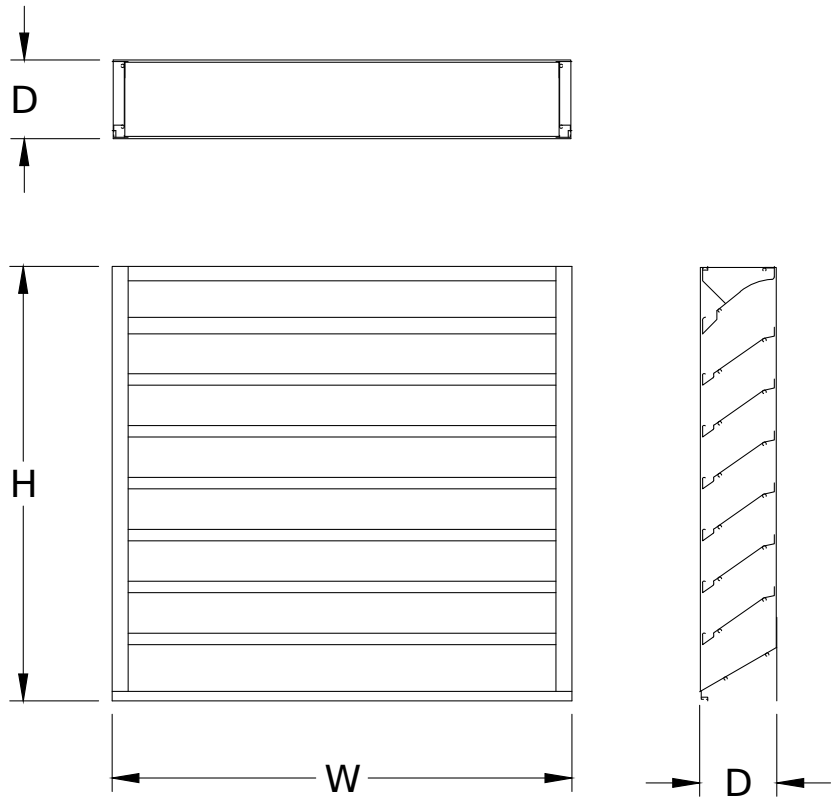
6 in. Drainable Blade Louver

Certifications/special requirements: AMCA-500-L (Air), AMCA-500-L (Water)

Construction	
Material	Aluminum
Blade Type	All
Blade Orientation	Horizontal
Weight (lbs)	29
Mullion Type	No Preference

Dimensional	
Nominal Width (in)	30
Nominal Height (in)	36
Actual Width (in)	29.75
Actual Height (in)	35.75
Blade Depth (in)	6
Sections Wide	1
Sections High	1

Performance	
Application	Exhaust
Volume (CFM)	2,100
Pressure Drop (in. wg)	0.04
Free Area Velocity (ft/min)	515
Free Area (ft^2)	4.1
Air Density (lbs/ft^3)	0.075



*Louvers are tested to figure 5.5-6.5
*Sections wide x high are as configured with a base mill finish channel frame product and may vary depending on options selected.

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Job Name: ESD-635-30x24 Cut Sheet
Tag: MK-1
Quantity: 1
Printed Date: January 18, 2024

Model: ESD-635-30x24

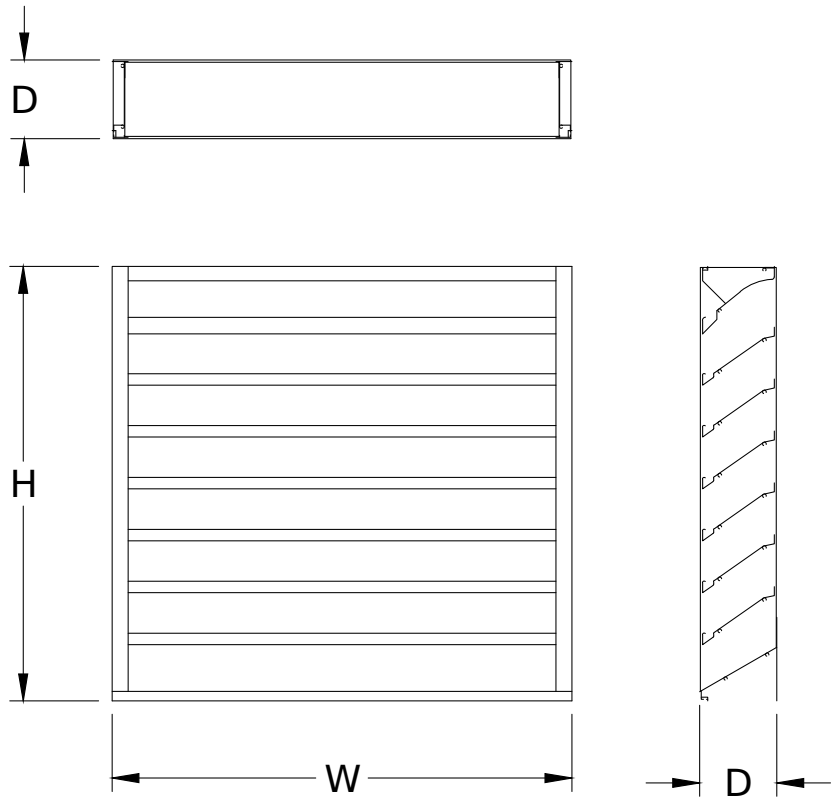
6 in. Drainable Blade Louver

Certifications/special requirements: AMCA-500-L (Air), AMCA-500-L (Water)

Construction	
Material	Aluminum
Blade Type	Drainable
Blade Orientation	Horizontal
Weight (lbs)	19
Mullion Type	No Preference

Dimensional	
Nominal Width (in)	30
Nominal Height (in)	24
Actual Width (in)	29.75
Actual Height (in)	23.75
Blade Depth (in)	6
Sections Wide	1
Sections High	1

Performance	
Application	Intake
Volume (CFM)	1,740
Pressure Drop (in. wg)	0.08
Free Area Velocity (ft/min)	745
Free Area (ft^2)	2.3
Air Density (lbs/ft^3)	0.075



*Louvers are tested to figure 5.5-6.5
*Sections wide x high are as configured with a base mill finish channel frame product and may vary depending on options selected.

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Bell & Gossett
a xylem brand

Submittal

Job/Project:	**Representative: Bornquist, Inc,**	
ESP-Systemwize: WIZE-2236E57C **Created On: 03/19/2024**	**Phone: (773) 774-2800**	
Location/Tag:	**Email: sales@bornquist.com**	
Engineer:	**Submitted By:**	**Date:**
Contractor:	**Approved By:**	**Date:**

Small Close Coupled In-Line Centrifugal Pump

Series: e-90E

Model: 1AAB

Part Number: 90EBF01P45E4RM0

Features & Design

- Install vertical or horizontal
- Integrated VFD and PM motor
- Robust Pump Design
- Internally Self-Flushing Mechanical Seal

The Bell & Gossett Series e-90E is a close-coupled, centrifugal, in-line Smart Pump, combines the wide hydraulic coverage of the e-90 pump and the efficiency of Xylem's Smart Motor in a pre-assembled package. Available in 12 pre-configured designs in bronze fitted or all bronze construction, the e-90E Smart Pump offers proven hydraulic performance resulting in efficiency improvements of 2%-18% BEP.

https://qr.xylemsales.com/czxnj6

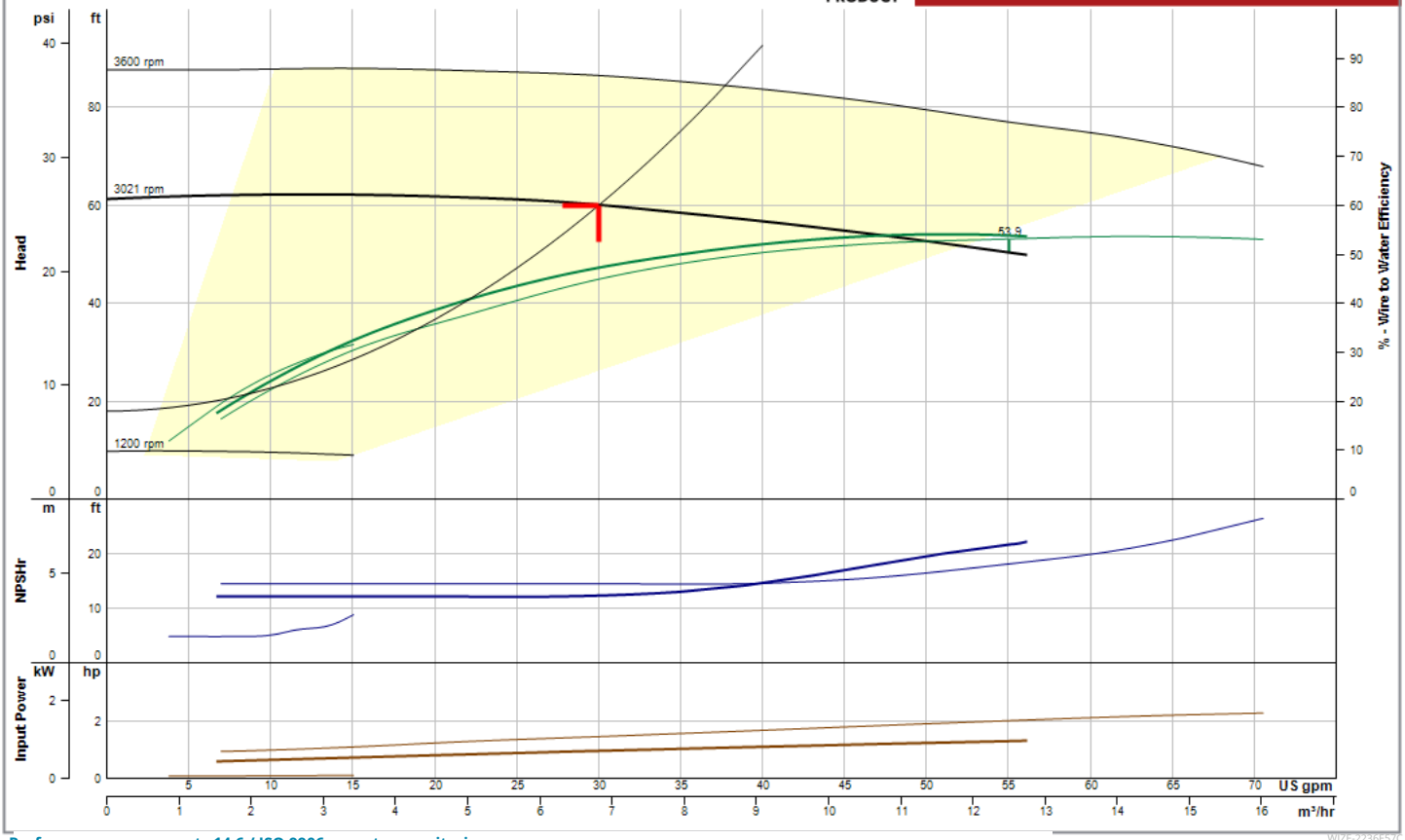
Pump Selection Summary

Pump Capacity	30 US gpm
Pump Head	60 ft
Control Head	18 ft
WTW Efficiency at Duty Point	47 %
Impeller Diameter	4.5 in
Motor HP	2 hp
Duty Point Power	---
Motor Speed	3600 rpm
RPM @ Duty Point	3021 rpm
NPSHr	12.5 ft
Minimum Shutoff Head	61.3 ft
Minimum Flow at RPM	--- US gpm
Flow @ BEP	--- US gpm
Fluid Temperature	105 °F
Fluid Type	Water
Weight *(approx. - consult rep for exact)*	65 lbs
Pump Floor Space Calculation	--- ft²

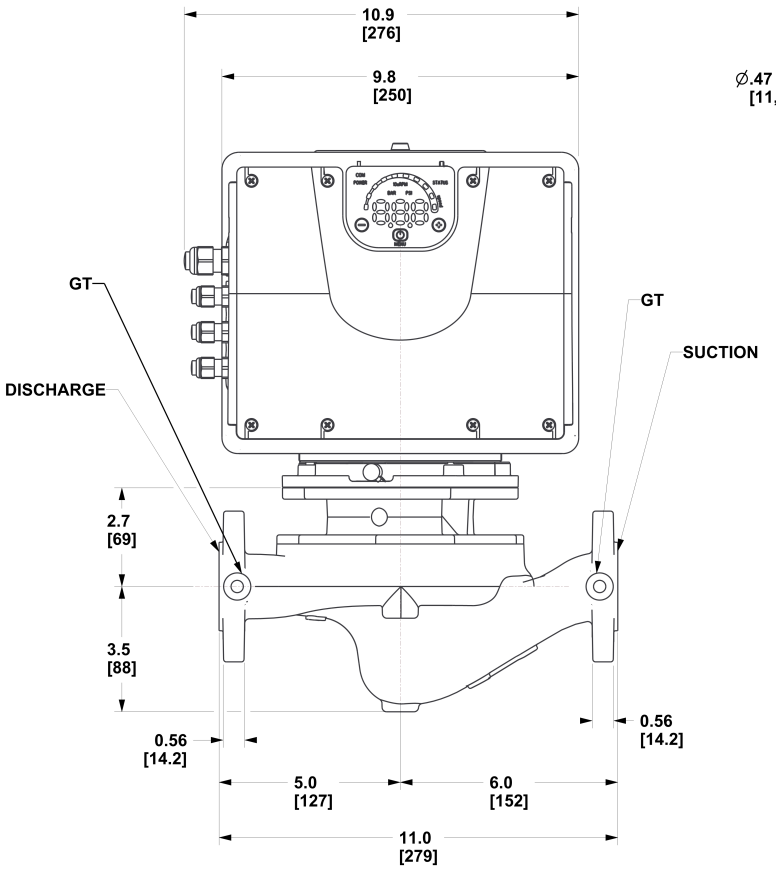
Performance Curve

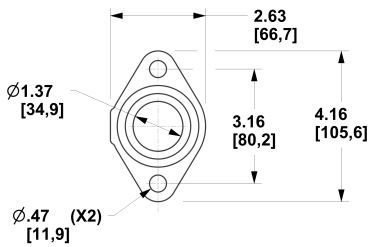
PREMIUM EFFICIENCY PRODUCT

e-90E
1AAB

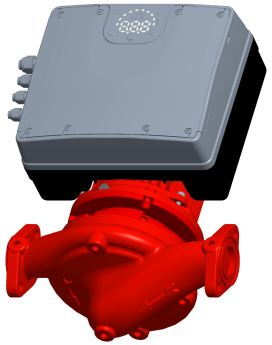


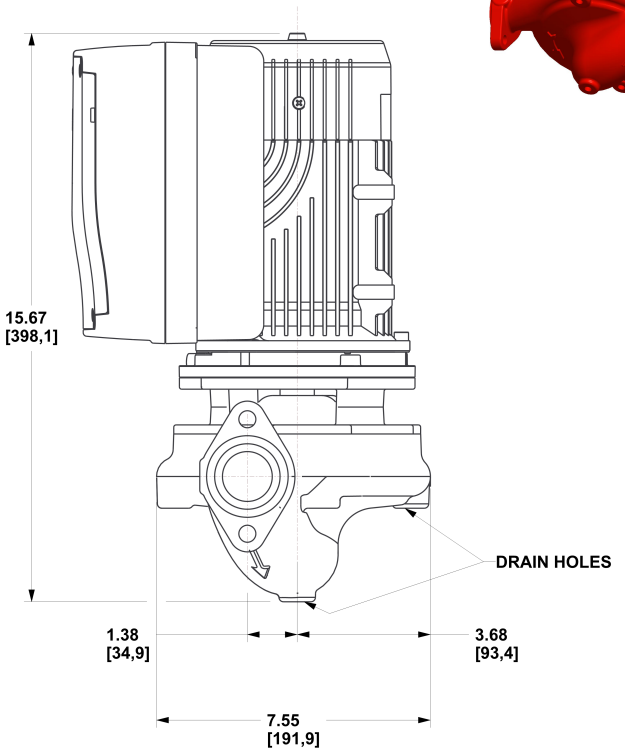
Performance curve meets 14.6 / ISO 9906 acceptance criteria





SUCTION AND DISCHARGE
FLANGE DETAILS





Bell & Gossett
a xylem brand
8200 N. Austin Ave.
Morton Grove, IL 60053, USA

Dimensions are subject to change
Not to be used for construction unless certified

BG-E90E-1AAB-300-3600-3

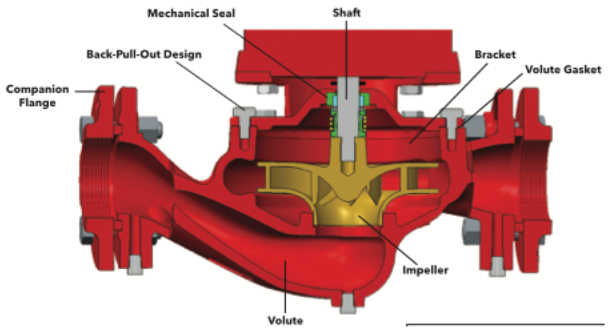
Motor HP: 3	Motor Speed: 3600	Motor Phase: 3	Flange: 1" NPT
Dimensions : IN (mm)	Scale : N.T.S.	Submittal # :	

Standard Materials of Construction *contact your local rep for configuration		
Construction:	**Bronze Fitted**	**All Bronze**
Volute	Cast Iron ASTM A159	Cast Bronze ASTM B584
Impeller:	ASTM B584	ASTM B584
Shaft	Stainless Steel	Stainless Steel
Bracket	Cast Iron ASTM #A159	CF8 Stainless ASTM #A351
Companion Flange	1", 11/4", 11/2" - Steel SAE1006 2", 3" - Cast Iron ASTM #A159	1", 11/4", 11/2" - Bronze ASTM #36 2", 3" - Cast Bronze ASTM #B584

Pump Options *contact your local rep to configure	
Three Phase motors	FKM and EPR seals
Available as a Header pump for boiler recirculation	ECM Permanent Magnet Smart Motor Option

Standard Mechanical Seal Assembly	
Elastomer:	EPR
Spring	Stainless Steel
Seat Insert	Silicon-Carbide
Seal Ring	Carbon
Seal Housing	Stainless Steel

Maximum Operating Tolerances	
Max Working Pressure (standard)	175 psi (12 bar)
Max fluid Temperature	250°F



Xylem Inc.
8200 N. Austin Avenue, Morton Grove, IL 60053
Phone: (847)966-3700 Fax: (847)965-8379
www.bellgossett.com

Job Name:	
Tag#	

Submittal Data Sheet

FTX36NVJU / RK36NMVJUA

3-Ton Wall Mounted Cooling Only System

Complete warranty details available from your local dealer or at www.daikincomfort.com. Warranty registration not required to receive the 10-Year parts limited warranty for residential or commercial installations.

Efficiency

Cooling	
SEER	15.90
EER	9.10

Performance

Cooling (Btu/hr)	
Rated (Min/Max)	34,400 (10,200 / 34,400)
Sensible @ AHRI	22,160
Standard Operating Range	50°F – 115°F
Extended Operating Range*	-22°F – 115°F

Rated Cooling Conditions: Indoor: 80°F DB/67°F WB
Outdoor: 95°F DB/75°F WB

***With field settings and wind baffle**

Indoor Specifications

	Cooling	
Airflow Rate (cfm)	**H**	**M**
	915	742
	L	**SL**
	572	512
Sound (dBA) H / M / L / SL	54 / 47 / 40 / 37	
Dimensions (H × W × D) (in)	13-3/8 × 47-1/4 × 10-3/16	
Weight (Lbs)	38	

Outdoor Specifications

Compressor	Hermetically Sealed Swing Type	
Refrigerant	R-410A	
Factory Charge (Lbs)	3.64	
Refrigerant Oil	PVE (FVC50K)	
Airflow Rate (cfm)	**Cooling**	
	H	2,811
Sound Pressure Level (dBA)	59	
Dimensions (H × W × D) (in)	28-15/16 × 34-1/4 × 12-5/8	
Weight (Lbs)	133	

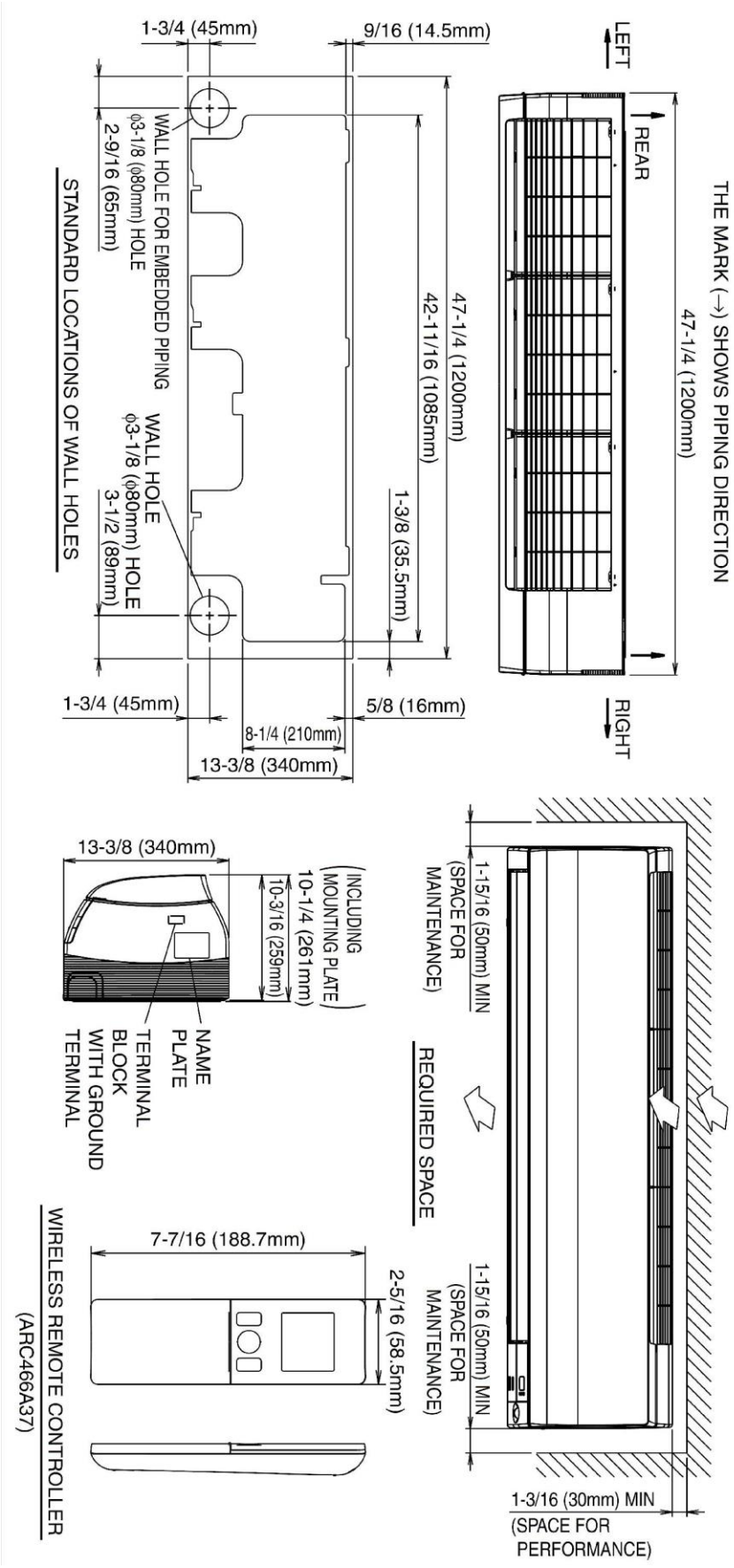
Electrical

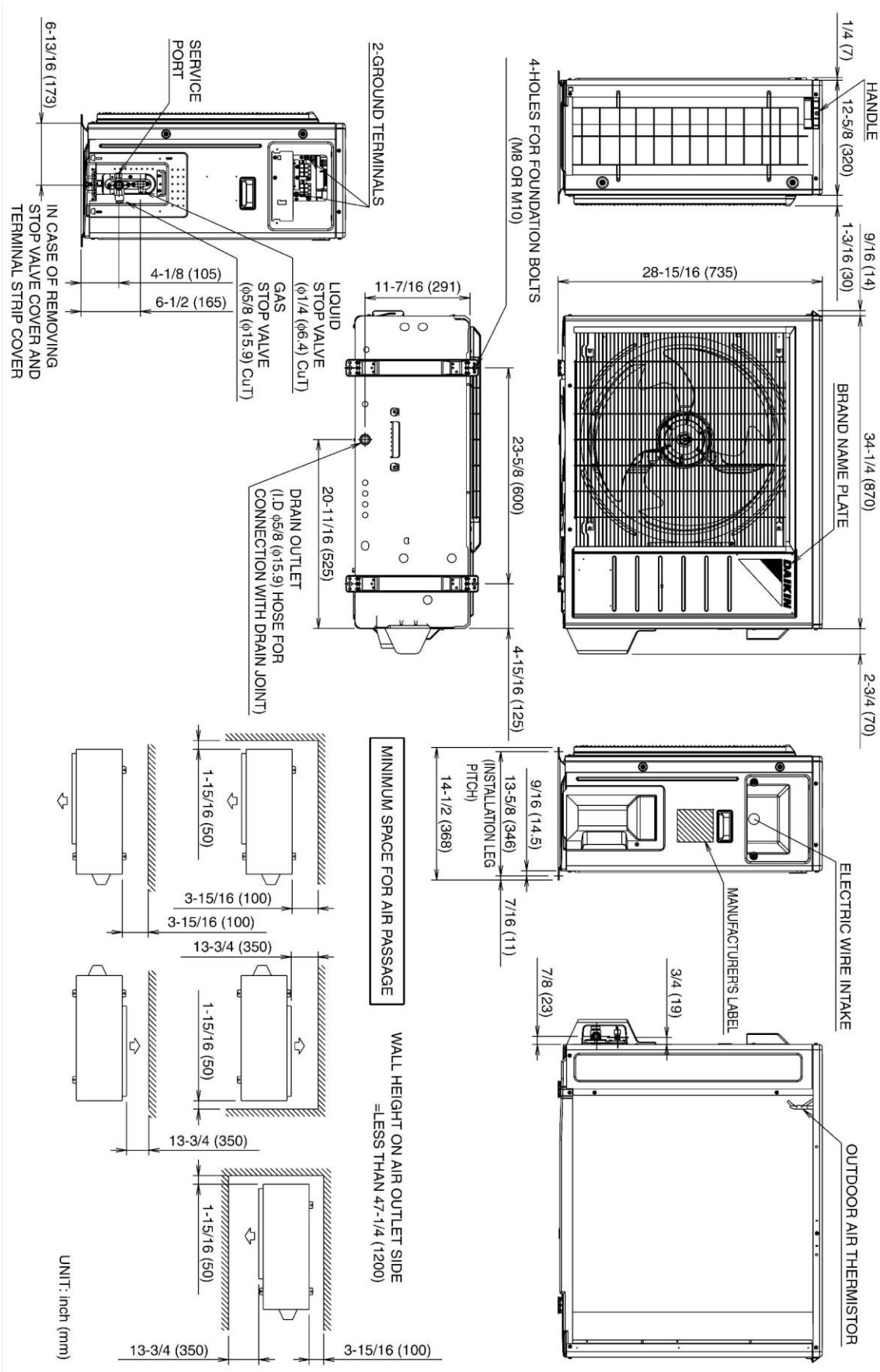
	208/60/1	230/60/1
System MCA	17	17
System MFA	20	20
Compressor RLA	16.25	16.25
Outdoor fan motor FLA	.83	.83
Outdoor fan motor W	123	123
Indoor fan motor FLA	.37	.37
Indoor fan motor W	64	64

MFA: Max. fuse amps **MCA**: Min. circuit amps (A) **FLA**: Full load amps (A)
RLA: Rated load amps (A) **W**: Fan motor rated output (W)

Piping

Liquid (in)	1/4
Gas (in)	5/8
Drain (in)	5/8
Max. Interunit Piping Length (ft)	98.4
Max. Interunit Height Difference (ft)	65.625
Chargeless (ft)	32.8
Additional Charge of Refrigerant (oz/ft)	.32


1-3/4 (45mm)
9/16 (14.5mm)
LEFT
REAR
RIGHT
THE MARK (→) SHOWS PIPING DIRECTION
47-1/4 (1200mm)
WALL HOLE FOR EMBEDDED PIPING
φ3-1/8 (φ80mm) HOLE
2-9/16 (65mm)
47-1/4 (1200mm)
42-11/16 (1085mm)
1-3/8 (35.5mm)
WALL HOLE
φ3-1/8 (φ80mm) HOLE
3-1/2 (89mm)
STANDARD LOCATIONS OF WALL HOLES
1-3/4 (45mm)
5/8 (16mm)
8-1/4 (210mm)
13-3/8 (340mm)
13-3/8 (340mm)
10-3/16 (259mm)
(INCLUDING MOUNTING PLATE)
10-1/4 (261mm)
NAME PLATE
TERMINAL BLOCK WITH GROUND TERMINAL
1-15/16 (50mm) MIN
(SPACE FOR MAINTENANCE)
REQUIRED SPACE
1-15/16 (50mm) MIN
(SPACE FOR MAINTENANCE)
1-3/16 (30mm) MIN
(SPACE FOR PERFORMANCE)
7-7/16 (188.7mm)
2-5/16 (58.5mm)
WIRELESS REMOTE CONTROLLER
(ARC466A37)


1/4 (7)
HANDLE
12-5/8 (320)
1-3/16 (30)
9/16 (14)
28-15/16 (735)
34-1/4 (870)
BRAND NAME PLATE
2-3/4 (70)
4-HOLES FOR FOUNDATION BOLTS (M8 OR M10)
11-7/16 (291)
23-5/8 (600)
4-15/16 (125)
20-11/16 (525)
DRAIN OUTLET (I.D ϕ5/8 (ϕ15.9) HOSE FOR CONNECTION WITH DRAIN JOINT)
2-GROUND TERMINALS
SERVICE PORT
6-13/16 (173)
IN CASE OF REMOVING STOP VALVE COVER AND TERMINAL STRIP COVER
4-1/8 (105)
6-1/2 (165)
GAS STOP VALVE (ϕ5/8 (ϕ15.9) CuT)
LIQUID STOP VALVE (ϕ1/4 (ϕ6.4) CuT)
MINIMUM SPACE FOR AIR PASSAGE
WALL HEIGHT ON AIR OUTLET SIDE =LESS THAN 47-1/4 (1200)
1-15/16 (50)
3-15/16 (100)
13-3/4 (350)
UNIT: inch (mm)
14-1/2 (368)
13-5/8 (346)
(INSTALLATION LEG PITCH)
9/16 (14.5)
7/16 (11)
ELECTRIC WIRE INTAKE
MANUFACTURER'S LABEL
7/8 (23)
3/4 (19)
OUTDOOR AIR THERMISTOR

Optional Accessories

Indoor Unit		
Included	**Part Number**	**Description**
	AZAI6WSCDKB	DKN Residential Cloud Wi-Fi Adaptor for Single- and Multi-Zone System (S21)
	AZAI6WSPDKC	DKN Plus Interface
	DTST-ONE-ADA-A	Daikin *One*+ Smart Thermostat for Ductless Products
	BRC944B2	Wired Remote Controller
	BRCW901A08	Wired Remote Controller Cable – 25ft
	BRCW901A03	Wired Remote Controller Cable – 10ft
	DACA-CP1-1	Inline Condensate Pump (Fits inside all Daikin wall & floor mount units)
	DACA-CP4-1	External Condensate Pump
	KRP928BB2S	Interface Adaptor for DIII-NET

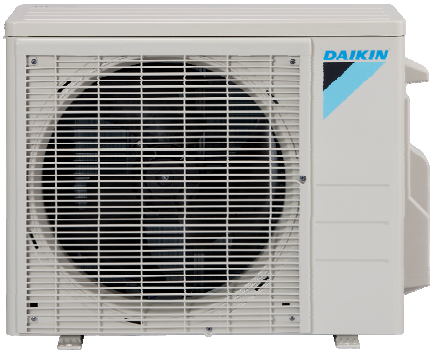
Outdoor Unit		
Included	**Part Number**	**Description**
	KPW063B4	Air Adjustment Grille (RX & RK)
	KKG063A42	Back protection wire net

Job Name:	
Tag#	

Submittal Data Sheet

FTX36NVJU / RX36NMVJU

3-Ton Wall Mounted Heat Pump System



Complete warranty details available from your local dealer or at www.daikincomfort.com. Warranty registration not required to receive the 10-Year parts limited warranty for residential or commercial installations.

Efficiency

Cooling		Heating	
SEER	15.9	**HSPF**	9.2
EER	9.10	**COP**	2.78

Performance

Cooling (Btu/hr)	
Rated (Min/Max)	34,400 (10,200 / 34,400)
Sensible @ AHRI	22,160
Standard Operating Range	50°F – 115°F
Extended Operating Range*	-4°F – 115°F

Rated Cooling Conditions: Indoor: 80°F DB/67°F WB
Outdoor: 95°F DB/75°F WB

***With field settings and wind baffle**

Heating (Btu/hr)	
1:@ 47° Rated (Min/Max)	36,000 (10,200 / 36,000)
2: @ 17° Rated	22,800
3: @ 5°	15,740
Operating Range	5 – 65°F

1: Rated Heating Conditions: Indoor: 70°F DB/60°F WB
Outdoor: 47°F DB/43°F WB

2: Rated Heating Conditions: Indoor: 70°F DB/60°F WB
Outdoor: 17°F DB/15°F WB

3: Heating Conditions: Indoor: 70°F DB/60°F WB
Outdoor: 5°F DB/5°F WB

Indoor Specifications

	Cooling		Heating	
Airflow Rate (cfm)	**H**	**M**	**H**	**M**
	915	742	960	791
	L	**SL**	**L**	**SL**
	572	512	629	544
Sound (dBA) H / M / L / SL	54 / 47 / 40 / 37		53 / 46 / 38 / 35	
Dimensions (H × W × D) (in)	13-3/8 × 47-1/4 × 10-3/16			
Weight (Lbs)	38			

Outdoor Specifications

Compressor	Hermetically Sealed Swing Type			
Refrigerant	R-410A			
Factory Charge (Lbs)	3.64			
Refrigerant Oil	PVE (FVC50K)			
Airflow Rate (cfm)	**Cooling**		**Heating**	
	H	2,811	**H**	2,352
Sound Pressure Level (dBA)	59			
Dimensions (H × W × D) (in)	28-15/16 × 34-1/4 × 12-5/8			
Weight (Lbs)	133			

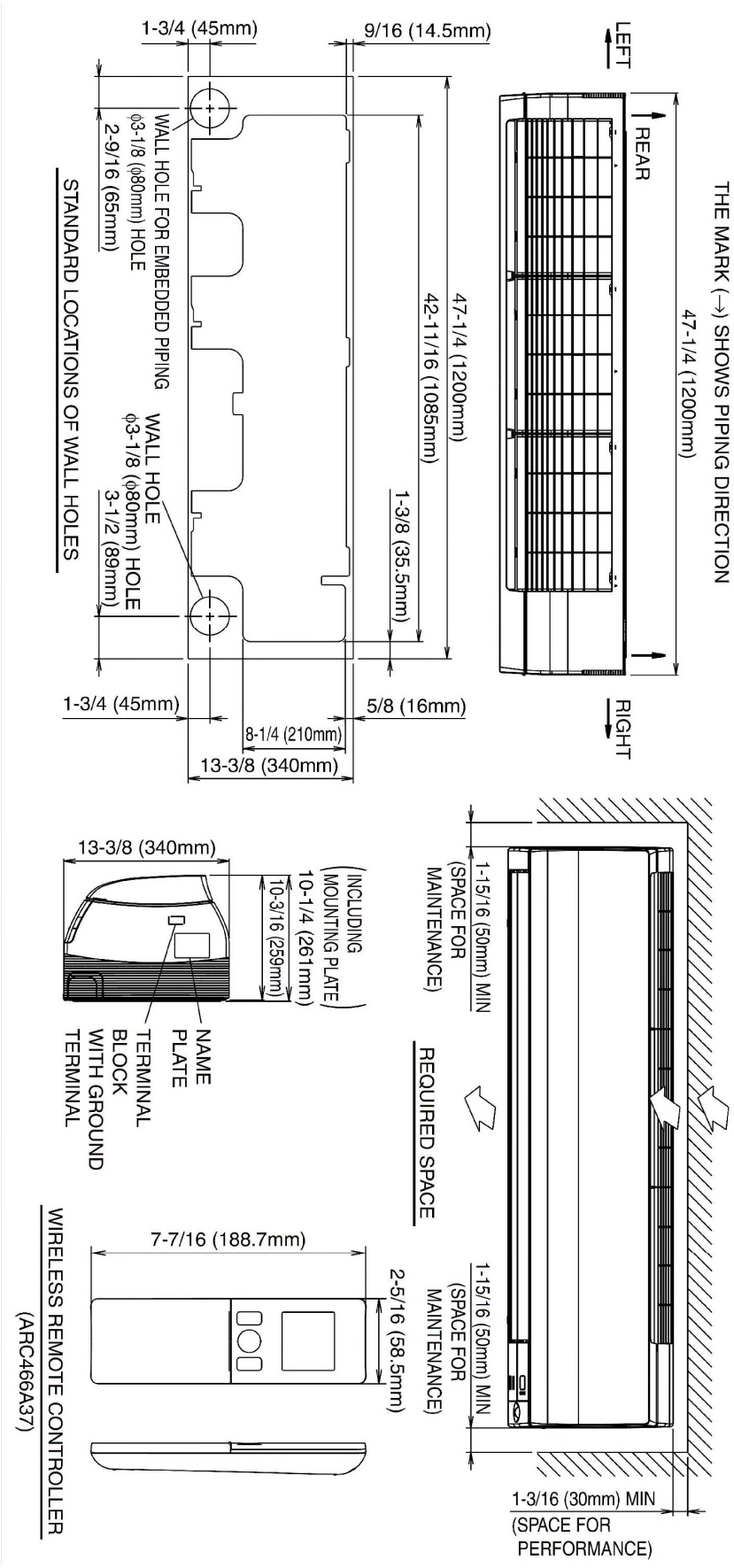
Electrical

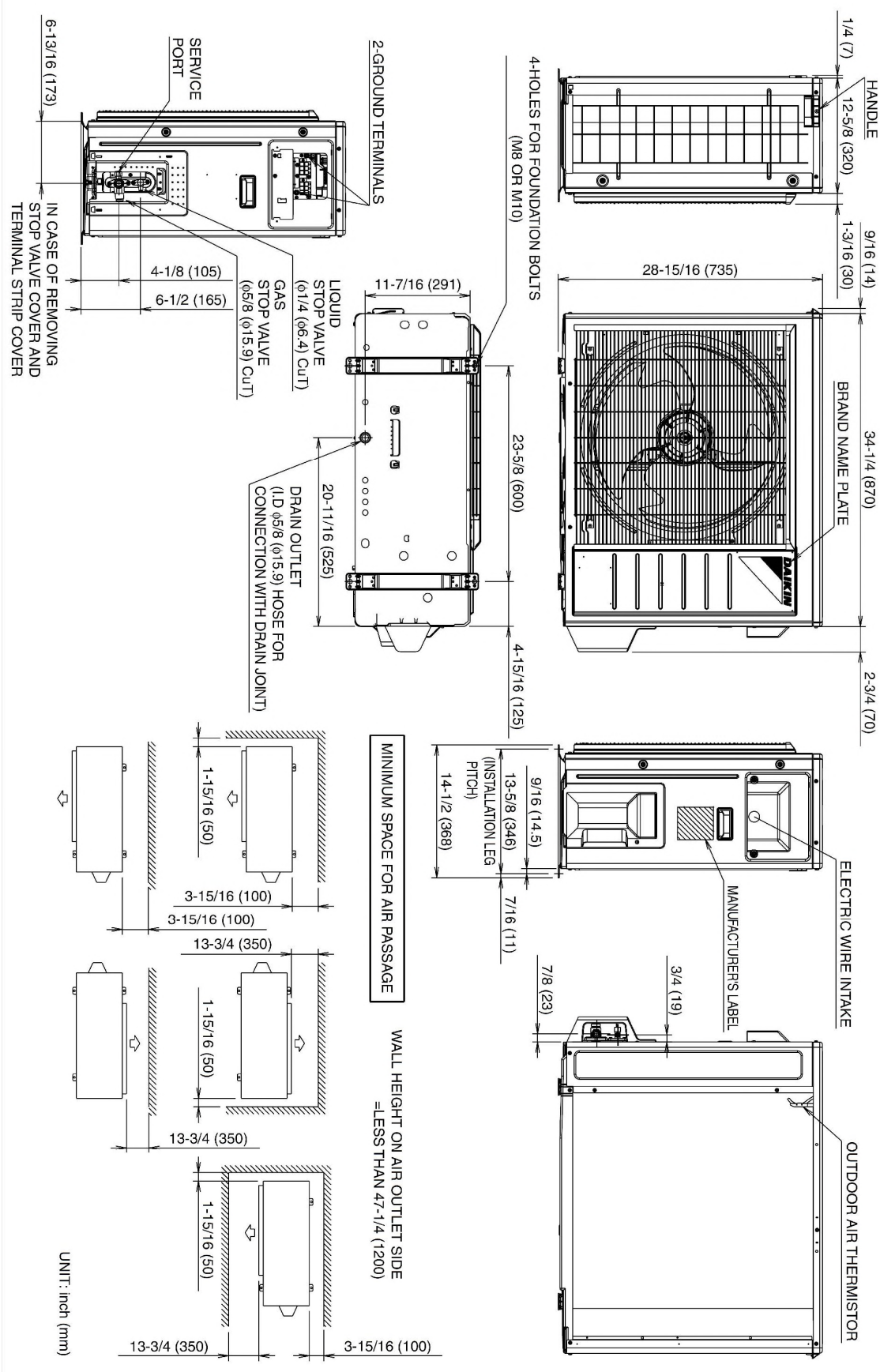
	208/60/1	230/60/1
System MCA	19.8	19.8
System MFA	20	20
Compressor RLA	18.25	18.25
Outdoor fan motor FLA	.83	.83
Outdoor fan motor W	123	123
Indoor fan motor FLA	.37	.37
Indoor fan motor W	64	64

MFA: Max. fuse amps **MCA**: Min. circuit amps (A) **FLA**: Full load amps (A)
RLA: Rated load amps (A) **W**: Fan motor rated output (W)

Piping

Liquid (in)	1/4
Gas (in)	5/8
Drain (in)	5/8
Max. Interunit Piping Length (ft)	98.4
Max. Interunit Height Difference (ft)	65.625
Chargeless (ft)	32.8
Additional Charge of Refrigerant (oz/ft)	.32


1-3/4 (45mm)
9/16 (14.5mm)
LEFT
REAR
RIGHT
THE MARK (→) SHOWS PIPING DIRECTION
47-1/4 (1200mm)
WALL HOLE FOR EMBEDDED PIPING
φ3-1/8 (φ80mm) HOLE
2-9/16 (65mm)
47-1/4 (1200mm)
42-11/16 (1085mm)
1-3/8 (35.5mm)
WALL HOLE
φ3-1/8 (φ80mm) HOLE
3-1/2 (89mm)
STANDARD LOCATIONS OF WALL HOLES
1-3/4 (45mm)
5/8 (16mm)
8-1/4 (210mm)
13-3/8 (340mm)
13-3/8 (340mm)
10-1/4 (261mm)
(INCLUDING MOUNTING PLATE)
10-3/16 (259mm)
NAME PLATE
TERMINAL BLOCK WITH GROUND TERMINAL
1-15/16 (50mm) MIN
(SPACE FOR MAINTENANCE)
REQUIRED SPACE
1-15/16 (50mm) MIN
(SPACE FOR MAINTENANCE)
1-3/16 (30mm) MIN
(SPACE FOR PERFORMANCE)
7-7/16 (188.7mm)
2-5/16 (58.5mm)
WIRELESS REMOTE CONTROLLER
(ARC466A37)


1/4 (7)
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23-5/8 (600)
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DRAIN OUTLET
(I.D ϕ5/8 (ϕ15.9) HOSE FOR
CONNECTION WITH DRAIN JOINT)
6-13/16 (173)
SERVICE
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IN CASE OF REMOVING
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ELECTRIC WIRE INTAKE
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7/8 (23)
3/4 (19)
OUTDOOR AIR THERMISTOR
MINIMUM SPACE FOR AIR PASSAGE
WALL HEIGHT ON AIR OUTLET SIDE
=LESS THAN 47-1/4 (1200)
1-15/16 (50)
3-15/16 (100)
3-15/16 (100)
13-3/4 (350)
1-15/16 (50)
13-3/4 (350)
1-15/16 (50)
13-3/4 (350)
3-15/16 (100)
UNIT: inch (mm)

Optional Accessories

Indoor Unit		
Included	**Part Number**	**Description**
	BRP072A43	Wireless Interface Adapter
	BRC944B2-A08	Wired Remote Controller kit
	BRCW901A08	Wired Remote Controller Cable – 25 ft (included in above kit)
	BRCW901A03	Wired Remote Controller Cable – 10ft
	DACA-CP1-1	Inline Condensate Pump (Fits inside all Daikin wall & floor mount units)
	DACA-CP4-1	External Condensate Pump
	KRP928BB2S	Interface Adaptor for DIII-NET

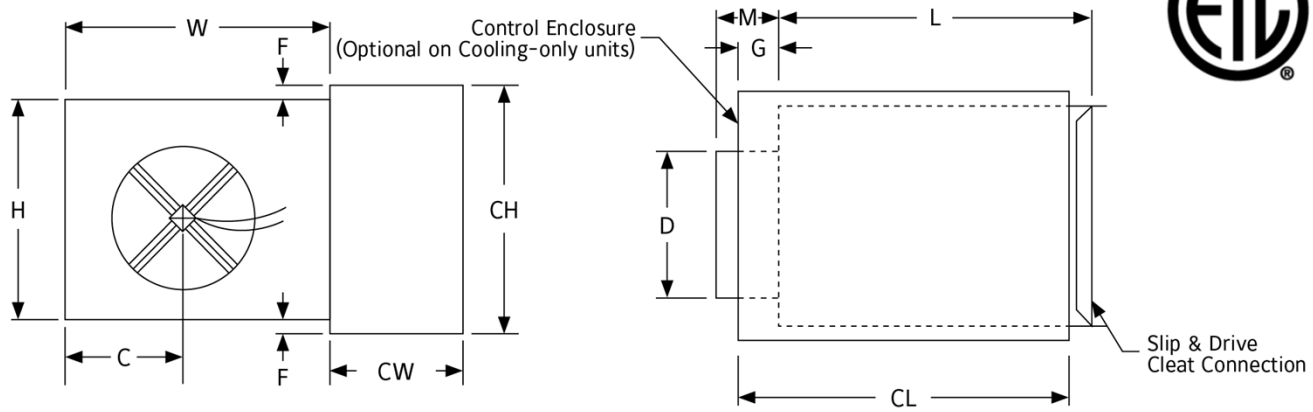
Outdoor Unit		
Included	**Part Number**	**Description**
	KEH063A4E	Drain Pan Heater (RX)
	KPW063A4	Air Adjustment Grille (RX & RK)
	KKG063A42	Back protection wire net

ESV

Single Duct Terminal Unit

Digital, Analog or Electric Control, Pressure Independent

☐ Digital Control, DESV ☐ Analog Control, AESV ☐ Electric Control, EESV



Right hand unit shown. All dimensions are in inches.

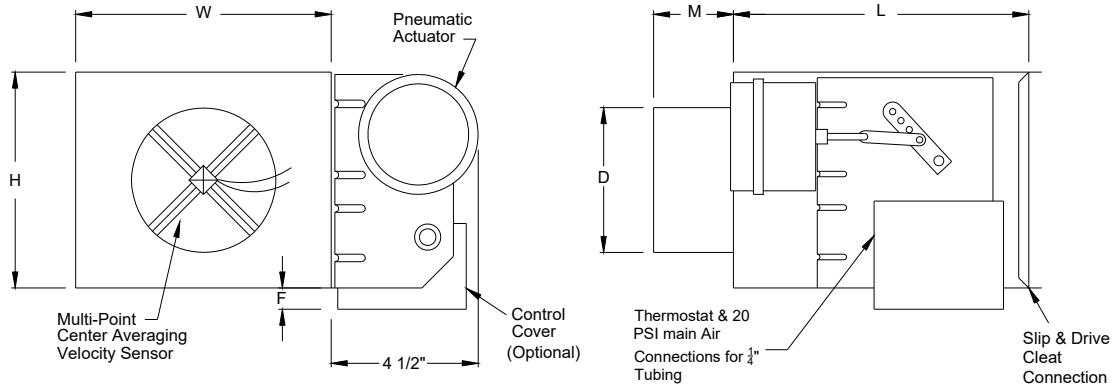
Size	CFM Range	D (H x W)	C	F	G	H	L	M	W	CH	CL	CW
4	0-225	3 7/8	6 1/2	2 1/8	7 3/8	8	15 1/2	5 3/8	12	12 1/4	18	6 1/2
5	0-350	4 7/8	6 1/2	2 1/8	7 3/8	8	15 1/2	5 3/8	12	12 1/4	18	6 1/2
6	0-500	5 7/8	6 1/2	2 1/8	7 3/8	8	15 1/2	3 3/8	12	12 1/4	18	6 1/2
7	0-650	6 7/8	6	1 1/8	7 3/8	10	15 1/2	3 3/8	12	12 1/4	18	6 1/2
8	0-900	7 7/8	6	1 1/8	7 3/8	10	15 1/2	3 3/8	12	12 1/4	18	6 1/2
9	0-1050	8 7/8	7	-	5 3/8	12 1/2	15 1/2	3 3/8	14	12 1/4	18	6 1/2
10	0-1400	9 7/8	7	-	5 3/8	12 1/2	15 1/2	3 3/8	14	12 1/4	18	6 1/2
12	0-2000	11 7/8	8	-	5 3/8	15	15 1/2	3 3/8	16	12 1/4	18	6 1/2
14	0-3000	13 7/8	10 1/2	-	3 3/8	17 1/2	15 1/2	3 3/8	20	12 1/4	18	6 1/2
16	0-4000	15 7/8	13 1/2	-	3 3/8	18	15 1/2	3 3/8	24	12 1/4	18	6 1/2
20	0-2000	7 1/2 x 12 1/4	8	1/8	3	10	15 1/2	3 3/8	16	10 1/4	15 1/4	6 1/2
30	0-4000	7 1/2 x 23 3/4	13 5/8	1/8	3	10	15 1/2	3 3/8	27 1/4	10 1/4	15 1/4	6 1/2
40	0-8000	15 7/8 x 23 7/8	19	1 1/8	5 3/8	18	15	3 3/8	38	12 1/4	18	6 1/2
5E	0-350	4 7/8	6	2 1/8	7 3/8	10	15 1/2	3 3/8	12	12 1/4	18	6 1/2
6E	0-500	5 7/8	6	2 1/8	7 3/8	10	15 1/2	3 3/8	12	12 1/4	18	6 1/2
7E	0-650	6 7/8	7	1 1/8	5 3/8	12 1/2	15 1/2	3 3/8	14	12 1/4	18	6 1/2
8E	0-900	7 7/8	7	1 1/8	5 3/8	12 1/2	15 1/2	3 3/8	14	12 1/4	18	6 1/2
1E	0-1400	9 7/8	8	-	5 3/8	15	15 1/2	3 3/8	16	12 1/4	18	6 1/2
2E	0-2000	11 7/8	10	-	3 3/8	17 1/2	15 1/2	3 3/8	20	12 1/4	18	6 1/2
4E	0-3000	13 7/8	12	-	3 3/8	18	15 1/2	3 3/8	24	12 1/4	18	6 1/2

This submittal is meant to demonstrate general dimensions of this product. The drawings are not meant to detail every aspect of the product. Drawings are not to scale. Titus reserves the right to make changes without written notice.

ESV

Single Duct Terminal Unit
Pneumatic Control, Pressure Independent

☐ Pneumatic Control, PESV



Right hand unit shown. All dimensions are in inches.

Size	CFM Range	D (H x W)	F	H	L	M	W
4	0-225	3 7/8	2 1/8	8	15 1/2	5 3/8	12
5	0-350	4 7/8	2 1/8	8	15 1/2	5 3/8	12
6	0-500	5 7/8	2 1/8	8	15 1/2	3 3/8	12
7	0-650	6 7/8	1 1/8	10	15 1/2	3 3/8	12
8	0-900	7 7/8	1 1/8	10	15 1/2	3 3/8	12
9	0-1050	8 7/8	-	12 1/2	15 1/2	3 3/8	14
10	0-1400	9 7/8	-	12 1/2	15 1/2	3 3/8	14
12	0-2000	11 7/8	-	15	15 1/2	3 3/8	16
14	0-3000	13 7/8	-	17 1/2	15 1/2	3 3/8	20
16	0-4000	15 7/8	-	18	15 1/2	3 3/8	24
20	0-1800	7 1/2 x 12 1/4	1 1/8	10	15 1/2	3 3/8	16
30	0-4000	7 1/2 x 23 3/4	1/4	10	15 1/2	3 3/8	27 1/4
40	0-8000	23 7/8 x 15 7/8	1 1/8	18	15	3 3/8	38

This submittal is meant to demonstrate general dimensions of this product. The drawings are not meant to detail every aspect of the product. Drawings are not to scale. Titus reserves the right to make changes without written notice.

General Description

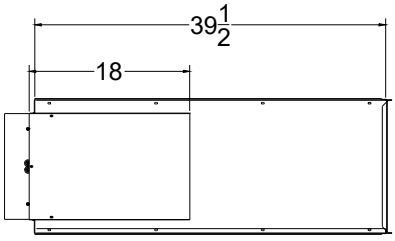
- Heavy gauge steel housing. Mechanically sealed and gasketed, leak resistant construction. Less than 2% of nominal cfm at 1.5" sp wg.
- Dual density internal insulation, treated to resist air erosion. Meets requirements of NFPA 90A and UL 181.
- Units equipped with the Titus II velocity controller can either be direct acting or reverse acting, with the damper either normally open or normally closed. Controller maintains constant span and start point. (Span and start point are adjustable.)
- Rectangular discharge opening is designed for slip and drive cleat duct connection.
- Multipoint center averaging inlet velocity sensor.
- Control packages can be factory mounted by Titus.
- Choice of right hand or left hand control location.
- Units equipped with the Titus I velocity controller are available in both direct acting / normally open and reverse acting / normally closed operating modes.
- Model DESV without coils can be installed horizontally, vertically, or at any angle. Operation is not affected by position. For units with coils, consult technical support.
- Gauge tees for cfm measurement.
- OSHPD Seismic Certification: OSP-0352-10
- Only Titus Alpha digital and pneumatic controls approved for seismic installation.

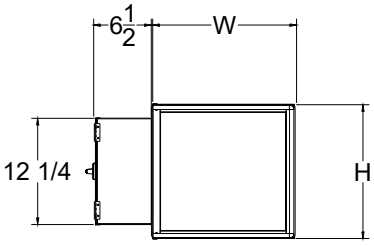
Accessories (Optional)

Check ☑ if provided.

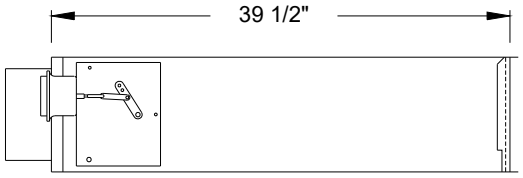
- ☐ 24 V Control Transformer
- ☐ Dust Tight Enclosure Seal
- ☐ Fibre Free Liner
- ☐ ½” EcoShield Liner
- ☐ ½” Fibre Free Liner
- ☐ 1" Fiberglass Liner
- ☐ 1" EcoShield Liner
- ☐ 1" Fibre Free Liner
- ☐ Low Leakage Seal/Test/Certify
- ☐ SteriLoc Liner
- ☐ UltraLoc Liner
- ☐ ½” EcoShield Liner (Foil Face)
- ☐ 1” EcoShield Liner (Foil Face)
- ☐ Disconnect Switch
- ☐ Hanger Brackets
- ☐ Removable Air Flow Sensor
- ☐ Bottom Access Door
- ☐ OSP & IBC -S Seismic Certification
- ☐ Red List Compliant “Google” Gasketing
- ☐ Stainless Steel Construction
- ☐ _____

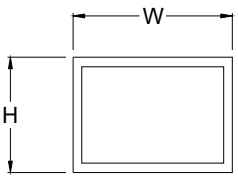
☐ Integral Sound Attenuator





DESV, AESV, EESV





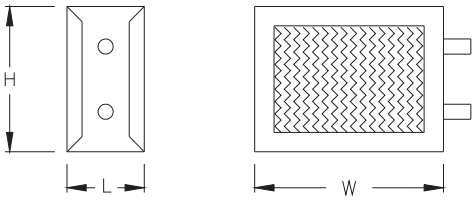
PESV

Accessories (Optional)

☐ Hot Water Coil Section

- Aluminum ripple fins, 10 per inch
- Coil pipe connections are male, sweat, type "L" copper. Connection sizes on unit sizes 04-08 are $^{1}/_{2}$" OD for 1 row coil and $^{5}/_{8}$" on 2 row coils. All other coils have $^{7}/_{8}$" OD.
- Coil is installed at discharge of unit.
- On units with attenuators, coil are installed at the discharge of attenuator.
- Coils rated and certified to AHRI Standard 410

☐ 1 Row
☐ 2 Row
☐ 3 Row
☐ 4 Row



☐ Electric Coil Section ☐ Optional SCR Controlled Electric Heater ☐ Optional Lynergy Controlled Electric Heater

Standard Features

- Single side access to low voltage, high voltage, and electric heater controls.
- Automatic reset thermal cutouts, one per element
- Manual reset secondary protection.
- Positive pressure flow switch
- Magnetic contactor for each step.
- Slip and drive cleat discharge duct connection.

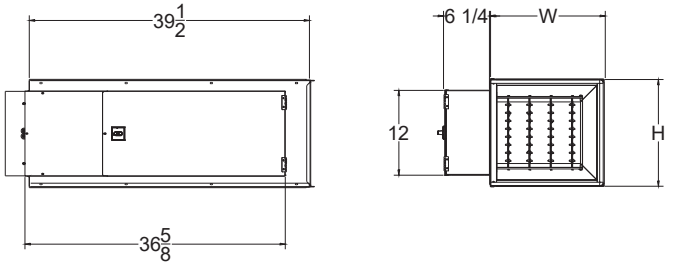
Options

☐ Fuse Block
☐ Disconnect switch, door interlock type
☐ Dust tight construction

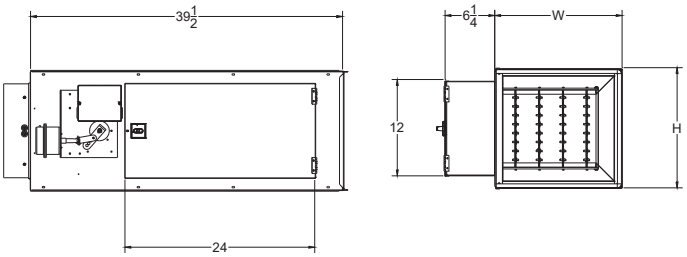
Supply Voltage

☐ 120V, 1 ph, 60Hz
☐ 208V, 1 ph, 60Hz
☐ 240V, 1 ph, 60Hz
☐ 277V, 1 ph, 60Hz
☐ 208V, 3 ph, 60Hz
☐ 480V, 3 ph, 60Hz (4 wire wye standard)

DESV, AESV, EESV



PESV



Size	H	W	Water Coil	
			L (1-2 Row)	L (3-4 Row)
4	8	12	5	7 1/4
5	8	12	5	7 1/4
6	8	12	5	7 1/4
7	10	12	5	7 1/4
8	10	12	5	7 1/4
9	12 1/2	14	5	7 1/4
10	12 1/2	14	5	7 1/4
12	15	16	5	7 1/4
14	17 1/2	20	7 1/2	9 3/4
16	18	24	7 1/2	9 3/4
20	10	16	5	7 1/4
30	10	27 1/4	5	7 1/4
40	18	38	5	7 1/4

The total length of the ESV unit is the summation of the unit length (with or without attenuator) and the length of the optional water coil.

This submittal is meant to demonstrate general dimensions of this product. The drawings are not meant to detail every aspect of the product. Drawings are not to scale. Titus reserves the right to make changes without written notice.

VRV Selection

Project Report

Report details

Produced on: 2/20/2024

Application version: 2024.2.19.2

Project details

Project name: MCC Automotive Institute (shared)

Solution name: 02 20 2024

Client Name:

Customer reference:

Quotation reference:

Project number: 620308/799204

Selection parameters of the indoor units can be found in the Engineering Data Books
Selection parameters of the outdoor units can be found in the Engineering Data Books
Only the data published in the data book are correct. This program uses close approximations of these data.

Material list

Model	Quantity	Description
RXYQ192AAYDA	1	VRV EMERION (460V)
REYQ312AAYDA	1	VRV EMERION (460V) (VRV EMERION (460V))
BSF4Q54TVJ	1	Branch selector unit
BSF6Q54TVJ	1	Branch selector unit
BSF8Q54TVJ	1	Branch selector unit
FXFQ24TVJU	2	FXFQ_T - Round Flow Sensing Cassette
FXMQ72MVJU	1	FXMQ - Concealed Ducted (Medium Static)
FXSQ18TBVJU	1	FXSQ-TB - MSP Concealed Ducted Unit (Medium Static)
FXSQ24TBVJU	1	FXSQ-TB - MSP Concealed Ducted Unit (Medium Static)
FXSQ30TBVJU	2	FXSQ-TB - MSP Concealed Ducted Unit (Medium Static)
FXSQ36TBVJU	1	FXSQ-TB - MSP Concealed Ducted Unit (Medium Static)
FXSQ48TBVJU	2	FXSQ-TB - MSP Concealed Ducted Unit (Medium Static)
FXZQ05TBVJU	3	FXZQ_TBVJU - 4-Way Discharge Ceiling Cassette Vista (2' x 2') white
VAM1200GVJU	2	CEILING MOUNTED DUCT TYPE ERV
FXMQ96MFVJU	2	OA Processing Unit
KHRP25M72TUA	1	Refnet branch piping kit
KHRP25M73TUA	1	Refnet branch piping kit
KHRP26M72TUA	1	Refnet branch piping kit
DCM601B71	1	intelligent Touch Manager (iTM)
BHFP26P100UA	1	Dual Module Multi Connection Piping Kit - VRV HR
BRC1E73	17	new Navigation Remote Controller
BYCQ125B-W1	2	Standard Decoration Panel
BYFQ60C3W2W	3	Decoration Panel White
DCM014A51	1	ITM BACnet Server Gateway Option (Do not add with client or MS-TP, max 128 Device IDs)
KHFP26A100CA	4	Branch Selector Closed Pipe Kit
KHFP26P100UA	1	Reducer Kit for VRV EMERION OU multi connection
KHRP26A250TA	1	Branch Selector 2-ports Joint Kit
KRP1C74	2	Adaptor PCB (Aux Heat, Humidifier, OSA, Damper, etc) - VRVIII Indoor units

Remarks

Note: Upon depletion of inventory of current REFNET models, order of current REFNET models will be substituted with the new upgraded -A models with no additional fee.

Outdoor air processing units are considered as indoor units. They have an influence on the selection of outdoor units, the piping diagram, the wiring diagram and the centralized controller diagram.

The use of VAM devices has no influence on the selection of outdoor units or its piping diagram. It only affects the wiring diagram and the centralized controller diagram.

Piping	Liquid	Suction	Discharge	Total
	ft	ft	ft	ft
1/4"	170.0	0.0	0.0	170.0
3/8"	500.0	0.0	0.0	500.0

1/2"	60.0	170.0	0.0	230.0
5/8"	250.0	405.0	0.0	655.0
3/4"	165.0	50.0	60.0	275.0
7/8"	140.0	105.0	0.0	245.0
1 1/8"	0.0	415.0	305.0	720.0
1 3/8"	0.0	140.0	0.0	140.0

Indoor unit details

Table of abbreviations

Abbreviation	Description
Name	Logical name of the device
FCU	Device model name
Tmp C	Indoor conditions in cooling
Max TC	Available total cooling capacity
Rq SC	Required sensible cooling capacity
Tevap	Evaporating temperature of indoor unit coil
Max SC	Available sensible cooling capacity
Tmp H	Indoor temperature in heating
Max HC	Available heating capacity
Sound	Sound pressure level low and high
PS	Power supply (voltage and phases)
MCA	Minimum Circuit Amps
MOP	Maximum Overcurrent Protection
WxHxD	WidthxHeightxDepth
Weight	Weight of the device
Air Flow Rate	Air Flow Rate

HP 1 - RXYQ192AAYDA

Capacity data at conditions and connection ratio (100) as entered

Name	FCU	Cooling				
		Tmp C	Max TC	Rq SC	Tevap	Max SC
		°F (DBT/WBT)	BTU/h	BTU/h	°F	BTU/h
DOAS-A1	FXMQ96MFVJU	n/a	90,000	n/a	42.8	n/a
DOAS-A2	FXMQ96MFVJU	n/a	90,000	n/a	42.8	n/a
ERV-1	VAM1200GVJU	n/a	n/a	n/a	42.8	n/a
ERV-2	VAM1200GVJU	n/a	n/a	n/a	42.8	n/a

Name	FCU	Heating		
		Tmp H	Max HC	Air Flow Rate
		°F	BTU/h	cfm
DOAS-A1	FXMQ96MFVJU	n/a	80,000	n/a
DOAS-A2	FXMQ96MFVJU	n/a	80,000	n/a
ERV-1	VAM1200GVJU	n/a	n/a	n/a
ERV-2	VAM1200GVJU	n/a	n/a	n/a

Name	FCU	Room	Sound	PS	MCA	MOP	WxHxD	Weight
			dBA		A		inch	lbs
DOAS-A1	FXMQ96MFVJU		-	208-230V 1ph	4.1		54.3 x 18.5 x 43.3	271.2
DOAS-A2	FXMQ96MFVJU		-	208-230V 1ph	4.1		54.3 x 18.5 x 43.3	271.2
ERV-1	VAM1200GVJU		-	208-230V 1ph	8.1		63.7 x 30.9 x 47.8	345.9
ERV-2	VAM1200GVJU		-	208-230V 1ph	8.1		63.7 x 30.9 x 47.8	345.9

Remarks

Reduced operational load

The sum of the required indoor unit capacities is 180,000BTU/h for cooling and 160,000BTU/h for heating. However, the outdoor unit selection uses reduced load values for cooling of 90,000BTU/h (=50%) and for heating of 80,000BTU/h (=50%). Be aware that unrealistic reductions may lead to reduced comfort levels, different noise levels or increased wear and tear.

Outdoor vs. indoor position

Outdoor unit placed at the same level as the indoor units.

OU-2 - REYQ312AAYDA = REYQ168AAYDA + REYQ144AAYDA

Capacity data at conditions and connection ratio (119) as entered

Name	FCU	Cooling				
		Tmp C	Max TC	Rq SC	Tevap	Max SC
		°F (DBT/WBT)	BTU/h	BTU/h	°F	BTU/h
IU-A101	FXZQ05TBVJU	74.9/63.0	5,004	3,600	42.8	4,244
IU-A109	FXSQ30TBVJU	75.0/63.0	26,476	19,000	42.8	20,009
IU-A202	FXSQ48TBVJU	75.0/63.0	42,330	30,000	42.8	30,234
IU-A201a	FXMQ72MVJU	75.0/63.0	61,895	40,000	42.8	47,752
IU-B201b	FXSQ48TBVJU	75.0/63.0	42,330	23,500	42.8	30,234

Name	FCU	Cooling				
		Tmp C	Max TC	Rq SC	Tevap	Max SC
		°F (DBT/WBT)	BTU/h	BTU/h	°F	BTU/h
IU-A102	FXSQ18TBVJU	75.0/63.0	15,729	10,600	42.8	11,953
IU-A104	FXZQ05TBVJU	75.0/63.0	5,004	1,900	42.8	4,265
IU-A105	FXZQ05TBVJU	75.0/63.0	5,004	1,200	42.8	4,265
IU-A120	FXFQ24TVJU	75.0/63.0	20,642	13,000	42.8	16,860
IU-A119	FXFQ24TVJU	75.0/63.0	20,642	13,000	42.8	16,860
IU-A117	FXSQ24TBVJU	75.0/63.0	21,051	14,000	42.8	15,210
IU-A122	FXSQ30TBVJU	75.0/63.0	26,476	19,500	42.8	20,009
IU-A203	FXSQ36TBVJU	75.0/63.0	31,685	20,000	42.8	22,736

Name	FCU	Heating		
		Tmp H	Max HC	Air Flow Rate
		°F	BTU/h	cfm
IU-A101	FXZQ05TBVJU	70.0	6,483	300
IU-A109	FXSQ30TBVJU	70.0	34,000	812
IU-A202	FXSQ48TBVJU	70.0	54,000	1,307
IU-A201a	FXMQ72MVJU	70.0	80,997	2,048
IU-B201b	FXSQ48TBVJU	70.0	54,000	1,307
IU-A102	FXSQ18TBVJU	70.0	20,000	600
IU-A104	FXZQ05TBVJU	70.0	6,483	300
IU-A105	FXZQ05TBVJU	70.0	6,483	300
IU-A120	FXFQ24TVJU	70.0	26,989	777
IU-A119	FXFQ24TVJU	70.0	26,989	777
IU-A117	FXSQ24TBVJU	70.0	27,000	742
IU-A122	FXSQ30TBVJU	70.0	34,000	812
IU-A203	FXSQ36TBVJU	70.0	40,000	1,130

Name	FCU	Room	Sound	PS	MCA	MOP	WxHxD	Weight
			dBA		A		inch	lbs
IU-A101	FXZQ05TBVJU		30 - 32	208-230V 1ph	0.3	15A	22.6 x 10.2 x 22.6	35.3
IU-A109	FXSQ30TBVJU		30 - 38	208-230V 1ph	1.8	15A	39.4 x 9.6 x 31.5	82.0
IU-A202	FXSQ48TBVJU		35 - 42	208-230V 1ph	2.8	15A	55.1 x 9.6 x 31.5	104.0
IU-A201a	FXMQ72MVJU		45 - 48	208-230V 1ph	9.0	15A	54.3 x 18.1 x 43.3	302.0
IU-B201b	FXSQ48TBVJU		35 - 42	208-230V 1ph	2.8	15A	55.1 x 9.6 x 31.5	104.0
IU-A102	FXSQ18TBVJU		29 - 34	208-230V 1ph	1.6	15A	39.4 x 9.6 x 31.5	77.0
IU-A104	FXZQ05TBVJU		30 - 32	208-230V 1ph	0.3	15A	22.6 x 10.2 x 22.6	35.3
IU-A105	FXZQ05TBVJU		30 - 32	208-230V 1ph	0.3	15A	22.6 x 10.2 x 22.6	35.3
IU-A120	FXFQ24TVJU		28 - 36	208-230V 1ph	0.7	15 A	33.1 x 9.7 x 33.1	50.7
IU-A119	FXFQ24TVJU		28 - 36	208-230V 1ph	0.7	15 A	33.1 x 9.7 x 33.1	50.7
IU-A117	FXSQ24TBVJU		29 - 36	208-230V 1ph	1.8	15A	39.4 x 9.6 x 31.5	82.0
IU-A122	FXSQ30TBVJU		30 - 38	208-230V 1ph	1.8	15A	39.4 x 9.6 x 31.5	82.0
IU-A203	FXSQ36TBVJU		32 - 39	208-230V 1ph	2.5	15A	55.1 x 9.6 x 31.5	101.0

Remarks

Reduced operational load

The sum of the required indoor unit capacities is 280,883BTU/h for cooling. However, the outdoor unit selection uses reduced load values for cooling of 140,441BTU/h (=50%). Be aware that unrealistic reductions may lead to reduced comfort levels, different noise levels or increased wear and tear.

Outdoor vs. indoor position

Outdoor unit placed at the same level as the indoor units.

Outdoor unit details

Table of abbreviations

Abbreviation	Description
Name	Logical name of the device
Model	Device model name
CR	Connection ratio
Tmp C	Outdoor conditions in cooling
WFR per module	Water flow per outdoor unit module
CC	Available cooling capacity
Rq CC	Required cooling capacity
PIC	Power input in cooling mode
InC	Water inlet temperature in cooling mode
OutC	Water outlet temperature in cooling mode
Tmp H	Outdoor conditions in heating (dry bulb temp. / RH)
HC	Available heating capacity (integrated heating capacity)
Rq HC	Required heating capacity
PIH	Power input in heating mode
InH	Water inlet temperature in heating mode
OutH	Water outlet temperature in heating mode
Piping	Largest distance from indoor unit to outdoor unit
Bse Refr	Standard factory refrigerant charge (16.4ft actual piping length) excluding extra refrigerant charge. For calculation of extra refrigerant charge refer to the databook
Ex Refr	Extra refrigerant charge
PS	Power supply (voltage and phases)
MCA	Minimum Circuit Amps
MOP	Maximum Overcurrent Protection
FLA	Fan Motor Input
RLA	Nominal Running Amps
WxHxD	WidthxHeightxDepth
Weight	Weight of the device
EER	EER value at nominal condition
EER2	EER2 value at nominal condition
IEER	IEER value at nominal condition
COP47	COP value at nominal condition and at ambient temperature of 47°F
COP17	COP value at nominal condition and at ambient temperature of 17°F

Outdoor details

Name	Model	CR	Cooling			Heating			Piping
			Tmp C	CC	Rq CC	Tmp H	HC	Rq HC	
		%	°F	BTU/h	BTU/h	°F (DBT/WBT)	BTU/h	BTU/h	ft
HP 1	RXYQ192AAYDA	100.0	105.0	169,867	90,000	0.0/-2.0	120,434	80,000	286.6
OU-2	REYQ312AAYDA	119.0	105.0	261,232	140,441	0.0/-2.0	199,311	0	349.3

Name	Model	PS	MCA	MOP	RLA	FLA	WxHxD	Weight
			A	A	A	A	inch	lbs
HP 1	RXYQ192AAYDA	460V 3ph	28.3	35.0	15.1		68.9 x 65.4 x 30.1	914.9
OU-2	REYQ312AAYDA	460V 3ph						
A	- REYQ168AAYDA		24.9	30.0	14.8		48.8 x 65.4 x 30.1	802.5
B	- REYQ144AAYDA		21.3	25.0	11.7		48.8 x 65.4 x 30.1	800.3
BS-A1	BSF8Q54TVJ	208-230V 1ph	0.8	15.0			23.3 x 9.5 x 23.7	81.6
SBS-A1	BSF6Q54TVJ	208-230V 1ph	0.6	15.0			23.3 x 9.5 x 23.7	72.8
SBS-A2	BSF4Q54TVJ	208-230V 1ph	0.4	15.0			13.7 x 9.5 x 23.7	48.5

Name	Efficiency Metrics - Ducted									
	EER	EER2	IEER	COP47	COP17	SCHE	SEER	SEER2	HSPF	HSPF2
HP 1	11.6		21.2	3.4	2.1					
OU-2	10.8		19.2	3.25	2.1	20.8				

Name	Efficiency Metrics - Non Ducted									
	EER	EER2	IEER	COP47	COP17	SCHE	SEER	SEER2	HSPF	HSPF2
HP 1	11.6		23.6	3.7	2.2					
OU-2	11.3		22.8	3.6	2.35	24.4				

Sound Data

Name	Model	Sound Power		Sound Pressure	
		Cooling	Heating	Cooling	Heating
		dBA	dBA	dBA	dBA
HP 1	RXYQ192AAYDA	-	-	67	-
OU-2	REYQ312AAYDA	-	-	69	-

Refrigerant information

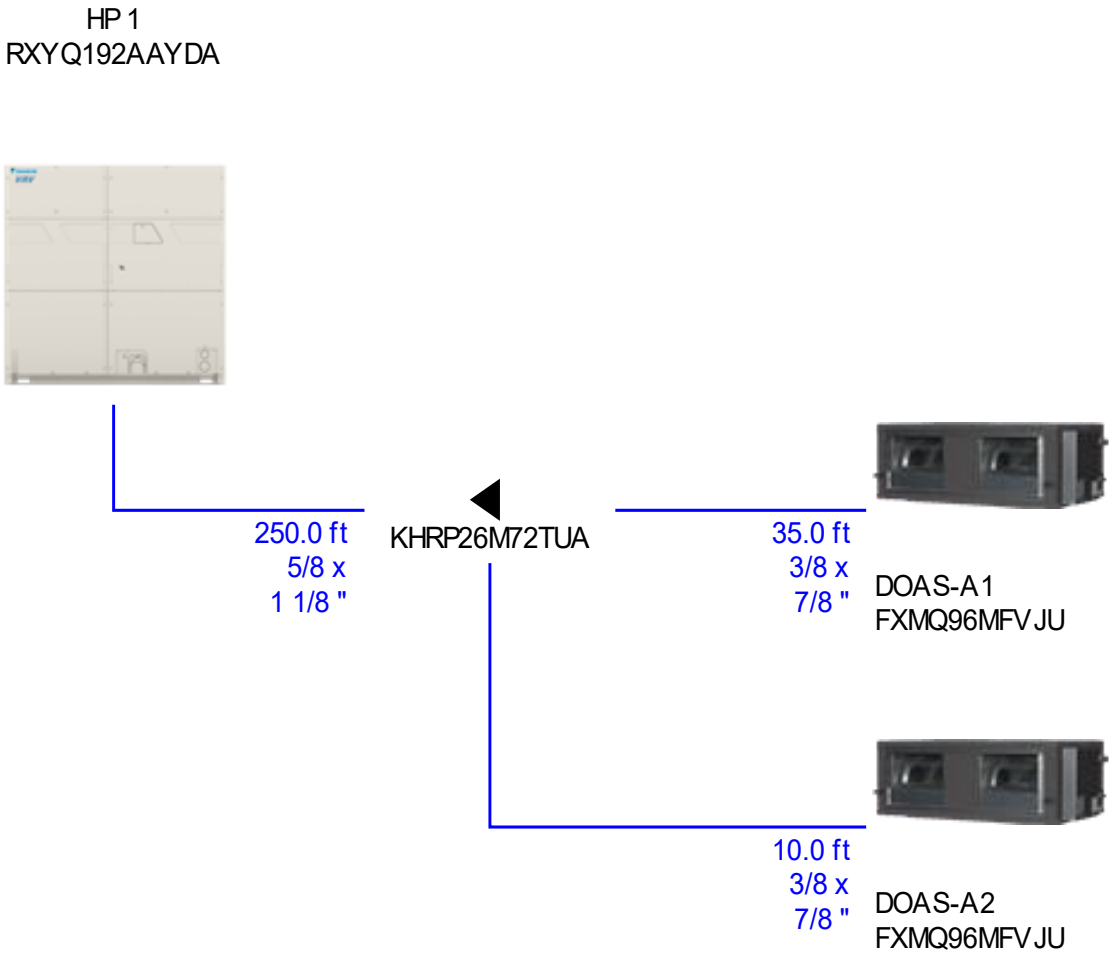
Name	Model	Refrigerant type	GWP	Base charge lbs	Extra charge lbs	Total refrigerant charge lbs	Total CO2 equivalent tonnes
HP 1	RXYQ192AAYDA	R410A	2087.5	25.79	50.54	76.34	72.28
OU-2	REYQ312AAYDA	R410A	2087.5	51.59	125.88	177.47	168.04

The system(s) contain fluorinated greenhouse gases.

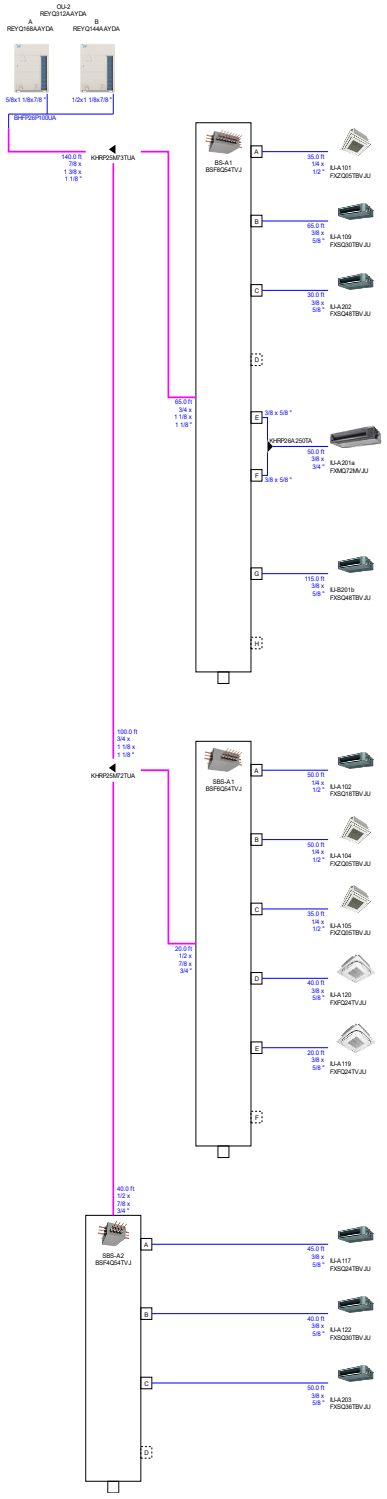
The extra charge is calculated based on the pipe lengths specified. This may differ from the actual pipe lengths on site and therefore also from the real extra charge and the real TCO2 equivalent.

Piping diagrams

Piping HP 1

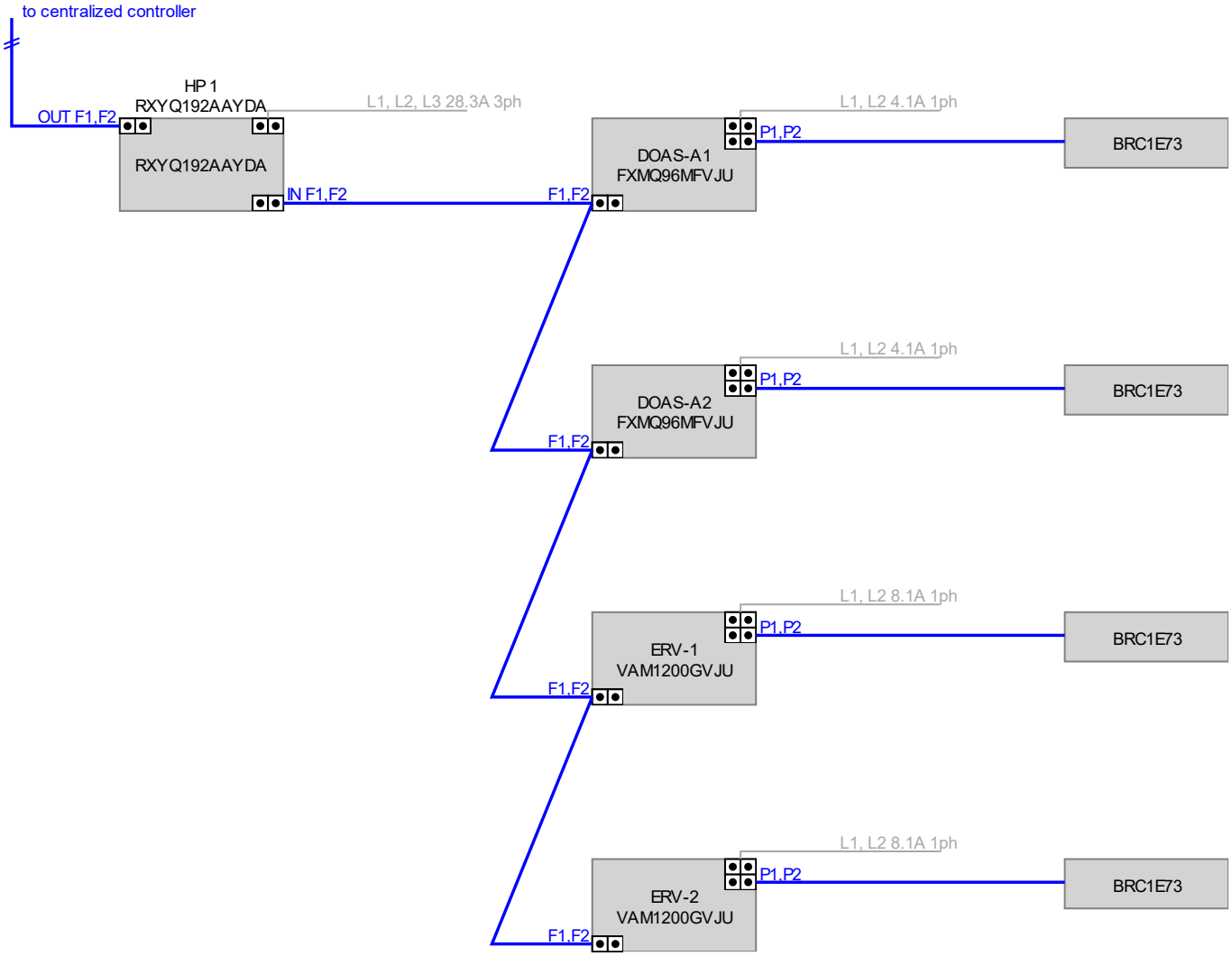


Piping OU-2



Wiring diagrams

Wiring HP 1



Remarks

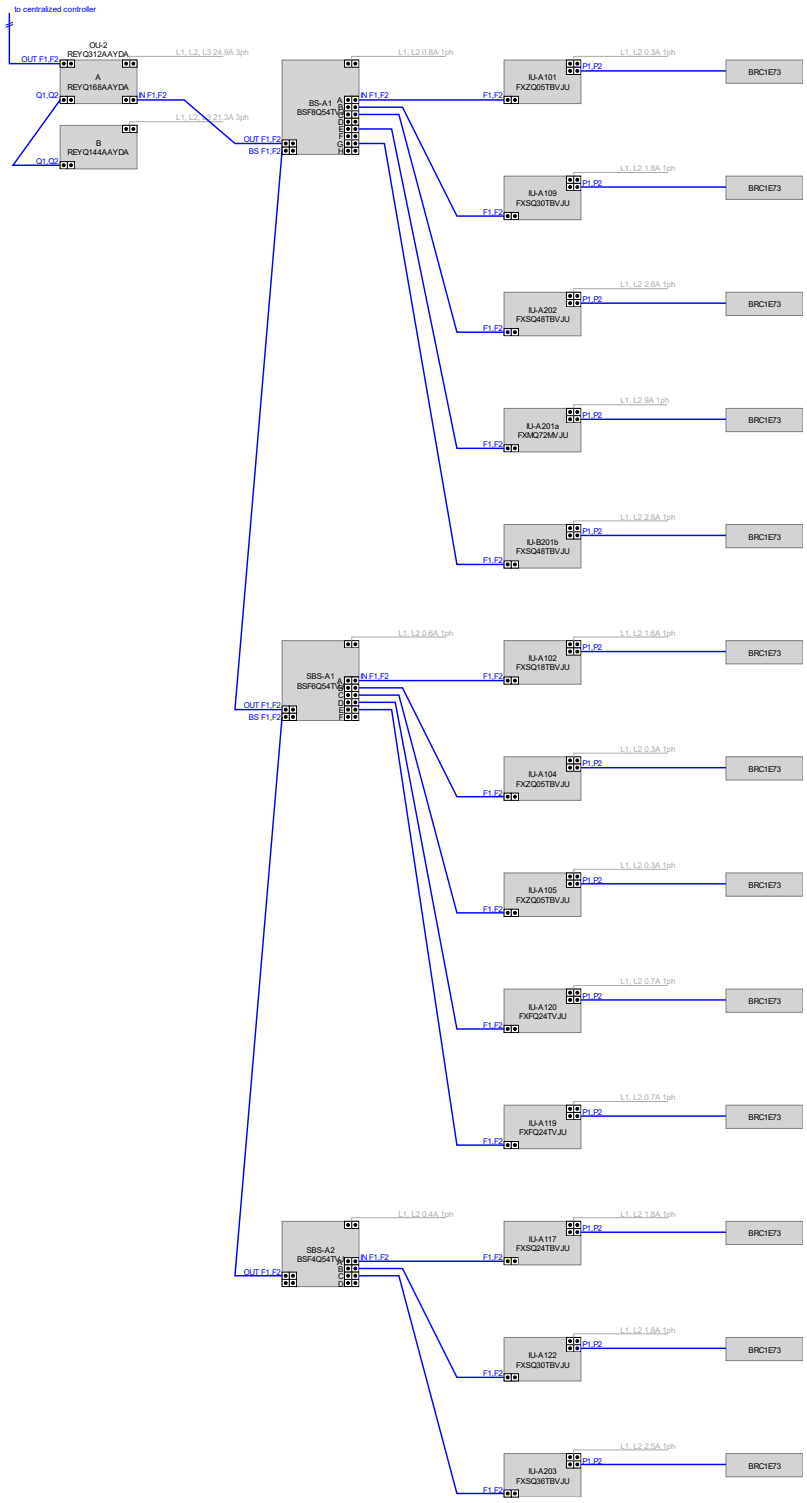
The room temperature cannot be controlled by an outdoor air processing unit.

P1P2 = AWG 18-2 is required - however always refer to local code for further information.

F1F2 IN/OUT = AWG 18-2 is required - however always refer to local code for further information

Note:

Wiring OU-2



Remarks

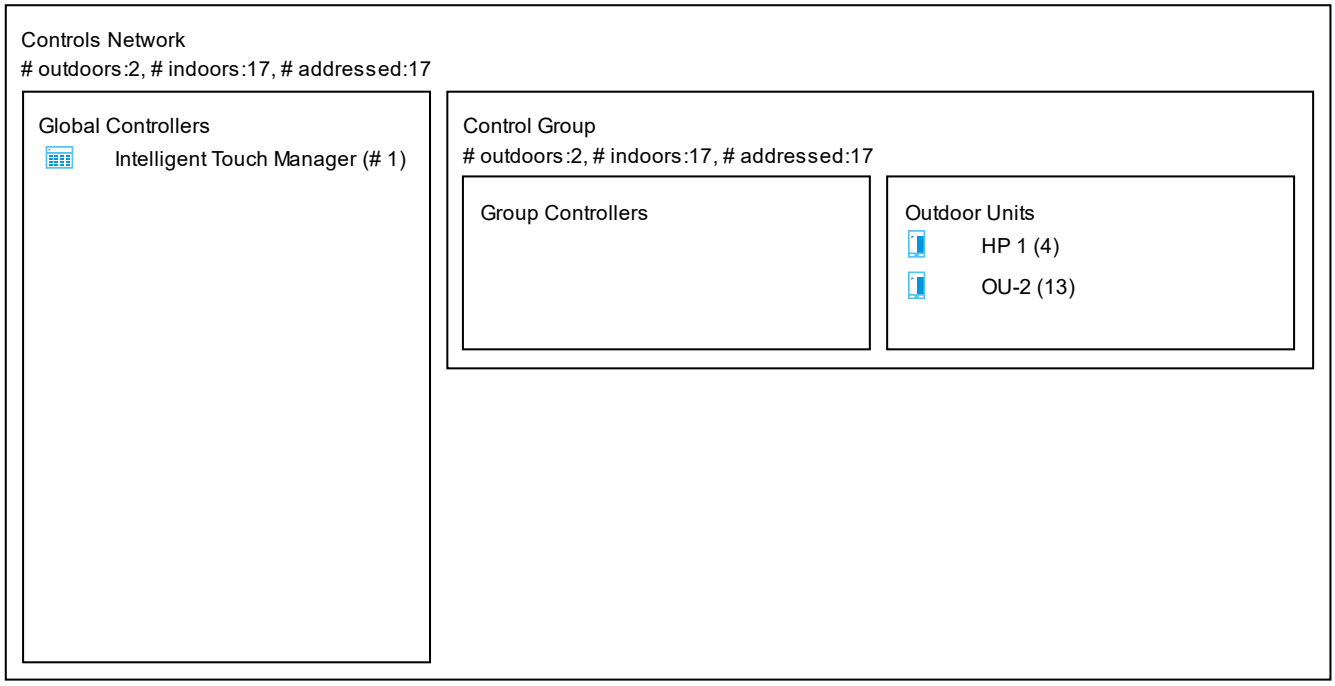
P1P2 = AWG 18-2 is required - however always refer to local code for further information.

F1F2 IN/OUT = AWG 18-2 is required - however always refer to local code for further information

Note:

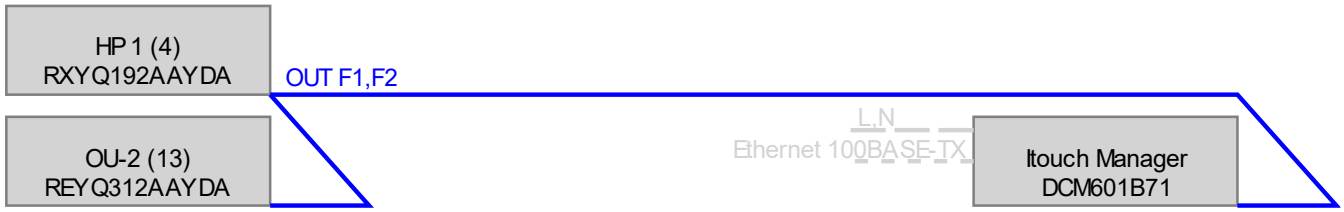
Centralized controllers

Concept



Controller wiring diagrams

Control Group



MAKING FUME EXTRACTION EASY

The Lincoln Electric Company
22221 Saint Clair Ave.
Cleveland, OH 44117
+1 216-383-2667
WWW.LINCOLNELECTRIC.COM

December 13, 2023

Lincoln Electric Proposal #: 32312131

Metropolitan Community College

SUBJECT: Weld Fume Control Systems

Lincoln Electric is pleased to submit this proposal for weld fume control systems. We look forward to working with you to create the optimal welding environment for you and your facility.

We hope that our proposal and the enclosed literature will answer any questions or concerns you may have. If you have any further questions after reviewing this information, please do not hesitate to contact us.

We look forward to assisting you on this project in any way we can.

Sincerely,

Brian Vincent Sullivan | **Environmental Systems Engineer**
The Lincoln Electric Company
St. Louis, Missouri
C: 216.650.3572 | E: bvsullivan@lincolnelectric.com

Need to include automatic controls on the extraction arms to turn on the system when someone strikes a spark

CONFIDENTIAL: DO NOT DISTRIBUTE

REVISION LOG

Quote No.	Description	Date
0	Initial Release	12/13/2023

Project Summary: Weld Fume Control Systems

Prism 8 20HP Top Mount Fan System (Qty. 1):
THE LINCOLN ELECTRIC PRISM SYSTEM CONSISTS OF FILTER CABINETS EACH HOUSING FILTERS AND CLEANING CONTROLS IN AN EASY-TO-ASSEMBLY PACKAGE READY TO ACCEPT THE TOP-MOUNT FAN. FILTERS ARE ORIENTED IN THE VERITCAL POSITION, ENHANCING THE EFFECTIVENESS OF THE UNIFORM, HIGH-ENERGY PULSES OF COMPRESSED AIR RELEASED DURING THE FILTER CLEANING CYCLE.

APPLICATIONS INCLUDE EXTRACTING AND FILTERING FUME AND PARTICULATE GENERATED BY ARC WELDING, PLASMA CUTTING, ARC GOUGING, AND GRINDING. (NOT SUITABLE WHEN GRINDING ALUMINUM, MAGNESIUM OR OTHER MATERIALS WHICH MAY PRODUCT EXPLOSIVE DUST.)

K1655-14 Prism Wall Mount Extraction Arms (Qty. 10)
DESIGNED WITH THE WELDER IN MIND, LINCOLN ELECTRIC EXTRACTION ARMS ARE LIGHT WEIGHT, DENT AND SCRATCH RESISTANT. PRISM EXTRACTION ARMS ARE RECOMMENDED TO HAVE 650-750CFM PER ARM.

5ft x 5ft Weld Booths (Qty. 10 Weld Booths):
INCLUDES BOOTHS WITH PARTITIONS, CURTAINS, TABLES AND HARDWARE. FINISHED INTERIOR BOOTH SIZE WILL BE 5FT X 5FT X 7.5FT (WXDXH). QUOTE BASED ON LAYOUT PROVIDED WITH ONE ROW OF SIX AND ONE ROW OF FOUR WELD BOOTHS. WALLS WILL BE PAINTED BLACK. END PANELS WILL BE PAINTED BLACK WITH A LINCOLN ELECTRIC LOGO. ALL PANELS/POSTS ARE MADE FROM STEEL WITH 2" X 2" SUPPORTS.

Project Management and Documentation
LINCOLN ELECTRIC WILL ESTABLISH A PROJECT MANAGER AT THE BEGINNING OF THE PROJECT. THE PROJECT MANAGER WILL WORK WITH THE CUSTOMER'S PROJECT MANAGER AND BE RESPONSIBLE FOR PROVIIDING THE CUSTOMER WITH A SINGLE POINT OF CONTACT WITHIN LINCOLN ELECTRIC FOR ALL INFORMATION REGARDING THIS PROJECT. THIS PERSON WILL BE RESPONISBLE FOR MAINTAINING PROJECT SCHEDULES WITHIN LINCOLN ELECTRIC AND PROVIDING THE CUSTOMER WITH PROEJCT STATUS UPDATES AND TIMELINES.

System Commission
INCLUDED IS SYSTEM START-UP, COMMISSIONING AND TECHNICIAN SUPPORT TO TEST AND TUNE THE SYSTEM AT INITIAL SYSTEM OPERATION. COMMISSIONING INCLUDES MANUAL DAMPER ADJUSTMENT, AIRFLOW SETPOINT, EXTRACTION SYSTEM OPERATION VERIFICATION AND EXPLANATION OF SYSTEM OPERATION AND MAINTENANCE. POST INSTALLATION COMMISSIONING INCLUDES A POINT-BY-POINT CHECKLIST AND SIGN-OFF PROCEDURE.

Freight Cost
ESTIMATED FREIGHT COST FOR SHIPMENT IN A 53-FOOT VAN(S) (SWING DOOR) FROM CLEVELAND, OH TO END USER FACILITY. ADDITIONAL CHARGE MAY APPLY IF A SPECIAL TRAILER TYPE IS REQUIRED DUE TO THE UNLOADING CAPABILITIES AT THE DESTINATION.

Total Equipment Price: $95,961

Equipment Lead Time: 8-12 weeks from time of order.
NOTE: MECHANICAL/ELECTRICAL INSTALLATION AND DUCT MATERIAL NOT INCLUDED IN PRICE.

Recommended Options (not included in total price above):

AD1321-4 BUDGETARY INSTALLATION $90,000
THIS PRICE IS FOR BUDGETING PURPOSES ONLY. A DESIGN INTENT LAYOUT DRAWING IS REQUIRED FOR ACCCURATE PRICING. THIS CAN BE PROVIDED UPON REQUEST OF THE CUSTOMER WITH A LAYOUT OF THE AREA AND/OR FACILITY.

SST20.G Spark Trap 20" with Drop-Out $7,330
THE SPARK GUARDIAN IS PART OF THE LINCOLN ELECTRIC GUARDIAN FIRE SAFETY SOLUTIONS FOR FUME CONTROL SYSTEMS AND IS RECOMMENDED FOR APPLICATIONS WITH INCREASED FIRE RISK.

XCUSTOM UPGRADE TO ADD THERMAL SUPPRESSION $12,848
THE PRISM THERMAL SUPPRESSION SYSTEM MITIGATES THE RISK OF THERMAL EVENTS CAUSED BY WELDING AND CUTTING PARTICULATE ENTERING THE FUME EXTRACTION UNIT. THIS FULLY INTEGRATED FIRE SUPPRESSION SYSTEM IS UL-LISTED, FM-APPROVED AND A RECOMMENDED OPTION BY LINCOLN ELECTRIC.

K5248-1	**WELD TABLE WITH POST 32 IN. WIDE**	**$696 per table**
K5248-3	**WELD TABLE WITH POST 47 IN. WIDE**	**$772 per table**
L15788-6	**LOCKABLE STORAGE CABINET**	**$1,654 per locker**
L15788-101	**FLOOR-MOUNTED POST (82 IN)**	**$383 per post**
AD1389-20	**BOOTH LED LIGHT KITS, 4 & 5 FT W**	**$644 per kit**

PLEASE REFER TO CUSTOMER PROVIDED DRAWING FOR ADDTIONAL DETAIL ON SCOPE OF WORK AS WELL AS CUSTOMER RESONSIBILITY CHECKLIST PAGE PROVIDED.

Lincoln Electric Weld Fume Control Solutions

Weld fume control products manufactured by The Lincoln Electric Company are designed to be utilized as an engineering safety control to aide in achieving adequate ventilation while conducting welding or its allied processes. The operation of welding fume control equipment is affected by various factors including proper use and positioning of the equipment, and the specific welding procedure and application involved. When the equipment is used as designed - and when properly installed, operated and maintained - it can be a valuable and effective tool to help employers maintain adequate ventilation in the workplace. Lincoln Electric defines adequate ventilation as that which is required to maintain occupational exposure levels below the applicable exposure limits when sound work practices are utilized. Worker exposure levels should be checked upon installation and periodically thereafter to be certain it is within applicable OSHA PEL and ACGIH TLV limits.

Delivery

Estimated shipping date is 8-12 weeks. Actual shipping timeline may vary, and is to be determined based on production schedule at the time an order is received, accepted and confirmed. The confirmed ship date may qualify for expedited delivery based on equipment and production availability. Any partial or expedited delivery before confirmed shipment date will result in an additional fee.
Delivery date to be confirmed upon receipt of purchase order.

Terms and Conditions

This quote is valid for 60 days, and is governed by Seller's Terms and Conditions of Sale located at https://www.lincolnelectric.com/en/Terms-and-Conditions. Any reference to Buyer's request for quote incorporates only the technical information described therein. ALL TERMS AND CONDITIONS IN BUYER'S REQUEST FOR PROPOSAL/QUOTE ARE DEEMED MATERIAL ALTERATIONS AND ARE HEREBY EXPRESSLY REJECTED.

All prices are F.O.B. Cleveland, Ohio. Shipping and handling will be prepaid and allowed by Lincoln Electric, provided shipment is arranged through Lincoln Electric's preferred carrier and shipment occurs within the 48 contiguous states of the United States. For all other shipments, contact Lincoln Electric. Special shipping and/or handling requirements due to unloading capabilities of the destination may result in an additional fee.

The terms of payment are Net 30 days after shipment with pre-approved credit in place, no cash discounts allowed. The Lincoln Electric Company may change this method of payment in its sole discretion.

Prices do NOT include, unless explicitly stated:

1. Assembly, electrical or mechanical installation
2. Electrical wiring
3. State and local taxes
4. Ducting
5. Air-compressor (for systems with filtration) and related accessories

Warranty

All Lincoln Electric central weld fume systems are warrantied for 3 years.
For details, please see Lincoln Electric "Industrial Limited Warranty" at https://www.lincolnelectric.com/en/Legal-Information/Warranty-Statements.

Order Cancellation Charges

If an order is cancelled after work has been started on the order, cancellation charges will be assessed based on the percent completion of the order.

Engineering Change Orders

Changes to the technical specifications, design, or delivery requested by the customer may modify the price, technical description, and delivery of the equipment quoted. The customer is to notify Lincoln Electric in writing of any change requests, provide new drawings indicating the changes, and a written description of the changes. Lincoln Electric will then estimate the costs for changes, including the cost plus reasonable markup for any work provided by Lincoln Electric, and also any purchase parts that will no longer be used due to the changes. The customer must authorize or reject the changes in cost within ten days of Lincoln Electric sending them confirmation of the changes.

Central Filter/Fan Location

The central filter bank and fan must be installed on a flat and level surface that is able to support the weight of these system components and their accessory items. Recommended surface material is concrete; asphalt is not a suitable surface.
A climate controlled shelter may be recommended if area temperatures fluctuate between hot and cold and/or high levels of humidity exist.

Ducting Specifications

The fume extraction system will need a duct system based on the facility layout and positioning of the central fan, filter bank (if included) and extraction devices (arms, hoods, downdraft tables). The duct system is not included in the total system price unless previously identified in the quotation. Lincoln Electric can aid in duct system design and provide an estimate for material and installation costs of which is the final responsibility of the customer.
The recommended duct design utilizes round, galvanized steel spiral pipe. The ductwork should be gauged and installed per the "Round Industrial Duct Construction Standards - Third Edition" published by the Sheet Metal and Air Conditioning Contractors' National Association (SMACNA). Gauge information is shown in Table 11.3.2, "Minimum Required Gage for Class 1 Carbon and Coated Steel Spiral Pipe". If applicable, removable caps are recommended at all terminal ends, and the last branch connection should not be more than six inches from the capped end.
An acceptable alternative to round spiral duct is clamp-together ducting.

Non-Filtration Systems

Non-filtration systems are welding fume extraction systems that draw the welding fume into the system and exhaust it to the outdoors without filtering the particulate. A fan exhaust shutter must be installed on the exhaust port of the central fan to prevent backflow or reverse air flow back into the facility when the fan is not running. Please review section Welding Fume

Exhaust to the Outdoors and USEPA Regulations for additional information regarding exhausting of welding particulate into the outside environment.

Suspended Ambient Systems

Installation of ambient systems intended to be hung from roof structures or wall mounted must have a building structure adequate to support the live weight of the equipment.
Installation of these units (including but not limited to the building structure, brackets, hardware and any other structural supports) shall be approved by a structural engineer licensed in the governing jurisdiction. Should the customer decline the Lincoln Electric optional quoted structural analysis, it is the customer's responsibility to obtain approval which meets the codes of the local jurisdiction.

Pre- and Post- Installation

A pre-installation procedure is provided by Lincoln Electric which includes an overview of the system configuration and components with mechanical and electrical contractor(s). Pre-installation shall occur through teleconference.
A post installation inspection is provided by Lincoln Electric which includes system start-up, fume extraction system adjustments, airflow balancing for optimal performance and training of operation and routine service and maintenance. Routine service and maintenance of the fume extraction system is recommended and not included in the quoted price.

Pre- and Post- Industrial Hygiene Air Monitoring

The purpose of pre- and post-installation industrial hygiene air monitoring is to document and confirm that the ventilation system is sufficient for its intended use from both an equipment and work practice perspective. OSHA defines adequate ventilation as that which is required to maintain occupational exposure levels below the applicable Permissible Exposure Limits.
Lincoln does not provide pre- and post-installation industrial hygiene air monitoring services. Contact a certified Industrial Hygienist to conduct air monitoring.

Welding Fume Exhaust to the Outdoors and US EPA Regulations

The United States Environmental Protection Agency through state and local authorities sets limits on a facility's aggregate emissions of regulated chemicals (i.e. metals). The addition of a new stationary exhaust source such as a central welding fume extraction system with an outside exhaust may trigger the requirement for an air permit. If it does, then you will need a permit to install prior to getting a permit to operate.
If you do not know if you need an air permit to install a ventilation system with an outside exhaust, then you should contact your air permitting authority and determine what your requirements are. Failure to comply with air authority requirements in your region can result in significant fines. For more information, see http://www.epa.gov/nsr

Recirculation of Filtered Welding Fume

It is not the responsibility of Lincoln Electric to research, test and comply with local codes and regulations if filtered air is recirculated (exhausted inside the facility) or unfiltered air is exhausted outside of the facility. If exhausted outside the facility, Lincoln Electric is not responsible for any type of damage or environmental compliance caused by any exhausted particulates and/or substances within the exhausted air.

It is strongly recommended that an indoor/outdoor exhaust duct valve (aka summer/winter switch) be installed if the intention is to recirculate filtered air inside the facility. The duct valve will allow filtered air to be either diverted back into the facility or sent to the outdoors. If recirculation is used, it is recommended to apply a fresh air exchange rate of 30% (minimum).

Service and Maintenance

Routine service and maintenance of the fume extraction system is required. Lincoln Electric does provide service and maintenance contracts, but it is not included in the fume extraction system quoted price. A contract can be supplied on request.

To sustain an optimal system performance level, routine service and maintenance of the fume extraction system is required. Based on the level of annual consumable usage, welding process(es), condition of base metal and overall type of usage and air quality extracted through system, it is recommended that the particulate drums be emptied as needed.

Because the particulate matter collected in the filter bank may be hazardous, take necessary precautions so that you and your fellow workers do not breathe dust and particulate. Wear a suitable respirator when disposing of the particulate. Follow local environmental regulations for disposal of filters and particulate matter.
NOTE: Lincoln Electric Environmental Systems are designed specifically for welding fume particulate extraction.

Due to weld fume compositions and resultant build-up over time, it is recommended that the duct and overall system be routinely inspected and cleaned. Periodic inspection and cleaning of the duct will preserve effectiveness and life of weld fume extraction system, and help prevent any potential fire hazards.

NOTE: When using weld fume extraction or Local Exhaust Ventilation (LEV) equipment, sparks from welding, cutting or grinding processes can cause fire within the equipment. To minimize potential fire, operation, service and maintenance guidelines for fume extraction or LEV equipment should be followed.
Improper maintenance of filter unit such as operating with fully saturated main filter over extended period of time may reduce equipment life, filter efficiency, and increase chance of overheating blower motor(s) and potential fire hazard.

The filter media is designed for dry air filtration. If the air and fume extracted contains any type of oils, anti-spatter, tip-dip and/or moisture, this can affect filter and system performance and life expectancy. It is recommended that routine system maintenance be performed at one month intervals for robotic welding applications and three month intervals for semi-automatic manual welding applications. For robotic welding application(s) with hood canopy fume extraction system(s) design, this includes monthly inspection and cleaning of inner hood canopy, deflector plate and hood outlet, extraction duct, pre-separator, filter, fan housing, fan blade condition and filter surface condition, recirculation duct and/or exhaust stack (if applicable). For semi-automatic welding application(s) with multiple arm fume extraction system(s), this includes inspection and cleaning every three months of extraction arm(s), extraction duct, pre-separator, filter, fan housing, fan blade condition, filter surface condition, recirculation duct and/or exhaust stack (if applicable). Based on the cleanliness or condition of the system components (i.e. hood, arm, duct, filter, fan), the maintenance schedule may have to be adjusted for shorter or longer intervals.

NOTE: If routine service and maintenance are not performed, applications and processes with oils, anti-spatter, tip-dip and/or moisture may cause damage to system equipment and may void the equipment and filter warranty. If the environmental system is not properly and routinely maintained, the airflow (CFM) level may also be affected.
Proper personal protection equipment (PPE) (i.e. respirators, eyewear, clothing and gloves) should be used when servicing and maintaining the system, along with disposal of filter (s). Proper disposal of filter (s) should adhere to federal, state and/or local guidelines and regulations.

Users and employers have the sole responsibility for and control over workplace conditions, including the manner in which work is performed and the safety measures taken. Always read and follow applicable OSHA regulations as well as all information on product labeling and safety data sheets (SDS available at http://www.lincolnelectric.com/msds) when using Lincoln Electric products. Further information regarding their safe use may be found here: http://www.lincolnelectric.com/safety.

The operation of welding fume control equipment is affected by various factors including proper use and positioning of such equipment, maintenance of the equipment and the specific welding procedure and application involved. Users and employers should have an industrial hygienist check worker exposure levels to be certain that they are within applicable OSHA PEL and ACGIH TLV limits.

Customer Assistance Policy

The business of the Company is manufacturing and selling high quality welding equipment, consumables, and cutting equipment. Our challenge is to meet the needs of our customers and to exceed their expectations. On occasion, purchasers may ask the Company for information or advice about their use of our products. Our employees respond to inquiries to the best of their ability based on information provided to them by the customers and the knowledge they may have concerning the application. Our employees, however, are not in a position to verify the information provided or to evaluate the engineering requirements for the particular weldment. Accordingly, the Company does not warrant or guarantee or assume any liability with respect to such information or advice. Moreover, the provision of such information or advice does not create, expand, or alter any warranty on our products. Any express or implied warranty that might arise from the information or advice, including any implied warranty of merchantability or any warranty of fitness for any customers# particular purpose is specifically disclaimed.

The Company is a responsive manufacturer, but the selection and use of specific products sold by the Company is solely within the control of, and remains the sole responsibility of the customer. Many variables beyond the control of the Company affect the results obtained in applying these types of fabrication methods and service requirements.

Subject to Change - This information is accurate to the best of our knowledge on the date provided. Please refer to http://www.lincolnelectric.com/assistpolicy for any updated information.

Prism 8 (20 HP) Specifications

The Lincoln Electric Prism® 8 consists of a filtration unit and filter cleaning controls in an easy-to-assemble package. Top-mount fan, exhaust silencer, fan control and filters are specified separately.

Applications include extracting and filtering fume and particulate generated by arc welding, plasma cutting, arc gouging, and grinding*.

Filters are oriented in the vertical position, enhancing the effectiveness of the uniform, high-energy pulses of compressed air** released during the filter cleaning cycle.

Wheels on the dustbins make system maintenance easier.

A wide variety of filter types are available.

* Not suitable when grinding aluminum, magnesium or other materials which may produce explosive dust.

** Customer supplied. Must be clean, dry and oil-free.

TECHNICAL SPECIFICATIONS		
Product Number		L17587-1 (shown above with fan and silencer in position)
Number of Filters (supplied separately)		8
Number of Inlets (dia.) / Position		1 (20 in.) | Back
Number of Dustbins (30 gal. each)		2
Filter Cleaning Control	Type	Pressure-based
	FL Current	1.6 amps @ 115/1/60
Exhaust Fan (S31229-53)	Position	Top-Mounted
	Motor Characteristics	20 HP | 3600 rpm | 256T | TEFC
	FL Current	50 – 45.2/22.6 amps @ 208-230/460/3/60
Airflow @ Static Pressure		8800 CFM @ 7 in. WG | 7400 CFM @ 12 in. WG
Sound Level with Silencer*		75 dBA at 5 ft. at Position B (side of silencer) under “free field” conditions
Assembled Weight (approx.) w/o Filters		2910 lb. (993 kg)
Dimensions		See page 2
Clearance Requirements		3.5 ft. (min.) in front to change filters / 3 ft. (min.) on side for control panel access

* *This value represents noise generated by the moving air and does not take into consideration other factors which may contribute to the overall sound level. For example; noise from the motor, casing, duct and other equipment.*

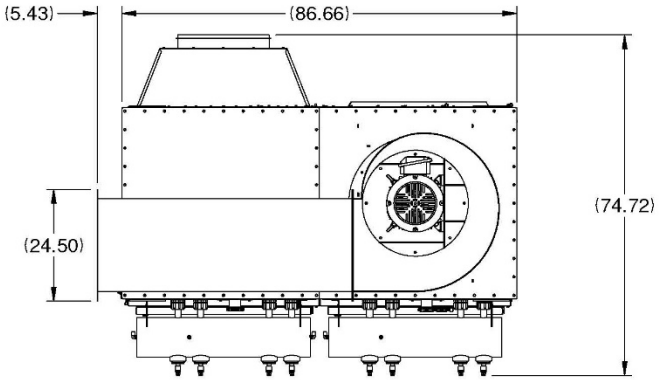
Subject to Change – This information is accurate to the best of our knowledge at the time of printing.

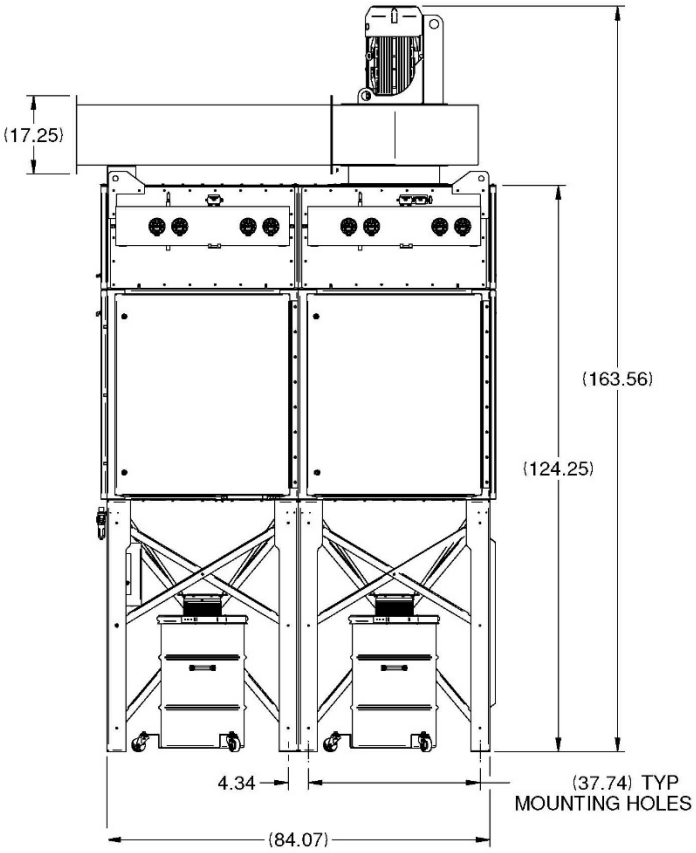
The operation of welding fume control equipment is affected by various factors including proper use and positioning of the equipment, maintenance of the equipment and the specific welding procedure and application involved. Worker exposure level should be checked upon installation and periodically thereafter to be certain it is within applicable OSHA PEL and ACGIH TLV limits.

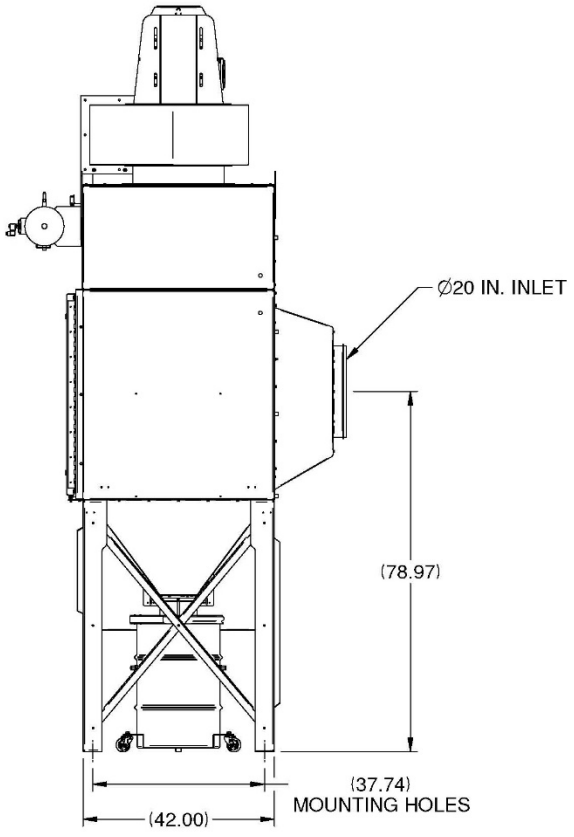
Last Updated: November 14, 2022

L17587-1 (20 HP)

Dimensions







Control Panel HMI/PLC

The control panel has an easy-to-use HMI screen for system configuration, operation, monitoring and preventive maintenance. It includes a built-in timer feature to schedule system operation.

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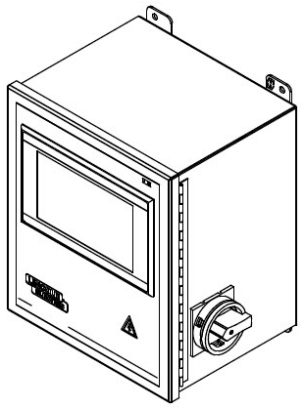


TECHNICAL SPECIFICATIONS	
Product Number	L18378
Input Power	115V or 230V/1-Phase/50/60Hz
Maximum Input Current	4 amps
Output Voltage	24V DC
Dimensions (H x W x D)	13.50 in. x 12.04 in. x 8.49 in. (343 mm x 306 mm x 216 mm)
Approx. Net Weight	20.2 lbs. (9.2 kg)

Subject to Change – This information is accurate to the best of our knowledge at the time of printing.

Last Updated: May 11, 2023

Variable Frequency Drive Specifications – 20 HP

The Danfoss FC 101 VLT® HVAC Basic Drive is optimized for efficient, basic control of fans and pumps in variable speed operation applications.

Photo courtesy of Danfoss A/S

TECHNICAL SPECIFICATIONS	
Product Number	AD1283-75
Model	Danfoss FC 101
Input Power	380-480V ±10%/3-Phase/50-60Hz
Max. Input Current, Continuous, 440-480V	24.7 amps
Output Rating	20 HP (15 kW)
Output Current, Continuous, 440-480V	27 amps
Frame Size	H4
Enclosure	IP20 / NEMA 1
Ambient Temperature	up to 50 °C
Accessories Included	Decoupling Plate, IP20/NEMA 1 Kit, LCP Panel
Dimensions (H* x W x D)	14.1 in. x 5.3 in. x 9.5 in. (359 mm x 135 mm x 241 mm)
Approx. Net Weight**	17.4 lbs. (7.9 kg)

* Including decoupling plate.
** Without accessories.

Danfoss is a trademark of Danfoss A/S.
Subject to Change – This information is accurate to the best of our knowledge at the time of printing.

Last Updated: October 24, 2017

Filter Specifications

The KP4519-2 filter cartridge is used as the main filter in the Prism® filter bank and Prism Compact. The number of filters required is based on the size of the filter bank.

All filters installed in an individual filter bank should have the same MERV rating and material.

Package includes filter, dust mask, gloves and plastic bag.

TECHNICAL SPECIFICATIONS	
Product Number	KP4519-2
Where Used	Prism Filter Bank, Prism Compact
Filter Characteristics	MERV 16 according to ASHRAE 52.2
Filter Material	Cellulose/Nano
Band Color	White
Type	Cylinder
Diameter (Exterior)	14.4 in. (365 mm)
Top Flange	16.8 x 21 in. (426 x 534 mm)
Overall Height	40 in. (1017 mm)
Filter Surface Area	323 $ft.^2$ (30 m^2)
Net Weight	25 lbs. (11.3 kg)

Subject to Change – This information is accurate to the best of our knowledge at the time of printing.

Last Updated: September 28, 2023

Telescoping Extraction Arm Specifications

The Prism® Wall-Mount Fume Arm CW is a telescopic extraction arm with a rotatable hood. Incorporated into the hood is a throttle valve to control airflow at the hood opening. The rugged dent-resistant plastic construction is both lightweight and durable.

The extraction arm design combines a telescopic tube with a counterweight mechanism, allowing the arm to be extended to an 8.2 ft. (2.5 m) working radius and compressed to 5 ft. (1.5 m). The arm is also spring-balanced, enabling it to be moved from a vertical to a horizontal position in one easy motion.

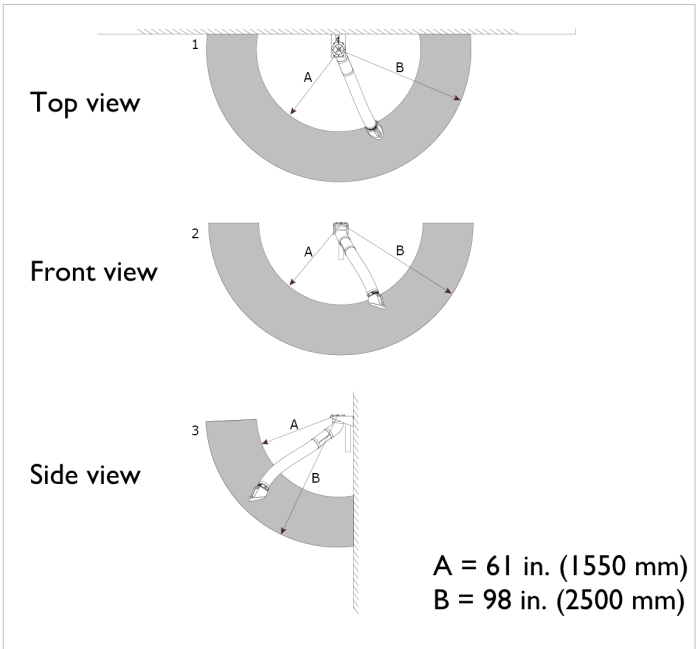
If mounted on a column, the rotating hinge allows the arm to turn through 300°. All movement of the arm is controlled from the hood.

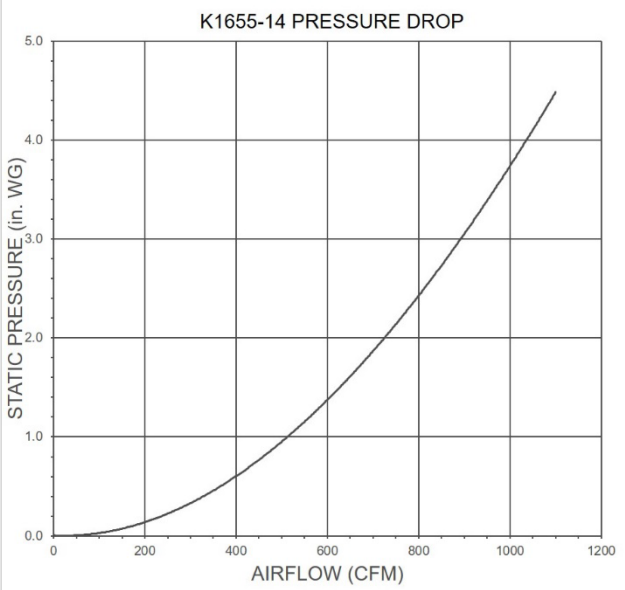
TECHNICAL SPECIFICATIONS	
Product Number	K1655-14
Arm Length	5 ft. – 8.2 ft. (1.5 m – 2.5 m)
Arm Diameter	8 in. (203 mm)
Extraction Capacity Range	350 CFM – 940 CFM (600 m^3/hr – 1600 m^3/hr)
Max./Min. Ambient Operating Temperature	41°F (5°C) / 113°F (45°C)
Maximum Ambient Relative Humidity	80%
Net Weight	59.5 lb. (27 kg)

Subject to Change – This information is accurate to the best of our knowledge at the time of printing.

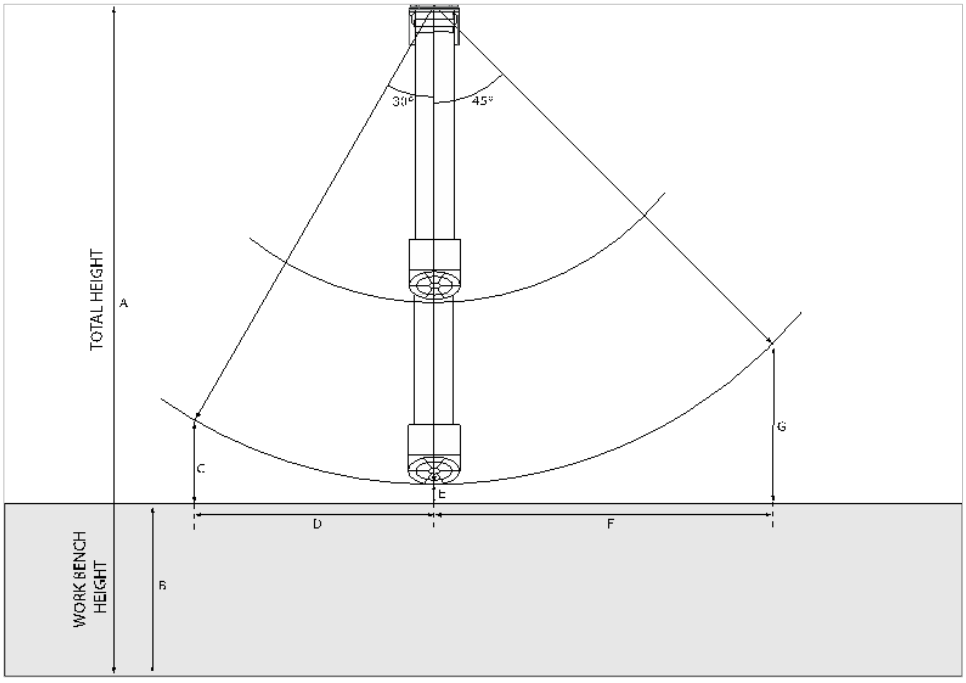
Last Updated: January 4, 2023

Arm Reach and Pressure Curve





Mounting Measurements



DIMENSIONS	
A	138.8 in. (3500 mm)
B	35.4 in. (900 mm)
C	17.7 in. (450 mm)
D	49.2 in. (1250 mm)
E	4.0 in. (100 mm)
F	70.9 in. (1800 mm)
G	31.5 in. (800 mm)

Welding Booth – 5 ft. x 5 ft.

The Lincoln Electric welding booth is ideal for use in production welding applications, vocational centers, and training facilities.

Features:

- Rugged all-steel construction
- 16 gauge sheet metal and 11 gauge angle frame panel construction; 2 in. x 2 in. steel posts
- Adjacent booths share side and back panels
- Powder-coated anti-reflective black finish paint
- Open space of 18 inches at bottom of booth walls for air circulation and safety [Exceeds AWS EG2.0:2006 recommendation of 12 inches]
- Simple installation

Accessories (ordered separately):

- Welding Table
- Welding Curtain
- Lockable Storage Cabinet
- Mounting Bracket for installing an extraction arm to the booth wall when a nearby vertical surface of solid construction is not available. Connection of extraction arm to a low-vacuum weld fume control system is required.

DIMENSIONS – ASSEMBLED BOOTHS		
Inside (W x D x H)	60 in. x 60 in. x 90 in.	
Outside, Single Row (W x D x H)	(62n + 4) in. x 71 in. x 90 in.	See Note 1
Outside, Back-to-Back Rows (W x D x H)	(62n + 4) in. x 133 in. x 90 in.	See Note 1

Notes:
(1) n = number of booths in the row.

Subject to Change – This information is accurate to the best of our knowledge at the time of printing.

Last Updated: December 17, 2020

Booth Curtain Kit – 50 in. W x 66 in. H

The welding curtain helps to protect other students and workers from arc flash and sparks. Comprised of overlapping individual strips, the curtain covers the entire width of the entrance to the Lincoln Electric welding booth.

When installed at the top of the welding booth, the curtain strips hang to approximately 24 inches above the floor.

The assembly includes curtain strips with pre-drilled holes for hanging, mounting bracket, cover angle, wing nuts and washers.

Contents from a different size welding curtain assembly are shown. Quantity of items and length of mounting bracket will vary based on the assembly width.

TECHNICAL SPECIFICATIONS	
Product Number	K5249-1
Size (W x H) – Overall	50 in. x 66 in. (1270 mm x 1676 mm)
Strip Width / Overlap / Thickness	8 in. (203 mm) / 50% / 0.08 in. (2 mm)
Strip Color	Weld Screen Red
Strip UV Resistance	Yes

Subject to Change – This information is accurate to the best of our knowledge at the time of printing.

Last Updated: December 16, 2021

Weld Table (32 in. wide) with Post

The 32-inch wide weld table is ruggedly built, featuring a 1/4-inch thick steel top and formed steel legs. Each leg has a provision for lagging the table to the floor.

The post can be installed on either side of the table. The adjustable 25-inch long bar and gun/torch holder are standard.

This work table is designed to fit beside the lockable storage cabinet when both are positioned against the back wall of the 5 ft. wide welding booth.

TECHNICAL SPECIFICATIONS	
Product Number	K5248-1
Size (W x D)	32 in. x 16 in. (813 mm x 406 mm)
Size (H) – To Table Surface	36.5 in. (927 mm)
Size (H) – To Top of Post	82.75 in. (2102 mm)
Foot Pad / Mounting Hole	1/4 in. (6.35 mm) thick / 0.54 in. (13.7 mm) diameter
Finish	jet black semi-gloss enamel (table surface is paint-free)
Approx. Weight	113 lbs. (51 kg)

Subject to Change – This information is accurate to the best of our knowledge at the time of printing.

Last Updated: November 9, 2022