KORDA

Submittal ID: 89314

Shop Drawing Submittal

Send To: **MOODY NOLAN, INC.**
300 SPRUCE STREET, SUITE 300
COLUMBUS , OH 43215-

Attention: Bernard Constantino

Project Id: **2018-0217** **Project Name:** **Dayton Charter School-Connor Group**

Discipline: HVAC **Spec Description:** 237413 ROOFTOP AIR-HANDLING UNITS

Submittal Description: PRODUCT DATA AND DETAIL DRAWINGS FOR ROOFTOP AIR-HANDLING UNITS

Date Recv'd: 2/16/2022 **Date Sent:** 2022-02-23

Copies Recv'd: 1 E-COPY **Copies Sent:** 1 E-COPY

Action Taken

- ☐ Approved
- ■ Approved As Noted
- ☐ Revise and Resubmit
- ☐ Reviewed
- ☐ Returned without review per "Submittals" Specification

Comments:

COORDINATE UPSIZED CIRCUIT BREAKER FOR RTU6 FROM 110/3 TO 125/3 WIH DIV 26 CONTRACTOR.

Logged In By:: AMS **Marked/Logged Out By:** MRT

Checked By: Edwartoski, Dan **Initials:** DJE **Date:** 02/22/2022

Coordinated By: Jones, Rob **Initials:** RRJ **Date:** 2022-02-22

Coordinated By: **Initials:** **Date:**

Signature: Daniel J Edwartoski

#40

DAIMLER
Development • Leasing • Construction • Sales

SUBMITTAL SHEET

Job: 1521. - GREATER DAYTON SCHOOL

DATE: 2/15/2022
SPEC #: 23 74 13
REV #: 0

To: **Bernard Costantino**
MOODY NOLAN INC
300 SPRUCE ST
COLUMBUS, OH 43215

From: **Holly Morrow**
THE DAIMLER GROUP INC
1533 LAKE SHORE DRIVE
COLUMBUS, OH 43204

Submittal Title: 23.10-237413 RTU-TPM-22FEB15

Submittal Item:	**Sent Date:**	**Due Date:**
23.10-237413 RTU-TPM-22FEB15	2/15/2022	02/22/2022

THE DAIMLER GROUP
SHOP DRAWING REVIEW

REVIEWED ☒

SUBMIT CORRECTED COPIES FOR DISTRIBUTION

Review is for general conformance with the design concept and contract documents. Notations shall not relieve the contractor from compliance with said documents. Contractor is responsible for intended detail and accuracy, confirmation of dimensions and quantities, selecting fabrication processes, techniques of assembly, performing work in a safe manner and coordinating work with other trades.

ARCHITECT STAMP

MOODY•NOLAN
SHOP DRAWING REVIEW
This review is for general conformance with the design concept and the contractor remains responsible for:
a. Compliance with the contract documents.
b. Confirming and correlating quantities and dimensions.
c. Selecting fabrication process and techniques of construction.
d. Coordination of the work with the other trades.

☑ REVIEWED WITH NO CORRECTIONS ☐ REVISE AND RESUBMIT
☐ REVIEWED WITH CORRECTIONS NOTED ☐ NOT REVIEWED

This review neither extends nor alters any contractual obligations of the architect or contractor, and does not authorize changes in the contract sum or contract time.

BY: BJC DATE: 02/23/22

ENGINEER STAMP

JOB NO. 2018-0217 DATE 2022-02-16

SUBMITTALS HAVE BEEN REVIEWED FOR CONFORMANCE WITH THE DESIGN PRINCIPLES AND CONTRACT DOCUMENTS OF THE PROJECT. CONTRACTOR IS NOT RELIEVED FROM HIS SOLE RESPONSIBILITY REGARDING CHECKING OF DIMENSIONS, COORDINATION OF THE WORK OF ALL TRADES, CORRELATION OF DESIGN DOCUMENTS THAT MAY CONTAIN CONTRADICTORY INFORMATION AND FOR INFORMATION THAT PERTAINS TO THE FABRICATION OR CONSTRUCTION PROCESSES, OR TO SAFETY REQUIREMENTS.

DEVIATIONS, IF ANY FROM THE CONTRACT DOCUMENTS NOT CLEARLY NOTED AS SUCH BY THE CONTRACTOR, HAVE NOT BEEN REVIEWED, ARE NOT APPROVED AND CAN BE AUTHORIZED ONLY BY A PROPERLY EXECUTED CHANGE ORDER.

☐ SEE WRITTED COMMENTS DATED _____

APPROVED ■
APPROVED AS NOTED ☐
REVISE AND RESUBMIT ☐
REVIEWED ☐
DATE 2022-02-23
BY D. Edwartoski

KORDA/NEMETH ENGINEERING, INC
1650 WATERMARK DRIVE, SUITE 200, COLUMBUS, OHIO 43215-1094

Additional Notes:

TP Mechanical
CONTRACTORS | SERVICE | FABRICATION

SUBMITTAL DATA

Project:	**The Greater Dayton School**
Bid Category :	**HVAC**
Project No.:	**E1000110**
TP Tab No.:	**112**
Construction Manager:	**Daimler Group**
Architect/Engineer:	**Moody Nolan**
Submittal For:	**RoofTop Units**
Specification #:	**237413**
Manufacturer:	**Various**
Project Manager:	**Josh Bolton 937-768-2289**

The attached submittal data has been reviewed by TP Mechanical Contractors for compliance with the Architect/Engineer's specifications and plan schedule for this project.

In order to maintain the project schedule, we request that this submittal be returned to TP Mechanical Contractors **within 7 days**.

NOTE: Material cannot be released without Architect/Engineer's approval of submittal.

(Please place stamp of approval here)

X PRODUCT DATA

_____ DRAWINGS

2/14/22 DATE SUBMITTED

_____ DATE RESUBMITTED

T. P. MECHANICAL CONTRACTORS

BY Josh Bolton TJ

This drawing or brochure has been checked to quality or proper components only. Approval of this drawing or brochure shall not relieve the supplier of responsibility for accuracy or dimensions of full compliance with plans and specifications and purchase order.

1500 Kemper Meadow Drive ♦ Cincinnati, OH 45240 ♦ 513-851-8881 ♦ FAX 513-851-0612

Rooftop Air Handling Unit-1 Submittal

The Greater Dayton School

Innovent Rooftop (#1)

2/14/22

TP Mechanical

Sales Engineer:
Brian Turner
ElitAire
bturner@elitaire.com
513-673-0600 cell

Notes:

- 460/3
- Disconnect Switch
- 36” Plenum Roofcurb with Vibration Isolation Rails (Separate curb submittal package to be provided)
- Cooling Only
- Powered Exhaust
- BACnet Card
- Outdoor Airflow Station
- 1 Year Parts Warranty and 5 Year Compressor Warranty
- Start Up is Included

Innovent Submittal *Job #: 2001127* *Issue 1*

Date	1/27/2022
Job	Connor School - Dayton
Location	Dayton, OH
Rep	ELITAIRE (COLUMBUS)
Engineer	
Contractor	

Innovent
Air Handling Equipment

Innovent is a business of

UNISON COMFORT TECHNOLOGIES

Tag	***Innovent Model #***
RTU1	CAHU-50000-AC-460

Table of Contents

Performance Data Summary

RTU1

MODEL	ALTITUDE (Ft)
CAHU-50000-AC-460	0.00

SUPPLY FILTER — SUPPLY

	CFM	TYPE	DEPTH (in)	FACE VEL. (FPM)	MERV	QTY	WIDTH (in)	HEIGHT (in)	CLEAN PD	TOTAL PD
PRE	50000	Pleated	2	495	8	28	20	16	0.72	1.61
						14	25	16		
FINAL	50000	Cartridge	4	495	14	28	20	16		
						14	25	16		

DX COIL — SUPPLY

CFM	FPM	EAT (DB/WB)(°F)	LAT (DB/WB)(°F)	MBH (T/S)	REF	CIRCUITS	SST (°F)	ROWS	FPI	PD
50000	499	79.0/64.6	55.7/55.1	1428.0/1276.4	R-410A	4	51.2	6	11	0.88

SUPPLY FAN — SUPPLY

QTY	CFM	CLASS	SIZE (in)	TYPE	TSP ("WC)	BHP	MHP	RPM	MOTOR RPM	VFD Hz	MOTOR TYPE
4	12500	II	24	Plenum	6.29	17.3	20.0	2076	1800	71.2	TEFC
TOTAL:	50000	-	-	-	6.29	69.4	80.0	-	-	-	-

TSP CALCULATION

RA ESP ("WC)	1.00	Casing Loss ("WC)	0.30	Supply Filter Loading PD ("WC)	0.89	-	-
SA ESP ("WC)	2.50	Supply Filter Clean PD ("WC)	0.72	DX Coil ("WC)	0.88	TSP:	6.29 "WC

The recirculation path (return to supply) leads to a greater TSP than the outside air path, so its components are listed above.

EXHAUST FAN — EXHAUST

CFM	QTY	SIZE (in)	TYPE	DRIVE	ESP ("WC)	TSP ("WC)	RPM	BHP	MHP	MOTOR TYPE
50000	2	48	AXIAL	VGD	1.0	1.3	1160	2 x 9.12	2 x 10.0	TEFC

AIR-COOLED REFRIGERATION — NONAIRSTREAM

TONS	AMBIENT (°F)	CIRCUITS	# OF STAGES	REF. EER	COMP.	FANS/HP
119.0	95.0	4	4	12.5	(4) ZPT308KCE	(8) 24"/1.0

ELECTRICAL INFORMATION — UNIT POWER

COMPONENT	VOLTS	PHASE	FREQ. (Hz)	MOP	MCA
Electrical Enclosure	460	3	60	350	335.1

AMP SUMMARY

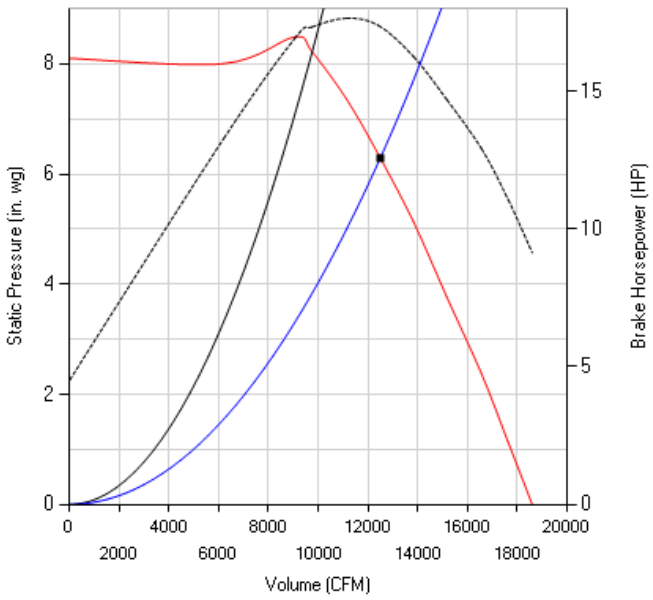
Exhaust Fan	14.1 x 2	Air-Cooled Refrigeration	2.1 x 8	--	--
Supply Fan	24.0 x 4	Air-Cooled Refrigeration	23.1 x 8	Total:	325.8

Fan Curve

RTU1 Supply Fan

APH-24-4-100-II-200

Volume Per Fan (CFM)	12,500	Total Volume (CFM)	50,000	Drive Loss (%)	-
External SP (In. wg)	3.50	Total SP (In. wg)	6.29	Static Efficiency (%)	71.33
Elevation (ft.)	0	Brake Horsepower (bhp)	69.36	Fan Manufacturer	Greenheck
Airstream Temp. (F)	68.0	Fan RPM	2076	Fan Size (In.)	24
Motor Horsepower (hp)	80.0	Max Class RPM	2178		



Sound Power by Octave Band

Sound Data	62.5	125	250	500	1000	2000	4000	8000	LwA	dBA
Inlet	90	94	98	101	92	89	85	82	100	95
Outlet	97	99	101	105	101	95	90	86	105	100

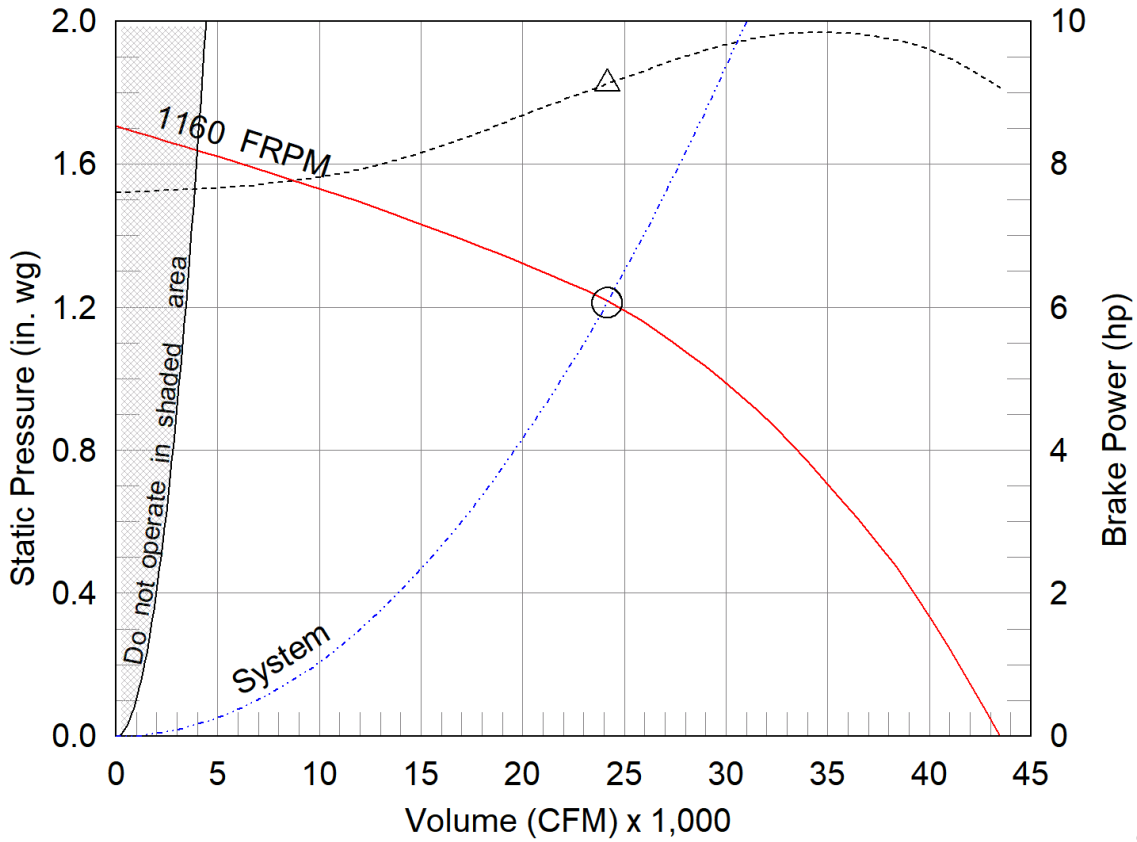
Fan arrays display sound data for the array.

EXHAUST FANS X 2

AER-E48C-615-B-VGD100

Chart Type: Operating Conditions

Requested Volume (CFM)	25,000	Actual Volume (CFM)	24,151	Drive Loss (%)	-
Total External SP (in. wg)	1.213	Static Efficiency (%)	51		
Elevation (ft)	699	Operating Power (hp)	9.12		
Airstream Temp. (F)	70	Fan RPM	1160		



△ Operating Bhp point
○ Operating point at Total External SP
Fan curve
System curve
Brake horsepower curve

External SP	1.3	in. wg
Direct Drive RPM Adjustment	-0.087	in. wg
Total External SP	1.213	in. wg

amca WORLDWIDE CERTIFIED RATINGS SOUND AND AIR PERFORMANCE
AIR MOVEMENT AND CONTROL ASSOCIATION INTERNATIONAL, INC. www.amca.org

Sound Power by Octave Band

Sound Data	62.5	125	250	500	1000	2000	4000	8000	LwA	dBA	Sones
Inlet	95	102	107	108	105	99	95	90	109	98	101

LwA - A weighted sound power level, based on ANSI S1.4
dBA - A weighted sound pressure level, based on 11.5 dB attenuation per Octave band at 5 ft. dBA levels are not licensed by AMCA International
Sones - calculated using AMCA 301 at 5 ft

Note: The sound data listed is for an individual fan. The array is 3dB more in each octave band.

COMPONENTS:

1.) EXHAUST BLOWER/MOTOR ASSEMBLY (TYP. OF 2)
2.) RECIRCULATION AIR DAMPER
3.) OURSIDE AIR LOUVER (TYP. OF 2)
4.) OUTSIDE AIR FLOW MONITORING DAMPER (TYP. OF 2)
5.) 2" MERV 8 SUPPLY AIR PRE-FILTER
6.) 4" MERV 14 SUPPLY AIR FINAL FILTER
7.) VFD CABINET
8.) DX COIL (TYP. OF 2)
9.) COIL CONDENSATE DRAIN (1 1/4" MPT, TYP. OF 2)
10.) CONTROL PANEL/MAIN DISCONNECT
11.) SUPPLY BLOWER/MOTOR ASSEMBLY (TYP. OF 4)
12.) AIR COOLED CONDENSING SECTION

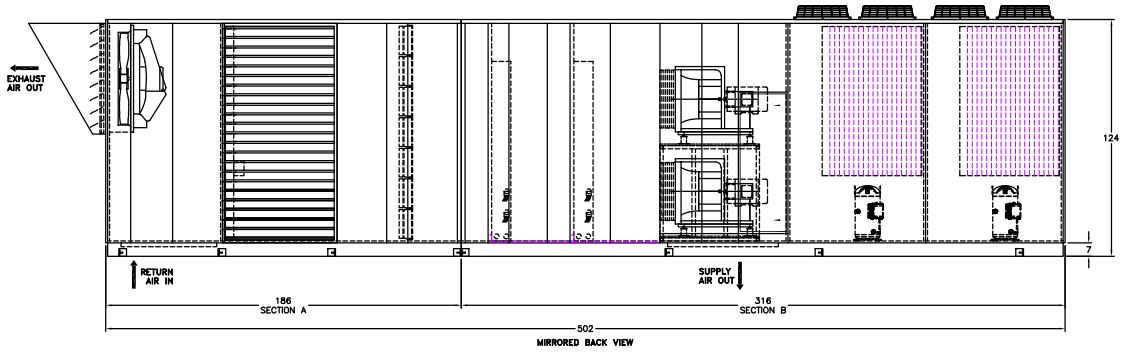
WEIGHT:

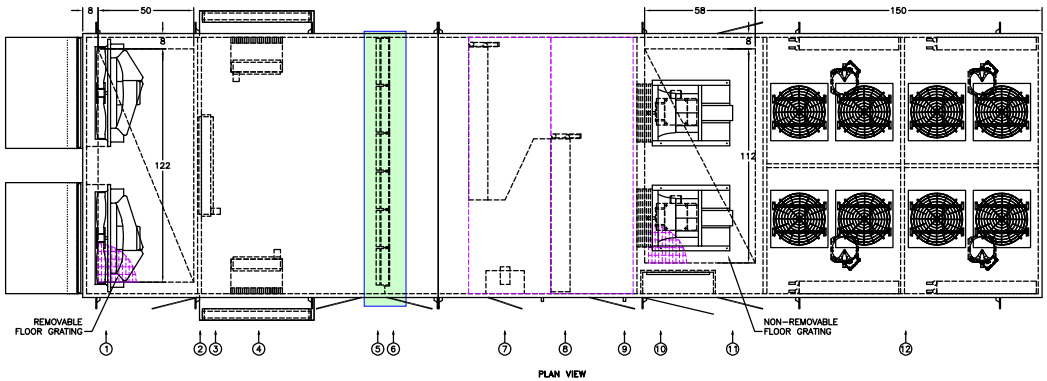
SECTION A: 9,400 LBS.
SECTION B: 17,200 LBS.
TOTAL: 26,600 LBS.

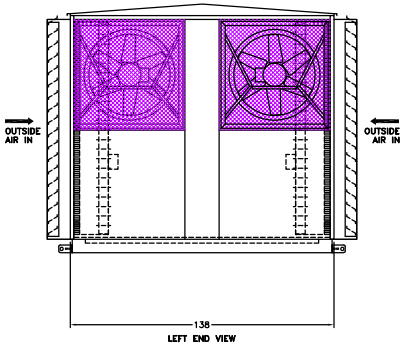
NOTE:

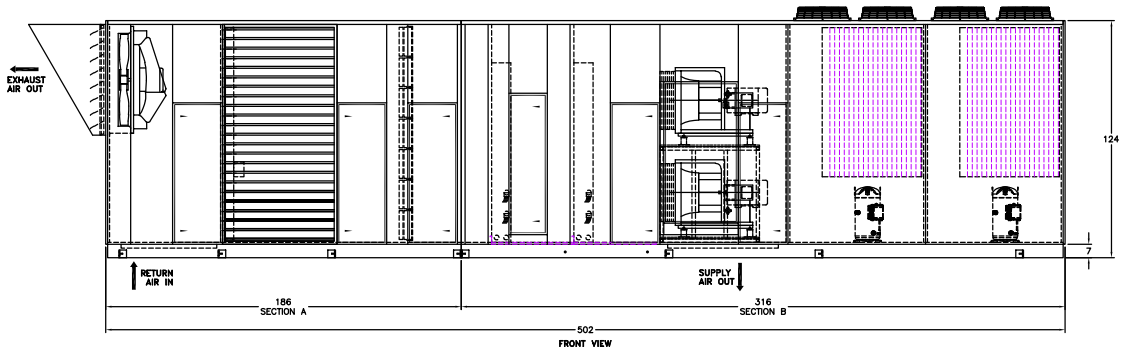
OUTSIDE AIR LOUVER & EXHAUST AIR HOOD MAY BE SHIPPED LOOSE FOR FIELD INSTALLATION BY OTHERS.

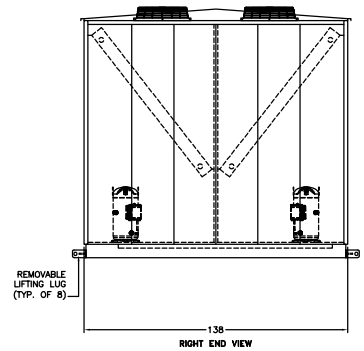
OUTSIDE AIR LOUVER – 12"
EXHAUST AIR HOOD – 41"









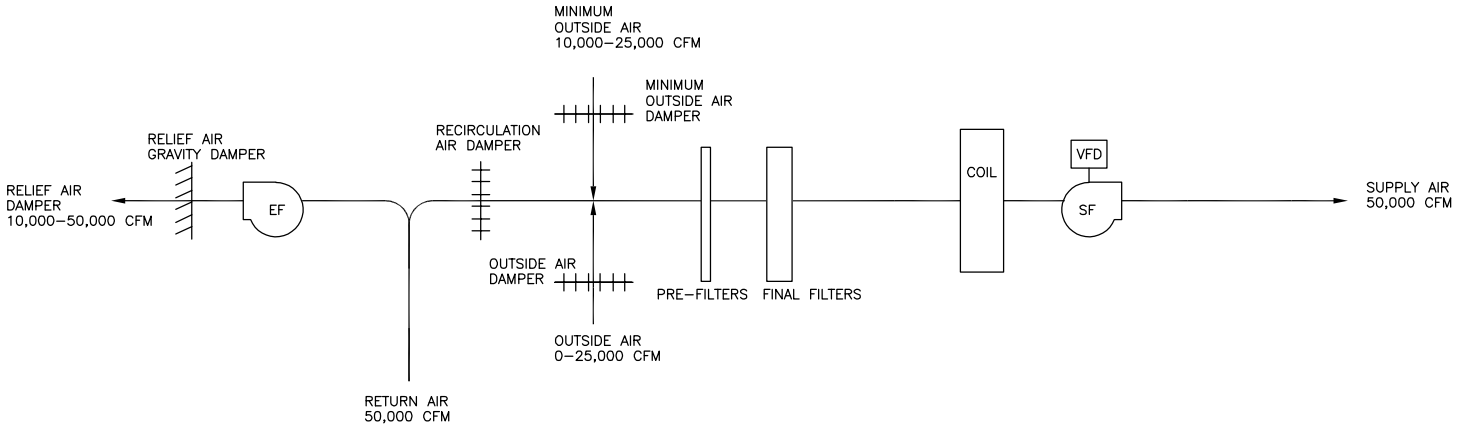


RECOMMENDED CLEARANCES

- MINIMUM 12" IN FRONT OF ALL HOODS.
- MINIMUM 24" IN FRONT OF ALL LOUVERS.
- MINIMUM 40" IN FRONT OF ALL SERVICE ACCESS LOCATIONS.
- MINIMUM 36", OR AS LOCAL CODES DICTATE, IN FRONT OF ALL ELECTRICAL PANELS. EXTERNALLY MOUNTED PANELS CAN BE UP TO 16" DEEP.
- MINIMUM 48" ABOVE ALL CONDENSER FANS.
- MINIMUM 48" IN FRONT OF ALL CONDENSER COILS.
- COMPONENT REMOVAL MAY REQUIRE MORE SPACE THAN SHOWN ABOVE.

Innovent
Air Handling Equipment

ENGINEER: M. KAHLE		DESCRIPTION: UNIT DRAWING	
DRAWN BY: CAS		PROJECT: CONNOR SCHOOL – DAYTON	
JOB #: 2001127		TAG #: RTU1	REV #:
FILE NAME: 2001127UR01	DATE: 1/26/22	MODEL #: CAHU-50000-AC-460	



Innovent Air Handling Equipment	ENGINEER: M. KAHLE	DESCRIPTION: AIRFLOW SCHEMATIC	
	DRAWN BY: MDK	PROJECT: CONNOR SCHOOL – DAYTON	
	JOB #: 2001127	TAG #: RTU1	REV #:
	FILE NAME: / DATE: 1/24/22	MODEL #: SEE UNIT DRAWING FOR MODEL #	

NOTE: SENSORS THAT ARE SHIPPED LOOSE AND INSTALLED IN THE FIELD BY OTHERS.

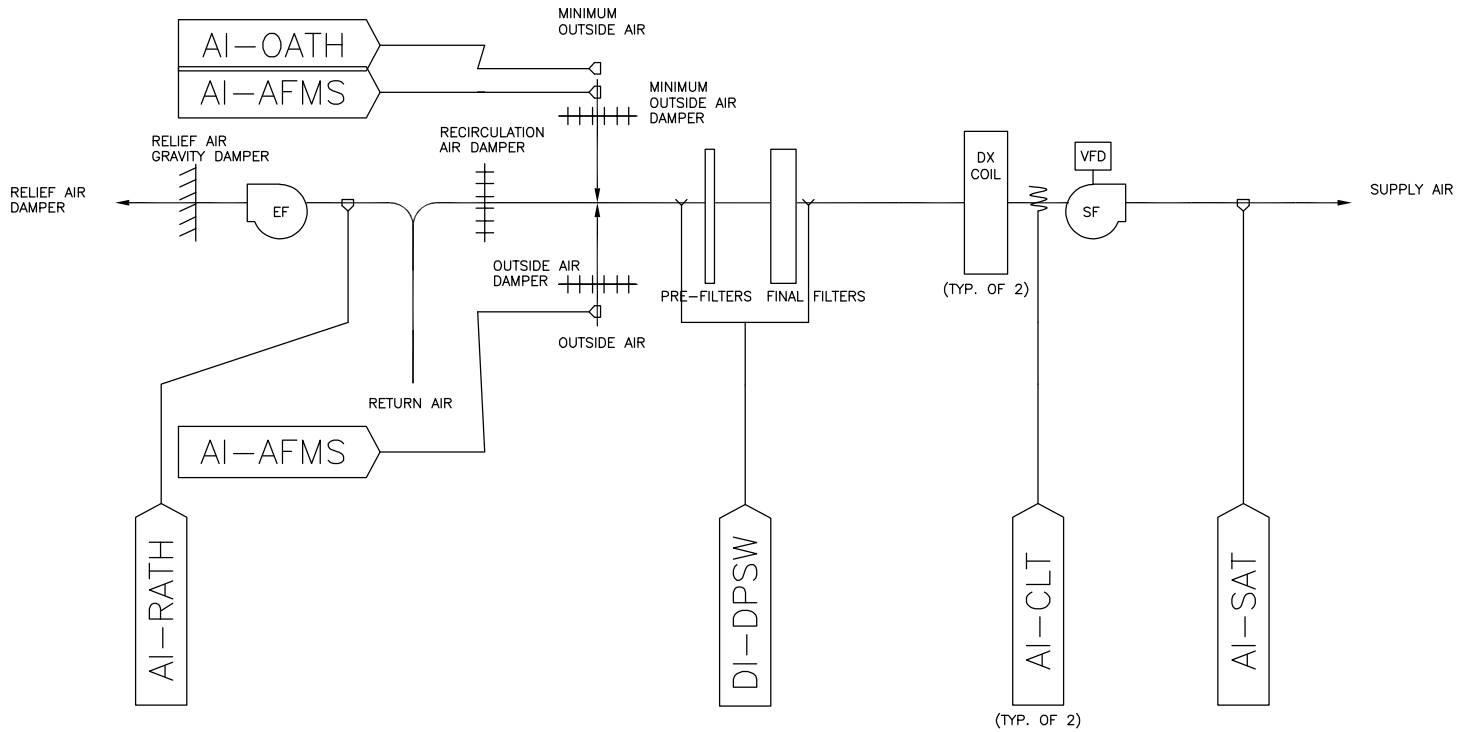
AI–SADSP

AI–RMDPS

LEGEND

OATH – OUTSIDE AIR TEMPERATURE AND HUMIDITY
RATH – RETURN AIR TEMPERATURE AND HUMIDITY
SAT – SUPPLY AIR TEMPERATURE
CLT – COIL LEAVING TEMPERATURE
DPSW – DIFFERENTIAL PRESSURE SWITCH
SADSP – SUPPLY AIR DUCT STATIC PRESSURE
RMDPS – ROOM DIFFERENTIAL PRESSURE SENSOR
AFMS – AIRFLOW MONITORING SYSTEM

AI – ANALOG INPUT
DI – DIGITAL INPUT



Innovent Air Handling Equipment	ENGINEER: M. KAHLE	DESCRIPTION: SENSOR SCHEMATIC	
	DRAWN BY: MDK	PROJECT: CONNOR SCHOOL – DAYTON	
	JOB # 2001127	TAG # RTU1	REV #:
	FILE NAME:	DATE: 1/24/22	MODEL # SEE UNIT DRAWING FOR MODEL #

Specification

RTU1

CONSTRUCTION

CASING

- SMACNA leakage class rating of 5.0
- Maximum panel deflection shall not exceed L/250 at design total static pressure
- Minimum R-13 insulation value for walls, ceilings, and flooring
- 2" thick double wall thermal-break panels, 22 gauge high performance polyester painted steel (Innovent standard gray) outer wall, 22 gauge galvanized steel inner wall
- 2 lb/ft3 polyurethane foam injected insulation in the walls and ceiling
- Designed for outdoor installation
- 22 gauge high performance polyester painted steel (Innovent standard gray) pitched roof
- Unit shall be shipped in 2 sections. Sections shall be reassembled by others in the field. All silicone, gasketing, flashing and fasteners required to reassemble the unit sections shall be provided and shipped loose inside the unit sections.

FLOOR

- Floor shall be 2" thick paneled construction with 18 gauge galvanized steel walk-on surface and 22 gauge galvanized steel underside of paneled floor (not exposed to air stream)
- 2 lb/ft3 polyurethane foam injected insulation
- Safety grating provided for duct penetrations through the unit floor
- The unit construction described above will not accommodate a plenum style curb

FRAME & STRUCTURAL BASE

- Frame and panel construction provided with structural tube framing members
- 10 ga coated welded steel structural base
- Lifting lugs mounted on unit base

ACCESS

- Double wall insulated access doors with stainless steel hinges, corrosion resistant compression latches
- Doors shall be tool lockable
- Doors shall have pressure relief safety latches (doors that open with pressure)

UNIT INLETS/OUTLETS

- Return air inlet with duct connection
- Supply air outlet with duct connection
- Exhaust air outlet with weather hood and aluminum bird screen
- Outside air inlet aluminum louvers with a mill finish and aluminum bird screen

COMPONENTS

DX COIL

- Rated in accordance with AHRI 410-2001 DX Coil with galvanized steel casing, 0.016 thick copper tubes, and 0.01 thick aluminum fins
- Stainless steel IAQ drain pan

SUPPLY FAN

- Airfoil plenum fan, welded aluminum wheel
- AMCA certified ratings for sound and performance
- Direct drive assembly
- 1" spring isolated unitary fan/motor base, flex connectors provided at fan inlet
- TEFC premium efficiency motors
    - VFD-rated with class F insulation
    - Shaft grounding is provided on each motor

SUPPLY FILTER

- 2" pleated MERV 8 filter
- 4" cartridge MERV 14 filter
- Front access filter rack construction to be galvanized steel
- 1 spare set(s) of pre-filters provided
- 1 spare set(s) of final filters provided
- Accessories:
    - Dirty filter indicator switch

DAMPERS

- Recirculation: galvanized steel formed blade, galvanized steel frame, modulating actuator
- Outside air inlet: galvanized steel formed blade, galvanized steel frame airflow monitoring, modulating actuator
- Exhaust air outlet: aluminum extruded blade, aluminum frame gravity
- Airflow monitoring dampers:
    - AMCA certified performance
    - Integral airflow straightener
    - Leakage rating of 3 CFM/ft2 at 1" wg
    - Synthetic bearings
- Gravity Dampers:
    - Tested in accordance with AMCA standard 500-D
    - 0.125" aluminum blade

EXHAUST FAN

- Axial fan with aluminum airfoil blades, welded aluminum blades
- Galvanized steel motor drive frame
- Direct drive assembly
- EC Titanium TEFC/IP54 premium efficiency motors
- Shaft grounding is provided on each motor

AIR-COOLED REFRIGERATION

- Integral air cooled refrigeration system provided with hermetic scroll compressor(s), condenser coil(s) and prop condenser fan(s).
- All refrigeration circuits tested, dehydrated and charged with refrigerant.

ELECTRICAL

- Unit ETL listed as a complete package, unit factory wired to unit mounted NEMA 3R control panel
- Major electrical components UL listed (non-fused disconnect switch, control circuit fusing, control circuit transformer, fan motor starters, and overloads as applicable)
- Power wiring enclosed in conduit
- Single point power connection
- Unit shall have a short circuit current rating (SCCR) of 5 kA
- A single supply fan VFD is provided by Innovent and factory installed by Innovent
    - No manual bypass included
    - Variable frequency drive shall be ventilated by the unit airstream
- All power wiring shall be coiled into the section with its respective electrical component. Field extension of wire through air handler tunnel and termination of wires at control panel shall be by others.
- Unit shall be fully factory wired for testing purposes with labeled quick connections at section splits. After testing, all control wiring will be disconnected at section splits and placed inside a junction box. Field reconnection of wires shall be by others after the unit is set.
- Electrical Accessories:
    - Unit has phase/voltage protection

CONTROLS

- A fully-programmed Carel DDC controller is provided.
    - A standard Innovent sequence of operation will be provided. Any customization of the standard sequence will require factory approval.
- BACnet MS/TP interface is included
- Sensors/transducers/switches are provided and installed by Innovent.

Specification

ADDITIONAL UNIT DETAILS

EQUIPMENT MOUNTING

- Roof curb by others

ETL Listing

- ANSI/U.L. 1995: Heating and Cooling Equipment

WARRANTIES

- All Innovent warranties begin at equipment start up or 6 months from shipment, whichever occurs first. If the warranties need to be extended from what is shown, please contact the factory for pricing.
- 1 year PARTS ONLY unit warranty is provided per Innovent's standard warranty terms
- 5 year PARTS ONLY warranty is provided for all compressors

FACTORY TESTING/REPORTS

- Standard run testing done (consult factory for more details)

Reference Info:

- Sales Order Number: 2001127
- Project Name: Connor School - Dayton
- Project Location: Dayton, OH
- Unit Type: C-Series
- Unit Tags: RTU1

Control Application Summary:

- This C-Series unit is a heat/cool air handling unit. Key components include; supply fan, exhaust fan, direct expansion coil (cooling), and a unit controller.
- The unit controller provides control of temperature, ventilation, as well as, unit status, component safeties, alarm and diagnostic information.
- The unit controller will maintain a constant supply temperature set point. The supply fan is controlled to maintain supply duct pressure. The exhaust fan is controlled to maintain space static pressure.

Operating States

Occupied

- Supply Fan on, 100% balanced airflow.
- Exhaust Fan on, control per sequence.
- Economizer enabled.
- Cooling enabled.
- All dampers are enabled.

Supply Fan Control

- The supply fan variable speed shall modulate based on the supply duct static pressure set point: 1.5" WC adjustable.

Exhaust Fan Control

- The exhaust fan variable speed shall control based on the differential pressure between the space and an adjacent (or ambient) in order to maintain space pressure: 0.05" W.C, adjustable.

Operating Modes

Cooling

- Economizer Mode: The economizer (modulating outside air/recirculation air type) and the direct expansion coil are controlled to maintain the supply temperature set point. The economizer, if available, will be used as the first stage of cooling.
    - Outside air temperature < supply air temperature set point:
        - The mixing dampers modulate (increasing/decreasing the outside air) to maintain the supply temperature set point.
        - Each damper has an adjustable minimum & maximum position (field balanced by others) that it will modulate between.
    - Outside air enthalpy < return air enthalpy AND outside air temperature > supply air temperature set point:
        - The mixing dampers modulate to 100% OA
        - Mechanical cooling may be required to maintain the supply temperature set point
    - Outside air enthalpy > return air enthalpy:
        - Outdoor Damper at minimum position.
        - Mechanical cooling required.
- Cooling Mode: The direct expansion coil is controlled to maintain the unit supply temperature set point.
- Cooling Lockout: The direct expansion coil will be locked out when the outside air is < 50°F, adjustable.

Supply Temperature Set Point

- The unit controller will maintain a constant unit supply temperature: 55.7°F, adjustable.

Minimum Outside Air Control

- The outside air damper and recirculation air damper shall modulate to maintain the minimum outside air cfm set point: 10000CFM, adjustable.

Non-Shutdown Safeties

Dirty Filter Switches

- If the filter differential pressure rises above the adjustable set point of the switch, the differential pressure switch shall signal the unit controller to activate an alarm.

Unit Shutdown Safeties

Supply Temperature Low Limit

- If the unit supply temperature drops below 35°F (adjustable), the unit controller shall immediately shut down the unit after an adjustable time delay.

Supply Temperature High Limit

- If the unit supply temperature rises above 120°F (adjustable), the unit controller shall immediately shut down the unit after an adjustable time delay.

Phase/Voltage Monitor

- A phase/voltage protection relay shall be provided for each unit. Upon sensing a loss of phase or voltage, the unit shall immediately shut down.

Smoke Detector(s)

- Return and/or supply smoke detector(s), provided, installed and field wired in series, by others. Upon detecting smoke, the smoke detector(s) shall send a single binary signal to the unit controller to immediately shut down the unit.

High Limit Duct Static Pressure Switch

- If supply duct static pressure rises above the switch set point (4" W.C., adjustable), the differential pressure switch shall signal the unit controller to immediately shut down the unit.

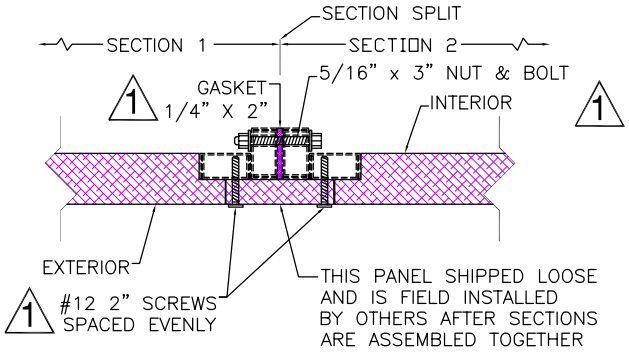
Sequence Required Sensors

Analog (Factory)

- Supply Air Temperature
- Outside Air Temperature
- Outside Air Humidity
- Return Air Temperature
- Return Air Humidity
- Outside Air Flow Monitoring
- Supply Duct Static Pressure
- Space Differential Pressure Sensor
- Coil Leaving Temperature

Digital (Factory)

- Filter Pressure Switch
- Phase/Voltage Protection Relay



PLAN VIEW FRONT/BACK CONNECTION DETAIL

LOOK

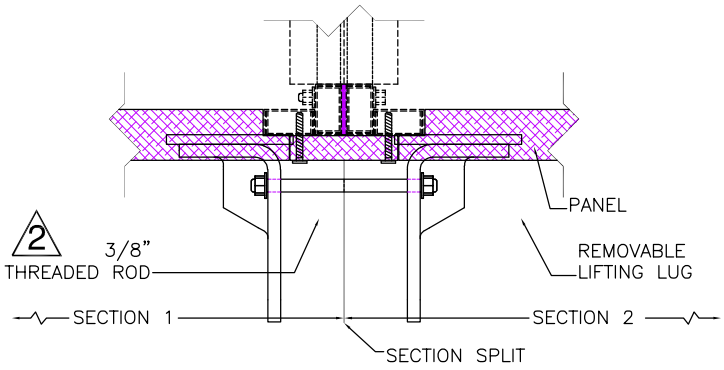
NOTE: SECTIONS MUST BE DRAWN TOGETHER BY THE BASE ANGLE AND NOT THE INTERIOR FRAME.

EACH SECTION FACE REQUIRES A LAYER OF GASKET TO BE APPLIED PRIOR TO DRAWING SECTIONS TOGETHER.

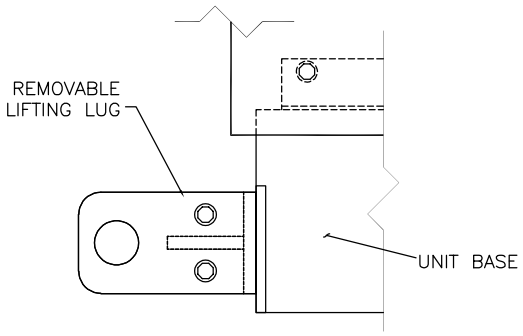
REFER TO INSTALLATION, OPERATION, AND MAINTENANCE MANUAL TO ADDITIONAL INFORMATION.

1 PARTS PROVIDED BY INNOVENT FOR FIELD INSTALLATION BY OTHERS.

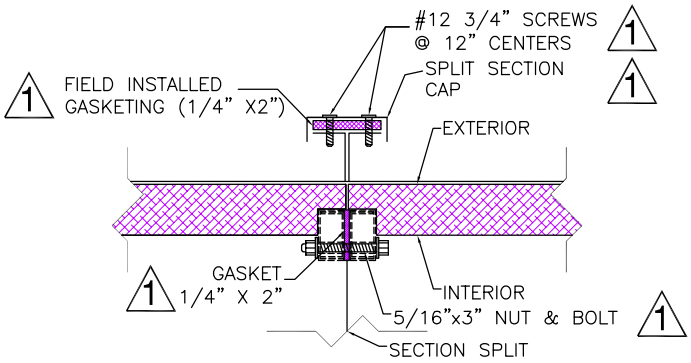
2 QTY. 2 LENGTHS OF 3/8" THREADED ROD PROVIDED FOR DRAWING SECTIONS TOGETHER. UPON COMPLETION OF INTERIOR SPLIT CONNECTIONS, REMOVE THREADED ROD AND REUSE AT NEXT SECTION.



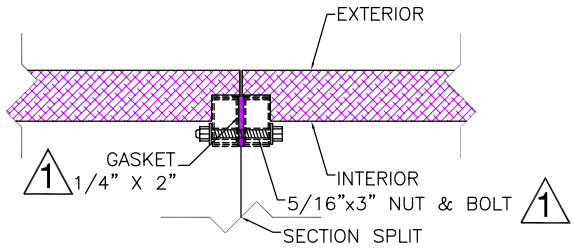
PLAN VIEW BASE CONNECTION DETAIL



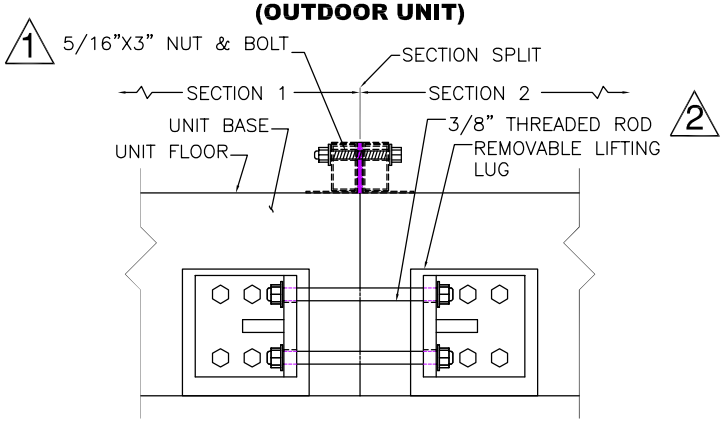
RIGHT END VIEW BASE CONNECTION



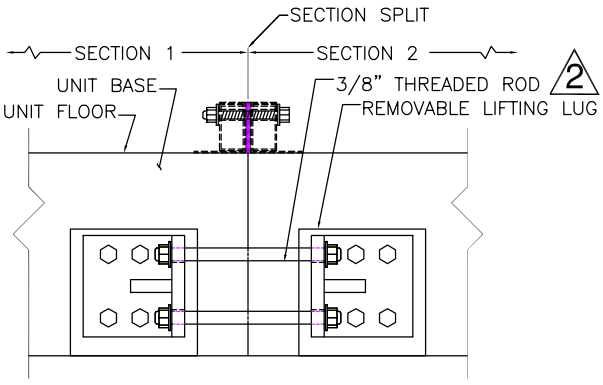
FRONT VIEW ROOF CONNECTION (OUTDOOR UNIT)



FRONT VIEW ROOF CONNECTION (INDOOR UNIT)



FRONT VIEW BASE CONNECTION (OUTDOOR)



FRONT VIEW BASE CONNECTION (INDOOR)

Innovent
Air Handling Equipment

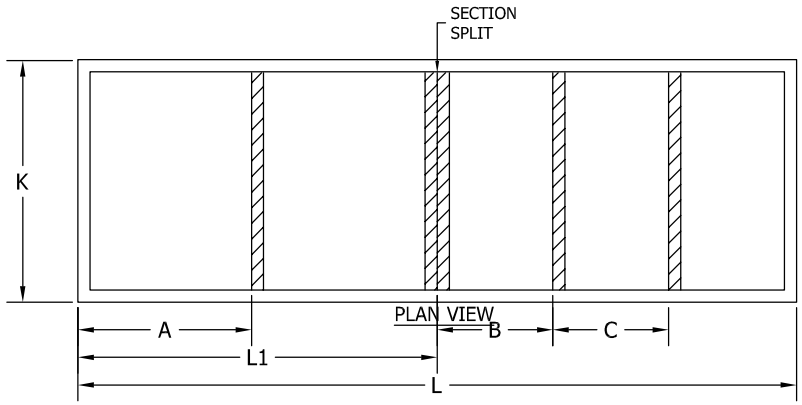
ENGINEER: M. KAHLE	DESCRIPTION: CONNECTION DETAIL – REMOVABLE LIGHT DUTY LIFTING LUG
DRAWN BY: CAS	PROJECT: CONNOR SCHOOL – DAYTON
JOB #: 2101127	TAG #: SEE UNIT DRAWING — REV #:
FILE NAME: 2001127XR01 — DATE: 1/26/22	MODEL #: SEE UNIT DRAWING FOR TAG TO MODEL # REFERENCE

CURB DETAIL DRAWING

QUANTITY	TAG(S)	DIMENSIONAL DATA	H	MATERIAL	UNIT WT.	CURB WT.
1	RTU1	**K**=130 1/2 **L**=494 1/2 **L1**=182 1/4 **A**=90 5/16 **B**=103 9/16 **C**=103 9/16	N/A	GALV.	26,600 LBS	N/A

CROSS MEMBERS AT SECTION SPLIT(S) NEED TO BE STRUCTURAL AND SUPPORTED FROM BELOW

CURB BY OTHERS

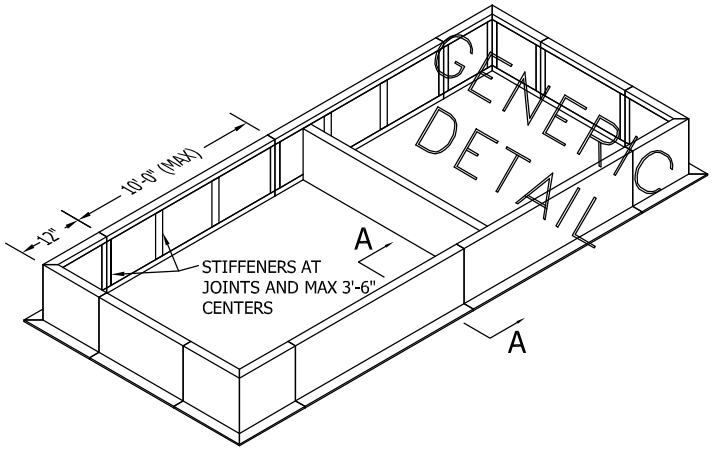


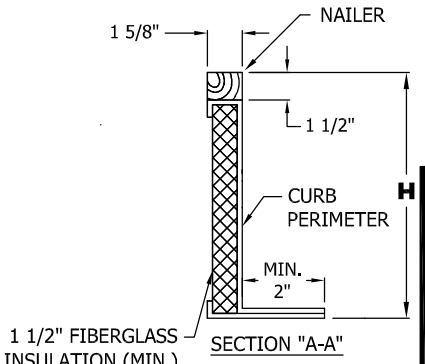
CROSS MEMBER KEY

ANGLE IRON CROSS BRACE

RECESSED 1" BELOW PERIMETER

FLUSH WITH PERIMETER





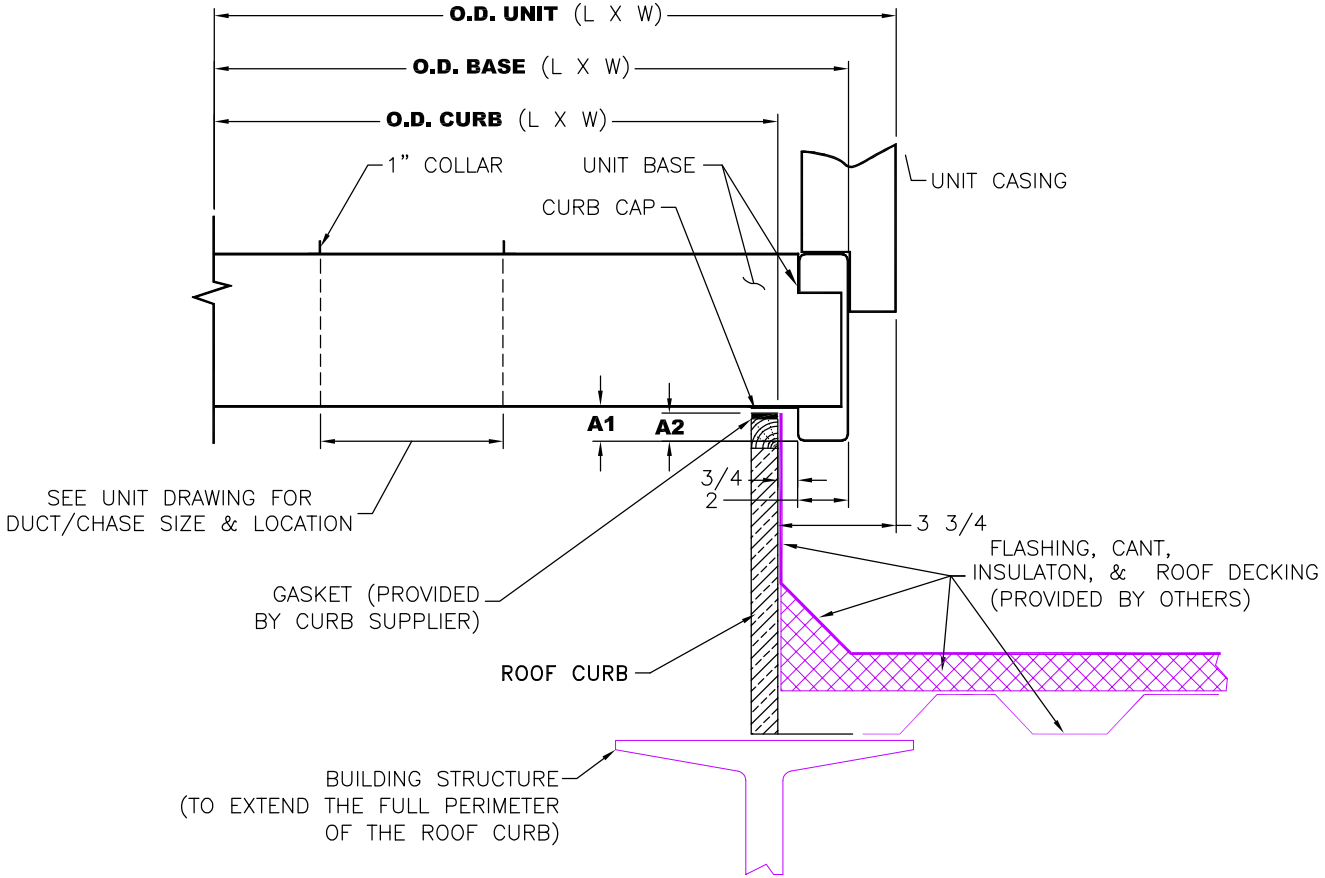
NOTES:
1.) NOT TO SCALE

Innovent
Air Handling Equipment

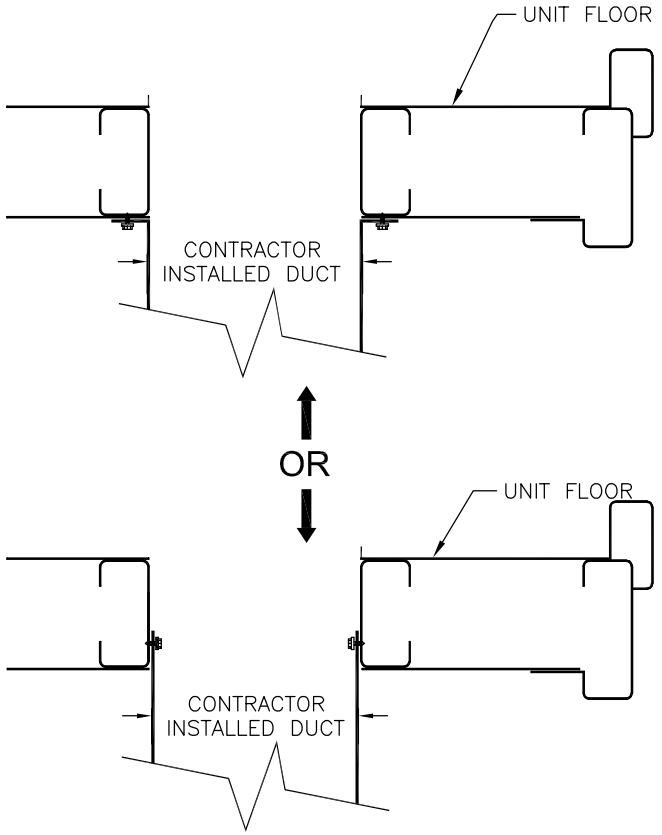
ENGINEER: M. KAHLE	DESCRIPTION: CURB DETAIL DRAWING
DRAWN BY: CAS	PROJECT: CONNOR SCHOOL – DAYTON
JOB #: 2001127	TAG #: SEE SCHEDULE ABOVE
FILE NAME: 2001127CR01	DATE: 1/26/22
	MODEL #: SEE UNIT DRAWING FOR TAG TO MODEL # REFERENCE
	REV #:

TAG(S)	O.D. UNIT	O.D. BASE	O.D. CURB	A1	A2
RTU1	502"L x 138"W	500"L x 136"W	494 1/2"L x 130 1/2"W	1 1/8"	1"

CURB BY OTHERS



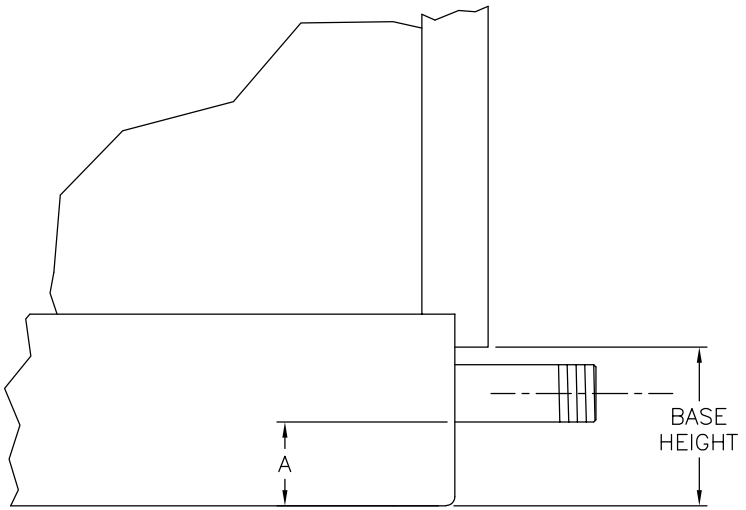
CONTRACTOR INSTALLED DUCT CONNECTION DETAILS



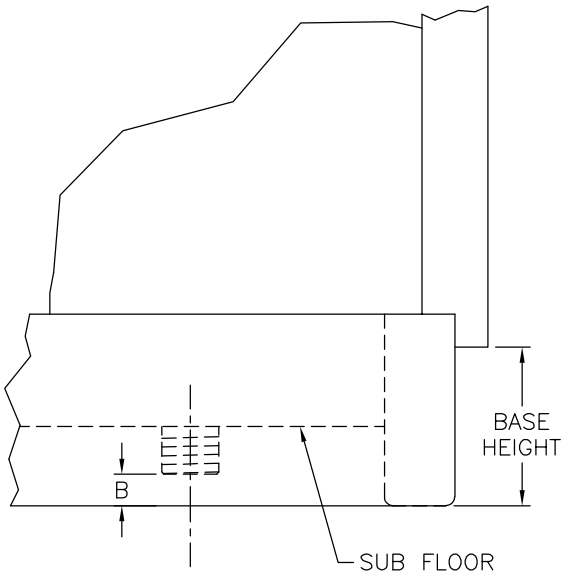
Innovent
Air Handling Equipment

ENGINEER: M. KAHLE		DESCRIPTION: BASE/CURB DETAIL	
DRAWN BY: CAS		PROJECT: CONNOR SCHOOL – DAYTON	
JOB #: 2001127		TAG #: SEE SCHEDULE ABOVE	REV #:
FILE NAME: 2001127BR01	DATE: 1/26/22	MODEL #: SEE UNIT DRAWING FOR TAG TO MODEL # REFERENCE	

SIDE DRAIN CONNECTION



BOTTOM DRAIN CONNECTION



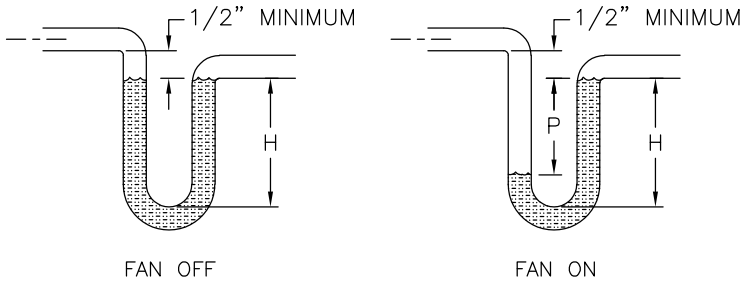
BASE HEIGHT	DRAIN SIZE (MPT)	"A" MIN	"B"
7"	1" HX	3 5/8"	1/8"
	1"	2 13/16"	
	1 1/4"	1 3/8"	
9"	1" HX	5 5/8"	1/8"
	1"	4 13/16"	
	1 1/4"	3"	
11"	1" HX	7 5/8"	1/8"
	1"	6 13/16"	
	1 1/4"	5"	

NOTE: REFER TO UNIT DRAWING TO DETERMINE WHETHER CONNECTION IS THROUGH BOTTOM AND/OR SIDE OF UNIT.

RECOMMENDED DRAIN TRAP DESIGN

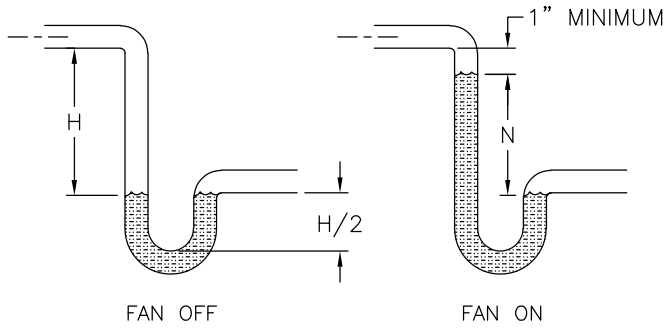
(TRAP BY OTHERS)

POSITIVE PRESSURE TRAP*
(BLOW THRU FAN)



P = POSITIVE FAN PRESSURE (" W.C.)
H = P + (1/2" MINIMUM)

NEGATIVE PRESSURE TRAP*
(DRAW THRU FAN)



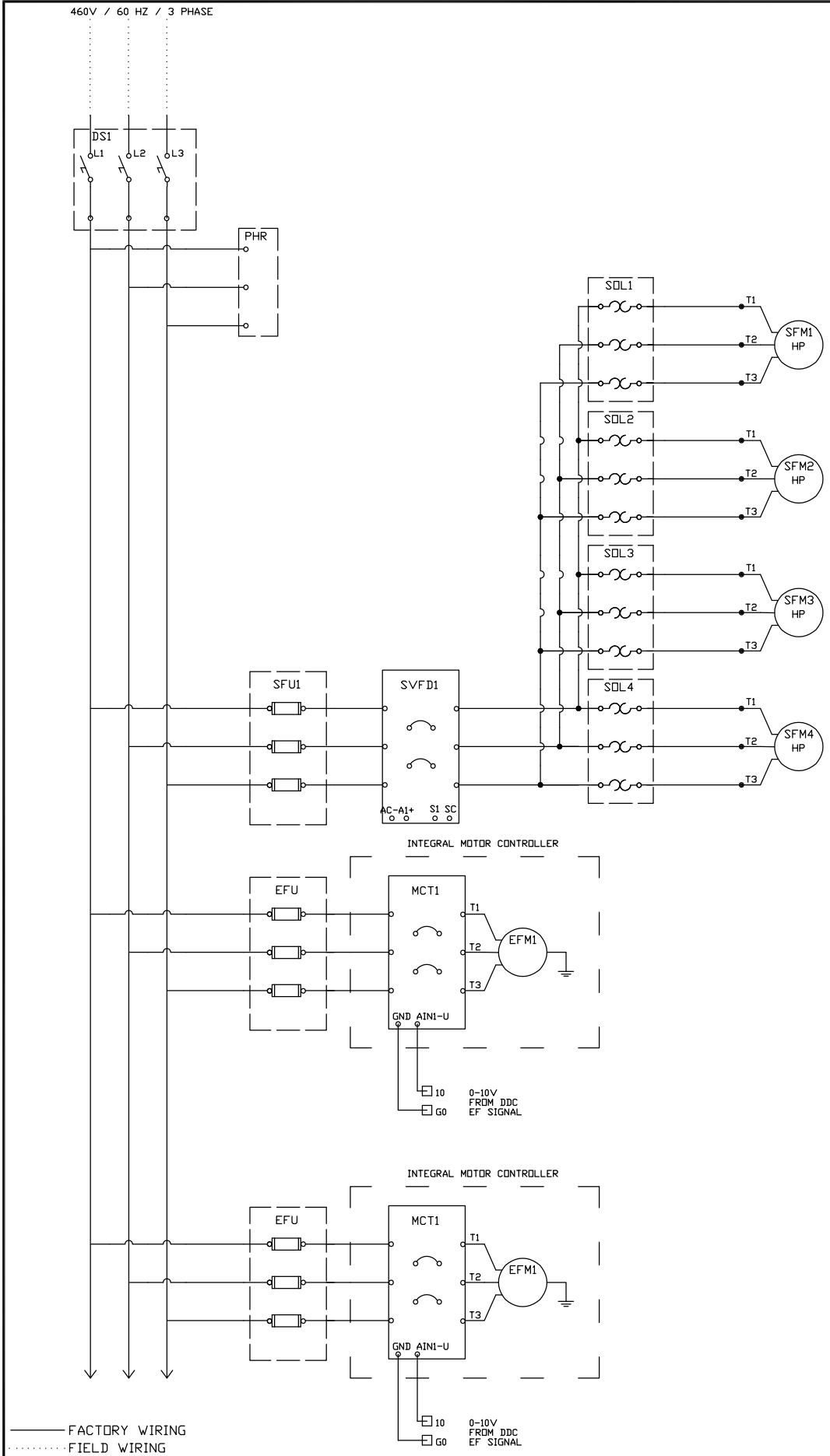
N = NEGATIVE FAN PRESSURE (" W.C.)
H = N + (1" MINIMUM)

*NOTE: A CONSERVATIVE METHOD OF TRAP HEIGHT DESIGN IS TO SET N=TSP AND P=TSP (TSP=TOTAL STATIC PRESSURE)

Innovent
Air Handling Equipment

ENGINEER: M. KAHLE		DESCRIPTION: DRAIN CONNECTION/TRAP DETAIL
DRAWN BY: CAS		PROJECT: CONNOR SCHOOL – DAYTON
JOB #: 2001127		TAG #: SEE UNIT DRAWING
FILE NAME: 2001127TR01	DATE: 1/26/22	MODEL #: SEE UNIT DRAWING FOR TAG TO MODEL # REFERENCE

REV #:



FACTORY WIRING

FIELD WIRING

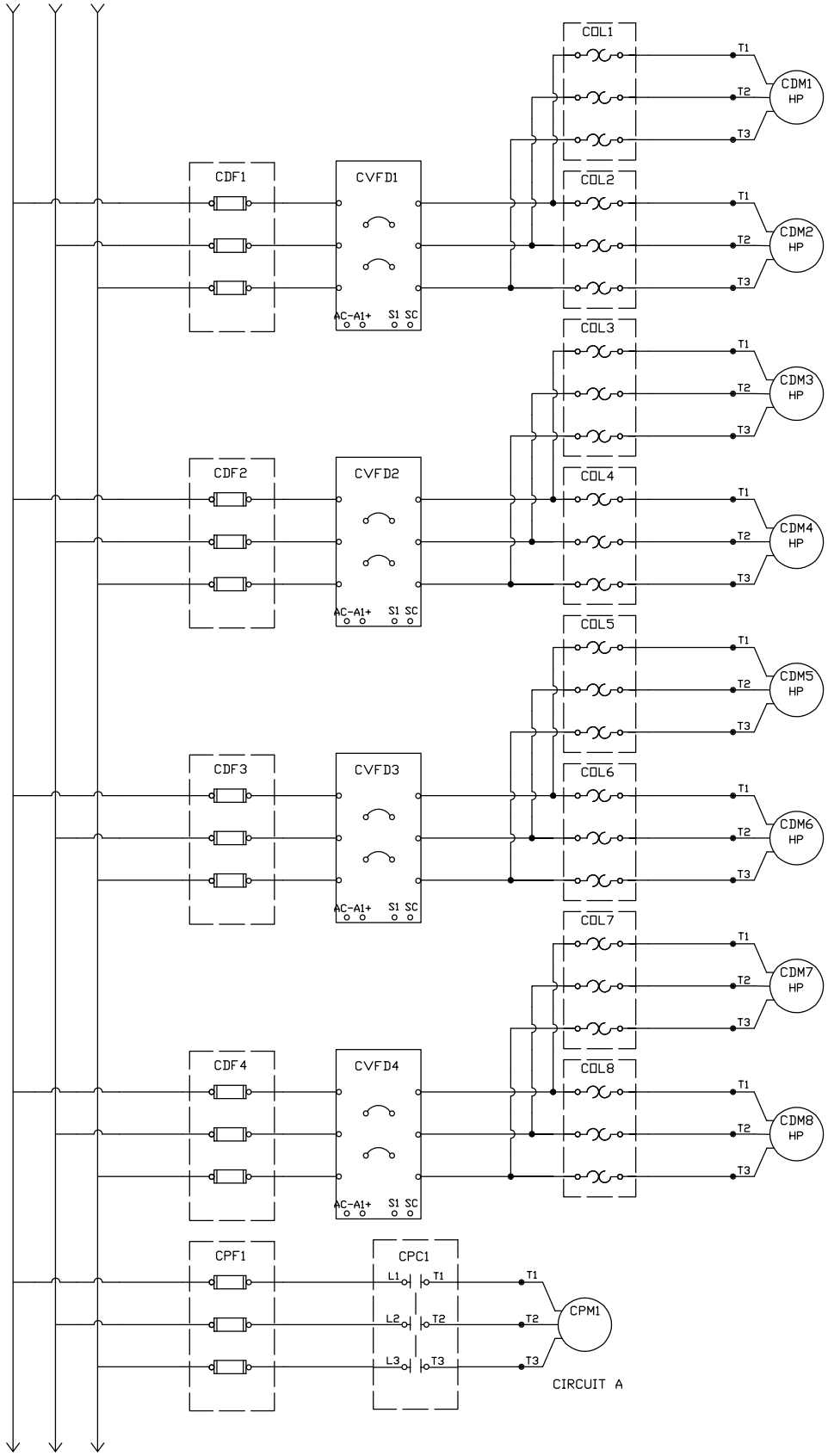
NOTE:
CONTROL SCHEME SHOWN

- • WIRE NUT
- ○ SCREW TERMINAL
- □ TERMINAL POINT IN UNIT CONTROL PANEL
- ◬ TERMINAL POINT IN REMOTE CONTROL PANEL
- ⊙ TERMINAL POINT BY OTHERS

Innovent
Air Handling Equipment

ENGINEER: M. KAHLE		DESCRIPTION: POWER ELECTRICAL SCHEMATIC 1
DRAWN BY: MDK		PROJECT: CONNOR SCHOOL – DAYTON
JOB #: 2001127		TAG #: RTU1
FILE NAME:	DATE: 1/25/2022	MODEL #: SEE UNIT DRAWING FOR MODEL #

REV #:

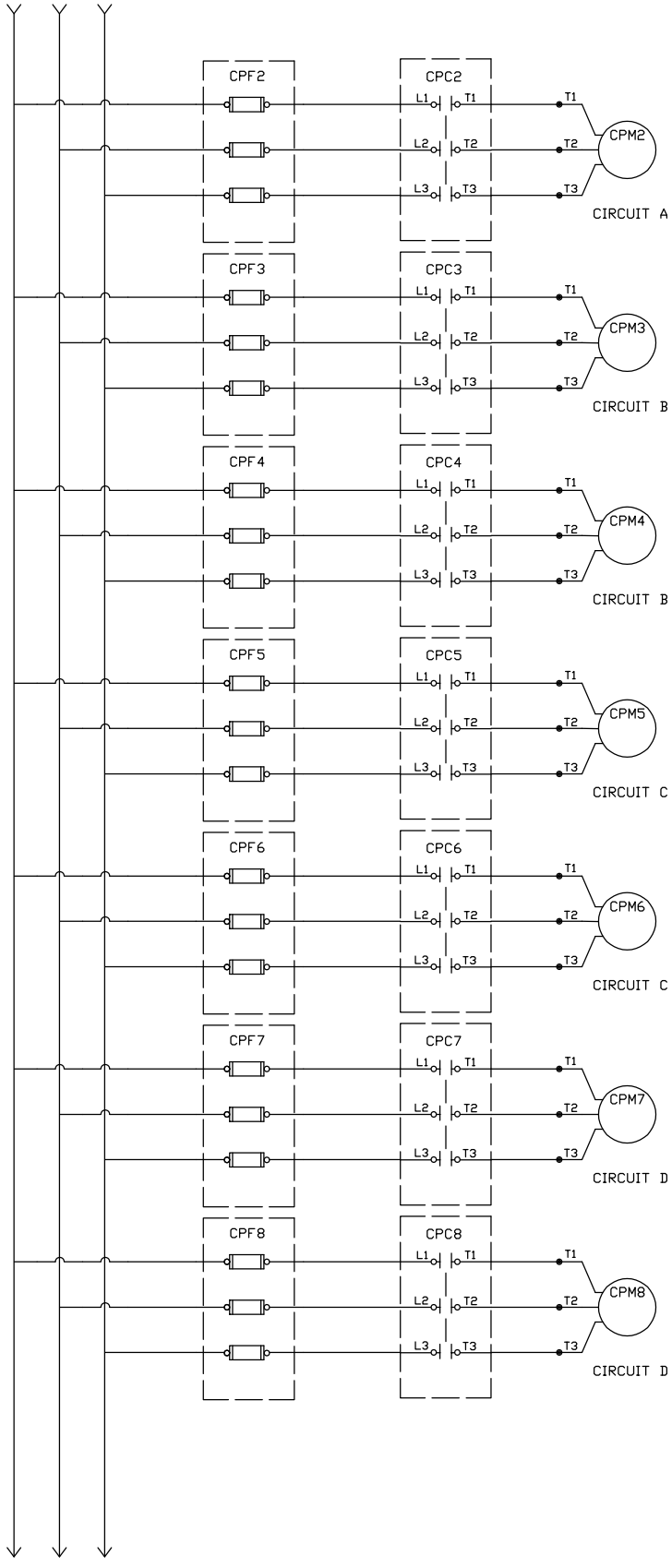


FACTORY WIRING
FIELD WIRING
NOTE:
CONTROL SCHEME SHOWN

- WIRE NUT
- SCREW TERMINAL
- TERMINAL POINT IN UNIT CONTROL PANEL
- TERMINAL POINT IN REMOTE CONTROL PANEL
- TERMINAL POINT BY OTHERS

Innovent
Air Handling Equipment

ENGINEER: M. KAHLE	DESCRIPTION: POWER ELECTRICAL SCHEMATIC 2	
DRAWN BY: MDK	PROJECT: CONNOR SCHOOL – DAYTON	
JOB #: 2001127	TAG #: RTU1	REV #:
FILE NAME:	DATE: 1/25/2022	MODEL #: SEE UNIT DRAWING FOR MODEL #



——— FACTORY WIRING

····· FIELD WIRING

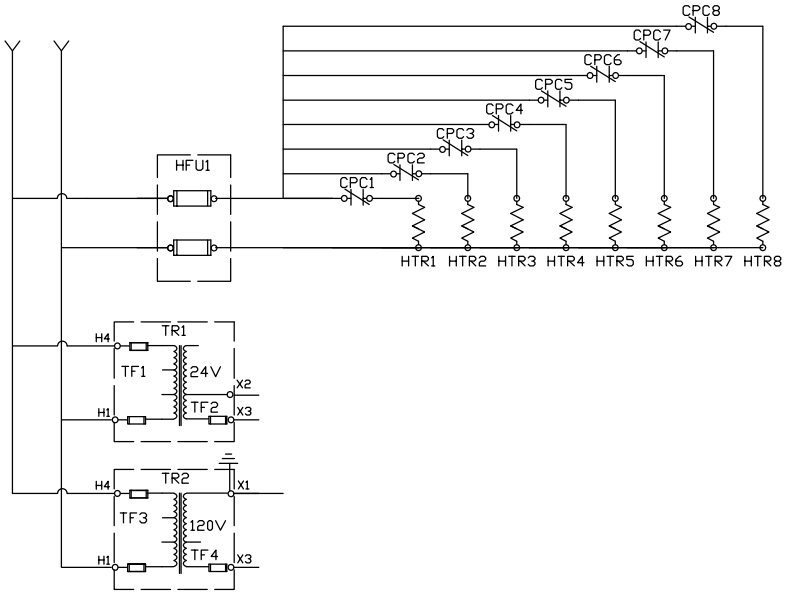
NOTE:
CONTROL SCHEME SHOWN

- • WIRE NUT
- ○ SCREW TERMINAL
- □ TERMINAL POINT IN UNIT CONTROL PANEL
- ◬ TERMINAL POINT IN REMOTE CONTROL PANEL
- ⊙ TERMINAL POINT BY OTHERS

Innovent
Air Handling Equipment

ENGINEER: M. KAHLE		DESCRIPTION: POWER ELECTRICAL SCHEMATIC 3
DRAWN BY: MDK		PROJECT: CONNOR SCHOOL – DAYTON
JOB #: 2001127		TAG #: RTU1
FILE NAME:	DATE: 1/25/2022	MODEL #: SEE UNIT DRAWING FOR MODEL #

REV #:



FACTORY WIRING

FIELD WIRING

NOTE:
CONTROL SCHEME SHOWN

- WIRE NUT
- SCREW TERMINAL
- TERMINAL POINT IN UNIT CONTROL PANEL
- TERMINAL POINT IN REMOTE CONTROL PANEL
- TERMINAL POINT BY OTHERS

Innovent
Air Handling Equipment

ENGINEER: M. KAHLE		DESCRIPTION: POWER ELECTRICAL SCHEMATIC 4
DRAWN BY: MDK		PROJECT: CONNOR SCHOOL – DAYTON
JOB #: 2001127		TAG #: RTU1
FILE NAME:	DATE: 1/25/2022	MODEL #: SEE UNIT DRAWING FOR MODEL #

REV #:

Components Provided By Innovent

Field Installed by Others

RTU1

- Unit Section Split Materials

AUTHORIZATION TO MARK

This authorizes the application of the Certification Mark(s) shown below to the models described in the Product(s) Covered section when made in accordance with the conditions set forth in the Certification Agreement and Listing Report. This authorization also applies to multiple listee model(s) identified on the correlation page of the Listing Report.

This document is the property of Intertek Testing Services and is not transferable. The certification mark(s) may be applied only at the location of the Party Authorized To Apply Mark.

Applicant:	Unison Comfort Technologies 60 28th Avenue North	**Manufacturer:**	Valent, LLC
Address:	Minneapolis, MN 55411	**Address:**	60 28th Avenue North Minneapolis, MN 55411
Country:	USA	**Country:**	USA
Contact:	James Regan	**Contact:**	James Regan
Phone:	(612) 877-4850	**Phone:**	(612) 877-4850
FAX:	(612) 877-4851	**FAX:**	(612) 877-4851
Email:	N/A	**Email:**	N/A

Party Authorized To Apply Mark: Same as Manufacturer
Report Issuing Office: Columbus

Control Number: 3061909 **Authorized by:** Ellen Swialek

for Thomas J. Patterson, Certification Manager

Intertek

This document supersedes all previous Authorizations to Mark for the noted Report Number.

Intertek Testing Services NA Inc.
545 East Algonquin Road, Arlington Heights, IL 60005
Telephone 800-345-3851 or 847-439-5667 Fax 312-283-1672

Standard(s):	Standard for Safety for Heating and Cooling Equipment, ANSI/UL 1995, CAN/CSA C22.2 No.236-05 Third Edition, dated 02/18/2005 with revisions dated July 30, 2009 and Non-Recirculating Direct Gas-Fired Industrial Air Heaters ANSI Z83.4-2003/ CSA 3.7-2003 with addenda ANSI Z83.4a-2004/ CSA 3.7a-2004, ANSI Z83.4b-2006/ CSA 3.7b-2006
Product:	Heating and cooling, energy recovery and dehumidification equipment
Brand Name:	Retrovent, Valent, Innovent, Greenheck, or Accurex

AUTHORIZATION TO MARK

Models:	Series ERU, LASER, LASER-1, LASER-2, NDHU, CAHU and DDHU Energy Recovery and Custom Air Handling Units. Series RWC, RWCU, RAC, RACU, and WW Remote Condenser and Remote Condensing Units. Model Series VPR under Brand names: Valent, Innovent, Greenheck or Accurex. VPR may be followed by E, X, P or C followed by 110, 210, 310, 350 or 450 followed by A, B, or X followed by I, J, T, or X, followed by any number followed by A, B, or C. Series RCD air handling units under Brand names: Retrovent, Valent, Innovent, Greenheck or Accurex. RCD fb 20, 25, 30, 40, 50, or 60 fb A,B,C, or D, fb 1, fb A-H, fb GH, GM, GL, EH, EM, EL, HW, ST, or AH fb 2-5, fb S or H, fb B,S,M,or N fb A-D, fb A-D, fb A-D, fb letters indicating other customer options

UNISON COMFORT TECHNOLOGIES
LIMITED WARRANTY & DISCLAIMER POLICY

(Please read the Unison Comfort Technologies terms and conditions of sale Section 9 for additional details, conditions and exclusions.)

PRODUCT WARRANTY

Unison warrants that at the time of delivery and for a period of twelve (12) months from the initial startup or eighteen (18) months from the date of shipment, whichever is less, its products will be free from defects in materials and manufacture, provided that the products have been installed properly, maintained and operated under normal conditions and serviced in accordance with Unison's instructions, and are operating within capacities and ratings set forth in design specifications. **Labor or consumable parts are not included in this limited standard product warranty.** Consumable parts include, but are not limited to, refrigerant, belts and filters.

START-UP LABOR LIMITED WARRANTY

While labor is not included in the Unison standard product warranty, Unison offers a limited labor warranty, for a period beginning on the start-up date and continuing for sixty (60) days, with the completion and documentation of a qualified start-up. The limited labor warranty will not be available if the product warranty has expired.

Start-up services are included on all Innovent compressorized products, and may be available as an option on other Innovent products. These services must be performed by a Factory Certified Technician ("FCT"). Startup services include verifying proper operation of the unit, including proper refrigerant charge and repair of minor refrigerant leaks outside the coil. At the completion of start-up, an approved start-up record must be submitted to the Innovent service department for processing. Once the start-up record is received, the (60) day limited labor warranty, from date of start-up, will be activated. Labor associated with the diagnosis, validation and repair of warranty parts failures will be covered outside of the start-up, at a negotiated labor rate.

CONSIDERATIONS REGARDING PARTS-SUPPLIED-BY-OTHERS

Unison may supply equipment at a customer's request which has components, like controls, sensors, drives, which are engineered, provided, programmed or configured by other non-Unison parties. Unison does not provide a warranty for these parts or components. These components can be mounted in the factory or at the jobsite. In these instances, Unison's support is limited to verification of basic functionality of the components and not the overall operation or integration of the equipment within the overall building HVAC system. As stated in the Unison Terms & Conditions – *No warranty herein extended shall apply to repair or correction of conditions arising from improper or incorrectly connected air duct, piping, wiring, power supply, blown fuses, freezing, improper Product control when programmed by non-Seller controls, or personnel, or by anyone other than Seller employee or its representative*. In these situations, Unison will assist in the diagnosis of issues and provide support to the customer provided the customer issues a purchase order to cover Unison's expenses in doing so.

UNISON COMFORT TECHNOLOGIES TERMS & CONDITIONS OF SALE

ALL SALES ARE SUBJECT TO THESE UNISON COMFORT TECHNOLOGIES TERMS AND CONDITIONS OF SALES ("TERMS") AND AS CONTAINED IN UNISON'S INVOICE AND ARE ALSO SUBJECT TO UNISON'S CREDIT AND OTHER POLICIES AND PROCEDURES, WHICH ARE HEREBY INCORPORATED BY REFERENCE AND SUBJECT TO CHANGE.

1. TERMS TO GOVERN: These Terms shall be binding upon Unison Comfort Technologies, LLC and its subsidiaries and affiliates ("Seller") and the buyer ("Buyer"). No modification, amendment or change, whether in Buyer's purchase order, shipping release forms or otherwise shall obligate Seller, unless authorized in writing by Seller. Any different or inconsistent terms and conditions of sale contained in Buyer's forms, contracts or invoices are hereby superseded by these Terms.

2. ACCEPTANCE & PRICES: Any proposal offered by Seller to Buyer is valid for sixty (60) days. Upon the expiration of sixty (60) days, the proposal shall expire. Pricing shall remain valid for Seller's products ("Products") shipped within one hundred and twenty (120) days from the date of Seller's acceptance. Thereafter, prices are subject to change. Prices include transportation charges predicated on a single shipment and any partial shipments may result in additional cost to Buyer. Seller reserves the right, at any time, to withdraw a bid, quote or a price that contains an error.

3. PAYMENT & TAXES: Upon credit approval, payment terms for Products shipped hereunder or labor performed will be thirty (30) days net with no retainages unless contrary terms appear on the face hereof or otherwise expressly agreed to in writing by Seller. Should Buyer default in the timely payment to Seller of sums due on an order, Seller is entitled to any remedies provided in these Terms or by law. If Buyer fails to pay any amounts when due, Buyer shall pay Seller interest thereon at a periodic rate of the lesser of one and one-half percent (1.5%) per month or the maximum allowable legal interest rate, along with all costs and expenses (including without limitation reasonable attorneys' fees and disbursements and Court costs) incurred by Seller. Buyer is responsible for all sales, customs, or use tax imposed by any governmental agency, including, but not limited to, Federal, State, Local or international agencies payable on the transaction under any applicable statute, except those taxes due as a result of Seller's gross profits.

4. PERFORMANCE: Seller shall be obligated to furnish only the Products or labor described in the applicable purchase order or acknowledgement and agreed to in writing. The duty to perform under any order on the part of Seller and the price thereof is subject to the approval of its Credit Department, and is contingent upon the absence of strikes, accidents, floods, act(s) of terrorism, war, fires, fuel shortages, the inability to procure materials from the usual sources of supply, the requirements of the US Government (through the use of priorities or preference or any other manner) that Seller divert either the material or the furnished Product to the direct or indirect benefit of the US Government, or upon any like or unlike cause beyond the reasonable control of Seller. Upon disapproval of the Credit Department or upon the occurrence of any such event, Seller may delay performance or, at its option, renegotiate prices and terms and conditions of sale with Buyer. If Seller elects to renegotiate and Seller and Buyer are unable to agree on revised prices or terms, Seller may cancel without any liability.

5. SHIPMENT & RISK OF LOSS: Shipment dates are estimates only. Shipment shall be FOB factory with title passing to Buyer upon delivery to the carrier by Seller. Seller specifically rejects any order containing a time is of the essence clause or liquidated damage penalties for late shipments. Risk of loss, including but is not limited to loss of goods from shortages, damages or transit delays, shall pass to Buyer when the Products have been delivered to any transportation carrier (excluding proprietary transportation facilities of Seller). Any claims for damage to, or loss or misdelivery or damage of the Products shall be filed with Seller.

6. CHANGES, CANCELLATION & RETURNS: Changes requested by Buyer following Seller's acceptance of order must be approved by Seller in writing and may result in an increase in price deemed appropriate by Seller to recover all associated labor and material costs, including normal overhead and profit. If any portion of a Seller accepted order is cancelled by Buyer without default on the part of Seller or without Seller's written consent, Buyer shall be liable to Seller for cancellation charges including, but not limited to, Seller's incurred costs and such profit as would have been realized by Seller from the transaction had the agreement not been breached by Buyer. Products shall not be returned except by written permission of Seller pursuant to Seller's return policy.

7. AUTHORITY OF AGENTS: No agent, employee or representative of Seller has the authority to bind Seller to any affirmation, representation or warranty concerning the Product or labor sold, except for Seller's authorized agents, employees or representatives.

8. INDEMNITY: Seller shall protect and indemnify Buyer from and against all claims, damages, judgments and loss arising from infringement or alleged infringement of any United States patent by any of the articles or material delivered hereunder, provided that in the event of suit or threat of suit for patent infringement, Seller shall promptly be notified and given full opportunity to negotiate a settlement. Seller does not warrant against infringement by reason of Buyer's design of the articles or the use thereof in combination with other materials, or in the operation of any process. In the event of litigation, Buyer agrees reasonably to cooperate with Seller. All parties concerned shall be entitled, in connection with any proceeding under the provisions of this Article, to be represented by counsel at their own expense. Seller shall also defend, indemnify and hold harmless Buyer from any third party personal injury, wrongful death or property damage caused solely by Seller's negligent act(s). Buyer shall defend, indemnify and hold Seller harmless from any personal injury, wrongful death or property damage caused by Buyer's negligent or intentional act(s).

9. LIMITED WARRANTY AND DISCLAIMER: Seller warrants that at the time of delivery and for a period of twelve (12) months from the initial startup ("Start-Up") or eighteen (18) months from date of shipment, whichever is less, Products will be free from defects in material and manufacture provided that Products have been installed with proper Start-Up, maintained and operated under normal conditions for service in accordance with the instructions of Seller, and that Products have the capacities and ratings set forth in Seller's design specifications. No warranty is made against corrosion, erosion or deterioration. At Seller's option, Seller's obligations and liabilities under this warranty are limited to repair of Products or replacement of components for Products not conforming to this warranty. Limited warranty does not cover labor for component replacement. Once Seller's service department has been notified and approved any warranty related service work, Seller will repair or replace components as needed and ship FOB factory. Seller shall not be obligated to pay for the cost of lost refrigerant. Consumable parts and Products that are consumable in nature are explicitly excluded from this warranty. Consumables include, but are not limited to, belts, filters, and refrigerant. No warranty or liability whatever shall attach to Seller until full payment has been received. No warranty herein extended shall apply to repair or correction of conditions arising from improper or incorrectly connected air duct, piping, wiring, power supply, blown fuses, freezing, improper Product control when programmed by non-Seller controls, or personnel, or by anyone other than Seller employee or its representative. Operation of Products for temporary conditioning of a building during construction without the written consent of an officer of the Seller immediately voids any warranty coverage. If the Product is replaced, the replacement may not be new, but will be in good working order and at least functionally equivalent to the item or Product replaced. The replacement assumes the warranty status of the replaced Product. The warranty period does not start over. **THIS LIMITED WARRANTY IS IMMEDIATELY VOIDED AND CANCELLED BY ANY MISUSE, NEGLECT, FAILURE TO FOLLOW INSTRUCTIONS, OR MANUALS OF INSTALLATION OR MAINTENANCE REPAIR, SERVICE, RELOCATION OR ALTERATION TO OR OF, OR OTHER TAMPERING WITH, THE PRODUCTS PERFORMED BY ANY PERSON OR ENTITY OTHER THAN SELLER WITHOUT SELLER'S PRIOR WRITTEN APPROVAL OR ANY USE OF REPLACEMENT PARTS NOT SUPPLIED BY SELLER WITH RESPECT TO THE AFFECTED PRODUCTS. BACK CHARGES RESULTING FROM CLAIMS UNDER THE WARRANTY SHALL BE RECOGNIZED ONLY WHEN PREVIOUSLY AUTHORIZED IN WRITING BY SELLER. THE WARRANTY AND LIABILITY SET FORTH HEREIN ARE IN LIEU OF ALL OTHER WARRANTIES AND LIABILITIES WHETHER IN CONTRACT, TORT, OR IN NEGLIGENCE, EXPRESSED OR IMPLIED, IN LAW OR IN FACT, INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR USE. SELLER PROVIDES NO INDEPENDENT WARRANTY FOR THIRD PARTY PRODUCTS OR COMPONENTS SOLD TOGETHER OR INCORPORATED WITH SELLER'S PRODUCT(S).**

10. LIABILITY DISCLAIMER: TO THE MAXIMUM EXTENT PERMITTED BY LAW, SELLER'S TOTAL LIABILITY FOR CLAIMS, REGARDLESS OF THE FORM OF ACTION OR THEORY OF LIABILITY (INCLUDING CONTRACT, TORT OR WARRANTY), SHALL BE LIMITED TO THE FEES PAID TO SELLER BY BUYER FOR THE PRODUCTS OR LABOR ALLEGED TO CAUSE THE DAMAGE. IN NO EVENT SHALL SELLER BE LIABLE TO BUYER FOR ANY INCIDENTAL, CONSEQUENTIAL, SPECIAL, PUNITIVE, OR INDIRECT DAMAGES OF ANY KIND (INCLUDING, WITHOUT LIMITATION, LOST PROFITS, LOSS OF USE, OR CLAIMS OF THIRD PARTIES) THAT MIGHT OCCUR AS A RESULT OF THE PERFORMANCE OR BREACH OF THE AGREEMENT OR IN ANY WAY ARISING OUT OF OR IN CONNECTION WITH THE AGREEMENT.

11. ASSIGNMENT: No right or interest may be assigned by Buyer, nor may any obligation or performance delegated by Buyer without Seller's written permission. Any attempted assignment or delegation shall be void and ineffective for all purposes. Seller may assign its rights or obligations under this Agreement in the event of a merger or change of control of Seller.

12. GOVERNING LAW: This agreement shall be governed and construed in accordance with the laws State of Minnesota. Buyer consents to jurisdiction in the Circuit Court of Hennepin County, Minnesota.

13. EXPORT CONTROLS: Buyer shall comply with the export laws and regulations of the United States and other applicable jurisdictions with regard to Products and labor. Buyer agrees it shall not export or enter into an agreement for the export any goods from Seller to any prohibited or embargoed country or to any denied, blocked or restricted person or entity including those so designated by the US Dept. of Commerce or Treasury.

14. MISCELLANEOUS: In the event that any provision of this Agreement is held invalid by the final judgment of any court of competent jurisdiction, the remaining provisions shall remain in full force and effect as if such invalid provision had not been included herein. The waiver or failure of either party to enforce the terms of this Agreement in one or multiple instances shall not constitute a waiver of that party's rights under this Agreement with respect to other violations. The titles and headings used herein are for convenience only and do not constitute any part of this Agreement. Those sections of this Agreement, which by their nature are intended to survive, shall survive termination of this Agreement. The prevailing party may recover their attorney fees and reasonable out-of-pocket expenses.

Rooftop Air Handling Unit Submittal

The Greater Dayton School

Daikin Rooftop Units (#2-5)

1/10/22

TP Mechanical

Sales Engineer:
Brian Turner
ElitAire
bturner@elitaire.com
513-673-0600 cell

Notes:

- 460/3
- Disconnect Switch
- VFD – except RTU-5, RTU-5 to include ECM supply fan motor
- Shaft Grounding Rings Included
- 24” Plenum Roofcurb with Vibration Isolation Rails (Separate submittal package to be provided)
- RTU-5 includes Variable Speed Compressor
- Dry Bulb Economizer
- RTU-4 includes Hot Gas Reheat & Modulating Gas Heat
- Powered Exhaust
- BACnet Card
- Outdoor Airflow Station
- Units include 1 Year Parts Warranty & 5 Year Compressor Warranty
- Start Up is Included

Table of Contents

Technical Data Sheet for RTU-2

Job Information	*Technical Data Sheet*
Job Name	The Greater Dayton School -adc-
Date	1/10/2022
Submitted By	Tony Decrescenzo
Software Version	07.91
Unit Tag	RTU-2

Unit Overview

Model Number	Voltage V/Hz/Phase	Design Cooling Capacity Btu/hr	AHRI 360 Standard Efficiency	ASHRAE 90.1
RPS080D	460/60/3	901433	10	2016 Compliant

Unit

Model Number:	RPS080D
Altitude:	0 ft
Heat Type:	None
Condenser Type:	Air-Cooled
Approval	ETL/MEA-USA unit

Physical

Unit

Length	Height	Width	Weight	Estimated Lifting Lugs
370 in	97.0 in	99.0 in	13433 lb	3 per side

Electrical

Voltage	MCA	MROPD	SCCR
460/60/3	207.1 A	250 A	10 kAIC

Note: Use only copper supply wires with ampacity based on 75° C conductor rating. Connections to terminals must be made with copper lugs and copper wire.

Return/Outside/Exhaust Air

Outside Air Option

Type	Pressure Drop	Damper Actuator
0-100% Economizer with Ebtron Sensor	0.32 inH_2O	Electric Actuator

Return Air Option

Return Air Location: Bottom

Fan

Type	Fan Diameter	Vibration Isolation	Drive Type	Fan Efficiency Index
SWSI AF	44 in	Spring Isolation	Standard Service Factor, Fixed Drive	0.625

Motor

Horsepower	Type	Full Load Current
20.0 HP	ODP, Premium Efficiency	23.5 A

Performance

Air Flow CFM	External Static Pressure inH_2O	Fan Speed rpm	Brake Horsepower HP
28000	2.0	782	15.68

Technical Data Sheet for RTU-2

Filter Section

Physical

Type	(Quantity) Height x Width x Depth	Face Area	Face Velocity	Air Pressure Drop
95% 12 in Cartridge (MERV 14), 2" prefilter (MERV8)	(12) 24 in x 24 in (4) 12 in x 24 in	56.0 ft²	500.0 ft/min	0.95 inH_2O

DX Cooling Coil

Physical

Fins per Inch	Rows	Face Area	Face Velocity	Air Pressure drop	Drain Pan Material	Casing Material
10	6	53.9 ft²	519.5 ft/min	0.82 inH_2O	Stainless Steel	Galv. Steel

Cooling Performance

Capacity		Refrigerant Type	Indoor Air Temperature				Ambient Air Temperature	
			Entering		Leaving			
Total Btu/hr	Sensible Btu/hr		Dry Bulb °F	Wet Bulb °F	Dry Bulb °F	Wet Bulb °F	Dry Bulb °F	Wet Bulb °F
901433	760912	R410A	79.6	65.3	54.8	54.6	95.0	75.0

Fan Section SUPPLY FAN

Fan

Type	Fan Wheel Diameter	Fan Isolation	Fan Efficiency Index
AF DWDI	33 in	Spring	0.839

Performance

Airflow	Total Static Pressure	Fan Speed	Brake Horsepower
28000 CFM	5.10 inH_2O	1320 rpm	32.28 HP

Motor

Type	Horsepower	FLA
ODP, Premium Efficiency	40.0 hp	46.0 A

Drive

Type
Standard service factor, Fixed drive

Discharge Plenum

Discharge Location:	Bottom

Unit Discharge Conditions

AirTemperature

DX coil Configuration:	Draw-thru Coil			
Motor Heat Btu/hr	Moisture Removal lb/h	Unit Leaving Dry Bulb °F	Unit Leaving Wet Bulb °F	Unit Leaving Dewpoint °F
92366	119.0	57.8	55.6	54.5

Technical Data Sheet for RTU-2

Condensing Section

Compressor

Type	Quantity	Total Power	Capacity Control	Compressor Isolation
Scroll	6	73.9 kW	6 stage	Resilient

Compressor Amps:

Fixed Speed Compressor 1	18.6 A
Fixed Speed Compressor 2	18.6 A
Fixed Speed Compressor 3	18.6 A
Fixed Speed Compressor 4	18.6 A
Fixed Speed Compressor 5	18.6 A
Fixed Speed Compressor 6	18.6 A

Piping Options: Replaceable core filter drier

Condenser Coil

Type	Fins per Inch	Fin Material	Refrigerant Charge
Aluminum tube MicroChannel	18	Aluminum	110.0 lb

Condenser Coil Options: Build in Hail Protection

Condenser Fan Motors

Number of Motors	Full Load Current (each)
6	2.1 A

AHRI 360 Certified Data at AHRI 360 Standard Conditions

EER	IEER	ASHRAE 90.1
10	14	2016 Compliant

Sound

Sound Power (db)

Frequency	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
Inlet	91	91	86	82	78	72	64	56
Discharge	94	90	91	86	85	80	72	65
Radiated	-	96	93	91	91	88	85	83

Supply Fan Total Pressure Drop Calculation

External Static Pressure:	2.50 inH_2O
Filter:	0.95 inH_2O
Dirty Filter:	0.50 inH_2O
Outside Air:	0.32 inH_2O
DX Coil:	0.82 inH_2O
Total Static Pressure:	5.10 inH_2O

Return/Exhaust Fan Total Pressure Drop Calculation

External Static Pressure:	2.00 inH_2O
Total Static Pressure:	2.00 inH_2O

Technical Data Sheet for RTU-2

Options	
Unit	
Unit Exterior:	Prepainted Galvanized Steel
Insulation and Liners:	2", 1 1/2# nominal insulation, full solid liners
Fan Shaft Grounding:	Fan motors are provided with shaft grounding rings and class H insulation.
Electrical	
Electrical Connection Option:	Single thru door disconnect switch
GFI 115v Receptacle:	Field powered
Controls	
Application:	Variable Volume - Discharge Air Control
Temperature Control:	DAC, BACNet MSTP communication card
Fan Speed Control:	Factory mounted Inverter
Inverter Manufacturer:	Daikin
Inverter Location:	Inverter(s) in fan section
Airflow Control:	1 duct sensor, 1 space sensor (Bldg Pressure)
Economizer Control:	Outside Air Dry Bulb and Enthalpy Control
Low Ambient:	Fantrol, operation to 45 deg F (7.22 deg C)

Warranty	
Parts:	Standard 1 year
Compressor:	Extended 4 year, 5 year total

AHRI Certification

All equipment is rated and certified in accordance with AHRI 360.

Notes

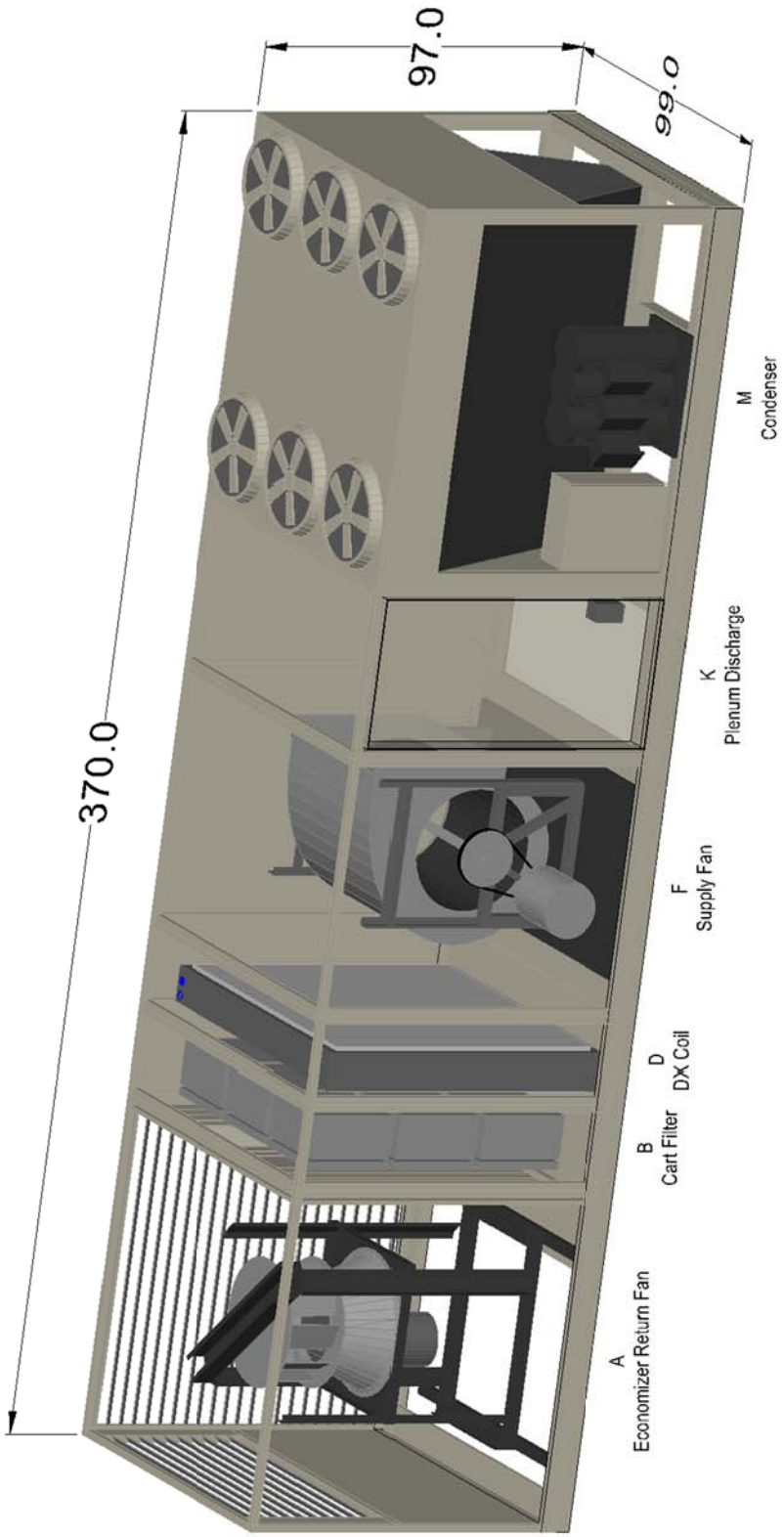
As a standalone component, unit meets or exceeds the requirements of ASHRAE 90.1.2010. The approving authority is responsible for compliance of multi-component building systems.

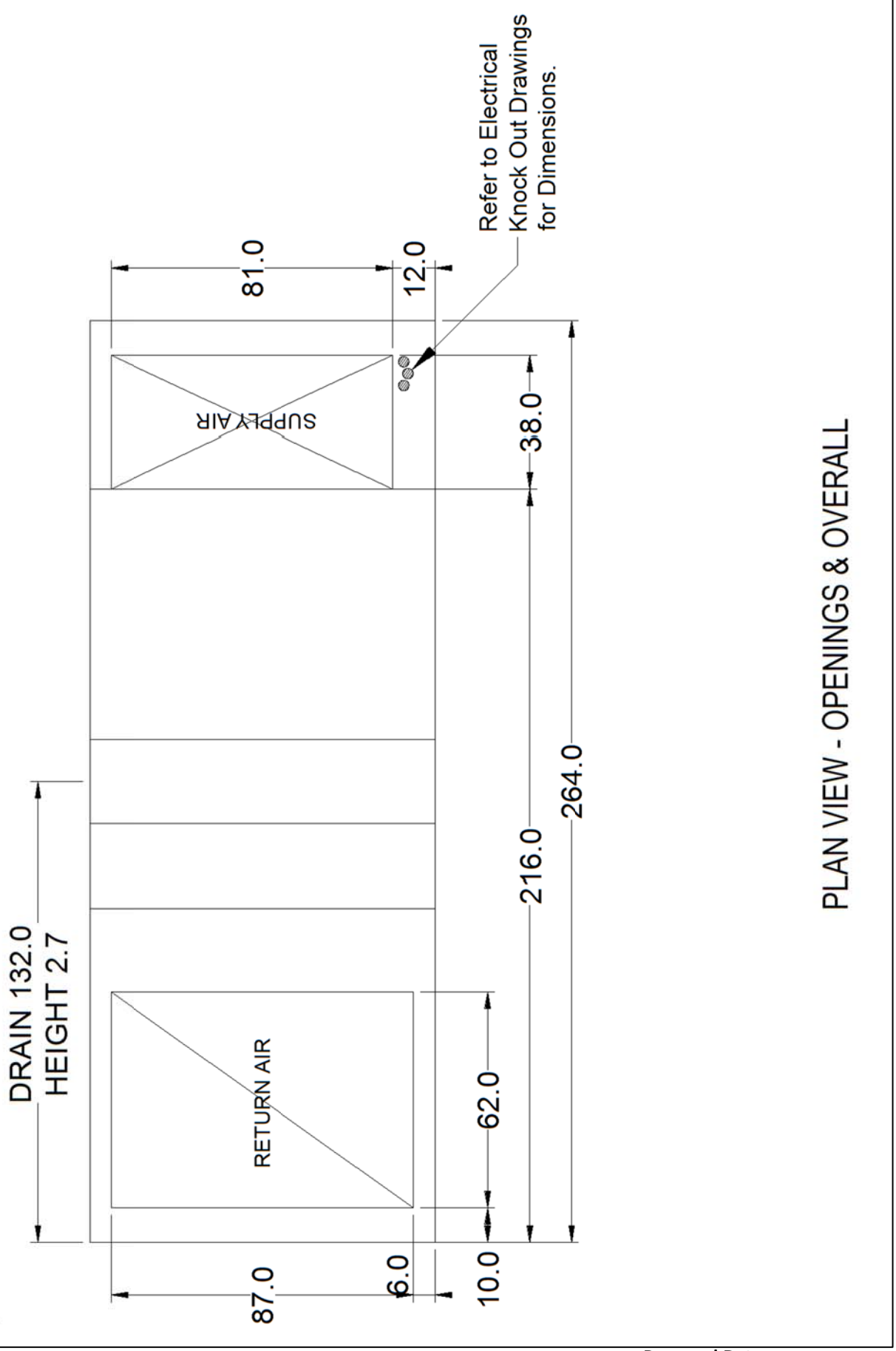
Accessories

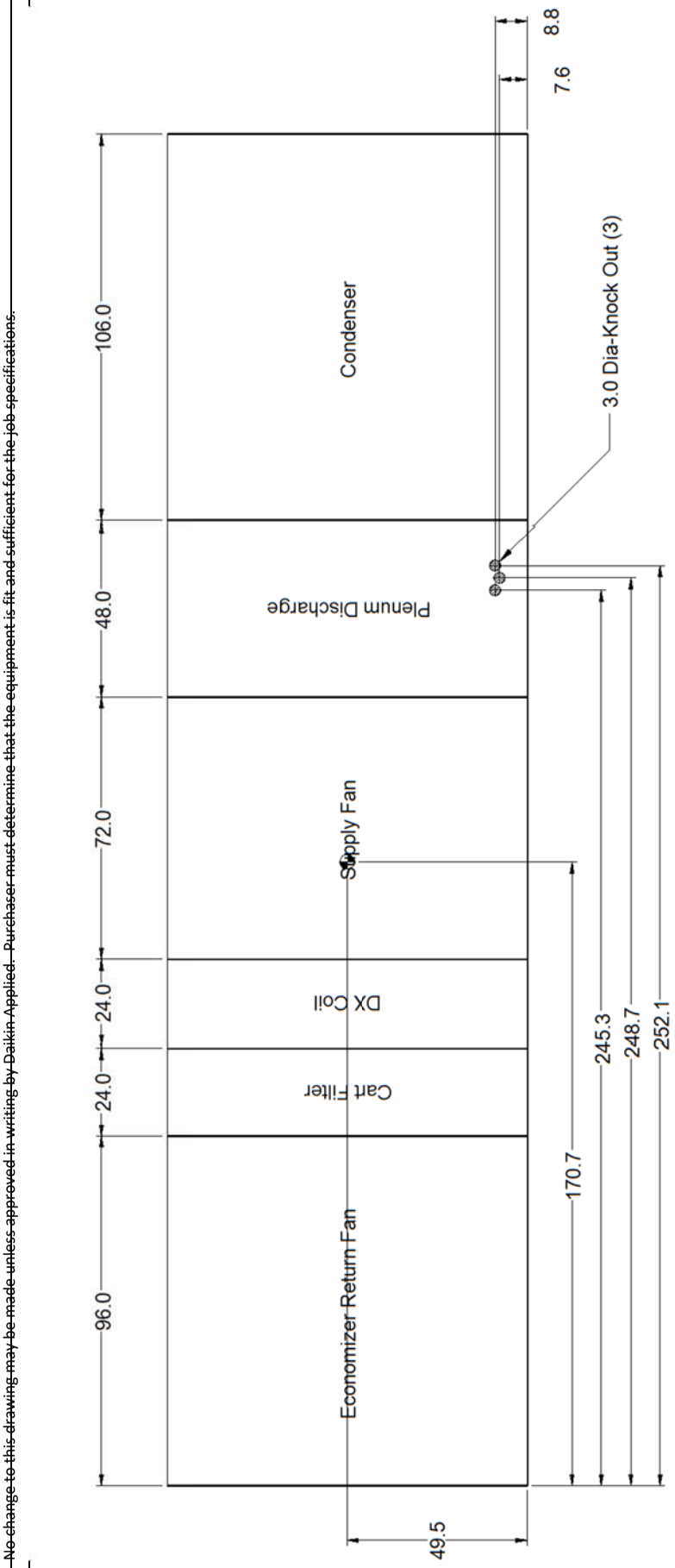
Optional

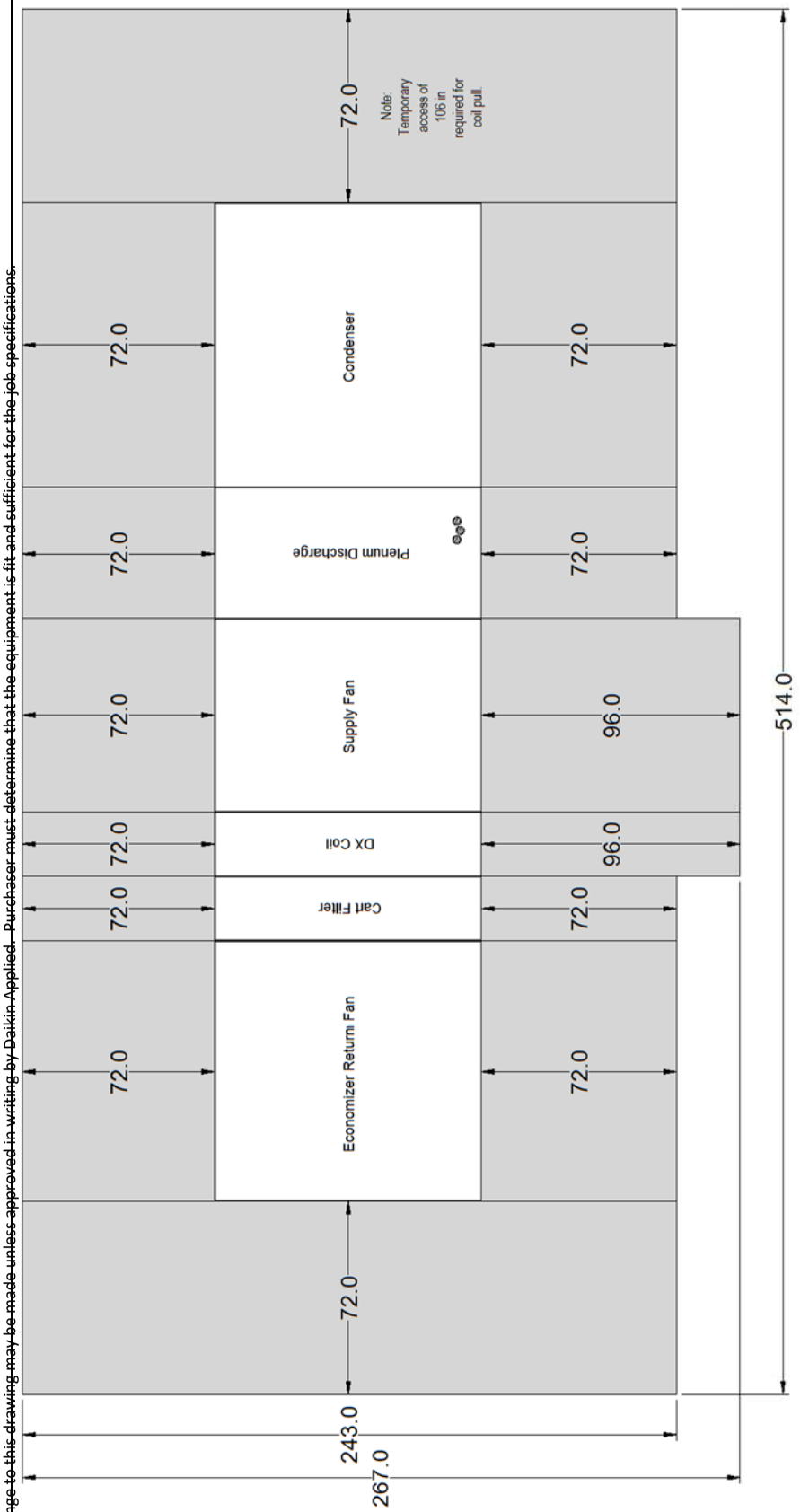
Part Number	Description
910181702	OA STATIC PRESSURE TIP (DWYER A-306)

Drawings(1) for RTU-2



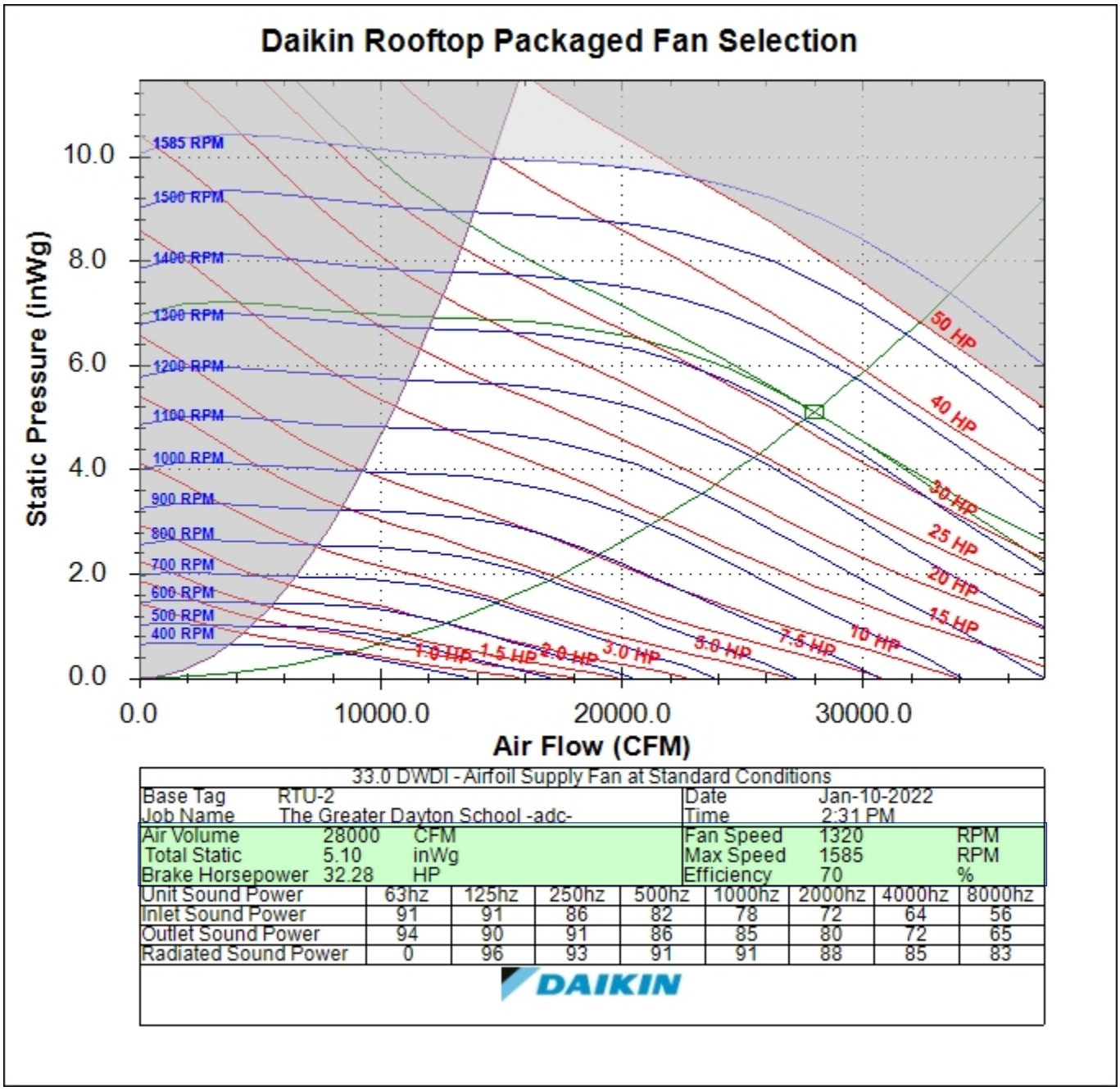






PLAN VIEW - SERVICE CLEARANCE

Fan Curve - Supply for RTU-2



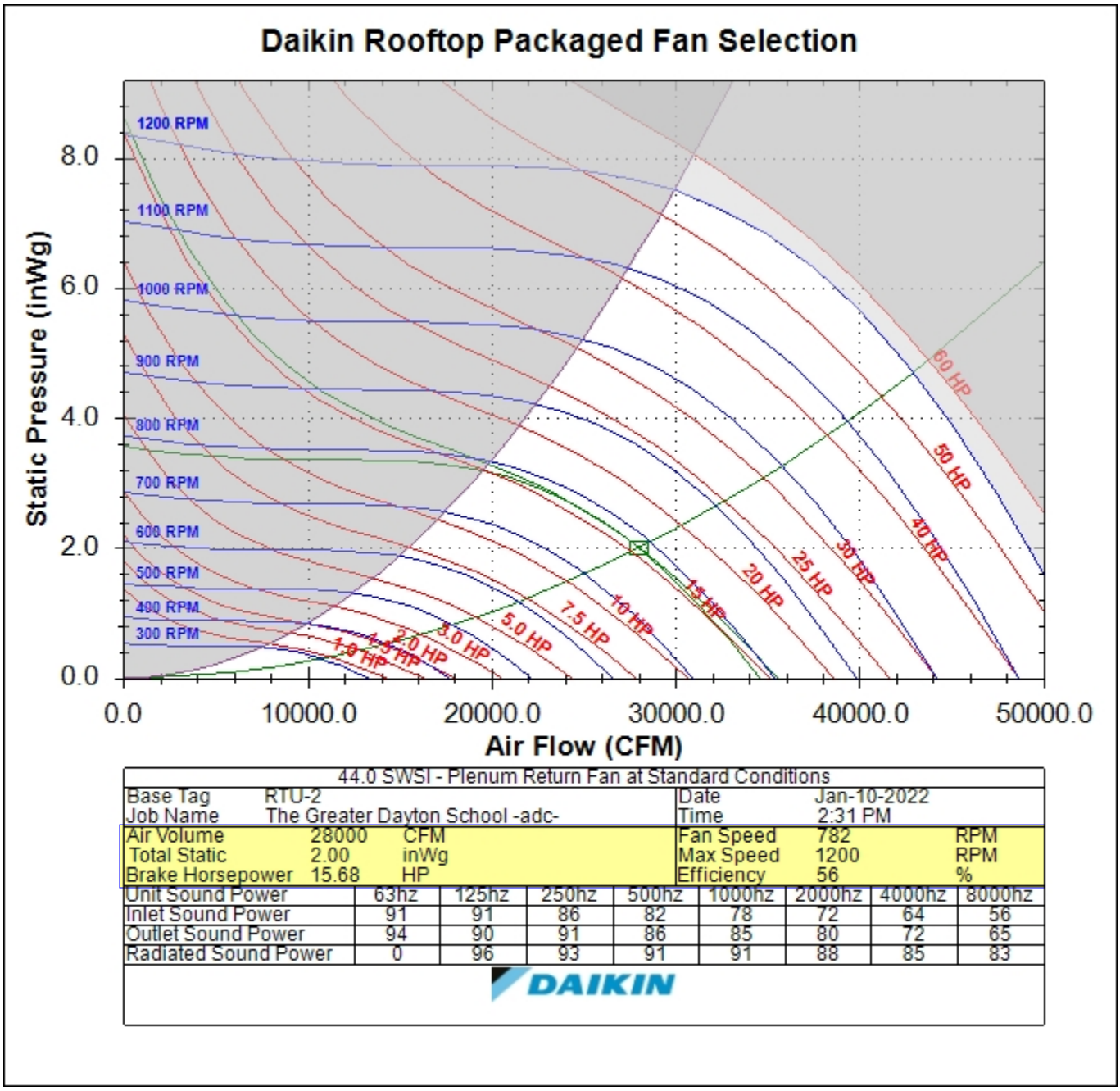
33.0 DWDI - Airfoil Supply Fan at Standard Conditions

Base Tag	RTU-2		Date	Jan-10-2022	
Job Name	The Greater Dayton School -adc-		Time	2:31 PM	
Air Volume	28000	CFM	Fan Speed	1320	RPM
Total Static	5.10	inWg	Max Speed	1585	RPM
Brake Horsepower	32.28	HP	Efficiency	70	%

Unit Sound Power	63hz	125hz	250hz	500hz	1000hz	2000hz	4000hz	8000hz
Inlet Sound Power	91	91	86	82	78	72	64	56
Outlet Sound Power	94	90	91	86	85	80	72	65
Radiated Sound Power	0	96	93	91	91	88	85	83

DAIKIN

Fan Curve - Return for RTU-2



44.0 SWSI - Plenum Return Fan at Standard Conditions

Base Tag	RTU-2		Date	Jan-10-2022	
Job Name	The Greater Dayton School -adc-		Time	2:31 PM	
Air Volume	28000	CFM	Fan Speed	782	RPM
Total Static	2.00	inWg	Max Speed	1200	RPM
Brake Horsepower	15.68	HP	Efficiency	56	%

Unit Sound Power	63hz	125hz	250hz	500hz	1000hz	2000hz	4000hz	8000hz
Inlet Sound Power	91	91	86	82	78	72	64	56
Outlet Sound Power	94	90	91	86	85	80	72	65
Radiated Sound Power	0	96	93	91	91	88	85	83

DAIKIN

Technical Data Sheet for RTU-3

Job Information	*Technical Data Sheet*
Job Name	The Greater Dayton School -adc-
Date	1/10/2022
Submitted By	Tony Decrescenzo
Software Version	10.90
Unit Tag	RTU-3

Unit Overview

Model Number	Voltage	Design Cooling Capacity	AHRI 360 Standard Efficiency		ASHRAE 90.1
			EER	IEER	
MPS061E	460/60/3	679200 Btu/hr	10	13.0	2016 Compliant

Unit

Model Number:	MPS061E
Model Type:	Cooling, Standard Efficiency
Heat Type:	None
Application:	Variable volume, w/ VFD, Duct Pressure Control
Altitude:	0 ft
Approval	ETL/MEA

Physical

Unit Dimensions and Weights

Unit Length	Unit Height	Unit Width	Unit Weight
275.0 in	73.0 in	99.5 in	8902 lb

Unit Construction

Exterior:	Prepainted Galv Steel	**Doors:**	Fan, Filter, Coil, Control Panel, Heat, and Economizer section
Insulation:	2" Insulation	**Drain Pan Material**	Stainless Steel
Liners:	Double wall construction		

Unit Electrical Data

Voltage	SCCR	FLA	MCA	MROPD
460/60/3 V	10 kAIC	147.9 A	156.6 A	175 A

Note:	Use only copper supply wires with ampacity based on 75° C conductor rating. Connections to terminals must be made with copper lugs and copper wire.

Return/Outside/Exhaust Air

Outside Air Option

Type	Damper	Damper Pressure Drop	Leakage Rate
0-100% Econ with dry bulb control	Low leak with blade and jamb seals	0.12 inH_2O	1.5 cfm/sq ft @1" differential pressure

Ventilation Control:	Outdoor Air Monitor

Draw Through Filters

Efficiency	Quantity/Nominal Size	Face Area ft^2	Face Velocity ft/min	Air Pressure Drop inH_2O
95% Cartridge (MERV 14), 2 in. prefilter (MERV8)	(8) 24 in x 24 in x 12 in (4) 12 in x 24 in x 12 in	40.0	438	0.69

Technical Data Sheet for RTU-3

Exhaust Air Option					
Fan Airflow	**Max Static Pressure**	**Fan Type**	**Fan Quantity**	**Fan Diameter**	**Capacity Control**
16000 CFM	0.50 inH_2O	Prop	1	36"	One modulating exhaust fan w/ VFD

Motor Power	**Motor Type**	**Motor Quantity**	**Full Load Current**	**Drive Type**
5.00	Open Drip Proof	1	6.6 AA	Belt Drive

Cooling Coil

Fins per Inch	**Rows**	**Face Area** ft^2	**Face Velocity** ft/min	**Condensate Connection Size**	**Air Pressure drop** inH_2O
12	6	39.5	443	1.5 In. Male NPT	0.79

Cooling Performance						
Total Capacity Btu/hr	**Sensible Capacity** Btu/hr	**Entering Air Temperature**		**Leaving Air Temperature**		**Ambient Air Temp** °F
		Dry Bulb °F	**Wet Bulb** °F	**Dry Bulb** °F	**Wet Bulb** °F	
679200	518298	80.9	66.1	53.9	53.3	95.0

Fan Section SUPPLY FAN

Type	**Fan Wheel Diameter**	**Vibration Isolation**
AF SWSI	40 in	Fixed drive with seismic spring isolation

Fan Performance				
Air Flow	**Total Static Pressure**	**Fan Speed**	**Brake Horsepower**	**Altitude**
17500 CFM	5.10 inH_2O	1022 RPM	23.0 HP	0 ft

Motor			
Horsepower	**Type**	**Efficiency**	**Full Load Current**
30 HP	Open drip proof, Premium efficiency	94.1	35.0 A

Drives	
Type	**Service Factor**
Belt Drive	120%

Unit Discharge Conditions

AirTemperature				
Motor Heat Btu/hr	**Moisture Removal** lb/h	**Unit Leaving Dry Bulb** °F	**Unit Leaving Wet Bulb** °F	**Unit Leaving Dewpoint** °F
66311	137.9	57.4	54.5	52.4

Technical Data Sheet for RTU-3

Condensing Section

Compressor

Type	Quantity	Refrigerant Charge	Total Power	Capacity Control	Refrigerant Type
Scroll	4	44.8 lbs	51.9 kW	4 steps	R410A

Compressor Amps:

Compressor 1	Fixed Speed	23.1 A
Compressor 2	Fixed Speed	23.1 A
Compressor 3	Fixed Speed	23.1 A
Compressor 4	Fixed Speed	23.1 A

Condenser Coil

Type	Fins Per Inch	Rows	Fin Material	Refrigerant Valves
Aluminum tube micro channel	18	Micro Channel	Aluminum	None

Condenser Coil Options:	None
Low Ambient Control:	Std low ambient control to 45 F (7.22 C)

Condenser Fan Motors

Number of Motors	Full Load Current
6	2.1 A

AHRI 360 Certified Data at AHRI 360 Standard Conditions

Net Capacity	Efficiency		ASHRAE 90.1
640000 Btu/hr	10 EER	13.0 IEER	2016 Compliant

Internal Static Pressure Drop Calculation

External Static Pressure:	3.00
Outside Air Damper:	0.12
Filter:	0.69
Additional Filter Static Pressure:	0.50
Cooling Coil:	0.79
Energy Wheel and Filters:	0.00
Total Static Pressure:	5.10 inH_2O

Sound Power

Inlet

63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
86	85	78	73	66	55	42	27

Outlet

63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
90	93	89	87	86	81	73	66

Radiated

63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
-	95	93	93	90	87	86	84

Options

Electrical

Field Connection:	Non-Fused Disc Sw, Field powered 115V GFI outlet
Power Options:	Phase Failure Monitor

Controls

Temperature Controls:	Discharge air control, field installed BACNet MSTP

Technical Data Sheet for RTU-3

Warranty

Parts Warranty:	Standard one year
Compressor Warranty:	Four year extended, five year total

AHRI Certification

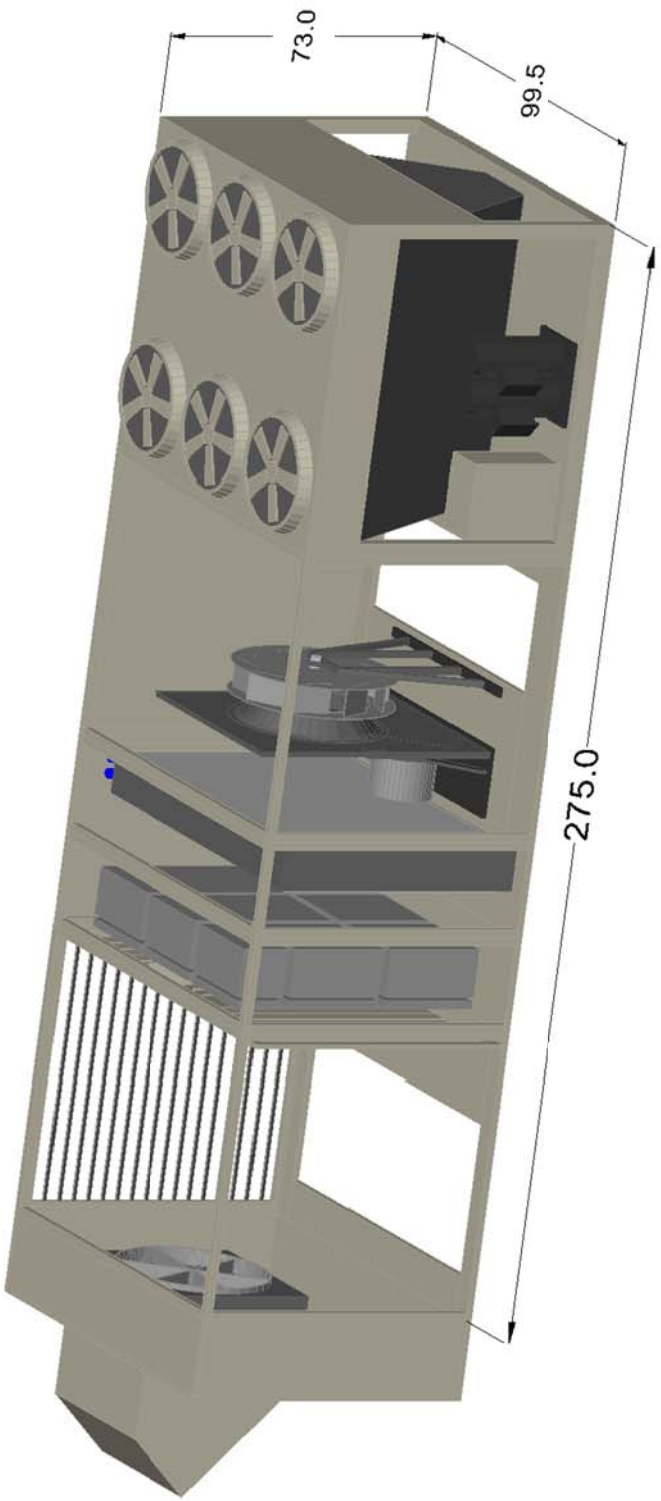
All equipment is rated and certified in accordance with AHRI 340/360

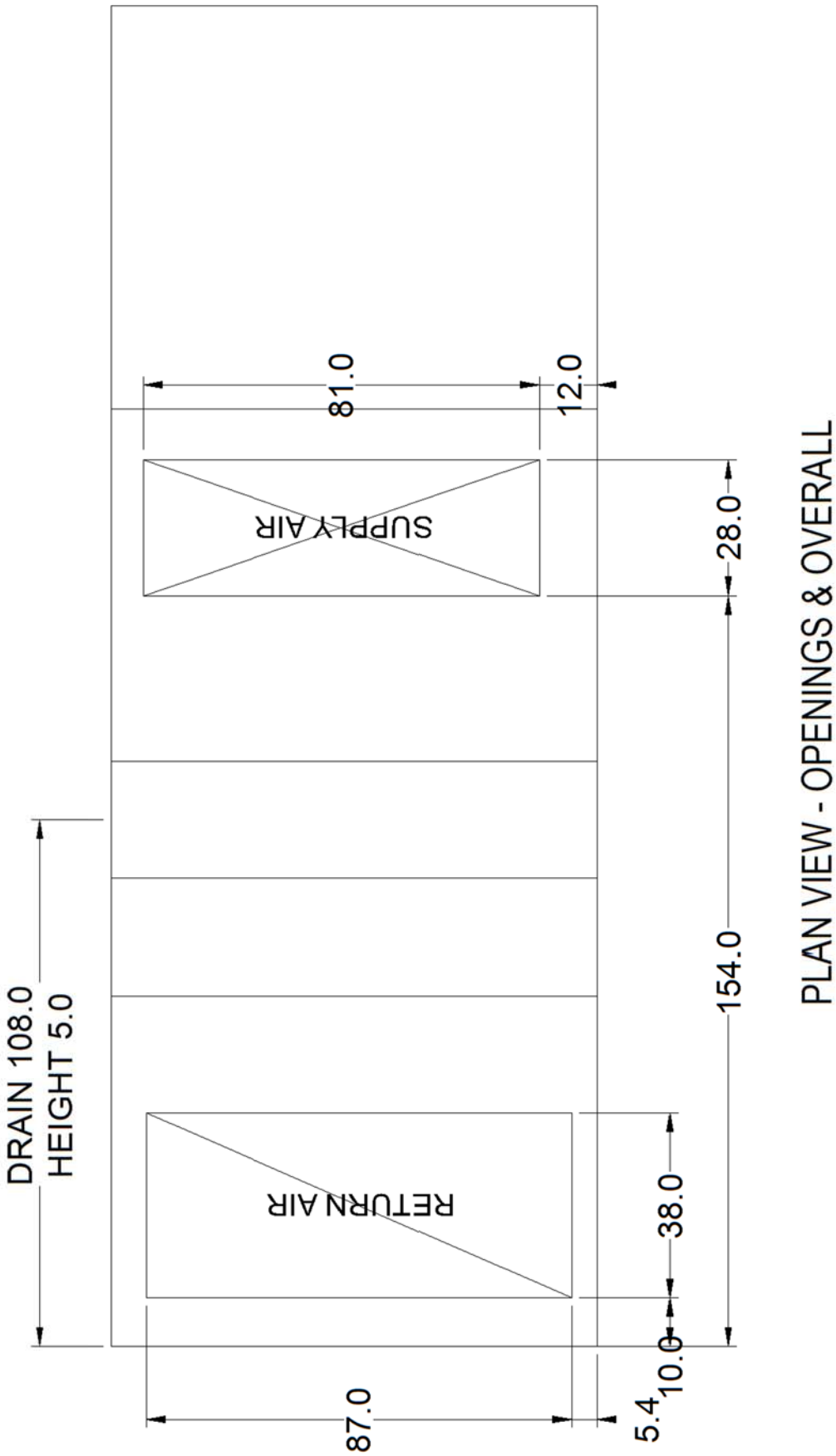
Notes

Accessories

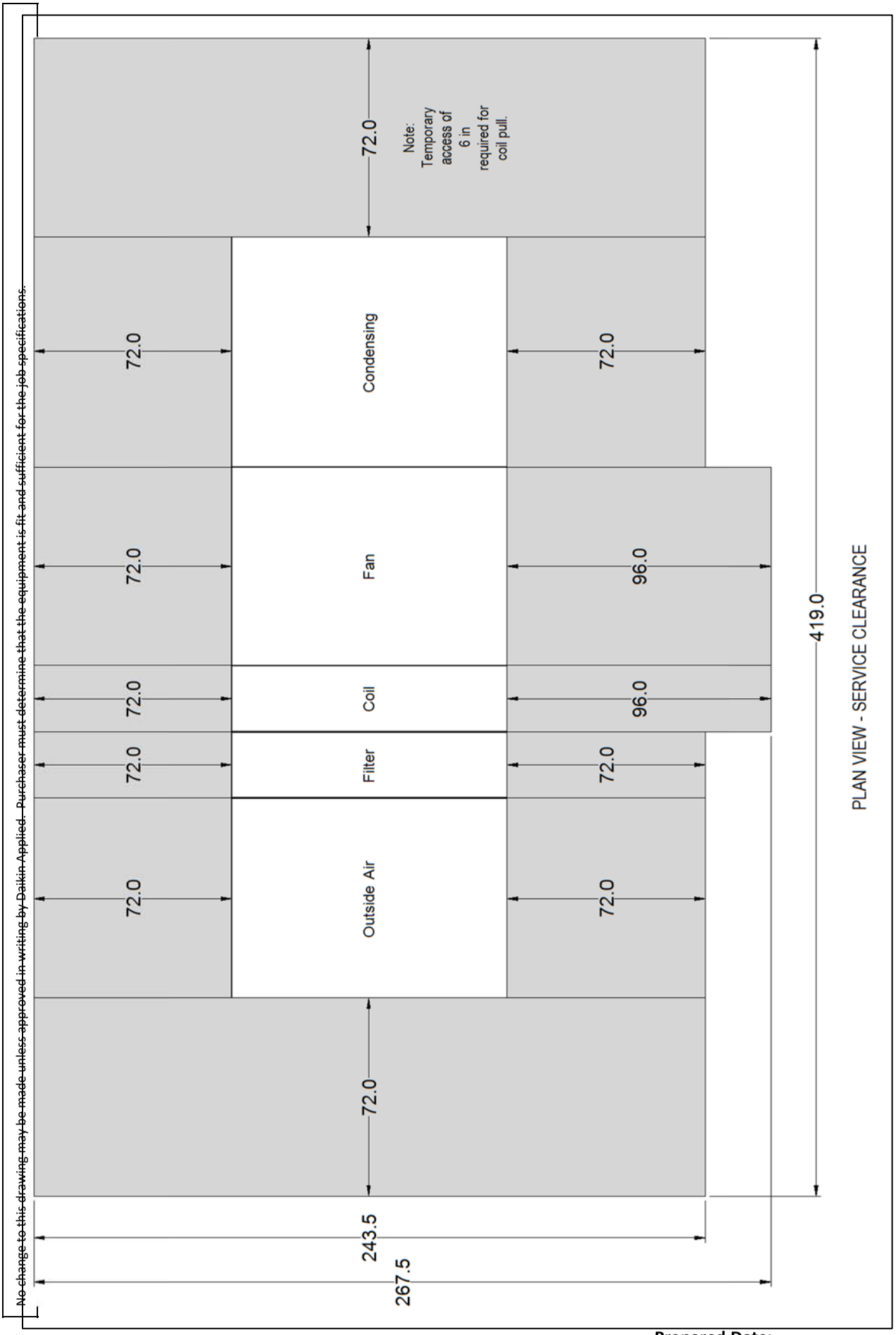
Part Number	Description
Note:	
090016710	MT III Com Mod for Applied Rooftops, BACnet MS/TP

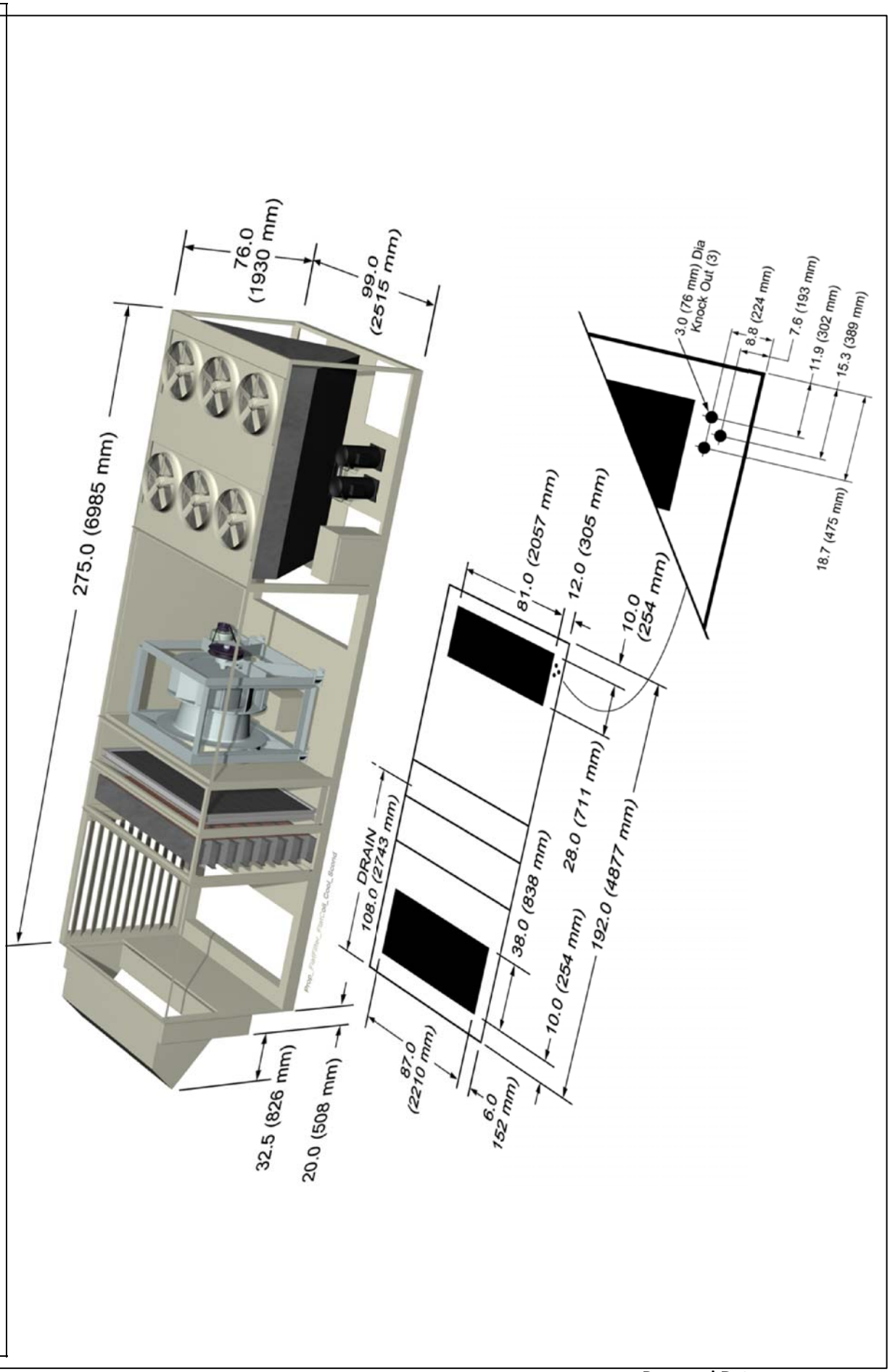
Drawings(1) for RTU-3



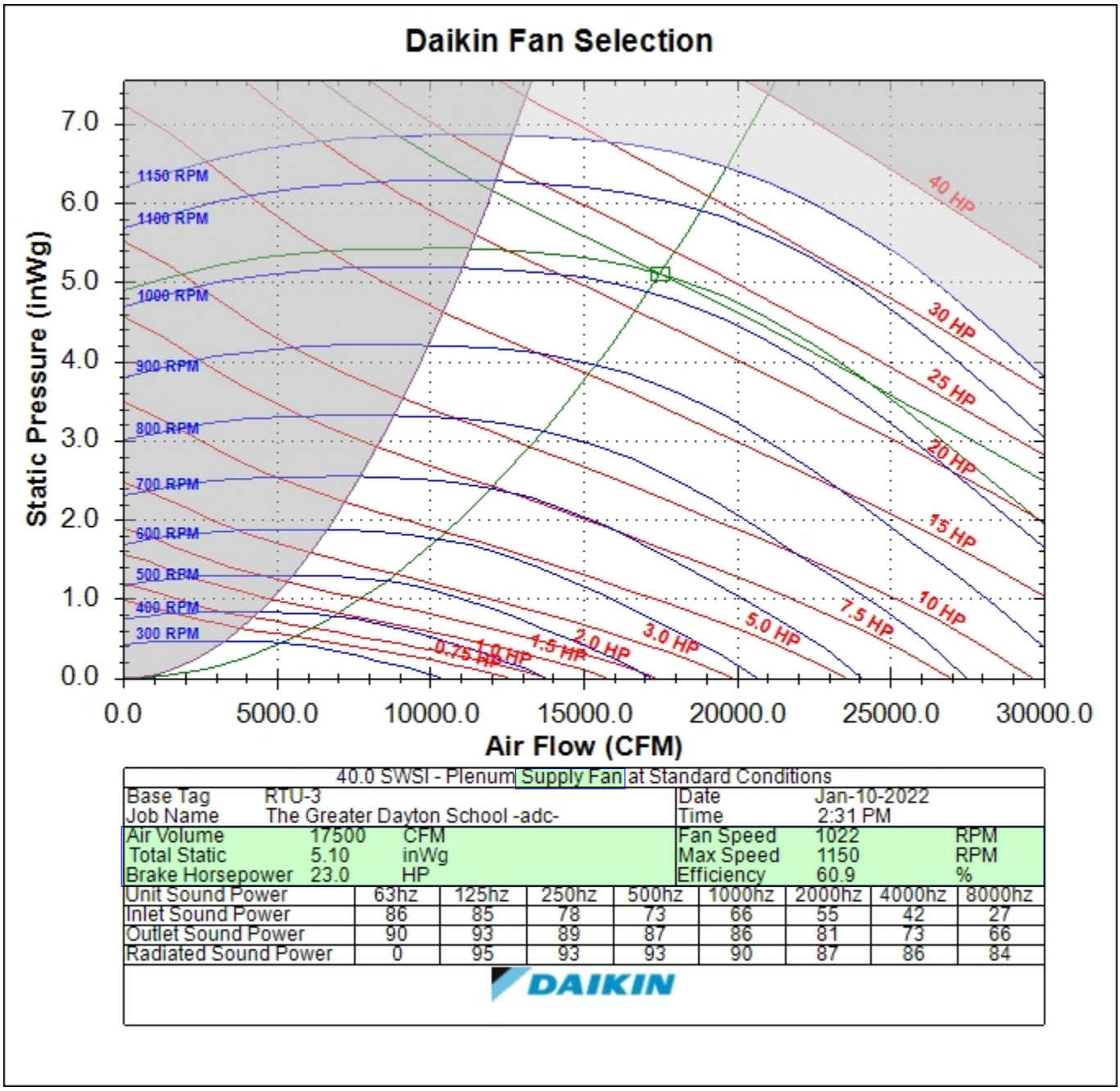


Drawings(3) for RTU-3





Fan Curve - Supply for RTU-3



40.0 SWSI - Plenum Supply Fan at Standard Conditions

Base Tag	RTU-3		Date	Jan-10-2022	
Job Name	The Greater Dayton School -adc-		Time	2:31 PM	
Air Volume	17500	CFM	Fan Speed	1022	RPM
Total Static	5.10	inWg	Max Speed	1150	RPM
Brake Horsepower	23.0	HP	Efficiency	60.9	%

Unit Sound Power	63hz	125hz	250hz	500hz	1000hz	2000hz	4000hz	8000hz
Inlet Sound Power	86	85	78	73	66	55	42	27
Outlet Sound Power	90	93	89	87	86	81	73	66
Radiated Sound Power	0	95	93	93	90	87	86	84

DAIKIN

Technical Data Sheet for RTU-4

Job Information	*Technical Data Sheet*
Job Name	The Greater Dayton School -adc-
Date	1/10/2022
Submitted By	Tony Decrescenzo
Software Version	10.90
Unit Tag	RTU-4

Unit Overview

Model Number	Voltage	Design Cooling Capacity	AHRI 360 Standard Efficiency		ASHRAE 90.1
			EER	IEER	
MPS040F	460/60/3	461377 Btu/hr	10.1	13	2016 Compliant

Unit

Model Number:	MPS040F
Model Type:	Cooling, Standard Efficiency
Heat Type:	Natural gas heat
Hot Gas Reheat:	Hot Gas Reheat with Combination Space Temp and Humidity Sensor
Application:	Variable volume, w/ VFD, Space Control
Altitude:	0 ft
Approval	cETLus

Physical

Unit Dimensions and Weights

Unit Length	Unit Height	Unit Width	Unit Weight
245.5 in	73.2 in	97.5 in	5500 lb

Unit Construction

Exterior:	Prepainted Galv Steel	**Doors:**	Fan, Filter, Control Panel, and Heat Vestibule sections
Insulation:	R-value of 4.0	**Drain Pan Material**	Stainless Steel
Liners:	Double wall construction		

Unit Electrical Data

Voltage	SCCR	FLA	MCA	MROPD
460/60/3 V	10 kAIC	96.4 A	101.0 A	110 A

Note: Use only copper supply wires with ampacity based on 75° C conductor rating. Connections to terminals must be made with copper lugs and copper wire.

Return/Outside/Exhaust Air

Outside Air Option

Type	Damper	Damper Pressure Drop	Leakage Rate
0-100% Econ with dry bulb control	Low leak with blade and jamb seals	0.03 inH_2O	1.5 cfm/sq ft @1" differential pressure

Ventilation Control: Outdoor Air Monitor and Duct Mounted CO2 Sensor

Draw Through Filters

Efficiency	Quantity/Nominal Size	Face Area ft^2	Face Velocity ft/min	Air Pressure Drop inH_2O
30% MERV 8	8 / 24 in x 24 in x 2 in, 4 / 18 in x 24 in x 2 in	36.0	356	0.1

Technical Data Sheet for RTU-4

Exhaust Air Option

Fan Airflow	Max Static Pressure	Fan Type	Fan Quantity	Fan Diameter	Capacity Control
14000 CFM	0.50 inH_2O	Prop	3	26"	Power Exhaust - Mod w/ VFD - Building pressure control

Motor Power	Motor Type	Motor Quantity	Full Load Current	Drive Type
1.00	Open Drip Proof	3	2.0 AA	Direct Drive

Cooling Coil

Fins per Inch	Rows	Face Area ft^2	Face Velocity ft/min	Condensate Connection Size	Air Pressure drop inH_2O
12	4	35.7	359	1.0 in. Male NPT	0.32

Cooling Performance

Total Capacity Btu/hr	Sensible Capacity Btu/hr	Entering Air Temperature		Leaving Air Temperature		Ambient Air Temp °F
		Dry Bulb °F	Wet Bulb °F	Dry Bulb °F	Wet Bulb °F	
461377	358689	81.2	66.4	55.6	54.5	95.0

Hot Gas Reheat Coil Section

Type	Face Area	Air Pressure Drop	Total Capacity	Entering DB	Leaving DB
Aluminum Tube Micro-channel	26.8 ft^2	0.09 inH_2O	192202 Btu/hr	55.6 °F	68.0 °F

Control Type: Modulating Control

Fan Section SUPPLY FAN

Type	Fan Wheel Diameter	Vibration Isolation
AF SWSI	30 in	1 inch spring, seismic

Fan Performance

Air Flow	Total Static Pressure	Fan Speed	Brake Horsepower	Altitude
12800 CFM	3.83 inH_2O	1268 RPM	10.8 HP	0 ft

Motor

Horsepower	Type	Efficiency	Full Load Current
15 HP	Open drip proof, Premium efficiency	93.0	17.7 A

Drives

Type	Service Factor
Belt Drive	120%

Gas Heat Section

Type	Main Gas Pressure	Material	Gas Type
Tubular Heat exchanger with in-shot burner manifold	7-14 inH_2O	Stainless steel	Natural Gas
Ignition	**Combustion Blower**	**Heat Stages**	**Gas Piping Connection Size**
Electric	Induced draft blower	Modulating	3/4 in. Female NPT

Heating Performance

Input Size	Heat Airflow	Total Capacity	Steady State Efficiency	Entering Air Dry Bulb	Leaving Air Dry Bulb
800 MBH Input/640 MBH Output	12800 CFM	640000 Btu/hr	81%	40.0 °F	86.1 °F

Technical Data Sheet for RTU-4

Unit Discharge Conditions

AirTemperature				
Motor Heat Btu/hr	Moisture Removal lb/h	Unit Leaving Dry Bulb °F	Unit Leaving Wet Bulb °F	Unit Leaving Dewpoint °F
31357	90.5	57.9	55.3	53.5

Condensing Section

Compressor

Type	Quantity	Refrigerant Charge		Total Power	Capacity Control	Refrigerant Type
		Circuit1	Circuit 2			
Scroll	4	26.5lbs	26.0 lbs	36.8 kW	5 steps	R410A

Compressor Amps:

Compressor 1	Fixed Speed	18.6 A
Compressor 2	Fixed Speed	18.6 A
Compressor 3	Fixed Speed	13.1 A
Compressor 4	Fixed Speed	13.1 A

Condenser Coil

Type	Fins Per Inch	Rows	Fin Material	Refrigerant Valves
Aluminum tube micro channel	18	Micro Channel	Aluminum	None

Low Ambient Control:	Std low ambient control to 0 F (-17.7 C)

Condenser Fan Motors

Number of Motors	Full Load Current
4	2.0 A

AHRI 360 Certified Data at AHRI 360 Standard Conditions

Net Capacity	Efficiency		ASHRAE 90.1
438000 Btu/hr	10.1 EER	13 IEER	2016 Compliant

Internal Static Pressure Drop Calculation

External Static Pressure:	2.00
Outside Air Damper:	0.03
Filter:	0.10
Additional Filter Static Pressure:	1.00
Cooling Coil:	0.32
Energy Wheel and Filters:	0.00
Gas Heat:	0.29
Hot Gas Reheat:	0.09
Total Static Pressure:	3.83 inH_2O

Sound Power

Inlet

63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
74	77	84	76	72	67	65	62

Outlet

63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
80	84	89	85	81	76	72	68

Radiated

63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
84	96	94	93	91	88	87	85

Technical Data Sheet for RTU-4

Options	
Electrical	
Field Connection:	Non-Fused Disc Sw, Field powered 115V GFI outlet
Power Options:	Phase Failure Monitor
Controls	
Temperature Controls:	DDC controls, FACTORY installed BACnet/MSTP card

Factory Installed Sensors

Leaving Coil/Entering Fan Temp Sensor
Duct High Limit Switch
Building Static Pressure Sensor
Return Air Temperature Sensor
Discharge Air Temperature Sensor
Outside Air Temperature Sensor
Dirty Filter On/Off Switch
Airflow Proving Switch
Leaving Coil/Entering Fan Temperature Sensor

Warranty

Parts Warranty:	Standard one year
Compressor Warranty:	Four year extended, five year total
Heat Exchanger Warranty:	Standard one year

AHRI Certification

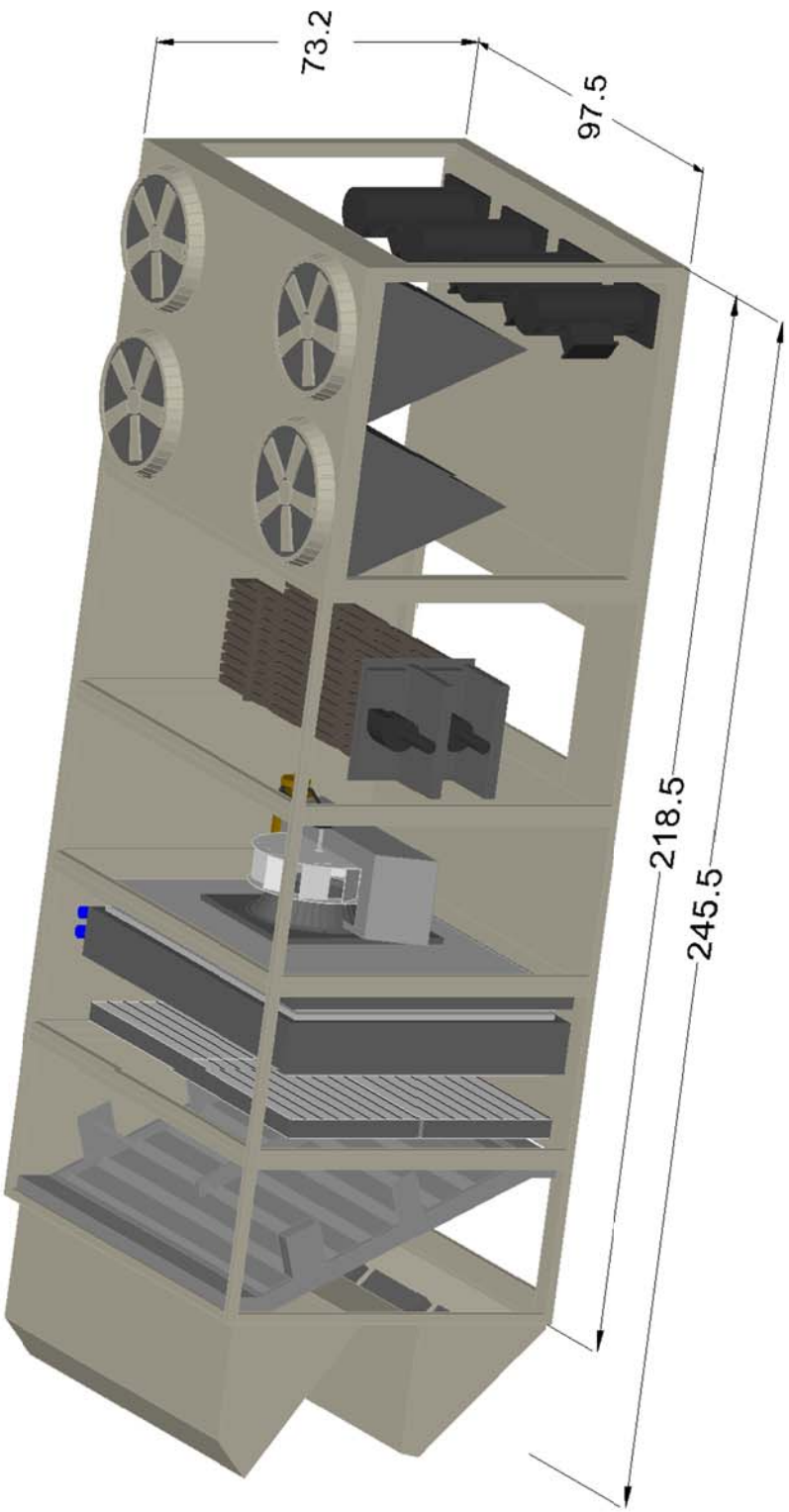
All equipment is rated and certified in accordance with AHRI 340/360

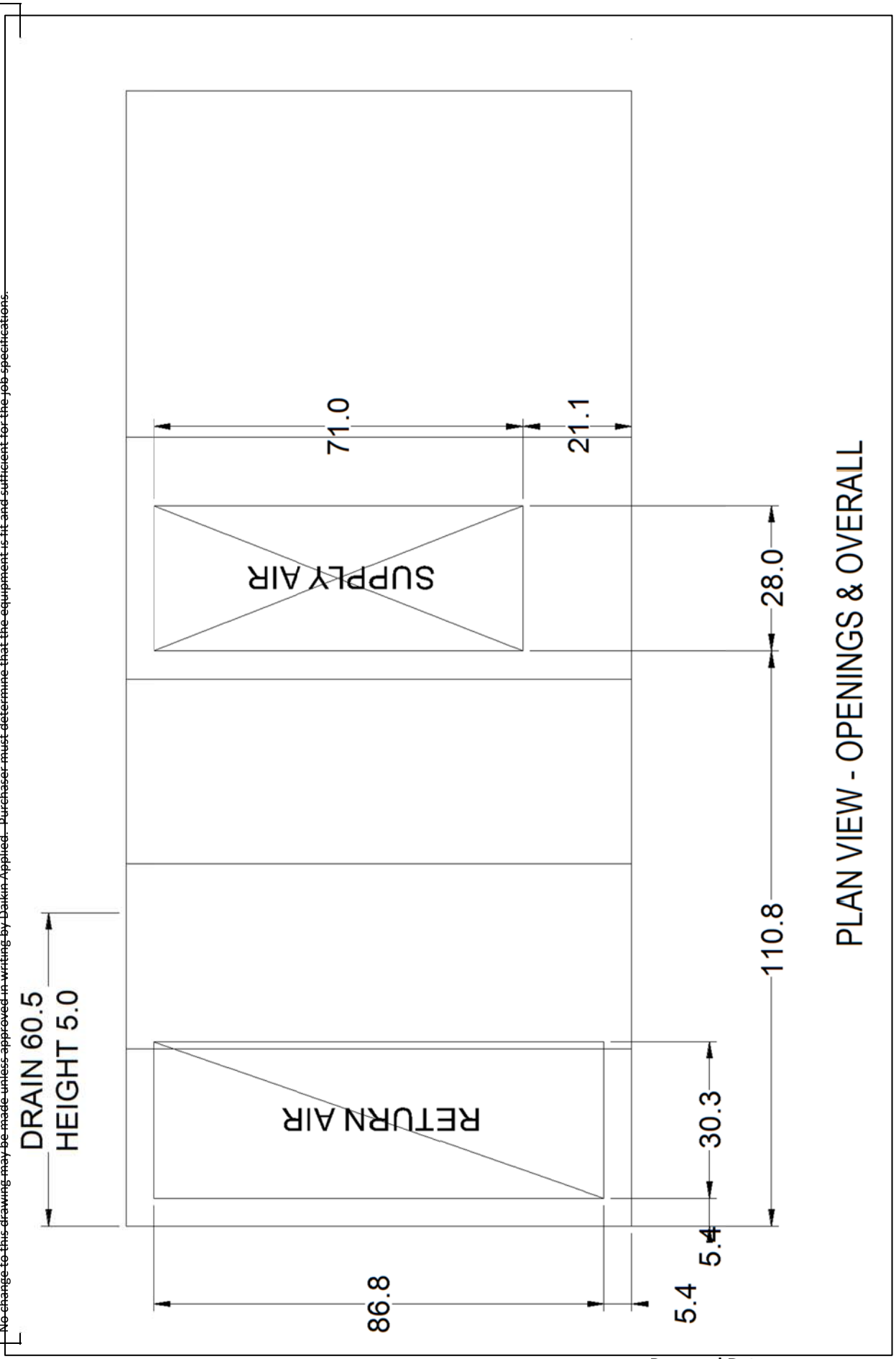
Notes

Accessories

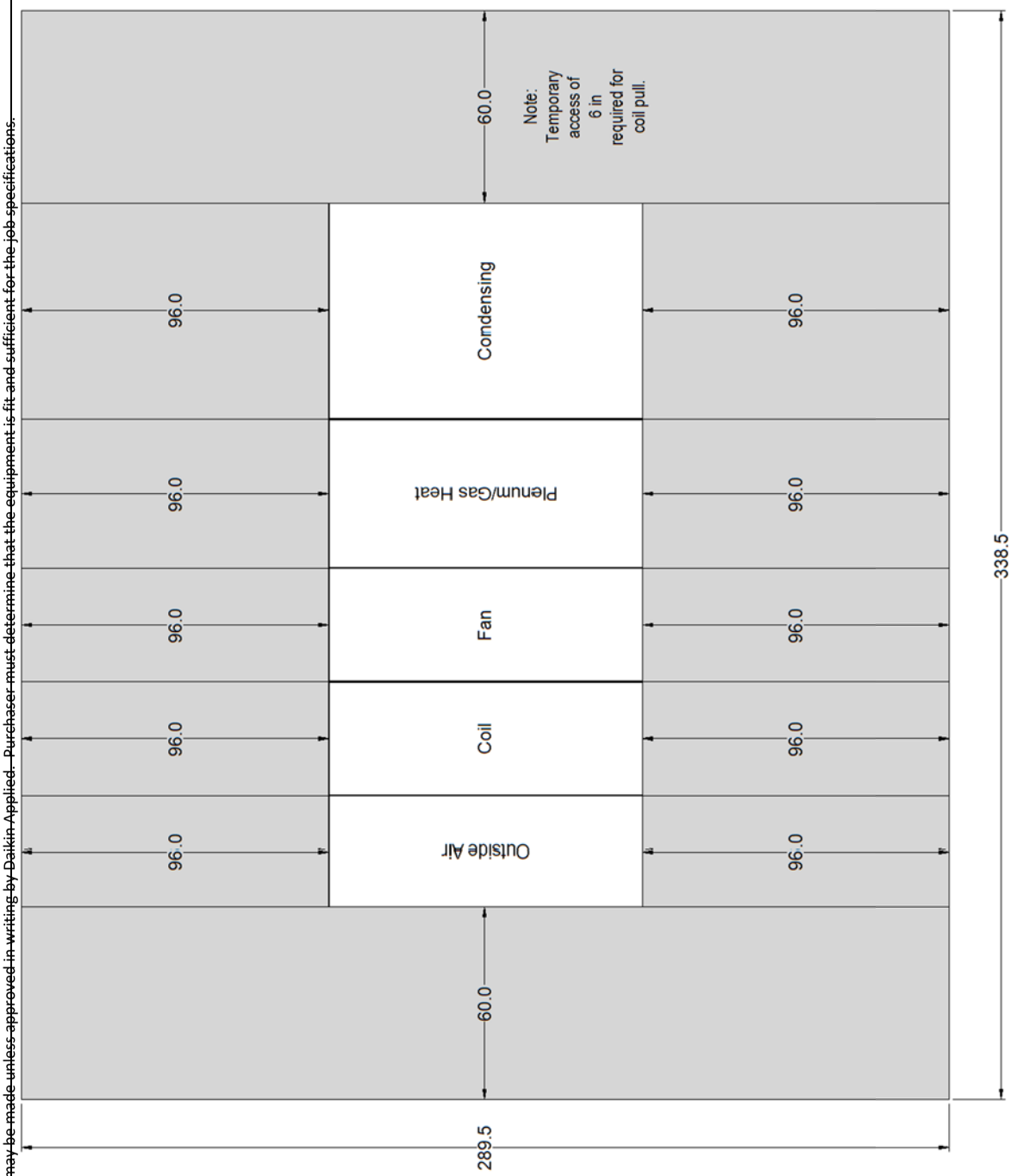
Part Number	Description
Note:	
910191961	Combo Digital Temp and Humidity Sensor w/Adj setpoint and tenent override
910274504	CO2, Dwyer, Duct Sensor

Drawings(1) for RTU-4



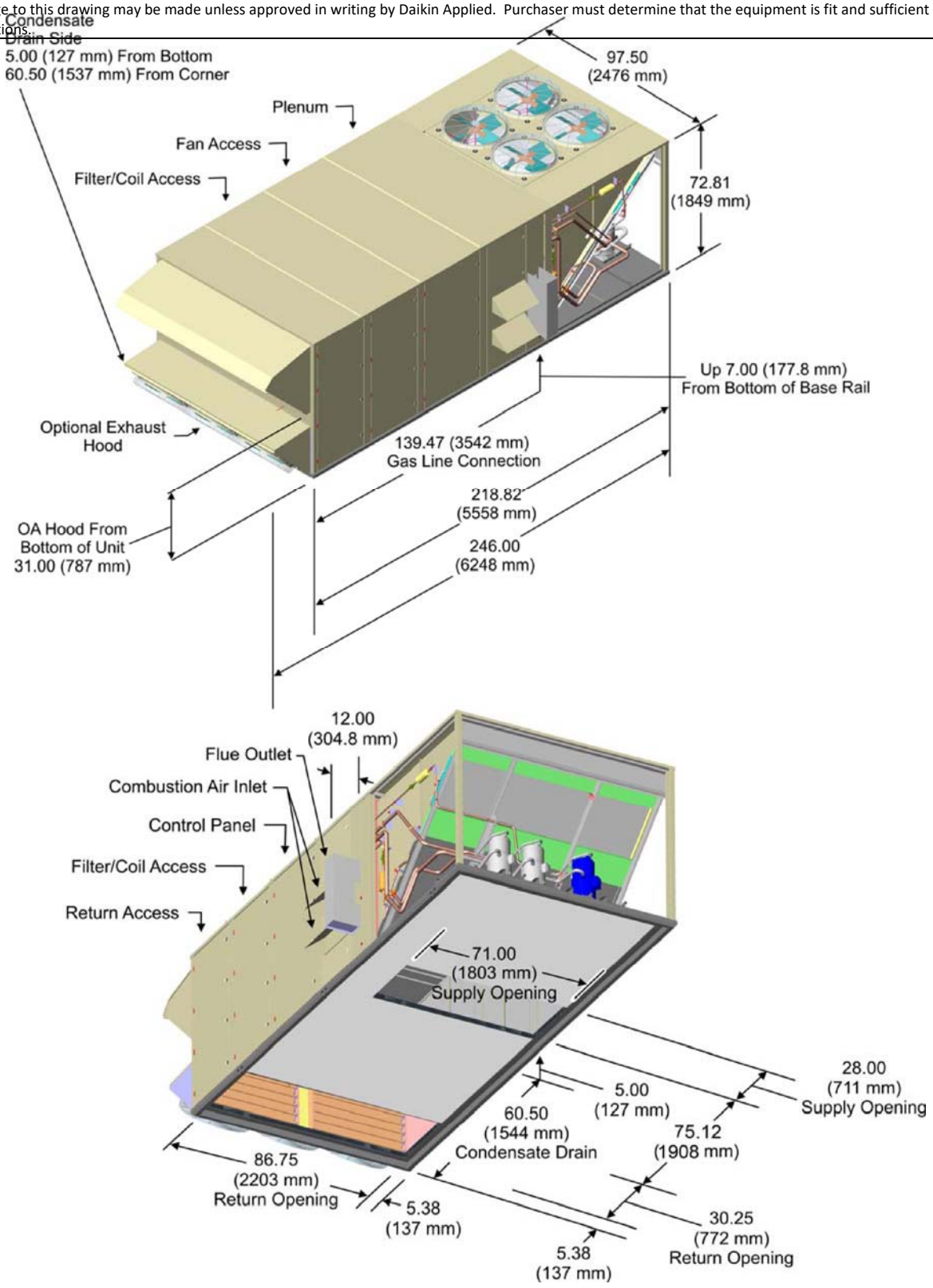


Drawings(3) for RTU-4

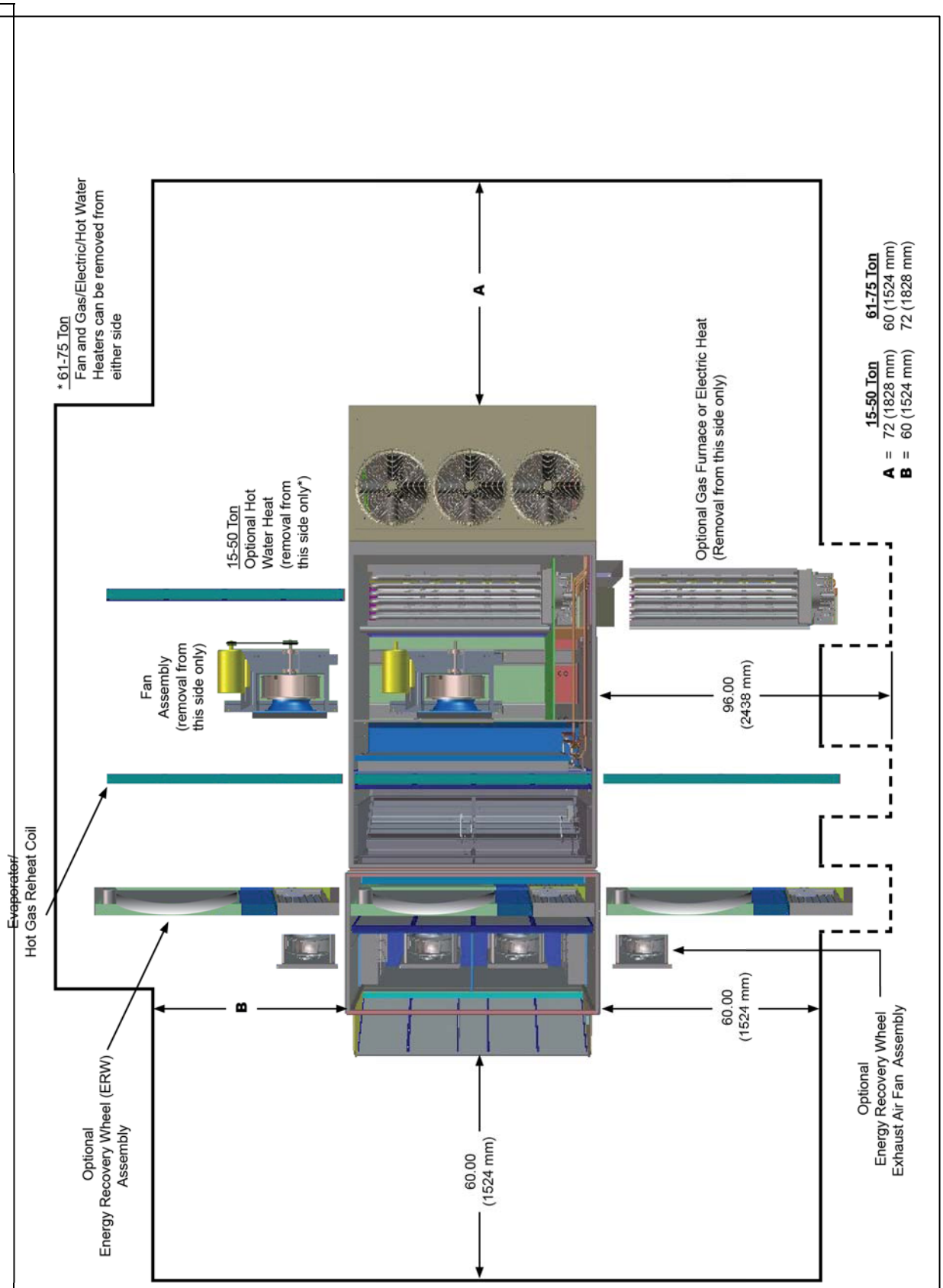


MPS040-050A Gas heat_Drawing for RTU-4

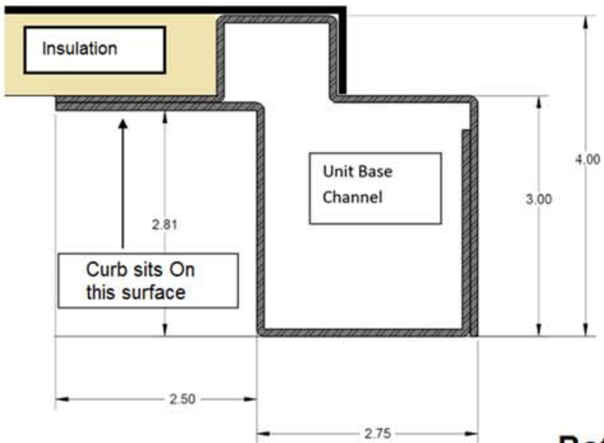
No change to this drawing may be made unless approved in writing by Daikin Applied. Purchaser must determine that the equipment is fit and sufficient for the job specifications.



MPSII Service Clearance_Drawing for RTU-4

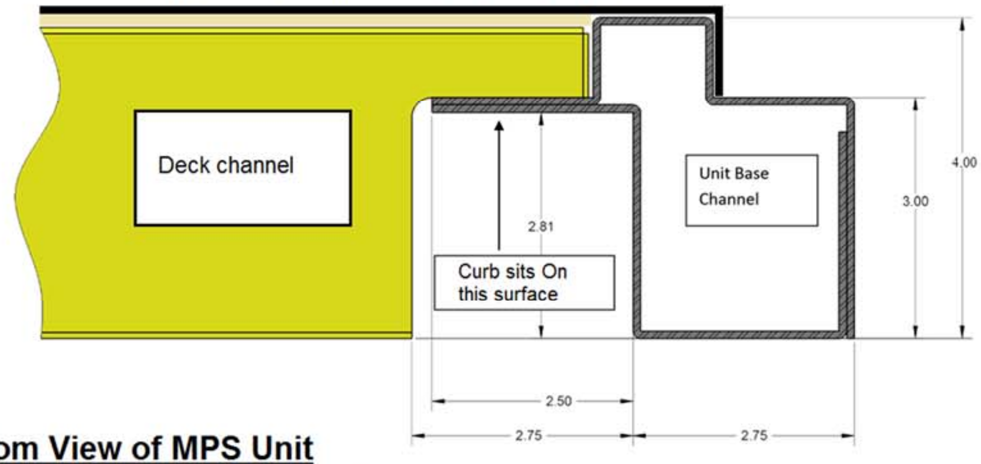


Section B-B



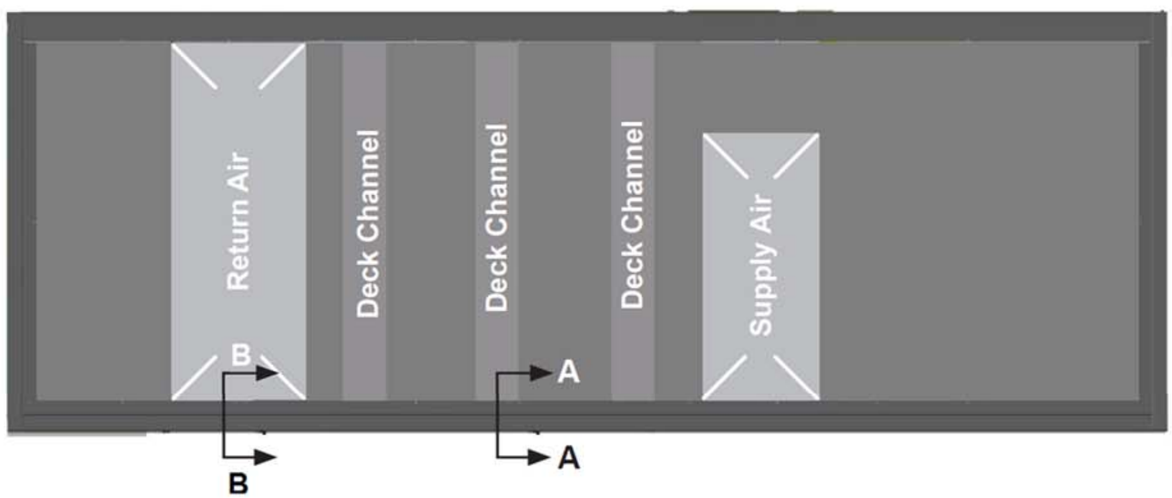
Section A-A

(Structural Deck Channel under DX coil and supply fan (qty 2))



Bottom View of MPS Unit

(Note: Return air opening not provided on 100% OA units)



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

Weight Distribution for Maverick® II (15-50 ton)

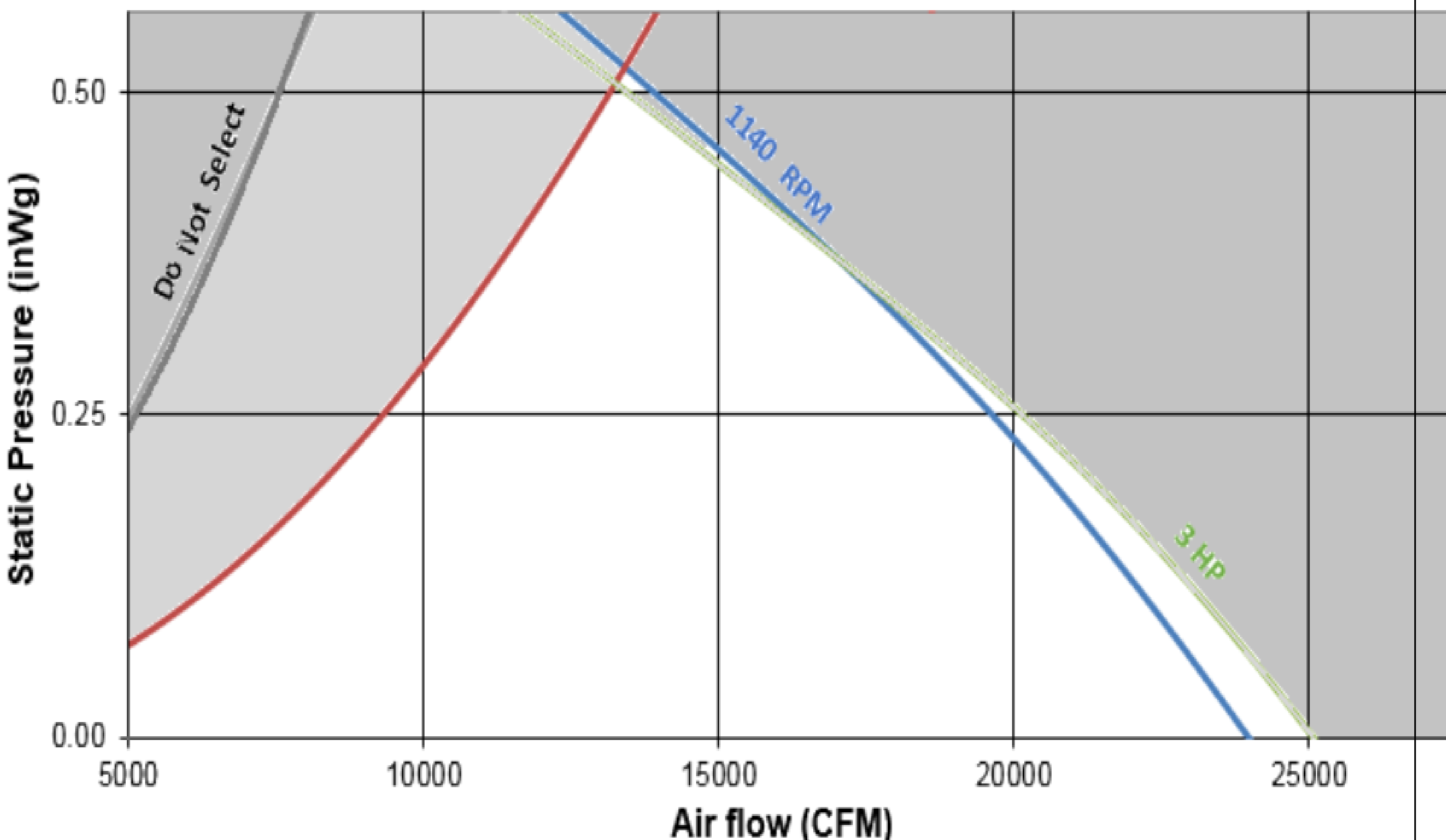
Table 1: Weight Distribution Locations

Unit (Tons)	Distance		
	L1	L2	L3
015-035 Ton Unit	35.5	62	52
040-050 Ton Unit	40	69	89

Table 2: Weight Distribution % per location

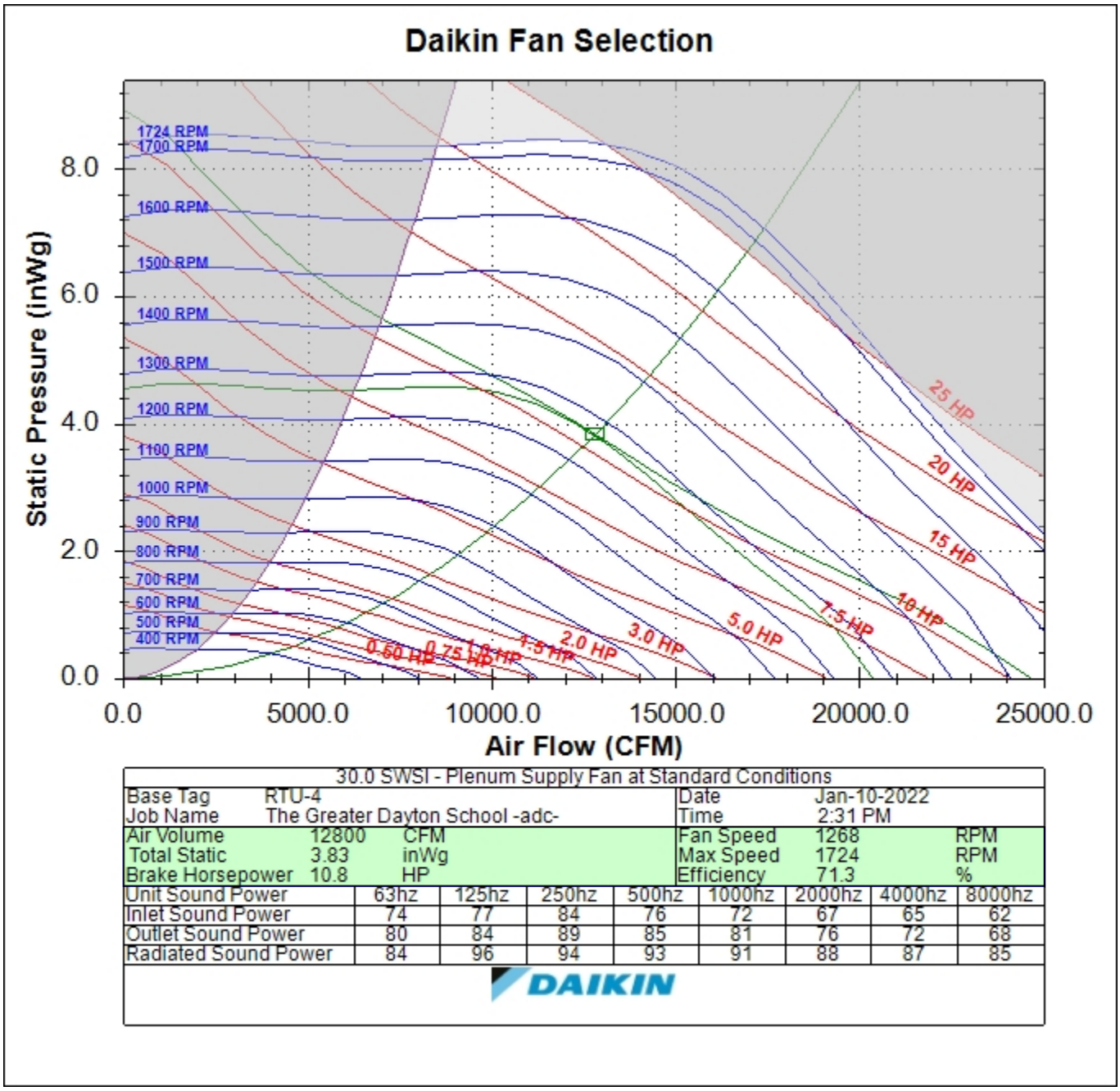
Unit	Point and Percent of total					
	A	B	C	D	E	F
015-050 Without Energy Wheel	11	11	20	24	16	18
015-035 with Energy Wheel	13	12	20	21	17	17

3-PROP 26" MPS II Exhaust Fan



Prepared Date:

Fan Curve - Supply for RTU-4



30.0 SWSI - Plenum Supply Fan at Standard Conditions

Base Tag	RTU-4		Date	Jan-10-2022	
Job Name	The Greater Dayton School -adc-		Time	2:31 PM	
Air Volume	12800	CFM	Fan Speed	1268	RPM
Total Static	3.83	inWg	Max Speed	1724	RPM
Brake Horsepower	10.8	HP	Efficiency	71.3	%

Unit Sound Power	63hz	125hz	250hz	500hz	1000hz	2000hz	4000hz	8000hz
Inlet Sound Power	74	77	84	76	72	67	65	62
Outlet Sound Power	80	84	89	85	81	76	72	68
Radiated Sound Power	84	96	94	93	91	88	87	85

DAIKIN

Technical Data Sheet for RTU-5

Job Information	*Technical Data Sheet*
Job Name	The Greater Dayton School -adc-
Date	1/10/2022
Submitted By	Tony Decrescenzo
Software Version	09.60
Unit Tag	RTU-5

Unit Overview

Model Number	Voltage V/Hz/Phase	Design Cooling Capacity Btu/hr	AHRI360 Standard Efficiency		ASHRAE 90.1-2016 Compliant
			EER	IEER	
DPS015A	460/60/3	174901	11.1	18.0	ASHRAE 90.1-2016 compliant

Unit

Model Number:	DPS015A
Model Type:	Cooling
Heat Type:	None
Energy Recovery:	None
Application:	Variable Air Volume, Duct SP Control (Mixed Air or 100% OA)
Controls:	Microtech III
Outside Air:	0-100% Economizer with Drybulb Control
Altitude:	0 ft
Approval	cETLus

Physical

Dimensions and Weight

Length	Height	Width	Weight
91.0 in	56.8in	96.5 in	2494 lb

Corner Weights

L1	L2	L3	L4
380 lb	322 lb	821 lb	971 lb

Construction

Exterior	Insulation and Liners	Air Opening Location	
		Return	Supply
Painted Galvanized Steel	1" Injected Foam, R-7, Galvanized Steel Liner	Bottom	Bottom

Electrical

Unit FLA	MCA	MROPD	SCCR
32.6 A	35.8 A	45 A	5 kAIC

Note: Use only copper supply wires with ampacity based on 75° C conductor rating. Connections to terminals must be made with copper lugs and copper wire.

Technical Data Sheet for RTU-5

Return/Outside/Exhaust Air

Outside Air Option

Type	Damper Pressure Drop	Exhaust Air Type
0-100% Econ with Dry Bulb Control	0.29 inH_2O	Powered, Modulating with Building Pressure Control

Exhaust Fan

Type	Drive Type	Wheel Diameter
SWSI AF	Direct Drive	18 in

Motor

(Qty) Horsepower	Type	Efficiency	Full Load Current (Each)
(1) 4.0 HP	ECM	Premium	4.0 A

Performance

Air Flow CFM	External Static Pressure inH_2O	Fan Speed RPM	Brake Horsepower HP
6000	0.50	1989	2.33

Filter Section

Type	Quantity / Size	Physical: Face Area	Physical: Face Velocity	Physical: Air Pressure Drop
2" MERV 8 & 4" MERV 14 Filters	6 / 18 in x 24 in x 2 in & 6 / 18 in x 24 in x 4 in	18.0 ft^2	333.3 ft/min	0.47

DX Cooling Coil

Physical

Coil Type	Refrigerant Type	Fins per Inch	Rows	Face Area	Face Velocity	Air Pressure drop	Drain Pan Material
Cu Tube/ Al Fin	R410A	15	6	15.4 ft^2	388.9 ft/min	0.52 inH_2O	Stainless Steel

Cooling Performance

Capacity: Total Btu/hr	Capacity: Sensible Btu/hr	Capacity: Moisture Removal lb/h	Indoor Air Temperature: Entering Dry Bulb °F	Indoor Air Temperature: Entering Wet Bulb °F	Indoor Air Temperature: Leaving Dry Bulb °F	Indoor Air Temperature: Leaving Wet Bulb °F	Indoor Air Temperature: Leaving Dewpoint °F	Ambient air Temperature °F
174901	155071	16.6	78.3	64.4	54.7	54.6	54.6	95.0

Condensate Connection Size: 3/4 in. Male NPT

Fan Section SUPPLY FAN

Fan

Type	Fan Wheel Diameter	Fan Isolation
SWSI AF	22 in	None

Performance

Airflow	Total Static Pressure	Fan Speed	Brake Horsepower	Altitude
6000 CFM	3.3 inH_2O	1664 rpm	4.91 HP	0 ft

Motor

Type	Horsepower	Efficiency	FLA
ECM Motor	8.0	Premium	6.1 A

Drive

Type
Direct Drive

Technical Data Sheet for RTU-5

Unit Discharge Conditions

AirTemperature				
Motor Heat Btu/hr	Moisture Removal lb/h	Unit Leaving Dry Bulb °F	Unit Leaving Wet Bulb °F	Unit Leaving Dewpoint °F
14540	16.6	56.9	55.4	54.6

Minimum Airflows	
Fan Only Minimum Airflow	Cooling Minimum Airflow
1980 CFM	1157 CFM

Notes: Refer to fan curve for applicability of approximate airflows

Condensing Section

Compressor					
Type	Quantity	Refrigerant Charge lb	Total Power	Capacity Control	Compressor Isolation
Inverter Scroll + Fixed Scroll	2	24.4	12.53 kW	Mod Control with Inverter Compressor	Rubber in Shear

Compressor Amps:	
Compressor 1	7.9 A
Compressor 2	12.8 A

Condenser Coil		
Type	Fins per Inch	Fin Material
Aluminum Microchannel	21	Aluminum

Coil Options: Vandal Guard

Condenser Fan Motors	
Number of Motors	Full Load Current (Total)
2	1.8 A

AHRI 360 Certified Data at AHRI 360 Standard Conditions			
Net Capacity	EER	IEER	ASHRAE 90.1
170000 Btu/hr	11.1	18.0	ASHRAE 90.1-2016 compliant

Internal Pressure Drop Calculation

External Static Pressure:	1.50 inH_2O
Filter:	0.47 inH_2O
Dirty Filter:	0.50 inH_2O
Outside Air:	0.29 inH_2O
DX Coil:	0.52 inH_2O
Total Static Pressure:	3.28 inH_2O

Sound

	Sound Power (db)							
Frequency	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
Inlet	84	85	81	82	77	74	68	63
Discharge	84	88	84	87	83	80	76	71
Radiated	85	85	81	78	76	71	64	57

Technical Data Sheet for RTU-5

Options	
Unit	
Ventilation Controls:	Outdoor Air Monitor
Electrical	
Field Connection:	Non-Fused Disconnect Switch
Powered Receptacle:	Field powered 115V GFI outlet
Power Options:	Phase Failure Monitor
Controls	
Communication Card:	BACnet/MSTP card, Factory installed

Factory Installed Sensors

- Duct High Limit Switch
- Duct Static Pressure Sensor
- BACnet/MSTP Card
- Return Air Temperature Sensor
- Discharge Air Temperature sensor – Wired in unit, mounted in supply duct
- Outside Air Temperature Sensor
- Dirty Filter On/Off Switch
- Supply Fan Air Proving Via Modbus
- Building Static Pressure Sensor
- Ebtron Airflow Station

Warranty

Parts:	Standard One Year
Compressor:	Additional Four Year, Five Year Total

AHRI Certification

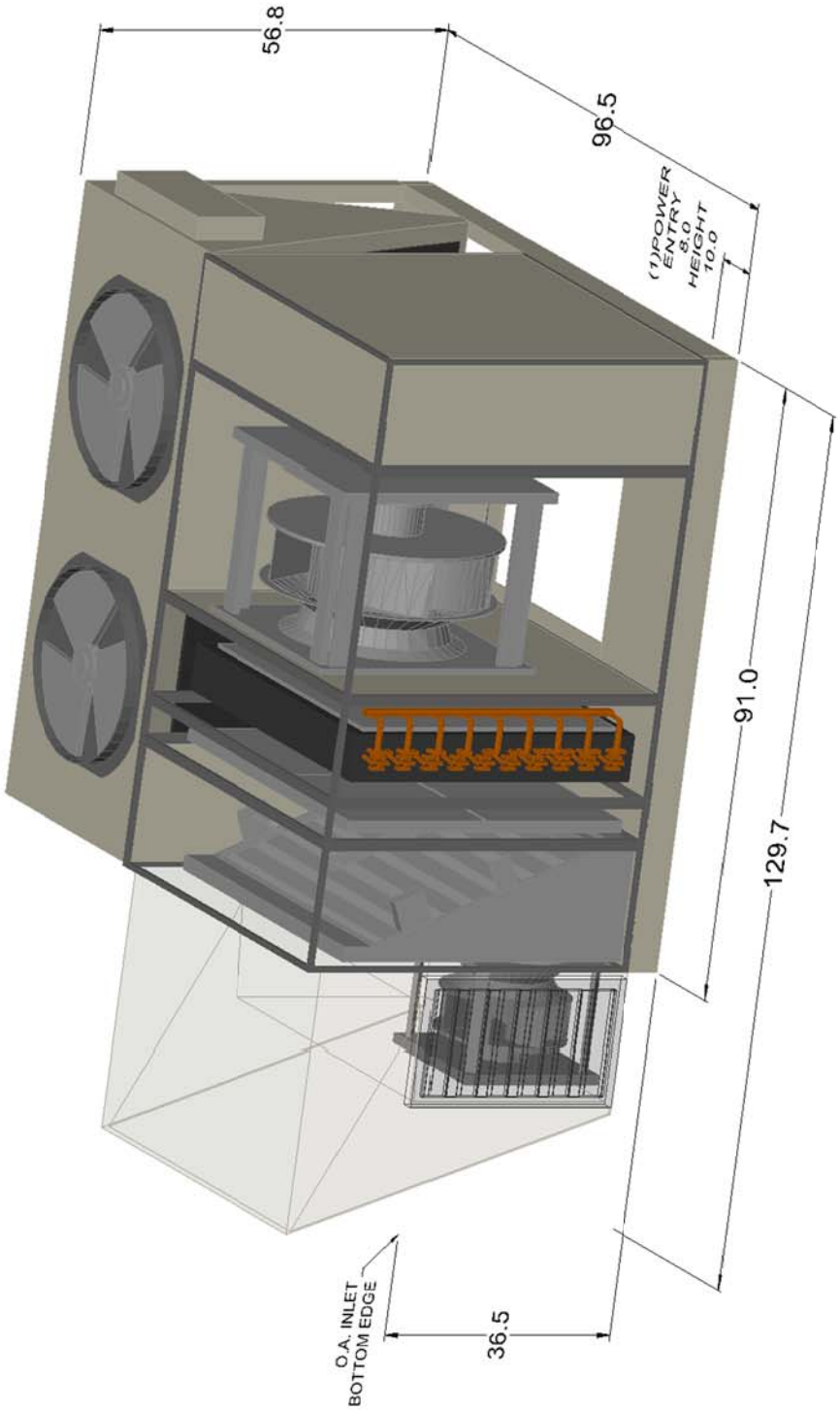
All equipment is rated and certified in accordance with AHRI 360.

Notes

Accessories

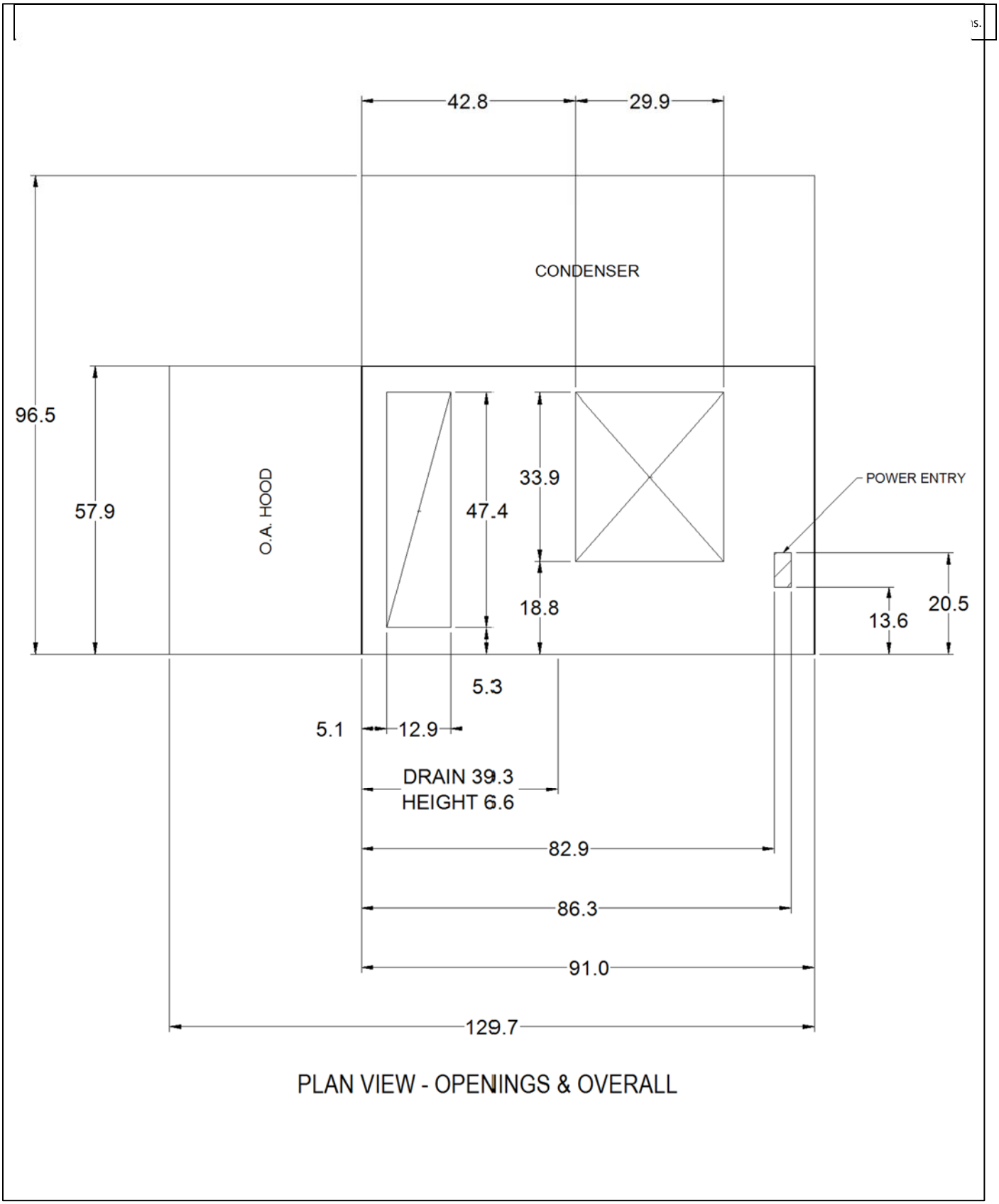
Optional	
Part Number	**Description**
910181702	OA STATIC PRESSURE TIP (DWYER A-306)

Drawings(1) for RTU-5

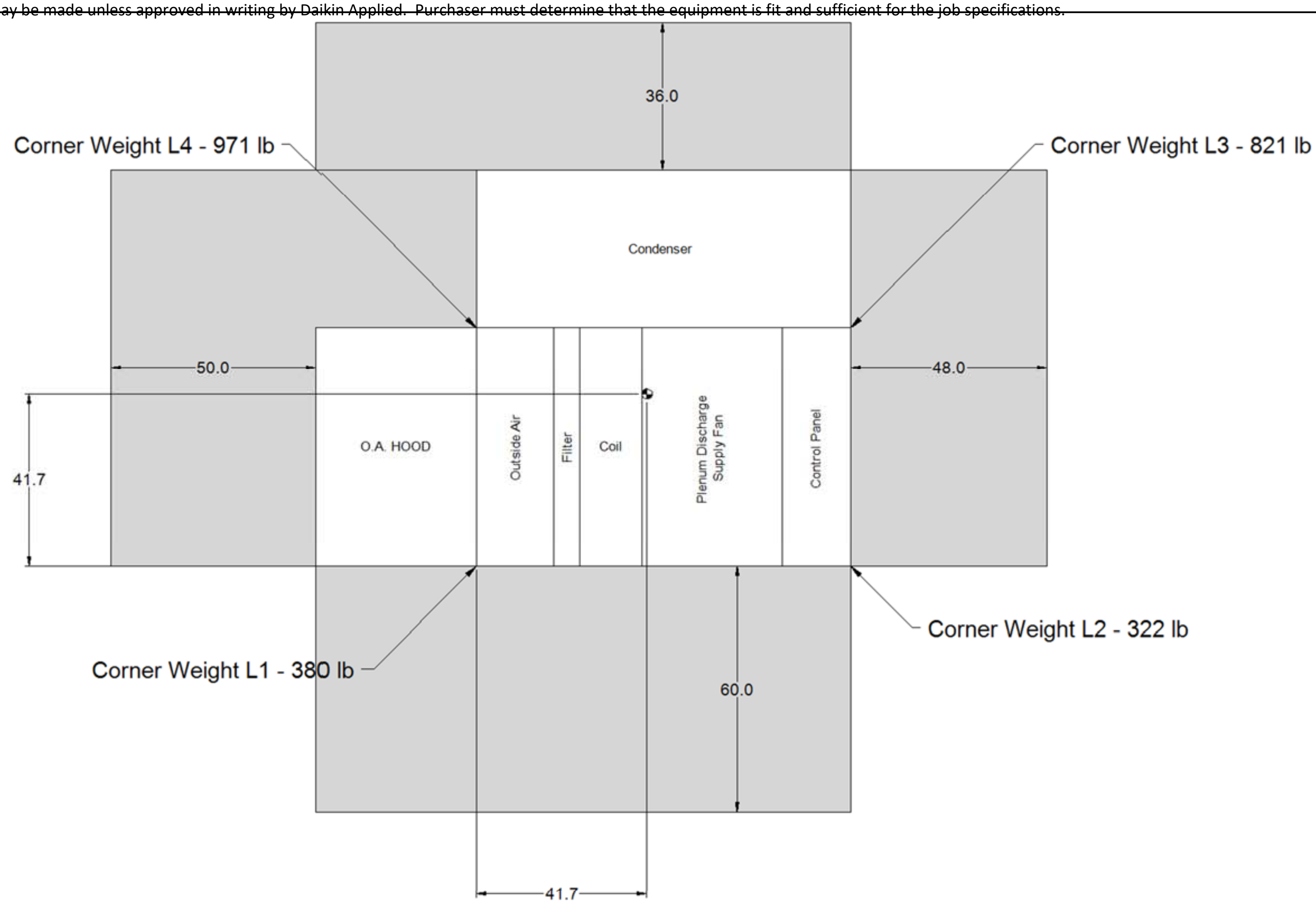


Notes:
(1) Recommended location for optional field cut side power connection.

Drawings(2) for RTU-5

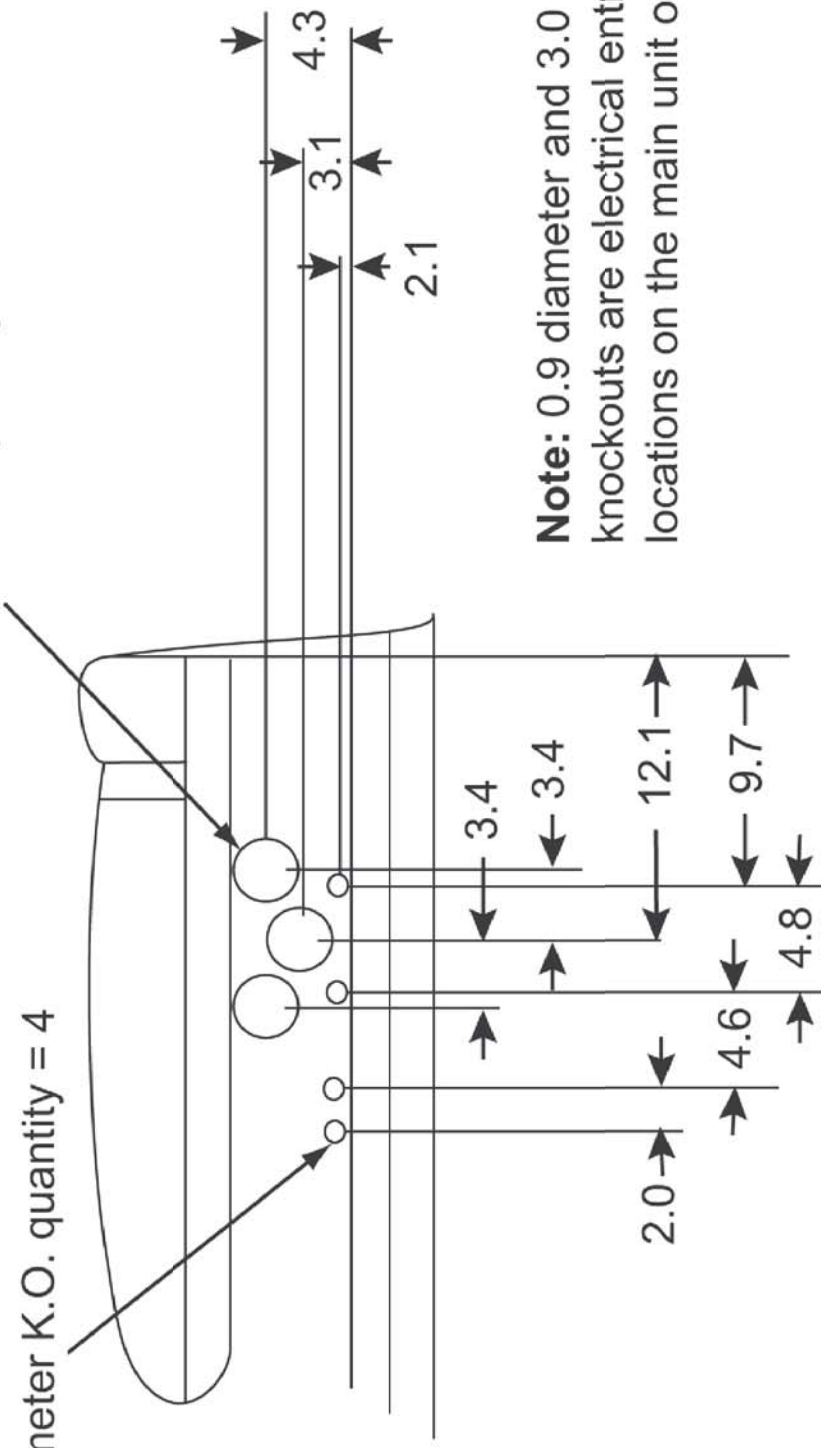


PLAN VIEW - OPENINGS & OVERALL



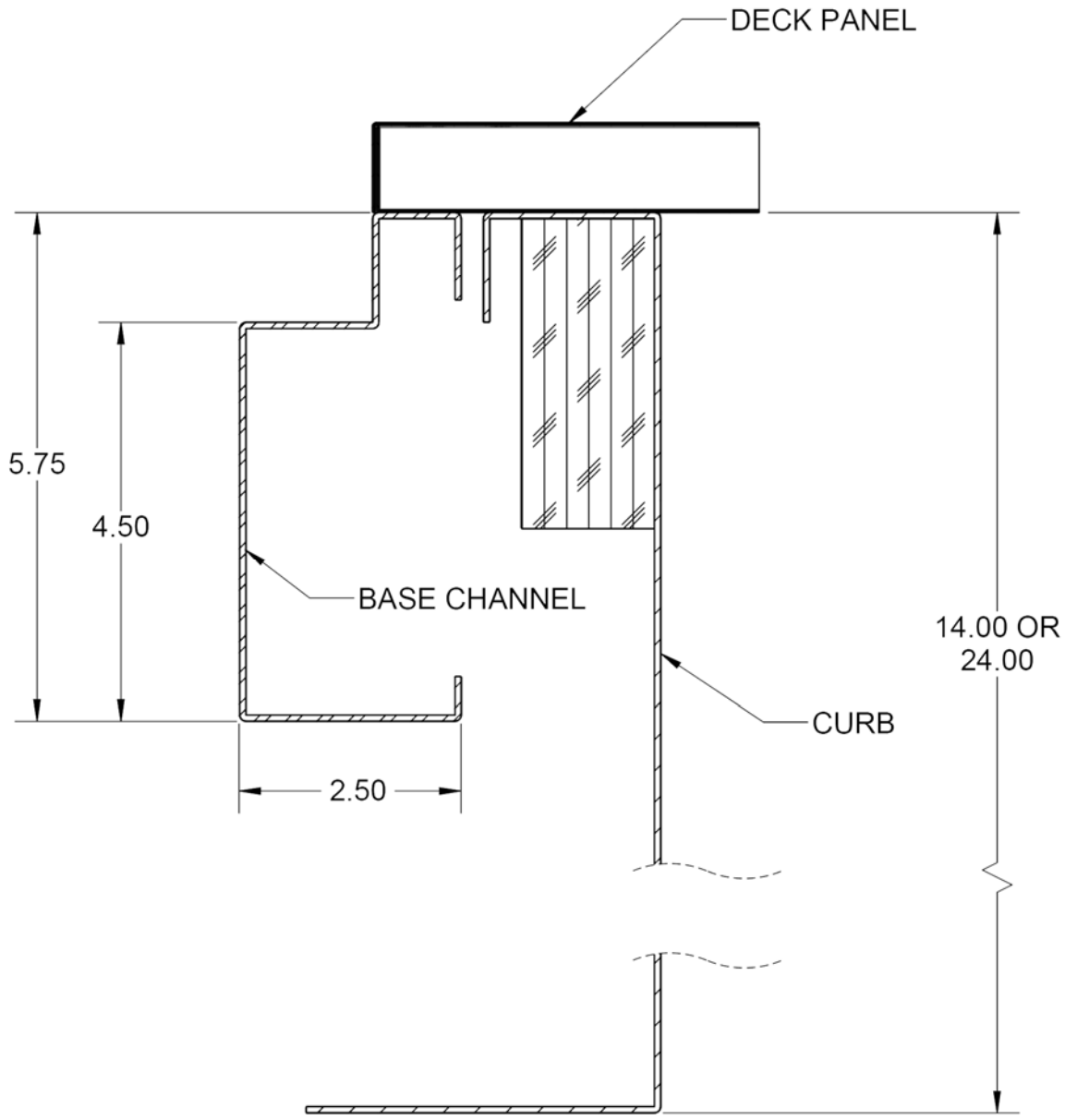
PLAN VIEW - CG, CORNER WEIGHTS, SERVICE CLEARANCE

Notes:
(1) Center of Gravity Height = 27.9
(2) Total Weight = 2494 lb

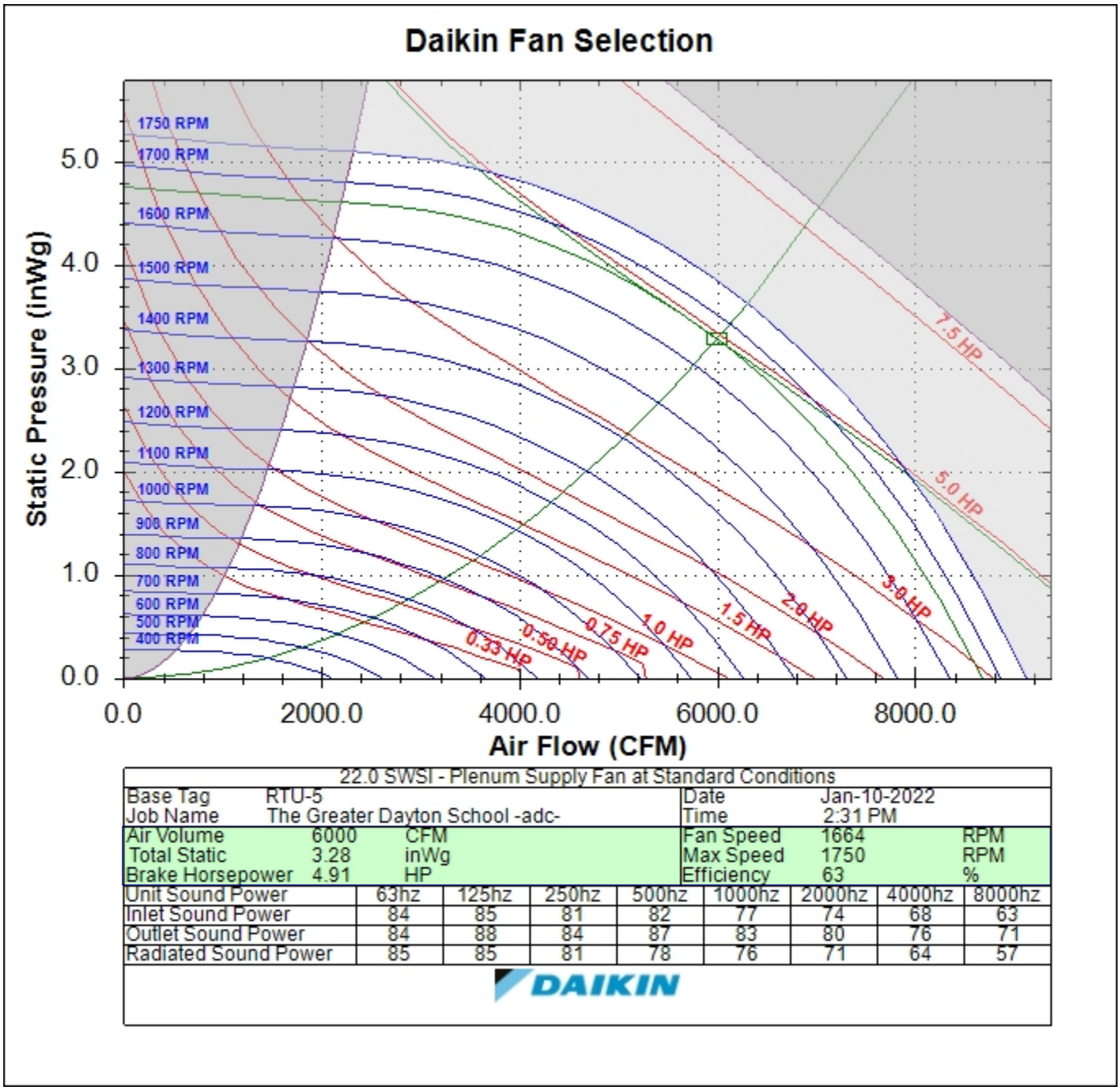


Small and Medium Cabinet Rebel Base Rail_Drawing for RTU-5

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



Fan Curve - Supply for RTU-5



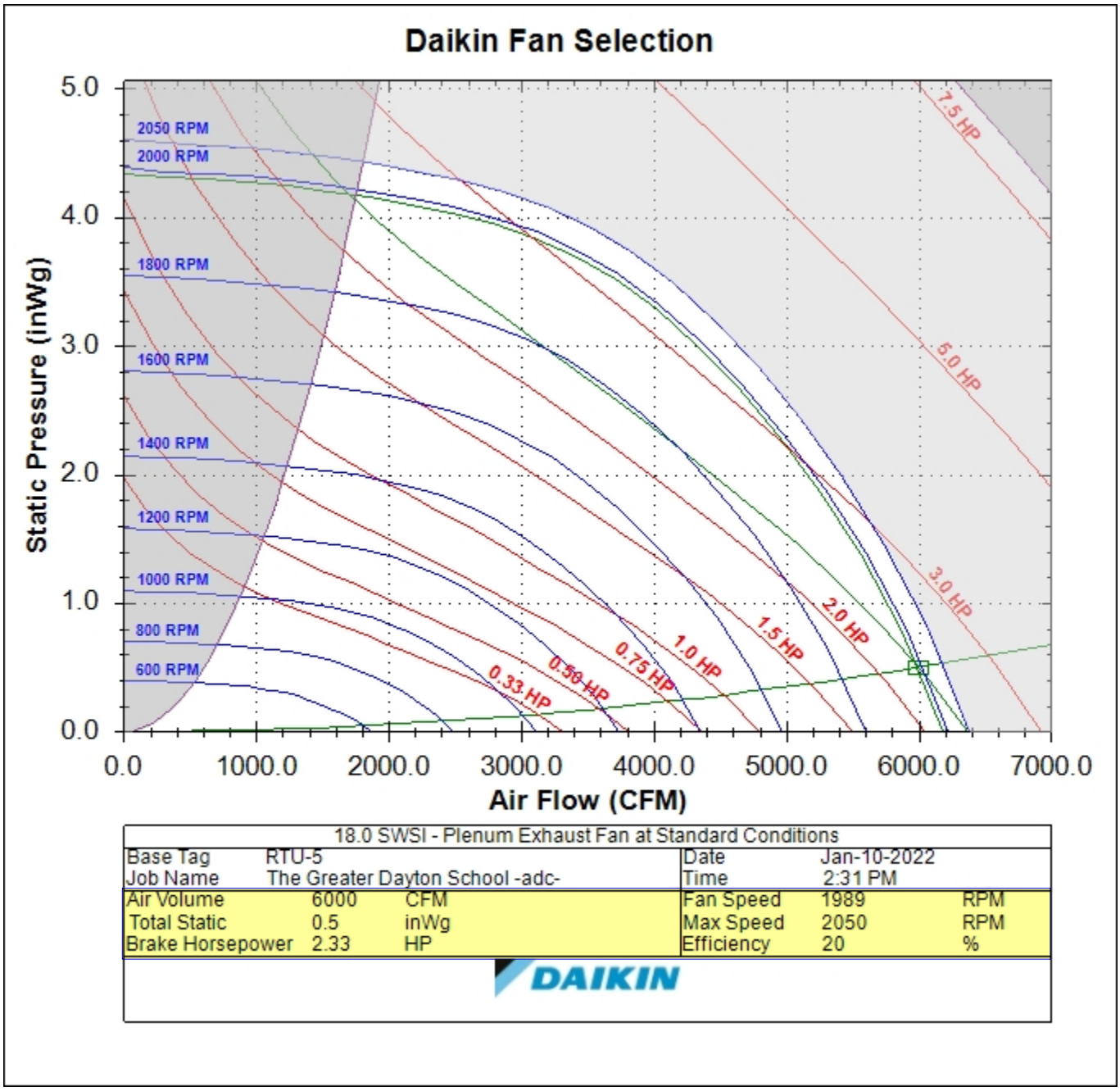
22.0 SWSI - Plenum Supply Fan at Standard Conditions

Base Tag	RTU-5		Date	Jan-10-2022	
Job Name	The Greater Dayton School -adc-		Time	2:31 PM	
Air Volume	6000	CFM	Fan Speed	1664	RPM
Total Static	3.28	inWg	Max Speed	1750	RPM
Brake Horsepower	4.91	HP	Efficiency	63	%

Unit Sound Power	63hz	125hz	250hz	500hz	1000hz	2000hz	4000hz	8000hz
Inlet Sound Power	84	85	81	82	77	74	68	63
Outlet Sound Power	84	88	84	87	83	80	76	71
Radiated Sound Power	85	85	81	78	76	71	64	57

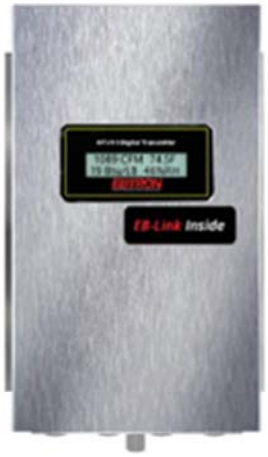
DAIKIN

Fan Curve - Exhaust for RTU-5



Ebtron® Gold Airflow Sensor

Part Number: 111055305



Description

This is Ebtron's top-of-the-line airflow measurement solution for accurate and repeatable measurement. The output of the Ebtron Transmitter will communicate a 0-10 VDC signal to the Microtech® III (MTIII) RTU controller. The MTIII will then interpret this as an outdoor airflow measurement. This measurement can be used as a control setpoint for outdoor air dampers on mixed air units (e.g. economizers or 30% Outdoor Air), a control setpoint for supply fan speed control on 100% Outdoor Air/Dedicated Outdoor Air System units, or it can be used as a read-only option for the building automation system. This is an ideal solution for outdoor air delivery monitoring and airflow tracking applications.

Benefits

- Complies with ASHRAE standards
- Demonstrates code compliance
- Satisfies LEED prerequisites and credits
- Provides acceptable IAQ
- Saves energy
- Reduces liability
- Improves performance

Applications

- Control RTU outdoor air dampers (mixed air RTUs)
- Control supply fan speed (100% OA RTUs)
- LEED outdoor air delivery monitoring
- Air change verification and monitoring
- System performance monitoring

CSD-00033-00 (Jan-18)

RTU-S 2020.10.28, RTU-S 2021.10.05, RTU-S

Rooftop Air Handling Unit-6 Submittal

The Greater Dayton School

Valent Rooftop (#6)

1/10/22

TP Mechanical

Sales Engineer:
Brian Turner
ElitAire
bturner@elitaire.com
513-673-0600 cell

Notes:

- 460/3
- Disconnect Switch
- 24” Plenum Roofcurb with Vibration Isolation Rails (Separate curb submittal package to be provided)
- RTU-6 includes Variable Speed Compressor
- 100% Outside Air
- Modulating Gas Heat
- Modulating Hot Gas Reheat
- Powered Exhaust
- BACnet Card
- Outdoor Airflow Station
- Energy Recovery Wheel
- 1 Year Parts Warranty and 5 Year Compressor Warranty
- Start Up is Included

Printed Date: 01/17/2022
Job: The greater Dayton School
Mark: RTU-6
Model: VXE-312-74-30L-30I-O

COORDINATE UPSIZED CIRCUIT BREAKER FROM 110/3 TO 125/3 WIH DIV 26 CONTRACTOR.

VXE-312-74-30L-30I-O

Unit Performance

Design Conditions

Elevation (ft)	Summer		Winter DB (F)	Supply (CFM)	Outdoor Air (CFM)	Recirc Air (CFM)	Exhaust Air (CFM)
	DB (F)	WB (F)					
817	95.0	75.0	0.0	9,000	9,000	-	4,400

Unit Specifications

Qty	Weight (lb)	Cooling Type	Heating Type	Unit Installation	Unit ETL Listing	Furnace ETL Listing
1	7,035 (+/- 5%)	Packaged DX	Indirect Gas	Outdoor	UL\cUL 1995	ANSI Z83.8 / CSA 2.6

Configuration

Outdoor Air		Exhaust Air	
Intake	Discharge	Intake	Discharge
End	Bottom	Bottom	End

ASHRAE 90.1-2016 Compliance

	ASHRAE 90.1 Min. Efficiency	Calculated Efficiency	Compliance
EER	9.8	9.8	✓
IEER	11.4	14.1	✓
Enthalpy Recovery Ratio (%)	50	48.5	✗

Energy Recovery Performance

Design Condition	Temperature (F)								Capacity Reduction (BTU/h)
	Outdoor Air		Supply Air		Return Air		Exhaust Air		
	DB	WB	DB	WB	DB	WB/RH	DB	WB	
Summer	95.0	75.0	85.2	69.4	75.0	62.4/50	94.0	74.4	206,550.0
Winter	0.0	-1.6	32.4	29.3	72.0	55.7/35	2.8	2.6	314,928.0

Cooling Specifications

Type	Total Capacity (MBH)	Sensible Capacity (MBH)	Lead Compressor Type	Coil (DB/WB)		Reheat	
				EAT (F)	LAT (F)	Capacity (MBH)	LAT (F)
Packaged DX	400.3	286.1	Inverter Scroll	85.2 / 69.3	55.8 / 55.7	227.4	79.3

Heating Specifications

Type	Gas Type	Input (MBH)	Output (MBH)	Temperature Rise		Turndown	Performance	
				Min (F)	Max (F)		EAT (F)	LAT (F)
Indirect Gas	Natural	600.0	480.0	12.0	49.0	4:1	32.4	81.8

Air Performance

Type	Total Volume (CFM)	External SP (in. wg)	Total SP (in. wg)	FRPM	Fan		
					Qty	Type	Drive-Type
Supply	9,000	2	4.036	1622	2	Plenum	Direct
Exhaust	4,400	0.5	1.05	1190	2	Plenum	Direct

Motor Specifications

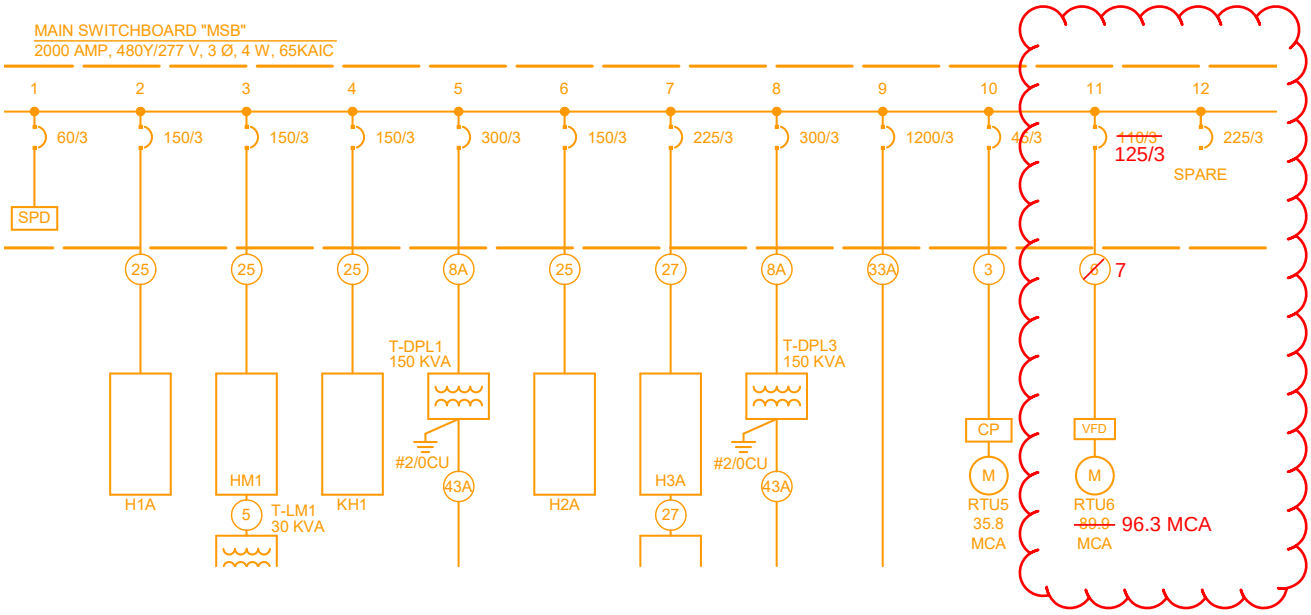
Motor	Qty	Operating Power (hp)	Size (hp)	Enclosure	Efficiency	RPM
Supply	2	4.1	7-1/2	ODP	PE	1770
Exhaust	2	0.58	1	ODP	PE	1760

Electrical Specifications

Power Supply	Rating (V/C/P)	MCA (A)	MOP (A)	Fan Power (W/CFM)*
Unit	460/60/3	96.3	125.0	0.775

*Fan Power (W/CFM) = (Supply BHP + Exhaust BHP) / Supply CFM

SHEET E601; PARTIAL ONE LINE



Construction Features And Accessories

Unit	
Unit Installation - Outdoor	Std
Unit Construction - Double Wall	Std
Insulation - 2 inch 2.4# R13 foam	Std
Corrosion Resistant Fasteners	Std
Hinged Access	Std
Factory Wired Non-Fused Disconnect Switch	X
Direct Drive Plenum Blower & Motor Assemblies	Std
Factory Wired VFDs	Std
Unit Finish - Permatector, Concrete Gray (RAL 7023)	X
Stainless Steel Condensate Drain Pan and Connection	Std
Condensate Drain Trap	Std
Short Circuit Current - 5 kA	Std
Energy Recovery Device - Polymer Wheel w/ Silica Gel Desiccant	Std
Controls	
Unit Controls - Full Control	Std
Internally Mounted Control Center with 24 VAC control transformer(s) and control circuiting fusing	Std
BMS Protocol - BACNetMSTP	X
BMS Monitoring Points	
Supply Fan Control - Duct Static Pressure By Factory	X
Exhaust Fan Control - Constant Volume-Adj. Setpoint	X
Energy Wheel Economizer Control - Modulating Wheel w/VFD Wheel	X
Economizer Control - Temp./Enthalpy	X
Exhaust Fan Only Power	
Energy Wheel Rotation Sensor	X
Web-Based User Interface	Std
Outd/Rec. Air Damper Ctrl - Constant Position-Adj. Setpoint	X
Control Accessories	
Remote Display	
Dirty Filter Sensor(s) - Outdoor	X
Airflow Monitor - Outdoor Air	X
Room Thermostat - Temperature	X
Phase/Brownout Protection	Std
Economizer Fault Detection Diagnostics	

Accessories	
Frost Control - Modulating Wheel	X
Outdoor Air Damper - Low Leakage	X
Return Air Damper	
Roof Curb	
Supply Air Filters - 2" Merv 13, 8-20x20x2, 4-16x20x2	X
Service Outlet	
Piping Vestibule	
Vapor Tight Lights	
Condensate Overflow Switch	X
Spare Filters	
Exhaust Discharge Gravity Backdraft Damper	Std
ElectroFin Coil Coating	
Motor Shaft Grounding	X
Energy Wheel Bypass Damper - By Factory	X
Return Air Filters - 2" Merv 8, 8-20x24x2	Std
Outdoor Air Filters - 2" Merv 8, 8-20x24x2	Std
Furnace Control - 4:1 Modulating	X
Spare Energy Wheel Belt	
Spare Energy Wheel Segments	
UV Lights	
Bipolar Ionization	
Smoke Detector(s)	
Barometric Relief Damper	
Power Venting	Std
Hail Guards	
Warranty Options	
Unit Warranty - 1 Yr (Standard)	Std
Energy Wheel Warranty - 5 Yrs Less Motor	Std
Furnace HX Warranty - 25 Yrs	Std
Compressor Warranty - 5 Yrs (4 Yrs Extended)	X
Furnace HX Warranty - 25 Yrs	Std

Standard Option	Std
Not Included	
Included	X

Notes
Outdoor Air Damper supplied is low leakage, motorized VCD-23 (leakage rate of 3 CFM / ft^2 @ 1 in. wg), Class 1A

Supply Fan Charts And Performance

Supply Fan Performance

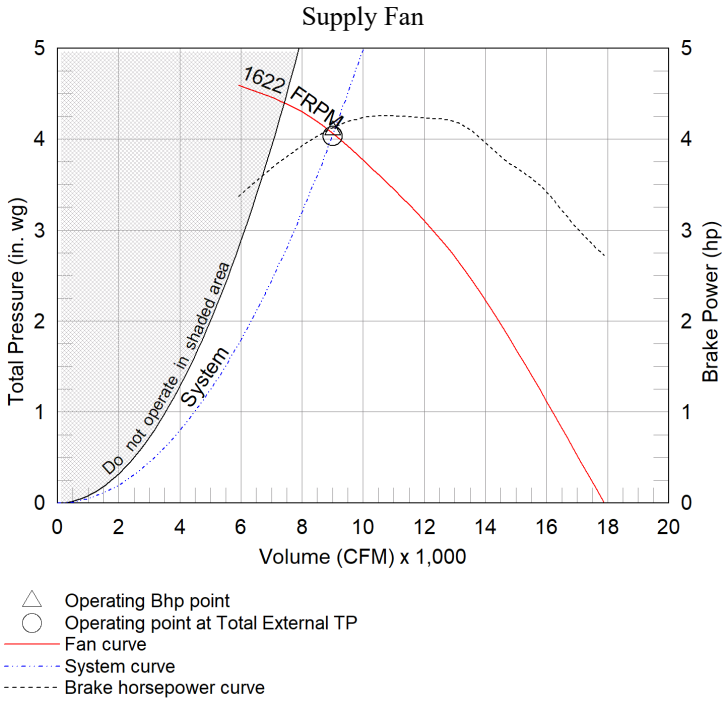
Total Volume (CFM)	External SP (in. wg)	Total SP (in. wg)	RPM	Operating Power (hp)	Motor		Fan		
					Qty	Size (hp)	Qty	Type	Drive-Type
9,000	2	4.036	1622	4.1	2	7-1/2	2	Plenum	Direct

Pressure Drop (in. wg)

Weatherhood	Filter	Damper	Cooling	Heating	External	Total
0.13	0.177	0.07	0.211	0.307	2	4.036

Sound Performance in Accordance with AMCA

Sound Power by Octave Band								Lwa	dBA	Sones
62.5	125	250	500	1000	2000	4000	8000			
91	90	94	86	83	78	81	76	90	79	32

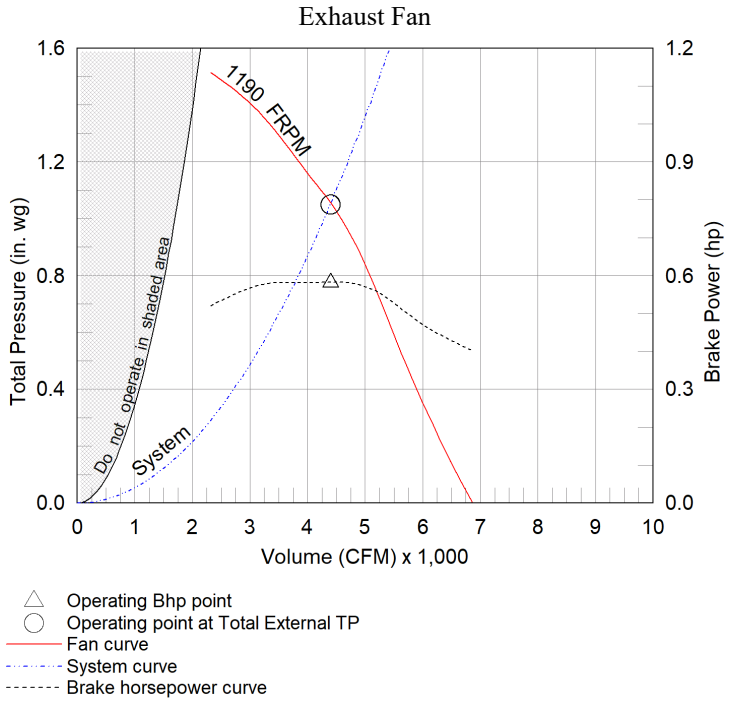


Exhaust Fan Charts And Performance

Exhaust Fan Performance									
Total Volume (CFM)	External SP (in. wg)	Total SP (in. wg)	RPM	Operating Power (hp)	Motor		Fan		
					Qty	Size (hp)	Qty	Type	Drive-Type
4,400	0.5	1.05	1190	0.58	2	1	2	Plenum	Direct

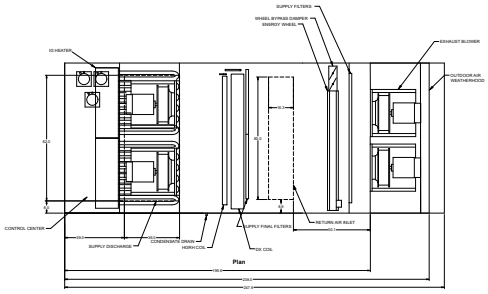
Pressure Drop (in. wg)						
Weatherhood	Filter	Damper	Cooling	Heating	External	Total
-	-	-	-	-	0.5	1.05

Sound Performance in Accordance with AMCA										
Sound Power by Octave Band								Lwa	dBA	Sones
62.5	125	250	500	1000	2000	4000	8000			
72	78	67	63	61	60	65	56	70	59	10



Radiated Sound

Position A



Position D

Position B

Position C

"E" is the Top Plane

Supply Air Flow Nominal, Largest Tonnage Condensing Section Available, PDX units only

Radiated Sound Levels										
Plane	Octave Bands (Lw)								Plane Lw	Plane LwA
	1	2	3	4	5	6	7	8		
A	89	88	90	87	87	79	74	71	95	90
B	92	88	93	91	93	87	80	77	99	96
C	90	89	92	87	86	80	75	71	96	91
D	83	80	80	77	72	65	59	53	86	76
E	95	95	87	84	85	79	72	68	99	89
Total	98	97	97	94	95	89	83	79	104	98

AMCA 320-07 - Laboratory Methods of Sound Testing of Fans Using Sound Intensity
Tests conducted in accordance with this standard.
Free field measurement plane created 1 foot from unit on all sides and top.
Sound Intensity measured in Watts/m^2.
Sound data converted to Sound Power (Lw) for the chart above.
A-Weighted Sound Power was determined using AMCA Standard 301-90 Clause 9.1.
Plane E sound data was measured above the top plane of the unit.

Cooling Performance

Cooling Specifications									
Nominal Tonnage	Entering Air (F)		Leaving Air (F)		Capacity (MBH)		Reheat		Condensing Ambient Temp (F)
	DB	WB	DB	WB	Total	Sensible	Capacity (MBH)	LAT (F)	
30.0	85.2	69.3	55.8	55.7	400.3	286.1	227.4	79.3	95.0

Coil Information								
PDX Coil Model	Fins Per Inch	Rows Deep	Face Vel. (ft/min)	Coil PD (in. wg)	Refrigerant	Refrig. Velocity (ft/min)	Face Area (ft2)	Suction Temp (F)
DX38S04S12-56x86.5-RH	12	4	268	0.211	R-410A	1,552	27	45.3

Compressor Details									
Lead Compressor Type	Compressor Qty	Compressor RLA (A)				Compressor LRA (A)			
		Comp. 1	Comp. 2	Comp. 3	Comp. 4	Comp. 1	Comp. 2	Comp. 3	Comp. 4
Inverter Scroll	2	32	25	-	-	N/A	182	-	-

Unit Details
Refrigerant charges provided by the factory are approximate and may require adjustment in the field
Hermetic scroll type compressors
Compressors mounted on neoprene vibration isolation
Crankcase heater on staged compressor
Electronic expansion valve on lead circuit, thermostatic expansion valve on staged circuit
Stainless steel double sloped drain pan
Moisture-indicating sight glass
Service/charging valves
Refrigerant low pressure switch (auto reset)
Refrigerant high pressure switch (manual reset)
Liquid-Line filter drier
Multiple low sound condensing fans with Lead ECM condensing fan for modulating head pressure control
Inverter scroll compressor

Heating Performance

Heating Specifications								
Type	Gas Type	Input (MBH)	Output (MBH)	Temperature Rise		Turndown	Performance	
				Min (F)	Max (F)		EAT (F)	LAT (F)
Indirect Gas	Natural	600.0	480.0	12.0	49.0	4:1	32.4	81.8

Unit Details
ANSI standard Z83.8 and CSA 2.6
High Thermal efficiency
Direct spark ignition
3/4" Gas Connection
At least 6 in. wg of natural gas pressure (14 in. wg for LP) is required at the units gas connection in order to achieve maximum performance
Power Venting
24 Volt Control Power
Stainless Steel heat exchange tubes
Unit controller maximum allowable supply discharge air set point is 100F (37.8C)
Discharge temperature assumes proper energy wheel operation and maintenance.

Energy Recovery Summer Performance

Outdoor Air		Supply Air	
Dry Bulb (F)	95.0	Dry Bulb (F)	85.2
Wet Bulb (F)	75.0	Wet Bulb (F)	69.4
Specific Humidity (gr/lb)	103	Specific Humidity (gr/lb)	86
Enthalpy (BTU/lb)	39.0	Enthalpy (BTU/lb)	33.9
Exhaust Air		**Return Air**	
Dry Bulb (F)	94.0	Dry Bulb (F)	75.0
Wet Bulb (F)	74.4	Rel. Humidity (%)	Rel. Humidity (%) 50
Specific Humidity (gr/lb)	99	Specific Humidity (gr/lb)	67
Enthalpy (BTU/lb)	38.2	Enthalpy (BTU/lb)	28.4

ENERGY WHEEL

Mixed Air Conditions			
Dry-bulb (F)	**Wet-bulb (F)**	**Specific Humidity (gr/lb)**	**Enthalpy (BTU/lb)**
85.2	69.3	86	33.9

Design Air Flow Conditions			
OA Volume (CFM)	**ASHRAE 90.1 OA Enthalpy Recovery Ratio**	**EA Volume (CFM)**	**EA Wheel Effectiveness**
9,000	48.5	4,400	89.8

Outdoor Air Cooling Reduction				
OA Load w/o Energy Recovery		**OA Load with Energy Recovery**		**Equipment Reduction (tons)**
(BTU/h)	**(tons)**	**(BTU/h)**	**(tons)**	
639,900.0	53.33	433,350.0	36.11	17.21

Summer Conditions

1 = Outdoor Air Design

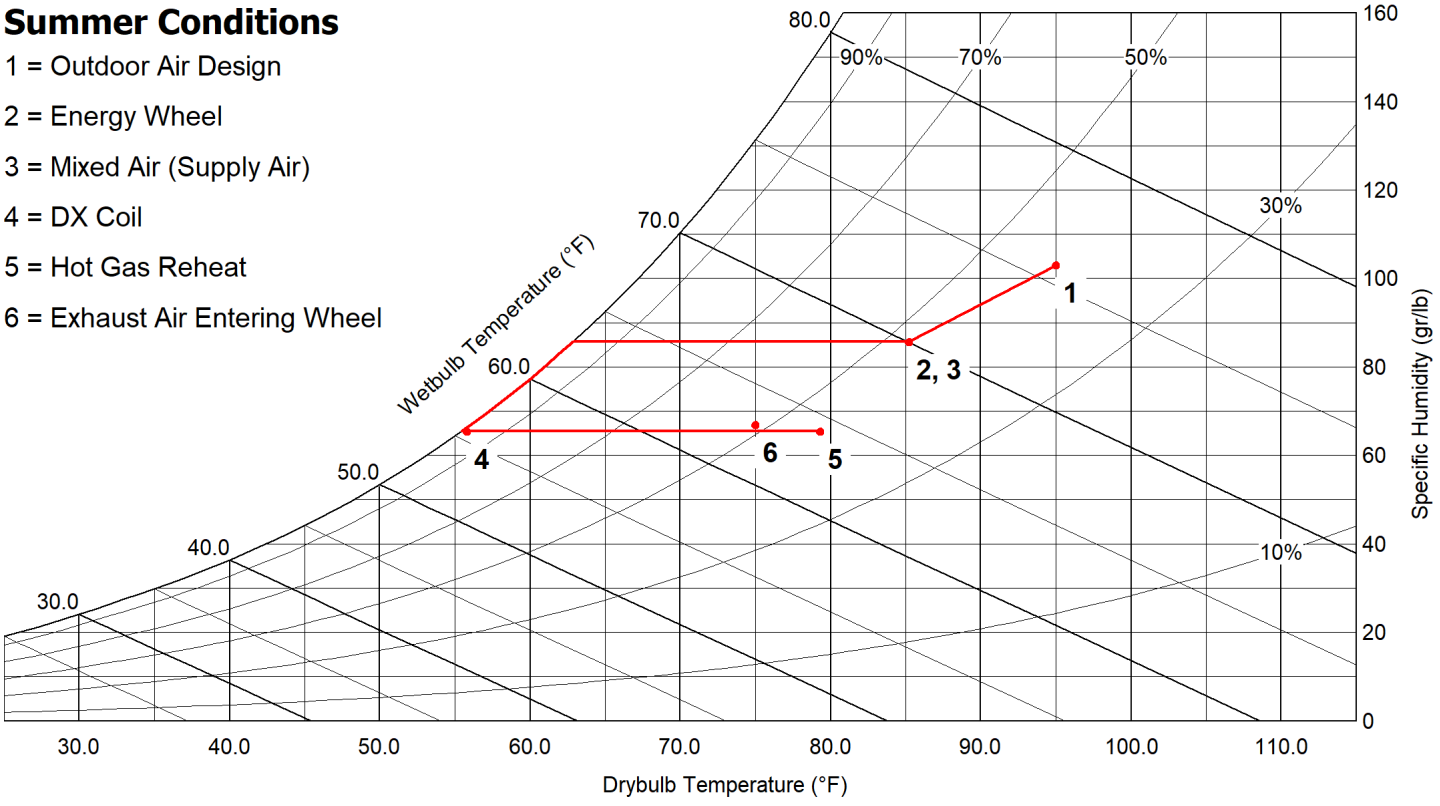
2 = Energy Wheel

3 = Mixed Air (Supply Air)

4 = DX Coil

5 = Hot Gas Reheat

6 = Exhaust Air Entering Wheel



Energy Recovery Winter Performance w/out Preheater

Outdoor Air		Supply Air	
Dry Bulb (F)	0.0	Dry Bulb (F)	32.4
Wet Bulb (F)	-1.6	Wet Bulb (F)	29.3
Specific Humidity (gr/lb)	3	Specific Humidity (gr/lb)	20
Enthalpy (BTU/lb)	0.4	Enthalpy (BTU/lb)	10.8
Exhaust Air		**Return Air**	
Dry Bulb (F)	2.8	Dry Bulb (F)	72.0
Wet Bulb (F)	2.6	Rel. Humidity (%)	Rel. Humidity (%) 35
Specific Humidity (gr/lb)	6	Specific Humidity (gr/lb)	42
Enthalpy (BTU/lb)	1.6	Enthalpy (BTU/lb)	23.8

ENERGY WHEEL

Mixed Air Conditions			
Dry-bulb (F)	**Wet-bulb (F)**	**Specific Humidity (gr/lb)**	**Enthalpy (BTU/lb)**
32.4	29.4	20	10.8

Design Air Flow Conditions			
OA Volume (CFM)	**ASHRAE 90.1 OA Enthalpy Recovery Ratio**	**EA Volume (CFM)**	**EA Wheel Effectiveness**
9,000	44.2	4,400	90.8

Outdoor Air Heating Reduction			
OA Load w/o Energy Recovery (BTU/h)	**OA Load with Energy Recovery (BTU/h)**	**Equipment Reduction (BTU/h)**	**Sensible Effectiveness (%)**
699,840.0	384,912.0	314,928.0	96.2

Winter Conditions

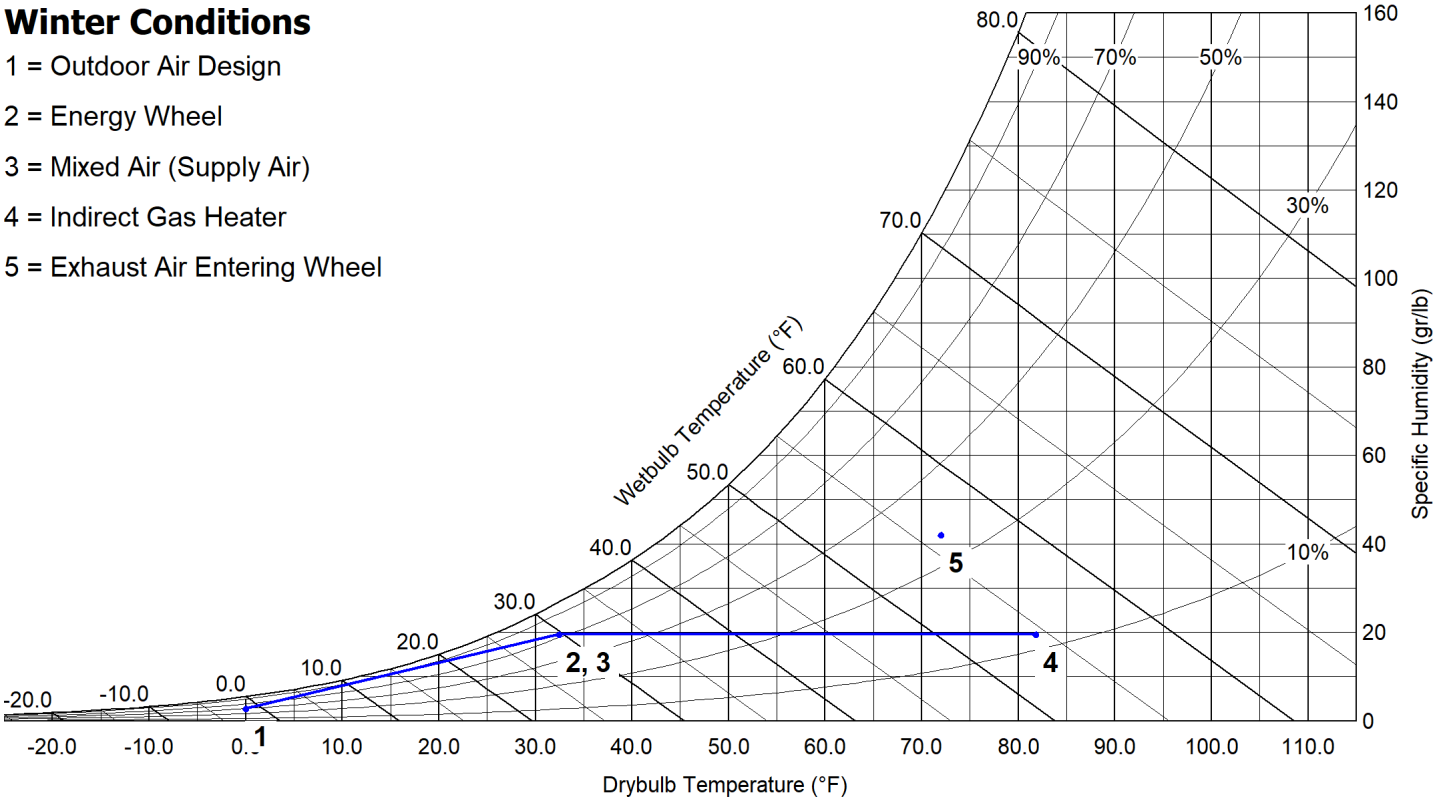
1 = Outdoor Air Design

2 = Energy Wheel

3 = Mixed Air (Supply Air)

4 = Indirect Gas Heater

5 = Exhaust Air Entering Wheel



AHRI Performance Ratings

Energy Recovery Performance Rating in accordance with AHRI Standard 1060 (I-P)							
Rated Airflow (SCFM)		Net Supply Airflow (SCFM)	EATR (%)	OACF	Pressure Drop (in. wg)		Purge Angle (degrees)
Leaving Supply	Entering Exhaust				Supply	Exhaust	
9287	4687	9000	3.1	1.01	0.94	0.47	0

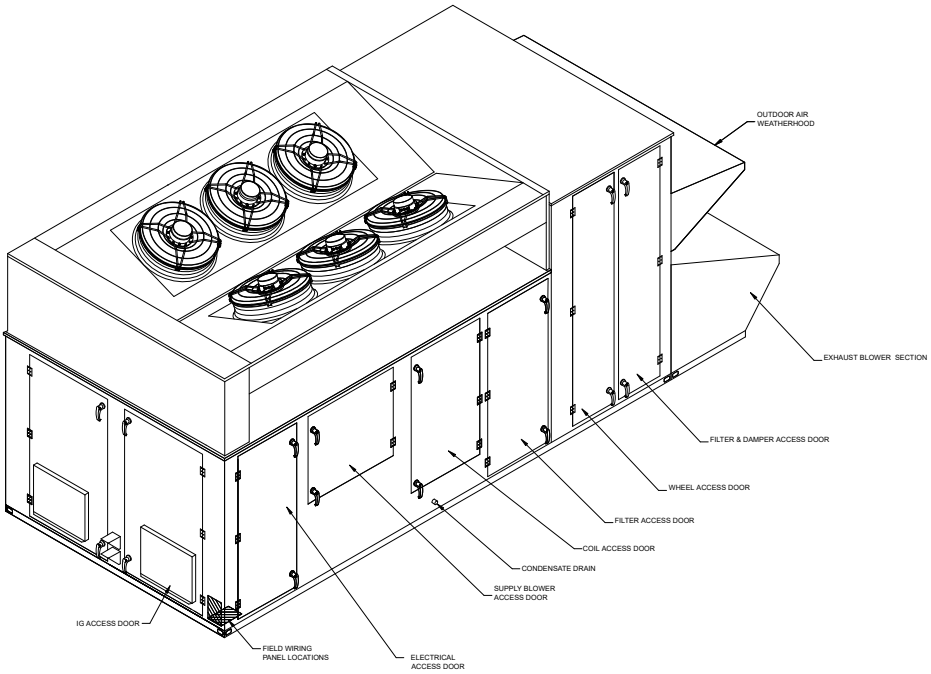
Thermal Effectiveness Ratings							
Enthalpy Recovery		Sensible Effectiveness		Latent Effectiveness		Total Effectiveness	
Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter
48.5	44.2	95.3	96.2	90.7	91.5	89.8	90.8

Note(s)

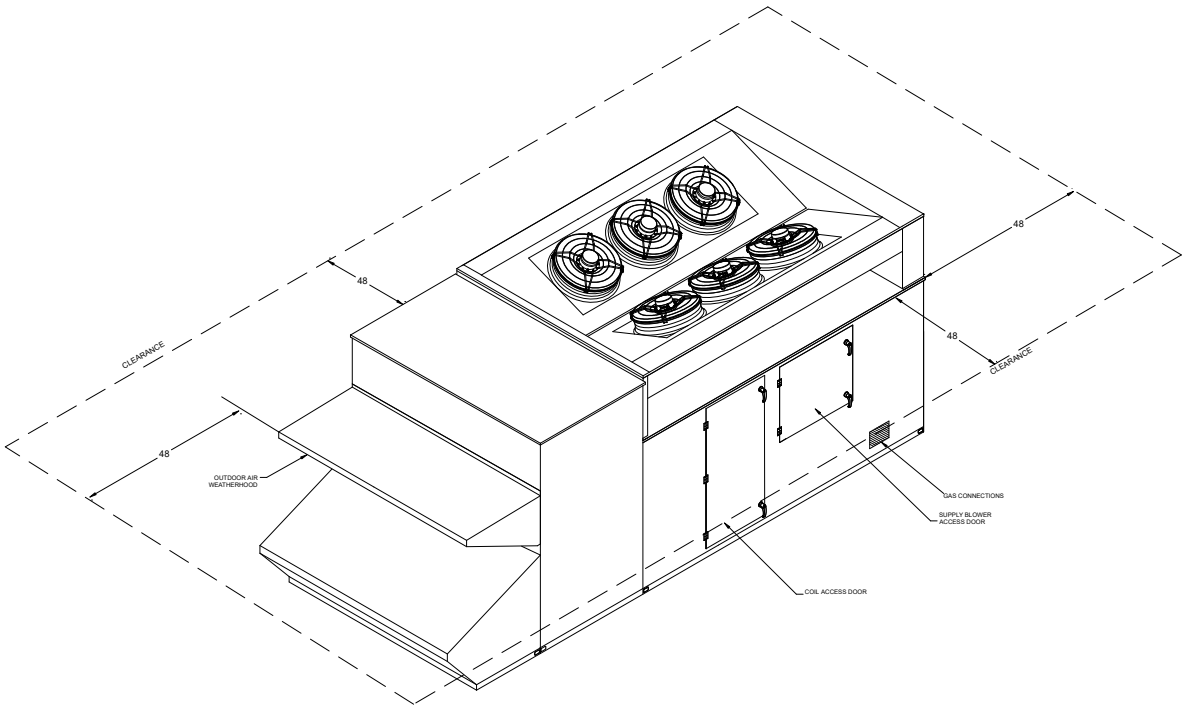
Summer Design Conditions:
Certified in accordance with the AHRI ERV Certification Program, which is based on AHRI Standard 1060. Certified units may be found in the AHRI Directory at www.ahridirectory.org.

Winter Design Conditions:
Application Rating is outside the scope of AHRI ERV Certification Program, but is rated in accordance with AHRI Standard 1060.

Isometric Drawings

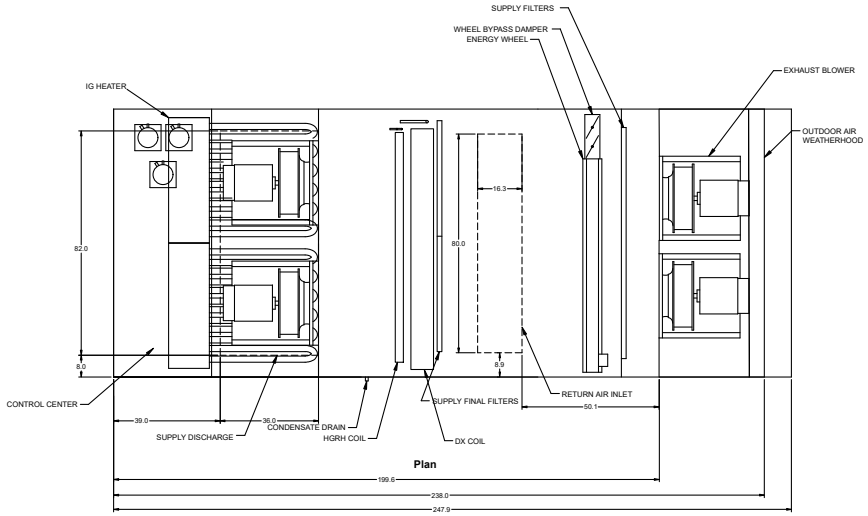


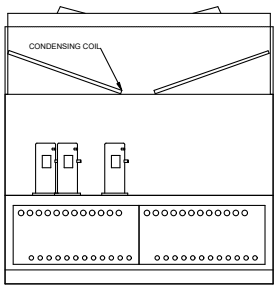
Back Right Isometric



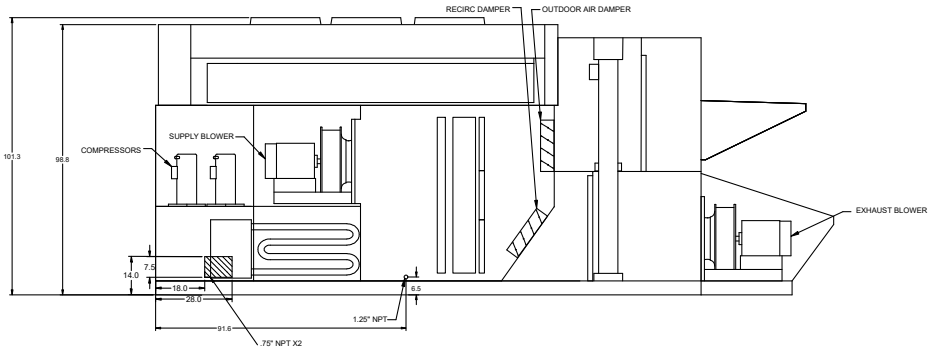
Front Left Isometric

Overview Drawings

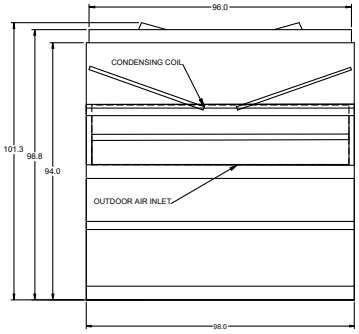




Left End



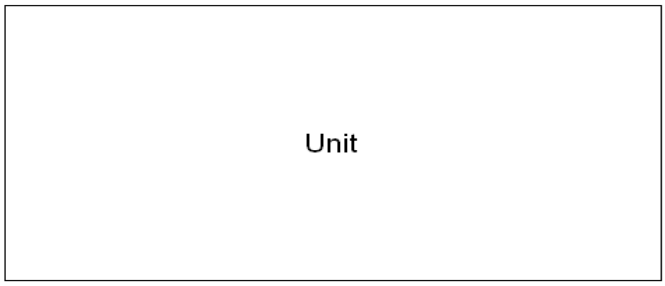
Elevation



Right End

Unit Corner Weights

1,580 lb 1,888 lb

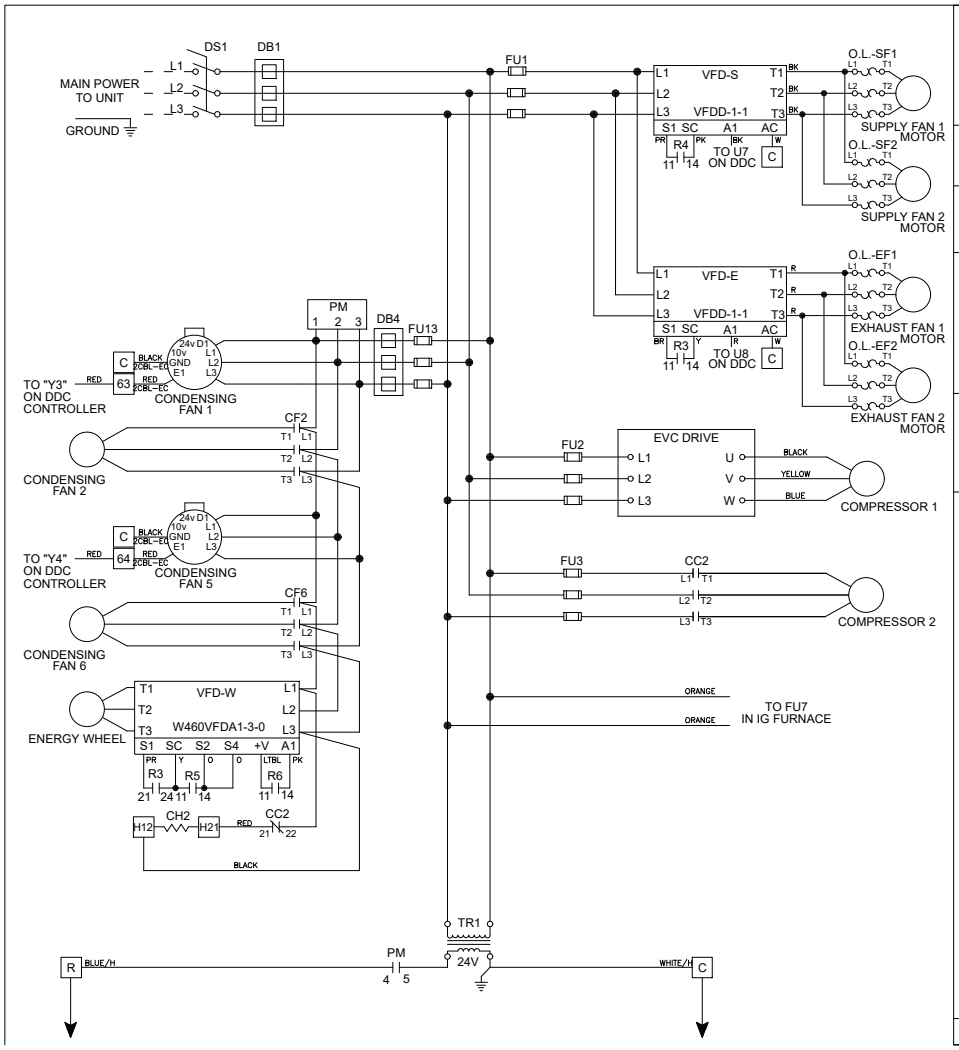


1,625 lb 1,942 lb

Note

Estimated corner weights are shown looking down on unit and the outside air intake will be on the right. Weights are applied at the base of the unit. Images not drawn to scale.

Wiring Diagram



AIR MANAGEMENT SYSTEMS

Wiring Diagram Code:

V24G2B1AK12H24X01HF23G0300BH25

CAUTION

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

NOTES

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

FIELD CONTROL WIRING RESISTANCE SHOULD NOT EXCEED 0.75 OHM.

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

WIRE COLOR CODE

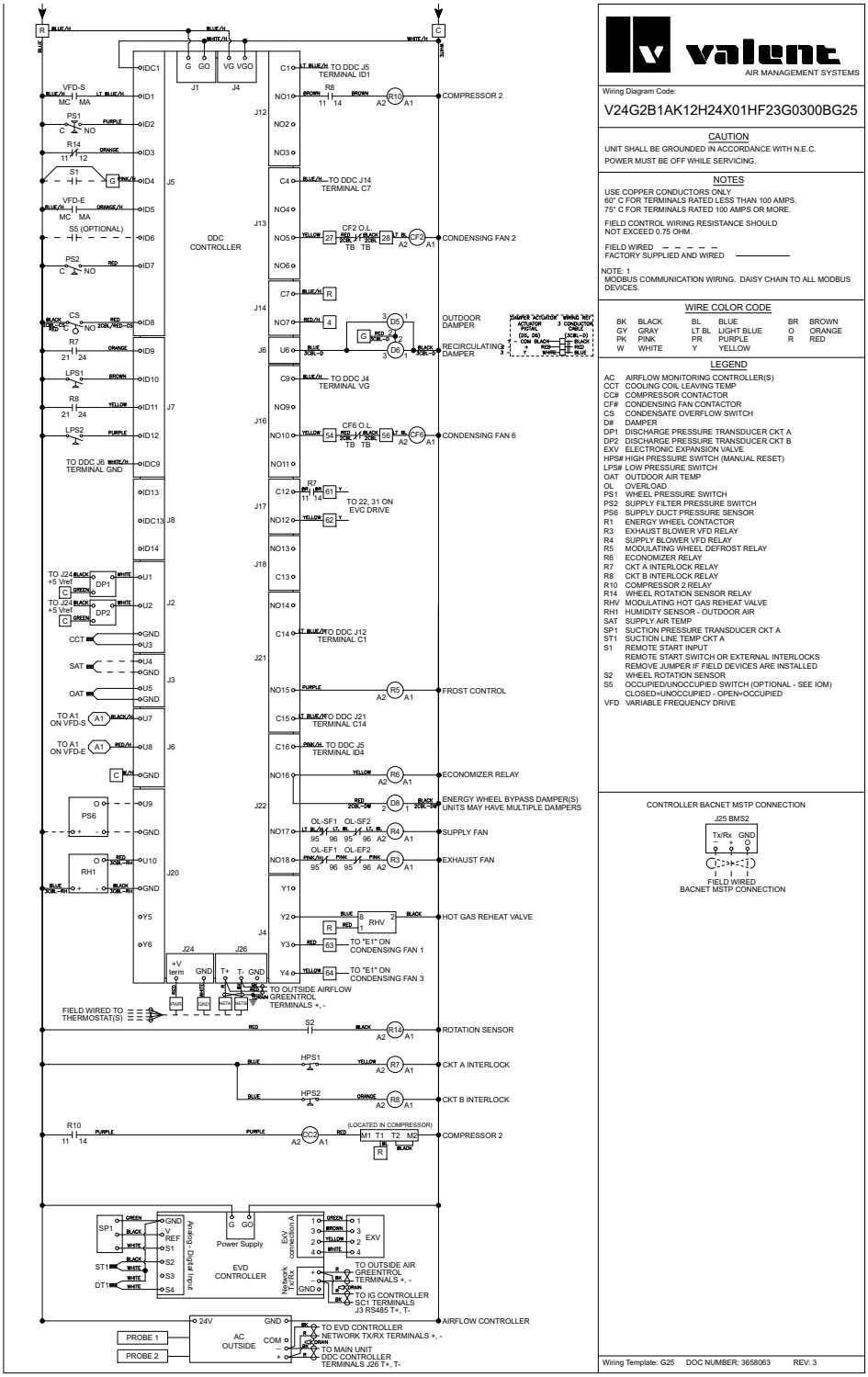
BK	BLACK	BL	BLUE	BR	BROWN
GY	GRAY	LT BL	LIGHT BLUE	O	ORANGE
PK	PINK	PR	PURPLE	R	RED
W	WHITE	Y	YELLOW		

LEGEND

CC#	COMPRESSOR CONTACTOR
CF#	CONDENSING FAN CONTACTOR
CH#	COMPRESSOR SUMP HEATER
DB#	POWER DISTRIBUTION BLOCK
DS	DISCONNECT SWITCH
FU#	FUSES
OL	OVERLOAD
PM	PHASE VOLTAGE MONITOR
R1	ENERGY WHEEL CONTACTOR
R3	EXHAUST BLOWER VFD RELAY
R4	SUPPLY BLOWER VFD RELAY
R5	MODULATING WHEEL DEFROST RELAY
TR#	TRANSFORMER
VFD	VARIABLE FREQUENCY DRIVE

Wiring Template: H25 DOC NUMBER: 3658063 REV: 3

Wiring Diagram 2



valent
AIR MANAGEMENT SYSTEMS

Wiring Diagram Code:

V24G2B1AK12H24X01HF23G0300BG25

CAUTION

UNIT SHALL BE GROUNDED IN ACCORDANCE WITH N.E.C.

POWER MUST BE OFF WHILE SERVICING.

NOTES

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

FIELD CONTROL WIRING RESISTANCE SHOULD NOT EXCEED 0.75 OHM.

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

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

WIRE COLOR CODE

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

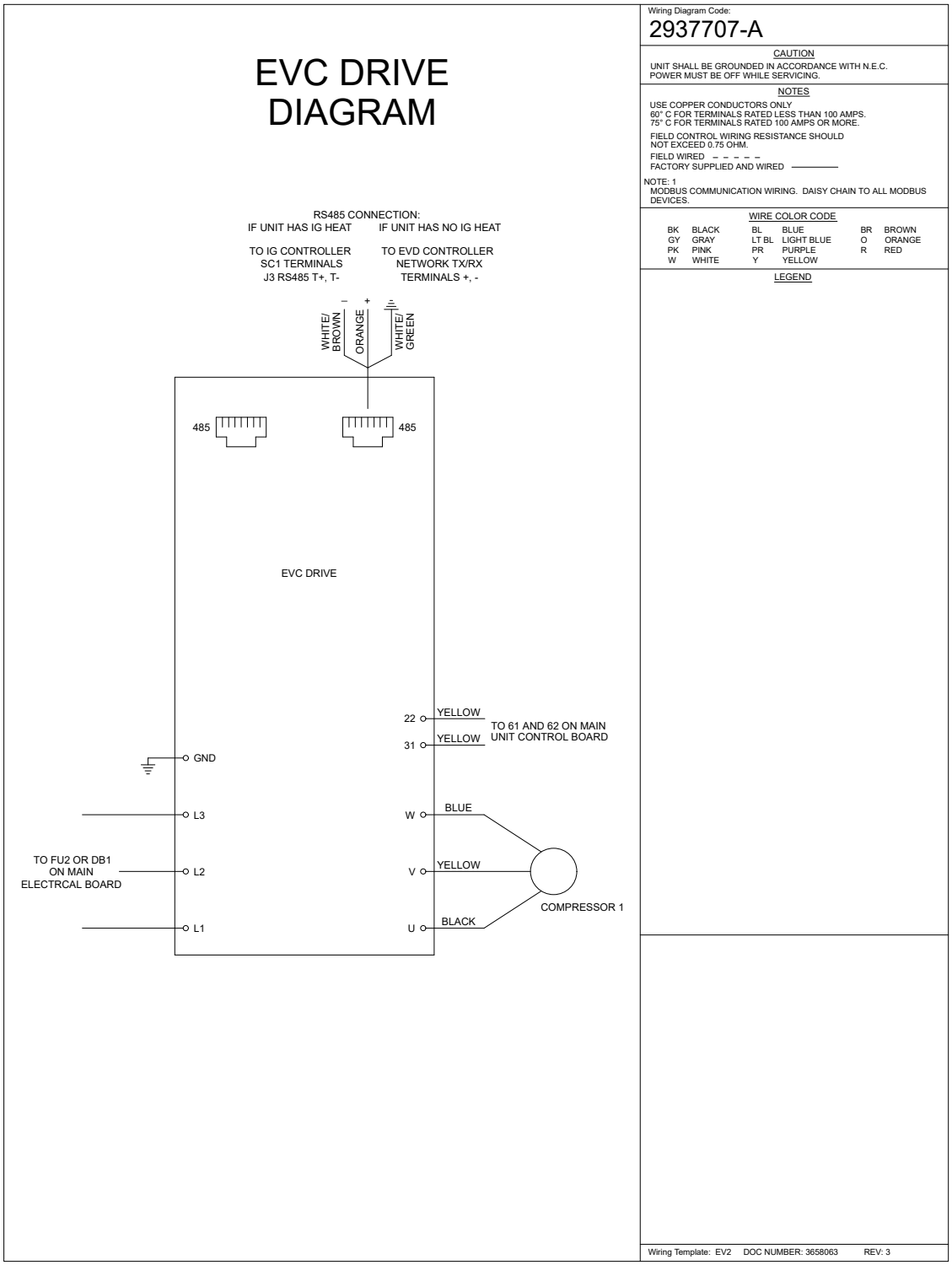
LEGEND

AC	AIRFLOW MONITORING CONTROLLER(S)
CCT	COOLING COIL LEAVING TEMP
CC#	COMPRESSOR CONTACTOR
CF#	CONDENSING FAN CONTACTOR
CS	CONDENSATE OVERFLOW SWITCH
D#	DAMPER
DP1	DISCHARGE PRESSURE TRANSDUCER CKT A
DP2	DISCHARGE PRESSURE TRANSDUCER CKT B
EXV	ELECTRONIC EXPANSION VALVE
HPS#	HIGH PRESSURE SWITCH (MANUAL RESET)
LPS#	LOW PRESSURE SWITCH
OAT	OUTDOOR AIR TEMP
OL	OVERLOAD
PS1	WHEEL PRESSURE SWITCH
PS2	SUPPLY FILTER PRESSURE SWITCH
PS6	SUPPLY DUCT PRESSURE SENSOR
R1	ENERGY WHEEL CONTACTOR
R3	EXHAUST BLOWER VFD RELAY
R4	SUPPLY BLOWER VFD RELAY
R5	MODULATING WHEEL DEFROST RELAY
R6	ECONOMIZER RELAY
R7	CKT A INTERLOCK RELAY
R8	CKT B INTERLOCK RELAY
R10	COMPRESSOR 2 RELAY
R14	WHEEL ROTATION SENSOR RELAY
RHV	MODULATING HOT GAS REHEAT VALVE
RH1	HUMIDITY SENSOR - OUTDOOR AIR
SAT	SUPPLY AIR TEMP
SP1	SUCTION PRESSURE TRANSDUCER CKT A
ST1	SUCTION LINE TEMP CKT A
S1	REMOTE START INPUT REMOTE START SWITCH OR EXTERNAL INTERLOCKS REMOVE JUMPER IF FIELD DEVICES ARE INSTALLED
S2	WHEEL ROTATION SENSOR
S5	OCCUPIED/UNOCCUPIED SWITCH (OPTIONAL - SEE IOM) CLOSED=UNOCCUPIED - OPEN=OCCUPIED
VFD	VARIABLE FREQUENCY DRIVE

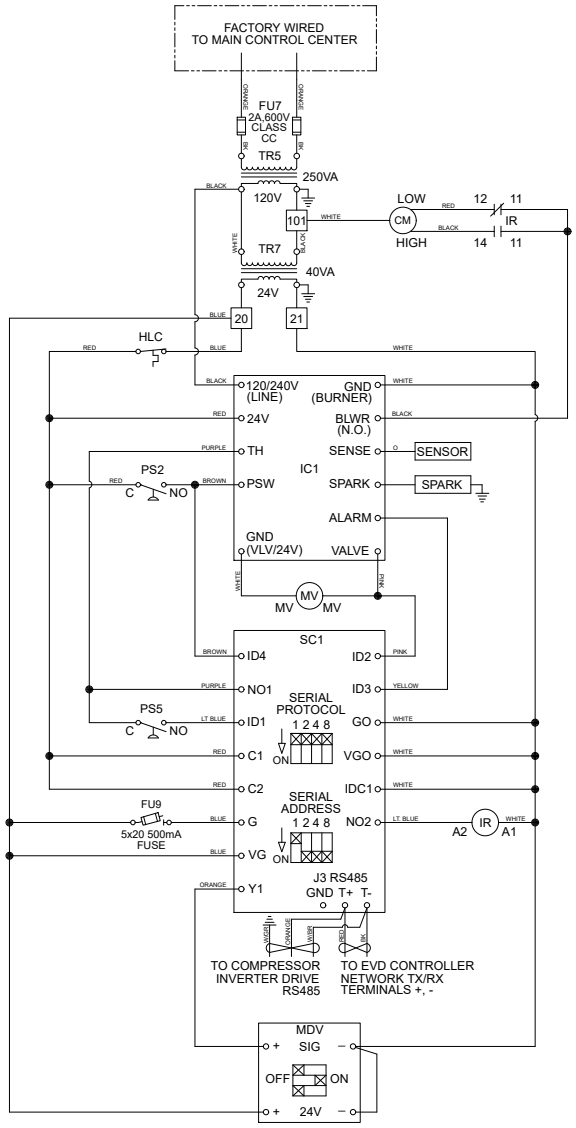
CONTROLLER BACNET MSTP CONNECTION

Wiring Template: G25 DOC NUMBER: 3658063 REV: 3

Wiring Diagram 3



INDIRECT GAS WIRING DIAGRAM
FURNACE 1 - 4:1 MODULATING



valent
AIR MANAGEMENT SYSTEMS

Wiring Diagram Code:

V6K52P1RX0253GS18

CAUTION

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

NOTES

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

FIELD CONTROL WIRING RESISTANCE SHOULD
NOT EXCEED 0.75 OHM.

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

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

WIRE COLOR CODE

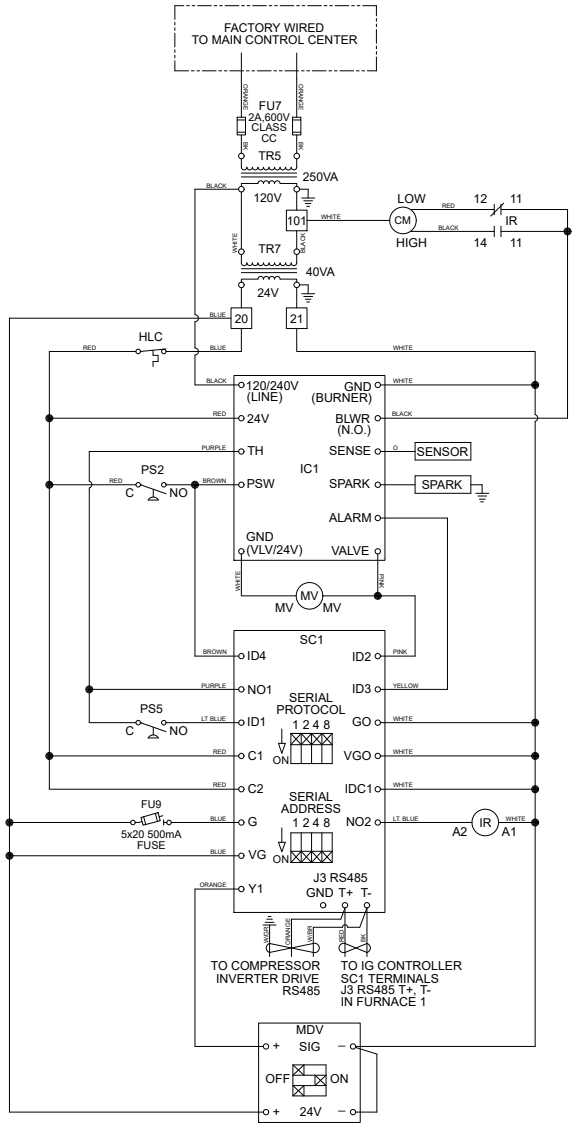
BK	BLACK	BL	BLUE	BR	BROWN
GY	GRAY	LT BL	LIGHT BLUE	O	ORANGE
PK	PINK	PR	PURPLE	R	RED
W	WHITE	Y	YELLOW		

LEGEND

CM	COMBUSTION BLOWER MOTOR
FU#	FUSE(S)
HLC	HIGH TEMPERATURE LIMIT CONTROL
IC1	IGNITION CONTROL
IR	INDUCTION RELAY
MDV	MODULATING VALVE
MV	MAIN GAS VALVE
PS2	COMBUSTION AIR PROVING SWITCH
PS5	HIGH SPEED PRESSURE SWITCH
SC1	STAGE CONTROLLER
TR#	TRANSFORMER(S)

Wiring Template: S18 DOC NUMBER: 3658063 REV: 3

INDIRECT GAS WIRING DIAGRAM
FURNACE 2 - 4:1 MODULATING



valent
AIR MANAGEMENT SYSTEMS

Wiring Diagram Code:

V6K54P1RX0255GS18

CAUTION

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

NOTES

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

FIELD CONTROL WIRING RESISTANCE SHOULD
NOT EXCEED 0.75 OHM.

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

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

WIRE COLOR CODE

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

LEGEND

CM	COMBUSTION BLOWER MOTOR
FU#	FUSE(S)
HLC	HIGH TEMPERATURE LIMIT CONTROL
IC1	IGNITION CONTROL
IR	INDUCTION RELAY
MDV	MODULATING VALVE
MV	MAIN GAS VALVE
PS2	COMBUSTION AIR PROVING SWITCH
PS5	HIGH SPEED PRESSURE SWITCH
SC1	STAGE CONTROLLER
TR#	TRANSFORMER(S)

Wiring Template: S18 DOC NUMBER: 3658063 REV: 3

Valent Network Interface v5.002 Modbus/BACnet Points List

Variable	Description	Units	BACNET		Read (R) Write (W)	MODBUS		Included
			Object Instance	Object Type		Index	Register Type	
Circuit_A_Discharge_Temp_Analog_Input	Circuit A Discharge Temp		1	AI	R	30196	Input	X
Circuit_A_Suction_Temp_Analog_Input	Circuit A Suction Temp		3	AI	R	30200	Input	X
Circuit_B_Discharge_Temp_Analog_Input	Circuit B Discharge Temp		4	AI	R	30202	Input	X
Cold_Coil_1_Temp_Analog_Input	Cold Coil 1 Temperature		25	AI	R/W	30243	Input	X
CL_Coil_Spt_Temp	Cold Coil Setpoint Temp		31	AI	R	30256	Input	X
CL_Supply_Spt_Temp	Cooling Supply Setpoint Temp		32	AI	R	30258	Input	X
Outside_Air_Temp_Analog_Input	Outside Air Temperature		37	AI	R	30267	Input	X
Space_Temp_Analog_Input	Space Temperature		44	AI	R	30281	Input	X
Supply_Temp_Analog_Input	Supply Temperature		45	AI	R	30283	Input	X
Outside_RH_Analog_Input	Outside % Relative Humidity		86	AI	R	30349	Input	X
Return_RH_Analog_Input	Return Air Relative Humidity		88	AI	R	30354	Input	
Space_RH_Analog_Input	Space % Relative Humidity		89	AI	R	30355	Input	
Return_Duct_Static_Pressure_Analog_Input	Return Duct Pressure		93	AI	R	30364	Input	
Space_Static_Pressure_Analog_Input	Space Static Pressure		94	AI	R	30365	Input	
Supply_Duct_Static_Pressure_Analog_Input	Supply Duct Static Pressure		95	AI	R	30367	Input	X
Space_CO2_1_Analog_Input	Space 1 CO2 ppm		116	AI	R	30401	Input	
Circuit_A_Discharge_Pressure_Analog_Input	Circuit A Discharge Pressure Analog Input		119	AI	R	30407	Input	X
Circuit_A_Suction_Pressure_Analog_Input	Circuit A Suction Pressure Analog Input		120	AI	R	30410	Input	X
Circuit_B_Discharge_Pressure_Analog_Input	Circuit B Discharge Pressure Analog Input		121	AI	R	30411	Input	X
Aux_In_Customer_1	Aux Input Customer 1		640	AI	R	30640	Input	
Aux_In_Customer_2	Aux Input Customer 2		642	AI	R	30642	Input	
Aux_In_Customer_3	Aux Input Customer 3		644	AI	R	30644	Input	
Aux_In_Customer_4	Aux Input Customer 4		646	AI	R	30646	Input	
Aux_In_Customer_5	Aux Input Customer 5		648	AI	R	30648	Input	
Aux_In_Customer_6	Aux Input Customer 6		650	AI	R	30650	Input	
Temperature_Setpoint	Main Temperature Setpoint Supply, Space, or Return Target Temperature		1	AV	R/W	40001	Holding	X
Temperature_Heat_Cool_Deadband	Heat/Cool Spt Deadband when Space or Return control is active Clg Spt = Offset/2 + Temp Spt Htg Spt = Offset/2 - Temp Spt		2	AV	R/W	40003	Holding	X
Cooling_Coil_Setpoint	Cooling Coil Leaving Air Setpoint		3	AV	R/W	40005	Holding	X
Dehumidification_Setpoint	Dehumidification Setpoint % RH for Space or Return control		5	AV	R/W	40009	Holding	X
Outside_Dewpoint_Setpoint	Outside Dewpoint Dehumidification Trigger Setpoint		6	AV	R/W	40011	Holding	X
Inside_Dewpoint_Setpoint	Inside Dewpoint Dehumidification Trigger Setpoint		7	AV	R/W	40013	Holding	
Unocc_Inside_Dewpoint_Setpoint	Unoccupied Inside Dewpoint Dehumidification Trigger Setpoint		9	AV	R/W	40017	Holding	
Unoccupied_Cooling_Setpoint	Unoccupied Cooling Setpoint		10	AV	R/W	40019	Holding	X
Unoccupied_Dehumidification_Setpoint	Unoccupied Dehumidification % RH Setpoint		11	AV	R/W	40005	Holding	
Unoccupied_Heating_Setpoint	Unoccupied Heating Setpoint		12	AV	R/W	40023	Holding	X
Economizer_Temp_Enable_Setpoint	Economizer Ambient Temp Enable Setpoint Allow Econ when OAT < Spt		16	AV	R/W	40031	Holding	X
Economizer_Enthalpy_Enable_Setpoint	Economizer Enthalpy Enable Setpoint Allow Econ when OA Enthalpy < Spt		17	AV	R/W	40033	Holding	X
Outside_RH_from_BMS	Outside RH from BMS Used when source selection is set to BMS		21	AV	R/W	40041	Holding	X
Outside_Temp_from_BMS	Outside Temp from BMS Used when source selection is set to BMS		22	AV	R/W	40043	Holding	X
Return_RH_from_BMS	Return RH from BMS Used when source selection is set to BMS		23	AV	R/W	40045	Holding	X
Return_Temp_from_BMS	Return Temp from BMS Used when source selection is set to BMS	-	24	AV	R/W	40047	Holding	X
Space_1_CO2_from_BMS	Space 1 CO2 from BMS Used when source selection is set to BMS		25	AV	R/W	40049	Holding	X
Space_RH_from_BMS	Space RH from BMS Used when source selection is set to BMS		28	AV	R/W	40055	Holding	X
Space_Static_from_BMS	Space Static from BMS Used when source selection is set to BMS		29	AV	R/W	40057	Holding	X
Space_Temp_from_BMS	Space Temp from BMS Used when source selection is set to BMS		30	AV	R/W	40059	Holding	X
Cooling_Lockout_Setpoint	Cooling Ambient Lockout Setpoint		31	AV	R/W	40061	Holding	X
Heating_Lockout_Setpoint	Heating Ambient Lockout Setpoint		32	AV	R/W	40063	Holding	X
Preheat_Lockout_Setpoint	Preheat Lockout Setpoint		33	AV	R/W	40066	Holding	
Return_Duct_Static_Pressure_Setpoint	Return Duct Static Pressure Setpoint		36	AV	R/W	40072	Holding	
Space_Static_Pressure_Setpoint	Space Static Pressure Setpoint		37	AV	R/W	40073	Holding	
Supply_Duct_Static_Pressure_Setpoint	Supply Duct Static Pressure Setpoint		38	AV	R/W	40075	Holding	X
Space_CO2_Setpoint	Space CO2 Setpoint		39	AV	R/W	40077	Holding	
SF_Control_Signal_BMS	BMS to control signal for supply fan speed		133	AV	R/W	40083	Holding	X
EF_Control_Signal_BMS	BMS to control signal for exhaust fan speed		134	AV	R/W	40085	Holding	X
OAD_Control_Signal_BMS	Allows the BMS to control OAD position		136	AV	R/W	40089	Holding	X
Outside_Air_Damper_Minimum_Setpoint	Outside Air Damper Minimum Setpoint		137	AV	R/W	40091	Holding	X

Valent Network Interface v5.002 Modbus/BACnet Points List

Variable	Description	Units		BACNET		Read (R) Write (W)	MODBUS		Included
				Object Instance	Object Type		Index	Register Type	
Aux_BMS_Analog_Output_1	Aux BMS Analog Output 1			138	AV	R/W	40094	Holding	
Aux_BMS_Analog_Output_2	Aux BMS Analog Output 2			139	AV	R/W	40096	Holding	
Aux_BMS_Analog_Output_3	Aux BMS Analog Output 3			140	AV	R/W	40098	Holding	
Aux_BMS_Analog_Output_4	Aux BMS Analog Output 4			141	AV	R/W	40104	Holding	
Unit_Status_Mode	See Table 13: Unit status mode			40	AV	R	30001	Input	X
Supply_Temperature_Calculated_Setpoint	Active Supply Temperature Setpoint			41	AV	R	30003	Input	X
Cooling_1_Ramp_Capacity	Cooling Ramp 1 Compressor Capacity			43	AV	R	30007	Input	X
Economizer_Ramp	Economizer Ramp			48	AV	R	30017	Input	X
Exhaust_Fan_Space_Static_Pressure_Ramp	Exhaust Fan Space Static Pressure Ramp			49	AV	R	30019	Input	
Exhaust_Fan_Supply_Tracking_Ramp	Exhaust Fan Supply Tracking Ramp			50	AV	R	30021	Input	
Head_Pressure_Control_Ramp_1_Ramp	Head Pressure Control Ramp 1			51	AV	R	30023	Input	X
Heating_Ramp	Heating Ramp			60	AV	R	30041	Input	X
Hot_Gas_Reheat_Ramp	Hot Gas Reheat Ramp			61	AV	R	30043	Input	X
Space_CO2_Control_Ramp	Space CO2 Control Ramp			71	AV	R	30063	Input	
Supply_Duct_Static_Pressure_Ramp	Supply Duct Static Pressure Ramp			72	AV	R	30065	Input	X
Supply_Fan_Space_Static_Pressure_Ramp	Supply Fan Space Static Pressure Ramp			74	AV	R	30069	Input	
Winter_Ramp_Output	Winter Ramp Output			75	AV	R	30071	Input	
Outside_Dewpoint	Outside Dewpoint			82	AV	R	30085	Input	X
Outside_Enthalpy	Outside Enthalpy			83	AV	R	30087	Input	X
Return_Dewpoint	Return Air Dewpoint			86	AV	R	30094	Input	
Return_Enthalpy	Return Air Enthalpy			87	AV	R	30096	Input	
Space_Dewpoint	Space Dewpoint			88	AV	R	30097	Input	
Space_Enthalpy	Space Enthalpy			89	AV	R	30099	Input	
Circuit_A_Superheat	Circuit A Air Superheat			93	AV	R	30108	Input	X
Circuit_B_Superheat	Circuit B Air Superheat			95	AV	R	30112	Input	X
Total_Supply_Fan_CFM_BMS	Total Supply Fan CFM			110	AV	R	30140	Input	
Total_Exhaust_Fan_CFM_BMS	Total Exhaust Fan CFM			107	AV	R	30135	Input	
OAD_CFM_BMS	OAD CFM			129	AV	R	30173	Input	X
Active_Temperature_Setpoint	Active Temperature Setpoint			132	AV	R	30179	Input	X
SF_Control_Source_BMS	Allows the BMS to control supply fan speed	BMS	Local	56	BV	R/W	19	Coil	X
EF_Control_Source_BMS	Allows the BMS to control exhaust fan speed	BMS	Local	57	BV	R/W	20	Coil	X
OAD_Control_Source_BMS	Allows the BMS to control OAD position	BMS	Local	59	BV	R/W	22	Coil	X
Chilled_Water_1_Valve_Analog_Output	Chilled Water 1 Valve Analog Output			201	AV	R	30473	Input	
Condenser_1_Analog_Output	Condenser 1 Analog Output			205	AV	R	30481	Input	X
Electric_Heater_1_Analog_Output	Electric Heater 1 Analog Output			221	AV	R	30513	Input	
Energy_Recovery_Analog_Output	Energy Recovery Analog Output			229	AV	R	30517	Input	X
Exhaust_Fan_Speed_Analog_Output	Exhaust Fan Speed Analog Output			231	AV	R	30521	Input	X
Hot_Gas_Reheat_Analog_Output	Hot Gas Reheat Analog Output			235	AV	R	30523	Input	X
Hot_Water_Valve_1_Analog_Output	Hot Water Valve 1 Analog Output			236	AV	R	30525	Input	
Mod_Gas_Furnace_1_Analog_Output	Mod Gas Furnace 1 Analog Output			242	AV	R	30537	Input	
Outside_Air_Damper_Analog_Output	Outside Air Damper Analog Output			250	AV	R	30541	Input	X
Supply_Fan_Speed_Analog_Output	Supply Fan Speed Analog Output			264	AV	R	30557	Input	X
Modulating_Compressor_Analog_Output_BMS	Modulating Compressor Analog Output			285	AV	R	30585	Input	X
Circuit_A_Sat_Discharge_Temperature	Circuit A Saturated Discharge Temperature			286	AV	R	30587	Input	X
Circuit_B_Sat_Discharge_Temperature	Circuit B Saturated Discharge Temperature			287	AV	R	30589	Input	X
Circuit_A_Sat_Suction_Temperature	Circuit A Saturated Suction Temperature			294	AV	R	30604	Input	X
Coil_Temperature_Calculated_Setpoint	Coil Temperature Calculated Active Setpoint			312	AV	R	30654	Input	X
Cooling_Coil_Setpoint_Max	Cooling Coil Max Setpoint			313	AV	R/W	40102	Holding	X
		ACTIVE TEXT	**INACTIVE TEXT**						
Exhaust_Fan_1_Status_Digital_Input	Exhaust Fan 1 Status	On	Off	23	BI	30587	10072	Discrete	X
Occupancy_Digital_Input	Occupancy Digital Input Status	Occupied	Unoccupied	53	BI	R	10102	Discrete	X
Outside_Filter_Alarm_Digital_Input	Outside Filter Alarm Digital Input Status	Alarm	Normal	54	BI	R	10103	Discrete	X
Shutdown_Alarm_Digital_Input	Shutdown Alarm Digital Input Status	Alarm	Normal	75	BI	R	10124	Discrete	X
Supply_Fan_1_Status_Digital_Input	Supply Fan 1 Status	On	Off	78	BI	R	10127	Discrete	X
Unit_Enable_Digital_Input	Remote Unit Enable Digital Input Status	Enabled	Disabled	82	BI	R	10131	Discrete	X
Wheel_Status_Digital_Input	Heat Wheel Status	Enabled	Disabled	83	BI	R	10132	Discrete	X
BMS_Watchdog	BMS Watchdog command Used to determine comm status Must heartbeat within the watch dog timeout delay to detect comm status	Active	Inactive	1	BV	R/W	2	Coil	X
System_Enable	Master system enable	Enabled	Disabled	2	BV	R/W	3	Coil	X
BMS_Occupancy_Command	Occupancy Command	Unoccupied	Occupied	3	BV	R/W	4	Coil	X
Reset_All_Alarms	Alarm Reset Command	Reset	Normal	4	BV	R/W	5	Coil	X
Outside_RH_Source_BMS	Outside RH Source Selection	BMS	Local	5	BV	R/W	6	Coil	X
Outside_Temp_Source_BMS	Outside Temp Source Selection	BMS	Local	6	BV	R/W	7	Coil	X
Return_Temp_Source_BMS	Return Temp Source Selection	BMS	Local	8	BV	R/W	9	Coil	X
Space_1_CO2_Source_BMS	Space 1 CO2 Source Selection	BMS	Local	9	BV	R/W	10	Coil	
Return_CO2_Source_BMS	Return CO2 Source Selection	BMS	Local	11	BV	R/W	11	Coil	X
Return_CO2_from_BMS	Return CO2 Source From BMS	BMS	Local	27	AV	R/W	40054	Holding	X

Valent Network Interface v5.002 Modbus/BACnet Points List

Variable	Description	ACTIVE TEXT	INACTIVE TEXT	BACNET		Read (R) Write (W)	MODBUS		Included
				Object Instance	Object Type		Index	Register Type	
Space_RH_Source_BMS	Space RH Source Selection	BMS	Local	12	BV	R/W	13	Coil	X
Space_Static_Source_BMS	Space Static Source Selection	BMS	Local	13	BV	R/W	14	Coil	
Space_Temp_Source_BMS	Space Temp Source Selection	BMS	Local	14	BV	R/W	15	Coil	X
Occupied	Occupied Status	Occupied	Unoccupied	16	BV	R	10002	Discrete	X
Unoccupied	Unoccupied Status	Unoccupied	Occupied	17	BV	R	10003	Discrete	X
Unoccupied_Cooling_Call	Unoccupied Cooling Call Status	On	Off	18	BV	R	10004	Discrete	X
Unoccupied_Dehumidification_Call	Unoccupied Dehumidification Call Status	On	Off	19	BV	R	10005	Discrete	X
Unoccupied_Heating_Call	Unoccupied Heating Call Status	On	Off	20	BV	R	10006	Discrete	X
Occupied_Start	Occupied Start Command Status	Start	Stop	21	BV	R	10007	Discrete	X
Unoccupied_Start	Unoccupied Start Command Status	Start	Stop	22	BV	R	10008	Discrete	X
Enable_Controls	Status to indicate startup is complete and the unit is ready	Yes	No	23	BV	R	10009	Discrete	X
Global_Alarm	General alarm point Optionally set to indicate any alarm is active, or a shutdown alarm is active	Alarm	Normal	24	BV	R	10010	Discrete	X
System_Shutdown_Alarm	Shutdown alarm status When true, System Enable will be set to false and the unit will remain off	Alarm	Normal	25	BV	R	10011	Discrete	X
Damper_Open	Indicates there is an open air path and the supply fan can run	Open	Closed	26	BV	R	10012	Discrete	X
Cooling_is_On	Indicates that the unit is cooling	Yes	No	27	BV	R	10013	Discrete	X
Economizer_is_On	Indicates that the unit is economizing	Yes	No	28	BV	R	10014	Discrete	X
Heating_is_On	Indicates that the unit is heating	Yes	No	29	BV	R	10015	Discrete	X
Dehumidification_Mode_Enabled	Indicates the unit is dehumidifying	Yes	No	31	BV	R	10017	Discrete	X
Manual_Override_Active	Indicates that manual overrides are active	Active	Inactive	32	BV	R	10018	Discrete	X
Cooling_Not_Locked_Out	Indicates that cooling is allowed	Allowed	Locked Out	33	BV	R	10019	Discrete	X
Heating_Not_Locked_Out	Indicates that heating is allowed	Allowed	Locked Out	34	BV	R	10020	Discrete	X
Preheat_Not_Locked_Out	Indicates that preheat is allowed	Allowed	Locked Out	36	BV	R	10022	Discrete	
HGRH_Purging	Indicates the hot gas reheat value is purging	Yes	No	37	BV	R	10023	Discrete	X
Allow_Dampers	Startup sequence command to open dampers	Yes	No	43	BV	R	10029	Discrete	X
Allow_Exhaust_Fans	Startup sequence command to trigger exhaust fans to start	Yes	No	44	BV	R	10030	Discrete	X
Allow_Supply_Fans	Startup sequence command to trigger supply fans to start	Yes	No	48	BV	R	10034	Discrete	X
BMS_Watchdog_Active	Status of the BMS watchdog ping	Active	Inactive	49	BV	R	10035	Discrete	X
BMS_Occupancy_Status	Status of the BMS occupancy command	Unoccupied	Occupied	50	BV	R	10036	Discrete	X
Damper_Actuator_Power_1_Digital_Output	Damper Actuator Power 1 Digital Output	Active	Inactive	100	BV	R	10153	Discrete	X
Compressor_1_Enable_Digital_Output	Compressor 1 Enable	On	Off	111	BV	R	10164	Discrete	X
Compressor_2_Enable_Digital_Output	Compressor 2 Enable	On	Off	112	BV	R	10165	Discrete	X
Compressor_3_Enable_Digital_Output	Compressor 3 Enable	On	Off	113	BV	R	10166	Discrete	X
Compressor_4_Enable_Digital_Output	Compressor 4 Enable	On	Off	114	BV	R	10167	Discrete	X
Condenser_Fan_1_Digital_Output	Condenser Fan Stage 1	On	Off	119	BV	R	10171	Discrete	X
Condenser_Fan_2_Digital_Output	Condenser Fan Stage 2	On	Off	120	BV	R	10172	Discrete	X
Condenser_Fan_3_Digital_Output	Condenser Fan Stage 3	On	Off	121	BV	R	10173	Discrete	X
Condenser_Fan_4_Digital_Output	Condenser Fan Stage 4	On	Off	122	BV	R	10174	Discrete	X
Condenser_Fan_5_Digital_Output	Condenser Fan Stage 5	On	Off	123	BV	R	10175	Discrete	X
Condenser_Fan_6_Digital_Output	Condenser Fan Stage 6	On	Off	124	BV	R	10176	Discrete	X
Condenser_Fan_7_Digital_Output	Condenser Fan Stage 7	On	Off	125	BV	R	10177	Discrete	X
Condenser_Fan_8_Digital_Output	Condenser Fan Stage 8	On	Off	126	BV	R	10178	Discrete	X
Exhaust_Fan_1_Start_Stop_Digital_Output	Exhaust Fan 1 Start Stop	On	Off	127	BV	R	10180	Discrete	X
Furnace_1_Stage_1_Digital_Output	Furnace 1 Stage 1	On	Off	131	BV	R	10184	Discrete	X
Furnace_2_Stage_1_Digital_Output	Furnace 2 Stage 1	On	Off	133	BV	R	10186	Discrete	X
Heat_Wheel_Enable_Digital_Output	Heat Wheel Enable	On	Off	163	BV	R	10208	Discrete	X
PreHeat_Enable_Digital_Output	PreHeat Enable Digital Output	On	Off	166	BV	R	10211	Discrete	
Reversing_Valve_Digital_Output	Reversing Valve Digital Output HP	On	Off	175	BV	R	10219	Discrete	
Supply_Fan_1_Start_Stop_Digital_Output	Supply Fan 1 Start	Start	Stop	186	BV	R	10231	Discrete	X
Aux_BMS_Digital_Output_1	Aux BMS Digital Output	BMS	Local	207	BV	R/W	23	Coil	
Aux_BMS_Digital_Output_2	Aux BMS Digital Output	BMS	Local	208	BV	R/W	24	Coil	
Aux_BMS_Digital_Output_3	Aux BMS Digital Output	BMS	Local	209	BV	R/W	25	Coil	
Aux_BMS_Digital_Output_4	Aux BMS Digital Output	BMS	Local	210	BV	R/W	26	Coil	
Aux_BMS_Digital_Output_5	Aux BMS Digital Output	BMS	Local	211	BV	R/W	27	Coil	
Aux_BMS_Digital_Output_6	Aux BMS Digital Output	BMS	Local	212	BV	R/W	28	Coil	
BMS_Offline_Alarm_Active	BMS Offline Alarm	Alarm	Normal	313	BV	R	10264	Discrete	X
Cold_Coil_1_Temperature_Sensor_Alarm_Active	Cold Coil 1 Temperature Sensor Alarm	Alarm	Normal	387	BV	R	10338	Discrete	X
Comp_Circ_A_High_Pressure_Alarm.Active	Comp Circ A High Pressure Alarm	Alarm	Normal	395	BV	R	10345	Discrete	X
Comp_Circ_A_Low_Pressure_Alarm.Active	Comp Circ A Low Pressure Alarm	Alarm	Normal	396	BV	R	10346	Discrete	X
Comp_Circ_B_High_Pressure_Alarm.Active	Comp Circ B High Pressure Alarm	Alarm	Normal	397	BV	R	10347	Discrete	X
Comp_Circ_B_Low_Pressure_Alarm.Active	Comp Circ B Low Pressure Alarm	Alarm	Normal	398	BV	R	10348	Discrete	X
Comp_Maintenance_Alarm_Active	Comp Maintenance Alarm	Alarm	Normal	411	BV	R	10362	Discrete	X
Drain_Pan_Alarm.Active	Condensate Drain Pan Alarm	Alarm	Normal	422	BV	R	10371	Discrete	X

Valent Network Interface v5.002 Modbus/BACnet Points List

Variable	Description	ACTIVE TEXT	INACTIVE TEXT	BACNET		Read (R) Write (W)	MODBUS		Included
				Object Instance	Object Type		Index	Register Type	
Exhaust_Fan_1_Alarm_Active	Exhaust Fan 1 Alarm	Alarm	Normal	423	BV	R	10372	Discrete	X
Exhaust_Fan_1_AMD_analog_input_Alarm.Active	Exhaust AMD Analog Input Alarm	Alarm	Normal	424	BV	R	10373	Discrete	
Expansion_Board_1_Alarm_Active	Expansion Board 1 Alarm	Alarm	Normal	434	BV	R	10384	Discrete	
Expansion_Board_2_Alarm_Active	Expansion Board 2 Alarm	Alarm	Normal	435	BV	R	10385	Discrete	
Expansion_Board_3_Alarm_Active	Expansion Board 3 Alarm	Alarm	Normal	436	BV	R	10386	Discrete	
Internal_Board_Temp_Alarm_Active	Internal Board Temp Alarm	Alarm	Normal	498	BV	R	10448	Discrete	X
Multi_Channel_Conf_Alarm_Active	Multi Channel Conf Alarm	Alarm	Normal	503	BV	R	10453	Discrete	X
Outside_Air_Temperature_Sensor_Alarm_Active	Outside Air Temperature Sensor Alarm	Alarm	Normal	507	BV	R	10457	Discrete	X
Outside_Filter_Alarm_Active	Outside Filter Alarm	Alarm	Normal	508	BV	R	10458	Discrete	X
Outside_RH_Sensor_Alarm_Active	Outside RH Sensor Alarm	Alarm	Normal	509	BV	R	10459	Discrete	X
Return_Duct_Static_Pressure_Analog_Input_Alarm.Active	Return Duct Static Pressure Analog Input Alarm	Alarm	Normal	521	BV	R	10470	Discrete	
Return_Low_Static_Alarm.Active	Return Low Static Pressure Alarm	Alarm	Normal	531	BV	R	10480	Discrete	
Return_RH_Sensor_Alarm.Active	Return RH Sensor Alarm	Alarm	Normal	532	BV	R	10481	Discrete	
Return_Temperature_Sensor_Alarm.Active	Return Temp Sensor Alarm	Alarm	Normal	533	BV	R	10482	Discrete	
Space_CO2_1_Analog_Input_Alarm_Active	Space CO2 1 Analog Input Alarm	Alarm	Normal	535	BV	R	10485	Discrete	
Space_High_Static_Alarm_Active	Space High Static Alarm	Alarm	Normal	537	BV	R	10487	Discrete	
Space_RH_Sensor_Alarm_Active	Space RH Sensor Alarm	Alarm	Normal	538	BV	R	10488	Discrete	
Space_Static_Pressure_Analog_Input_Alarm_Active	Space Static Pressure Analog Input Alarm	Alarm	Normal	540	BV	R	10490	Discrete	
Space_Temperature_Sensor_Alarm_Active	Space Temperature Sensor Alarm	Alarm	Normal	541	BV	R	10491	Discrete	X
Shutdown_Input_Alarm_Active	Shutdown Input Alarm	Alarm	Normal	546	BV	R	10496	Discrete	
Supply_Air_Temp_Low_Limit_Active	Supply Air Temp Low Limit Alarm	Alarm	Normal	551	BV	R	10501	Discrete	X
Supply_Air_Temperature_Sensor_Alarm_Active	Supply Air Temperature Sensor Alarm	Alarm	Normal	552	BV	R	10502	Discrete	X
Supply_Duct_Static_Pressure_Analog_Input_Alarm_Active	Supply Duct Static Pressure Analog Input Alarm	Alarm	Normal	553	BV	R	10503	Discrete	X
Supply_Fan_1_Alarm_Active	Supply Fan 1 Alarm	Alarm	Normal	554	BV	R	10504	Discrete	X
Supply_High_Duct_Static_Alarm_Active	Supply High Duct Static Alarm	Alarm	Normal	563	BV	R	10513	Discrete	X
Supply_Temp_High_Limit_Alarm_Active	Supply Temp High Limit Alarm	Alarm	Normal	565	BV	R	10515	Discrete	X
TMem_Error_Active	TMem Error Alarm	Alarm	Normal	567	BV	R	10517	Discrete	X
Wheel_Rotation_Alarm_Active	Wheel Rotation Alarm	Alarm	Normal	576	BV	R	10526	Discrete	X
AI_Batt_EVD_1_Active	EVD Battery Alarm	Alarm	Normal	589	BV	R	10539	Discrete	X
AI_ConfigErr_EVD_1_Active	EVD Configuration Alarm	Alarm	Normal	590	BV	R	10540	Discrete	X
AI_DscgHiP_COMP_Active	Compressor Envelope-High Discharge Pressure Alarm	Alarm	Normal	591	BV	R	10541	Discrete	X
AI_DscgHiTemp_COMP_Active	Compressor Envelope-High Discharge Temperature Alarm	Alarm	Normal	592	BV	R	10542	Discrete	X
AI_DscgLowP_COMP_Active	EVD Low Discharge Pressure Alarm	Alarm	Normal	593	BV	R	10543	Discrete	X
AI_EEPROM_EVD_1_Active	EVD EEPROM Alarm	Alarm	Normal	594	BV	R	10544	Discrete	X
AI_EEV_A_EVD_1_Active	ExV Motor Alarm - Valve A	Alarm	Normal	595	BV	R	10545	Discrete	X
AI_EmergencyClosing_EVD_1_Active	EVD Emergency Closing Alarm	Alarm	Normal	597	BV	R	10547	Discrete	X
AI_EVD_Offline_EVD_1_Active	EVD Offline Communication Alarm	Alarm	Normal	598	BV	R	10548	Discrete	X
AI_FW_CompatibErr_EVD_1_Active	EVD Firmware Compatibility Alarm	Alarm	Normal	599	BV	R	10549	Discrete	X
AI_HiCurr_COMP_Active	Compressor Envelope-High Current Alarm	Alarm	Normal	600	BV	R	10550	Discrete	X
AI_HiRatioP_COMP_Active	Compressor Envelope-High Pressure Ratio Alarm	Alarm	Normal	601	BV	R	10551	Discrete	X
AI_HiT_Cond_EVD_1_Active	AI HiT Cond EVD 1	Alarm	Normal	602	BV	R	10552	Discrete	X
AI_IncompleteClosing_EVD_1_Active	EVD Incomplete Closing Alarm	Alarm	Normal	603	BV	R	10553	Discrete	X
AI_LOP_A_EVD_1_Active	EVD Low Operating Pressure Alarm - Valve A	Alarm	Normal	604	BV	R	10554	Discrete	X
AI_Low_SH_A_EVD_1_Active	EVD Low Super Heat Alarm - Circuit A	Alarm	Normal	606	BV	R	10556	Discrete	X
AI_LowDeltaP_COMP_Active	Compressor Envelope-Low Pressure Delta Alarm	Alarm	Normal	608	BV	R	10558	Discrete	X
AI_LowRatioP_COMP_Active	Compressor Envelope-Low Pressure Ratio Alarm	Alarm	Normal	609	BV	R	10559	Discrete	X
AI_LowSuct_A_EVD_1_Active	Low Suction Refrigerant Temperature - Circuit A	Alarm	Normal	610	BV	R	10560	Discrete	X
AI_MOP_A_EVD_1_Active	EVD Max Operating Pressure Alarm - Valve A	Alarm	Normal	612	BV	R	10562	Discrete	X
AI_S1_EVD_1_Active	EVD-S1 Suction Pressure Sensor Alarm	Alarm	Normal	614	BV	R	10564	Discrete	X
AI_S2_EVD_1_Active	EVD-S2 Suction Temperature Sensor Alarm	Alarm	Normal	615	BV	R	10565	Discrete	X
AI_S4_EVD_1_Active	EVD-S4 Discharge Temperature Sensor Alarm	Alarm	Normal	617	BV	R	10567	Discrete	X
AI_SuctHiP_COMP_Active	Compressor Envelope - SuctHiP_COMP	Alarm	Normal	618	BV	R	10568	Discrete	X
AI_SuctLowP_COMP_Active	Compressor Envelope - SuctLowP_COMP	Alarm	Normal	619	BV	R	10569	Discrete	X
Comp_Staging_Order_Skipped_Active	Compressor Staging Order is Skipped Warning	Alarm	Normal	632	BV	R	10579	Discrete	X
Heat_Pump_Heating_Lock_Out_Alarm.Active	Heat Pump Heating Lockout	Alarm	Normal	633	BV	R	10580	Discrete	
EVD_PrePosition_Alarm_Active	Unexpected EEV Position	Alarm	Normal	634	BV	R	10582	Discrete	X
ER_Wheel_High_DP.Active	ER Wheel High DP.Active	Alarm	Normal	731	BV	R	10679	Discrete	X
High_Low_Press_Circ_A_Alarm.Active	High Low Press Circ A Alarm.Active	Alarm	Normal	733	BV	R	10682	Discrete	X
High_Low_Press_Circ_B_Alarm.Active	MHigh Low Press Circ B Alarm.Active	Alarm	Normal	734	BV	R	10683	Discrete	X
High_Low_Press_Circ_C_Alarm.Active	MHigh Low Press Circ C Alarm.Active	Alarm	Normal	735	BV	R	10684	Discrete	X
High_Low_Press_Circ_D_Alarm.Active	MHigh Low Press Circ D Alarm.Active	Alarm	Normal	736	BV	R	10685	Discrete	X
Greentrol_1_Alarm.Active	Greentrol 1 Alarm.Active	Alarm	Normal	737	BV	R	10686	Discrete	X

Valent Network Interface v5.002 Modbus/BACnet Points List

Variable	Description	ACTIVE TEXT	INACTIVE TEXT	BACNET		Read (R) Write (W)	MODBUS		Included
				Object Instance	Object Type		Index	Register Type	
OAD_Feedback_Error_Not_Economizing.Active	OAD Feedback Error Not Economizing	Alarm	Normal	741	BV	R	10689	Discrete	
OAD_Feedback_Error_Economizing.Active	OAD Feedback Error Economizing	Alarm	Normal	742	BV	R	10691	Discrete	
OAD_Feedback_Error_OAD_Not_Modulating.Active	OAD Feedback Error OAD Not Modulating	Alarm	Normal	743	BV	R	10693	Discrete	
OAD_Feedback_Error_Excess_OA.Active	OAD Feedback Error Excess OA	Alarm	Normal	744	BV	R	10695	Discrete	
Space_TStat_1_Offline.Active	Space Thermostat 1 Offline	Alarm	Normal	745	BV	R	10699	Discrete	X
Space_TStat_2_Offline.Active	Space Thermostat 2 Offline	Alarm	Normal	746	BV	R	10701	Discrete	X
Space_TStat_3_Offline.Active	Space Thermostat 3 Offline	Alarm	Normal	747	BV	R	10703	Discrete	X
Space_TStat_4_Offline.Active	Space Thermostat 4 Offline	Alarm	Normal	748	BV	R	10705	Discrete	X
Inverter_Scroll_1_Alarm	Inverter Scroll Alarm	Alarm	Normal	749	BV	R	10707	Discrete	X
IG_Furnace_Alarm	IG Furnace Alarm	Alarm	Normal	753	BV	R	10715	Discrete	X
Supply_Fan_Delay_Remaining	Supply Fan startup sequence Time before starting supply fan			2	IV	R	30183	Input	X
Exhaust_Fan_Delay_Remaining	Exhaust Fan startup sequence Time before starting exhaust fan			3	IV	R	30185	Input	X
LatestAlm	Most recent alarm See alarm table			7	IV	R	30193	Input	X

UNIT STATUS MODE

TABLE 13: UNIT STATUS MODE

0	Off/Standby	14	Shutdown Alarm
1	Unoccupied Start	18	Unassigned
2	Occupied Start	19	Fans Only
3	Opening Dampers	20	Economizing
4	End Switch	21	Cooling
5	Dampers Open	22	Heating
6	Fan Start Delay	23	Dehumidifying
7	Fans Starting	25	HGRH Purging
9	Heat/Cool Delay	26	Defrost Active
10	System On	28	Cooling & Heating
11	Soft Shutdown	29	Dehum w/Heat
12	System Disabled	30	Overrides Active
13	Remote Off	31	Expansion Offline

Factory Controller Sequence of Operation

FACTORY CONTROLLER: Controller shall be provided with required sensors and programming for rooftop unit. Controller shall be factory programmed, mounted and tested. Controller shall have a LCD readout for changing set points and monitoring unit operation.

UNIT START COMMAND (Unit will be enabled to start once a jumper is placed between R to G):

- Factory mounted and wired outdoor air and recirculated air damper actuators are powered.
- Exhaust fan starts after a (adj.) delay.
- Supply fan starts after a (adj.) delay.
- Tempering options and energy wheel option to function as described below.

UNIT STOP COMMAND (OR DE-ENERGIZED):

- Supply fan, exhaust fan, energy wheel and tempering options de-energized.
- Outdoor air damper actuator is spring return close, and the recirculated air damper actuator is spring open.

OCCUPIED/UNOCCUPIED MODES: Shall be based on a 7-day time clock internal to the controller. The schedule shall be set by the end user. When a user initiates an override input, the controller will switch from unoccupied to occupied mode. The controller will return to the scheduled occupied/unoccupied mode after the override time has expired. If internal time clock is disabled, a remote contact or a BMS can control the occupied/unoccupied mode.

Occupied Mode:

- Damper control per below.
- Energy wheel control per below.
- Exhaust fan ON.
- Supply fan ON.
- Heating per below.
- Cooling per below.

Unoccupied mode (Cycle on Room Temp): The unit will cycle to maintain unoccupied room set points if there is a call for unoccupied heating, cooling or dehumidification.

- Supply fan OFF
- Exhaust fan OFF
- Recirculation air damper open.
- Outdoor air damper closed.
- On a call for heating (room temp set point – differential) supply fan cycles ON, and the heating increases the room temperature. Unit cycles off when room temperature reaches the unoccupied set point (adj.).
- On a call for cooling (room temp set point + differential) supply fan cycles ON, and the cooling decreases the room temperature. Unit cycles off when room temperature reaches the unoccupied set point (adj.)

MORNING WARMUP/COOL DOWN: Prior to occupancy, the unit will run using the warmup or cool down sequence until the occupied set point is achieved. The heating or cooling mode must not be locked out and the space temperature is below or above set point by the unoccupied hysteresis (adj.) (This Sequence must be field configured.)

SUPPLY BLOWER SEQUENCE: The supply blower is provided with a factory mounted variable frequency drive. The supply blower speed will be controlled with the following sequence.

Duct Static Pressure Sensor: The supply blower is modulated based upon the signal from a duct static pressure sensor (factory provided and wired, field mounted and tubing by others). The controller will modulate the supply fan based upon a comparison of the duct static pressure set point (adj.) to the actual duct static pressure level reported from the sensor. (**Mechanical high static protection cutoffs must be**

installed by others to protect the system and equipment from over-pressurization. The manufacturer does not assume responsibility for this.)

BMS Control: The supply blower is modulated based upon a command from the Building Management System. (This Sequence must be field configured.)

OUTDOOR AIR AND RE-CIRCULATED (RECIRC) AIR DAMPER CONTROL: The outdoor and recirculated air dampers are factory mounted and wired. Outside air damper and recirculation damper will be inverse positions of each other. Example, when the outside air damper is set to 35% opening, the recirculation damper will be at 65% opening. The modulating actuator will be controlled to dictate position by the following sequence.

Constant Position-Adj. Setpoint: The outside air damper and recirculation damper will be modulating dampers that will be hold a constant position set by the minimum damper setpoint (adj.).

Supply Fan Reset: The active source will be set to local from the factory (Minimum outdoor air percentage will be constant, set using the controller) and can be field configured to Supply Fan Reset (The minimum and maximum positions are reset based off supply fan speed).

EXHAUST BLOWER SEQUENCE: The exhaust blower is provided with a factory mounted variable frequency drive. The exhaust blower speed will be controlled with the following sequence.

Constant Volume-Adj. Setpoint: The exhaust blower will operate at a constant speed set point (adj.) during operation.

BMS Control: The exhaust blower is modulated based upon a command from the Building Management System. (This sequence must be field configured.)

COOLING SEQUENCE: The cooling is controlled to maintain the supply temperature set point. The mechanical cooling will be locked out when the outside air is < 55 F (adj.).

Packaged DX Cooling (Inverter Scroll): The controller will provide a modulating signal for cooling. From 0-50%, the inverter scroll will be controlled to maintain discharge temperature. From 50-100% the second stage will be on in combination with the inverter scroll compressor to maintain the discharge temperature. The electronic expansion valve will modulate to maintain 8.0 F of superheat.

Modulating Hot Gas Reheat Sequence: During dehumidification the modulating HGRH is controlled to maintain the supply temperature set point.

Modulating Head Pressure Control: Lead condenser fan will have an EC motor and will modulate to maintain a head pressure set point.

DEHUMIDIFICATION CONTROL SEQUENCE: The cooling is controlled to maintain the cooling-coil set point. The dehumidification sequence will be locked out when the OA is < 10 F(adj.) above the cold-coil set point (adj.).

Cold Coil Set Point Control: The controller will control the cooling to maintain a cold coil set point. The active set point will set to local control (55 F, adj.) from the factory and can be field adjusted locally or by the BMS.

REHEAT SEQUENCE: While the unit is in dehumidification mode the outdoor air will be reheated via Modulating Hot Gas Reheat for space neutral applications.

Modulating Hot Gas Reheat: The controller will modulate the hot gas reheat reheat valve with a 0-10 V signal to maintain the supply temperature set point (adj.).

HEATING SEQUENCE: The heating is controlled to maintain the supply temperature set point. The heating will be locked out when the outside air is > 80 F (adj.). Maximum allowable discharge air set point is 100 F.

Indirect Gas Furnace: The controller will modulate the indirect gas furnace to maintain the supply temperature set point (adj.).

TEMPERATURE CONTROL SEQUENCE: The unit will maintain the supply air discharge setpoint per the following. Adjustable locally or by BMS.

Space Setpoint Control: The supply setpoint will adjust between minimum (adj.) and maximum (adj.) limits, to satisfy the desired space temperature setpoint. Adjustable locally or by BMS.

BUILDING FREEZE PROTECTION: If the supply air temperature drops below 35 F (adj.) for 300s (adj.), the controller will de-energize the unit and activate the alarm output.

TEMPERATURE PROTECTION (Winter Ramp): The controller will enable the outdoor air and recirc. air dampers to modulate in order to help the unit keep up with heating demand in the event of wheel failure or the unit operating outside design conditions. (This can be enabled in the controller.)

ENERGY WHEEL FROST CONTROL: Frost control for the energy wheel is enabled when frost is present on the wheel; based on the outside air temperature and the pressure drop across the wheel. If the outdoor air temperature is below 5 F adj. and the differential pressure across the wheel is about 1.5", adj. frost control will enable.

Wheel VFD (Modulate Wheel): When frosting is occurring, the VFD modulates the wheel down to a slow rotational speed to defrost wheel. Once either the pressure drop decreases below the pressure switch set point, or the outdoor air temperature increases about the temperature set point, the unit will resume normal operation.

ECONOMIZER SEQUENCE: When the application requires cooling, and the outdoor air conditions are suitable for free cooling, the controller will first modulate the energy wheel speed and then modulate the outdoor air and recirculated air dampers to maintain the supply air temperature set point. If the outdoor air damper modulates to the maximum economizer set point and the supply air temperature is not met, the controller will increase the call for cooling to meet the supply air temperature and could engage mechanical cooling.

Temp./Enthalpy: The economizer will be locked out when: the outdoor air is < 40 F DB (adj.) or > 75 F DB (adj.) or > 55 F dew point (adj.) ; the unit is operating in dehumidification mode; or there is a call for heating

ENERGY WHEEL SEQUENCE

Modulate Wheel: When economizer mode is enabled and there is a signal for cooling, the wheel VFD modulates wheel speed to maintain the supply air temperature set point.

ENERGY WHEEL BYPASS DAMPERS

By Factory: The unit will be provided with energy wheel bypass dampers for both the outdoor air and return airstreams. During normal operation, the dampers will remain closed to allow full operation of the energy wheel. During economizer sequences, the bypass dampers will be open to alleviate pressure drop through the wheel, while allowing more outdoor air to be used for economizer cooling.

ALARMS INDICATION: The controller will display alarms and have one digital output for remote indication of an alarm condition. Possible alarms include:

Building Management System: The controller will send all alarms to the BMS.

Dirty Filter Alarm: A digital signal is sent to the controller indicating an increased pressure drop across the outdoor air filter (Must be adjusted in field during start up). The controller will then provide a dirty filter alarm.

Dirty Wheel Alarm: The controller monitors pressure across the wheel and sends an alarm in the case of an increased pressure drop.

Wheel Rotation Alarm: The controller monitors wheel rotation, if the wheel does not rotate for a set period of time (adj.) an alarm will generate.

Supply and Exhaust Air Alarm: The controller monitors the proving switch on each blower and sends an alarm in the case of either blower proving switch not engaging.

DX Alarm: The controller monitors the refrigerant pressure. In the case of low refrigerant pressure the compressors will shut down until refrigerant pressure returns to normal values and the controller will send an alarm. In the case of high refrigerant pressure the compressors will shut down, requiring a manual reset and the controller will send a alarm.

Temperature Sensor Alarm: The controller sends an alarm in the case of a failed air temperature sensor.

Pressure Sensor Alarm: The controller sends an alarm in the case of a failed pressure sensor.

Humidity Sensor Alarm: The controller sends an alarm in the case of a failed humidity sensor.

ACCESSORIES: The following accessories will be included with the unit to expand the functionality or usability of the controller.

BMS Interfacing: A BMS port or serial card is provided with the controller for field interfacing with a building management system. Each card is sent out with the default parameters, and the controls contractor must change the appropriate addresses to match the BMS settings.

Phase and Brownout Protection: Factory mounted and wired component which monitors the main power coming into the unit. If a phase drops out, or if the incoming voltage exceeds the acceptable range, the component will turn off the unit to help protect the electrical systems.

Condensate Overflow Unit Shutdown: Factory mounted condensate overflow switch wired to the unit controller. The controller monitors the condensate overflow switch. If the water level in the drain pan reaches a certain level, the unit will shutdown and send an alarm.

Airflow Monitoring: The outdoor airflow monitoring device is installed as a standalone option in the control center. It includes a heated thermistor that is used to measure feet per minute in the housing. This feet per minute is converted to CFM in the factory supplied airflow readout device. This device is not connected to the controller.

Warranty Statement for Dedicated Outdoor Air Systems (DOAS)

Unit Warranty

Valent warrants the equipment to be free from defects in material and workmanship for a period of 12 months from start-up or 18 months from ship date, whichever is less. Initial startup must be completed within six months of the shipment date, and a startup report must be submitted to Valent.

Energy Wheel Warranty

The energy recovery wheel is warranted to be free from defects in material and workmanship for a period of 5 years from the shipment date.

Heat Exchanger Extended Warranty

Valent warrants the stainless steel heat exchanger to be free from defects in material and workmanship for a period of 25 years from the shipment date.

Compressor Extended Warranty

Valent warrants the refrigerant compressor(s) to be free from defects in material and workmanship for a period of 5 years from the shipment date.

Warranty Notes

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

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

Roof Curb Submittal

The Greater Dayton School

Curb Technologies roof curbs

4/6/22

TP Mechanical

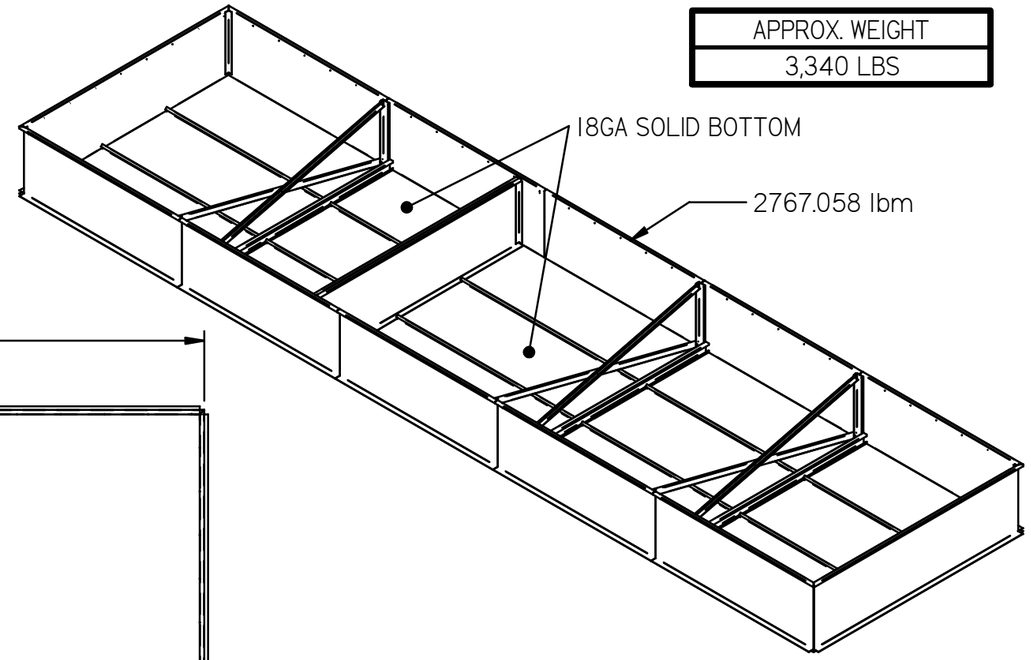
Sales Engineer:
Brian Turner
ElitAire
bturner@elitaire.com
513-673-0600 cell

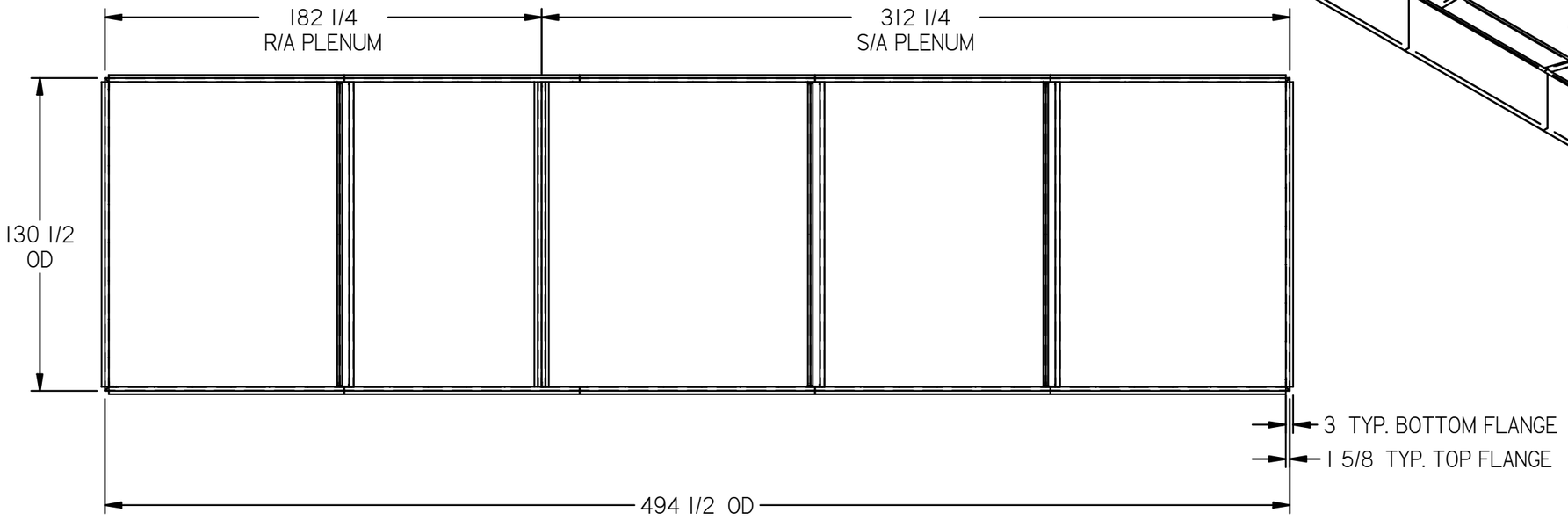
Notes:

- RTU-1 includes 36” tall plenum curb. Supply and return penetrations to be field cut
- RTU-2 – 5 includes 24” tall curb.
- Vibration Isolation rails included for all curbs

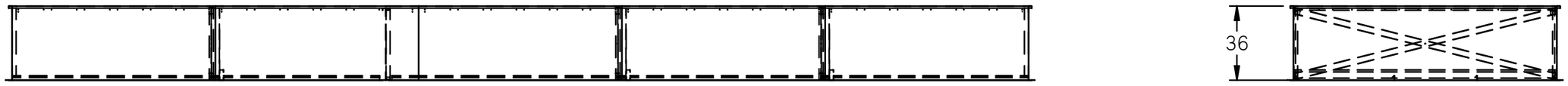
ALL INTERNAL PIECES ARE 1" DOWN FROM TOP OF CURB

APPROX. WEIGHT
3,340 LBS





OPENINGS FIELD CUT BY OTHERS



NOTES:
1. CURB SHIPPED WELDED, ONE PIECE
2. CURB MUST BE INSTALLED SQUARE AND LEVEL
3. MATERIAL IS GALVANIZED 14ga STEEL
4. FACTORY INSTALLED P.T. 2x4 WOOD NAILER
5. SUPPLIED WITH 1-1/2x1/4" CLOSED CELL NEOPRENE GASKET
6. 1" DEFLECTION ISOLATION RAILS (SHIPPED SEPARATELY FOR FIELD ASSEMBLY AND INSTALLATION) FLEX DUCT BY OTHERS
7. INSULATED W/ 1" DUCT LINER

CURB TECHNOLOGIES™

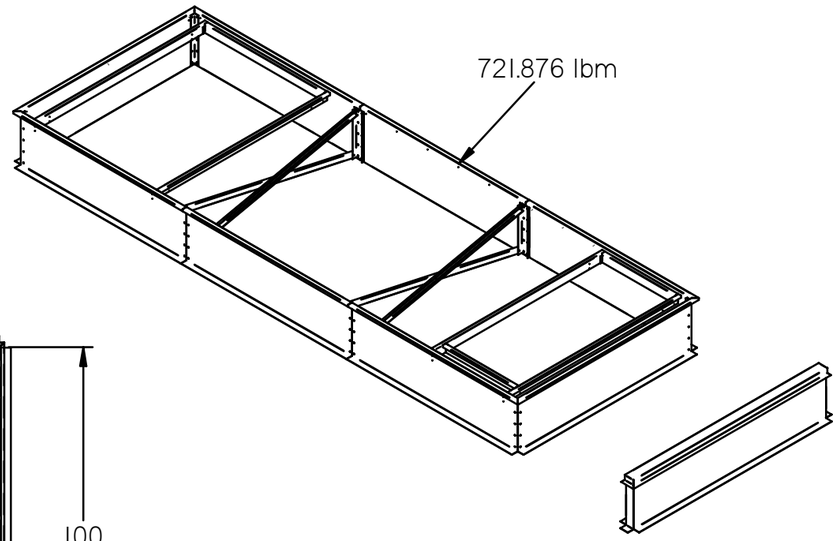
QUANTITY: 1
DIMENSIONS: INCHES
DRAWN BY SGRR

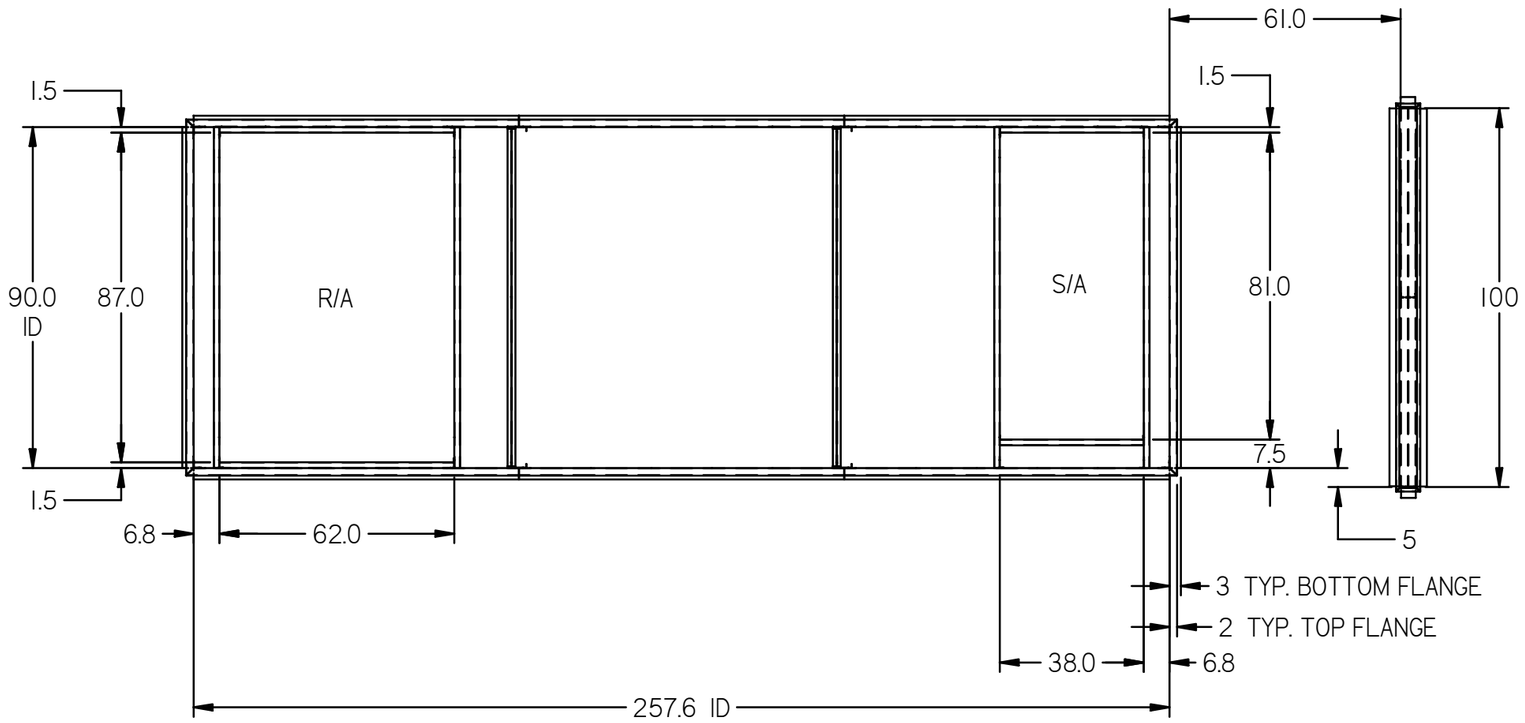
PROJECT: Connor School - Dayton (211116-TG05)
UNIT TAG: RTU-1
MODEL: INNOVENT

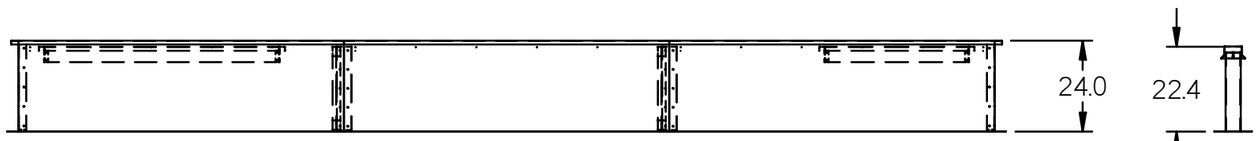
Rev. 00	4/6/22

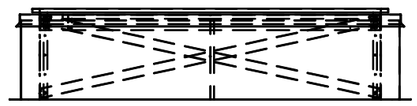
ALL INTERNAL PIECES ARE 1.6" BELOW CURB PERIMETER

APPROX. WEIGHT
960 LBS









NOTES:
1. CURB SHIPPED IN PIECES FOR FIELD ASSEMBLY
2. CURB MUST BE INSTALLED SQUARE AND LEVEL
3. MATERIAL IS GALVANIZED 14ga STEEL
4. FACTORY INSTALLED P.T. 2x4 WOOD NAILER
5. SUPPLIED WITH 1-1/2"x1/4" CLOSED CELL NEOPRENE GASKET
6. 1" DEFLECTION ISOLATION RAILS (SHIPPED SEPARATELY FOR FIELD ASSEMBLY AND INSTALLATION) FLEX DUCT BY OTHERS

CURB TECHNOLOGIES, LLC

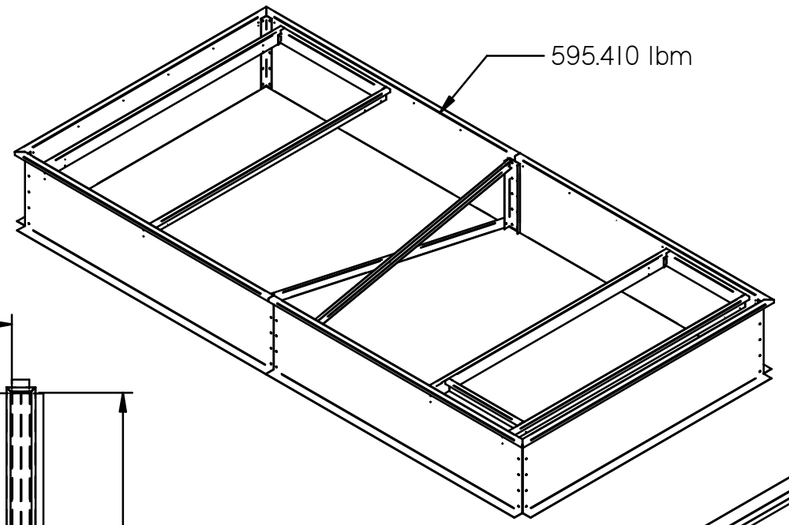
QUANTITY: 1
DIMENSIONS: INCHES
DRAWN BY SGRR

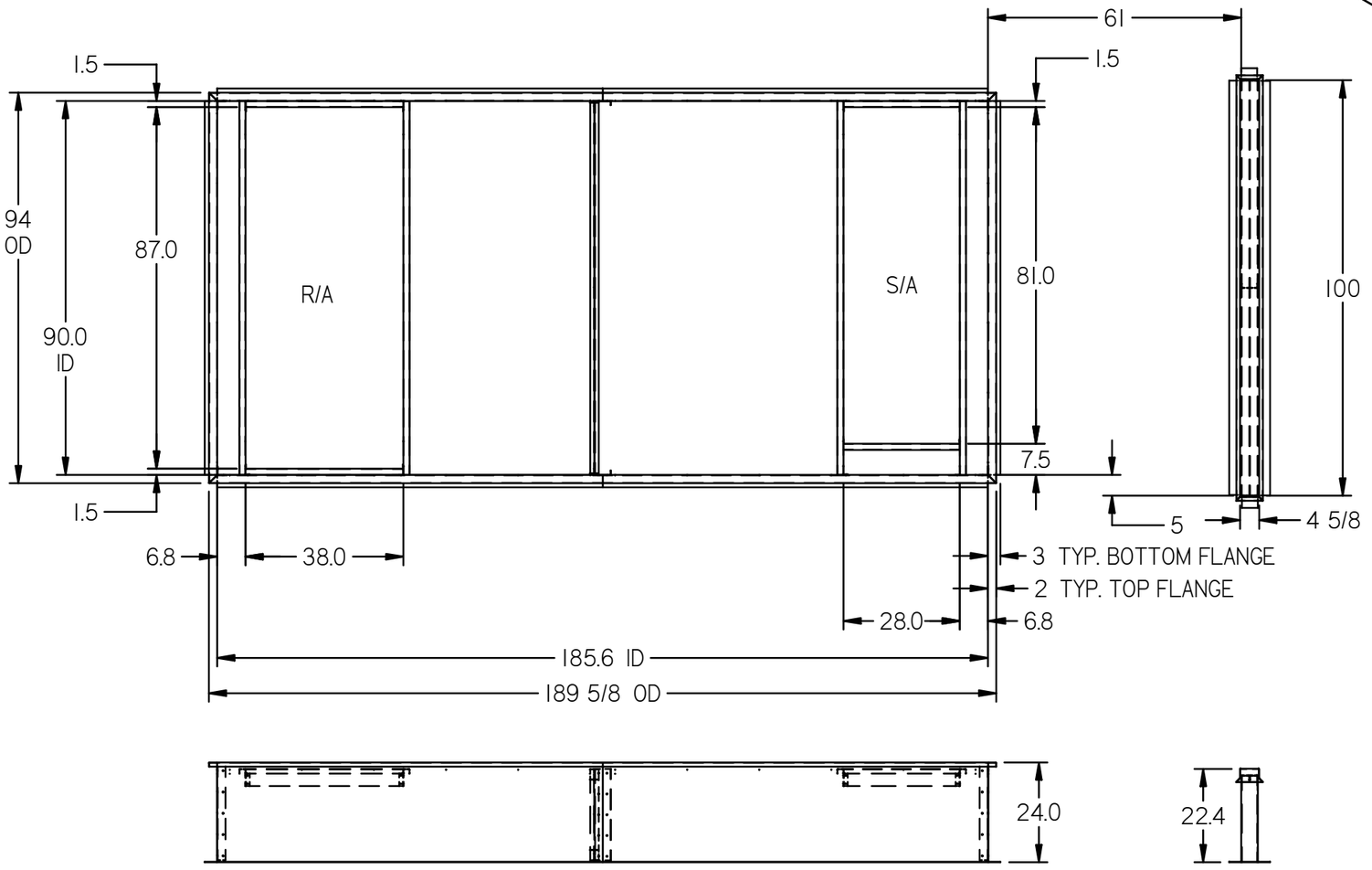
PROJECT: Connor School - Dayton (211116-TG05)
UNIT TAG: RTU-2
MODEL: D_RPS

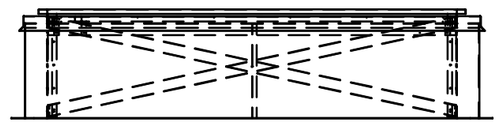
Rev. 00	4/6/22

ALL INTERNAL PIECES ARE 1.6" BELOW CURB PERIMETER

APPROX. WEIGHT
790 LBS







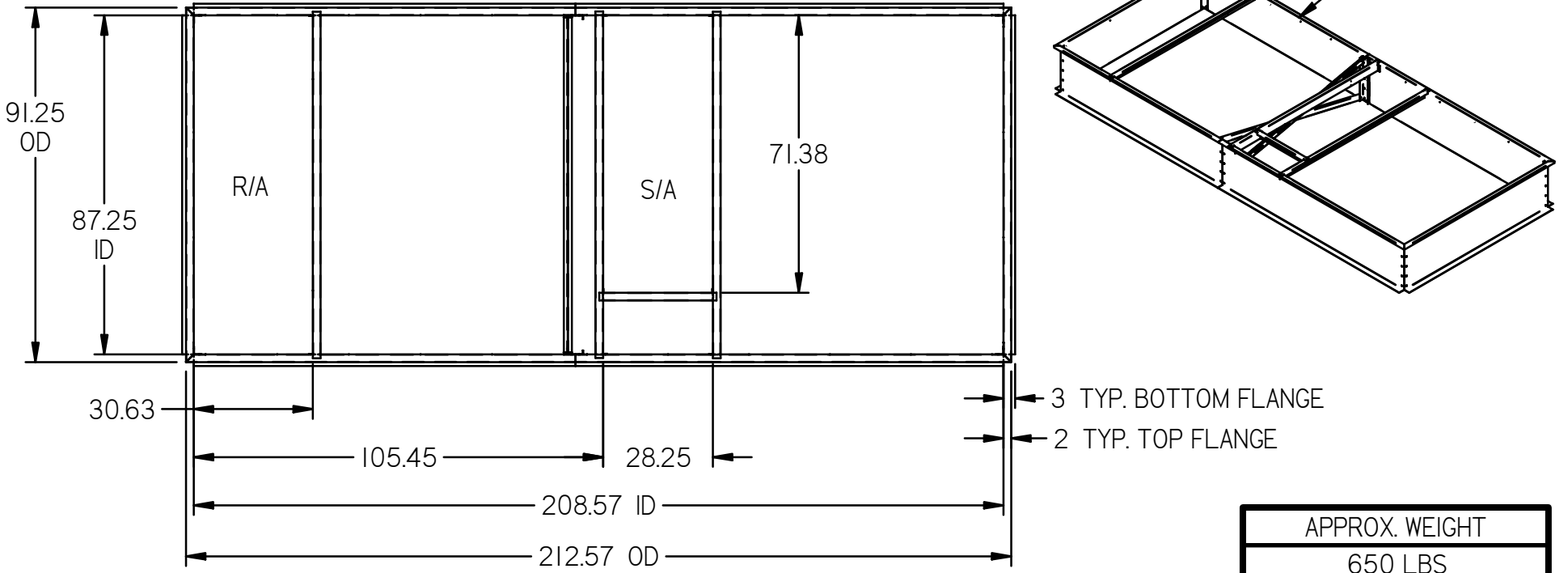
NOTES:
1. CURB SHIPPED IN PIECES FOR FIELD ASSEMBLY
2. CURB MUST BE INSTALLED SQUARE AND LEVEL
3. MATERIAL IS GALVANIZED 14ga STEEL
4. FACTORY INSTALLED P.T. 2x4 WOOD NAILER
5. SUPPLIED WITH 1-1/2x1/4" CLOSED CELL NEOPRENE GASKET
6. 1" DEFLECTION ISOLATION RAILS (SHIPPED SEPARATELY FOR FIELD ASSEMBLY AND INSTALLATION) FLEX DUCT BY OTHERS

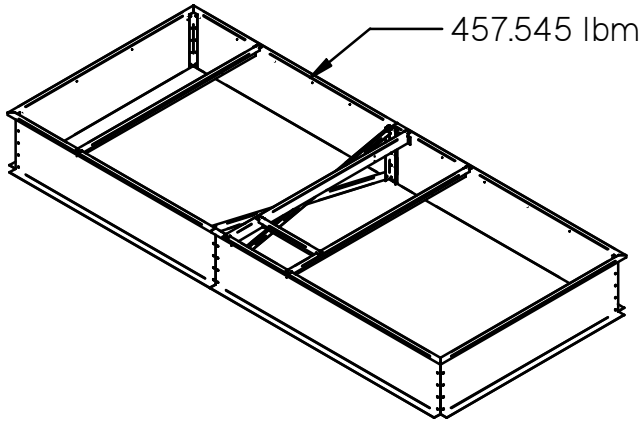
CURB TECHNOLOGIES, LLC

QUANTITY: 1
DIMENSIONS: INCHES
DRAWN BY SGRR

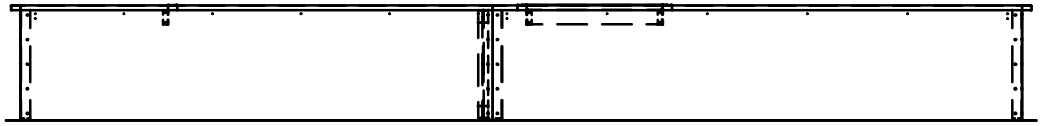
PROJECT: Connor School - Dayton (211116-TG05)
UNIT TAG: RTU-3
MODEL: D_MPS062-075E

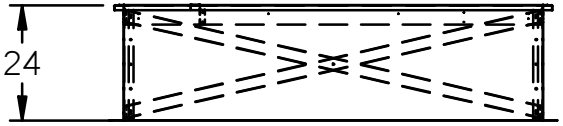
Rev. 00	4/6/22





APPROX. WEIGHT
650 LBS





NOTES:
1. CURB SHIPPED IN PIECES FOR FIELD ASSEMBLY
2. CURB MUST BE INSTALLED SQUARE AND LEVEL
3. MATERIAL IS GALVANIZED 14ga STEEL
4. FACTORY INSTALLED P.T. 2x4 WOOD NAILER
5. SUPPLIED WITH 1-1/2x1/4" CLOSED CELL NEOPRENE GASKET
6. DUCT SIZES ARE APPROXIMATE. ALLOW FOR CONNECTING HARDWARE WHEN SIZING DUCT
7. 1" DEFLECTION ISOLATION RAILS (SHIPPED SEPARATELY FOR FIELD ASSEMBLY AND INSTALLATION) FLEX DUCT BY OTHERS

CURB TECHNOLOGIES™

QUANTITY: 1
DIMENSIONS: INCHES

DRAWN BY SGRR

PROJECT: Connor School - Dayton (211116-TG05)
UNIT TAG: RTU-4
MODEL: D_MPS040F-050F

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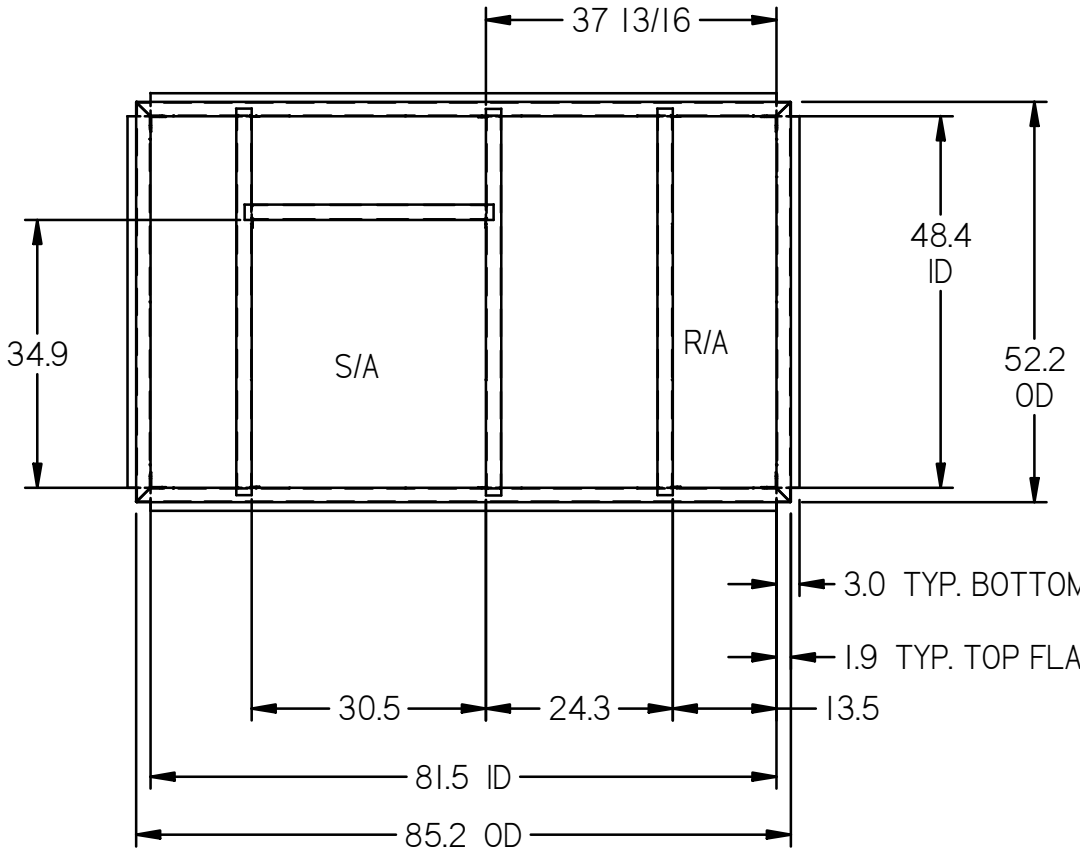
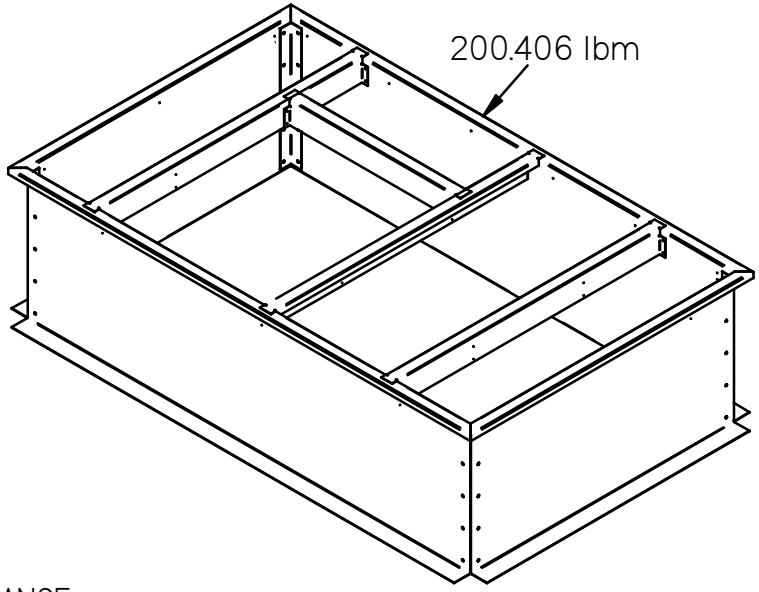
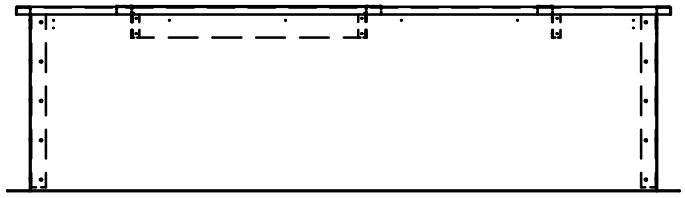
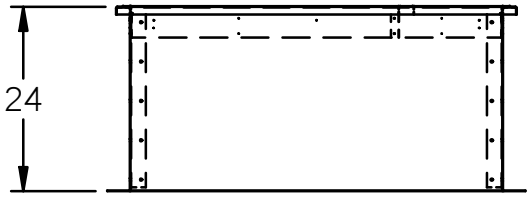




APPROX. WEIGHT
285 LBS





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CURB TECHNOLOGIES™

QUANTITY: 1
DIMENSIONS: INCHES

DRAWN BY SGRR

PROJECT: Connor School - Dayton (211116-TG05)
UNIT TAG: RTU-5
MODEL: D_DPS 007-015

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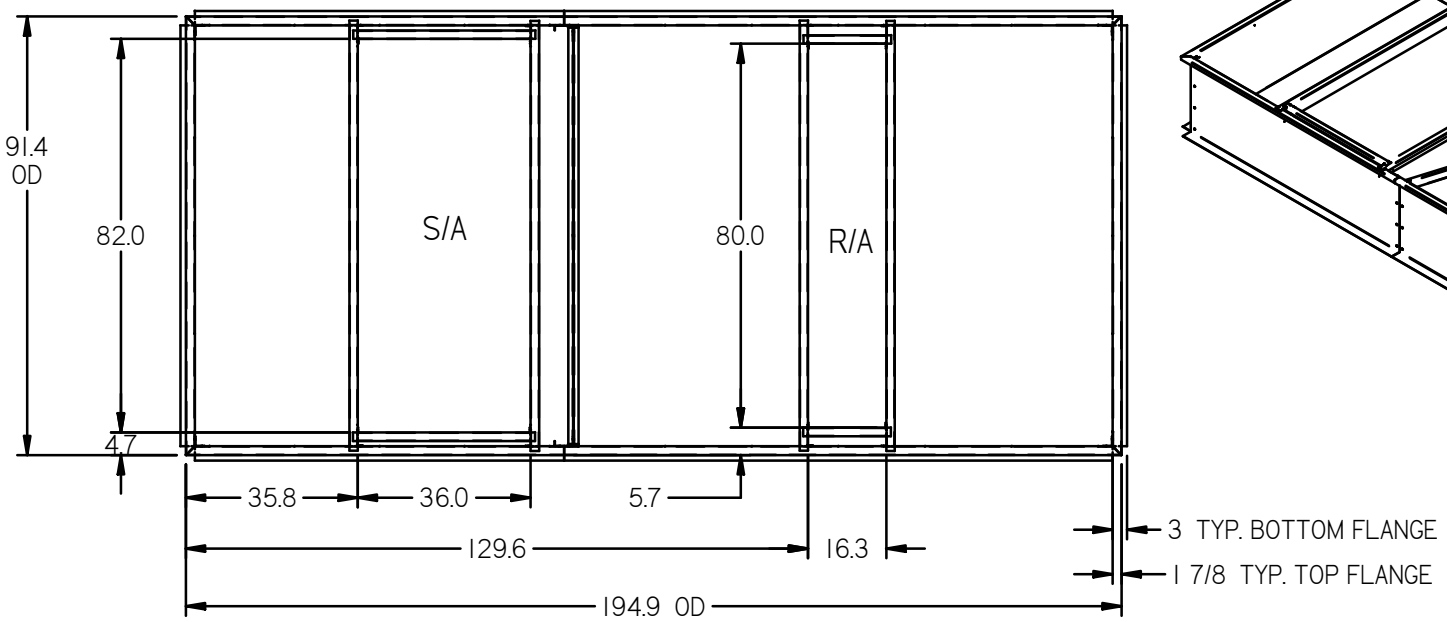
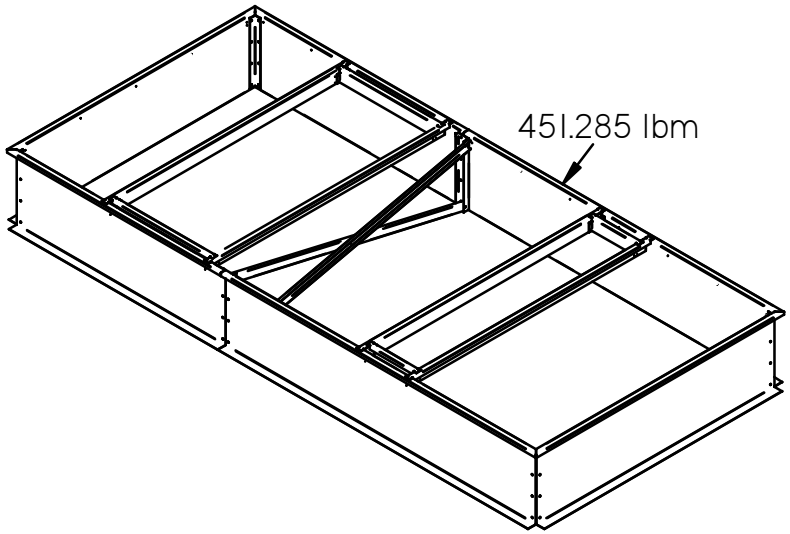
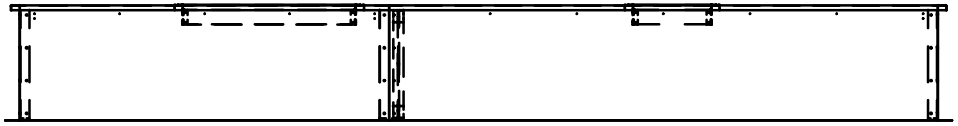
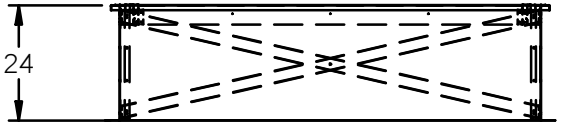




APPROX. WEIGHT
630 LBS





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CURB TECHNOLOGIES™

QUANTITY: 1
DIMENSIONS: INCHES

DRAWN BY SGRR

PROJECT: Connor School - Dayton (211116-TG05)
UNIT TAG: RTU-6
MODEL: VALENT

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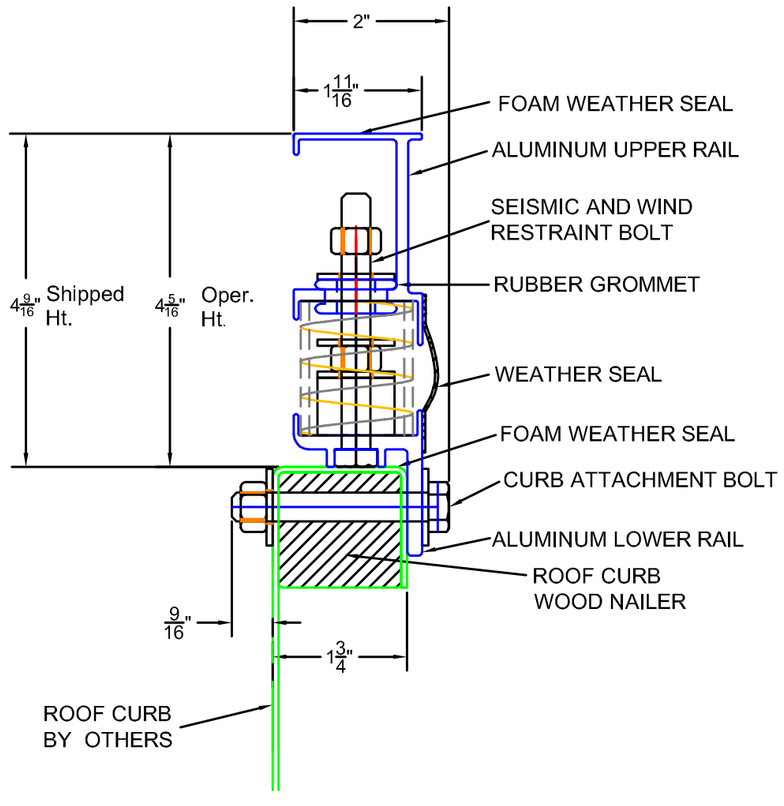
REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED

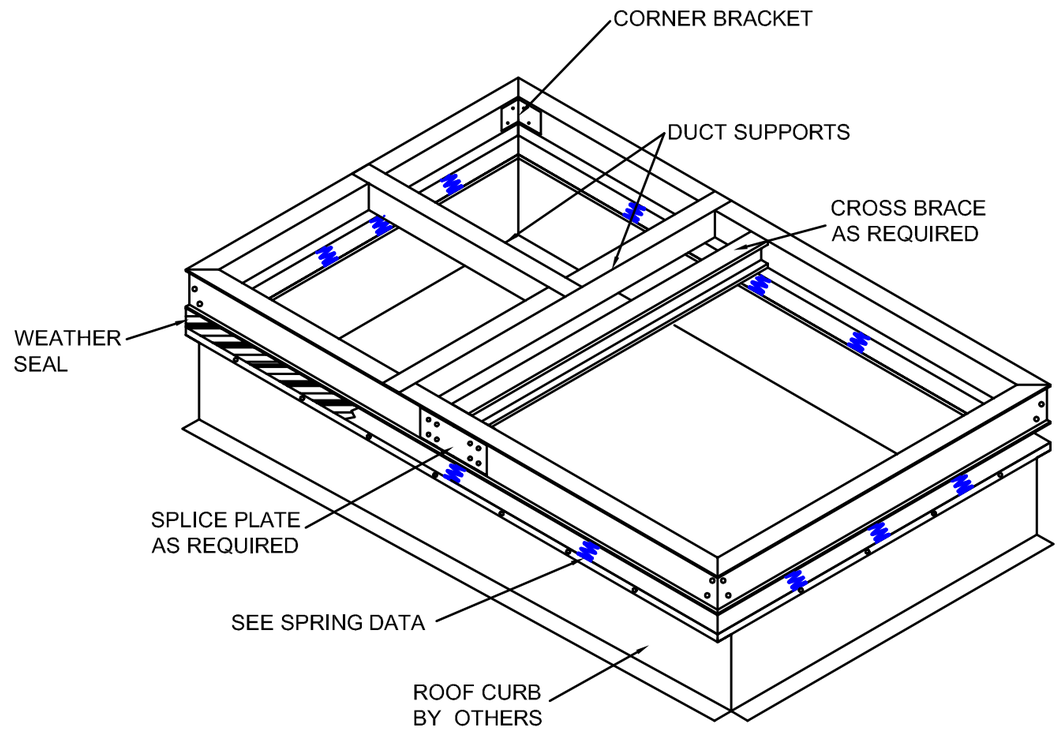
SPRING NOTES

- VIR-1 SPRINGS ARE SELECTED TO DEFLECT 1" WHEN THE ROOF TOP UNIT IS AT IS OPERATING WEIGHT.
- THE VIR-1 SPRINGS COME PRELOADED A $\frac{1}{2}$" AS PART OF THE FACTORY PRE ASSEMBLY.
- THE SPRINGS ARE POWDER COATED 4 DIFFERENT COLORS FOR IDENTIFICATION.
- ALL SPRINGS HAVE AT LEASE A 150% OVERLOAD CAPACITY.
- ADDITIONAL SPRINGS ARE SHIPPED WITH THE UNIT FOR TROUBLE SHOOTING.

SPRING DATA TABLE			
LOAD RATING (LBS)	RATED DEFLECTION	OPERATING HEIGHT	SPRING COLOR
35	1"	1.5"	BLUE
65	1"	1.5"	GREEN
126	1"	1.5"	RED
200	1"	1.5"	BLACK



VIR-1 CROSS SECTION VIEW



VIR-1 ISOMETRIC VIEW

CURB TECHNOLOGIES

VIR-1 INSTALLATION DRAWING

SIZE	FSCM NO.	DWG NO.	REV
SCALE		SHEET	

FNAME REVDATE USER