Trane Performance Climate Changer Air Handler

Unit Overview - Veg flower, Veg flower-1

Application	Unit Size	External Dimensions			Weight	
		Height	Width	Length	Installed	Rigging
Outdoor unit	CSAA008	43.6 in	50.5 in	331.5 in	3959 lb	3935 lb

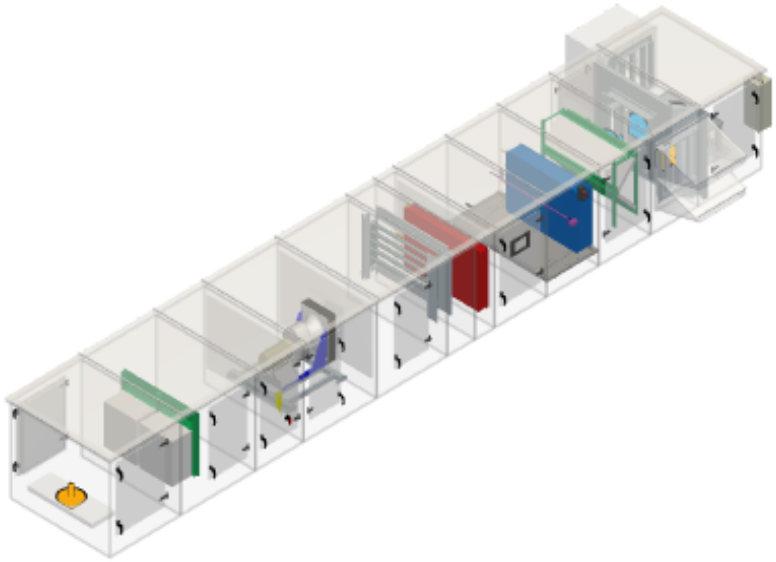
Quantity of Shipping Sections	Largest Ship Split			Heaviest Ship Split	Elevation
	Height	Width	Length		
1 piece	43.6 in	50.5 in	331.5 in	3959 lb	0.00 ft

Supply Fan				Return/Exhaust Fan			
Airflow	3400 cfm	Total Static Pressure	4.718 in H2O	Airflow	3400 cfm	Total Static Pressure	1.914 in H2O

Note: The unit's height includes the outdoor roof.

Construction Features

Panel	2in. foam injected R-13 with thermal break
Panel Material	All unit inner panels - galvanized
Integral Base Frame	6in. integral base frame
Paint	Slate gray
Agency Approval	YES
Roof Curb Type	Pier or pad mounted unit



Unit Electrical

Circuit	Voltage/Phase/Frequency	FLA	MCA	Max Fuse Size
Circuit number 1 SPP (Field provided unit disconnect)	460/3/60	11.98 A	14.03 A	20.00 A
Circuit number 2 UV lights 1	115/1/60	1.54 A	1.93 A	15.00 A

Warranty

Warranty section	Std. warranty only

Return fan section - Position: 1

Fan Data	
Wheel Diameter/Type/Class	19.5in 3 kW motorized impeller
Fan Quantity	1
Discharge Location	Front top
Motor Location	Right side drive
Drive Service Factor	Direct drive
Fan Performance	
Airflow	3400 cfm
Total Static Pressure	1.914 in H2O
Total Brake Power	1.667 hp
Operating Speed	1353 rpm
AMCA FEG	FEG80
Unit Static Efficiency	61.54 %
Max Total Static Pressure @ 10V	3.266 in H2O
Motor Interface Options	
Selection Type	Motorized impeller control panel
Voltage	460/3
Mounting Location	External mounting

Motor Data	
Power / Fan	Motorized impeller fan
Voltage	460/3
Impeller Fan Control Voltage	7.7 V
Impeller Fan horsepower	3.800 hp
Fan Section Options	
Door Location	Right
Door Guard	Yes

Fan Discharge Options

Face	Type	Airflow	Face Velocity	Area	Pressure Drop	Damper Torque Requirement	Exhaust Hood
Front Face Feature			337 ft/min	10.09 sq ft	0.018 in H2O	N/A	N/A

Pressure Drop in (in w.g.)

Return fan	
Fan section	0.02
Economizer section	0.40
Internal Static Pressure	**0.41**
External Static Pressure	**1.50**
Total Static Pressure	**1.91**

Economizer section - Position: 2

Economizer Performance

Outside Air Path

Damper Type	Hood Type	Airflow	Face Velocity	Area	Pressure Drop	Damper Torque Requirement
Parallel blade damper	OA - hood w/eliminators	3400 cfm	1086 ft/min	3.13 sq ft	0.245 in H2O	N/A

Exhaust Air Path

Damper Type	Hood Type	Airflow	Face Velocity	Area	Pressure Drop	Damper Torque Requirement
Parallel blade damper	Exhaust hood w/ bird screen	3400 cfm	1086 ft/min	3.13 sq ft	0.151 in H2O	N/A

Return Air Path

Damper Type	Airflow	Face Velocity	Area	Pressure Drop	Damper Torque Requirement
Parallel blade damper	3400 cfm	1086 ft/min	3.13 sq ft	0.245 in H2O	N/A

Economizer Section Options

Door Location	Left

Filter section - Position: 3

Primary Filter

Type	Frame	Loading	Airflow	Face Area	Face Velocity	Condition	Pressure Drop	Filter Quantity	Filter Size
Pleated media - MERV 8	2in. filter frame	Side load filters	3400 cfm	11.11 sq ft	306 ft/min	Mid-life	0.576 in H2O	4.00	20x20

Filter Section Options

Door Location	Right

Cooling coil section - Position: 4

Coil Construction	
Model	Refrigerant - UF
Rows	4
Tube Diameter	1/2in. tube diameter (12.7 mm)
Tube Matl/Wall Thickness	Internally enhanced copper tubes
Fin Spacing	78 Per Foot
Fin Material	Aluminum fins
Fin Type	Delta flo E (energy efficient)
Face Area	7.99 sq ft
Coil (top/single) H x L	28 in. (711 mm) X 40" (1016 mm) finned length
Casing	Galvanized
Rigging Weight	81.9 lb
Voltage	115/60/1
Coil Section Options	
Drain Pan	Galvanized
Drain Connection	Left
Minimum Trap Height (L)	6.216 in
H Trap Dimension	3.477 in
J Trap Dimension	1.739 in
Service Panel	Standard panels
UV Light	Yes

Coil Performance	
Capacity	
Total	120.00 MBh
Sensible	82.73 MBh
Air	
Flow	3400 cfm
Entering Dry Bulb	80.00 F
Entering Wet Bulb	67.00 F
Leaving Dry Bulb	57.84 F
Leaving Wet Bulb	55.72 F
Pressure Drop	0.325 in H2O
Face Velocity	426 ft/min
Refrigerant	
Type	R-410A
Liquid Temperature	115.00 F
Suction Temperature	45.00 F
Circuiting Type	Intertwined circuits
Capacity Circuits	Half circuiting
Number of Distributors	2
VRF Applications	
AHRI 410 Classification	
AHRI 410 Classification	AHRI ACHC Certified
Data Generation Date	5/6/2020
TOPSS update number	2350

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 at www.ahridirectory.org.

Access/blank/turning section - Position: 5

Options	
Section Length	26.500 in
Door Location 1	Right
Window 1	Right - thermal

Heating coil section - Position: 6

Coil Construction	
Model	Hot water - 5W
Rows	2
Tube Diameter	5/8in. tube diameter (15.875 mm)
Tube Matl/Wall Thickness	.020" (0.508 mm) copper tubes
Fin Spacing	114 Per Foot
Fin Material	Aluminum fins
Fin Type	Prima flo H (Hi efficient)
Face Area	7.31 sq ft
Coil (top/single) H x L	27 in. (686 mm) X 39" (991 mm) finned length
Casing	Galvanized
Turbulators	Not Included
Rigging Weight	77.5 lb
Installed Weight	102.1 lb
Coil Section Options	
Extended Drain and Vent	Holes only
Service Panel	Standard panels

Coil Performance	
Capacity	
Total	165.93 MBh
Air	
Flow	3400 cfm
Entering Dry Bulb	45.00 F
Leaving Dry Bulb	90.00 F
Pressure Drop	0.153 in H2O
Face Velocity	465 ft/min
Fluid	
Flow	16.61 gpm
Entering	150.00 F
Leaving	130.00 F
Pressure Drop	0.24 ft H2O
Tube Velocity	1.02 ft/s
Reynolds Number	10613.91
Type	Water
Concentration	100.00 %
Fouling Factor	0.00025 hr-sq ft-deg F/Btu
Volume	2.95 gal
VRF Applications	
AHRI 410 Classification	
AHRI 410 Classification	AHRI ACHC Certified
Data Generation Date	5/28/2020
TOPSS update number	2350

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 at www.ahridirectory.org.

Humidifier section - Position: 7

Construction	
Steam Source	Building steam
Steam Pressure	15.00 psig
Connection Location	Left
Required Orifice Size	1/4"
Valve Pipe Connection Size	1/2"
Options	
Drain Connection/Material	Galvanized drain pan
Drain Connection	Left
Service Panel	Standard panels

Performance	
Airflow	3400 cfm
Entering Dry Bulb	78.00 F
Entering Relative Humidity	35.00 %
Leaving Relative Humidity	55.00 %
Steam Rate	66.80 lb/hr
Air Temperature Gain	0.87 F
Condensation Loss	3.38 lb/hr

Access/blank/turning section - Position: 8

Options	
Section Length	36.000 in
Door Location 1	Right

Supply fan section - Position: 9

Fan Data	
Wheel Diameter/Type/Class	16.5in. dd plenum, 80% width, M press
Fan Quantity	1
Discharge Location	Front top
Motor Location	Right side drive
Blades	Higher eff.(some bands lower,more spike)
Drive Service Factor	Direct drive

Fan Performance	
Airflow	3400 cfm
Total Static Pressure	4.718 in H2O
Total Brake Power	4.286 hp
Operating Speed	2823 rpm
AMCA FEG	FEG75
Unit Static Efficiency	59.01 %

Motor Interface Options	
Selection Type	VFD
Voltage	460/3
Mounting Location	Internal mounting
VFD Frequency	96.00 Hz

Motor Data	
Power / Fan	5 hp
Voltage	460/3
Speed	1800
Class	NEMA premium compliant ODP
Efficiency	89.90 %
Part Load Efficiency	86.16 %

Fan Section Options	
Fan Wheel Balance	Inverter balance with shaft grounding
Door Location	Right
Door Guard	Yes

Fan Discharge Options

Face	Type	Airflow	Face Velocity	Area	Pressure Drop	Damper Torque Requirement	Exhaust Hood
Front Face Feature			337 ft/min	10.09 sq ft	0.018 in H2O	N/A	N/A

Pressure Drop in (in w.g.)

Supply fan	
Economizer section	0.40
Filter section	0.58
Coil section	0.32
Coil section	0.15
Humidification section	0.04
Fan section	0.02
Filter section	1.66
Discharge plenum	0.05
Internal Static Pressure	**3.22**
External Static Pressure	**1.50**
Total Static Pressure	**4.72**

Starter/VFD only section - Position: 10

Supply Fan Motor Interface Door	Right

Filter section - Position: 11

Primary Filter

Type	Frame	Loading	Airflow	Face Area	Face Velocity	Condition	Pressure Drop	Filter Quantity	Filter Size
HEPA - 99.97% eff (500 fpm)	HEPA filter frame	Front load filters	3400 cfm	7.00 sq ft	486 ft/min	Mid-life	1.656 in H2O	1.00 1.00	24x12 24x30

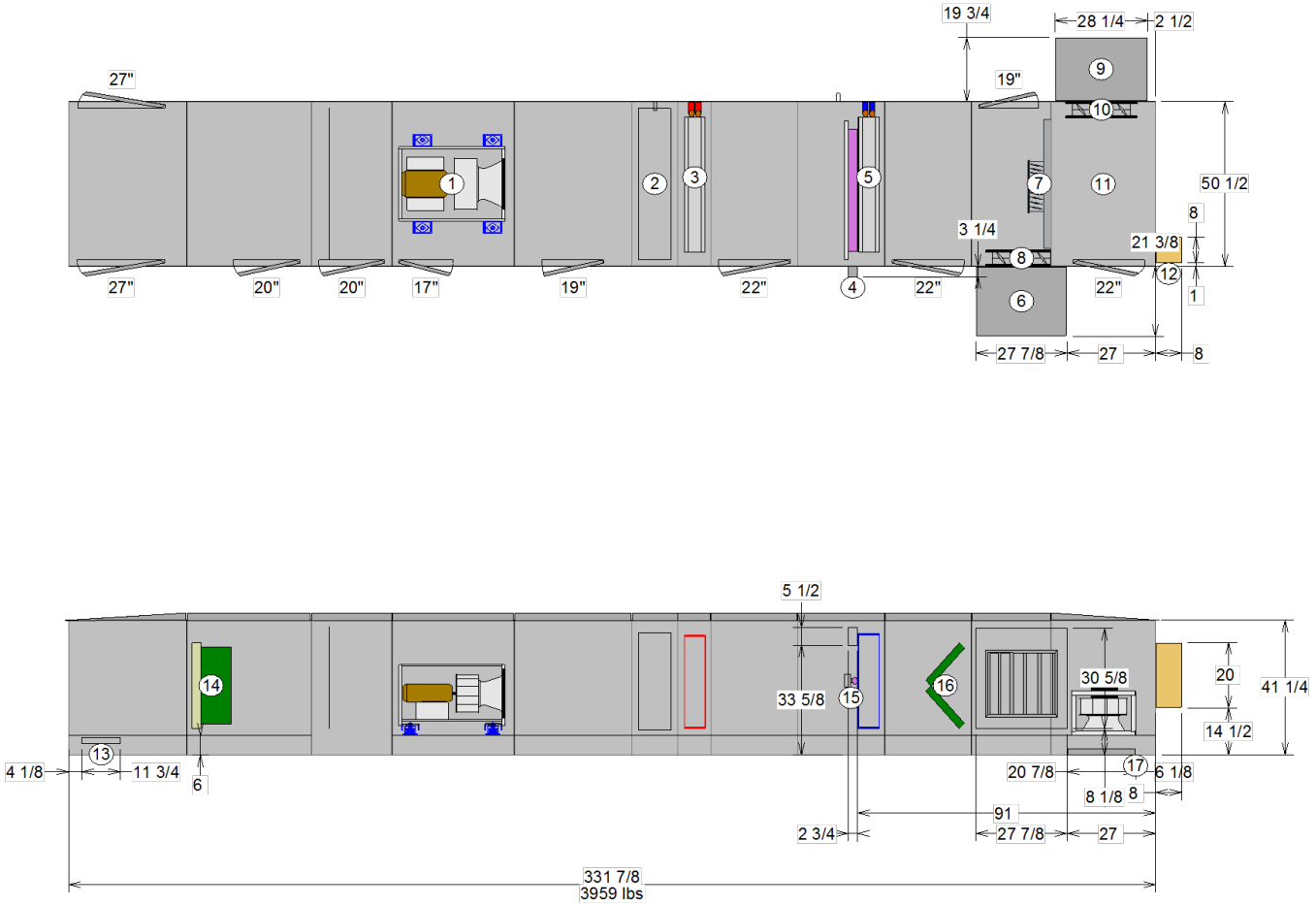
Filter Section Options

Door Location	Right

Discharge plenum - Position: 12

Openings						
Location	**Type**	**Airflow**	**Face Velocity**	**Area**	**Pressure Drop**	**Hood**
Bottom Face	Sizeable rectangular opening	3400 cfm	1275 ft/min	2.67 sq ft	0.051 in H2O	N/A

Section Options	
Door Location	Both
Bottom Face Protective Grate	No



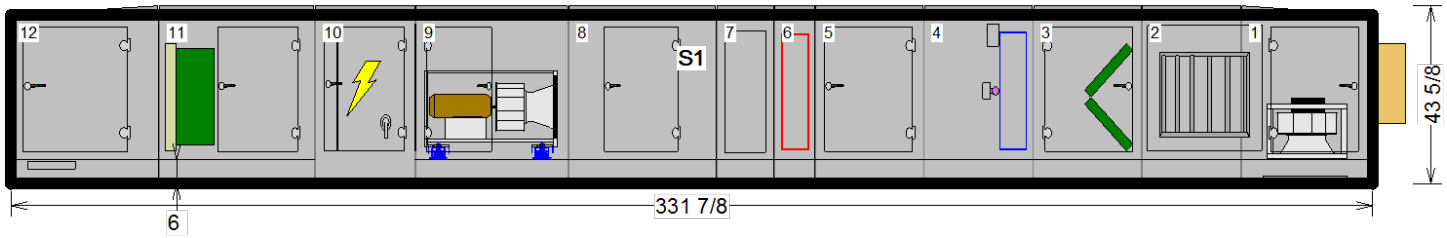
1	Plenum fan - 16.5in. dd plenum, 80% width, M press Supply fan 5 hp 460/3 None
2	Humidifier LH
3	Heating coil - 2 Coil type 5W
4	UV light switch RH
5	Cooling coil - 4 Coil type UF
6	Hood right
7	Return air damper right
8	Outside air damper right 21.25 x 22.22
9	Hood left
10	Damper left-parallel blade 21.25 x 22.22
11	Plenum fan - 19.5in 3 kW motorized impeller Return fan Motorized impeller fan 460/3 None
12	External unit controller Back
13	Opening bottom 32.83 x 11.7
14	HEPA filters - HEPA - 99.97% eff (500 fpm)
15	UV light rack
16	Angled filters - Pleated media - MERV 8
17	Opening bottom 20.87 x 20.87
	Doors 27 width x 31 height 20 width x 31 height 17 width x 31 height 19 width x 31 height 22 width x 31 height

For maneuvering purposes, include 1.125 inches to each ship split length for overlapping panel flange. Flange will not add to overall installed unit length shown.

OPENING AND DIMENSIONS MAY VARY FROM CONTRACT DOCUMENTS / RETURN OF APPROVED DRAWINGS CONSTITUTES ACCEPTANCE OF THESE VARIANCES / NOT TO SCALE

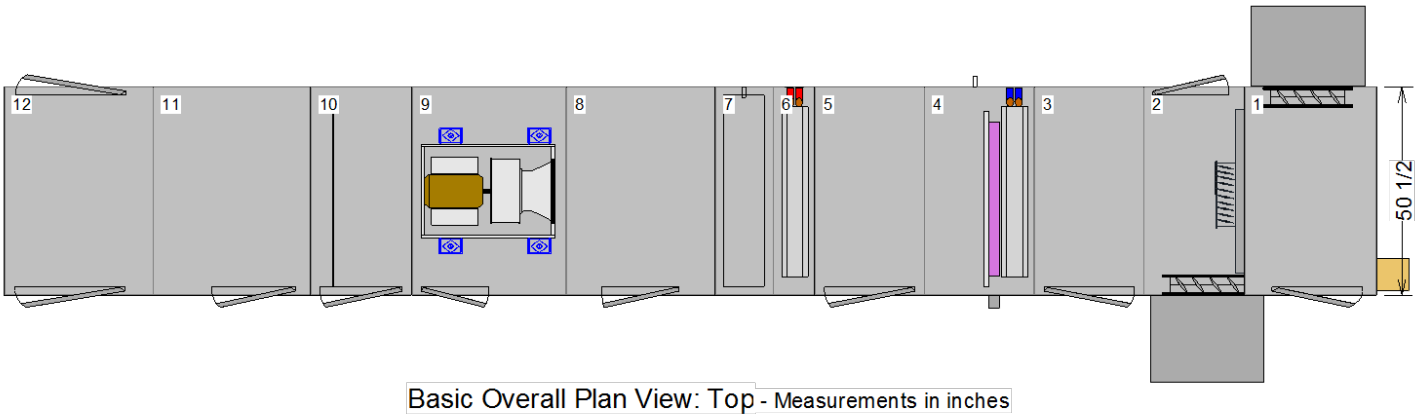
Unit size: 8	Job Name: CEC- Impressed Cultivation	Unit Casing: 2in Double Wall Foam
Product group: Outdoor unit	Actual airflow: 3400	Proposal Number:
Integral base frame: 6in. integral base frame	Sales Office:	Tags: Veg flower, Veg flower-1
Paint: Slate gray		Rigging weight: 3934.9 / Installed weight: 3959.5

Performance Climate Changer
Air Handlers



For maneuvering purposes, include 1.125 inches to each ship split length for overlapping panel flange. Flange will not add to overall installed unit length sh

Pos #	Module	Length	Weight
1	Fan section	32	550.85
2	Economizer section	24 1/4	375.55
3	Filter section	26 1/2	236.75
4	Coil section	26 5/8	274.28
5	Access section	26 5/8	180.73
6	Coil section	10	170.82
7	Humidification section	14	206.35
8	Access section	36 1/8	269.95
9	Fan section	37 1/4	723.60
10	Controls section	24 1/2	247.96
11	Filter section	38 1/8	421.74
12	Discharge plenum	36 1/8	300.89
		Installed Unit Weight	3959.48 lbs



Basic Overall Plan View: Top - Measurements in inches

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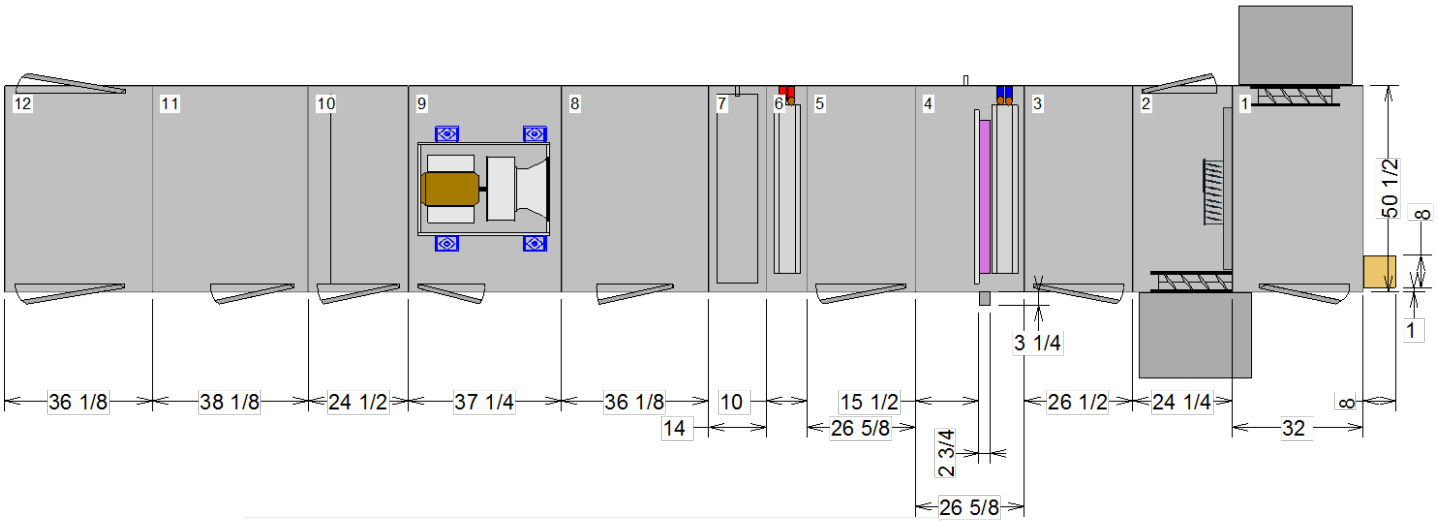
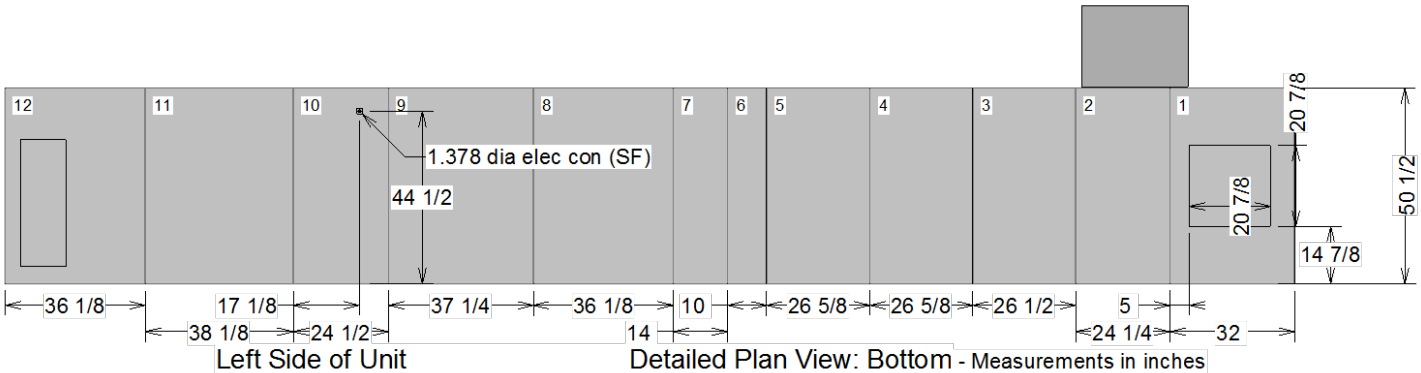
Unit size: 8	Job Name: CEC- Impressed Cultivation	Unit Casing: 2in Double Wall Foam	TRANE Performance Climate Changer Air Handlers
Product group: Outdoor unit	Actual airflow: 3400	Proposal Number:	
Integral base frame: 6in. integral base frame	Sales Office:	Tags: Veg flower, Veg flower-1	
Paint: Slate gray		Rigging weight: 3934.9 / Installed weight: 3959.5	



Right Side of Unit

Detailed Plan View: Top - Measurements in inches



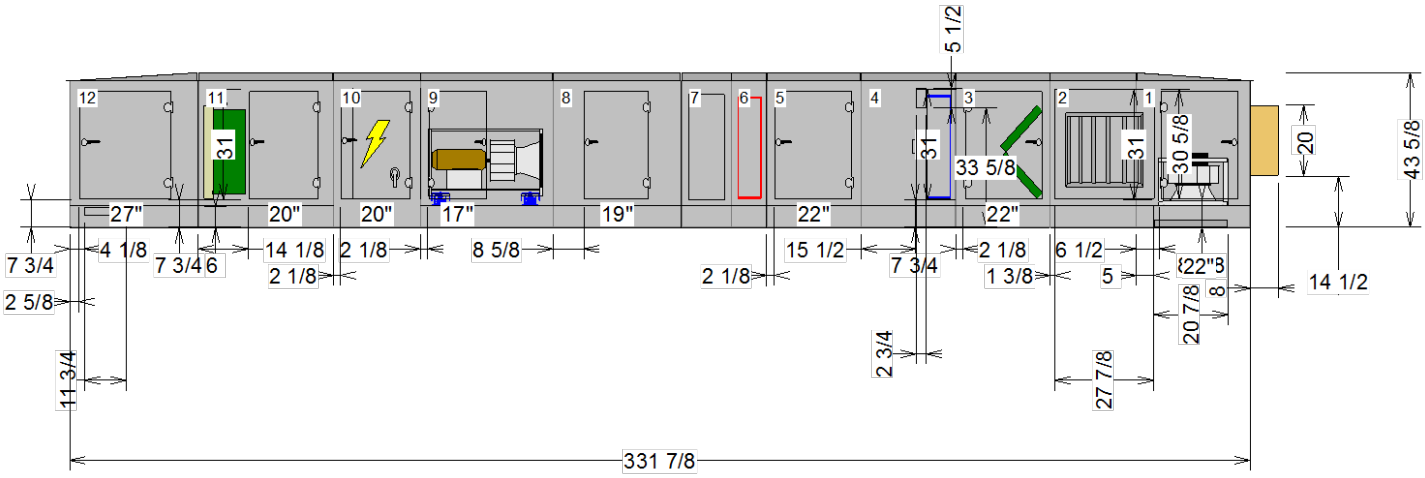
Left Side of Unit

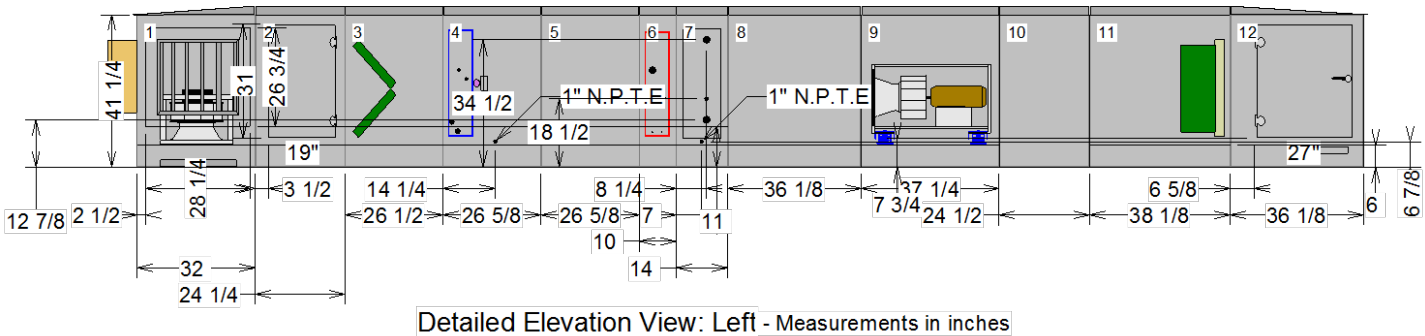
Detailed Plan View: Bottom - Measurements in inches

****Placement of electrical conduit may vary by a tolerance of 8" in any direction.**

OPENING AND DIMENSIONS MAY VARY FROM CONTRACT DOCUMENTS / RETURN OF APPROVED DRAWINGS CONSTITUTES ACCEPTANCE OF THESE VARIANCES / NOT TO SCALE

Unit size: 8	Job Name: CEC- Impressed Cultivation	Unit Casing: 2in Double Wall Foam	TRANE Performance Climate Changer Air Handlers
Product group: Outdoor unit	Actual airflow: 3400	Proposal Number:	
Integral base frame: 6in. integral base frame	Sales Office:	Tags: Veg flower, Veg flower-1	
Paint: Slate gray		Rigging weight: 3934.9 / Installed weight: 3959.5	



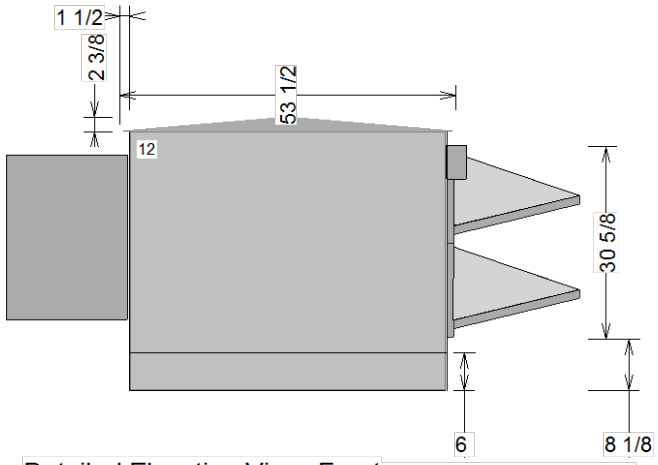


Detailed Elevation View: Left - Measurements in inches

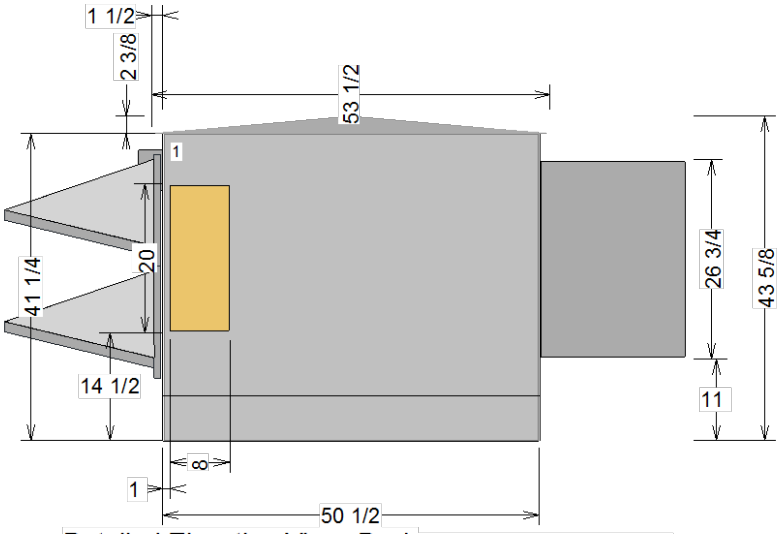
OPENING AND DIMENSIONS MAY VARY FROM CONTRACT DOCUMENTS / RETURN OF APPROVED DRAWINGS CONSTITUTES ACCEPTANCE OF THESE VARIANCES / NOT TO SCALE

Unit size: 8	Job Name: CEC- Impressed Cultivation	Unit Casing: 2in Double Wall Foam
Product group: Outdoor unit	Actual airflow: 3400	Proposal Number:
Integral base frame: 6in. integral base frame	Sales Office:	Tags: Veg flower, Veg flower-1
Paint: Slate gray		Rigging weight: 3934.9 / Installed weight: 3959.5

TRANE
Performance Climate Changer
Air Handlers



Detailed Elevation View: Front - Measurements in inches



Detailed Elevation View: Back - Measurements in inches

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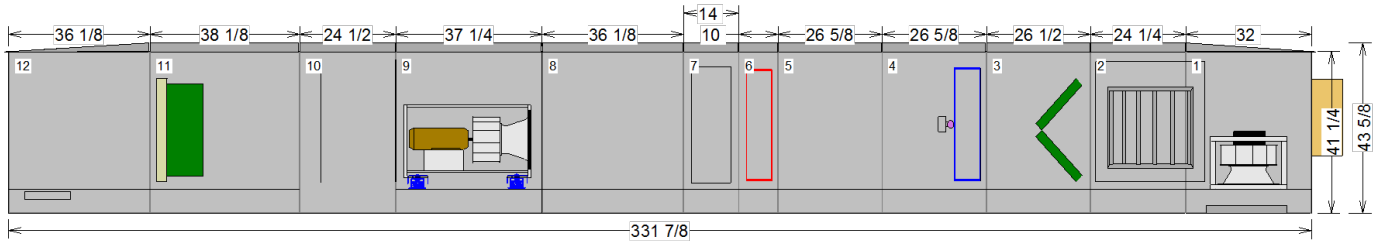
Unit size: 8	Job Name: CEC- Impressed Cultivation	Unit Casing: 2in Double Wall Foam	TRANE Performance Climate Changer Air Handlers
Product group: Outdoor unit	Actual airflow: 3400	Proposal Number:	
Integral base frame: 6in. integral base frame	Sales Office:	Tags: Veg flower, Veg flower-1	
Paint: Slate gray		Rigging weight: 3934.9 / Installed weight: 3959.5	



NPTI : National Pipe Thread Internal Connection
NPTE : National Pipe Thread External Connection

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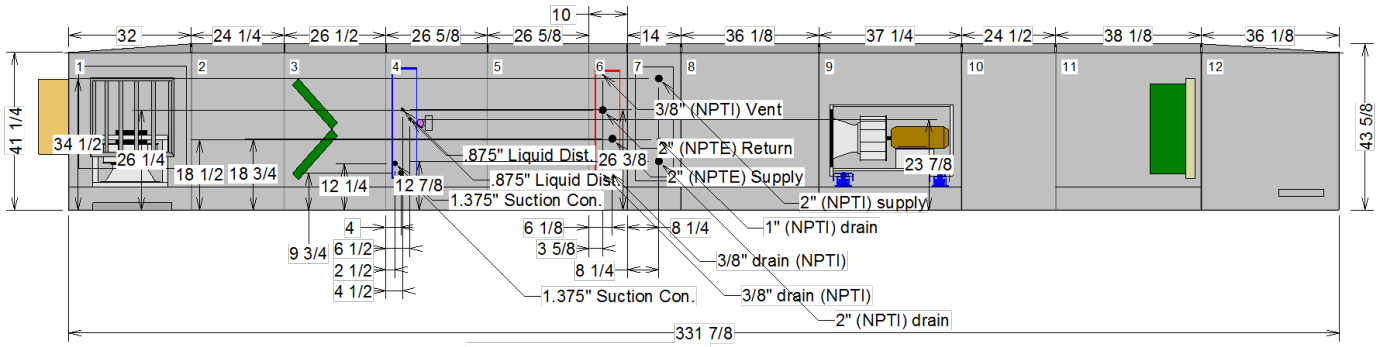
Product group: Outdoor unit	Actual airflow: 3400	Proposal Number:
Integral base frame: 6in. integral base frame	Sales Office:	Tags: Veg flower, Veg flower-1
Paint: Slate gray		Rigging weight: 3934.9 / Installed weight: 3959.5

TRANE
Performance Climate Changer
Air Handlers



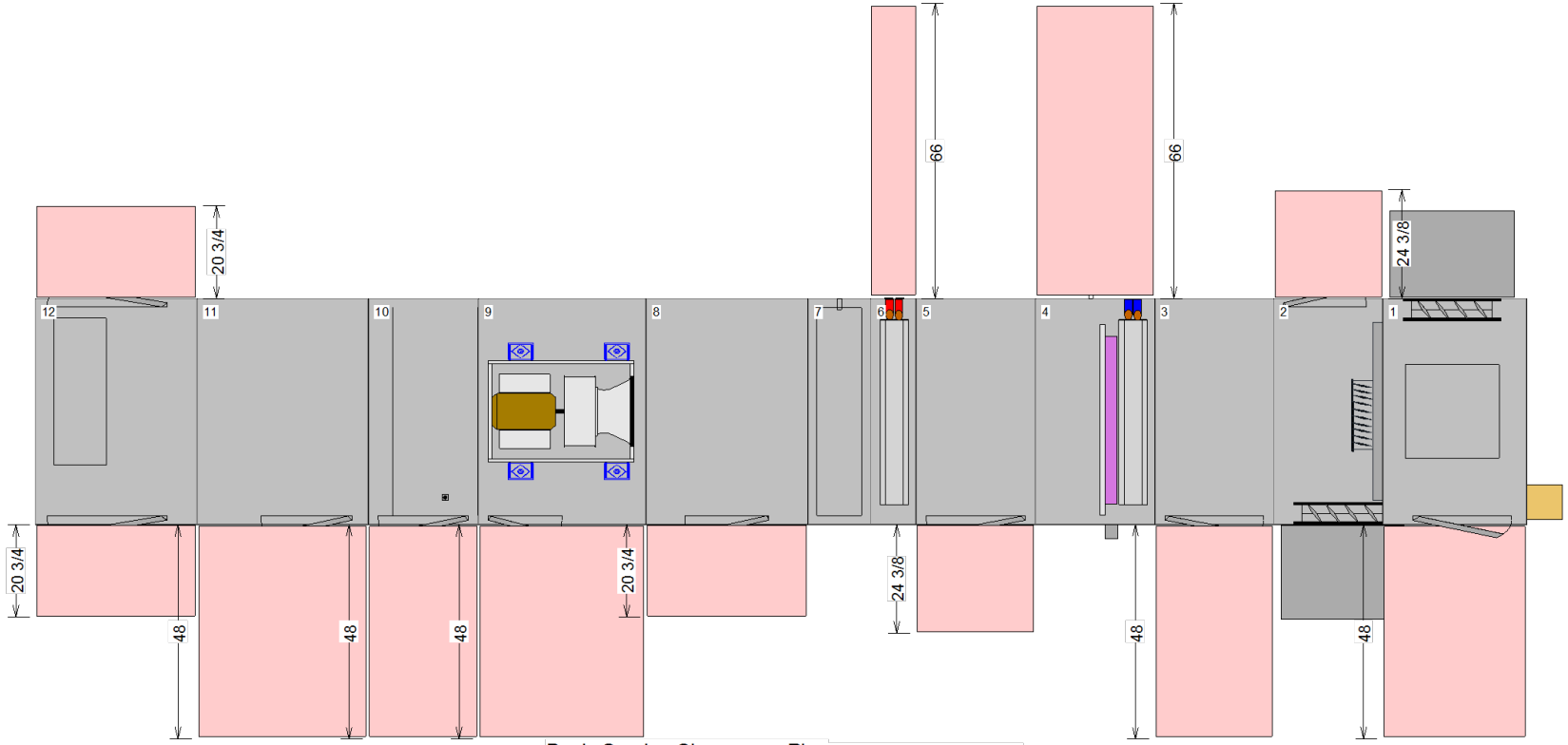
Coil connection view: Left - Measurements in inches

NPTI : National Pipe Thread Internal Connection
NPTE : National Pipe Thread External Connection

OPENING AND DIMENSIONS MAY VARY FROM CONTRACT DOCUMENTS / RETURN OF APPROVED DRAWINGS CONSTITUTES ACCEPTANCE OF THESE VARIANCES / NOT TO SCALE

Unit size: 8	Job Name: CEC- Impressed Cultivation	Unit Casing: 2in Double Wall Foam
Product group: Outdoor unit	Actual airflow: 3400	Proposal Number:
Integral base frame: 6in. integral base frame	Sales Office:	Tags: Veg flower, Veg flower-1
Paint: Slate gray		Rigging weight: 3934.9 / Installed weight: 3959.5

Performance Climate Changer
Air Handlers

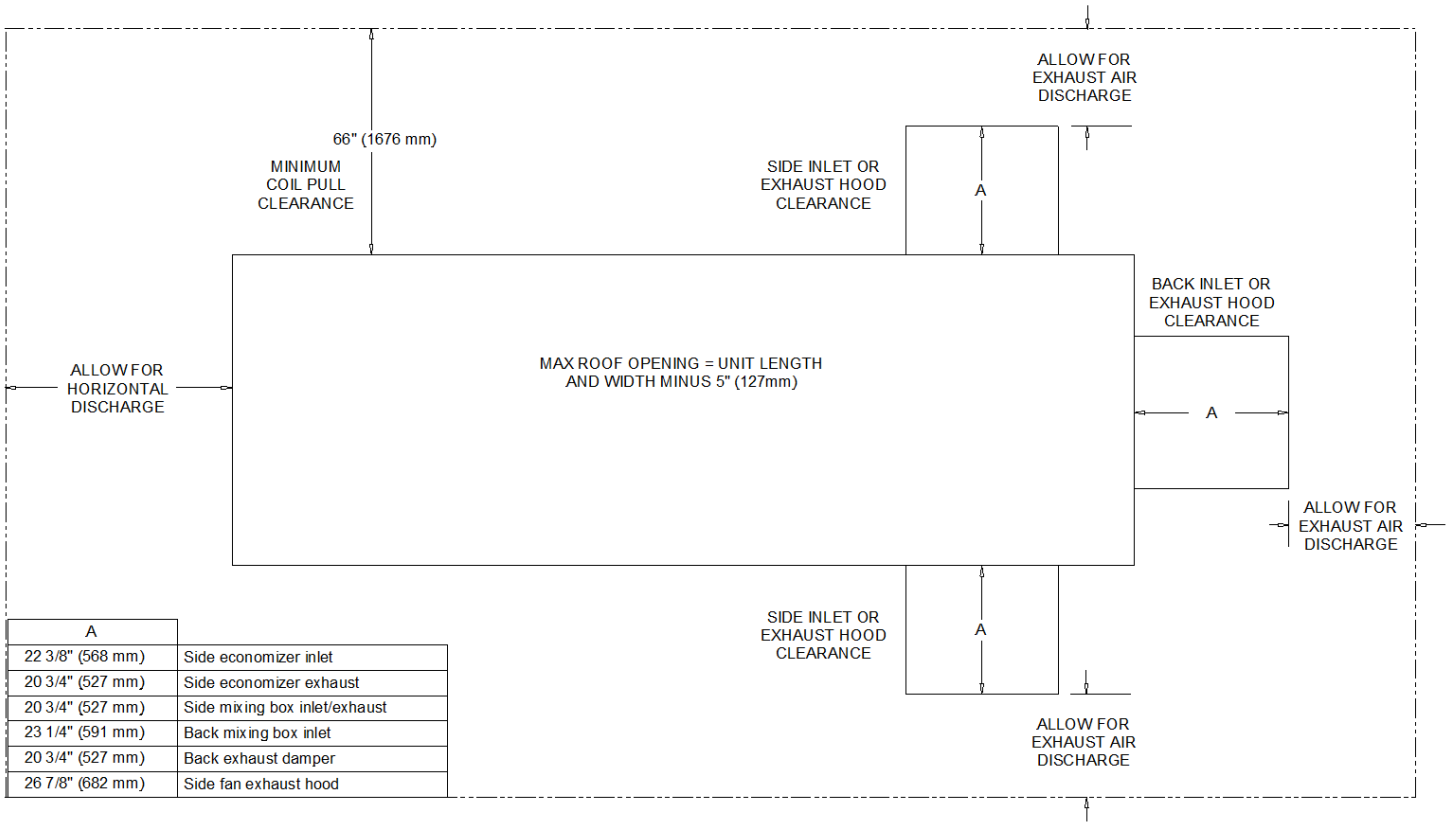


Basic Service Clearance - Plan - Measurements in inches

OPENING AND DIMENSIONS MAY VARY FROM CONTRACT DOCUMENTS / RETURN OF APPROVED DRAWINGS CONSTITUTES ACCEPTANCE OF THESE VARIANCES / NOT TO SCALE

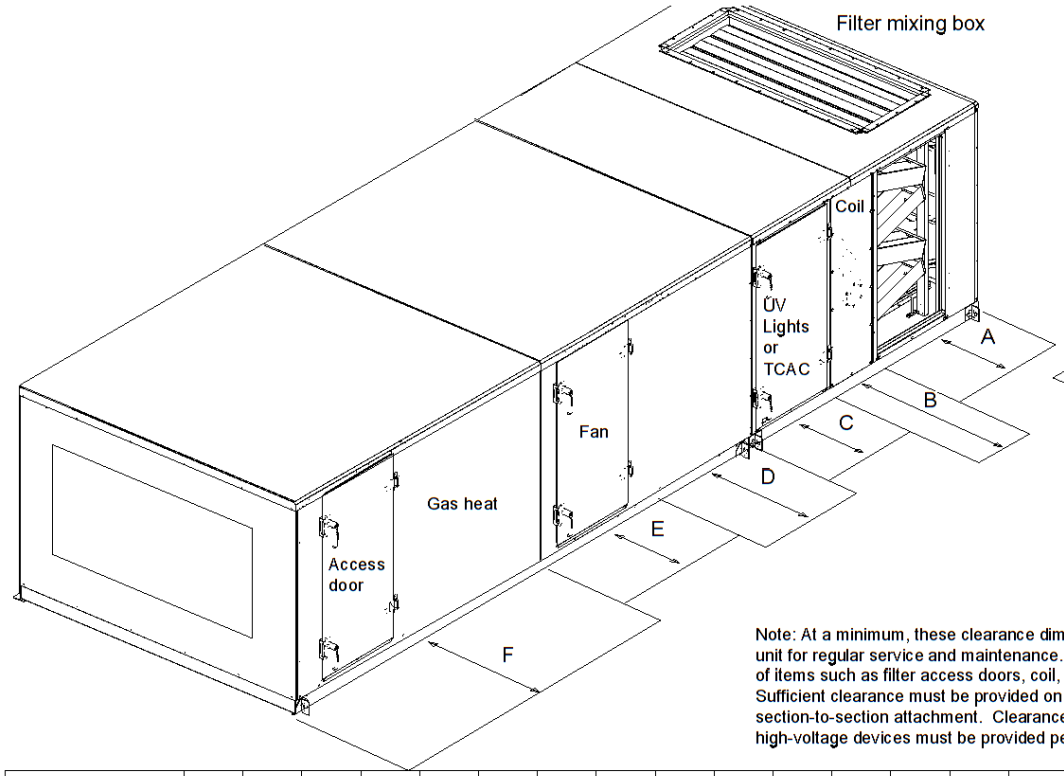
Unit size: 8	Job Name: CEC- Impressed Cultivation	Unit Casing: 2in Double Wall Foam
Product group: Outdoor unit	Actual airflow: 3400	Proposal Number:
Integral base frame: 6in. integral base frame	Sales Office:	Tags: Veg flower, Veg flower-1
Paint: Slate gray		Rigging weight: 3934.9 / Installed weight: 3959.5

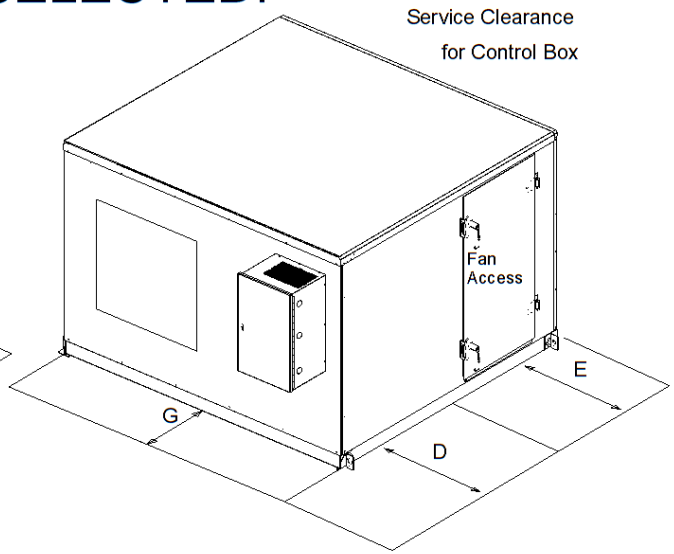
TRANE
Performance Climate Changer
Air Handlers



A	
22 3/8" (568 mm)	Side economizer inlet
20 3/4" (527 mm)	Side economizer exhaust
20 3/4" (527 mm)	Side mixing box inlet/exhaust
23 1/4" (591 mm)	Back mixing box inlet
20 3/4" (527 mm)	Back exhaust damper
26 7/8" (682 mm)	Side fan exhaust hood

EXAMPLE UNIT - NOT CONFIGURED AS SELECTED.





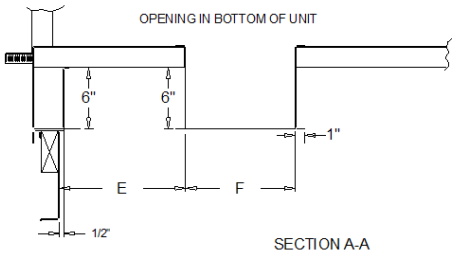
Note: At a minimum, these clearance dimensions are recommended on one side of the unit for regular service and maintenance. Refer to as-built submittal for locations of items such as filter access doors, coil, piping connections, motor locations, etc. Sufficient clearance must be provided on all sides of unit for removal of panels or section-to-section attachment. Clearance for starters, VFDs, or other high-voltage devices must be provided per NEC requirements.

Component	3	4	6	8	10	12	14	17	21	25	30	35	40	50	57	66	80	100	120
A (filter)	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	52	56	58	58
B (coil, humidifier)	48	59	59	66	77	82	87	87	95	95	109	115	128	141	141	156	156	170	197
B (staggered coil)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	67	67	76	80	88	96	96	105	105	113	129
C (UV Lights)	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	52	56	58	58
C (TCAC)	43	59	59	63	75	81	83	83	58	58	83	75	83	83	83	83	83	75	83
D (External Starter, VFD, LV box or Overload box)	61	61	61	61	61	61	61	61	64	64	64	64	64	64	64	64	64	64	64
D (Internal Starter or VFD)	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48
E (fan)	48	48	48	48	51	54	58	61	60	66	66	66	70	77	77	93	93	101	101
F (Gas Heat Ext Vestible)	N/A	N/A	89	90	108	100	100	105	115	115	118	136	140	156	156	170	179	180	N/A
F (Gas Heat Int Vestible)	N/A	N/A	56	63	74	79	84	84	92	92	106	112	125	138	138	153	153	167	194

Component	All Sizes
G (Side mount LV box)	36
G (Front mount LV box)	13

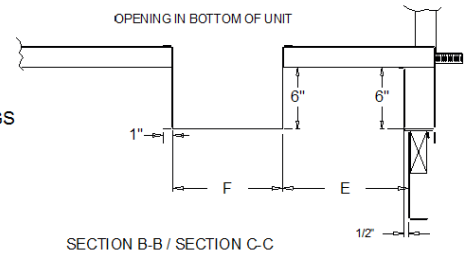
RELATIONSHIP OF CURB TO UNIT AS-BUILT

RECTANGULAR OPENINGS



SECTION A-A

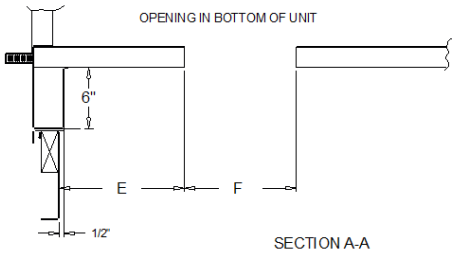
SUPPLY FAN OR DISCHARGE PLENUM (SEE NOTE 1)



SECTION B-B / SECTION C-C

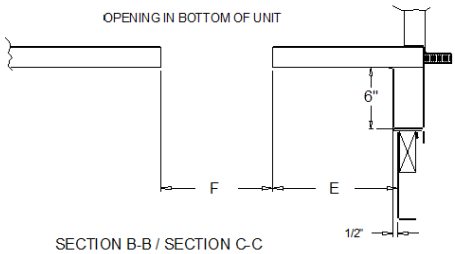
MIX BOX, RETURN FAN OR EXHAUST FAN SECTION (SEE NOTE 1)

ROUND OPENINGS



SECTION A-A

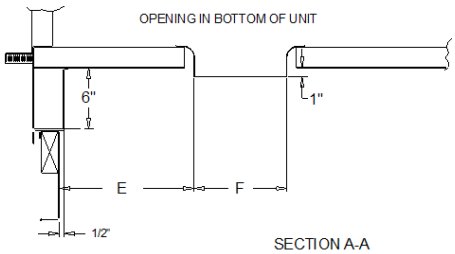
SUPPLY FAN OR DISCHARGE PLENUM (SEE NOTE 1)



SECTION B-B / SECTION C-C

MIX BOX, RETURN FAN OR EXHAUST FAN SECTION (SEE NOTE 1)

BELLMOUTH OPENINGS



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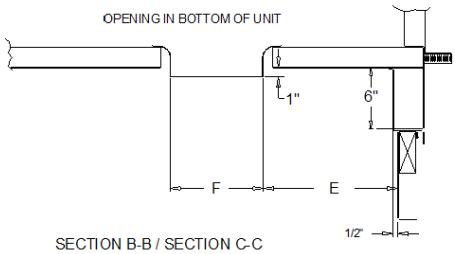
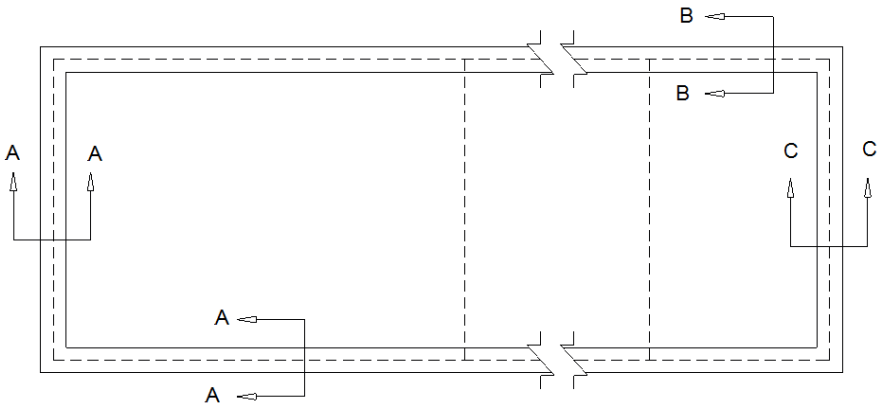


SECTION B-B / SECTION C-C

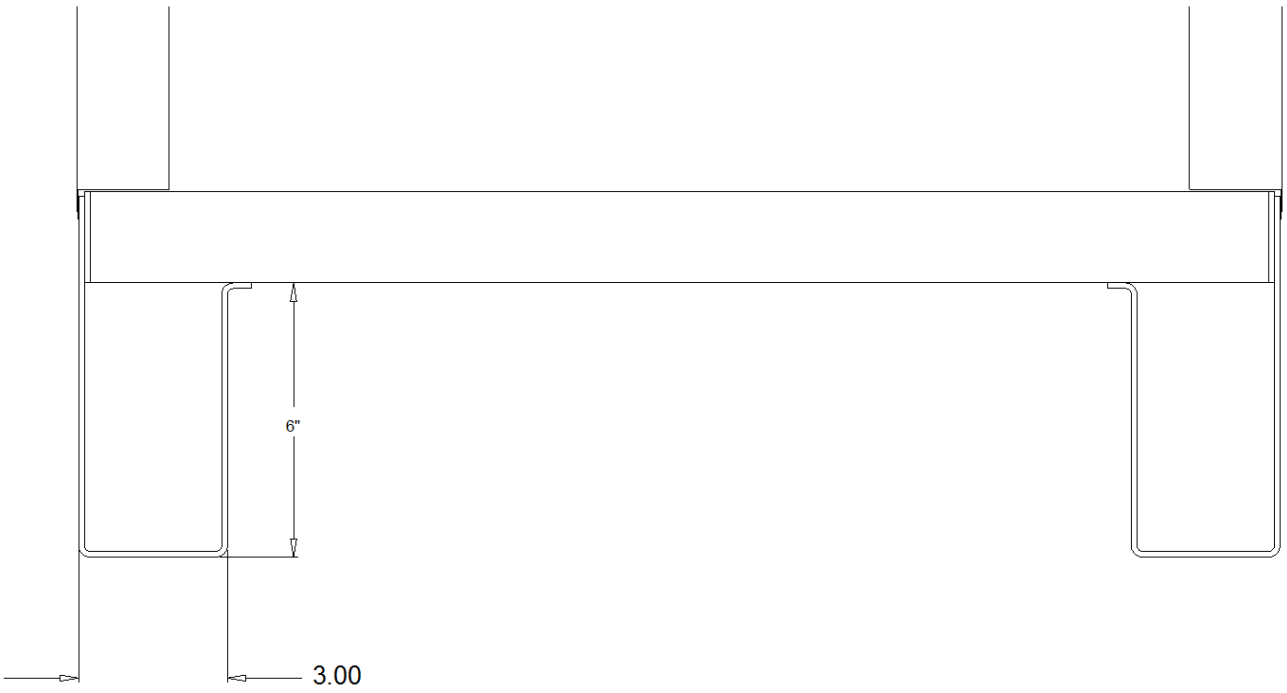
MIX BOX, RETURN FAN OR EXHAUST FAN SECTION (SEE NOTE 1)

NOTE:

1. E and F are representative of dimensions on the accessory as-built used to locate opening(s) in the roof surface.

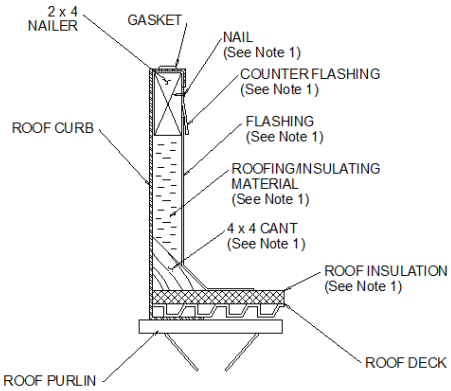


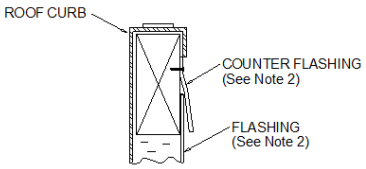
Base Detail

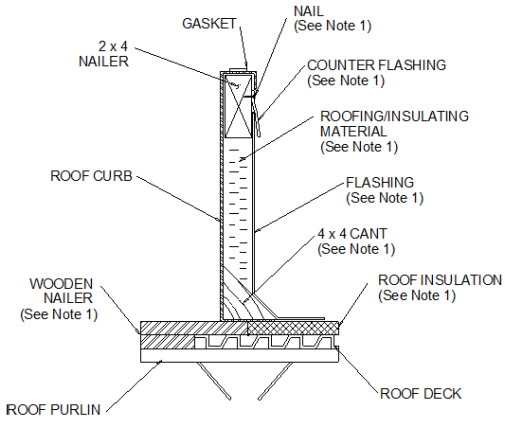


Recommendation for Roof Curb Installation

Refer to Performance IOM for specific installation instructions





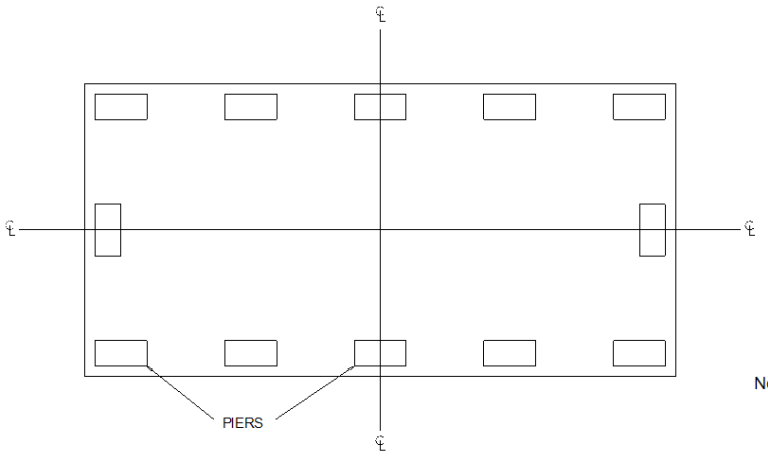


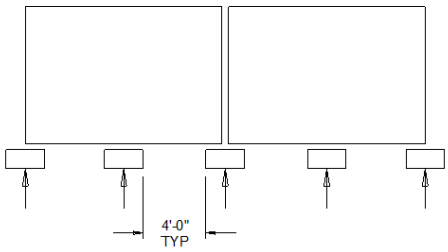
Note:

1. Materials to attach roof curb to roof are to be supplied by the installer.
2. Flashing or counter flashing should not come to or over top of curb.
3. Roof curb must be mechanically fastened to roof surface.

Recommendation for Pier Mounting

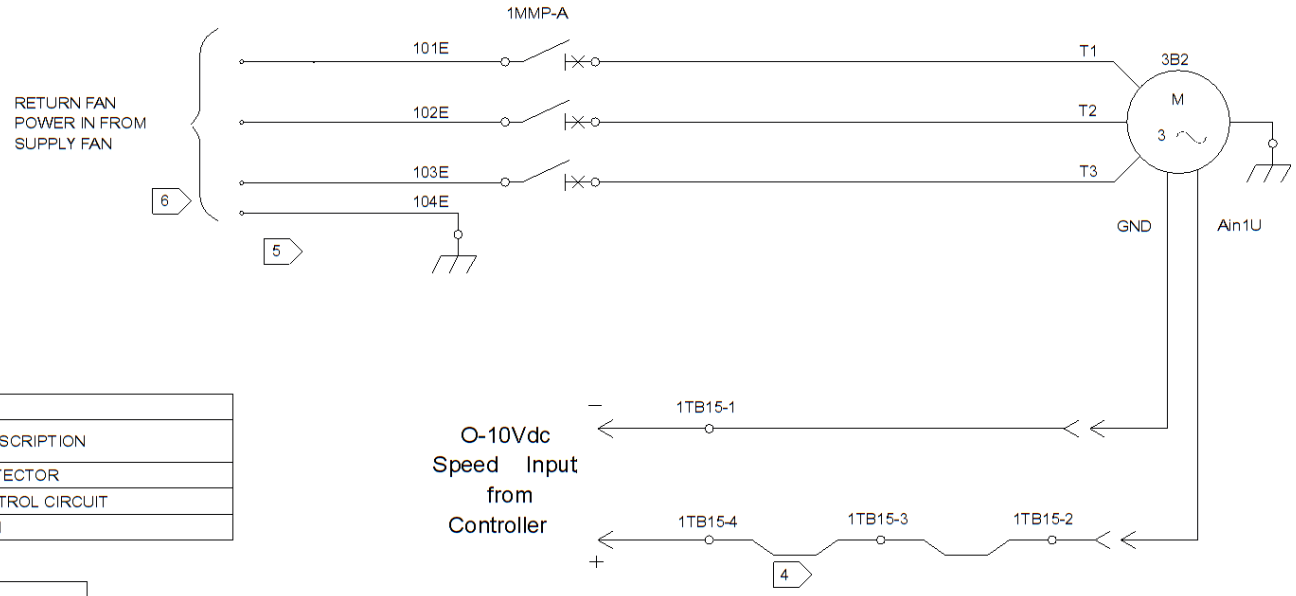
Refer to Performance IOM for specific installation instructions





Note:

1. Pier supports should be inside 3" (3 - 50) or 4" (57 - 120) flat of unit base. Unit cannot be supported by unit base drip leg.
2. Piers beneath shipping splits must be structurally sound to support the weight of the unit.



LEGEND	
DEVICE DESIGNATION	DESCRIPTION
1MMP-A	MANUAL MOTOR PROTECTOR
1TB15	TERMINAL STRIP CONTROL CIRCUIT
3B2	RETURN FAN MOTOR 1

DEVICE PREFIX LOCATION CODE	
AREA	LOCATION
1	HIGH VOLTAGE PANEL
2	LOW VOLTAGE PANEL (UNIT SCHEMATIC)
3	AIR HANDLER SECTION

NOTES:

1. DASHED LINES INDICATE RECOMMENDED FIELD WIRING BY OTHERS. PHANTOM LINES INDICATE CONTROL OPTION. REF. CONTROL PANEL SCHEMATIC FOR SPECIFIC DETAIL.
2. ALL FIELD WIRING MUST BE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE (NEC), STATE AND LOCAL REQUIREMENTS. OTHER COUNTRIES APPLICABLE NATIONAL AND/OR LOCAL REQUIREMENTS SHALL APPLY. FIELD CONDUCTORS SHALL HAVE INSULATION RATINGNOT LESS THAN 600V COPPER CONDUCTORS ONLY.
3. THE MINIMUM CIRCUIT AMPACITY, THE MAXIMUM FUSE SIZE, AND DISCONNECT SIZE ARE CALCULATED BASED ON THE INVERTER INPUT LINE CURRENTS PER ARTICLE 430-2 OF THE NATIONAL ELECTRICAL CODE.

4. REMOVE JUMPER AND INSTALL FIELD SAFETY INTERLOCK.

5. ATTACH GROUND OR EQUIPMENT GROUND.

6. IF UNIT HAS SHIPPING SPLITS WIRING WILL TERMINATE TO MODULE AT EACH SHIPPING SPLIT

4953525

NOTICE

USE COPPER CONDUCTORS ONLY!

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FAILURE TO DO THE ABOVE COULD RESULT IN EQUIPMENT DAMAGE.

AVIS

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FAIRE DÉFAUT À LA PROCÉDURE CI-DESSUS PEUT ENTRAÎNER DES DOMMAGES À L'ÉQUIPEMENT.

AVISO

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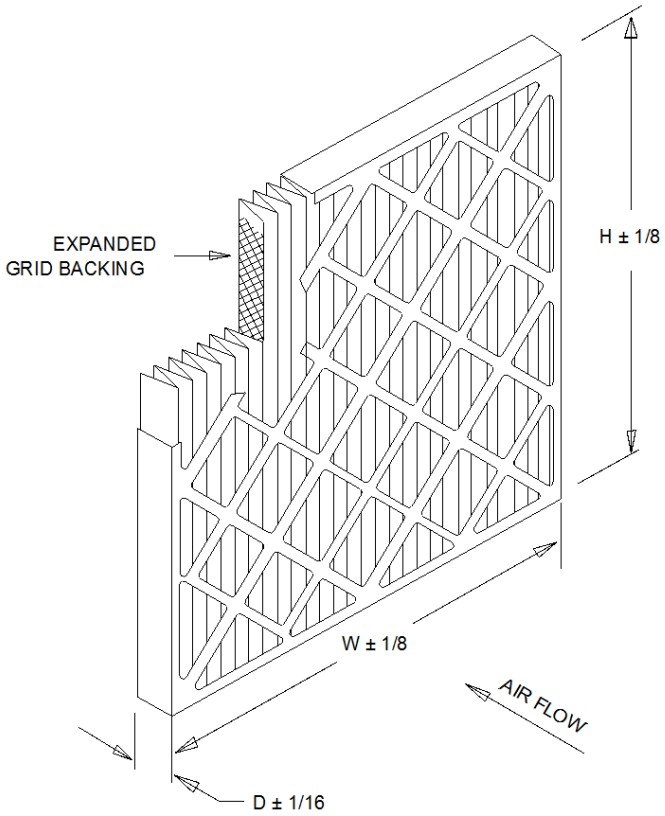
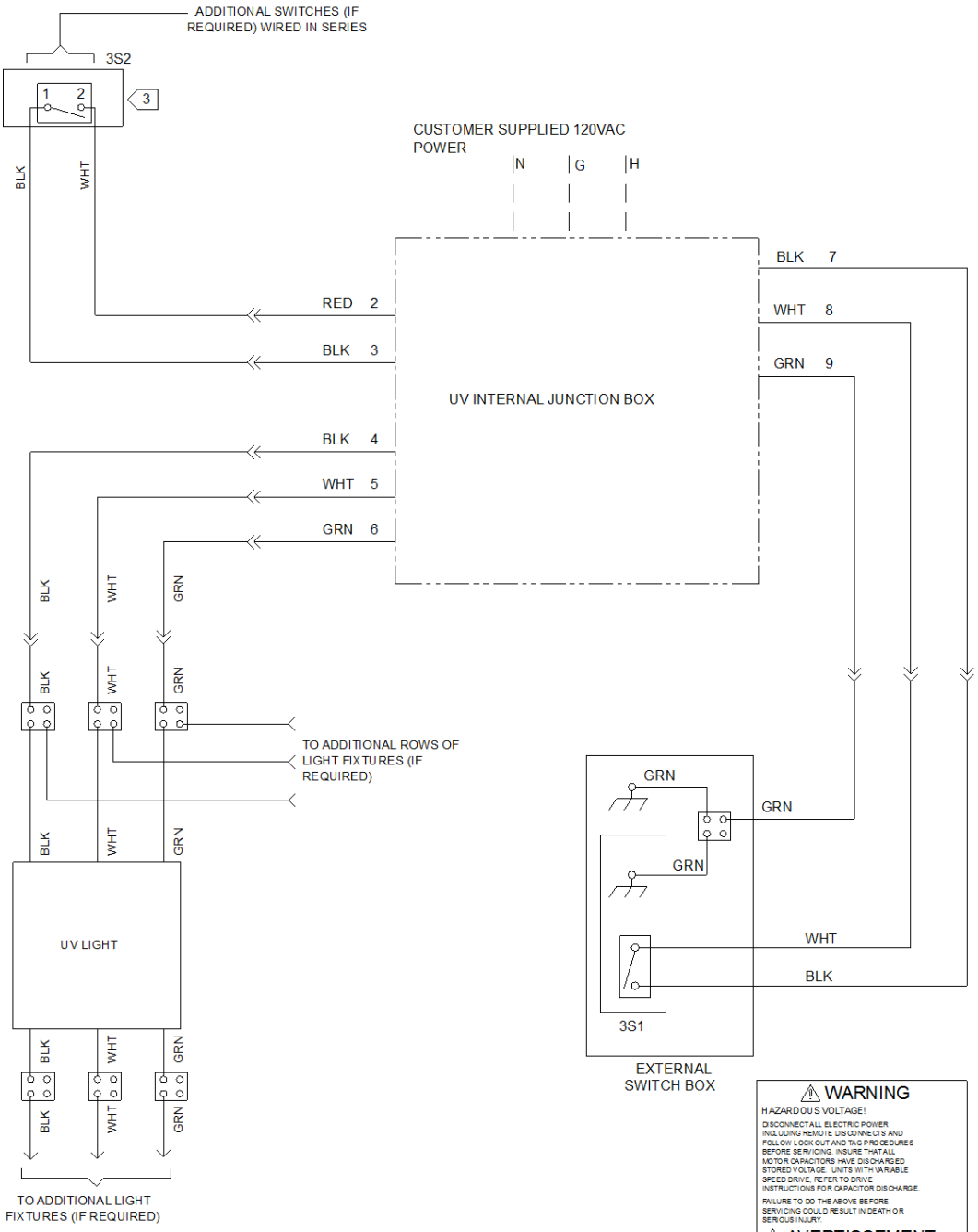


STANDARD CONSTRUCTION
1. 100 % Synthetic White Un-Dyed Media
2. 10.0 Pleats Per Foot
3. Expanded Metal Pleat Supports
4. Moisture Resistant Beverage Board Frame
5. Double Wall Frame

NOTES
1. MERV 8-A Per ASHRAE 52.2-2007 Appendix J.
2. Final Resistance: 1/0" W.G.
3. Rated Velocity: 500 FPM
4. Class 2 Filter Per U.L. Standard 900
5. Maximum Operating Temperature: 225 DEG. F

MODEL NUMBER	NOMINAL SIZE IN. W X H X D	ACTUAL SIZE IN. W X H X D	RATED AIR FLOW CFM	INITIAL RESISTANCE IN. W.G.	MEDIA AREA SQ. FT.
MX40-STD2-217	10 X 20 X 2	9-1/2 X 19-1/2 X 1-3/4	700	0.29	4.7
MX40-STD2-220	12 X 20 X 2	11-1/2 X 19-1/2 X 1-3/4	840	0.29	5.5
MX40-STD2-210	12 X 24 X 2	11-3/8 X 23-3/8 X 1-3/4	1000	0.29	6.2
MX40-STD2-239	14 X 20 X 2	13-1/2 X 19-1/2 X 1-3/4	980	0.29	5.7
MX40-2TD2-241	14 X 25 X 2	13-1/2 X 24-1/2 X 1-3/4	1220	0.29	7.1
MX40-STD2-245	15 X 20 X 2	14-1/2 X 19-1/2 X 1-3/4	1050	0.29	6.2
MX40-STD2-201	16 X 20 X 2	15-1/2 X 19-1/2 X 1-3/4	1120	0.29	6.7
MX40-STD2-216	16 X 24 X 2	15-3/8 X 23-3/8 X 1-3/4	1340	0.29	8.0
MX40-STD2-202	16 X 24 X 2	15-1/2 X 24-1/2 X 1-3/4	1400	0.29	8.0
MX40-STD2-280	15 X 20 X 2	17-1/2 X 19-1/2 X 1-3/4	1250	0.29	7.8
MX40-STD2-212	18 X 24 X 2	17-3/8 X 23-3/8 X 1-3/4	1500	0.29	9.3
MX40-STD2-285	18 X 25 X 2	17-1/2 X 24-1/2 X 1-3/4	1570	0.29	9.7
MX40-STD2-203	20 X 20 X 2	19-1/2 X 19-1/2 X 1-3/4	1400	0.29	8.3
MX40-STD2-211	20 X 24 X 2	19-3/8 X 23-3/8 X 1-3/4	1670	0.29	9.9
MX40-STD2-204	20 X 25 X 2	19-1/2 X 24-1/2 X 1-3/4	1750	0.29	10.3
MX40-STD2-205	24 X 24 X 2	23-3/8 X 23-3/8 X 1-3/4	2000	0.29	11.7
MX40-STD2-225	25 X 25 X 2	24-1/2 X 24-1/2 X 1-3/4	2170	0.29	13.6



LEGEND	
DEVICE DESIGNATION	DESCRIPTION
3S1	MAIN EXTERNAL UV LIGHT SWITCH
3S2	DOOR KILL SWITCH FOR UV LIGHTS

NOTES:

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2. ALL FIELD WIRING MUST BE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE (NEC), STATE AND LOCAL REQUIREMENTS. OTHER COUNTRIES APPLICABLE NATIONAL AND/OR LOCAL REQUIREMENTS SHALL APPLY. FIELD CONDUCTORS SHALL HAVE INSULATION INSULATION RATING NOT LESS THAN 600V.
3. SWITCH CLOSES WHEN ACCESS DOORS ARE SHUT.
4. UV LAMPS WILL NEED TO BE INSTALLED IN LAMP FIXTURES BEFORE UNIT START UP.
5. UV LAMPS WILL NOT REMOVE AIRBORNE CONTAMINANTS. LAMPS ARE DESIGNED TO CONTROL MICROBIAL GROWTH ON COIL AND DRAIN PAN SURFACES. DO NOT CYCLE LAMPS OFF AND ON. REPLACE LAMPS ONCE PER YEAR.

CAUTION

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FAILURE TO DO SO MAY CAUSE DAMAGE TO THE EQUIPMENT.

ATTENTION

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⚠ WARNING

HAZARDOUS VOLTAGE!

DISCONNECT ALL ELECTRIC POWER INCLUDING REMOTE DISCONNECTS AND FOLLOW LOCK OUT AND TAG PROCEDURES BEFORE SERVICING. INSURE THAT ALL MOTOR CAPACITORS HAVE DISCHARGED STORED VOLTAGE. UNITS WITH VARIABLE SPEED DRIVE, REFER TO DRIVE INSTRUCTIONS FOR CAPACITOR DISCHARGE.

FAILURE TO DO THE ABOVE BEFORE SERVICING COULD RESULT IN DEATH OR SERIOUS INJURY.

⚠ AVERTISSEMENT

TENSION DANGEREUSE!

COUPER TOUTES LES TENSIONS ET OUVRIR LES SECTIONNEURS À DISTANCE. PUIS SUIVRE LES PROCÉDURES DE VERROUILLAGE ET DES ÉTIQUETTES AVANT TOUTE INTERVENTION. VÉRIFIER QUE TOUS LES CONDENSATEURS DES MOTEURS SONT DÉCHARGÉS. DANS LE CAS D'UNITÉS COMPORTANT DES ENTRAÎNEMENTS À VITESSE VARIABLE, SE REPORTER AUX INSTRUCTIONS DE L'ENTRAÎNEMENT POUR DÉCHARGER LES CONDENSATEURS.

NE PAS RESPECTER CES MESURES DE PRÉCAUTION PEUT ENTRAÎNER DES BLESSURES GRAVES POUVANT ÊTRE MORTELLES.

⚠ ADVERTENCIA

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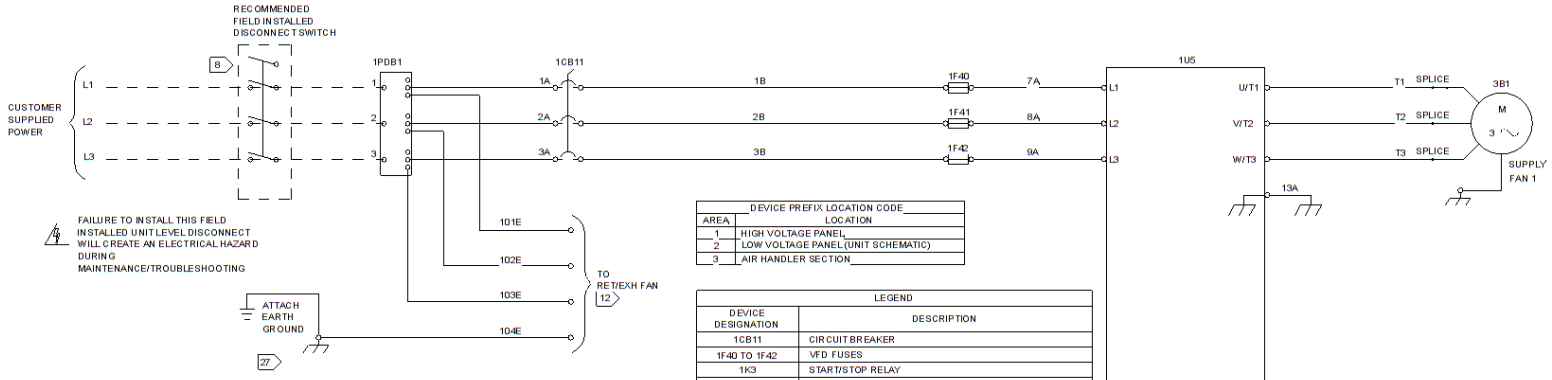
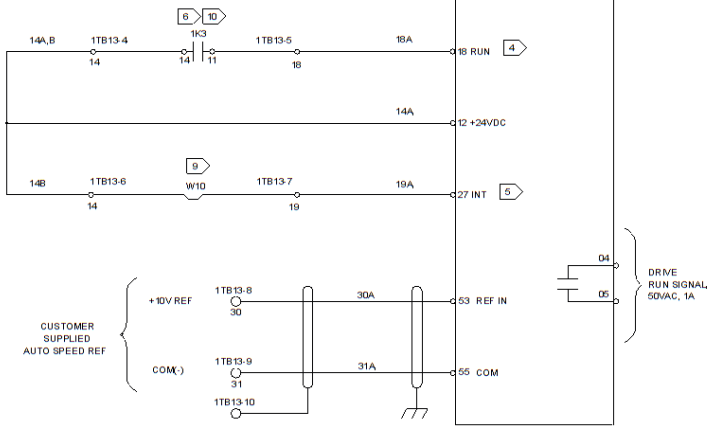


DEVICE PREFIX LOCATION CODE	
AREA	LOCATION
1	HIGH VOLTAGE PANEL
2	LOW VOLTAGE PANEL (UNIT SCHEMATIC)
3	AIR HANDLER SECTION

LEGEND	
DEVICE DESIGNATION	DESCRIPTION
1CB11	CIRCUIT BREAKER
1F40 TO 1F42	VFD FUSES
1K3	START/STOP RELAY
1K5	LOW LIMIT RELAY
1PDB1	POWER DISTRIBUTION BLOCK
1TB13	TERMINAL STRIP CONTROL CIRCUIT
1U5	VFD CONTROLLER
3B1	MOTOR 1



VFD FUSES (CLASS T)			
FUSE	VOLTAGE	HP	P/N
1F40 1F41 1F42	200/230	1,1.5	JJN-10
		2	JJN-15
		3	JJN-20
		5	JJN-25
		7.5	JJS-30
		10	JJN-50
		15	JJN-60
		20	JJN-80
		25,30	JJN-125
		40	FWH-150B
		50	FWH-200B
	460	1,1.5	JJS-6
		2,3	JJS-10
		5	JJS-20
		7.5	JJS-25
		10	JJS-30
		15,20	JJS-40
		25	JJS-50
		30	JJS-60
		40	JJS-80
		50	JJS-100
		60	JJS-125
		75	FWH-150B
		100	FWH-200B
		125	FWH-250B
	575	1,1.5	JJS-3
		2,3	JJS-6
		5,7.5	JJS-10
		10	JJS-15
		15	JJS-20
		20	JJS-30
		25	JJS-35
		30	JJS-45
		40	JJS-60
		50	JJS-80
		60	JJS-90
		75	JJS-100
		100	FWP-125A
		125	FWP-175B

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10040

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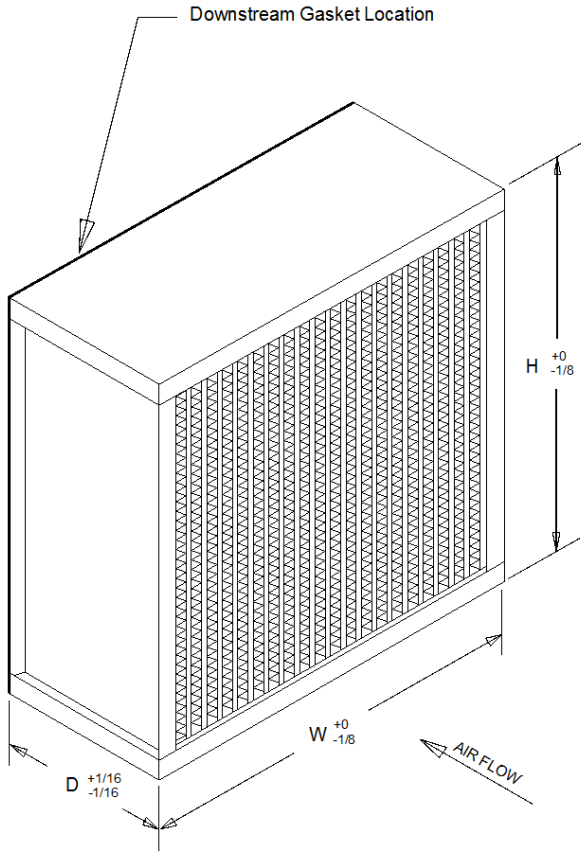
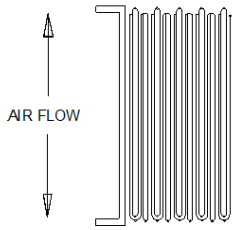
3. THE MINIMUM CIRCUIT AMPACITY, THE MAXIMUM FUSE SIZE, AND DISCONNECT SIZE ARE CALCULATED BASED ON THE INVERTER INPUT LINE CURRENTS PER ARTICLE 430-2 OF THE NATIONAL ELECTRICAL CODE.
4. PROGRAM TERMINAL 18 AS RUN.
5. PROGRAM TERMINAL 27 INV. COASTING STOP.
6. CLOSES TO RUN AUTO MODE OR BYPASS AUTO FOR OPTION VFD OR STARTER.
8. CUSTOMER SUPPLIED LOCKABLE DISCONNECTING MEANS, SUCH AS A DISCONNECT SWITCH OR CIRCUIT BREAKER, INSTALLED LOCAL TO UNIT. SIZE AND PLACEMENT OF DEVICE SHALL BE DONE IN ACCORDANCE WITH APPLICABLE NATIONAL AND LOCAL ELECTRICAL CODES.
9. REMOVE JUMPER AND INSTALL FIELD SAFETY INTERLOCK.
10. FIELD SUPPLIED CONTACTS.
12. IF UNIT HAS SHIPPING SPLITS WIRING WILL TERMINATE TO MODULE AT EACH SHIPPING SPLIT.
27. ATTACH GROUND OR EQUIPMENT GROUND.





Frame Cross Section Top View

Construction	Code	Description
Standard and Certification	0	HEPA-IEST-RP-CC001.3, Type A per MIL-STD 282
Frame Material	A	16 GA Corrosion Resistant Steel
Frame Style	G	Metal C-Style
Gasket	0	SCE 43 Neoprene 1/4" x 3/4" (180 deg. F). Dovetail Joints
Gasket Location	0	Downstream
Sealant	0	Urethane (180 deg. F)
Hardware	0	None
Acceptance Level	0	99.97 % on 0.3 Micron Overall (Q-107 Tested)
Separators	F	Aluminum Separators, High Capacity

Item Number	Model Number	Construction Code	Actual Size (Inches) H x W x D	Rated Air Flow (CFM)	Initial Resistance (In. W.G.)	Efficiency	Media Area (Square Feet)
2970315	MC2000-501	H2424B00-0AG 000 00F	24 x 24 x 11-1/2	2000	1.35	99.97 % @ 0.3 Micron	286
2970754	MC2000-501A	H2323B33-0AG 000 00F	23-3/8 x 23-3/8 x 11-1/2	1890	1.35	99.97 % @ 0.3 Micron	271
2971408	MC2000-500	H1224B00-0AG 000 00F	12 x 24 11-1/2	1000	1.35	99.97 % @ 0.3 Micron	133
2973408	MC2000-500A	H1123B33-0AG 000 00F	11-3/8 x 23-3/8 x 11-1/2	924	1.35	99.97 % @ 0.3 Micron	122
2971988	MC2000-500R	H2412B00-0AG 000 00F	24 x 12 x 11-1/2	1000	1.35	99.97 % @ 0.3 Micron	133
2971544	MC2000-500AR	H2311B33-0AG 000 00F	23-3/8 x 11-3/8 x 11-1/2	924	1.35	99.97 % @ 0.3 Micron	122
2970102	MC2000-502	H2430B00-0AG 000 00F	24 x 30 x 11-1/2	2750	1.35	99.97 % @ 0.3 Micron	362
	MC2000-502R	H3024B00-0AG 000 00F	30 x 24 x 11-1/2	2750	1.35	99.97 % @ 0.3 Micron	362
2972861	MC2000-241	H2424A00-0AG 000 00F	24 x 24 x 5-7/8	1000	1.35	99.97 % @ 0.3 Micron	149
	MC2000-241A	H2323A33-0AG 000 00F	23-3/8 x 23-3/8 x 5-7/8	950	1.35	99.97 % @ 0.3 Micron	142
2974237	MC2000-1202	H1224A00-0AG 000 00F	12 x 24 x 5-7/8	500	1.35	99.97 % @ 0.3 Micron	70
	MC2000-1202A	H1123A33-0AG 000 00F	11-3/8 x 23-3/8 x 5-7/8	462	1.35	99.97 % @ 0.3 Micron	64
2974168	MC2000-1202R	H2412A00-0AG 000 00F	24 x 12 x 5-7/8	500	1.35	99.97 % @ 0.3 Micron	70
	MC2000-1202AR	H2311A33-0AG 000 00F	23-3/8 x 11-3/8 x 5-7/8	462	1.35	99.97 % @ 0.3 Micron	64

NOTES
1. Media: Micro-Glass Fiber/Acrylic Resin Binder
2. Rated Velocity
   11-1/2" Depth - 500 FPM
   5-7/8" Depth - 250 FPM
3. See Drawings MKT-B-00362 & MKT-B-00363 For Resistance Curves
4. Recommended Final Resistance: 2.7" W.G. @ Rated Flow (Twice Initial Resistance)
5. Class 1 Filter Per U.L. Standard 900
6. Maximum Operating Temperature: 180 Deg. F
7. Standard Gasket Location Downstream, Construction Code 0AG 000 00F
8. Optional Gasket Locations (Do NOT Use Item Number Shown Above)
   -U: Upstream Sides (Ex. MC200-501-UD), Construction Code 0AG 110 00F
   -UD: Both Sides (Ex. MC2000-501-UD), Construction Code 0AG 130 00F
   No Gasket (Ex. MC2000-501, No Gasket), Construction Code 0AG 750 00F

GENERAL

Outdoor air handling units will be shipped with all openings covered to protect unit interior from in-transit debris.

Installing contractor is responsible for long term storage in accordance with the Installation, Operation, and Maintenance manual (CLCH-SVX07B-EN).

Unit shall be UL and C-UL Listed.

Supply fans within the scope of AHRI Standard 430 shall be certified in accordance with AHRI Standard 430.

Unit sound performance data shall be provided using AHRI Standard 260 test methods and reported as sound power. Trane, in providing this program and data, does not certify or warrant NC levels. These levels are affected by factors specific to each application and/or installation and therefore unable to be predicted or certified by Trane. *Refer to product data for specific fan footnote references*.

Manufacturer provided VFDs shall be certified to AHRI Standard 1210 "Performance Rating of Variable Frequency Drives" to ensure documented and reliable VFD efficiency.

Unit Construction

Outdoor unit roofs shall incorporate a standing seam on the exterior to ensure a rigid roof construction and prevent water infiltration. Roof assembly shall overhang all walls by 1.5-inch minimum to prevent sheeting from roof to side panels. Rain gutters shall also be provided over all doors shorter than total unit height to direct rain away from the door assembly. Outdoor roofs shall be sloped, not less than 0.125 inches per foot, for water drainage. Where outdoor units are shipped in multiple sections, provide standing-seam joiners at each split with adhesive, hardware, and cover strips for field joining by the installing contractor.

All unit panels shall be 2" solid, double-wall construction to facilitate cleaning of unit interior. Unit panels shall be provided with a mid-span, no-through-metal, internal thermal break. Casing thermal performance shall be such that under 55°F supply air temperature and design conditions on the exterior of the unit of 81°F dry bulb and 73°F wet bulb, condensation shall not form on the casing exterior.

All outdoor AHU interior casing panels will be made of galvanized steel.

Unit Paint

External surface of unit casing will be coated with water-based polyurethane paint. Color to be standard "Slate Gray". Factory-painted units will be able to withstand a salt spray test in accordance with ASTM B117 for a minimum of 500 consecutive hours and shall meet the following requirements following the salt-spray test:
- Mean scribe creepage rating of at least 6 per ASTM D1654 procedure A
- Blister size no larger than #6 per ASTM D714
- Blister density no greater than Medium per ASTM D714
- No onset of red rust

Casing Deflection

The casing shall not exceed 0.0042 inch deflection per inch of panel span at 1.00 times design static pressure. Maximum design static shall not exceed +8 inches w.g. in all positive pressure sections and -8 inches w.g. in all negative pressure sections.

Floor Construction

The unit floor shall be of sufficient strength to support a 300.0 lb load during maintenance activities and shall deflect no more than 0.0042 inch per inch of panel span.

Unit base
Manufacturer to provide a full perimeter integral base frame for either ceiling suspension of units or to support and raise all sections of the unit for proper trapping. Indoor unit base frame will either be bolted construction or welded construction. All outdoor unit base frames shall be welded construction. For indoor units, refer to schedule for base height and construction type. Contractor will be responsible for providing a housekeeping pad when unit base frame is not of sufficient height to properly trap unit. Unit base frames not constructed of galvanized steel shall be chemically cleaned and coated with both a rust-inhibiting primer and finished coat of rust-inhibiting enamel. Unit base height to be included in total height required for proper trap height.

Insulation
Panel insulation shall provide a minimum thermal resistance (R) value of 13 ft^2-h-^oF/Btu throughout the entire unit. Insulation shall completely fill the panel cavities in all directions so that no voids exist and settling of insulation is prevented. Panel insulation shall comply with NFPA 90A.

Drain Pan
In sections provided with a drain pan, the drain pan shall be designed in accordance with ASHRAE 62.1. To address indoor air quality (IAQ) the drain pan shall be sloped in two planes promoting positive drainage to eliminate stagnant water conditions. Drain pan shall be insulated, and of double wall construction. The outlet shall be the lowest point on the pan, and shall be of sufficient diameter to preclude drain pan overflow under normally expected operating conditions. All drain pans connections shall have a threaded connection, extending a minimum of 2-1/2" beyond the unit base, and shall be made from the same material as the drain pan. Drain pan located under a cooling coil shall be of sufficient size to collect all condensate produced from the coil.
Refer to Product Data for specific information on which sections are supplied with a drain pan, the drain pan material and connection location.

Access Door Construction
Access doors shall be 2" double wall construction. Interior and exterior door panels shall be of the same construction as the interior and exterior wall panels respectively. All doors shall be provided with a thermal break construction of door panel and door frame. Gasketing shall be provided around the full perimeter of the doors to prevent air leakage. Surface mounted handles shall be provided to allow quick access to the interior of the functional section and to prevent through cabinet penetrations that could likely weaken the casing leakage and thermal performance. Handle hardware shall be designed to prevent unintended closure. Access doors shall be hinged and removable for quick easy access. Hinges shall be interchangeable with the door handle hardware to allow for alternating door swing in the field to minimize access interference due to unforeseen job site obstructions. Door handle hardware shall be adjustable and visually indicate locking position of door latch external to the section. Door hinges shall be galvanized.

All doors shall be a minimum of 60" high when sufficient height is available or the maximum height allowed by the unit height.

Door handles shall be provided for each latching point of the door necessary to maintain the specified air leakage integrity of the unit. Optionally for indoor AHUs and as standard on outdoor AHUs, outward swing doors are provided with a single handle linked to multiple latching points. An optional shatterproof window shall be provided in access doors where indicated on the plans. Window shall either be single pane, or thermal dual pane, as defined on schedule. Window shall be capable of withstanding unit operating pressures and shall be safe for viewing UV-C lamps.
Refer to Product Data for specific information on which sections are supplied with an access door, the door location, a single handle and a window.

Pier-mount
Outdoor units to be mounted to a pier support system must have at a minimum one pier at each corner of the unit and every four feet at equally spaced intervals around the entire unit perimeter. In addition, if the unit has shipping split(s) a pier must be located under split point(s) on both sides of the unit, ensuring equal support to both sides of the unit split. Both the main unit, and optional external piping cabinet(s), require pier supports.

For air handling units requiring both a supply and return/exhaust fan, the unit manufacturer shall supply single point power wiring to both factory installed and tested fan motor starters or variable frequency drives. Individual high voltage enclosures will be supplied for both the supply and return/exhaust fans. Single point power wiring shall include a high voltage distribution block located in the supply fan starter or variable frequency drive cabinet. Single point power wiring shall not compromise the UL or ETL certification of the unit. Single point power wiring shall also include factory installed and wired control systems if ordered.

ECONOMIZER SECTION
Unit shall be capable of supporting the damper assemblies for outside, return, and exhaust air.

Dampers
Dampers shall modulate the volume of outdoor, return, or exhaust air. The dampers shall be of double-skin airfoil design with metal, compressible jamb seals and flexible blade-edge seals on all blades. The blades shall rotate on stainless-steel sleeve bearings. The dampers shall be rated for a maximum leakage rate of 3 cfm/ft² at 1 in. w.g. complying with ASHRAE 90.1 maximum damper leakage. All leakage testing and pressure ratings shall be based on AMCA Standard 500-D. Dampers may be arranged in a parallel or opposed-blade configuration.

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Title 24
The following specifications apply only to units with outside air and return air dampers, with actuators. The 5 year warranty applies only to these items.
This unit contains Economizer that meets or exceeds all mandatory requirements prescribed by Title 24, including but not limited to:
- 5 yr parts only warranty
- Successfully tested to 60,000 Actuations
- Less than 10 cfm/sq.ft. of damper leakage at 1" WG per AMCA 500D

Inlet Hood
Inlet hoods are provided on the outside air openings and equipped with high performance moisture eliminators to minimize water carryover from the outside into the unit casing. Eliminators also perform the function of a bird screen to prevent nesting.
Refer to the unit As-Built and Product Data section for specific information on which sections are supplied with inlet hood.

Exhaust Hood
Exhaust hoods are provided on exhaust air openings and equipped with bird screens to prevent nesting.
Refer to unit As-Built and Product Data section for specific information on which sections are supplied with an exhaust hood.

FILTER SECTION
A section shall be provided to support the filter rack as indicated throughout the unit. Refer to Product Data and As-Built sections of the submittal for specific locations within each unit.

Primary Filters

2-inch pleated media filters made with 100% synthetic fibers that are continuously laminated to a supported steel-wire grid with water repellent adhesive shall be provided. Filters shall be capable of operating up to 625 fpm face velocity without loss of filter efficiency and holding capacity. The filters shall have a MERV 8 rating when tested in accordance with the ANSI/ASHRAE Standard 52.2.

HEPA Filters
The HEPA filter cells shall be enclosed in a galvanized steel frame with neoprene rubber applied to the leaving-air side of the filter cell to reduce air leakage. Front-load filter frames with filter holding clips shall be mounted inside the section casing and shall be gasketed to prevent leakage or air bypass. Filter clips shall require tooling in order to tighten and hold filter cells to frame. Filter media shall be produced from glass waterproof microfiber with a continuous pleat and aluminum separators between pleat folds. Filters as produced shall be capable of operating up to 500-fpm face velocity without loss of filter efficiency. HEPA filter efficiency shall be not less than 99.97 percent when tested in accordance with IEST RP CC 001.4. By definition (IEST RP CC 001.4), HEPA filters are a minimum of 99.97% efficient when tested using 0.3-µm thermally generated particles. Filter frame assemblies when tested in accordance IEST-RP-CC0.34.3 are a minimum of 99.97% efficient when tested using 0.3-µm generated particles.

COIL SECTION WITH FACTORY INSTALLED COIL
The coil section shall be provided complete with coil and coil holding frame. The coils shall be installed such that headers and return bends are enclosed by unit casings. If two or more cooling coils are stacked in the unit, an intermediate drain pan shall be installed between each coil and be of the same material as the primary drain pan. Like the primary drain pan, the intermediate drain pan shall be designed being of sufficient size to collect all condensation produced from the coil and sloped to promote positive drainage to eliminate stagnant water conditions. The intermediate pan shall begin at the leading face of the water-producing device and be of sufficient length extending downstream to prevent condensate from passing through the air stream of the lower coil. Intermediate drain pan shall include downspouts to direct condensate to the primary drain pan. The outlet shall be located at the lowest point of the pan and shall be sufficient diameter to preclude drain pan overflow under any normally expected operating condition.

Casing penetrations supplied for hydronic drain and vents. Piping contractor shall provide extended piping.

No casing penetrations supplied for hydronic drain and vents. If required, piping contractor will need to drill drain and vent penetrations using factory located features provided in coil panel.

Refrigerant Cooling Coils
The coils shall have aluminum fins and seamless copper tubes. The fins shall have collars drawn, belled, and firmly bonded to tubes by mechanical expansion of the tubes. Suction and liquid line connections shall extend to the unit exterior. The coil casing may be galvanized or stainless steel. Refer to the Product Data section of the submittal for the coil casing material.
The coils shall be proof-tested to 715 psig and leak-tested to 650 psig air pressure under water or equivalent tracer gas leak test. After testing, the inside of the coils shall be dried, all connections shall be sealed, and the coil shall be shipped with a charge of dry air or nitrogen.
Suction headers and liquid connections shall be constructed of copper tubing with connections penetrating unit casings to permit sweat connections to refrigerant lines. The coils shall have equalizing vertical distributors sized according to the capacities of the coils. Cooling coil performance is 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 at www.ahridirectory.org. Heating performance for heat pump or condenser mode is not certified.

Water Coils (UP, WP, UW, UU, UA, 3W, 3U, W, 5W, 5A, WD, 5D, D1, D2, P, or TT)
The coils shall have aluminum fins and seamless copper tubes. Copper fins may be applied to coils with 5/8-inch tubes. Fins shall have collars drawn, belled, and firmly bonded to tubes by mechanical expansion of the tubes. The coil casing may be galvanized or stainless steel. Refer to the Product Data section of the submittal for the coil casing material.
The coils shall be proof-tested to 300 psig and leak-tested under water to 200 psig. Coils containing water or ethylene glycol are 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 at www.ahridirectory.org. Propylene glycol and calcium chloride, or mixtures thereof, are outside the scope of AHRI Standard 410 and, therefore, do not require AHRI 410 rating or certification.

Coil connections are constructed of cast iron with female connections, steel block with female connections or steel pipe with male connections. Type P or TT coil connections do not extend out of unit casing. All other water coil types have connections that extend out beyond unit casing. Headers on downstream coil bank of staggered coil sections do not extend beyond the unit casing and must be completed by the on-site piping contractor.

Tubes are 5/8" [16 mm] OD 0.020" [0.508 mm] thick copper.

Refrigerant coil tubes are 1/2" [13mm] OD, 0.016" [0.406mm] thick, internally enhanced copper.

Ultraviolet (UVc) Lights
UV-C light fixtures and lamps shall be provided by the air handler manufacturer. The UV-C fixtures shall be factory-assembled and tested in the air handler. Lamp life shall be 9,000 hours minimum with no more than a 15% loss of output after one year of continuous use. The UV-C fixtures and lamps shall be accessible via downstream door for maintenance of the bulbs. Fixtures shall meet the UL drip-proof design criteria. Fixtures shall be constructed of UV resistant polymer to resist corrosion. Fixtures shall have been tested and recognized by UL/C-UL under Category Code ABQK (Accessories, Air Duct Mounted), UL Standards 153, 1598 & 1995.

All polymeric materials that come into direct or indirect (reflected) contact with UV-C light shall be UV-C resistant or shielded from the UV-C light using a certified UV-C tolerant material such as metal.

Access doors shall be provided at the location of each UV-C light as indicated on the plans and schedule. A window or viewport shall be provided to allow viewing of the UV-C light array to confirm operation. The AHU windows shall be treated to assure the UV-C energy emitted through it is below the threshold limits specified by NIOSH and ACGIH.

All sections of the handler with access doors where the UV-C lights may pose a risk for direct exposure shall have a mechanical interlock switch that disconnects power to the lights when the door is opened. Each UV section shall also be equipped with an externally mounted on-off/disconnect/shut off switch that disconnects power to the UV-C lights. The switch shall be equipped with a lock-out/tag-out to prevent unwanted operation of the UV-C lights.

ACCESS/INSPECTION / TURNING SECTION

A section shall be provided to allow additional access/inspection of unit components and space for field-installed components as needed. An access door shall be provided for easy access. All access sections shall be complete with a double-wall, removable door downstream for inspection, cleaning, and maintenance. Interior and exterior door panels shall be of the same construction as the interior and exterior wall panels, respectively. All doors downstream of cooling coils shall be provided with a thermal break construction of door panel and door frame.

MOTORIZED IMPELLER FAN SECTION
The fan assembly shall be a nine-blade, single width, single inlet, direct-drive plenum fan with high efficiency welded-aluminum impeller that is dynamically balanced as an assembly. Fan shall be maintenance free throughout its operating life. Fans shall be balanced to G6.3 per AMCA 204. No vibration isolation is necessary. Access to motor and fan assembly through hinged access door. Access door shall be sized for removal of entire motor and fan assembly. Motor contains integrated PID controller and accepts 0-10VDC input for variable speed control. Motorized impeller fans are outside the scope of AHRI Standard 430, but rated in accordance with AHRI Standard 430.

DIRECT-DRIVE PLENUM FAN SECTION
The fan type shall be provided as required for stable operation and optimum energy efficiency. The fan shall be a single-width, single-inlet, multiblade-type direct-drive plenum fan. Motor bearing life of the direct-drive plenum fan shall be not less than L-10 250,000 hrs**.** *Refer to the Product Data section for fan quantity and number of blades selected within each unit*. Fans shall be certified as complying with AHRI Standard 430 for airflow performance. Fans shall be tested and rated in-accordance with AHRI Standard 260 for sound performance.

Fans that are selected with inverter balancing shall first be dynamically balanced at design RPM. The fans then will be checked in the factory from 25% to 100% of design RPM to insure they are operating within vibration tolerance specifications, and that there are no resonant frequency issues throughout this operating range. Inverter balancing that requires lockout frequencies inputted into a variable frequency drive to in order to bypass resonant frequencies shall not be acceptable. If supplied in this manner by the unit manufacturer, the contractor will be responsible for rebalancing in the field after unit installation. Fans selected with inverter balancing shall have a maintenance free grounding assembly installed on the fan motor to discharge both static and induced shaft currents to ground.

On units supplied with plenum or motorized impeller fans, expanded metal door guard(s) shall be supplied on the access door(s) to the fan and those downstream access door(s) where unintended access to the plenum or motorized impeller fan could occur. Door guard is intended to deter unauthorized entry and incidental contact with rotating components. *Refer to the Product Data section for fans with access door guard(s)*.

Motor Frame
The motor shall be mounted integral to the isolated fan assembly and furnished by the unit manufacturer. The motor is mounted inside the unit casing on an adjustable base to permit adjustment of drive belt tension (not applicable for direct drive plenum fans). The motor shall meet or exceed all NEMA Standards Publication MG 1 requirements and comply with NEMA Premium efficiency levels when applicable except for fractional horsepower motors which are not covered by the NEMA classification. The motor shall be T-frame, squirrel cage with size, type, and electrical characteristics as shown on the equipment schedule. *Refer to the Product Data section for selected fan motors within each unit.*

Two-Inch Spring Isolators
Direct-drive fan and motor assemblies shall be internally isolated from the unit casing with 2-inch (50.8 mm) deflection spring isolators. The isolation system shall be designed to resist loads produced by external forces, such as earthquakes, and conform to the current IBC seismic requirements.

Starter/VFD shall be mounted externally in a NEMA Type 1 enclosure on the return or exhaust fan section. An external disconnect shall be mounted through-the-door to the starter/VFD to disconnect full power from starter/VFD.

Combination VFD / Disconnect
A combination Variable Frequency Drive (VFD) / disconnect shall be provided when variable air volume control is required for fan operation. Whether for single fan, dual fan, or fan array applications, a single VFD shall be provide to ensure proper operation and to optimize operating life. Each VFD / disconnect shall be properly sized, factory mounted in a full metal enclosure, wired to the fan motor(s), and commissioned to facilitate temporary heating, cooling, ventilation, and/or timely completion of the project. VFD / disconnects shall include a circuit breaker disconnect with a through-the-door interlocking handle and shall be lockable. The VFD package shall also include:

a) Electronic manual speed control
b) Hand-Off-Auto (H-O-A) selector switch
c) Inlet fuses to provide maximum protection against inlet short circuit
d) Current limited stall prevention
e) Auto restart after momentary power loss
f) Speed search for starting into rotating motor
g) Anti-windmill w/DC injection before start
h) Phase-to-phase short circuit protection
i) Ground fault protection

Units with factory-mounted controls shall include power wiring from the VFD panel to the control system transformers, binary output on/off wiring, analog output-speed-signal wiring, and all interfacing wiring between the VFD and the direct digital controller.

The VFD shall be UL508C listed and CSA certified and conform to applicable NEMA, ICS, NFPA, & IEC standards.

The supply fan's Starter/VFD shall be mounted internal of unit casing in the controls section. The internal enclosure shall be an integral part of the unit casing to allow for thermal venting to casing interior, but shall be accessible from unit exterior through access door. Internally mounted starters shall have doors with the same construction as other doors on unit. An external disconnect shall be mounted through the door to the starter/VFD to disconnect full power from starter/VFD.

The fan section shall be provided with a factory installed NEMA 1 or NEMA 4 motorized impeller motor control panel. The control panel provides a common externally accessible disconnect means, motor over current protection for each fan and a terminal block for ease of control wiring.

DISCHARGE PLENUM SECTION
Plenums shall be provided to efficiently turn air and provide sound attenuation. Discharge plenum opening types and sizes shall be scaled to meet engineering requirements. The vertical discharge plenum height may be scaled to accommodate the appropriate discharge duct height.

HUMIDIFIER SECTION (Direct Steam)
Humidifier section shall be provided with a humidifier panel designed for building steam. Humidifier panel shall include stainless steel construction of all wetted parts including the integrated header/separator and multiple tube dispersion assembly. Tube-to-header joints shall consist of welded stainless steel. Humidifier shall provide a uniform steam discharge. Humidifiers shall be provided with a control valve, inverted bucket steam trap, wye strainer, and two float and thermostatic steam traps shipped loose for field installation. All pipe connections shall be made from one side of the air handler.

Lifting Instructions

The air handling units must be rigged, lifted, and installed in strict accordance with the Installation, Operation, and Maintenance manual (CLCH-SVX07G-EN). The units are also to be installed in strict accordance with the specifications. Units may be shipped fully assembled or disassembled to the minimum functional section size in accordance with shipping and job site requirements.

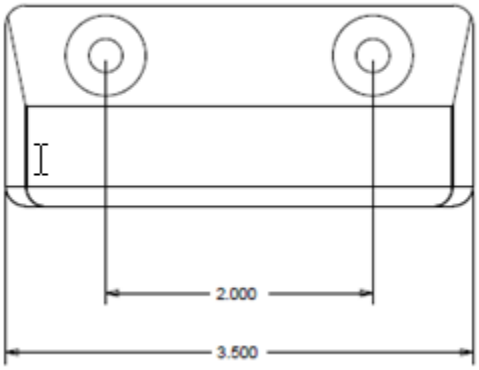
Outdoor units shall be shipped on 6" integral base frame for the purpose of mounting units on a roof curb or field-supplied pier support system. Refer to the Product Data section for type of the base frame provided (for roof curb or pier-mount).

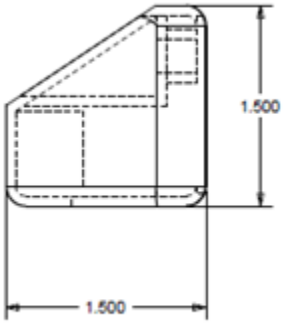
All units will be shipped with an integral base frame designed with the necessary number of lift points for safe installation. All lifting lugs are to be utilized during lift. The lift points will be designed to accept standard rigging devices and be removable after installation. Units shipped in sections will have a minimum of four points of lift.

Limit Switch

Notes:

1. Parts Must Have Trane Part Number With Bar Code per ES.
2. All Dimensions Are Reference Dimensions Unless Otherwise Noted.
3. Replace 2 Mounting Screws with Pan Head Combination Drive Sheet Metal Screws, 18-8 Stainless Steel, #6 Size ½" Length.





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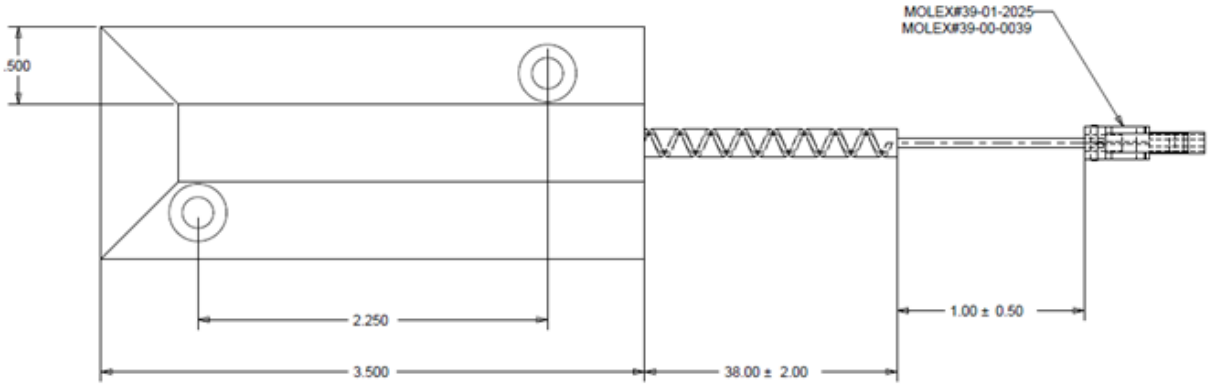
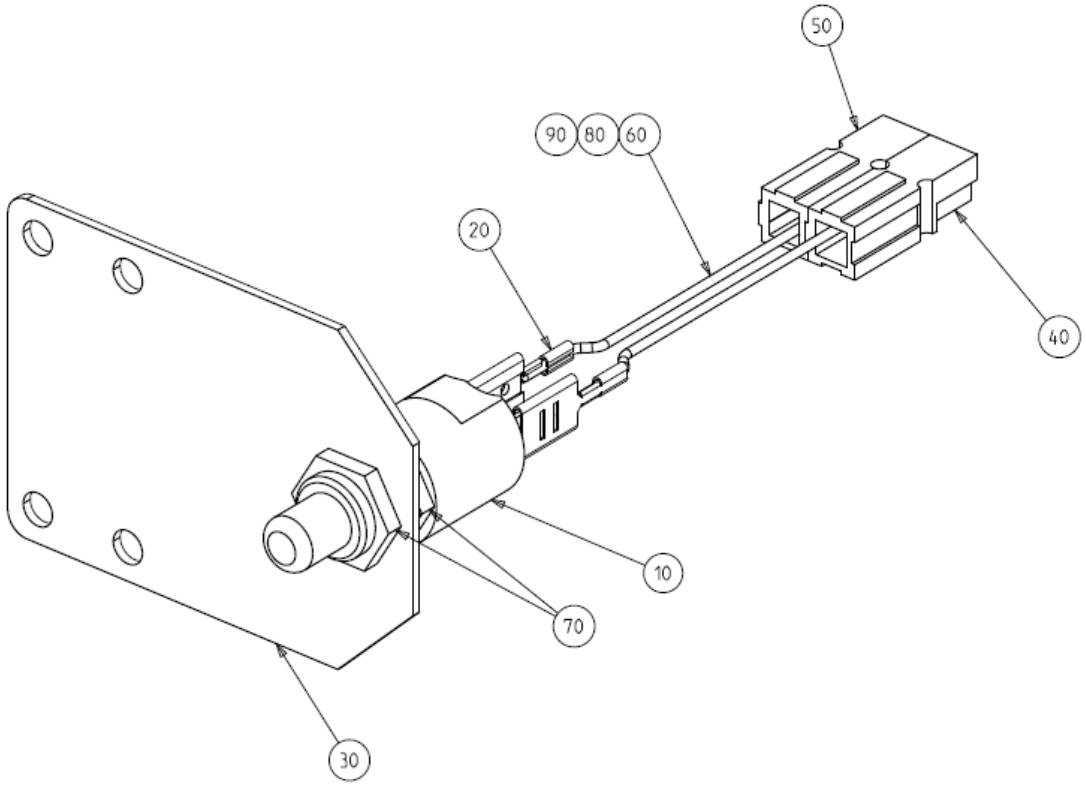

MOLEX#39-01-2025
MOLEX#39-00-0039
.500
2.250
3.500
38.00 ± 2.00
1.00 ± 0.50


1.500

Limit Switch UV

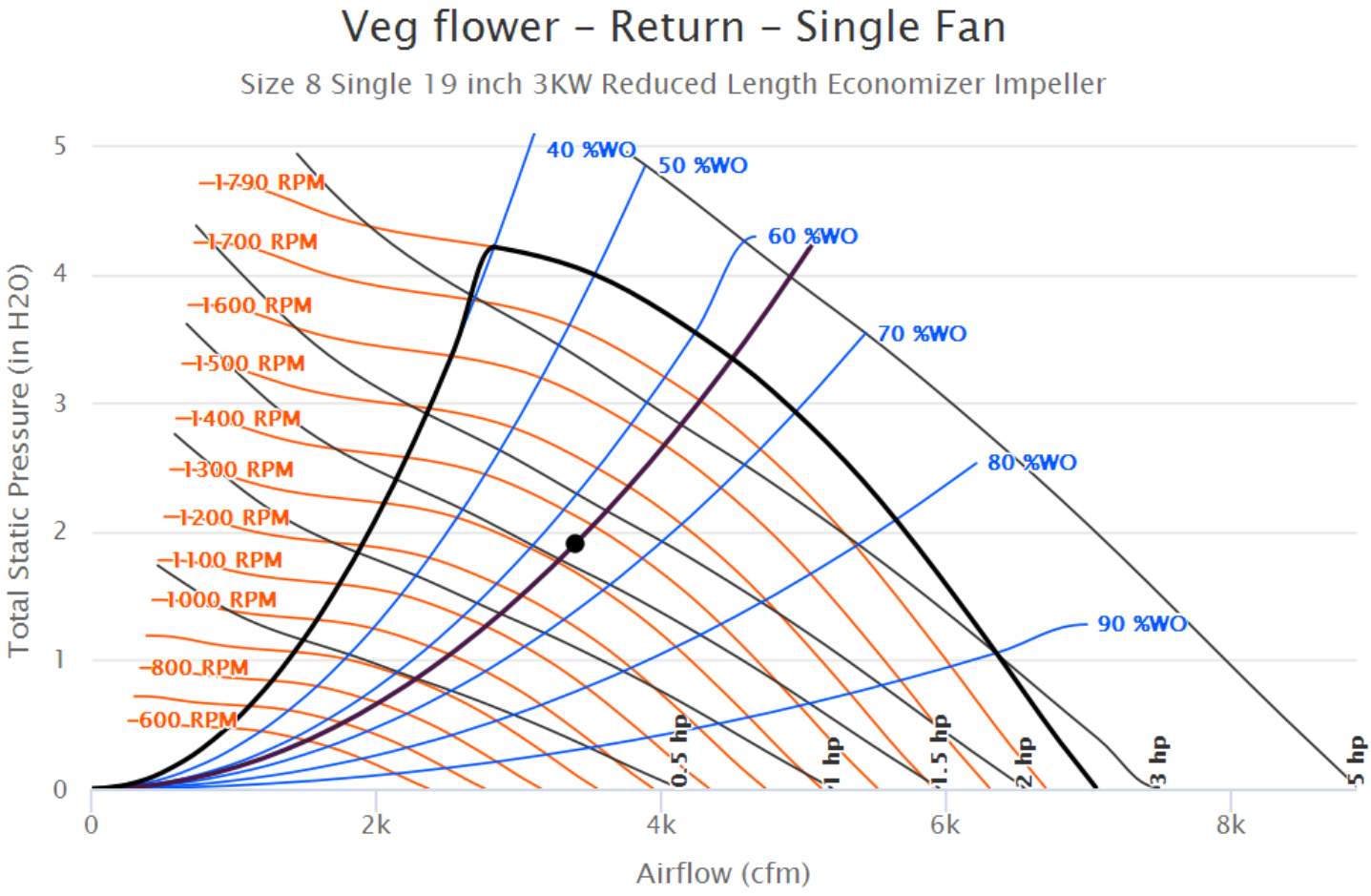
Item	Description	Vendor No. or Equivalent	QTY
10	Momentary Switch. Eaton Metal Button	8418K12	1
20	Female Disconnects (Red) Panduit	DNF18-250FIB-C	2
30	Mounting Bracket 495319590001	16 GA. Galvanized	1
40	Anderson Contact and Connector	1327G6 (Blk)	1
50	Anderson Contact and Connector	1327G7 (Wht)	1
60	18 AWG Wire THHN Blk: Length 2.5"	--	2
70	Nut: 15/32-32; Hexagon. Eaton	15-192	3
80	Heat Shrink Tube: Panduit 3/4": Length 3.5"	HSTTA75-48-5	1
90	Aluminum Tape 2" Wide: Length 4.5"	--	1



Fan Details

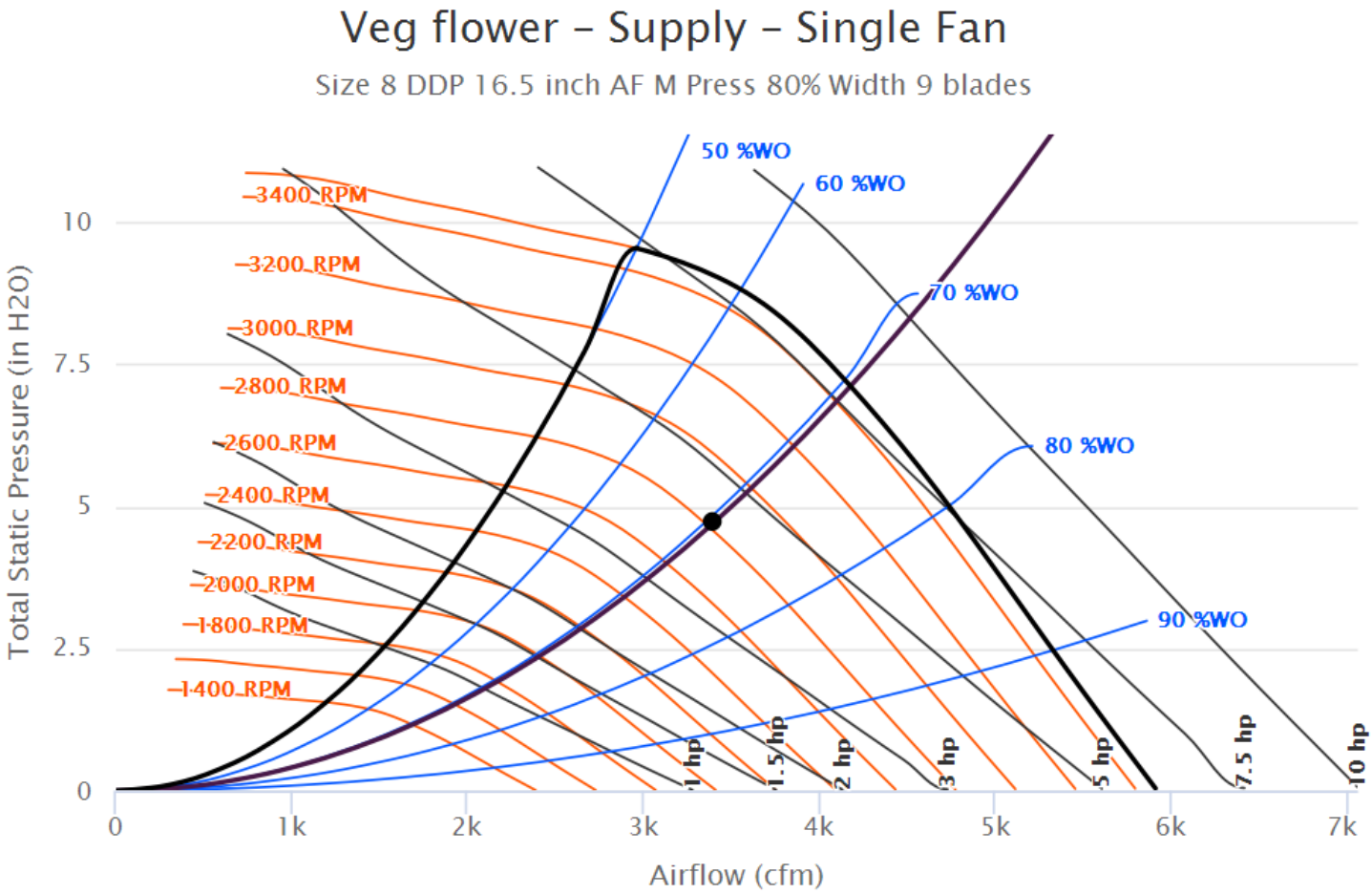
Unit Size	19EP	**Operating Brake Power**	1.667 hp
Motor Frequency	0	**Altitude**	0.00 ft
Operating Airflow	3,400 cfm	**Design Temp.**	70.00 F
Operating Static Pressure	1.914 in H2O	**Efficiency**	61.54 %
Operating RPM	1,353 rpm		

Design voltage is less than 10. Ensure the air delivery system can handle being pressurized to the Maximum static pressure detailed in the product data and shown on the fan curve.

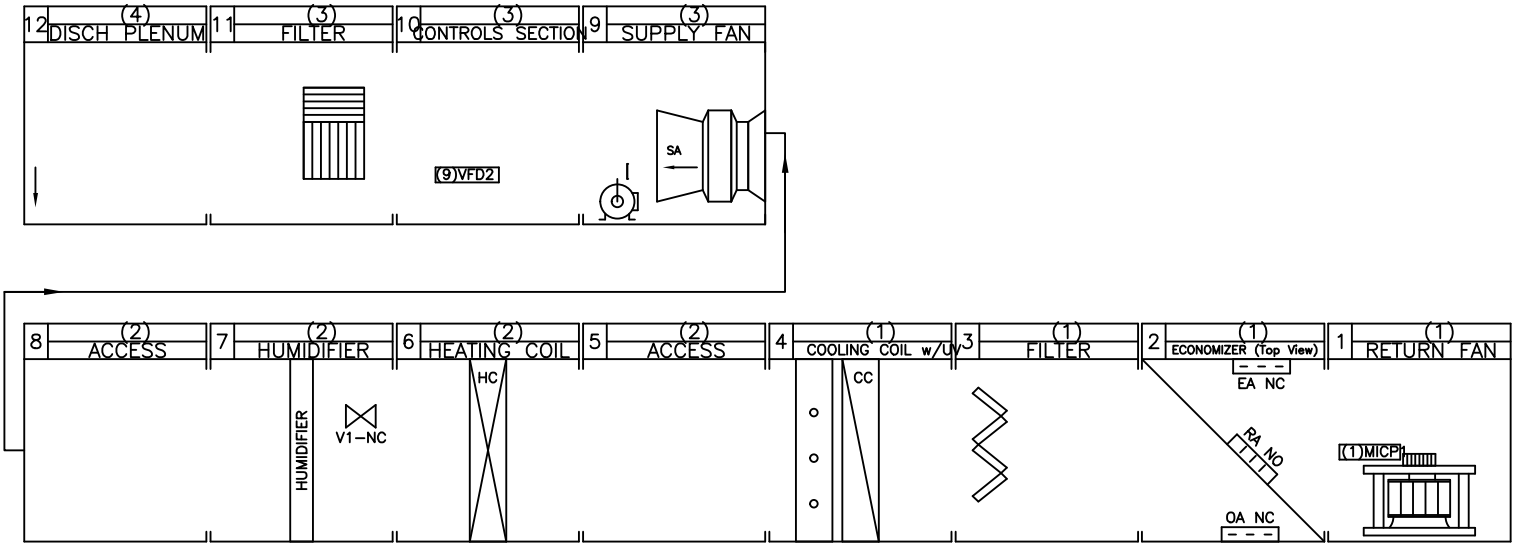


Fan Details

Unit Size	16TR	**Operating Brake Power**	4.286 hp
Motor Frequency	96.00 Hz	**Altitude**	0.00 ft
Operating Airflow	3,400 cfm	**Design Temp.**	70.00 F
Operating Static Pressure	4.718 in H2O	**Efficiency**	59.01 %
Operating RPM	2,823 rpm		



WIRING DETAIL 1 (OUTDOOR)



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DATE 7/23/2020		CSOA-SCHEMATIC UNIT SIZE: 8 UNIT TAG: Veg flower
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LEGEND DETAIL 1
(OUTDOOR)

POS#	DESCRIPTION	PT	LABEL	PWR HR-WIRE	SIGNAL HR-WIRE	XFMR	POWER VA
1	Return/Exhaust Fan Speed	AO1	VFD1				
7	Valve Control	AO2	V1				
7	High limit sensor		HLT1				
10	Supply Fan VFD	AO3	VFD2				

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