



Triton services, inc.

8162 Duke Bo
Mason, OH

Phone: 513-67
Fax: 513-67

http://www.tritonservice

Submittal:

Pakgd, Small Cap, Rooftop AC Units 1A - 1B

Spec Section: 23 7416.11

Attention: Mr. Chip Branscum

Phone: 513-621.6211

Fax: 513-621-6530

Cell:

Email: Chip.Branscum@kzf.com

Job Name: Maderia HS Gym HVAC Replace

Job #: 227219

PM: Brent Ernsth

To:

KZF Design Inc.
Attention: Mr. Chip Branscum
700 Broadway Street

Cincinnati, OH 45202

Phone: 513-621.6211

Fax: 513-621-6530

**Submittal
Notes:**

Comments:

Contacts:

Supplier

Habegger Commercial Group -Cincinnati
Mr. Jeff Gries, Commercial Sales Engineer
11413 Enterprise Park Drive,
Cincinnati, OH, 45241-
Phone 513-772-3300 Fax: 513-612-4701

Architect

KZF Design Inc.
Mr. Chip Branscum, Unknown
700 Broadway Street,
Cincinnati, OH, 45202
Phone 513-621.6211 Fax: 513-621-6530

Owner

Madeira City Schools
Mr. Dave Bergan, Assistant Project Manager
7465 Loannes Drive,
Maderia, OH, 45243
Phone 513-985-6070 Fax:

- Contractor to coordinate breaker size with EC

- Reviewed For Submittal Approved
- _____

Review does not relieve supplier from compliance with requirements of the drawings and specifications or conformance with contract documents.

By: Date: 7-18-22
Brent Ernsth

- REVIEWED REVIEWED/CORRECTIONS NOTED
- REJECTED REVISE AND RESUBMIT

Corrections or comments made on the submittals during this review do not relieve Contractor from compliance with requirements of the Contract Documents. This review is for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Contractor remains responsible for determining the accuracy and completeness of other details such as dimensions and quantities; for substantiating instructions for installations; verifying materials, field measurements and related construction criteria; checking, coordinating, and performing work in compliance with the Contract Documents.

KZF DESIGN Inc. lydia.jordan Date 07-18-22

RTU-1A, 1B

Project: Madeira High School Gym - RTU-1A,1B
Prepared By: Jeff Gries

07/15/2022
04:12PM

RTU-1A, 1B

**Tag Cover Sheet
Unit Report
Certified Drawing
Performance Report
Unit Feature Sheet
Spec Sheet**

Unit Report For RTU-1A, 1B

Project: Madeira High School Gym - RTU-1A,1B
 Prepared By: Jeff Gries

07/15/2022
 04:12PM

Unit Parameters

Unit Model: **50FC-M28B2A6-3F2A0**
 Unit Size: **28 (25.0 Tons)**
 Volts-Phase-Hertz: **460-3-60**
 Heating Type: **None**
 Duct Cfg: **Vertical Supply / Vertical Return**
 Two-Stage Compressor Models

Dimensions (ft. in.) & Weight (lb.) ***

Unit Length: **11' 9.5"**
 Unit Width: **7' 2.375"**
 Unit Height: **3' 11.75"**

*** Weights and Dimensions are approximate. Weight does not include roof curbs, unit packaging, field installed accessories or factory installed options. Approximate dimensions are provided primarily for shipping purposes. For exact dimensions and weights, refer to appropriate product data catalog.

Base Unit Weight (Does not include any accessories):
 **2047 lb**

Lines and Filters

Return Air Filter Type: **Throwaway**
 Return Air Filter Quantity: **9**
 Return Air Filter Size: **20 x 25 x 2**

Selection includes construction throwaway filter into the base fan curve. This filter is not MERV Rated.

Unit Configuration

RA Smoke Detector
 Std / Med Static Motor - Vert Supply
 Al/Cu - Al/Cu
 SystemVu Bacnet Controller
 Enthalpy Economizer with Barometric Relief. Vertical and Horizontal Air Flow.
 Powered Convenience Outlet
 Standard Packaging

Warranty Information

5-Year compressor parts (STD.)
 1-Year parts (STD.)

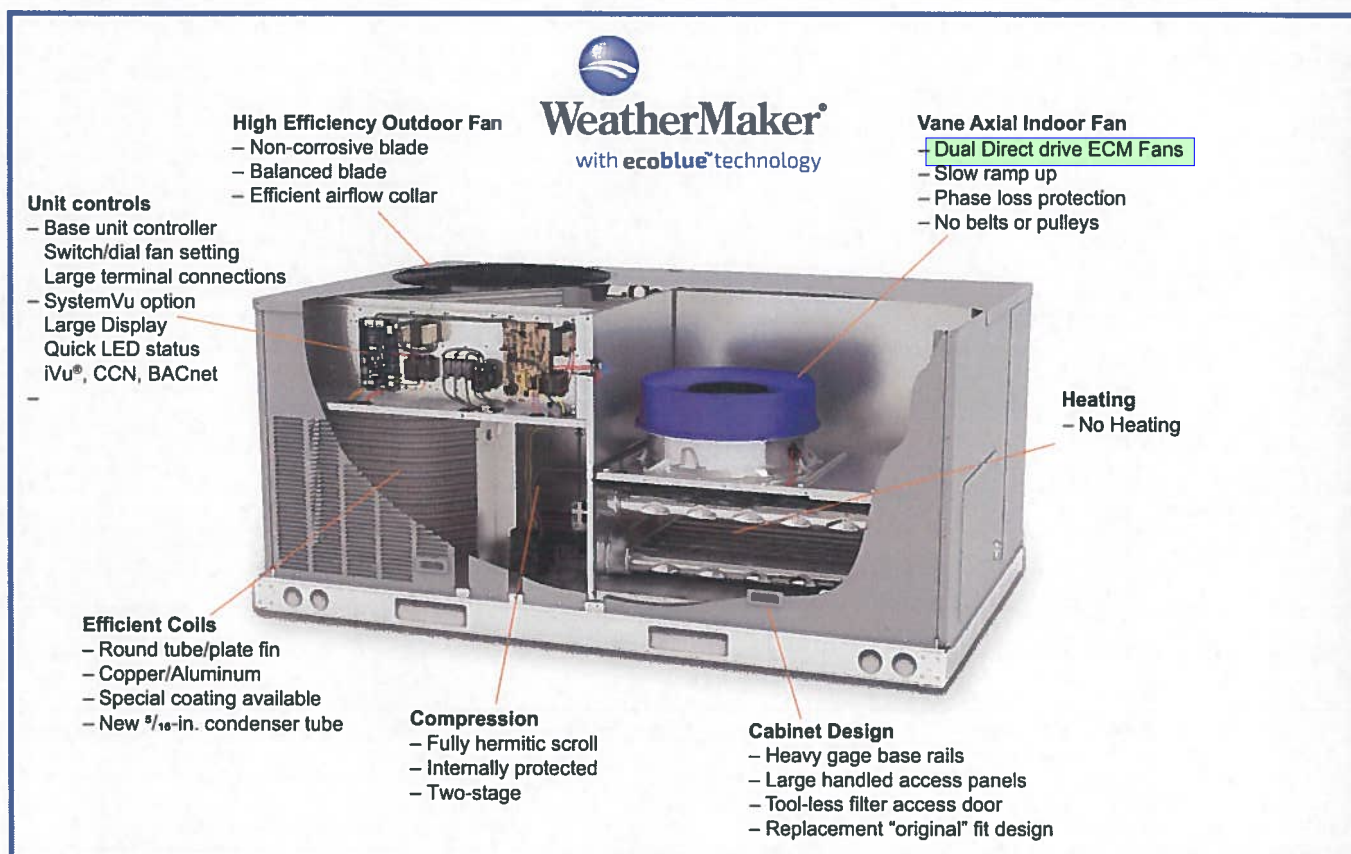
Ordering Information

Part Number	Description	Quantity
50FC-M28B2A6-3F2A0	Rooftop Unit	2
	Base Unit	
	Return Smoke Detector	
	Powered Convenience Outlet	
	Dual Direct Drive ECM Eco-Blue Fans	
Field Installed Accessories		
CRRFCURB047A00	14-inch Tall Roof Curb	2
CRSDHNSB001A00	Horn/Strobe Annunciator with clear colored lens	2
1500 Needlepoint Ionization	Plasma-Pure AutoClean Needlepoint Ionization - 6000 Cfm each	4

EcoBlue™ Technology

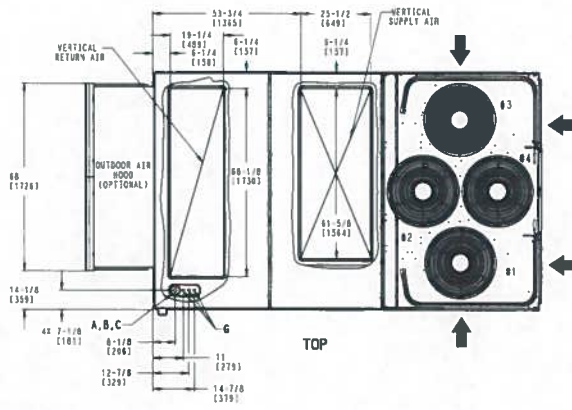
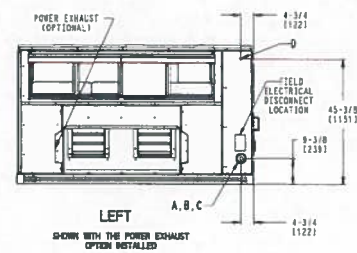
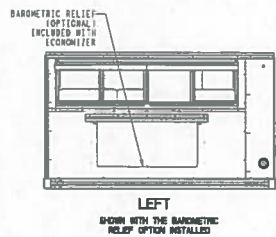
Direct drive EcoBlue Technology indoor fan system uses Vane Axial fan design and electrically commutated motors.

This new Vane Axial design over past belt drive systems has 75% fewer moving parts, uses up to 40% less energy and has no fan belts, blower bearings and shaft.



Certified Drawing for RTU-1A, 1B

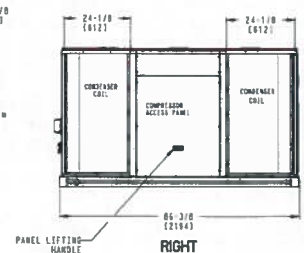
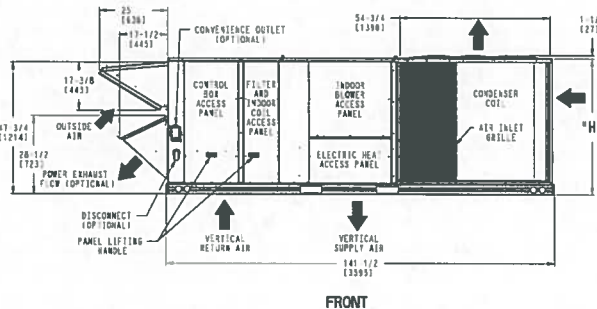
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CONNECTION SIZES	
A	1 3/8" DIA (35) FIELD POWER SUPPLY KNOCKOUT
B	3" DIA (76) FIELD POWER SUPPLY KNOCKOUT
C	3 5/8" DIA (92) FIELD POWER SUPPLY KNOCKOUT
D	1 7/8" DIA (22) FIELD CONTROL WIRING HOLE
G	1 7/8" DIA (22) FIELD CONTROL WIRING KNOCKOUT

UNIT	H
24 SIZE	49-3/8 (1253)
28 SIZE	57-3/8 (1456)

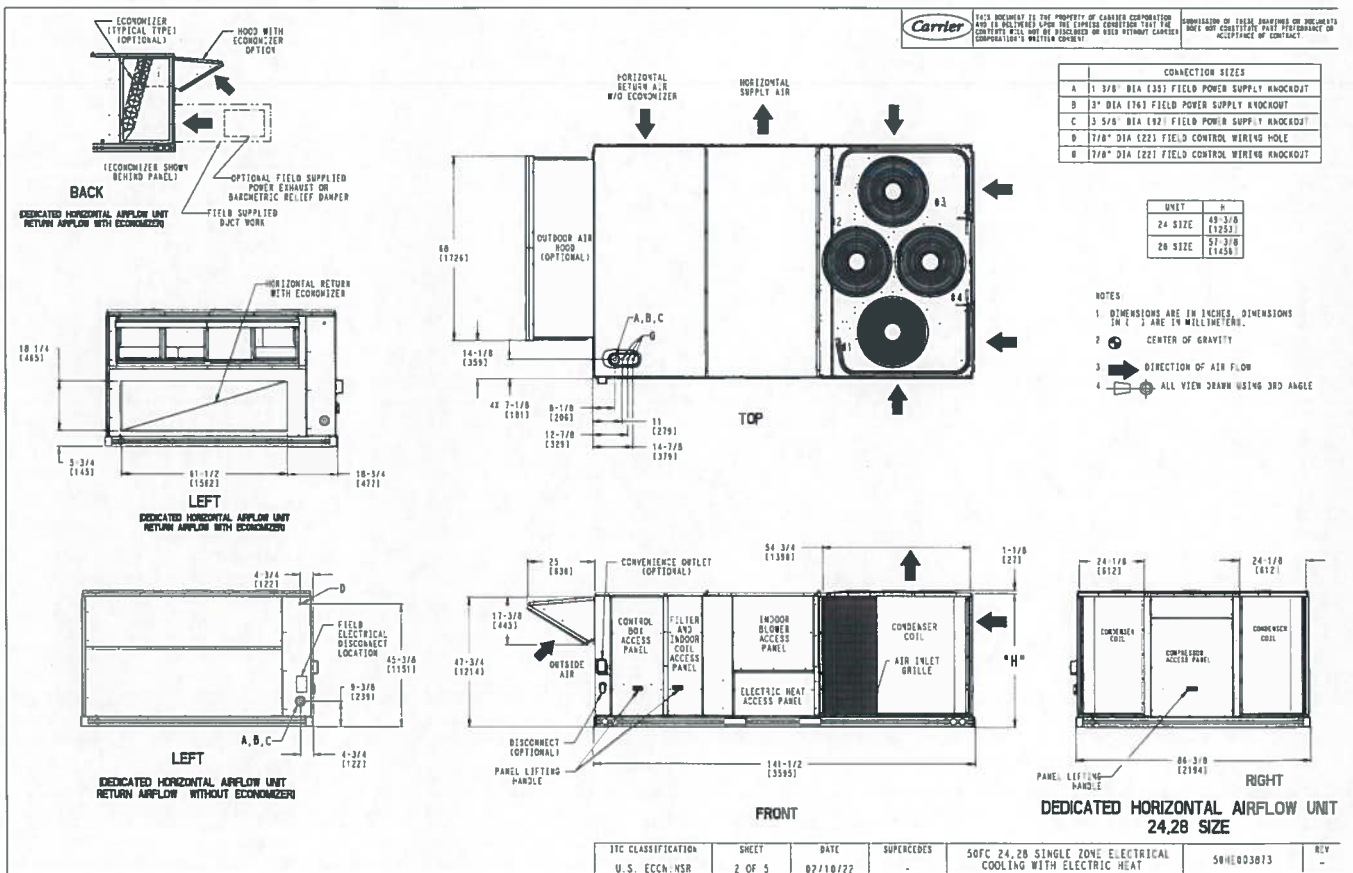
- NOTES:
1. DIMENSIONS ARE IN INCHES, DIMENSIONS IN 1" ARE IN MILLIMETERS
 2. CENTER OF GRAVITY
 3. DIRECTION OF AIR FLOW
 4. ALL VIEW DRAWN USING 3RD ANGLE



DEDICATED VERTICAL AIRFLOW UNIT
 24,28 SIZE

17C CLASSIFICATION	SHEET	DATE	SUPERCEDES	58FC 24,28 SINGLE ZONE ELECTRICAL COOLING WITH ELECTRIC HEAT	58HE003873	REV
U.S. ECN NSR	1 OF 5	02/10/22				-

Certified Drawing for RTU-1A, 1B



Certified Drawing for RTU-1A, 1B

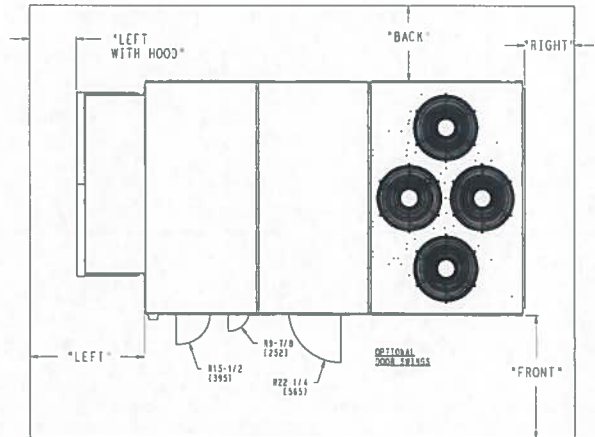
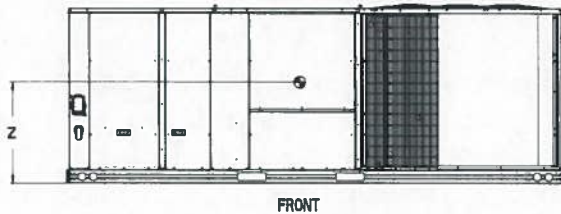
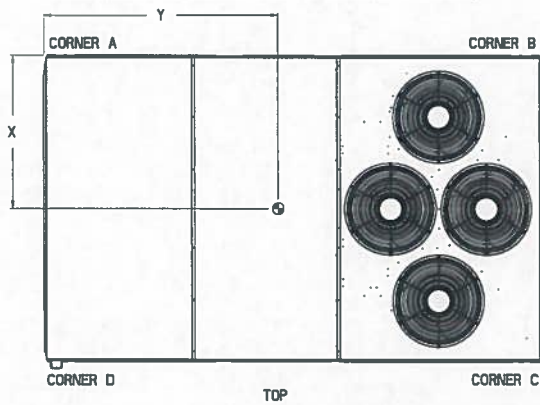
Project: Madeira High School Gym - RTU-1A,1B
 Prepared By: Jeff Gries

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 04:12PM

UNIT	STD UNIT WEIGHT #	CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		C.R.					
		LBS.	KG	LBS.	KG	LBS.	KG	LBS.	KG	X	Y	Z			
58FC24	1873	850	402	182	83	215	539	248	258	76 1/2	(1943)	48	(1168)	18 1/2	(468)
58FC28	2267	1028	431	195	88	249	597	271	489	79 1/4	(2013)	45	(1143)	18	(457)

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* STANDARD UNIT WEIGHT IS WITHOUT ELECTRIC HEAT AND WITHOUT PACKAGING. FOR OTHER OPTIONS AND ACCESSORIES, REFER TO THE PRODUCT DATA CATALOG.



- NOTES
1. CLEARANCE ABOVE THE UNIT TO BE 72"
 2. FOR ALL MINIMUM CLEARANCES LOCAL CODES OR JURISDICTIONS MAY PREVAIL.

SURFACE	SERVICE WITH		OPERATING CLEARANCE
	CONDUCTIVE BARRIER	NONCONDUCTIVE BARRIER	
FRONT	48 (1219mm)	36 (914mm)	18 (457mm)
LEFT	48 (1219mm)	42 (1067mm)	18 (457mm)
BACK	42 (1067mm)	36 (914mm)	18 (457mm)
LEFT WITH HOOD	36 (914mm)	36 (914mm)	18 (457mm)
RIGHT	36 (914mm)	36 (914mm)	18 (457mm)
TOP	72 (1829mm)	72 (1829mm)	72 (1829mm)

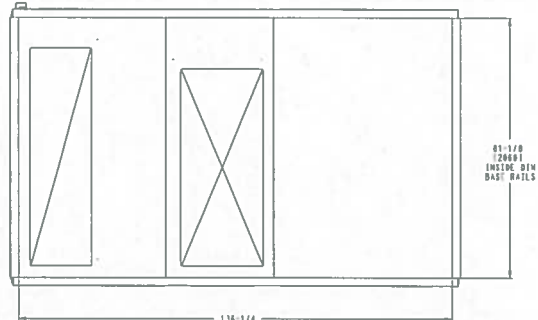
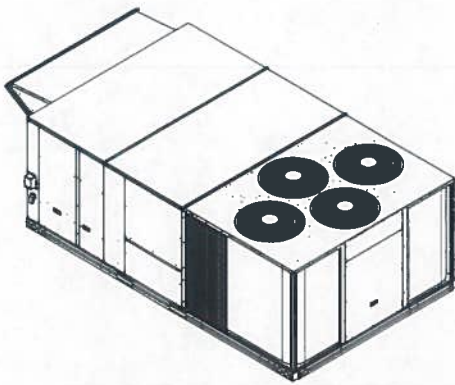
ITC CLASSIFICATION	SHEET	DATE	SUPERCEDES	50FC 24, 28 SINGLE ZONE ELECTRICAL COOLING WITH ELECTRIC HEAT	58HE03873	REV
U.S. ECCN: NSR	4 OF 3	02/10/22				-

Project: Madeira High School Gym - RTU-1A,1B
 Prepared By: Jeff Gries

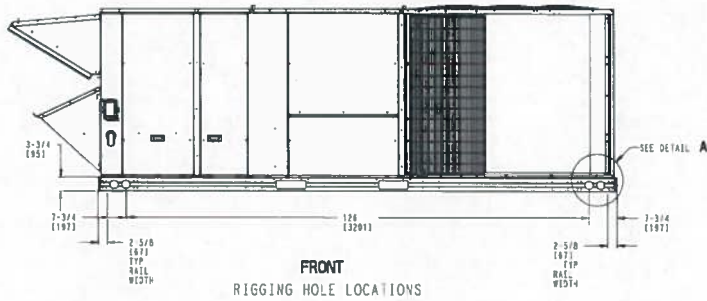
Certified Drawing for RTU-1A, 1B

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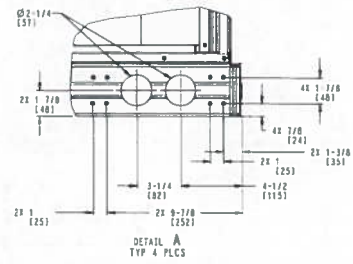
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138-1/4 (3480)
 INSIDE DIM
 BASE RAILS
BOTTOM
 INSIDE BASE RAIL DIMENSIONS



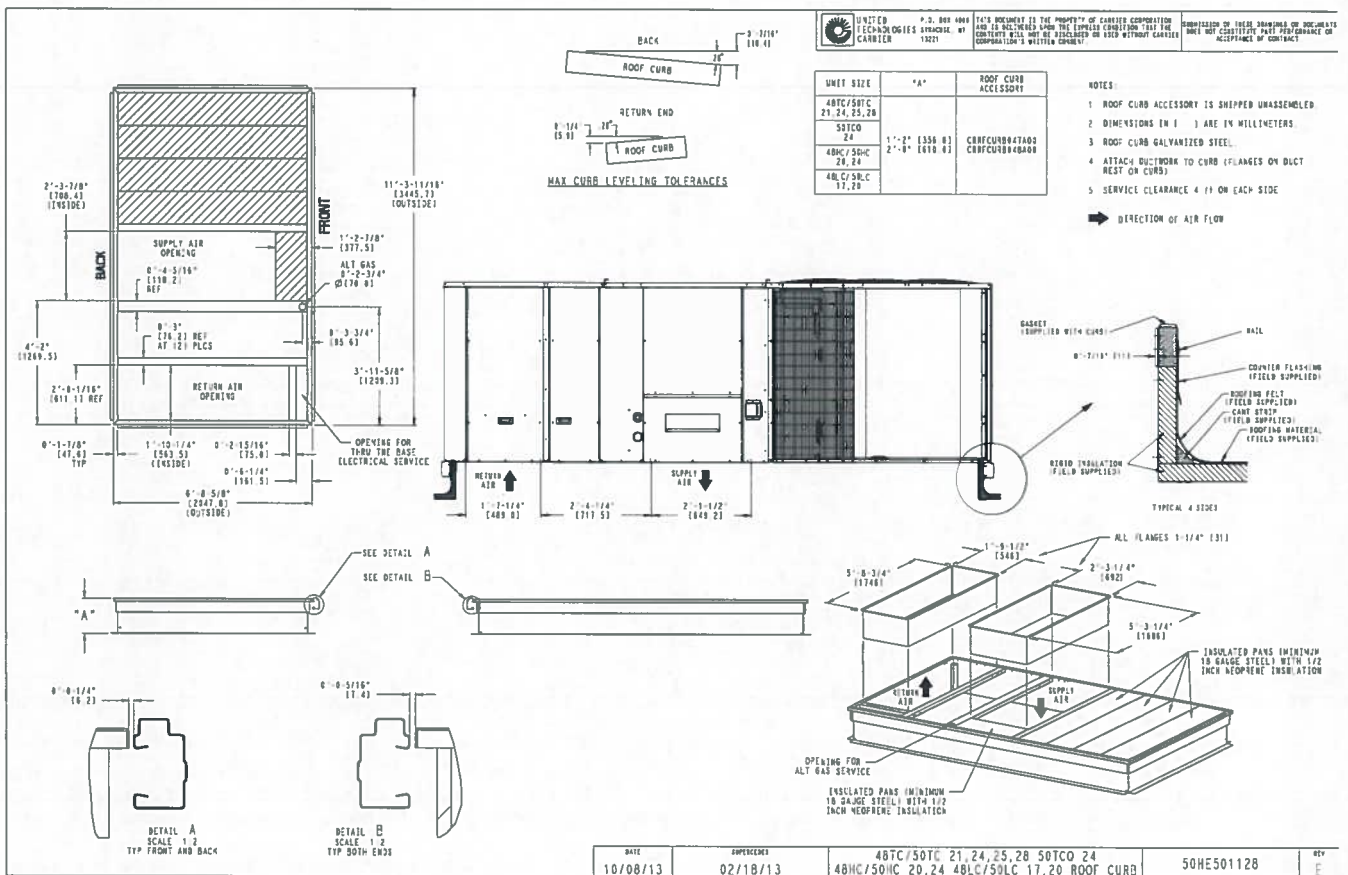
FRONT
 RIGGING HOLE LOCATIONS



DETAIL A
 TYP. A PLCS

ITC CLASSIFICATION	SHEET	DATE	SUPERCEDES	50FC 24,28 SINGLE ZONE ELECTRICAL COOLING WITH ELECTRIC HEAT	50HE003073	REV
U.S. ECCN: NSR	5 OF 5	02/10/22	-			-

Certified Drawing for RTU-1A, 1B



Performance Summary For RTU-1A, 1B

Project: Madeira High School Gym - RTU-1A,1B
 Prepared By: Jeff Gries

07/15/2022
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Part Number: 50FC-M28B2A6-3F2A0

ARI EER: 9.80
 IEER: 14.0

Base Unit Dimensions

Unit Length: 141.5 in
 Unit Width: 86.4 in
 Unit Height: 47.8 in
Base Unit Weight (Does not include any accessories): 2047 lb

Unit

Unit Voltage-Phase-Hertz: 460-3-60
 Air Discharge: Vertical
 Fan Drive Type: Vane Axial
Actual Airflow: 10000 CFM
 Site Altitude: 0 ft

Cooling Performance

Condenser Entering Air DB: 95.0 F
 Evaporator Entering Air DB: 80.0 F
 Evaporator Entering Air WB: 67.0 F
 Entering Air Enthalpy: 31.44 BTU/lb
 Evaporator Leaving Air DB: 58.2 F
 Evaporator Leaving Air WB: 57.1 F
 Evaporator Leaving Air Enthalpy: 24.86 BTU/lb
 Net Cooling Capacity: 275.97 MBH
 Net Sensible Capacity: 208.47 MBH
 Compressor Power Input: 23.89 kW
 Coil Bypass Factor: 0.174

Supply Fan

External Static Pressure: 0.50 in wg
 Options / Accessories Static Pressure
 Economizer: 0.10 in wg
Total Application Static (ESP + Unit Opts/Acc.): 0.60 in wg
 Fan RPM: 1657
 Fan Power: 4.30 BHP
 NOTE: Selected IFM RPM Range: 250 - 1860

Selection includes construction throwaway filter into the base fan curve. This filter is not MERV Rated.

Electrical Data

Voltage Range: 414 - 506
 Compressor #1 RLA: 18.6
 Compressor #1 LRA: 125
 Compressor #2 RLA: 18.6
 Compressor #2 LRA: 125
 Indoor Fan Motor Type: MED
Indoor Fan Motor FLA: 3.5
 Power Supply MCA: 54.7
 Power Supply MOCP (Fuse or HACR): 60
 Disconnect Size FLA: 58
 Disconnect Size LRA: 270
 Electrical Convenience Outlet FLA (based on unit line voltage): 2.2
 Outdoor Fan [Qty / FLA (ea)]: 4 / 0.9
 NOTE: Convenience outlet must be field connected to the line/load side of the unit disconnect per local code.

Control Panel SCCR: 5kA RMS at Rated Symmetrical Voltage

Performance Summary For RTU-1A, 1B

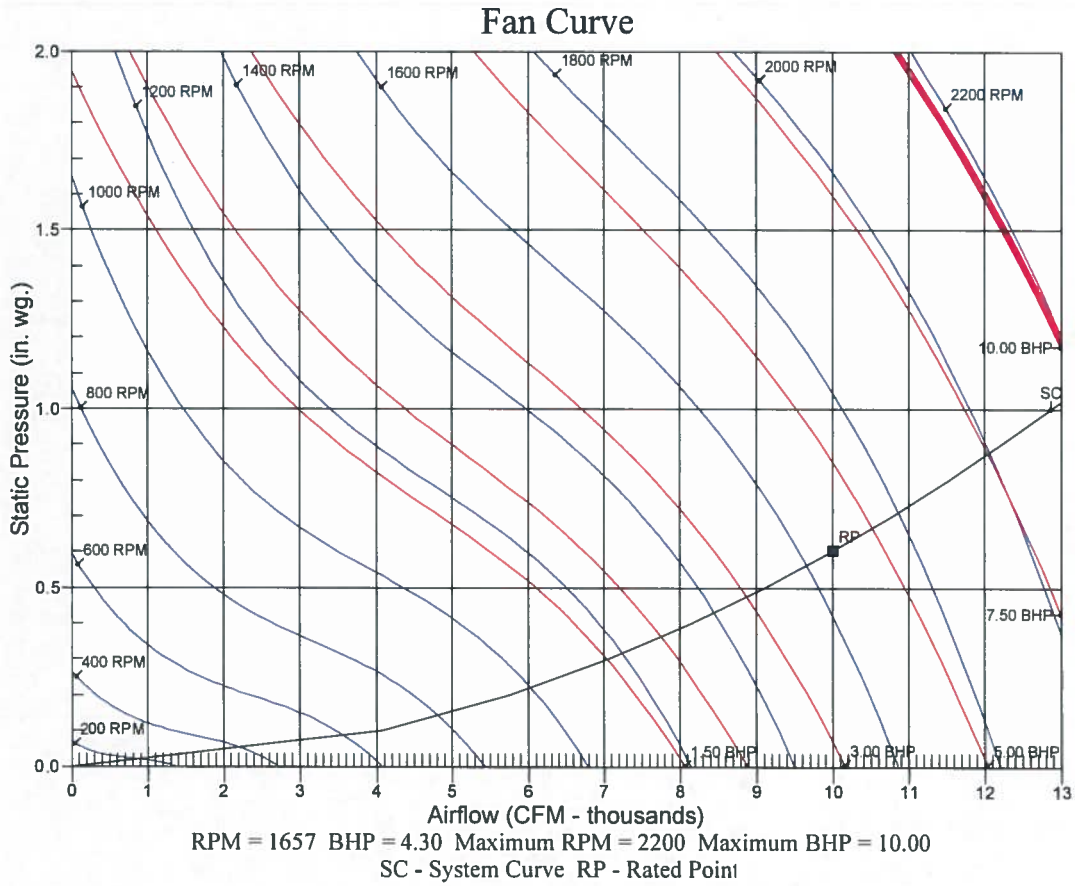
Project: Madeira High School Gym - RTU-1A,1B
 Prepared By: Jeff Gries

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Acoustics

Sound Power Levels, db re 10E-12 Watts

	Discharge	Inlet	Outdoor
63 Hz	110.2	106.5	NA
125 Hz	113.4	101.0	NA
250 Hz	88.8	77.1	NA
500 Hz	87.3	74.9	NA
1000 Hz	84.0	68.4	NA
2000 Hz	89.4	69.6	NA
4000 Hz	92.0	68.4	NA
8000 Hz	87.3	65.9	NA



Unit Feature Sheet for RTU-1A, 1B

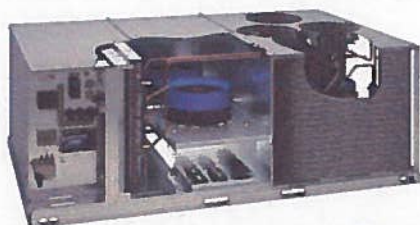
Project: Madeira High School Gym - RTU-1A,1B
Prepared By: Jeff Gries

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WeatherMaker[®]
with **ecoblue**™ technology – 50FC

PACKAGED ROOFTOP ELECTRIC HEATING/ ELECTRIC COOLING UNITS – WITH ECOBLUE TECHNOLOGY 17.5, 20, 25, 27.5 TONS



ecoblue™ technology



WEATHERMAKER® SERIES

50FC units are single packaged electric heating, electric cooling units that are pre-wired and charged with Puron (R-410) refrigerant. The units are factory tested in both heating and cooling modes. All models use two stage cooling capacity control with a full active evaporator coil and new EcoBlue™ direct drive ECM indoor fan system

Approved and certified by:



Use of the AHRI Certified TM Mark indicates a manufacturer's participation in the program. For verification of certification for individual products, go to www.ahridirectory.org

For a complete list of options and accessories refer to Product Data

STANDARD FEATURES INCLUDE:

- Puron (R-410A) HFC refrigerant
- Two-stage/single-circuit cooling capacity control on all models
- IEER's up to 14.7
- Exceeds current DOE IEER efficiencies while meeting DOE's new stringent 2023 IEER efficiency requirements
- 2023 ASHRAE 90.1, and IECC – IEER energy compliant
- NEW Direct Drive – EcoBlue™ Technology Indoor fan system uses Vane Axial fan design and electronically commutated motor. Indoor fan motor also delivers Staged Air Volume (SAV) fan speed control.
- Non-corrosive composite condensate pan in accordance with ASHRAE 62 Standard, sloping design; side or center drain
- Pre-painted exterior panels and primer-coated interior panels tested to 500 hours salt spray protection
- TXV refrigerant metering device on all models
- Insulated cabinet
- Cooling operating range up to 125°F (52°C), and down to 40°F (4°C)
- Round tube, plate fin evaporator and condenser coil design
- Rated in accordance with AHRI Standards 340/360
- Designed in accordance with UL Standard 1995
- Listed by ETL
- New Unit Control Board with intuitive quick fan speed adjustment
- Low pressure, high pressure, mixed air temperature switch protection

MAINTENANCE FEATURES:

- Access panels with easy grip handles
- Innovative easy starting, no-strip screws on unit access panels
- Two-inch disposable return air filters and Tool-less filter access door
- New slide out - Vane Axial evaporator-fan system has no fan belts, pulleys, blower shaft and blower bearings

INSTALLATION FEATURES:

- Thru-the-bottom power entry capability
- Single point electric connections
- Full perimeter base rail with built-in rigging adapters and fork slots
- Dedicated Vertical and Horizontal air flow models. No field kits required

STANDARD WARRANTY:

- 5-year electric heaters
- 5-year compressor
- 3-year SystemVu™
- 1-year parts
- Many optional upgrades also available

OPTIONS INCLUDE BUT ARE NOT LIMITED TO:

- Intelligent SystemVu communicating controls
- Supply and Return Air Smoke Detectors, high static motors
- Louvered condenser coil guards
- Disconnect switch and convenience outlet options
- Stainless Steel heat exchanger option
- Corrosion resistant coil coating.
- MERV-13, 4" Return Air Filters
- Patented Humidi-Mizer[®] adaptive dehumidification system.
- Hinged access panels
- Integrated economizer system. Low and Ultra Low Leak versions
- Phase monitor and condensate overflow protection

Spec Sheet for RTU-1A, 1B

Project: Madeira High School Gym - RTU-1A,1B
 Prepared By: Jeff Gries

07/15/2022
 04:12PM



Light Commercial Rooftop Units

Smoke Detectors

Four Wire Photoelectric Sensing Detector and Control Module

This smoke detector system comprises a four-wire controller and one or two sensors (Return Air and/or Supply Air). Its primary function is to shut down the rooftop unit in order to prevent smoke from circulating throughout the building. Factory installed smoke detectors require no additional sampling tubes to be field installed.



System Description:

Controller - The controller includes a controller housing, a printed circuit board, and an easily removable clear plastic cover for access to the multiple terminal connections and relay contacts. These can be connected to fire alarm systems, heating, ventilating and air conditioning (HVAC) controls, and other auxiliary functions. A remote test/reset/visual alarm station can be connected to the controller.

Detectors - The detector includes a plastic housing, a printed circuit board, a clear plastic cover, an exhaust tube, and a sampling tube. The exhaust tube and sampling tube are attached during factory installation. The cover forms an airtight chamber around the sensing electronics.

System Specifications:

- Four Wire Controller and Photoelectric Sensing Detector with differential sensing for reliable, stable and drift-free sensitivity
- Operating environment: Temperature -4° to 158°F (-20° to 70° C), Humidity 10% to 93% RH, non-condensing
- Magnet-activated test/reset sensor switches
- Tool-less connection terminal access
- Recessed momentary switch for testing and resetting the detector

Controller Specifications:

- One set of normally open alarm initiation contacts for connection to an initiating device circuit on a fire alarm control panel
- Two Form-C aux alarm relays for interface with rooftop unit or other equipment
- One Form-C supervision (trouble) relay to control the operation of the Trouble LED on a remote test/reset station
- Capable of direct connection to two individual detector modules (Return and Supply)
- Interconnect up to 15 controllers for multiple fan shut-down

Detector Specifications:

- Sensor: 8.70 x 5.45 x 1.90 in.
- Smoke detection method: Photoelectric
- Air velocity (min. – max.): 100 – 4,000 ft./min.
- Pressure differential (min. – max.): 0.005 – 1.00 in.
- Sensitivity: 0.67 – 2.46% obscuration/ft.
- Wire size: 14 – 22 AGW (high voltage terminals 12 – 22 AGW)
- Reset time: 2 seconds max.
- Power up time: 8 seconds max.
- Alarm test response time: 5 – 7 seconds
- LED indicators: Alarm (red), Trouble (yellow), Dirty (yellow), Power (green)



EDUCATION



HEALTHCARE



HOSPITALITY



MIXED USE



OFFICES



RETAIL



Spec Sheet for RTU-1A, 1B

Project: Madeira High School Gym - RTU-1A,1B
 Prepared By: Jeff Gries

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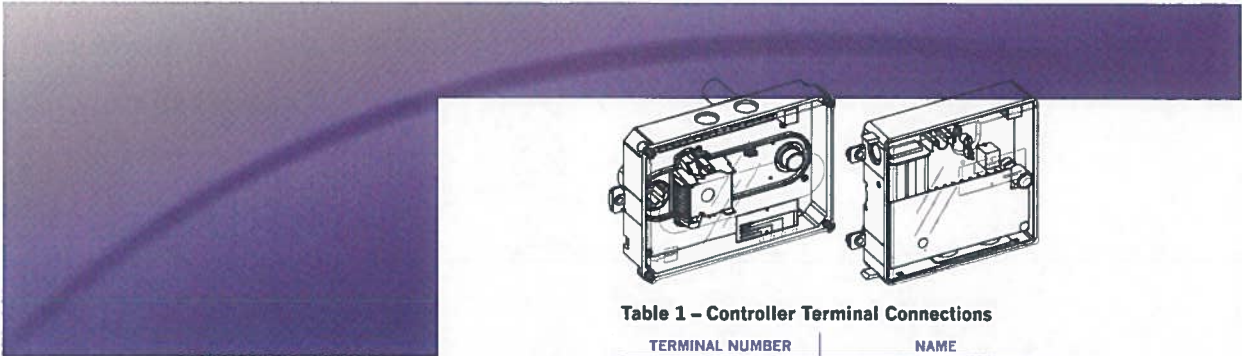


Table 1 – Controller Terminal Connections

TERMINAL NUMBER	NAME
1	AUX (-)
2	Reset
3	SUPV Contact COM
4	Alarm Contact COM
5	Alarm Contact NO
6	AUX 1 Contact COM
7	AUX 2 Contact NO
8	AUX 2 Contact NC
9	24V AC/DC In (+)
10	24V AC/DC In (-)
11	Not used
12	Multi-Shutdown
13	SUPV Contact NO
14	SUPV Contact NC
15	REM Alarm LED Out
16	AUX 1 Contact NC
17	AUX 1 Contact NO
18	AUX 2 Contact COM
19	18 VDC Output (+)
20	18VDC Output (-)
TB3-1	Not Used
TB3-2	Not Used
N	AC Neutral
L	AC Line

Operating Current:

- 20 – 29 VDC: 175 mA
- 24 VAC: 500 mA at 50/60 Hz
- 120 VAC: 100 mA, 50 Hz, 75 mA at 60 Hz
- 220/240 VAC: 53 mA at 50 Hz, 40 mA at 60 Hz

Alarm Initiation Relay:

- Quantity: 1
- Style: Normally open
- Ratings: 2.0 A at 30 VDC (resistive)

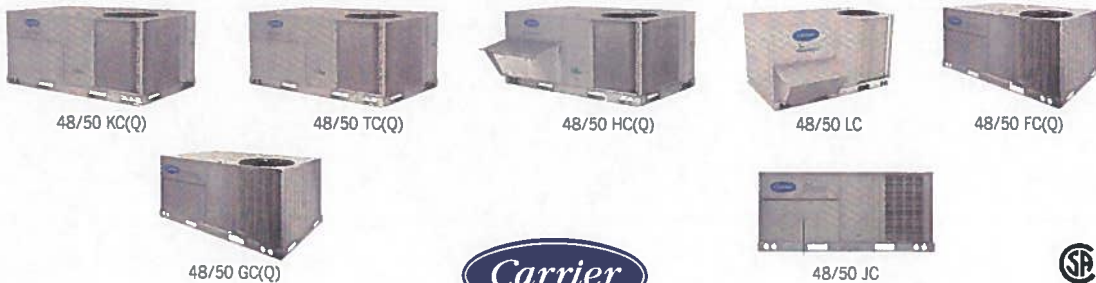
Auxiliary Relays:

- Quantity: 2
- Style: Form C
- Ratings: 10 A at 30 VDC, 10 A at 250 VAC

Supervision (Trouble) Relay:

- Quantity: 1
- Style: Form C
- Ratings: 2.0 A at 30 VDC (resistive)

Available on the following Carrier® Packaged Rooftop Units:



Turn to the experts



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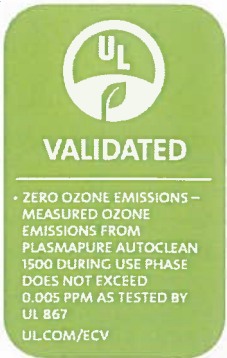
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 Cat. No. 04-811-70010

PlasmaPure AutoClean 1500

IONIZATION PRODUCT SUBMITTAL



The **PlasmaPURE AutoClean 1500** is a self-cleaning needlepoint ionizer that produces positive and negative ions that neutralize harmful pollutants and odors in the home. This compact unit automatically removes dust and dirt build-up on the emitters eliminating the need for any maintenance. It can be easily mounted at the fan inlet of almost any air handling system including residential air conditioners, furnaces, mini-splits, fan coil units and VRF systems. Unit will accept 12-24V AC/DC. The AutoClean 1500 is UL 2998 validated for zero ozone emissions.



SPECIFICATIONS:

Airflow Capacity:6,000 CFM
 Pressure Drop:Negligible
 Housing Material: PC-ABS Plastic Blend
 Weight: 0.3 lbs
 Maximum Operating Temperature: 131° F (55°C)
 Electrical:
 Input Voltages: 12-24V AC/DC
 Input Current: 0.2 amps
 Frequency: 50/60 hertz
 Ionization Output: 10¹² ions/second
 Mode of Operation:Needlepoint Type

DIMENSIONS: See Figure 1

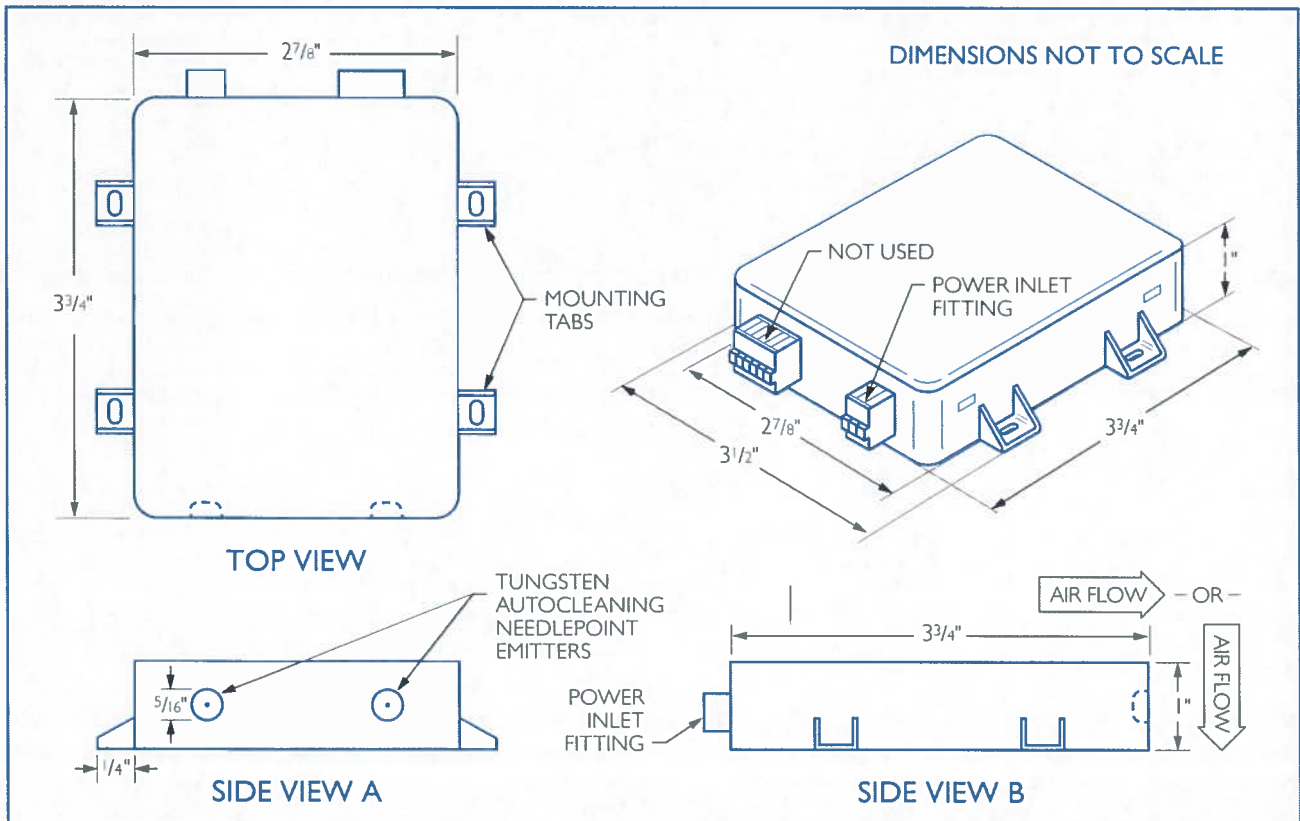
FEATURES:

- Inactivates airborne pollutants such as viruses, bacteria, fungi and mold spores
- Factory programmed for auto-cleaning once per day and on ionizer unit start up
- Discharges static electricity and electrostatic build-up

COMPLIANCE AND CERTIFICATIONS:

UL 867, CSA C22.2# 187, UL 2998, CARB, UL 2043, ISO 16000, RoHS2

FIGURE 1



All stated specifications are subject to change without notice or obligation.



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