HIBSER YAMAUCHI Architects, Inc.

"LA" Building HVAC Upgrades System Description

Background:

Existing heating and cooling for the "LA" (Language Arts) Building installed in 2019 is provided by cassette style VRF systems. Each classroom has a ceiling mounted cassette fan coil unit that supplies individually controlled hot and cold air for thermal comfort. The cassettes are interconnected with roof top equipment which provided dedicated and filtered outdoor air, as well as to rooftop mounted condensing units for cooling and are connected to gas fired boilers for heating. The air handling system installed in 2007 was a modification to the previous rooftop unit and is now nearing the end of its useful life span. The district desires that the HVAC system be disconnected with the boilers and provide heating and cooling directly from the electrically powered rooftop heat pump equipment. The district also desires the new system to be connected to the site wide EMS system (which it is not currently).

Design Criteria:

Design Criteria were established primarily via District Facilities Review of the existing conditions report and assessment prepared by Capital Engineering (06/05/24) as well as the Schematic Design Review Meeting with District Facilities and Maintenance Staff (9/11/24) by for the project are as follows:

1. Design Degree Temperatures for heating shall be based on 72 degrees supply air provided and based on 30 degrees outside air.
2. Design Degree Temperatures for cooling shall be based on 72 degrees supply air provided and based on 95 degrees outside air.
3. The HVAC system shall be converted to all electric power basis (requires decoupling of the existing heating hot water piping from the gas fired boilers).
4. Existing boilers will remain as they also provide heating hot water for the AD building, however the existing piping coils will be decommissioned and the coils removed (piping capped outside of the airstream).
5. Coordination with Syserco for complete integration with campus wide EMS system as well as for integration with the existing classroom cassettes is required.
6. Heating recovery is required by code and will be provided via integrated coils on the rooftop air handling units. These coils do not require pumps or special maintenance and are approximately 12x more efficient than air to air heat exchange.
7. The existing air handling equipment will be completely replaced (rather than retrofit) as the anticipated remaining lifespan of the equipment is approximately 5 years or less.
8. Provide re-heat for defrost mode (anticipated maximum defrost time of approximately 10 minutes per unit when temperatures fall below 40 degrees).
9. Provide protection on Supply Air Intake from wind driven rain (Hood).

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Oakland Davis

10. Provide R13 filtration via 4" deep air filter. Ensure access to air filters is readily avialable on equipment layout.
11. Maintain existing rooftop openings.

Mechanical Systems Upgrades (see also Mechanical SD Memo – Capital Engineering 9/20/24):

HVAC System

1. Provide new dedicated outdoor air supply unit (DOAS) at existing location on LA Building roof.
2. Provide 1 new condensing unit to the existing 3-unit array at rooftop equipment Condensing Unit (CU4).
3. Re-pipe refrigerant lines between all condensing units (1-4) and DOAS to facilitate sequential defrost of condensing units (rather than simultaneous).
4. Air handling equipment will be placed on the existing footprint via manufactured 16" curb to provide continuous support to the individual components.
5. Provide 70kw strip heater (480v) to fully offset reduced heating capacity of heat pumps during defrost mode.
6. Existing System is R410A refrigerant and new equipment will be designed for R410A. This equipment is expected to be available through December of 2025 and the district may need to facilitate early procurement of the air handling equipment to ensure this is achievable. Currently lead times are 16 weeks minimum.
7. Based on analysis of heating and cooling design parameters, existing condensing Units 1-3 are of adequate capacity and are in good conditions, therefore replacement is not recommended at this time.

HVAC Controls

1. Existing Daikin controls shall be modified to support heating mode as well as cooling mode.
2. Controls will provide sequential defrost of condensing units rather than simultaneous.
3. Controls sequence will engage the strip heater to fully offset the reduced heating capacity during defrost.
4. Extend existing site wide Allerton controls to connect to Daikin iTouch interface (all new cabling and new controllers).
5. DOAS controls to be incorporated and reviewed with Syserco representative during DD or CD phase.

Architectural/Structural (see also Schematic Structural Design Memo – ZFA Structural Engineers 09/23/-24):

The mechanical system is designed to perform based on the existing envelope which is comprised of uninsulated concrete walls, single pane glazing, and built-up roof, over 1" rigid insulation, over 3" concrete slab. A memo noting the deterioration of the existing built-up roof system was provided during schematic design investigations. The design team understands that the district will be performing a

complete re-roof of the "LA" Building over the summer of 2025. The design will incorporate flashing and cricketing detailing in conjunction with design documents for the re-roof provided the system information is provided to the team by the conclusion of the DD phase.

For the most part the new equipment is lighter than the existing equipment that will be replaced. The footprint of the new equipment is slightly longer and narrower than the existing equipment which is to be removed. The design team anticipates localized structural strengthening in the form of additional beams within the roof system. Due to the existing concrete topping slap on the roof, structural strengthening will likely need to be provided via access from below. See attached RCP noting the likely areas of impact for roof access.

Electrical:

All proposed mechanical equipment upgrades can be fed from the existing 400 amp 277/480V service.

The existing and new condensing units and the new strip heater can be fed from the existing roof top electrical panel.

The 2 existing air handling are currently fed from existing 120/280V Panel DBL-D in the basement. The new air handling units may be connected to the existing power from Panel DBL-D via existing feeders. The existing breakers may need to be replaced to support the new air handling units (to be confirmed during Design Development). The loads on the new units are smaller than the existing ones, so there will not be an adverse impact on the panel loads.

Commissiong:

While not mandatory, complete independent recommissioning of the entire system is recommended to ensure start-up, maintenance training, and system performance before turn-over.

Additional Coordination:

1. Coordinate with district re-roofing project by others. Detailing will be provided for flashing and roofing adjustments based on design information to be provided by the district. Design information is required by conclusion of DD phase for inclusion.

2. Control locations and pathways to be verified with existing conditions and sequence of operations as well as control points to be confirmed via coordination meeting with Maintenance and Syserco.

Project Schedule:

Design Development	10/25/24

DSA Submittal	12/13/24
DSA Review & Approval	4/4/25 (anticipated)
Bidding & Contracts	6/4/25
Construction	6/13/25 – 8/1/25

Attached:

- Capital Engineering memo dated 9/20/24
- ZFA Structural Engineers memo dated 9/23/24
- Marked up roof and third floor reflected ceiling plan dated 9/27/24
- Equipment cut sheets

9/20/24

Vicky Leung
HY Architects

San Rafael City Schools, San Rafael HS, LA Building, SD-240920 package

DESIGN TEMPERATURES

Winter

Supply temperature 72 degrees @ outside temperature of 30 degrees

Summer

Supply temperature 72 degrees @ outside temperature of 95 degrees

REMOVAL OF HOT WATER REHEAT COILS

100 floor: Exposed coils mounted in ductwork located in mechanical space between rooms and exterior wall. Total of 7 coils.

200 floor: Coils above Corridor T-bar ceiling. Total of 16 coils.

300 floor: Coils above Corridor T-bar ceiling. Total of 18 coils.

REPLACEMENT HVAC EQUIPMENT

As illustrated in the attached roof plan the new equipment is narrower and in the case of the return air handler is much smaller. The supply air handler is longer and will require extending the platform to support it. As the air handlers are made of multiple sections continuous support is necessary. To facilitate the support, a manufactured curb of 16 inches high is included. This will make the installed air handlers approximately 6 inches taller than the existing.

Current selection shows manufacture provided rain hoods.

4 inch thick MERV-13 filters are shown on roof plan for both supply and return systems.

There is an existing roof drain to the left of the supply air handler. We calculate there should be about 3 feet between the new air handler and the drain.

The new heatpump outdoor section has the same footprint as the existing and should fit that location.

All of the existing refrigerant piping of the DOAS system will be replaced.

R410A REFRIGERANT PHASEOUT

The existing systems are all R410A refrigerant. This refrigerant is being phased out, and although available for service and repair of existing equipment for the foreseeable future, will not be available in new equipment sold after January 12026.

HVAC CONTROLS

The existing Daikin controls shall be modified to support heating mode as well as cooling. Control sequence to allow only one of the outdoor sections to defrost at a time. During design conditions of 30 degrees outdoor air the new 70KW electric heat section shall engage to fully offset the systems reduced heating capacity during defrost.

Daikin controls to be modified to add a BACnet database. Addition of a site IT network connection to the controls will be required

Existing site Alerton controls shall be extended to connect via BACnet to the Daikin iTouch interface. This will allow monitoring of room conditions and relay of alarms to the Site EMS. Points to be mapped across as available and requested by the district.

Additional Alerton controls to be provided to perform the following:

DOAS and building system start stop via the iTouch interface

DOAS discharge air temperature sensing and 0-10v signal to Daikin controls for unit temperature control.

DOAS T24 required inlet and discharge damper control.

DOAS inlet and discharge temperature monitoring of heat recovery system on both the supply and return air handlers.

DOAS EQUIPMENT CURRENT SHIPPING

16 weeks.

Very Truly Yours,

Capital Engineering
Chuck Shinneman, P.E.

Reference: 09-16-24 Update

SAN RAFAEL HIGH SCHOOL LA BUILDING
SCHEMATIC STRUCTURAL DESIGN MEMO
September 23, 2024

PROJECT SUMMARY

The project consists of modifying some of the mechanical units on the upper roof of the existing LA Building at San Rafael High School. The building is a three-level structure built in the mid-1960s. There is a daylighting basement at the ground floor, a first floor that sits partially over the basement and partially on grade, and a second floor only over the portion with no basement. The as-built structural plans, dated 1964, indicate that the roof and floors are framed with proprietary steel joists with a 3" concrete slab above. Perimeter walls are concrete, and interior supports are concrete-encased steel wide flange columns. Foundations are deepened continuous and pad footings.

PROPOSED CHANGES

Existing mechanical units at the high roof are being replaced. Information on existing and proposed units was provided by HY. Units of structural concern that are being replaced include:

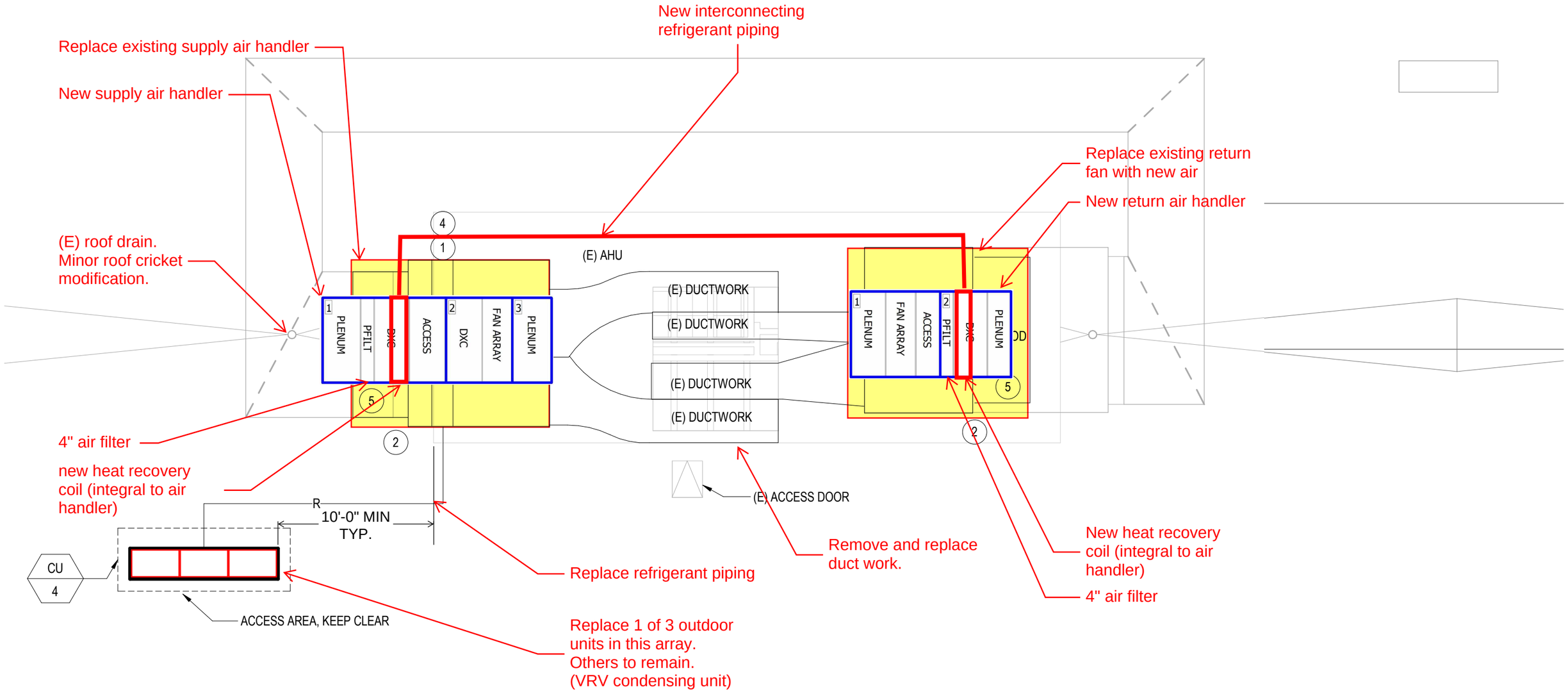
Unit	Existing Dims	Existing Weight	New Dims	New Weight
Condensing Unit (VRV)	50"x31"x67"	1971#	48"x30"x65"	2179#
Return Air Handling	142"x210"x??	7,760#	162"x94"x84"	4,300#
Supply Air Handling	142"x121"x??	6,475#	226"x94"x84"	5,913#

Each unit will sit on a 16"-tall curb. No new openings will be added in the roof framing. The exact locations and support conditions for these units, both existing and new, is not currently fully known. Understanding these conditions and how to provide support to new units will be the structural design objective for the project.

STRUCTURAL IMPLICATIONS

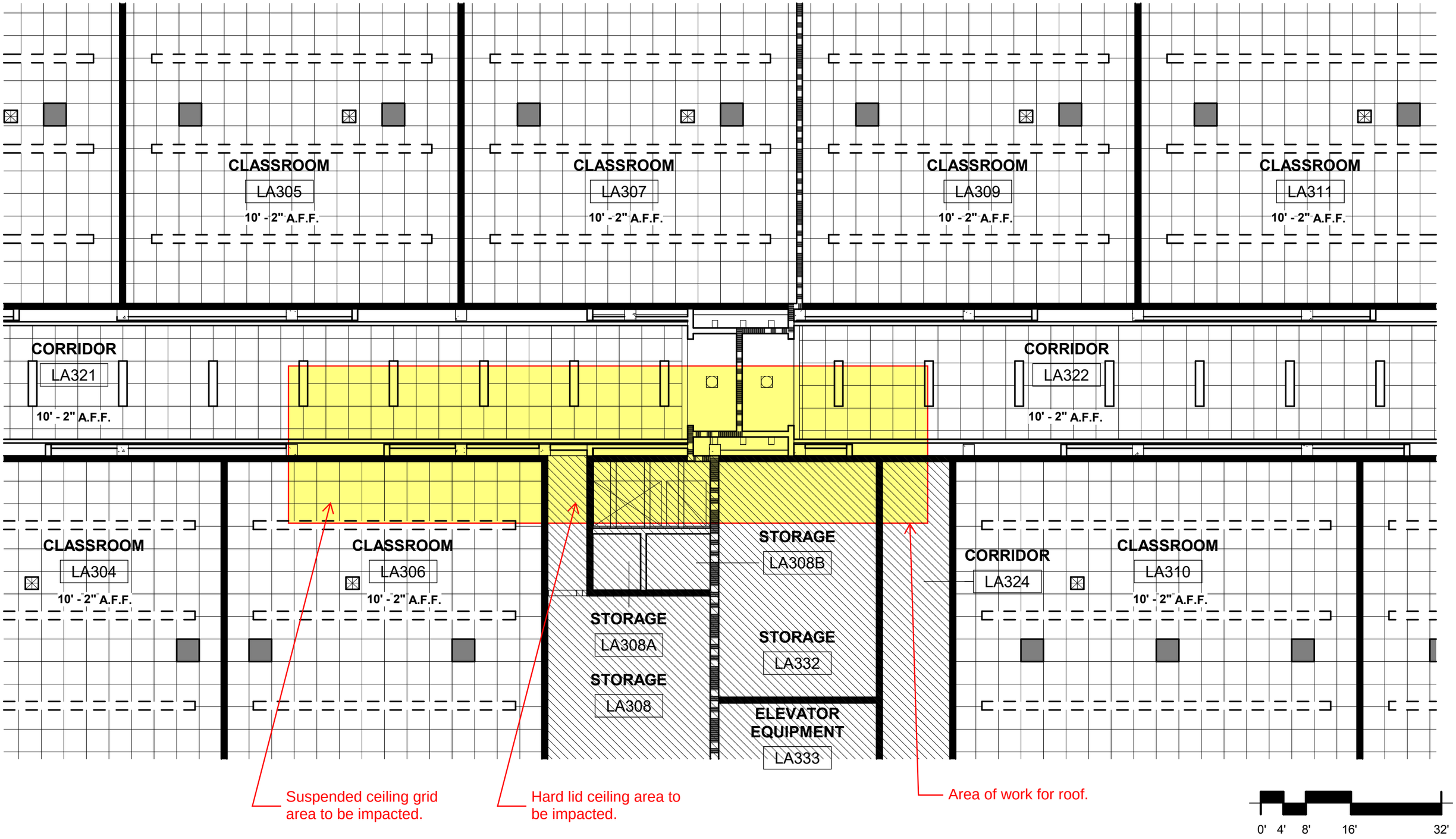
Based on the information provided, the structural implications to the existing building will likely be as follows:

- At return/supply air handling units: provide infill or strengthened roof framing to support and anchor new unit as needed.
- At condensing units: justify existing framing for support/anchorage of new units or provide additional framing to support new units as needed.
- Assume that access to install new framing will be from below to maintain the 3" concrete roof slab.
- Calculations to justify proprietary steel joists may not be feasible; additional framing may be needed to support new units where existing framing cannot be easily calculated or augmented.
- No impact to the existing framing below roof trusses (e.g. walls, columns, foundations) is expected.
- No impact to the existing lateral force-resisting system of the building is expected.



ROOF PLAN

09/27/24



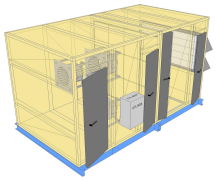
RCP - 3RD FLOOR

09/27/24

Equipment Cut Sheet:

Air Handling Unit – Return

Job Information	Technical Data Sheet
Job Name	San Rafael HS - LA (Liberal Arts) Building
Date	September 23 2024
Submitted By	DH
Software Version	13.43
Unit Tag	AHU Return



Unit Overview

Model Number	Supply					
	Air Volume cfm	Static Pressure		External Dimensions		
		External inWc	Total inWc	Height in	Width in	Length in
OAH039GVCM	17750	1.50	2.89	84*	86*	162

**Not including base rails, coil connectors, drain connectors, vestibule sections, control boxes and hoods.*

Unit

Model Number:	OAH039GVCM		
Approval:	ETL Listed / ETL Listed to Canadian Safety Standards (ETL Label / ETLc Label)		
Outer Panel:	Painted 24 gauge G60 Galvanized Steel		
Liner:	24 gauge Galvanized Steel (unless noted per section)		
Insulation:	R-13 Injected Foam		
Unit Configuration:	Inline horizontal	**Drive (Handling) Location:**	Right
Base:	Curb ready	**Wall Thickness:**	2 in
Roof Curb Kit:	16 in	**Altitude:**	0 ft
Parts Warranty:	Standard One Year		

Plenum Section	Component: 1	Length: 36 in	Shipping Section: 1

Opening Location	Opening Size	Air Pressure Drop
End center	32.00" x 82.00"	0.06 inWc

Door

Location	Width	Opening
Drive side	28 in	Outward

Supply Fan Array

Component: 2 | Length: 30 in | Shipping Section: 1

Fan Performance

Air Volume*	Static Pressure			Fan Energy Index(FEI)	Total Input Power	Fan Shaft Power*	Speed		Redundancy(N-1)	Fan Circuit	
	External	Total	Cabinet				Operating	Maximum		MOP	MCA
5917 cfm	1.50 inWc	2.89 inWc	0.00 inWc	1.18	11.8 kW	4.65 BHP	2391 rpm	2600 rpm	81.9 %	60.0 A	51.4 A

Fan Data

Fan Type	Blade Type / Class	Quantity of Fans	Wheel Diameter	Number of Blades	Discharge	Motor Location
ECM / 2x2 : 3	Airfoil / N/A	3	17.71 in	5	Axial	Behind Fan

Motor Data

Power*	Electrical Supply	Speed	Control Signal	Full Load Current*
6.6 HP	200/60/3 V/Hz/Phase	2600 rpm	0-10V	15.80 A

Fan Options

Isolator Type:	Rigid

Control Data

Selection Type:	Integrated Drive	**Vendor:**	Daikin Applied
Auxiliary Control:	Disconnect w/ motor starter	**Voltage:**	200 V
Disconnect Type:	Fused	**Height x Width x Depth:**	23.60 in x 15.75 in x 10.76 in
Mounting:	Drive Side	**Enclosure:**	NEMA 3R
Control box:	No controls, unit mounted power box, drive side		

Panel

Location	Width	Opening
Removable panels	- in	Outward

Notes

** after a unit label denotes the data for an individual fan.*

Due to multi-sourcing of ECM fans, motor nameplate electrical data values MOP, MCA and Full Load Current may be equal to or less than presented.

Due to multi-sourcing of ECM fans, motor nameplate Power may be greater than presented.

Access Section

Component: 3 | Length: 24 in | Shipping Section: 1

Air Pressure Drop

0.00 inWc

Door

Location	Width	Opening
Drive side	20 in	Outward

Panel Filter

Component: 4 | Length: 14 in | Shipping Section: 2

Type	Efficiency	Face Velocity	Face Area	Air Volume	Filter Loading
Pre Pleat	MERV 13	470 ft/min	37.7 ft²	17750 cfm	Side

Air Pressure Drop				Number of Filters	Height	Width	Depth
Clean Air	Mean Air	Dirty Air	User Spec				
0.21 inWc	0.61 inWc	1.00 inWc	N/A	12	24 in	20 in	4 in

Door

Location	Width	Opening
Drive side	10 in	Outward

Special Options

Sound Baffle	Filter Gauge
(As casing details)	Magnehelic 0-2"

Future Direct Expansion Coil

Component: 5 | Length: 34 in | Shipping Section: 2

Number of Coils	Number of Rows
2	10

Coil Air Pressure Drop	Finned Height	Finned Width	Face Area	Face Velocity
1.00 inWc	36 in	73 in	36.50 ft²	486 ft/min

Connection Location	Connection Material
Drive side	Carbon steel

Coil Model	Drain Pan	Drain Pan Side
Future Coil (Not Supplied)	Stainless steel	Opp drive side

Total Refrigerant Weight is the total for all circuits of all coils in this coil section and is estimated. Refer to the AHU and Condensing Unit IOMs for recommendations on system start-up.

Minimum allowable face velocity = 150 fpm

AHRI 410 Certification

Coil is NOT certified by AHRI

Plenum Section

Component: 6 | Length: 24 in | Shipping Section: 2

Air Pressure Drop

0.12 inWc

Custom Dampers

Custom Damper	Damper Type	Location	Size (Width x Height)		Material	Blade Action	Rainhood w/Screen
			Overall	Opening			
1	UltraSeal Low Leak	End	82 in x 40 in	72 in x 36 in	Galv. Steel	Parallel	Provided - Factory Installed

Door

Location	Width	Opening
Drive side	20 in	Outward

Special Options

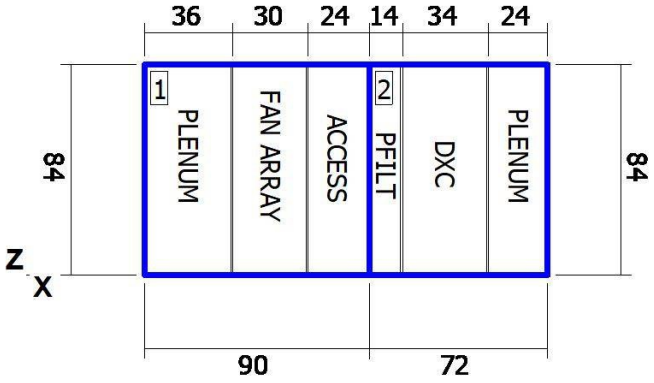
Tread Plate Floor Liner	Sound Baffle
Tread plate installed	(As casing details)

Unit Sound Power (dB)

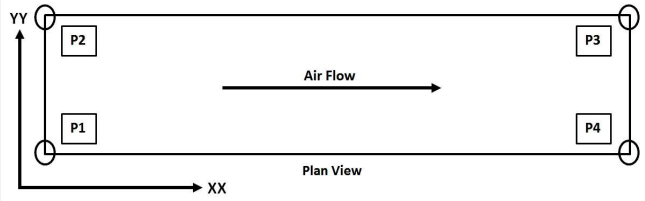
Type	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
Radiated:	76	79	85	75	75	63	52	51
Unit Discharge:	76	79	89	82	83	77	74	67
Unit Return:	79	84	90	85	79	78	81	78

Shipping Section Details

Section	Length in	Weight lb	Corner Weights (lb)				Center of Gravity (in)		
			P1	P2	P3	P4	XX	YY	ZZ
1	90	1916	477	459	481	499	46	42	42
2	72	1549	392	392	383	383	36	43	41
Entire Unit	**162**	**3465**	**869**	**851**	**864**	**882**	**82**	**43**	**41**
Roof Curb	**162**	**338**							



Elevation View



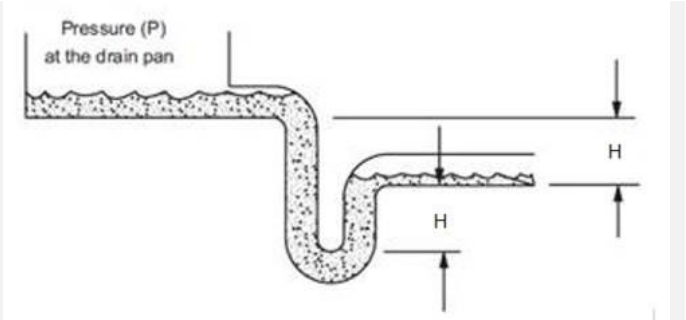
NOTE: Special components aren't included in the corner weights and center of gravity data.

Supply Static Pressure Drop

Component	Option	Static Pressure Drop
Plenum Section	Plenum Section	0.06 insWg
Supply Fan	Cabinet	
Access Section	Access Section	
Panel Filter	Panel Filter	0.21 insWg
DX Coil	DX Coil	1.00 insWg
Plenum Section	Plenum Section	0.12 insWg
External Static	External Static	1.50 insWg
Total Supply Fan Static		2.89 insWg

Minimum Recommended Drain Pan Trap Dimensions

Shipping Section	Component	H
2	DX Coil	2.74



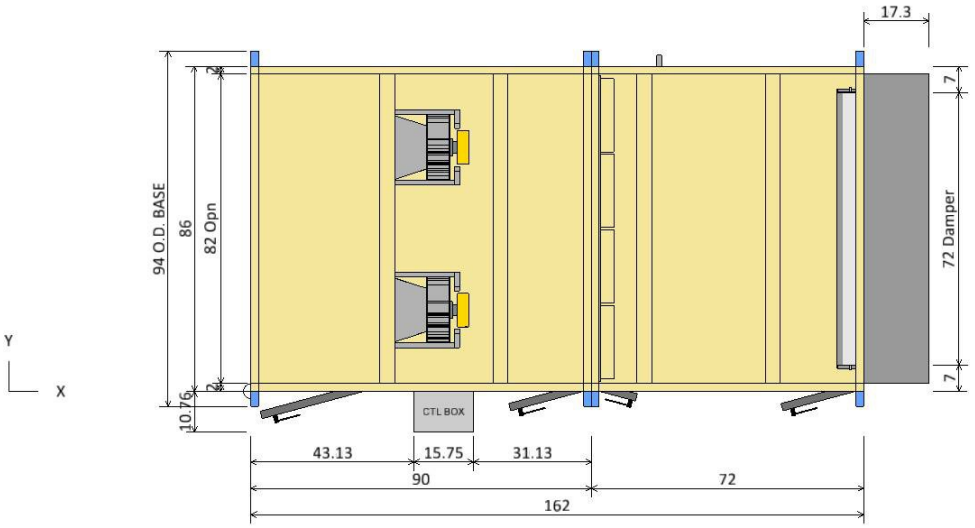
Dimensions provided as a courtesy and are recommended minimums only. Daikin is not responsible for supplying or designing drain pan traps and is not responsible for any damage caused by incorrect trap heights. The dimensions listed above should be reviewed and approved by a licensed plumbing professional.

AHRI Certification

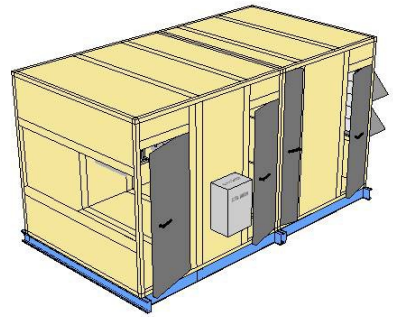
Certified by the AHRI Central Station Air-Handling Unit (AHU) Certification Program, which is based on AHRI Standard 430/431. AHRI certified units are subject to rigorous and continuous testing, have performance ratings independently measured and are third-party verified. Certified units may be found in the AHRI Directory at www.ahridirectory.org.

Notes

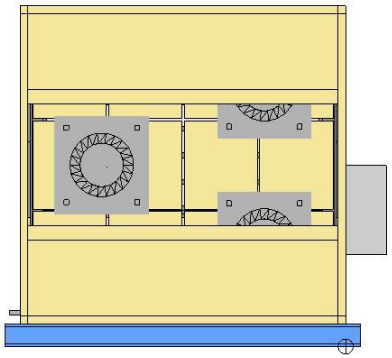
Standard
1. As a standalone component, unit meets or exceeds requirements of ASHRAE 90.1 - 2007. The approving authority is responsible for compliance of multi - component building systems.



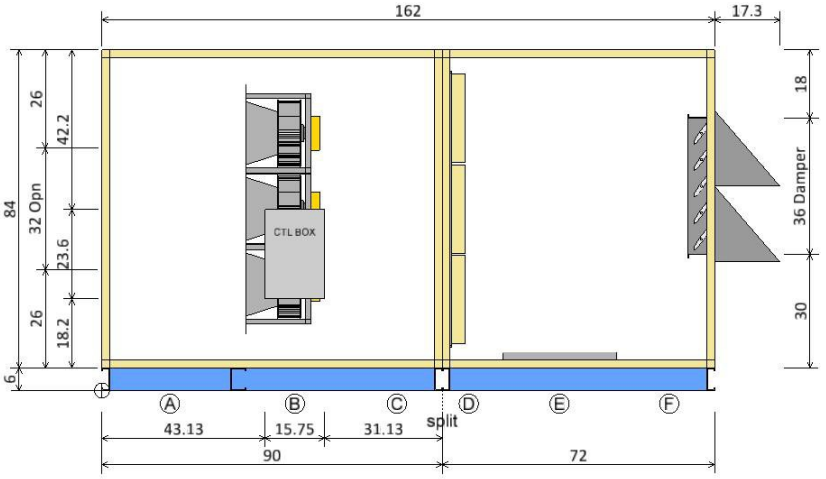
PLAN VIEW



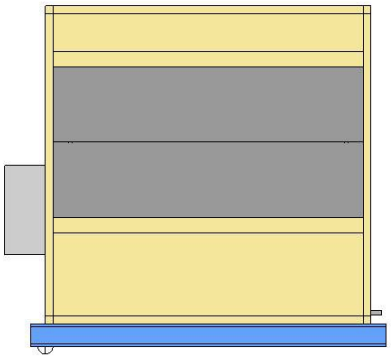
ISOMETRIC VIEW



FRONT END VIEW



ELEVATION VIEW

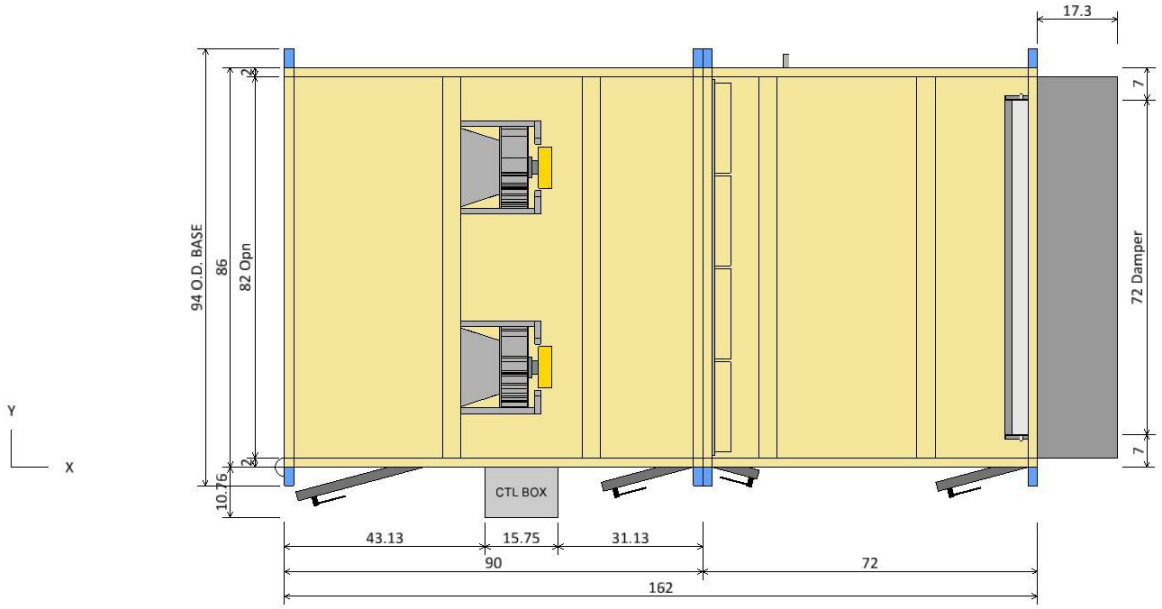


REAR END VIEW

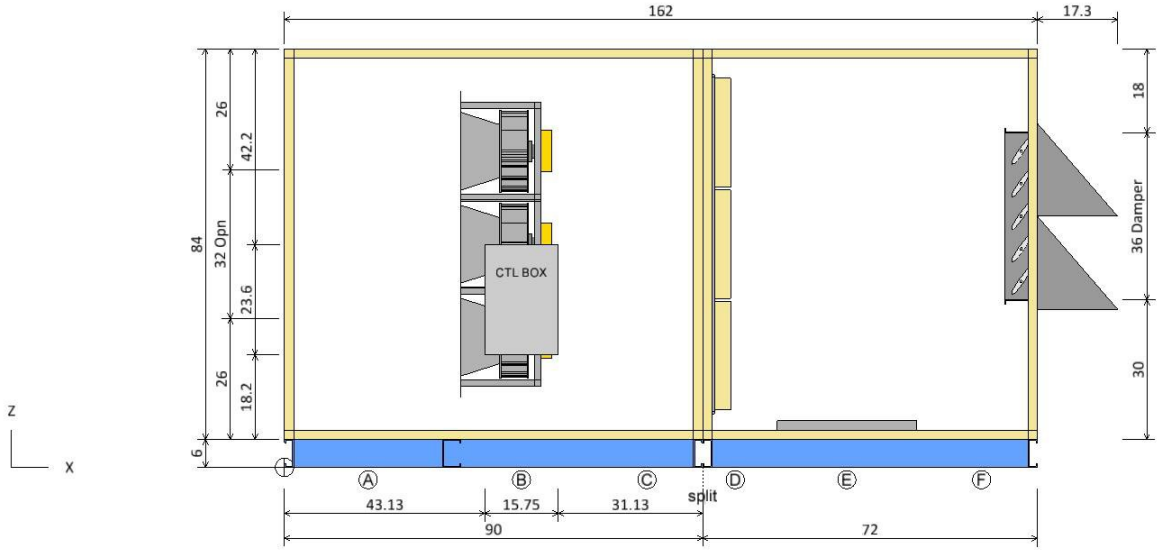
Plan/Elevation	Unit Tag: AHU Return			Sales Office: Norman Wright Mech. Equip. Corp.		
Product: Skyline Air Handler	Project Name: San Rafael HS - LA (Liberal Arts) Building			Billing Engineer:		
Model: OAH039GVCM	Sept. 23, 2024	Ver/Rev:	Sheet: 1 of 1	Scale: NTS	Tolerance: +/-0.25"	Dwg Units: in

DAIKIN
13600 Industrial Park Blvd, Minneapolis, MN 55441
www.DaikinApplied.com Software Version: 13.43

All opening dimensions have a 1" mounting flange along the inner edge. The actual airflow area of the opening is 2" smaller in each dimension.



PLAN VIEW



ELEVATION VIEW

Component Key		
Ⓐ	Plenum Section	
	Opening Location:	End center
	Opening Size:	32 ins x 82 ins
	Right Door (WxH):	28 ins x 68 ins
Ⓑ	Supply Fan	
	Fan Type:	Centrifugal - Plenum
	Fan Size (Class):	450 (2)
	Air Flowrate:	5916.7 cfm
	T.S.P:	2.9 insWg
	Motor Power:	6.6 HP
	Control box door swing:	15.75 ins
Ⓒ	Access Section	
	Right Door (WxH):	20 ins x 68 ins
Ⓓ	Panel Filter	
	Filter Type:	PrePleat (MERV 13)
	Right Door (WxH):	10 ins x 80 ins
Ⓔ	DX Coil	
	Coil Model:	5EN0010C
	Total Capacity:	0.0 Btu/hr
Ⓕ	Plenum Section	
	Right Door (WxH):	20 ins x 68 ins

Opening dimensions shown are for unit only, refer to curb drawing for duct opening dimensions.

Plan/Elevation - No Ends	Unit Tag: AHU Return			Sales Office: Norman Wright Mech. Equip. Corp.		
Product: Skyline Air Handler	Project Name: San Rafael HS - LA (Liberal Arts) Building			Billing Engineer:		
Model: OAH039GVCM	Sept. 23, 2024	Ver/Rev:	Sheet: 1 of 1	Scale: NTS	Tolerance: +/-0.25"	Dwg Units: in

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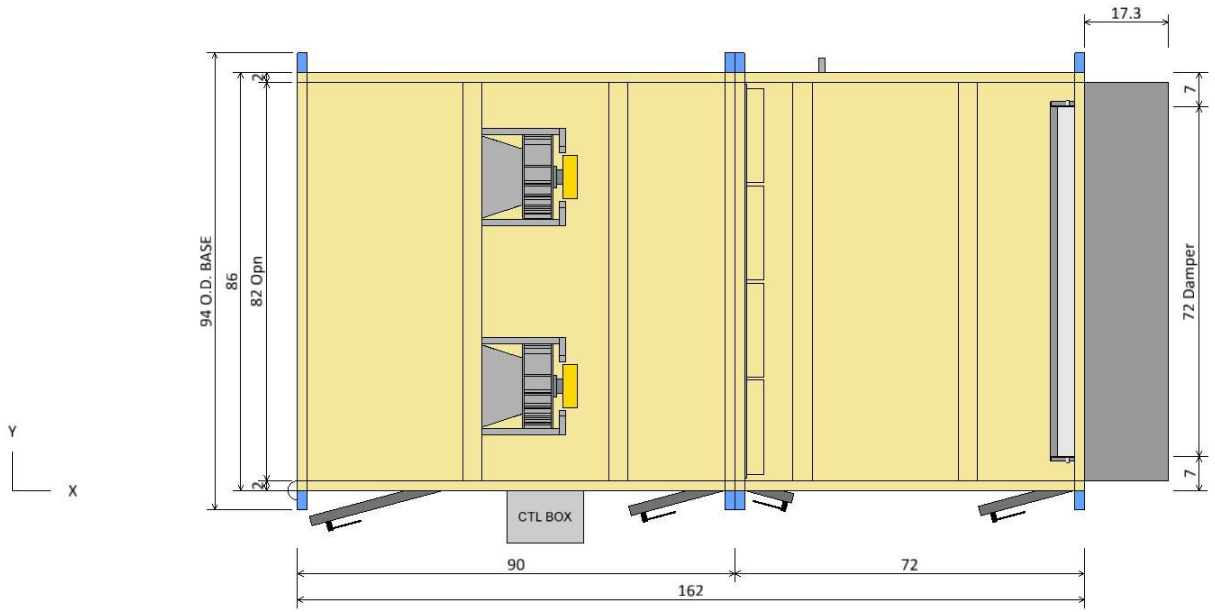
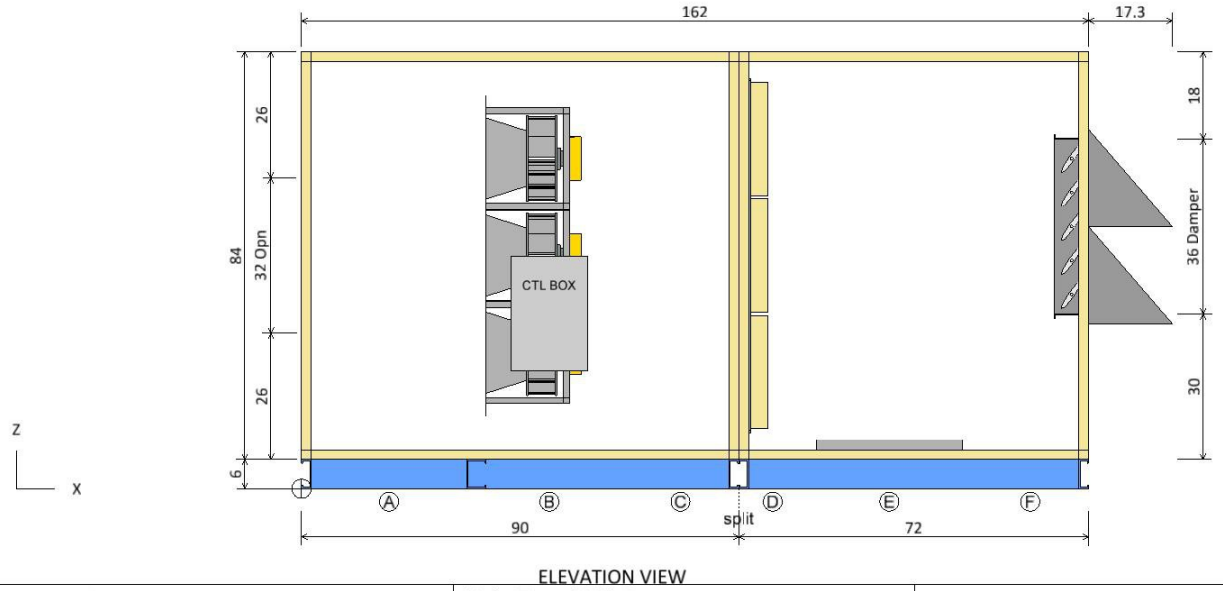


PLAN VIEW



ELEVATION VIEW

Component Key

	Type	X	Y	Z	Wid	Hgt
Ⓐ	Plenum Section Opening	0.00	2.00	32.00	82.00	32.00
Ⓕ	Plenum Section Exhaust air damper	162.00	7.00	36.00	72.00	36.00

Opening dimensions shown are for unit only, refer to curb drawing for duct opening dimensions.

Note: Dimensions are measured from the origin point.

Opening/Damper Connections	Unit Tag: AHU Return			Sales Office: Norman Wright Mech. Equip. Corp.		
Product: Skyline Air Handler	Project Name: San Rafael HS - LA (Liberal Arts) Building			Billing Engineer:		
Model: OAH039GVCM	Sept. 23, 2024	Ver/Rev:	Sheet: 1 of 1	Scale: NTS	Tolerance: +/-0.25"	Dwg Units: in

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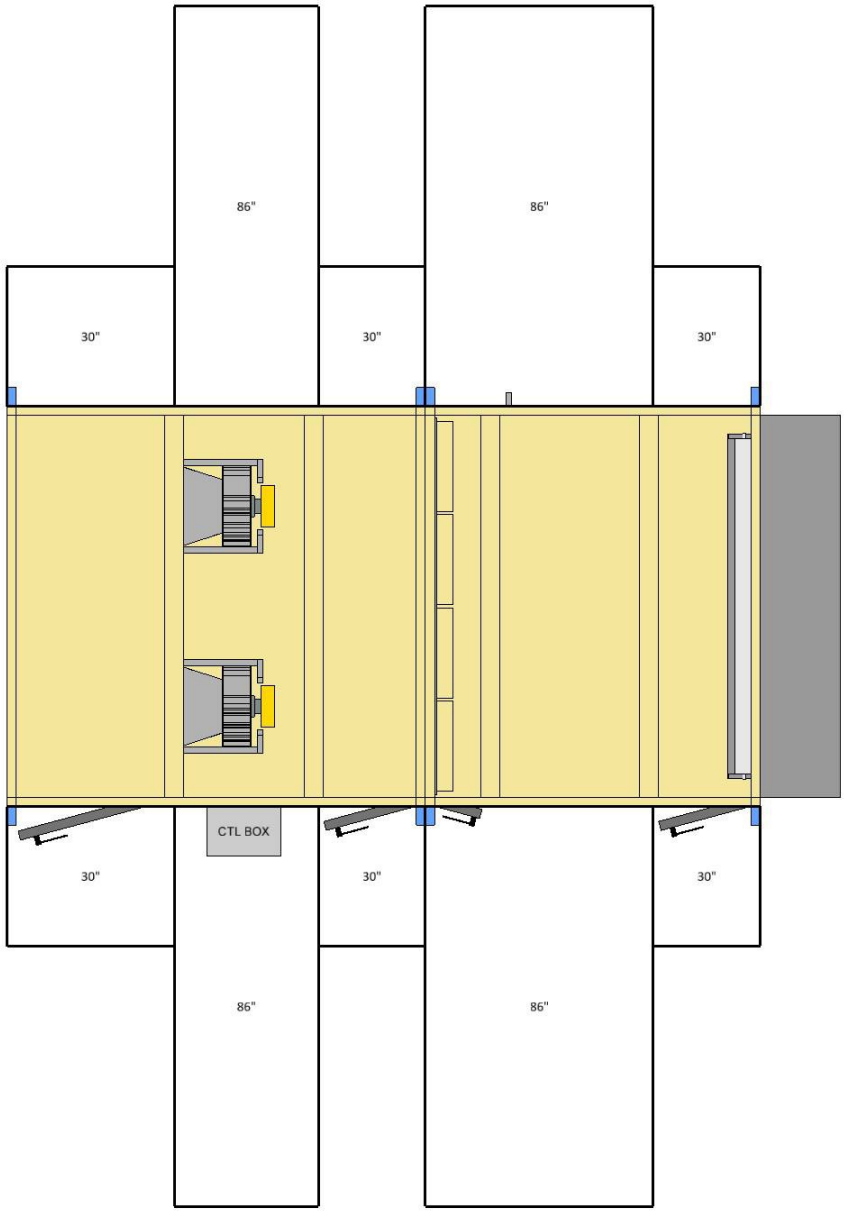
All opening dimensions have a 1" mounting flange along the inner edge. The actual airflow area of the opening is 2" smaller in each dimension.



PLAN VIEW

Notes

Check local electrical component service clearance codes for specific distances.

Access is only required on one side of the unit.

Service Clearance View	Unit Tag: AHU Return			Sales Office: Norman Wright Mech. Equip. Corp.		
Product: Skyline Air Handler	Project Name: San Rafael HS - LA (Liberal Arts) Building			Sales Engineer:		
Model: OAH039GVCM	Sept. 23, 2024	Ver/Rev:	Sheet: 1 of 1	Scale: NTS	Tolerance: +/-0.25"	Dwg Units: in

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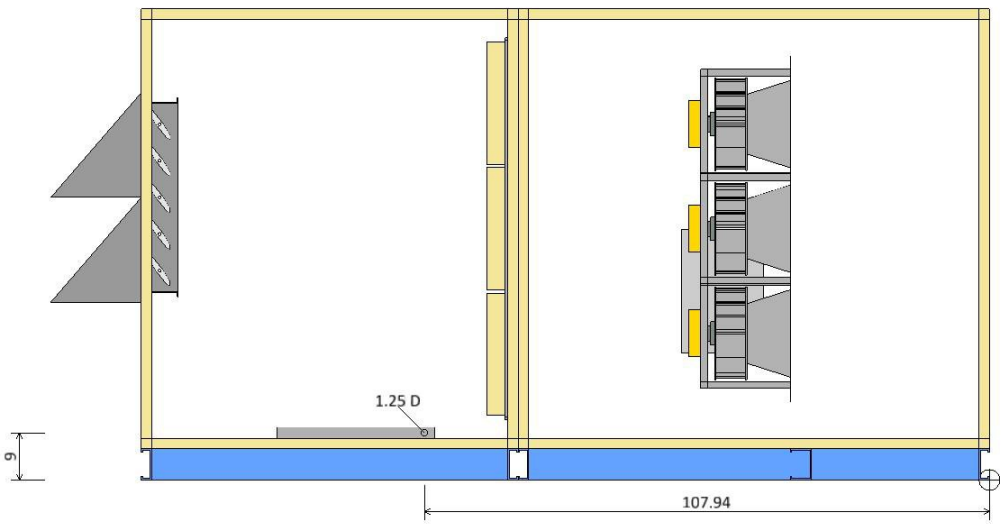
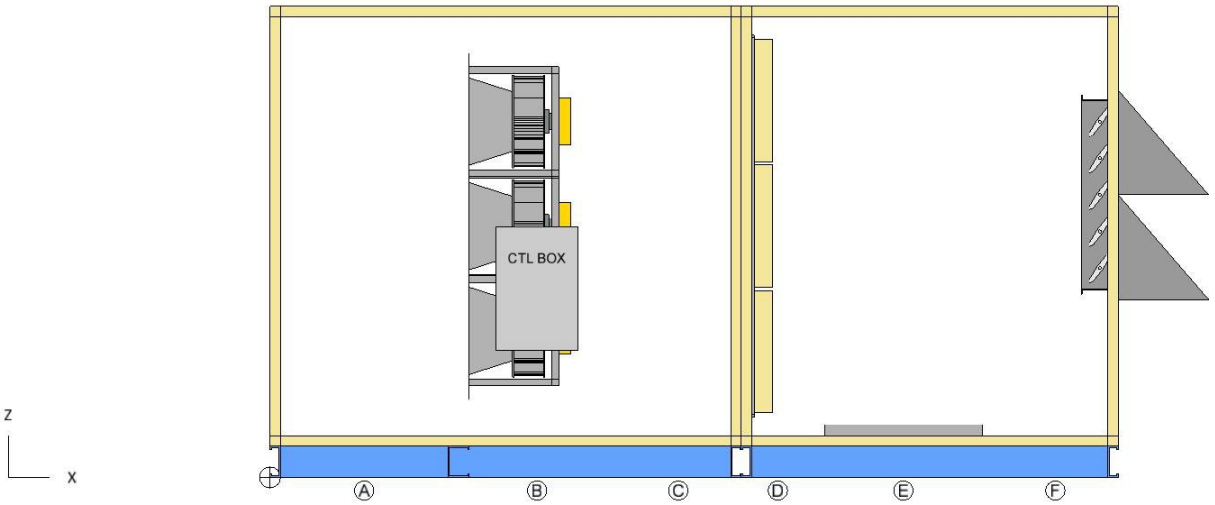


LEFT ELEVATION VIEW



RIGHT ELEVATION VIEW

Coil and Drain Connections

	Type	X	Y	Z	Diam
Ⓔ	DX Coil Condensate drain conn:	107.94	88.90	9.00	1.25

Note: Dimensions are measured from the origin point.

Coil and Drain Connections	Unit Tag: AHU Return			Sales Office: Norman Wright Mech. Equip. Corp.			DAIKIN
Product: Skyline Air Handler	Project Name: San Rafael HS - LA (Liberal Arts) Building			Billing Engineer:			13600 Industrial Park Blvd, Minneapolis, MN 55441
Model: OAH039GVCM	Sept. 23, 2024	Ver/Rev:	Sheet: 1 of 1	Scale: NTS	Tolerance: +/-0.25"	Dwg Units: in	www.DaikinApplied.com Software Version: 13.43

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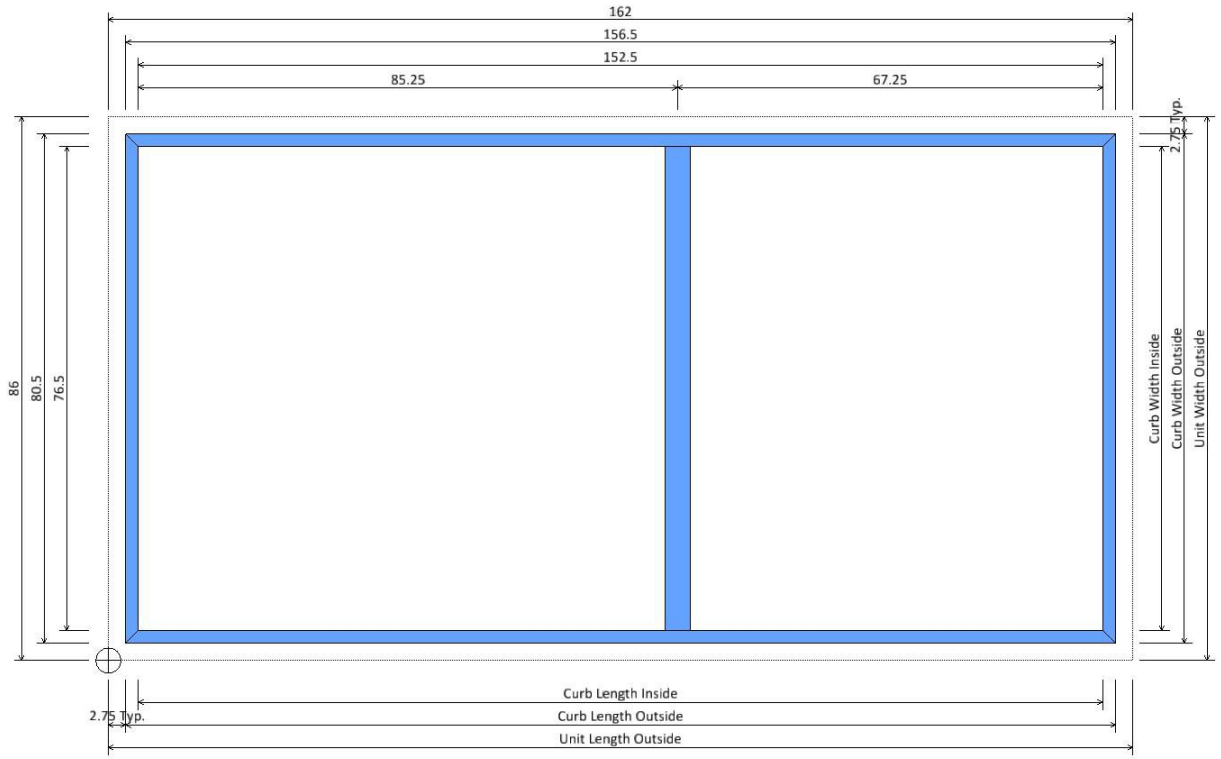

PLAN VIEW

ELEVATION VIEW

Plan/Elevation - No Ends	Unit Tag: AHU Return			Sales Office: Norman Wright Mech. Equip. Corp.		
Product: Skyline base	Project Name: San Rafael HS - LA (Liberal Arts) Building			Billing Engineer:		
Model: OAH039GVCM	Sept. 23, 2024	Ver/Rev:	Sheet: 1 of 1	Scale: NTS	Tolerance: +/-0.25"	Dwg Units: in

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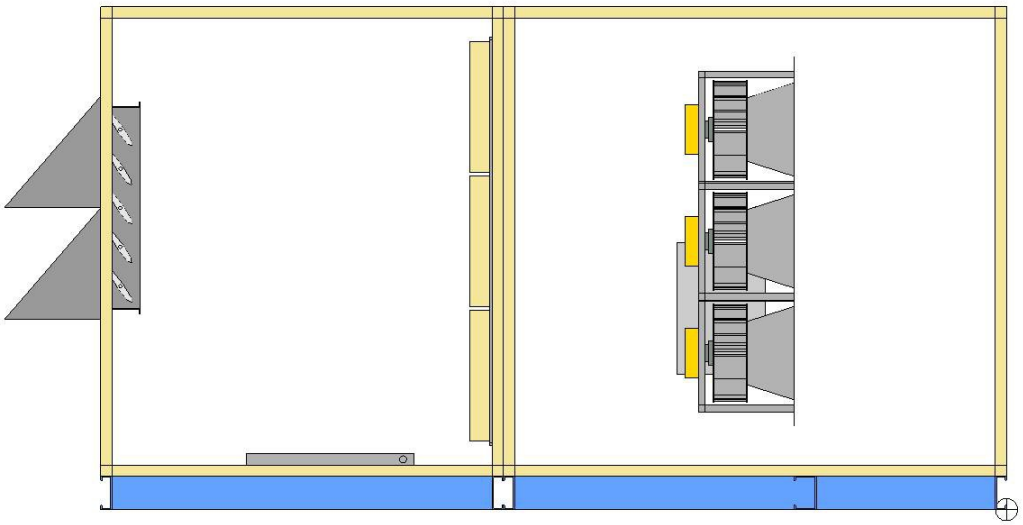
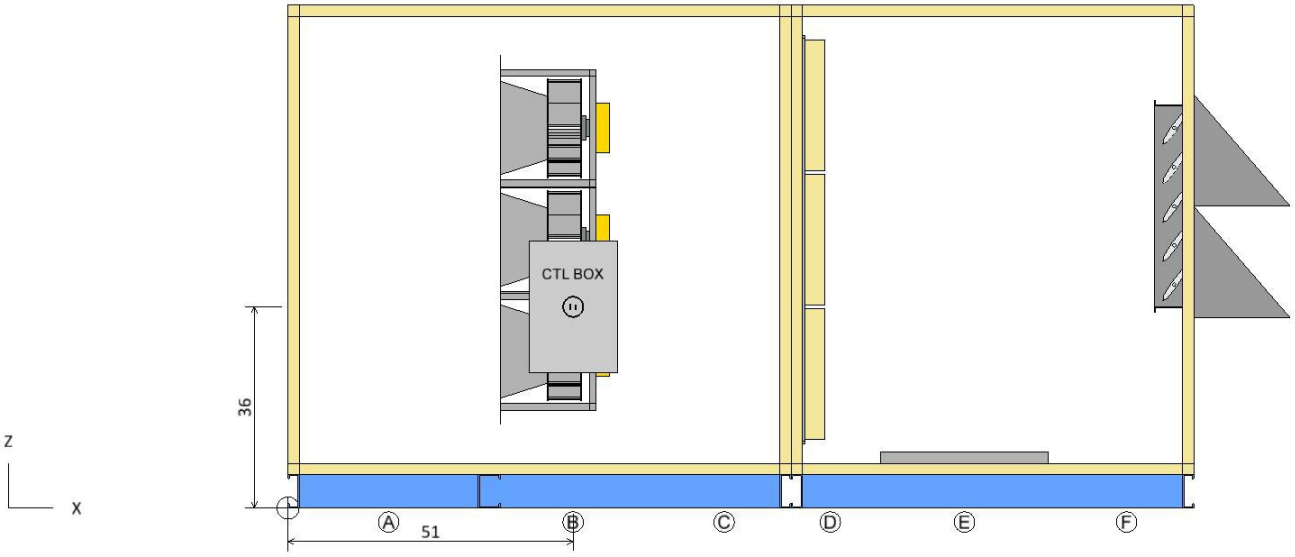


LEFT ELEVATION VIEW



RIGHT ELEVATION VIEW

Component Key

	Type	X	Y	Z	Volts	Phase
Ⓑ	Supply Fan Fan	51.00	0.00	36.00	200	3

Note: Dimensions are measured from the origin point.

Electrical Connections	Unit Tag: AHU Return			Sales Office: Norman Wright Mech. Equip. Corp.		
Product: Skyline Air Handler	Project Name: San Rafael HS - LA (Liberal Arts) Building			Billing Engineer:		
Model: OAH039GVCM	Sept. 23, 2024	Ver/Rev:	Sheet: 1 of 1	Scale: NTS	Tolerance: +/-0.25"	Dwg Units: in

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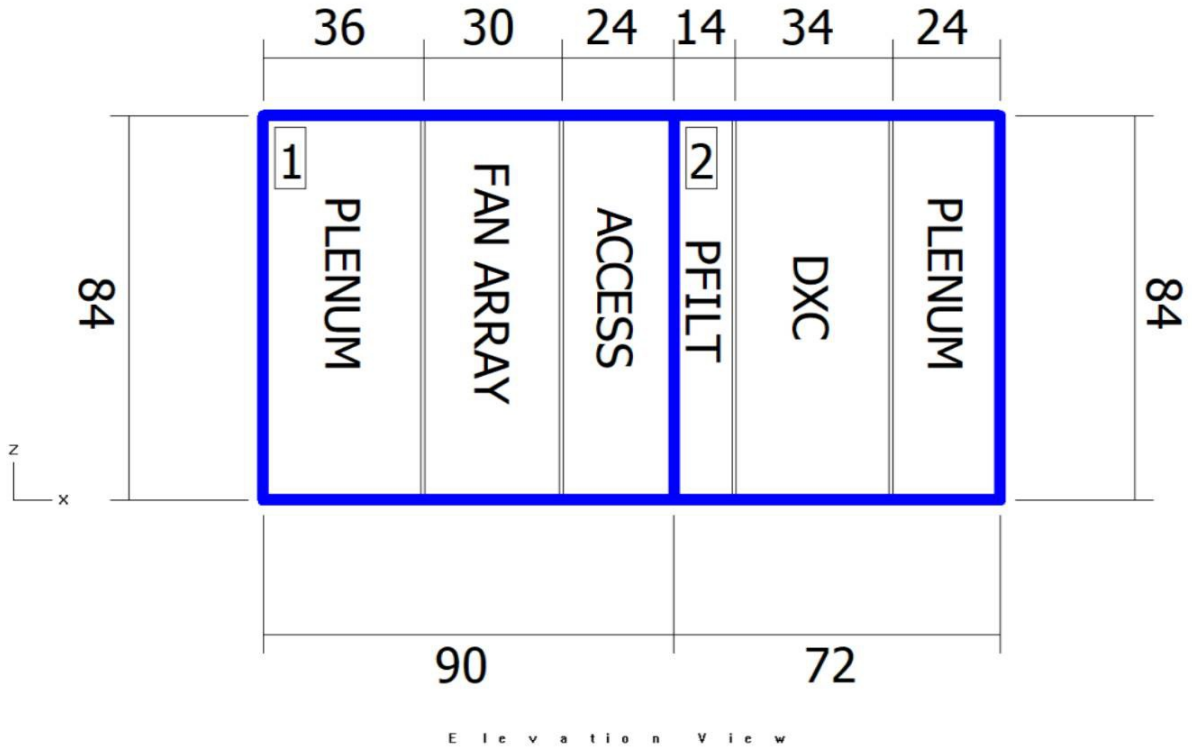

Elevation View

Shipping Sections

Section	Weight (lb)	X	Y	Z
Section 1	1915.67	90	86	84
Section 2	1549.41	72	86	84
Total Unit	3465.09	162	86	84

Note: Base rails, curb ready base, coil connectors, drain connectors, and control boxes not included in height X, Y, Z dimensions.
Shipping section may be 2" longer in air flow direction due to internal splice joint.

Shipping Sections	Unit Tag: AHU Return			Sales Office: Norman Wright Mech. Equip. Corp.		
Product: Skyline Air Handler	Project Name: San Rafael HS - LA (Liberal Arts) Building			Sales Engineer:		
Model: OAH039GVCM	Sept. 23, 2024	Ver/Rev:	Sheet: 1 of 1	Scale: NTS	Tolerance: +/-0.25"	Dwg Units: in

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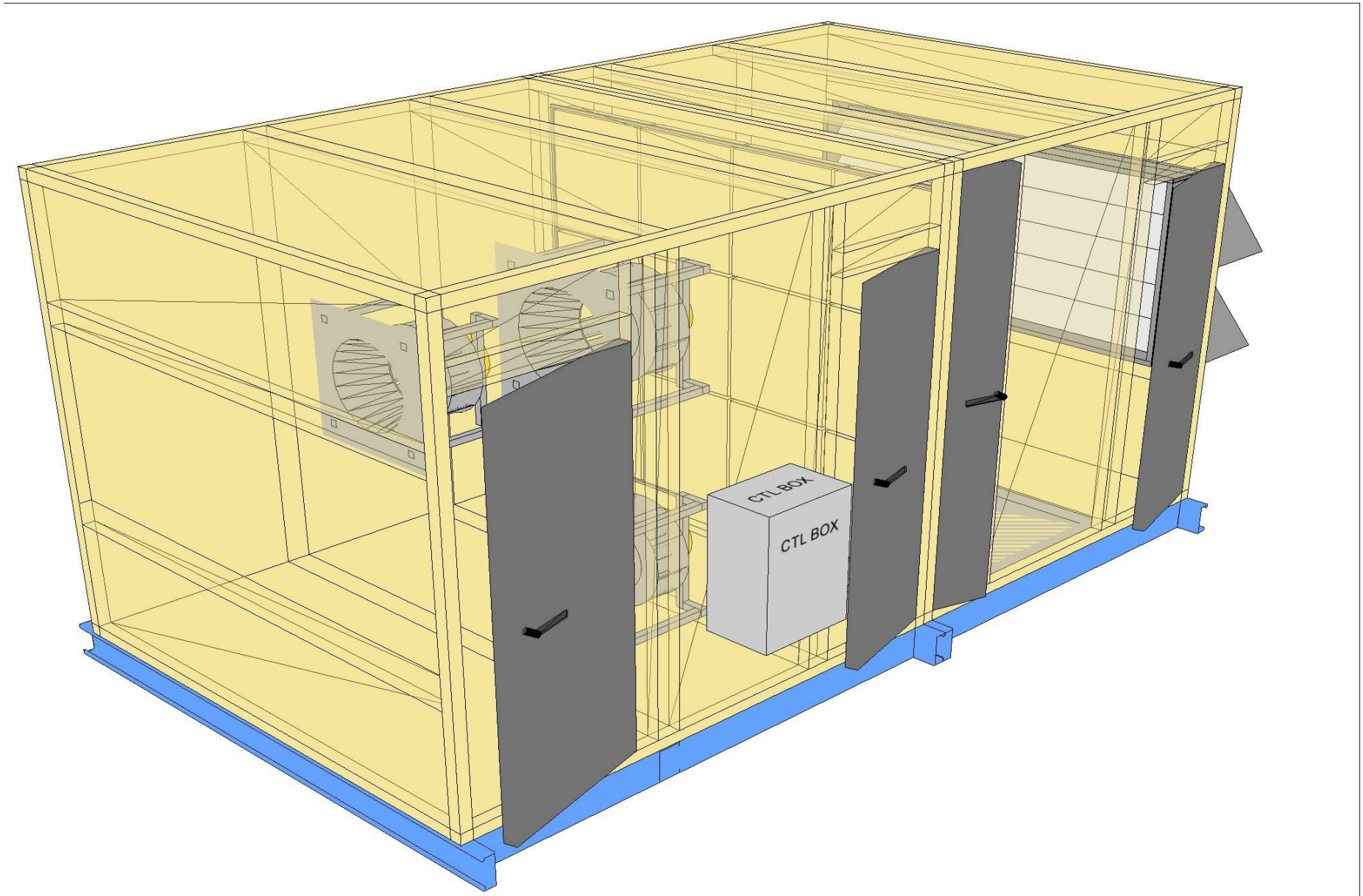

Product Drawing	Unit Tag: AHU Return			Sales Office: Norman Wright Mech. Equip. Corp.		
Product: Skyline Air Handler	Project Name: San Rafael HS - LA (Liberal Arts) Building			Billing Engineer:		
Model: OAH039GVCM	Sept. 23, 2024	Ver/Rev:	Sheet: 1 of 1	Scale: NTS	Tolerance: +/-0.25"	Dwg Units: in

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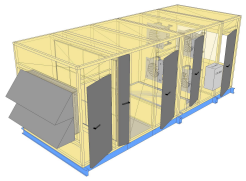
All opening dimensions have a 1" mounting flange along the inner edge. The actual airflow area of the opening is 2" smaller in each dimension.

Equipment Cut Sheet:

Air Handling Unit – Supply

Job Information	Technical Data Sheet
Job Name	San Rafael HS - LA (Liberal Arts) Building
Date	September 23 2024
Submitted By	DH
Software Version	13.43
Unit Tag	AHU Supply - w Electric heat



Unit Overview

Model Number	Supply					
	Air Volume cfm	Static Pressure		External Dimensions		
		External inWc	Total inWc	Height in	Width in	Length in
OAH039GVCM	18830	2.00	4.44	84*	86*	226

**Not including base rails, coil connectors, drain connectors, vestibule sections, control boxes and hoods.*

Unit

Model Number:	OAH039GVCM		
Approval:	ETL Listed / ETL Listed to Canadian Safety Standards (ETL Label / ETLc Label)		
Outer Panel:	Painted 24 gauge G60 Galvanized Steel		
Liner:	24 gauge Galvanized Steel (unless noted per section)		
Insulation:	R-13 Injected Foam		
Unit Configuration:	Inline horizontal	**Drive (Handling) Location:**	Right
Base:	Curb ready	**Wall Thickness:**	2 in
Roof Curb Kit:	16 in	**Altitude:**	0 ft
Parts Warranty:	Standard One Year		

Plenum Section

Component: 1 | Length: 38 in | Shipping Section: 1

Air Pressure Drop

0.21 inWc

Custom Dampers

Custom Damper	Damper Type	Location	Size (Width x Height)		Material	Blade Action	Rainhood w/Screen
			Overall	Opening			
1	UltraSeal Low Leak	End	70 in x 40 in	60 in x 36 in	Galv. Steel	Parallel	Provided - Factory Installed

Door

Location	Width	Opening
Drive side	30 in	Outward

Panel Filter

Component: 2 | Length: 14 in | Shipping Section: 1

Type	Efficiency	Face Velocity	Face Area	Air Volume	Filter Loading
Pre Pleat	MERV 13	499 ft/min	37.7 ft²	18830 cfm	Side

Air Pressure Drop				Number of Filters	Height	Width	Depth
Clean Air	Mean Air	Dirty Air	User Spec				
0.23 inWc	**0.61** inWc	1.00 inWc	N/A	12	24 in	20 in	4 in

Door

Location	Width	Opening
Drive side	10 in	Outward

Future Direct Expansion Coil	Component: 3	Length: 34 in	Shipping Section: 1

Number of Coils	Number of Rows
2	10

Coil Air Pressure Drop	Finned Height	Finned Width	Face Area	Face Velocity
1.00 inWc	36 in	73 in	36.50 ft²	516 ft/min

Connection Location	Connection Material
Drive side	Carbon steel

Coil Model	Drain Pan	Drain Pan Side
Future Coil (Not Supplied)	Stainless steel	Opp drive side

Total Refrigerant Weight is the total for all circuits of all coils in this coil section and is estimated. Refer to the AHU and Condensing Unit IOMs for recommendations on system start-up.

Minimum allowable face velocity = 150 fpm

AHRI 410 Certification

Coil is NOT certified by AHRI

Access Section	Component: 4	Length: 36 in	Shipping Section: 1

Air Pressure Drop

0.00 inWc

Door

Location	Width	Opening
Drive side	28 in	Outward

Special Options

Sound Baffle

(As casing details)

Special Text

test

Future Direct Expansion Coil	Component: 5	Length: 36 in	Shipping Section: 2

Number of Coils	Number of Rows
2	4

Coil Air Pressure Drop	Finned Height	Finned Width	Face Area	Face Velocity
0.50 inWc	36 in	73 in	36.50 ft²	516 ft/min

Connection Location	Connection Material
Drive side	Copper tube

Coil Model	Drain Pan	Drain Pan Side
Future Coil (Not Supplied)	Stainless steel	Drive side

Total Refrigerant Weight is the total for all circuits of all coils in this coil section and is estimated. Refer to the AHU and Condensing Unit IOMs for recommendations on system start-up.

Minimum allowable face velocity = 150 fpm

AHRI 410 Certification

Coil is NOT certified by AHRI

Door

Location	Width	Opening
Drive side	20 in	Outward

Supply Fan Array

Component: 6 | Length: 30 in | Shipping Section: 2

Fan Performance

Air Volume*	Static Pressure			Fan Energy Index(FEI)	Total Input Power	Fan Shaft Power*	Speed		Redundancy(N-1)	Fan Circuit	
	External	Total	Cabinet				Operating	Maximum		MOP	MCA
4708 cfm	2.00 inWc	4.44 inWc	0.00 inWc	1.34	16.3 kW	4.95 BHP	2410 rpm	2600 rpm	95.1 %	80.0 A	67.2 A

Fan Data

Fan Type	Blade Type / Class	Quantity of Fans	Wheel Diameter	Number of Blades	Discharge	Motor Location
ECM / 2x2 : 4	Airfoil / N/A	4	17.71 in	5	Axial	Behind Fan

Motor Data

Power*	Electrical Supply	Speed	Control Signal	Full Load Current*
6.6 HP	200/60/3 V/Hz/Phase	2600 rpm	0-10V	15.80 A

Fan Options

Isolator Type:	Rigid

Control Data

Selection Type:	Integrated Drive	**Vendor:**	Daikin Applied
Auxiliary Control:	Disconnect w/ motor starter	**Voltage:**	200 V
Disconnect Type:	Fused	**Height x Width x Depth:**	23.60 in x 15.75 in x 10.76 in
Mounting:	Drive Side	**Enclosure:**	NEMA 3R
Control box:	No controls, unit mounted power box, drive side		

Panel

Location	Width	Opening
Removable panels	- in	Outward

Notes

** after a unit label denotes the data for an individual fan.*

Due to multi-sourcing of ECM fans, motor nameplate electrical data values MOP, MCA and Full Load Current may be equal to or less than presented.

Due to multi-sourcing of ECM fans, motor nameplate Power may be greater than presented.

Plenum Section

Component: 7 | Length: 38 in | Shipping Section: 3

Opening Location	Opening Size	Air Pressure Drop
End center	34.00" x 82.00"	0.12 inWc

Door

Location	Width	Opening
Drive side	30 in	Outward

Special Options

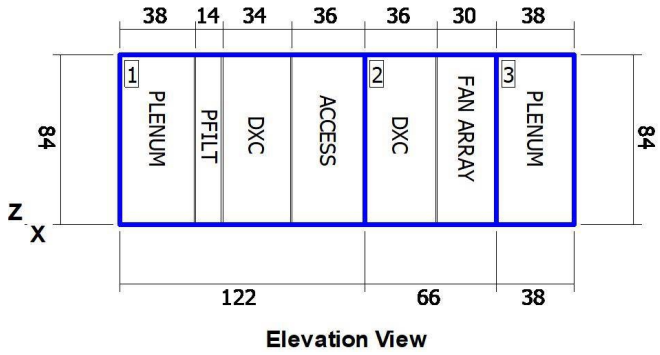
Tread Plate Floor Liner	Sound Baffle
Tread plate installed	(As casing details)

Unit Sound Power (dB)

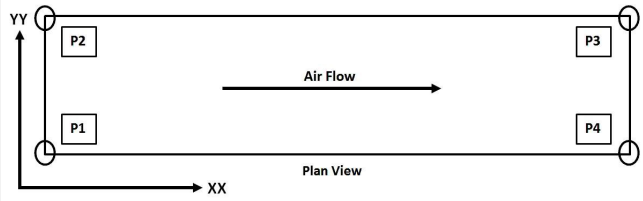
Type	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
Radiated:	80	82	86	74	76	64	48	51
Unit Discharge:	85	87	98	89	92	86	80	77
Unit Return:	80	82	86	74	76	69	61	53

Shipping Section Details

Section	Length in	Weight lb	Corner Weights (lb)				Center of Gravity (in)		
			P1	P2	P3	P4	XX	YY	ZZ
1	122	2316	601	601	557	557	59	43	39
2	66	1696	397	379	451	469	36	42	43
3	38	601	152	152	149	149	19	43	43
Entire Unit	**226**	**4613**	**1148**	**1130**	**1158**	**1177**	**114**	**43**	**41**
Roof Curb	**226**	**417**							



Elevation View



Plan View

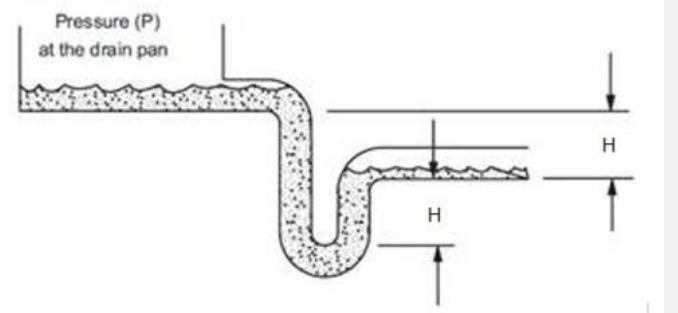
NOTE: Special components aren't included in the corner weights and center of gravity data.

Supply Static Pressure Drop

Component	Option	Static Pressure Drop
Plenum Section	Plenum Section	0.21 insWg
Panel Filter	Panel Filter	0.61 insWg
DX Coil	DX Coil	1.00 insWg
Access Section	Access Section	
DX Coil	DX Coil	0.50 insWg
Supply Fan	Cabinet	
Plenum Section	Plenum Section	0.12 insWg
External Static	External Static	2.00 insWg
Total Supply Fan Static		4.44 insWg

Minimum Recommended Drain Pan Trap Dimensions

Shipping Section	Component	H
1	DX Coil	4.14
2	DX Coil	5.14



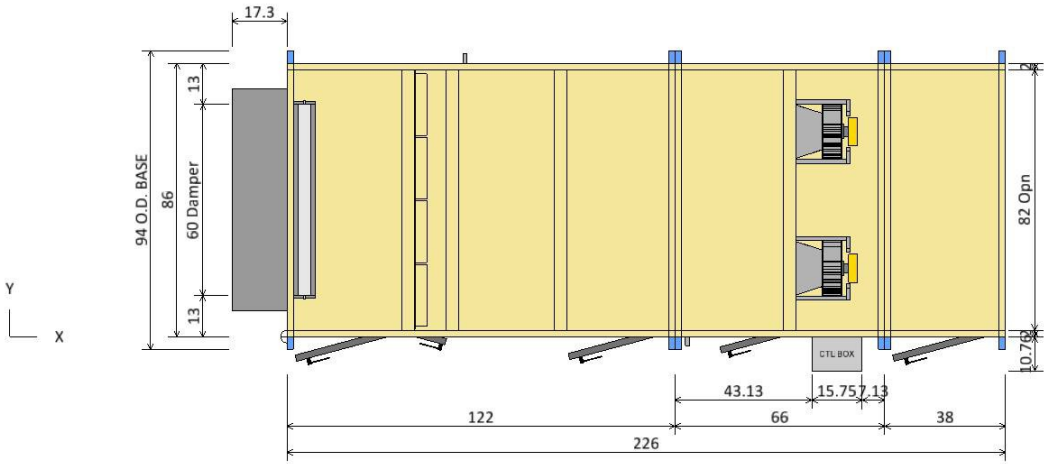
Dimensions provided as a courtesy and are recommended minimums only. Daikin is not responsible for supplying or designing drain pan traps and is not responsible for any damage caused by incorrect trap heights. The dimensions listed above should be reviewed and approved by a licensed plumbing professional.

AHRI Certification

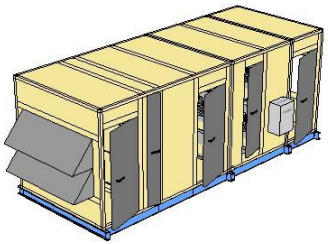
Certified by the AHRI Central Station Air-Handling Unit (AHU) Certification Program, which is based on AHRI Standard 430/431. AHRI certified units are subject to rigorous and continuous testing, have performance ratings independently measured and are third-party verified. Certified units may be found in the AHRI Directory at www.ahridirectory.org.

Notes

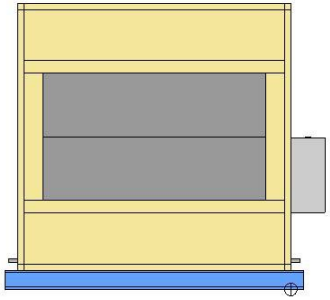
Standard
1. As a standalone component, unit meets or exceeds requirements of ASHRAE 90.1 - 2007. The approving authority is responsible for compliance of multi - component building systems.



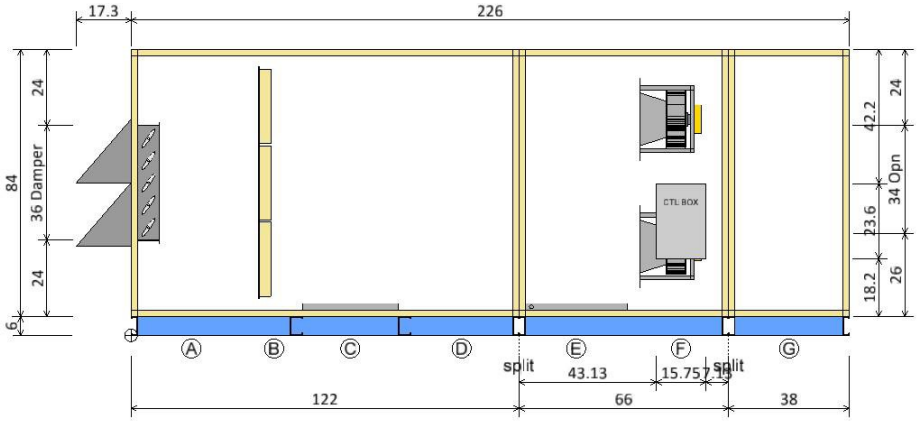
PLAN VIEW



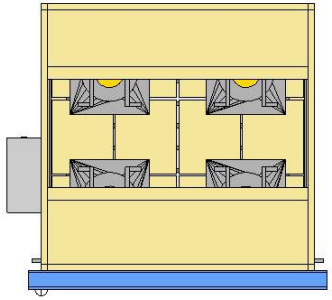
ISOMETRIC VIEW



FRONT END VIEW



ELEVATION VIEW



REAR END VIEW

Plan/Elevation	Unit Tag: AHU Supply - w Electric heat			Sales Office: Norman Wright Mech. Equip. Corp.		
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Model: OAH039GVCM	Sept. 23, 2024	Ver/Rev:	Sheet: 1 of 1	Scale: NTS	Tolerance: +/-0.25"	Dwg Units: in

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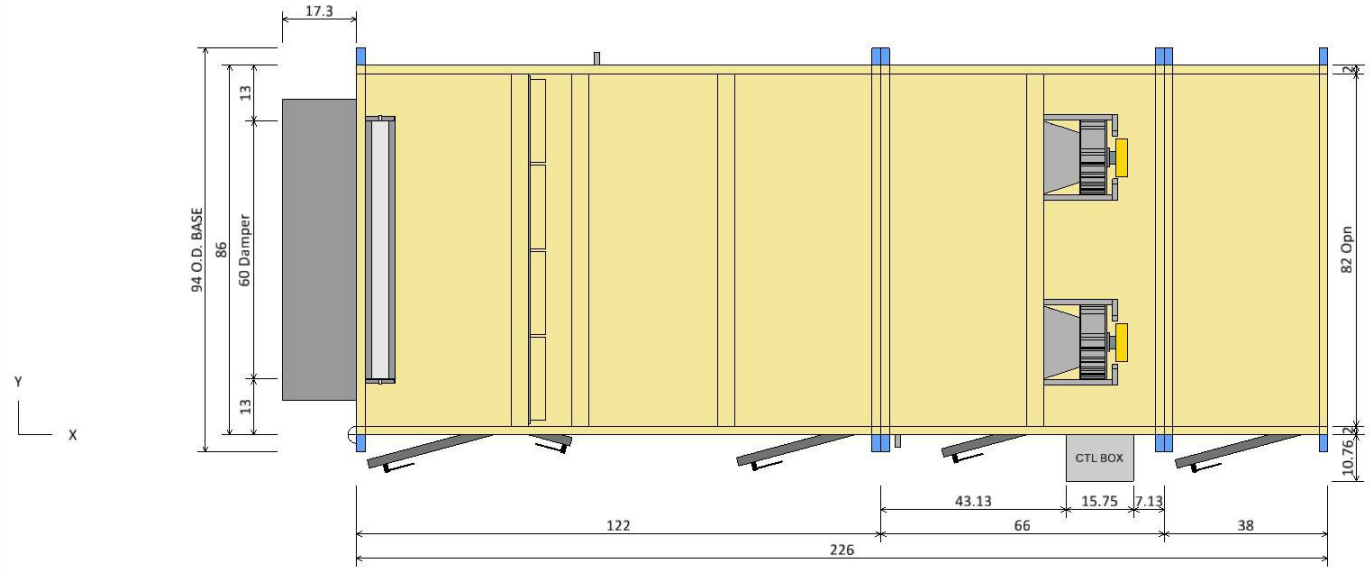
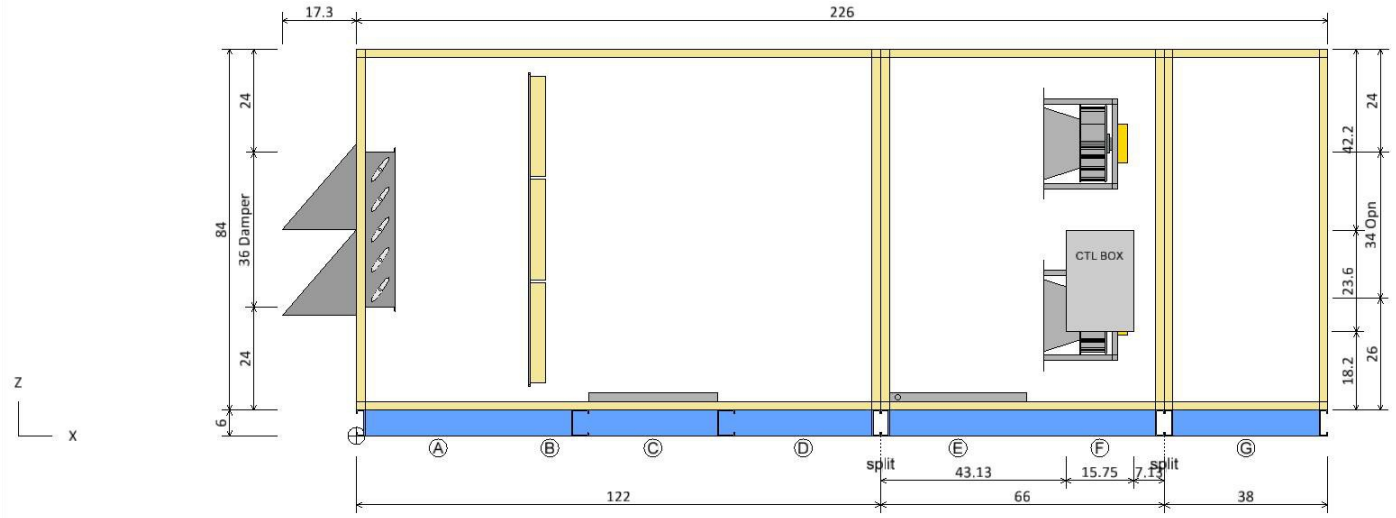


PLAN VIEW



ELEVATION VIEW

Component Key		
Ⓐ	Plenum Section Right Door (WxH):	 30 ins x 68 ins
Ⓑ	Panel Filter Filter Type: Right Door (WxH):	 PrePleat (MERV 13) 10 ins x 80 ins
Ⓒ	DX Coil Coil Model: Total Capacity:	 5EN0010C 0.0 Btu/hr
Ⓓ	Access Section Right Door (WxH):	 28 ins x 68 ins
Ⓔ	DX Coil Coil Model: Total Capacity: Right Door (WxH):	 5EN0004C 820032.0 Btu/hr 20 ins x 68 ins
Ⓕ	Supply Fan Fan Type: Fan Size (Class): Air Flowrate: T.S.P: Motor Power: Control box door swing:	 Centrifugal - Plenum 450 (2) 4707.5 cfm 4.4 insWg 6.6 HP 15.75 ins
Ⓖ	Plenum Section Opening Location: Opening Size: Right Door (WxH):	 End center 34 ins x 82 ins 30 ins x 68 ins

Opening dimensions shown are for unit only, refer to curb drawing for duct opening dimensions.

Plan/Elevation - No Ends	Unit Tag: AHU Supply - w Electric heat			Sales Office: Norman Wright Mech. Equip. Corp.		
Product: Skyline Air Handler	Project Name: San Rafael HS - LA (Liberal Arts) Building			Billing Engineer:		
Model: OAH039GVCM	Sept. 23, 2024	Ver/Rev:	Sheet: 1 of 1	Scale: NTS	Tolerance: +/-0.25"	Dwg Units: in

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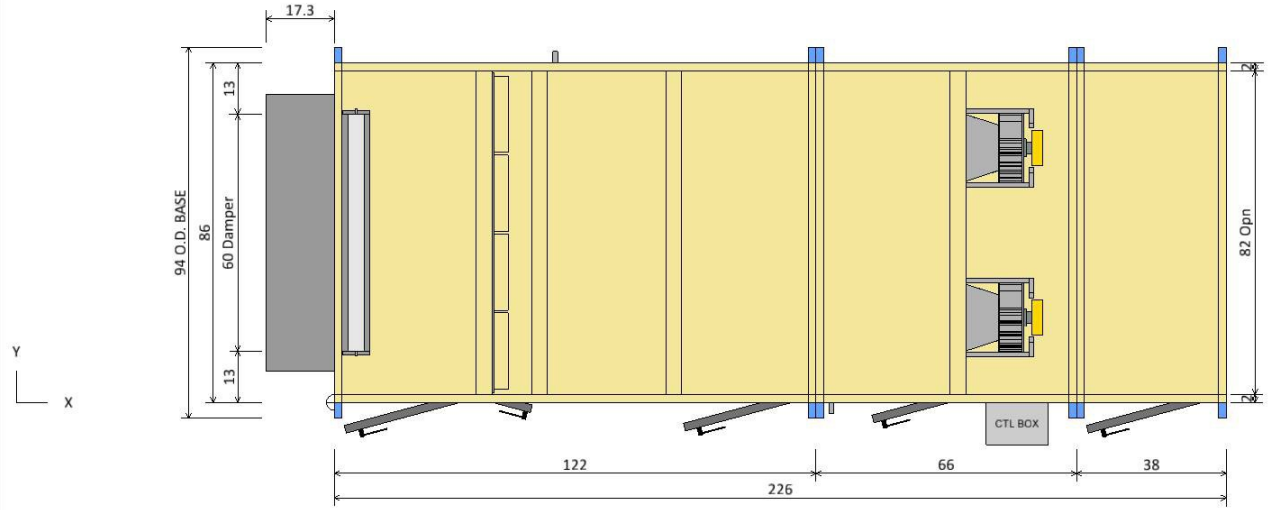
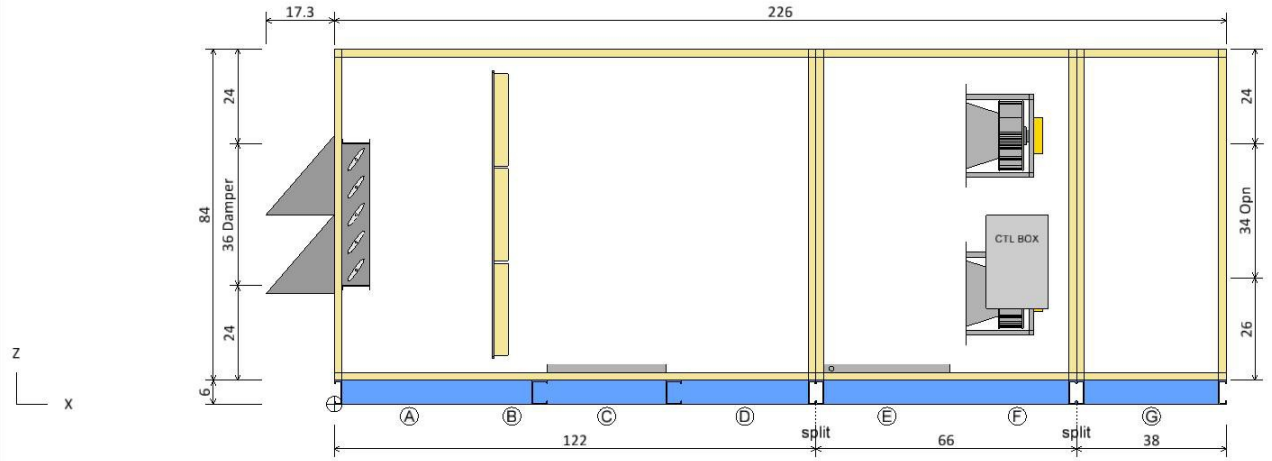


PLAN VIEW



ELEVATION VIEW

Component Key

	Type	X	Y	Z	Wid	Hgt
Ⓐ	Plenum Section Fresh air damper	0.00	13.00	30.00	60.00	36.00
Ⓖ	Plenum Section Opening	226.00	2.00	32.00	82.00	34.00

Opening dimensions shown are for unit only, refer to curb drawing for duct opening dimensions.

Note: Dimensions are measured from the origin point.

Opening/Damper Connections	Unit Tag: AHU Supply - w Electric heat			Sales Office: Norman Wright Mech. Equip. Corp.		
Product: Skyline Air Handler	Project Name: San Rafael HS - LA (Liberal Arts) Building			Billing Engineer:		
Model: OAH039GVCM	Sept. 23, 2024	Ver/Rev:	Sheet: 1 of 1	Scale: NTS	Tolerance: +/-0.25"	Dwg Units: in

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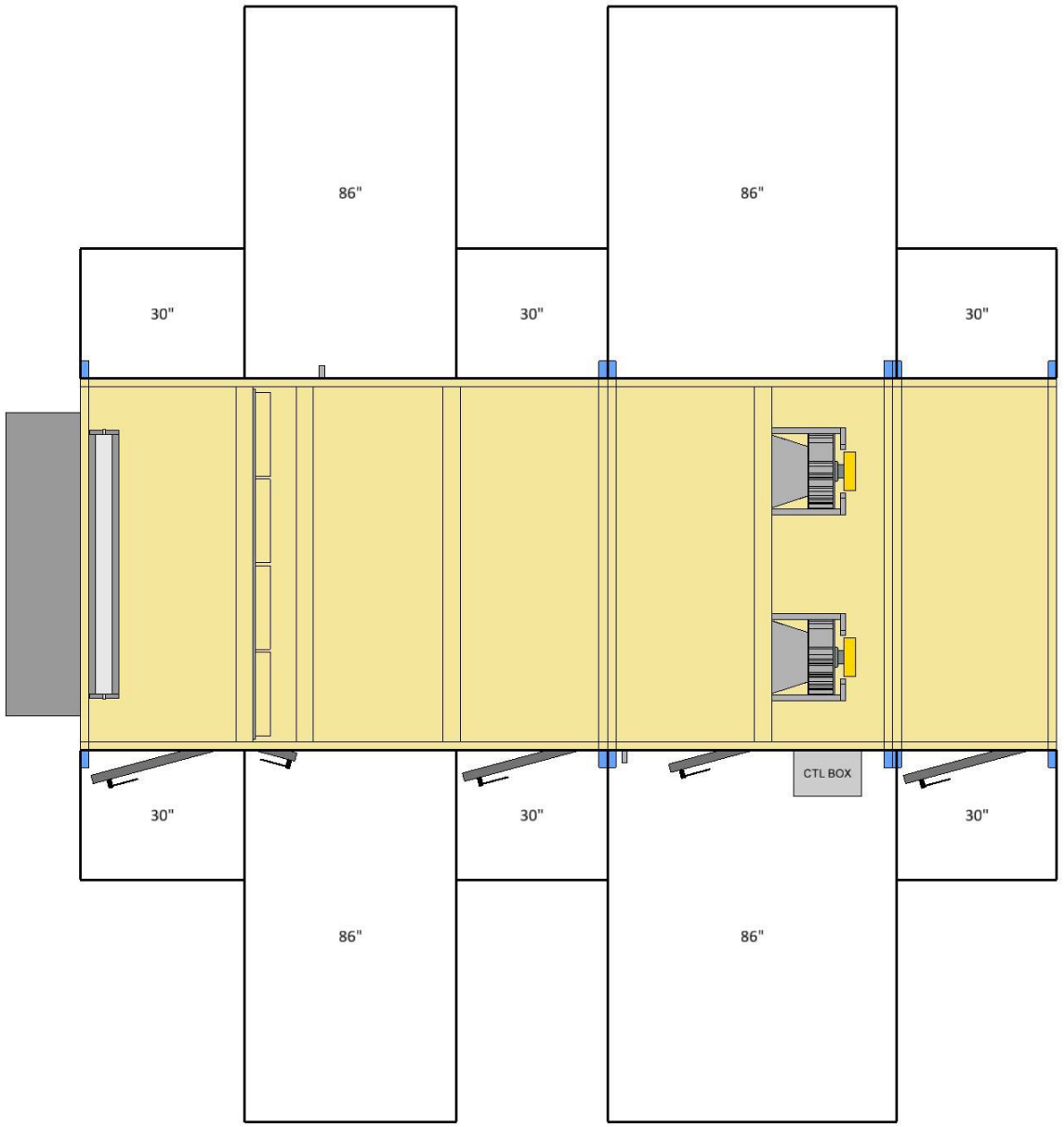

PLAN VIEW

Notes

Check local electrical component service clearance codes for specific distances.

Access is only required on one side of the unit.

Service Clearance View	Unit Tag: AHU Supply - w Electric heat			Sales Office: Norman Wright Mech. Equip. Corp.		
Product: Skyline Air Handler	Project Name: San Rafael HS - LA (Liberal Arts) Building			Billing Engineer:		
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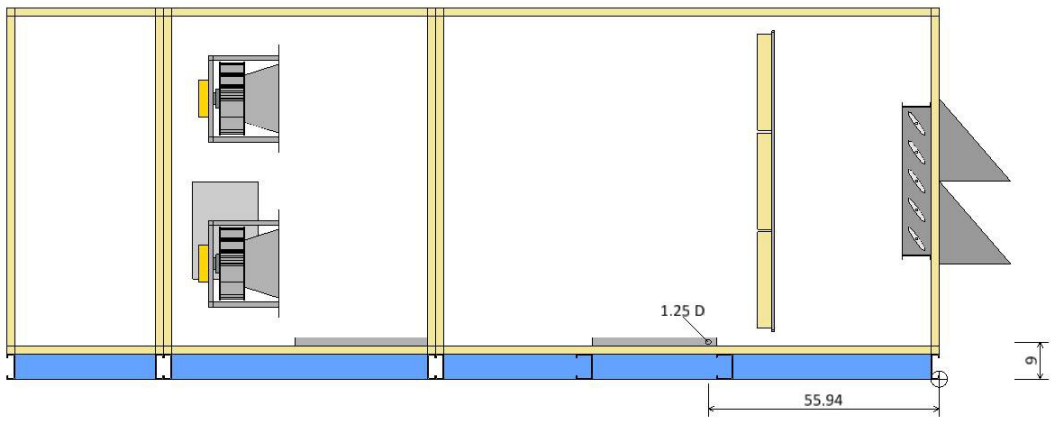
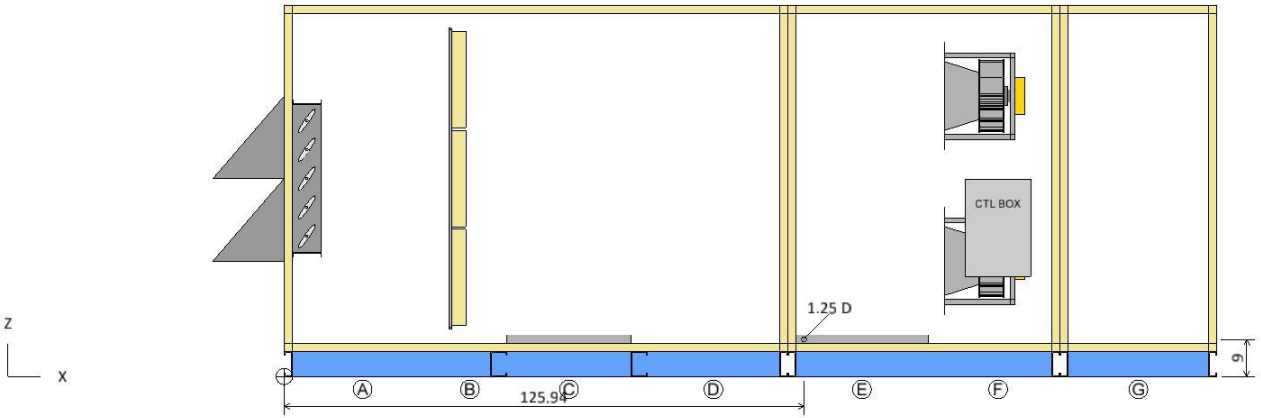


LEFT ELEVATION VIEW



RIGHT ELEVATION VIEW

Coil and Drain Connections

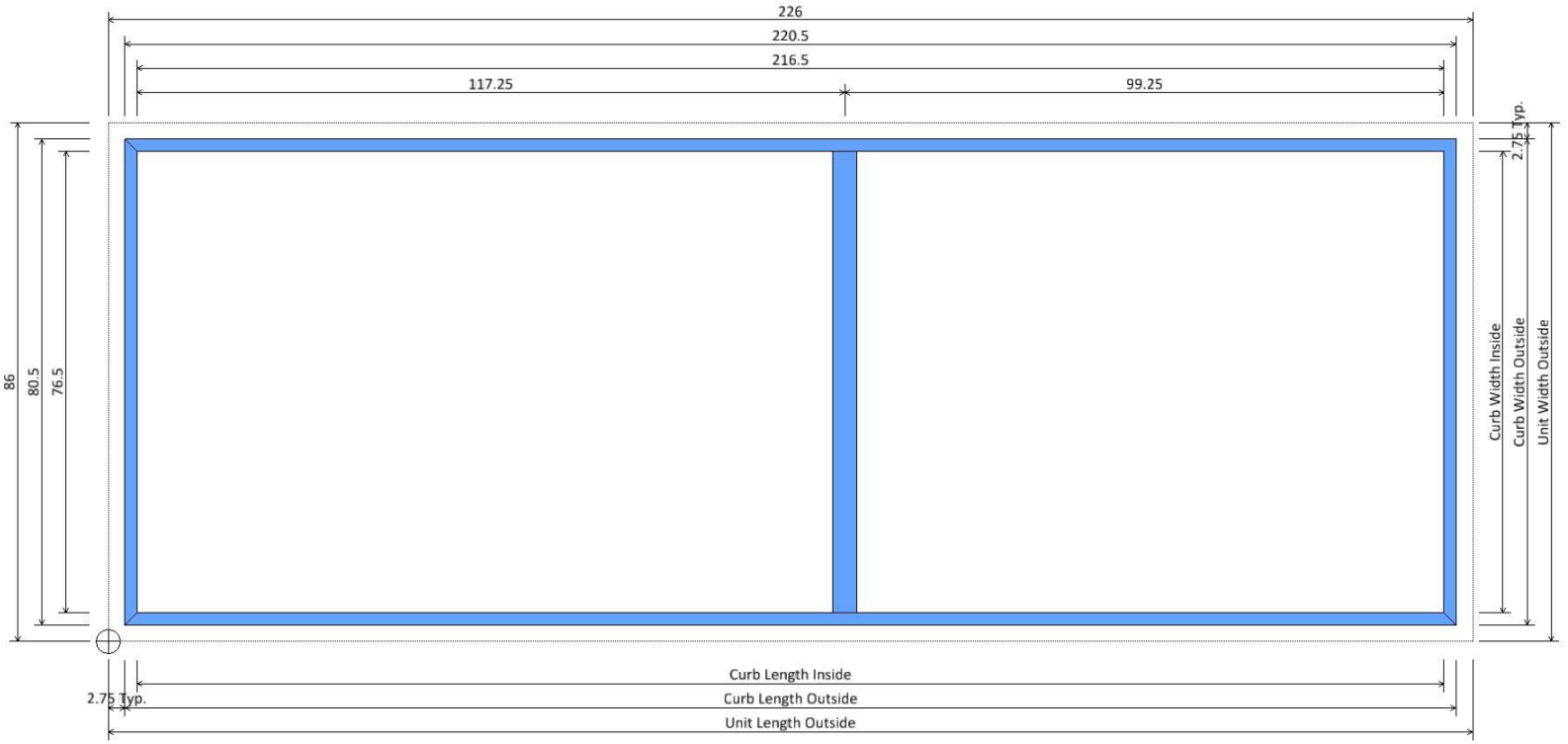
	Type	X	Y	Z	Diam
Ⓒ	DX Coil Condensate drain conn:	55.94	88.90	9.00	1.25
Ⓔ	DX Coil Condensate drain conn:	125.94	-2.90	9.00	1.25

Note: Dimensions are measured from the origin point.

Coil and Drain Connections	Unit Tag: AHU Supply - w Electric heat			Sales Office: Norman Wright Mech. Equip. Corp.		
Product: Skyline Air Handler	Project Name: San Rafael HS - LA (Liberal Arts) Building			Billing Engineer:		
Model: OAH039GVCM	Sept. 23, 2024	Ver/Rev:	Sheet: 1 of 1	Scale: NTS	Tolerance: +/-0.25"	Dwg Units: in

DAIKIN
13600 Industrial Park Blvd, Minneapolis, MN 55441
www.DaikinApplied.com Software Version: 13.43

All opening dimensions have a 1" mounting flange along the inner edge. The actual airflow area of the opening is 2" smaller in each dimension.



PLAN VIEW

ELEVATION VIEW

Plan/Elevation - No Ends	Unit Tag: AHU Supply - w Electric heat			Sales Office: Norman Wright Mech. Equip. Corp.		
Product: Skyline base	Project Name: San Rafael HS - LA (Liberal Arts) Building			Billing Engineer:		
Model: OAH039GVCM	Sept. 23, 2024	Ver/Rev:	Sheet: 1 of 1	Scale: NTS	Tolerance: +/-0.25"	Dwg Units: in

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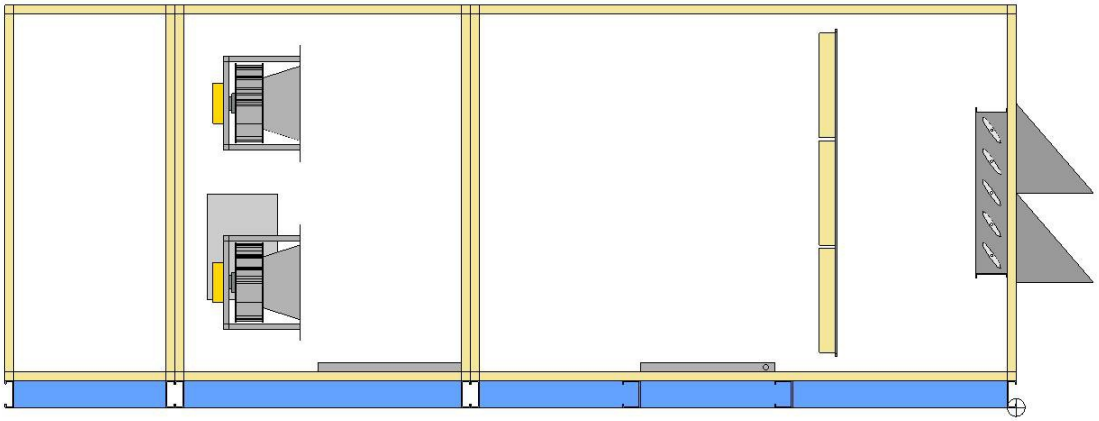
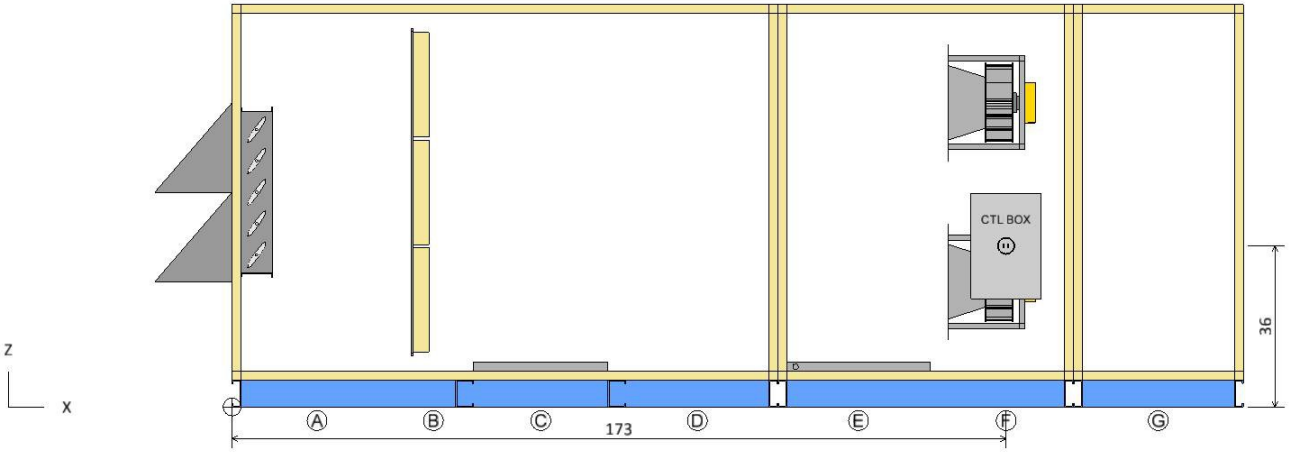


LEFT ELEVATION VIEW



RIGHT ELEVATION VIEW

Component Key

	Type	X	Y	Z	Volts	Phase
Ⓕ	Supply Fan Fan	173.00	0.00	36.00	200	3

Note: Dimensions are measured from the origin point.

Electrical Connections	Unit Tag: AHU Supply - w Electric heat			Sales Office: Norman Wright Mech. Equip. Corp.		
Product: Skyline Air Handler	Project Name: San Rafael HS - LA (Liberal Arts) Building			Billing Engineer:		
Model: OAH039GVCM	Sept. 23, 2024	Ver/Rev:	Sheet: 1 of 1	Scale: NTS	Tolerance: +/-0.25"	Dwg Units: in

DAIKIN
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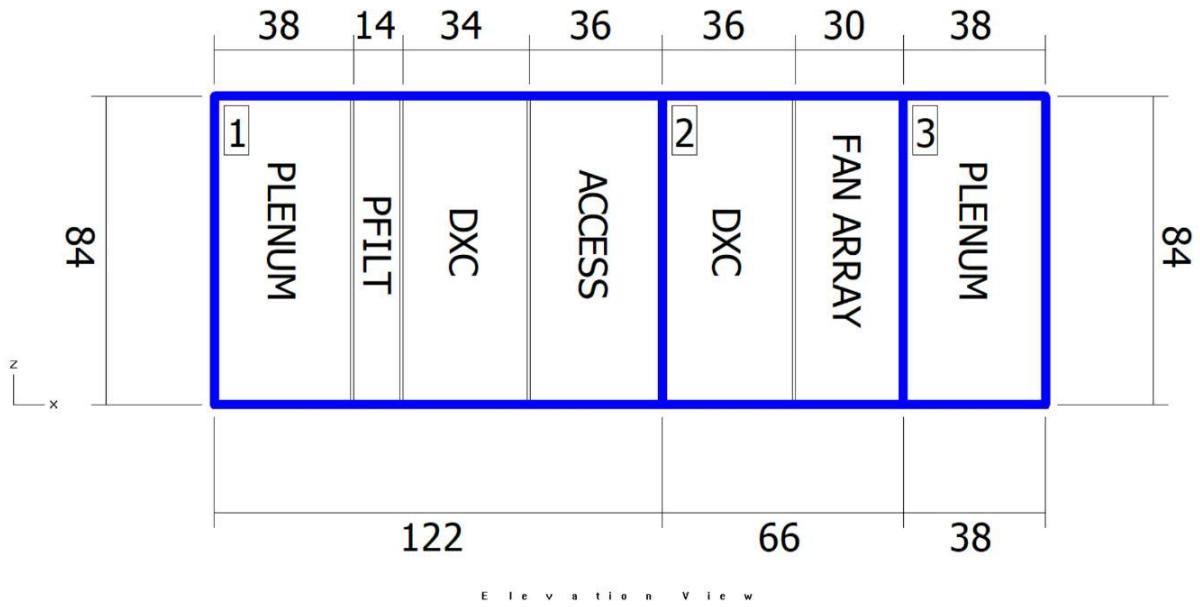
www.DaikinApplied.com Software Version: 13.43

All opening dimensions have a 1" mounting flange along the inner edge. The actual airflow area of the opening is 2" smaller in each dimension.



Elevation View

Shipping Sections

Section	Weight (lb)	X	Y	Z
Section 1	2315.90	122	86	84
Section 2	1695.79	66	86	84
Section 3	601.12	38	86	84
Total Unit	4612.81	226	86	84

Note: Base rails, curb ready base, coil connectors, drain connectors, and control boxes not included in height X, Y, Z dimensions.
Shipping section may be 2" longer in air flow direction due to internal splice joint.

Shipping Sections	Unit Tag: AHU Supply - w Electric heat			Sales Office: Norman Wright Mech. Equip. Corp.		
Product: Skyline Air Handler	Project Name: San Rafael HS - LA (Liberal Arts) Building			Sales Engineer:		
Model: OAH039GVCM	Sept. 23, 2024	Ver/Rev:	Sheet: 1 of 1	Scale: NTS	Tolerance: +/-0.25"	Dwg Units: in

DAIKIN
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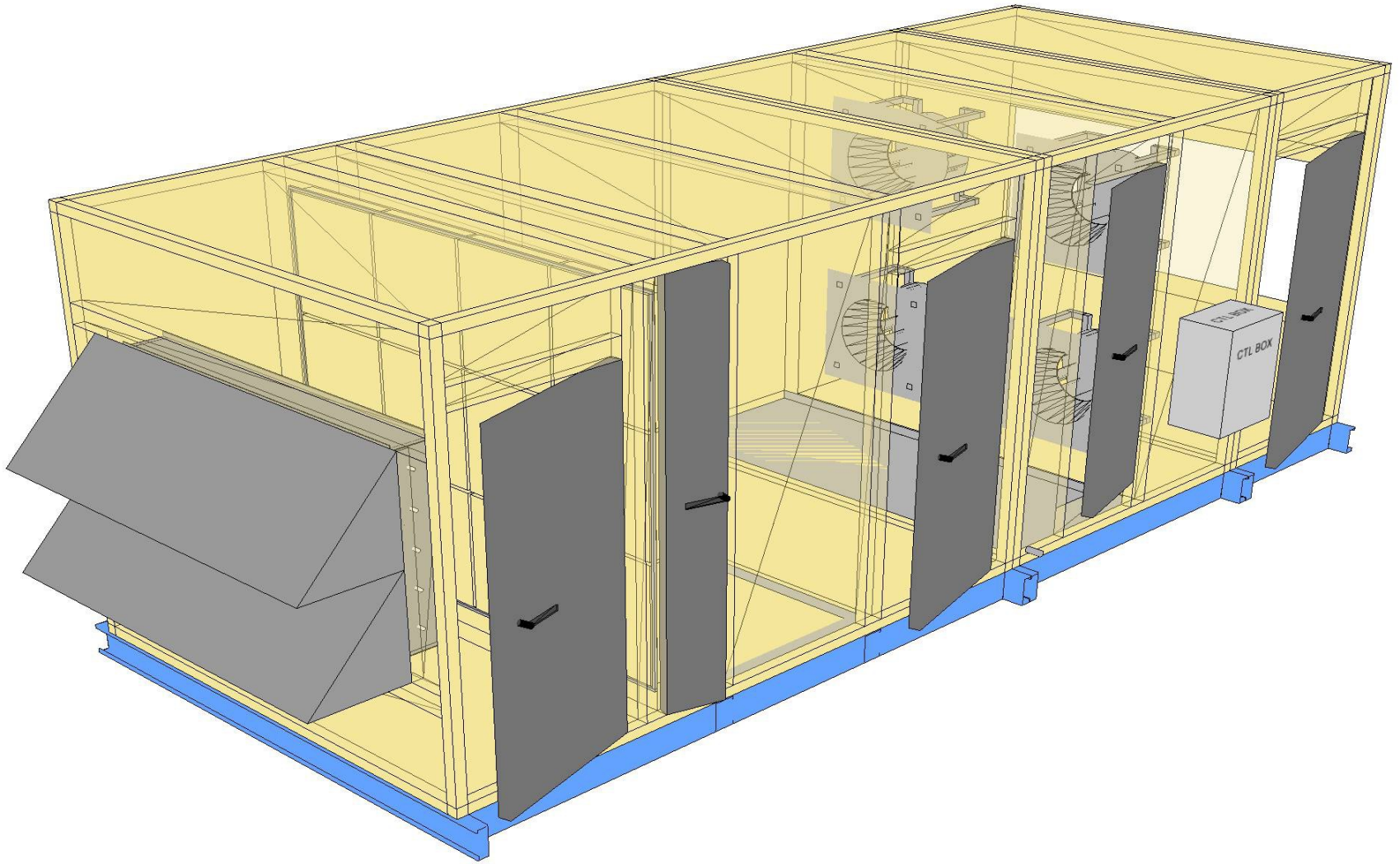
All opening dimensions have a 1" mounting flange along the inner edge. The actual airflow area of the opening is 2" smaller in each dimension.



Product Drawing	Unit Tag: AHU Supply - w Electric heat			Sales Office: Norman Wright Mech. Equip. Corp.			DAIKIN
Product: Skyline Air Handler	Project Name: San Rafael HS - LA (Liberal Arts) Building			Billing Engineer:			13600 Industrial Park Blvd, Minneapolis, MN 55441
Model: OAH039GVCM	Sept. 23, 2024	Ver/Rev:	Sheet: 1 of 1	Scale: NTS	Tolerance: +/-0.25"	Dwg Units: in	www.DaikinApplied.com Software Version: 13.43

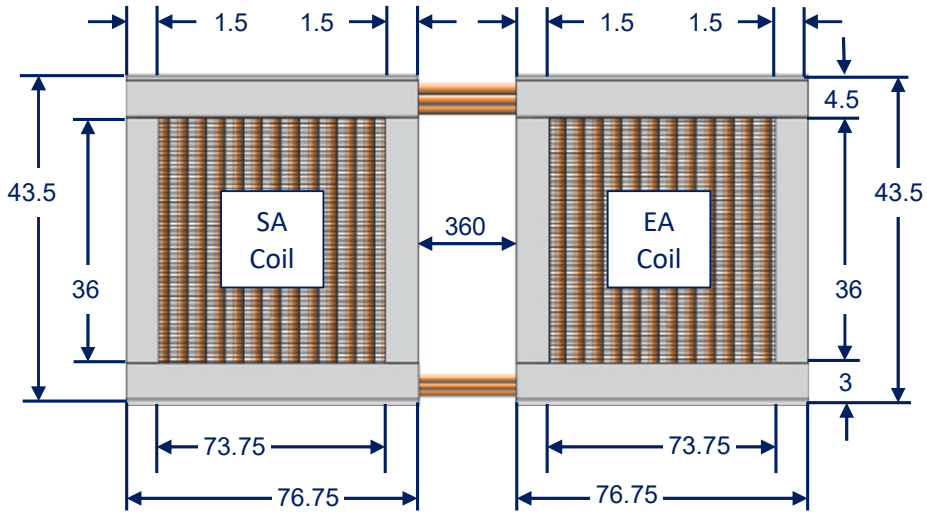
All opening dimensions have a 1" mounting flange along the inner edge. The actual airflow area of the opening is 2" smaller in each dimension.

Equipment Cut Sheet:

Heat Pipe Coil

300 – 27th Street | Oakland, CA 94612 | phone: (510) 446-2222 | fax: (510) 446-2211
Oakland Davis Los Angeles

ADVANCED COOLING TECHNOLOGIES
The Thermal Management Experts | www.1-ACT.com



SA Coil Dimensions (in)	FH_{SA}	FL_{SA}	E1	E2	E5	E6	H_{SA}	L_{SA}
	36	73.75	1.5	1.5	4.5	3	43.5	76.75

EA Coil Dimensions (in)	FH_{EA}	FL_{EA}	E3	E4	E5	E6	H_{EA}	L_{EA}
	36	73.75	1.5	1.5	4.5	3	43.5	76.75

Overall Dimensions (in)	Stacked Units	Rows	FPI	OAH	OAL	W	FW	C
	1	10	14	43.5	513.5	12	10.83	360

Coil Characteristics	Coating	Valves	Refrigerant	Casing	Est Weight, lbs
	Ecoat	5	None	Stainless Steel	1940

DOAS 10 Row Traditional Pipe-to-Pipe AAHX

- Standard Air to Air Heat Pipe Heat Exchanger (AAHX)
- 72.5in FH x 73in FL (SA) 73in FL (EA)
- ½" copper rifled tube heat pipes
- Aluminum corrugated fins (.006" thick)
- Stainless Steel Casing
- Refrigerant R134a
- Electrofin Coated
- No Controls Required

Equipment Cut Sheet:

Condensing Unit - VRV

VRV Selection

Project Report

Report details

Produced on: 8/26/2024

Application version: 2024.8.21.2

Project details

Project name: San Rafael HS VRV Replacement

Solution name: Existing System with 96->144 upgrade

Client Name:

Customer reference:

Quotation reference:

Project number: 651555/820876

Selection parameters of the indoor units can be found in the Engineering Data Books
Selection parameters of the outdoor units can be found in the Engineering Data Books
Only the data published in the data book are correct. This program uses close approximations of these data.

Material list

Model	Quantity	Description
RXYQ144AAYDA	2	VRV EMERION (460V)
RXYQ168AAYDA	1	VRV EMERION (460V)
EKEXV400-US	3	AHU INTEGRATION VALVE KIT
EKEQFCBAV3-US	3	AHU Kit W-Control box

Indoor unit details

Table of abbreviations

Abbreviation	Description
Name	Logical name of the device
FCU	Device model name
Tmp C	Indoor conditions in cooling
Max TC	Available total cooling capacity
Max SC	Available sensible cooling capacity
Tmp H	Indoor temperature in heating
Max HC	Available heating capacity
Tdis H	Indoor unit discharge air temperature in heating based on maximum capacities
Sound	Sound pressure level low and high
PS	Power supply (voltage and phases)
MCA	Minimum Circuit Amps
MOP	Maximum Overcurrent Protection
WxHxD	WidthxHeightxDepth
Weight	Weight of the device
Air Flow Rate	Air Flow Rate

Out 1 - RXYQ168AAYDA

Capacity data at conditions and connection ratio (94) as entered

Name	FCU	Cooling		
		Tmp C	Max TC	Max SC
		°F (DBT/WBT)	BTU/h	BTU/h
Coil Circuit 1 box 1	EKEXV400-US	n/a	168,901	n/a

Name	FCU	Heating			
		Tmp H	Max HC	Tdis H	Air Flow Rate
		°F	BTU/h	°F	cfm
Coil Circuit 1 box 1	EKEXV400-US	n/a	187,668	n/a	n/a

Name	FCU	Room	Sound	PS	MCA	MOP	WxHxD	Weight
			dBA		A		inch	lbs
Coil Circuit 1 box 1	EKEXV400-US		-	12 1ph			8.5 x 15.8 x 3.1	6.4

Outdoor vs. indoor position

Outdoor unit placed at the same level as the indoor units.

Out 2 - RXYQ144AAYDA

Capacity data at conditions and connection ratio (91) as entered

Name	FCU	Cooling		
		Tmp C	Max TC	Max SC
		°F (DBT/WBT)	BTU/h	BTU/h
Coil Circuit 2 box 1	EKEXV400-US	n/a	168,901	n/a

Name	FCU	Heating			
		Tmp H	Max HC	Tdis H	Air Flow Rate
		°F	BTU/h	°F	cfm
Coil Circuit 2 box 1	EKEXV400-US	n/a	187,668	n/a	n/a

Name	FCU	Room	Sound	PS	MCA	MOP	WxHxD	Weight
			dBA		A		inch	lbs
Coil Circuit 2 box 1	EKEXV400-US		-	12 1ph			8.5 x 15.8 x 3.1	6.4

Outdoor vs. indoor position

Outdoor unit placed at the same level as the indoor units.

Out 3 Upsized - RXYQ144AAYDA

Capacity data at conditions and connection ratio (91) as entered

Name	FCU	Cooling		
		Tmp C	Max TC	Max SC
		°F (DBT/WBT)	BTU/h	BTU/h
Coil Circuit 2 box 1	EKEXV400-US	n/a	168,901	n/a

Name	FCU	Heating			
		Tmp H	Max HC	Tdis H	Air Flow Rate
		°F	BTU/h	°F	cfm
Coil Circuit 2 box 1	EKEXV400-US	n/a	187,668	n/a	n/a

Name	FCU	Room	Sound	PS	MCA	MOP	WxHxD	Weight
			dBA		A		inch	lbs
Coil Circuit 2 box 1	EKEXV400-US		-	12 1ph			8.5 x 15.8 x 3.1	6.4

Outdoor vs. indoor position

Outdoor unit placed at the same level as the indoor units.

Outdoor unit details

Table of abbreviations

Abbreviation	Description
Name	Logical name of the device
Model	Device model name
CR	Connection ratio
Tmp C	Outdoor conditions in cooling
WFR per module	Water flow per outdoor unit module
CC	Available cooling capacity
Rq CC	Required cooling capacity
PIC	Power input in cooling mode
InC	Water inlet temperature in cooling mode
OutC	Water outlet temperature in cooling mode
Tmp H	Outdoor conditions in heating (dry bulb temp. / RH)
HC	Available heating capacity (integrated heating capacity)
Rq HC	Required heating capacity
PIH	Power input in heating mode
InH	Water inlet temperature in heating mode
OutH	Water outlet temperature in heating mode
Piping	Largest distance from indoor unit to outdoor unit
Bse Refr	Standard factory refrigerant charge (16.4ft actual piping length) excluding extra refrigerant charge. For calculation of extra refrigerant charge refer to the databook
Ex Refr	Extra refrigerant charge
PS	Power supply (voltage and phases)
MCA	Minimum Circuit Amps
MOP	Maximum Overcurrent Protection
FLA	Fan Motor Input
RLA	Nominal Running Amps
WxHxD	WidthxHeightxDepth
Weight	Weight of the device
EER	EER value at nominal condition
EER2	EER2 value at nominal condition
IEER	IEER value at nominal condition
COP47	COP value at nominal condition and at ambient temperature of 47°F
COP17	COP value at nominal condition and at ambient temperature of 17°F

Outdoor details

Out 1 & 2 are existing. Out 3 is upsized from 96 -> 144 MBH

Name	Model	CR	Cooling			Heating			Piping
			Tmp C	CC	Rq CC	Tmp H	HC	Rq HC	
		%	°F	BTU/h	BTU/h	°F (DBT/WBT)	BTU/h	BTU/h	ft
Out 1	RXYQ168AAYDA	93.8	95.0	168,024	84,000	30.0/28.0	145,737	84,000	24.6
Out 2	RXYQ144AAYDA	91.2	95.0	144,115	70,000	30.0/28.0	138,031	70,000	24.6
Out 3 Upsized	RXYQ144AAYDA	91.2	95.0	144,115	70,000	30.0/28.0	138,031	70,000	24.6

Name	Model	PS	MCA	MOP	RLA	FLA	WxHxD	Weight
			A	A	A	A	inch	lbs
Out 1	RXYQ168AAYDA	460V 3ph	24.9	30.0	14.8		48.8 x 65.4 x 30.1	760.6
Out 2	RXYQ144AAYDA	460V 3ph	21.3	25.0	11.7		48.8 x 65.4 x 30.1	760.6
Out 3 Upsized	RXYQ144AAYDA	460V 3ph	21.3	25.0	11.7		48.8 x 65.4 x 30.1	760.6

Name	Efficiency Metrics - Ducted									
	EER	EER2	IEER	COP47	COP17	SCHE	SEER	SEER2	HSPF	HSPF2
Out 1	11		21.2	3.3	2.1					
Out 2	11.7		22.9	3.4	2.1					
Out 3 Upsized	11.7		22.9	3.4	2.1					

Name	Efficiency Metrics - Non Ducted									
	EER	EER2	IEER	COP47	COP17	SCHE	SEER	SEER2	HSPF	HSPF2
Out 1	11.2		23.4	3.4	2.2					
Out 2	12.4		25.4	3.7	2.2					
Out 3 Upsized	12.4		25.4	3.7	2.2					

Sound Data

Name	Model	Sound Power		Sound Pressure	
		Cooling	Heating	Cooling	Heating
		dBA	dBA	dBA	dBA
Out 1	RXYQ168AAYDA	-	-	65	-
Out 2	RXYQ144AAYDA	-	-	65	-
Out 3 Upsized	RXYQ144AAYDA	-	-	65	-

Refrigerant information

Name	Model	Refrigerant type	GWP	Base charge lbs	Extra charge lbs	Total refrigerant charge lbs	Total CO2 equivalent tonnes
Out 1	RXYQ168AAYDA	R410A	2087.5	25.79	unknown	unknown	24.42
Out 2	RXYQ144AAYDA	R410A	2087.5	25.79	unknown	unknown	24.42
Out 3 Upsized	RXYQ144AAYDA	R410A	2087.5	25.79	unknown	unknown	24.42

The system(s) contain fluorinated greenhouse gases.

When extra refrigerant charge requirements are not calculated, TCO2 equivalent is calculated only considering the base refrigerant charge. Depending on the field pipe length extra refrigerant needs to be added which will increase the TCO2 equivalent.

Out 1 - RXYQ168AAYDA

Model	Quantity	Description
RXYQ168AAYDA	1	VRV EMERION (460V)
EKEXV400-US	1	AHU INTEGRATION VALVE KIT
EKEQFCBAV3-US	1	AHU Kit W-Control box

Refrigerant information

Refrigerant type	GWP	Base charge lbs	Extra charge lbs	Total refrigerant charge lbs	Total CO2 equivalent tonnes
R410A	2087.5	25.79	unknown	unknown	24.42

The system(s) contain fluorinated greenhouse gases.

When extra refrigerant charge requirements are not calculated, TCO2 equivalent is calculated only considering the base refrigerant charge. Depending on the field pipe length extra refrigerant needs to be added which will increase the TCO2 equivalent.

Out 2 - RXYQ144AAYDA

Model	Quantity	Description
RXYQ144AAYDA	1	VRV EMERION (460V)
EKEXV400-US	1	AHU INTEGRATION VALVE KIT
EKEQFCBAV3-US	1	AHU Kit W-Control box

Refrigerant information

Refrigerant type	GWP	Base charge lbs	Extra charge lbs	Total refrigerant charge lbs	Total CO2 equivalent tonnes
R410A	2087.5	25.79	unknown	unknown	24.42

The system(s) contain fluorinated greenhouse gases.

When extra refrigerant charge requirements are not calculated, TCO2 equivalent is calculated only considering the base refrigerant charge. Depending on the field pipe length extra refrigerant needs to be added which will increase the TCO2 equivalent.

Out 3 Upsized - RXYQ144AAYDA

Model	Quantity	Description
RXYQ144AAYDA	1	VRV EMERION (460V)
EKEXV400-US	1	AHU INTEGRATION VALVE KIT
EKEQFCBAV3-US	1	AHU Kit W-Control box

Refrigerant information

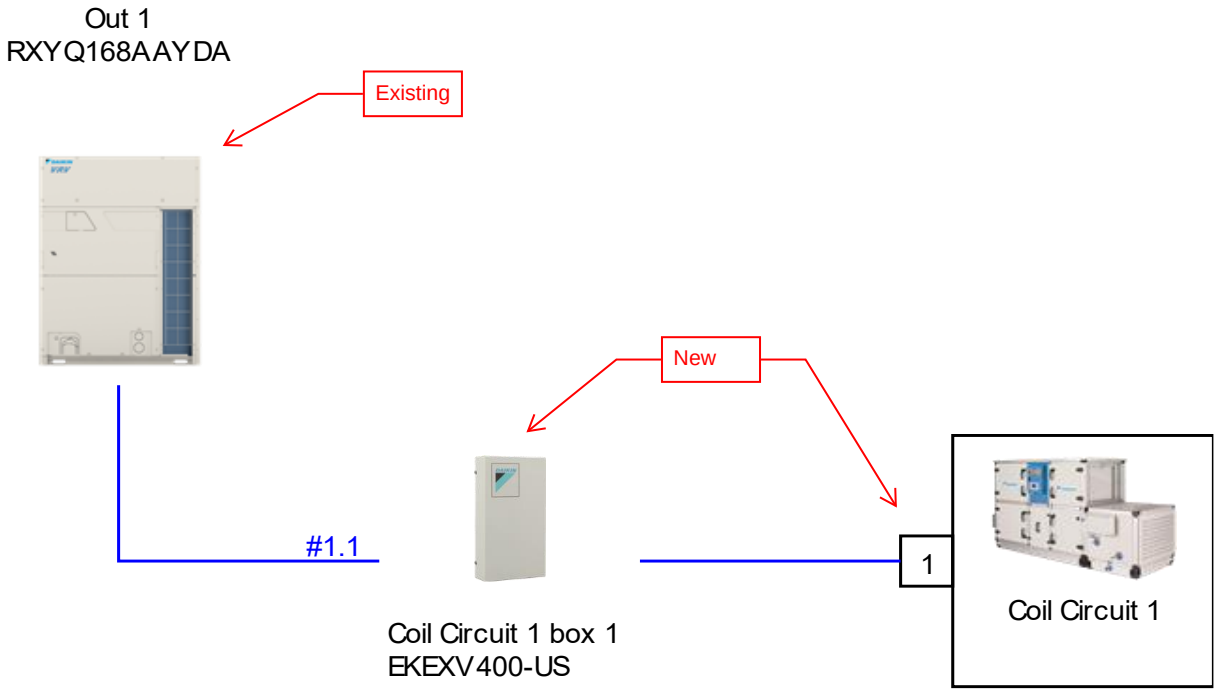
Refrigerant type	GWP	Base charge lbs	Extra charge lbs	Total refrigerant charge lbs	Total CO2 equivalent tonnes
R410A	2087.5	25.79	unknown	unknown	24.42

The system(s) contain fluorinated greenhouse gases.

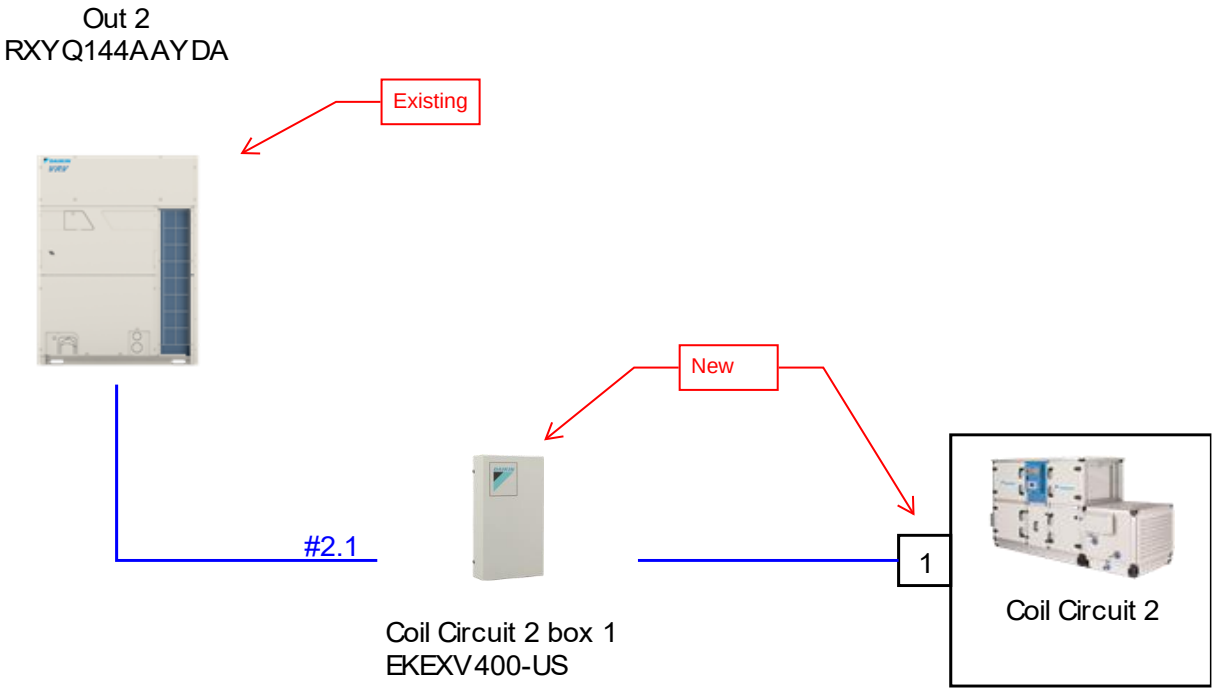
When extra refrigerant charge requirements are not calculated, TCO2 equivalent is calculated only considering the base refrigerant charge. Depending on the field pipe length extra refrigerant needs to be added which will increase the TCO2 equivalent.

Piping diagrams

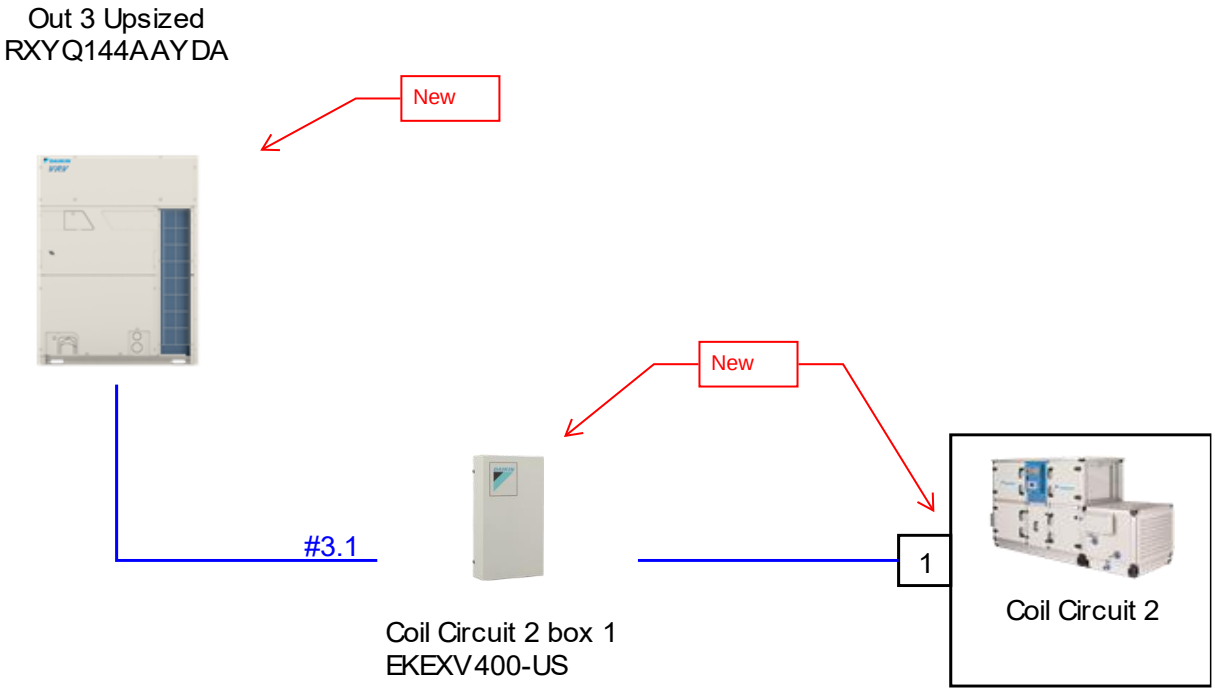
Piping Out 1



Piping Out 2

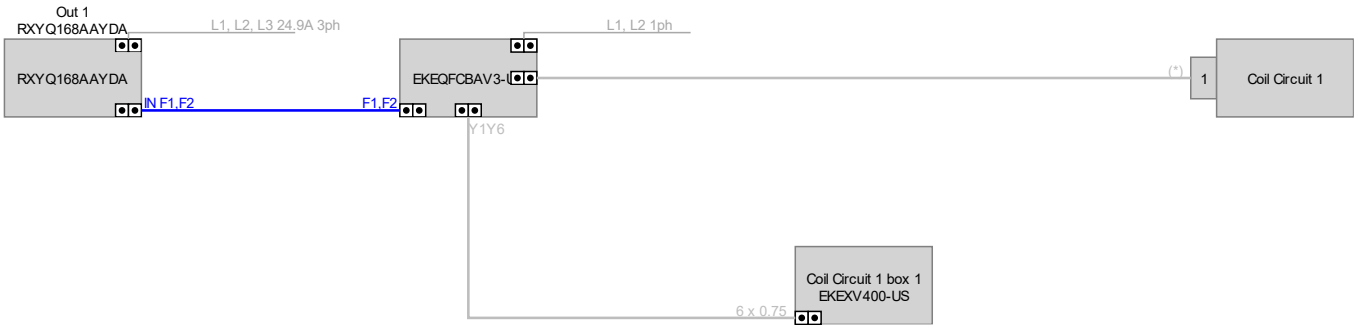


Piping Out 3 Upsized



Wiring diagrams

Wiring Out 1

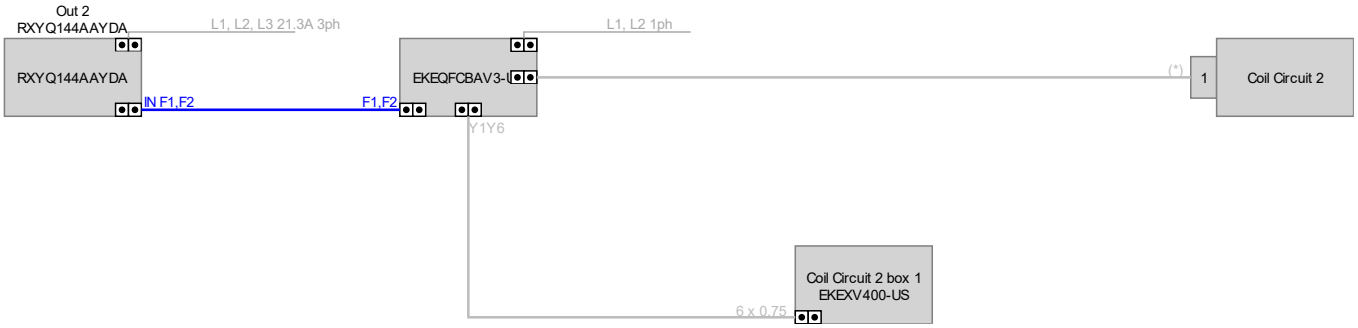


Remarks

F1F2 IN/OUT = AWG 18-2 is required - however always refer to local code for further information

Note:

Wiring Out 2

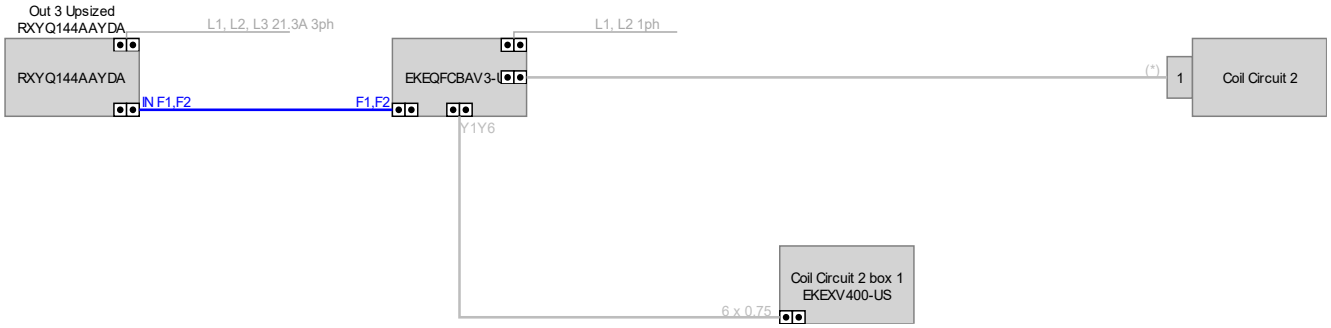


Remarks

F1F2 IN/OUT = AWG 18-2 is required - however always refer to local code for further information

Note:

Wiring Out 3 Upsized



Remarks

F1F2 IN/OUT = AWG 18-2 is required - however always refer to local code for further information

Note:

Submittal Data Sheet

12 Ton, 460V, VRV EMERION HP

RXYQ144AAYDB

FEATURES

- New Simple and Stylish design with expanded line up with single modeule units from
- Space-saving 16 - 20 T single module units provide up to 34% footprint and up to 500 lbs./unit weight reduction compared to previous series
- High energy efficiency with IEERs up to 28.5 delivers up to 30% efficiency increase
- Year-round comfort and energy saving with Daikin's Variable Refrigerant Temperature Technology (VRT)
- Heating down to -13°F as standard and high heating capacities at 17°F make it an ideal choice for all-electric heat pump solutions
- Hot gas defrost circuit allows for installation without base pan heater
- High dust moisture protection with an IP55 rated sealed E-box
- Dual-Fuel ready with connectivity to Daikin communicating gas furnance or all-electric heat pump heating for optimized operational cost based on utility rates
- Increased piping lengths of up to 361 ft. vertical separation between ODU and IDU provide additional application flexibilty compared to previous VRV systems
- Design flexibility to enlarge system from single to a dual-module without changes to installed main pipe sizes for phased installation or tenant fit-out buildings
- Local code compliance-ready from factory via alignment with compliance needs, such as OSHPD Seismic, Miami Dade Wind, and Chicago Pressure relief code
- Reduced wiring costs with up to 27.4% reduction in MCA values compared to previous series
- Engineered for ease of installation and service with three-segment panel desgn
- Factory ships with increase space for easy field piping connection to service valves
- Built-in data recorder to store up to 40 minutes of operational data
- Ingtegrates with new Daikin HERO ecosystem, an IoT -based remote monitoring and diagnostics platform
- Connect non standard VRV terminal units and AHUs with Daikin VRV EMERION leveraging Daikin Air Handling Unit Integration Kit to extend benefits of inverter technology to custom terminal units and AHUs. A kit consists of One Control Box and One EEV box. Offered via EKEQMCBAV3-US and EKEQFCBAV3-US.

Submittal Data Sheet
12 Ton, 460V, VRV EMERION HP
RXYQ144AAYDB

PERFORMANCE

Outdoor Unit Model No.	RXYQ144AAYDB	Outdoor Unit Name:	12 Ton, 460V, VRV EMERION HP
Type:	Heat Pump	Unit Combination:	
Rated Cooling Conditions:	Indoor (°F DB/WB): 80 / 67 Ambient (°F DB/WB): 95 / 75	Rated Heating Conditions:	Indoor (°F DB/WB): 70 / 60 Ambient (°F DB/WB): 47 / 43
Rated Piping Length(ft):			
Rated Height Difference (ft):			
Rated Cooling Capacity (Btu/hr):	138,000	Rated Heating Capacity (Btu/hr):	138,000
Nom Cooling Capacity (Btu/hr):	144,000	Nom Heating Capacity (Btu/hr):	162,000
Cooling Input Power (kW):		Heating Input Power (kW):	
EER (Non-Ducted/Ducted):	11.00 / 10.90	Heating COP (Non-Ducted/Ducted):	3.3 / 3.4
IEER (Non-Ducted/Ducted):	21.80 / 18.80	Heating COP 17F (Non-Ducted/Ducted):	2.1 / 2.1

OUTDOOR UNIT DETAILS

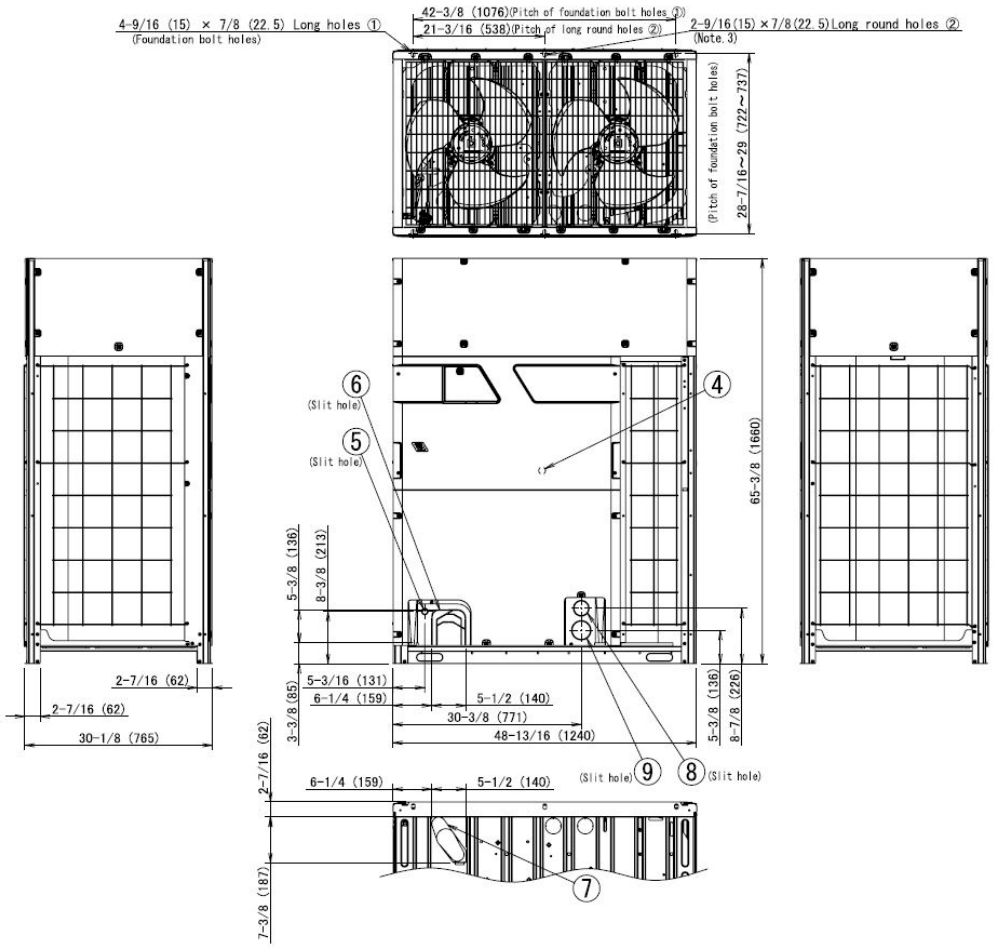
Power Supply (V/Hz/Ph):	460 / 60 / 3	Compressor Stage:	
Power Supply Connections:		Capacity Control Range (%):	3 - 100
Min. Circuit Amps MCA (A):	21.3	Capacity Index Limit:	-
Max Overcurrent Protection (MOP) (A):	25	Airflow Rate (H) (CFM):	9935
Max Starting Current MSC(A):		Gas Pipe Connection (inch):	1-1/8
Rated Load Amps RLA(A):		Liquid Pipe Connection (inch):	1/2
Dimensions (Height) (in):	65-3/8	H/L Pressure Connection (inch)	
Dimensions (Width) (in):	48-13/16	H/L Equalizing Connection (inch)	
Dimensions (Depth) (in):	30-1/8	Sound Pressure (H) (dBA):	65
Net Weight (lb):	761	Sound Power Level (dBA):	

Submittal Data Sheet
12 Ton, 460V, VRV EMERION HP
RXYQ144AAYDB

SYSTEM DETAILS

Refrigerant Type:		Cooling Operation Range (°F DB):	23 - 122
Holding Refrigerant Charge (lbs):	25.8	Heating Operation Range (°F WB):	-13 - 60
Additional Charge (oz/ft):		Max. Pipe Length (Vertical) (ft):	
Pre-charge Piping (Length) (ft):		Cooling Range w/Baffle (°F DB):	-
Max. Pipe Length (Total) (ft):			
Max Height Separation (Ind to Ind ft):			

DIMENSIONAL DRAWING



Equipment Cut Sheet:

Condensing Unit – VRV Coil

COILCALC EVAPORATOR VERIFICATION

Customer **Date** 8/26/2024 12:30:45 PM

Contact

Telephone

Email

Project

Saved run \ Version#: 2833515 \ 2.1.2316.1378

Item/Description DX-1 (12 Ton Circuit-A)

CONSTRUCTION DATA

Model		3EN0604B - 22 x 73	Connection material	Copper
Coils per bank		1	Connection type	Sweat
Style		EN		
Tube OD	[in]	3/8		
Fin spacing	[/in]	6.000		
Rows		4		
Fin surface		B		
Fin height x length	[in]	22.00 x 73.00		
Circuiting		11.00		
Tube material	[in]	0.020 Copper		
Fin material	[in]	0.0075 Aluminum		

THERMODYNAMIC

AIR SIDE			REFRIGERANT SIDE		
Face velocity (Standard)	[ft/min]	505.7	Refrigerant		R-410A
Air flow (Standard)	[cfm]	5,640	Liquid temp.	[°F]	77.00
Altitude	[ft]	0	Saturated temp.	[°F]	42.80
EAT db / wb	[°F]	80.00 / 65.00	Superheat	[°F]	9.000

OPTIONS/SPECIALTIES

Dist. #1	[in]	(1) 0.875 Code 7011/10	Mounting holes
			Label kit
			Nitrogen charge

RESULTS

CONSTRUCTION			AIR SIDE		
Number of circuits		11.00	Total / Sensible capacity	[MBH]	142.0 / 110.3
Internal volume	[in³]	696.4	LAT db / wb	[°F]	61.89 / 56.81
Weight	[lbs]	123.0	Air pressure drop (Standard)	[in wg]	0.2945
Refrigerant mass	[lbm]	1.418			
Suction qty		1			
Suction size	[in]	1.375			
Face area	[ft²]	11.15			

REFRIGERANT SIDE		
Refrigerant pressure drop	[psi]	8.419
Refrigerant velocity	[ft/min]	1,818
Refrigerant mass flow	[lbm/h]	1,803

NOTES FROM CALCULATIONS

C - Coil is NOT certified by AHRI. Coil is within the scope of the AHRI Forced-Circulation Air-Cooling and Air-Heating Coils Certification Program.

M - Coil rating valid for Heatcraft coils only.

USER NOTES

1. 12 Ton Circuit performance
2. Circuit to take (1) EXV400

Heatcraft® heat transfer coils

MODINE

COILCALC EVAPORATOR VERIFICATION

Customer		**Date**	8/26/2024 12:30:45 PM
Contact		**By**	
Telephone		**Company**	
Email		**Return telephone**	
Project		**Email**	

Saved run \ Version#: 2833531 \ 2.1.2316.1378
Item/Description DX-1 (12 Ton Circuit-B)

CONSTRUCTION DATA

Model		3EN0604B - 22 x 73	Connection material		Copper
Coils per bank		1	Connection type		Sweat
Style		EN			
Tube OD	[in]	3/8			
Fin spacing	[/in]	6.000			
Rows		4			
Fin surface		B			
Fin height x length	[in]	22.00 x 73.00			
Circuiting		11.00			
Tube material	[in]	0.020 Copper			
Fin material	[in]	0.0075 Aluminum			

THERMODYNAMIC

AIR SIDE			**REFRIGERANT SIDE**		
Face velocity (Standard)	[ft/min]	505.7	Refrigerant		R-410A
Air flow (Standard)	[cfm]	5,640	Liquid temp.	[°F]	77.00
Altitude	[ft]	0	Saturated temp.	[°F]	42.80
EAT db / wb	[°F]	80.00 / 65.00	Superheat	[°F]	9.000

OPTIONS/SPECIALTIES

Dist. #1	[in]	(1) 0.875 Code 7011/10	Mounting holes
			Label kit
			Nitrogen charge

RESULTS

CONSTRUCTION			**AIR SIDE**		
Number of circuits		11.00	Total / Sensible capacity	[MBH]	142.0 / 110.3
Internal volume	[in³]	696.4	LAT db / wb	[°F]	61.89 / 56.81
Weight	[lbs]	123.0	Air pressure drop (Standard)	[in wg]	0.2945
Refrigerant mass	[lbm]	1.418			
Suction qty		1			
Suction size	[in]	1.375			
Face area	[ft²]	11.15			

REFRIGERANT SIDE		
Refrigerant pressure drop	[psi]	8.419
Refrigerant velocity	[ft/min]	1,818
Refrigerant mass flow	[lbm/h]	1,803

NOTES FROM CALCULATIONS

C - Coil is NOT certified by AHRI. Coil is within the scope of the AHRI Forced-Circulation Air-Cooling and Air-Heating Coils Certification Program.
M - Coil rating valid for Heatcraft coils only.

USER NOTES

1. 12 Ton Circuit performance
2. Circuit to take (1) EXV400

COILCALC EVAPORATOR VERIFICATION

Customer		**Date**	8/26/2024 12:30:45 PM
Contact		**By**	
Telephone		**Company**	
Email		**Return telephone**	
Project		**Email**	

Saved run \ Version#: 2833534 \ 2.1.2316.1378
Item/Description DX-1 (16 Ton Circuit-C)

CONSTRUCTION DATA

Model		3EN0604B - 28 x 73	Connection material		Copper
Coils per bank		1	Connection type		Sweat
Style		EN			
Tube OD	[in]	3/8			
Fin spacing	[/in]	6.000			
Rows		4			
Fin surface		B			
Fin height x length	[in]	28.00 x 73.00			
Circuiting		14.00			
Tube material	[in]	0.020 Copper			
Fin material	[in]	0.0075 Aluminum			

THERMODYNAMIC

AIR SIDE			**REFRIGERANT SIDE**		
Face velocity (Standard)	[ft/min]	529.8	Refrigerant		R-410A
Air flow (Standard)	[cfm]	7,520	Liquid temp.	[°F]	77.00
Altitude	[ft]	0	Saturated temp.	[°F]	42.80
EAT db / wb	[°F]	80.00 / 65.00	Superheat	[°F]	9.000

OPTIONS/SPECIALTIES

Dist. #1	[in]	(1) 1.125 Code 7014/12	Mounting holes
			Label kit
			Nitrogen charge

RESULTS

CONSTRUCTION			**AIR SIDE**		
Number of circuits		14.00	Total / Sensible capacity	[MBH]	184.7 / 144.3
Internal volume	[in³]	885.3	LAT db / wb	[°F]	62.24 / 57.03
Weight	[lbs]	146.6	Air pressure drop (Standard)	[in wg]	0.3191
Refrigerant mass	[lbm]	1.802			
Suction qty		1			
Suction size	[in]	1.375			
Face area	[ft²]	14.19			

REFRIGERANT SIDE		
Refrigerant pressure drop	[psi]	8.738
Refrigerant velocity	[ft/min]	1,858
Refrigerant mass flow	[lbm/h]	2,346

NOTES FROM CALCULATIONS

C - Coil is NOT certified by AHRI. Coil is within the scope of the AHRI Forced-Circulation Air-Cooling and Air-Heating Coils Certification Program.
M - Coil rating valid for Heatcraft coils only.

USER NOTES

1. 14 Ton Circuit performance
2. Circuit to take (1) EXV500

COILCALC CONDENSER VERIFICATION

Customer		**Date**	8/26/2024 12:30:45 PM
Contact		**By**	
Telephone		**Company**	
Email		**Return telephone**	
Project		**Email**	

Saved run \ Version#: 2856042 \ 2.1.2316.1378
Item/Description DX-1 (Circuit A Heating)

CONSTRUCTION DATA

Model		3CN0604B - 22 x 73	Connection material		Copper
Coils per bank		1	Connection type		Sweat
Duty / Style		Condenser / CN	Connection end		Same End
Tube OD	[in]	3/8			
Fin spacing	[/in]	6.000			
Rows		4			
Fin surface		B			
Fin height x length	[in]	22 x 73			
Number of circuits		11			
Tube material	[in]	0.020 Copper			
Fin material	[in]	0.0075 Aluminum			

THERMODYNAMIC

AIR SIDE			**REFRIGERANT SIDE**		
Face velocity (Standard)	[ft/min]	505.7	Refrigerant		R-410A
Air flow (Standard)	[cfm]	5,640	Condensing temp.	[°F]	96.80
Altitude	[ft]	0	Vapor temp.	[°F]	140.0
EAT db	[°F]	50.00	Subcooling temp.	[°F]	5.455

OPTIONS/SPECIALTIES

Casing material		Galvanized Steel	Nitrogen charge
Casing type		Flanged	
Coating		None	
Hand		Left	

RESULTS

CONSTRUCTION			**AIR SIDE**		
Number of circuits		11.00	Capacity	[MBH]	160.3
Tubes of liquid		2.404	LAT db	[°F]	76.20
Weight	[lbs]	123.0	Air pressure drop (Standard)	[in wg]	0.2267
Connection size Vapor / Liquid	[in]	1.125 / 0.875			
Connections per header		1.000			
Face area	[ft²]	11.15			
			REFRIGERANT SIDE		
			Refrigerant pressure drop	[psi]	2.799
			Refrigerant mass flow	[lbm/h]	1,803
			Internal volume	[in³]	702.1

NOTES FROM CALCULATIONS

M - Coil rating valid for Heatcraft coils only.

USER NOTES

1. Performance to show total capacity and leaving air temp only
2. condensing temp set at 96.8 to maintain valve capacity.

COILCALC CONDENSER VERIFICATION

Customer		**Date**	8/26/2024 12:30:45 PM
Contact		**By**	
Telephone		**Company**	
Email		**Return telephone**	
Project		**Email**	

Saved run \ Version#: 2856043 \ 2.1.2316.1378
Item/Description DX-1 (Circuit B Heating)

CONSTRUCTION DATA

Model		3CN0604B - 22 x 73	Connection material		Copper
Coils per bank		1	Connection type		Sweat
Duty / Style		Condenser / CN	Connection end		Same End
Tube OD	[in]	3/8			
Fin spacing	[/in]	6.000			
Rows		4			
Fin surface		B			
Fin height x length	[in]	22 x 73			
Number of circuits		11			
Tube material	[in]	0.020 Copper			
Fin material	[in]	0.0075 Aluminum			

THERMODYNAMIC

AIR SIDE			**REFRIGERANT SIDE**		
Face velocity (Standard)	[ft/min]	505.7	Refrigerant		R-410A
Air flow (Standard)	[cfm]	5,640	Condensing temp.	[°F]	96.80
Altitude	[ft]	0	Vapor temp.	[°F]	140.0
EAT db	[°F]	50.00	Subcooling temp.	[°F]	5.455

OPTIONS/SPECIALTIES

Casing material		Galvanized Steel	Nitrogen charge
Casing type		Flanged	
Coating		None	
Hand		Left	

RESULTS

CONSTRUCTION			**AIR SIDE**		
Number of circuits		11.00	Capacity	[MBH]	160.3
Tubes of liquid		2.404	LAT db	[°F]	76.20
Weight	[lbs]	123.0	Air pressure drop (Standard)	[in wg]	0.2267
Connection size Vapor / Liquid	[in]	1.125 / 0.875			
Connections per header		1.000			
Face area	[ft²]	11.15			

REFRIGERANT SIDE		
Refrigerant pressure drop	[psi]	2.799
Refrigerant mass flow	[lbm/h]	1,803
Internal volume	[in³]	702.1

NOTES FROM CALCULATIONS

M - Coil rating valid for Heatcraft coils only.

USER NOTES

1. Performance to show total capacity and leaving air temp only
2. condensing temp set at 96.8 to maintain valve capacity.

COILCALC CONDENSER VERIFICATION

Customer		**Date**	8/26/2024 12:30:45 PM
Contact		**By**	
Telephone		**Company**	
Email		**Return telephone**	
Project		**Email**	

Saved run \ Version#: 2856044 \ 2.1.2316.1378
Item/Description DX-1 (Circuit C Heating)

CONSTRUCTION DATA

Model		3CN0604B - 28 x 73	Connection material		Copper
Coils per bank		1	Connection type		Sweat
Duty / Style		Condenser / CN	Connection end		Same End
Tube OD	[in]	3/8			
Fin spacing	[/in]	6.000			
Rows		4			
Fin surface		B			
Fin height x length	[in]	28 x 73			
Number of circuits		14			
Tube material	[in]	0.020 Copper			
Fin material	[in]	0.0075 Aluminum			

THERMODYNAMIC

AIR SIDE			**REFRIGERANT SIDE**		
Face velocity (Standard)	[ft/min]	529.8	Refrigerant		R-410A
Air flow (Standard)	[cfm]	7,520	Condensing temp.	[°F]	96.80
Altitude	[ft]	0	Vapor temp.	[°F]	140.0
EAT db	[°F]	50.00	Subcooling temp.	[°F]	5.388

OPTIONS/SPECIALTIES

Casing material	Galvanized Steel	Nitrogen charge
Casing type	Flanged	
Coating	None	
Hand	Left	

RESULTS

CONSTRUCTION			**AIR SIDE**		
Number of circuits		14.00	Capacity	[MBH]	210.0
Tubes of liquid		3.041	LAT db	[°F]	75.75
Weight	[lbs]	146.6	Air pressure drop (Standard)	[in wg]	0.2457
Connection size Vapor / Liquid	[in]	1.375 / 1.125			
Connections per header		1.000			
Face area	[ft²]	14.19			
			REFRIGERANT SIDE		
			Refrigerant pressure drop	[psi]	2.946
			Refrigerant mass flow	[lbm/h]	2,363
			Internal volume	[in³]	921.1

NOTES FROM CALCULATIONS

M - Coil rating valid for Heatcraft coils only.

USER NOTES

1. Performance to show total capacity and leaving air temp only
2. condensing temp set at 96.8 to maintain valve capacity.

Equipment Cut Sheet:

Condensing Unit – Expansion Valve

Submittal Data Sheet
AHU Integration Kit – Expansion Valve
EKEXV***-US

DESCRIPTION

Allows for connection and control of non-*VRV* air handling equipment to Daikin *VRV* condensing units.

EKEXV***-US operates in conjunction with EKEQ(M/F)CBAV3-US.

FEATURES

- Electronic expansion valve capable of 2000 steps
- 18 MBH to 192 MBH individual coil capacity capability
- Suitable for indoor and outdoor installation
- Compatible with both EKEQMCBAV3-US and EKEQFCBAV3-US AHU Integration Kit control boxes

SPECIFICATIONS

Model No.	EKEXV50-US	EKEXV63-US	EKEXV80-US	EKEXV100-US	EKEXV125-US
Nominal Capacity (MBh)	18	24	30	36	48
Height (in.)	15 - 25/32"	15 - 25/32"	15 - 25/32"	15 - 25/32"	15 - 25/32"
Width (in.)	8 - 15/32"	8 - 15/32"	8 - 15/32"	8 - 15/32"	8 - 15/32"
Depth (in.)	3 - 5/64"	3 - 5/64"	3 - 5/64"	3 - 5/64"	3 - 5/64"
Liquid Pipe Connection*	1/4"	3/8"	3/8"	3/8"	3/8"
Gas Pipe Connection	1/2"	5/8"	5/8"	5/8"	5/8"
Power Supply	*12V DC from EKEQ box*				

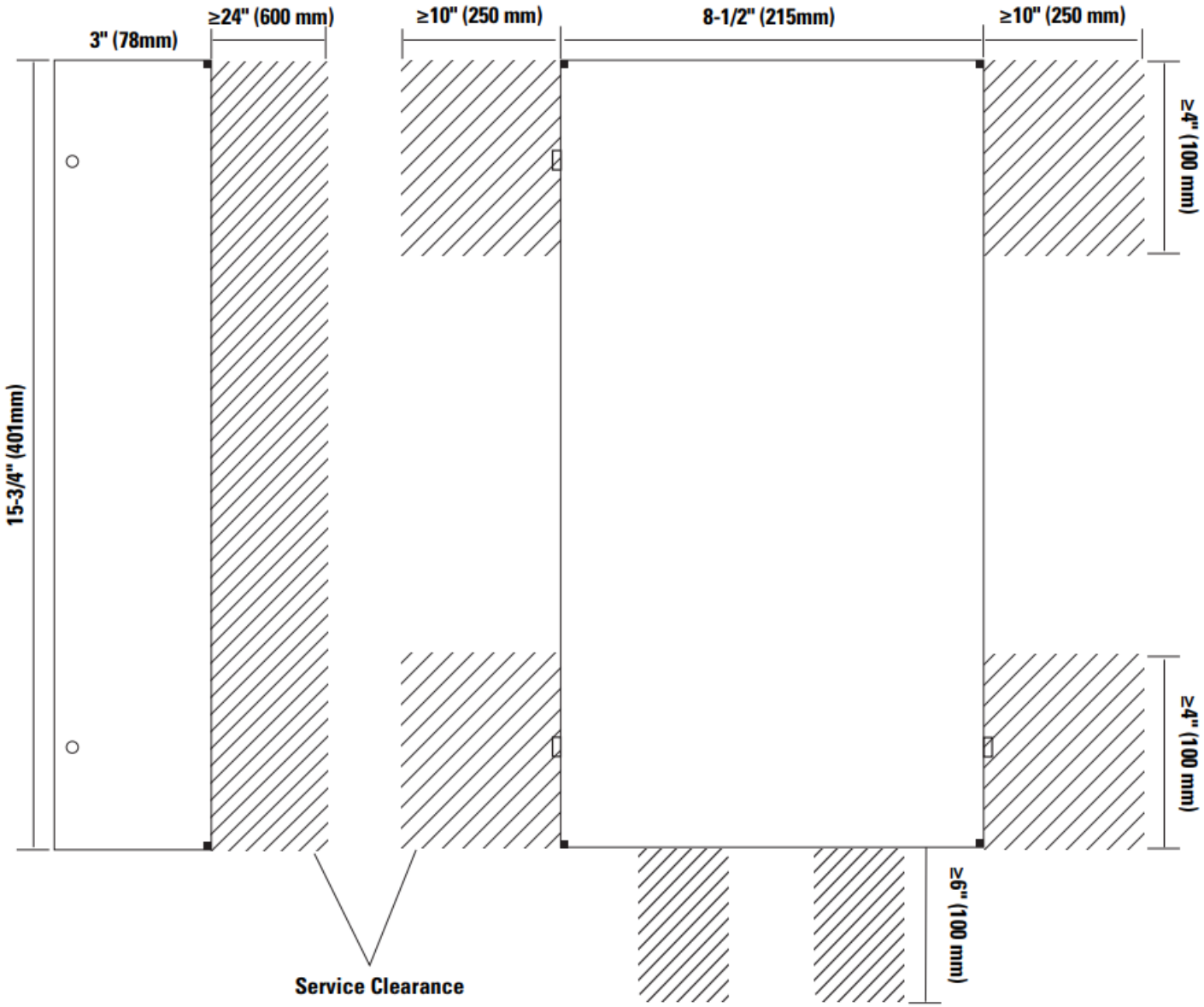
SPECIFICATIONS

Model No.	EKEXV140-US	EKEXV200-US	EKEXV250-US	EKEXV400-US	EKEXV500-US
Nominal Capacity (MBh)	60	72	96	144	192
Height (in.)	15 - 25/32"	15 - 25/32"	15 - 25/32"	15 - 25/32"	15 - 25/32"
Width (in.)	8 - 15/32"	8 - 15/32"	8 - 15/32"	8 - 15/32"	8 - 15/32"
Depth (in.)	3 - 5/64"	3 - 5/64"	3 - 5/64"	3 - 5/64"	3 - 5/64"
Liquid Pipe Connection*	3/8"	3/8"	3/8"	1/2"	5/8"
Gas Pipe Connection	5/8"	3/4"	7/8"	1-1/8"	1-1/8"
Power Supply	*12V DC from EKEQ box*				

Daikin North America LLC, 5151 San Felipe, Suite 500, Houston TX, 77056
www.daikinac.com www.daikincomfort.com

Submittal Data Sheet
AHU Integration Kit – Expansion Valve
EKEXV***-US

DEMENSIONS



Daikin North America LLC, 5151 San Felipe, Suite 500, Houston TX, 77056
www.daikinac.com www.daikincomfort.com

Equipment Cut Sheet:

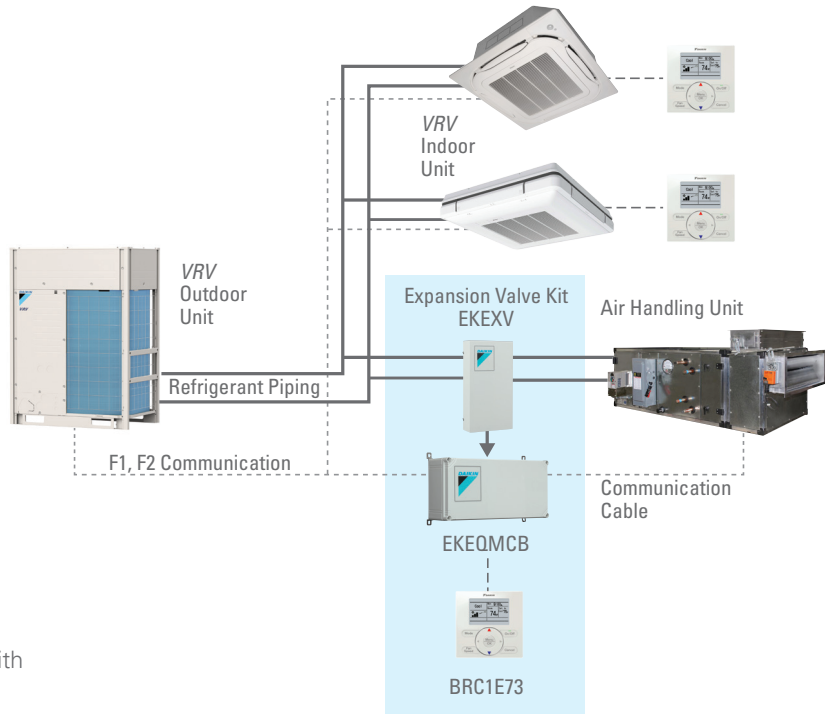
Condensing Unit – Control Box

Control Box
EKEQ_CBAV3-US

EKEQMCBAV3 - US

For use with both Daikin *VRV* indoor units and custom air handling units

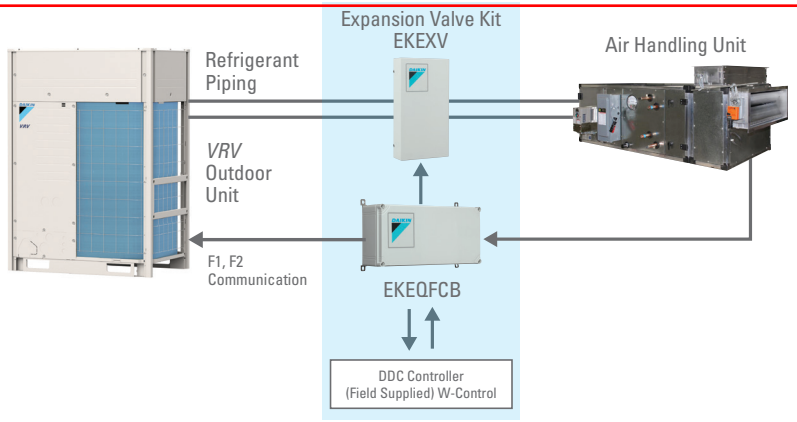
- Allows for return air temperature control
- Seamless integration of non-*VRV* air handling units with *VRV IV* HP and HR systems
- Enables control of the AHU as a *VRV* Indoor unit when integrated with a Daikin remote control
- Connect other *VRV* indoor units along with the AHU to the condensing units
- Provides remote ON/OFF option when integrated with optional KRP4A71 board
- Designed for both indoor and outdoor installations



EKEQFCBAV3 - US

For use with custom air handling units only

- Seamlessly integrate non-*VRV* air handling units with *VRV IV* HP
- Best suited for applications where 1 AHU is connected to 1 *VRV* system only
- Connect up to 3 integration kits per *VRV* system to serve a large capacity AHU
- Unified cooling and heating mode programming
- Enables control of AHU unit using field temperature sensor and 0-10V field supplied DDC controller
- Allows for discharge air temperature control



CONTROL BOX SPECIFICATIONS		EKEQMCBAV3-US (Z-Control)	EKEQFCBAV3-US (W-Control)
Entering Air Temperature Limits	Cooling °F	57 WB - 77 WB	106 DB / 89 WB
	Heating °F	50 DB - 80 DB	Min. of 23 DB
Power Supply	V/ph/Hz	208-230/1/60	
Weight	lbs	8	8.6
Height	in.	5-13/64	
Width	in.	15-3/4	
Depth	in.	9-3/8	
Connection Ratio		50 - 110%	90 - 110%
Max Piping Distance	EKEXV to AHU	16 ft.	16ft.
	ODU to AHU	Standard *VRV* outdoor unit piping limitations based on model selection apply	360 ft.*
Max number of IDU/system *VRV* IDU + AHU AHU Only		64 32	Not available 1

*Additional constraints apply when >164', see selection guide.

VRV SYSTEM	Z-Control (EKEQMCBAV3-US)	W-Control* (EKEQFCBAV3-US)
AURORA all voltages	✓	✓
VRV IV X all voltages	✓	✓
VRV-W T Series all voltages	✓	✓
VRV IV S	✓	✓

* W-Control can only be applied on heat pump systems.

Additional information

Before purchasing this appliance, read important information about its estimated annual energy consumption, yearly operating cost, or energy efficiency rating that is available from your retailer.