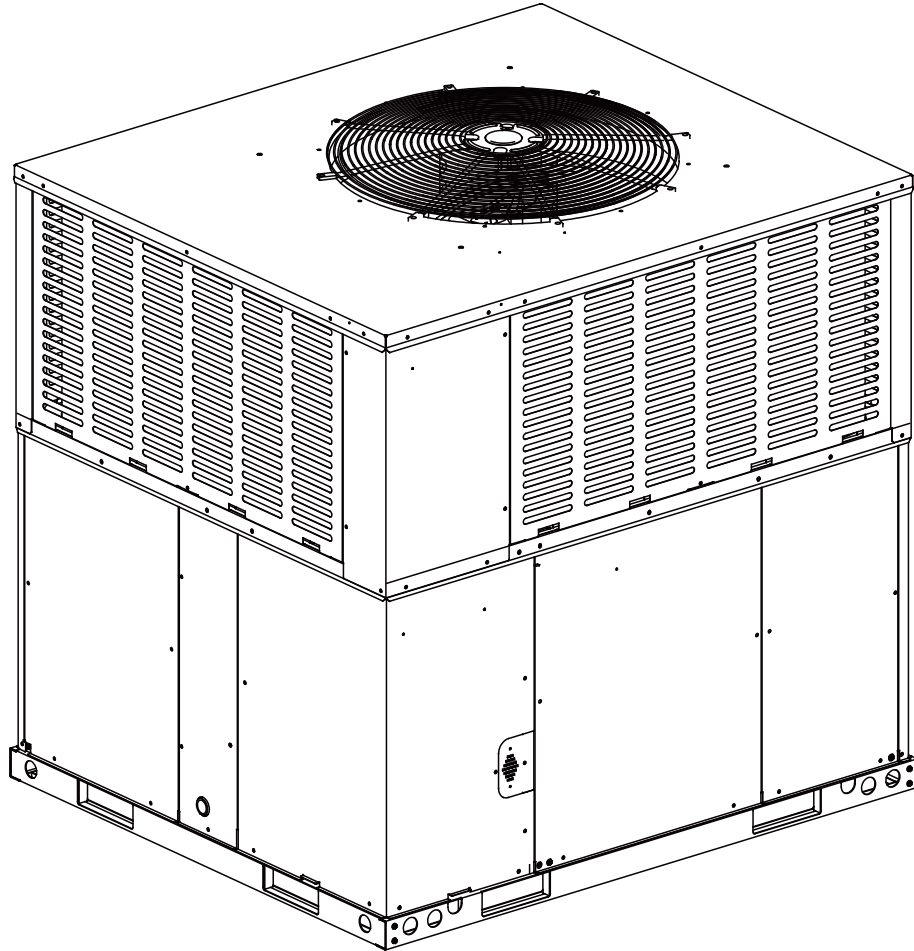


INSTALLATION INSTRUCTIONS

PACKAGE HEAT PUMP & AIR CONDITIONING

FEATURING R-410A

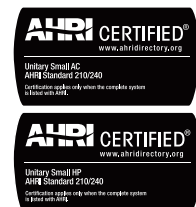
14 SEER SERIES - (2-5Tons)



RECOGNIZE THIS SYMBOL AS AN INDICATION OF IMPORTANT SAFETY INFORMATION

WARNING

These instructions are intended as an aid to qualified licensed service personnel for proper installation, adjustment and operation of this unit. Read these instructions thoroughly before attempting installation or operation. Failure to follow these instructions may result in improper installation, adjustment, service or maintenance possibly resulting in fire, electrical shock, property damage, personal injury or death.



DO NOT DESTROY THIS MANUAL

Please read carefully and keep in a safe place for future reference by a serviceman.

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This document is customer property and is to remain with this unit.


These instructions do not cover all the different variations of systems nor does it provide for every possible contingency to be met in connection with installation.


All phases of this installation must comply with NATION, STATE AND LOCAL CODES. If additional information is required please contact your local distributor.


1.0 SAFETY


When you see the symbols below on labels or in the manual, be alert to the potential or immediate hazards of personal injury, property and/or product damage. It is the owner's or installer's responsibility to comply with all safety instructions and information accompanying these symbols.


 **WARNING:** This is a safety alert symbol indicating a potential hazardous situation, which could result in personal injury, property and/or product damage or death.


 **CAUTION:** This is a safety alert symbol indicating a potential hazardous situation, which could result in moderate personal injury, and/or property and product damage.


 WARNING
These instructions are intended as an aid to qualified, licensed service personnel for proper installation, adjustment and operation of this unit. Read these instructions thoroughly before attempting installation or operation. Failure to follow these instructions may result in improper installation, adjustment, service or maintenance possibly resulting in fire, electrical shock, property damage, personal injury or death.


 WARNING
The manufacturer's warranty does not cover any damage or defect to the heat pump caused by the attachment or use of any components, accessories or devices (other than those authorized by the manufacturer) into, onto or in conjunction with the heat pump. You should be aware that the use of unauthorized components, accessories or devices may adversely affect the operation of the heat pump and may also endanger life and property. The manufacturer disclaims any responsibility for such loss or injury resulting from the use of such unauthorized components, accessories or devices.

 WARNING
Disconnect all power to the unit before starting maintenance. Failure to do so can result in severe electrical shock or death.

 WARNING
Do not, under any circumstances, connect return ductwork to any other heat producing device such as a fireplace insert, stove, etc. Unauthorized use of such devices may result in fire, carbon monoxide poisoning, explosion, property damage, severe personal injury or death.

 WARNING
The unit must be permanently grounded. A grounding lug is provided. Failure to ground this unit can result in fire or electrical shock causing property damage, severe personal injury or death.

 WARNING
Only electric heater kits supplied by this manufacturer as described in this publication have been designed, tested, and evaluated by a nationally recognized safety testing agency for use with this unit. Use of any other manufactured electric heaters installed within this unit may cause hazardous conditions resulting in property damage, fire, bodily injury or death.

 WARNING
Proposition 65: This appliance contains fiberglass insulation. Respirable particles of fiberglass are known to the state of California to cause cancer.



CAUTION

Only use this unit in well-ventilated spaces and ensure that there are no obstructions that could impede the airflow into and out of the unit.

Do not use this unit in the following locations:

- Locations with mineral oil.
- Locations with saline atmospheres, such as seaside locations.
- Locations with sulphurous atmospheres, such as near natural hot springs.
- Where high voltage electricity is present, such as in certain industrial locations.
- On vehicles or vessels, such as trucks or ferry boats.
- Where exposure to oily or very humid air may occur, such as kitchens.
- In proximity to sources of electromagnetic radiation, such as high-frequency transmitters or other high strength radiation devices.

1.1 INSPECTION

As soon as unit is received, it should be inspected and noted for possible shipping damage during transportation. It is carrier's responsibility to cover the cost of shipping damage. Manufacturer or distributor will not accept the claims from dealer for any transportation damage.

1.2 LIMITATIONS

Refer to Fig. 2-3, 2-4, 2-6, 2-7 for unit physical data and to Table 6-1, 6-2 for electrical data.

If components are to be added to a unit they must meet local codes, they are to be installed at the dealer's and /or the customer's expense.

Size of unit for proposed installation should be based on heat loss / heat gain calculations made in accordance with industry recognized procedures identified by the Air conditioning contractors of America.

2.0 INSTALLATION

2.1 PRE-INSTALLATION

Before installation, carefully check the following:

1. Unit should be installed in accordance with national and local safety codes, including but not limit to ANSI/NFPA No. 70 or Canadian Electrical Code Part 1, C22.1, local plumbing and wastewater codes and any other applicable codes.
2. For rooftop installation, be sure the structure has enough strength to support the weight of unit. Unit should be installed on roof curb and leveled.
3. For ground level installation, a level slab should be used.
4. Condenser airflow should not be restricted.
5. On applications when a roof curb is used, the unit must be positioned on the curb so the front of the unit is tight against the curb.

2.2 RIGGING AND HANDING

Exercise care when moving the unit. Do not remove any packaging until the unit is near the place of installation. Rig the unit by attaching chain or cable slings to the lifting holes provided in the base rails. Spreader bars, whose length exceeds the largest dimension across the unit, MUST be used across the top of the unit.

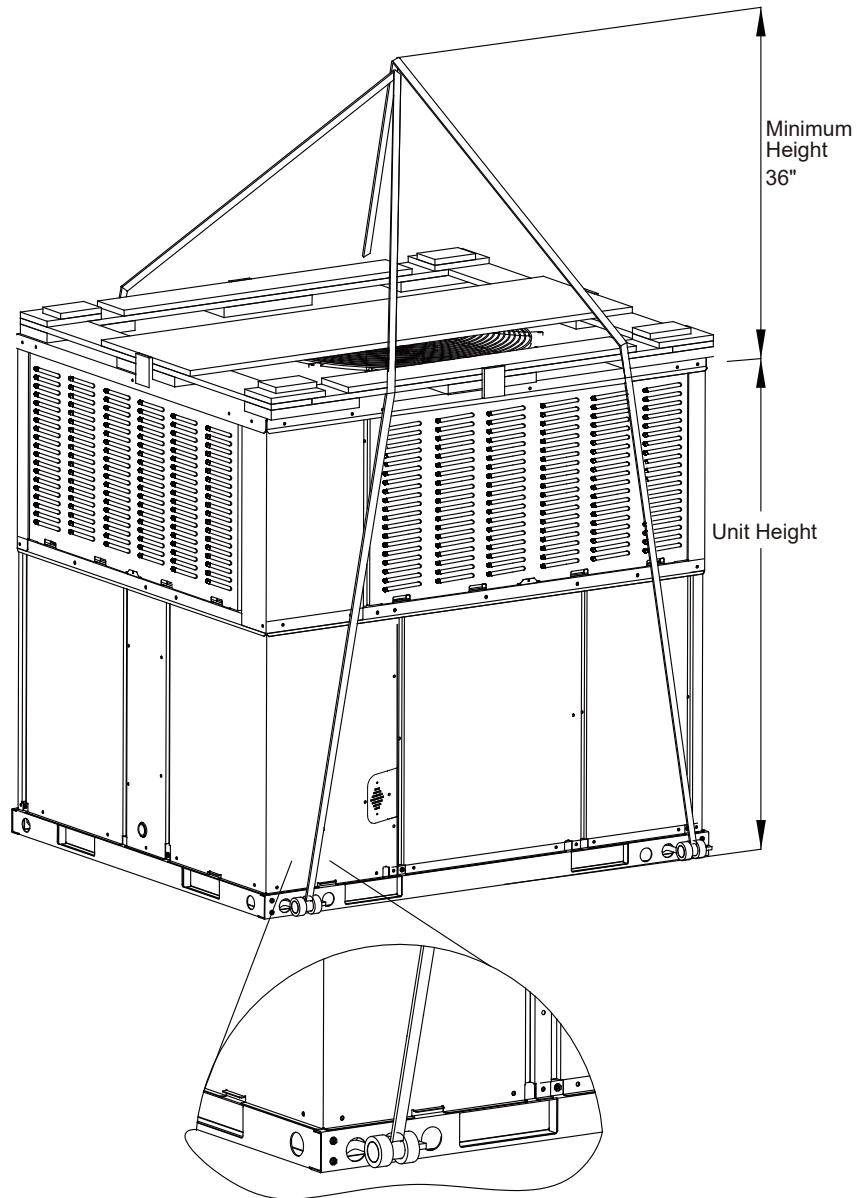


Fig. 2-1 Hoisting diagram

* The above figure for reference purpose only.



CAUTION

Before lifting, make sure the unit weight is distributed equally on the rigging cables so it will lift evenly.

Units may be moved or lifted with a forklift. Slotted openings in the base rails are provided for this purpose.



CAUTION

All panels must be secured in place when the unit is lifted.
The condenser coils should be protected from rigging cable damage with plywood or other suitable material.



WARNING

Check the electric wire, water and gas pipeline layout inside the wall, floor and ceiling before installation. Do not implement drilling unless confirm safety with the user, especially for the hidden power wire. An electroprobe can be used to test whether a wire is passing by at the drilling location, to prevent physical injury or death caused by insulation broken cords.



WARNING

Check the power supply before installation. Ensure that the power supply must be reliably grounded following local, state and National Electrical Codes. If not, for example, if the ground wire is detected charged, installation is prohibited before it is rectified. Otherwise, there is a risk of fire and electric shock, causing physical injury or death.

Component Location-24k&36k

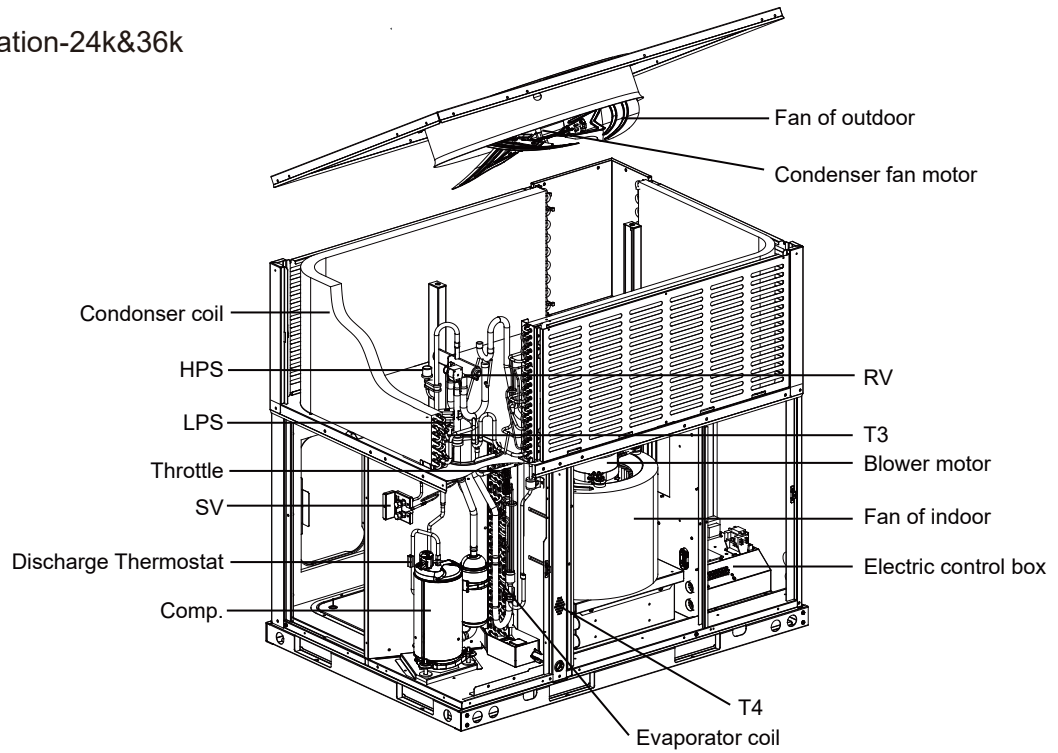


Fig. 2-2 Component Location

* The above figure for reference purpose only.

2.3 Unit Dimensions

Unit Dimensions-24k&36k

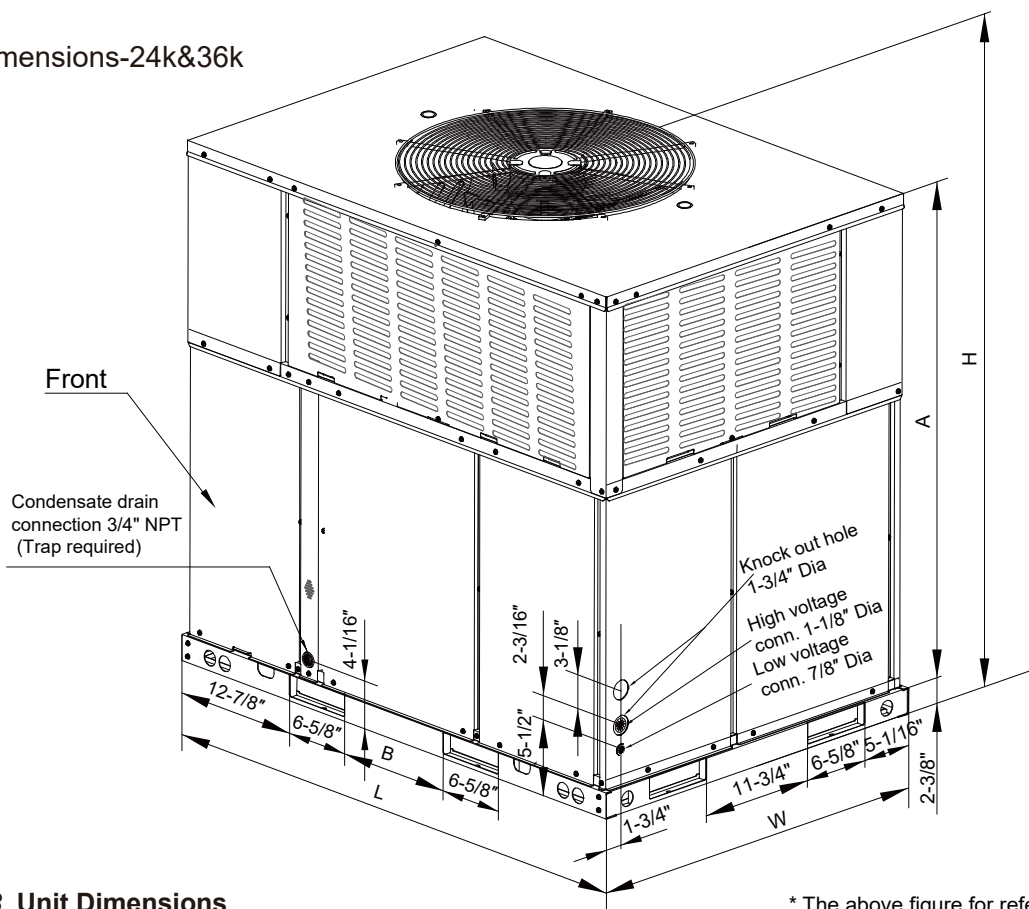


Fig. 2-3 Unit Dimensions

* The above figure for reference purpose only.

Model size	Dimensions				
	"L" in.[mm]	"W" in.[mm]	"H" in.[mm]	"A" in.[mm]	"B" in.[mm]
24,36	50-11/16 [1287]	35-1/16 [891]	46-13/16 [1190]	44-1/16 [1120]	11-3/4 [298]

Table 2-1

Dimensions Back and Bottom-24K&36K

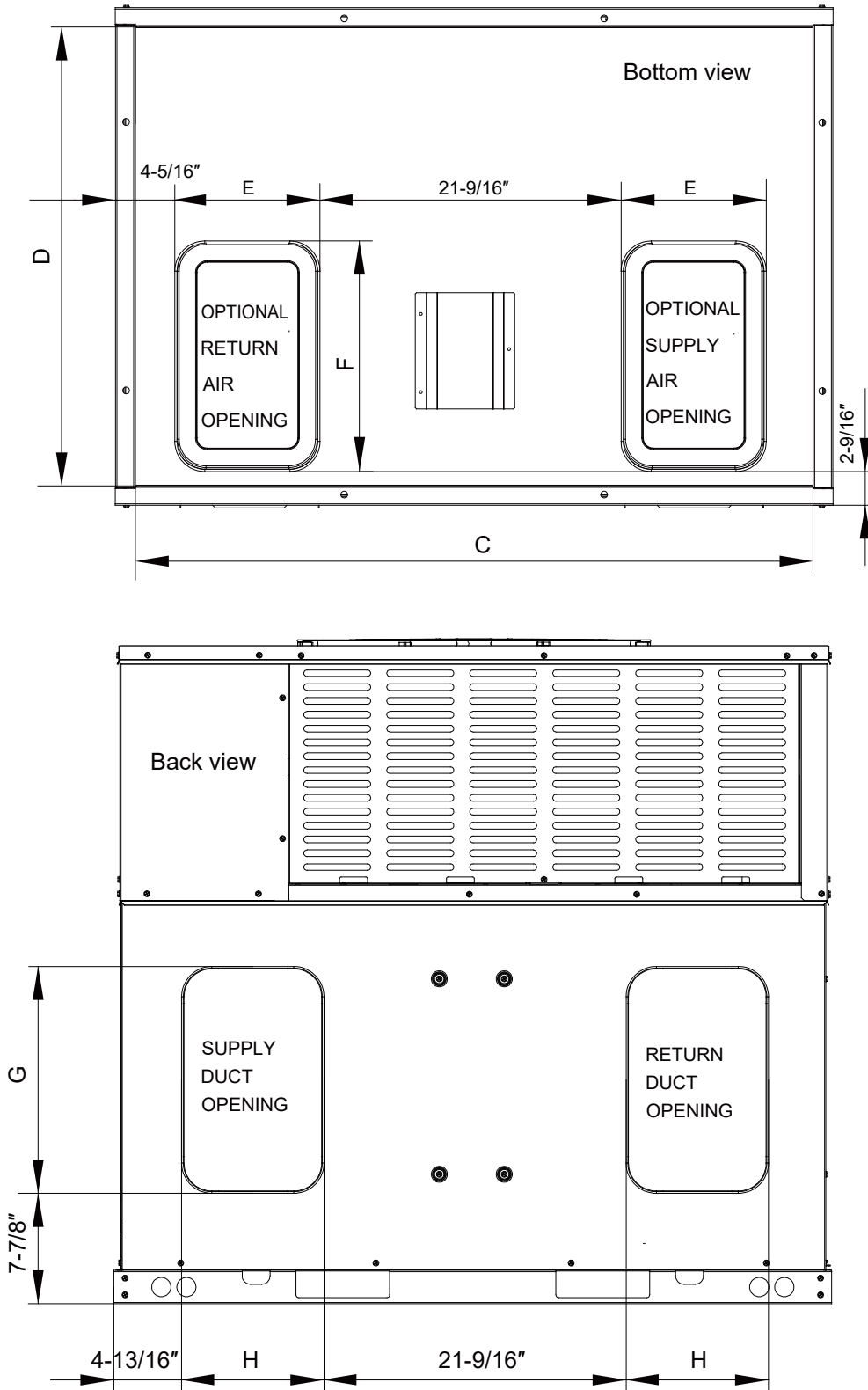


Fig. 2-4

* The above figure for reference purpose only.

Model size	Dimensions					
Heat Pump	"C" in.[mm]	"D" in.[mm]	"E" in.[mm]	"F" in.[mm]	"G" in.[mm]	"H" in.[mm]
24,36	47-13/16 [1215]	32-1/4 [820]	9-15/16 [252]	15-7/8 [403]	15-3/4 [400]	9-3/4 [249]

Table 2-2

Component Location-48K&60K

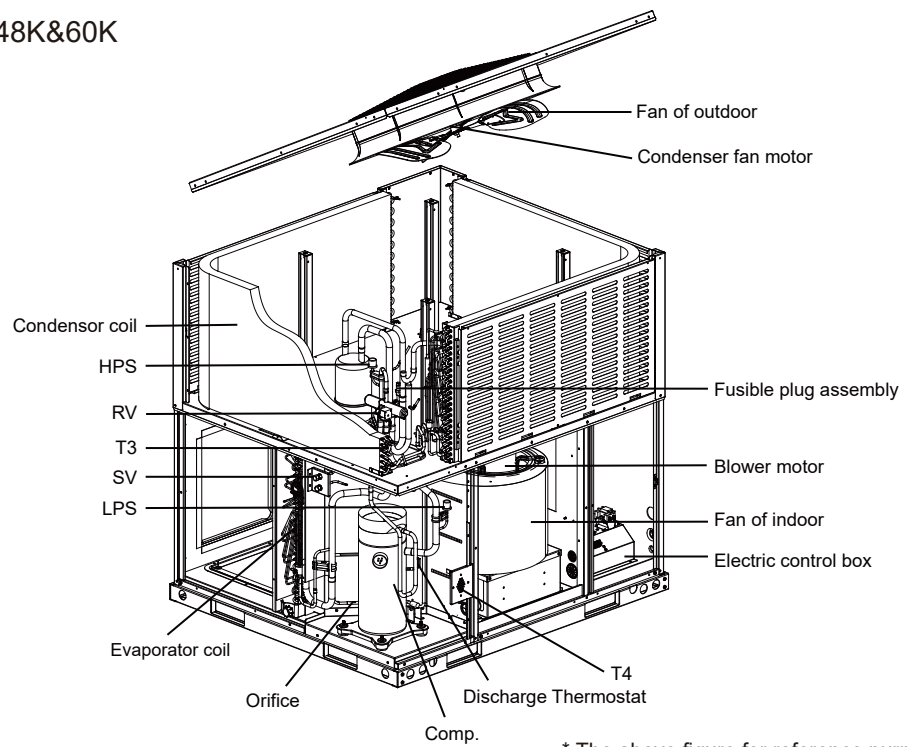


Fig. 2-5

* The above figure for reference purpose only.

Unit Dimensions-48K&60K

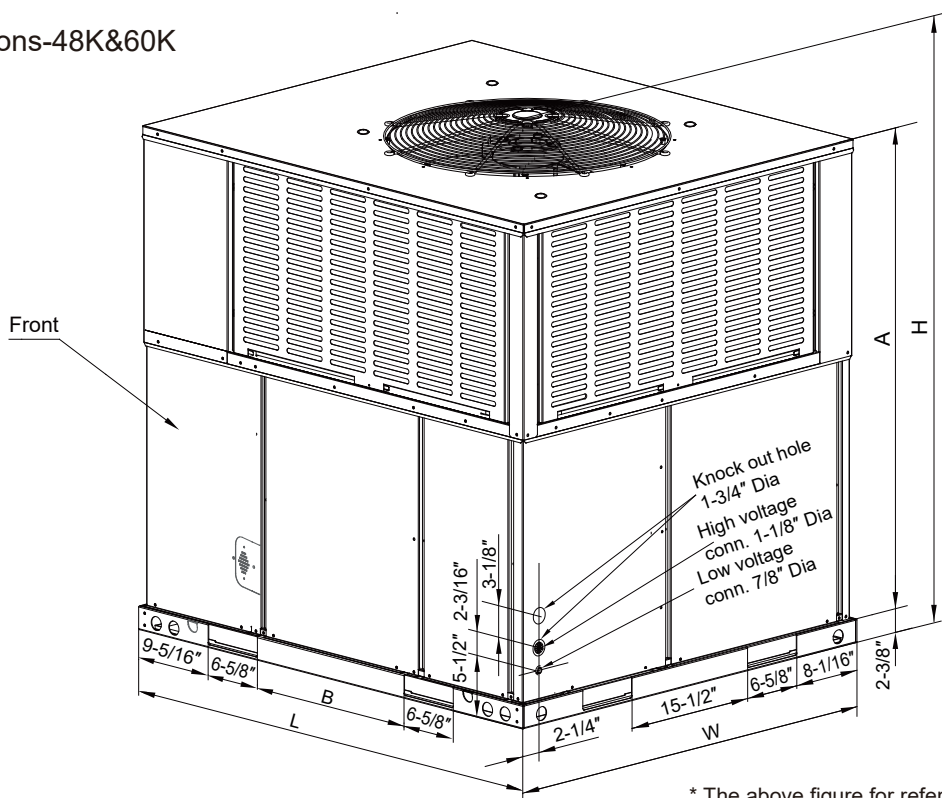


Fig. 2-6

* The above figure for reference purpose only.

Model size	Dimensions				
	"L" in.[mm]	"W" in.[mm]	"H" in.[mm]	"A" in.[mm]	"B" in.[mm]
48,60	51-9/16 [1310]	44-13/16 [1140]	51-7/16 [1306]	47-5/16 [1202]	19-11/16 [500]

Table 2-3

Dimensions Back and Bottom-48K&60k

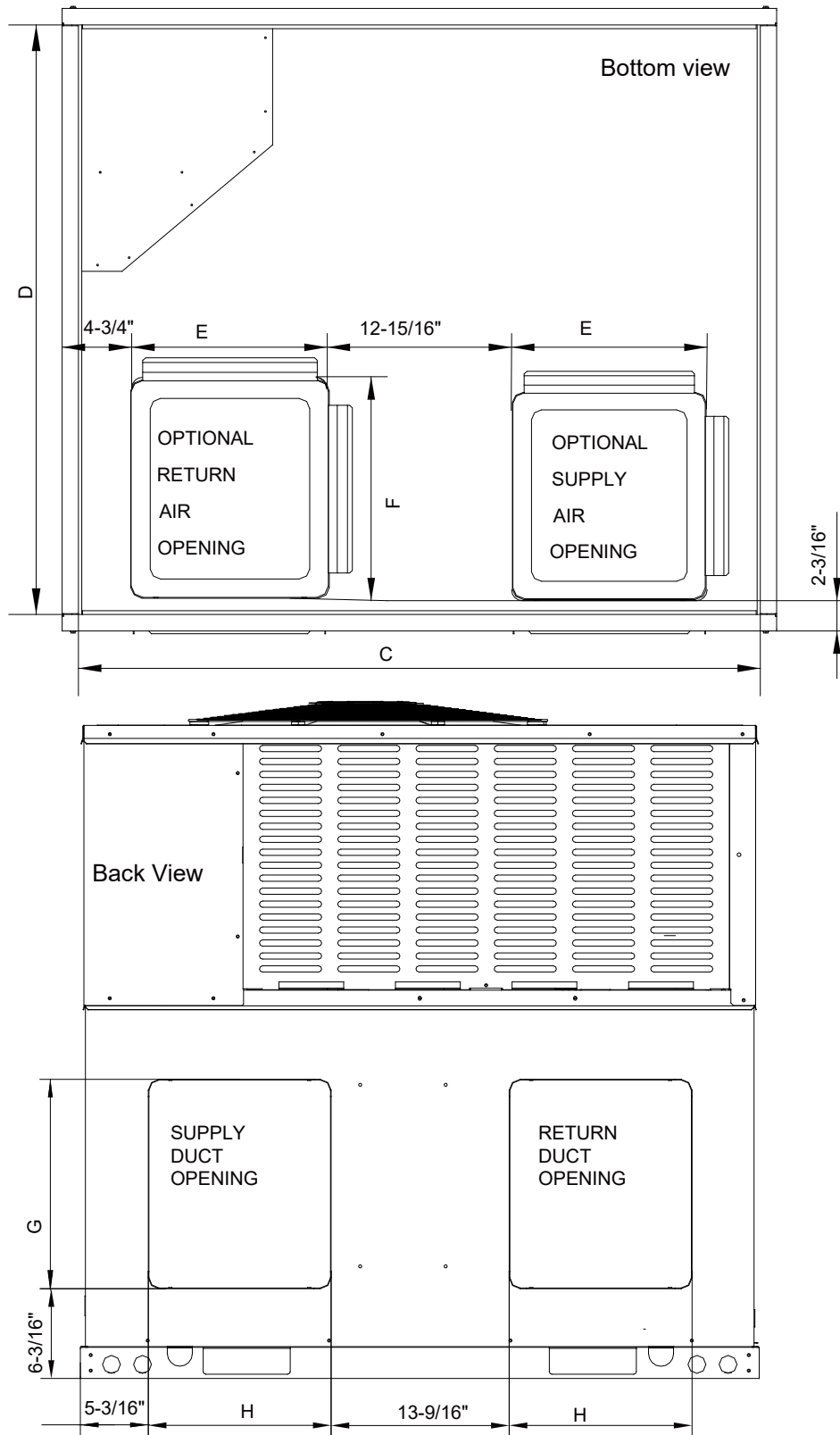


Fig. 2-7

* The above figure for reference purpose only.

Model size	Dimensions					
	"C" in.[mm]	"D" in.[mm]	"E" in.[mm]	"F" in.[mm]	"G" in.[mm]	"H" in.[mm]
Heat Pump	49-1/4 [1250]	42-1/2 [1080]	14-1/8 [358]	16-1/8 [409]	15-7/8 [403]	13-7/8 [352]

Table 2-4



NOTE

For units applied with a roof curb, the minimum clearance may be reduced from 1 inch to 1/2 inch between combustible roof curb material and this supply air duct.

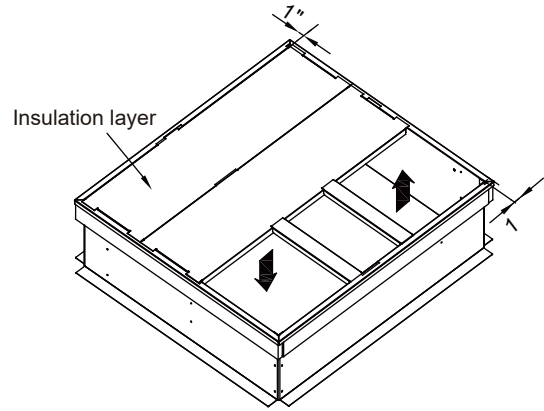
2.4 Roof Curb

On applications when a roof curb is used, the unit must be positioned on the curb so the front of the unit is tight against the curb. (See Fig.2-8 ROOF CURB DIMENSIO)



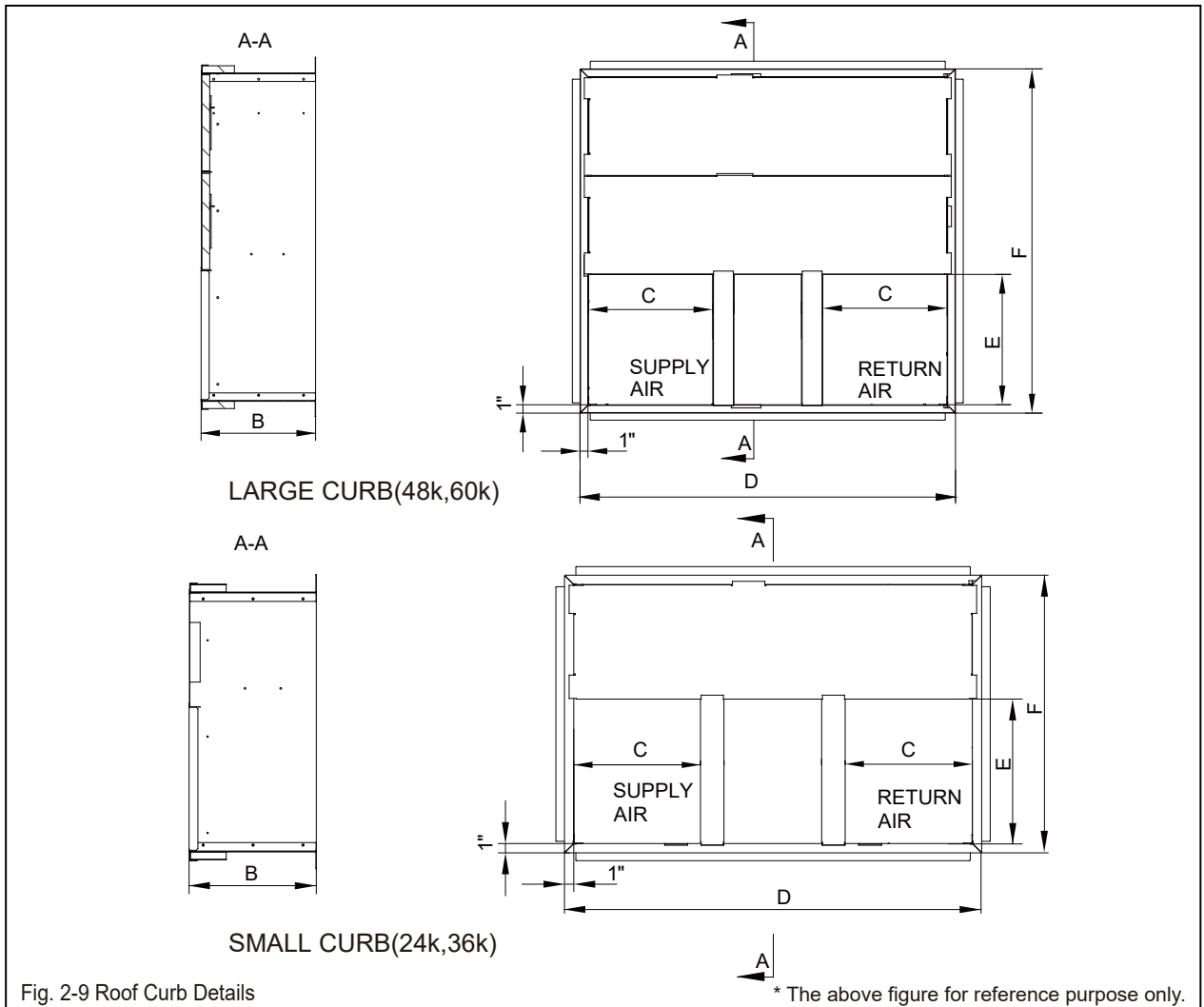
For units applied with a roof curb, the minimum clearance may be reduced from 1 inch to 1/2 inch between combustible roof curb material and this supply air duct.

Roof Curb Dimension



Supply and return air (including duct support rails) shown are typical for bottom duct applications. For location of horizontal duct applications (on back of unit), refer to unit dimension details.

Fig. 2-8



CURB	Dimensions(Inches)				
	"B" in.[mm]	"C" in.[mm]	"D" in.[mm]	"E" in.[mm]	"F" in.[mm]
LARGE	14-1/4 [362]	15-1/4 [387]	46-1/16 [1170]	16 [406]	42-3/16 [1070]
SMALL	14-1/4 [362]	14 [356]	46-1/16 [1170]	16 [406]	30-5/8 [778]

Table 2-5



All panels must be secured in place when the unit is lifted. The condenser coils should be protected from rigging cable damage with plywood or other suitable material.

2.5 Location restrictions

Ensure the top discharge area is unrestricted for at least 60 inches above the unit.

Do not locate outdoor unit near bedrooms since normal operational sounds may be objectionable.

Position unit to allow adequate space for unobstructed airflow, wiring, refrigerant lines, and serviceability.

Allow a minimum of 12 in. clearance on one side of access panel to a wall and a minimum of 24 in. on the adjacent side of access panel.

Maintain a distance of 24 in. between units.

Position unit where water, snow, or ice from roof or overhang cannot fall directly on unit. (See Fig.2-11 and Fig.2-12.)

CAUTION:

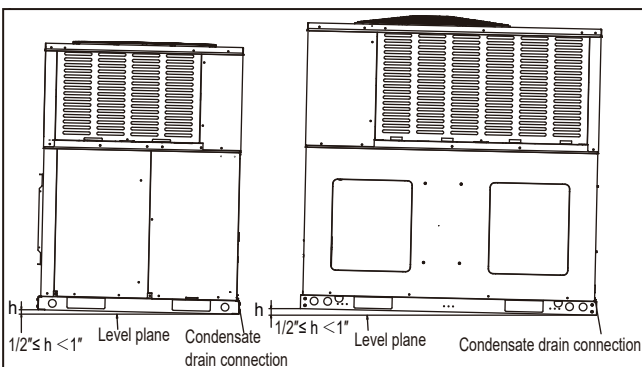
Cold climate considerations (heat pump only)



Precautions must be taken for units being installed in areas where snow accumulation and prolonged below-freezing temperatures occur.

- Units should be elevated 3-12 inches above the pad or rooftop, depending on local weather. This additional height will allow drainage of snow and ice melted during defrost cycle prior to its refreezing. Ensure that drain holes in unit base pan are not obstructed, preventing drainage of defrost water (See Fig.2-13).
- If possible, avoid locations that are likely to accumulate snow drifts. If not possible, a snow drift barrier should be installed around the unit to prevent a build-up of snow on the sides of the unit.

Note: Make sure that Condensate Drain side is not higher than the other side (Fig.2-10).



* The above figure for reference purpose only.

Fig. 2-10 Slab installation

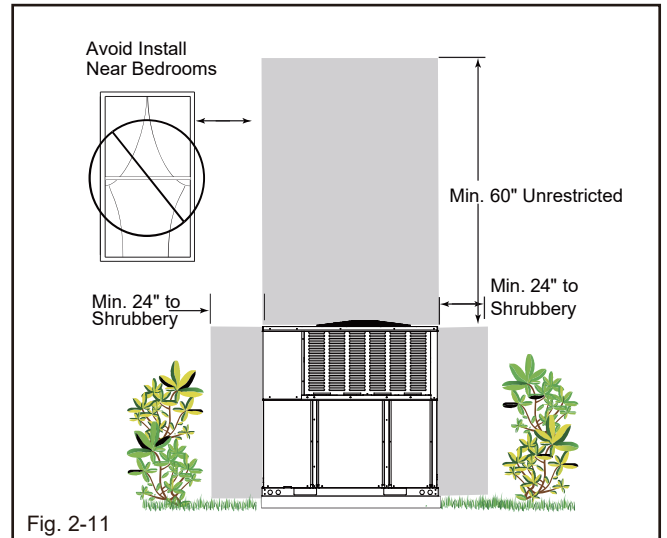


Fig. 2-11

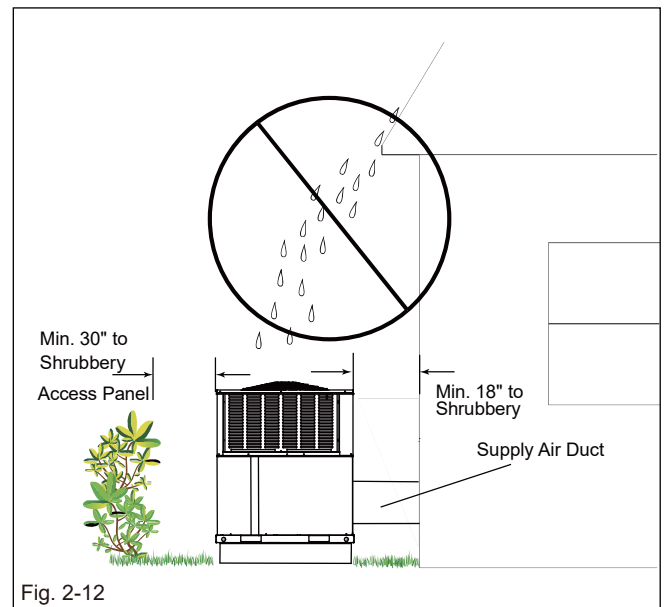


Fig. 2-12

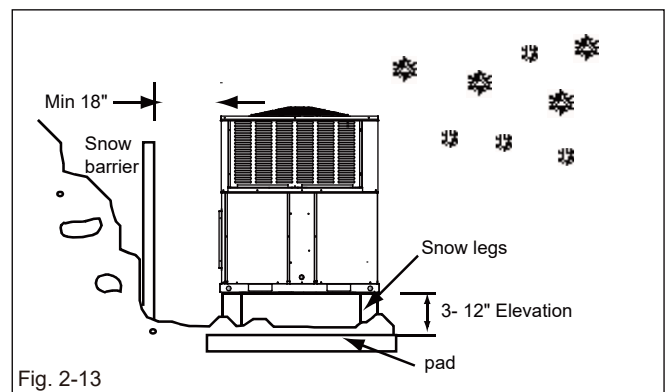




Fig. 2-13


3. DUCTWORK

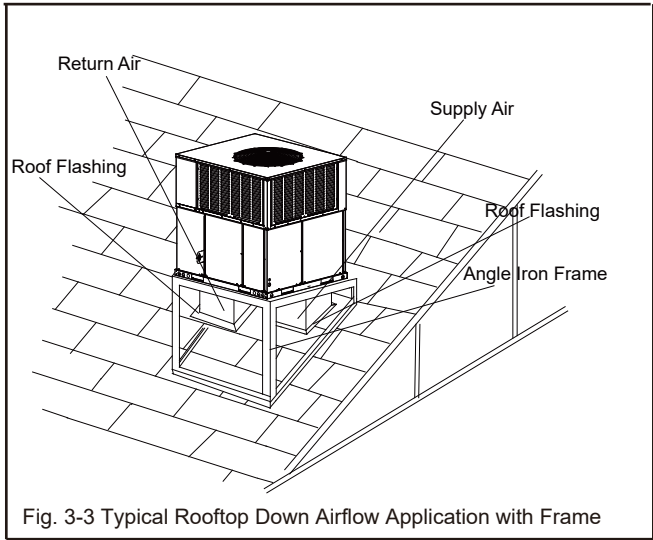
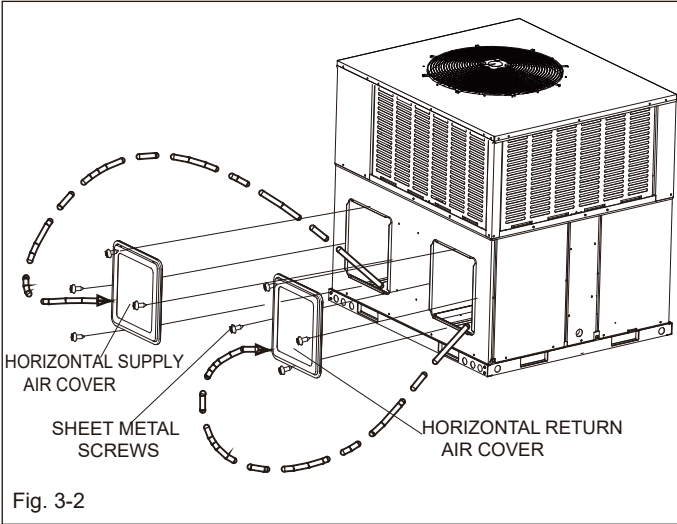
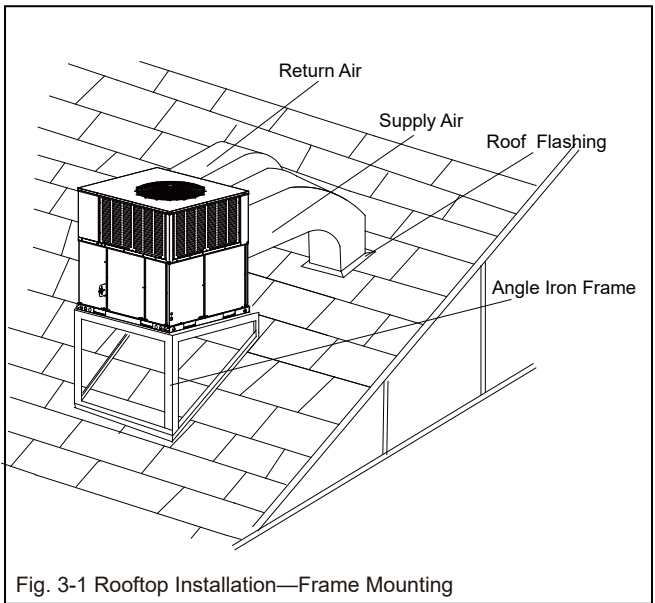
Ductwork should be sized and installed by the installing contractor in accordance with the Manual D from the Air Conditioning Contractors of America, and all national, state and local codes.

 On ductwork exposed to outside air space, use at least 2" of insulation and a vapor barrier. Flexible joint may be used to reduce noise.


A closed return duct system shall be used. This shall not preclude use of economizers or ventilation air intake. Flexible joints may be used in the supply and return duct work to minimize the transmission of noise.

 **CAUTION:**
When fastening duct work to the side duct flanges on the unit, insert the screws through the duct flanges only. DO NOT insert the screws through the casing. Outdoor duct work must be insulated and waterproofed.

 **NOTE:**
Be sure to note supply and return openings. Refer to Fig. 2-7 for information concerning supply and return air duct openings.



After the unit is installed, there should be no open passages through the supporting structure that would permit flame or hot gases from a fire originating in the space below the supporting structure to travel to the space above that structure.

 **NOTE:**
A unit with electric heaters with an inlet or outlet duct that penetrates the building structure supporting the unit shall be provided with a mounting base of noncombustible material so designed that, after the unit is installed, there will be no open passages through the supporting structure that would permit flame or hot gases from a fire originating in the space below the supporting structure to travel to the space above that structure. If the unit is intended to be installed on a supporting structure of combustible material, the base shall be so designed that the required clearance will be maintained between the supporting unit mounting base, and shall extend not less than 76 mm (3 in.) below the upper surface of the supporting structure, except that, in a unit designed for use only in a mobile home, the distance shall be not less than 19 mm (3/4 in.).

4.0 CONDENSATE DRAIN CONNECTION

Consult local codes for special requirements.

To provide extra protection from water damage, install an additional drain pan, provided by installer, under the entire unit with a separate drain line. Manufacturer will not be responsible for any damages due to the failure to follow these requirements.

4.1 INSTALL DRAIN PIPE

1. Use the provided female NPT threaded fitting for outside connection and make sure that drain holes are not blocked.
2. Insulation may be needed for drain line to prevent sweating.
3. Use a sealing compound on male pipe threads. Install the condensate drain line (NPT) to spill into an open drain.
4. Ensure a trap is included in the condensate drain line.
5. Make sure that the outlet of the trap is at least 1 in. (25mm) lower than the drain pan condensate connection to prevent the pan from overflowing (See Fig. 4-1).
6. Unit must be slightly inclined toward drain connection.(See Fig. 2-10).

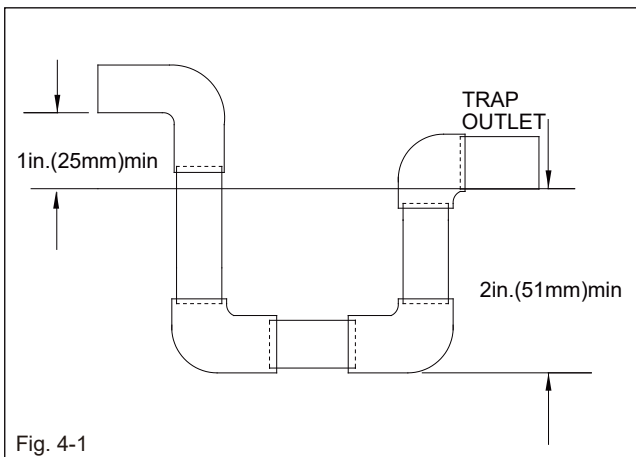


Fig. 4-1

4.2 REMOVAL AND CLEAN THE DRAIN PAN

See above Figure.4-1 B, disconnect the Connective Tube and Drain Commutator, screw off the two fixed screws of Drain Pan, and then along with the rail pull out the Drain Pan and Connective Tube from the bottom of evaporator. Using a wet cloth or water to wash out the drain pan carefully.

5.0 FILTERS

Units are shipped without a filter or filter racks. It is the responsibility of the installer to secure a filter in the return air ductwork or install a filter/frame Kit.

Filter must always be used and must be kept clean. When filter become dirt laden, insufficient air will be delivered by the blower, decreasing your units efficiency and increasing operation costs and wear-and tear on the unit and controls.

Filters should be checked monthly; this is especially important since this unit is used for both heating and cooling.

6.0 ELECTRICAL WIRING

Field wiring must comply with the National Electric Code (NEC) or Canadian Electrical Code (CEC) and any applicable local ordinance.



WARNING


Disconnect all power to unit before installing or servicing. More than one disconnect switch may be required to de-energize the equipment. Hazardous voltage can cause severe personal injury or death.

6.1 POWER WIRING

1. Proper electrical power should be available at unit. Voltage tolerance should not be over 10% from rating voltage.
2. If any of the wire must be replaced, replacement wire must be the same type as shown in nameplate, wiring diagram and electrical data sheet.
3. Install a branch circuit disconnect of adequate size to handle starting current, located within sight of, and readily accessible to the unit.
4. ELECTRIC HEATER - If the Electric Heater is installed, unit may be equipped with 30~60A. circuit breakers or fuse. These breaker(s) protect the internal wiring in the event of a short circuit and serve as a disconnect. Circuit breakers installed within the unit do not provide over-current protection of the supply wiring and therefore may be sized larger than the branch circuit protection.
 - Supply circuit power wiring must be 221 °F minimum copper conductors only. See Electrical Data in this section for ampacity, wire size and circuit protector requirements. Supply circuit protective devices may be either fuses or "HACR" type circuit breakers.
 - An 1-3/8" knockouts inside cabinet is provided for connection of power wiring to electric heater.
 - Power wiring is connected to the power terminal block in unit electric cabinet.

See Electrical Heater Installation Instruction for details.

6.2 GROUNDING

	WARNING
<p>The unit must be permanently grounded. Failure to do so can result in electrical shock causing personal injury or death.</p>	

- Grounding may be accomplished by grounding metal conduit when installed in accordance with electrical codes to the unit cabinet.
- Grounding may also be accomplished by attaching ground wire(s) to ground lug(s) provided in the unit wiring compartment.

6.3 CONTROL WIRING

IMPORTANT: Class 2 low voltage control wiring SHOULD NOT be run in conduit with main power wiring and must be separated from power wiring, unless class 1 wire of proper voltage rating is used.

- Low voltage control wiring should be 18 AWG color-coded. For lengths longer than 50 ft, 16 AWG wire should be used.
- Two 7/8" holes can be used for control wires going into the unit, one on left side and one at the bottom.
- Make sure, after installation, separation of control wiring and power wiring has been maintained.

Thermostat should be mounted on an inside wall about 58" from floor and will not be affected by unconditioned air, sun and/or heat exposure. Follow the instruction carefully because there are many wiring requirements.

See Fig. 6-1 ~ 2, Table 6-1

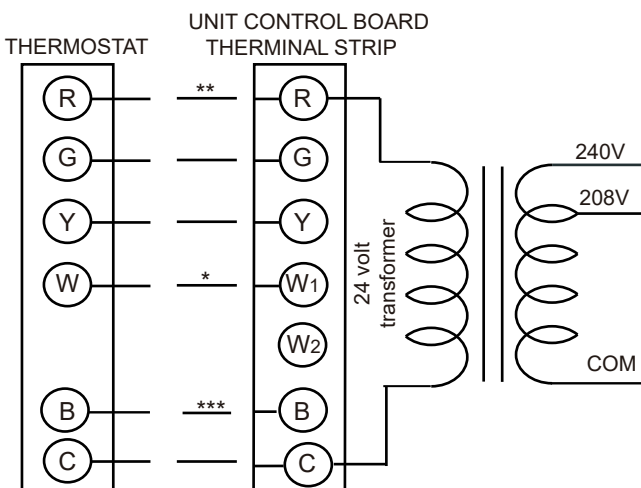



Fig. 6-1 Typical Field Control Wiring Diagram

- *** B wire be used with heat pump system only.
- ** Minimum wire size of 18 AWG wire should be used for all field installed 24 volt wire.
- * Only required on units with supplemental electric heat.

	CAUTION
<p>Label all wire prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation. Verify proper operation after servicing.</p>	

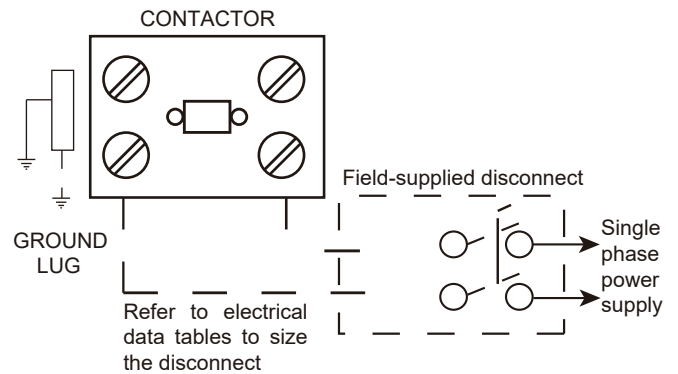


Fig. 6-2 Typical Field Power Wiring Diagram

Table 6-1: 14 SEER Heat Pump W/Without Electric Heat

Size (Tons)	Volt	Compressors		OD Fan Motors	Supply Blower Motor	Heater Circuit(without units)						Heater Fan Speed		
		RLA	LRA	FLA	FLA	Model	KW	Stages	Amps	MCA (Amps)	Max Fuse Breaker Size (Amps)	Low	Middle	High
24(2.0)	208/230-1-60	10.0	34.8	0.61	2.0	None	-	-	None	15.1	25			
						EHK-05J	3.8/5	1	18.1/20.8	23/26	25/30	●	●	●
						EHK-08J	5.6/7.5	1	27.1/31.3	34/40	35/40	✗	●	●
						EHK-10J	7.5/10	1	36.1/41.7	46/53	50/60	✗	●	●
36(3.0)	208/230-1-60	16.0	72	1.0	3.2	None	-	-	None	24.2	40			
						EHK-05J	3.8/5	1	18.1/20.8	23/26	25/30	●	●	●
						EHK-08J	5.6/7.5	1	27.1/31.3	34/40	35/40	●	●	●
						EHK-10J	7.5/10	1	36.1/41.7	46/53	50/60	✗	●	●
						EHK-15J	11.3/15	2	54.2/62.5	68/79	70/80	✗	●	●
48(4.0)	208/230-1-60	23.0	108	1.9	4.4	None	-	-	None	35.1	50			
						EHK-05J	3.8/5	1	18.1/20.8	23/26	25/30	●	●	●
						EHK-08J	5.6/7.5	1	27.1/31.3	34/40	35/40	●	●	●
						EHK-10J	7.5/10	1	36.1/41.7	46/53	50/60	●	●	●
						EHK-15J	11.3/15	2	54.2/62.5	68/79	70/80	✗	●	●
						EHK-20J	15/20	2	72.2/83.3	91/105	100/110	✗	✗	●
60(5.0)	208/230-1-60	26.0	127.9	1.9	4.0	None	-	-	None	38.4	60			
						EHK-05J	3.8/5	1	18.1/20.8	23/26	25/30	●	●	●
						EHK-08J	5.6/7.5	1	27.1/31.3	34/40	35/40	●	●	●
						EHK-10J	7.5/10	1	36.1/41.7	46/53	50/60	●	●	●
						EHK-15J	11.3/15	2	54.2/62.5	68/79	70/80	✗	●	●
						EHK-20J	15/20	2	72.2/83.3	91/105	100/110	✗	✗	●
60(5.0)	208/230-3-60	22.0	136.8	1.9	5.8	None	-	-	None	35.2	50			
						EHK-10J	7.5/10	1	36.1/41.7	46/53	50/60	●	●	●
						EHK-15J	11.3/15	2	54.2/62.5	68/79	70/80	✗	●	●
						EHK-20J	15/20	2	72.2/83.3	91/105	100/110	✗	✗	●

Table 6-2: 14 SEER Physical Data

Component	Models				
	2.0	3.0	4.0	5.0	5.0
Nominal Tonnage	2.0	3.0	4.0	5.0	5.0
Volt	208/230-1-60	208/230-1-60	208/230-1-60	208/230-1-60	208/230-3-60
ARI COOLING PERFORMANCE					
ARI net capacity (Btu)	23200	34600	47000	58500	57000
EER	12.0	11.5	11.5	11.8	11.8
SEER	14.0	14.0	14.0	14.0	14.0
Nominal CFM	780	1200	1600	1850	1850
System power (kW)	1.93	3.01	4.09	4.96	4.83
Refrigerant type	R410a	R410a	R410a	R410a	R410a
Refrigerant charge (lb-oz)	6-3	7-4	9-4	12-6	13-4
ARI HEATING PERFORMANCE					
47°F Capacity Rating (Btu)	22800	35000	48000	58500	57000
System power (kW)	1.70	2.69	3.91	4.56	4.58
17°F Capacity Rating (Btu)	12100	19000	28500	32500	34500
System power (kW)	1.58	2.35	3.52	4.00	4.04
HSPF	8.2	8.2	8.2	8.0	8.0
DIMENSIONS (Inches)					
Length	50-11/16	50-11/16	51-9/16	51-9/16	51-9/16
Width	35-1/16	35-1/16	44-13/16	44-13/16	44-13/16
Height	46-13/16	46-13/16	51-7/16	51-7/16	51-7/16
OPERATING WT. (lbs)	400	411	537	568	557
COMPRESSORS					
Type	Rotary	Rotary	Scroll	Scroll	Scroll
Quantity	1	1	1	1	1
CONDENSER COIL DATA					
Face area (Sq. Ft)	14.11	14.11	20.17	20.17	20.17
Rows	2+2	2+3	2+2	3+3	3+3
Fins per inch	17	17	17	17	17
Tube diameter	9/32	9/32	9/32	9/32	9/32
Circuitry type	interlaced	interlaced	interlaced	interlaced	interlaced
EVAPORATOR COIL DATA					
Face area (Sq. Ft)	3.96	3.96	6.1	6.1	6.1
Rows	4	4	4	4	4
Fins per inch	17	17	17	17	17
Tube diameter	9/32	9/32	9/32	9/32	9/32
Circuitry type	interlaced	interlaced	interlaced	interlaced	interlaced
Refrigerant control	Orifice	Orifice	Orifice	Orifice	Orifice
CONDENSER FAN DATA					
Fan diameter (inch)	23-5/8	23-5/8	26-3/8	26-3/8	26-3/8
Type	Prop	Prop	Prop	Prop	Prop
Drive type	Direct	Direct	Direct	Direct	Direct
No. speeds	1	1	1	1	1
Number of motors	1	1	1	1	1
Motor HP each	1/12 (60W)	1/6 (110W)	1/3 (290W)	1/3 (290W)	1/3 (290W)
RPM	880	840	1070	1070	1070
Nominal total CFM	2200	2770	5100	5000	5000
DIRECT DRIVE EVAP FAN DATA					
Quantity	1	1	1	1	1
Fan Size (Inch)	10×10	10×10	11×10-5/8	11×10-5/8	11×10-5/8
Type	Centrifugal	Centrifugal	Centrifugal	Centrifugal	Centrifugal
No. speeds	1	1	1	1	1
Motor HP each	1/5 (150W)	1/2 (375W)	1/2 (400W)	3/4 (600W)	3/4 (560W)

* The above Table data for reference only.

7.0 AIRFLOW PERFORMANCE

Airflow performance data is based on cooling performance with a coil and no filter in place. Use this performance table for appropriate unit size, external static applied to unit and allow operation within the minimum and maximum limits shown in table below for both cooling and electric heat operation.

7.1 AIRFLOW PERFORMANCE DATA

Table 7-1 Side Duct Application

Model Number	Motor Speed	External Static Pressure-Inches W.C.[kPa]									
			0[0]	0.1[.02]	0.2[.05]	0.3[.07]	0.4[.10]	0.5[.12]	0.6[.15]	0.7[.17]	0.8[.20]
24	Low-Factory	CFM	/	860	767	677	593	/	/	/	/
		Current/A	/	1.0	1.0	1.0	1.0	/	/	/	/
		Power/W	/	229	225	222	218	/	/	/	/
	Middle	CFM	/	/	/	900	819	736	629	/	/
		Current/A	/	/	/	1.4	1.4	1.3	1.3	/	/
		Power/W	/	/	/	314	309	303	298	/	/
	High	CFM	/	/	/	/	/	868	761	653	600
		Current/A	/	/	/	/	/	1.7	1.7	1.7	1.7
		Power/W	/	/	/	/	/	384	376	370	365
36	Low (Tap2)	CFM	1170	1107	1042	984	926	867	798	/	/
		Current/A	1.6	1.6	1.7	1.7	1.8	1.8	1.9	/	/
		Power/W	176	182	188	194	200	206	211	/	/
	Middle (Tap3)-Factory	CFM	1339	1284	1224	1168	1119	1065	1014	961	900
		Current/A	2.2	2.2	2.3	2.3	2.4	2.4	2.5	2.5	2.6
		Power/W	254	260	266	272	279	286	294	300	305
	High (Tap4)	CFM	1436	1385	1328	1274	1226	1178	1128	1079	1031
		Current/A	2.6	2.6	2.7	2.7	2.8	2.9	2.9	3.0	3.0
		Power/W	307	315	322	328	335	342	350	357	364
48	Low-Factory	CFM	1800	1757	1684	1601	1486	1399	1302	1200	/
		Current/A	2.7	2.7	2.7	2.7	2.7	2.7	2.6	2.6	/
		Power/W	557	549	541	531	521	509	498	383	/
	Middle	CFM	/	/	1800	1728	1607	1506	1411	1307	/
		Current/A	/	/	3.4	3.4	3.3	3.3	3.3	3.3	/
		Power/W	/	/	657	646	634	621	610	593	/
	High	CFM	/	/	/	/	1733	1621	1513	1400	1260
		Current/A	/	/	/	/	4.3	4.3	4.20	4.2	4.2
		Power/W	/	/	/	/	802	788	773	761	741
60	Low-Factory	CFM	2110	2049	1980	1897	1804	1715	1605	/	/
		Current/A	3.2	3.1	3.0	3.0	2.9	2.8	2.7	/	/
		Power/W	726	716	701	685	663	643	615	/	/
	Middle	CFM	2271	2192	2106	2016	1904	1801	1689	1557	/
		Current/A	3.6	3.5	3.4	3.3	3.2	3.1	3.0	2.9	/
		Power/W	832	804	779	755	728	702	673	643	/
	High	CFM	2363	2278	2191	2096	1980	1873	1757	1621	1500
		Current/A	3.9	3.8	3.7	3.6	3.5	3.4	3.3	3.2	3.0
		Power/W	899	873	850	825	797	771	743	712	676
60 (208/230-3-60)	Low (Tap3)	CFM	1784	1732	1675	1610	1548	/	/	/	/
		Current/A	2.6	2.7	2.7	2.8	2.9	/	/	/	/
		Power/W	312	321	329	337	347	/	/	/	/
	Middle (Tap4)-Factory	CFM	2046	1996	1953	1900	1844	1790	1700	1676	1550
		Current/A	3.7	3.8	3.9	3.9	4.0	4.1	4.2	4.3	4.6
		Power/W	459	471	481	492	503	514	527	538	577
	High (Tap5)	CFM	/	2227	2185	2142	2094	2042	1951	1938	1790
		Current/A	/	5.1	5.2	5.2	5.3	5.4	5.5	5.6	5.7
		Power/W	/	646	658	670	683	695	709	724	735

* The above airflow data for reference only.

Table 7-2 Bottom Duct Application

Model Number	Motor Speed	External Static Pressure-Inches W.C.[kPa]									
			0[0]	0.1[.02]	0.2[.05]	0.3[.07]	0.4[.10]	0.5[.12]	0.6[.15]	0.7[.17]	0.8[.20]
24	Low-Factory	CFM	/	860	767	677	593	/	/	/	/
		Current/A	/	1.0	1.0	1.0	1.0	/	/	/	/
		Power/W	/	229	225	222	218	/	/	/	/
	Middle	CFM	/	/	/	900	819	736	629	/	/
		Current/A	/	/	/	1.4	1.4	1.3	1.3	/	/
		Power/W	/	/	/	314	309	303	298	/	/
	High	CFM	/	/	/	/	/	868	761	653	600
		Current/A	/	/	/	/	/	1.7	1.7	1.7	1.7
		Power/W	/	/	/	/	/	384	376	370	365
36	Low (Tap2)	CFM	1170	1107	1042	984	926	867	798	/	/
		Current/A	1.6	1.6	1.7	1.7	1.8	1.8	1.9	/	/
		Power/W	176	182	188	194	200	206	211	/	/
	Middle (Tap3)-Factory	CFM	1339	1284	1224	1168	1119	1065	1014	961	900
		Current/A	2.2	2.2	2.3	2.3	2.4	2.4	2.5	2.5	2.6
		Power/W	254	260	266	272	279	286	294	300	305
	High (Tap4)	CFM	1436	1385	1328	1274	1226	1178	1128	1079	1031
		Current/A	2.6	2.6	2.7	2.7	2.8	2.9	2.9	3.0	3.0
		Power/W	307	315	322	328	335	342	350	357	364
48	Low-Factory	CFM	1800	1757	1684	1601	1486	1399	1302	1200	/
		Current/A	2.7	2.7	2.7	2.7	2.7	2.7	2.6	2.6	/
		Power/W	557	549	541	531	521	509	498	383	/
	Middle	CFM	/	/	1800	1728	1607	1506	1411	1307	/
		Current/A	/	/	3.4	3.4	3.3	3.3	3.3	3.3	/
		Power/W	/	/	657	646	634	621	610	593	/
	High	CFM	/	/	/	/	1733	1621	1513	1400	1260
		Current/A	/	/	/	/	4.3	4.3	4.20	4.2	4.2
		Power/W	/	/	/	/	802	788	773	761	741
60	Low-Factory	CFM	2110	2049	1980	1897	1804	1715	1605	/	/
		Current/A	3.2	3.1	3.0	3.0	2.9	2.8	2.7	/	/
		Power/W	726	716	701	685	663	643	615	/	/
	Middle	CFM	2271	2192	2106	2016	1904	1801	1689	1557	/
		Current/A	3.6	3.5	3.4	3.3	3.2	3.1	3.0	2.9	/
		Power/W	832	804	779	755	728	702	673	643	/
	High	CFM	2363	2278	2191	2096	1980	1873	1757	1621	1500
		Current/A	3.9	3.8	3.7	3.6	3.5	3.4	3.3	3.2	3.0
		Power/W	899	873	850	825	797	771	743	712	676
60 (208/230 -3-60)	Low (Tap3)	CFM	1784	1732	1675	1610	1548	/	/	/	/
		Current/A	2.6	2.7	2.7	2.8	2.9	/	/	/	/
		Power/W	312	321	329	337	347	/	/	/	/
	Middle (Tap4)-Factory	CFM	2046	1996	1953	1900	1844	1790	1700	1676	1550
		Current/A	3.7	3.8	3.9	3.9	4.0	4.1	4.2	4.3	4.6
		Power/W	459	471	481	492	503	514	527	538	577
	High (Tap5)	CFM	/	2227	2185	2142	2094	2042	1951	1938	1790
		Current/A	/	5.1	5.2	5.2	5.3	5.4	5.5	5.6	5.7
		Power/W	/	646	658	670	683	695	709	724	735

* The above airflow data for reference only.

- The air distribution system has the greatest effect on airflow. The duct system is totally controlled by the contractor. For this reason, the contractor should use only industry-recognized procedures.
- Heat pump systems require a specified airflow. Each ton of cooling requires between 350 and 450 cubic feet of air per minute (CFM), or 400 CFM nominally.
- Duct design and construction should be carefully done. System performance can be lowered dramatically through bad planning or workmanship.
- Air supply diffusers must be selected and located carefully. They must be sized and positioned to deliver treated air along the perimeter of the space. If they are too small for their intended airflow, they become noisy. If they are not located properly, they cause drafts. Return air grilles must be properly sized to carry air back to the blower. If they are too small, they also cause noise.
- The installers should balance the air distribution system to ensure proper quiet airflow to all rooms in the home. This ensures a comfortable living space.
- An air velocity meter or airflow hood can give a reading of system CFM.
- When installation, installer should select the air speed according to the actual setting static pressure. Please refer to the *Table 7-1, 7-2 AIRFLOW PERFORMANCE DATA*.

Table 7-3 Refrigerant charge for H/P system

24K Cooling Mode Mode De Refroidissement		Cooling Charge Chart/Tableau De Charge de Refroidissement													
		Outdoor Ambient Temperature(F)/Temperature Amdiante Exterieur(en F)													
		55	60	65	70	75	80	85	90	95	100	105	110	115	
Low Pressure Detected Valve(psig) Vanne Détectée de Pression Basse(en psig)		High Pressure Detected Valve(psig)/Vanne Détecté de Pression Haute(en psig)													
		165	/	/	303	316	328	350	370	400	426	446	465	487	508
		161	/	/	300	313	325	346	366	394	421	440	459	481	503
		157	/	/	297	310	322	342	362	389	415	434	453	476	499
		153	/	282	294	307	319	339	358	384	410	428	446	471	496
		149	/	279	291	304	316	335	353	374	399	419	443	468	493
		145	/	275	287	300	312	331	349	370	393	416	440	465	490
		141	256	272	284	297	309	328	346	368	389	413	437	462	486
		137	251	268	280	293	305	324	343	365	386	410	434	459	483
		133	246	264	276	289	301	321	340	361	382	406	430	455	479
		129	241	260	272	285	297	317	336	357	378	403	427	451	475
		125	236	256	268	281	293	313	332	353	374	399	423	447	471
		121	231	252	264	277	289	309	328	349	370	395	420	444	467
		117	226	248	260	273	285	305	324	345	366	392	417	440	463
		113	221	244	256	269	281	301	320	341	362	388	414	437	459
109	216	240	252	265	277	297	316	337	358	385	411	433	455		
105	211	236	248	261	273	293	312	333	354	381	408	429	450		

Table 7-4 Refrigerant charge for H/P system

24K Heating Mode Mode De Chauffage		Heating Charge Chart/Tableau De Charge de Chauffage													
		Indoor Dry Bulb Temperature(F)/Temperature Interieur au Themometre sec(en F)													
		60	62	64	66	68	70	72	74	76	78	80	82		
Low Pressure Detected Valve(psig) Vanne Détectée de Pression Basse(en psig)		High Pressure Detected Valve(psig)/Vanne Détecté de Pression Haute(en psig)													
		135	322	328	334	340	346	352	362	371	380	389	398	416	
		128	315	320	326	332	337	342	351	360	369	378	387	405	
		121	308	313	319	324	330	336	340	347	354	362	377	395	
		114	301	306	310	315	319	324	330	337	344	351	368	386	
		107	294	297	300	304	308	312	320	327	334	341	360	378	
		100	287	291	294	297	300	303	310	317	324	332	345	363	
		93	280	282	285	288	291	294	299	307	315	324	330	348	
		86	271	274	277	280	283	286	295	302	309	316	323	341	
		79	259	262	265	268	271	274	285	294	301	308	316	334	
		72	250	254	257	260	263	266	279	286	293	300	307	325	
		65	242	245	248	252	255	258	265	272	279	287	295	313	
		58	/	/	/	245	248	252	257	272	277	282	287	305	
		51	/	/	/	/	237	241	248	255	263	270	278	296	
		44	/	/	/	/	/	230	238	246	254	258	270	288	
37	/	/	/	/	/	/	226	236	242	248	262	280			
30	/	/	/	/	/	/	/	/	/	/	/	/			

Table 7-5 Refrigerant charge for H/P system

36K Cooling Mode Mode De Refroidissement		Cooling Charge Chart/Tableau De Charge de Refroidissement													
		Outdoor Ambient Temperature(F)/Temperature Amdiante Exterieur(en F)													
		55	60	65	70	75	80	85	90	95	100	105	110	115	
Low Pressure Detected Valve(psig)		High Pressure Detected Valve(psig)/Vanne Détecté de Pression Haute(en psig)													
		Vanne Détectée de Pression Basse(en psig)													
Low Pressure Detected Valve(psig)	Vanne Détectée de Pression Basse(en psig)	165	/	/	308	323	338	352	365	386	407	432	456	482	508
		161	/	/	304	319	334	348	361	382	403	428	452	478	503
		157	/	/	300	315	330	344	357	378	399	423	447	473	499
		153	/	281	296	311	326	340	353	374	395	419	443	469	495
		149	/	277	292	307	322	336	349	370	391	415	439	465	490
		145	/	273	288	303	318	332	345	367	388	412	435	461	487
		141	248	269	284	299	314	328	341	363	385	408	431	457	482
		137	243	265	280	295	310	325	339	360	381	405	428	458	488
		133	238	261	276	291	306	321	336	357	378	402	425	450	474
		129	233	257	272	287	302	318	334	355	375	399	422	448	473
		125	228	253	268	283	298	314	330	352	373	396	419	444	469
		121	223	249	264	279	294	310	326	348	370	393	416	441	465
		117	218	245	260	275	290	306	322	345	367	390	413	437	461
		113	213	241	256	271	286	302	318	341	364	387	410	434	457
		109	208	237	252	267	282	298	314	338	361	384	407	430	453
		105	203	233	248	263	278	294	310	334	358	381	404	427	449

Table 7-6 Refrigerant charge for H/P system

36K Heating Mode Mode De Chauffage		Heating Charge Chart/Tableau De Charge de Chauffage													
		Indoor Dry Bulb Temperature(F)/Temperature Interieur au Themometre sec(en F)													
		60	62	64	66	68	70	72	74	76	78	80	82		
Low Pressure Detected Valve(psig)		High Pressure Detected Valve(psig)/Vanne Détecté de Pression Haute(en psig)													
		Vanne Détectée de Pression Basse(en psig)													
Low Pressure Detected Valve(psig)	Vanne Détectée de Pression Basse(en psig)	135	336	347	358	369	380	392	399	406	413	420	424	432	
		128	328	339	350	361	372	384	390	396	402	408	413	421	
		121	320	331	342	353	364	376	381	386	391	396	402	410	
		114	313	324	335	346	351	358	363	370	377	384	391	399	
		107	305	313	321	329	337	345	352	359	366	373	380	388	
		100	295	303	311	319	327	335	342	349	356	363	369	377	
		93	286	294	301	309	316	323	330	337	344	351	358	366	
		86	277	284	291	298	305	312	319	326	333	340	347	355	
		79	267	274	280	287	294	300	307	314	321	328	336	344	
		72	258	265	271	277	283	289	296	303	311	318	326	334	
		65	248	254	260	266	272	278	285	293	300	307	315	323	
		58	/	/	/	/	260	268	275	283	290	297	305	313	
		51	/	/	/	/	/	259	266	273	280	287	294	302	
		44	/	/	/	/	/	/	256	263	270	277	284	292	
		37	/	/	/	/	/	/	/	258	265	272	279	287	
		30	/	/	/	/	/	/	/	/	/	/	/	/	

Table 7-7 Refrigerant charge for H/P system

48K Cooling Mode Mode De Refroidissement		Cooling Charge Chart/Tableau De Charge de Refroidissement													
		Outdoor Ambient Temperature(F)/Temperature Amdiante Exterieur(en F)													
		55	60	65	70	75	80	85	90	95	100	105	110	115	
Low Pressure Detected Valve(psig)	Vanne Détectée de Pression Basse(en psig)	High Pressure Detected Valve(psig)/Vanne Détecté de Pression Haute(en psig)													
		165	/	/	291	310	328	347	365	392	418	442	466	496	525
		161	/	/	282	298	324	344	363	389	415	440	464	493	522
		157	/	/	284	303	321	342	362	387	412	437	462	491	520
		153	/	262	281	299	318	339	360	385	410	435	460	489	517
		149	/	260	279	297	316	337	358	382	407	433	458	486	513
		145	/	258	277	296	315	335	355	380	405	430	456	483	509
		141	237	255	273	292	311	332	353	378	402	428	453	477	501
		137	235	253	272	290	309	330	351	373	394	419	444	469	494
		133	233	251	270	288	307	327	346	366	386	412	437	462	486
		129	230	248	266	284	302	322	341	361	381	406	430	454	478
		125	226	244	262	280	297	315	334	355	377	400	423	447	471
		121	222	239	256	273	291	308	326	349	372	394	416	440	464
		117	215	232	249	266	284	300	315	341	367	388	409	433	457
		113	209	226	243	260	278	292	306	334	362	382	402	426	450
		109	203	220	237	254	272	285	298	328	357	376	395	419	443
105	197	214	231	248	266	278	293	321	347	370	388	412	436		

Table 7-8 Refrigerant charge for H/P system

48K Heating Mode Mode De Chauffage		Heating Charge Chart/Tableau De Charge de Chauffage													
		Indoor Dry Bulb Temperature(F)/Temperature Interieur au Themometre sec(en F)													
		60	62	64	66	68	70	72	74	76	78	80	82		
Low Pressure Detected Valve(psig)	Vanne Détectée de Pression Basse(en psig)	High Pressure Detected Valve(psig)/Vanne Détecté de Pression Haute(en psig)													
		135	333	340	347	354	361	370	382	390	398	406	414	426	
		128	325	332	339	346	353	360	376	383	390	397	404	416	
		121	318	325	332	339	346	353	367	374	381	388	396	408	
		114	310	317	324	331	338	347	358	366	374	382	390	402	
		107	302	309	316	323	330	337	348	355	362	369	379	391	
		100	295	302	309	316	323	330	338	345	352	359	369	379	
		93	287	294	301	308	315	322	330	337	344	351	359	368	
		86	278	285	292	299	306	313	319	327	335	343	351	359	
		79	269	276	283	290	297	304	310	318	326	334	342	350	
		72	258	265	272	279	287	295	305	312	319	326	333	342	
		65	/	/	/	/	/	/	293	304	310	319	326	334	
		58	/	/	/	/	/	/	/	299	305	313	321	328	
		51	/	/	/	/	/	/	/	/	301	308	316	323	
		44	/	/	/	/	/	/	/	/	/	304	311	317	
		37	/	/	/	/	/	/	/	/	/	/	307	314	
30	/	/	/	/	/	/	/	/	/	/	/	/			

Table 7-9 Refrigerant charge for H/P system

60K Cooling Mode Mode De Refroidissement		Cooling Charge Chart/Tableau De Charge de Refroidissement												
		Outdoor Ambient Temperature(F)/Temperature Amdiante Exterieur(en F)												
		55	60	65	70	75	80	85	90	95	100	105	110	115
Low Pressure Detected Valve(psig)		High Pressure Detected Valve(psig)/Vanne Détecté de Pression Haute(en psig)												
		Vanne Détectée de Pression Basse(en psig)												
	165	/	/	278	300	322	341	360	382	405	429	454	479	505
	161	/	/	276	297	319	338	357	379	402	427	453	477	502
	157	/	/	273	294	316	335	354	376	399	424	450	474	499
	153	/	246	270	292	315	334	352	374	396	422	448	472	496
	149	/	242	267	289	312	331	350	371	393	419	445	469	493
	145	/	239	264	286	309	328	348	369	390	416	442	466	490
	141	216	235	261	283	306	326	347	367	387	413	439	464	489
	137	214	231	258	280	305	325	345	365	384	410	437	462	487
	133	211	228	255	277	302	322	342	362	381	408	434	459	484
	129	209	224	252	274	299	319	339	359	379	405	431	456	482
	125	206	220	249	271	296	316	336	356	376	402	428	453	479
	121	204	217	247	268	293	313	334	353	373	399	425	451	477
	117	202	213	244	265	292	312	332	351	370	396	422	449	476
	113	199	210	241	263	289	309	329	348	367	393	419	446	473
	109	197	206	238	260	286	306	326	345	364	390	416	444	471
	105	191	204	235	257	283	303	323	342	361	387	413	441	468

Table 7-10 Refrigerant charge for H/P system

60K Heating Mode Mode De Chauffage		Heating Charge Chart/Tableau De Charge de Chauffage												
		Indoor Dry Bulb Temperature(F)/Temperature Interieur au Themometre sec(en F)												
		60	62	64	66	68	70	72	74	76	78	80	82	
Low Pressure Detected Valve(psig)		High Pressure Detected Valve(psig)/Vanne Détecté de Pression Haute(en psig)												
		Vanne Détectée de Pression Basse(en psig)												
	135	341	353	364	376	388	400	404	408	414	420	426	432	
	128	337	349	360	372	384	396	400	404	408	412	416	428	
	121	329	340	351	362	373	384	389	394	399	404	408	420	
	114	321	331	342	353	364	371	377	383	389	395	401	413	
	107	313	321	329	337	345	354	362	370	378	386	394	406	
	100	305	313	321	329	337	345	353	361	369	377	386	398	
	93	297	305	313	321	329	338	344	350	356	362	369	386	
	86	289	296	303	311	318	326	333	340	347	354	362	374	
	79	278	285	292	300	307	315	324	331	339	347	355	367	
	72	267	274	281	289	296	304	315	322	331	340	348	360	
	65	256	264	271	279	287	296	306	312	322	331	341	353	
	58	/	/	/	/	/	/	297	302	313	324	334	346	
	51	/	/	/	/	/	/	/	294	304	315	327	339	
	44	/	/	/	/	/	/	/	/	297	304	320	332	
	37	/	/	/	/	/	/	/	/	/	296	313	325	
	30	/	/	/	/	/	/	/	/	/	/	308	320	

8.0 SYSTEM OPERATION

8.1 COMPRESSOR CRANKCASE HEATER (Optional)

Refrigerant migration during the off cycle can result in a noisy start up. Add a crankcase heater to minimize refrigeration migration, and to help eliminate any start up noise or bearing “wash out”.

All heaters are located on the lower half of the compressor shell. Its purpose is to drive refrigerant from the compressor shell during long off cycles, thus preventing damage to the compressor during start-up. At initial start-up or after extended shutdown periods, make sure the heater is energized for at least 12 hours before the compressor is started. (Disconnect switch on and wall thermostat off.)

The crankcase heater will start up or shut down according to the following logic:

The crankcase heater will start up when the compressor is off and $T4 < 41^{\circ}\text{F}$.

The crankcase heater will shut down when $T4 \geq 44.6^{\circ}\text{F}$.

In any condition, the crankcase heater will shut down when the compressor is on

8.2 Protection

8.2.1 Protection for HP system If sensors ($T3$ & $T4$) become open-circuit or short-circuit, the compressor, outdoor fan motor and reversing valve circuit will shut down.

Discharge temperature protection:

If discharge temp. is $> 275^{\circ}\text{F}$ ($4T \setminus 5T$), the compressor will shut down, If discharge temp. is $< 194^{\circ}\text{F}$ ($4T \setminus 5T$), the compressor will resume operation.

If discharge temp. is $> 239^{\circ}\text{F}$ ($2T \setminus 3T$), the compressor will shut down, If discharge temp. is $< 167^{\circ}\text{F}$ ($2T \setminus 3T$), the compressor will resume operation.

High pressure protection

If high pressure is $> 638\text{PSIG}$, the compressor and the outdoor fan motor will stop running.

If high pressure is $< 464\text{PSIG}$, the compressor and the outdoor fan motor will resume running (3 minutes delay necessary).

Outdoor coil temperature protection ($T3$)

If $T3 > 147.2^{\circ}\text{F}$, compressor is de-energized

If $T3 < 125.6^{\circ}\text{F}$, compressor is energized.

Low pressure protection

When low pressure is $< 21\text{PSIG}$, the compressor and the outdoor fan motor will stop running.

When low pressure is $> 44\text{PSIG}$, the compressor and the outdoor fan motor will resume running (3 minutes delay necessary). In stand-by status, if low pressure protection was detected, the compressor will not start. If protection cycles occur four times within 30 minutes, the compressor and outdoor fan will shut down. In this condition, the system needs to power on once more in order to keep on working.

T4 function:

When $T4$ is $< 5^{\circ}\text{F}$, the compressor will stop. If the electrical heater kit is installed in the indoor unit, the outdoor unit will send the operation signal to the indoor unit. When $T4$ is $> 10.4^{\circ}\text{F}$, the compressor will restart.

8.3 DEFROST MODE* (For HP system only)

Manual defrost mode

To manually cycle the defrost mode, set switch SW3-1 to the “ON” position (See Fig 7). The system will engage a defrost cycle, and automatically exit defrost mode once the **Shut-down conditions of defrost mode** described below are met.

Caution: Once the manual defrost mode is finished, please set switch SW3-1 back to “OFF”.

Start-up conditions of defrost mode:

When SW3-3 switch is set to “ON” (See Fig 7), the system will perform a defrost cycle in any of the following conditions:

1. If the compressor is operating and $T3$ is $< 30.2^{\circ}\text{F}$, the system will perform a defrost cycle every 30 minutes of operation.
2. When $T3$ is $< 28.4^{\circ}\text{F}$ and the compressor is operating for the first time after being connected power.
3. When $T3$ is $< 28.4^{\circ}\text{F}$ and The system has been in standby for two hours.

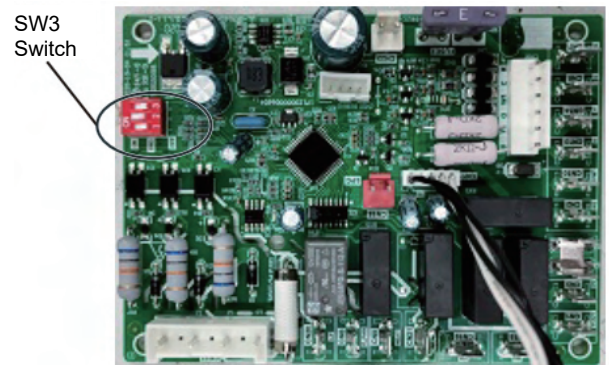


Fig.7 SW3 Switch Location in the PCB Board (For reference only)

SW3	Position	Function
SW3-1	ON	MANUAL DEFROST
	OFF	AUTOMATIC DEFROST
SW3-2	ON	INTELLIGENT DEFROST
	OFF	NORMAL DEFROST
SW3-3	ON	DEFROSTING CYCLE: 60MIN
	OFF	DEFROSTING CYCLE: 30MIN

When SW3-3 switch is set to “OFF” (See in Fig 7), the system will perform a defrost cycle in any of the following conditions:

1. If the compressor is operating and $T3$ is $< 30.2^{\circ}\text{F}$, the system will perform a defrost cycle every 60 minutes of operation.
2. When $T3$ is $< 28.4^{\circ}\text{F}$ and the compressor is operating for the first time after being connected power.
3. When $T3$ is $< 28.4^{\circ}\text{F}$ and the system has been in standby for two hours.

Shut-down conditions of defrost mode:

The mode will shut down in any of the following conditions:

1. The defrosted time lasting for 10 minutes;
2. T3 is ≥ 77 °F when T4 ≥ 28.4 C;
3. Compressor stop operating;
4. T3 is ≥ 77 °F last for 60s when T4 < 28.4 C.

8.4 THERMOSTAT SIGNALS

Table 8-1: Thermostat Signals

Signal	State	Board Function
G	ON	Blower instant ON
	OFF	Blower 90 sec. delay OFF
G & W1	ON	Blower instant ON Heater bank 1 elec.onstant ON
	OFF	Heater bank 1 elec.instant OFF Blower 90 sec. delay OFF
G & W & W2	ON	Blower instant ON Heater 1 instant ON Heater 2 instant ON
	OFF	Blower 90 sec. delay OFF Heater 1 instant OFF Heater 2 instant OFF
G & Y	ON	Blower instant ON Compressor and outdoor fan instant ON
	OFF	Compressor and outdoor fan instant OFF Blower fan delay 90 sec. OFF
G & B & Y	ON	Blower instant ON Compressor and outdoor fan instant ON 4-way valve instant ON
	OFF	Compressor and outdoor fan instant OFF Blower fan delay 90 sec. OFF 4-way valve instant OFF
G & B & Y & W1	ON	Blower instant ON Compressor and outdoor fan instant ON 4-way valve instant ON Heater 1 instant ON
	OFF	Blower fan delay 90 sec. OFF Compressor and outdoor fan instant OFF 4-way valve instant OFF Heater 1 instant OFF
G & B & Y & W1 & W2	ON	Blower instant ON Compressor and outdoor fan instant ON 4-way valve instant ON Heater 1 instant ON Heater 2 instant ON
	OFF	Blower fan delay 90 sec. OFF Compressor and outdoor fan instant OFF 4-way valve instant OFF Heater 1 instant OFF Heater 2 instant OFF

9.0 OPERATION CHECK-UP

- **Cooling Startup**
 1. Turn thermostat to OFF and turn power to ON
 2. Turn ON thermostat and set as high as possible
 3. Turn Fan switch ON and indoor blower should run
 4. Turn fan switch to AUTO, system switch to COOL and thermostat temperature setting below room temperature.
Unit should run in COOLING mode.

- **Heating Startup**

After normal cooling run


 1. Turn thermostat switch to HEAT. After unit stops, wait about 5 minutes.
 2. Turn thermostat setting above room temperature.
Unit should run in HEATING mode.

After unit has run for a while, check the following:

1. Are fans running properly?
2. Is compressor running correctly?
3. Check refrigerant change.
4. Check duct connection and leaks.
5. Check tubing and sheet metal rattles.

(See Wiring Diagram for electric connection detail.)

10.0 TROUBLE SHOOTING

	WARNING
<p>Components trouble shooting requires opening control box with power on. Use extreme care while working on this condition. Check nameplate and this instruction when making wire connections.</p>	


	NOTE
<p>When the outdoor temperature is between 50°F and 67°F, the compressor can only run for cooling within a short time, otherwise it may cause damage to compressor.</p>	

ILLUSTRATION FOR COVERING SIDE OPENINGS FOR DOWNFLOW APPLICATION

FOAM STICKED METHOD:

- 1. Use two covers from bottom openings to cover the side openings.
- 2. Use four sticking foam tapes provided in accessory bag and stick tapes on covers. See FIG.1 and 2.
- 3. Place the covers on supply and return openings and use screws and washers provided to hold covers. See FIG.3.
- 4. Use silicon sealant to seal four sides of covers to prevent water from coming into equipment.

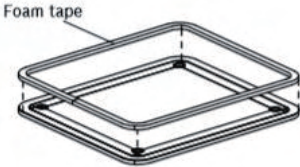


FIG.1



FIG.2

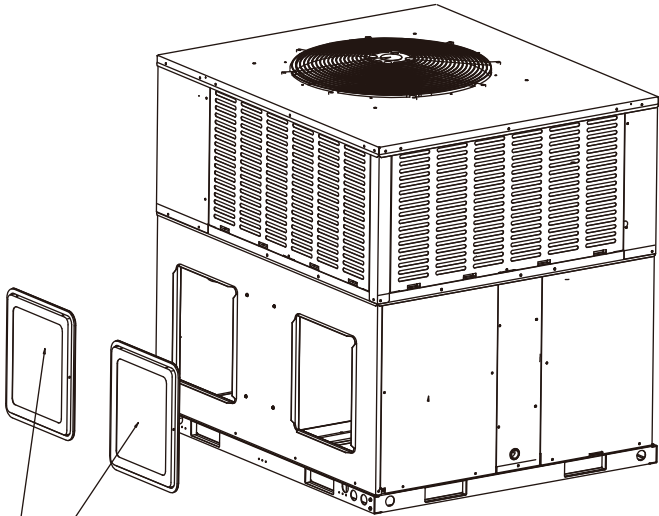


FIG.3

Return/Supply duct cover
(attach with 4 screws)