

Addendum #3

Issued March 6, 2024

The following information changes the competitive process documents issued on February 14, 2024.

GENERAL INFORMATION

- Item 1: See 'Construction Site Specific Information Sheet', for reference purposes only, issued by HWDSB (4 pages)
- Item 2: See 'Structural Mechanical Electrical Addendum No. 02' dated March 6, 2024, issued by EXP Services Inc. (6 pages)
- Item 3: See 'Glendale HVAC- TRANE Shop Drawings_2024 03 05' dated March 5, 2024, issued by EXP Services Inc., for mechanical equipment that HWDSB has preordered as part of this project. (137 pages)

QUESTIONS AND RESPONSES

- Q1 Please confirm grill sizes for CMU infill. There are no sections that indicate the size of these infills.
- R1 **Refer to 2024-136-P01941 Addendum 2, amended drawing M1.1 note 12 which indicates size of existing grilles to be demolished.**
- Q2 What is the intended completion schedule for this year?
- R2 **Please refer to the RFT, 1.5 Project Schedule. It will be the Successful Bidder's responsibility to work with HWDSB and the equipment supplier (Trane) to phase and schedule Work throughout the construction period. It is anticipated that the majority of Work will occur during the summer months, winter break and March break.**
- Q3 To avoid material cost increase, is the customer willing to purchase all of the controls material up front?
- R3 **HWDSB is willing to purchase all of the controls material up front if the following conditions can be met:**
- **Warranty starts after final commissioning and substantial completion.**
 - **The supplier will order and store the material/equipment in a secure/bonded location at their own cost.**
 - **Photos and access will be provided to the consultants to confirm the material/equipment has been received.**

- Q4 Per the room finishing schedule, no new finishes are indicated for the mechanical rooms 2090A, 2090B and 2090C. Please confirm there is no requirement for fresh paint or any other finishes in these areas.
- R4 Confirmed.**
- Q5 we have a cash allowance for roof repairs but at the location of the 6 legs of the new structural platform it calls for cutting the deck open to support to the posts and beam below. Do we carry a roofer here or is this covered under cash allowance as well?
- R5 This is covered under the allowance.**
- Q6 Under painting there is nothing mentioned on the room schedule for painting the mechanical rooms at all after the work. Does this mean that the rooms keep existing finishes including no floor painting?
- R6 Correct.**
- Q7 There is no information regarding the platform railings and the stair, only the notes on the structural drawings. Please provide details and sizes of the railing, stair and a platform.
- R7 Guardrail system is in Specification - Division 05000 Guardrails.**
- Q8 Electrical Rooms 1027C and 1027D – Could you provide pictures of the inside of both these rooms, including the existing electrical equipment c/w manufacturer data plates.
- R8 Refer to 2024-134-P01941 Addendum 2 for photos.**
- Q9 HWDSB mentioned that they had purchased some of the mechanical equipment for the project already during the walk thru. Is HWDSB also supplying the New Boiler Control Panel? Can you provide a cut sheet for this panel?
- R9 Refer to 2024-134-P01941 Addendum 2 for response.**
- Q10 EPO switch location for new boilers – provide preferred location and mounting heights
- R10 Refer to 2024-134-P01941 Addendum 2 for response.**
- Q11 Existing breaker panels in Rooms 1055 (PNL-U) and 1056(PNL-V) – Could you provide pictures of these panels and manufacturer data plate.
- R11 Refer to 2024-134-P01941 Addendum 2 for response.**
- Q12 Switch board HVD-B in Room 1040 – Could you provide pictures and manufacturer data plate
- R12 Refer to 2024-134-P01941 Addendum 2 for photos.**
- Q13 Maintenance receptacles that are to be added to rooftop – 15 or 20 GFCI?
- R13 Refer to 2024-134-P01941 Addendum 2 for response.**

- Q14 Fire Alarm control panel/Annunciator panel – Could you provide pictures of these including manufacturer data plates
- R14 Refer to 2024-134-P01941 Addendum 2 for response.**
- Q15 Spec on hydronic piping reads 2” and smaller sizes to be BMI screwed, 2-1/2” and larger sizes to be buttweld. Is grooved joint acceptable for 2-1/2” and larger sizes?
- R15 Refer to 2024-134-P01941 Addendum 2 for response.**
- Q16 Can you please provide a list of mechanical contractors who are approved to work at HWDSB?
- R16 HWDSB does not require preapproved mechanical contractors for this project.**

End of Addendum #3



Structural Mechanical Electrical Addendum No. 02

EXP Project: ALL-23010629-A0 HWDSB Glendale

Date: March 6, 2024

Prepared By: EXP Services Inc.

Requirements:

The addendum forms part of the Contract Documents and amends the original Specifications and Drawings, as noted below.

Ensure that all parties submitting bids are aware of all items included in this Addendum.

This Addendum consists of 6 pages.

Question and Answer

Question 1:

Can you please clarify 'Notes - Electrical Wiring Instructions' on drawing ME1.1? Several elements referenced in these notes are not part of the scope of work or referenced in drawings. Specifically Note 30, that references 'DWG E3.61.', which is not in the electrical set.

Answer 1:

Disregard Note 30. Only refer to notes relevant to the scope of work.

Question 2:

Photos in Addendum 2 are not clear in regards to panel types, makes and models. This information is essential for determining proper KA rating for overcurrent protection with motor loaded rated distribution. Can you please provide written spec for written spec for HVD-A Main Switchboard and DP-A Switchboard?

Answer 2:

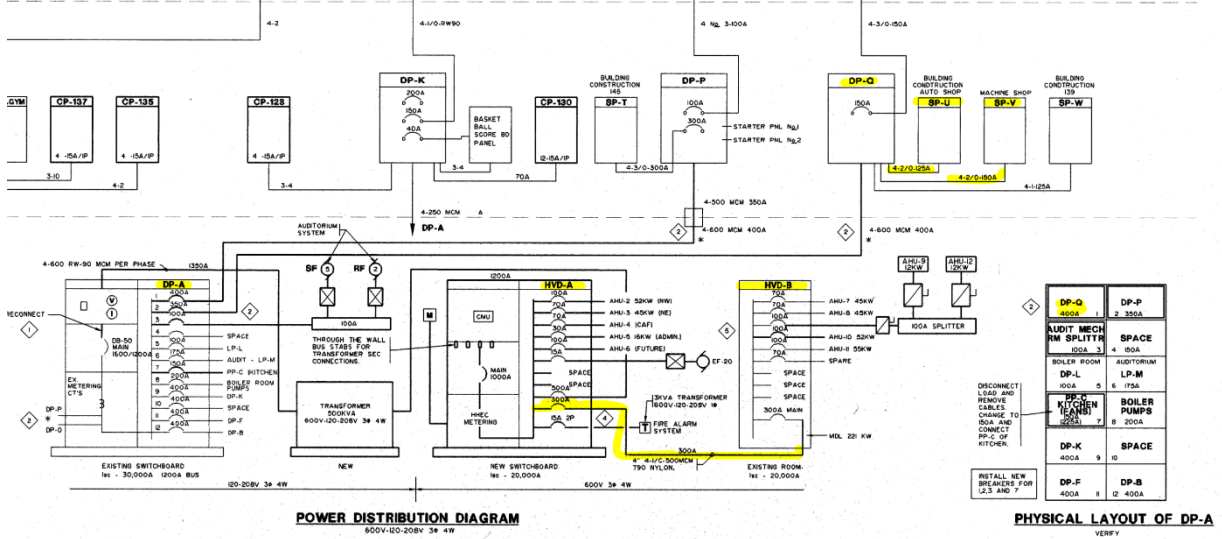
Refer to answers 3, 5, 6

Question 3:

Note 5 on Drawing E2.1 calls for load testing and providing a separate price prior to adding loads to the existing panelboards PNL-U, PNL-V, DP-Q. Can you please clarify 'upgrades', including new panel size, type, single line distribution diagram and feeder size and location of where we are to feed the upgraded panel from for tendering purposes?

Answer 3:

Refer to the snapshot of the existing SLD below.



Question 4:

Can you please provide HWDSB Vendor Approved Fire Alarm and Security Contractors?

Answer 4:



Question 5:

Please provide the following:

- 1) Complete model number from EX Panel LP-L.
- 2) Complete model number from EX Panel DP-A.
- 3) Complete model number from EX Switchboard HVD-A.
- 4) Complete model number from EX Panel PNL-U.
- 5) Complete model number from EX Panel PNL-V.
- 6) Complete model number from EX Switchboard HVD

Answer 5:

Refer to answer 6

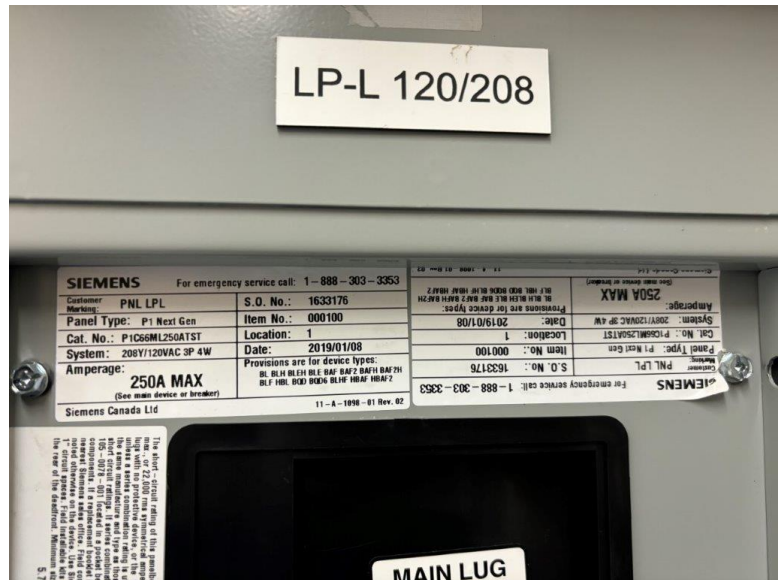
Question 6:

Please provide the following as the photos in Addendum #2 are not clear enough to see this information:

- 1) Complete model number(photo of nameplate) from EX Panel LP-L.
- 2) Complete model number(photo of nameplate) from EX Panel DP-A.
- 3) Complete model number(photo of nameplate) from EX Switchboard HVD-A.
- 4) Complete model number(photo of nameplate) from EX Panel PNL-U.
- 5) Complete model number(photo of nameplate) from EX Panel PNL-V.
- 6) Complete model number(photo of nameplate) from EX Switchboard HVD-B.

Answer 6:

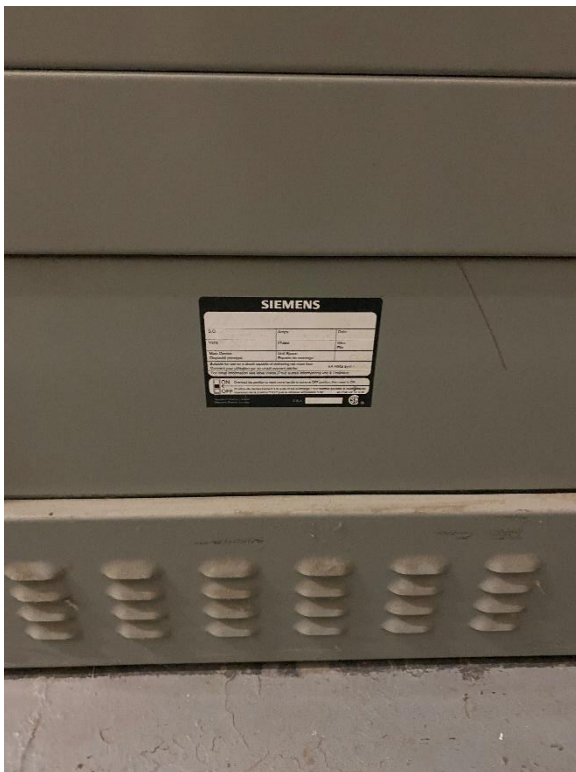
EX Panel LP-L.



EX Panel DP-A.



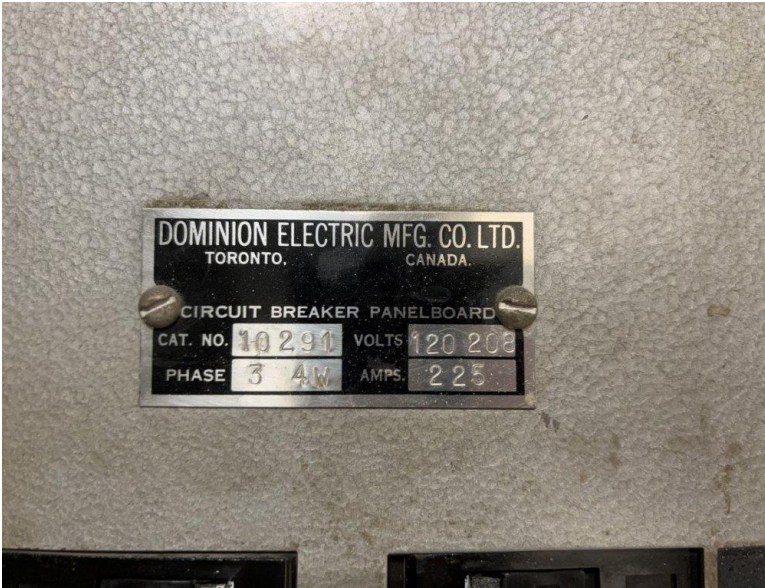
EX Switchboard HVD-A.



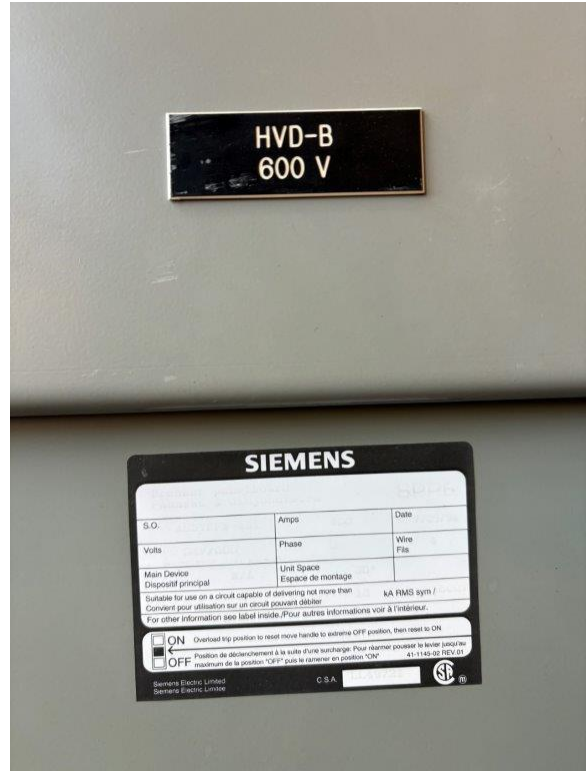
EX Panel PNL-U.



EX Panel PNL-V.



EX Switchboard HVD-B.





Shop Drawing Review

Date:	March 5, 2024	Remarks applicable to the following system: UV-01 = ① Make Corrections Noted Resubmission Not Required UV-02 = ① No Exception Taken CU-01 = ① No Exception Taken AHU-09 = ① No Exception Taken AHU-10 = ① No Exception Taken AHU-11 = ① Make Corrections Noted Resubmission Not Required AHU-12 = ① No Exception Taken ERV-1 = ① No Exception Taken RTU-1 = ① No Exception Taken RTU-2 = ① No Exception Taken See Remarks.
Project No.:	ALL-23010629-A0	
Project:	HWDSB Glendale Sec Sch Boiler AHU Replacement	
Spec Section No.:	15817	
Submission No.:	1	
By:	Jonah Leibtag, Walter D'Souza	Review is for general conformance with the design concept of the project and general compliance with the information given in the contract documents. Any action shown is subject to the requirements of the contract documents. Contractor is responsible for the dimensions which shall be confirmed and correlated at the job site; fabrication processes and techniques of construction; coordination of his or her work with that of all other trades; and the satisfactory performance of his or her work.
No. of Pages in Set:	137	
No Exception Taken ① Revise & Resubmit ② Make Corrections Noted ① Rejected, Submit ③ Resubmission Not Required Compliant Product/System		

Remarks

- .1 **UV-1 and UV-2** Architect to comment on unit colour.
- .2 **UV-1** Door grilles not to be punched out. Side cabinet opening to be made for ducted return air.
- .3 **UV-1, UV-2, AHU-9 and AHU-12** Contractor to confirm and submit shop drawings for UV accessories after noted site visit.
- .4 **AHU-10** Structural to review unit weight increase from 8600 lbs to 9500 lbs.
- .5 **AHU-11** Filters to be updates to MERV 13.
- .6 **AHU-11** Unit MOCP decreased from 60A to 50A. Electrical ESI to be issued for updated breaker size.
- .7 **AHU-11** Structural to review unit weight increase from 6900 lbs to 7400 lbs.
- .8 **RTU-1** Structural to review unit weight decrease from 8800 lbs to 8000 lbs.

No further comments



Submittal

Prepared For:
EXP Stoney Creek

Date: February 27, 2024

Sold To:
HWDSB

Job Name:
Glendale SS HWDSB 2024

Trane Canada ULC is pleased to provide the following submittal for your review and approval.

Product Summary

Qty Product

- 2 Changeair Unit Ventilators
- 1 Split System Condensing Unit

Tags: UV-1 & UV-2
Tag: CU-1

Submittal Notes:

UV Accessories Submittal to Follow Once Site Visit Has Been Completed With Awarded Contractor

<p>Carmine Bozzo / Rory Mills Trane Hamilton 110 Lancing Drive, Building 1, Unit 3 Hamilton, ON L8W 3A1 Phone: (905) 308-7780 Cell: (905) 979-2433 Fax: (905) 308-9573</p>	<p>The attached information describes the equipment we propose to furnish for this project and is submitted for your approval.</p> <p><i>Submittal acceptance and return is a critical step, so please ensure submittals are returned with approval to release to production within <u>14 days</u> of submittal date.</i></p> <p>Product performance and submittal data is valid for a period of 6 months from the date of submittal generation. If six months or more has elapsed between submittal generation and equipment release, the product performance and submittal data will need to be verified. It is the customer's responsibility to obtain such verification.</p>
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Tag Data – Changeair Unit Ventilators (Qty: 2)

Item	Tag(s)	Qty	Description
E1	UV-1	1	Freshman Unit Ventilator
E2	UV-2	1	Sophomore Unit Ventilator

Product Data – Changeair Unit Ventilators

Item: E1, E2 Qty: 2 Tag(s): UV-1, UV-2

Hot Water Heating Coil with factory installed 2-way valve package (includes Control valve, Isolation valves, Strainer, and Circuit Balancing valve)

Low Sound Package

DDC Ready for Field Supplied and Install BAS Controller

Built in Economizer Section

Supply and Exhaust Fans with Low sound, High Efficiency ECM motors

2 inch MERV13 filters

1 Year Parts Warranty

Startup By Changeair

Delivery with a liftgate truck

Tag: UV-1

DX Refrigerant coil with TX valve, and Stainless Steel Drain Pan

208-240/1/60 Power with Disconnect

Replacement Front Door & Side Panel for Side Return (Fld)

Tag: UV-2

2-Stage Self-Contained Cooling with Stainless Steel Drain Pan

208/60/3 Power with Disconnect

Fld- Field Installed On Site By Contractor



Submittal Confirmation Items

****This Page Must be Completed in Full in Order to Schedule Production****

Project Name: HWDSB – Glendale

Submittal Date: 2/27/2024

<u>Description</u>	<u>Choices / Options</u>	<u>Confirm or Advise Value</u>
Unit Color	See attached Std. Color Chart	
Exterior Louver Color	See attached Std. Color Chart	
Exterior Louver Size		Size TBD. To Be Confirmed Once Site Visit Has Been Completed With Awarded Contractor
Exterior Louver Sill Height Above Fixed Floor (AFF)		Sill Height TBD. To Be Confirmed Once Site Visit Has Been Completed With Awarded Contractor
Voltage Requirement	Submitted: UV- 1: 208-240/1/60 UV-2: 208/3/60	
Controls	Submitted: None, DDC Ready With Terminal Strip	
Heating Piping Connection (Facing Unit)	Submitted: HW top left ONLY	
Door Handing (Facing Unit)	UV-1: Left Hand Hinge UV-2: Double Doors	
Delivery contact name and Phone Number		
Delivery Address		145 Rainbow Dr, Hamilton, ON L8K 4G1

Please Note

Any changes after of Delivery Confirmation will incur a minimum change order fee of \$950 and will change the promised delivery date.

Standard Colors

Exterior Cabinet Colors



Textured Sand



Textured Gray

Exterior Louver Colors



Bronze



Textured Gray

Colors may not be exactly as seen.
Samples are available upon request.

Unit Option Summary

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Ph: 519.688.6363 · rfq@systemair.net





ALL UNIT OPTION SUMMARY

Project Name: HWDSB Glendale School	CLASS Identification #: 23120028
Engineering Sales Office: TRANE (HAMILTON)	Project Status: Unlocked-Firm Quote
Lead Sales Engineer: Carmine Bozzo	Project Last Modified: 2/27/2024
City:	Initial Firm-Quote Date: 12/15/2023
	Revision Number: 4
	Total Units: 2

	CAH-1 HRA 36 1200 B C IQ UV - 1 1	CAH-2 HPA 36 1200 O B IQ b UV - 2 1
	Description	Description
DESIGN		
Unit Series	Select	Select
Unit Category	Non Compressorized - VCU	Self Contained Air to Air - VCU
Unit Design	Standard Ventilation	Packaged AC with Standard Ventilation Damper
Sound Package	Full IQ Sound Package	Full IQ Sound Package
Heating Type	Hot Water Heating Coil	Hot Water Heating Coil
Cooling Type	Split System Evaporator Coil	Self Contained - Nominal 36 MBtu (3 ton)
Cabinet	B-Cabinet	O-Cabinet
UNIT	S11112B	S27116O
PERFORMANCE		
Supply Voltage	208-240/1/60	208/3/60
Unit Disconnect	Internal Disconnect	Internal Disconnect
Cooling - Split System Direct Expansion Coil	3R (SC VPCOL238) 20x29	
Cooling - Air to Air - Compressor		Nominal 3 ton Cooling
Heating - Hot Water Coil	2R (SC-VPCOL250) 20x29	2R (SC-VPCOL250) 20x29
Primary Filter	2" MERV 13 (16" x 20") quantity x2	2" MERV 13 (18" x 18") quantity x2
Relief Fans (No ERW)	No Relief Fan	
Cooling - Air to Air - Condensing Fan		Delta ECM Condensing Fan
Supply Fan	1/2hp ECM Supply Fan (DFB 10-6)	1/2 hp ECM Supply Fan (DFB 12-6)
Condensate Pump	Condensate Pump	Condensate Pump
CABINET OPTIONS		
Unit & Accessory Color	Color Sand	Color Sand
	TBD	TBD
Unit Doors	Left Hinge Door Punched Grille	Double Tall Doors Punched Grilles
Unit Insulation	Std Acoustic Insulation	Std Acoustic Insulation

HEATING OPTIONS		
Hot Water Coil Connection	HWC exits unit top left	HWC exits unit top left
Hot Water Piping Packages	Piping Package #4 - 1 isolation valve, Y strainer, 2-Way Modulating Control Vlv, Man Bal Vlv + blowdown valve	Piping Package #4 - 1 isolation valve, Y strainer, 2-Way Modulating Control Vlv, Man Bal Vlv + blowdown valve
Hot Water Freeze Protection	Auto Reset LTA	Auto Reset LTA
Hot Water Coil Position	HWC Post Heat	
COOLING OPTIONS		
Cooling Coil Freeze Protection	Snap Disc	
Condensate Drain Pan	Stainless Steel sloped drain pan	Stainless Steel sloped drain pan
ELECTRICAL		
CONTROLS		
Controller & Communication	DDC ready	DDC ready
Controller Room Interface	No Room Interface	No Room Interface
ACCESSORIES		
Exterior Louvers	No Exterior Louver	None (Approval req)
Louver Wall Sleeve	None	None
Louver Color	Not Required	Bronze
		TBD
WARRANTIES		
Warranty Type	1 yr Parts Only	1 yr Parts Only
CAH Notes	- Front door: blank, no return grille	

Mechanical Schedule

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Non Compressorized Units

General Unit Information							Supply & Outside Air Airflow				Condensate Pump	Electrical		
CAH	Name	Tag	Model	Cabinet Size	Type	Filter	Total CFM	Fan Motor HP	Min O.A. F.L.A.	ESP in. wc	F.L.A.	Voltage	M.C.A	M.O.P
CAH-1	HRA 36 1200 B C IQ	UV - 1	Freshman HRA IQ - B Cabinet	25"D x 39.75" W x 91" H	Standard Ventilation	2" Disposable Filters MERV 13(16" x 20")	1200	0.5	4.00	450	0.5	208-240/1/60	5.50	15

CAH	Hot Water Coil										DX Cooling											
	Coil Info		Fluid Properties		EAT	LAT	Flow	WPD	EWT	LWT	Total	Coil Info			EAT		LAT		Refrigerant	RPD	Total	Sensible
	Face Area (sq.ft.)	Rows	Type	%	db°F	db°F	G/min	PSI	°F	°F	mbh	Face Area (sq.ft.)	Rows	Coil Volume (Cu. In)	db°F	wb°F	db°F	wb°F		PSI	mbh	mbh
CAH-1	4.03	2	Water	100	55.02	104.32	3.5	0.24	180	142.13	64.56	4.03	3	196	81.19	68.37	56.23	54.8	R410A	1.01	51.4	32.46

For external duct static 0.25" and below, certified AMCA sound data is available.

Manufacturer's shall provide sound data in accordance to AHRI Standard 260 "Sound Rating of Ducted Air Moving and Conditioning Equipment".

Data to be collected in an AMCA accredited reverberant Laboratory.

Please note, certified AMCA sound data is available only with 2" MERV 8 filters selected.

Sound data is unavailable when any other type of filter is selected.

Supplemental heat is a secondary heat source that is used in conjunction with the heat pump when the primary heating source capacity is not enough to meet heating load. The supplemental heating source will provide the extra heating capacity as required during heat pump operation.

Back Up (or Emergency) heat is a secondary heat source that is only used when the heat pump is unable to run as the main heat source and heat pump operation is terminated. The Emergency or Back Up heating is then the primary heating source.

The electrical ratings (MOP, MCA) and sequence of operations of the unit will change depending on the heating type chosen and required.

	Pipe Sizing (as applicable)		
	Coil	GPM	Copper Sweat (")
Freshman	Hydronic	<=10	3/4
	HW/CW	>=10.1	1
	Steam	n/a	7/8
	Split System	Liquid	3/8
	DX 3 Row	Suction	3/4
	Split System	Liquid	1/2
Sophomore	Dx 4 Row	Suction	7/8
	Hydronic	<=10	3/4
	HW	>=10.1	1
	Steam	n/a	7/8

Compressorized Units

General Unit Information							Supply & Outside Air Airflow				Condenser Fan	Condensate Pump	Electrical			
CAH	Name	Tag	Model	Cabinet Size	Type	Filter	Total	Fan Motor		Min O.A.	ESP			Voltage	M.C.A	M.O.P
							CFM	HP	F.L.A	CFM	in. wc	F.L.A	F.L.A			
CAH-2	HPA 36 1200 O B IQ b	UV - 2	Sophomore HPA IQ - O Cabinet 3T	32" D x 44" W x 91" H	Packaged AC with Standard Ventilation Damper	2" disposable filters MERV 13(18" x 18")	1200	0.5	4.00	450	0.25	6.94	0.50	208/3/60	23.40	30

CAH	Hot Water Coil											Packaged A/C						Packaged A/C - Part Load								
	Coil Info		Fluid Properties		EAT	LAT	Flow	WPD	EWT	LWT	Total	EAT		Cooling ambient	Total	Sensible	EER	Compressor	Airflow	EAT		Cooling ambient	Total	Sensible	EER	IPLV
	Face Area (sq.ft.)	Rows	Type	%	db°F	db°F	G/min	PSI	°F	°F	mbh	db°F	wb°F	db°F	mbh	mbh		FLA	CFM	db°F	wb°F	db°F	mbh	mbh		
CAH-2	4.03	2	Water	100	55.02	110.52	6.1	0.69	180	155.54	72.67	80	67	95	36.3	27.7	11.3	9.6	1200	80	67	80	27	21.6	15.5	13.5

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Please note, certified AMCA sound data is available only with 2" MERV 8 filters selected. Sound data is unavailable when any other type of filter is selected.

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Pipe Sizing (as applicable)			
	Coil	GPM	Copper Sweat (")
Freshman	Hydronic	<=10	3/4
	HW/CW	>=10.1	1
	Steam	n/a	7/8
	Split System	Liquid	3/8
	DX 3 Row	Suction	3/4
	Split System	Liquid	1/2
Sophomore	Dx 4 Row	Suction	7/8
	Hydronic	<=10	3/4
	HW	>=10.1	1
	Steam	n/a	7/8

Wiring Diagrams

As Built Wiring Diagram To Follow

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Shop Drawings

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BACK VIEW

39 1/4
91
30
8
A
2 CONDENSATE DRAIN LINES EXITING THROUGH LOWER BACK OF UNIT

TOP VIEW

38
CONNECTION FOR HOT WATER COIL (REFER TO CONFIRMATION SHEET)
24" x 12" x 3/4" RAISE FLANGE DUCT CONNECTION
REFRIGERANT CONNECTION (REFER TO CONFIRMATION SHEET)
FIELD WIRING CONDUIT
UNIT FRONT
ACCESS PANEL
REQUIRED CLEARANCE

UNIT	DIM "A"
STD SOUND	22"
IQ SOUND	32 1/2"

RIGHT SIDE VIEW

25 SUPPLY AIR
CONDENSATE DRAIN PAN
ELECTRICAL CONTROL BOX
(2)- DISPOSABLE AIR FILTERS
FACTORY SUPPLIED & INSTALLED DAMPER ACTUATOR
RETURN AIR DAMPER
RETURN AIR

SUPPLY FAN(S)
HOT WATER HEATING COIL
DX COOLING COIL
30" X 8" OUTSIDE AIR DAMPER
OUTSIDE AIR INTAKE

FRONT VIEW

RETURN AIR
Front Door To Be Blank
Side Return To Be Field Cut On-Site

REAR VIEW

H+1/2" (WALL SLEEVE)
W+1/2" (WALL SLEEVE)
W (LOUVER)
H (LOUVER)
H+1" (WALL OPENING)
W+1/2" (WALL SLEEVE)

STANDARD EXTERIOR LOUVER W/ 2" FLANGE (SUPPLIED BY SYSTEMAIR UNLESS SPECIFIED) "SEE MANUFACTURERS CUTSHEET FOR EXACT DETAIL ON LOUVER"

RIGHT SIDE VIEW

SUPPLY AIR
WALL SLEEVE DEPTH TO SUIT WALL THICKNESS (SUPPLIED BY SYSTEMAIR UNLESS SPECIFIED)
H (LOUVER SIZE)
H+1" (WALL OPENING HEIGHT)
OUTSIDE AIR INTAKE
B
RETURN AIR
FINISHED FLOOR LEVEL

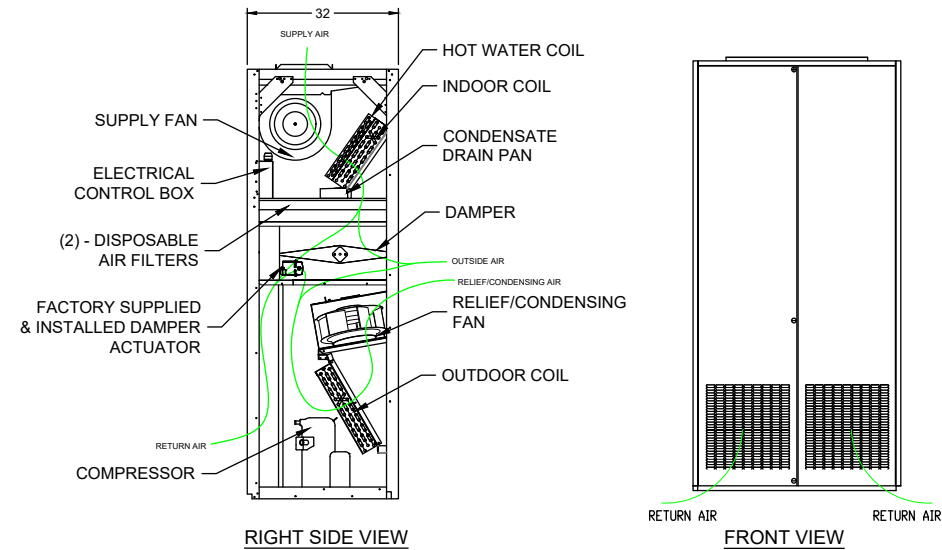
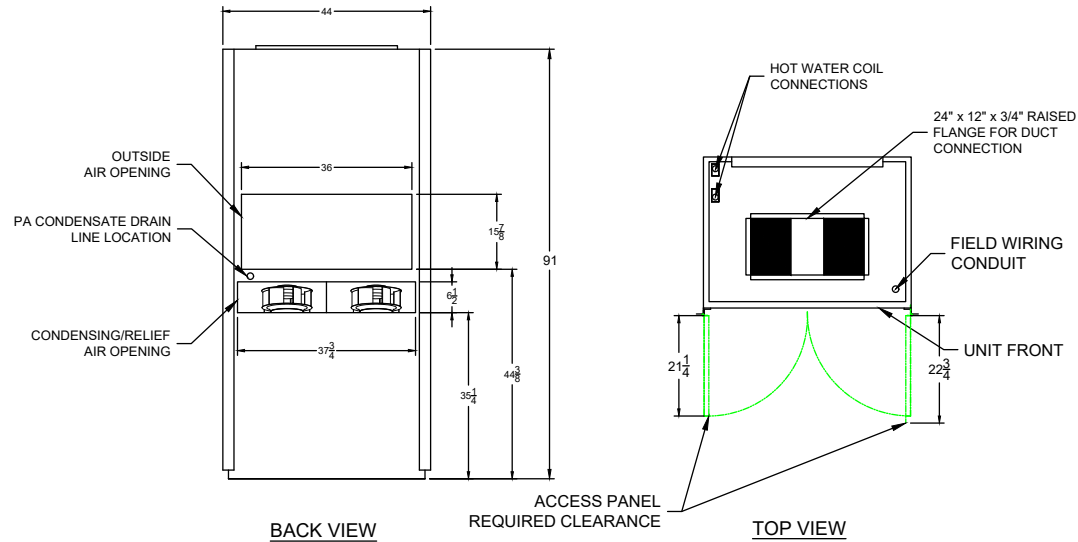
OPTION AND SOUND PACKAGE	LOUVER SIZE	SILL HEIGHT (A.F.F) DIM "B" RANGE
OPTION 1 (CLASS DEFAULT) STD SOUND	36"W X 2"D X 36"H	0" TO 16 1/2"
OPTION 1 (CLASS DEFAULT) IQ	36"W X 2"D X 36"H	4 1/2" TO 27"
OPTION 2 (STD W/O POWER RELIEF) STD SOUND	36"W X 2"D X 20"H	9 3/4" TO 16 1/2"
OPTION 2 (STD W/O POWER RELIEF) IQ	36"W X 2"D X 20"H	20 1/2" TO 27"

NOTE: OPTIONAL POWER RELIEF FAN NOT SHOWN, SILL HEIGHT WILL BE FIXED AT 10" AFF WITHOUT A REAR PLENUM

ATTENTION:

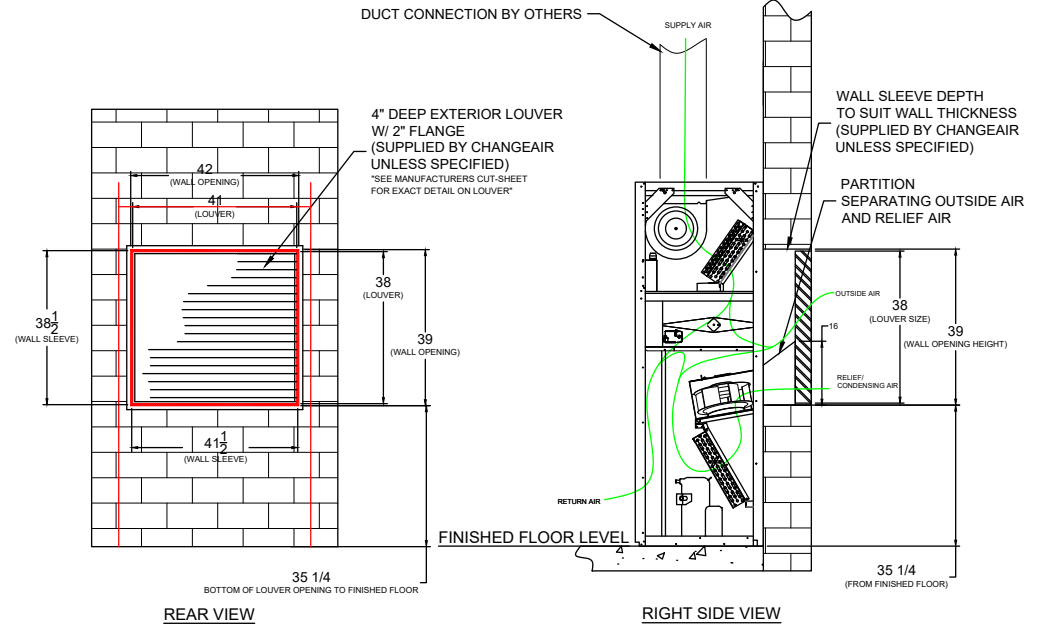
1. THE UNIT MUST BE INSTALLED PROPERLY ON LEVEL FLOOR SURFACE
2. THE UNIT MUST BE LAGGED TO THE FLOOR
3. IMPROPER STATIC PRESSURE CONTROL OF THE VENTILATED SPACE WILL AFFECT VENTILATION CAPACITY
4. SEE OWNER'S MANUAL-INSTALLATION, OPERATING & SERVICE INSTRUCTIONS (IN UNIT) FOR MORE DETAILS
5. FOR DIMENSIONS OF ACCESSORIES, SILL HEIGHTS AND PIPING LOCATIONS PLEASE REFER TO THE CONFIRMATION SHEET

UNIT TYPE:	FRESHMAN-HW HEAT-SPLIT DX COOLING-B CABINET
UNIT WEIGHT:	750 lbs



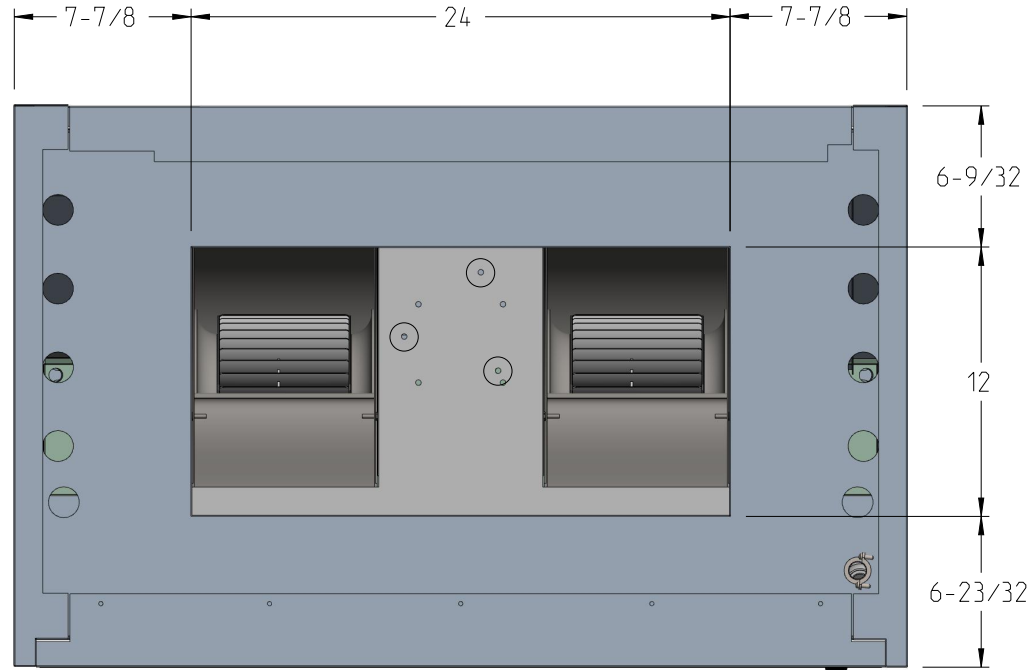
ATTENTION:

1. THE UNIT MUST BE INSTALLED PROPERLY ON LEVEL FLOOR SURFACE
2. THE UNIT MUST BE LAGGED TO THE FLOOR
3. IMPROPER STATIC PRESSURE CONTROL OF THE VENTILATED SPACE WILL AFFECT VENTILATION CAPACITY
4. SEE OWNER'S MANUAL-INSTALLATION, OPERATING & SERVICE INSTRUCTIONS (IN UNIT) FOR MORE DETAILS






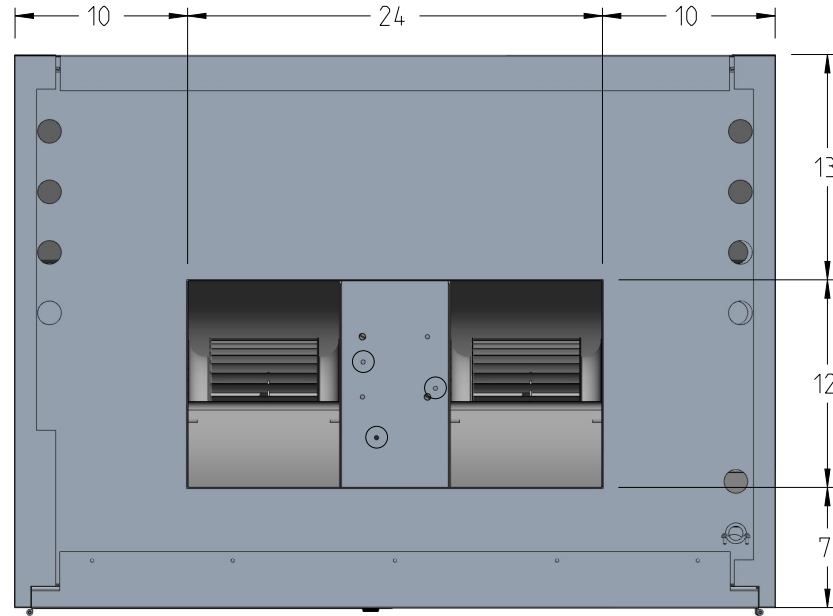
CLASS DRAWING NUMBER D-271160








FRONT SIDE OF UNIT

				1- ALL BEND 90° UP UNLESS OTHERWISE NOTED	 8 Rouse Street Tillsonburg, ON, N4G 5W8 CANADA Tel: (519) 688-6363	DRAWN BY: Divyajeetsinh Alonja	DATE: 08-Dec-2023
				2- DIMENSIONS ARE CONSIDERED TO BE OUTSIDE BEND UNLESS OTHERWISE NOTED		DESCRIPTION: B-CAB TOP DUCT CONNECTION	MASS: XX KG
				3- FLAT VIEW DIMENSIONS ARE SET UP REFERENCE ONLY		DRAWING NO.:	SCALE: NTS
REV	MODIFICATIONS	BY:	DATE	ALL DIMENSIONS IN MILLIMETERS DIMENSIONS IN PARENTHESIS (INCHES)	XX Ga. MATERIAL: N/A	The duplication and usage of this document or the contents thereof, without proper authorization is strictly prohibited.	
				 GENERAL TOLERANCES: ±1.0MM	PAINT: CUSTOM		



FRONT SIDE OF UNIT

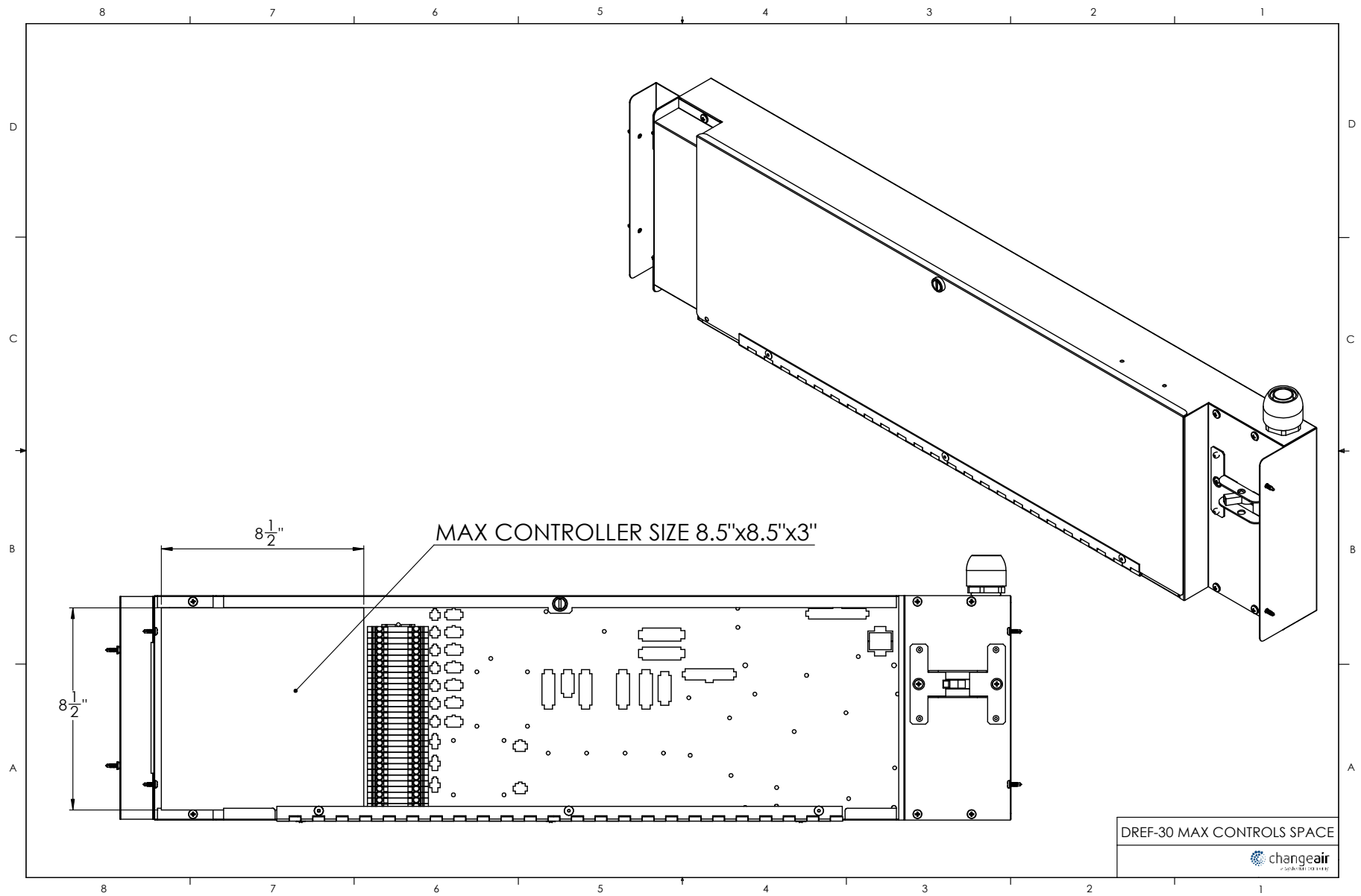
				1- ALL BEND 90° UP UNLESS OTHERWISE NOTED	 8 Rouse Street Tillsonburg, ON, N4G 5W8 CANADA Tel: (519) 688-6363	DRAWN BY: Divyajeetsinh Alonja	DATE: 08-Dec-2023
				2- DIMENSIONS ARE CONSIDERED TO BE OUTSIDE BEND UNLESS OTHERWISE NOTED		DESCRIPTION: O-CAB TOP DUCT CONNECTION	MASS: N/A
				3- FLAT VIEW DIMENSIONS ARE SET UP REFERENCE ONLY		DRAWING NO.:	SCALE: NTS
REV	MODIFICATIONS	BY:	DATE	ALL DIMENSIONS IN MILLIMETERS DIMENSIONS IN PARENTHESIS (INCHES)	MATERIAL: N/A PAINT: N/A	The duplication and usage of this document or the contents thereof, without proper authorization is strictly prohibited.	
				 GENERAL TOLERANCES: ±1.0MM			 1/1

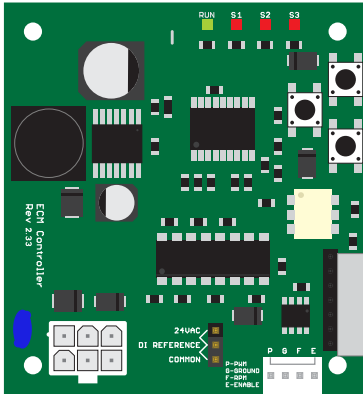
Controls

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ECM Controller 2.33

Operating Instructions

Operation

On power up the green Run LED will light indicating the control board is ready to receive an input signal on any of the inputs. Applying a 24VAC input voltage to any of the digital inputs will command the control board to output the programmed duty cycle associated to that particular input. Typically Input 1 is used for the slowest fan speed and Input 3 the highest. The control boards input priority order is Input 3, Input 2, Input 1 and lastly the analog input. A control signal on Input 2 will override Input 1. The same applies for Input 3, regardless if an input signal is present on Input 1, Input 2 or the analog input. LED's S1, S2 and S3 are provided to give a visual indication of which input is currently selected. If a 0.5V to 10VDC signal is applied the S1 LED will flash indicating there is a signal present and the output will be proportional to the input. For example:

2VDC = 20% Duty Cycle (approx. 4.7V measured on red wire, P terminal on CN3)
 8VDC = 80% Duty Cycle (approx. 18.8V measured on red wire, P terminal on CN3)

A signal below 0.5VDC is not considered to be valid.

NOTE: If no input signal is being detected on the digital inputs and you are confident there is a signal present you may have to switch the input reference point by moving the jumper JP1 to the alternate pin pair. The default setting is for a controller switching the 24VAC line.

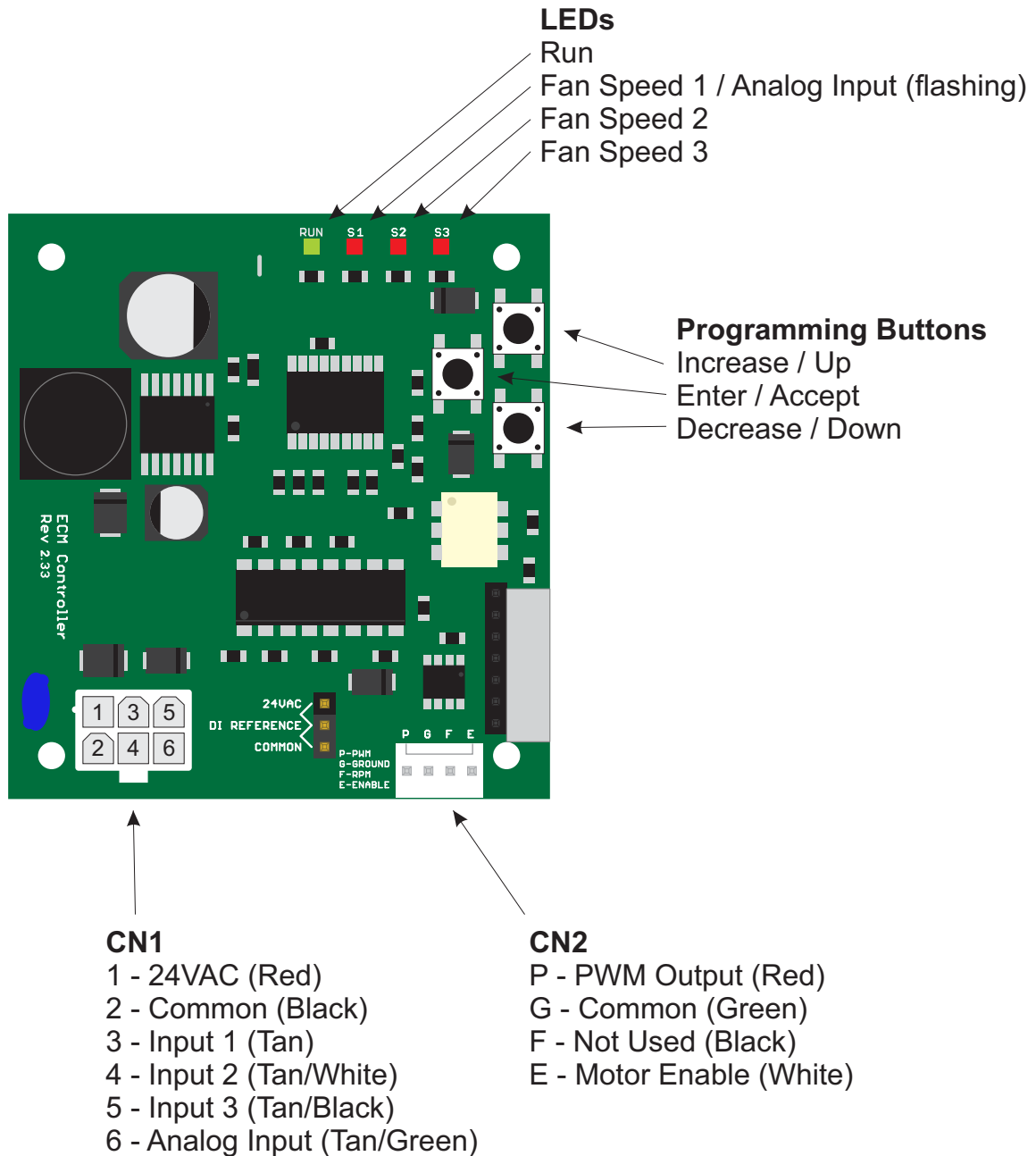
Setup / Programming

Upon power up you will then be able to program the output duty cycle that correspond to their respective inputs. To program Input 1 press the SETUP button once. You'll notice the Run LED will turn off and the S1 LED will now be lit.

Using the UP and DOWN buttons you will be able to increase or decrease the duty cycle output. Pressing and holding the UP / DOWN button will steadily increase/decrease the duty cycle output. Once the desired voltage is reached press the SETUP button to save the setting and advance to the next input. If no change is necessary just press the SETUP button to advance to the next input. After Input 3 is set press SETUP to save the settings and return to run mode.

NOTE: Whenever the Run LED is off the controller is in program mode and will ignore all inputs. If no button is pressed for 20 seconds the controller will return to run mode. If this happens the controller will revert back to the previously programmed duty cycle for that particular input that you were programming.

Component Locations





8 Rouse Street, Tillsonburg, ON N4G 5W8
 Ph 519-688-6363 Fax 519-688-7851
 www.changeair.com

SEQUENCE OF OPERATIONS

1 OVERVIEW

- 1.1 Standard Elementary School
- 1.2 Series: Freshman Series Classroom Air Handler
 - 1.2.1 Standard remote cooling (Split system)
 - 1.2.2 Power Relief
- 1.3 Controller supplied by others

2 SEQUENCE

2.1 Occupied

- 2.1.1 The occupied cycle of the unit will be controlled by the schedule within the control system and or the space occupancy sensor if available.
- 2.1.2 During the occupied cycle, the outdoor air damper will be enabled to a predetermined position. When directed so by high carbon dioxide signals (if CO₂ is available) or an economizer signal, the outdoor air damper will continue to open together with the return air damper closing.
- 2.1.3 The supply fan will operate continuously regardless of outdoor air requirements until unit is moved to the unoccupied state.
- 2.1.4 Heating - when room space temperature falls below programmed occupied room temperature set point, the heating source will be enabled until room space temperature is met.
- 2.1.5 Cooling - when room space temperature rises above programmed occupied room temperature set point, the mechanical cooling signal will be enabled until room space temperature is met.
- 2.1.6 Economizer - during a call for cooling and when the outdoor to indoor air temperature delta is sufficient to cool the room space, the outdoor air damper will modulate open together with the return air damper modulating closed to achieve set point (discharge air temperature not to fall below 50 F.).

2.2 Unoccupied

- 2.2.1 Unoccupied cycles will be determined by the schedule within the control system and or when the space occupancy sensor (if available) does not see motion for a predetermined period.
- 2.2.2 During the unoccupied cycle the return air damper will be fully open and the outdoor air bypass damper will only be enabled during an economizer cycle (CO₂ if available will be disabled).
- 2.2.3 The supply fan will only operate as required during a call for heating or cooling.
- 2.2.4 Heating - when room space temperature falls below programmed unoccupied room temperature set point, the heating source will be enabled until room space temperature is met.
- 2.2.5 Cooling - when room space temperature rises above programmed unoccupied room temperature set point, the mechanical cooling signal will be enabled until room space temperature is met.
- 2.2.6 Economizer - cycle will operate the same during the unoccupied cycle as when in the occupied cycle.



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2.3 Preconditioning/Standby

- 2.3.1 Unit operates at occupied set points with ventilation disabled. Outdoor air damper and relief fan are all disabled.

3 SYSTEM PROTECTIONS

3.1 Temperature, electrical & safety

- 3.1.1 A temperature disc will monitor the temperature leaving the evaporator coil temperature and if it falls below a fixed threshold, indicating that the coil is freezing, the cooling signal will be disabled until the temperature returns to a normal state.
- 3.1.2 If the low voltage door switch is open, all mechanical relays will be disabled effectively disabling all heating, cooling and fan operations. All dampers will receive no signals and return to their default spring return positions.

4 SUPPORTING INFORMATION

4.1 Inputs/Outputs

4.1.1 Inputs

- Analog - Room Space temperature
- Analog - Mixed temperature
- Analog - Discharge temperature
- Analog - Outdoor temperature
- Analog - CO2 Sensor (Optional)
- Binary - Occupancy Sensor (Optional)

4.1.2 Outputs

- Analog - Supply Fan
- Analog - Hot water valve (optional)
- Binary - Electric Heat Stage 1 (optional)
- Binary - Electric Heat Stage 2 (optional)
- Analog - Gas furnace output (Optional)
- Binary - Gas furnace signal (Optional)
- Binary - DX Cooling (remote cooling signal)
- Analog - Return/outdoor air damper
- Analog - Relief fan **Applies to only ECM fan relief

4.2 Suggested Values

- Preconditioning time - 7:00am
- Occupied time - 8:30am
- Unoccupied with motion - 9:00am
- Unoccupied without motion - 4:30pm
- Occupied heat - 70 F, 21 C
- Unoccupied heat - 60 F, 16 C
- Occupied cool - 75 F, 24 C
- Unoccupied Cool - 79 F, 26 C



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- 4.3 Components covered in the sequence which need to be supplied by others
 - Unit controller
 - Room interface including room space temperature sensor
 - Occupancy sensor (optional)
 - CO2 monitor (optional)
 - Discharge air temperature sensor
 - Mixed air temperature sensor
 - Outdoor air temperature sensor

- 4.4 Components included with manufactured equipment
 - Compressor relays
 - 75VA control transformer
 - Damper actuators
 - ECM supply fan control board (receives a 0-10vdc signal from the controller and outputs a PWM signal to the supply fan for full modulating control.
 - ECM relief fan control board (receives a 0-10vdc signal from the controller and outputs a PWM signal to the supply fan for full modulating control.

So

Sequence of Operations - Sophomore VPS

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Sequence of Operations

Sophomore Series

1 Overview

- 1.1 Standard Elementary School
- 1.2 Series: Sophomore Series Classroom Air Handler
- 1.2.1 Packaged air unit with optional hot water heat
- 1.2.2 Standard packaged air unit with optional electric heat
- 1.3 Controller supplied by others

2 Sequence

2.1 Occupied

- 2.1.1 The occupied cycle of the unit will be controlled by the schedule within the control system and/or the space occupancy sensor if available.
- 2.1.2 During the occupied cycle, the outdoor air damper will be enabled and open to a predetermined minimum position. When directed so by high carbon dioxide signals (if CO2 is available) or by an economizer signal, the outdoor air damper will modulate open. For the purpose of standard operating ventilation 450cfm (typical), the condenser fan will also operate as a relief fan. The condenser/relief fan shall be modulated from 20% up to a percentage that ensures that the appropriate amount of relief air is expelled from the space.
- 2.1.3 The supply fan will operate continuously regardless of outdoor air requirements until unit is moved to the unoccupied state.
- 2.1.4 Heating – when room space temperature falls below programmed occupied room temperature set point, the primary heat (Heat pump, electric, or hydronic) will be enabled until room space temperature is met (For Heat pump application, the reversing valve is enabled if valve is in fail-cool configuration). Second stage primary (electric/heat pump)

will also be supplied if required to meet room temperature set point (also additional stages or supplemental electric if applicable). If supplementary heat is modulated, the further the room space temperature moves off set point, the further the secondary heat will be modulated on (supplemental hydronic). For hydronic applications, if room space temperature is met, the primary heat will maintain at least a 65°F discharge air temperature. For electric heating purposes, the supply fan shall be increased to the maximum scheduled cfm to ensure the discharge air temperature does not exceed 100°F. The electric heating stages shall cycle if the supply fan is insufficient to maintain maximum discharge air temperature.

2.1.5 Cooling – when room space temperature rises above programmed occupied room temperature set point and economizer cooling is unavailable, the two-stage mechanical cooling and the condenser fan will be enabled until room space temperature is met. The controller will monitor the discharge air temperature and modulate the supply fan from minimum speed to maximum speed in order to maintain a discharge air temperature of 55°F (adjustable). The condenser fan shall be modulated from a minimum of 20% to its maximum. The maximum flow rate of the condensing fan is 2700cfm. Mechanical cooling will be disabled with outdoor temperatures below 55°F.

2.1.6 Economizer – during a call for cooling and when the outdoor-to-indoor air temperature (delta) is sufficient to cool the room space, the outdoor air damper will modulate open, return air damper modulating closed to achieve set point, and the relief fan will be enabled to achieve

set point. For the purposes of economization, the condenser fan will also operate as a relief fan. The relief fan shall be modulated from 20% up to a percentage that does not exceed the current supply volume called for by the unit. Discharge air temperature shall be maintained at or above 50°F (mixed minimum temperature).

2.2 Unoccupied

- 2.2.1 Unoccupied cycles will be determined by the schedule within the control system and/or when the space occupancy sensor (if available) does not see motion for a predetermined period.
- 2.2.2 During the unoccupied cycle, the outdoor air damper will only be enabled during an economizer cycle (CO2, if available, will be disabled).
- 2.2.3 The supply fan will cycle as required during a call for heating, cooling, or economizing.
- 2.2.4 Heating – when room space temperature falls below programmed unoccupied room temperature set point, the primary heat (Heat pump, electric, or hydronic) will be enabled until room space temperature is met. The further the room space temperature moves off set point, second stage primary (electric/heat pump)/modulated (hydronic) heat will also be supplied (also additional stages, supplemental electric/hydronic, if applicable).
- 2.2.5 Cooling – when room space temperature rises above programmed unoccupied room temperature set point, the mechanical cooling, and the condenser fans, will be enabled until room space temperature is met.
- 2.2.6 Economizer - cycle will operate the same

during the unoccupied cycle as when in the occupied cycle.

2.3 Preconditioning/Standby

- 2.3.1 Unit operates at occupied set points with ventilation disabled. Outdoor air, as well as the relief/condensing fans are disabled.

2.4 Dehumidification – Hot Gas Reheat

- 2.4.1 The unit shall cycle into DH mode under two circumstances. If the unit is currently in cooling mode and the rh level is greater than the rh set point, then the unit will go into a continuation dehumidification process. This process holds the compressor on and engages the reheat valve to begin a DH cycle at the end of a cooling call. It is disabled when room rh drops below (rh set point – rh Δ). The second DH condition is when the room rh is (rh set point + rh Δ), the unit will engage the compressor and reheat valve to lower the rh to (rh set point – rh Δ). DH mode consists of stage two compressor, low speed fan and the hot gas reheat valve energized.

If the space temp rises to (space set point + space set point Δ) DH mode is disabled with the compressor still on to cool the room back to set point. After set point is reached, DH mode is enabled again with the compressor still running.

2.5 Condenser Fan Settings – Standard Condition

	Stage 1 @ 90°F (32°C)	Stage 2 @ 90°F (32°C)
2 Ton	50%	50%
3 Ton	60%	67%
4 Ton	70%	83%
5 Ton	80%	100%

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Sequence of Operations

Sophomore Series

3 System Protections

3.1 Temperature, electrical, & safety

- 3.1.1** A temperature disc (standard), or averaging bulb sensor (optional), will monitor the temperature leaving the hot water coil and if it falls below a fixed threshold of 37°F, the water valve will spring return open, the supply fan will be disabled, and the outdoor air damper will close until the temperature rises back above the minimum allowable water temperature.
- 3.1.2** ERW freeze protection is provided by ramping the relief fan to increase the amount of relief air leaving the wheel to keep it above the freezing threshold (22°F).
- 3.1.3** If the low voltage door switch is open, all mechanical relays will be disabled effectively immobilizing all heating, cooling, and fan operations. All dampers will receive no signals and return to their default spring return positions.
- 3.1.4** The compressor will have cycle protection built into the control programming, not allowing the compressor to restart for any reason within five minutes of stopping.
- 3.1.5** A temperature disc/freeze-stat will monitor the temperature of the evaporator coil (located on the DX coil) and if it falls below the fixed 37°F setting, mechanical cooling will be disabled until the temperature rises back above 59°F.

4 Supporting Information

4.1 Inputs/Outputs

- 4.1.1** Inputs
 - Analog – Room Space temperature
 - Analog – Mixed temperature (Optional)

- Analog – Discharge temperature
- Analog – Outdoor temperature
- Analog – Relief temperature (ERW leaving air temp)
- Analog – CO2 Sensor (Optional)
- Analog – Humidity sensor (Optional)
- Analog – Condenser Temperature (Standard)
- Analog – Damper position feedback (Optional)
- Analog – Valve position feedback (Optional)
- Binary – Dirty Filter Switch (Optional)
- Binary – Occupancy/Motion Sensor (Optional)
- Binary – Smoke detector (Optional)
- Binary – Low pressure switch (Standard)
- Binary – Drain pain overflow switch (Optional)
- Binary – Hot water coil freeze-stat status (Optional)
- Binary – DX coil freeze-stat status (Optional)

4.1.2 Outputs

- Analog – Supply Fan
- Analog – Economizer/Outdoor air damper
- Analog – Return damper
- Analog – Condenser damper
- Analog – Hot water valve
- Analog – Chilled water valve
- Analog – SCR electric heat
- Analog – Baseboard heater
- Analog – Relief/Condenser Fan
- Binary – Compressor stage one
- Binary – Compressor stage two
- Binary – SCR electric heat enable

- Binary – Electric Heat Stage 1
- Binary – Electric Heat Stage 2
- Binary – Hot Gas Reheat
- Binary – Reversing Valve
- Binary – Baseboard Heater

4.2 Suggested Values

- Preconditioning time – 7:00am
- Occupied time – 8:30am
- Unoccupied with motion – 9:00am
- Unoccupied without motion – 4:30pm
- Occupied heat – 70°F, 21°C
- Unoccupied heat – 60°F, 16°C
- Occupied cool – 75°F, 24°C
- Unoccupied Cool – 79°F, 26°C

4.3 Components covered in the sequence which need to be supplied by others

- Unit controller
- Room interface including room space temperature sensor
- Occupancy sensor (optional)
- CO2 monitor (optional)
- Discharge air temperature sensor
- Mixed air temperature sensor
- Outdoor air temperature sensor

4.4 Components included with manufactured equipment

- Compressor relays
- 75VA control transformer
- Damper actuator
- ECM supply fan control board (receives a 0-10vdc signal from the controller and outputs a pulse width signal to the supply fan for full modulating control.

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Piping Components

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B Series Forged Brass Ball Valves with Drain

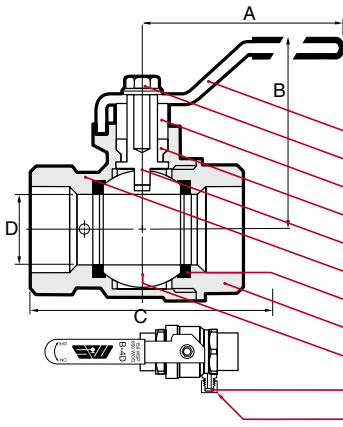
B-3D

Full port
Two piece body
Blowout-proof stem
Adjustable packing gland
600 WOG, ANSI B1.20.1 NPT
Markings to MSS - SP25
NPT threads to manufacturer's standard
CRN number available upon request

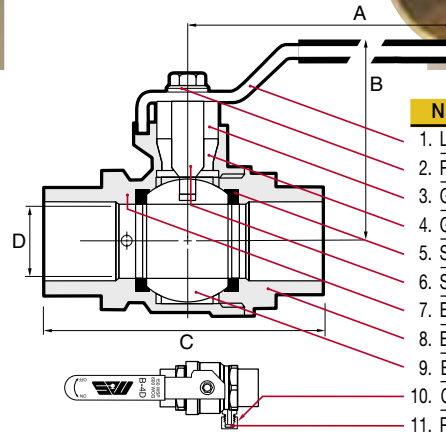


B-4D

Full port
Two piece body
Blowout-proof stem
Adjustable packing gland
600 WOG
Markings to MSS - SP25
ANSI B16.22 solder ends (CXC)
CRN number available upon request



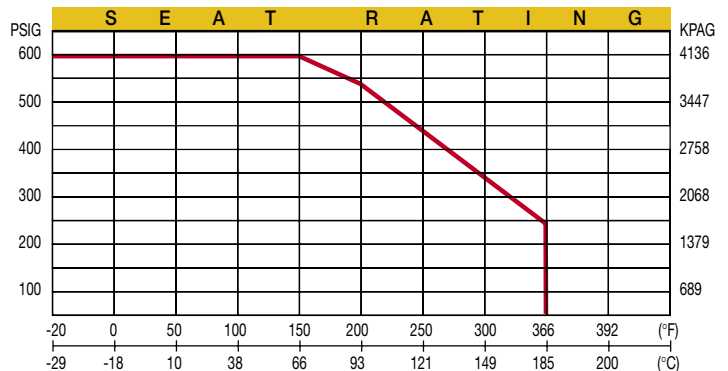
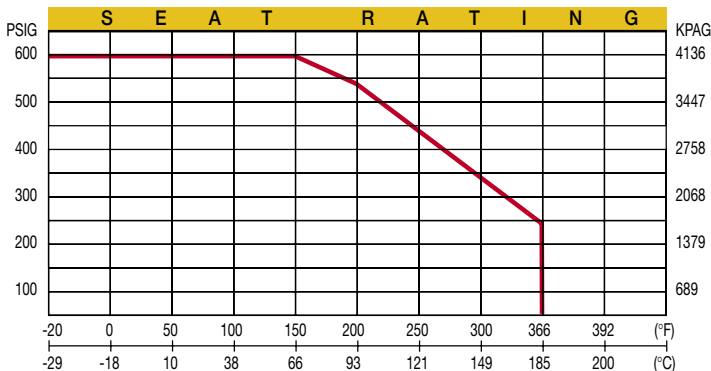
NAME / MATERIAL	
1.	Lever / Steel ASTM A36
2.	Retaining Screw / Steel ASTM A36
3.	Gland Nut / Brass ASTM B124-C37700
4.	Packing Ring / Teflon PTFE
5.	Stem / Brass ASTM B124-C37700
6.	Body / Brass B-283-C37700
7.	Seat / Teflon PTFE
8.	Body / Brass B-283-C37700
9.	Ball / Brass B283-C37700
10.	Cap Washer / EPDM 50/60 SH
11.	Plug / Brass B124-C37700



NAME / MATERIAL	
1.	Lever / Steel ASTM A36
2.	Retaining Screw / Steel ASTM A36
3.	Gland Nut / Brass ASTM B124-C37700
4.	Gasket / Teflon PTFE
5.	Seats / Teflon PTFE
6.	Stem / Brass ASTM B124-C37700
7.	Body / Brass B-283-C37700
8.	Body / Brass B-283-C37700
9.	Ball / Brass B283-C37700
10.	Cap Washer / EPDM 50/60 SH
11.	Plug / Brass B124-C37700

D I M E N S I O N S			
size (in.)	1/2	3/4	1
A	91.5	91.5	126.5
mm/in	3.60	3.60	4.98
B	54.4	57.8	66.3
mm/in	2.14	2.28	2.61
C	53.0	62.0	71.0
mm/in	2.08	2.44	2.80
D	15.0	20.0	25.0
mm/in	0.59	0.78	0.98
CV	15	30	60
Weight	0.56	0.78	1.25
lb/kg	0.254	0.353	0.567

D I M E N S I O N S			
size (in.)	1/2	3/4	1
A	91.5	91.5	126.5
mm/in	3.60	3.60	4.98
B	54.4	57.8	66.3
mm/in	2.14	2.28	2.61
C	56.5	75.0	87.0
mm/in	2.22	2.95	3.43
D	15.0	20.0	25.0
mm/in	0.59	0.78	0.98
CV	15	30	60
Weight	0.59	0.78	1.25
lb/kg	0.267	0.353	0.567



Solder ends subject to limits as specified by ANSI B16.22

HCi Drain or Blowdown BALL VALVE w/ 3/4" GARDEN HOSE MALE MECHANICAL CAP AND RETAINER SPECIFICATIONS



These Drain and Blowdown ball valves by **HCi** are specifically designed for commercial and industrial applications for use in complementing the **Terminator System** product line. Like all **Terminator System** valves these components boast a state of the art hot forged brass body and hard chrome plated brass ball which insures reliable, leak-free performance.

These valves have an integrated 3/4" male garden hose end connection with a durable plastic retainer and brass cap. Featuring the "triple sealed stem" which utilizes a virgin PTFE gland packing and two Viton O-ring stem seals this valve ensures the most reliable and high cycle-life stem available anywhere. Using these valves in your system is the perfect compliment to the incredibly high standard set forth by all the other **Terminator System** products.

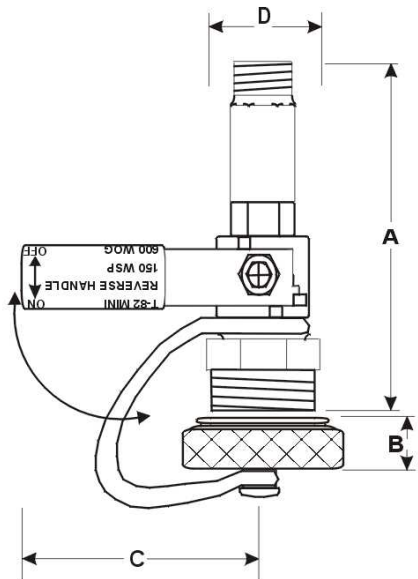
Pressure/ Temperature Ratings:

1/8"x3/4"- 1/4"x3/4": 600 PSI WOG Non - Shock

All Sizes: 300 Deg. F. Maximum

Dimensional Information & Material Specifications:

Model #	Size	A	B	C	D
TQ-B1	1/4"NPTx3/4"GH	2.98	0.52	1.64	1.06
TQ-B2	1/8"NPTx3/4"GH	2.98	0.52	1.64	1.06



Valve Body:	Hot Forged Brass
Ball:	Chrome Plated/Hot Forged Brass
Stem:	Extruded Brass
Lever Handle:	Dacromet Coated Steel w/PVC Grip
Lever Screw:	Dacromet Coated Steel
Seats & Packing:	Virgin PFTE
O-Rings:	Viton

Typical Specifications:

Furnish and install where indicated on plans **drain and blowdown ball valves** as provided by **Hydronic Components, Inc.** Valves shall be rated for 600 PSI WOG service. Valves shall be provided complete with chrome plated ball and repackable blowout-proof triple seal stem with 3/4" hose end connection, durable plastic retainer and brass cap.

JOB: _____ ENGINEER: _____
 REP: _____ CONTRACTOR: _____

Y Strainers

Cast Iron NPT Threaded, Cast Bronze NPT Threaded & Sweat End

Types T250G Cast Iron & TB150 & TB300 Bronze, **TB150SW**



Features

Sure Flow threaded strainers in Cast Iron and Cast Bronze feature a machined, tapered seat which ensures a perfect fit for the removable, stainless steel screen. All sizes come complete with NPT blow-off with plug, which can be replaced with a ball valve for on-line blow-down of particulate.

Construction

Cast Iron - Body, cover, plug - High Tensile ASTM A126 Class B Cast Iron

All screens are Stainless Steel

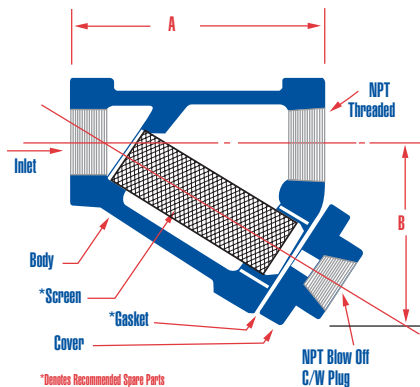
Cast Bronze - Body, cover, plug - ASTM B62 Bronze

Operating Pressures and Temperatures

Type	Size	PSI @ Temp Steam*	PSI @ Temp WOG
T250G	1/4" - 3"	250 400 °F	400 150 °F
Tb150	1/4" - 3"	150 358 °F	300 150 °F
Tb300	1/2" - 3"	300 400 °F	400 150 °F

Standard Screens

Size	Std.	Opening
1/4" - 2"	20 mesh	0.032"
2 1/2" - 3"	3/64" perf	0.045"



Dimensional Data

Size		A				B				Blow-Off NPT			Shipping Weight (lbs)		
Inches	Prefix	TB150	TB150SW	T250G	TB300	TB150	TB150SW	T250G	TB300	TB150	TB150SW	T250G	TB300	TB150 & T250G	TB300
1/4	0025	3 7/32	3 11/12	2 5/8		2 5/32	2 3/8	2		3/8	3/8	1/4		2	
3/8	0038	3 7/32	3 11/12	2 5/8		2 5/32	2 3/8	2		3/8	3/8	1/4		2	
1/2	0050	3 7/32	3 11/12	3 1/4	3	2 5/32	2 3/8	2 1/4	2 5/16	3/8	3/8	1/4	3/8	2 1/2	2 1/2
3/4	0075	3 15/16	4 11/32	3 3/4	3 7/16	2 3/4	2 3/4	2 5/8	2 1/2	3/8	3/8	1/2	3/8	3	3
1	0100	4 17/32	5	4	4 1/16	2 15/16	3 3/16	2 3/4	3 1/8	1/2	1/2	1/2	3/4	5	6
1 1/4	0125	5 11/32	5 29/32	5	4 7/8	3 9/16	3 23/32	3 3/4	3 5/8	1/2	1/2	3/4	3/4	9	9
1 1/2	0150	6 7/32	6 29/32	5 13/16	5 3/4	3 27/32	4 1/8	4	4 1/8	1/2	1/2	3/4	3/4	10	11
2	0200	7 1/2	8 21/32	7	6 3/4	5 7/16	5 3/16	5	5	1/2	1/2	1	3/4	16	19
2 1/2	0250	9 1/16		9 5/16	7 1/2	5 29/32		6	5 1/4	1/2		1 1/2	1 1/4	29	29
3	0300	10 7/32		10 1/8	8 1/2	6 9/32		7	6 1/2	1/2		1 1/2	1 1/4	38	42

Ordering Information

Example: Include full description

Size (Prefix) Model Number *Screen Opening

0150 - T250G - 032

1 1/2" NPT, Y Strainer, Cast Iron, 20 Mesh Screen

Notes

Manufacturer reserves the right to modify dimensions, materials, or design. Contact factory for certification.

*Must specify if for steam service.





B2/B3 Series Characterized Control Valve™, Spring Return Actuator

Two-way and Three-way Valves with **Chrome Plated Brass Ball and Brass Stem**, NPT female ends



2 Way Valve for hot water



B2...B Two-way Characterized Control Valve, Chrome Plated Brass Ball and Brass Stem

Model # CCV Valve	C _v Rating	Valve Nominal Size		Close-Off psi	Spring Return Actuator		
		Inches	DN mm		On/Off	Floating	Proportional
					TF24 US	TF24-3 US	TF24-SR US
B207B	0.3	1/2"	15	200	<input type="checkbox"/> Pg 28	<input type="checkbox"/> Pg 30	<input type="checkbox"/> Pg 32
B208B	0.46	1/2"	15	200	<input type="checkbox"/> Pg 28	<input type="checkbox"/> Pg 30	<input type="checkbox"/> Pg 32
B209B	0.8	1/2"	15	200	<input type="checkbox"/> Pg 28	<input type="checkbox"/> Pg 30	<input type="checkbox"/> Pg 32
B210B	1.2	1/2"	15	200	<input type="checkbox"/> Pg 28	<input type="checkbox"/> Pg 30	<input type="checkbox"/> Pg 32
B211B	1.9	1/2"	15	200	<input type="checkbox"/> Pg 28	<input type="checkbox"/> Pg 30	<input type="checkbox"/> Pg 32
B212B	3.0	1/2"	15	200	<input type="checkbox"/> Pg 28	<input type="checkbox"/> Pg 30	<input type="checkbox"/> Pg 32
B213B	4.7	1/2"	15	200	<input type="checkbox"/> Pg 28	<input type="checkbox"/> Pg 30	<input type="checkbox"/> Pg 32
B214B	7.4	1/2"	15	200	<input type="checkbox"/> Pg 28	<input type="checkbox"/> Pg 30	<input type="checkbox"/> Pg 32
B215B*	10	1/2"	15	200	<input type="checkbox"/> Pg 28	<input type="checkbox"/> Pg 30	<input type="checkbox"/> Pg 32
B217B	4.7	3/4"	20	200	<input type="checkbox"/> Pg 28	<input type="checkbox"/> Pg 30	<input checked="" type="checkbox"/> Pg 32
B218B	7.4	3/4"	20	200	<input type="checkbox"/> Pg 28	<input type="checkbox"/> Pg 30	<input type="checkbox"/> Pg 32
B219B	10	3/4"	20	200	<input type="checkbox"/> Pg 28	<input type="checkbox"/> Pg 30	<input type="checkbox"/> Pg 32
B220B*	24	3/4"	20	200	<input type="checkbox"/> Pg 28	<input type="checkbox"/> Pg 30	<input type="checkbox"/> Pg 32
Electrical Connection					3 ft cable, 1/2" conduit fitting	3 ft cable, 1/2" conduit fitting	3 ft cable, 1/2" conduit fitting

* Models without characterizing discs.
See for corrected C_vs with piping reduction factor



B3...B Three-way Characterized Control Valve, Chrome Plated Brass Ball and Brass Stem

Model # CCV Valve	C _v Rating	Valve Nominal Size		Close-Off psi	Spring Return Actuator		
		Inches	DN mm		On/Off	Floating	Proportional
					TF24 US	TF24-3 US	TF24-SR US
B307B	0.3	1/2"	15	200	<input type="checkbox"/> Pg 34	<input type="checkbox"/> Pg 36	<input type="checkbox"/> Pg 38
B308B	0.46	1/2"	15	200	<input type="checkbox"/> Pg 34	<input type="checkbox"/> Pg 36	<input type="checkbox"/> Pg 38
B309B	0.8	1/2"	15	200	<input type="checkbox"/> Pg 34	<input type="checkbox"/> Pg 36	<input type="checkbox"/> Pg 38
B310B	1.2	1/2"	15	200	<input type="checkbox"/> Pg 34	<input type="checkbox"/> Pg 36	<input type="checkbox"/> Pg 38
B311B	1.9	1/2"	15	200	<input type="checkbox"/> Pg 34	<input type="checkbox"/> Pg 36	<input type="checkbox"/> Pg 38
B312B	3.0	1/2"	15	200	<input type="checkbox"/> Pg 34	<input type="checkbox"/> Pg 36	<input type="checkbox"/> Pg 38
B313B	4.7	1/2"	15	200	<input type="checkbox"/> Pg 34	<input type="checkbox"/> Pg 36	<input type="checkbox"/> Pg 38
B315B*	10	1/2"	15	200	<input type="checkbox"/> Pg 34	<input type="checkbox"/> Pg 36	<input type="checkbox"/> Pg 38
B317B	4.7	3/4"	20	200	<input type="checkbox"/> Pg 34	<input type="checkbox"/> Pg 36	<input type="checkbox"/> Pg 38
B318B	7.4	3/4"	20	200	<input type="checkbox"/> Pg 34	<input type="checkbox"/> Pg 36	<input type="checkbox"/> Pg 38
B320B*	24	3/4"	20	200	<input type="checkbox"/> Pg 34	<input type="checkbox"/> Pg 36	<input type="checkbox"/> Pg 38
Electrical Connection					3 ft cable, 1/2" conduit fitting	3 ft cable, 1/2" conduit fitting	3 ft cable, 1/2" conduit fitting

* Models without characterizing discs.
TF24 US, TF120 US available March 2005.
TF24-S US, TF120-S US, TF24-3 (-S) US, TF24-SR (-S) US available May 2005.
See for MFT Configuration.

Options (add to list price)		TF24 US	TF24-3 US	TF24-SR US
built-in aux. switch ...S US		<input type="checkbox"/> Pg 28/34	<input type="checkbox"/> Pg 30/36	<input type="checkbox"/> Pg 32/38
120 VAC power supply	..120...	<input type="checkbox"/> Pg 28/34		

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B2...B Two-way Characterized Control Valve, Chrome Plated Brass Ball and Stem TF Actuators, Proportional



Technical Data/Submittal



Valve Specifications

Service	chilled or hot water, 60% glycol
Flow characteristic	A port equal percentage
Action	Max 95° rotation
Sizes	1/2" to 3/4"
Type of end fitting	female, NPT
Materials:	
Body	forged brass, nickel plated
Ball	chrome plated brass
Stem	brass
Seats	PTFE
Characterizing disc	TEFZEL®
Packing	2 EPDM O-rings, lubricated
Pressure rating	600 psi
Ambient temp. range	-22°F to 122°F [-30°C to 50°C]
Media temp. range	0°F to 212°F [-18°C to 100°C]
Close off pressure	200 psi
Maximum differential: pressure (ΔP)	For Characterized A-port 20 psi for typical applications 30 psi max for quiet service
	For full flow versions only (no A-disc) On/Off control 150 psi
Leakage	0%
Cv rating	A port: see product chart for values

Tefzel® is a registered trademark of DuPont

Additional Models

TF24-SR(-S)/300 US	TF24-SR(-S) US with 10 ft. plenum rated cable
TF24-SR(-S)/500 US	TF24-SR(-S) US with 16 ft. plenum rated cable

Application

This valve is typically used in air handling units on heating or cooling coils, and fan coil unit heating or cooling coils. Some other common applications include Unit Ventilators and VAV Box reheat coils. This valve is suitable for use in a hydronic system with variable flow. This valve is designed for modulating control using 2...10VDC or 4...20mA and fail safe is required. (for 4...20mA control input a 500 ohm resistor is required).

Actuator Specifications

<input type="checkbox"/> TF24-SR US	
<input type="checkbox"/> TF24-SR-S US	
Control	Proportional
Power supply	24VAC ± 20%, 50/60Hz 24VDC ± 10%
Power consumption:	running: 2.5 W holding: 1.0 W
Transformer sizing:	4 VA (class 2 power source)
Electrical connection:	TF24-SR US 3 ft. plenum rated cable TF24-SR-S US 3 ft, 18 GA appl. cables (2) (6 ft, 10 ft cables optional) 1/2" conduit connector
Electrical protection:	actuators are double insulated
Overload protection:	electronic throughout 0 to 95° rotation
Operating range Y:	2 to 10 VDC, 4 to 20 mA
Input impedance:	100 kΩ (0.1mA), 500Ω
Angle of rotation:	90°, adjust. with mechanical stop
Direction of rotation:	spring: reversible with cw/ccw mounting motor: reversible with built-in switch
Position indication:	visual indicator, 0° to 95° (0° spring return position)
Auxiliary switch:	1 x SPDT 3A (0.5A) @ 250 VAC, UL listed adjustable 0° to 95°
Running time:	motor: 1s / 1° for 90° independent of load spring: < 25 sec @ -4°F to +122°F [-20°C to +50°C] < 60 sec @ -22°F [-30°C]
Humidity:	5 to 95% RH non-condensing
Ambient temperature:	-22°F to +122°F [-30°C to +50°C]
Storage temperature:	-40°F to +176°F [-40°C to +80°C]
Housing:	NEMA type 2 / IP42
Housing material:	UL94 - 5VA
Agency listings:	cULus listed acc. to UL 60730-1/-2-14 and CAN/CSA C22.2 No.24, CE according to 73 / 23 / EEC
Quality standard:	ISO 9001
Noise level:	max: running < 35 db (A) spring return 62 dB (A)

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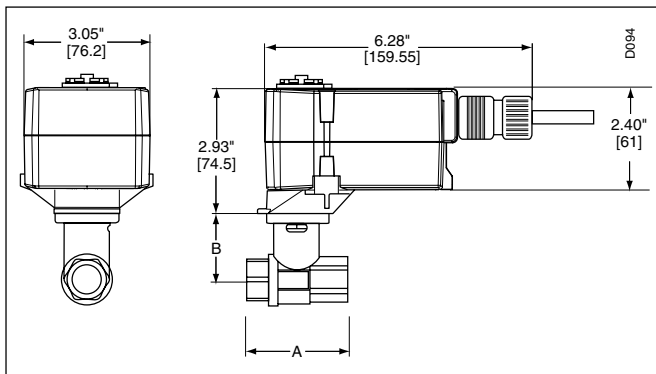




B2...B Two-way Characterized Control Valve, Chrome Plated Brass Ball and Stem TF Actuators, Proportional

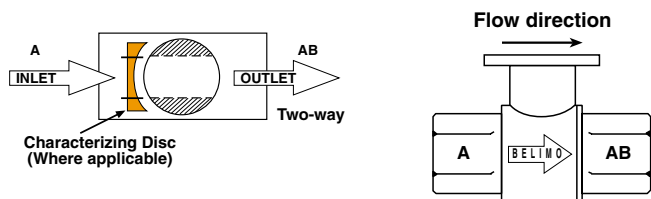
Technical Data/Submittal

Dimensions

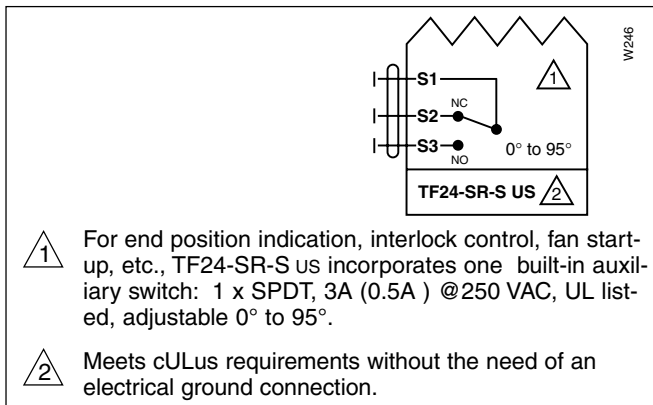


Valve Body	Nominal Valve Size		Dimensions	
	in	[mm]	A	B
B207B-B211B	1/2"	15	2.06 [52.2]	1.39 [35.3]
B212B-B215B	1/2"	15	2.38 [60.5]	1.63 [41.4]
B217B-B220B	3/4"	20	2.63 [66.8]	1.75 [44.5]

Flow Pattern



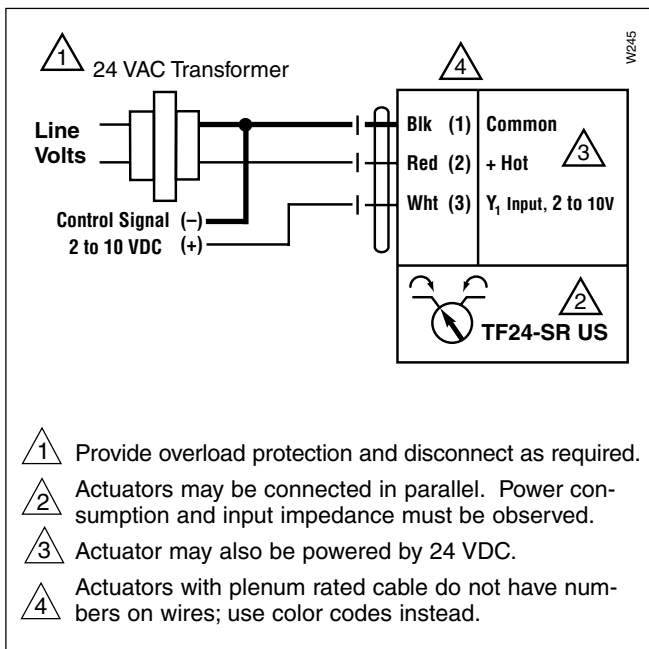
Wiring



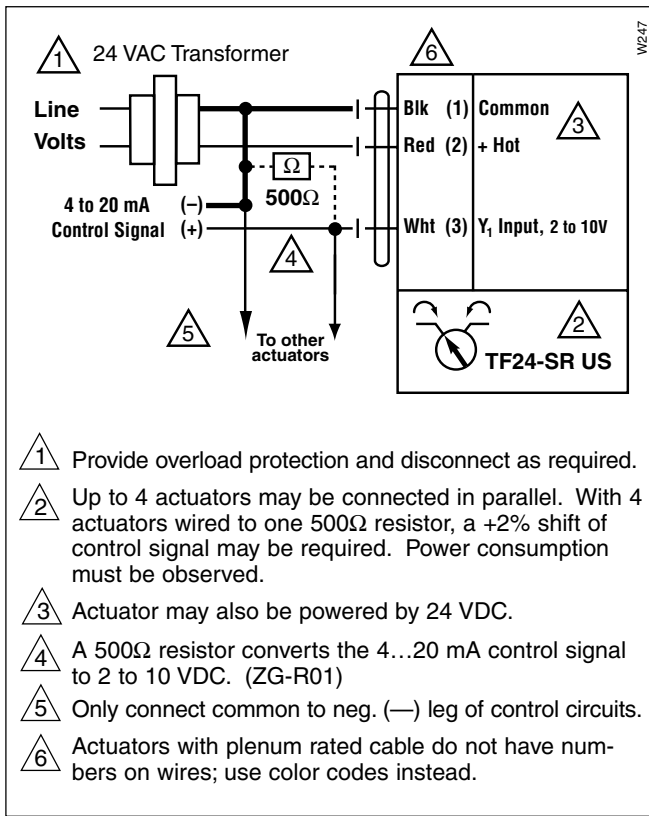
- 1 For end position indication, interlock control, fan start-up, etc., TF24-SR-S us incorporates one built-in auxiliary switch: 1 x SPDT, 3A (0.5A) @250 VAC, UL listed, adjustable 0° to 95°.
- 2 Meets cULus requirements without the need of an electrical ground connection.

Auxiliary switch of TF24-SR-S US

Wiring



2 to 10 VDC control of TF24-SR (-S) US



4 to 20 mA control of TF24-SR (-S) US

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W245

W247

W246



Electronic Characterized Control Valves™

B2/B3 Series Characterized Control Valves™

Default Set-Up:

	Two-way valve (Default)	Two-way valve (specify upon ordering)	Three-way valve (Default)	Three-way valve (specify upon ordering)
Non-Spring Return - Stays in last position	TR24-3-T US	Power to pin 2 will drive valve CCW Power to pin 3 will drive valve CW		Power to pin 2 will drive valve CCW Power to pin 3 will drive valve CW
	TR24-SR-T US	NC: Closed A to AB, will open as voltage increases	NO: Open A to AB, will close as voltage increases. (Can be chosen with switch inside terminal block of actuator).	NC: Closed A to AB, will open as voltage increases NO: Open A to AB, will close as voltage increases. (Can be chosen with switch inside terminal block of actuator).
	LRB24-3, LRB24-SR, LRX24-MFT, ARB24-3, ARB24-MFT	Power to pin 2 will drive valve CCW Power to pin 3 will drive valve CW	NO: Open A to AB, will close as voltage increases or power applied. (Can be chosen with CW/CCW switch).	Power to pin 2 will drive valve CCW Power to pin 3 will drive valve CW
Spring Return - Note Fail Position	TFX24 US LF24 US AF24 US	NO/FO Valve: Open A to AB will drive closed. Spring Action: Will spring open A to AB upon power loss.	NC/FC Valve: Closed A to AB will drive open. Spring Action: Will spring closed A to AB upon power loss.	NO/FO Valve: Open A to AB will drive closed. Spring Action: Will spring open A to AB upon power loss. NC/FC Valve: Closed A to AB will drive open. Spring Action: Will spring closed A to AB upon power loss.
	TF (-3), MFT, SR LF (-3), MFT, SR AF (-3), MFT, SR Floating or proportional type actuators	NC/FO Valve: Closed A to AB will drive open. Spring Action: Will spring open A to AB upon power loss.	NC/FC or NO/FC Valve: Closed A to AB or Open A to AB (Can be chosen with CW/CCW switch). Spring Action: Will spring closed A to AB upon power loss. NO/FO Valve: Open A to AB Spring Action: Will spring open A to AB upon power loss. (NO action can be chosen with CW/CCW switch).	NC/FO Valve: Closed A to AB will drive open Spring Action: Will spring open A to AB upon power loss. NC/FC or NO/FC Valve: Closed A to AB or Open A to AB (Can be chosen with CW/CCW switch). Spring Action: Will spring closed A to AB upon power loss. NO/FO Valve: Open A to AB Spring Action: Will spring open A to AB upon power loss. (NO action can be chosen with CW/CCW switch).

General Wiring Instructions

WARNING The wiring technician must be trained and experienced with electronic circuits. Disconnect power supply before attempting any wiring connections or changes. Make all connections in accordance with wiring diagrams and follow all applicable local and national codes. Provide disconnect and overload protection as required. Use copper, twisted pair, conductors only. If using electrical conduit, the attachment to the actuator must be made with flexible conduit.

Always read the controller manufacturer's installation literature carefully before making any connections. Follow all instructions in this literature. If you have any questions, contact the controller manufacturer and/or Belimo.

Transformer(s)

Belimo actuators require a 24 VAC class 2 transformer and draws a maximum of 10 VA per actuator. The actuator

enclosure cannot be opened in the field, there are no parts or components to be replaced or repaired.

- EMC directive: 89/336/EEC
- Software class A: Mode of operation type 1
- Low voltage directive: 73/23/EEC

CAUTION: It is good practice to power electronic or digital controllers from a separate power transformer than that used for actuators or other end devices. The power supply design in our actuators and other end devices use half wave rectification. Some controllers use full wave rectification. When these two different types of power supplies are connected to the same power transformer and the DC commons are connected together, a short circuit is created across one of the diodes in the full wave power supply, damaging the controller. Only use a single power transformer to power the controller and actuator if you know the controller power supply uses half wave rectification.

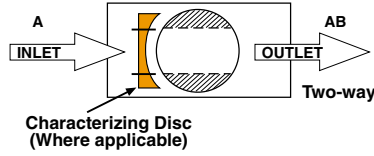
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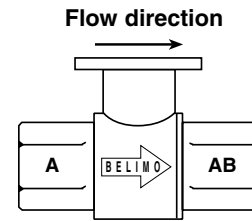
Characterized Control Valves™ (CCV)

Flow Pattern

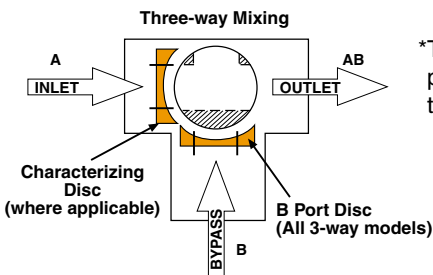
Two-way Characterized Control Valves™ (Belimo B2 Series) (Belimo B6 Series)



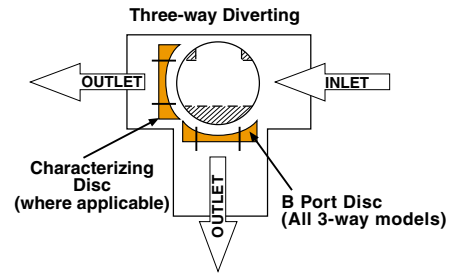
*Two-way valves should be installed with the disc upstream.



Three-way Characterized Control Valves™ (Belimo B3 Series)



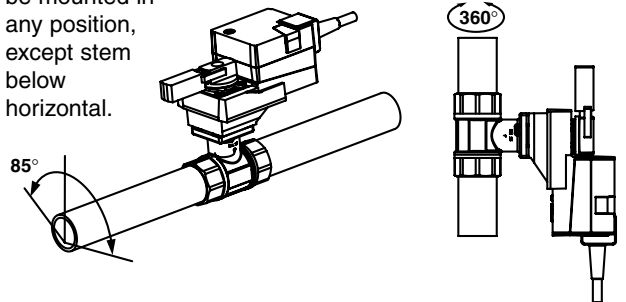
*The A port must be piped to the coil to maintain proper control.



“B” Port must be piped to the by-pass line.

Mounting:

The valves can be mounted in any position, except stem below horizontal.



D164

Balancing Valves

TA SERIES 786/787/788/789 AND SERIES 78K



Tour & Andersson calibrated balancing valves offer a reliable, simple and cost effective way to measure and balance all flow rates. Full throttling range is achieved by 4, 8, 12, 16, 20 or 22 full turns of the handwheel, enabling a precise setting. This high degree of accurate adjustment means that the system can be balanced precisely.

The actual pressure drops in heating and cooling systems are difficult to establish by calculation because water flows vary from design flows. They can be corrected easily by regulating the desired water flow with Tour & Andersson globe style balancing valves. By measuring the pressure drop across measuring ports at a particular handwheel setting, the water flow for the valve size can be read easily from the appropriate pressure drop graph or flow balancing wheel. If the flow does not conform with that specified, adjust the valve and repeat the measuring procedure until the correct flow has been obtained.

NOTE: All Tour & Andersson balancing valves include a concealed memory feature with a locking tamper-proof setting.

Series 78K and TA Series 786 and 787 valves have an Ametal® body. Ametal is a copper alloy that eliminates the added expense of dielectric fittings.

TA Series 788 and 789 balancing valves have ductile iron bodies and Ametal or ductile iron trim, depending on size. Test ports feature self-sealing construction for insertion-type pressure or temperature probes.

All valves are rated from -4°F/-20°C to +250°F/+120°C. Service will also be governed by the connecting coupling gasket ratings for grooved and flanged valves.

Insulation kits are available for ½ - 6" / 15 - 150mm sizes for Series 78K and TA Series 786, 787, 788 and 789 balancing valves.

TA Balancing valves provided by Victaulic can be ordered individually or as a component of the Series 799 or 79V KOIL-KIT Coil Pack. See the Series 799/79V Contractor Order Form (A) on page 9 of publication 08.30 for help ordering your Victaulic KOIL-KIT Coil Pack.

Victaulic KOIL-KIT Coil Packs provide a simplified, quality coil installation while ensuring optimal hydronic systems design requirements are met. The Series 799/79V is suitable for a variety of hot and cold water applications including treated and untreated water systems.

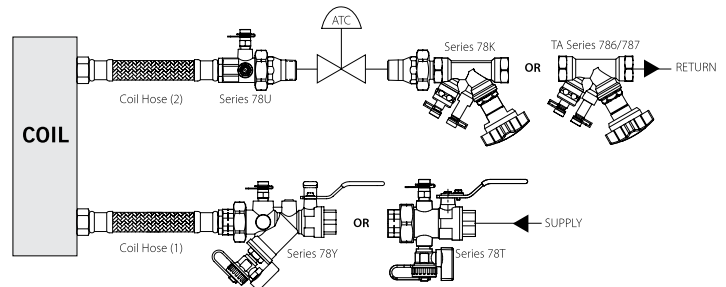
The Victaulic KOIL-KIT Coil Pack consists of the following components: Series 78Y Y-Strainer/Ball Valve or Series 78T Ball Valve Union Combination, two Coil Hoses, a Series 78U Union Port Fitting and a TA balancing valve. There are two options when ordering a Victaulic KOIL-KIT Coil Pack: Series 799 KOIL-KIT Coil Pack or Series 79V KOIL-KIT Coil Pack with ATC Valve.

The Series 799 and Series 79V comes standard with the components listed above. Additionally, the Series 79V includes the option to have the ATC valve of your choosing assembled and shipped with the Victaulic KOIL-KIT Coil Pack. Please note that when ordering a Series 79V, Victaulic offers one balancing valve, the Series 78K. Specify either Series 799 or Series 79V when ordering.

For added convenience, when coil hoses are ordered as a component of the Series 799 or 79V KOIL-KIT Coil Pack, all hoses can be provided pre-connected to the Series 78Y or 78T on the supply side and the Series 78U on the return side (specify connection preference when ordering).

For information on Victaulic KOIL-KIT Coil Packs, refer to publication 08.30.

VICTAULIC SERIES 799/79V KOIL-KIT™ COIL PACK



JOB/OWNER

System No. _____

Location _____

CONTRACTOR

Submitted By _____

Date _____

ENGINEER

Spec Sect _____ Para _____

Approved _____

Date _____

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Balancing Valves

TA SERIES 786/787/788/789 AND SERIES 78K

MATERIAL SPECIFICATIONS

Balancing Valves

BODY:

Series 78K and TA Series 786, 787: Ametal, (pressure die cast, nonporous copper alloy)
TA Series 788, 789: Ductile iron, ASTM A536 Grade 60-40-18 (BS Grade 400/15)

BODY COATING:

TA Series 788, 789: 2 ½, 3, 4" – Epoxy resin coated
5-16" - painted

TRIM: (Bonnet, Stem and Restriction Cone)

Series 78K and TA Series 786, 787: Ametal
TA Series 788, 789:
Bonnet – 2 ½ – 6" – Ametal
Bonnet – 8 – 16" – Ductile Iron
Stem: Ametal
Restriction Cone: Ametal

UNION:

Series 78K: Brass with EPDM o-ring

TAILPIECE & ADAPTER:

Series 78K: DZR Brass

SEAT:

Series 78K, and TA Series 786, 787: Ametal
TA Series 788, 789: Ductile Iron

SEAT SEAL:

Series 78K and TA Series, 786, 787, 788, 789: EPDM

STEM SEALS: EPDM

PROBE SEALS: EPDM

OPTIONAL SEAT, STEM AND PROBE SEALS: Fluoroelastomer (available on 1 ½ and 2" TA Series 787; 2 ½ – 10" TA Series 789 (except 5"). Contact Victaulic for availability.

HANDWHEEL:

Series 78K and TA Series 786, 787 – Red Polyamide plastic
TA Series 788, 789: 2 ½-6" – Red Polyamide plastic
8-16" – Aluminum

OPTIONAL EQUIPMENT:

TA Series 786, 787: Drain kit-Ametal
TA Series 786, 787: Insulation Kit-Polyurethane. Also available on TA Series 789 2 ½-6" sizes.

Allen Wrench Sizes

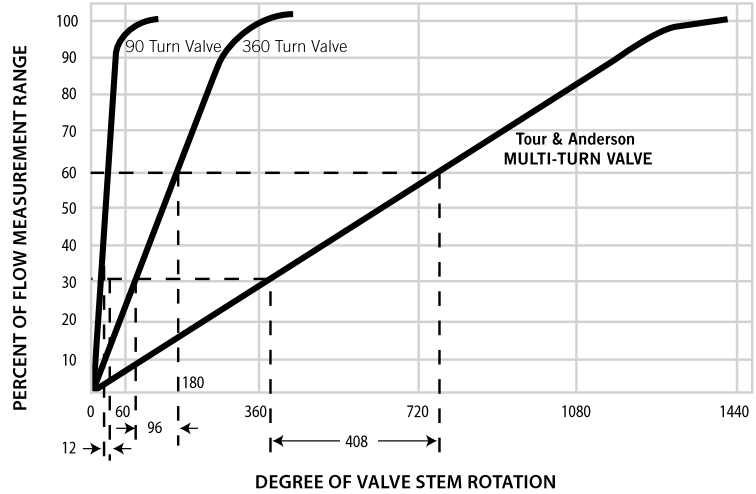
3 mm memory ½ – 2" TA Series 786, 788 valves
5 mm memory 2 ½ – 12" TA Series 788 & 2 ½ – 6" TA Series 789 valves
8 mm memory 8 – 16" TA Series 789 valves
5 mm drain kit ½ – 2" TA Series 786 valves

Balancing Valves

TA SERIES 786/787/788/789 AND SERIES 78K

COMPARISON OF BALANCING VALVE THROTTLING CHARACTERISTICS

- This curve illustrates the advantage of the four (4) turn adjustment available with Tour & Andersson balancing valves (½ – 2”/15 – 50mm). Valves 2 ½”/65mm) and larger have 8, 12 or 16 turns.
- A 90° fully open to closed valve requires just a 12° change in adjustment to equal 30% change of the flow.
- A 360° fully open to closed valve would require 96° change in adjustment to equal the same 30% change in the flow measurement.
- Tour & Andersson balancing valves would require a 408° change in adjustment to equal the same 30% change in the flow.



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REV_0



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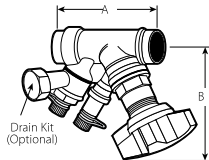
Balancing Valves

TA SERIES 786/787/788/789 AND SERIES 78K

Balancing Valve

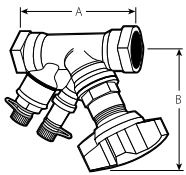
TA SERIES 786 Solder End

TA SERIES 787 Female Threaded End



TA SERIES 786

TYPICAL 1/2 - 2 1/15 - 50 MM SIZES



TA SERIES 787

TYPICAL 1/2 - 2 1/15 - 50 MM SIZES

Size		TA Series 786 Solder End (300psi/2065 kPa) Balancing Valve			TA Series 787 NPT (Female) Threaded End (300psi/2065 kPa) Balancing Valve		
Nominal Size Inches/mm	Actual Outside Dia. Inches/mm	A End to End Inches/mm	B Center to Top Inches/mm	Approx. Weight Each Lbs./kg	A End to End Inches/mm	B Center to Top Inches/mm	Approx. Weight Each Lbs./kg
1/2 15	0.840 21.3	3.50 89	4.00 102	1.4 0.6	3.50 89	4.00 102	1.5 0.7
3/4 20	1.050 26.7	3.81 97	4.00 102	1.4 0.6	3.81 97	4.00 102	1.6 0.7
1 25	1.315 33.7	4.31 110	4.50 114	1.9 0.9	4.31 110	4.50 114	2.0 0.9
1 1/4 32	1.660 42.4	4.88 124	4.31 110	2.4 1.1	4.88 124	4.31 110	2.6 1.2
1 1/2 40	1.900 48.3	5.13 130	4.75 121	3.1 1.4	5.13 130	4.75 121	3.3 1.5
2 50	2.375 60.3	6.13 156	4.75 121	4.5 2.0	6.13 156	4.75 121	5.0 2.3

VALVE SELECTION GUIDE

Size		Flow Data for TA Series 786 & 787		
Nominal Size Inches/mm	Actual Outside Dia. Inches/mm	Absolute Min. Flow GPM/LPM	Nominal Range of Flow GPM/LPM	Absolute Max. Flow GPM/LPM
1/2 15	0.840 21.3	0.1 0.5	0.6 - 2.8 2.3 - 10.6	8.6 32.6
3/4 20	1.050 26.7	0.4 1.5	2.0 - 6.0 7.6 - 22.7	20.0 76.0
1 25	1.315 33.7	0.5 1.7	3.9 - 10.0 14.8 - 37.9	30.0 114.0
1 1/4 32	1.660 42.4	0.9 3.3	5.0 - 15.0 18.9 - 56.8	48.0 182.0
1 1/2 40	1.900 48.3	1.3 4.9	6.6 - 20.0 25.0 - 75.7	66.0 250.0
2 50	2.375 60.3	2.0 7.6	12.6 - 36.0 47.7 - 136.0	110.0 416.0

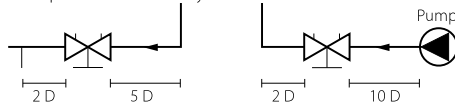
IMPORTANT NOTES:

Balancing valves should be sized in accordance with the GPM/LPM flows (and not in relation to pipeline size). Sizing balancing valves based on the minimum or maximum flow rates is not recommended. Valves should be sized using the nominal flow rate only. The Minimum Flow is calculated from the minimum open setting of the valve and a minimum pressure drop 1 Ft. WG (= 3 kPa). The Nominal Flow is calculated from the maximum open setting of the valve and the minimum recommended pressure drop, 2 Ft. WG (= 6 kPa). The Maximum Flow is calculated from the maximum open setting of the valve and the maximum pressure drop, 20 Ft. WG (= 60 kPa). A computer program, TA-Select, is available for calculation of valve handwheel pre-set position and other applications. Note: For information regarding Allen Wrench sizes see the Material Specifications section on page 2.

MEASURING ACCURACY:

The hand wheel zero position is calibrated and must not be changed. Valves have an accuracy of flow measurement of 2% to 3% when used within their recommended flow range and installed in accordance with the figure below.

Note: For the most accurate results, a Series 734 TA SCOPE or Series 73M CMI should be used. However, any differential pressure meter may be used.



The illustration above relates to the accuracy of differential pressure measurement and is not an installation requirement.

A+

Accessories

UV Accessories Submittal to Follow Once Site Visit Has
Been Completed With Awarded Contractor

Our Dedication to Education.

8 Rouse Street, Tillsonburg ON N4G 5W8
Ph: 519.688.6363 · rfq@systemair.net



Tag Data - Split System Air Conditioning Units (Small) (Qty: 1)

Item	Tag(s)	Qty	Description	Model Number
A1	CU-1	1	3 Ton Unitary Split Systems (SSC)	4TTA4036A3

Product Data - Split System Air Conditioning Units (Small)**Item: A1 Qty: 1 Tag(s): CU-1**

Split System Cooling Outdoor Unit
3 Ton Nominal Cooling Capacity
200 - 230 Volt 3 Phase 60 Hertz
Braze Coil Connections
1st Year Parts & Labor Warranty Whole Unit

Mechanical Specifications - Split System Air Conditioning Units (Small)**Item: A1 Qty: 1 Tag(s): CU-1****4TTA4 - General**

The Outdoor Units are fully charged from the factory for up to 15 feet of piping. This unit is designed to operate at outdoor ambient temperatures as high as 115°F. Cooling capacities are matched with a wide selection of air handlers and furnace coils that are AHRI certified. The unit is certified to UL 1995. Exterior is designed for outdoor application.

4TTA4 - Casing

Unit casing is constructed of heavy gauge, galvanized steel and painted with a weather-resistant powder paint finish on all louvered panels and the fan top panel. The corner panels are prepainted. All panels are subjected to our 1,000 hour salt spray test. The base is made of a CMBP-G30 weatherproof material to resist corrosion.

4TTA4 - Refrigerant Controls

Refrigeration system controls include condenser fan, compressor contactor and high pressure switch. High and low pressure controls are inherent to the compressor. A factory supplied liquid line drier is standard. Some models may require field installation.

4TTA4 - Compressor

The compressor features internal over temperature, pressure protection and total dipped hermetic motor. Other features include: Centrifugal oil pump and low vibration and noise.

4TTA4 - Condenser Coil

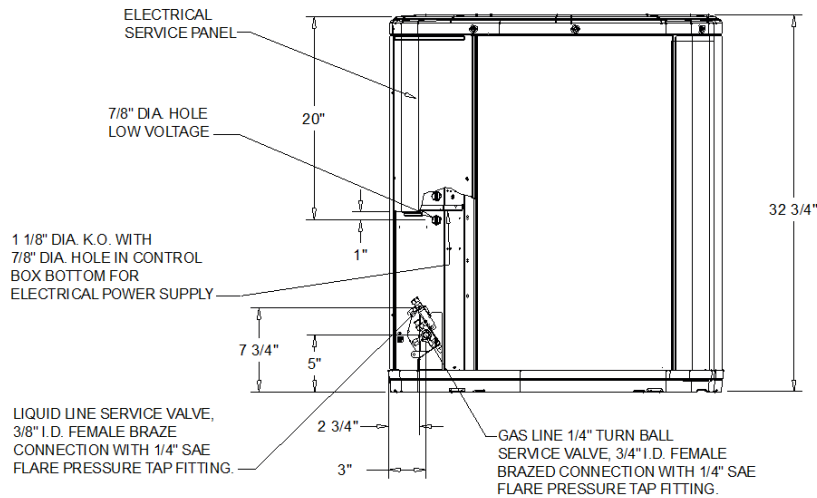
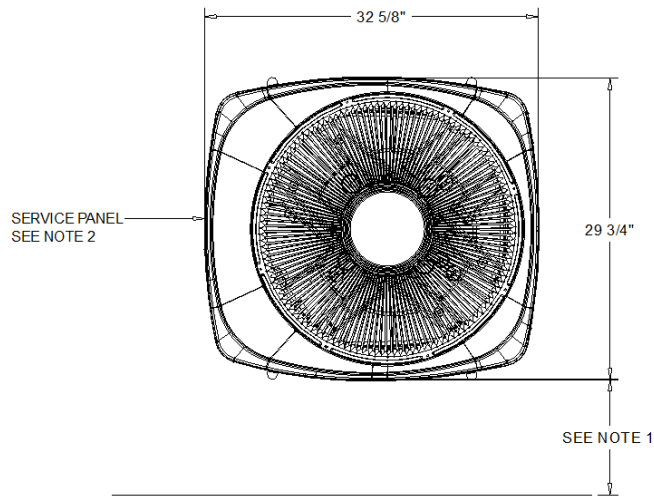
The outdoor coil provides low airflow resistance and efficient heat transfer. The coil is protected on all four sides by louvered panels.

Dimensional Drawings - Split System Air Conditioning Units (Small)

Item: A1 Qty: 1 Tag(s): CU-1

NOTES

1. TOP DISCHARGE AREA SHOULD BE UNRESTRICTED FOR AT LEAST 60" ABOVE UNIT. UNIT SHOULD BE PLACED SO ROOF RUN-OFF WATER DOES NOT POUR DIRECTLY ON UNIT, AND SHOULD BE AT LEAST 12" FROM WALL AND ALL SURROUNDING SHRUBBERY ON TWO SIDES. OTHER TWO SIDES UNRESTRICTED.
2. ELECTRICAL AND REFRIGERANT COMPONENT CLEARANCES PER PREVAILING CODES.
3. VERIFY WEIGHT, CONNECTION, AND ALL DIMENSION WITH INSTALLER DOCUMENTS BEFORE INSTALLATION



SPLIT SYSTEM COOLING - 4TTA4036

OUTLINE DRAWING

Dimensional Drawings - Split System Air Conditioning Units (Small)

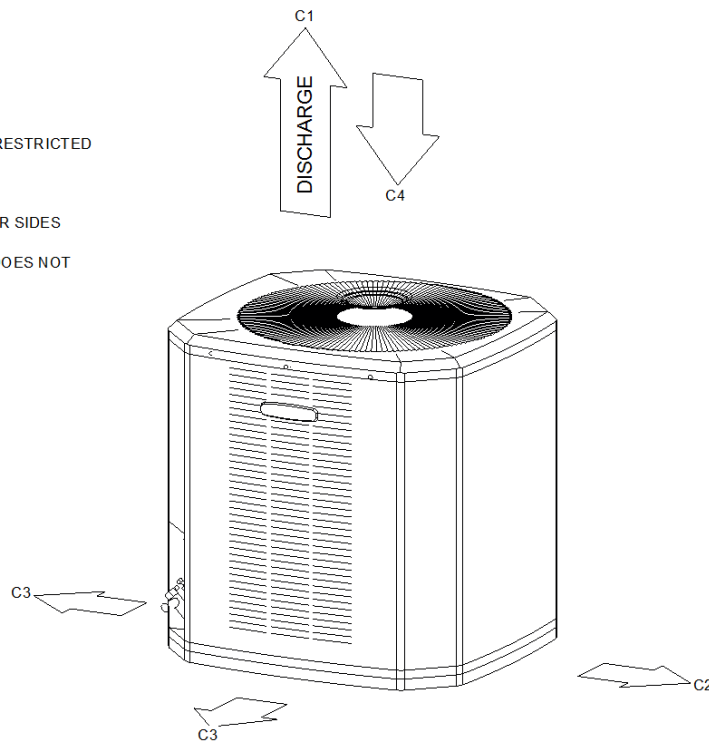
Item: A1 Qty: 1 Tag(s): CU-1

ELECTRICAL / GENERAL DATA

<p>GENERAL</p> <p>Model: 4TTA4036A3000A</p> <p>Operating Voltage:</p> <p>Unit Primary Voltage:</p> <p>Unit Secondary Voltage:</p> <p>Unit Hertz:</p> <p>Unit Phase:</p>	<p>POWER CONN.</p> <p>Minimum Circuit Ampacity: 12.0</p> <p>Maximum Circuit Breaker: 20.0</p> <p>Minimum Protection Rating: 20.0</p>	<p>COMPRESSOR</p> <p>Number: 1</p> <p>Phase: 3</p> <p>Rated Load Amps: 9.0</p> <p>Locked Rotor Amps: 71.0</p>
<p>OUTDOOR MOTOR</p> <p>Number: 1</p> <p>Horsepower: 0.125</p> <p>Motor Speed (RPM): -</p> <p>Phase: 1</p> <p>Full Load Amps: 0.77</p> <p>Locked Rotor Amps: -</p>	<p>NOTES:</p> <ol style="list-style-type: none"> 1. Certified in accordance with the Unitary Air-Conditioner equipment certification program which is based on AHRI Standard 210/240. 2. Calculated in accordance with N.E.C. Use only HACR circuit breakers or fuses. 3. Standard line lengths - 60'. Standard lift - 60' Suction and Liquid line. For Greater lengths and lifts refer to refrigerant piping software Pub# 32-3312-0 4. * = 15, 20, 25, 30, 40 and 50 foot lineset available. 	
<p>REFRIGERANT</p> <p>Type: R-410A</p> <p>Charge: 6.1 lb</p> <p>Line Size O.D. Gas: 3/4"</p> <p>Line Size O.D. LIQ: 3/8"</p>		

WEIGHT	
NET	156.0 lb
SHIPPING	183.0 lb

- NOTES:**
- C1. TOP DISCHARGE SHOULD BE UNRESTRICTED FOR AT LEAST 60" ABOVE UNIT
 - C2. PLACE UNIT FROM WALL
 - C3. PLACE SHRUBBERY AT LEAST 12" FROM UNIT ON TWO SIDES, OTHER SIDES UNRESTRICTED
 - C4. PLACE UNIT SO ROOF RUN-OFF DOES NOT FALL DIRECTLY ON UNIT



WEIGHT AND CLEARANCE



Submittal

Prepared For:
All Bidders

Date: February 27, 2024

Job Name:
Glendale SS - RTU Replacements 2023

Trane Canada ULC is pleased to provide the following submittal for your review and approval.

Product Summary

Qty Product

3 6- 25 Ton PKGD Precedent Unitary Rooftops (RTU-2, AHU-9, AHU-12)

Carmine Bozzo/Rory Mills
Trane Canada ULC

The attached information describes the equipment we propose to furnish for this project and is submitted for your approval.

Submittal acceptance and return is a critical step, so please ensure submittals are returned with approval to release to production within 14 days of submittal date.

Product performance and submittal data is valid for a period of 6 months from the date of submittal generation. If six months or more has elapsed between submittal generation and equipment release, the product performance and submittal data will need to be verified. It is the customer's responsibility to obtain such verification.

Table of Contents

Product Summary	1
6- 25 Ton PKGD Precedent Unitary Rooftops (Items A1, A2)	3
Tag Data	3
Product Data.....	3
Performance Data.....	4
Mechanical Specifications	6
Dimensional Drawings.....	9
Weight, Clearance & Rigging	17
Accessory	19
Field Wiring.....	25
Field Installed Options - Part/Order Number Summary	30
6- 25 Ton PKGD Precedent Unitary Rooftops.....	30

Tag Data - 6- 25 Ton PKGD Precedent Unitary Rooftops (Qty: 3)

Item	Tag(s)	Qty	Description	Model Number
A1	RTU-2	1	6- 25 Ton PKGD Precedent Unitary Rooftop	YSJ210AWSAH**00E0A2B1A002
A2	AHU-9, AHU-12	2	6- 25 Ton PKGD Precedent Unitary Rooftop	YSJ090AWS0H**D0E0A2A10001

Product Data - 6- 25 Ton PKGD Precedent Unitary Rooftops

All Units

- DX Cooling / Gas Heat
- R-410A
- 575/60/3
- Symbio 700
- Toolless coil guards
- Startup and 1st Yr Labor Whole Unit

Item: A1 Qty: 1 Tag(s): RTU-2

- 17.5 Ton
- Stainless Steel Gas Heat
- High Gas Heat
- Hinged Access Panels with 2-in MERV 13 Filter
- Through the Base Electric
- Circuit Breaker
- Powered 15A Convenience Outlet
- Advanced Controls and BACnet BAS – Terminal strip for BAS connection
- Modulating Hot Gas Reheat (HGRH)
- Condensate Overflow Switch (COS)
- Fresh Air Option Module (Field Installed)
- Low Leak Economizer, Dry Bulb, Horiz (Field Installed)
- Power exhaust (Field Installed)
- Return air remote sensor (Field Installed)
- Clogged filter switch MERV 13 (Field Installed)
- Low Ambient Kit (Field Installed)
- Horizontal Conversion Panel (Field Installed)

Item: A2 Qty: 2 Tag(s): AHU-9, AHU-12

- 7.5 Ton
- High Gas Heat
- Economizer, DB with Barometric Relief
- Hinged Access Panels with 2-in MERV 13 Filters
- Through the Base Electric
- Circuit Breaker
- Unpowered 20A Convenience Outlet
- Advanced Controls and BACnet BAS– Terminal strip for BAS connection
- Clogged Filter Switch (CFS) and Fan Fail Switch (FFS)
- Power exhaust (Field Installed)
- Roofcurb Adaptor- Drawing to Follow after field measurements by Successful Mechanical Contractor

Performance Data - 6- 25 Ton PKGD Precedent Unitary Rooftops

Tags	RTU-2	AHU-9, AHU-12
Cooling Entering Dry Bulb (F)	80.30	80.00
Cooling Entering Wet Bulb (F)	68.70	67.00
Summer Ambient (F)	95.00	95.00
Entering Dry Bulb (in HGRH) (F)	60.00	73.00
Entering Wet Bulb (in HGRH) (F)	59.00	64.00
Ambient (In HGRH) (F)	70.00	70.00
Heating Entering Air Temperature (F)	50.00	70.00
Design Airflow (cfm)	5300	3000
Airflow Application	Horizontal	Downflow
Design ESP (in H2O)	1.500	0.750
Fan Pressurized (in H2O)	1.911	1.321
Total SP (in H2O)	1.616	0.984
Gross Total Capacity (MBh)	213.47	94.46
Gross Sensible Capacity (MBh)	135.07	73.16
Gross Latent Capacity (MBh)	78.40	21.31
Net Total Capacity (MBh)	206.15	91.45
Net Sensible Capacity (MBh)	127.75	70.14
Net Sensible Heat Ratio (%)	62.00	77.00
Coil LAT DB (F)	56.13	57.49
Coil LAT WB (F)	55.63	56.82
Cooling Leaving Unit Dry Bulb (F)	58.81	58.99
Cooling Leaving Unit WB (F)	56.70	57.41
Fan Motor Heat (MBh)	1.19	0.51
Dew Point Temperature (F)	55.32	56.41
Refrigerant charge (HFC-410A) - Ckt 1 (lb)	15.0	9.0
Saturated Discharge Temperature (F)	120.14	116.44
Saturated Suction Temperature (F)	49.37	51.37
Heat Static Pressure Adj (in H2O)	0.000	0.000
Component SP Add (in H2O)	0.216	0.234
Max Available ESP (in H2O)	1.784	1.766
Supply Motor Horsepower (hp)	3.000	3.000
Supply Operating Horsepower (hp)	2.810	1.150
Supply RPM (rpm)	1303	1188
Compressor Power (kW)	14.88	6.11
System Power (kW)	20.13	8.70
EER @ AHRI (EER)	10.8	11.0
IEER @ AHRI (EER)	14.0	14.6
MCA (A)	40.00	19.00
MOP (A)	50.00	25.00
Compressor 1 RLA (A)	14.90	6.60
Compressor 2 RLA (A)	8.00	3.60
Condenser Fan FLA (A)	1.80	1.40
Evaporator Fan FLA (A)	3.20	3.20
Heating Input Capacity (MBh)	400.00	200.00
Output Heating Capacity (MBh)	324.00	162.00
Heating Leaving Air Temperature (F)	105.76	119.36
Heating Temperature Rise (F)	55.76	49.36
Height (ft)	4.92	4.24
Width (ft)	7.25	4.44
Length (ft)	10.25	7.34
Approx Installed Weight (lb)	2229.0	1199.0
Corner weight A (lb)	672.0	365.0
Corner Weight B (lb)	509.0	340.0
Corner Weight C (lb)	366.0	196.0

Tags	RTU-2	AHU-9, AHU-12
Corner Weight D (lb)	484.0	210.0
Center of Gravity - Length (ft)	4.42	3.58
Center of Gravity - Width (ft)	3.00	1.58
Ducted Discharge - 63 Hz (dB)	81	78
Ducted Discharge - 125 Hz (dB)	92	83
Ducted Discharge - 250 Hz (dB)	80	76
Ducted Discharge - 500 Hz (dB)	72	69
Ducted Discharge - 1 kHz (dB)	67	65
Ducted Discharge - 2 kHz (dB)	63	62
Ducted Discharge - 4 kHz (dB)	63	61
Ducted Discharge - 8 kHz (dB)	62	62
Ducted Inlet - 63 Hz (dB)	82	80
Ducted Inlet - 125 Hz (dB)	87	83
Ducted Inlet - 250 Hz (dB)	79	79
Ducted Inlet - 500 Hz (dB)	81	81
Ducted Inlet - 1 kHz (dB)	78	78
Ducted Inlet - 2 kHz (dB)	73	73
Ducted Inlet - 4 kHz (dB)	71	71
Ducted Inlet - 8 kHz (dB)	68	68
Outdoor Noise - 63 Hz (dB)	89	85
Outdoor Noise - 125 Hz (dB)	90	88
Outdoor Noise - 250 Hz (dB)	96	90
Outdoor Noise - 500 Hz (dB)	94	91
Outdoor Noise - 1 kHz (dB)	92	89
Outdoor Noise - 2 kHz (dB)	88	85
Outdoor Noise - 4 kHz (dB)	86	84
Outdoor Noise - 8 kHz (dB)	80	79
Acoustic Footnote 1	Ducted Discharge and Ducted Inlet Sound in accordance with AHRI 260-2017	Ducted Discharge and Ducted Inlet Sound in accordance with AHRI 260-2017
Acoustic Footnote 2	Outdoor Sound in accordance with AHRI 370-2015	Outdoor Sound in accordance with AHRI 270-2015
Leaving dry bulb w HGRH (F)	74.59	-
Temperature Rise (HGRH) (F)	29.41	-
HGRH Capacity (MBh)	170.52	-
Dew Point Temperature (HGRH) (F)	44.04	-
Reheat Coil LAT DB (HGRH) (F)	73.28	-
Reheat Coil LAT WB (HGRH) (F)	56.83	-
Moisture Removal Rate (HGRH) (gph)	12.45	-
Evap Coil LAT DB (HGRH) (F)	43.87	-
Evap Coil LAT WB (HGRH) (F)	43.95	-
Supply Fan Count (Number)	2.00	1.00

Mechanical Specifications - 6- 25 Ton PKGD Precedent Unitary Rooftops
Item: A1, A2 Qty: 3 Tag(s): RTU-2, AHU-9, AHU-12**General**

- Packaged rooftop units cooling, heating capacities, and efficiencies are AHRI Certified within scope of AHRI Standard 210-240 for 6 to 25 Tons and ANSIZ21.47 and 10 CFR Part 431 pertaining to Commercial Warm Air Furnaces (all gas heating units).
- Convertible airflow.
- Symbio controls operating range is from 0-125.0 F from factory; if designing for cooling mode operation below 40.0 F ambient temp, add low ambient kit to assure continuous and reliable operation.
- Factory assembled, internally wired, fully charged with R-410A, and 100 percent run tested to check cooling operation, fan and blower rotation, and control sequence before leaving the factory.
- Colored and numbered wiring internal to the unit for simplified identification.
- Units cULus listed and labeled, classified in accordance for Central Cooling Air Conditioners.

Casing

- Zinc coated, heavy gauge, galvanized steel.
- Weather resistant pre-painted metal with galvanized substrate.
- Meets ASTM B117, 672 hour salt spray test.
- Removable single side maintenance access panels.
- Lifting handles in maintenance access panels (can be removed and reinstalled by removing fasteners while providing a water and air tight seal).
- Exposed vertical panels and top covers in the indoor air section insulated with a cleanable foil-faced, fire-retardant permanent, odorless glass fiber material.
- Base pan shall have no penetrations within the perimeter of the curb other than the raised 1 inch high downflow supply/return openings to provide an added water integrity precaution, if the condensate drain backs up.
- Base of the unit insulated with 1/8 inch, foil-faced, closed-cell insulation.
- Unit base provisions for forklift and/or crane lifting on three sides of unit.

Hail Guards

- Provides condenser coil protection.

Powered or Unpowered Convenience Outlet

- Powered GFCI, 120V/15A, 2 plug, convenience outlet or unpowered GFCI, 120V/20A, 2 plug, convenience outlet.
- When convenience outlet is powered, a service receptacle disconnect will be available.
- Convenience outlet is powered from the line side of the disconnect or circuit breaker, and therefore will not be affected by the position of the disconnect or circuit breaker.
- Available to order when through-the-base electrical with disconnect switch or circuit breaker option is ordered.

Microchannel Coils

- Optimal heat transfer performance due to flat, streamlined tubes with small ports, and metallurgical tube-to-fin bond.
- Reduce system refrigerant charge by up to 50% leading to better compressor reliability.
- Compact all-aluminum microchannel coils reduce the unit weight.
- Recyclable all aluminum coils All aluminium construction minimizes galvanic corrosion.
- Strong aluminum brazed structure provides better fin protection.
- Flat streamlined tubes more dust resistant and easy to clean.
- Coils leak tested at the factory to ensure the pressure integrity.

Compressors

- All units have direct-drive, hermetic, scroll type compressors with centrifugal type oil pumps.
- Suction gas-cooled motor with voltage utilization range of plus or minus 10 percent of unit nameplate voltage.
- Internal overloads standard with scroll compressors.
- All units have dual compressors.
- Three stages of cooling available on 6 to 17.5 tons units and four stages of cooling available on 20 and 25 tons units.

Filters

- Two inch pleated media filters shall be available on all models.

Frostat

- Utilized as a safety device.
- Opens to prevent freezing temperatures on evaporator coil.

- Temperature will need to rise to 50°F before closing.
- Utilized in low airflow or high outside air applications (cooling only).

Gas Heating Section

- The heating section shall have a progressive tubular heat exchanger with corrosion-resistant aluminized steel tubes and burners as standard on all models.
- Stainless steel heat exchanger with 409 stainless steel tubes and 439 stainless steel burners shall be optional.
- Induced draft combustion blower shall be used to pull the combustion products through the firing tubes.
- Heater shall use a direct spark ignition (DSI) system.
- On initial call for heat, the combustion blower shall purge the heat exchanger for 20 seconds before ignition.
- After three unsuccessful ignition attempts, entire heating system shall be locked out until manually reset at the thermostat/zone sensor.
- Units shall be suitable for use with natural gas or propane (field-installed kit).

Heat Exchanger

- Compact cabinet features a tubular heat exchanger in low, medium and high heat capacities.
- Corrosion-resistant aluminized steel tubes and burners are standard on all models.
- Induced draft blower to pull the gas mixture through the burner tubes.
- Direct spark ignition and a flame sensor as a safety device to validate the flame.

Indoor Fan

- Direct drive plenum fan design - 6 to 25 tons units.
- Plenum fan design - backward-curved fan wheel along with an external rotor direct drive variable speed indoor motor.
- Supply fan speed adjustments can be made using the Symbio 700 or Mobile App.
- Motors are thermally protected.
- Variable speed direct drive motors are high efficiency - 6 to 25 tons.

Stainless Steel Heat Exchanger

- Thermal magnetic, molded case, HACR circuit breaker with provisions for through-the-base electrical connections.
- Circuit breaker installed within unit in water tight enclosure.
- Wiring provided from the switch to the unit high voltage terminal block.
- Circuit breaker will provide overcurrent protection, sized per NEC and cULus guidelines, and agency recognized by cULus.

Powered Exhaust

- Available for 6 to 25 ton units.
- Shall provide exhaust of return air, when using an economizer.
- Maintain better building pressurization.

Through-the-Base Electrical with Circuit Breaker

- Thermal magnetic, molded case, HACR circuit breaker with provisions for through-the-base electrical connections.
- Circuit breaker installed within unit in water tight enclosure.
- Wiring provided from the switch to the unit high voltage terminal block.
- Circuit breaker will provide overcurrent protection, sized per NEC and cULus guidelines, and agency recognized by cULus.

Economizer (Standard)

- Available with or without barometric relief.
- Fully modulating 0-100 percent motor and dampers, minimum position setting, preset linkage, wiring harness with plug, spring return actuator and fixed dry bulb control.
- Barometric relief shall provide a pressure operated damper that shall be gravity closing.
- Barometric relief shall prohibit entrance of outside air during the equipment ?off? cycle.
- Optional solid state or differential enthalpy control.
- Arrives in shipping position and shall be moved to the operating position by the installing contractor.

Reference or Comparative Enthalpy

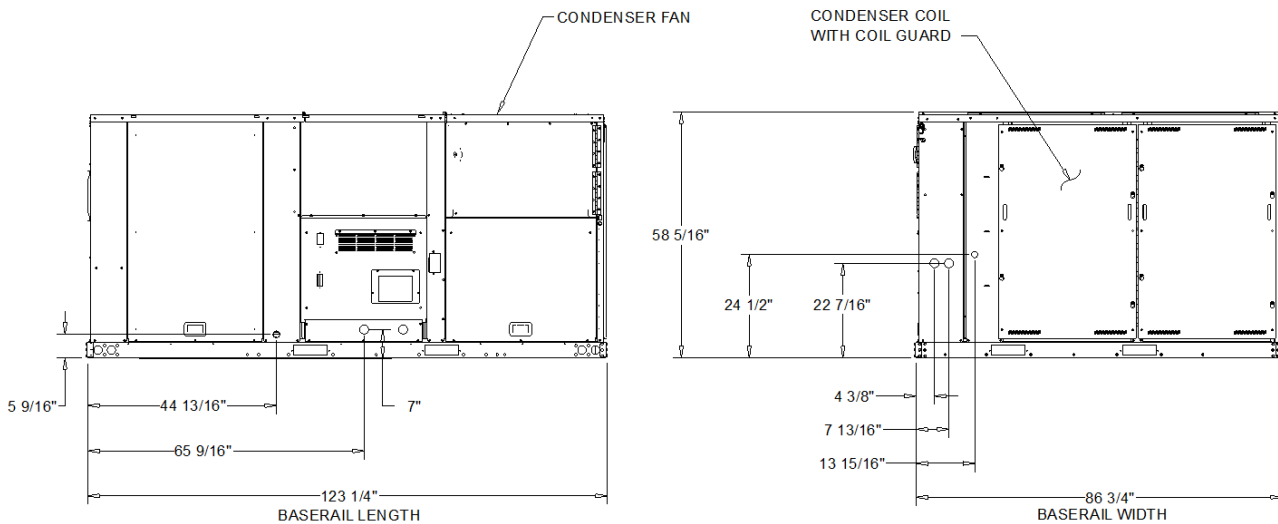
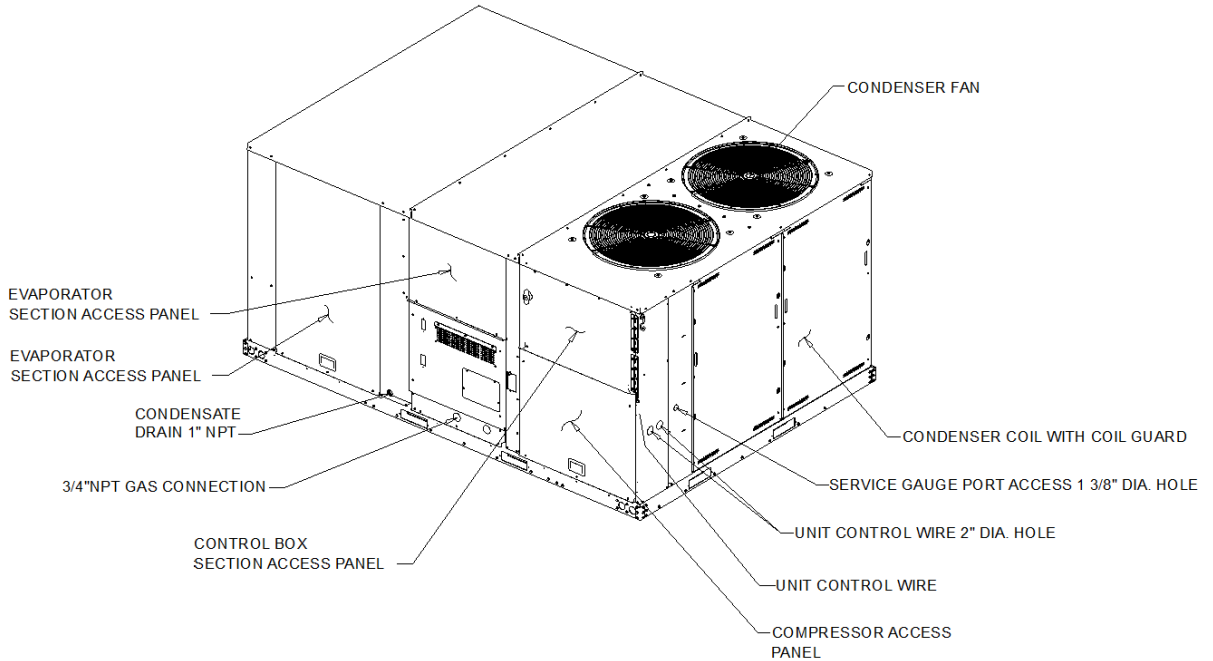
- Reference enthalpy used to measure and communicate outdoor humidity.
- Unit receives and uses information to provide improved comfort cooling while using the economizer.
- Comparative enthalpy measures and communicates humidity for both outdoor and return air conditions, and return air temperature.

- Unit receives and uses information to maximize use of economizer cooling, and to provide maximum occupant comfort control.
- Reference or comparative enthalpy available when a factory or field installed downflow economizer ordered.

Dimensional Drawings - 6- 25 Ton PKGD Precedent Unitary Rooftops

Item: A1 Qty: 1 Tag(s): RTU-2

- NOTES:
 1. THRU -THE -BASE ELECTRICAL IS NOT STANDARD ON ALL UNITS.
 2. VERIFY WEIGHT, CONNECTION, AND ALL DIMENSION WITH INSTALLER DOCUMENTS BEFORE INSTALLATION

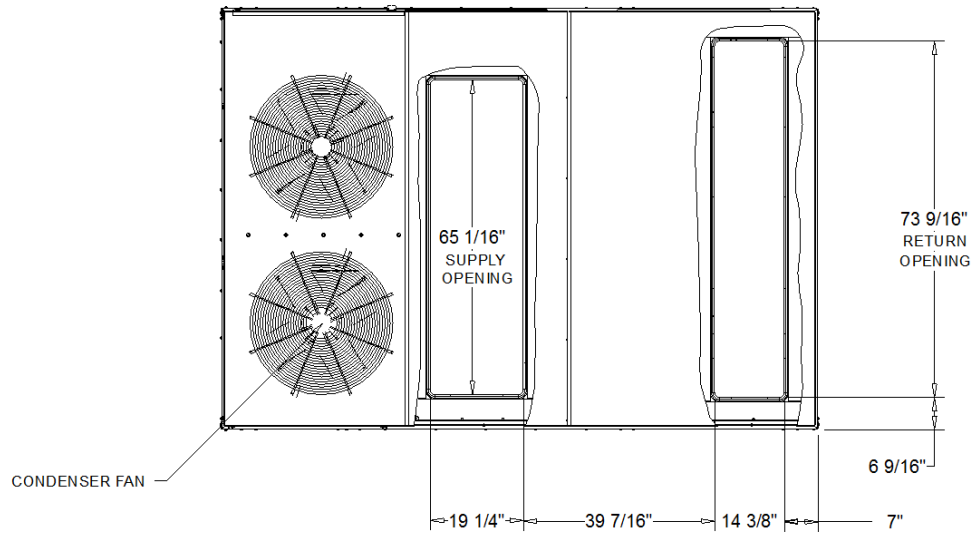


DX COOLING / GAS HEAT STANDARD EFFICIENCY

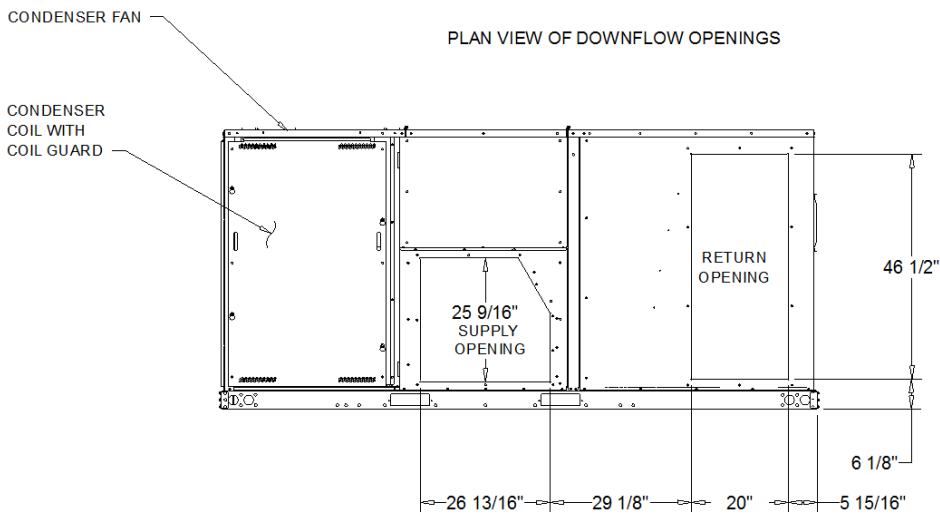
DIMENSION DRAWING

Dimensional Drawings - 6- 25 Ton PKGD Precedent Unitary Rooftops

Item: A1 Qty: 1 Tag(s): RTU-2



PLAN VIEW OF DOWNFLOW OPENINGS



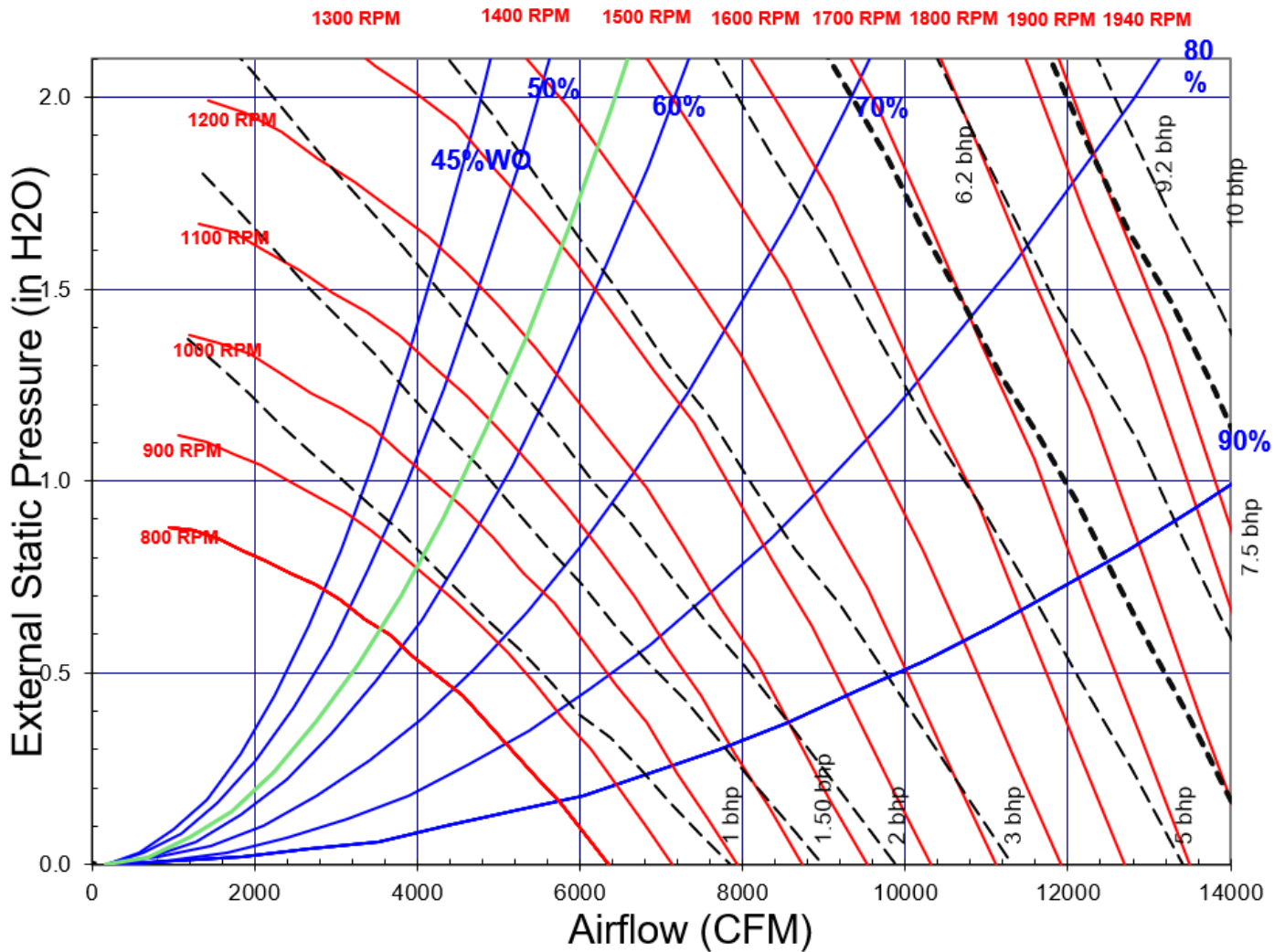
HORIZONTAL AIR FLOW OPENING

DX COOLING / GAS HEAT STANDARD EFFICIENCY

DIMENSION DRAWING

Dimensional Drawings - 6- 25 Ton PKGD Precedent Unitary Rooftops
 Item: A1 Qty: 1 Tag(s): RTU-2

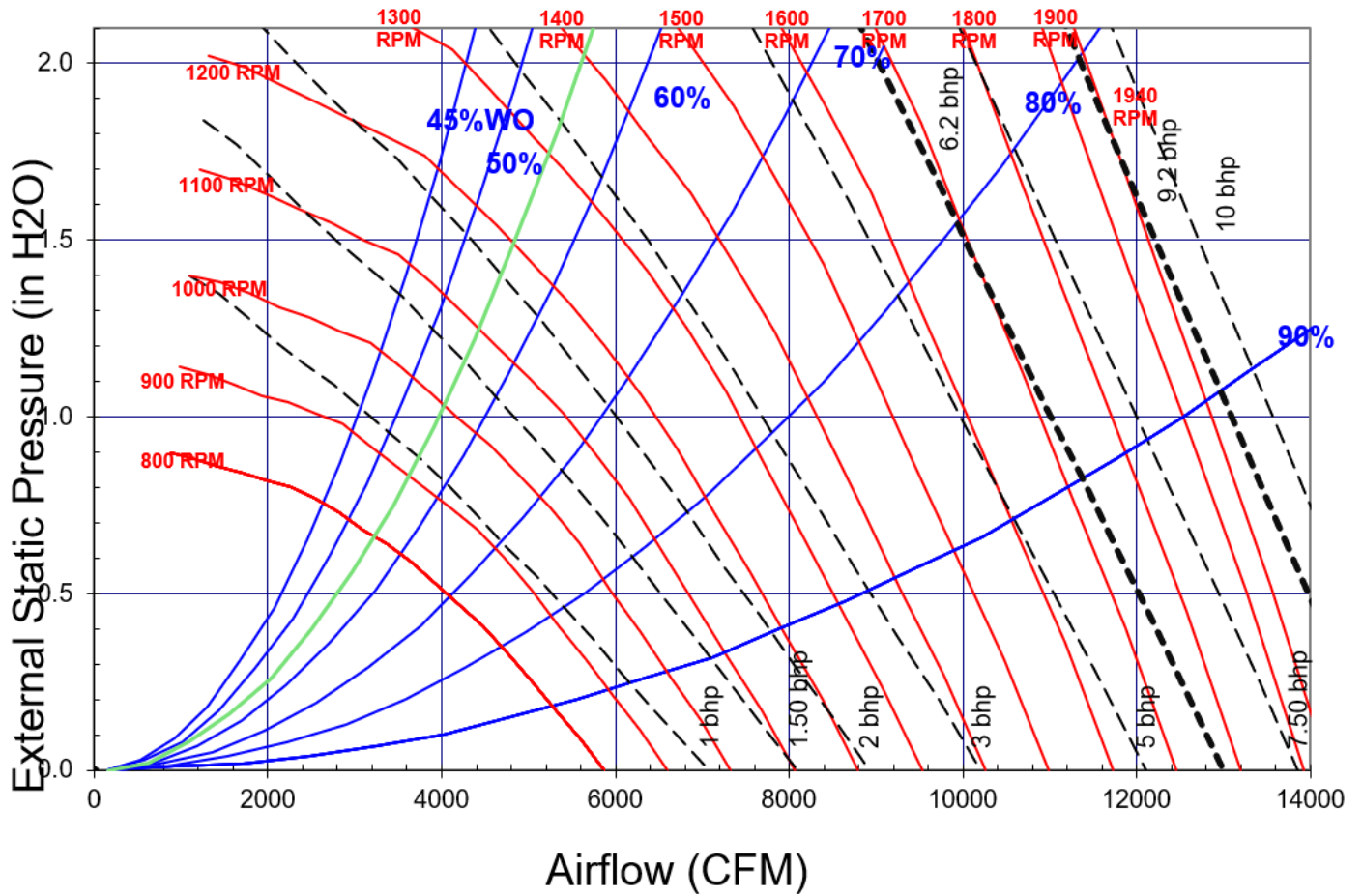
TSJ180-300*, Downflow, Std Filter, Wet Coil, Cooling Only



Note: Fan Curves are for TSJ/WSJ units. For YSJ units, add additional static pressure for Gas Heat Exchanger (ref. RT-PRC098*, table 47)

Dimensional Drawings - 6- 25 Ton PKGD Precedent Unitary Rooftops
 Item: A1 Qty: 1 Tag(s): RTU-2

TSJ180-300*, Horizontal, Std Filter, Wet Coil, Cooling Only

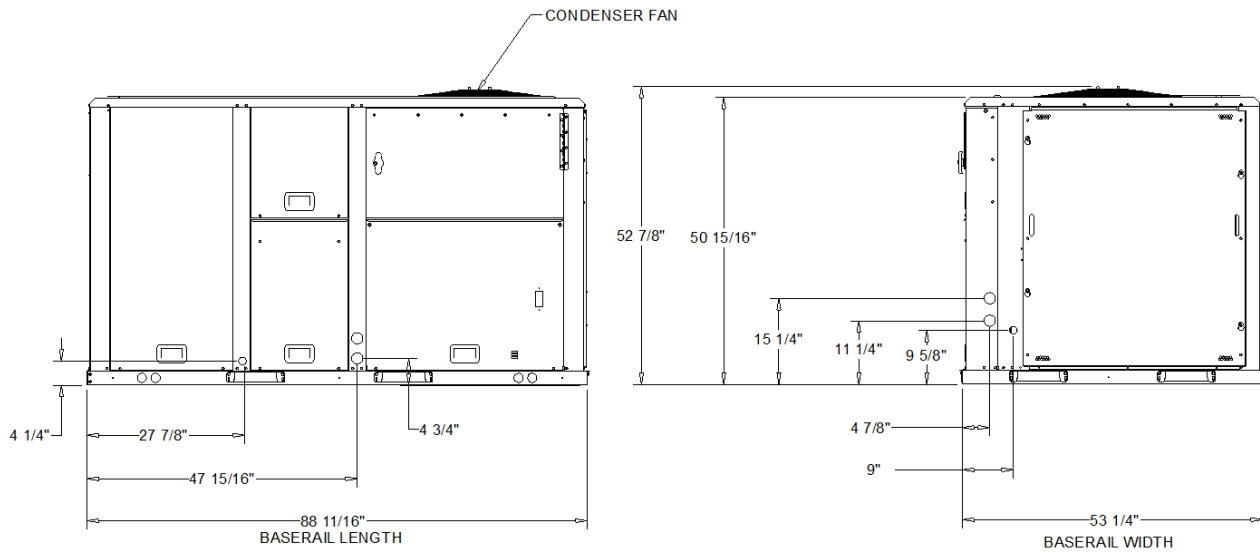
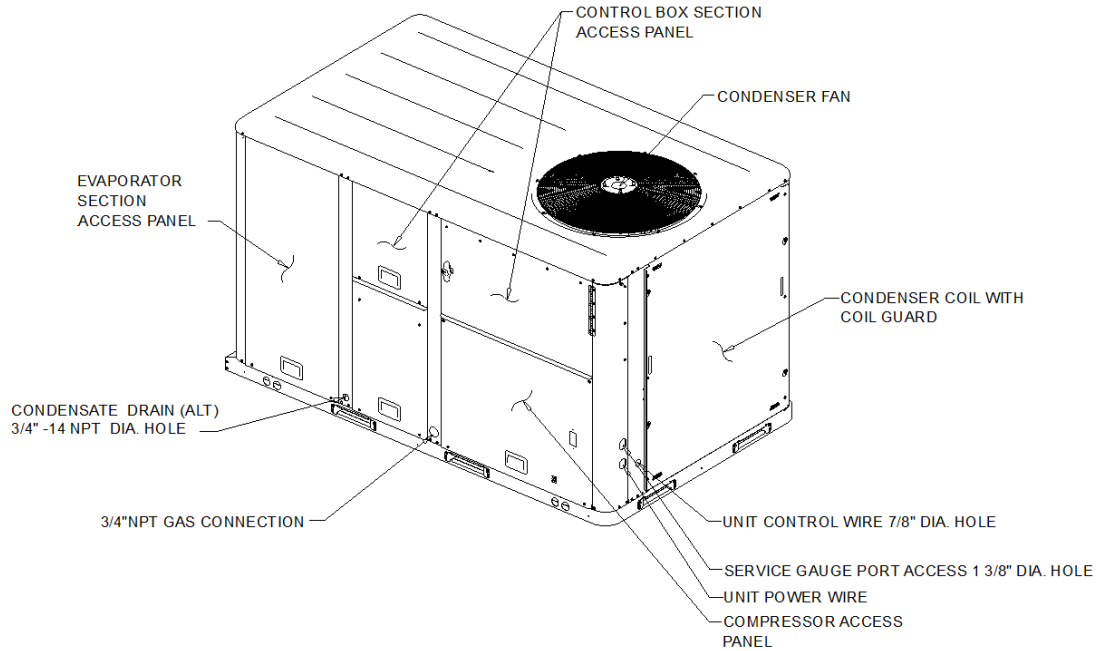


Note: Fan Curves are for TSJ/WSJ units. For YSJ units, add additional static pressure for Gas Heat Exchanger (ref. RT-PRC098*, table 47)

Dimensional Drawings - 6- 25 Ton PKGD Precedent Unitary Rooftops

Item: A2 Qty: 2 Tag(s): AHU-9, AHU-12

NOTES:
1. VERIFY WEIGHT, CONNECTION, AND ALL DIMENSION WITH INSTALLER DOCUMENTS BEFORE INSTALLATION

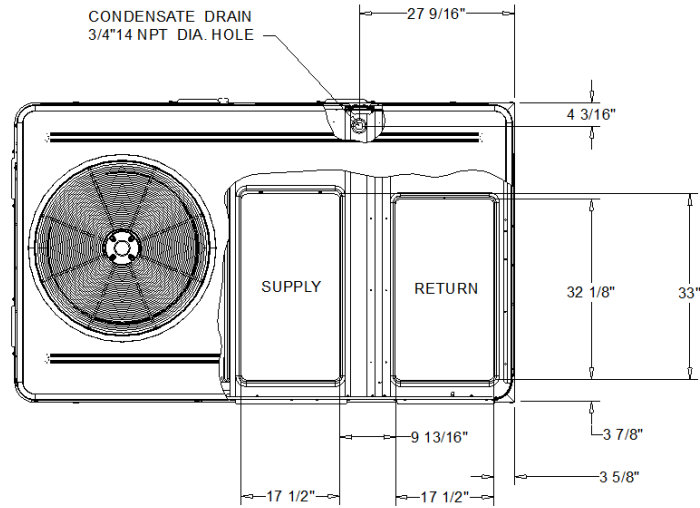


DX COOLING / GAS HEAT STANDARD EFFICIENCY

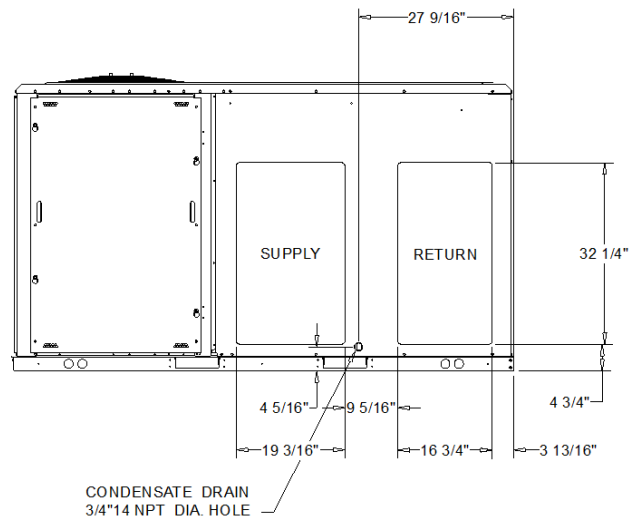
DIMENSION DRAWING

Dimensional Drawings - 6- 25 Ton PKGD Precedent Unitary Rooftops

Item: A2 Qty: 2 Tag(s): AHU-9, AHU-12



PLAN VIEW OF DOWNFLOW OPENINGS



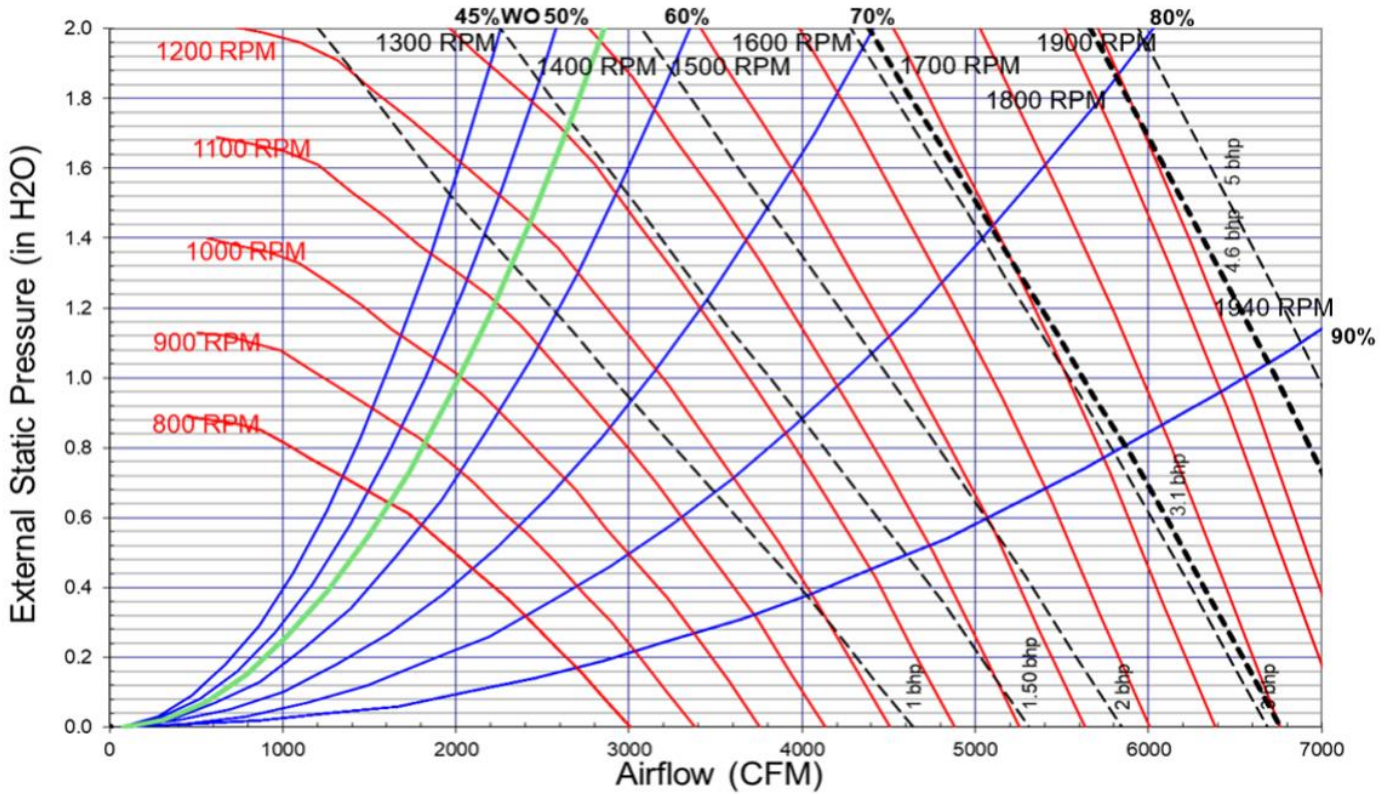
HORIZONTAL AIR FLOW OPENING

DX COOLING / GAS HEAT STANDARD EFFICIENCY

DIMENSION DRAWING

Dimensional Drawings - 6- 25 Ton PKGD Precedent Unitary Rooftops
 Item: A2 Qty: 2 Tag(s): AHU-9, AHU-12

TSJ072-120*, Downflow, Std Filter, Wet Coil, Cooling Only

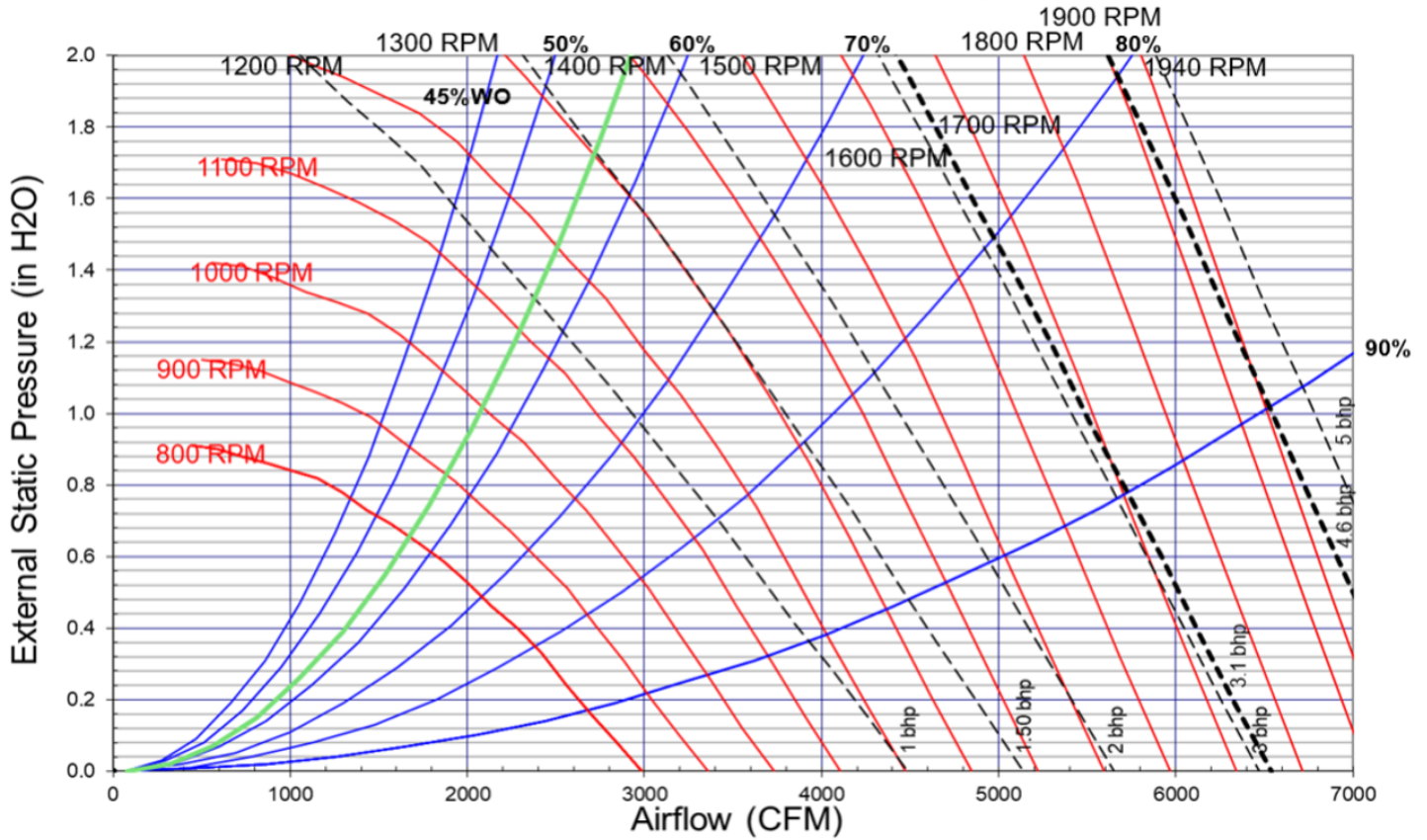


Note: Fan Curves are for TSJ/WSJ units. For YSJ units, add additional static pressure for Gas Heat Exchanger (ref. RT-PRC098*, table 47)

Dimensional Drawings - 6- 25 Ton PKGD Precedent Unitary Rooftops
Item: A2 Qty: 2 Tag(s): AHU-9, AHU-12

Saved to L: Drive

TSJ072-120*, Horizontal, Std Filter, Wet Coil, Cooling Only



Note: Fan Curves are for TSJ/WSJ units. For YSJ units, add additional static pressure for Gas Heat Exchanger (ref. RT-PRC098*, table 47)

Weight, Clearance & Rigging - 6- 25 Ton PKGD Precedent Unitary Rooftops

Item: A1 Qty: 1 Tag(s): RTU-2

NOTES:

1. APPROX. INSTALLED WEIGHT INCLUDES ALL SELECTED OPTIONS AND ACCESSORIES.
2. CORNER WEIGHTS ARE FOR BASE UNIT ONLY AND DO NOT INCLUDE OPTIONS OR ACCESSORIES.
3. WEIGHT INCLUDES BOTH FACTORY AND FIELD INSTALLED ACCESSORY.

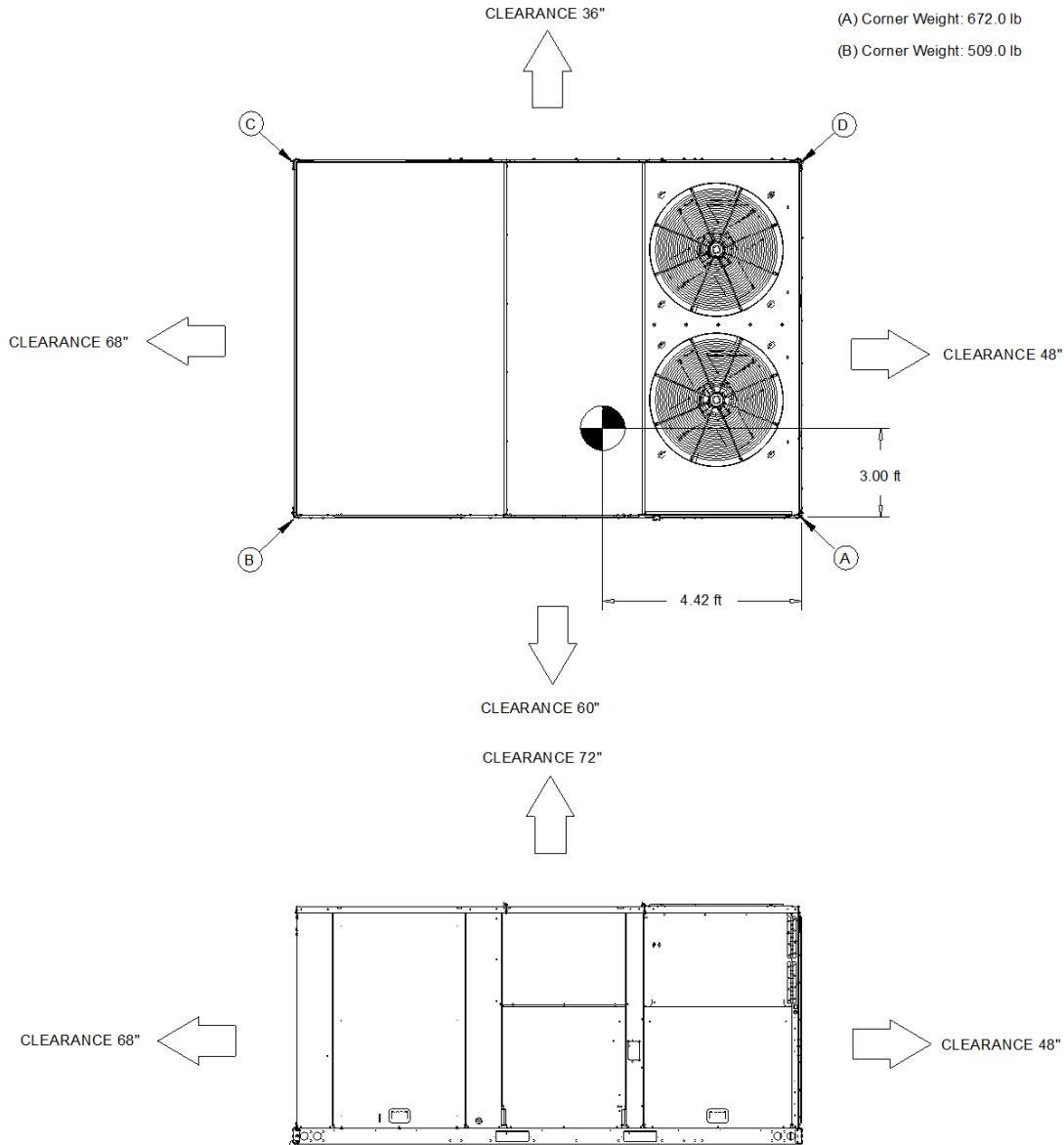
Approximate Installed Weight: 2,229.0 lb

(A) Corner Weight: 672.0 lb

(C) Corner Weight: 366.0 lb

(B) Corner Weight: 509.0 lb

(D) Corner Weight: 484.0 lb



DX COOLING / GAS HEAT STANDARD EFFICIENCY

WEIGHTS AND CLEARANCES

Weight, Clearance & Rigging - 6- 25 Ton PKGD Precedent Unitary Rooftops

Item: A2 Qty: 2 Tag(s): AHU-9, AHU-12

NOTES:

1. APPROX. INSTALLED WEIGHT INCLUDES ALL SELECTED OPTIONS AND ACCESSORIES.
2. CORNER WEIGHTS ARE FOR BASE UNIT ONLY AND DO NOT INCLUDE OPTIONS OR ACCESSORIES.
3. WEIGHT INCLUDES BOTH FACTORY AND FIELD INSTALLED ACCESSORY.

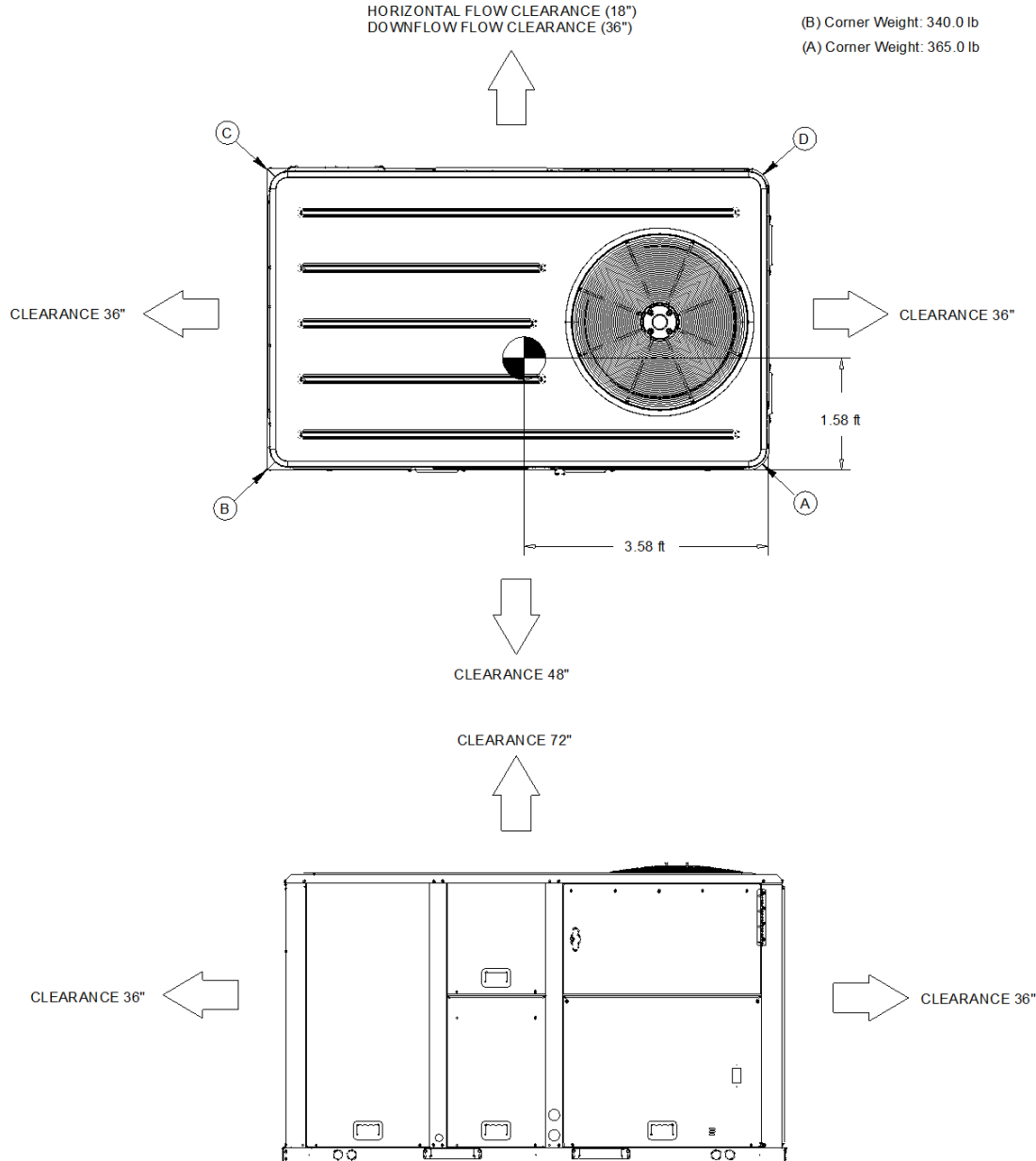
Approximate Installed Weight: 1,199.0 lb

(B) Corner Weight: 340.0 lb

(C) Corner Weight: 196.0 lb

(A) Corner Weight: 365.0 lb

(D) Corner Weight: 210.0 lb

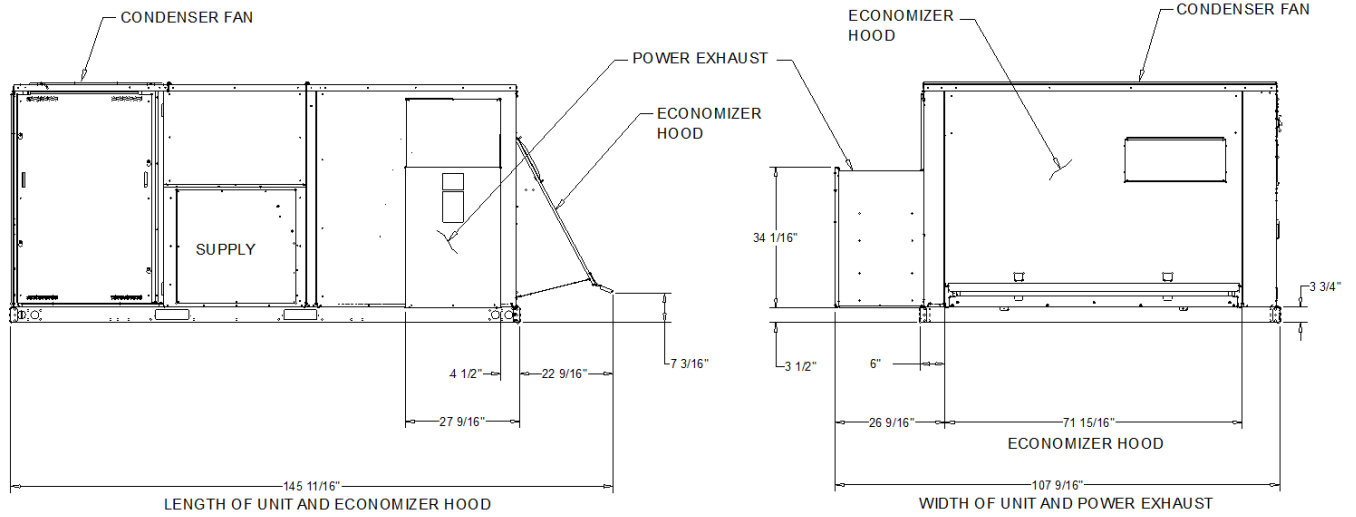
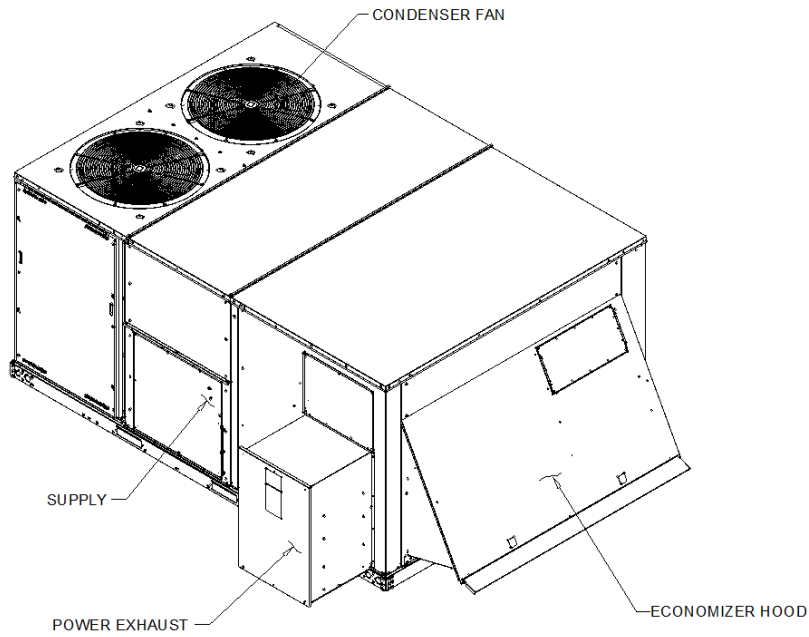


DX COOLING / GAS HEAT STANDARD EFFICIENCY

WEIGHTS AND CLEARANCES

Accessory - 6- 25 Ton PKGD Precedent Unitary Rooftops

Item: A1 Qty: 1 Tag(s): RTU-2

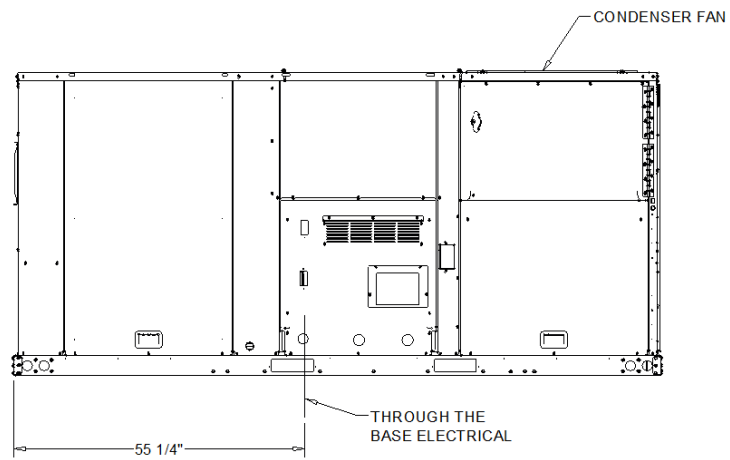
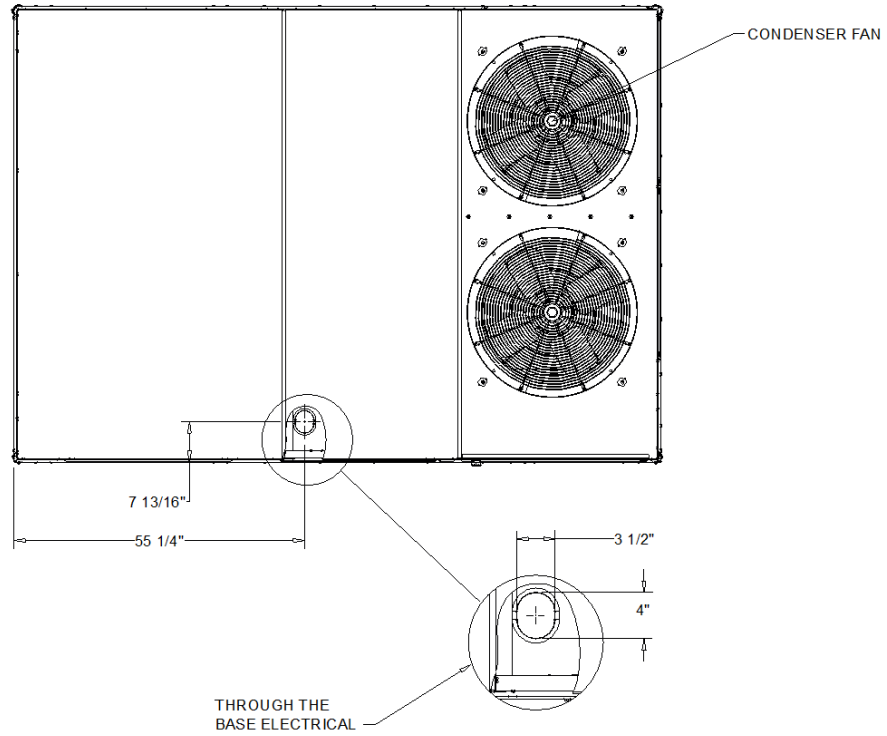


POWERED EXHAUST AND AIR DAMPER(S) (FIELD ACCESSORY)

DX COOLING / GAS HEAT STANDARD EFFICIENCY

Accessory - 6- 25 Ton PKGD Precedent Unitary Rooftops

Item: A1 Qty: 1 Tag(s): RTU-2

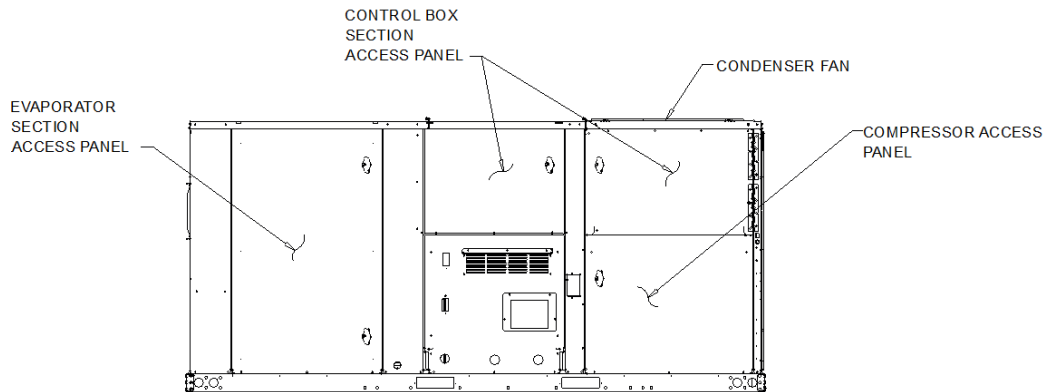
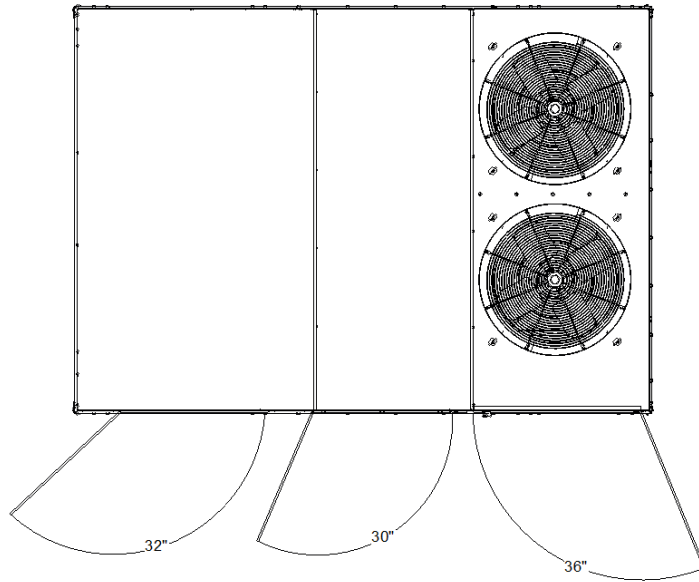


THROUGH-THE-BASE ELECTRICAL (OPTION)

DX COOLING / GAS HEAT STANDARD EFFICIENCY

Accessory - 6- 25 Ton PKGD Precedent Unitary Rooftops

Item: A1 Qty: 1 Tag(s): RTU-2

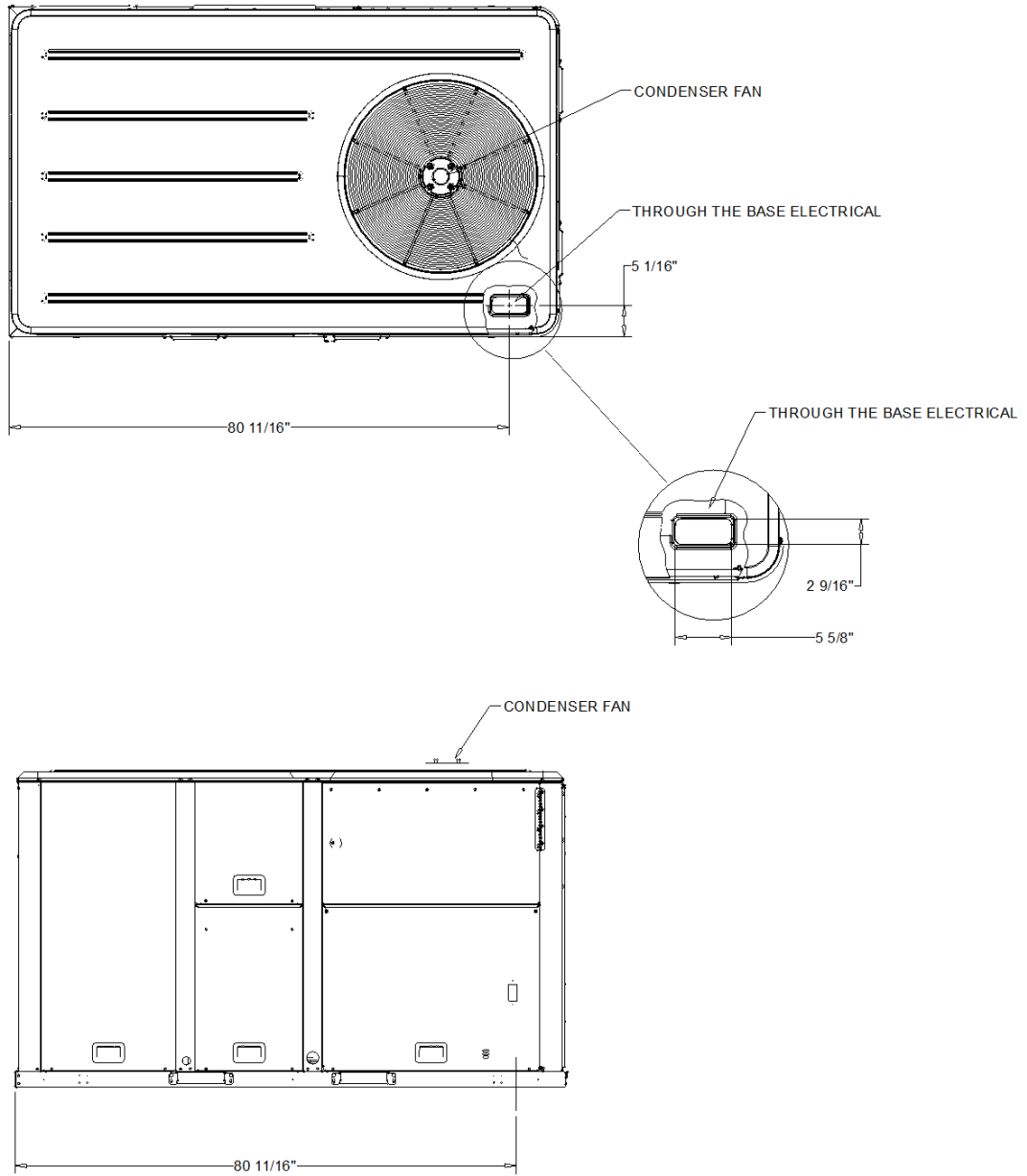


SWING DIAMETER FOR HINGED DOOR(S) (OPTION)

DX COOLING / GAS HEAT STANDARD EFFICIENCY

Accessory - 6- 25 Ton PKGD Precedent Unitary Rooftops

Item: A2 Qty: 2 Tag(s): AHU-9, AHU-12

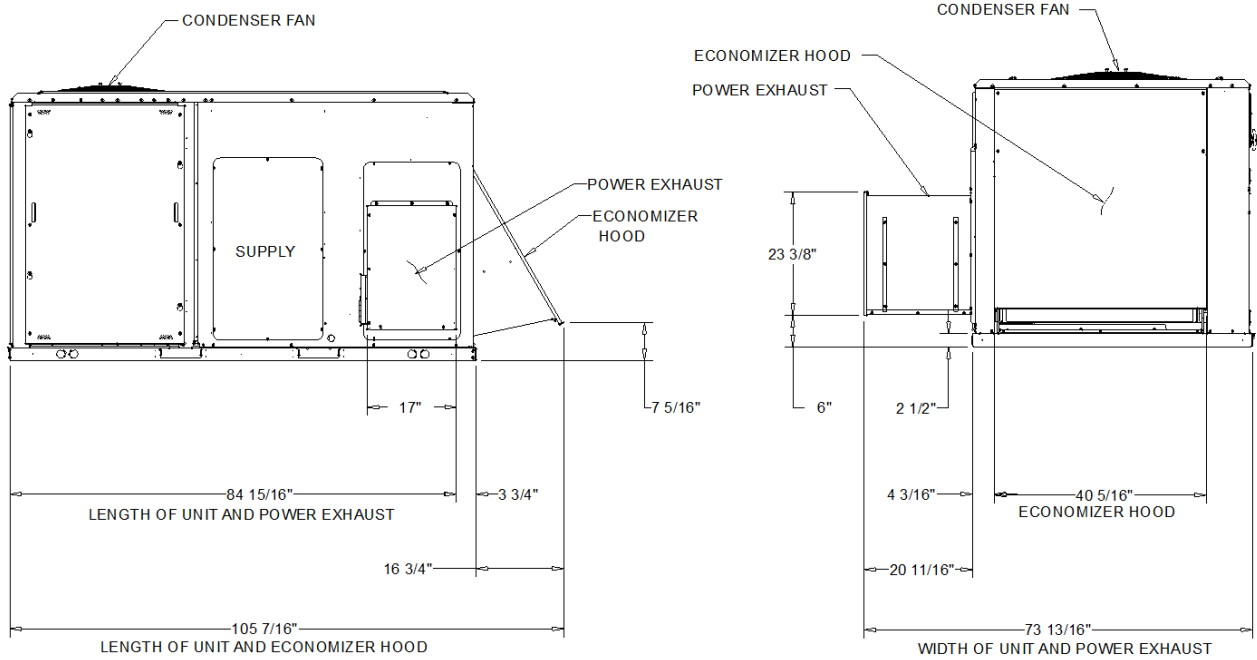
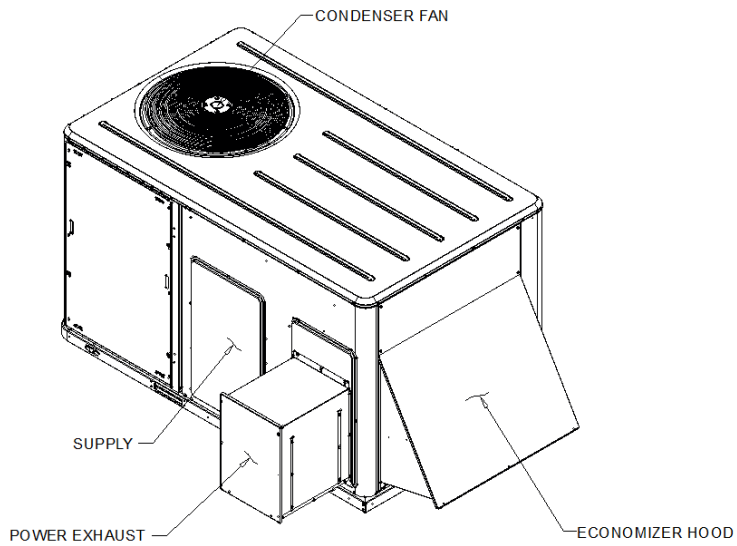


THROUGH-THE-BASE ELECTRICAL (OPTION)

DX COOLING / GAS HEAT STANDARD EFFICIENCY

Accessory - 6- 25 Ton PKGD Precedent Unitary Rooftops

Item: A2 Qty: 2 Tag(s): AHU-9, AHU-12

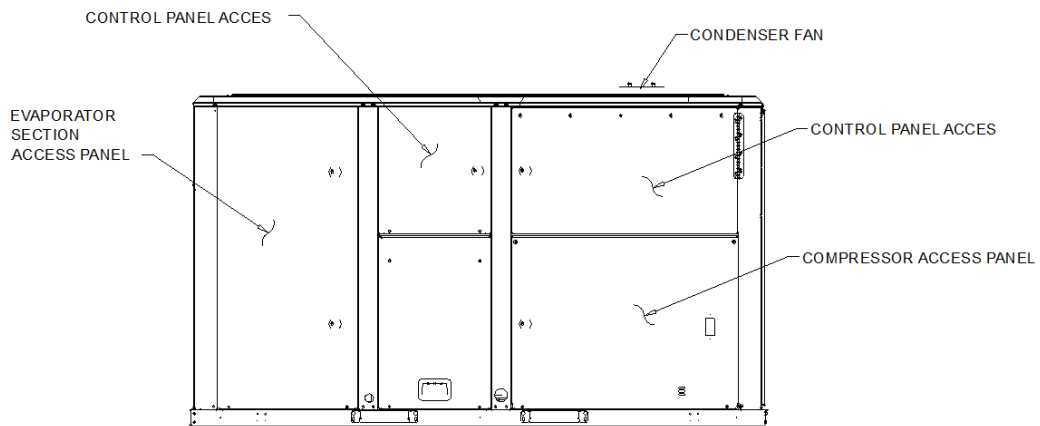
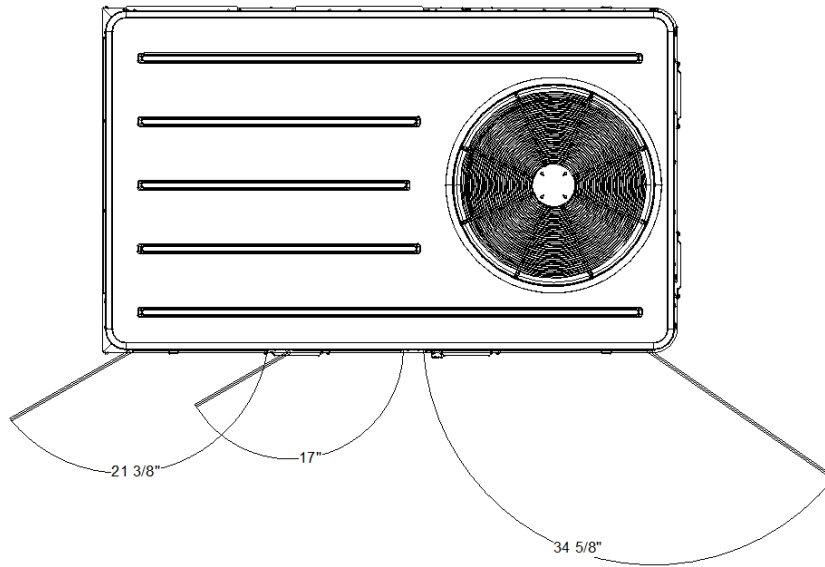


POWERED EXHAUST AND AIR DAMPER(S) (FIELD ACCESSORY)

DX COOLING / GAS HEAT STANDARD EFFICIENCY

Accessory - 6- 25 Ton PKGD Precedent Unitary Rooftops

Item: A2 Qty: 2 Tag(s): AHU-9, AHU-12

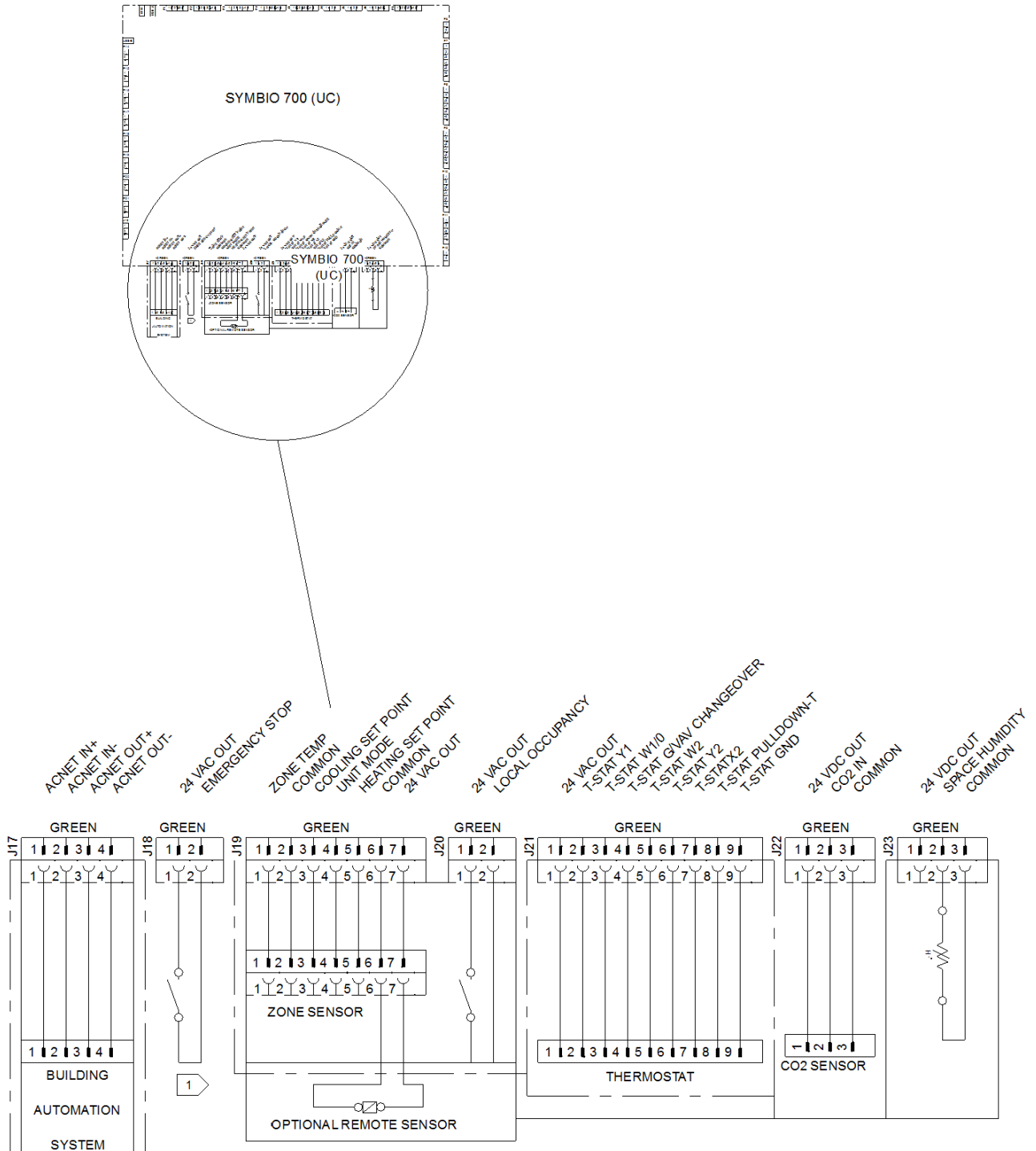


SWING DIAMETER FOR HINGED DOOR(S) (OPTION)

DX COOLING / GAS HEAT STANDARD EFFICIENCY

Field Wiring - 6- 25 Ton PKGD Precedent Unitary Rooftops
Item: A1, A2 Qty: 3 Tag(s): RTU-2, AHU-9, AHU-12

NOTES:
 1. VERIFY WEIGHT, CONNECTION, AND ALL DIMENSION WITH
 INSTALLER DOCUMENTS BEFORE INSTALLATION

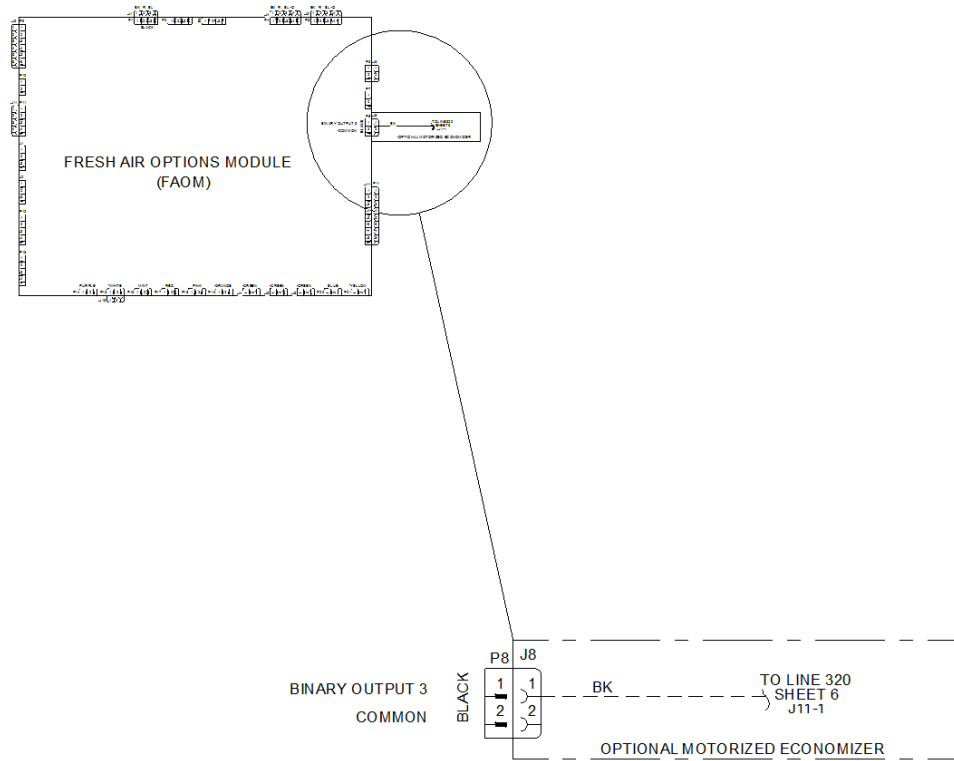


SYMBIO 700 (J17, j18, J19, J20, J21, J22, AND J23)

FIELD WIRING DRAWING

Field Wiring - 6- 25 Ton PKGD Precedent Unitary Rooftops
Item: A1 Qty: 1 Tag(s): RTU-2

- NOTES:
 1. VERIFY WEIGHT, CONNECTION, AND ALL DIMENSION WITH
 INSTALLER DOCUMENTS BEFORE INSTALLATION

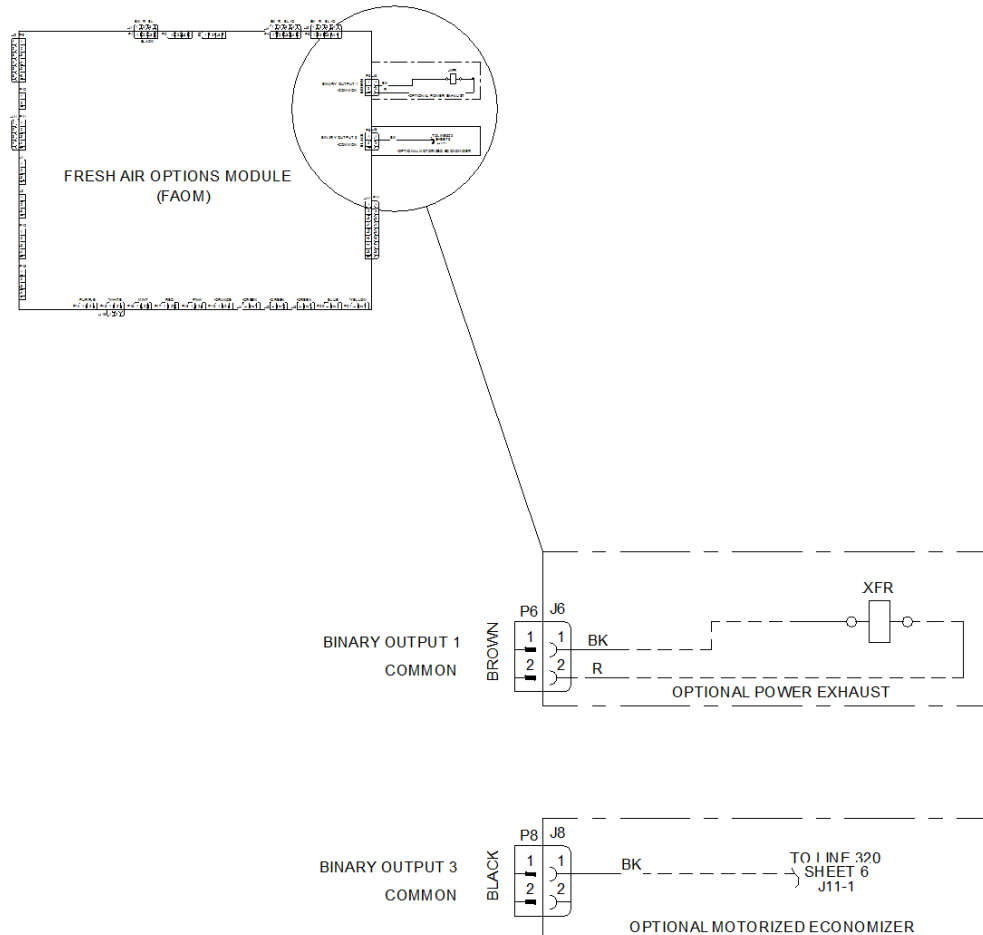


OPTIONAL MOTORIZED ECONOMIZER (J8)

FIELD WIRING DRAWING (INDOOR OPTION MODULE)

Field Wiring - 6- 25 Ton PKGD Precedent Unitary Rooftops
Item: A1, A2 Qty: 3 Tag(s): RTU-2, AHU-9, AHU-12

NOTES:
 1. VERIFY WEIGHT, CONNECTION, AND ALL DIMENSION WITH
 INSTALLER DOCUMENTS BEFORE INSTALLATION

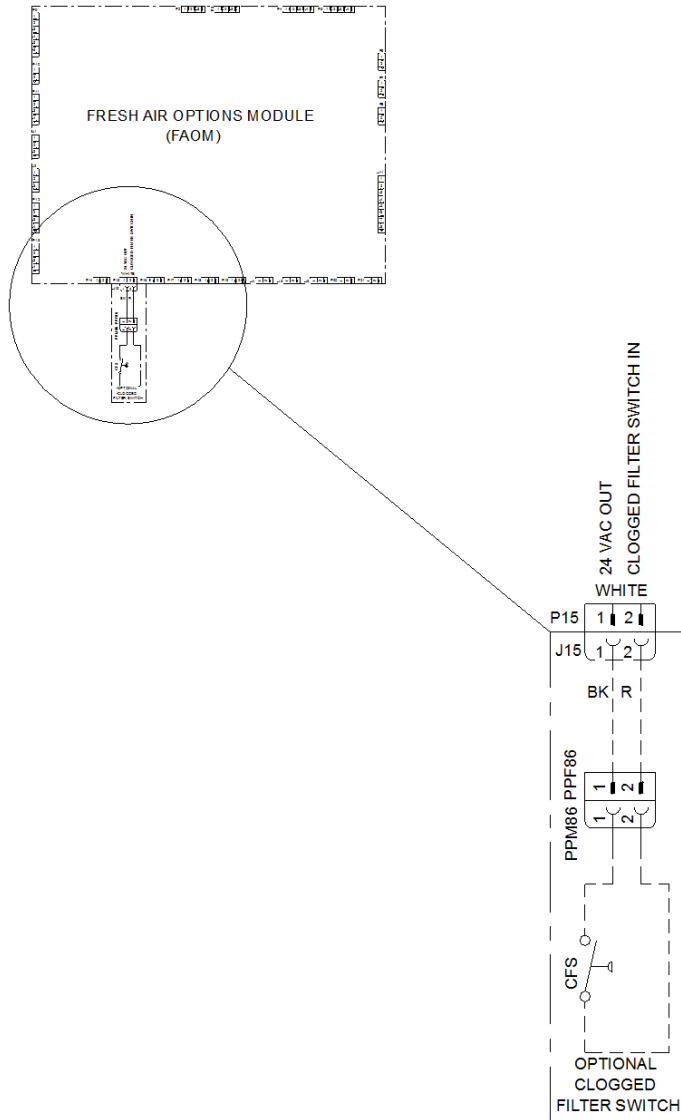


OPTIONAL POWER EXHAUST WITH MOTORIZED ECONOMIZER (J6 and J8)

FIELD WIRING DRAWING (INDOOR OPTION MODULE)

Field Wiring - 6- 25 Ton PKGD Precedent Unitary Rooftops
Item: A1 Qty: 1 Tag(s): RTU-2

- NOTES:
1. VERIFY WEIGHT, CONNECTION, AND ALL DIMENSION WITH
INSTALLER DOCUMENTS BEFORE INSTALLATION



OPTIONAL CLOGGED FILTER SWITCH (J15)
FIELD WIRING DRAWING (FRESH AIR OPTIONS MODULE)

Field Installed Options - Part/Order Number Summary

This is a report to help you locate field installed options that arrive at the jobsite. This report provides part or order numbers for each field installed option, and references it to a specific product tag. It is NOT intended as a bill of material for the job.

Product Family - 6- 25 Ton PKGD Precedent Unitary Rooftops

Item	Tag(s)	Qty	Description	Model Number
A1	RTU-2	1	6- 25 Ton PKGD Precedent Unitary Rooftop	YSJ210AWSAH**00E0A2B1A002

Field Installed Option Description	Part/Ordering Number
Fresh Air Option Module	FIAOPTN002A
Low Leak Economizer, Dry Bulb, Horiz	FIAECON203A
Power exhaust	FIAPWRXW03A
Return air remote sensor	BAYSTAT170A
Clogged filter switch MERV 13	FIACLFS004A
Low Ambient Kit	FIALOAM001A
Horizontal Conversion Panel	FIAHZDC001A

Item	Tag(s)	Qty	Description	Model Number
A2	AHU-9, AHU-12	2	6- 25 Ton PKGD Precedent Unitary Rooftop	YSJ090AWS0H**D0E0A2A10001

Field Installed Option Description	Part/Ordering Number
Power exhaust	FIAPWRXW02A



Submittal

Prepared For:
EXP Engineering

Date: February 28, 2024

Sold To:
HWDSB

Job Name:
Glendale SS - Renovation

Trane Canada ULC is pleased to provide the following submittal for your review and approval.

Product Summary

Qty Product

2 Custom Packaged RT Units (**AHU-10, AHU-11**)

Controls to be coordinated with Successful BAS contractor

Carmine Bozzo/Rory Mills
Trane Canada ULC

The attached information describes the equipment we propose to furnish for this project and is submitted for your approval.

Submittal acceptance and return is a critical step, so please ensure submittals are returned with approval to release to production within 14 days of submittal date.

Product performance and submittal data is valid for a period of 6 months from the date of submittal generation. If six months or more has elapsed between submittal generation and equipment release, the product performance and submittal data will need to be verified. It is the customer's responsibility to obtain such verification.

**AIR WISE SALES INC.**

CUSTOM DESIGNED AIR HANDLING SYSTEMS

UNIT SPECIFICATIONS**FP2746****AHU-10**

JOB NAME	GLENDALE SCHOOL
JOB NUMBER	FP2746
UNIT TAG	AHU-10
MODEL	PAC500/D30/RA
NO. OF UNITS	ONE (1)
PLACEMENT	OUTDOOR, BASE MOUNTED
HANDING	ACCESS AS SHOWN, SIDE DISCHARGE
SUPPLY CFM	11,220 CFM
ESP	1.80 " W.C.
TSP	3.82 " W.C.
FAN	ANPA28 254T/256T FAN, DIRECT DRIVE
BHP	8.87 BHP
RPM	1,208 RPM
MOTOR	10HP TEFC PREMIUM-EFFICIENCY, INVERTER DUTY, 1200 RPM
RETURN CFM	10,320 CFM
ESP	1.00 " W.C.
TSP	1.35 " W.C.
FAN	ANPL28 254T/256T FAN, DIRECT DRIVE
BHP	3.82 BHP
RPM	1,001 RPM
MOTOR	7.5HP TEFC PREMIUM-EFFICIENCY, INVERTER DUTY, 1200 RPM
O/A FILTER	2" MERV 13 FILTERS
QUANTITY AND SIZE	(6) 24 X 24 X 2
AREA	24 SQ.FT.
FACE VELOCITY	468 FPM
COOLING COIL	EXPANSION TYPE, SIZE: 68.75"FH X 47"FL
GAS INPUT	440 MBH
HEAT OUTPUT	356 MBH
FUEL TYPE	NATURAL GAS
INLET PRESSURE	7" W.C.
TEMPERATURE RISE	29 °F
CONDENSING SECTION	(1) ZPDT16MCE-TFE DIGITAL COPELAND SCROLL COMPRESSOR (1) ZPT166KCE-TFE COPELAND SCROLL COMPRESSOR 30 TON NOMINAL CAPACITY 4 STAGES OF COOLING, DIGITAL LEAD COMPRESSOR R410A REFRIGERANT, 575V/3/60 COMPRESSORS C/W RUBBER GROMMETS (2) AKFD 800-6-6 K.6LA CONDENSOR FANS

**AIR WISE SALES INC.**

CUSTOM DESIGNED AIR HANDLING SYSTEMS

UNIT SPECIFICATIONS**FP2746****AHU-10**

CONTROL SYSTEM	DISTECH DDC C/W EC SMART-VUE PROGRAMMABLE BACNET MS/TP CONTROLLER
O/A DAMPER	TAMCO1000, PARALLEL BLADE, LOW LEAK, SIZE: 36"L X 40"H
R/A DAMPER	TAMCO1000, PARALLEL BLADE, LOW LEAK, SIZE: 36"L X 40"H
E/A DAMPER	TAMCO1000, OPPOSED BLADE, LOW LEAK, SIZE: 36"L X 24"H
DAMPER ACTUATORS	MODULATING 0-10VDC SPRING RETURN
UNIT VOLTAGE	575V/3/60
SF MOTOR AMPS	10.3 A
RF MOTOR AMPS	7.9 A
CONTROL AMPS	1.3 A
COMPRESSOR AMPS	(4) 9.35 A
CONDENSER FAN MOTOR AMPS	(2) 3.24 A
UNIT MCA	66.0 A
UNIT MOP	70.0 A
CASING	20 GA SATIN COAT
LINER	20 GA GALVANIZED
FLOOR	18 GA GALVANIZED
BASE	6" FORMED CHANNEL
INSULATION	2" R13 FOAM INJECTED
DOORS	HINGED DOUBLE WALL DOORS C/W CAM LOCK FASTENERS AND NEOPRENE GASKETS
FINISH	ACRYLIC ENAMEL GREY PAINT
FEATURES	<ul style="list-style-type: none">• FACTORY UNIT MOUNTED NON-FUSED DISCONNECT SWITCH• O/A HOOD C/W BIRD SCREEN• S/A & E/A FAN / MOTOR ASSEMBLY MOUNTED ON RIS ISOLATORS• FACTORY MOUNTED VFD FOR S/A & E/A FAN MOTOR• UNIT TO FIT EXISTING CURB• STAINLESS STEEL DRAIN PAN WITH 1-1/4" NPT DRAIN CONNECTION FOR COOLING COIL• E/A 4-WAY DIFFUSER C/W BIRD SCREEN• ETL APPROVED
SHIPPED LOOSE	<ul style="list-style-type: none">• INTAKE HOOD• DISCHARGE AIR SENSOR
ESTIMATED TOTAL WEIGHT	9,500 LBS
PREPARATION DATE	FEBRUARY 27, 2024



AIR WISE SALES INC.
CUSTOM DESIGNED AIR HANDLING SYSTEMS
EXPANSION COIL SELECTION DATA

FP2746
AHU-10

JOB NAME	GLENDAL SCHOOL
JOB NUMBER	FP2746
UNIT TAG	AHU-10
MODEL	PAC500/D30/RA
COIL TYPE	EXPANSION
COIL DUTY	COOLING COIL
NO. OF COILS	ONE (1)
AIRFLOW THRU COIL (CFM)	11,220
ENT. AIR DB/WB (F)	79.5/68
LVG. AIR DB/WB (F)	62/58.27
TOTAL COIL CAPACITY (BTUH)	356,780
SENSIBLE CAPACITY (BTUH)	212,810
FACE VELOCITY (FT/MIN)	500
AIR PRES. DROP (IN.WG)	0.18
REFRIGERANT	R410A
SUCTION TEMP. (DEG F)	45.0
REFRIGERANT PRES. DROP (PSI)	9.75
ROWS	2
FINS PER INCH	11
FIN HEIGHT (IN)	68.75
FIN LENGTH (IN)	47.00
CASING MATERIAL	GALVANIZED STEEL 16 GAUGE
TUBE MATERIAL	COPPER
FIN MATERIAL	ALUMINUM
NO. OF CIRCUITS (PER COIL)	2



AIR WISE

CUSTOM AIR HANDLING UNITS

FP2746
AHU-10

EER PERFORMANCE CALCULATION

JOB NAME	GLENDALE SCHOOL	AGENT	-
MODEL NO.	PAC500/D30/RA	UNIT TAG(S)	AHU-10
COOLING CAPACITY	350,360 BTU/H	AIR SUPPLY	11,220 CFM
SUCTION TEMPERATURE	45	CONDENSING TEMPERATURE	117
STAGES OF COOLING	4	COMPRESSOR MODEL	ZP83 & ZPD83
NUMBER OF COMPRESSORS	4	COMPRESSOR TYPE	SCROLL
COMPRESSOR POWER AT DESIGN POINT (WATTS)	6,600	COMPRESSOR EER	13.79
CONDENSER FAN MODEL	AKFD 800-6-6 K.6LA	NUMBER OF FANS	2
CONDENSER FAN POWER (WATTS)	2,130		
SUPPLY FAN MODEL	ANPA 28	NUMBER OF FANS	1
FAN POWER* (BHP)	3.55 BHP	WATTS	2,647 W
		MOTOR EFFICIENCY	91.7
FAN POWER (ADJUSTED**) (WATTS)	3,038.8		

COMPONENT	POWER DRAW (W)	QUANTITY	SUBTOTAL
COMPRESSOR	6,600	4	26,400
CONDENSER FAN	2,130	2	4,260
SUPPLY FAN	3,039	1	3,039
CONTROL XFMR***	100	1	100
TOTAL POWER DRAW (WATTS)			33,799

EER CALCULATION

$$EER = \frac{\text{TOTAL COOLING (BTU/H)}}{\text{TOTAL POWER DRAW (W)}}$$

$$EER = \frac{350,360}{33,799}$$

$$EER = 10.37 \text{ BTU/W*H}$$

NOTES

* SUPPLY FAN EXTERNAL STATIC PRESSURE CORRECTED PER AHRI STANDARD 340/360

* FILTER STATIC PRESSURE CORRECTED TO MANUFACTURER'S STANDARD FILTER (SECTION E3.2.1)

** FAN MOTORS CORRECTED FOR EFFICIENCY AND DRIVE LOSSES

*** CONTROL TRANSFORMER CORRECTED TO 100 VA

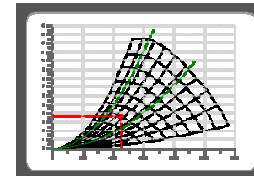


2023-10-23
Aeolus4 1.0.23093.0 Apr 2023

Customer	GLENDALE SECONDARY SCHOOL	Description	SF
Project	FP2746	Our Ref.	Air Wise Sales Inc
Your Ref.	AHU-10-PROPOSAL		

Input data			
Volume	11220 CFM	Temperature	68.0 °F
Static Pressure	3.62 In.W.G.	Altitude	0 ft
		Density	0.075 lb/cu.ft
		Free Inlet - Free Outlet	

Selected Fan ANPA28 -	Catalogue data		
	n Max	Pw Max	J
	1/min	BHP	lb ft²
	2100		140.01



Fan Information											
c ft/min	p tot * In.W.G.	p sta In.W.G.	p dyn ** In.W.G.	tip speed ft/min	RPM 1/min	eta Tot * %	eta Sta %	P fan BHP	Min Mot. BHP	P mot BHP	Shaft diameter in
	3.94	3.62	0.32	8841	1208	78.27	71.99	8.87		10 HP	0.00

(*)Theoric value calculated taking into account the dynamic pressure at the impeller outlet

(**)Theoric value, calculated at the impeller outlet

fm[Hz]		63	125	250	500	1000	2000	4000	8000	Tot.
Lw3 Total Sound Power Level in the inlet duct- Lwi Inlet Duct Sound Power Level includes the effect of duct end correction										
Level Lw3	dB/dB(A)	88 / 62	79 / 63	86 / 77	75 / 72	75 / 75	69 / 70	67 / 68	63 / 62	91 / 81
Lw5 Inlet Total Sound Power Level - Lwmi Inlet Sound Power Level (free inlet) do not includes the effect of duct end correction										
Level Lw5	dB/dB(A)	76 / 50	81 / 64	87 / 79	77 / 74	74 / 74	72 / 73	71 / 72	68 / 67	89 / 82
Lw6 Total Sound Power Level at the free outlet - Lwmo Outlet Sound Power Level (free outlet) do not includes the effect of duct end correction										
Level Lw6	dB/dB(A)	85 / 59	79 / 63	89 / 80	87 / 84	84 / 84	77 / 78	76 / 77	76 / 75	93 / 89

Certificates



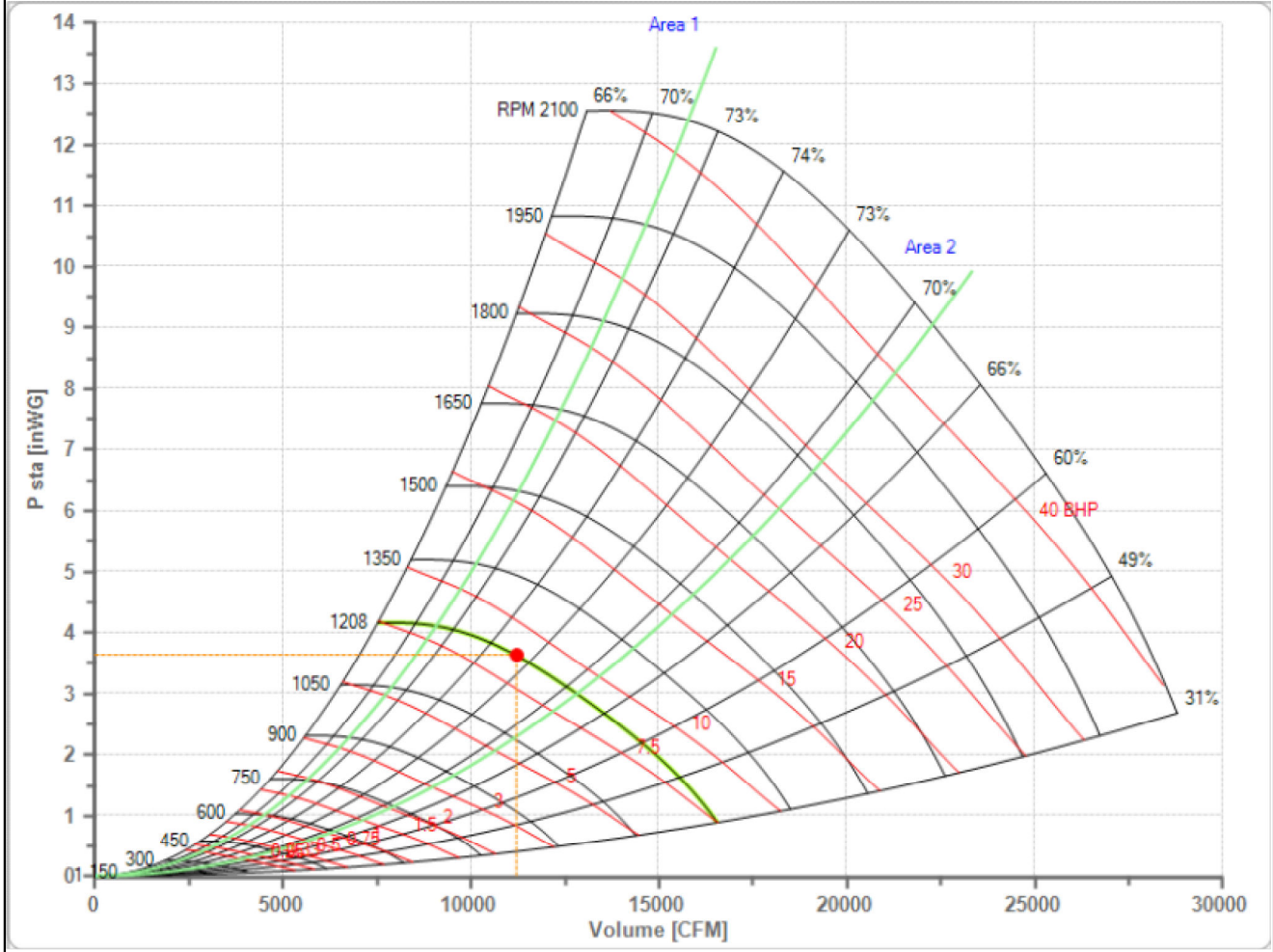
Comefri USA Inc. certifies that the ANPA28 - shown here is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 and 311 and comply with the requirements of the AMCA Certified Ratings Program. Performance ratings include to effects of spring dampers and does not include the effects of appurtenances (accessories). Power rating (kW or BHP) does not include transmission losses. Free inlet Lw5, LwA5 sound power levels shown are in decibels, referred to 10⁻¹² watts calculated per AMCA International Standard 301. Air and free inlet Lw5, LwA5 sound performances shown are for installation type A: Free inlet - Free outlet. The AMCA Certified Ratings Seal applies to air performance and to free inlet Lw5, LwA5 sound power levels. The AMCA Certified Ratings Seal does not apply either to in-duct inlet Lw3, LwA3 sound or outlet Lw6, LwA6 sound.

Chart



2023-10-23
Aeolus4 1.0.23093.0 Apr 2023

Selected Fan	ANPA28 -	Fan working conditions	Free Inlet - Free Outlet
n Max	2100 1/min	Volume	11220 CFM
Pw Max		Total Pressure	3.94 In.W.G.
J	140.01 lb ft ²	Static Pressure	3.62 In.W.G.
		P fan	8.87 BHP
Required working point	•	eta Tot	78.27 %
Effective working point	•	eta Sta	71.99 %
		RPM	1208 1/min
		Temperature	68.0 °F
		Altitude	0 ft



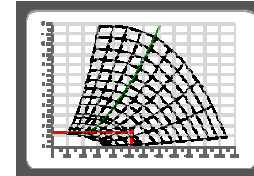


2024-02-27
Aeolus4 1.0.23093.0 Apr 2023

Customer	GLENDALE SECONDARY SCHOOL	Description	SF
Project	FP2746	Our Ref.	Air Wise Sales Inc
Your Ref.	AHU-10		

Input data			
Volume	10320 CFM	Temperature	68.0 °F
Static Pressure	1.35 In.W.G.	Altitude	0 ft
		Density	0.075 lb/cu.ft
		Free Inlet - Free Outlet	

Selected Fan ANPL 28 CL2	Catalogue data		
	n Max	Pw Max	J
	1/min	BHP	lb ft²
	1915		107.97



Fan Information											
c ft/min	p tot * In.W.G.	p sta In.W.G.	p dyn ** In.W.G.	tip speed ft/min	RPM 1/min	eta Tot * %	eta Sta %	P fan BHP	Min Mot. BHP	P mot BHP	Shaft diameter in
	1.58	1.35	0.24	7333	1001	67.37	57.37	3.82			0.00

(*)Theoric value calculated taking into account the dynamic pressure at the impeller outlet

(**)Theoric value, calculated at the impeller outlet

fm[Hz]		63	125	250	500	1000	2000	4000	8000	Tot.
Lw3 Total Sound Power Level in the inlet duct- Lwi Inlet Duct Sound Power Level includes the effect of duct end correction										
Level Lw3	dB/dB(A)	85 / 59	87 / 71	80 / 72	76 / 73	76 / 76	72 / 73	71 / 72	65 / 64	90 / 81
Lw5 Inlet Total Sound Power Level - Lwmi Inlet Sound Power Level (free inlet) do not includes the effect of duct end correction										
Level Lw5	dB/dB(A)	77 / 50	85 / 68	82 / 73	77 / 74	75 / 75	74 / 76	72 / 73	65 / 64	88 / 82
Lw6 Total Sound Power Level at the free outlet - Lwmo Outlet Sound Power Level (free outlet) do not includes the effect of duct end correction										
Level Lw6	dB/dB(A)	81 / 55	89 / 73	88 / 80	86 / 83	82 / 82	79 / 80	76 / 77	69 / 68	94 / 88

Certificates



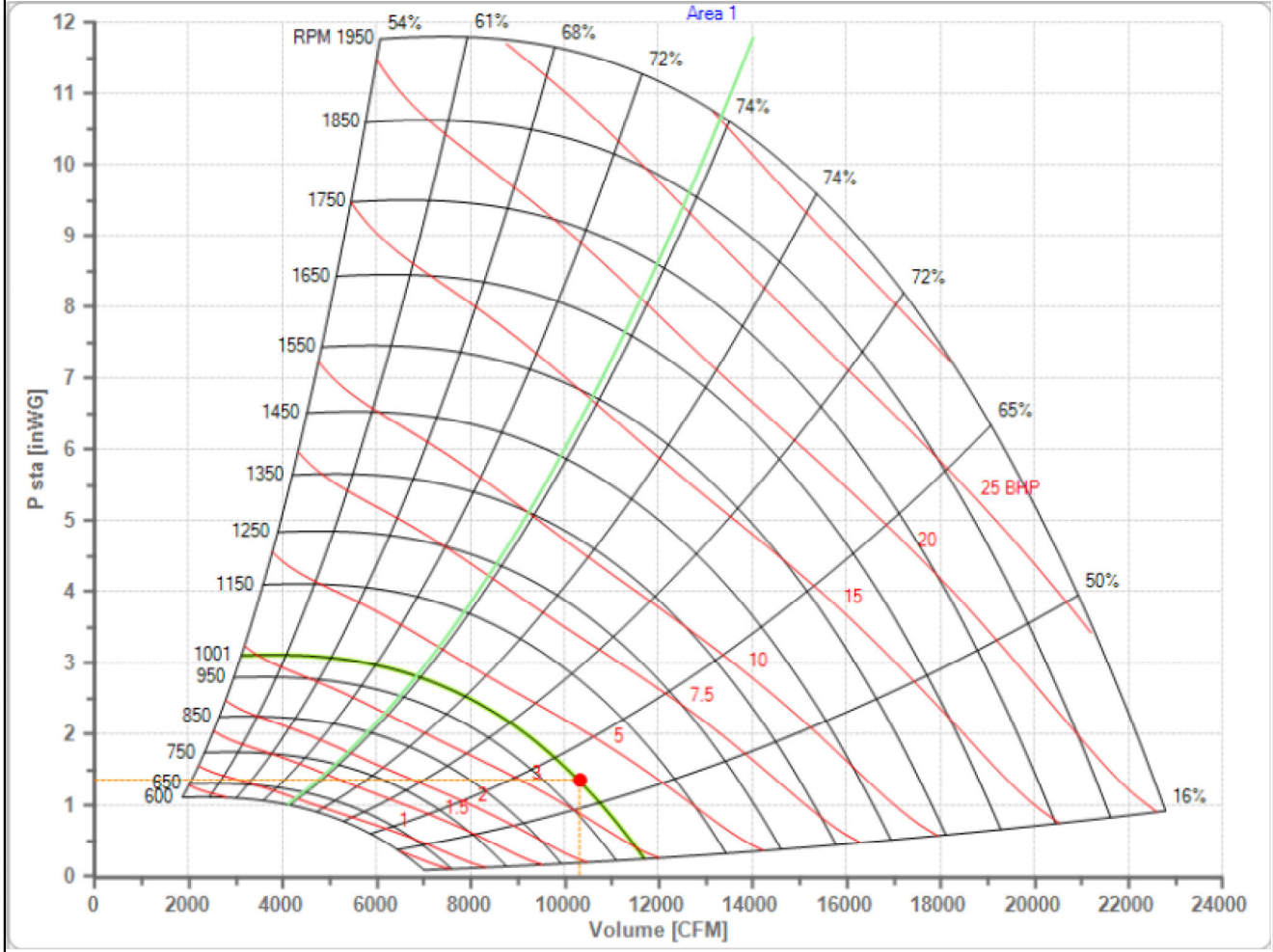
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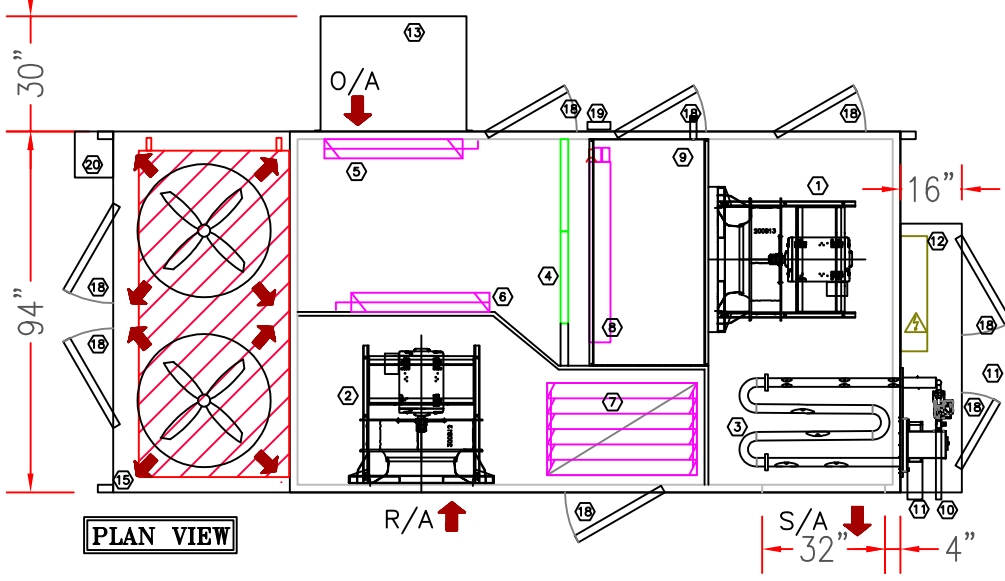
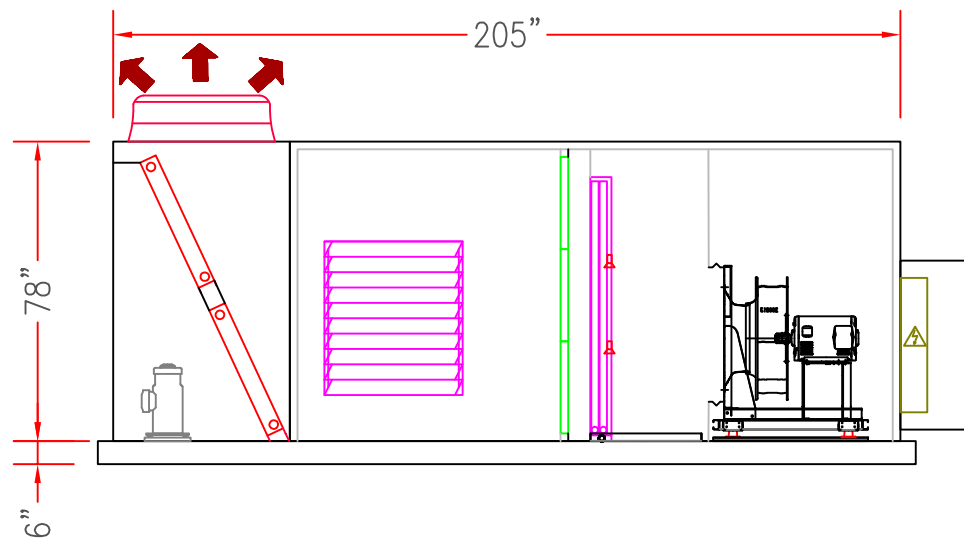
Chart



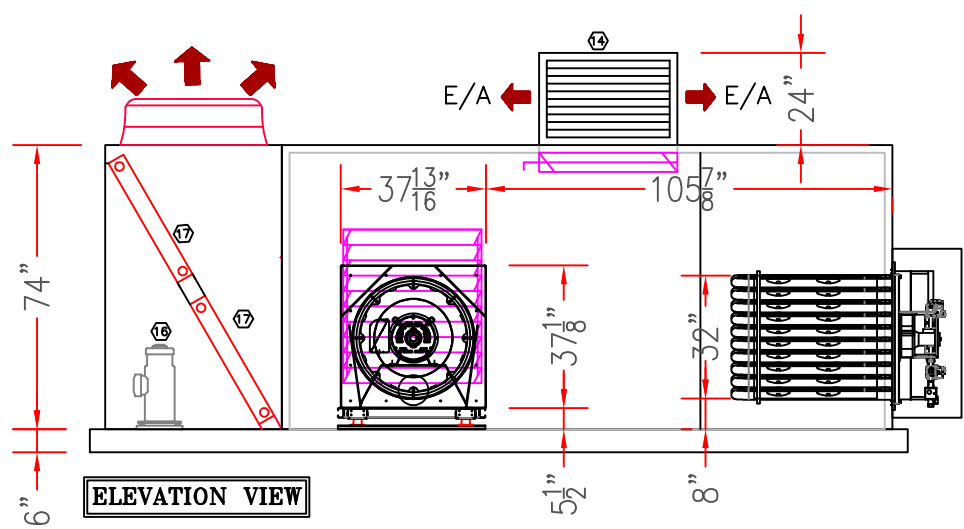
2024-02-27
Aeolus4 1.0.23093.0 Apr 2023

Selected Fan	ANPL 28 CL2	Fan working conditions	Free Inlet - Free Outlet
n Max	1915 1/min	Volume	10320 CFM
Pw Max		Total Pressure	1.58 In.W.G.
J	107.97 lb ft²	Static Pressure	1.35 In.W.G.
		P fan	3.82 BHP
Required working point	•	eta Tot	67.37 %
Effective working point	•	eta Sta	57.37 %
		RPM	1001 1/min
		Temperature	68.0 °F
		Altitude	0 ft



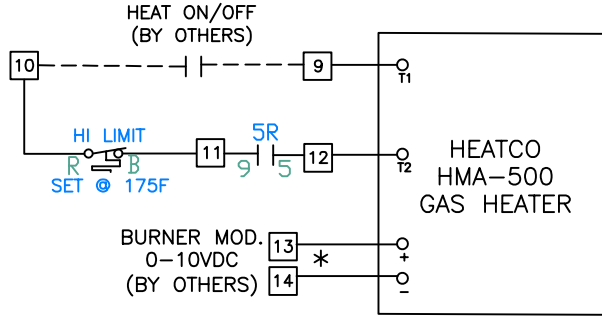
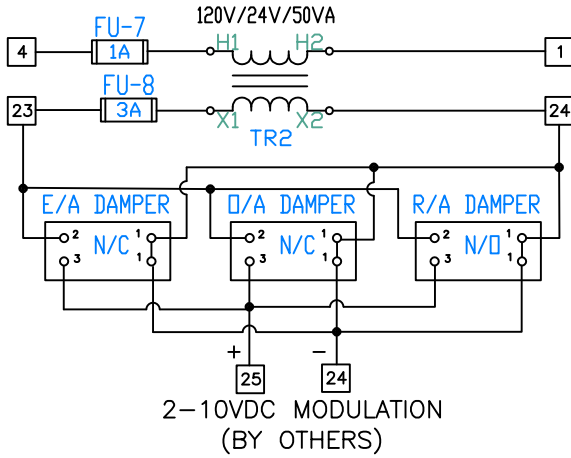
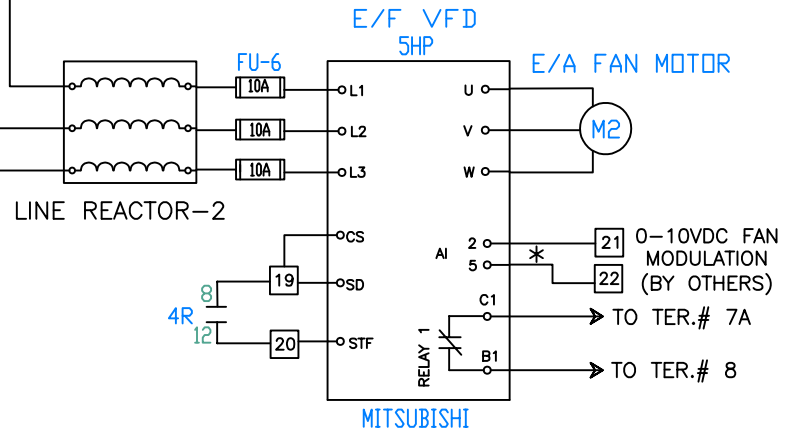
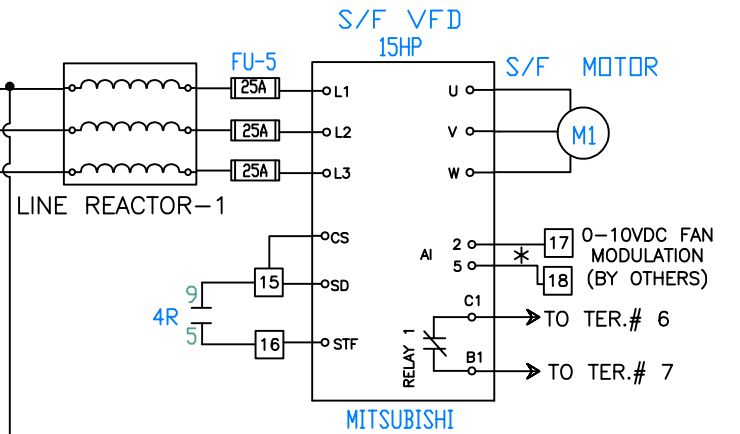
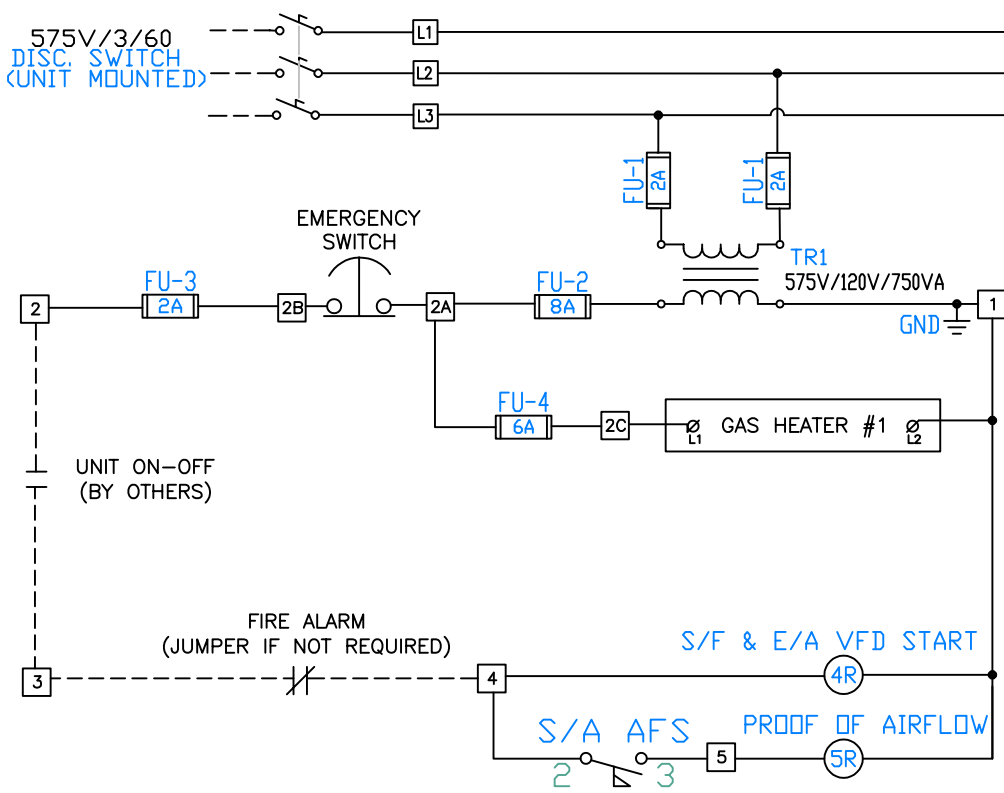


- ① S/A FAN & MOTOR ASS'Y
- ② R/A FAN & MOTOR ASS'Y
- ③ HEATCO TUBULAR FURNACE
- ④ 2" MERV8 FILTERS
- ⑤ O/A DAMPER C/W ACTUATOR
- ⑥ R/A DAMPER C/W ACTUATOR
- ⑦ E/A DAMPER C/W ACTUATOR
- ⑧ DX COIL
- ⑨ S.S. DRAIN PAN C/W DRAIN PIPE
- ⑩ GAS CONNECTION
- ⑪ EXHAUST FLUE
- ⑫ ELECTRICAL PANEL
- ⑬ O/A HOOD C/W BIRD SCREEN
- ⑭ E/A DIFFUSER C/W BIRD SCREEN
- ⑮ CONDENSING UNIT
- ⑯ COMPRESSOR
- ⑰ CONDENSER COIL
- ⑱ ACCESS DOOR
- ⑲ REMOVABLE PANEL
- ⑳ DISCONNECT SWITCH



	JOB NUMBER	FP2746	HANDING	ACCESS AS SHOWN	
	TOTAL UNIT WEIGHT	9,500 LBS	NO. REQ'D	1	
PROJECT NAME	GLENDALE SCHOOL		DESIGN BY	C.Z. 2024-02-09	
MODEL NO.	PAC500/D30/RA		CHK BY	S.A. 2024-02-13	
UNIT TAG	AHU-10		SCALE	SIZE	
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				REV	0

575V/3/60
DISC. SWITCH
(UNIT MOUNTED)

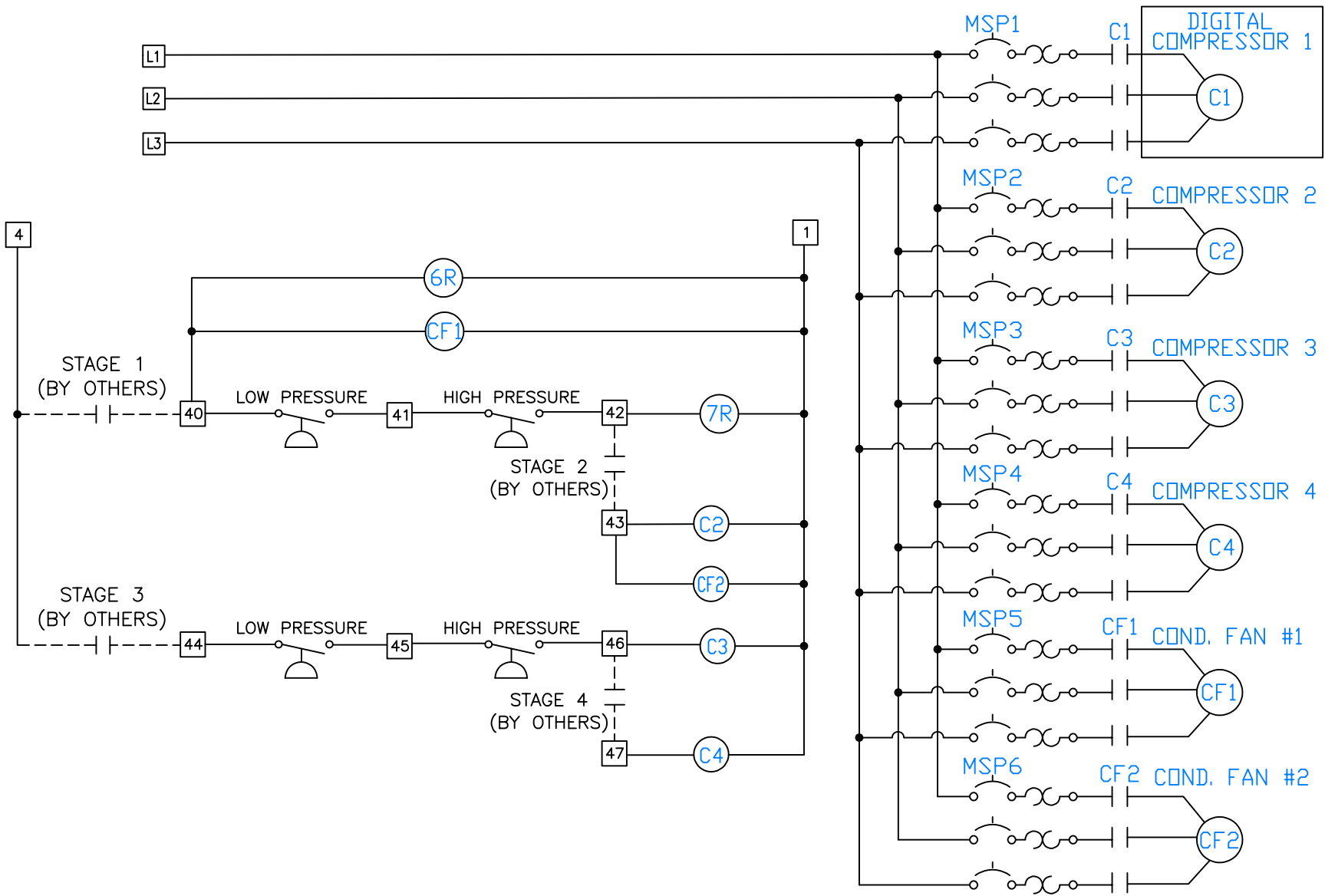


- LEGENDS
- FACTORY WIRING
 - WIRING BY OTHERS
 - TERMINAL IN MAIN CONT. PANEL
 - ◇ TERMINAL IN REMOTE STATION
 - Ⓢ TERMINAL IN CONDENSER
 - * USE SHIELDED CABLE ONLY
- NOTES 120V USE 14 AWG MINIMUM
24V USE 20AWG MINIMUM

airwise SALES INC.		JOB NUMBER FP2746	QTY 1
PROJECT NAME GLENDALE SCHOOL	DESIGN BY K.M.	2024-02-14	SHEET NO. 01 OF 04
MODEL NO. PAC500/D30/RA	CHK BY S.A.	2024-02-27	
UNIT TAG AHU-10	SCALE NTS	SIZE A	
DRAWING NO. E-FP2746-AHU-10			REV

REV	DESIGNER	DATE	DESCRIPTION

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- LEGENDS**
- FACTORY WIRING
 - - - - - WIRING BY OTHERS
 - TERMINAL IN MAIN CONT. PANEL
 - ◇ TERMINAL IN REMOTE STATION
 - ⊕ TERMINAL IN CONDENSER
 - * USE SHIELDED CABLE ONLY
- NOTES** 120V USE 14 AWG MINIMUM
24V USE 20AWG MINIMUM

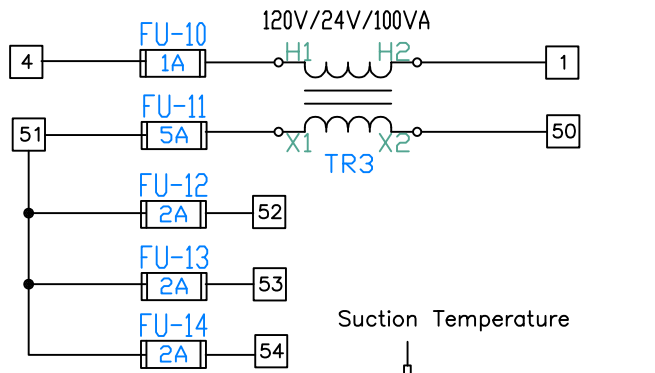
airwise SALES INC.		JOB NUMBER FP2746	QTY 1
PROJECT NAME GLENDALE SCHOOL	DESIGN BY K.M.	2024-02-14	SHEET NO. 02 OF 04
MODEL NO. PAC500/D30/RA	CHK BY S.A.	2024-02-27	
UNIT TAG AHU-10	SCALE NTS	SIZE A	
DRAWING NO. E-FP2746-AHU-10			REV

REV	DESIGNER	DATE	DESCRIPTION

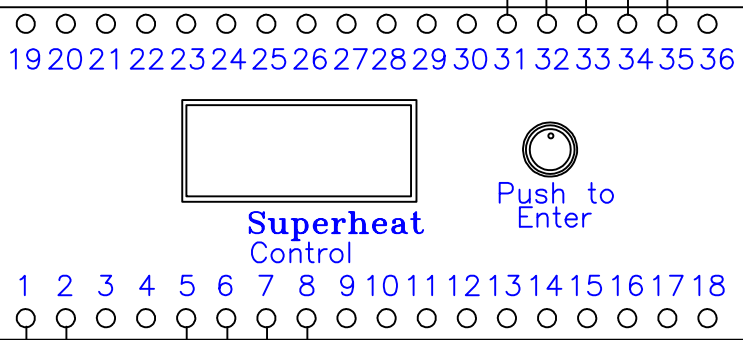
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STAGE 1
COOLING ENABLE

6R



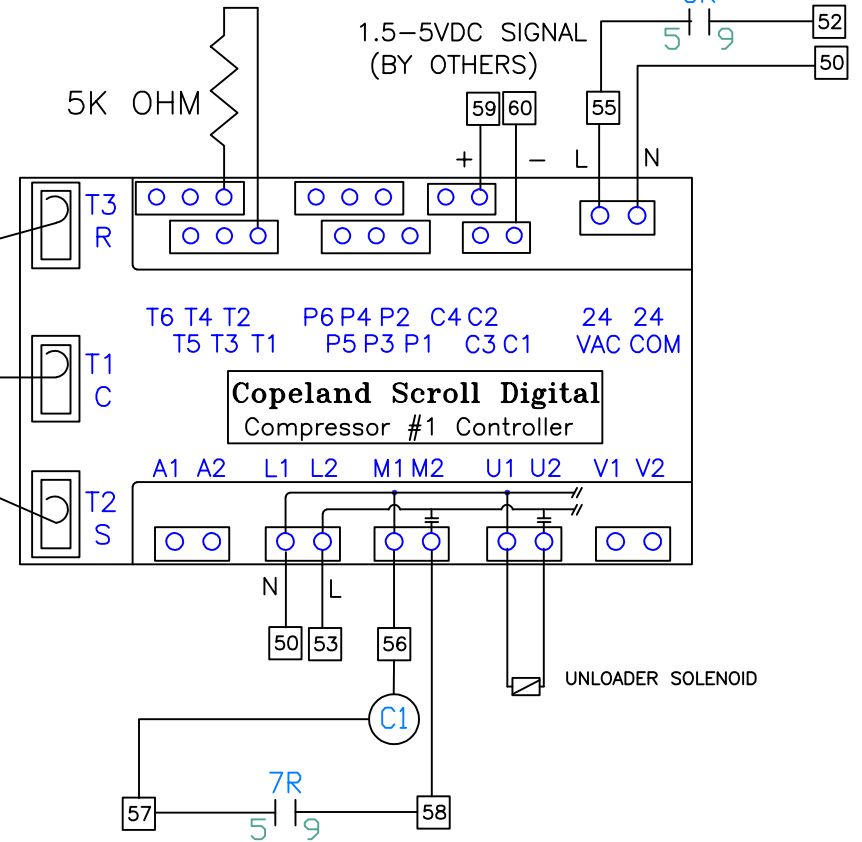
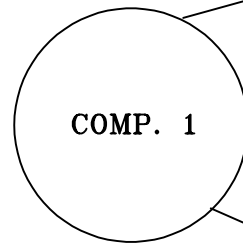
Suction Temperature
Pressure Transducer



24V
AC/DC

Black
White
Green
Red

Electric Expansion Valve



LEGENDS

- FACTORY WIRING
- - - WIRING BY OTHERS
- TERMINAL IN MAIN CONT. PANEL
- ◇ TERMINAL IN REMOTE STATION
- ⊕ TERMINAL IN CONDENSER
- * USE SHIELDED CABLE ONLY

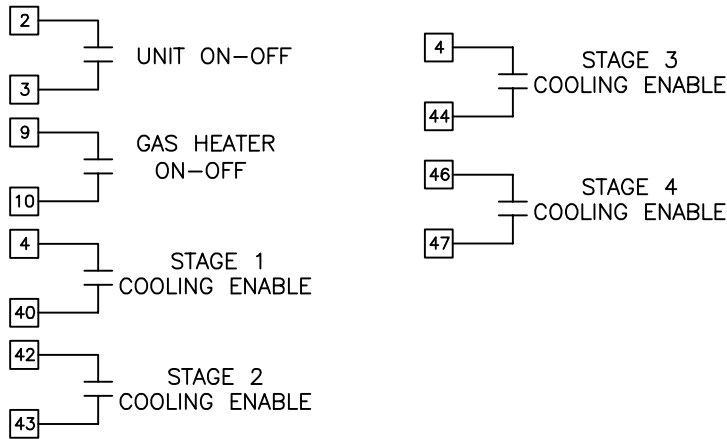
NOTES
120V USE 14 AWG MINIMUM
24V USE 20AWG MINIMUM

airwise SALES INC.		JOB NUMBER FP2746	QTY 1
PROJECT NAME GLENDALE SCHOOL	DESIGN BY K.M.	DATE 2024-02-14	SHEET NO. 03 OF 04
MODEL NO. PAC500/D30/RA	CHK BY S.A.	DATE 2024-02-27	
UNIT TAG AHU-10	SCALE NTS	SIZE A	
DRAWING NO. E-FP2746-AHU-10			REV

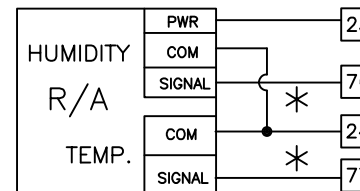
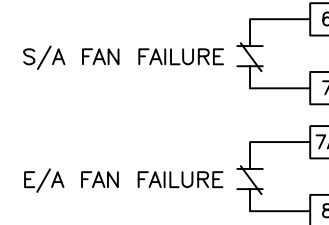
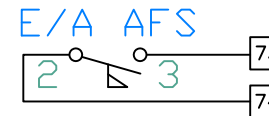
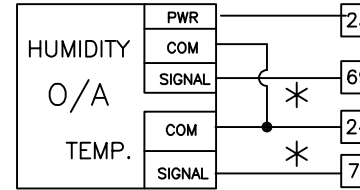
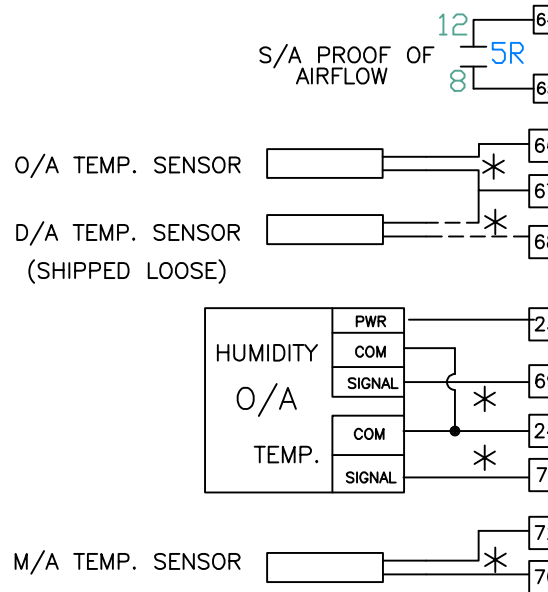
REV	DESIGNER	DATE	DESCRIPTION

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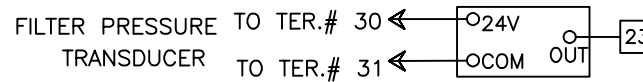
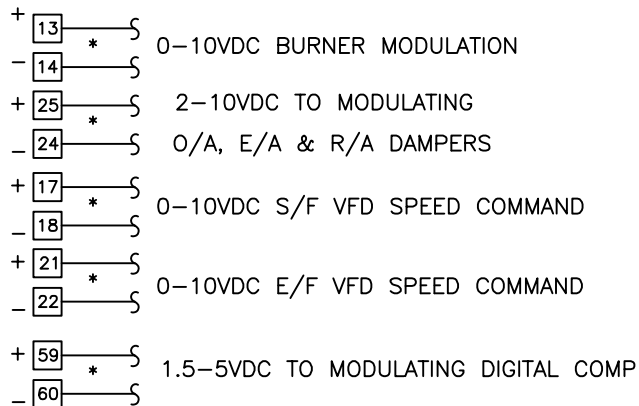
PLC DIGITAL OUTPUTS (120VAC)



PLC INPUTS



PLC ANALOG OUTPUTS



LEGENDS	
—	FACTORY WIRING
---	WIRING BY OTHERS
□	TERMINAL IN MAIN CONT. PANEL
◇	TERMINAL IN REMOTE STATION
⊕	TERMINAL IN CONDENSER
*	USE SHIELDED CABLE ONLY
NOTES 120V USE 14 AWG MINIMUM 24V USE 20AWG MINIMUM	

airwise SALES INC.		JOB NUMBER FP2746	QTY 1
PROJECT NAME	GLENDALE SCHOOL	DESIGN BY K.M.	2024-02-14
MODEL NO.	PAC500/D30/RA	CHK BY S.A.	2024-02-27
UNIT TAG	AHU-10	SCALE NTS	SIZE A
DRAWING NO. E-FP2746-AHU-10			REV

REV	DESIGNER	DATE	DESCRIPTION

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AIR WISE SALES INC.
CUSTOM DESIGNED AIR HANDLING SYSTEMS
UNIT SPECIFICATIONS

FP2746
AHU-11

JOB NAME	Glendale School
JOB NUMBER	FP2746
UNIT TAG	AHU-11
MODEL	PAC350/D24/RA
NO. OF UNITS	ONE (1)
PLACEMENT	OUTDOOR, BASE MOUNTED
HANDING	ACCESS AS SHOWN, SIDE DISCHARGE
SUPPLY CFM	7,800 CFM
ESP	1.80 " W.C.
TSP	3.52 " W.C.
FAN	(1) ANPA25 215T FAN, DIRECT DRIVE
BHP	6.01 BHP
RPM	1,307 RPM
MOTOR	(1) 7.5HP TEFC PREMIUM-EFFICIENCY, INVERTER DUTY, 1200 RPM
RETURN CFM	6,500 CFM
ESP	1.00 " W.C.
TSP	1.35 " W.C.
FAN	(1) ANPA22 213T FAN, DIRECT DRIVE
BHP	2.36 BHP
RPM	0,725 RPM
MOTOR	(1) 3HP TEFC PREMIUM-EFFICIENCY, INVERTER DUTY, 900 RPM
O/A FILTER	2" MERV 8 FILTERS
QUANTITY AND SIZE	(4) 24 X 24 X 2
AREA	16 SQ.FT.
FACE VELOCITY	488 FPM
COOLING COIL	EXPANSION TYPE, SIZE: 50"FH X 47"FL (SEE DATA SHEET ATTACHED)
GAS INPUT	310 MBH
HEAT OUTPUT	251 MBH
FUEL TYPE	NATURAL GAS
INLET PRESSURE	7" W.C.
TEMPERATURE RISE	29 °F
CONDENSING SECTION	ZPDT14MCE-TFE DIGITAL COPELAND SCROLL COMPRESSOR ZPT134KCE-TFE COPELAND SCROLL COMPRESSOR 24 TON NOMINAL CAPACITY 4 STAGES OF COOLING, DIGITAL LEAD COMPRESSOR R410A REFRIGERANT, 575V/3/60, COMPRESSORS C/W RUBBER GROMMETS (2) AKFD 800-8-8 K.6LA CONDENSOR FANS

Filters to be MERV 13

**AIR WISE SALES INC.**

CUSTOM DESIGNED AIR HANDLING SYSTEMS

UNIT SPECIFICATIONS**FP2746****AHU-11**

CONTROL SYSTEM	CONTROLLED BY OTHERS
O/A DAMPER	TAMCO1000, PARALLEL BLADE, LOW LEAK, SIZE: 24"L X 40"H
R/A DAMPER	TAMCO1000, PARALLEL BLADE, LOW LEAK, SIZE: 24"L X 40"H
E/A DAMPER	TAMCO1000, OPPOSED BLADE, LOW LEAK, SIZE: 24"L X 20"H
DAMPER ACTUATORS	MODULATING 0-10VDC SPRING RETURN
UNIT VOLTAGE	575V/3/60
S/A MOTOR AMPS	7.9 A
R/A MOTOR AMPS	3.5 A
CONTROL AMPS	1.3 A
COMPRESSOR AMPS	(4) 7
CONDENSER FAN MOTOR AMPS	(2) 2.08 A
UNIT MCA	46.8 A
UNIT MOP	50.0 A
CASING	20 GA SATIN COAT
LINER	20 GA GALVANIZED
FLOOR	18 GA GALVANIZED
BASE	6" FORMED CHANNEL
INSULATION	2" R13 FOAM INJECTED
DOORS	HINGE DOUBLE WALL DOORS C/W CAM LOCK FASTENERS AND NEOPRENE GASKETS
FINISH	ACRYLIC ENAMEL GREY PAINT
FEATURES	<ul style="list-style-type: none">• FACTORY UNIT MOUNTED NON-FUSED DISCONNECT SWITCH• O/A HOOD C/W BIRD SCREEN• S/A & E/A FAN / MOTOR ASSEMBLY MOUNTED ON RIS ISOLATORS• FACTORY MOUNTED VFD FOR S/A & E/A FAN MOTOR• UNIT TO FIT EXISTING CURB• STAINLESS STEEL DRAIN PAN WITH 1-1/4" NPT DRAIN CONNECTION FOR COOLING COIL• E/A 4-WAY DIFFUSER C/W BIRD SCREEN• ETL APPROVED
SHIPPED LOOSE	<ul style="list-style-type: none">• INTAKE HOOD• DISCHARGE AIR SENSOR
ESTIMATED TOTAL WEIGHT	7,400 lbs
PREPARATION DATE	FEBRUARY 29, 2024



AIR WISE SALES INC.
CUSTOM DESIGNED AIR HANDLING SYSTEMS
EXPANSION COIL SELECTION DATA

FP2746
AHU-11

JOB NAME	GLENDALE SCHOOL
JOB NUMBER	FP2746
UNIT TAG	AHU-11
MODEL	PAC350/D24/RA
COIL TYPE	EXPANSION
COIL DUTY	COOLING COIL
NO. OF COILS	ONE (1)
AIRFLOW THRU COIL (CFM)	7,800
ENT. AIR DB/WB (F)	79.5/68
LVG. AIR DB/WB (F)	59/56.41
TOTAL COIL CAPACITY (BTUH)	289,680
SENSIBLE CAPACITY (BTUH)	173,300
FACE VELOCITY (FT/MIN)	478
AIR PRES. DROP (IN.WG)	0.24
REFRIGERANT	R410A
SUCTION TEMP. (DEG F)	45
REFRIGERANT PRES. DROP (PSI)	4.32
ROWS	3
FINS PER INCH	10
FIN HEIGHT (IN)	50.00
FIN LENGTH (IN)	47.00
CASING MATERIAL	GALVANIZED STEEL 16 GAUGE
TUBE MATERIAL	COPPER
FIN MATERIAL	ALUMINUM
NO. OF CIRCUITS (PER COIL)	2



AIR WISE

CUSTOM AIR HANDLING UNITS

FP2746
AHU-11

EER PERFORMANCE CALCULATION

JOB NAME	GLENDALE SCHOOL	AGENT	-
MODEL NO.	PAC350/D24/RA	UNIT TAG(S)	AHU-11
COOLING CAPACITY	289,680 BTU/H	AIR SUPPLY	7,800 CFM
SUCTION TEMPERATURE	45	CONDENSING TEMPERATURE	117
STAGES OF COOLING	4	COMPRESSOR MODEL	ZPDT14 & ZPT14
NUMBER OF COMPRESSORS	4	COMPRESSOR TYPE	SCROLL
COMPRESSOR POWER AT DESIGN POINT (WATTS)	5,400	COMPRESSOR EER	13.8
CONDENSER FAN MODEL	AKFD 800-6-6 K.6LA	NUMBER OF FANS	2
CONDENSER FAN POWER (WATTS)	2,130		
SUPPLY FAN MODEL	ANPA25	NUMBER OF FANS	1
FAN POWER* (BHP)	2.34 BHP	WATTS	1,745 W
		MOTOR EFFICIENCY	90.2
FAN POWER (ADJUSTED**) (WATTS)	2,036.3		
COMPONENT	POWER DRAW (W)	QUANTITY	SUBTOTAL
COMPRESSOR	5,400	4	21,600
CONDENSER FAN	2,130	2	4,260
SUPPLY FAN	2,036	1	2,036
CONTROL XFMR***	100	1	100
	TOTAL POWER DRAW (WATTS)		27,996
EER CALCULATION			
	EER = $\frac{\text{TOTAL COOLING (BTU/H)}}{\text{TOTAL POWER DRAW (W)}}$		
	EER = $\frac{289,680}{27,996}$		
	EER = 10.35 BTU/W*H		
NOTES			
* SUPPLY FAN EXTERNAL STATIC PRESSURE CORRECTED PER AHRI STANDARD 340/360			
* FILTER STATIC PRESSURE CORRECTED TO MANUFACTURER'S STANDARD FILTER (SECTION E3.2.1)			
** FAN MOTORS CORRECTED FOR EFFICIENCY AND DRIVE LOSSES			
*** CONTROL TRANSFORMER CORRECTED TO 100 VA			

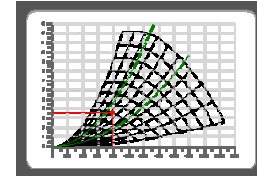


2024-02-13
Aeolus4 1.0.23093.0 Apr 2023

Customer	GLENDALE SCHOOL	Description	SF
Project	FP2646	Our Ref.	Air Wise Sales Inc
Your Ref.	AHU-11		

Input data			
Volume	7800 CFM	Temperature	68.0 °F
Static Pressure	3.52 In.W.G.	Altitude	0 ft
		Density	0.075 lb/cu.ft
		Free Inlet - Free Outlet	

Selected Fan ANPA25 -	Catalogue data		
	n Max	Pw Max	J
	1/min	BHP	lb ft ²
	2350		70.00



Fan Information											
c ft/min	p tot * In.W.G.	p sta In.W.G.	p dyn ** In.W.G.	tip speed ft/min	RPM 1/min	eta Tot * %	eta Sta %	P fan BHP	Min Mot. BHP	P mot BHP	Shaft diameter in
	3.77	3.52	0.25	8490	1307	77.03	71.86	6.01		7.5 HP	0.00

(*)Theoric value calculated taking into account the dynamic pressure at the impeller outlet

(**)Theoric value, calculated at the impeller outlet

fm[Hz]	63	125	250	500	1000	2000	4000	8000	Tot.		
Lw3 Total Sound Power Level in the inlet duct- Lwi Inlet Duct Sound Power Level includes the effect of duct end correction											
Level Lw3	dB/dB(A)		83 / 57	78 / 62	84 / 76	74 / 71	72 / 72	67 / 69	68 / 69	65 / 64	88 / 79
Lw5 Inlet Total Sound Power Level - Lwmi Inlet Sound Power Level (free inlet) do not includes the effect of duct end correction											
Level Lw5	dB/dB(A)		73 / 46	76 / 60	88 / 79	77 / 74	73 / 73	72 / 74	73 / 74	69 / 68	89 / 83
Lw6 Total Sound Power Level at the free outlet - Lwmo Outlet Sound Power Level (free outlet) do not includes the effect of duct end correction											
Level Lw6	dB/dB(A)		86 / 60	79 / 63	87 / 79	83 / 80	81 / 81	78 / 79	74 / 75	71 / 70	92 / 86

Certificates



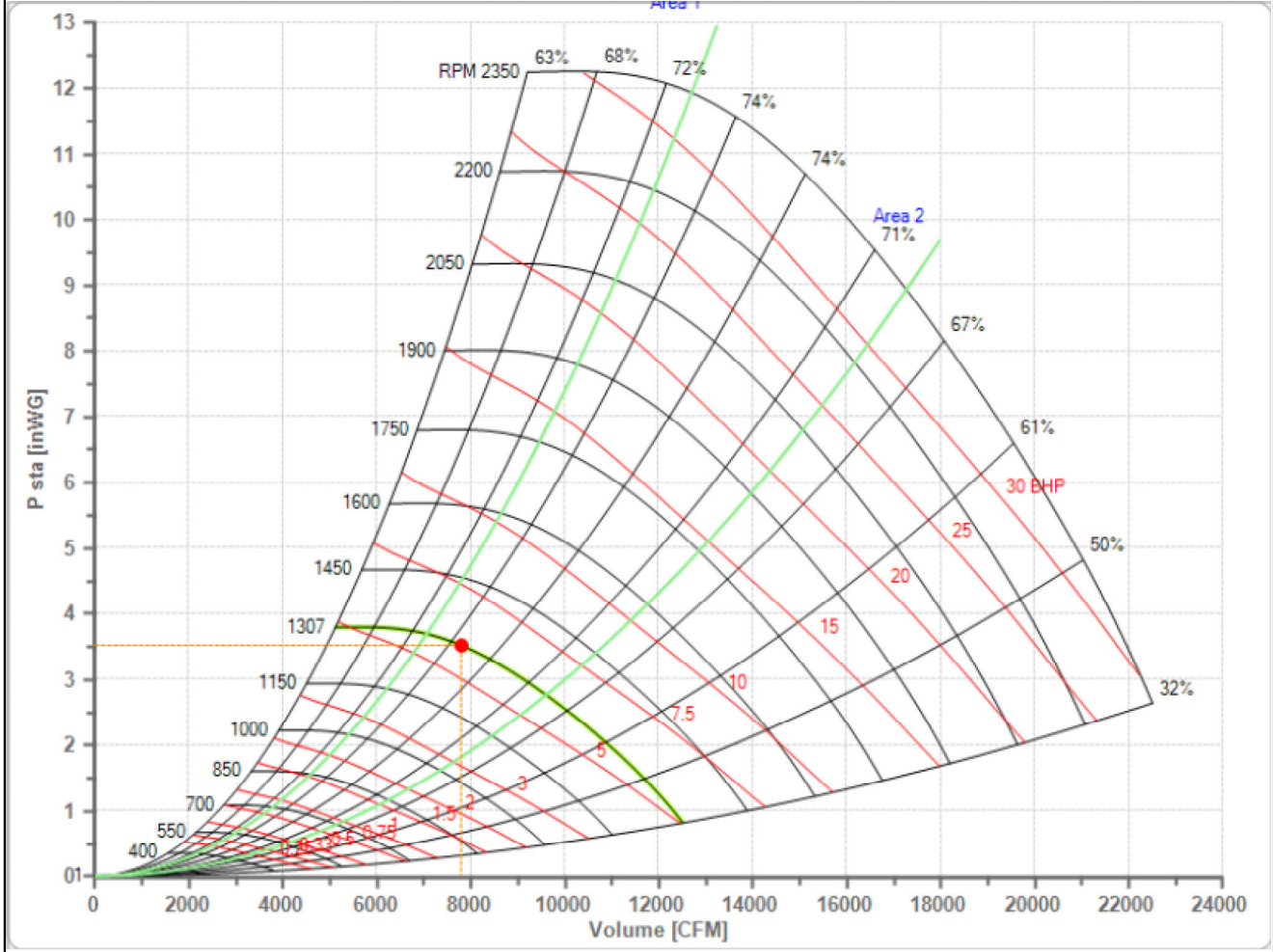
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Chart



2024-02-13
Aeolus4 1.0.23093.0 Apr 2023

Selected Fan	ANPA25 -	Fan working conditions	Free Inlet - Free Outlet
n Max	2350 1/min	Volume	7800 CFM
Pw Max		Total Pressure	3.77 In.W.G.
J	70.00 lb ft ²	Static Pressure	3.52 In.W.G.
		P fan	6.01 BHP
Required working point	•	eta Tot	77.03 %
Effective working point	•	eta Sta	71.86 %
		RPM	1307 1/min
		Temperature	68.0 °F
		Altitude	0 ft



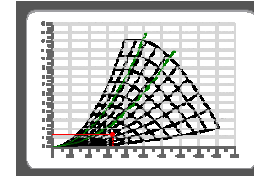


2024-02-27
Aeolus4 1.0.23093.0 Apr 2023

Customer	GLENDALE SECONDARY SCHOOL	Description	RF
Project	FP2746	Our Ref.	Air Wise Sales Inc
Your Ref.	AHU-11		

Input data			
Volume	6500 CFM	Temperature	68.0 °F
Static Pressure	1.35 In.W.G.	Altitude	0 ft
		Density	0.075 lb/cu.ft
		Free Inlet - Free Outlet	

Selected Fan ANPA22 -	Catalogue data		
	n Max	Pw Max	J
	1/min	BHP	lb ft ²
	2650		45.09



Fan Information											
c ft/min	p tot * In.W.G.	p sta In.W.G.	p dyn ** In.W.G.	tip speed ft/min	RPM 1/min	eta Tot * %	eta Sta %	P fan BHP	Min Mot. BHP	P mot BHP	Shaft diameter in
	1.62	1.35	0.27	6584	1140	70.23	58.35	2.36			0.00

(*)Theoric value calculated taking into account the dynamic pressure at the impeller outlet

(**)Theoric value, calculated at the impeller outlet

fm[Hz]		63	125	250	500	1000	2000	4000	8000	Tot.
Lw3 Total Sound Power Level in the inlet duct- Lwi Inlet Duct Sound Power Level includes the effect of duct end correction										
Level Lw3	dB/dB(A)	78 / 52	72 / 56	77 / 68	69 / 66	68 / 68	66 / 67	61 / 62	58 / 57	82 / 74
Lw5 Inlet Total Sound Power Level - Lwmi Inlet Sound Power Level (free inlet) do not includes the effect of duct end correction										
Level Lw5	dB/dB(A)	69 / 43	77 / 60	80 / 72	74 / 71	70 / 70	68 / 69	63 / 64	60 / 59	83 / 77
Lw6 Total Sound Power Level at the free outlet - Lwmo Outlet Sound Power Level (free outlet) do not includes the effect of duct end correction										
Level Lw6	dB/dB(A)	80 / 53	77 / 60	84 / 75	81 / 77	80 / 80	75 / 76	70 / 71	66 / 64	88 / 84

Certificates



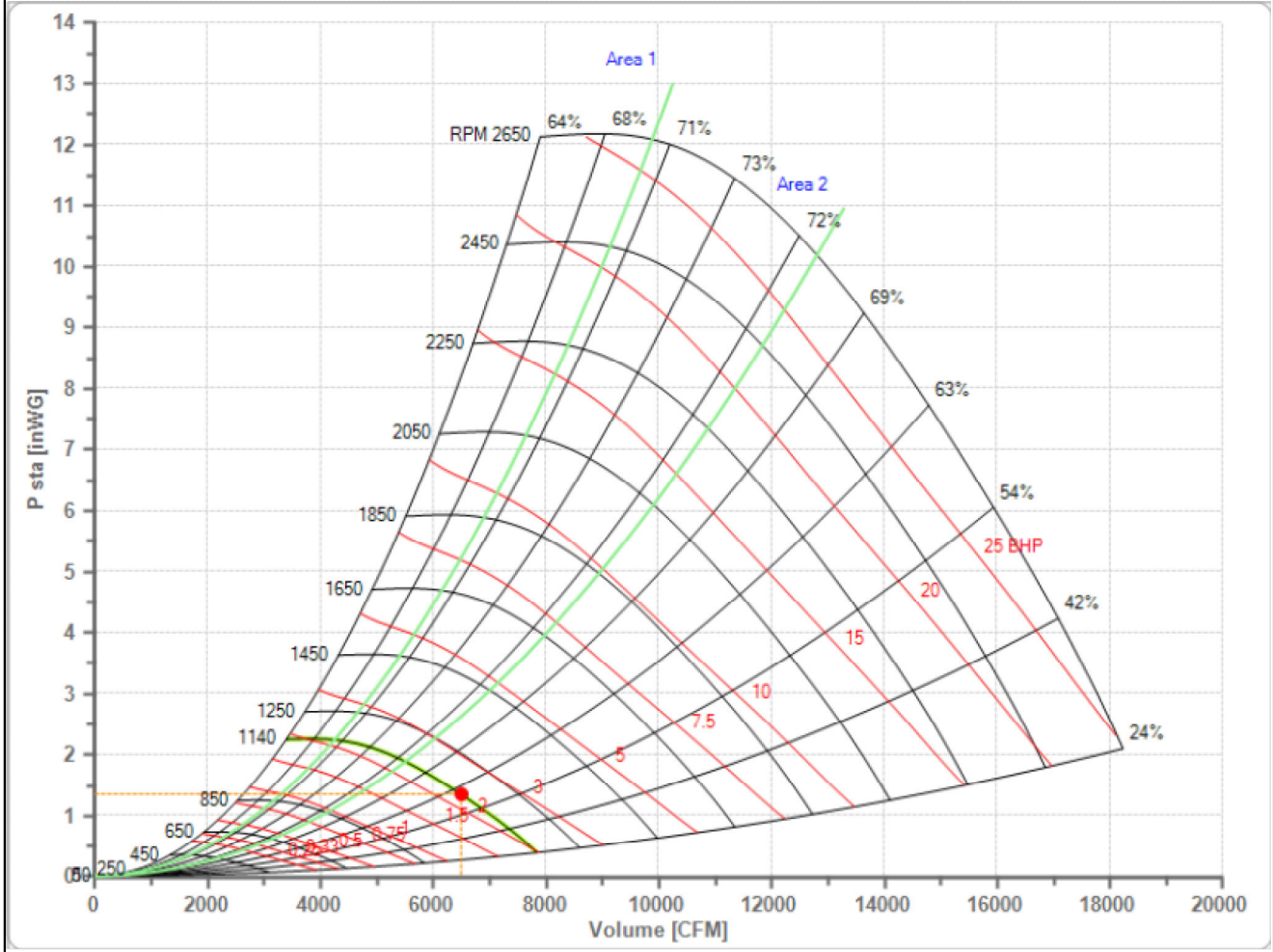
Comefri USA Inc. certifies that the ANPA22 - shown here is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 and 311 and comply with the requirements of the AMCA Certified Ratings Program. Performance ratings include to effects of spring dampers and does not include the effects of appurtenances (accessories). Power rating (kW or BHP) does not include transmission losses. Free inlet Lw5, LwA5 sound power levels shown are in decibels, referred to 10⁻¹² watts calculated per AMCA International Standard 301. Air and free inlet Lw5, LwA5 sound performances shown are for installation type A: Free inlet - Free outlet. The AMCA Certified Ratings Seal applies to air performance and to free inlet Lw5, LwA5 sound power levels. The AMCA Certified Ratings Seal does not apply either to in-duct inlet Lw3, LwA3 sound or outlet Lw6, LwA6 sound.

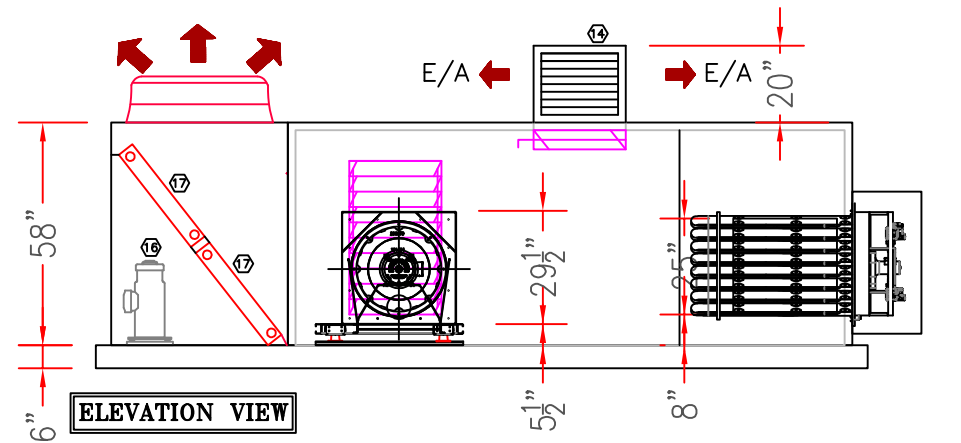
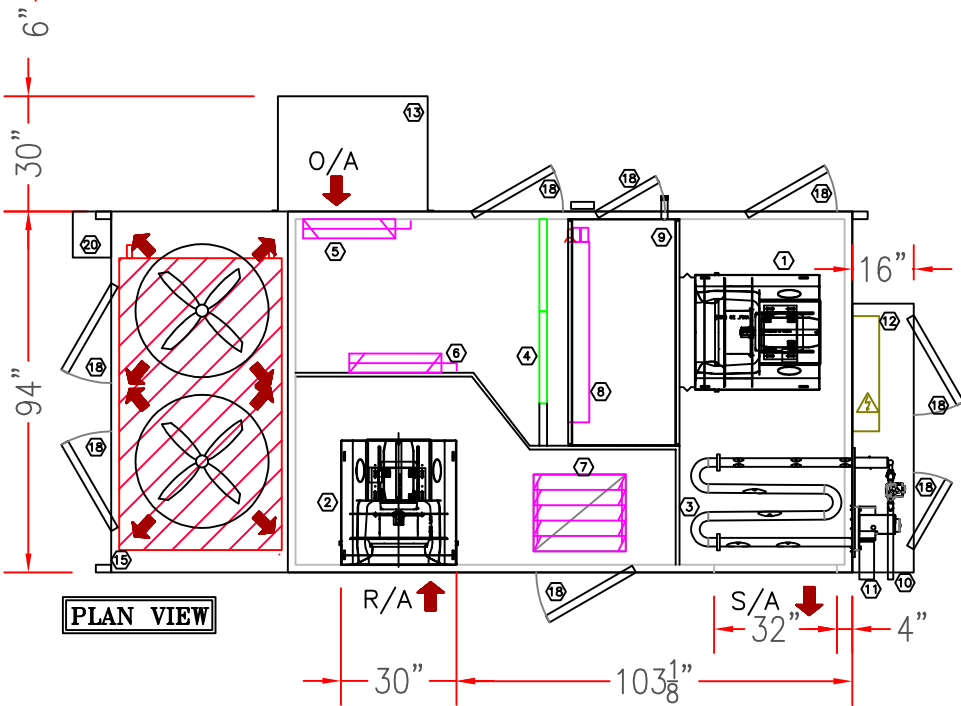
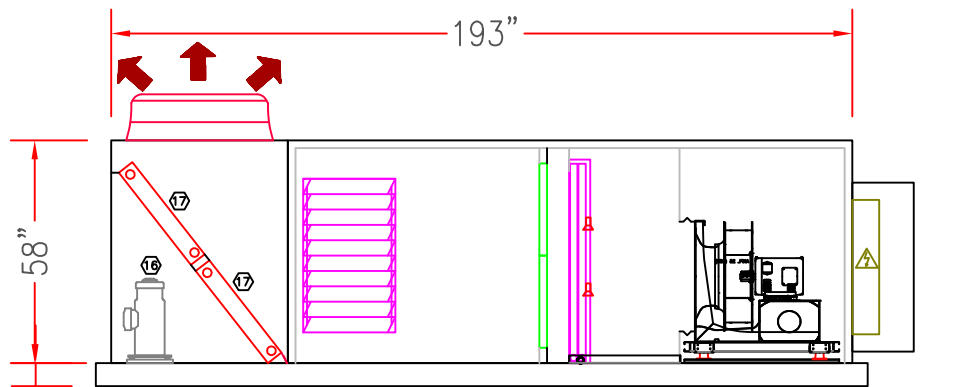
Chart



2024-02-27
Aeolus4 1.0.23093.0 Apr 2023

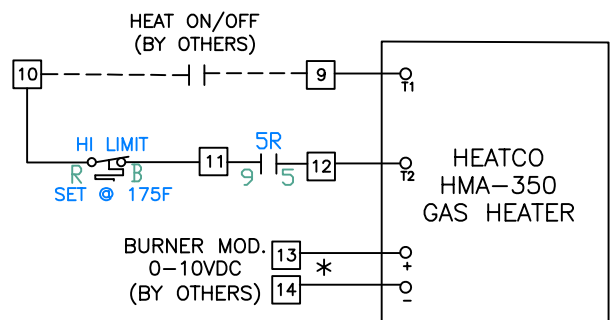
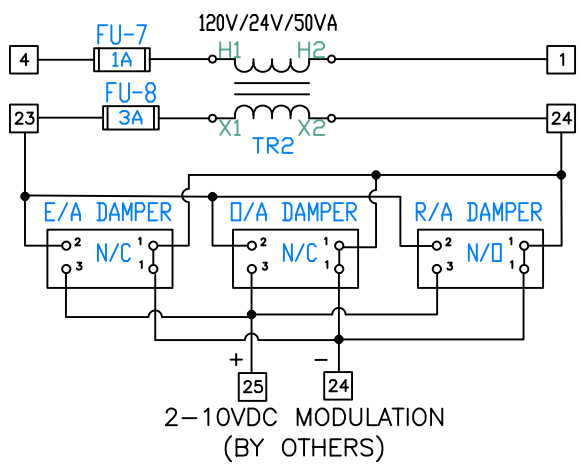
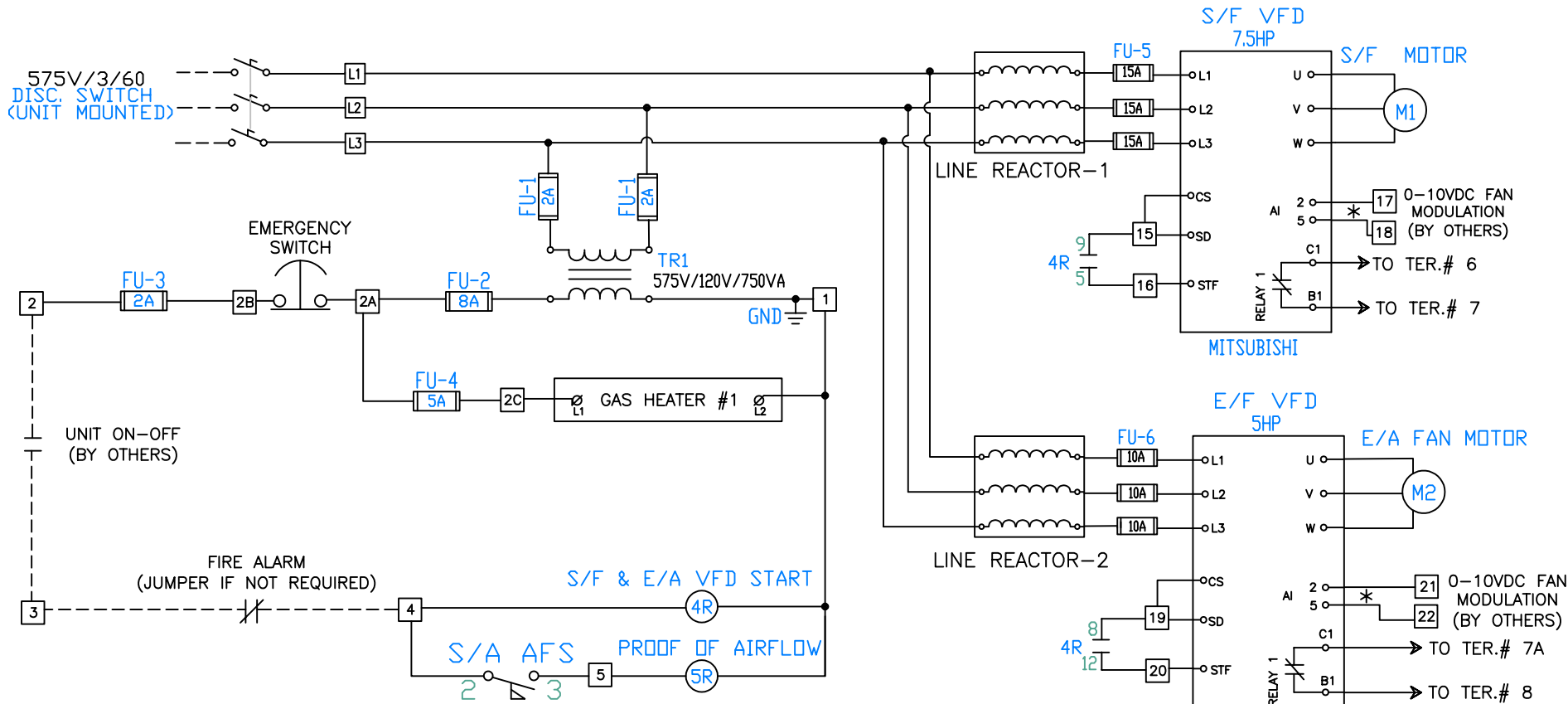
Selected Fan	ANPA22 -	Fan working conditions	Free Inlet - Free Outlet
n Max	2650 1/min	Volume	6500 CFM
Pw Max		Total Pressure	1.62 In.W.G.
J	45.09 lb ft²	Static Pressure	1.35 In.W.G.
		P fan	2.36 BHP
Required working point	•	eta Tot	70.23 %
Effective working point	•	eta Sta	58.35 %
		RPM	1140 1/min
		Temperature	68.0 °F
		Altitude	0 ft





- ① S/A FAN & MOTOR ASS'Y
- ② R/A FAN & MOTOR ASS'Y
- ③ HEATCO TUBULAR FURNACE
- ④ 2" MERV8 FILTERS
- ⑤ O/A DAMPER C/W ACTUATOR
- ⑥ R/A DAMPER C/W ACTUATOR
- ⑦ E/A DAMPER C/W ACTUATOR
- ⑧ DX COIL
- ⑨ S.S. DRAIN PAN C/W DRAIN PIPE
- ⑩ GAS CONNECTION
- ⑪ EXHAUST FLUE
- ⑫ ELECTRICAL PANEL
- ⑬ O/A HOOD C/W BIRD SCREEN
- ⑭ E/A DIFFUSER C/W BIRD SCREEN
- ⑮ CONDENSING UNIT
- ⑯ COMPRESSOR
- ⑰ CONDENSER COIL
- ⑱ ACCESS DOOR
- ⑲ REMOVABLE PANEL
- ⑳ DISCONNECT SWITCH

	JOB NUMBER	FP2746	HANDING	ACCESS AS SHOWN
	TOTAL UNIT WEIGHT	7,000LBS	NO. REQ'D	
PROJECT NAME	GLENDALE SECONDARY SCHOOL		DESIGN BY	C.Z. 2023-10-25
MODEL NO.	PAC350/D24/RA		CHK BY	S.A. 2024-02-27
UNIT TAG	AHU-11		SCALE	SIZE
<small> AIR WISE SALES INC. ALL RIGHTS RESERVED. THE INFORMATION CONTAINED IN THIS DOCUMENT IS CONFIDENTIAL AND SHALL NOT BE MADE PUBLIC, COPIED OR USED AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS UNLESS AUTHORIZED IN WRITING BY AIR WISE SALES AND SHALL BE RETURNED ON DEMAND. </small>			DRAWING NO.	REV
			MECHANICAL	0



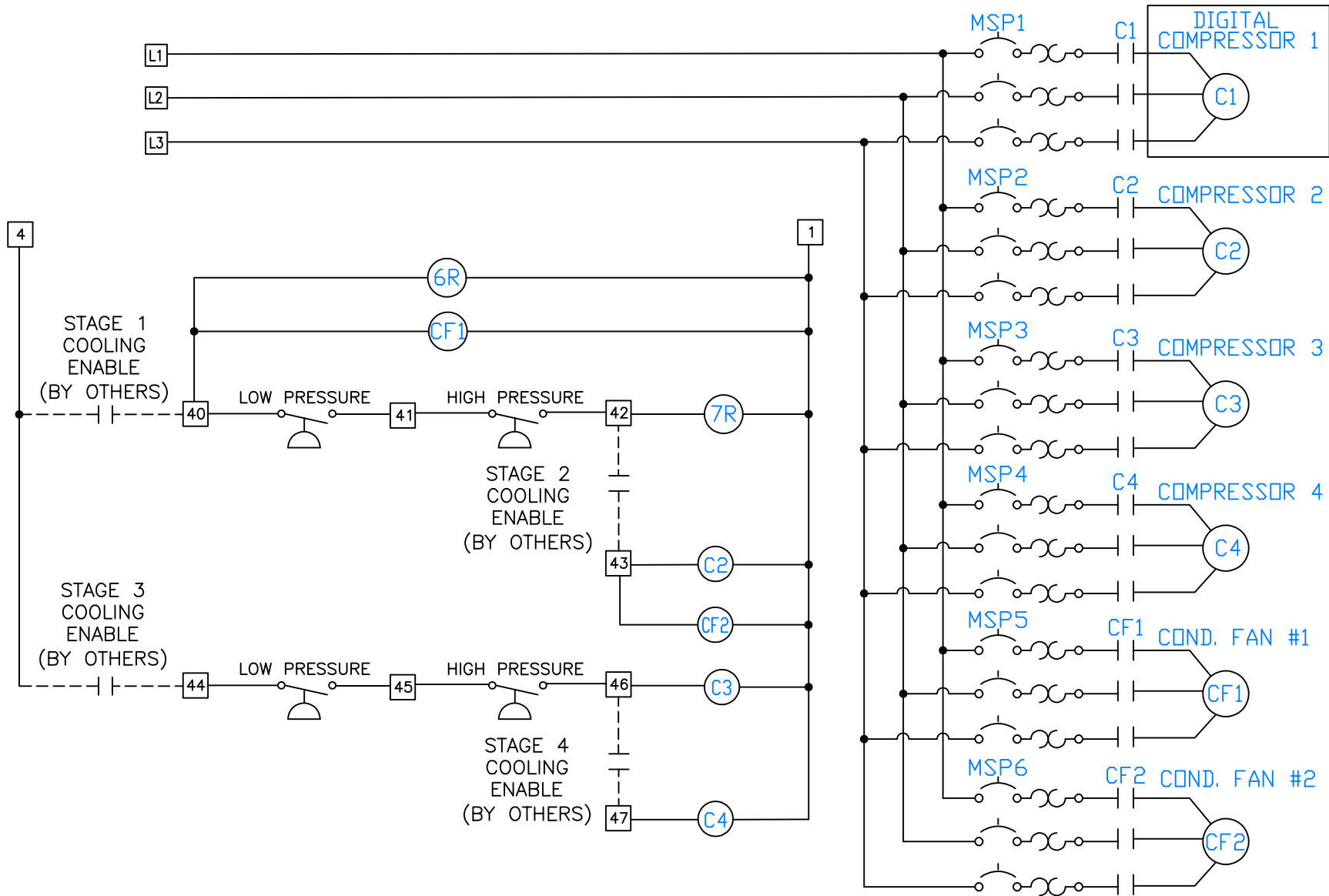
LEGENDS

- FACTORY WIRING
- WIRING BY OTHERS
- Terminal in main cont. panel
- Terminal in remote station
- Terminal in condenser
- USE SHIELDED CABLE ONLY

NOTES: 120V USE 14 AWG MINIMUM, 24V USE 20AWG MINIMUM

airwise SALES INC.		JOB NUMBER	FP2746	QTY	1
PROJECT NAME	GLENDALE SCHOOL	DESIGN BY	K.M.	2024-02-14	SHEET NO.
MODEL NO.	PAC350/D24/RA	CHK BY	S.A.	2024-02-23	01 OF 04
UNIT TAG	AHU-11	SCALE	NTS	SIZE	A
DRAWING NO.				E-FP2746-AHU-11	
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REV	DESIGNER	DATE	DESCRIPTION



LEGENDS

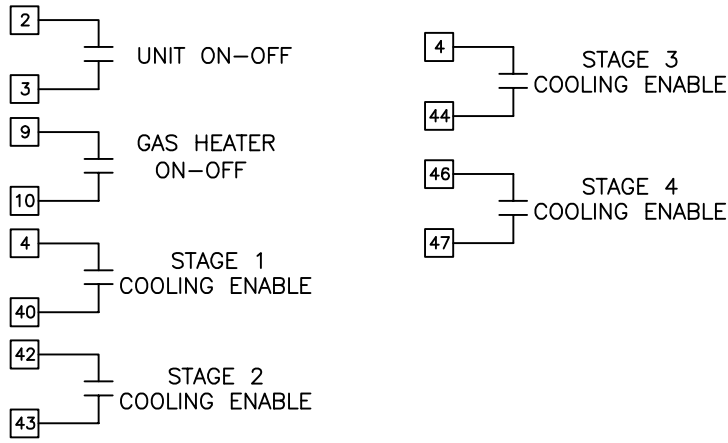
- FACTORY WIRING
- - - - - WIRING BY OTHERS
- TERMINAL IN MAIN CONT. PANEL
- ◇ TERMINAL IN REMOTE STATION
- ⊕ TERMINAL IN CONDENSER
- * USE SHIELDED CABLE ONLY

NOTES 120V USE 14 AWG MINIMUM
24V USE 20AWG MINIMUM

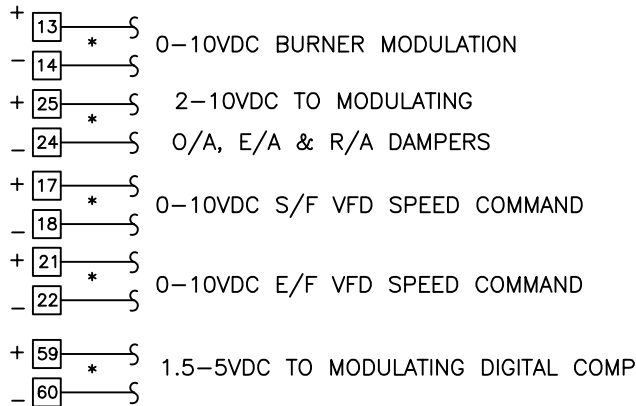
airwise SALES INC.		JOB NUMBER	FP2746	QTY	1
PROJECT NAME	GLENDALE SCHOOL		DESIGN BY	K.M.	2024-02-14
MODEL NO.	PAC350/D24/RA		CHK BY	S.A.	2024-02-23
UNIT TAG	AHU-11		SCALE	NTS	SIZE A
<small>©AIR WISE SALES INC. ALL RIGHTS RESERVED. THE INFORMATION CONTAINED IN THIS DOCUMENT IS CONFIDENTIAL AND SHALL NOT BE MADE PUBLIC, COPIED OR USED AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS UNLESS AUTHORIZED IN WRITING BY AIR WISE SALES AND SHALL BE RETURNED ON DEMAND.</small>			DRAWING NO.	E-FP2746-AHU-11	
REVISIONS	DESIGNER	DATE	DESCRIPTION	REV	

REV	DESIGNER	DATE	DESCRIPTION

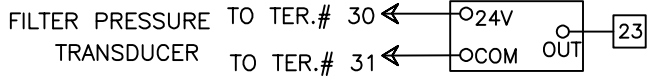
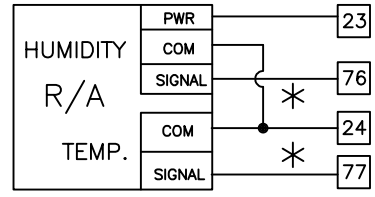
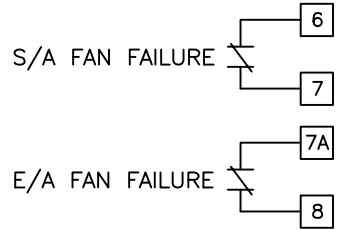
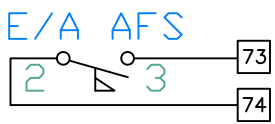
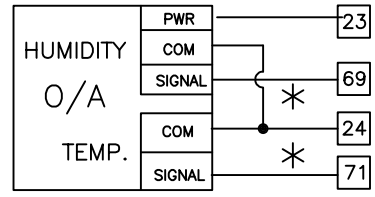
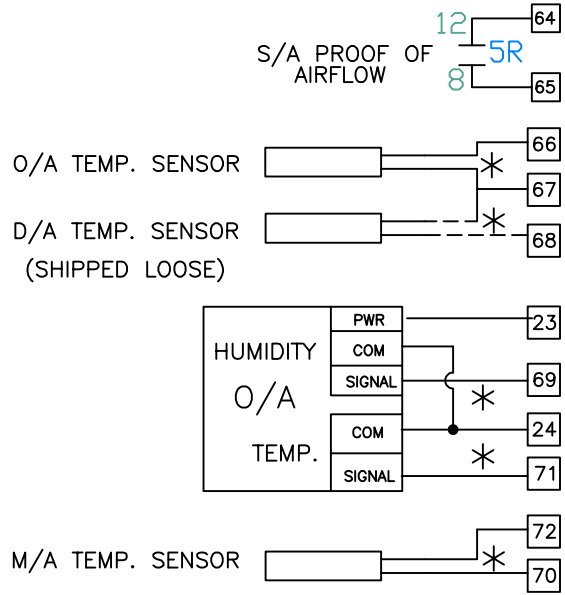
PLC DIGITAL OUTPUTS (120VAC)



PLC ANALOG OUTPUTS



PLC INPUTS



LEGENDS	
---	FACTORY WIRING
---	WIRING BY OTHERS
□	TERMINAL IN MAIN CONT. PANEL
◇	TERMINAL IN REMOTE STATION
⊕	TERMINAL IN CONDENSER
*	USE SHIELDED CABLE ONLY
NOTES 120V USE 14 AWG MINIMUM 24V USE 20AWG MINIMUM	

REV	DESIGNER	DATE	DESCRIPTION

	JOB NUMBER FP2746	QTY 1	DESIGN BY K.M.	DATE 2024-02-14	SHEET NO. 04 OF 04
	PROJECT NAME GLENDALE SCHOOL	MODEL NO. PAC350/D24/RA	CHK BY S.A.	DATE 2024-02-23	SCALE NTS
UNIT TAG AHU-11	DRAWING NO. E-FP2746-AHU-11		REV		

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Submittal

Prepared For:
EXP Engineering

Date: February 27, 2024

Sold To:
HWDSB

Job Name:
Glendale SS - Renovation

Trane Canada ULC is pleased to provide the following submittal for your review and approval.

Product Summary

Qty Product

2 Custom Packaged RT Units (ERV-1, RTU-1)

Controls to be coordinated with Successful BAS contractor

Carmine Bozzo/Rory Mills
Trane Canada ULC

The attached information describes the equipment we propose to furnish for this project and is submitted for your approval.

Submittal acceptance and return is a critical step, so please ensure submittals are returned with approval to release to production within 14 days of submittal date.

Product performance and submittal data is valid for a period of 6 months from the date of submittal generation. If six months or more has elapsed between submittal generation and equipment release, the product performance and submittal data will need to be verified. It is the customer's responsibility to obtain such verification.

**AIR WISE SALES INC.**

CUSTOM DESIGNED AIR HANDLING SYSTEMS

UNIT SPECIFICATIONS**FP2746****ERV-1**

JOB NAME	GLENDALE SCHOOL
JOB NUMBER	FP2746
UNIT TAG	ERV-1
MODEL	TBI-650/HRP
NO. OF UNITS	ONE (1)
PLACEMENT	OUTDOOR, BASE MOUNTED
HANDING	RIGHT HAND, SIDE DISCHARGE
SUPPLY CFM	7,000 CFM
ESP	0.70 " W.C.
TSP	4.85 " W.C.
FAN	(1) ATZAF 12-12 FF BT2/T1 FAN, DWDI
BHP	7.73 BHP
RPM	2,907 RPM
MOTOR	(1) 10HP TEFC PREMIUM-EFFICIENCY, INVERTER DUTY, 1800 RPM
RETURN CFM	8,300 CFM
ESP	1.00 " W.C.
TSP	2.81 " W.C.
FAN	(1) ANPA25 254T/256T FAN, DWDI
BHP	5.18 BHP
RPM	1,233 RPM
MOTOR	(1) 7.5HP TEFC PREMIUM-EFFICIENCY, INVERTER DUTY, 1200 RPM
O/A FILTER	2" MERV 8 FILTERS
QUANTITY AND SIZE	(3) 24 X 24 X 2 + (3) 24 X 12 X 2"
AREA	18 SQ.FT.
FACE VELOCITY	389 FPM
SECONDARY FILTER	4" MERV 13 FILTERS
QUANTITY AND SIZE	(3) 24 X 24 X 4 + (3) 24 X 12 X 4"
AREA	18 SQ.FT.
FACE VELOCITY	389 FPM
FINAL FILTER	12" CARBON FILTERS
QUANTITY AND SIZE	(3) 24 X 24 X 12 + (3) 24 X 12 X 12"
AREA	18 SQ.FT.
FACE VELOCITY	389 FPM
R/A FILTER	2" MERV 8 FILTERS
QUANTITY AND SIZE	(3) 24 X 24 X 2 + (3) 24 X 12 X 2"
AREA	18 SQ.FT.
FACE VELOCITY	461 FPM



AIR WISE SALES INC.

CUSTOM DESIGNED AIR HANDLING SYSTEMS

UNIT SPECIFICATIONS

FP2746

ERV-1

HEAT EXCHANGER	DRUM-AND-TUBE 4 PASS
PRIMARY	16 GA. TYPE 409 STAINLESS STEEL DRUM
SECONDARY	16 GA. TYPE 409 STAINLESS STEEL WELDED TUBE
BURNER	GP C6 BURNER WITH FULL MODULATION 15:1 TURNDOWN & ELECTRONIC LINEAR AIR & GAS CONTROLS
INLET	1 " NPT
GAS INPUT	800 MBH
HEAT OUTPUT	648 MBH
FUEL TYPE	NATURAL GAS
INLET PRESSURE	7" WC
TEMPERATURE RISE	86 F
CONTROL SYSTEM	CONTROLLED BY OTHERS
O/A DAMPER	(1) TAMCO1000, OPPOSED BLADE, LOW LEAK, SIZE: 64"L X 32"H
E/A DAMPER	(1) TAMCO1000, OPPOSED BLADE, LOW LEAK, SIZE: 64"L X 32"H
DAMPER ACTUATORS	TWO POSITION SPRING RETURN
FACE DAMPER	TAMCO1000, OPPOSED BLADE, LOW LEAK, SIZE: 35"L X 56"H
BY-PASS DAMPER	TAMCO1000, OPPOSED BLADE, LOW LEAK, SIZE: 35"L X 12"H
DAMPER ACTUATORS	MODULATING 0-10 VDC SPRING RETURN
UNIT VOLTAGE	575V/3/60
SF MOTOR AMPS	10.0 A
RF MOTOR AMPS	7.9 A
BURNER MOTOR AMPS	0.6 A
CONTROL AMPS	0.3 A
UNIT MCA	21.2 A
UNIT MOP	30.0 A
CASING	20 GA SATIN COAT
LINER	20 GA GALVANIZED
FLOOR	18 GA GALVANIZED
BASE	6" FORMED CHANNEL
INSULATION	1" R6.5 FOAM INJECTED PANEL
DOORS	LEVER LOCK QUARTER TURN HANDLES WITH AUTOMOTIVE BULB GASKETS
FINISH	ACRYLIC ENAMEL GREY PAINT



AIR WISE SALES INC.

CUSTOM DESIGNED AIR HANDLING SYSTEMS

UNIT SPECIFICATIONS

FP2746

ERV-1

FEATURES

- FACTORY UNIT MOUNTED NON-FUSED DISCONNECT SWITCH
- S/A FAN / MOTOR ASSEMBLIES MOUNTED ON 1" SPRING ISOLATORS
- FACTORY MOUNTED VFD FOR S/A FAN MOTOR
- O/A PLENUM C/W GALVANIZED DRAIN PAN WITH 1-1/4" DRAIN PIPE
- O/A & E/A LOUVERS C/W BIRD SCREEN
- CSA LISTED

SHIPPED LOOSE

- DISCHARGE AIR SENSOR
- EC - SMART - VUE CONTROLLER

ESTIMATED TOTAL WEIGHT

7,900 LBS

PREPARATION DATE

FEBRUARY 27, 2024

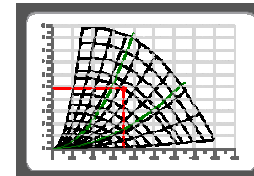


2024-01-25
Aeolus4 1.0.23093.0 Apr 2023

Customer	GLENDALE SCHOOL	Description	SF
Project	FP2746	Our Ref.	Air Wise Sales Inc
Your Ref.	ERV-1		

Input data			
Volume	7000 CFM	Temperature	68.0 °F
Static Pressure	4.85 In.W.G.	Altitude	0 ft
		Density	0.075 lb/cu.ft
		Free Inlet - Ducted Outlet	

Selected Fan ATZAF 12-12 FF BT2/T1	Catalogue data		
	n Max	Pw Max	J
	l/min	BHP	lb ft²
	3700	10.05	8.50



Fan Information											
c ft/min	p tot In.W.G.	p sta In.W.G.	p dyn In.W.G.	tip speed ft/min	RPM 1/min	eta Tot %	eta Sta %	P fan BHP	Min Mot. BHP	P mot BHP	Shaft diameter in
2415	5.21	4.85	0.36	9441	2907	74.21	69.04	7.73	8.89	10.00	0.00

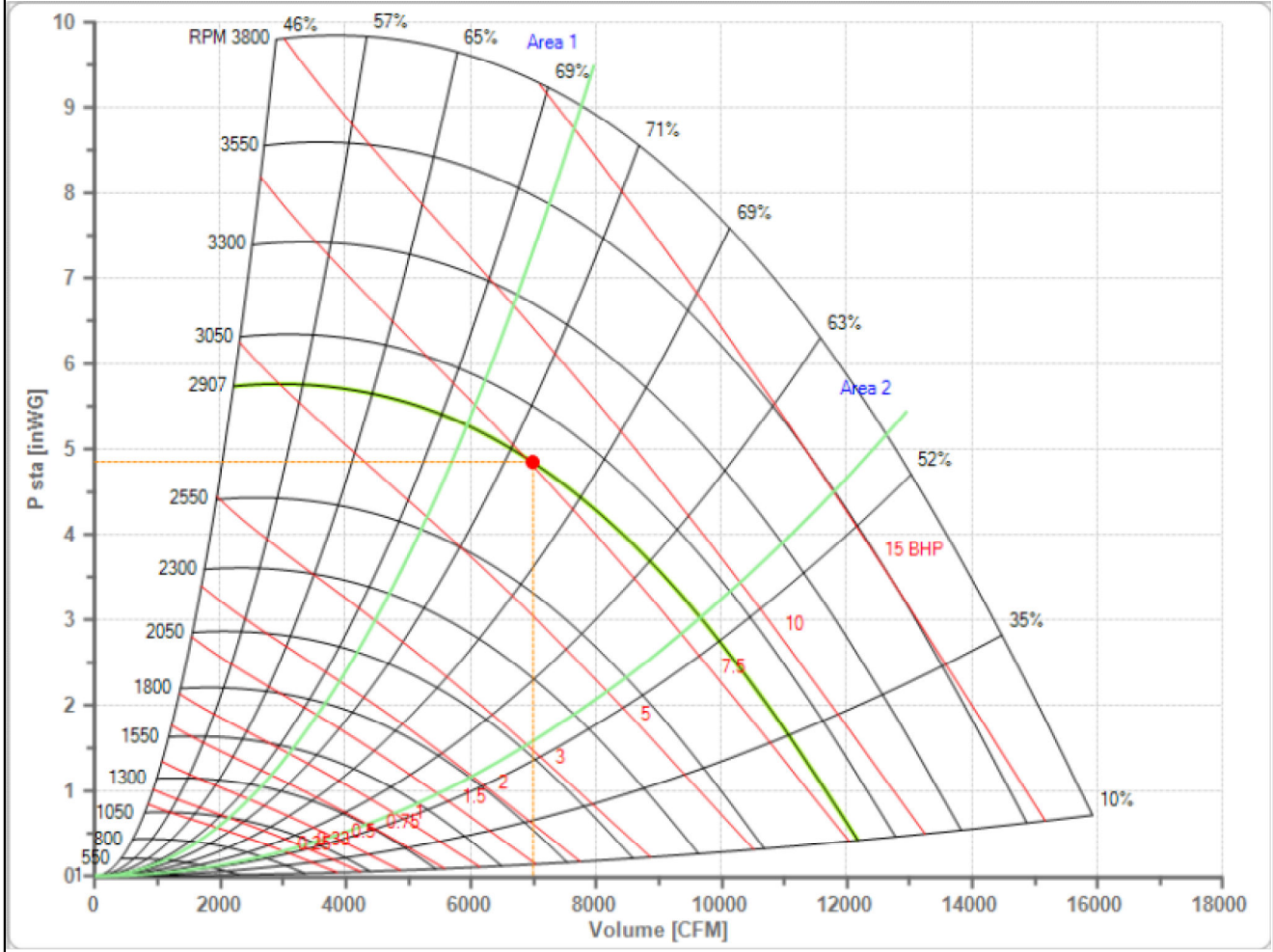
fm[Hz]	63	125	250	500	1000	2000	4000	8000	Tot.		
Lw4 Total Sound Power Level inside the outlet duct - Lwo Outlet Duct Sound Power Level includes the effect of duct end correction											
Level Lw4	dB/dB(A)		97 / 71	92 / 76	90 / 81	88 / 85	84 / 84	83 / 84	78 / 79	72 / 71	99 / 90
Lw6d Total Sound Power Level outside the termination of the outlet duct - Lwmo Outlet Sound Power Level (free outlet) do not includes the effect of duct end correction											
Level Lw6d	dB/dB(A)		85 / 59	85 / 69	87 / 78	88 / 85	84 / 84	83 / 84	78 / 79	72 / 71	94 / 90

Chart



2024-01-25
Aeolus4 1.0.23093.0 Apr 2023

Selected Fan	ATZAF 12-12 FF BT2/T1	Fan working conditions	Free Inlet - Ducted Outlet
n Max	3700 1/min	Volume	7000 CFM
Pw Max	10.05 BHP	Total Pressure	5.21 In.W.G.
J	8.50 lb ft ²	Static Pressure	4.85 In.W.G.
		P fan	7.73 BHP
Required working point	•	eta Tot	74.21 %
Effective working point	•	eta Sta	69.04 %
		RPM	2907 1/min
		Temperature	68.0 °F
		Altitude	0 ft



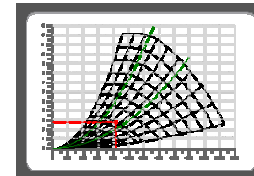


2024-01-25
Aeolus4 1.0.23093.0 Apr 2023

Customer	GLENDALE SCHOOL	Description	SF
Project	FP2746	Our Ref.	Air Wise Sales Inc
Your Ref.	ERV-1		

Input data			
Volume	8300 CFM	Temperature	68.0 °F
Static Pressure	2.81 In.W.G.	Altitude	0 ft
		Density	0.075 lb/cu.ft
		Free Inlet - Free Outlet	

Selected Fan ANPA25 -	Catalogue data		
	n Max	Pw Max	J
	1/min	BHP	lb ft ²
	2350		70.00



Fan Information											
c ft/min	p tot * In.W.G.	p sta In.W.G.	p dyn ** In.W.G.	tip speed ft/min	RPM 1/min	eta Tot * %	eta Sta %	P fan BHP	Min Mot. BHP	P mot BHP	Shaft diameter in
	3.10	2.81	0.29	8013	1233	77.97	70.75	5.18			0.00

(*)Theoric value calculated taking into account the dynamic pressure at the impeller outlet

(**)Theoric value, calculated at the impeller outlet

fm[Hz]	63	125	250	500	1000	2000	4000	8000	Tot.	
Lw3 Total Sound Power Level in the inlet duct- Lwi Inlet Duct Sound Power Level includes the effect of duct end correction										
Level Lw3	dB/dB(A)	82 / 55	77 / 61	83 / 74	73 / 69	71 / 71	66 / 67	67 / 68	64 / 63	86 / 78
Lw5 Inlet Total Sound Power Level - Lwmi Inlet Sound Power Level (free inlet) do not includes the effect of duct end correction										
Level Lw5	dB/dB(A)	72 / 46	78 / 62	88 / 79	76 / 73	72 / 72	71 / 72	71 / 72	68 / 67	89 / 82
Lw6 Total Sound Power Level at the free outlet - Lwmo Outlet Sound Power Level (free outlet) do not includes the effect of duct end correction										
Level Lw6	dB/dB(A)	86 / 59	79 / 63	87 / 78	83 / 79	81 / 81	78 / 79	74 / 75	71 / 70	91 / 86

Certificates



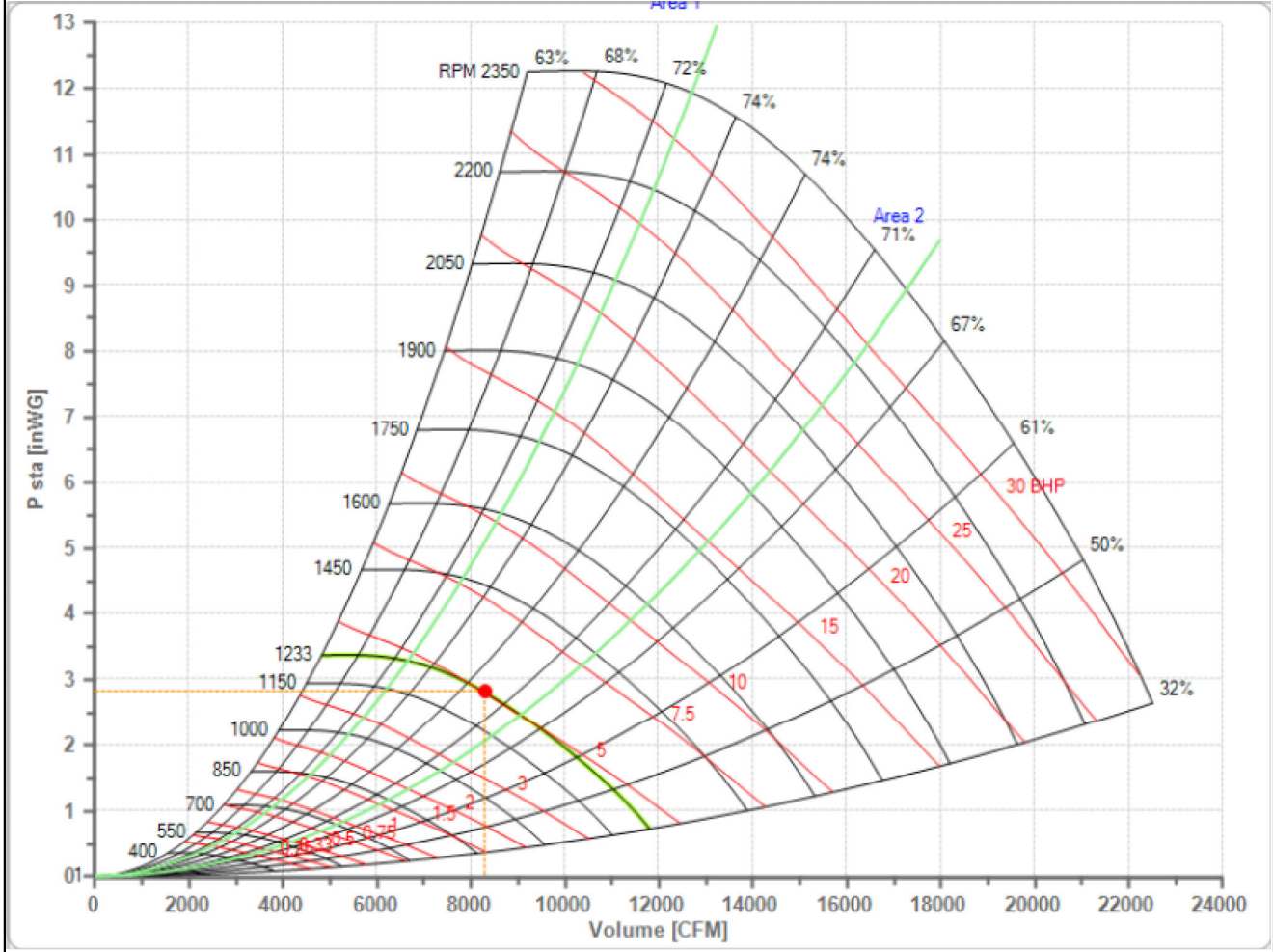
Comefri USA Inc. certifies that the ANPA25 - shown here is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 and 311 and comply with the requirements of the AMCA Certified Ratings Program. Performance ratings include to effects of spring dampers and does not include the effects of appurtenances (accessories). Power rating (kW or BHP) does not include transmission losses. Free inlet Lw5, LwA5 sound power levels shown are in decibels, referred to 10⁻¹² watts calculated per AMCA International Standard 301. Air and free inlet Lw5, LwA5 sound performances shown are for installation type A: Free inlet - Free outlet. The AMCA Certified Ratings Seal applies to air performance and to free inlet Lw5, LwA5 sound power levels. The AMCA Certified Ratings Seal does not apply either to in-duct inlet Lw3, LwA3 sound or outlet Lw6, LwA6 sound.

Chart



2024-01-25
Aeolus4 1.0.23093.0 Apr 2023

Selected Fan	ANPA25 -	Fan working conditions	Free Inlet - Free Outlet
n Max	2350 1/min	Volume	8300 CFM
Pw Max		Total Pressure	3.10 In.W.G.
J	70.00 lb ft ²	Static Pressure	2.81 In.W.G.
		P fan	5.18 BHP
Required working point	•	eta Tot	77.97 %
Effective working point	•	eta Sta	70.75 %
		RPM	1233 1/min
		Temperature	68.0 °F
		Altitude	0 ft



Project:
 Unit tag:
 Customer:
 Quote#:

HX1 - **SUMMER** 
 Hoval Product Serie S

AIR-TO-AIR PLATE EXCHANGER

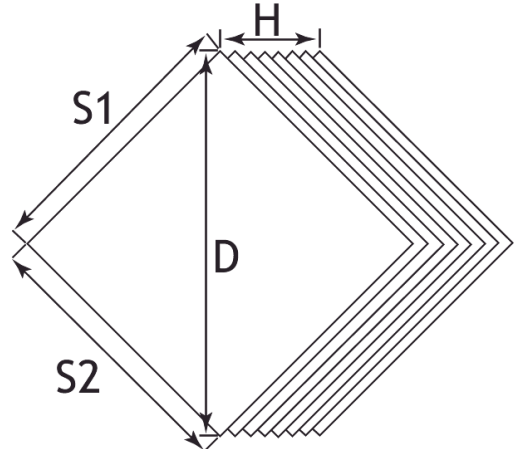
Hoval Product Serie S

Rated in accordance with ASHRAE Standard 84-2013
 Application Rating is outside of the scope of AHRI ERV Certification Program,
 but is rated in accordance with AHRI Standard 1060.

Plate exchanger Model: **SV-100/X-152.4**
 Face area supply side (sq.ft): **16.40**
 Face area exhaust side (sq.ft): **16.40**

Dimensions (in):

Height (H): **60** Supply Side (S1): **39.37**
 Diagonal (D): **54.88** Exhaust Side (S2): **39.37**
 Spacing: **0.17** Bypass Width: **0**



Weight (lb): **340**
 Pressure Differential SP2 - SP3 (in wg): **0.84**
 Face velocity of supply air (ft/min): **427**
 Face velocity of return air (ft/min): **506**
 Frost control system required: **NO**
 Unit will be shipped in section of 60 in (H): **1 Section(s)**
 Altitude (ft): **0**

Performance		
	Effectiveness	Capacity (Btu/hr)
Sensible	59.5 %	67425
Latent	0.0 %	0
Total	25.6 %	67425

Entering supply air T1

36.6 Btu/lb
 7000 CFM
 90 DB °F
 73 WB °F
 95.2 gr/lb
 45 RH %

Leaving exhaust air T4

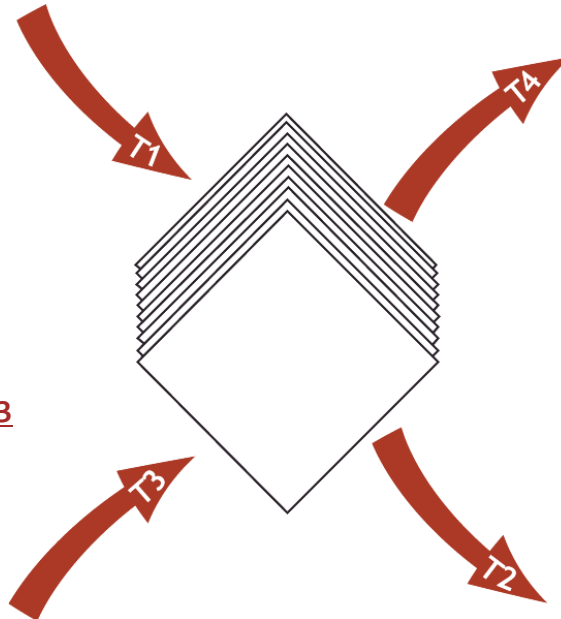
30 Btu/lb
 8300 CFM
 82.5 DB °F
 65.1 WB °F
 65.1 gr/lb
 39 RH %
 0.84 in wg

Entering exhaust air T3

28.2 Btu/lb
 8300 CFM
 75 DB °F
 62.6 WB °F
 65.1 gr/lb
 50 RH %

Leaving supply air T2

34.4 Btu/lb
 7000 CFM
 81.1 DB °F
 70.5 WB °F
 95.2 gr/lb
 60 RH %
 0.66 in wg



Project:
 Unit tag:
 Customer:
 Quote#:

HX1 - WINTER ❄️
 Hoval Product Serie S

AIR-TO-AIR PLATE EXCHANGER

Hoval Product Serie S

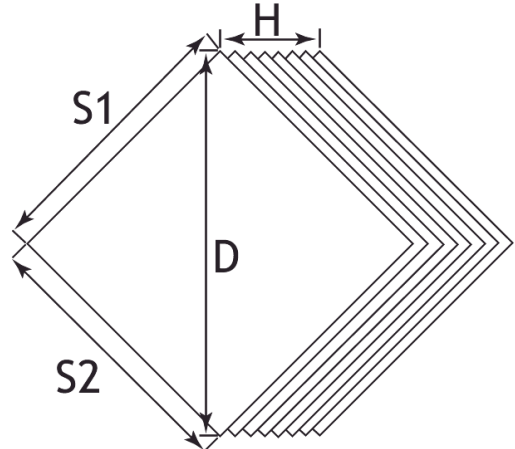
Rated in accordance with ASHRAE Standard 84-2013
 Application Rating is outside of the scope of AHRI ERV Certification Program,
 but is rated in accordance with AHRI Standard 1060.

Plate exchanger Model: **SV-100/X-152.4**
 Face area supply side (sq.ft): **16.40**
 Face area exhaust side (sq.ft): **16.40**

Dimensions (in):

Height (H): **60** Supply Side (S1): **39.37**
 Diagonal (D): **54.88** Exhaust Side (S2): **39.37**
 Spacing: **0.17** Bypass Width: **0**

Weight (lb): **340**
 Pressure Differential SP2 - SP3 (in wg): **0.73**
 Face velocity of supply air (ft/min): **427**
 Face velocity of return air (ft/min): **506**
 Frost control system required: **YES**
 Unit will be shipped in section of 60 in (H): **1 Section(s)**
 Altitude (ft): **0**



Performance		
	Effectiveness	Capacity (Btu/hr)
Sensible	61.2 %	346830
Latent	0.0 %	0
Total	49.0 %	346830

Condensation: 0.08 US gpm

Entering supply air T1

-0.6 Btu/lb
 7000 CFM
 -5 DB °F
 -5 WB °F
 4.2 gr/lb
 100 RH %

Leaving exhaust air T4

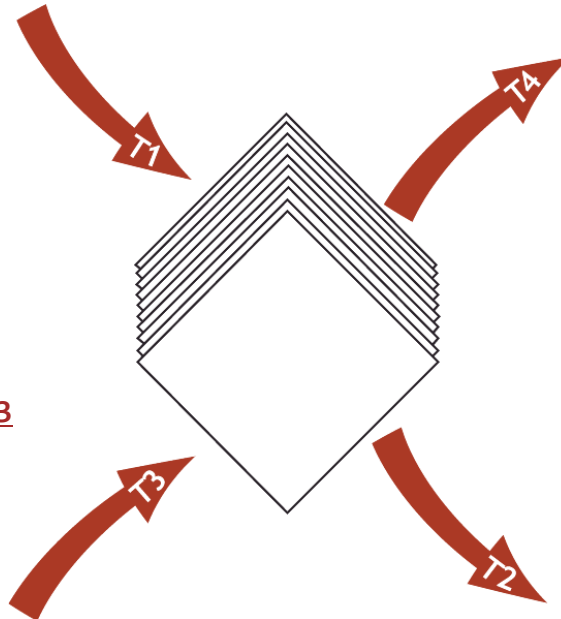
11.6 Btu/lb
 8300 CFM
 32.4 DB °F
 31.7 WB °F
 25 gr/lb
 93 RH %
 0.96 in wg

Entering exhaust air T3

21.9 Btu/lb
 8300 CFM
 70 DB °F
 52.9 WB °F
 32.4 gr/lb
 30 RH %

Leaving supply air T2

10.5 Btu/lb
 7000 CFM
 40.9 DB °F
 28.9 WB °F
 4.2 gr/lb
 11 RH %
 0.77 in wg



Project:
 Unit tag:
 Customer:
 Quote#:

HX1 - WINTER ❄️ FROST CONTROL
 Hoval Product Serie S

AIR-TO-AIR PLATE EXCHANGER

Hoval Product Serie S

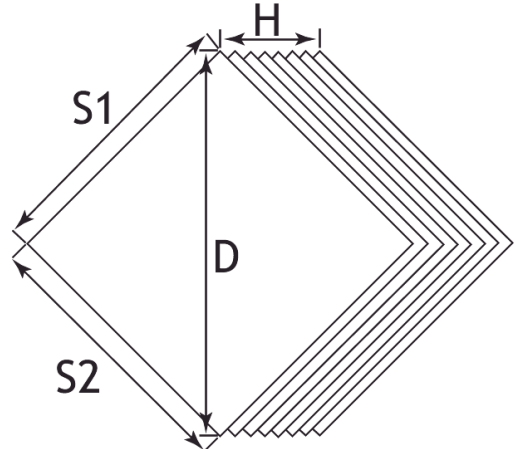
Rated in accordance with ASHRAE Standard 84-2013
 Application Rating is outside of the scope of AHRI ERV Certification Program,
 but is rated in accordance with AHRI Standard 1060.

Plate exchanger Model: **SV-100/X-152.4**
 Face area supply side (sq.ft): **16.40**
 Face area exhaust side (sq.ft): **16.40**

Dimensions (in):

Height (H): **60** Supply Side (S1): **39.37**
 Diagonal (D): **54.88** Exhaust Side (S2): **39.37**
 Spacing: **0.17** Bypass Width: **0**

Weight (lb): **340**
 Pressure Differential SP2 - SP3 (in wg): **0.85**
 Face velocity of supply air (ft/min): **372**
 Face velocity of return air (ft/min): **506**
 Frost control system required: **NO**
 Unit will be shipped in section of 60 in (H): **1 Section(s)**
 Altitude (ft): **0**



Performance		
	Effectiveness	Capacity (Btu/hr)
Sensible	61.4 %	311325
Latent	0.0 %	0
Total	50.6 %	311325

Condensation: 0.06 US gpm

Entering supply air T1

-0.6 Btu/lb
 6100 CFM
 -5 DB °F
 -5 WB °F
 4.2 gr/lb
 100 RH %

Leaving exhaust air T4

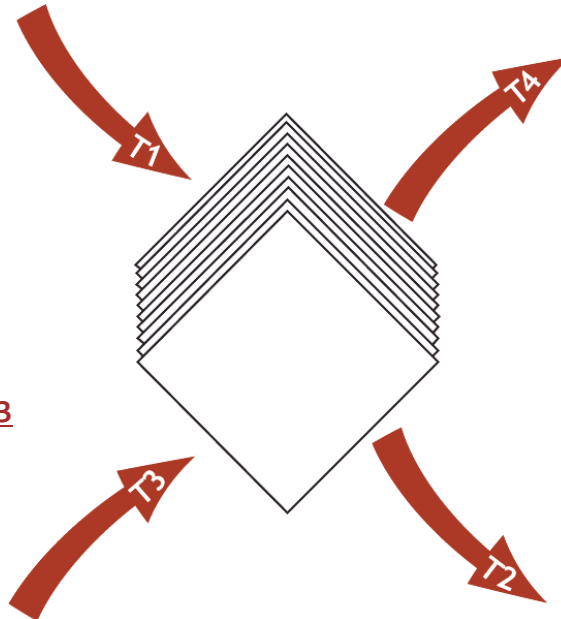
12.8 Btu/lb
 8300 CFM
 38 DB °F
 34.5 WB °F
 23.9 gr/lb
 71 RH %
 0.96 in wg

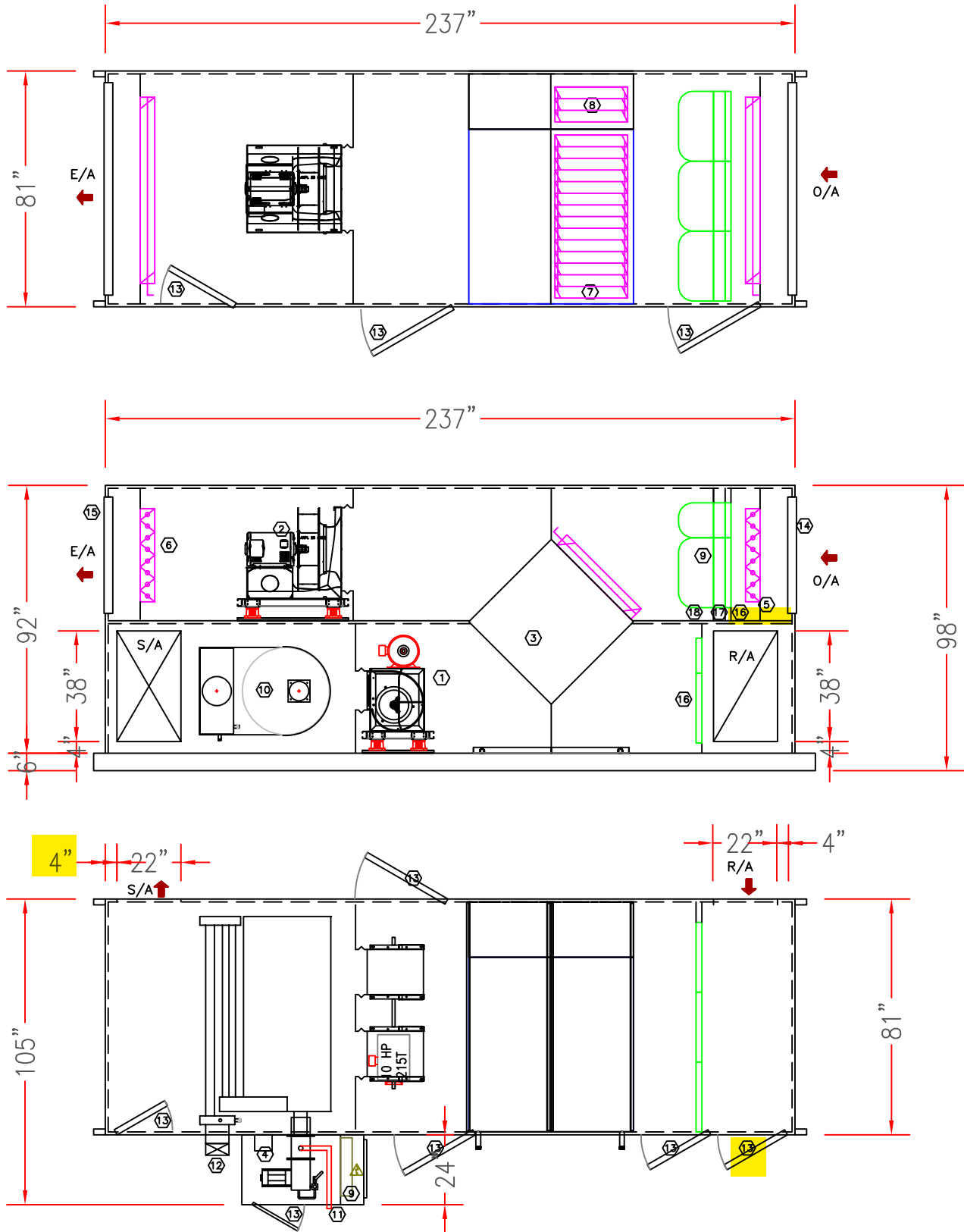
Entering exhaust air T3

21.8 Btu/lb
 8300 CFM
 72 DB °F
 52.9 WB °F
 29.2 gr/lb
 25 RH %

Leaving supply air T2

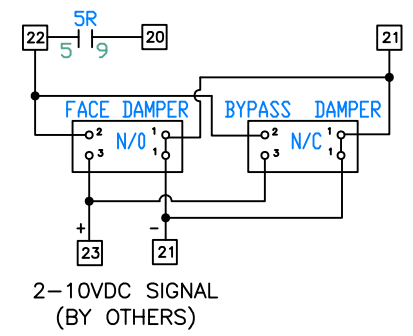
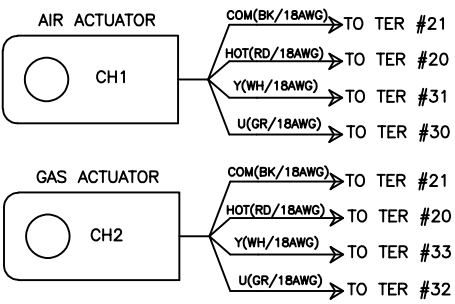
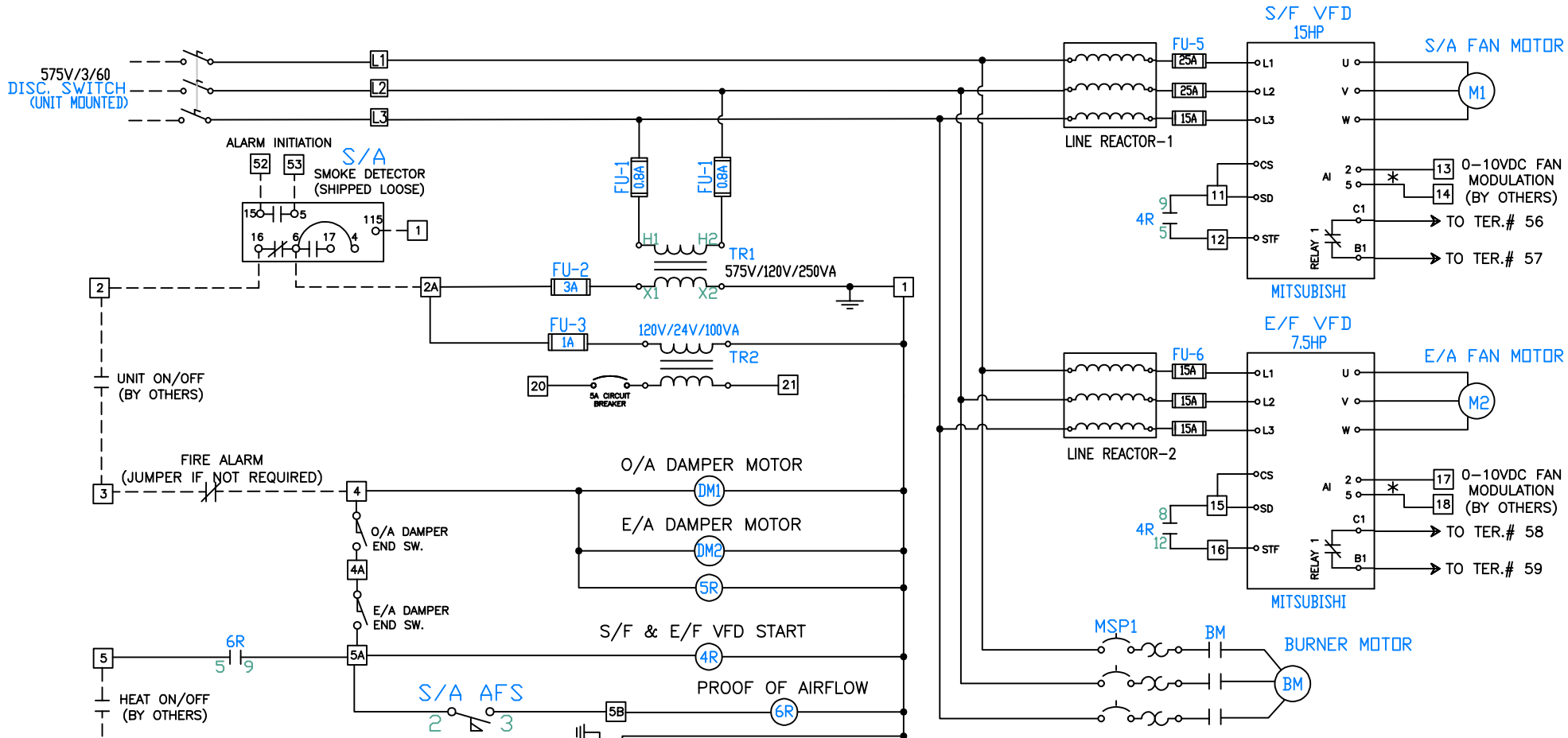
10.8 Btu/lb
 6100 CFM
 42.2 DB °F
 29.7 WB °F
 4.2 gr/lb
 11 RH %
 0.65 in wg





- | | |
|------------------------------|------------------------------|
| ① S/A FAN & MOTOR ASS'Y | ⑩ S.S. HEAT EXCHANGER |
| ② E/A FAN & MOTOR ASS'Y | ⑪ GAS CONNECTION |
| ③ HEAT RECOVERY PLATE | ⑫ OUTDOOR CHIMNEY |
| ④ VFD | ⑬ ACCESS DOOR |
| ⑤ O/A DAMPER C/W ACTUATOR | ⑭ O/A LOUVER C/W BIRD SCREEN |
| ⑥ E/A DAMPER C/W ACTUATOR | ⑮ E/A LOUVER C/W BIRD SCREEN |
| ⑦ FACE DAMPER C/W ACTUATOR | ⑯ 2" MERV8 FILTERS |
| ⑧ BYPASS DAMPER C/W ACTUATOR | ⑰ 4" MERV13 FILTERS |
| ⑨ ELECTRICAL PANEL | ⑱ CARBON FILTERS |

	JOB NUMBER	FP2746	HANDING	RIGHT HAND ACCESS	
	TOTAL UNIT WEIGHT	7,900 LBS	NO. REQ'D	1	
PROJECT NAME	GLENDALE SCHOOL		DESIGN BY	C.Z. 2024-01-24	
MODEL NO.	TBI-650/HRP		CHK BY	S.A. 2024-02-09	
UNIT TAG	ERV-1		SCALE	SIZE	
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				REV	0

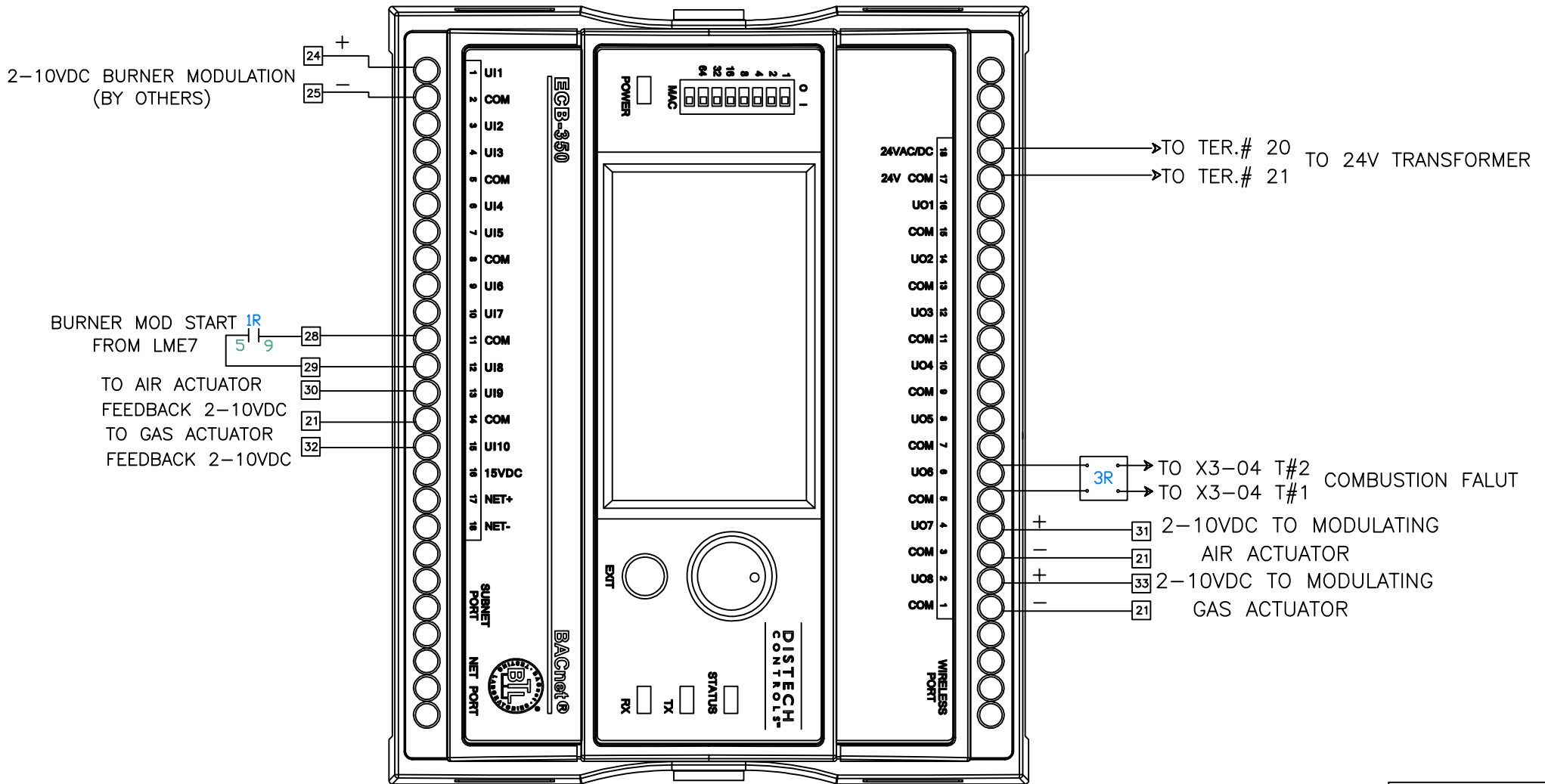


- LEGENDS
- FACTORY WIRING
 - WIRING BY OTHERS
 - TERMINAL IN MAIN CONT. PANEL
 - ◇ TERMINAL IN REMOTE STATION
 - ⊕ TERMINAL IN CONDENSER
 - * USE SHIELDED CABLE ONLY
- NOTES
- 120V USE 14 AWG MINIMUM
 - 24V USE 20AWG MINIMUM

airwise SALES INC.		JOB NUMBER	FP2746	QTY	1
PROJECT NAME	GLENDALE SCHOOL	DESIGN BY	K.M.	2024-02-14	SHEET NO.
MODEL NO.	TBI-650/HRP	CHK BY	S.A.	2024-02-27	01 OF 03
UNIT TAG	ERV-1	SCALE	NTS	SIZE	A
DRAWING NO.				E-FP2746-ERV-1	REV

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REV	DESIGNER	DATE	DESCRIPTION



CAUTION: DO NOT TIGHTEN TERMINALS BEYOND 0.4 N m (3.5 IN LBF) TORQUE!

ECB-350 FOR COMBUSTION CONTROL ONLY

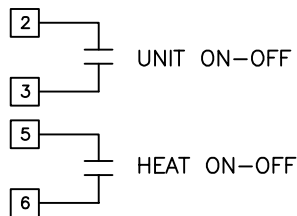
LEGENDS	
---	FACTORY WIRING
---	WIRING BY OTHERS
□	TERMINAL IN MAIN CONT. PANEL
◇	TERMINAL IN REMOTE STATION
⊕	TERMINAL IN CONDENSER
*	USE SHIELDED CABLE ONLY
NOTES 120V USE 14 AWG MINIMUM	
24V USE 20AWG MINIMUM	

airwise SALES INC.		JOB NUMBER FP2746	QTY 1
PROJECT NAME	GLENDALE SCHOOL	DESIGN BY K.M.	2024-02-14
MODEL NO.	TBI-650/HRP	CHK BY S.A.	2024-02-27
UNIT TAG	ERV-1	SCALE NTS	SIZE A
DRAWING NO. E-FP2746-ERV-1			REV

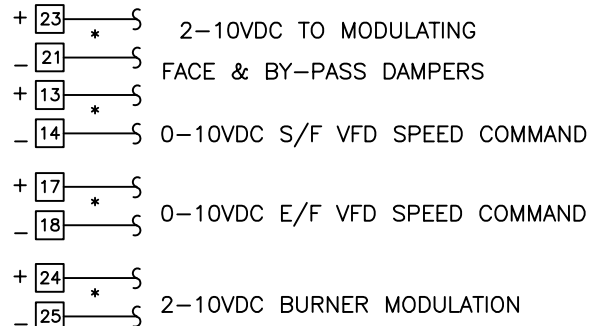
REV	DESIGNER	DATE	DESCRIPTION

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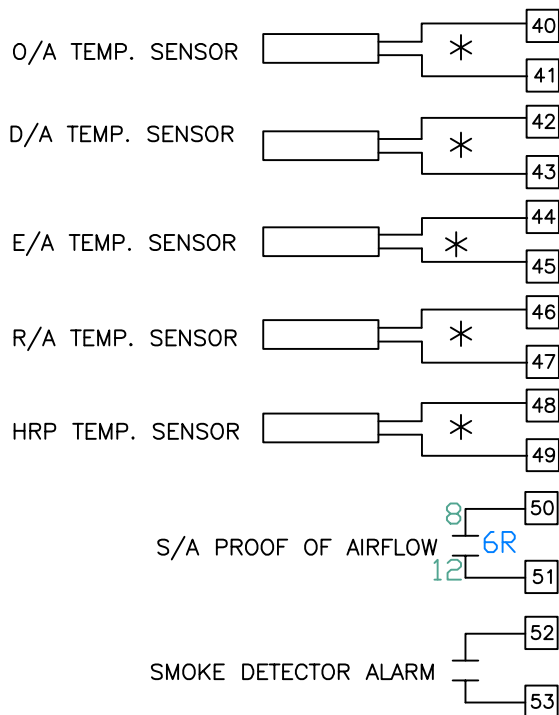
PLC DIGITAL OUTPUTS (120VAC)



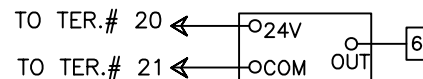
PLC ANALOG OUTPUTS



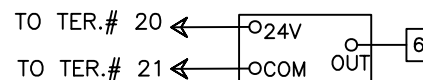
PLC INPUTS



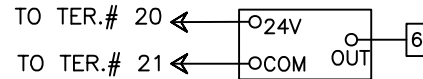
R/A FILTER PRESSURE TRANSDUCER



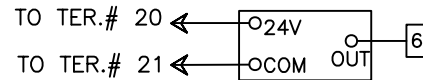
PRIMARY FILTER PRESSURE TRANSDUCER



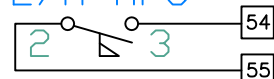
SECONDARY FILTER PRESSURE TRANSDUCER



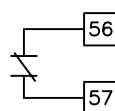
FINAL(CARBON) FILTER PRESSURE TRANSDUCER



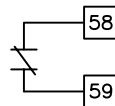
E/A AFS



S/A FAN FAILURE



E/A FAN FAILURE



LEGENDS	
---	FACTORY WIRING
---	WIRING BY OTHERS
□	TERMINAL IN MAIN CONT. PANEL
◇	TERMINAL IN REMOTE STATION
⊕	TERMINAL IN CONDENSER
*	USE SHIELDED CABLE ONLY
NOTES 120V USE 14 AWG MINIMUM 24V USE 20AWG MINIMUM	

airwise SALES INC.		JOB NUMBER FP2746	QTY 1
PROJECT NAME GLENDALE SCHOOL	DESIGN BY K.M.	DATE 2024-02-14	SHEET NO. 03 OF 03
MODEL NO. TBI-650/HRP	CHK BY S.A.	DATE 2024-02-27	
UNIT TAG ERV-1	SCALE NTS	SIZE A	
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REV	DESIGNER	DATE	DESCRIPTION

**AIR WISE SALES INC.**

CUSTOM DESIGNED AIR HANDLING SYSTEMS

UNIT SPECIFICATIONS**FP2746****RTU-1**

JOB NAME	GLENDALE SCHOOL
JOB NUMBER	FP2746
UNIT TAG	RTU-1
MODEL	TBI-350/HRW/D19/HGR
NO. OF UNITS	ONE (1)
PLACEMENT	OUTDOOR, BASE MOUNTED
HANDING	RIGHT HAND, END DISCHARGE
SUPPLY CFM	5,400 CFM
ESP	1.00 " W.C.
TSP	4.73 " W.C.
FAN	(1) ATLI 15-11 T2 FAN, DWDI
BHP	6.21 BHP
RPM	1,385 RPM
MOTOR	(1) 7.5HP TEFC PREMIUM-EFFICIENCY, INVERTER DUTY, 1800 RPM
RETURN CFM	5,400 CFM
ESP	1.00 " W.C.
TSP	3.50 " W.C.
FAN	(1) ANPA18 182T/184T FAN, DIRECT DRIVE
BHP	4.47 BHP
RPM	2,012 RPM
MOTOR	(1) 5HP TEFC PREMIUM-EFFICIENCY, INVERTER DUTY, 1800 RPM
PRIMARY O/A FILTER	2" MERV 8 FILTERS
QUANTITY AND SIZE	(4) (2) 24 X 24 X 2 + (2) 24 X 12 X 2"
AREA	12 SQ.FT.
FACE VELOCITY	450 FPM
SECONDARY O/A FILTER	4" MERV 13 FILTERS
QUANTITY AND SIZE	(4) (2) 24 X 24 X 4 + (2) 24 X 12 X 4"
AREA	12 SQ.FT.
FACE VELOCITY	450 FPM
PRIMARY R/A FILTER	2" MERV 8 FILTERS
QUANTITY AND SIZE	(4) (2) 24 X 24 X 2 + (2) 24 X 12 X 2"
AREA	12 SQ.FT.
FACE VELOCITY	450 FPM
SECONDARY R/A FILTER	4" MERV 13 FILTERS
QUANTITY AND SIZE	(4) (2) 24 X 24 X 4 + (2) 24 X 12 X 4"
AREA	12 SQ.FT.
FACE VELOCITY	450 FPM

**AIR WISE SALES INC.**

CUSTOM DESIGNED AIR HANDLING SYSTEMS

UNIT SPECIFICATIONS**FP2746****RTU-1**

COOLING COIL	(1) EXPANSION TYPE, SIZE: 32"FH X 50"FL (SEE DATA SHEET ATTACHED)
HOT GAS REHEAT COIL	(1) SIZE: 30"FH X 50"FL (SEE DATA SHEET ATTACHED)
HOT RECOVERY WHEEL	(1) INNERGYTECH WHEEL MODEL: I4-MS3A-48-09 (SEE DATA SHEET ATTACHED)
HEAT EXCHANGER	DRUM-AND-TUBE 4 PASS
PRIMARY	16 GA. TYPE 409 STAINLESS STEEL DRUM
SECONDARY	16 GA. TYPE 409 STAINLESS STEEL WELDED TUBE
BURNER	GP C4 BURNER WITH FULL MODULATION 15:1 TURNDOWN & ELECTRONIC LINEAR AIR & GAS CONTROLS
INLET	3/4" NPT
GAS INPUT	400 MBH
HEAT OUTPUT	324 MBH
FUEL TYPE	NATURAL GAS
INLET PRESSURE	7" WC
TEMPERATURE RISE	56 F
CONDENSING SECTION	(1) ZPD103KCE-TFE DIGITAL COPELAND SCROLL COMPRESSOR (1) ZP103KCE-TFE COPELAND SCROLL COMPRESSOR 18.5 TON NOMINAL CAPACITY 2 STAGES OF COOLING, DIGITAL LEAD COMPRESSOR R410A REFRIGERANT, 575V/3/60 COMPRESSORS C/W RUBBER GROMMETS (1) AKFD 800-6-6 K.6LA CONDENSOR FANS
CONTROL SYSTEM	CONTROLLED BY OTHERS
O/A DAMPER	(1) TAMCO1000, OPPOSED BLADE, LOW LEAK, SIZE: 40"L X 28"H
RE-CIRCULATE DAMPER	(1) TAMCO1000, OPPOSED BLADE, LOW LEAK, SIZE: 50"L X 16"H
BY-PASS DAMPER	(2) TAMCO1000, OPPOSED BLADE, LOW LEAK, SIZE: 50"L X 8"H
E/A DAMPER	(1) TAMCO1000, OPPOSED BLADE, LOW LEAK, SIZE: 20"L X 28"H
DAMPER ACTUATORS	MODULATING 0-10VDC SPRING RETURN

**AIR WISE SALES INC.**

CUSTOM DESIGNED AIR HANDLING SYSTEMS

UNIT SPECIFICATIONS**FP2746****RTU-1**

UNIT VOLTAGE	575V/3/60
SF MOTOR AMPS	7.6 A
RF MOTOR AMPS	5.3 A
BURNER MOTOR AMPS	0.6 A
HRW MOTOR AMPS	2.2 A
CONTROL AMPS	0.9 A
COMPRESSOR AMPS	(2) 10.6 A
CONDENSER FAN MOTOR AMPS	(1) 3.24 A
UNIT MCA	43.1 A
UNIT MOP	50.0 A
CASING	20 GA SATIN COAT
LINER	20 GA GALVANIZED
FLOOR	18 GA GALVANIZED
BASE	6" FORMED CHANNEL
INSULATION	1" R6.5 FOAM INJECTED PANEL
DOORS	LEVER LOCK QUARTER TURN HANDLES WITH AUTOMOTIVE BULB GASKETS
FINISH	ACRYLIC ENAMEL GREY PAINT
FEATURES	<ul style="list-style-type: none">• FACTORY UNIT MOUNTED NON-FUSED DISCONNECT SWITCH• S/A FAN / MOTOR ASSEMBLIES MOUNTED ON 1" SPRING ISOLATORS• FACTORY MOUNTED VFD FOR S/A FAN MOTOR• O/A & E/A LOUVERS C/W BIRD SCREEN & GALVANIZED DRAIN PAN WITH 1-1/4" DRAIN PIPE• STAINLESS STEEL DRAIN PAN WITH 1-1/4" NPT DRAIN CONNECTION FOR COOLING COIL• GFCI POWERED BY OTHERS• CSA LISTED
SHIPPED LOOSE	<ul style="list-style-type: none">• DISCHARGE AIR SENSOR• EC - SMART - VUE CONTROLLER
ESTIMATED TOTAL WEIGHT	8,000 lbs
PREPARATION DATE	FEBRUARY 28, 2024

**AIR WISE SALES INC.**

CUSTOM DESIGNED AIR HANDLING SYSTEMS

EXPANSION COIL SELECTION DATA**FP2746****RTU-1**

JOB NAME	GLENDALE SCHOOL
JOB NUMBER	FP2746
UNIT TAG	RTU-1
MODEL	TBI-350
COIL TYPE	EXPANSION
COIL DUTY	COOLING COIL
NO. OF COILS	ONE (1)
AIRFLOW THRU COIL (CFM)	5,400
ENT. AIR DB/WB (F)	79/67.9
LVG. AIR DB/WB (F)	56.54/54.66
TOTAL COIL CAPACITY (BTUH)	225,000
SENSIBLE CAPACITY (BTUH)	131,480
FACE VELOCITY (FT/MIN)	478
AIR PRES. DROP (IN.WG)	0.25
REFRIGERANT	R410A
SUCTION TEMP. (DEG F)	45
REFRIGERANT PRES. DROP (PSI)	8.14
ROWS	3
FINS PER INCH	11
FIN HEIGHT (IN)	32.5
FIN LENGTH (IN)	50.00
CASING MATERIAL	GALVANIZED STEEL 16 GAUGE
TUBE MATERIAL	COPPER
FIN MATERIAL	ALUMINUM
NO. OF CIRCUITS (PER COIL)	2

**AIR WISE SALES INC.**

CUSTOM DESIGNED AIR HANDLING SYSTEMS

HOT GAS REHEAT COIL SELECTION DATA**FP2746****RTU-1**

JOB NAME	GLENDAL SCHOOL
JOB NUMBER	FP2746
UNIT TAG	RTU-1
MODEL	TBI-350
COIL TYPE	HOT GAS REHEAT
COIL DUTY	REHEAT COIL
NO. OF COILS	ONE (1)
AIRFLOW THRU COIL (CFM)	5,400
ENT. AIR DB/WB (F)	56.25
LVG. AIR DB/WB (F)	70
TOTAL COIL CAPACITY (BTUH)	80,480
FACE VELOCITY (FT/MIN)	518
AIR PRES. DROP (IN.WG)	0.04
REFRIGERANT	R410A
SUCTION TEMP. (DEG F)	125
REFRIGERANT PRES. DROP (PSI)	0.976
ROWS	1
FINS PER INCH	7
FIN HEIGHT (IN)	30.00
FIN LENGTH (IN)	50.00
CASING MATERIAL	GALVANIZED STEEL 16 GAUGE
TUBE MATERIAL	COPPER
FIN MATERIAL	ALUMINUM
NO. OF CIRCUITS (PER COIL)	1



AIR WISE

CUSTOM AIR HANDLING UNITS

FP2746
RTU-1

EER PERFORMANCE CALCULATION

JOB NAME	GLENDALE SCHOOL	AGENT	-
MODEL NO.	TBI-350/HRW/D19/HGR	UNIT TAG(S)	RTU-1
COOLING CAPACITY	225,000 BTU/H	AIR SUPPLY	5,400 CFM
SUCTION TEMPERATURE	45	CONDENSING TEMPERATURE	117
STAGES OF COOLING	2	COMPRESSOR MODEL	ZP103 & ZPD103
NUMBER OF COMPRESSORS	2	COMPRESSOR TYPE	SCROLL
COMPRESSOR POWER AT DESIGN POINT (WATTS)	8,050	COMPRESSOR EER	12.66
CONDENSER FAN MODEL	AKFD 800-6-6 K.6LA	NUMBER OF FANS	1
CONDENSER FAN POWER (WATTS)	2,130		
SUPPLY FAN MODEL	ATLI 12-12	NUMBER OF FANS	1
FAN POWER* (BHP)	2.44 BHP	WATTS	1,820 W
		MOTOR EFFICIENCY	91.7
FAN POWER (ADJUSTED**) (WATTS)	2,088.6		

COMPONENT	POWER DRAW (W)	QUANTITY	SUBTOTAL
COMPRESSOR	8,050	2	16,100
CONDENSER FAN	2,130	1	2,130
SUPPLY FAN	2,089	1	2,089
CONTROL XFMR***	100	1	100
TOTAL POWER DRAW (WATTS)			20,419

EER CALCULATION

$$EER = \frac{\text{TOTAL COOLING (BTU/H)}}{\text{TOTAL POWER DRAW (W)}}$$

$$EER = \frac{225,000}{20,419}$$

$$EER = 11.02 \text{ BTU/W*H}$$

- NOTES**
- * SUPPLY FAN EXTERNAL STATIC PRESSURE CORRECTED PER AHRI STANDARD 340/360
 - * FILTER STATIC PRESSURE CORRECTED TO MANUFACTURER'S STANDARD FILTER (SECTION E3.2.1)
 - ** FAN MOTORS CORRECTED FOR EFFICIENCY AND DRIVE LOSSES
 - *** CONTROL TRANSFORMER CORRECTED TO 100 VA

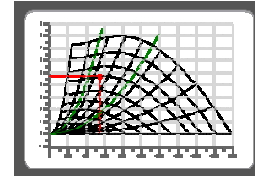


2024-02-28
Aeolus4 1.0.23093.0 Apr 2023

Customer	GLENDALE SCHOOL	Description	SF
Project	FP2746	Our Ref.	Air Wise Sales Inc
Your Ref.	RTU-1		

Input data			
Volume	5400 CFM	Temperature	68.0 °F
Static Pressure	4.73 In.W.G.	Altitude	0 ft
		Density	0.075 lb/cu.ft
		Free Inlet - Ducted Outlet	

Selected Fan ATLI 15 - 11 T2	Catalogue data		
	n Max	Pw Max	J
	l/min	BHP	lb ft²
	1720	13.30	5.81



Fan Information											
c ft/min	p tot In.W.G.	p sta In.W.G.	p dyn In.W.G.	tip speed ft/min	RPM 1/min	eta Tot %	eta Sta %	P fan BHP	Min Mot. BHP	P mot BHP	Shaft diameter in
3331	5.42	4.73	0.69	5714	1385	74.12	64.66	6.21	7.45	7.50	0.00

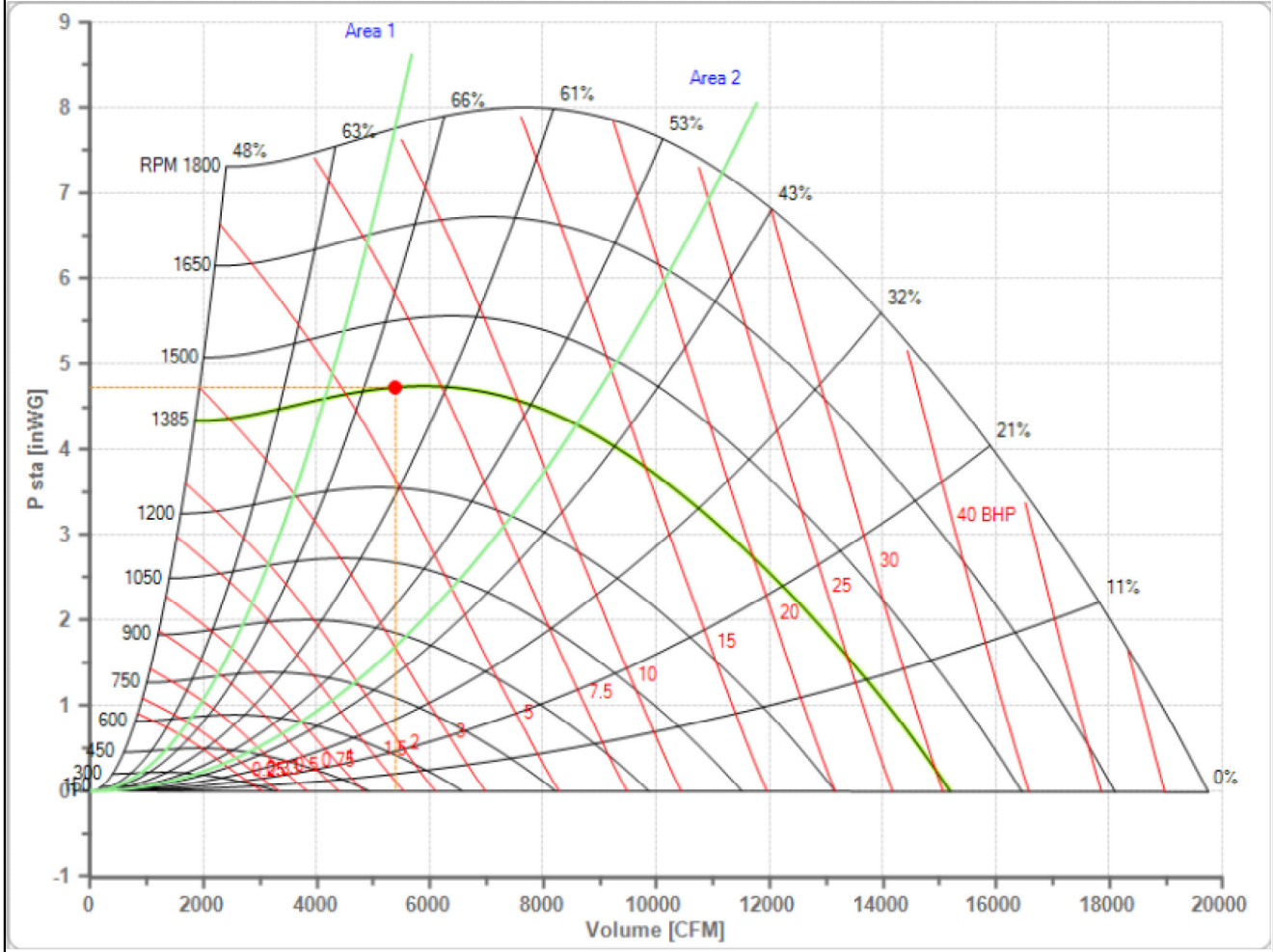
fm[Hz]	63	125	250	500	1000	2000	4000	8000	Tot.		
Lw4 Total Sound Power Level inside the outlet duct - Lwo Outlet Duct Sound Power Level includes the effect of duct end correction											
Level Lw4	dB/dB(A)		92 / 66	86 / 70	85 / 76	84 / 81	88 / 88	80 / 81	77 / 78	73 / 72	95 / 90
Lw6d Total Sound Power Level outside the termination of the outlet duct - Lwmo Outlet Sound Power Level (free outlet) do not includes the effect of duct end correction											
Level Lw6d	dB/dB(A)		82 / 55	80 / 63	83 / 74	84 / 81	88 / 88	80 / 81	77 / 78	73 / 72	92 / 90

Chart



2024-02-28
Aeolus4 1.0.23093.0 Apr 2023

Selected Fan	ATLI 15 - 11 T2	Fan working conditions	Free Inlet - Ducted Outlet
n Max	1720 1/min	Volume	5400 CFM
Pw Max	13.30 BHP	Total Pressure	5.42 In.W.G.
J	5.81 lb ft ²	Static Pressure	4.73 In.W.G.
Required working point	•	P fan	6.21 BHP
Effective working point	•	eta Tot	74.12 %
		eta Sta	64.66 %
		RPM	1385 1/min
		Temperature	68.0 °F
		Altitude	0 ft



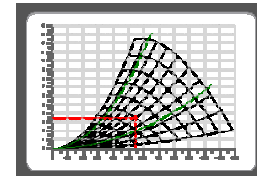


2024-02-26
Aeolus4 1.0.23093.0 Apr 2023

Customer	GLENDALE SCHOOL	Description	RF
Project	FP2746	Our Ref.	Air Wise Sales Inc
Your Ref.	RTU-1		

Input data			
Volume	5400 CFM	Temperature	68.0 °F
Static Pressure	3.50 In.W.G.	Altitude	0 ft
		Density	0.075 lb/cu.ft
		Free Inlet - Free Outlet	

Selected Fan ANPA18 -	Catalogue data		
	n Max	Pw Max	J
	1/min	BHP	lb ft ²
	3300		15.42



Fan Information											
c ft/min	p tot * In.W.G.	p sta In.W.G.	p dyn ** In.W.G.	tip speed ft/min	RPM 1/min	eta Tot * %	eta Sta %	P fan BHP	Min Mot. BHP	P mot BHP	Shaft diameter in
	3.97	3.50	0.47	9334	2012	75.41	66.53	4.47			0.00

(*)Theoric value calculated taking into account the dynamic pressure at the impeller outlet

(**)Theoric value, calculated at the impeller outlet

fm[Hz]		63	125	250	500	1000	2000	4000	8000	Tot.
Lw3 Total Sound Power Level in the inlet duct- Lwi Inlet Duct Sound Power Level includes the effect of duct end correction										
Level Lw3	dB/dB(A)	78 / 52	76 / 60	80 / 72	77 / 74	77 / 77	73 / 75	70 / 71	64 / 63	86 / 81
Lw5 Inlet Total Sound Power Level - Lwmi Inlet Sound Power Level (free inlet) do not includes the effect of duct end correction										
Level Lw5	dB/dB(A)	78 / 52	79 / 63	90 / 81	87 / 84	80 / 80	79 / 80	73 / 74	68 / 67	93 / 88
Lw6 Total Sound Power Level at the free outlet - Lwmo Outlet Sound Power Level (free outlet) do not includes the effect of duct end correction										
Level Lw6	dB/dB(A)	86 / 60	82 / 66	90 / 82	88 / 85	87 / 87	82 / 83	77 / 78	73 / 72	95 / 91

Certificates



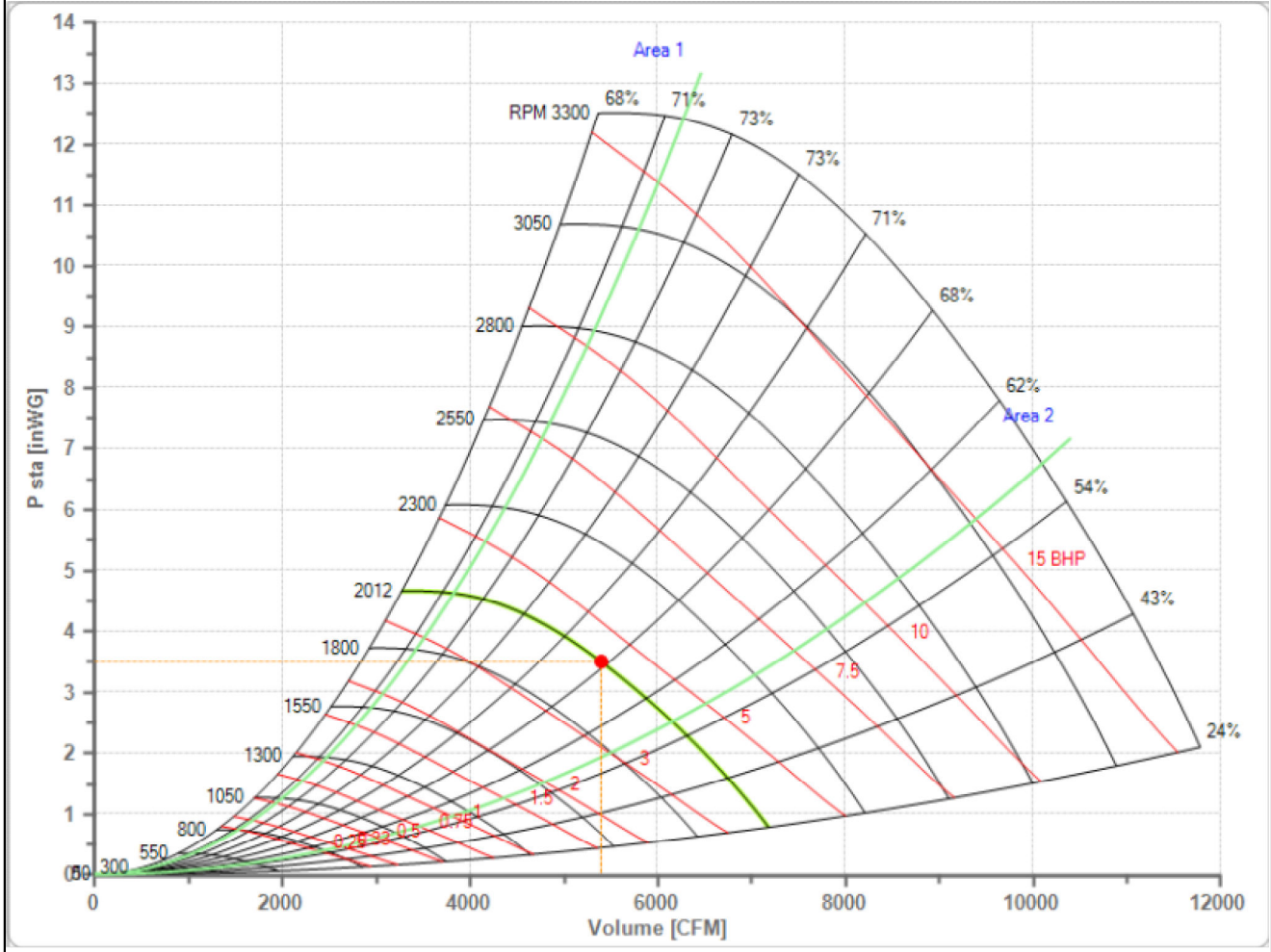
Comefri USA Inc. certifies that the ANPA18 - shown here is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 and 311 and comply with the requirements of the AMCA Certified Ratings Program. Performance ratings include to effects of spring dampers and does not include the effects of appurtenances (accessories). Power rating (kW or BHP) does not include transmission losses. Free inlet Lw5, LwA5 sound power levels shown are in decibels, referred to 10⁻¹² watts calculated per AMCA International Standard 301. Air and free inlet Lw5, LwA5 sound performances shown are for installation type A: Free inlet - Free outlet. The AMCA Certified Ratings Seal applies to air performance and to free inlet Lw5, LwA5 sound power levels. The AMCA Certified Ratings Seal does not apply either to in-duct inlet Lw3, LwA3 sound or outlet Lw6, LwA6 sound.

Chart




2024-02-26
Aeolus4 1.0.23093.0 Apr 2023

Selected Fan	ANPA18 -	Fan working conditions	Free Inlet - Free Outlet
n Max	3300 1/min	Volume	5400 CFM
Pw Max		Total Pressure	3.97 In.W.G.
J	15.42 lb ft ²	Static Pressure	3.50 In.W.G.
		P fan	4.47 BHP
Required working point	•	eta Tot	75.41 %
Effective working point	•	eta Sta	66.53 %
		RPM	2012 1/min
		Temperature	68.0 °F
		Altitude	0 ft



Project:
 Unit tag:
 Customer:
 Quote#:

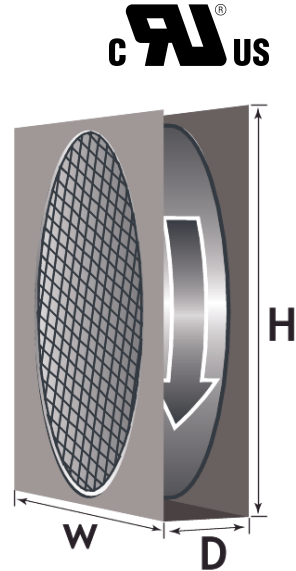
HX1 - **SUMMER** 
 Total Energy Recovery Wheel

Rotary AIR-TO-AIR

TOTAL ENERGY RECOVERY WHEEL

*Rated in accordance with ASHRAE Standard 84-2013
 Application Rating is outside of the scope of AHRI ERV Certification Program,
 but is rated in accordance with AHRI Standard 1060.*

Wheel Model: **I4-MS3A-48-09**
 Face area (sq.ft): **6.00**
 Motor power (hp): **N.A.**
Dimensions (in):
 Depth (D): **17**
 Width (W): **52**
 Height (H): **52**
 Weight (lb): **271**
 Wheel speed (RPM): **18.00**
 Pressure Differential SP2-SP3 (in wg): **1.05**
 Purge airflow (): **0**
 Purge angle (deg): **0**
 Face velocity of supply air (ft/min): **430**
 Face velocity of return air (ft/min): **430**
 Frost control system required: **NO**
 Altitude (ft): **0**



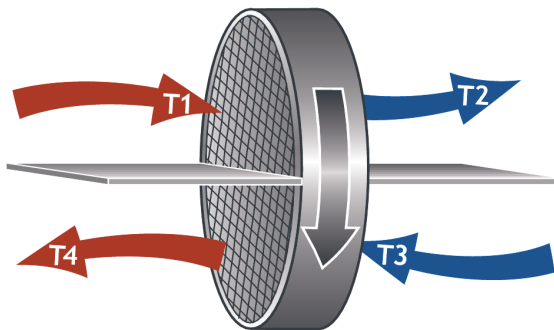
Performance		
	Effectiveness	Capacity (Btu/hr)
Sensible	75.9 %	28755
Latent	67.2 %	41267
Total	70.5 %	70022

Entering supply air T1

36.6 Btu/lb
 2700 CFM
 88 DB °F
 73 WB °F
 98.4 gr/lb
 49 RH %

Leaving supply air T2

30.7 Btu/lb
 2700 CFM
 78.1 DB °F
 65.9 WB °F
 76 gr/lb
 53 RH %
 0.45 in wg



Leaving exhaust air T4

34.1 Btu/lb
 2700 CFM
 84.9 DB °F
 70.2 WB °F
 87.5 gr/lb
 49 RH %
 0.53 in wg

Entering exhaust air T3

28.2 Btu/lb
 2700 CFM
 75 DB °F
 62.6 WB °F
 65.1 gr/lb
 50 RH %

Project:
 Unit tag:
 Customer:
 Quote#:

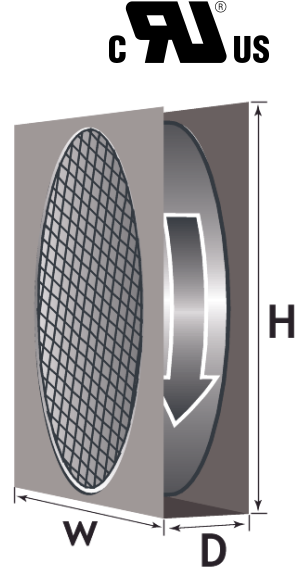
HX1 - WINTER ❄️
 Total Energy Recovery Wheel

Rotary AIR-TO-AIR

TOTAL ENERGY RECOVERY WHEEL

*Rated in accordance with ASHRAE Standard 84-2013
 Application Rating is outside of the scope of AHRI ERV Certification Program,
 but is rated in accordance with AHRI Standard 1060.*

Wheel Model: **I4-MS3A-48-09**
 Face area (sq.ft): **6.00**
 Motor power (hp): **N.A.**
Dimensions (in):
 Depth (D): **17**
 Width (W): **52**
 Height (H): **52**
 Weight (lb): **271**
 Wheel speed (RPM): **18.00**
 Pressure Differential SP2-SP3 (in wg): **1.05**
 Purge airflow (): **0**
 Purge angle (deg): **0**
 Face velocity of supply air (ft/min): **430**
 Face velocity of return air (ft/min): **430**
 Frost control system required: **YES**
 Altitude (ft): **0**



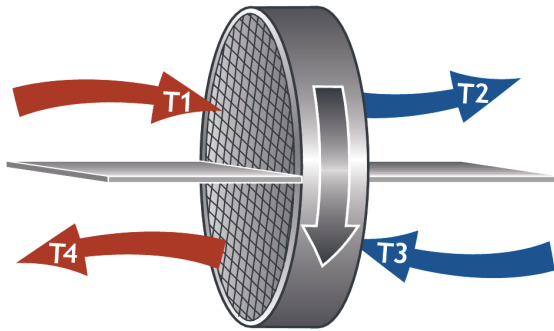
Performance		
	Effectiveness	Capacity (Btu/hr)
Sensible	76.9 %	172782
Latent	76.0 %	34934
Total	76.7 %	207716

Entering supply air T1

-0.6 Btu/lb
 2700 CFM
 -5 DB °F
 -5 WB °F
 4.2 gr/lb
 100 RH %

Leaving supply air T2

16.6 Btu/lb
 2700 CFM
 54.2 DB °F
 43 WB °F
 23.2 gr/lb
 37 RH %
 0.45 in wg



Leaving exhaust air T4

4.6 Btu/lb
 2700 CFM
 12.7 DB °F
 12.6 WB °F
 10.2 gr/lb
 97 RH %
 0.53 in wg

Entering exhaust air T3

21.8 Btu/lb
 2700 CFM
 72 DB °F
 52.9 WB °F
 29.2 gr/lb
 25 RH %

Project:
 Unit tag:
 Customer:
 Quote#:

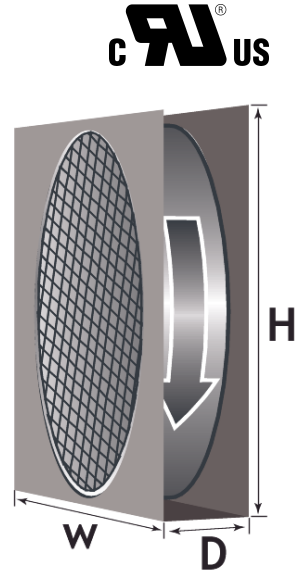
HX1 - WINTER ❄️ FROST CONTROL
 Total Energy Recovery Wheel

Rotary AIR-TO-AIR

TOTAL ENERGY RECOVERY WHEEL

*Rated in accordance with ASHRAE Standard 84-2013
 Application Rating is outside of the scope of AHRI ERV Certification Program,
 but is rated in accordance with AHRI Standard 1060.*

Wheel Model: **I4-MS3A-48-09**
 Face area (sq.ft): **6.00**
 Motor power (hp): **N.A.**
Dimensions (in):
 Depth (D): **17**
 Width (W): **52**
 Height (H): **52**
 Weight (lb): **271**
 Wheel speed (RPM): **0.87**
 Pressure Differential SP2-SP3 (in wg): **1.05**
 Purge airflow (): **0**
 Purge angle (deg): **0**
 Face velocity of supply air (ft/min): **430**
 Face velocity of return air (ft/min): **430**
 Frost control system required: **NO**
 Altitude (ft): **0**



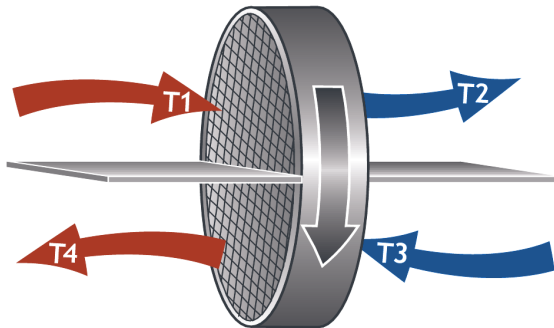
Performance	Effectiveness	Capacity (Btu/hr)
Sensible	44.2 %	99151
Latent	24.0 %	11031
Total	40.6 %	110181

Entering supply air T1

-0.6 Btu/lb
 2700 CFM
 -5 DB °F
 -5 WB °F
 4.2 gr/lb
 100 RH %

Leaving supply air T2

8.5 Btu/lb
 2700 CFM
 29 DB °F
 23.9 WB °F
 10.2 gr/lb
 44 RH %
 0.45 in wg

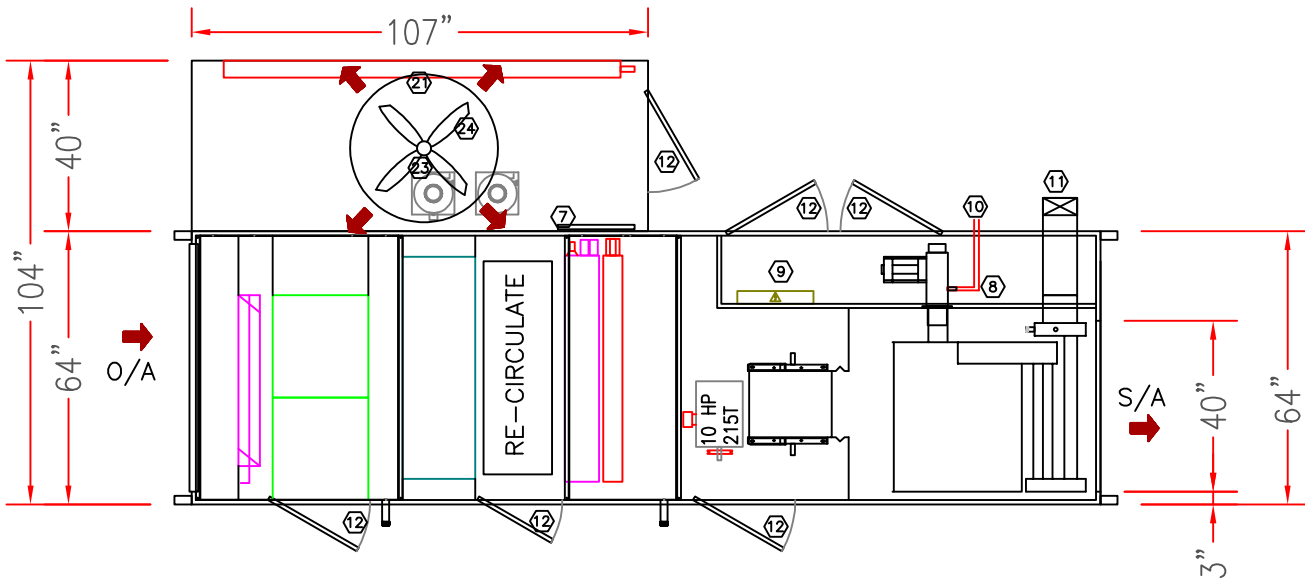
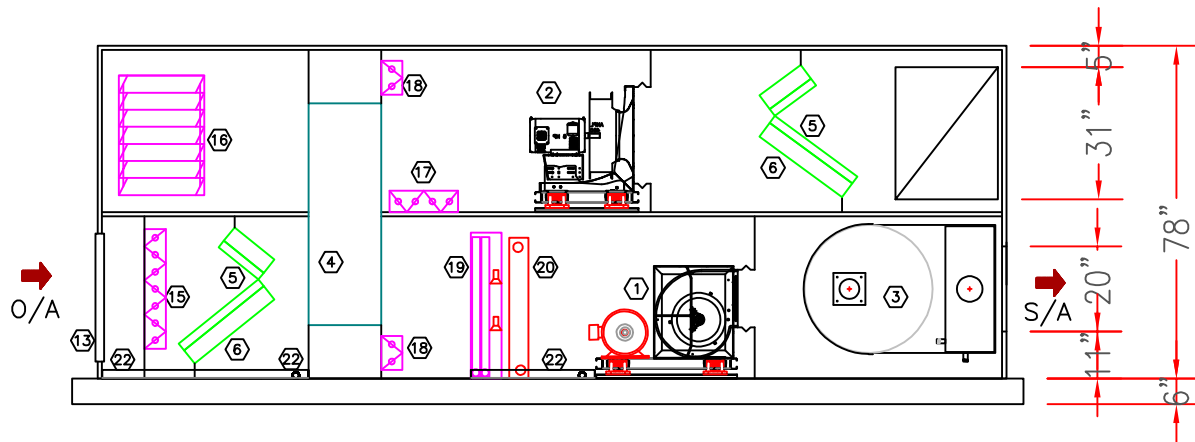
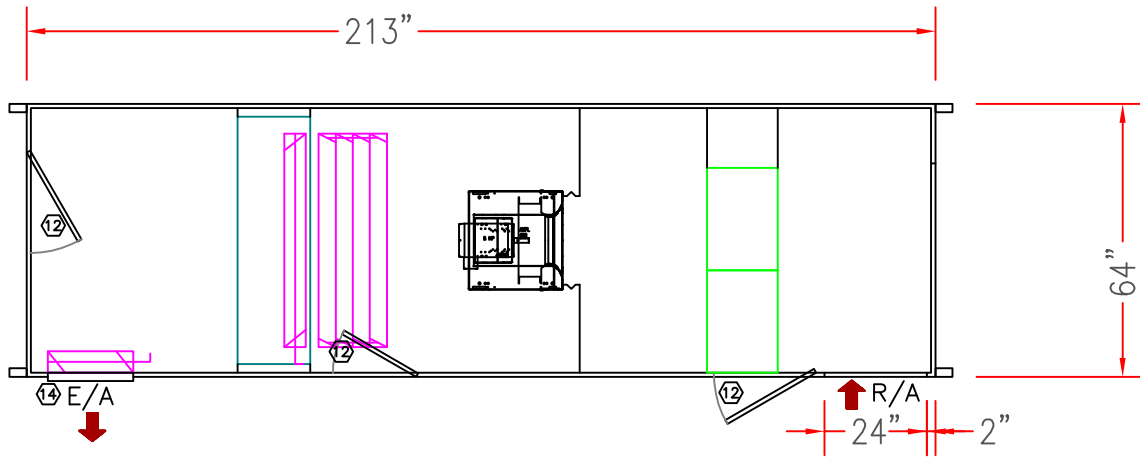


Leaving exhaust air T4

12.7 Btu/lb
 2700 CFM
 38 DB °F
 34.3 WB °F
 23.2 gr/lb
 69 RH %
 0.53 in wg

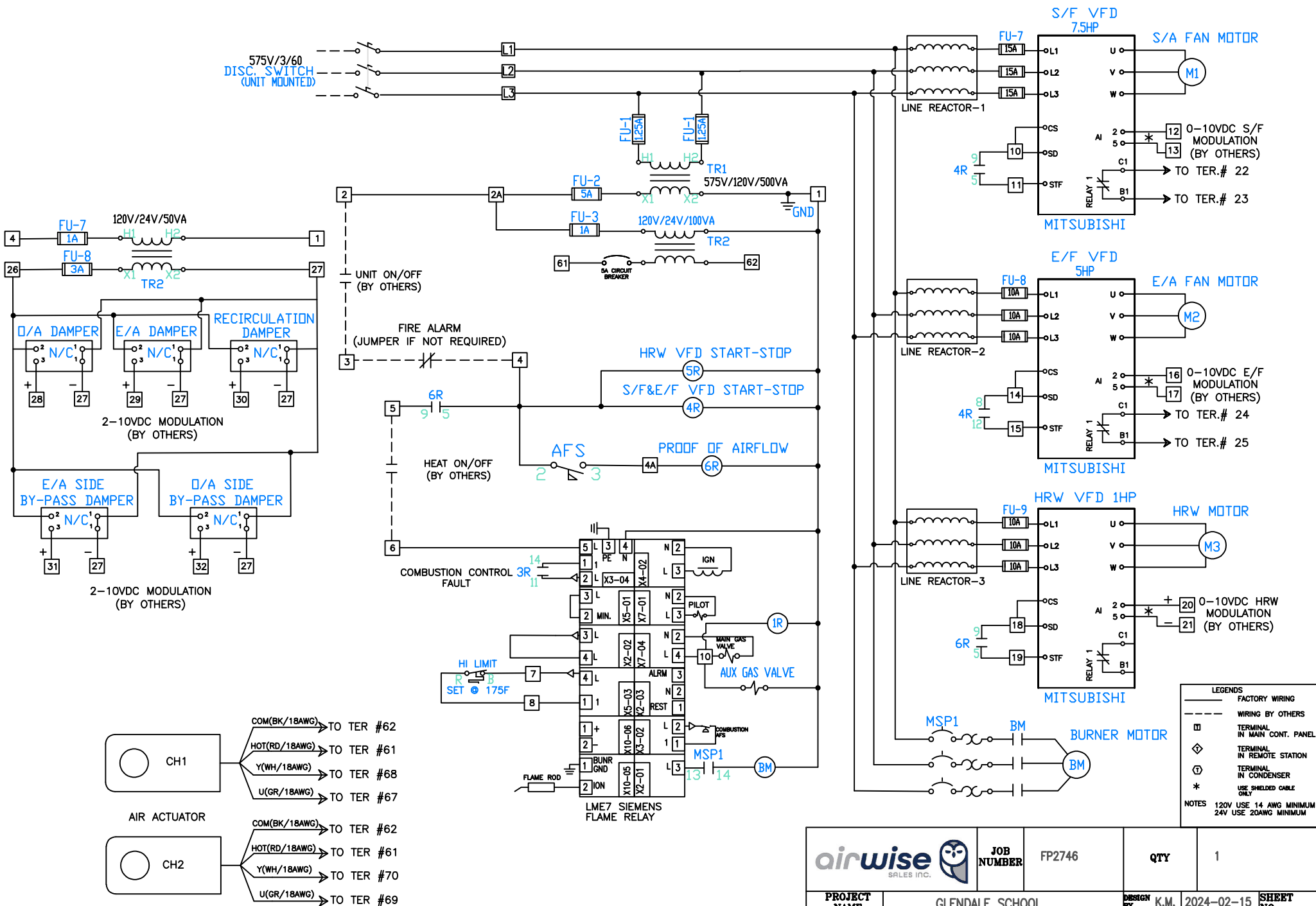
Entering exhaust air T3

21.8 Btu/lb
 2700 CFM
 72 DB °F
 52.9 WB °F
 29.2 gr/lb
 25 RH %



- ① S/A FAN & MOTOR ASS'Y
- ② E/A FAN & MOTOR ASS'Y
- ③ S.S. HEAT EXCHANGER
- ④ HEAT RECOVERY WHEEL
- ⑤ 2" MERV8 FILTERS
- ⑥ 4" MERV13 FILTERS
- ⑦ REMOVABLE ACCESS PANEL
- ⑧ GAS & ELECTRICAL VESTIBULE
- ⑨ ELECTRICAL PANEL
- ⑩ GAS CONNECTION
- ⑪ OUTDOOR CHIMNEY
- ⑫ ACCESS DOOR
- ⑬ O/A LOUVER C/W BIRD SCREEN
- ⑭ E/A LOUVER C/W BIRD SCREEN
- ⑮ O/A DAMPERS C/W ACTUATOR
- ⑯ RE-CIRCULATE DAMPERS C/W ACTUATOR
- ⑰ BY-PASS DAMPERS C/W ACTUATOR
- ⑱ DX COIL
- ⑲ HGR COIL
- ⑳ CONDENSER COIL
- ㉑ COMPRESSOR
- ㉒ CONDENSER FAN

		JOB NUMBER	FP2746	HANDLING	ACCESS AS SHOWN
		TOTAL UNIT WEIGHT	8,000 LBS	NO. REQ'D	1
PROJECT NAME	GLENADLE SCHOOL			DESIGN BY	C.Z. 2024-01-25
MODEL NO.	TBI-350/HRW/D19/HGR			CHK BY	S.A. 2024-01-25
UNIT TAG	RTU-1			SCALE	SIZE
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					REV 0

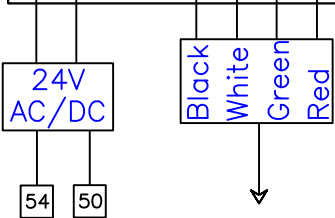
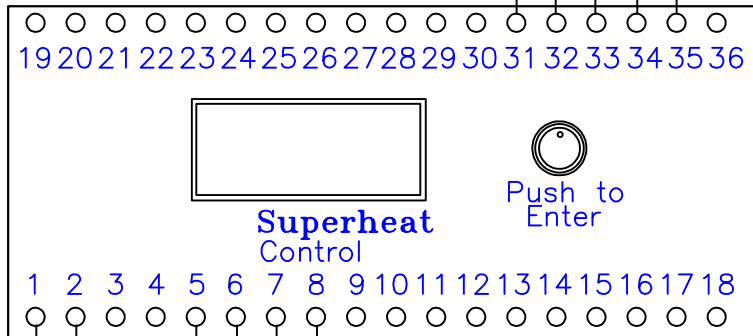
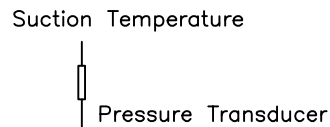
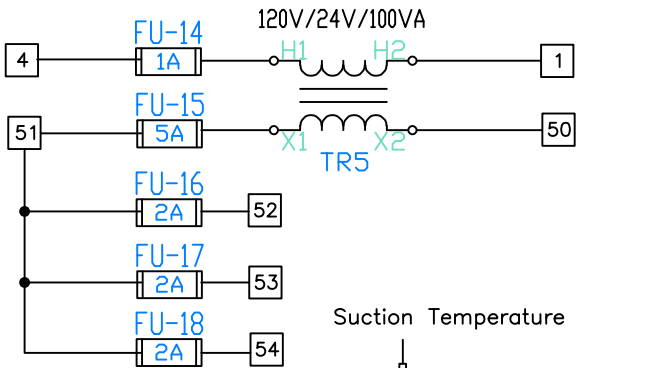


- LEGENDS**
- FACTORY WIRING
 - WIRING BY OTHERS
 - TERMINAL IN MAIN CONT. PANEL
 - ◇ TERMINAL IN REMOTE STATION
 - Ⓢ TERMINAL IN CONDENSER
 - * USE SHIELDED CABLE ONLY
- NOTES
 120V USE 14 AWG MINIMUM
 24V USE 20AWG MINIMUM

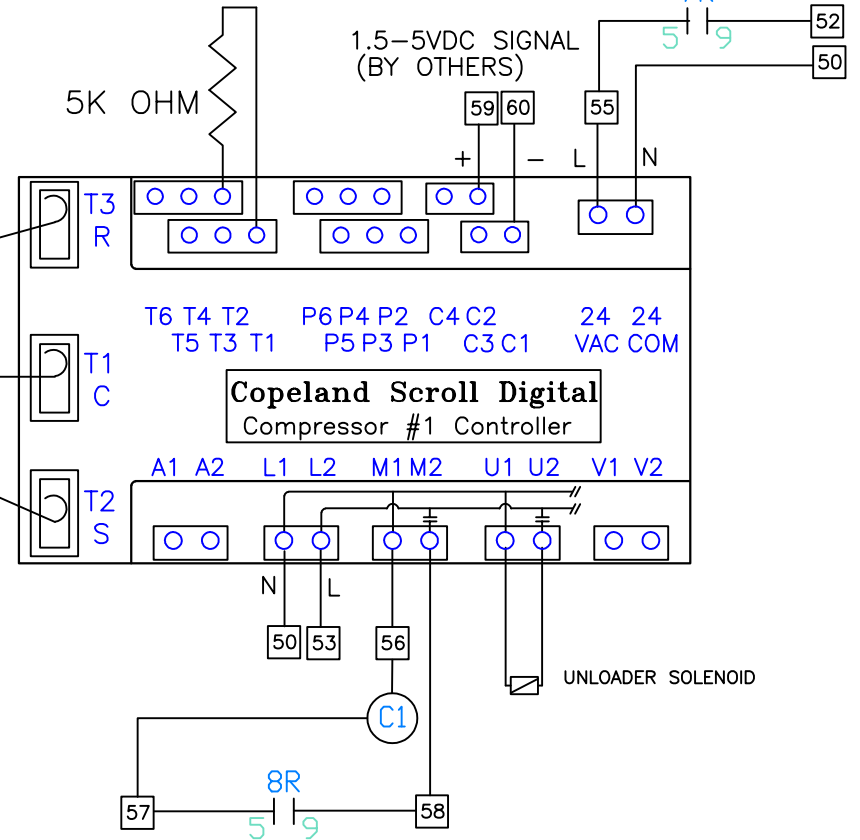
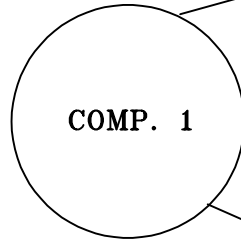
airwise SALES INC.		JOB NUMBER FP2746	QTY 1
PROJECT NAME GLENDALE SCHOOL	DESIGN BY K.M.	DATE 2024-02-15	SHEET NO. 01 OF 05
MODEL NO. TBI-350/HRW/D19/HGR	CHK BY S.A.	DATE 2024-02-28	
UNIT TAG RTU-1	SCALE NTS	SIZE A	
DRAWING NO. E-FP2746-RTU-1			REV 0

REV	DESIGNER	DATE	DESCRIPTION

STAGE 1
COOLING ENABLE



Electric Expansion Valve



LEGENDS

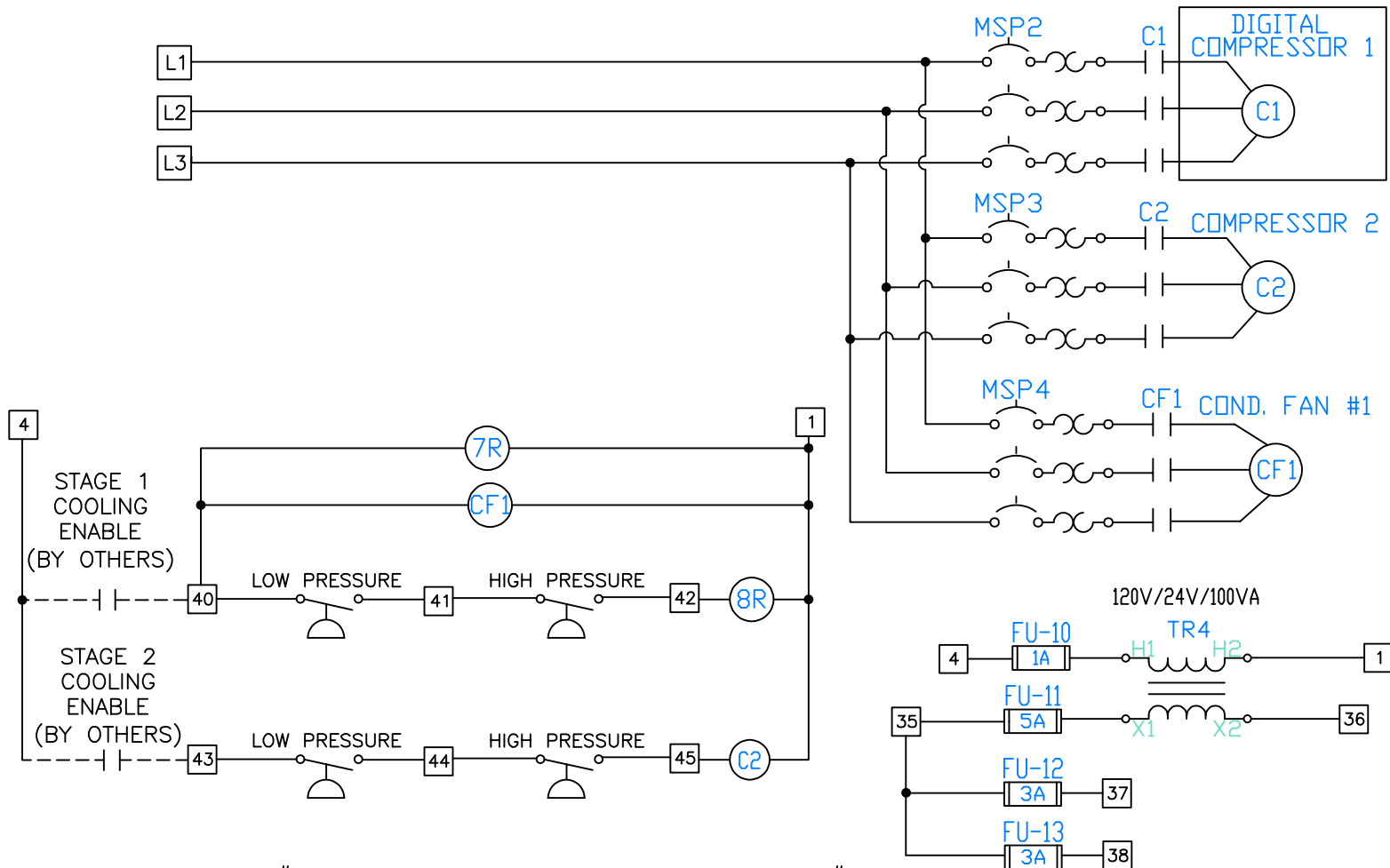
- FACTORY WIRING
- - - - - WIRING BY OTHERS
- TERMINAL IN MAIN CONT. PANEL
- ◇ TERMINAL IN REMOTE STATION
- ⊕ TERMINAL IN CONDENSER
- * USE SHIELDED CABLE ONLY

NOTES 120V USE 14 AWG MINIMUM
24V USE 20AWG MINIMUM

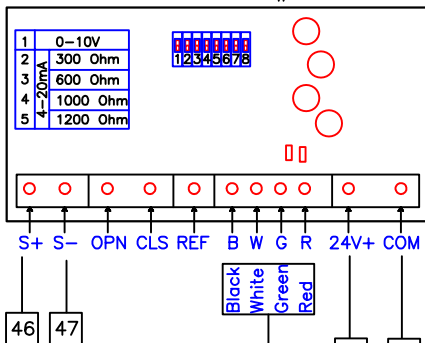
airwise SALES INC.		JOB NUMBER FP2746	QTY 1
PROJECT NAME GLENDALE SCHOOL	DESIGN BY K.M.	DATE 2024-02-15	SHEET NO. 03 OF 05
MODEL NO. TBI-350/HRW/D19/HGR	CHK BY S.A.	DATE 2024-02-27	
UNIT TAG RTU-1	SCALE NTS	SIZE A	
DRAWING NO. E-FP2746-RTU-1			REV 0

REV	DESIGNER	DATE	DESCRIPTION

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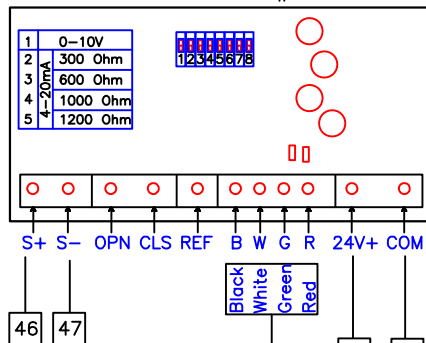


Interface Board #1



0-10VDC MODULATION (BY OTHERS) TO RE-HEAT VALVE 1 (CIRCUIT #1)

Interface Board #2



0-10VDC MODULATION (BY OTHERS) TO RE-HEAT VALVE 2 (CIRCUIT #2)

LEGENDS

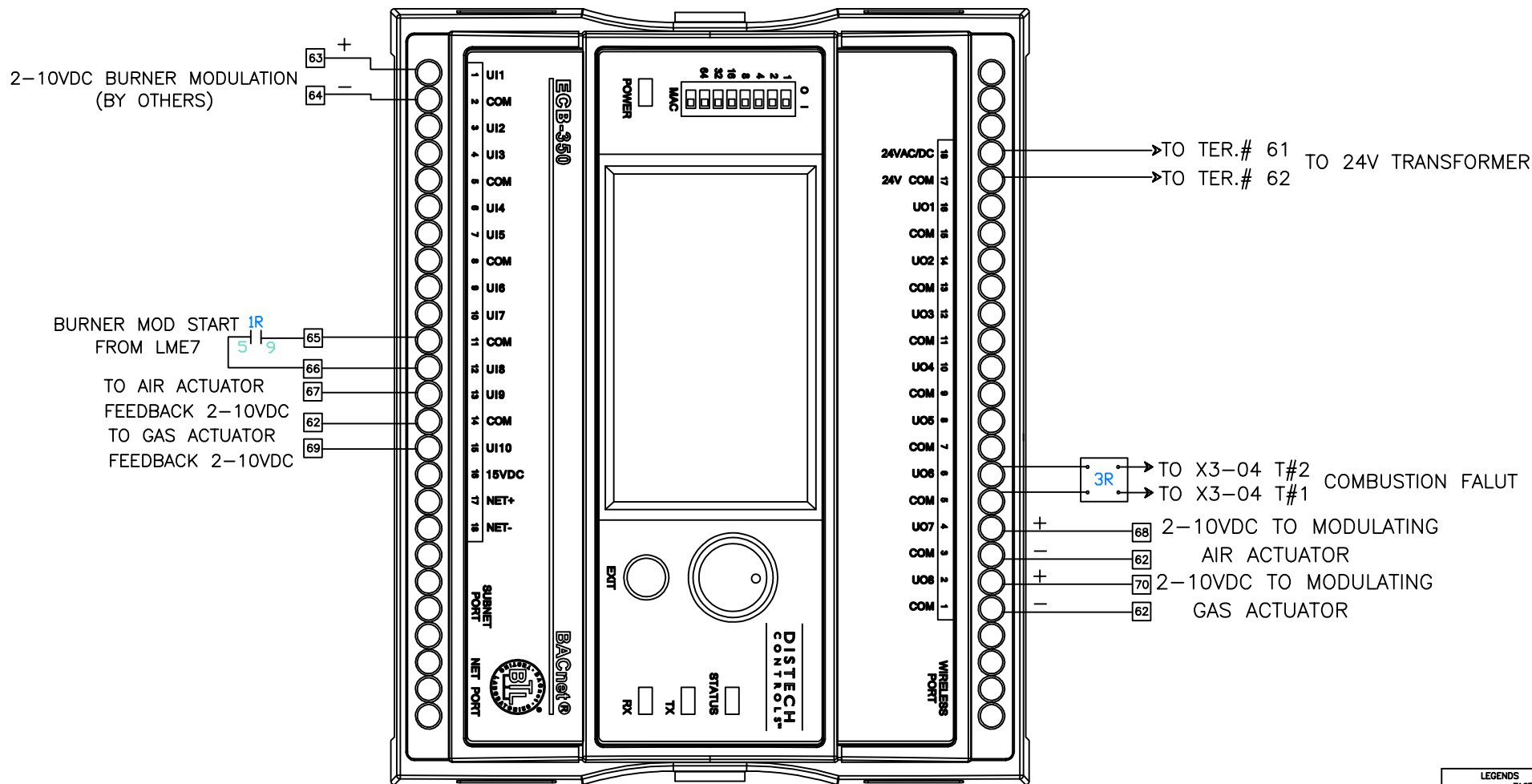
- FACTORY WIRING
- WIRING BY OTHERS
- Terminal in main cont. panel
- Terminal in remote station
- Terminal in condenser
- USE SHIELDED CABLE ONLY

NOTES: 120V USE 14 AWG MINIMUM, 24V USE 20AWG MINIMUM

airwise SALES INC.		JOB NUMBER	FP2746	QTY	1
PROJECT NAME	GLENDALE SCHOOL		DESIGN BY	K.M.	2024-02-15
MODEL NO.	TBI-350/HRW/D19/HGR		CHK BY	S.A.	2024-02-27
UNIT TAG	RTU-1		SCALE	NTS	SIZE A
DRAWING NO. E-FP2746-RTU-1			REV		0

REV	DESIGNER	DATE	DESCRIPTION

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CAUTION: DO NOT TIGHTEN TERMINALS BEYOND 0.4 N m (3.5 IN LBF) TORQUE!

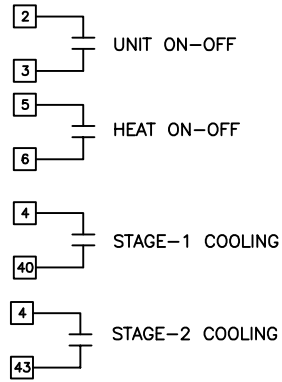
ECB-350 FOR COMBUSTION CONTROL ONLY

LEGENDS	
---	FACTORY WIRING
- - -	WIRING BY OTHERS
□	TERMINAL IN MAIN CONT. PANEL
◇	TERMINAL IN REMOTE STATION
⊕	TERMINAL IN CONDENSER
*	USE SHIELDED CABLE ONLY
NOTES 120V USE 14 AWG MINIMUM 24V USE 20AWG MINIMUM	

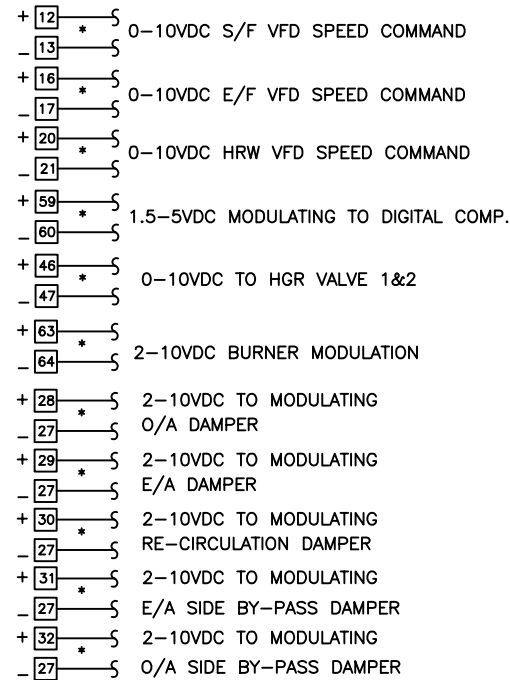
airwise SALES INC.		JOB NUMBER FP2746	QTY 1
PROJECT NAME GLENDALE SCHOOL	DESIGN BY K.M.	2024-02-15	SHEET NO. 04 OF 05
MODEL NO. TBI-350/HRW/D19/HGR	CHK BY S.A.	2024-02-27	
UNIT TAG RTU-1	SCALE NTS	SIZE A	
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REV	DESIGNER	DATE	REV 0

REV	DESIGNER	DATE	DESCRIPTION

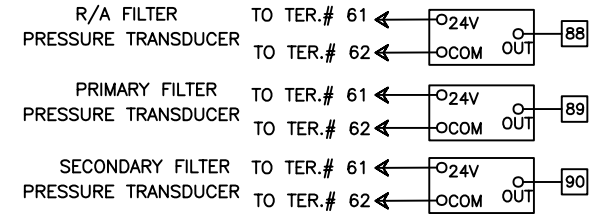
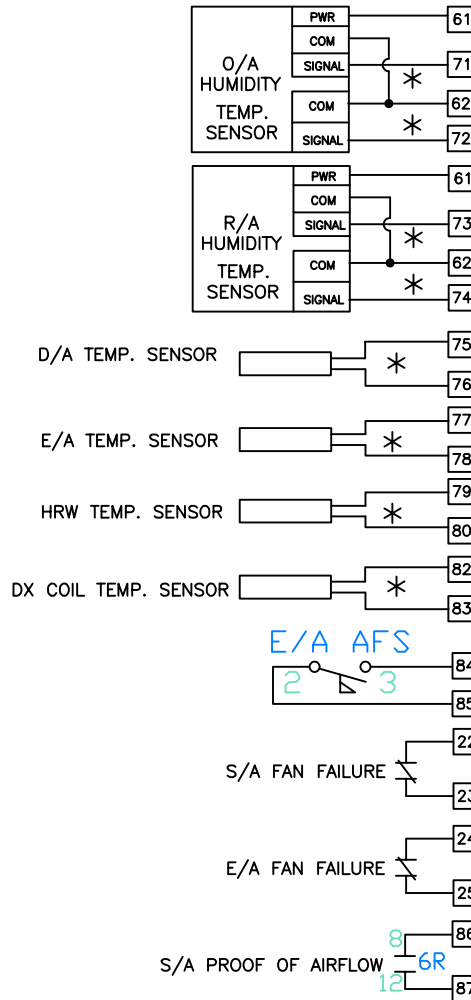
PLC DIGITAL OUTPUTS (120VAC)



PLC ANALOG OUTPUTS



PLC INPUTS



LEGENDS	
— — —	FACTORY WIRING
— — —	WIRING BY OTHERS
□	TERMINAL IN MAIN CONT. PANEL
◇	TERMINAL IN REMOTE STATION
⊕	TERMINAL IN CONDENSER
*	USE SHIELDED CABLE ONLY
NOTES 120V USE 14 AWG MINIMUM 24V USE 20AWG MINIMUM	

airwise SALES INC.		JOB NUMBER FP2746	QTY 1
PROJECT NAME GLENDALE SCHOOL	DESIGN BY K.M.	DATE 2024-02-15	SHEET NO. 05 OF 05
MODEL NO. TBI-350/HRW/D19/HGR	CHK BY S.A.	DATE 2024-02-27	
UNIT TAG RTU-1	SCALE NTS	SIZE A	
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REV	DESIGNER	DATE	DESCRIPTION