

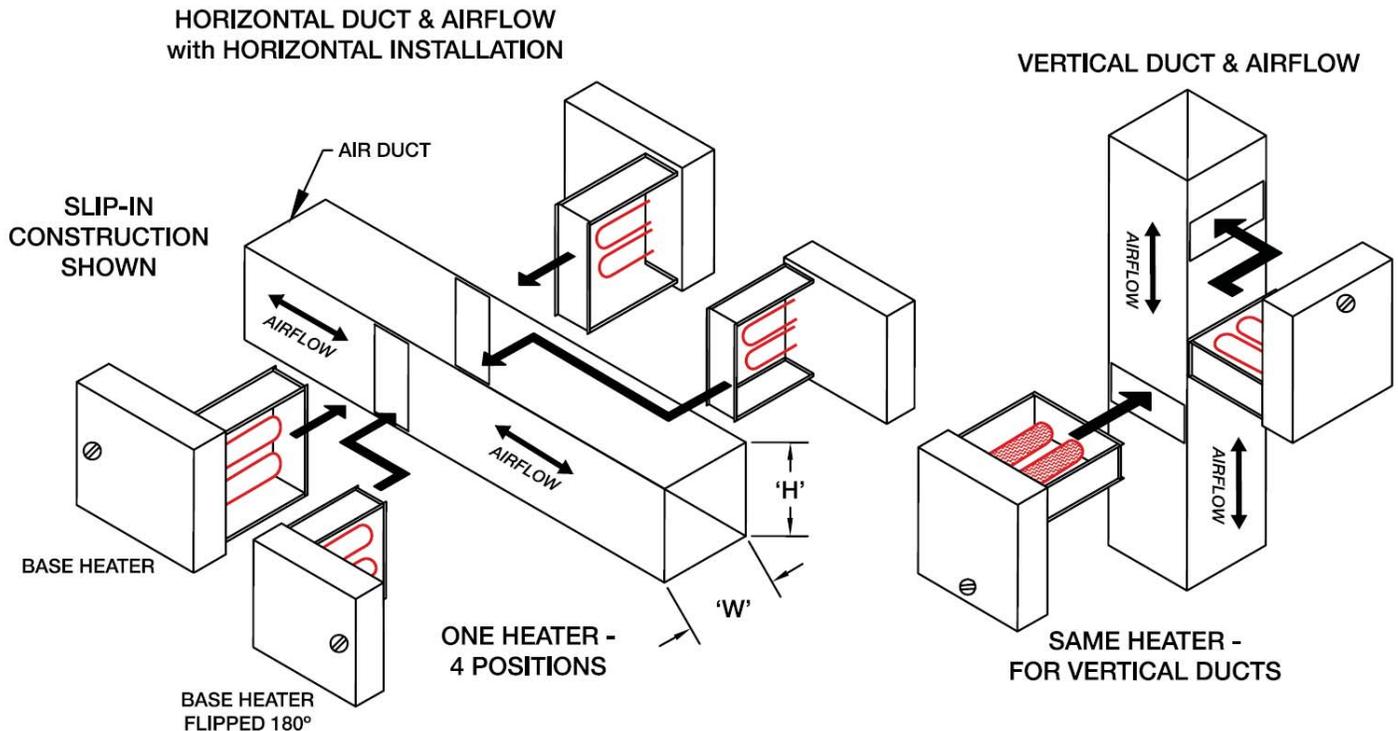
UL Listing

TUTCO electric duct heaters are UL 1996 listed and built in accordance with U.L file no E33341. If the accompanying installation requirements are not met, the UL listing and warranty is voided. In cases where installation requirements are not met, it is the customer’s responsibility to ensure the heater is tested by the appropriate agency and that it functions properly in the application.

Heater Construction and Design

TUTCO electric duct heaters are designed to be flip-able and tested for zero-clearance. Control panel and metal parts utilize heavy-gauge, corrosion-resistant steel; open coil heating elements are made from high nickel chrome alloy resistance wire with heliarc welded corrosion-resistant terminals; elements are supported by steatite insulators mounted in corrosion-resistant steel brackets spaced four inches maximum center-to-center.

TUTCO electric duct heaters will have disc-type automatic reset thermal cutouts for primary protection with primary contactors. Disc-type manual reset thermal cutouts for secondary protection, load carrying for less than 48 amps and pilot duty with secondary contactors for greater than 48 amps.



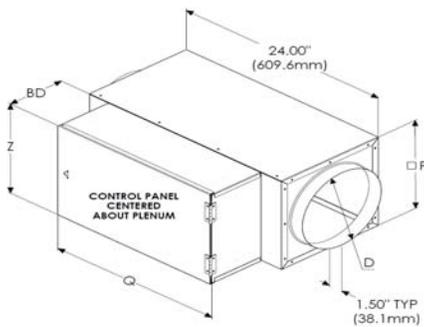
Heater Specifications

Item	Tag	Model	Duct Size	KW	Power	Control	Amps	MOCP	Stg	Mount	Accessories (see legend)
1		E-Series DH	38Wx 13H	23.00	230-3	24VAC	57.7	80	1	Slip-In	*03,04,*06,*08,13,14,16,*17,78

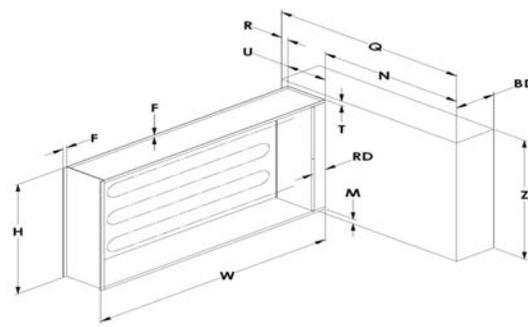
* denotes an item automatically selected per ETL/UL or NEC requirements, please visit <https://www.tutco.com/duct-heaters/accessories> for specific information.

Accessory Code Legend

Code	Name	Description
03	Disconnecting Contactors	Contactors provide full disconnection of all non-neutral voltage legs – Standard on all products
04	SCR Control	0-100% solid state step-less modulation from your 0-10V or 4-20mA signal
06	Manual Backup Limits	Manually-resettable thermal overloads – Standard on all products
08	Power Fusing	Protects each heater circuit from overvoltage/overcurrent, auto-added if heater exceeds 48 amps per NEC
13	Airflow Switch (Non-Adjustable)	Prevents heater from energizing with no airflow. Pressure differential must be 0.05 inH2O regardless of heater min airflow requirements.
14	Control Transformer	Utilized when control voltage differs from line voltage. Allows staged heaters to be controlled with dry contacts
16	Disconnect Switch	Unfused door interlocking switch, required per NEC to be on or in sight of heater
17	Step Controller	Provides electronic sequencing control up to 12 stages - Sometimes auto-added to SCR to save costs of multiple SCRs
78	Thermostat with Remote Duct Sensor	Allows controlled heater operation using temperature inside the Duct (wall hanging thermostat with duct mounted sensor)



Round Duct



E-Series DH and VAV

Heater Dimensions (in inches)

Item	Tag	W*	H*	D	P	Q	Z	BD	RD	F	R	U	N	T	M
1		37.75	12.94	-	-	27.00	14.94	8.00	0.00	0.50	1.00	6.00	20.00	1.00	1.00

* Note that H and W include flange widths and will differ from entered duct dimensions. For Slip-In design heaters, the H and W dimensions are undersized from duct dimensions (H by 1/16" and W by 1/4") to allow for insertion into the ductwork. For Flange-Mount heaters, the H and W dimensions include the flange mounting surfaces (see F dimension) outside of the duct area.

Airflow Requirements

TUTCO Electric Duct Heaters were designed and tested based on inlet air temperatures allowing for lower airflow requirements with colder inlet air.

NOTE: Minimum airflow requirements have nothing to do with required pressure differential needed to activate airflow switches.

Item	Tag	Inlet Air Temp					Inlet Air Temp								
		<=0°F	<=32°F	<=55°F	<=78°F	<=100°F	<=0°F	<=32°F	<=55°F	<=78°F	<=100°F				
		CFM1	CFM2	CFM3	CFM4	CFM5	FPM1	FPM2	FPM3	FPM4	FPM5				
1		427	582	760	1055	1601	124	170	222	308	467				
						To convert to LPS, multiply by 0.472					To convert to MPS, multiply by 0.005				



SUBMITTAL

Project

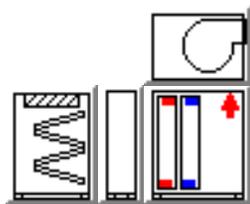
Saint Lukes Ph III Vertical _ ME eng

Date

November 29, 2021

CCS

Job Name Saint Lukes Ph III Vertical _ ME eng
Mark for AHU 1 with less preheat



Unit Parameters

Aero Indoor Air Handler
39MN Size 06W
Insulation: R-13 Double Wall Sealed Panel
Exterior Finish: Galvanized Exterior Panels
Interior Finish: Galvanized Interior Panels
Level I Thermal Break
6 inch tall Base Rail

Filter Mixing Box

Damper: Top Premium Opposed
2In. Angle Filter
2" Pleated MERV 13 Filter
Qty (4) 16in. x 20in.
Door Right Side

Plenum

Length 12 inches

Hot Water Direct Expansion Coils

304 Stainless Steel Drain Pan Right Side
Hot Water 4.13 sq.ft 2 Row 11 FPI Full Circuit
Coil Connection Right Side
1/2 in. Tube Diameter
AL fins Galv. Casing
Non-Ferrous Header
No Coating
Direct Expansion 4.13 sq.ft 6 Row 14 FPI Intertwined 1/2Circuit
Coil Connection Right Side
1/2 in. Tube Diameter
AL fins Galv. Casing
No Coating
TXV(s) Factory Installed
R-410A
Door Left Side

Draw-Thru Supply Fan

Bottom Inlet
Fan Sled
Forward Curve B FCA10_8A

Job Name Saint Lukes Ph III Vertical _ ME eng
Mark for AHU 1 with less preheat

1274 fanRPM Class I
Top Horiz. Front Discharge
Right Side Fan Motor Location
Spring Fan Isolation

Motor

1 HP Premium Efficiency ODP 208-230/460 3Ph 60Hz 1800 RPM
Manufacturer - Generic
Frame Size - 143T
Motor Shaft Diameter (in.) - 0.875
Voltage Selected - 208/3/60
Full Load Amps - 3.1
MCA - 3.9
MOCP - 6
Efficiency - 85.5%

Belt Drive

1.5 Service Factor
Variable Pitch Drive
1 or more belts

Variable Frequency Drive

208 Volts 3 Phase 60Hz
Field Mounted VFD with Integral Circuit Breaker

Door Right Side

Configuration Notes

Preheat coil configurations can cause freezstat to trip if the downstream cooling coil isn't drained in heating season and/or PID valve control loop is too slow to react.

Discharge duct(s) must be gasketed and screwed directly to the discharge panel of the unit.

Careful consideration must be made for mixing outside and return air streams in VAV applications due to reduced velocity in heating mode. Consider the use of a blow-thru plenum fan as a mixing device.

Weights and Dimensions

(LxWxH in ft in) 7' 6" x 3' 10" x 6' 0" **

Operating 1613 LB **

Weights and Dimensions are approximate. Weights include base unit weight, coils (wet & dry), fans and fan motors, and other components, but does not include filters, drives and skids. Approximate dimensions are provided primarily for shipping purposes. Shipping skids are not included.
All filter media efficiency ratings are for the filter media only.

DX Coil Performance Summary

Project: Saint Lukes Ph III Vertical _ ME eng
 Tag: AHU 1 with less preheat

DX Cooling Application's Balance Criteria: Leaving Air DB

Coil Model _____ Split Type _____ Row / FPI / Circ _____ Fin Thickness _____ Fin Type _____ Face Area Type _____ Coil Face Area _____ Face Velocity _____ Fin-Casing Material _____ Tube Diameter _____ Tube spacing: Stf x Str _____ Tube Wall Thickness _____ Actual Airflow _____ Site Altitude _____ Total Cooling Capacity _____ Sensible Cooling Capacity _____ Air Friction _____ Condensing Unit (D) (Circuit B, Upstream Connections) Nozzle Size _____ Note: Nozzles and TXVs Factory Installed Number of TXV's _____ TXV Tonnage _____ Sat. Suction Temp. _____ Sat. Cond. Temp. _____ Tons Per Circuit _____ Condensing Unit (D) (Circuit A, Downstream Connections) Nozzle Size _____ Note: Nozzles and TXVs Factory Installed Number of TXV's _____ TXV Tonnage _____ Sat. Suction Temp. _____ Sat. Cond. Temp. _____ Tons Per Circuit _____ Condensing Ent. Air Temp _____ Refrigerant Type _____ Suction Line Loss _____ Compressor Power _____ Vapor Superheat _____ Liquid Sub-Cooling _____ Entering Air Dry Bulb _____ Entering Air Wet Bulb _____ Entering Air Enthalpy _____ Leaving Air Dry Bulb _____ Leaving Air Wet Bulb _____ Leaving Air Enthalpy _____ Accessory PD _____ Cond vs Evap _____ Vertical Separation _____	<p style="text-align: center;">Carrier 28ME Intertwined Row Split (Dual Circuit) 6 / 14 / HF</p> <p>.0042 in</p> <p>Sine Wave Medium</p> <p>4.13 sqft 363.2 fpm</p> <p>Al-Galv. 0.5 in 1.25 x 0.781 in 0.016 in</p> <p>1500 CFM 0 ft</p> <p>139.95 MBH 68.14 MBH 0.56 in wg</p> <p>G4</p> <p>1 4 47.6 F 123.4 F 1.67 Tons</p> <p>G4</p> <p>1 4 47.7 F 121.7 F 1.66 Tons</p> <p>95.0 F</p> <p>R410A 2.7 F 11.7 kW 15.0 F 15.0 F</p> <p>99.60 F 82.10 F 45.68 BTU/lb 58.06 F 57.82 F 24.9 BTU/lb</p> <p>0.0 psig Even 0.0 ft</p>
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NOTE: Coil is NOT certified by AHRI.

Coil is NOT certified by AHRI.

LEGEND:

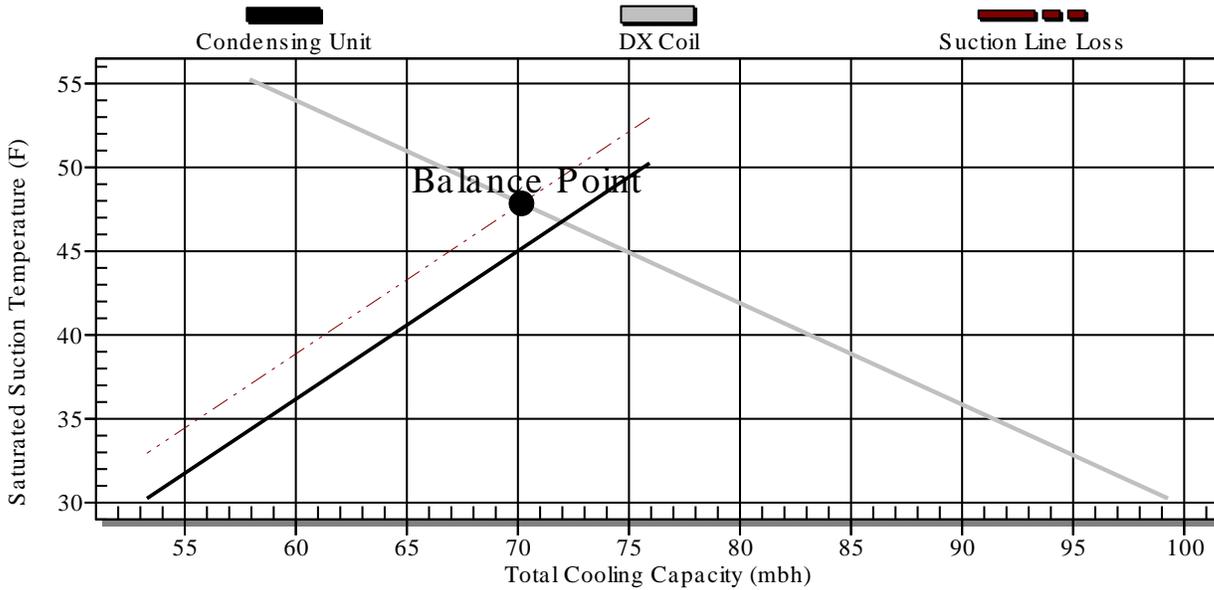
Stf -- Tube spacing across coil face

DX Coil Performance Summary

Project: Saint Lukes Ph III Vertical _ ME eng
Tag: AHU 1 with less preheat

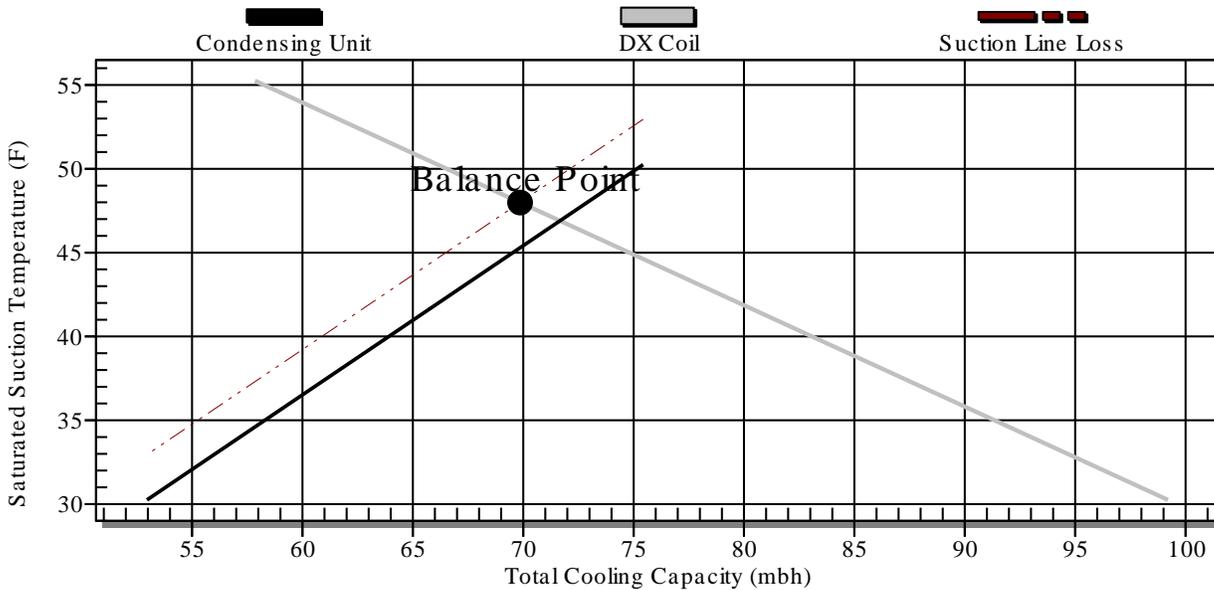
DX Coil Cross-Plot

6 / 14 / HF 38AUD014(D) (Circuit B, Upstream Connections)



DX Coil Cross-Plot

6 / 14 / HF 38AUD014(D) (Circuit A, Downstream Connections)



Hot Water Coil Performance Summary

Project: Saint Lukes Ph III Vertical _ ME eng
 Tag: AHU 1 with less preheat

Heating Application's Balance Criteria: Fluid Temp Diff.

Coil Model _____
 Number of Coils _____
 Row / FPI / Circ _____
 Fin Thickness _____
 Fin Type _____
 Face Area Type _____
 Coil Face Area _____
 Face Velocity _____
 Fin-Casing Material _____
 Tube Diameter _____
 Tube spacing: Stf x Str _____
 Tube Wall Thickness _____
 Actual Airflow _____
 Site Altitude _____
 Heating Capacity _____
 Fluid Flow Rate _____
 Fluid Pressure Drop _____
 Fluid Velocity _____
 Entering Fluid Temperature _____
 Leaving Fluid Temperature _____
 Fluid Temperature Drop _____
 Entering Air Temperature _____
 Leaving Air Temperature _____
 Air Friction _____
 Brine _____
 Brine Concentration _____
 Fouling Factor _____

Carrier 28MH	
1	
2 / 11 / FL	
.0042	in
Sine Wave	
Medium	
4.13	sqft
363.2	fpm
Al-Galv.	
0.5	in
1.25 x 0.781	in
0.016	in
1500	CFM
0	ft
100.41	MBH
5.1	gpm
0.1	ft wg
0.6	ft/s
180.00	F
140.00	F
40.0	F
35.00	F
92.75	F
0.15	in wg
FW	
0	%
0.0	(hr-sqft-F)/BTU



NOTE: Certified in accordance with the AHRI Forced-Circulation Air-Cooling and Air-Heating Coils Certification Program which is based on AHRI Standard 410 within the Range of Standard Rating Conditions listed in Table 1 of the Standard. Certified units may be found in the AHRI Directory (www.ahrirectory.org).

LEGEND:

- Stf -- Tube spacing across coil face
- Str -- Tube spacing in direction of airflow

Unit Acoustics Summary

Project: Saint Lukes Ph III Vertical _ ME eng
Tag: AHU 1 with less preheat

Unit Acoustics Sound Power Level:

	Discharge Inlet Casing		
63 Hz _____	87	76	78
125 Hz _____	76	66	67
250 Hz _____	73	55	57
500 Hz _____	68	49	52
1000 Hz _____	66	49	50
2000 Hz _____	63	46	47
4000 Hz _____	60	44	35
8000 Hz _____	51	32	26

Sound power levels for 39M units are rated in accordance with AHRI Standard 260.

Unit Acoustics A-weighted Sound Power Level:

	Discharge Inlet Casing		
63 Hz _____	60	49	51
125 Hz _____	59	49	50
250 Hz _____	64	46	48
500 Hz _____	65	46	49
1000 Hz _____	66	49	50
2000 Hz _____	65	48	49
4000 Hz _____	61	45	36
8000 Hz _____	50	31	25

Sound power levels for 39M units are rated in accordance with AHRI Standard 260.

Sound contributed by Supply Fan

Supply Fan Performance Summary

Project: Saint Lukes Ph III Vertical _ ME eng
 Tag: AHU 1 with less preheat

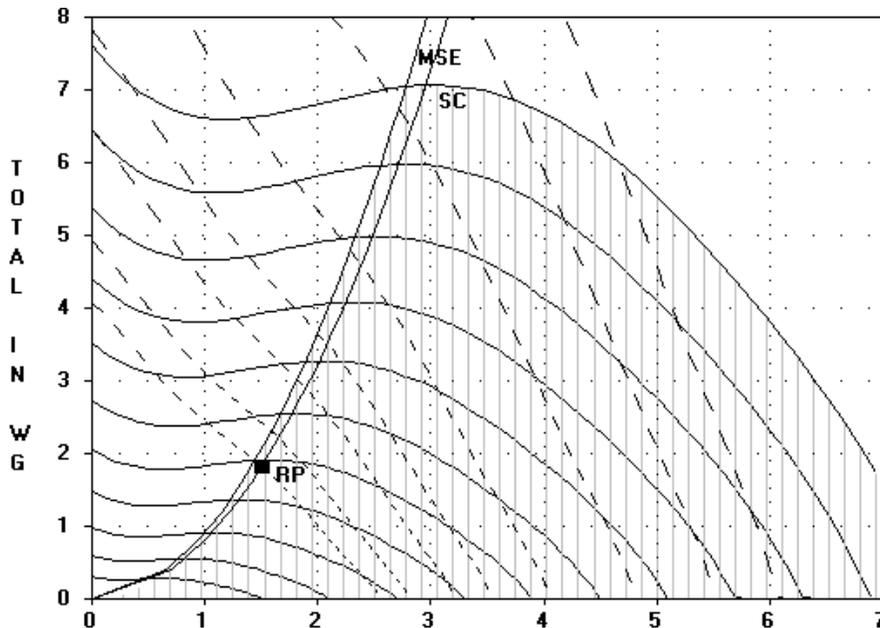
Fan Model	39M0601VFCA-D
Unit Size	06W
Fan Type	FORWARD CURVED
Fan Wheel Diameter	10
Fan Class	I
Fan Application	Draw Thru
Orientation	Vertical
Actual Airflow, CFM	1500
Site Altitude, ft	0
Upstream Ext. Static, in wg	0.00
Downstream Ext. Static, in wg	1.00
Cooling Coil Static, in wg	0.56
Heating Coil Static, in wg	0.15
Total Accessory Static, in wg	0.08
Total Static Pressure, in wg	1.82
Calculated Fan RPM / Motor RPM	1274 / 1800
Class I Max. RPM	1806
Static Efficiency (%)	57
Fan BHP	0.7
VFD Setting, Hz	43
Fan Electrical Power, kW	0.8



Accessories:

- (1) Filter/Mixing Box Synthetic (2") MERV 13 [0.06]
- (1) Mixing or Exhaust Box [0.02]

NOTE: Certified in accordance with the AHRI Central Station Air-Handling Unit Certification Program, which is based on AHRI Standards 430/431. Certified units may be found in the AHRI Directory at www.ahridirectory.org



Legend: AIRFLOW (1000 CFM)

\ - RPM \ - BHP MSE - Max. Static Eff. SC - System Curve RP - Rated Point

RPM = 1274 BHP = 0.7 CLASS I MAX. RPM = 1806

RPM's (x 100, L to R): 5. 7. 9. 11. 13. 15. 17. 19. 21. 23. 25.

BHP's (L to R): 0.8 1 1.5 2 3 5 7.5 10

Unit width: 3'-10" (plus lifting lugs)

2In. Angle Filter

Qty (4) 16in. x 20in.

Hat Water 2 Row 11 FPI Full Circuit (qty. 1)

Direct Expansion 6 Row 14 FPI Intertwined 1/2Circuit (qty. 1)

2 @ 0.875" diameter distributor(s)

Draw-Thru Supply Fan

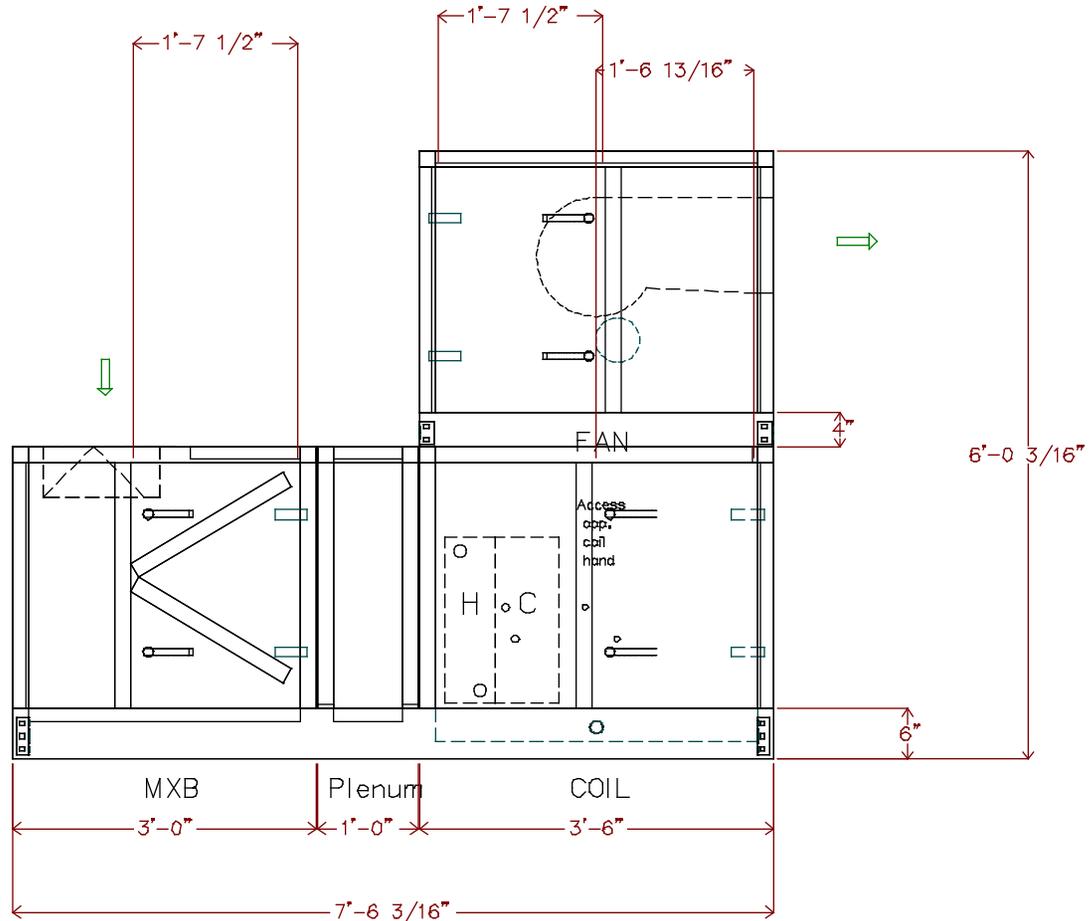
1 HP Premium Efficiency ODP 208-230/460 3Ph 60Hz 1800 RPM

Operating weight: 1613.0 lbs.

Upstream Corner Weight (each): 320.0 lbs.

Downstream Corner Weight (each): 487.0 lbs.

Split	Airway Length	Weight (lbs.)
(Split 1)	7'-6 3/16"	1613
(Split 2)	Variable Frequency Drive	44



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39MN

DATE
11/29/2021

AHUBuilder
v6.69k

39M Central Station Air-Handler, Size 06W
Saint Lukes Ph III Vertical - ME eng: AHU 1 with less preheat
Assembly Drawing

REVISION
Side View

Unit viewed from right side of side elevation view.
 Unit length: 7'-6 3/16"
 2In. Angle Filter
 Qty (4) 16In. x 20In.
 Hot Water 2 Row 11 FPI Full Circuit (qty. 1)
 Direct Expansion 6 Row 14 FPI Intertwined 1/2Circuit (qty. 1)
 2 @ 0.875" diameter distributor(s)

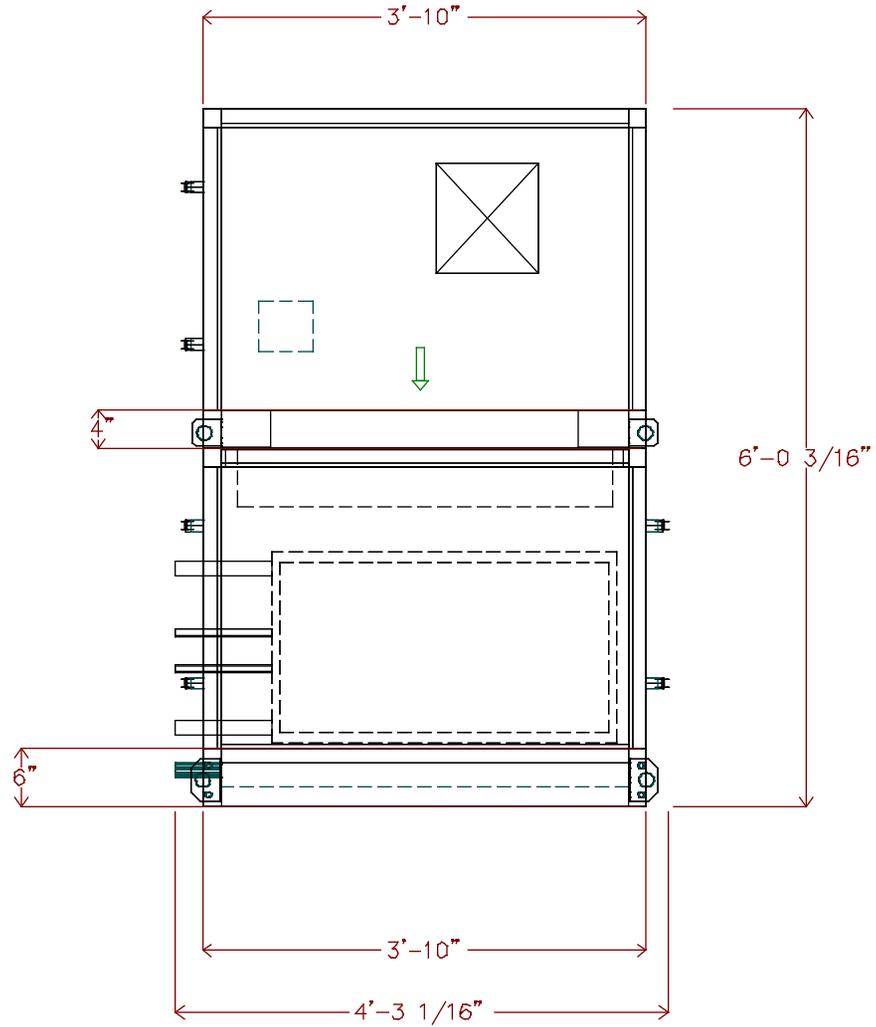
Draw-Thru Supply Fan
 1 HP Premium Efficiency ODP 208-230/460 3Ph 60Hz 1800 RPM
 Operating weight: 1613.0 lbs.
 Upstream Corner Weight (each): 320.0 lbs.
 Downstream Corner Weight (each): 487.0 lbs.



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DATE 11/29/2021	AHUBuilder v6.69k	39M Central Station Air-Handler, Size 06W Saint Lukes Ph III Vertical - ME eng: AHU 1 with less preheat Assembly Drawing	REVISION End View
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Unit height: 6'-0 3/16"

2In. Angle Filter

Qty (4) 16in. x 20in.

Hot Water 2 Row 11 FPI Full Circuit (qty. 1)

Direct Expansion 6 Row 14 FPI Intertwined 1/2Circuit (qty. 1)

2 @ 0.875" diameter distributor(s)

Draw-Thru Supply Fan

1 HP Premium Efficiency ODP 208-230/460 3Ph 60Hz 1800 RPM

Operating weight: 1613.0 lbs.

Upstream Corner Weight (each): 320.0 lbs.

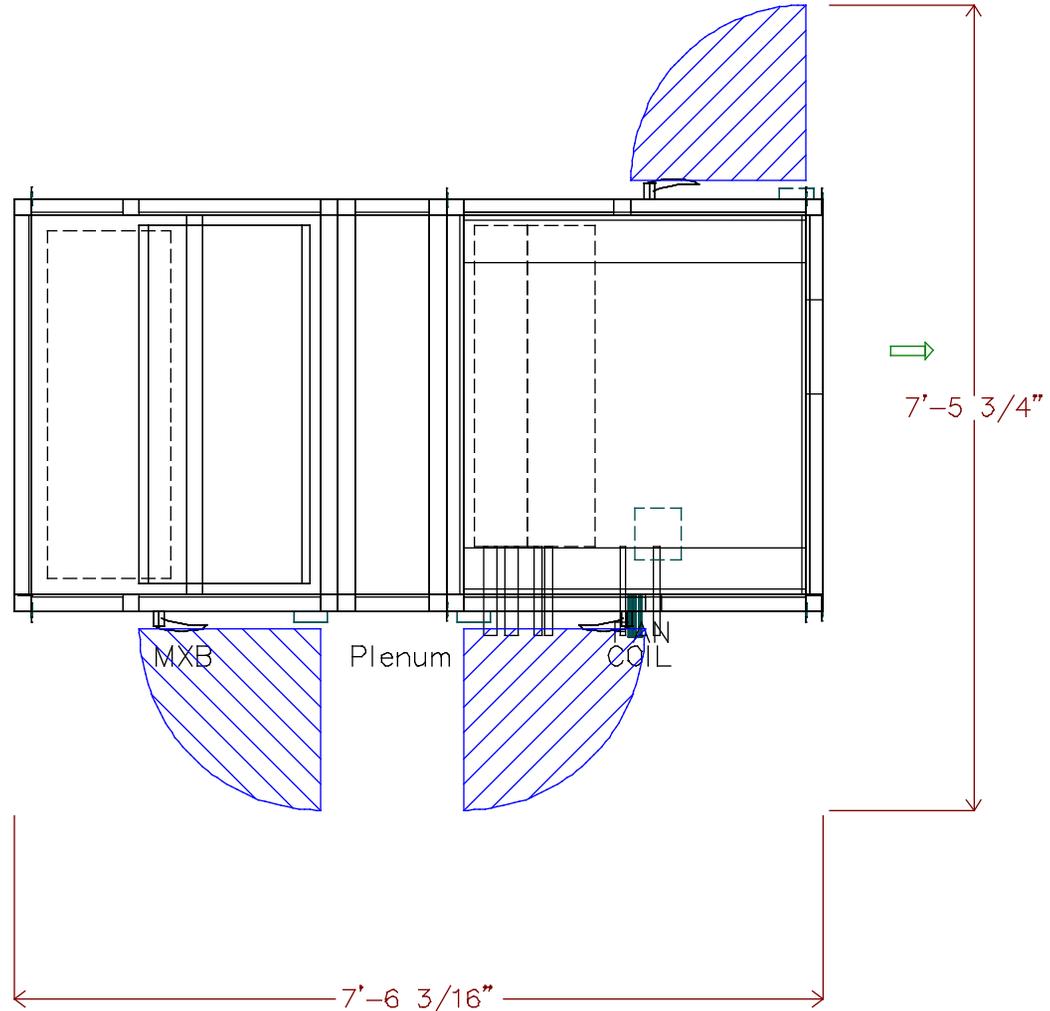
Downstream Corner Weight (each): 487.0 lbs.



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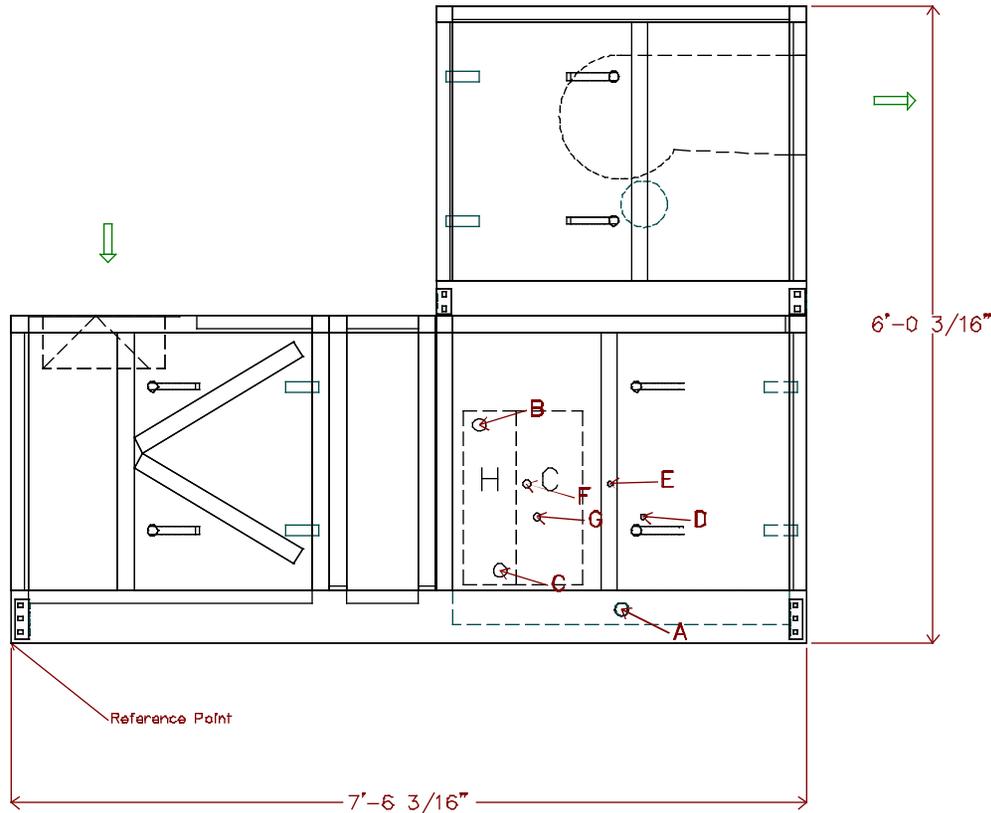
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39M Central Station Air-Handler, Size 06W
Saint Lukes Ph III Vertical - ME eng: AHU 1 with less preheat
Assembly Drawing

REVISION
preheat
Tap View

Hot Water 2 Row 11 FPI Full Circuit (qty. 1)
 Direct Expansion 6 Row 14 FPI Intertwined 1/2Circuit (qty. 1)
 2 @ 0.875" diameter distributor(s)

Pipe	x	y	diameter	Usage
A	5'-9 3/16"	3' 13/16"	1 1/2"	DrainPan
B	4'-5 1/16"	2'-0 11/16"	1 1/2"	HW Outlet
C	4'-7 7/16"	8 3/16"	1 1/2"	HW Inlet
D	5'-11 5/8"	1'-2 1/4"	0 5/8"	L2: 4-ton TXV, G4 nozzle, circuit A
E	5'-7 7/8"	1'-6"	0 5/8"	L1: 4-ton TXV, G4 nozzle, circuit B
F	4'-10 7/16"	1'-6"	0 7/8"	S1: Suction
G	4'-11 9/16"	1'-2 1/4"	0 7/8"	S2: Suction



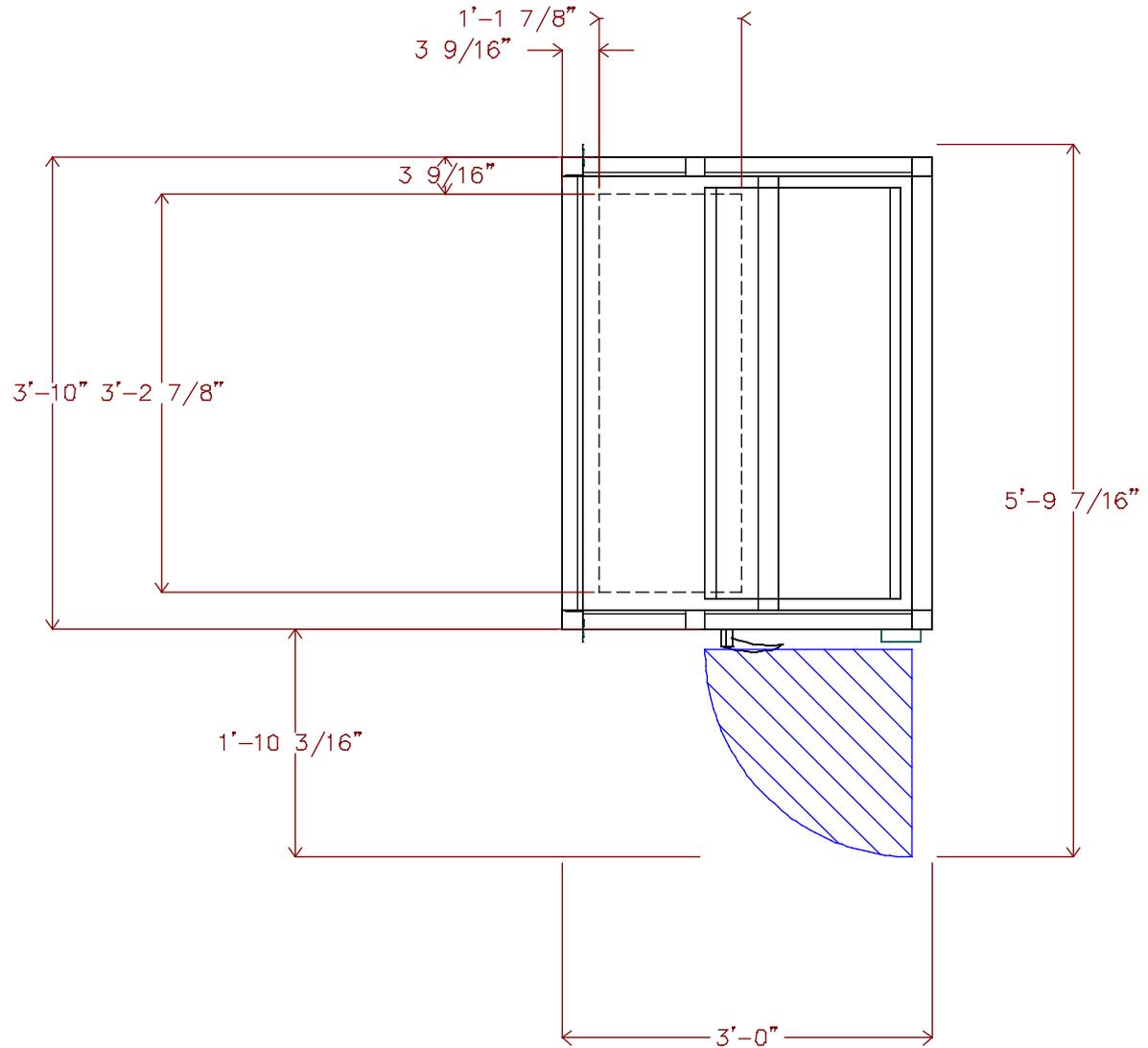
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DATE 11/29/2021	AHUBuilder v6.69k	39M Central Station Air-Handler, Size 06W Saint Lukes Ph III Vertical - ME eng: AHU 1 with less preheat Assembly Drawing	REVISION Side View
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2In. Angle Filter
 Qty (4) 16in. x 20in.



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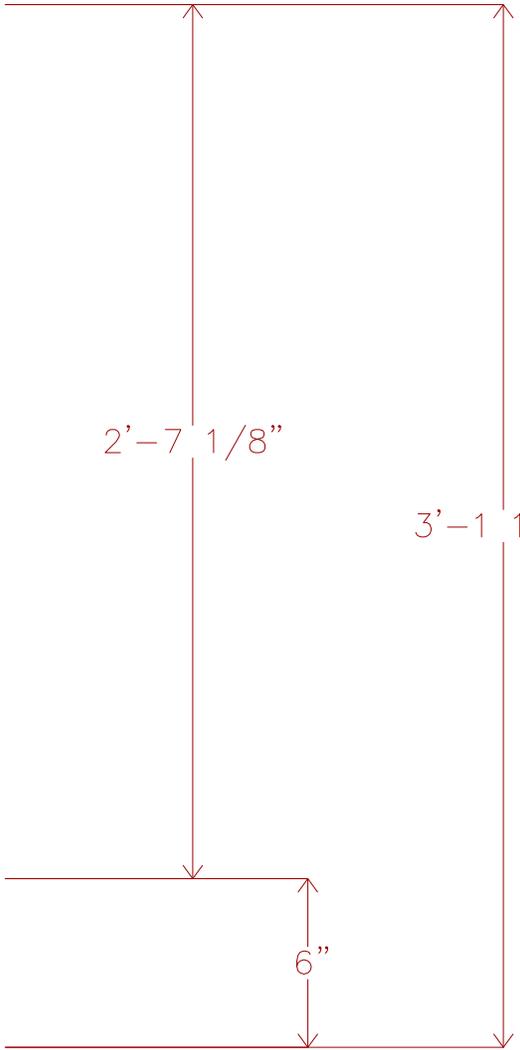
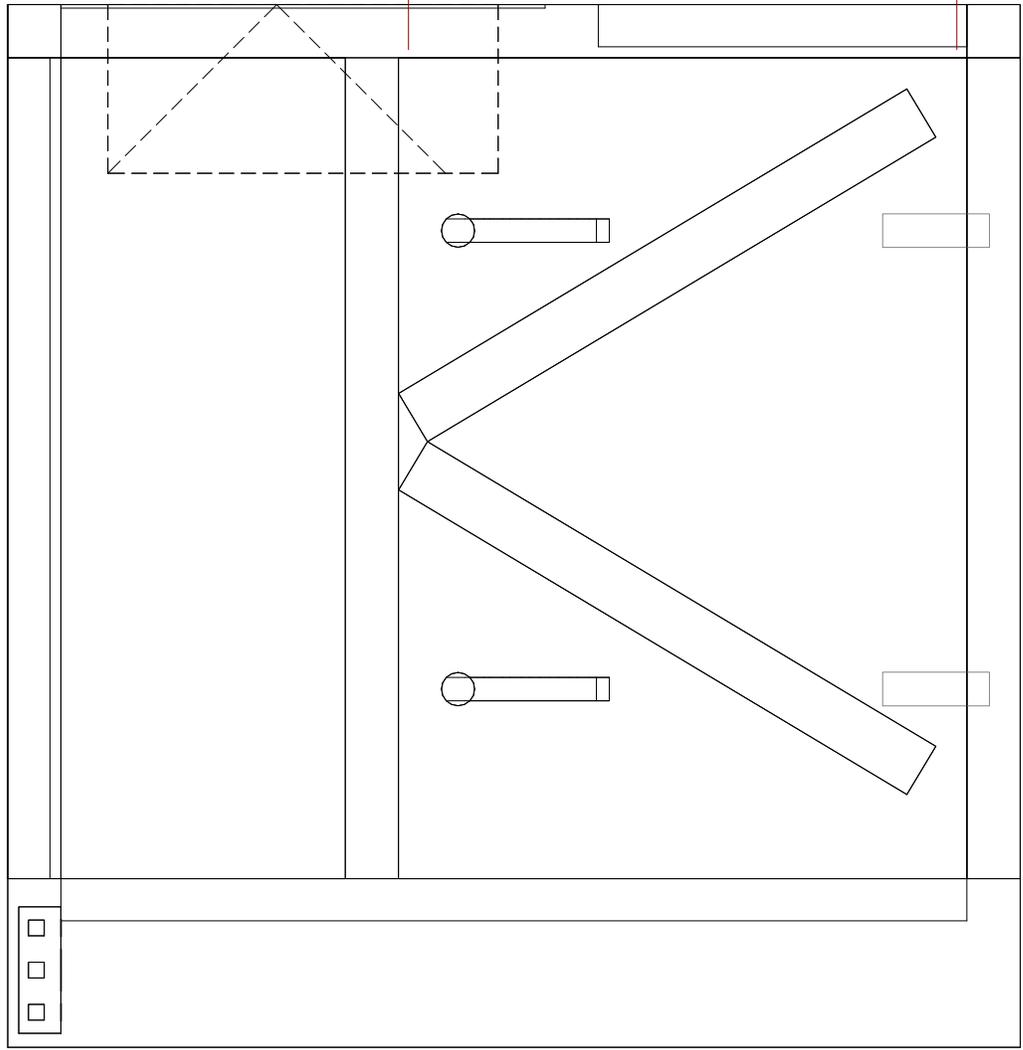
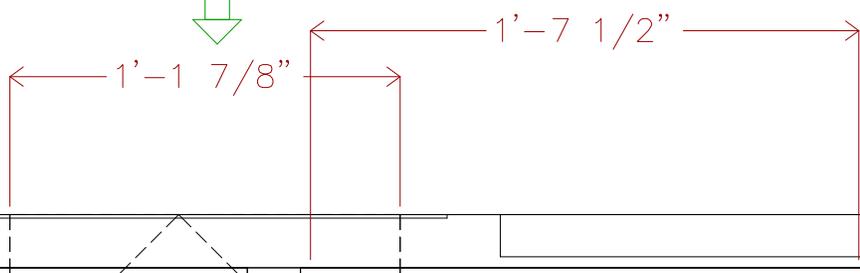
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39M Central Station Air-Handler, Size 06W
 Saint Lukes Ph III Vertical - ME eng: AHU 1 with less preheat
 Filter Mixing Box

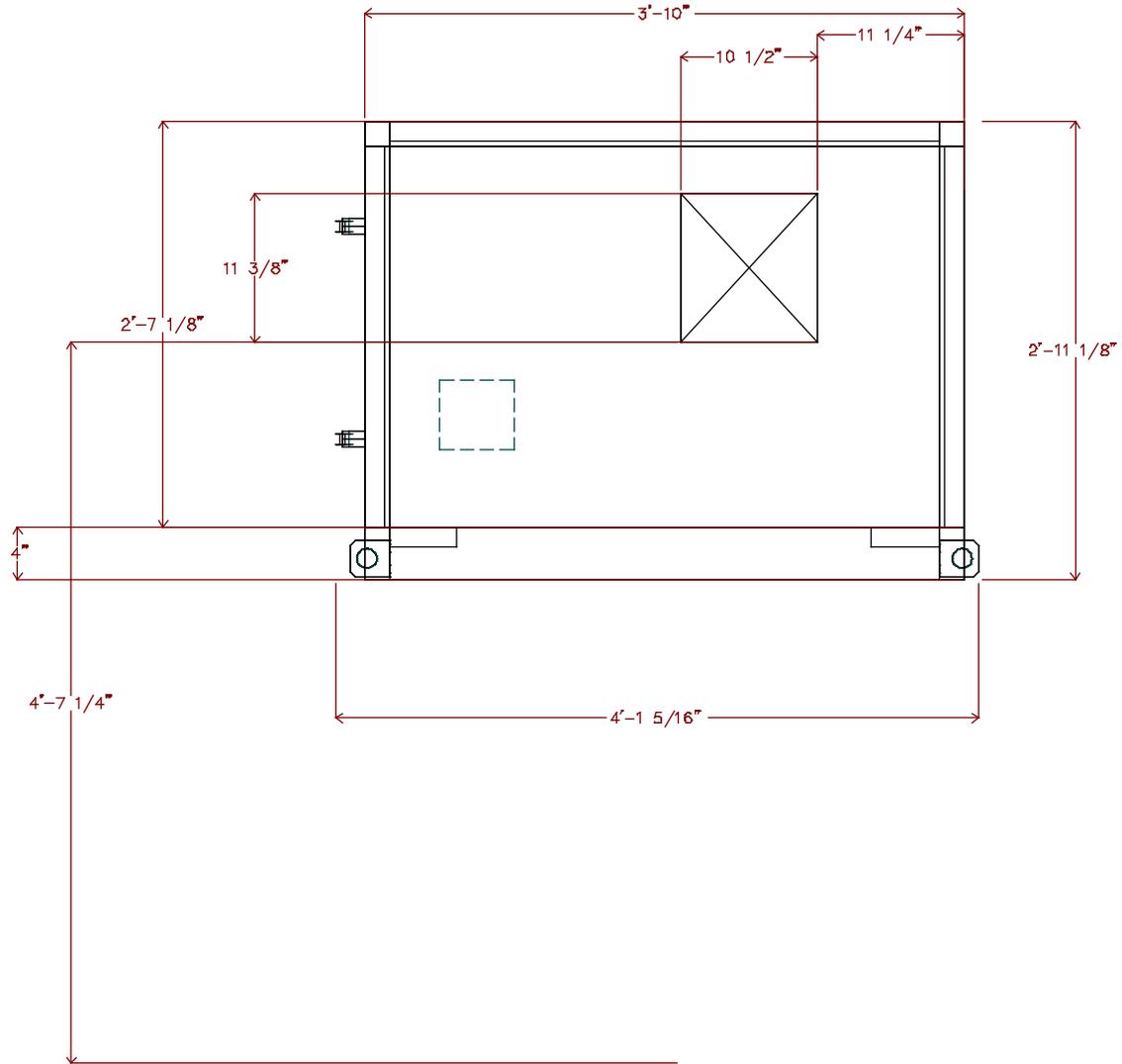
REVISION
 Tap View



Unit viewed from right side of side elevation view.

Draw-Thru Supply Fan

1 HP Premium Efficiency ODP 208-230/460 3Ph 60Hz 1800 RPM



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39M Central Station Air-Handler, Size 06W
Saint Lukes Ph III Vertical - ME eng: AHU 1 with less preheat
Draw-Thru Supply Fan

REVISION
End View

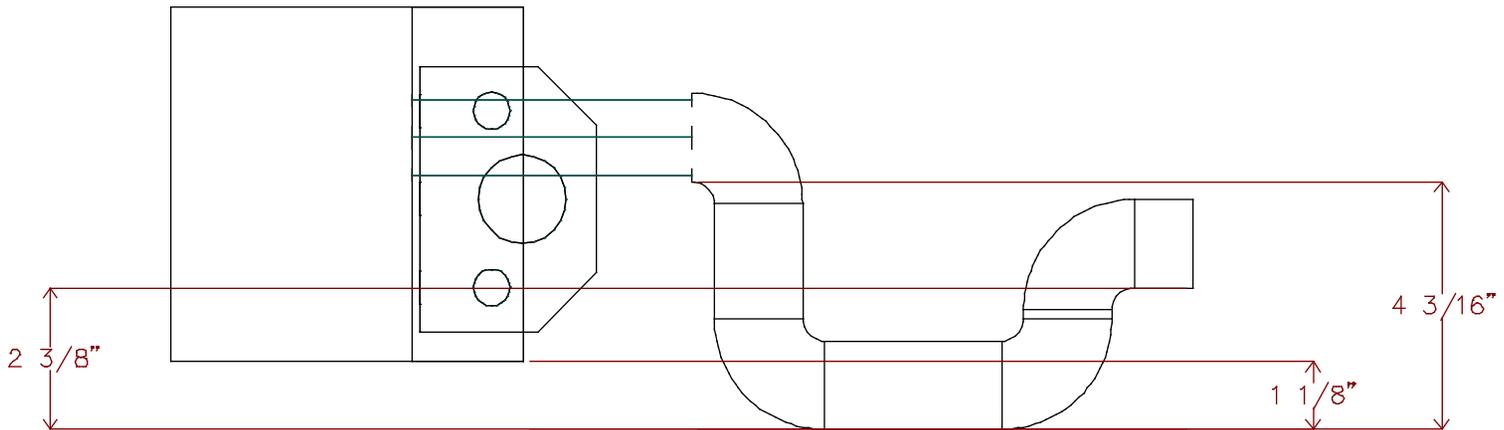


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39MN

DRAW-THRU



DATE
11/29/2021

AHUBuilder
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39M Central Station Air-Handler, Size 06W
Saint Lukes Ph III Vertical - ME eng: AHU 1 with less preheat
Condensate Trap Dimensions

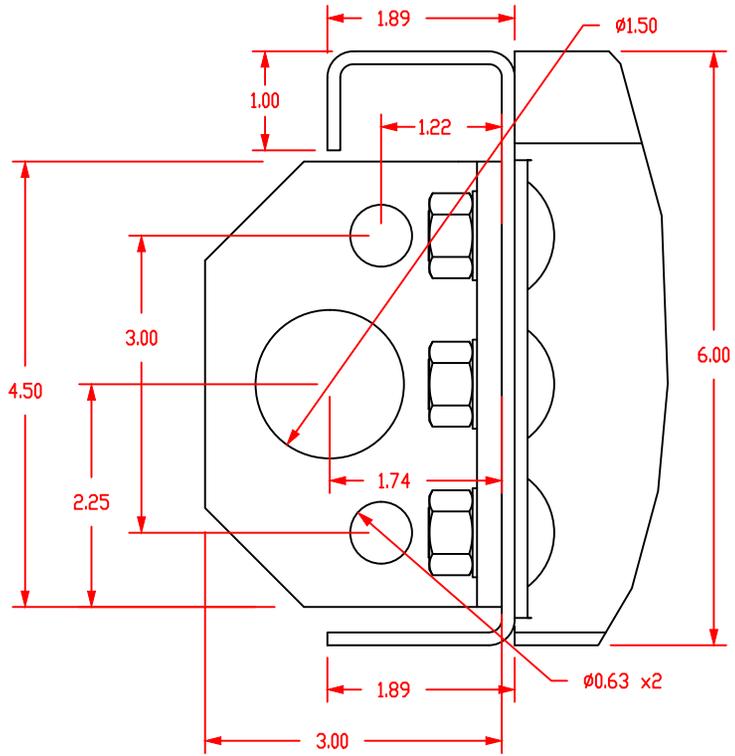
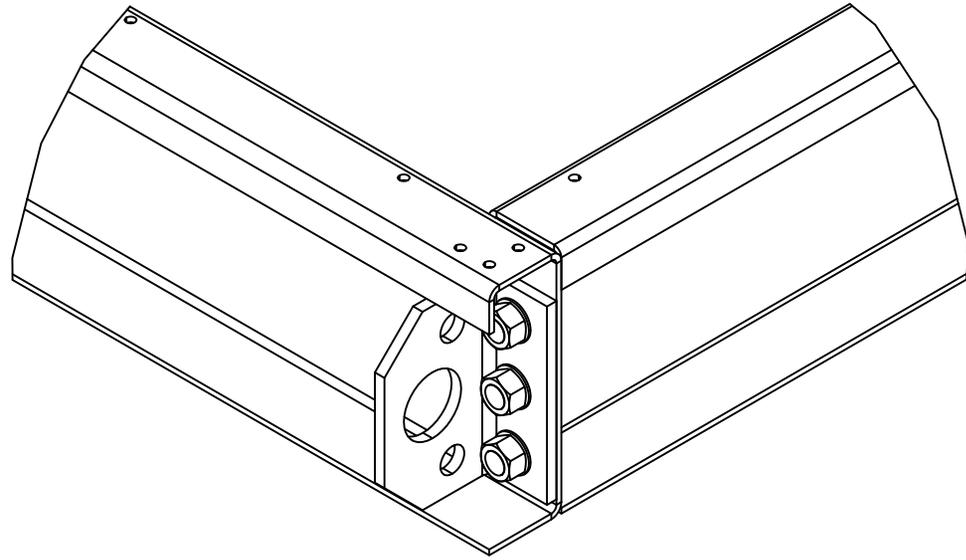
REVISION
End View



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39M



DATE
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AHUBuilder
v6.69k

39M Central Station Air-Handler, Size: 03 - 110
6" Baserail and Lifting Lug Detail

REVISION

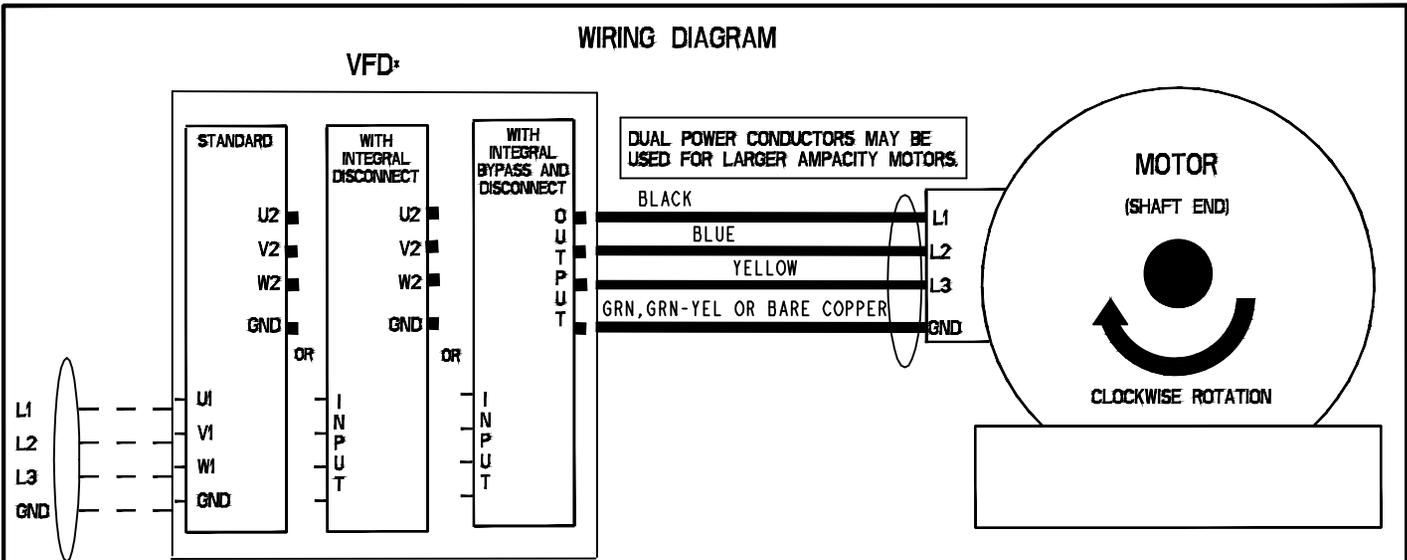


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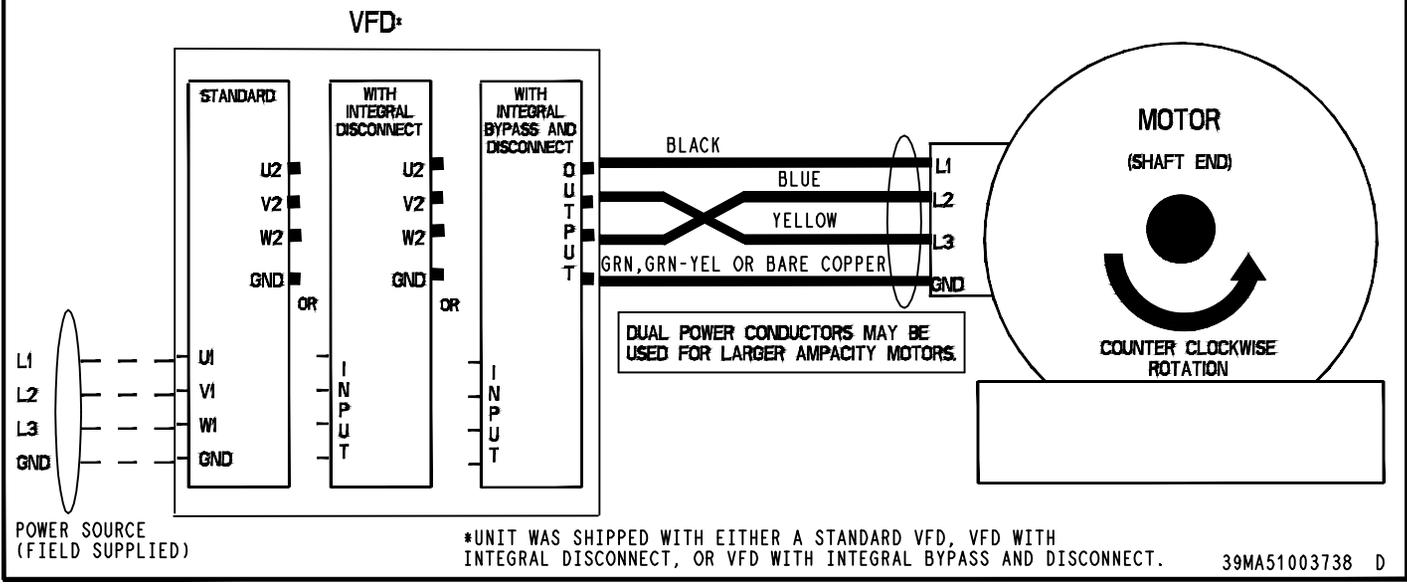
39M

WIRING DIAGRAM



POWER SOURCE (FIELD SUPPLIED)

- NOTES: 1) MOTOR CONNECTIONS L4 THRU L9 NOT SHOWN. CONNECT PER MOTOR MANUFACTURERS RECOMMENDATIONS AND SPECIFIED OPERATING VOLTAGE.
 2) FIELD WIRING TO VFD MUST BE IN ACCORDANCE WITH "NEC" CODE AND "LOCAL" CODE REQUIREMENTS. REFER TO INSTALLATION INSTRUCTIONS FOR MINIMUM WIRE GAUGE REQUIREMENTS AND RECOMMENDED MAXIMUM CIRCUIT BREAKER (MCCB).
 3) ALL FACTORY WIRING IS RATED FOR 90°C [194°F], TYPE THHN. REPLACE WITH SAME SIZE AND TYPE AS ORIGINALLY SUPPLIED



POWER SOURCE (FIELD SUPPLIED)

*UNIT WAS SHIPPED WITH EITHER A STANDARD VFD, VFD WITH INTEGRAL DISCONNECT, OR VFD WITH INTEGRAL BYPASS AND DISCONNECT. 39MA51003738 D

Component wiring for reference only. When components are factory installed, wiring will be factory installed unless otherwise noted. When components are provided by the factory for field installation, wiring is not included or installed.

DATE
11/29/2021

AHUBuilder
v6.69k

39M Central Station Air-Handler
Three Phase VFD Wiring Detail

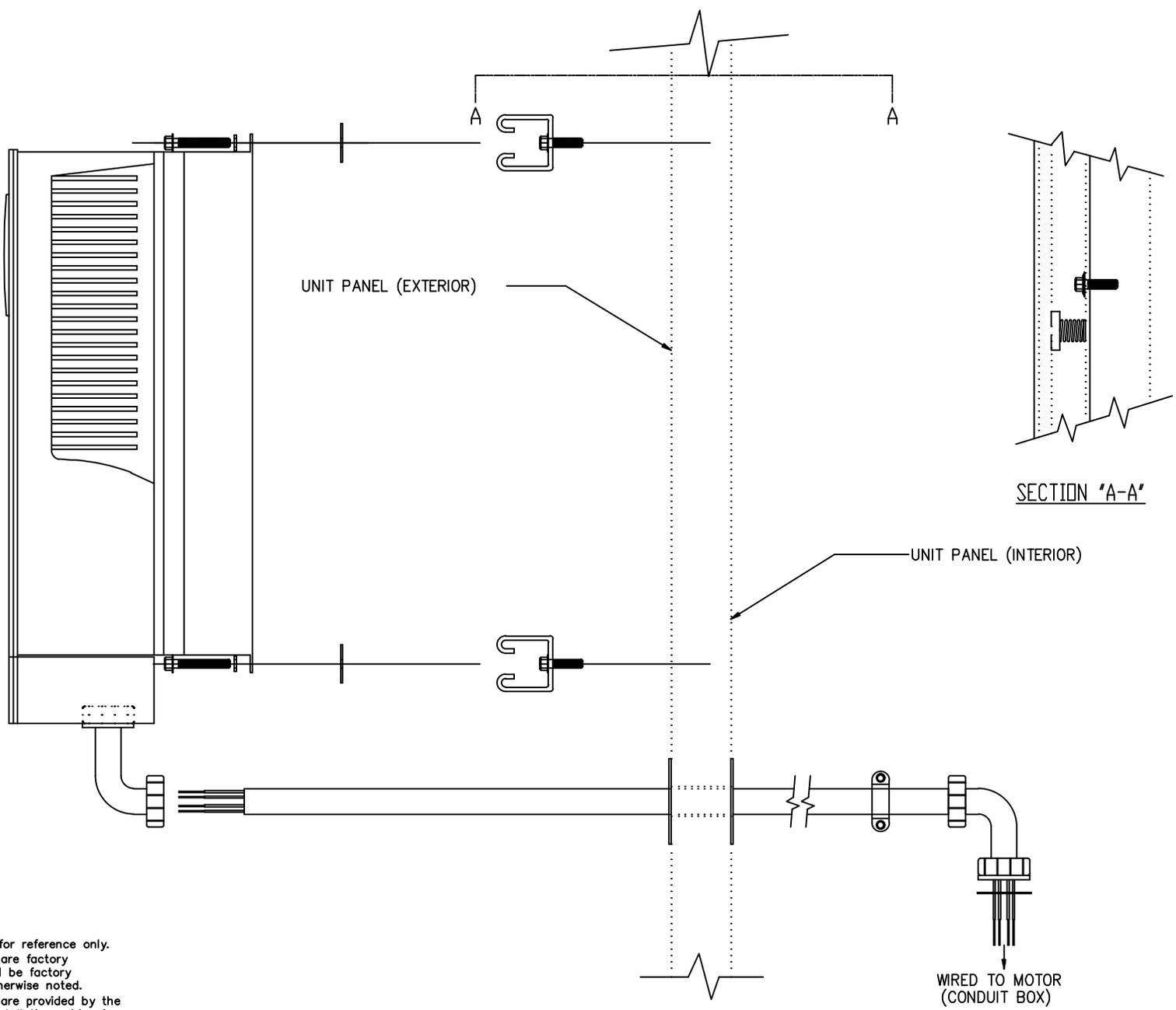
REVISION



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39MN



UNIT PANEL (EXTERIOR)

UNIT PANEL (INTERIOR)

SECTION "A-A"

WIRED TO MOTOR (CONDUIT BOX)

Component wiring for reference only.
When components are factory installed, wiring will be factory installed unless otherwise noted.
When components are provided by the factory for field installation, wiring is not included or installed.

DATE
11/29/2021

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39M Central Station Air-Handler, Size: 03 - 110
VFD Mounting Detail

REVISION

VFD Submittal

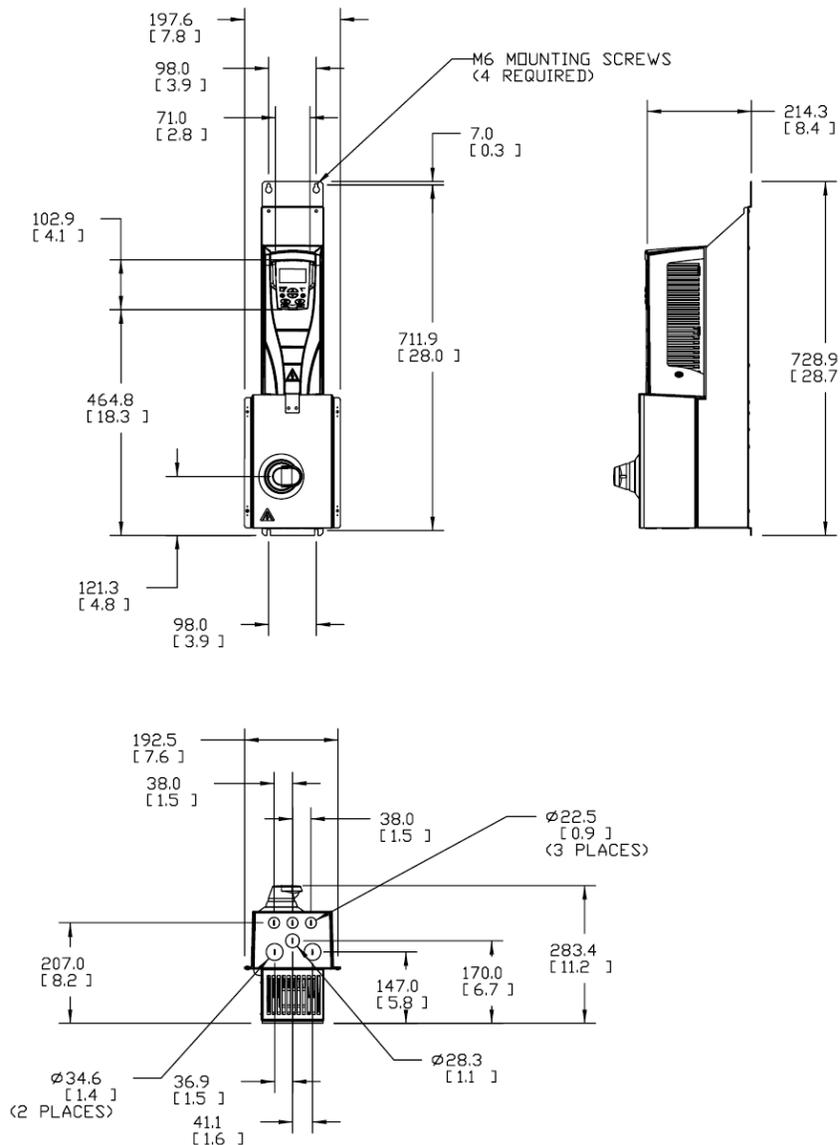
Project: Saint Lukes Ph III Vertical _ ME eng
 Unit Tag: AHU 1 with less preheat

Manufacturer Part Number	ACH550-PCR-04A6-2
Voltage	208 Volts 3 Phase 60Hz
Frame Size	DC1
Application Horsepower	1 HP
Maximum Continuous Output (A)	4.6
UL Class T Fuse Amps	N/A

DC1

General Dimensions

Height (in.).....	28.7
Width (in.).....	7.8
Depth (in.)	11.2
Shipping Weight (lbs.).....	32



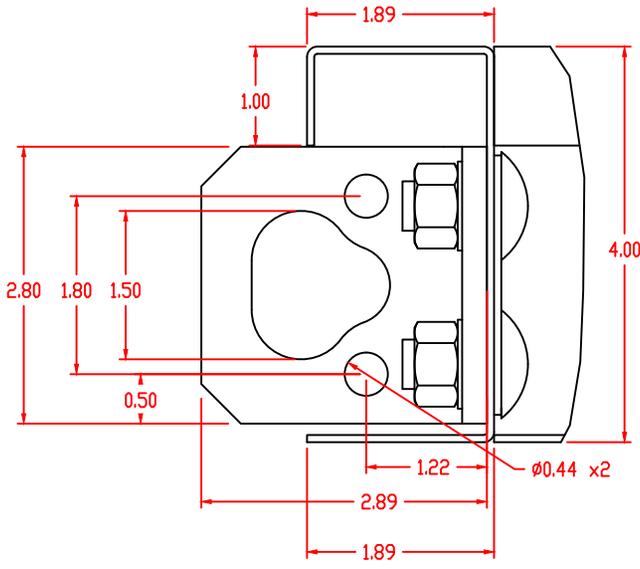
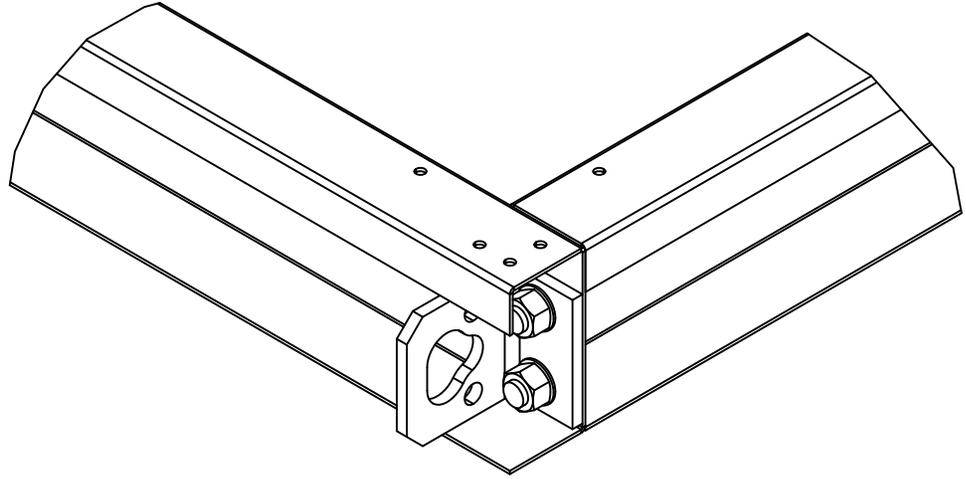
Note: Unbracketed dimensions listed in millimeters [Bracketed dimensions listed in inches]



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DATE
11/29/2021

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39M Central Station Air-Handler, Size: 03 - 25
4" Baserail and Lifting Lug Detail

REVISION

Air Filter Submittal

Project: Saint Lukes Ph III Vertical _ ME eng
 Unit Tag: AHU 1 with less preheat

Carrier Part Number	31K2C0000000416204
Kit Description	Filter Kit
Unit Airflow, CFM	1500
Filter Velocity, FPM	169
Filter Sizes and Quantities	Qty (4) 16in. x 20in.

DFpro MERV 13 Pleated Filter

The 100% synthetic graduated density media is continuously bonded to a 30 gauge galvanized, corrosion resistant, expanded metal support grid with an effective open area of 96%. The media is resistant to a wide range of chemicals, does not absorb moisture and will not support microbial growth. The controlled pleat spacing maximizes surface area and dust holding capacity and is bonded to the enclosure frame to prevent dust bypass. The enclosure frame is constructed of high wet strength moisture resistant beverage board. The diagonal support members of the frame are bonded to the entering and exiting apexes of each pleat to prevent pleat collapse and filter bowing.

