COM4T

HUMAN COMFORT

AIRSYS COM4T Wall Mounted Heat Pump

Installation and Operation Manual

Unit Models

CV36H2A

CV60H3A

AIRSYS

Balance the Environment

AIRSYS North America

915 De La Vina St.
Santa Barbara, CA 93101
https://airsysnorthamerica.com

Table of Contents

Chapter 1: Introduction

Using this Manual

Read this manual carefully before attempting to install or start the unit. Retain this manual for reference for the entire operational life of the unit. This manual provides information on the following topics:

- Product overview
- Instructions for physical, and electrical installation of heat pump units
- User's guide

For safety and to achieve the highest levels of performance, always follow the warnings and cautions in this manual when handling and operating the AIRSYS unit.

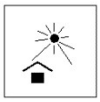
Danger. Emphasizes hazardous conditions that could cause personal injury or death.

Warning. Indicates where the operator must proceed with caution to avoid personal injury or damage to property.

Important. Indicates technical information critical for proper installation or operation.

Table 1 lists symbols that may appear on the external packaging.

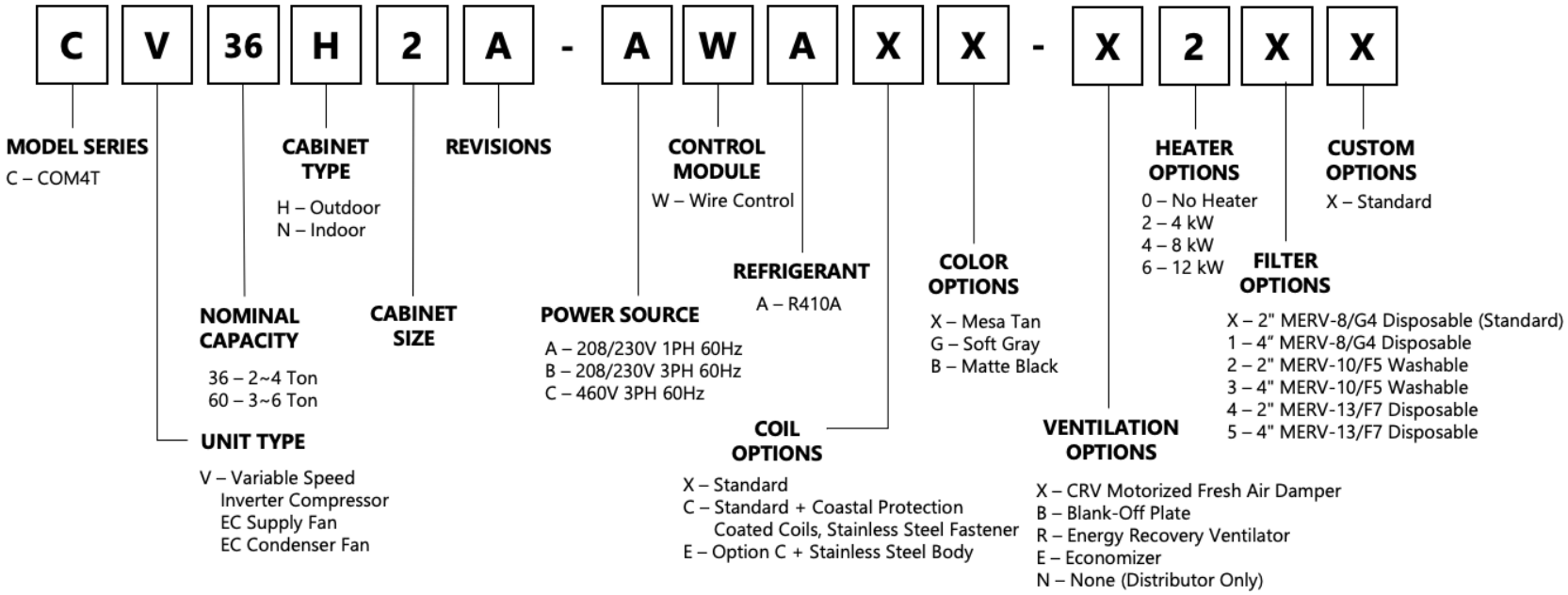
Table 1 : Packaging Symbols

Symbol	Description	Symbol	Description
	THIS SIDE UP Shows the orientation of the unit.		NO HOOKS Do not use hooks to lift the packed unit.
	FRAGILE Handle with care.		KEEP AWAY FROM HEAT The unit must be kept away from heat sources.
	PROTECT AGAINST RAIN: The packaged unit must be stored in a dry place.		DO NOT STACK

Model Identification

Each unit is identified by a model number, such as CV36H2A-AWAXX-X2XX. The elements in the number are explained in Figure 1.

Figure 1: Model Number



Acronyms and Abbreviations

Table 2 lists acronyms and abbreviations used in this manual.

Table 2 : Acronyms and Abbreviations

Term	Meaning
A	Ampere, unit of electric current, or rate of flow of electricity
AAST	AIRSYS Authorized Service Technician
AUT/MAN	Automatic/Manual
BMS	Building Monitoring System
CFM	Cubic Feet per Minute
Com	Common
Comp	Compressor
Cond	Condenser
CRV	Commercial Room Ventilator
DC	Direct Current
EC	Electronically Commutated (Refers to variable speed evaporator/supply fan)
ERV	Energy Recovery Ventilator
Evap	Evaporator
FC	Free Cooling
HVAC	Heating, Ventilation, and Air Conditioning
Humid	Humidity
I/O	Input/ Output
kW	Kilowatt
LED	Light Emitting Diode
MC	Mechanical Cooling
N.C.	Normally Closed
N.O.	Normally Open
PSI	Pounds per Square Inch
PWM	Pulse Width Modulation
R	Read Only
RoHS	Restriction of Hazardous Substances Directive
R/W	Read/Write
Temp	Temperature
VAC	Voltage in Alternating Current
VDC	Voltage in Direct Current

Chapter 2: Product Overview

The AIRSYS COM4T Wall Mounted Heat Pump is a self-contained energy efficient heating and cooling system, which is designed to offer maximum indoor comfort at a minimal cost without using valuable indoor floor space or outside ground space. The control system determines the unit's mode of operation: Cooling or Heating, as shown in Figure 2.

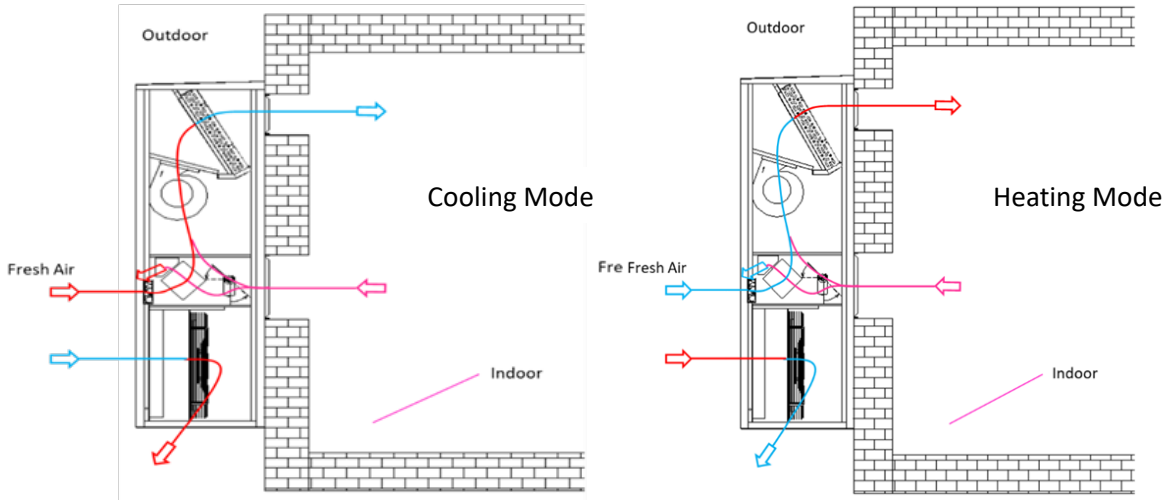


Figure 2 Basic Operating Modes

Any grille that meets the 5/8" louver criteria may be used. It is recommended that AIRSYS Return Air Grille Kit installed when no return duct is used. If using a return air filter grille, filters must be of sufficient size to allow a maximum velocity of 400fpm.

Note: If no return air duct is used, applicable installation codes may limit this cabinet to installation only in single-story structures.

Ventilation Options

Blank Off Plate

The blank-off plate prevents outside air from entering the building.
All capacity and efficiency ratings are based on installation of the blank off plate. This is recommended for maximum energy efficiency.

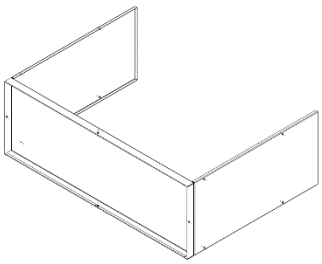


Figure 3: Blank Off Plate

Commercial Room Ventilator (CRV)

The power open, spring close, type fresh air damper allows outside fresh air to enter the building. The adjustable actuator allows varying amounts of outside air to enter the building.
There are (5) blade positions to adjust the airflow allowed into the building:

Table 3: CRV Air Flow Data

Fresh Air Flow (CFM)		
Damper Position	**CV36**	**CV60**
1	550	600
.8	450	550
.6	300	400
.4	180	250

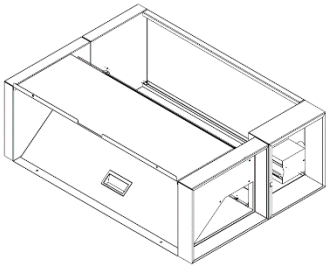


Figure 4: Fresh Air Damper

Energy Recovery Ventilator (ERV)

The energy recovery ventilator harvests energy contained in the exhaust air by mixing it with fresh air across a stationary cubic heat exchanger. The filter medium is designed to be pulled out for easy cleaning and replacement.

Table 4: ERV Characteristics

ERV characteristics		
Dial Position	**CFM**	**Efficiency**
6	450	54%
5	400	58%
4	350	62%
3	250	66%
2	220	70%

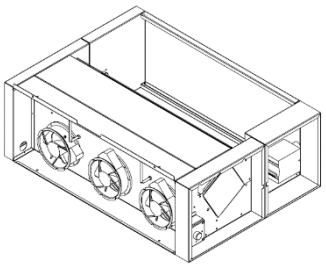


Figure 5: Energy Recovery Ventilator

Economizer

The economizer uses outdoor air to provide cooling when the outdoor temperature is sufficiently lower than the indoor temperature.

Note: Economizer section is only available for COM4T outdoor products.

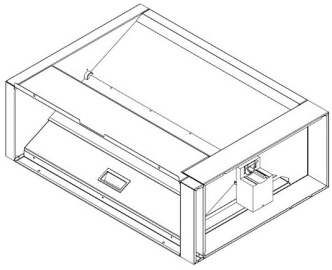


Figure 6: Economizer

Table 5: Economizer Characteristics

Economizer characteristics			
Model	**CFM**	**Btu/h**	**kW**
CV36H2A	920	17,800	5.24
CV60H3A	1,350	26,200	7.69

PTC Electrical Heater

The PTC electrical heater has both fast thermal response time and low inrush current. A protection device will automatically cut current when unsafe levels are reached.

The outer edge of the PTC heating component is designed with double insulation. When in contact with metal, it will not cause short circuits.

Filter

2" MERV8/G4 pleated filters are standard with each unit. The filter slides into for easy serviceability. This filter can be serviced from the outside by removing the filter access panel. Filters are also available in MERV10/F5 and MERV13/F7.

Condensate Drain

A plastic drain hose extends from the drain pan at the top of the unit down to the unit base. There are openings in the unit base for the drain hose to pass through. In the event the drain hose is connected to a drain system, it must be an open or vented type system to assure proper drainage.

Chapter 3: Installation

Installation Preparation

Unpack the unit carefully. Some parts are packed loosely and may move as the packaging is opened. Before discarding the box, check the packaging carefully for any parts or documents inside. Refer to Table 6 on Page 12 for the complete list of materials shipped with each unit.

Check for the following:

- The supply voltage meets the requirements as designated: 197-252VAC.
- The install location is clean on the inside and free of excess dirt and dust.
- Ensure that minimum clearance requirements are met (see Clearances on page15)

Also verify that all installer provided items, listed in Table 7 on Page 14 are accounted for.

Danger: All the installation work must be done by a licensed professional. Installation that does not comply with the instructions herein can result in the loss of warranty coverage. AIRSYS shall not be held liable for any damage caused to persons or objects due to incorrect installation or operation of the units.

Warning: All wiring must comply with the local safety standards and building codes under all circumstances.

Warning: For outdoor use, the risk of electric shock can cause injury or death. Disconnect all remote electric power supplies before installation.

When no longer in use, disposal of equipment and materials must be compliant with local laws and standards.

Delivery

When the units are delivered, be sure to inspect them to verify that they have not been damaged during transport. Also verify that all requested accessories listed on the purchase order have been included.

Important: If packaging shows any signs of shipping damage, or potential shipping damage, it is very important to annotate shipping damage on the Bill of Lading prior to signing for the freight. In order to recover for any damage, please take detailed photographs of all the packaging before the external packaging is removed. Once detailed photos of the external packaging have been taken, then the external packaging may be removed so the items can be inspected further. Please document with photos any damage to the equipment that relates directly to the damage observed to the external packaging. Without the detailed photos, it will be very difficult to recover equipment loss.

Warranty

The warranty duration is **(60) months from the date of installation**. AIRSYS warrants that its products will be free from defects in materials and workmanship for a period of (60) months after installation.

AIRSYS will furnish, free of charge, all replacement parts for any component failures that occur within the warranty period. The customer is responsible for the cost of shipment of replacement material from AIRSYS North America.

Note: Warranty assumes the warranty registration card that accompanied the units in shipment is submitted. If the warranty registration card was not filled out and returned to the supplier, then the warranty will expire (60) months from the date of shipment for all components.

The warranty does not cover damage to the systems caused by misuse or abuse of the systems such as physical damage due to mishandling. The warranty does not cover damage caused by force majeure.

Important: Any mishandling of the equipment or modifications to the equipment, unless agreed upon in writing by AIRSYS, will void the warranty.

Moving the Unit

Forklifts are recommended for moving, loading, unloading, and positioning the COM4T unit for installation. If bands or ropes are used to create a sling, make sure that excessive force is not applied to the upper edges of the machines or the package to avoid cosmetic or material damage. When using spacing bars, protective materials are required around the units to prevent damage. To avoid damage to the units while moving or transporting, ensure the units always remain in the upright position.

General Safety Rules

Danger: Do not carry out any operation on the machines if you do not have sufficient knowledge of the operating principles and have not taken all the precautions that permit the system to operate in safe conditions.

Warning: Work on the electric board only after verifying prime power is disconnected. Do not apply power to the machine with the covers removed.

Important: Before carrying out inspections, maintenance operations, and safety checks, follow all accident-prevention standards such as wearing protective goggles and gloves.

Required Materials

AIRSYS Supplied Materials

Table 6: AIRSYS System Shipping Materials List has all the material supplied by AIRSYS. After opening the package, verify that all items are accounted for. If any material is missing, please contact an AIRSYS distribution center using the following information:

AIRSYS North America
Web: https://airsysnorthamerica.com
Email: ASNSupport@air-sys.us
Phone: 855-874-5380

Table 6: AIRSYS Provided Materials

System Shipping Materials List

No.	Part #	Item Description	Comments	CV36H2A	CV60H3A
1	4070142980	CV36H2A-AWAXX	Main Unit	1	N/A
2	4070142960	CV60H3A-AWAXX	Main Unit	N/A	1
3	-	Shipping list	In document pack	1	1
4	-	Installation and operation manual	In document pack	1	1
5	-	Blank nameplate	In document pack	1	1
6	2801021420	Certification	In document pack	1	1
7	8458707260	Cable ties, 300X4mm	In document pack	10	10
8	7151011110	Rubber insulation cotton	In the box	3	3
9	8551016130	Hexagon flange bolts with cross recess, M5*16	In document pack, for door panel backup	2	2

Ventilation Options

No.	Part #	Item Description	Comments	Blank-off	CRV	ERV	ECONOMIZER
1	2121008960	Blank Off Panel for cabinet H2/H3	Ventilation Option	1	N/A	N/A	N/A
2	2121008610	CRV Motorized Fresh Air Ventilator for Cabinet H2/H3	Ventilation Option	N/A	1	N/A	N/A
3	2121008570	Energy Recovery Ventilator for Cabinet H2/H3	Ventilation Option	N/A	N/A	1	N/A
4	2121008860	Economizer (Full Flow) for Cabinet H2/H3	Ventilation Option	N/A	N/A	N/A	1
5	-	Shipping List	In document pack	1	1	1	1
6	8553702750	Self-tapping Screws，4.2*13	In document pack	13	12	N/A	N/A
7	9000001290	Self-tapping plastic protective cap	In document pack	13	12	N/A	N/A
8	8551016130	Hexagonal Flange bolt, Stainless steel, GB5789，M5*16	In document pack	N/A	N/A	6	6
9	7354006900	Nylon washers，φ 10.6*ϕ5.2* 1.2	In document pack	N/A	N/A	6	6
10	8458716720	Cable ties, G370HDB L=370	In document pack	N/A	N/A	5	3

Accessory Options:

No.	Part #	Item Description	Comments	Curb	Curb Adapter
1	2121008580	Curb for Cabinet H2/H3		1	N/A
2	2121008590	Adapter/Header for Cabinet H2/H3		N/A	1
3	2121009330	Top Supply Panel Option for Cabinet H2/H3		N/A	N/A
4	-	Shipping List	In document pack	1	1
5	8551014060	Hexagonal bolt, Stainless steel, GB/T5783，M10×40	In document pack	12	N/A
6	8552905200	Spring washer, Stainless steel, GB/T93，10	In document pack	12	N/A
7	8552904750	Flat washer, Stainless steel, GB/T97.1，10	In document pack	12	N/A
8	8551016130	Hexagonal Flange bolt, Stainless steel, GB5789，M5*16	In document pack	2	N/A
9	8458716720	Cable ties, G370HDB L=370	In document pack	10	N/A
10	1030230830	Fixed panel	Connect the Top Curb and Curb, In the box	N/A	2
11	8551001500	Hexagonal bolt, Stainless steel, GB/T5783，M6*20	Connect the Top Curb and Curb, In the box	N/A	12
12	8552904550	Flat washer, Stainless steel, GB/T97.1，6	Connect the Top Curb and Curb, In the box	N/A	12
13	8552905180	Spring washer, Stainless steel, GB/T93，6	Connect the Top Curb and Curb, In the box	N/A	12

Heater Options:

No.	Part #	Item Description	Comments	4kW	8kW	12kW
1	2121008460	4kW PTC Electrical Heater	In the box	1	N/A	N/A
2	8455520990	Miniature Circuit-Breaker，GSB2-D25/2	In document pack	1	N/A	N/A
3	2121008480	8kW PTC Electrical Heater	In the box	N/A	1	N/A
4	8455521840	Miniature Circuit-Breaker，GSB2-D40/2	In document pack	N/A	1	N/A
5	2121008500	12kW PTC Electrical Heater	In the box	N/A	N/A	1
6	8455521000	Miniature Circuit-Breaker，GSB2-D63/2	In document pack	N/A	N/A	1
7	-	Shipping List	In document pack	1	1	1
8	8554504650	Pan head screws with cross recess, GB/T818，M4*16	To fix the Electric Heater In document pack	2	2	2
9	8552906140	Plain Washers, GB/T97.1，M4	In document pack	2	2	2
10	8552905160	Single coil spring lock Washers, GB/T93，M4	In document pack	2	2	2
11	8458716720	Cable ties, G370HDB L=370	In document pack	5	5	5

Materials to be Supplied by Installer

Table 7 lists items required for installation that must be supplied by installer. The wire length and gauge depend on site-specific conditions. However, recommendations are provided.

Table 7: Installer Supplied Materials

No.	Item	Qty	Description	Comments
1	AC power supply cable	Same as number of units	1 set of two-wire cable per unit	Refer to Summary Electrical Ratings; Note the electric heater capacity.
2	Silicone sealant	As needed	Commercial grade outdoor silicone sealant	
3	Weather stripping	As needed	Commercial grade neoprene weather stripping or equivalent Recommend a minimum of 25 mm (~1″) wide and 20 mm (~0.8″) thick	Used to frame the HVAC outlet and inlet to create a weather tight seal
4	Nylon zip-tie	As needed	Small nylon zip tie	For properly dressing cables and harnesses
5	Thermostat	1	Thermostat should have at least 2 stage heat pump compatibility	
6	Thermostat cable	As needed	24-32AWG	
7	Expansion bolt M10	10	Connect unit/curb to wall.	Length depends on the wall material and thickness.

Summary Electrical Ratings (Wire Sizing)

Table 8: Electrical Ratings

		Single Circuit		Dual Circuit #1		Dual Circuit #2	
Mode	**Heater Size**	**MCA**	**MOP**	**MCA**	**MOP**	**MCA**	**MOP**
CV36H2A	0kw	16	25	--	--	--	--
	4kw	37	45	16	25	21	25
	8kw	59	70	16	25	43	45
	12kw	81	90	16	25	65	65
CV60H3A	0kw	27	40	-	-	-	-
	4kw	49	65	27	40	22	25
	8kw	70	85	27	40	43	45
	12kw	92	105	27	40	65	65

Note:

MCA = Minimum Circuit Ampacity (Wiring Amps)
MOP = Maximum Overcurrent Protection (HACR Breaker Size)

Physical Installation

Select the Wall for Installing the Unit

Select the wall where the unit will be installed. Be certain that the wall can support the weight of the unit and that sufficient space is available for easy operation and installation, both inside and outside the mounting location. Refer to Table 11 below for unit dimensions and weights by model number. Refer to Table 10 for weights of ventilation options.

Table 9: Unit Dimensions and Weight

Model		CV36H2A	CV60H3A
Width	in	45.67	45.67
Depth	in	27.56	27.56
Height	in	85.83	92.91
Weight	lbs	730	830

Table 10: Ventilation Option Weight

Accessory	Blank Off Plate	Fresh Air Damper	Economizer	ERV
Weight (lbs)	10	40	40	50

Clearances

- 48" (1200mm) free space in front of the unit
- 40" (1000mm) free space at the side of the unit

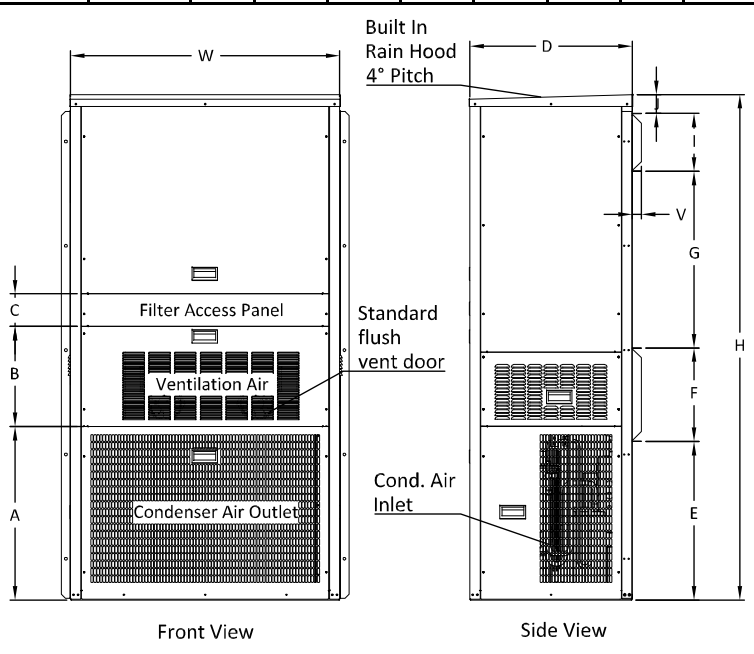
⚠ Important:

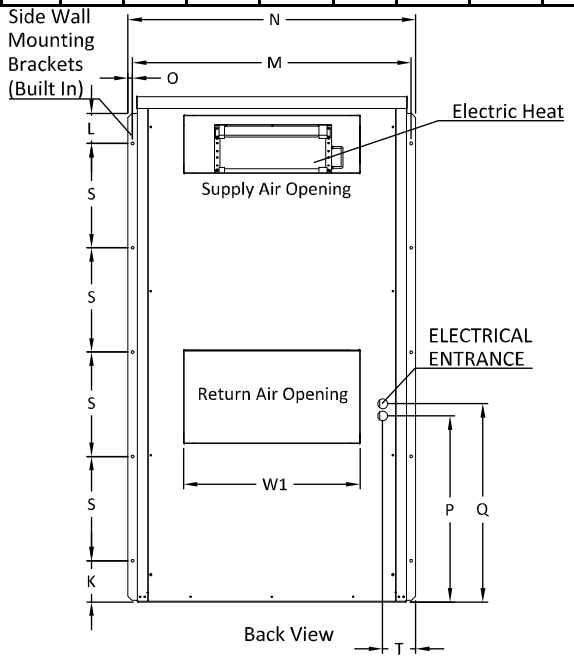
1. The wall selected for the unit must be strong enough to support both the static weight of the unit and the vibration of a unit under operation.
2. For any unit equipped with electrical heat, the supply grille should be at least three inches away from combustible material.

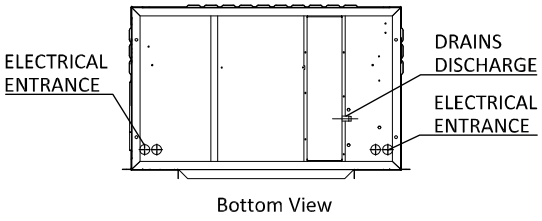
NOTE: To assist in the installation process, the following figures provide the unit dimensions to a tolerance of ± 1/16" (2 mm).

Table 11: Unit Dimensions

MODEL		WIDTH	DEPTH	HEIGHT	SUPPLY		RETURN																	
		(W)	(D)	(H)	I	W1	F	W1	A	B	C	E	G	V	J	M	N	O	K	S	L	T	P	Q
CV36H2A-	mm	1160	700	2180	250	760	403	760	748	402	170	684	762	40	81	1200	1240	20	178	450	130	142	803	855
	inch	45.67	27.56	85.83	9.84	29.92	15.87	29.92	29.45	15.83	6.69	26.93	30	1.57	3.19	47.24	48.82	0.79	7.01	17.72	5.12	5.59	31.61	33.66
CV60H3A-	mm	1160	700	2360	250	760	403	760	967	402	170	890	762	40	55	1200	1240	20	268	450	220	142	1021	1073
	inch	45.67	27.56	92.91	9.84	29.92	15.87	29.92	38.07	15.83	6.69	35.04	30	1.57	2.17	47.24	48.82	0.79	10.55	17.72	8.66	5.59	40.2	42.24







Make Openings In the Wall

Case 1: Direct Wall Mount. Cut openings per table below.

Table 12: Opening Dimension

MODEL	Unit of measurement	Dimensions											
		A	B	C	D	E	F	G	H	I	J	K	L
CV36H2A	mm	506	403	762	250	760	123	Φ35	119	52	1200	Φ12	450
	inch	19.92	15.87	30	9.84	29.92	4.84	Φ1.38	4.69	2.05	47.24	Φ0.47	17.72
CV60H3A	mm	622	403	762	250	760	123	35	132	52	1200	Φ12	450
	inch	24.49	15.87	30	9.84	29.92	4.84	Φ1.38	5.2	2.05	47.24	Φ0.47	17.72

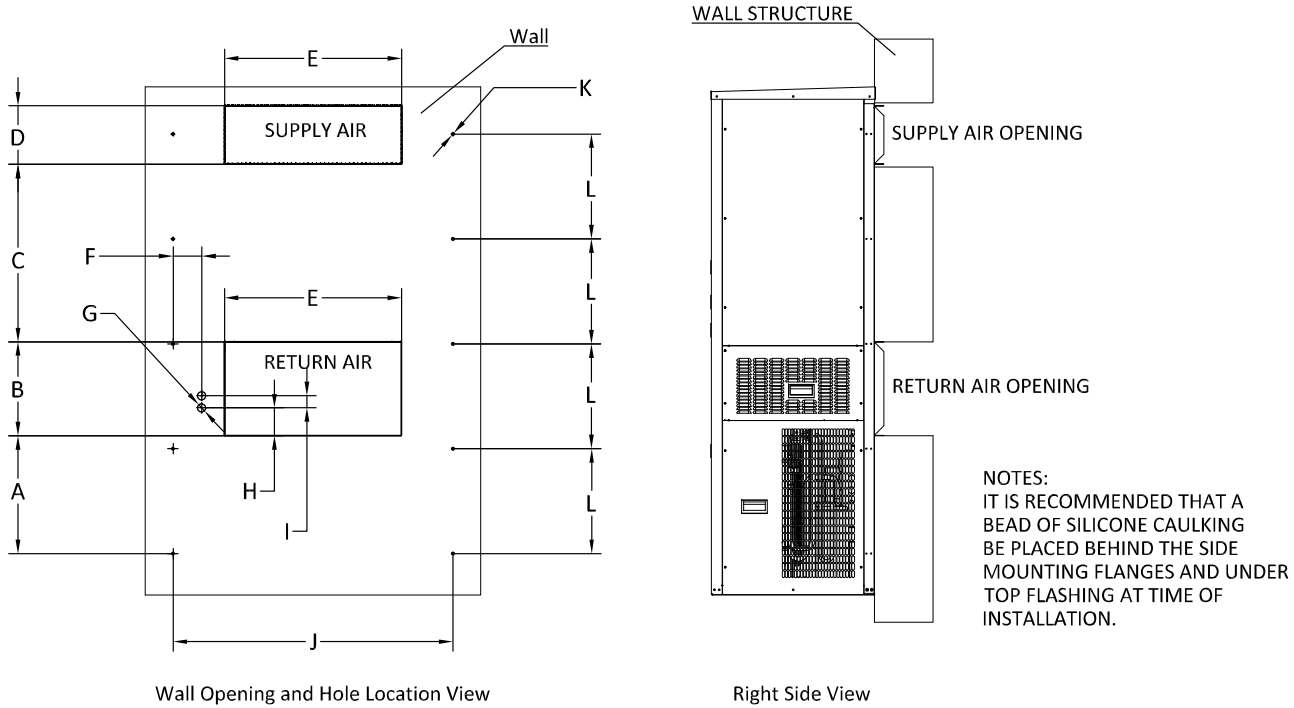


Figure 7: Wall Opening and Hole Location View

Case 2: Curb Mounting:

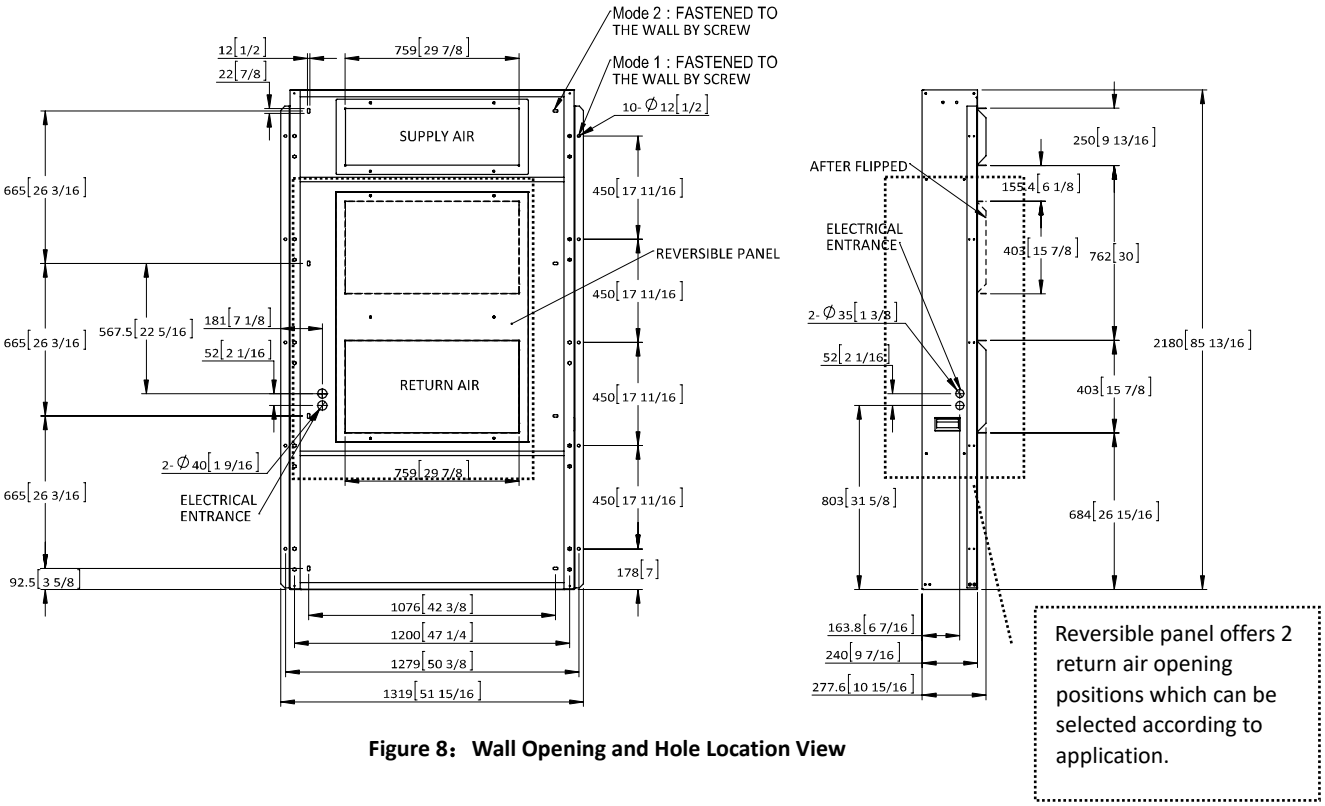


Figure 8： Wall Opening and Hole Location View

Case 3: Curb mounting with extension

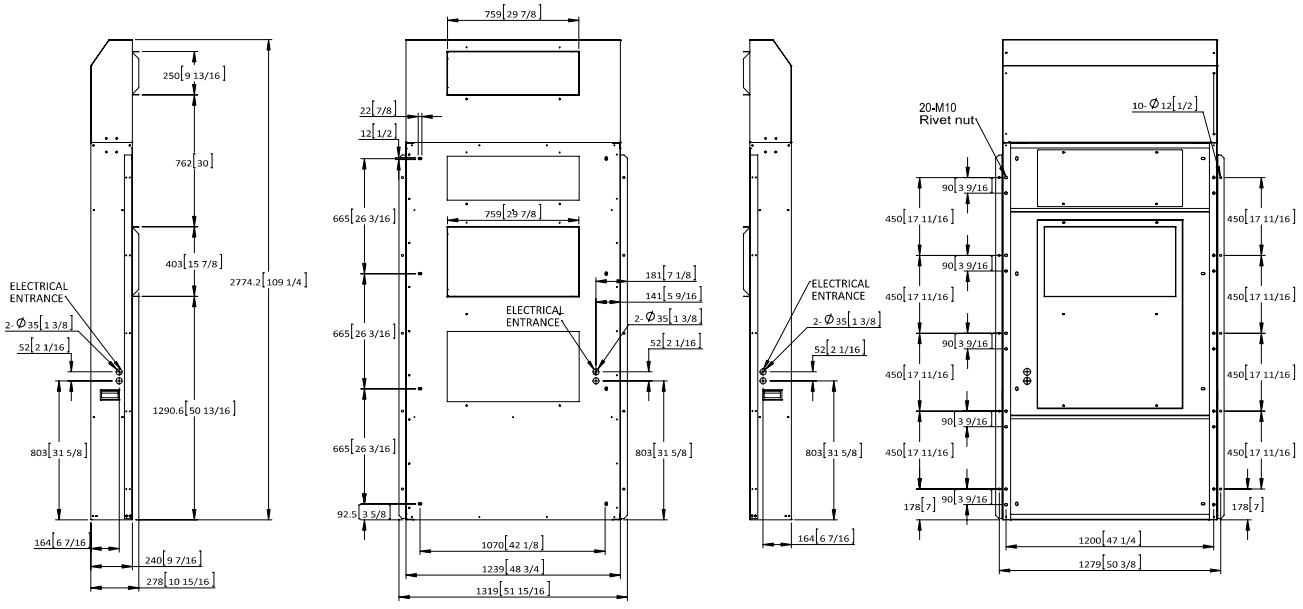
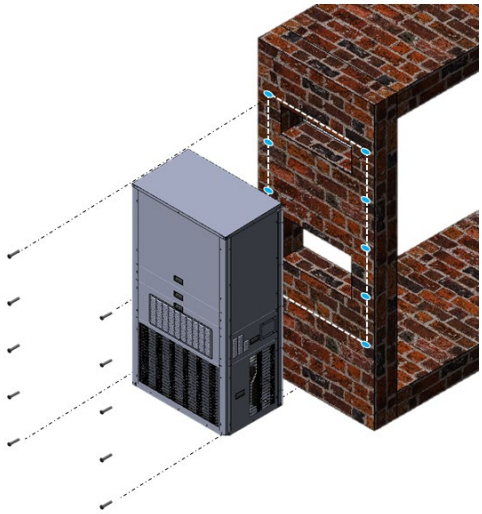
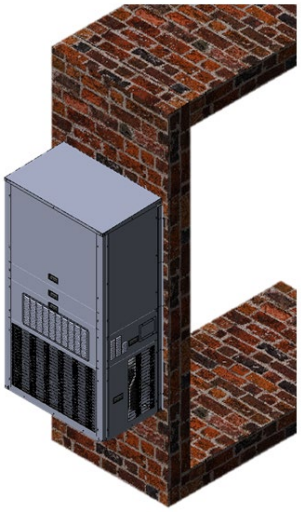


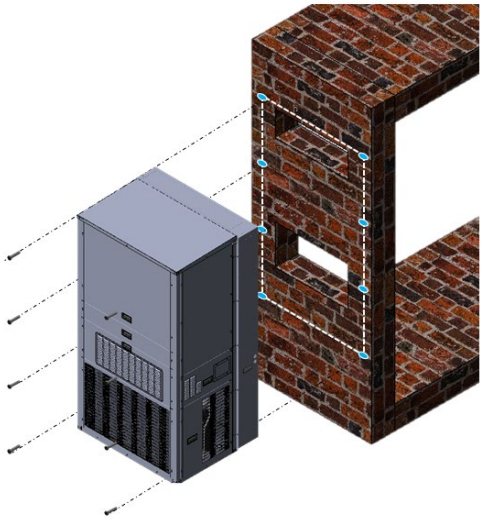
Figure 9: Wall Opening and Hole Location View-

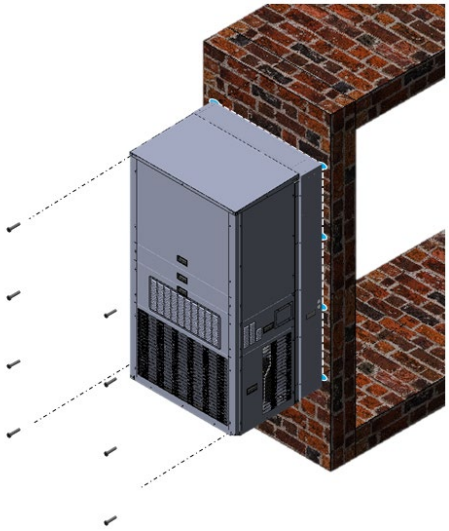
CASE 1



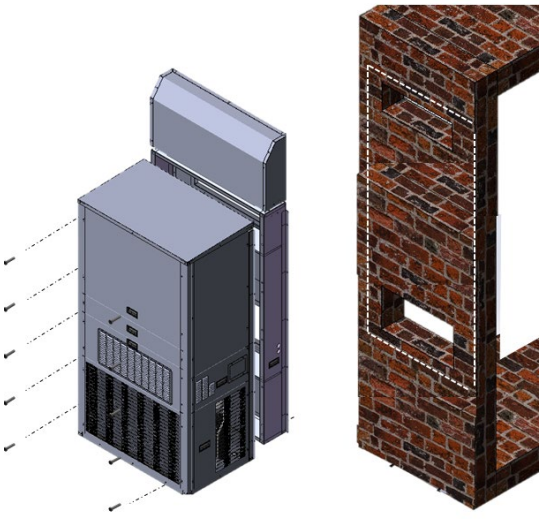


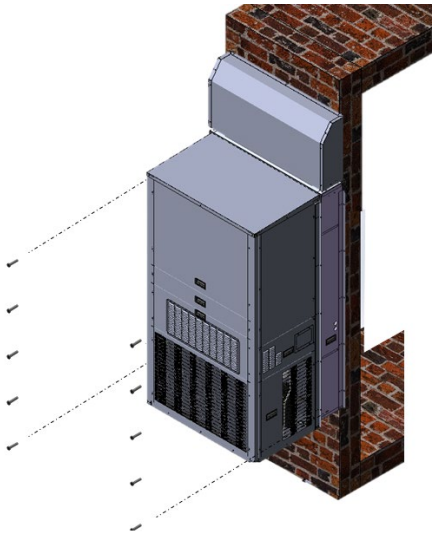
CASE 2





CASE 3





Framing and Mounting Instructions

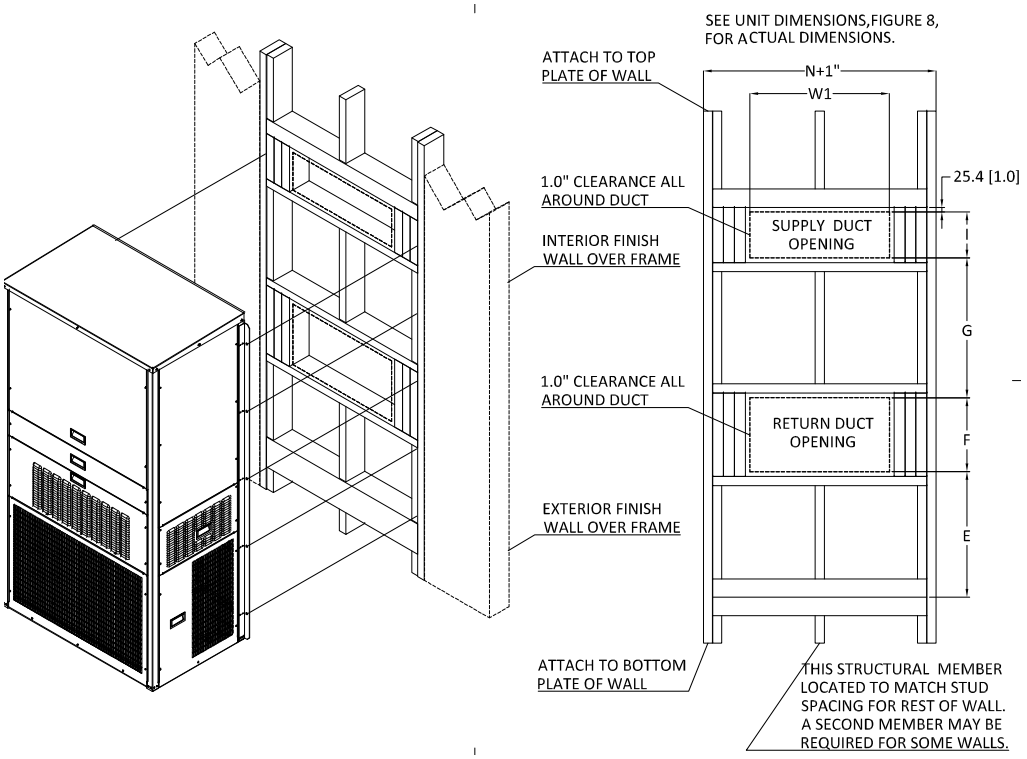


Figure 10: Wall Mounting Instruction

Install Weather Stripping

Before mounting the unit on the outside wall, fix neoprene weather stripping (installer provided) around the openings of the air supply and the air return to ensure an airtight closure, as shown in Figure 11: Install Weather Stripping.

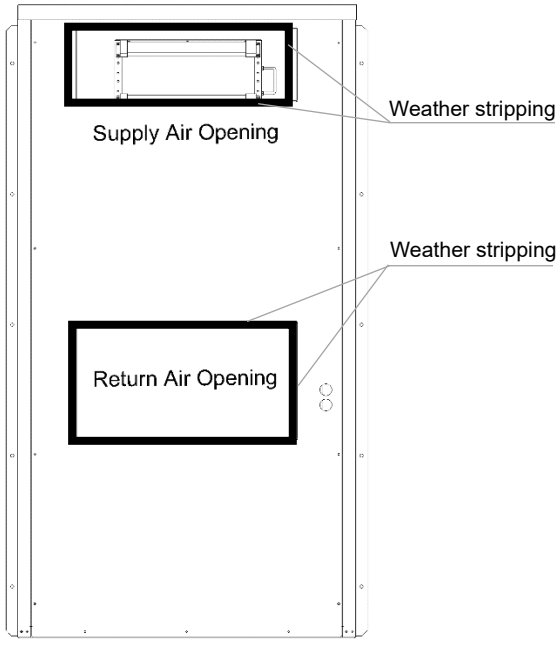


Figure 11: Install Weather Stripping

Position the Unit

Important. The unit is heavy. Exercise caution while putting the unit in place to prevent damage to the unit or personnel.

The unit must be installed in a level position. An inclination of more than 6-7 mm (± 1°) could cause the condensation tray to overflow.

Lift the unit from below with lifting equipment or tools, and then move the unit to the wall. Use the screws (installer supplied) to affix the unit on the wall. Generally, this is done by following these steps:

1. Position the unit next to the wall.
2. Attach a single mounting screw and adjust to ensure the unit is level.
3. After the unit is level, attach the remaining mounting screws.

Seal the Joints between Units and Wall

To prevent moisture from getting in and air leaking out, coat the joint between the rear panel of the unit and the wall with a layer of silicone sealant (installer provided, see Table 7: Installer Supplied Materials, item 1)

Duct Work

All duct work shall be properly sized for the airflow requirement of the equipment. A minimum of 1" of fiberglass insulation or equivalent is recommended to prevent energy loss and moisture build up. All joints shall be sealed to prevent leakage. Flexible joints shall be used to reduce noise transmission.

When no supply or return duct are used, metal grilles shall be deployed on all supply and return openings.

Complete Electrical Connections

The unit shall be installed in accordance with National Electrical Code (NEC) regulations.

Cautions

Danger: Only an authorized service technician should make the electrical connections to the heat pump unit.

Important: The electrical wiring of the unit must comply with IEC standards or with appropriate national standards.

Danger: The power supply must be disconnected or turned off before working on the unit.

Important: Noncompliance with these instructions may cause damage to the WPU or the controller box. Not following instructions can void the warranty.

Important: No modification to the unit's electric circuit is allowed. If a change is required, it must be authorized by AIRSYS in writing.

Wiring-Main Power

Refer to Table 5 on page 13 for electrical ratings. All wiring must conform to all applicable national and local codes.

The unit rating plate lists a maximum fuse or circuit breaker size that is to be used with the equipment. The correct size must be used to ensure proper operation of the units.

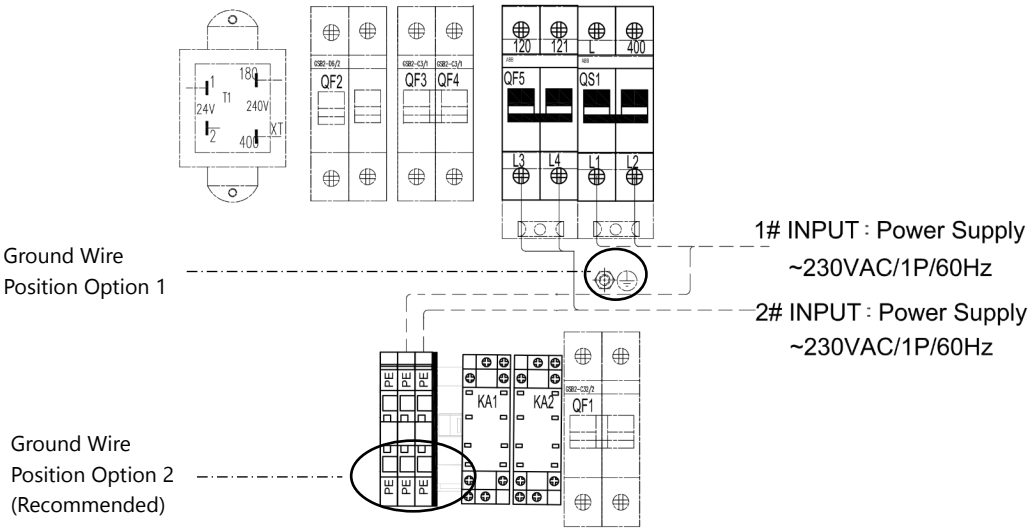
Units can be wired with either a single or a dual circuit. See the instructions below for wiring each type of power input.

Single circuit connection:

- Connect main power to circuit breaker QS1

Dual Circuits connection:

- Disconnect factory jumper from QS1 to QF5
- Connect Circuit #1 power supply to QS1
- Connect Circuit #2 power supply to QF5



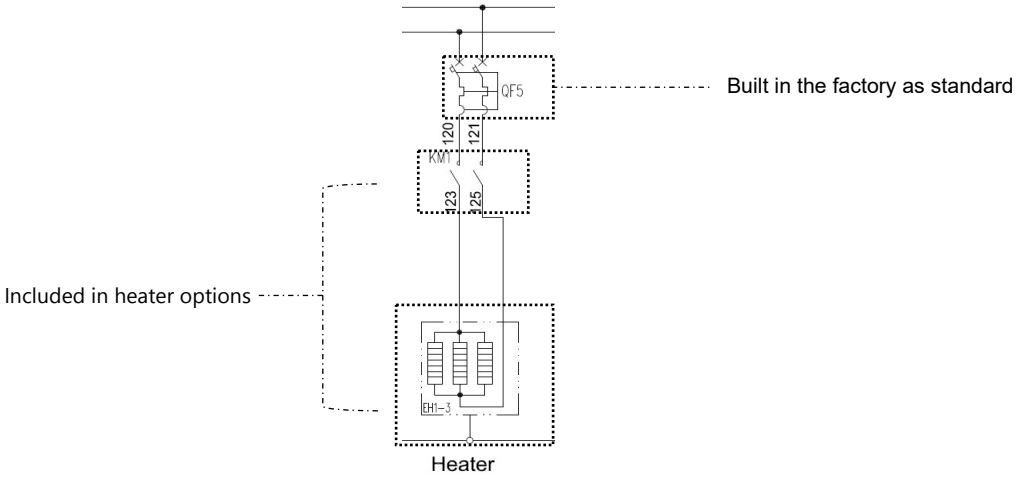
Wiring-Low Voltage Wiring

Control wiring from the thermostat is landed on a terminal strip inside the unit. The table below indicates which terminals will be energized for system functions.

Function	G	O	Y1	Y2	W2	Dehum.
Fan Only	X					
Low Speed Cool	X	X	X			
High Speed Cool	X	X	X	X		
Low Speed Heat	X		X			
High Speed Heat	X		X	X		
Electric Heat (Opt.)	X				X	
Dehum. (Opt.)	X	X	X	X		X

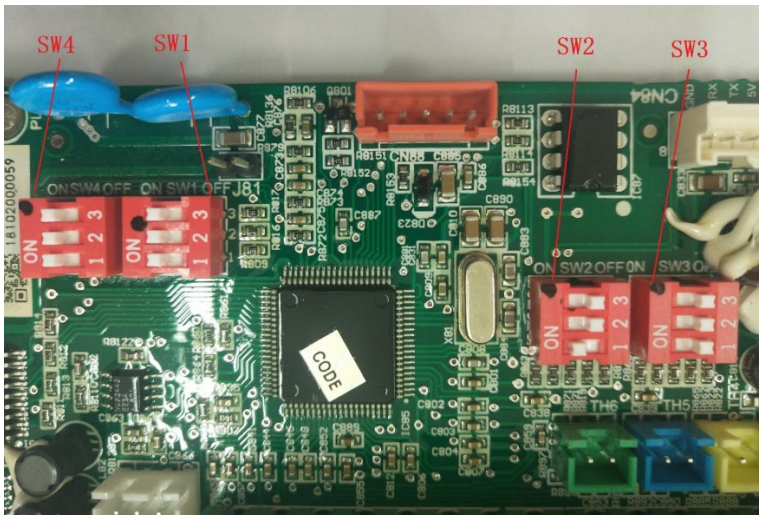
Wiring-Electrical Heater (Optional)

If a heater is to be installed, refer to the diagram below for electrical connection.



Dip Switch Settings (Optional)

Note: All units are factory configured. Changing these setting will change the fan speed and damper settings. Please reference the **SW1 Fresh Damper Setting**, as well as the **SW2 Max Supply Fan Setting** tables below when making any changes to the default settings.



SW1 Fresh Damper Setting				
SW1-1	**SW1-2**	**SW1-3**	**Max Damper Opening Level (less means less opening)**	**Optional or Default**
OFF	OFF	OFF	1	Optional
OFF	OFF	ON	2	Optional
OFF	ON	OFF	3	Optional
OFF	ON	ON	4	Optional
ON	OFF	OFF	5	Optional
ON	OFF	ON	6	Optional
ON	ON	OFF	7	Optional
ON	ON	ON	8	Default
SW2 Max Supply Fan Setting				
SW1-1	**SW1-2**	**SW1-3**	**Max Fan Speed Level**	**Optional or Default**

			(Less means lower speed)	
OFF	OFF	OFF	1	Optional
OFF	OFF	ON	2	Optional
OFF	ON	OFF	3	Optional
OFF	ON	ON	4	Default
ON	OFF	OFF	5	Optional
ON	OFF	ON	6	Optional
ON	ON	OFF	7	Optional
ON	ON	ON	8	Optional
SW3 Model Selection				
SW3-1	**SW3-2**	**SW3-3**	**Model**	**Description**
OFF	OFF	OFF	CV36	3Ton
OFF	OFF	ON	CV48	4Ton
OFF	ON	OFF	CV60	5Ton
SW4 (Not Used)				

Complete the Installation Checklist

The installation checklist should be completed prior to starting the system to ensure that no steps have been omitted. Please complete the installation and wiring checklist below.

Date: _____ Unit Factory Number:_____(refer to the unit name plate)	
Verify Physical Installation	✓ or ✖
Weather stripping has been attached to the air inlets and outlets of the hump pump unit or curb between the wall and the unit.	
All machines are securely fastened to the wall.	
All leaks are sealed with gel.	
Verify Electrical Installation	
The main voltage connections of heat pump unit are secured.	
The power connections between controller and units are secured.	

Turn on Component Breakers

After completing the checklist, turn on all breakers of all components in heat pump unit. Then reattach all covers and panels before turning on the breakers in the prime power panel.

Turn on Primary Power

Turn on the primary power breakers on the heat pump unit.

Chapter 4: System Operation

Sequence of Operation

Cooling and Heating

All units in the COM4T product line are equipped with variable speed compressors that can vary its frequency to meet capacity demand. The compressor speed will continuously modulate depending on return temperature and cooling/heating stage. When stage 1 command is received on Y1, the system will start the compressor at medium speed and slowly modulate between low to medium speed until a stable return temperature is found. When stage 2 command is received on Y2, the system will increase its speed and modulate between medium and high speed until a stable return temperature is found.

Compressor protection

After supplying power to the unit and after compressor has stopped, the compressor will remain off for 3 minutes to prevent short cycling. Low and high pressure alarms, if triggered 3 or more times in an hour, will prevent the compressor from running for 12 hours or until power is reset. A supply fan alarm, if triggered 5 or more times in an hour, will prevent the compressor from running for 12 hours or until power reset.

Aux/Emergency Heating

If auxiliary heaters are installed, they are triggered by W2 command.

Supply Fan (Indoor Blower)

The system will engage indoor blower when G command is received. If cool/heat command is received without G, the supply fan will also engage.

Defrost

Frost can build up on outdoor coil when the heat pump is operating in low temperatures and can adversely affect rate of heat transfer. If conditions are met, the automatic defrost function will engage to prevent frost buildup.

When the heating mode has been running for at least 4 minutes AND coil temperature is below 23°F for at least 10 minutes AND coil temperature is lower than outdoor air temperature by at least 15°F, defrost will engage. When defrost mode starts, the reversing valve is disengaged, and compressor runs at high speed to heat the outdoor coil. Defrost will disengage immediately after coil temperature reaches 64°F OR coil temperature stays above 50°F for 2 minutes OR continuous defrost for 10 minutes.

Dehumidification (optional)

When dehumidification is triggered on the *dehum* command, the EEV and compressor will automatic adjust to maximum latent (moisture removal) capacity. The system can seamlessly transition between cooling/heating and dehumidification without restarting the system.

Alarms

When a problem occurs during operation of the unit, the alarm will be expressed by a blinking code on the main control board. Depending on the severity of the alarm, various components are automatically shut down. The system will restart most of these devices without human intervention after a defined delay period. However, manual reset is required when certain alarms occur three times within an hour (configurable). A description of all system alarms is given below.

Alarm Code	Blinks		Alarm name	Error action	Recovery time
	Fast	Slow			
1		1	High pressure switch	Stops unit	Mechanical cooling will be locked after three occurrences. Lockout is reset via power reset or after 12 hours.
2		2	DC overvoltage	Stops unit	3min
3		3	DC undervoltage	Stops unit	3min
4		4	Overcurrent	Stops unit	3min
5		5	IPM temperature high	Stops unit	3min
6		6	PFC temperature high	Stops unit	3min
7		7	DC overvoltage immediately stop unit	Stops unit	3min
8		8	DC undervoltage immediately stop unit	Stops unit	3min
9		9	Compressor steps loss	Stops unit	3min
11	1	1	Current phase loss	Stops unit	3min
12	1	2	Compressor phase loss	Stops unit	3min
13	1	3	FO pull down	Stops unit	3min
14	1	4	FO voltage low level	Stops unit	3min
15	1	5	Current check circuit	Stops unit	3min
16	1	6	Current sensor error	Stops unit	3min
17	1	7	Communication error	Stops unit	3min
21	2	1	Return temperature sensor error	Alarm will be indicated without stopping unit	
22	2	2	Outside temperature sensor error	Alarm will be indicated without stopping unit	
23	2	3	Discharge temperature sensor error	Stops unit	
24	2	4	Suction temperature sensor error	Alarm will be indicated without stopping unit	
25	2	5	Evaporator coil temperature sensor error	Alarm will be indicated without stopping unit	
26	2	6	Condenser coil temperature sensor error	Alarm will be indicated without stopping unit	
27	2	7	High pressure via sensor	Alarm will be indicated without stopping unit	
28	2	8	Low pressure via sensor	Alarm will be indicated without stopping unit	
29	2	9	Humidity sensor 1 error	Alarm will be indicated without stopping unit	
31	3	1	Humidity sensor 2 error	Alarm will be indicated without stopping unit	

Alarm Code	Blinks		Alarm name	Error action	Recovery time
	Fast	Slow			
32	3	2	Communication error between control board and driver	Stops unit	3min
34	3	4	Terminal connection error	Stops unit	3min
35	3	5	Low pressure switch	Stops unit	Mechanical cooling will be locked after three occurrences. Lockout is reset via power reset or after 12 hours.
36	3	6	High pressure protection	Stops unit	Mechanical cooling will be locked after three occurrences. Lockout is reset via power reset or after 12 hours.
41	4	1	High discharge temperature protection	Stops unit	Mechanical cooling will be locked after three occurrences. Lockout is reset via power reset or after 12 hours.
42	4	2	High condenser temperature protection	Stops unit	Mechanical cooling will be locked after three occurrences. Lockout is reset via power reset or after 12 hours.
43	4	3	High evaporate temperature protection	Stops unit	Mechanical cooling will be locked after three occurrences. Lockout is reset via power reset or after 12 hours.
44	4	4	Evaporator temperature antifreeze protection	Stops unit	Mechanical cooling will be locked after three occurrences. Lockout is reset via power reset or after 12 hours.
45	4	5	Condenser fan overload	Stops unit	Mechanical cooling will be locked after five occurrences. Lockout is reset via power reset or after 12 hours.
46	4	6	Supply fan overload	Stops unit	Mechanical cooling will be locked after five occurrences. Lockout is reset via power reset or after 12 hours.
47	4	7	Electrical heater overload	Stop electrical heater	3min
48	4	8	Low input voltage	Stops unit	3min
49	4	9	Supply fan error with speed feedback	Stops unit	Mechanical cooling will be locked after five occurrences. Lockout is reset via power reset or after 12 hours.

Complete the Registration Card

The information on the registration card is critical for establishing the warranty start point.
The nameplate with the required information can be found on the outside of the unit. Information must be recorded on the AIRSYS Product Warranty Registration Card. The registration card can also be submitted online at:
https://airsysnorthamerica.com/support/warranty-registration/

AIRSYS PRODUCT WARRANTY REGISTRATION CARD

PRODUCT INFORMATION

HVAC #1 Model #:_____ Serial #:_____

HVAC #2 Model #:_____ Serial #:_____

HVAC #3 Model #:_____ Serial #:_____

HVAC #4 Model #:_____ Serial #:_____

HVAC #5 Model #:_____ Serial #:_____

HVAC #6 Model #:_____ Serial #:_____

INSTALLATION INFORMATION

Street address:_____ City:_____ State:_____ Zip:_____

Date Install Completed:____/____/_____ Installation Company:_____

Installer Name:_____ Phone #:_____ Email:_____

OWNERSHIP INFORMATION

Owner:_____

Site Supervisor Name:_____ Phone #:_____ Email:_____

REGISTRATION ONLINE: airsysnorthamerica.com/support/warranty-registration

BY EMAIL: Scan and send to: ASNSupport@air-sys.com

By MAIL: AIRSYS Product Registration, 915 De La Vina St, Santa Barbara, CA 93101