



**Xfinity Enpro 12 Top Discharge
Outdoor unit 31VA Series**

INSTRUCTION MANUAL

WARNING!

Read and follow all safety precautions in Instruction Manual - improper use can cause serious injury.

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Safety Considerations

Improper installation, adjustment, alteration, service, maintenance, or use can cause explosion, fire, electrical shock, or other conditions which may cause death, personal injury, or property damage. Instructions for installation and use of this product are provided by the manufacturer. Installation must be performed in accordance with the requirements of NEC and CEC by qualified installer or agency only. The qualified installer or agency must use factory--authorized kits or accessories when modifying this product. Refer to the individual instructions packaged with the kits or accessories when installing. Follow all safety codes. Wear safety glasses, protective clothing, and work gloves. Use quenching cloth for brazing operations. Have fire extinguisher available. Read these instructions thoroughly and follow all warnings or cautions included in literature and attached to the unit. Consult local building codes and National Electrical Code (NEC) for special requirements. Recognize safety information. This is the safety--alert symbol .When you see this symbol on the unit and in instructions or manuals, be alert to the potential for personal injury. Understand these signal words; DANGER, WARNING, and CAUTION. These words are used with the safety--alert symbol. DANGER identifies the most serious hazards which will result in severe personal injury or death. WARNING signifies hazards which could result in personal injury or death. CAUTION is used to identify unsafe practices which may result in minor personal injury or product and property damage. NOTE is used to highlight suggestions which will result in enhanced installation, reliability, or operation.



WARNING

ELECTRICAL SHOCK HAZARD

Failure to follow this warning could result in personal injury or death.

Before installing, modifying, or servicing system, main electrical disconnect switch must be in the OFF position. There may be more than 1 disconnect switch. Lock out and tag switch with a suitable warning label.



**This product must not be disposed together with the domestic waste.
This product has to be disposed at an authorized place for recycling of
electrical and electronic appliances.**

1. Physical Dimension

1.1 Outdoor Unit

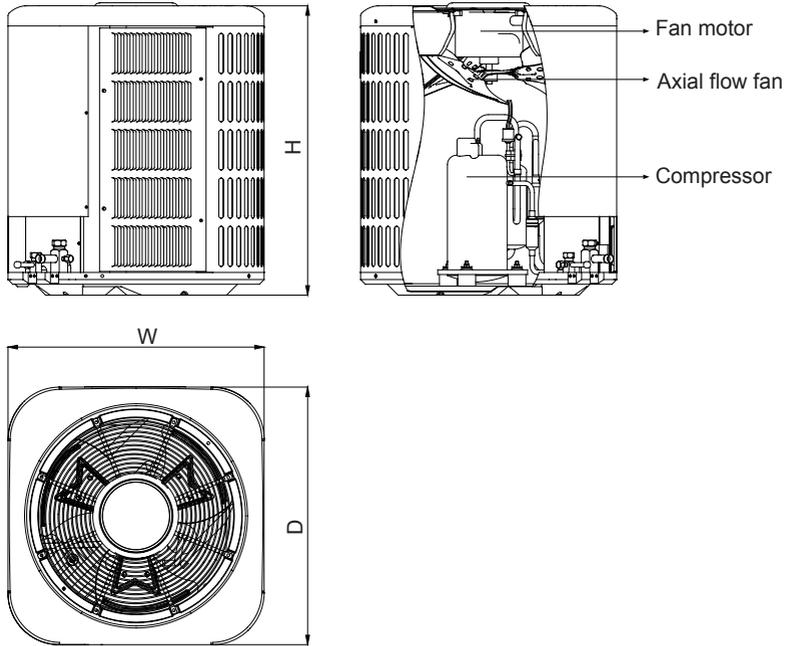


Fig.2—Outdoor Unit

Table 1—Dimension of Outdoor Unit

Unit: Inch (mm)

Unit: Inch (mm)

MODEL	DIMENSION		
	H	D	W
31VA024C24-070DLC	24"(610)	21-1/2"(546)	21-1/2"(546)
31VA036C24-105DHC	24 3/8"(620)	24"(610)	24"(610)
31VA048C24-140DSC	29"(735)	28"(710)	28"(710)
31VA060C24-175DSC	29"(735)	28"(710)	28"(710)

1.2 Installation Clearance Data

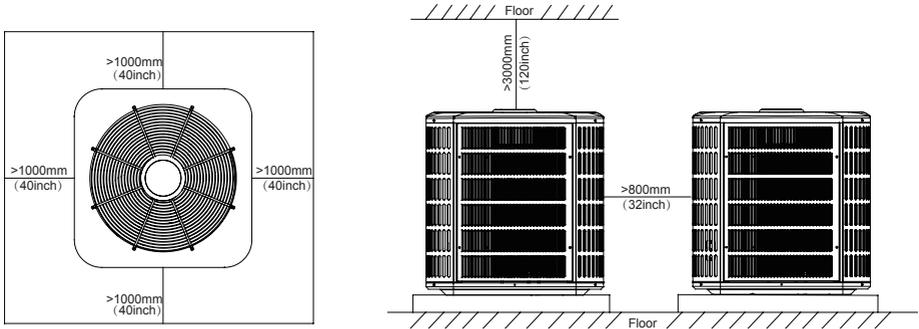


Fig.3

1.3 Units Installation

1.3.1 Installation Positions of Condensing Units

- Outdoor Unit must be fixed on stable and solid surface of floor.
- Don't install Outdoor Unit under window or between buildings, and prevent the operation noise from room.
- There should be no obstructions at both air inlet and outlet of indoor and outdoor units for maintaining well air ventilation.
- When installing indoor unit, make sure that the hanging parts at top are strong enough to stand the weight of unit.

3.3.2 Matters Need Attention

- Before installation, make sure that the power supply comply with nameplate and check the security of the power supply.
- Do not use or place combustible and explosive gas or liquid near the air conditioner.
- Do not attempt to install Air Conditioner by yourself to guarantee the air Conditioner can be permanent use.
- In the event of malfunction(burning smell, etc.),stop operation immediately and turn off the power switch.
- Do not insert fingers or objects into the outlet port or inlet grillers.
- Do not check or repair the air Conditioner when it is running.
- Do not sprinkle water on the air Conditioner or operate it with wet hands.
- Do not climb or place objects on the air conditioner.

1.4 Installation Recommendations

NOTE: In some cases noise in the living area has been traced to gas pulsations from improper installation of equipment.

- 1). Locate unit away from windows, patios, decks, etc. where unit operation sound may disturb customer.
- 2). Ensure that vapor and liquid tube diameters are appropriate for unit capacity.
- 3). Run refrigerant tubes as directly as possible by avoiding unnecessary turns and bends.
- 4). Leave some slack between structure and unit to absorb vibration.
- 5). When passing refrigerant tubes through the wall, seal opening with RTV or other pliable silicon--based caulk.(See Fig. 4.)
- 6). Avoid direct tubing contact with water pipes, duct work, floor joists, wall studs, floors, and walls.
- 7). Do not suspend refrigerant tubing from joists and studs with a rigid wire or strap which comes in direct contact with tubing. (See Fig. 4.)
- 8). Ensure that tubing insulation is pliable and completely surrounds vapor tube.
- 9). When necessary, use hanger straps which are 1 in. wide and conform to shape of tubing insulation. (See Fig. 4.)
- 10). Isolate hanger straps from insulation by using metal sleeves bent to conform to shape of insulation.

When outdoor unit is connected to factory--approved indoor unit, outdoor unit contains system refrigerant charge good for 25 ft.

For proper unit operation, check refrigerant charge using charging information located on control box cover and/or in the Check Charge section of this instruction.

NOTE: Avoid contact between tubing and structure

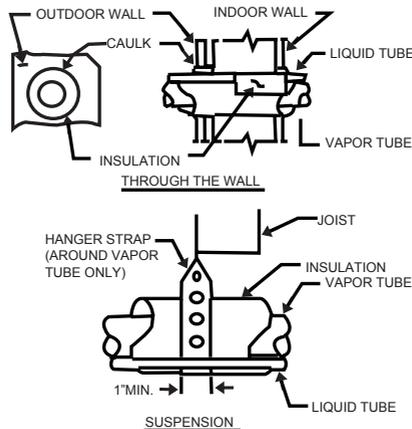


Fig.4 – Connecting Tubing Installation

2. Brazing Connections

2.1 Preparation the Line

Refer to Table 2 for field tubing diameters. The pipe must remain round. Do not crimp end of the line.

Table 2. Refrigerant Line Set Inches (mm)

Model	Valve Field Connections	
	Liquid Line	Suction(Gas) Line
31VA024C24-070DLC	3/8 in. (9.5 mm)	5/8 in. (16mm)
31VA036C24-105DHC	3/8 in. (9.5 mm)	3/4 in. (19mm)
31VA048C24-140DSC	3/8 in. (9.5 mm)	7/8 in. (22mm)
31VA060C24-175DSC	1/2 in. (12 mm)	7/8 in. (22mm)

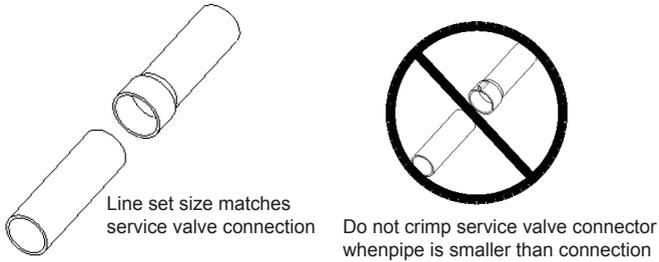


Fig.5

2.2 Cap and Core Removal

Remove service cap and core from both the vapor and liquid line service ports.

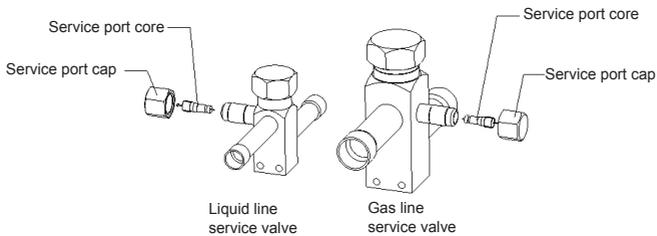


Fig.6

2.3 Attach Gauge

Flow regulated nitrogen (at 1 to 2 psig) through the low-side refrigeration gauge set into the liquid line service port valve, and out of the gas line service port valve.

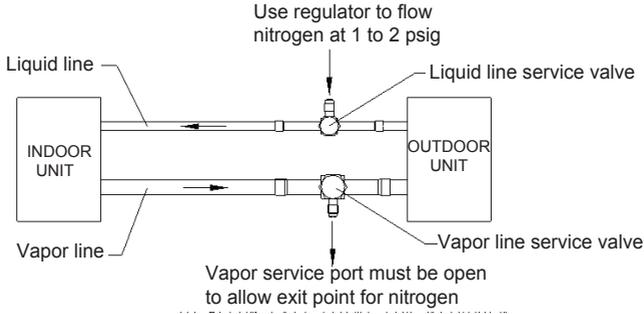


Fig.7

2.4 Braze Line Set

To help protect service valve seals during brazing, wrap water saturated cloths around service valve bodies and copper tube stubs. Water saturated cloths must remain water saturated throughout the brazing and cool-down process.

Braze line to the service valve.

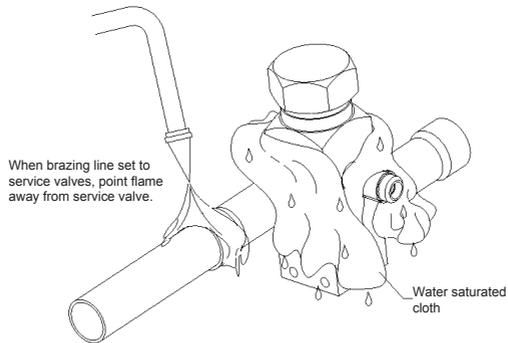


Fig.8

2.5 Preparation for Next Step

After all connections have been brazed, disconnect manifold gauge set from service ports. Apply water saturated cloths to both services valves to cool piping. Once piping is cool, remove all water saturated cloths. Reinstall service cap and core. Refer to the unit installation instructions for the next step in preparing the unit.

3. Check Piston

There is a piston located in outdoor condensing unit, please verify the piston size based on the below table. When matching with air handler, please make sure replace this piston in air handler.

Table 3

OUTDOOR UNIT	INDOOR UNIT	PISTON KIT PART NO.
31VA024C24-070DLC	21DN024C24-070DNC	057
31VA036C24-105DHC	21DN036C24-105DNC	076
31VA048C24-140DSC	21DN048C24-140DNC	092
31VA060C24-175DSC	21DN060C24-175DNC	097
31VA024C24-070DLC	21UT024C24-070DNC	060
31VA030C24-105DHC	21UT030C24-105DNC	073
31VA036C24-140DSC	21UT036C24-140DNC	092
31VA060C24-175DSC	21UT060C24-175DNC </td <td>080</td>	080

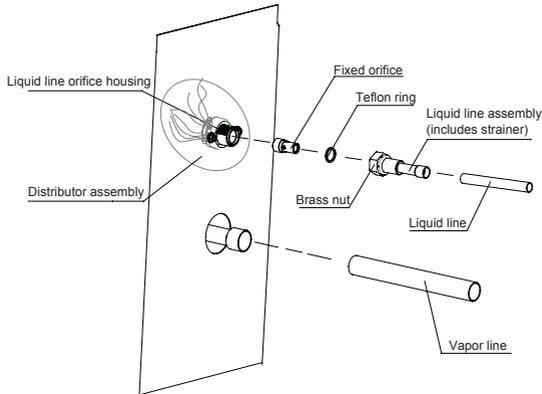


Fig.9

4. Operating Gauge Set and Service Valves

These instructions are intended as a general guide and do not supersede local codes in any way. Consult authorities who have jurisdiction before installation.

4.1 Torque Requirements

When servicing or repairing heating, ventilating, and air conditioning components, ensure the fasteners are appropriately tightened. Table 4 lists torque values for fasteners.



IMPORTANT

Only use Allen wrenches of sufficient hardness (50Rc –Rockwell Harness Scale minimum). Fully insert the wrench into the valve stem recess.

Service valve stems are factory–torqued (from 9 ft–lbs for small valves, to 25 ft–lbs for large valves) to prevent refrigerant loss during shipping and handling. Using an Allen wrench rated at less than 50Rc risks rounding or breaking off the wrench, or stripping the valve stem recess.

To prevent stripping of the various caps used, the appropriately sized wrench should be used and fitted snugly over the cap before tightening.

Table 4. Torque Requirements

Parts	Recommended Torque	
Service valve cap	8 ft.– lb.	11 NM
Sheet metal screws	16 in.– .lb	2 NM
Machine screws #10	28 in.– lb.	3 NM
Compressor bolts	90 in.– lb.	10 NM
Gauge port seal cap	8 ft.– lb.	11 NM

4.2 Using Manifold Gauge Set

When checking the system charge, only use a manifold gauge set that features low loss anti-blow back fittings.

Manifold gauge set used with HFC–410A refrigerant systems must be capable of handling the higher system operating pressures. The gauges should be rated for use with pressures of 0 – 800 psig on the high side and a low side of 30" vacuum to 250 psig with dampened speed to 500 psig. Gauge hoses must be rated for use at up to 800 psig of pressure with a 4000 psig burst rating.

4.3 Operating Service Valves

The liquid and suction(gas) line service valves are used for removing refrigerant, flushing, leak testing, evacuating, checking charge and charging.

Each valve is equipped with a service port which has a factory–installed valve stem. Figure 11 provides information on how to access and operating both angle service valves.

4.4 Operating Angle Type Service Valve

- 1). Remove stem cap with an appropriately sized wrench.
- 2). Use a service wrench with a hex–head extension (3/16" for liquid line valve sizes and 5/16" for vapor line valve sizes) to back the stem out counterclockwise as far as it will go.

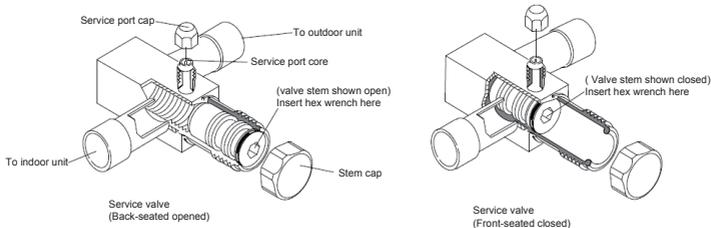
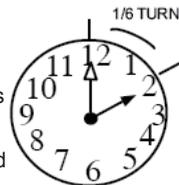


Fig.10

4.5 To Access Service Port

A service port cap protects the service port core from contamination and serves as the primary leak seal.

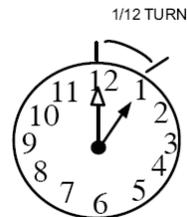
- 1). Remove service port cap with an appropriately sized wrench.
- 2). Connect gauge set to service port.
- 3). When testing is completed, replace service port cap and tighten as follows
 - With torque wrench: Finger tighten and torque cap per table 4.
 - Without torque wrench: Finger tighten and use an appropriately sized wrench to turn an additional 1/6 turn clockwise.



4.6 Reinstall Stem Cap

Stem cap protects the valve stem from damage and serves as the primary seal. Replace the stem cap and tighten as follows:

- With Torque Wrench: Finger tighten and then torque cap per table 4.
- Without Torque Wrench: Finger tighten and use an appropriately sized wrench to turn an additional 1/12 turn clockwise.



NOTE: A label with specific torque requirements may be affixed to the stem cap. If the label is present, use the specified torque.

4.7 Install Liquid Line Filter Drier Indoor

Refer to Fig. 12 and install filter drier as follows:

- 1). Braze 5 in. liquid tube to the indoor coil.
- 2). Wrap filter drier with damp cloth.
- 3). Braze filter drier to 5 in. long liquid tube from step 1.
- 4). Connect and braze liquid refrigerant tube to the filter drier.

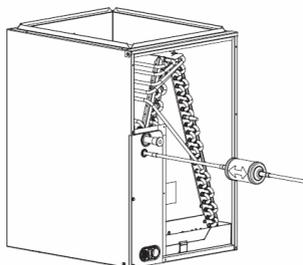


Fig.11—Liquid Line Filter Drier

5. Recovering Refrigerant from Existing System

5.1 Disconnect Power

Disconnect all power to the existing outdoor unit at the disconnect switch or main fuse box/breaker panel.

5.2 Connect Manifold Gauge Set

Connect a gauge set, clean recovery cylinder and a recovery machine to the service ports of the existing unit. Use the instructions provided with the recovery machine to make the connections.

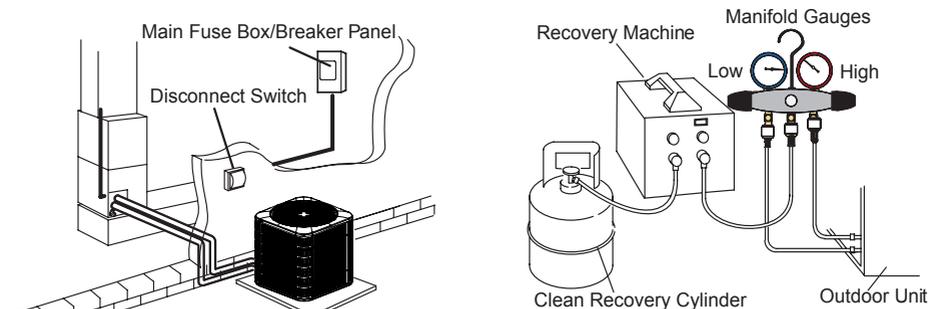


Fig.12

5.3 Recovering Refrigerant

Remove existing HCFC-410A refrigerant using one of the following procedures:

METHOD 1:

Use this method if the existing outdoor unit is not equipped with shut-off valves, or if the unit is not operational and you plan to use the existing HCFC-410A to flush the system.

Remove all HCFC-410A refrigerant from the existing system. Check gauges after shutdown to confirm that the entire system is completely void of refrigerant.

METHOD 2:

Use this method if the existing outdoor unit is equipped with manual shut-off valves, and you plan to use new HCFC-410A refrigerant to flush the system.

The following devices could prevent full system charge recovery into the outdoor unit:

- Outdoor unit's high or low-pressure switches (if applicable) when tripped can cycle the compressor OFF.
- Compressor can stop pumping due to tripped internal pressure relief valve.
- Compressor has internal vacuum protection that is designed to unload the scrolls (compressor stops pumping) when the pressure ratio meets a certain value or when the suction pressure is as high as 20 psig. (Compressor suction pressures should never be allowed to go into a vacuum. Prolonged operation at low suction pressures will result in overheating of the scrolls and permanent damage to the scroll tips, drive bearings and internal seals.)

Once the compressor can not pump down to a lower pressure due to one of the above system conditions, shut off the vapor valve. Turn OFF the main power to unit and use a recovery machine to recover any refrigerant left in the indoor coil and line set.

Perform the following task:

- a. Start the existing HCFC-410A system in the cooling mode and close the liquid line valve.
- b. Use the compressor to pump as much of the existing HCFC-410A refrigerant into the outdoor unit until the outdoor system is full. Turn the outdoor unit main power OFF and use a recovery machine to remove the remaining refrigerant from the system.

NOTE: It may be necessary to bypass the low pressure switches (if equipped) to ensure complete refrigerant evacuation.

- c. When the low side system pressures reach 0 psig, close the vapor line valve.
- d. Check gauges after shutdown to confirm that the valves are not allowing refrigerant to flow back into the low side of the system.

5.4 Leak Test Line Set and Indoor Coil

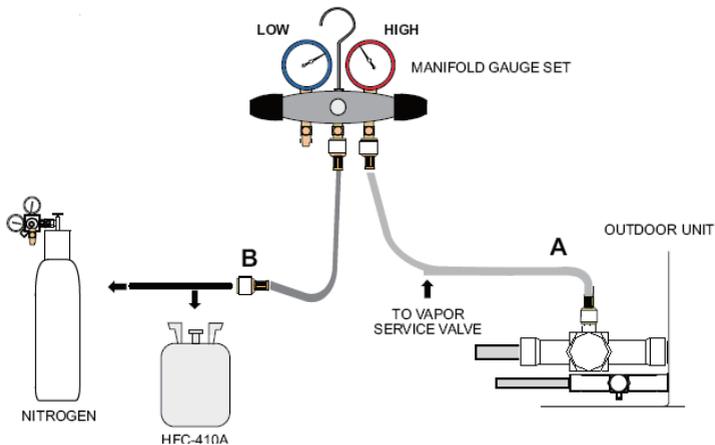


Fig.13—Leak Test

5.4.1 Connect Gauge Set

- 1). Connect an HFC-410A manifold gauge set high pressure hose to the gas valve service port.

NOTE: Normally, the high pressure hose is connected to the liquid line port. However, connecting it to the gas port better protects the manifold gauge set from high pressure damage.

- 2). With both manifold valves closed, connect the cylinder of HFC-410A refrigerant to the center port of the manifold gauge set.

NOTE: Later in the procedure, the HFC-410A container will be replaced by the nitrogen container.

5.4.2 Test For Leaks

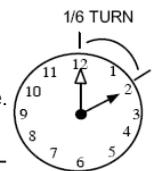
After the line set has been connected to the indoor and outdoor units, check the line set connections and indoor unit for leaks. Use the following procedure to test for leaks:

- 1). With both manifold valves closed, connect the cylinder of HFC-410A refrigerant to the center port of the manifold gauge set. Open the valve on the HFC-410A cylinder (gas only).

testing procedure.

NOTE: The term absolute pressure means the total actual pressure within a given volume or system, above the absolute zero of pressure. Absolute pressure in a vacuum is equal to atmospheric pressure minus vacuum pressure.

- 3). When the absolute pressure reaches 23,000 microns (29.01 inches of mercury), perform the following:
 - Close manifold gauge valves
 - Close valve on vacuum pump
 - Turn off vacuum pump
 - Disconnect manifold gauge center port hose from vacuum pump
 - Attach manifold center port hose to a dry nitrogen cylinder with pressure regulator set to 150 psig (1034 kPa) and purge the hose.
 - Open manifold gauge valves to break the vacuum in the line set and indoor unit.
 - Close manifold gauge valves.
- 4). Shut off the dry nitrogen cylinder and remove the manifold gauge hose from the cylinder. Open the manifold gauge valves to release the dry nitrogen from the line set and indoor unit.
- 5). Reconnect the manifold gauge to the vacuum pump, turn the pump on, and continue to evacuate the line set and indoor unit until the absolute pressure does not rise above 500 microns (29.9 inches of mercury) within a 20-minute period after shutting off the vacuum pump and closing the manifold gauge valves.
- 6). When the absolute pressure requirement above has been met, disconnect the manifold hose from the vacuum pump and connect it to an upright cylinder of HFC-410A refrigerant. Open the manifold gauge valve 1 to 2 psig in order to release the vacuum in the line set and indoor unit.
- 7). Perform the following:
 - Close manifold gauge valves.
 - Shut off HFC-410A cylinder.
 - Reinstall service valve cores by removing manifold hose from service valve.Quickly install cores with core tool while maintaining a positive system pressure.
 - Replace stem caps and secure finger tight, then tighten an additional one-sixth (1/6) of a turn as illustrated.



6. Electrical

In the U.S.A., wiring must conform with current local codes and the current National Electric Code (NEC). In Canada, wiring must conform with current local codes and the current Canadian Electrical Code (CEC).

Refer to the furnace or air handler installation instructions for additional wiring application diagrams and refer to unit nameplate for minimum circuit ampacity and maximum overcurrent protection size.

24VAC TRANSFORMER

Use the transformer provided with the furnace or air handler for low-voltage control power (24VAC – 40 VA minimum).

6.1 Circuit Size And Installation of Disconnect Switch

Refer to the unit nameplate for minimum circuit ampacity, and maximum fuse or circuit breaker (HACR per NEC). Install power wiring and properly sized disconnect switch.

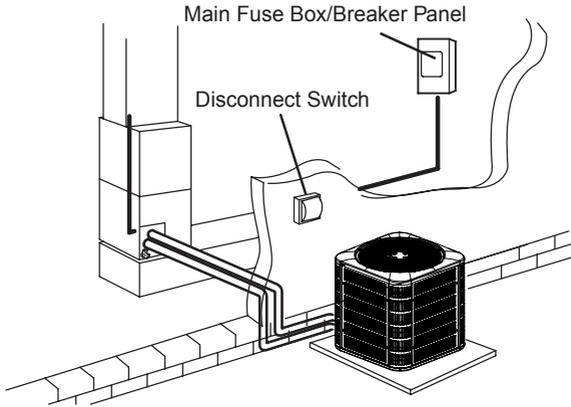


Fig.15

NOTE: Units are approved for use only with copper conductors. Ground unit at disconnect switch or to an earth ground.

6.2 Installation of Thermostat

Install room thermostat (ordered separately) on an inside wall approximately in the center of the conditioned area and 5 feet (1.5m) from the floor. It should not be installed on an outside wall or where it can be affected by sunlight or drafts.

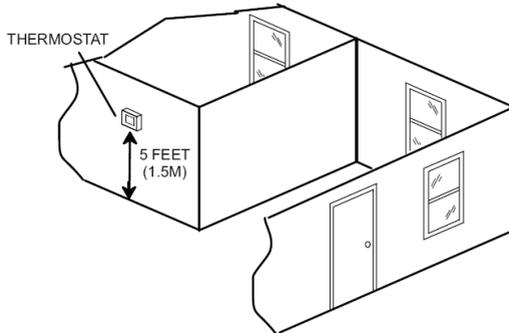


Fig.16

NOTE: 24VAC, Class II circuit connections are made in the control panel.

6.3 Unit Low Voltage Connections

-  High voltage field wiring
-  Low voltage (24v) field wiring

Table 5

WIRE RUN LENGTH	AWG#	INSULATION TYPE
LESS THAN 100' (30 METERS)	18	Temperature Rating
MORE THAN 100' (30 METERS)	16	35°C Minimum

A Run 24VAC control wires through cutout with grommet.

B Run 24VAC control wires through wire tie.

C Make 24VAC control wire connections.

NOTE: Wire tie provides low voltage wire strain relief and to maintain separation of field low and high voltage circuits

NOTE: For proper voltages, select thermostat wire (control wires) gauge per table above.

NOTE: Do not bundle any excess 24VAC control wires inside control box.

6.4 Unit High Voltage Connections

A Run HIGH VOLTAGE control wires through cutout with grommet.

B Make HIGH VOLTAGE control wires connections.

C Tighten wire tie to security HIGH VOLTAGE control wiring.

NOTE: Any excess high voltage field wiring should be trimmed and secured away from any low voltage field wiring

NOTE: To facilitate a conduit, a cutout is located in the bottom of the control box. Connect conduit to the control box using a proper conduit fitting.

NOTE: The signal line of the wired controller must be separated from the power line and the connecting line between the indoor unit and the outdoor unit.

Important Electric Data

Table 6

Model	Compressor				Fan Motor	Fuse/Breaker Capacity	Min. Power Supply Cord
	Power Supply	Qty.	RLA	LRA	FLA		
	V/Ph/Hz	-	A	A	A	A	AWG
31VA024C24-070DLC	(208-230)/1/60	1	10.5	52	1.2	20	2.1(AWG14)
31VA036C24-105DHC	(208-230)/1/60	1	18.1	85	1.2	40	5.3(AWG10)
31VA048C24-140DSC	(208-230)/1/60	1	22.3	139	1.7	50	8.4(AWG8)
31VA060C24-175DSC	(208-230)/1/60	1	28.5	139	1.7	60	8.4(AWG8)

Electric Wiring Design

Model:31VA024C24+21DN024C24; 31VA036C24+21DN036C24; .

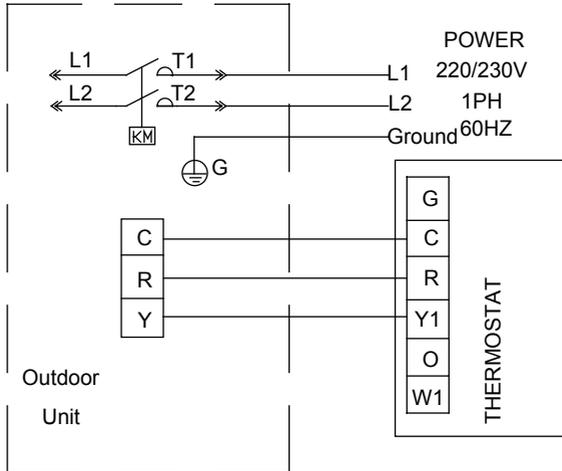


Fig.17

Model:31VA048C24+21DN048C24; 31VA060C24+21DN060C24.

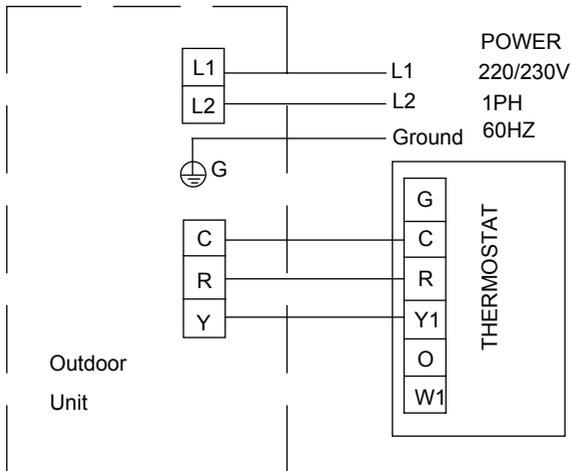


Fig.18

Model:31VA024C24+21UT024C24; 31VA036C24+ 21UT036C24.

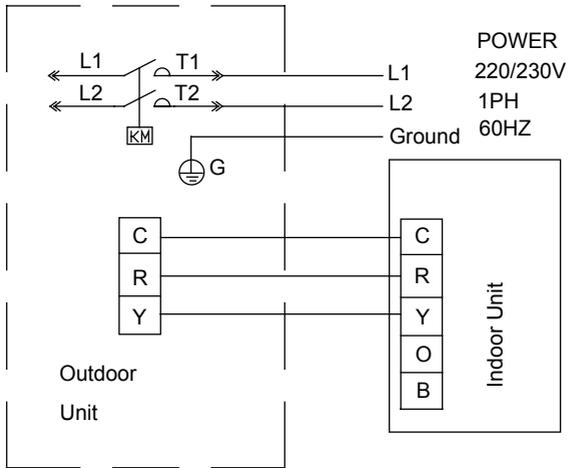


Fig.19

Model:31VA048C24+21UT048C24; 31VA060C24+ 21UT060C24.

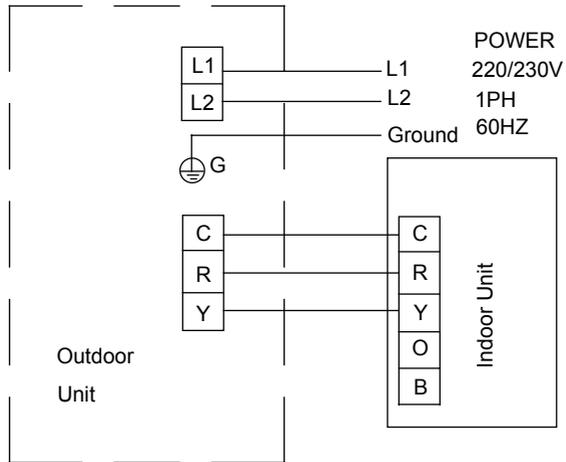


Fig.20

24/36k Circuit Diagram

Model:31VA024C24; 31VA036C24;

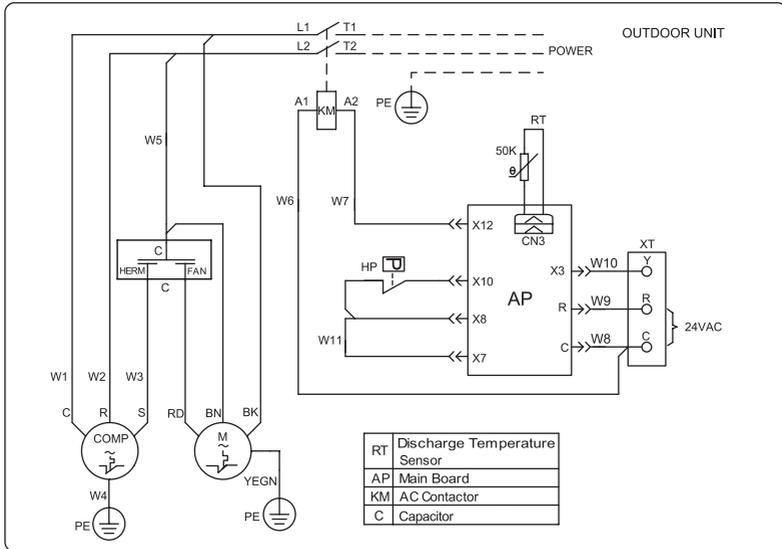


Fig.21

48/60k Circuit Diagram

Model:31VA048C24;31VA060C24;

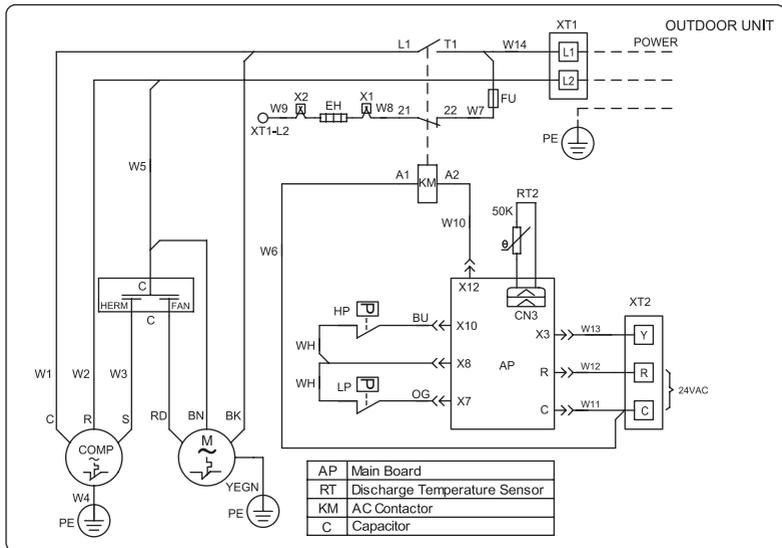


Fig.22

7. System Refrigerant

This section outlines procedures for:

- Connecting gauge set for testing and charging.
- Adding or removing refrigerant.

7.1 Gauge Set

Connections for testing and charging.

A Close manifold gauge set valves and connect the center hose to a cylinder of HFC-410A.

Set for liquid phase charging.

B Connect the manifold gauge set's low pressure side to the suction line service port.

C Connect the manifold gauge set's high pressure side to the liquid line service port.

D Position temperature sensor on vapor line near liquid line service port.

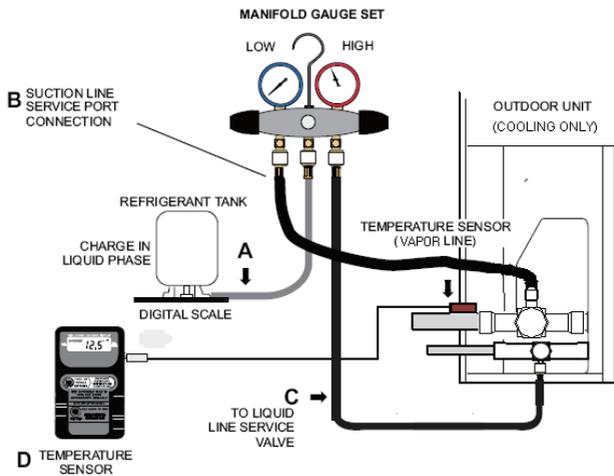


Figure 23. Gauge Set Setup and Connections for cooling only

7.2 Charging Refrigerant

Calculating system charge for outdoor unit void of charge

If the system is void of refrigerant, first, locate and repair any leaks and then weigh in the refrigerant charge into the unit. To calculate the total refrigerant charge:

$$\begin{array}{l} \text{Amount specified} \\ \text{on nameplate} \end{array} + \begin{array}{l} \text{Adjust amount for variation} \\ \text{in line set length listed on} \\ \text{line set length table below} \end{array} = \text{Total charge}$$

Refrigerant Charge per Line Set Length:

Table 7

Outdoor Unit	Liquid Line Set Diameter	Ounces per 5 feet (g per 1.5 m) adjust from 25 feet (7.6 m) line set*
COOLING ONLY	3/8" (9.5 mm)	2.9 ounce per 5 feet (81g per 1.5 m)
	1/2" (12.7 mm)	5.9 ounce per 5 feet (165g per 1.5 m)

*If line length is greater than 25 ft. (7.6 m), add this amount. If line length is less than 25 ft. (7.6

m), subtract this amount.

NOTE: Insulate liquid line when it is routed through areas where the surrounding ambient temperature could become higher than the temperature of the liquid line or when pressure drop is equal to or greater than 20 psig.

NOTE: The above nameplate is for illustration purposes only. Go to actual nameplate on outdoor unit for charge information.

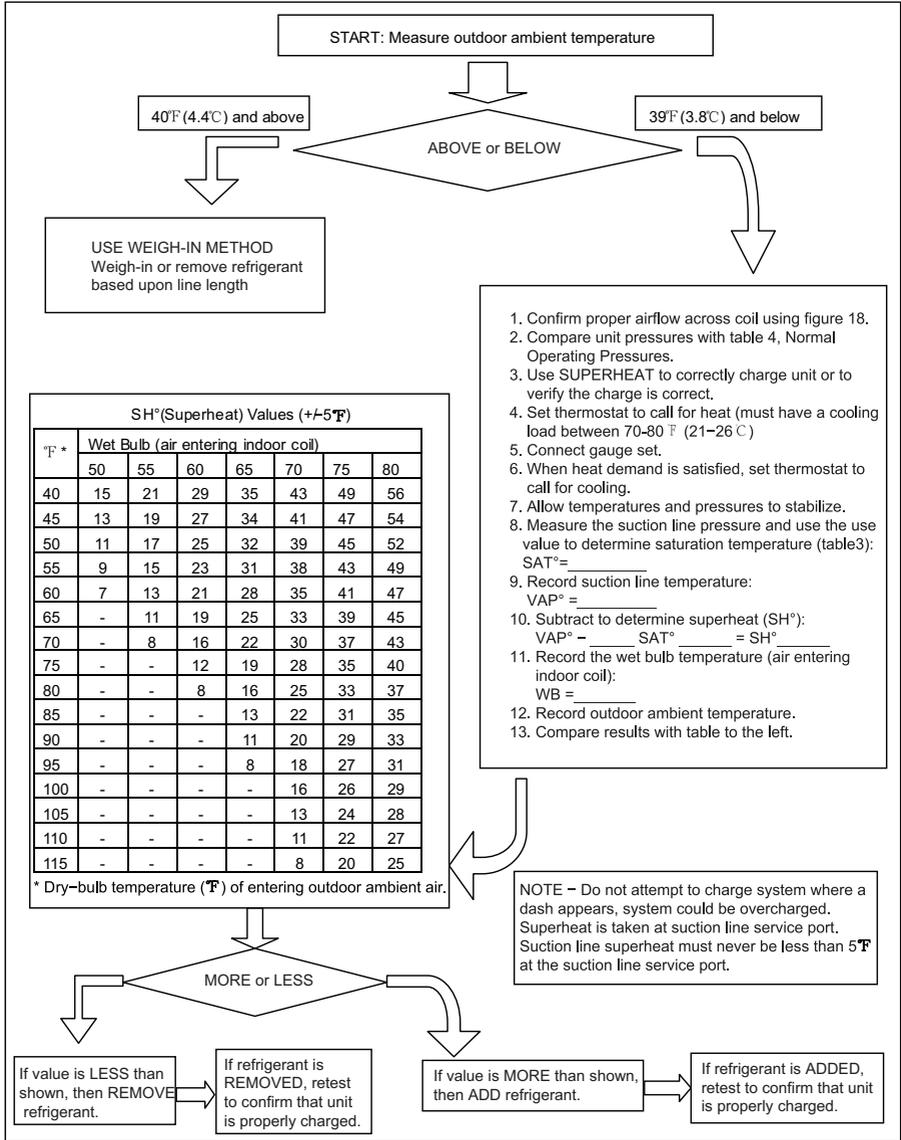


Figure 24. HFC-410A Superheat RFC Method

Table 8. HFC-410A Temperature (°F) – Pressure (Psig)

T	Psig	T	Psig	T	Psig	T	Psig	T	Psig	T	Psig	T	Psig	T	Psig
32	100.8	48	137.1	63	178.5	79	231.6	94	290.8	110	365.0	125	445.9	141	545.6
33	102.9	49	139.6	64	181.6	80	235.3	95	295.1	111	370.0	126	451.8	142	552.3
34	105.0	50	142.2	65	184.3	81	239.0	96	299.4	112	375.1	127	457.6	143	559.1
35	107.1	51	144.8	66	187.7	82	242.7	97	303.8	113	380.2	128	463.5	144	565.9
36	109.2	52	147.4	67	190.9	83	246.5	98	308.2	114	385.4	129	469.5	145	572.8
37	111.4	53	150.1	68	194.1	84	250.3	99	312.7	115	390.7	130	475.6	146	579.8
38	113.6	54	152.8	69	197.3	85	254.1	100	317.2	116	396.0	131	481.6	147	586.8
39	115.8	55	155.5	70	200.6	86	258.0	101	321.8	117	401.3	132	487.8	148	593.8
40	118.0	56	158.2	71	203.9	87	262.0	102	326.4	118	406.7	133	494.0	149	601.0
41	120.3	57	161.0	72	207.2	88	266.0	103	331.0	119	412.2	134	500.2	150	608.1
42	122.6	58	163.9	73	210.6	89	270.0	104	335.7	120	417.7	135	506.5	151	615.4
43	125.0	59	166.7	74	214.0	90	274.1	105	340.5	121	423.2	136	512.9	152	622.7
44	127.3	60	169.6	75	217.4	91	278.2	106	345.3	122	428.8	137	519.3	153	630.0
45	129.7	61	172.6	76	220.9	92	282.3	107	350.1	123	434.5	138	525.8	154	637.5
46	132.2	62	175.4	77	224.4	93	286.5	108	355.0	124	440.2	139	532.4	155	645.0
47	134.6			78	228.0			109	360.0			140	539.0		

8. Unit Control

10.1 Mainboard Description

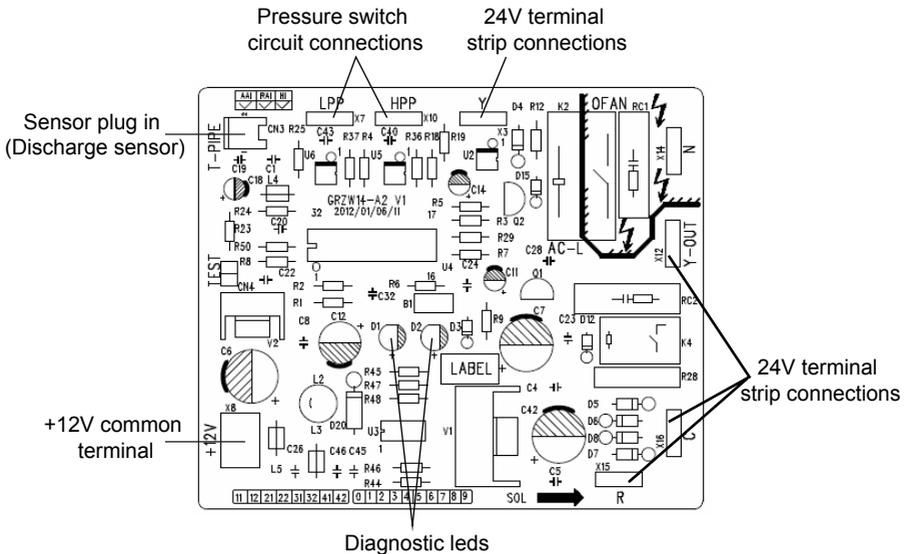


Fig.25 Mainboard Description for cooling only

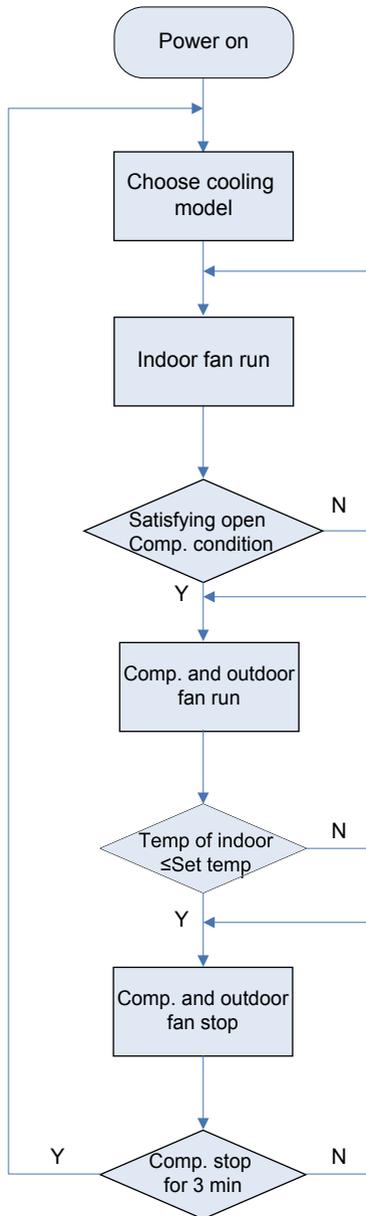
8.2 Terminal Description

Table 9. Demand Control Board Description for cooling only unit

ID	Description
X12(Y-OUT)	24 VAC output connection for compressor operation
X7(LPP)	Connection for low-pressure switch
X10(HPP)	Connection for high-pressure switch
X3(Y)	24 VAC input for compressor operation
CN3(T-PIPE)	Connection for discharge temperature sensor.
X16(C)	24 VAC system common
X15(R)	24 VAC system power input
X8(+12V)	Connection for low-pressure switch Connection for high-pressure switch

8.3 Control Flowchart

Cooling Operation



8.4 Error Analysis

COOLING ONLY

DEMAND CONTROL BOARD DIAGNOSTICS

The state (Off, On, Flashing) of two LEDs on the control board (DS1 [Red] and DS2 [Red]) indicate diagnostics conditions that are described in table 12. See table 12 to determine control board operational conditions and to diagnose cause and solution to problems.

Table 12. Demand Control board Diagnostic LEDs

DS1 Red	DS2 Red	Trouble Case	Origin of Trouble	Measure
OFF	OFF	Power problem	No power (24V) to demand control board terminals R and C or demand control board failure.	1 Check control transformer power (24V). 2 If power is available to demand control board and LED(s) do not light, replace control board.
FAULT and LOCKOUT CODES (Each fault adds 1 strike to that code's counter; 3 strikes per 30 minutes = LOCKOUT)				
0.5s Circulating Flash	OFF	Actuation of high pressure switch	High pressure switch	Abnormality is detected when the contact of the high pressure switch opens for 3 sec. The system will be shut down. The unit will report this fault. For the first two faults within 30 minutes, the unit can be recovered automatically. If over three times, the unit cannot be recovered automatically.
OFF	0.5s Circulating flash	Actuation of low pressure switch	Low pressure switch	When the unit runs more than 4 minutes or does not run, the low pressure switch opens for more than 3sec and the system will be shut down. The unit will report this fault. For the first two faults within 30 minutes, the unit can be recovered automatically. If over three times, the unit cannot be recovered automatically.

0.5s Circulating Flash	Continuous Light	Air discharge high- temperature protection of compressor	Exhaust over- temperature Protection	The exhaust temperature is higher than 125°C for more than 5s, the system will be shut down. After stopping the compressor for 3 mins, if the exhaust temperature is lower than 90°C for more than 5s, the compressor will re-start. For the first two faults within 30 minutes, the unit can be recovered automatically. If over three times, the unit cannot be recovered automatically.
Continuous Light	OFF	Malfunction of discharge Temp. Sensor	Discharge temperature sensor	If the exhaust temperature sensor is detected of open circuit 5 seconds successively after the compressor is started for 3 minutes or short circuit 5 seconds successively at any time The system will be shut down. After the fault is eliminated, the system can automatically resume to operation
0.5s Circulating Flash	0.5s Circulating flash	Normal operation	Unit operating normally or in standby mode.	None required.

8.5 Manual Defrost Cycle

There is a Manual Defrost Button located on the Defrost Control PCB, By pressing this button, the system will go to defrost cycle right away to melt the ice on the coil.

Thank you for Choosing



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