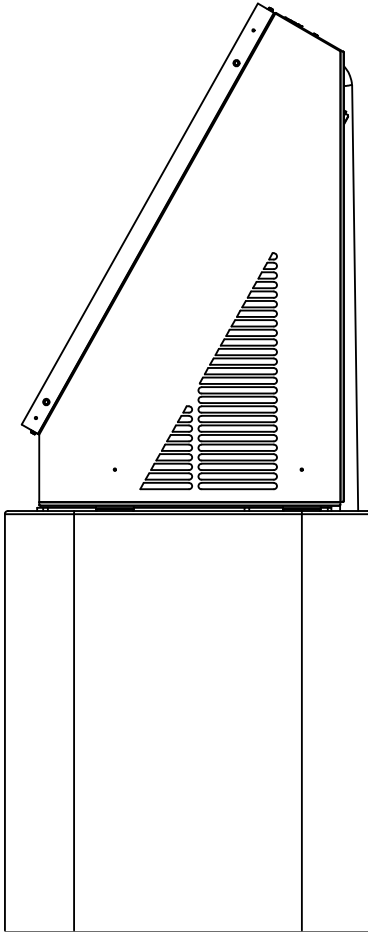




**Model "Z" with
Model "A" A-Coil
Solar HVAC
I/O/M manual**

Air conditioning & Heating

Split System Heat Pump & Air Conditioner 3 Tons R410A



NOTE: Appearance of unit may vary.

ALL phases of this installation must comply with NATIONAL, STATE AND LOCAL CODES

IMPORTANT - This Document is customer property and is to remain with this unit. Please return to service information pack upon completion of work.

These instructions do not cover all variations in systems or provide for every possible contingency to be met in connection with the installation. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to your installing dealer or local distributor.

Note : The manufacturer recommends installing only approved matched indoor and outdoor systems. All of the manufacturer's split systems are A.H.R.I. rated only with TXV indoor systems. Some of the benefits of installing approved matched indoor and outdoor split systems are maximum efficiency, optimum performance and the best overall system reliability.




Table of Contents


General Description	2
Safety Information	4
Part Number and Description	5
2 Ton Gas Condenser Dimensions	6
2 Ton A-Coil AHU Dimensions	7
3 Ton Gas Condenser Dimensions	8
3 Ton A-Coil AHU Dimensions	9
4 Ton Gas Condenser Dimensions	10
4 Ton A-Coil AHU Dimensions	11
5 Ton Gas Condenser Dimensions	12
5 Ton A-Coil AHU Dimensions	13
Condenser Clearances	14
A-Coil AHU Clearances	15
Unit Location Considerations	16 - 17
Unit Preparation	18
Refrigerant Line Considerations	19 - 24
Electrical - Low Voltage	25 - 26
Electrical - High Voltage	27
Start UP	28
System Charge Adjustment	29
Solar HVAC Wiring Diagram	30
Solar HVAC Check Table	31
Solar HVAC Gas Heat Plumbing Diagram	32
Ionization Option Wiring	33
Dirty Filter Switch Option Wiring	34
Water Guard Option Wiring	35
RTU Phase Monitor Wiring	36
Troubleshooting	37 - 53

Safety:

important- This document contains a wiring diagram and service information. This is customer property and is to remain with this unit. Please return to service information pack upon completion of work.


 **CAUTION**

This information is intended for use by individuals possessing adequate backgrounds of electrical and mechanical experience. Any attempt to repair a central air conditioning product may result in personal injury and/or property damage. The manufacturer or seller cannot be responsible for the interpretation of this information, nor can it assume any liability in connection with its use.

 **WARNING**

HAZARDOUS VOLTAGE!


Failure to follow this warning could result in property damage, severe personal injury, or death. Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power cannot be inadvertently energized.

 **WARNING**

REFRIGERANT OIL!


Any attempt to repair a central air conditioning product may result in property damage, severe personal injury, or death.

These units use R-410A refrigerant which operates at 50 to 70% higher pressures than R-22. Use only R-410A approved service equipment. Refrigerant cylinders are painted a "Rose" color to indicate the type of refrigerant and may contain a "dip" tube to allow for charging of liquid refrigerant into the system. All R-410A systems with variable speed compressors use a PVE oil that readily absorbs moisture from the atmosphere. To limit this "hygroscopic" action, the system should remain sealed whenever possible. If a system has been open to the atmosphere for more than 4 hours, the compressor oil must be replaced. Never break a vacuum with air and always change the driers when opening the system for component replacement.

 **CAUTION**

HOT SURFACE!


May cause minor to severe burning. Failure to follow this Caution could result in property damage or personal injury. Do not touch top of compressor.

 **CAUTION**

CONTAINS REFRIGERANT!


Failure to follow proper procedures can result in personal illness or injury or severe equipment damage.

System contains oil and refrigerant under high pressure. Recover refrigerant to relieve pressure before opening system.

 **CAUTION**


GROUNDING REQUIRED!

Failure to inspect or use proper service tools may result in equipment damage or personal injury. Reconnect all grounding devices. All parts of this product that are capable of conducting electrical current are grounded. If grounding wires, screws, straps, clips, nuts, or washers used to complete a path to ground are removed for service, they must be returned to their original position and properly fastened.

 **WARNING**


SERVICE VALVES!

Failure to follow this warning will result in abrupt release of system charge and may result in personal injury and/or property damage. Extreme caution should be exercised when opening the Liquid Line Service valve. Turn valve stem counterclockwise only until the stem contacts the rolled edge. No torque is required.

 **WARNING**

BRAZING REQUIRED!

Failure to inspect lines or use proper service tools may result in equipment damage or personal injury. If using existing refrigerant lines make certain that all joints are brazed, not soldered.

 **WARNING**

HIGH LEAKAGE CURRENT!

Failure to follow this warning could result in property damage, severe personal injury, or death. Earth connection essential before connecting electrical supply.

Model "Z" Part Number Scheme

SHR1Z- 23 4 5 67 8 910 11 - 12

Type (1)

G - Gas**

BTU's (23)

24 - 24,000 BTUs
36 - 36,000 BTUs
48 - 48,000 BTUs
60 - 60,000 BTUs

Fan (4)

0 - No Fan

Voltage (5)

G - 230 VAC 1Φ
H - 230VAC 3Φ

Gas Heat** (6,7)

00 - No Heat

Heat Stages (8)

A - No Controls

Disconnect (9,10)

00 - No Disconnect
01 - 240V - 30A Fuse
11 - 240V - 30A Switch

Configuration (11)

0 - Condenser Only
*A - Down Supply / Down Return
*D - Horizontal Supply / Horizontal Return

Options (12)

0 - No Options
*B - Whole Unit (UG)
*C - All Coils (UG)
D - Condenser Coil (UG)
G - Model 'A' AHU (A-Coil)
*K - DW w/ Poly Insulation
*N - Dirty Filter Switch
Y - Start Up
*3 - Condensate Flow Switch
7 - Phase Monitor
*8 - Ionization Installed in AHU

* - Only available when "G - Model 'A' AHU (A-Coil)" is selected in (Options (12))

** - Customer Supplied Gas Heater (Only A-Coil Supplied)

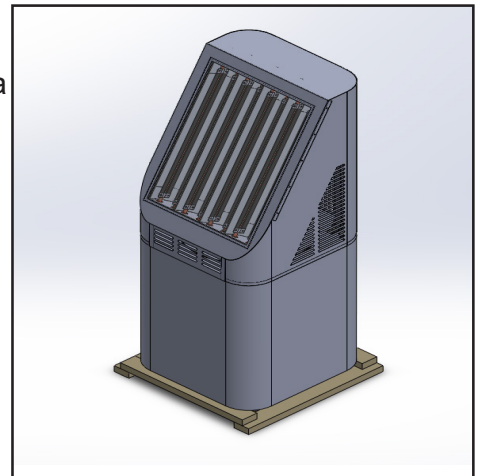
Model "ZxGA" Description

A Solar HVAC Residential Unit is more than twice as efficient as a standard residential split unit.

A solar box equipped with chambers lined with specialty reflective film is mounted to the top of the condensing unit. Through a patented process, ambient light is converted to thermal energy which reduces the energy demand on the compressor.

The highest efficiency condensing unit (made with the patented so-lar HVAC system) paired with a Model "A" A-Coil Unit that is intended to be added to a customer supplied gas heater.

Units come with a 1-year parts warranty and 10 year compressor warranty.



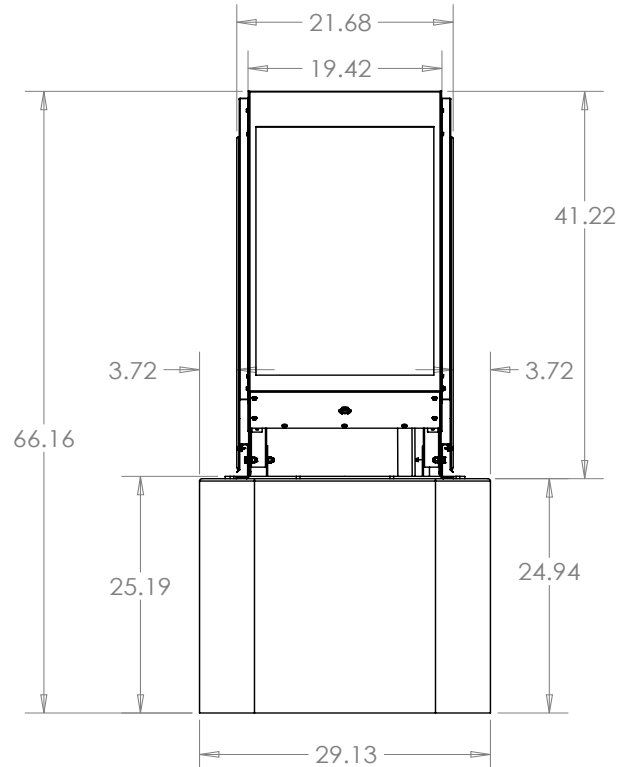
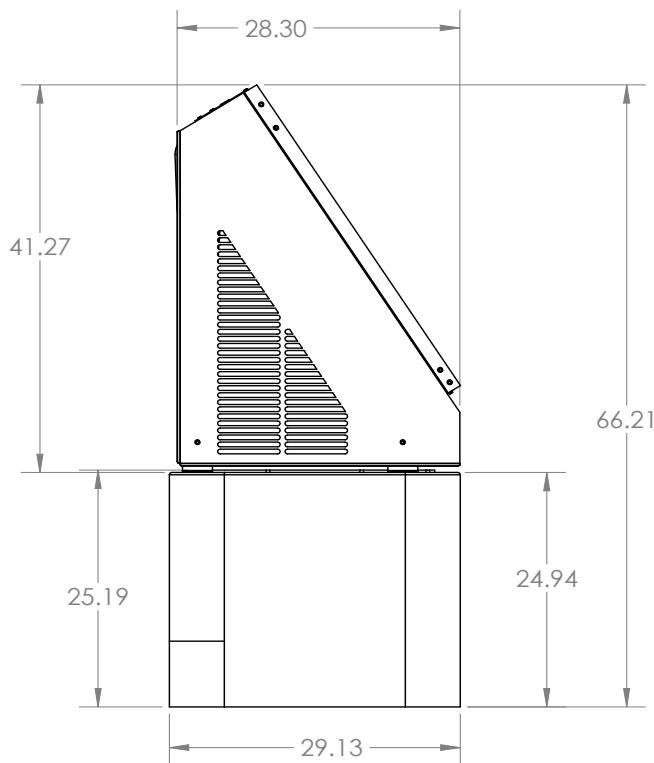
Model "Z" 2 Ton Gas Condenser Dimensions

Model		SHRDZ-24 (2 Ton)	
Code		Outdoor Code	
Outdoor Power Supply		V/Hz	
Cooling	Capacity	Btu/h	24000
		W	1920
	EER	Btu/h, W	12.5
SEER		17.5	
Compressor	Type	Twin-rotary DC	
Outdoor Dimension	Packing (WxHxD)	Inch	32-5/8 x 32-5/8 x 71

(Outdoor Unit) Model		SHRDZ-24 (2 Ton)	
Outdoor Weight	Net - Lbs (kg)	257 (117)	
	*Gross - Lbs (kg)	262 (119)	
Electrical Data 208/230 1ϕ	Minimum Circuit Ampacity	17.7 A	
	Max. Overcurrent Protection	30 A	
Electrical Data 208/230 3ϕ	Minimum Circuit Ampacity	10.23 A	
	Max. Overcurrent Protection	20 A	
Outdoor Noise Level (dB(A))		78	
Operation Temperatures (°F)		5 - 118	

* Gross = Net Weight + Shipping Box

Note:
 Unit should be UL 1995 listed
 Unit should be OG-100 Certified to the Solar certification on ICC901/SRCC100
Note: Face solar panels south for optimal performance.



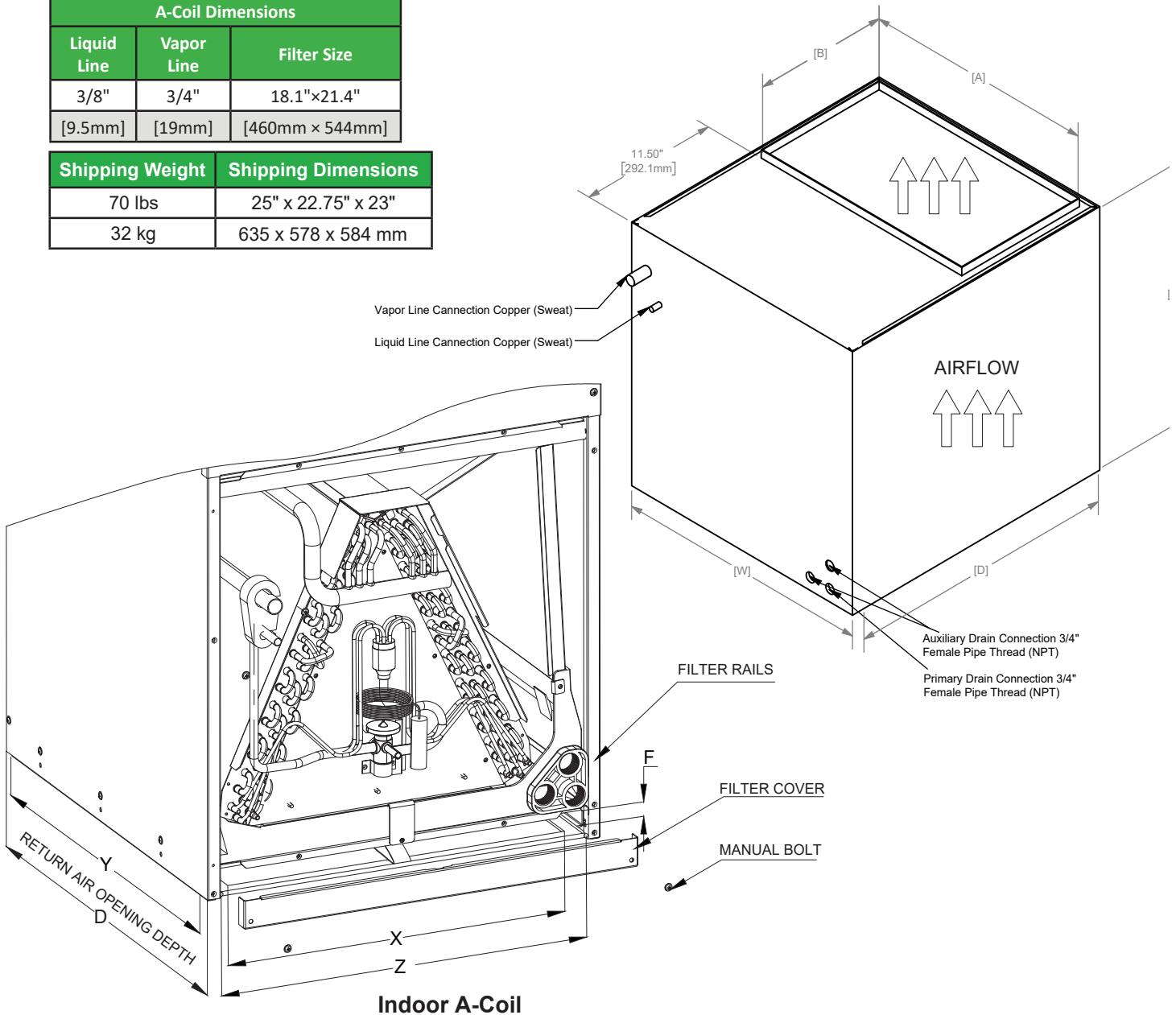
Model "Z" 2 Ton Gas A-Coil AHU Dimensions

Evap Coil Specs.	Type	Puron Refrigerant	Nominal Cooling Capacity	CFM	Ext. Static Pressure	Indoor Noise Level
	Inner Groove	TXV	24,000	780	0.10	63

Zero 24k AHU Dimensions								
Supply Duct "A"	Supply Duct "B"	Length "D"	Width "W"	Height "H"	Return Duct "X"	Return Duct "Y"	Filter "Z"	Filter "F"
17.875"	10.5"	22"	19.625"	20"	16.3"	20.8"	18.3"	1"
[454mm]	[267mm]	[559mm]	[498mm]	[508mm]	[414mm]	[528mm]	[465mm]	[25mm]

A-Coil Dimensions		
Liquid Line	Vapor Line	Filter Size
3/8"	3/4"	18.1"x21.4"
[9.5mm]	[19mm]	[460mm x 544mm]

Shipping Weight	Shipping Dimensions
70 lbs	25" x 22.75" x 23"
32 kg	635 x 578 x 584 mm



Model "Z" 3 Ton Gas Condenser Dimensions

Model		SHRDZ-36 (3 Ton)	
Code	Outdoor Code		
Outdoor Power Supply	V/Hz	208-230V/60Hz	
Cooling	Capacity	Btu/h	34500
		W	2974
	EER	Btu/h, W	11.6
	SEER		17.5
Compressor	Type	Twin-rotary DC	
Outdoor Dimension	Packing (WxHxD)	Inch	32-5/8 x 32-5/8 x 71

(Outdoor Unit) Model		SHRDZ-36 (3 Ton)	
Outdoor Weight	Net - Lbs (kg)	257 (117)	
	*Gross - Lbs (kg)	262 (119)	
Electrical Data 208/230 1 ϕ	Minimum Circuit Ampacity	24.2 A	
	Max. Overcurrent Protection	40 A	
Electrical Data 208/230 3 ϕ	Minimum Circuit Ampacity	13.98 A	
	Max. Overcurrent Protection	20 A	
Outdoor Noise Level (dB(A))		78	
Operation Temperatures (°F)		5 - 118	

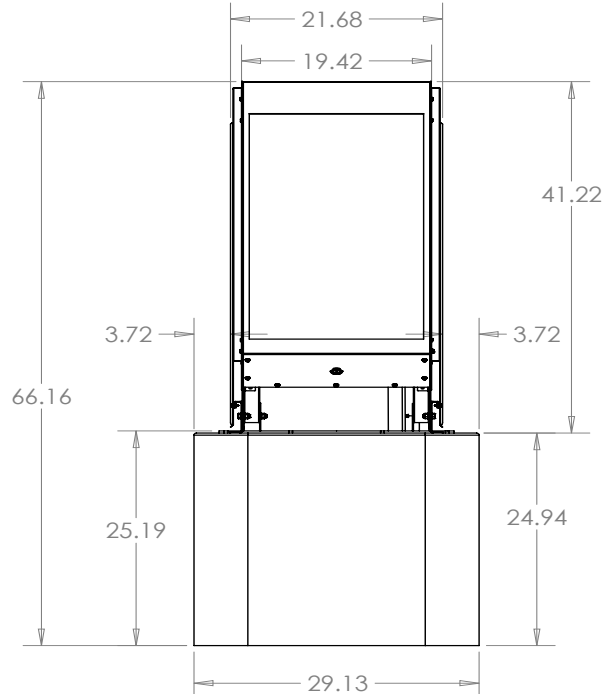
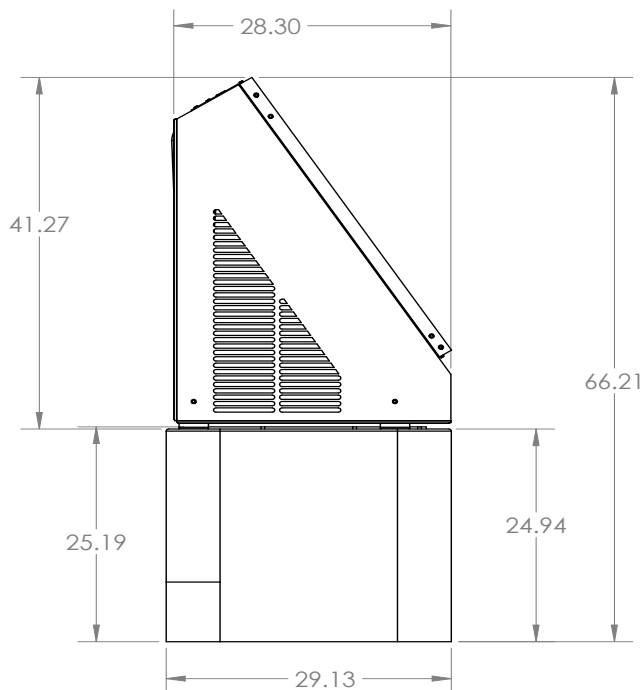
Note:

Unit should be UL 1995 listed

Unit should be OG-100 Certified to the Solar certification on ICC901/SRCC100

Note: Face solar panels south for optimal performance.

* Gross = Net Weight + Shipping Box



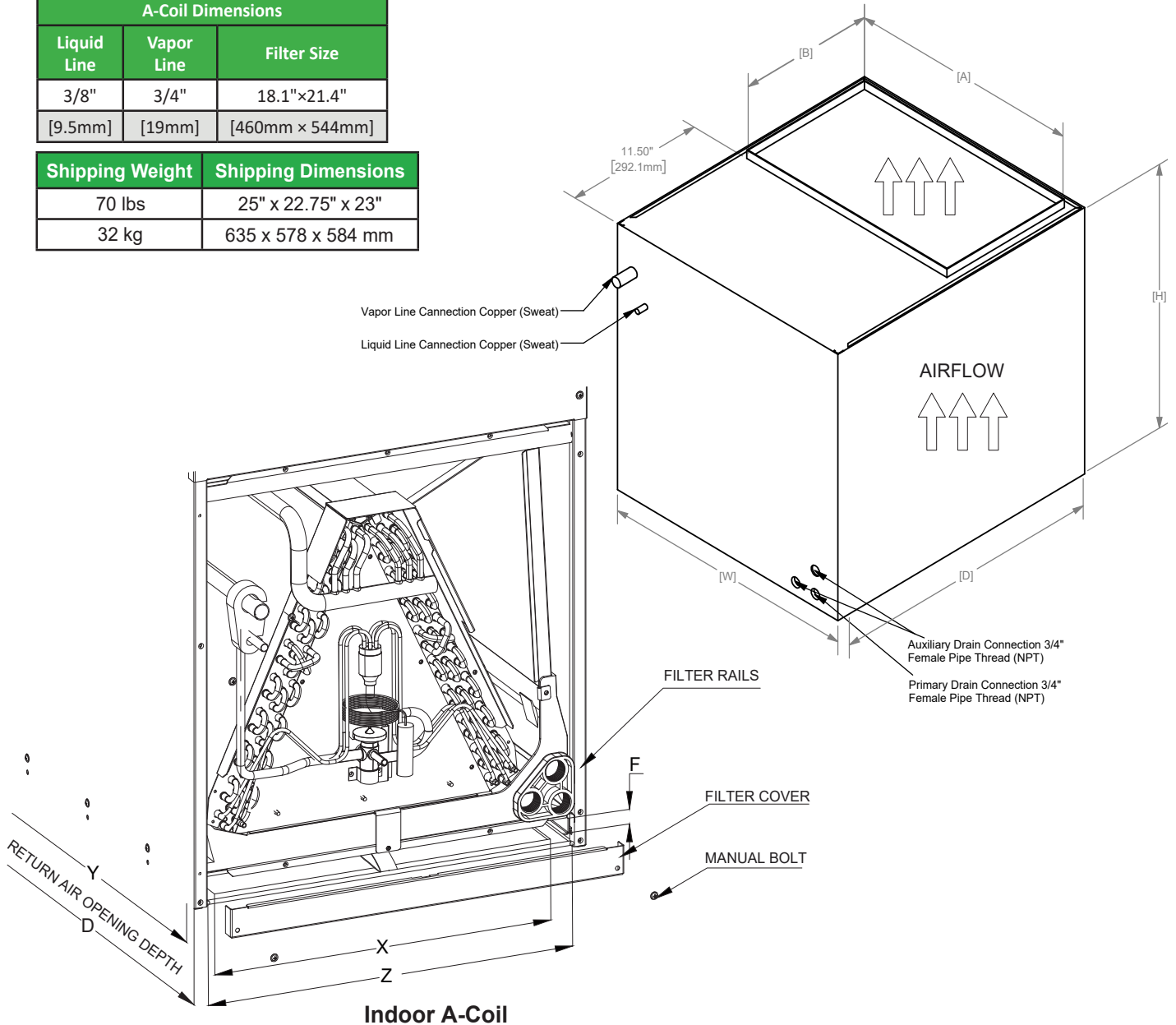
Model "Z" 3 Ton Gas A-Coil AHU Dimensions

Evap Coil Specs.	Type	Puron Refrigerant	Nominal Cooling Capacity	CFM	Ext. Static Pressure	Indoor Noise Level
	Inner Groove	TXV	36,000	780	0.10	63

Zero 36k AHU Dimensions								
Supply Duct "A"	Supply Duct "B"	Length "D"	Width "W"	Height "H"	Return Duct "X"	Return Duct "Y"	Filter "Z"	Filter "F"
17.875"	10.5"	22"	19.625"	20"	16.3"	20.8"	18.3"	1"
[454mm]	[267mm]	[559mm]	[498mm]	[508mm]	[414mm]	[528mm]	[465mm]	[25mm]

A-Coil Dimensions		
Liquid Line	Vapor Line	Filter Size
3/8"	3/4"	18.1"x21.4"
[9.5mm]	[19mm]	[460mm x 544mm]

Shipping Weight	Shipping Dimensions
70 lbs	25" x 22.75" x 23"
32 kg	635 x 578 x 584 mm



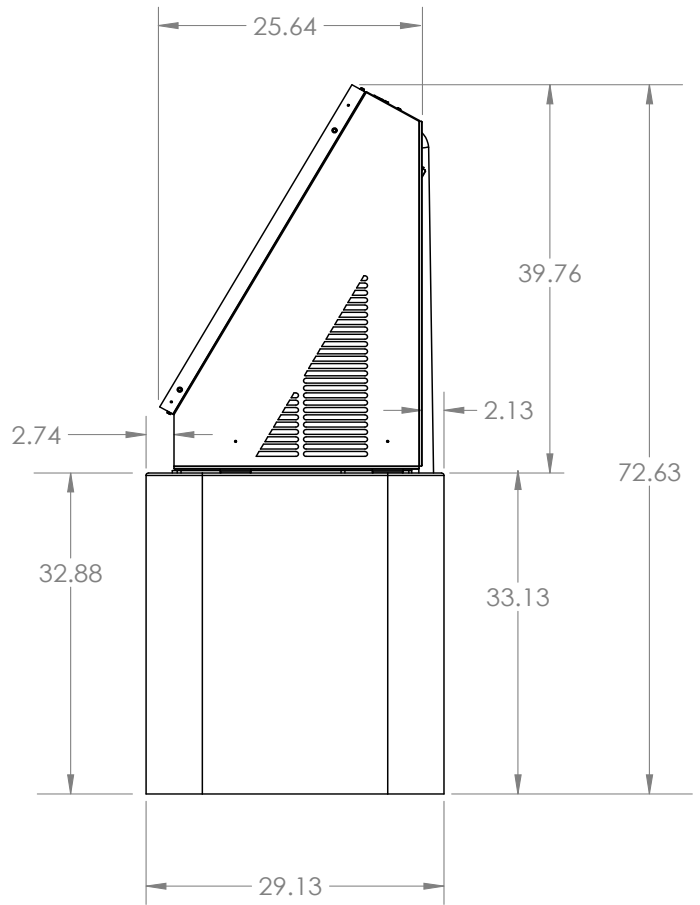
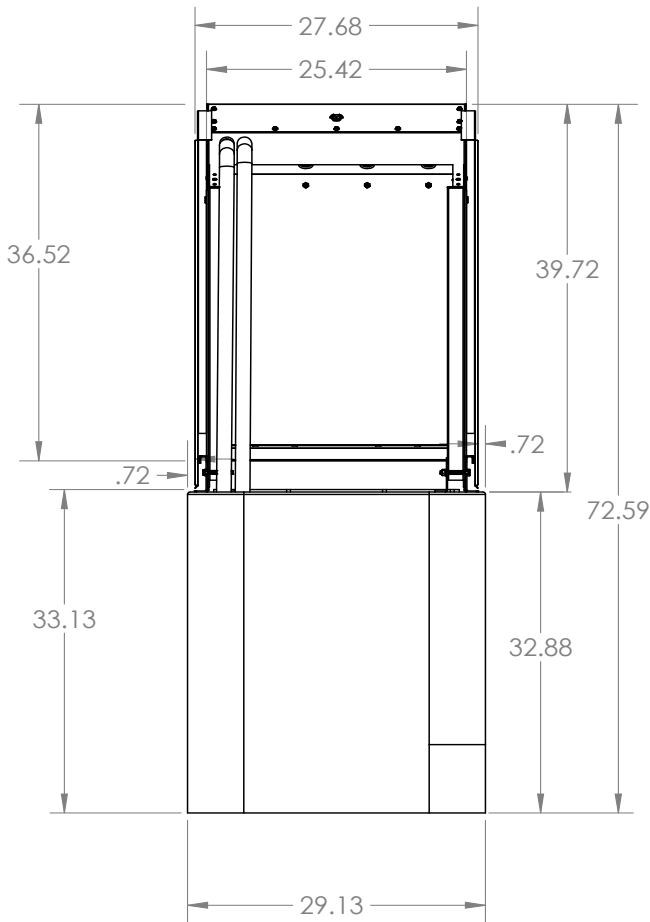
Model "Z" 4 Ton Gas Condenser Dimensions

Model		SHRDZ-48 (4 Ton)	
Code		Outdoor Code	
Outdoor Power Supply		V/Hz	
		208-230V/60Hz	
Cooling	Capacity	Btu/h	47000
		W	4692
	EER	Btu/h, W	11.6
SEER		17.5	
Compressor	Type	Twin-rotary DC	
Outdoor Dimension	Packing (WxHxD)	Inch	32-5/8 x 32-5/8 x 79-5/8

(Outdoor Unit) Model		SHRDZ-48 (4 Ton)
Outdoor Weight	Net - Lbs (kg)	301 (137)
	*Gross - Lbs (kg)	306 (139)
Electrical Data 208/230 1φ	Minimum Circuit Ampacity	31.9 A
	Max. Overcurrent Protection	50 A
Electrical Data 208/230 3φ	Minimum Circuit Ampacity	18.43 A
	Max. Overcurrent Protection	20 A
Outdoor Noise Level (dB(A))		79
Operation Temperatures (°F)		5 - 118

Note:
 Unit should be UL 1995 listed
 Unit should be OG-100 Certified to the Solar certification on ICC901/SRCC100
Note: Face solar panels south for optimal performance.

* Gross = Net Weight + Shipping Box



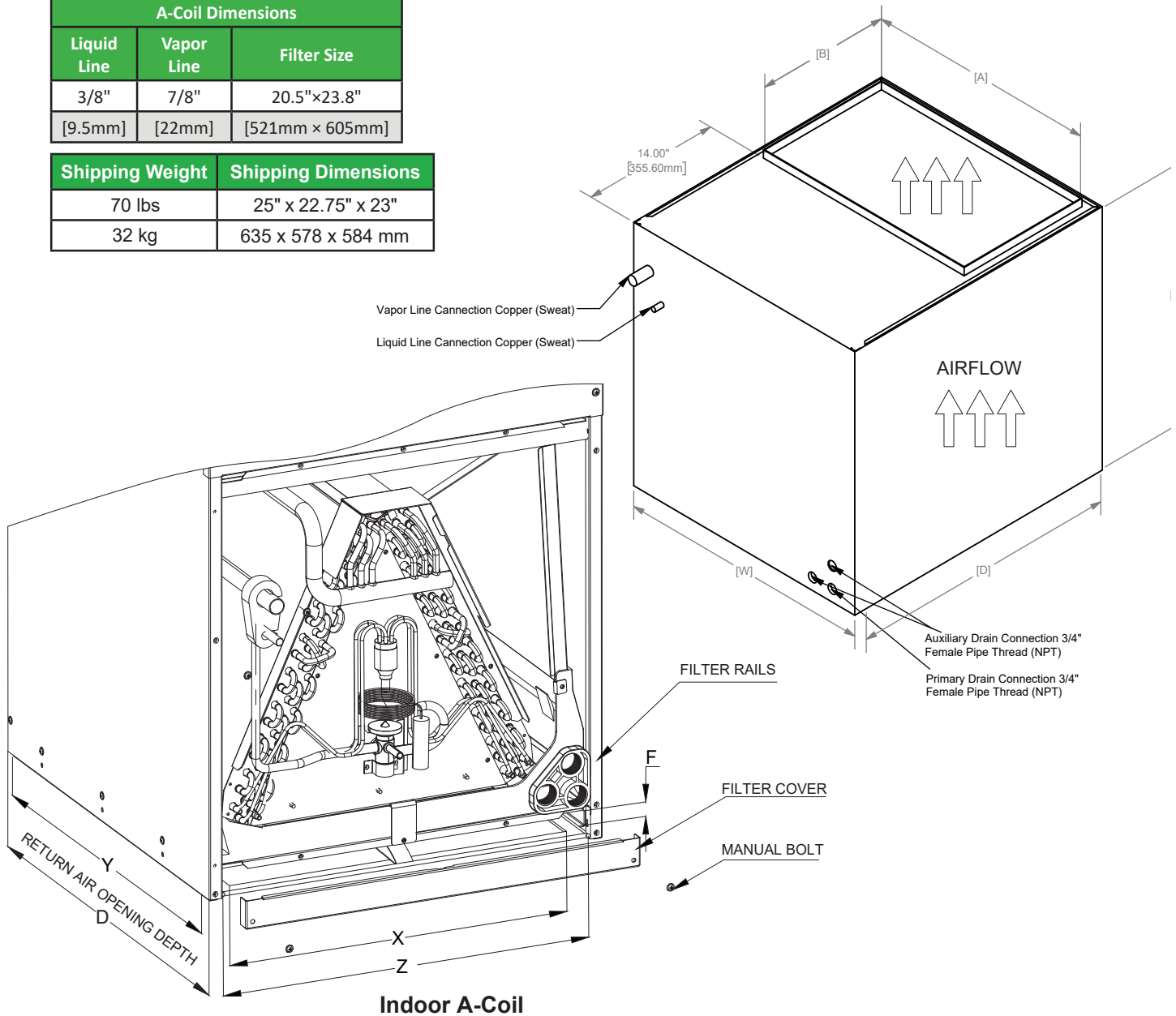
Model "Z" 4 Ton Gas A-Coil AHU Dimensions

Evap Coil Specs.	Type	Puron Refrigerant	Nominal Cooling Capacity	CFM	Ext. Static Pressure	Indoor Noise Level
	Inner Groove	TXV	47,000	1500	0.20	67

Zero 48k AHU Dimensions								
Supply Duct "A"	Supply Duct "B"	Length "D"	Width "W"	Height "H"	Return Duct "X"	Return Duct "Y"	Filter "Z"	Filter "F"
19.5"	10.5"	24.5"	22"	26.5"	18.8"	23"	20.7"	1"
[495mm]	[267mm]	[622mm]	[559mm]	[673mm]	[478mm]	[584mm]	[526mm]	[25mm]

A-Coil Dimensions		
Liquid Line	Vapor Line	Filter Size
3/8"	7/8"	20.5"×23.8"
[9.5mm]	[22mm]	[521mm × 605mm]

Shipping Weight	Shipping Dimensions
70 lbs	25" x 22.75" x 23"
32 kg	635 x 578 x 584 mm



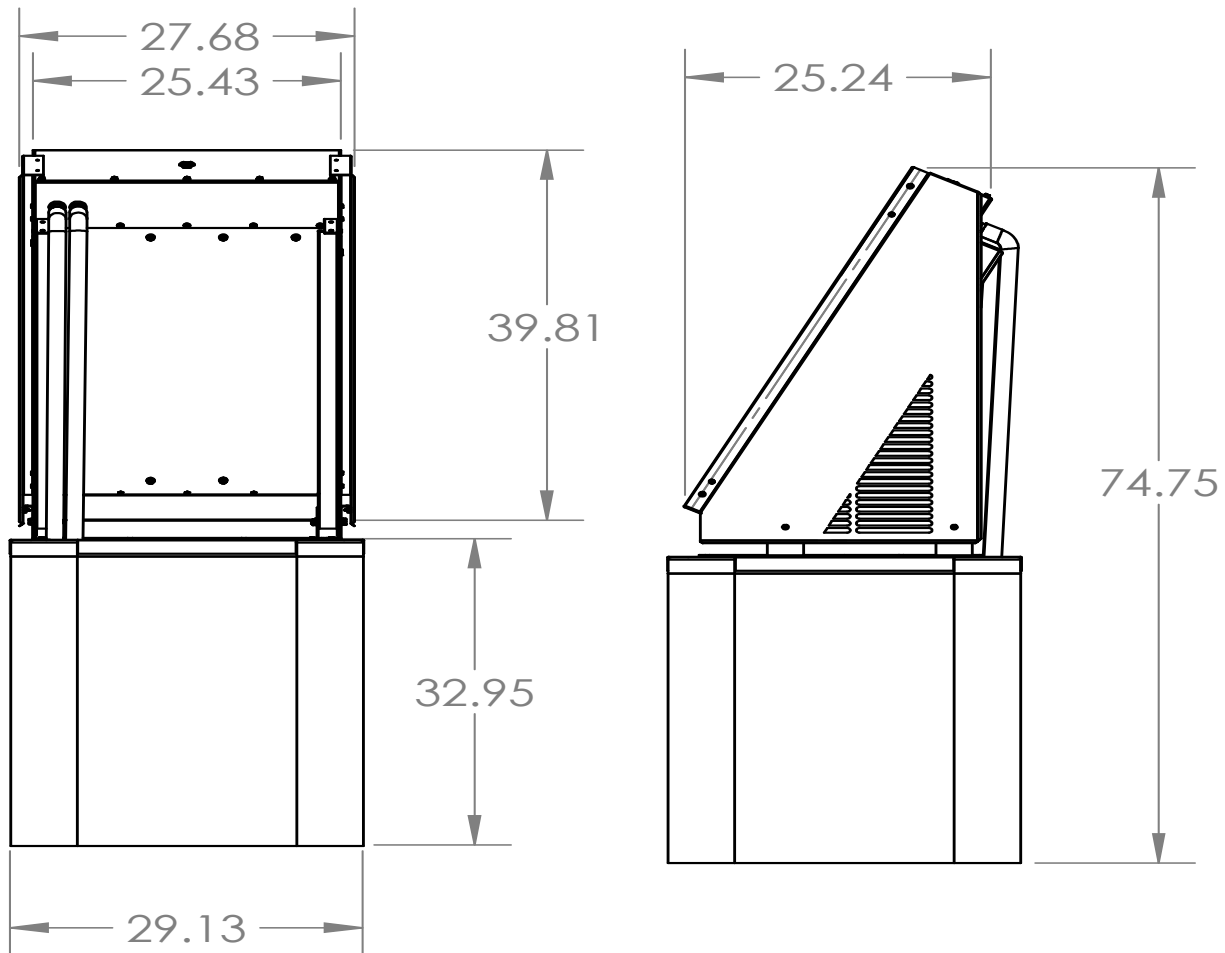
Model "Z" 5 Ton Gas Condenser Dimensions

Model		SHRDZ-60 (5 Ton)	
Code	Outdoor Code		
Outdoor Power Supply	V/Hz	208-230V/60Hz	
Cooling	Capacity	Btu/h	56000
		W	5185
	EER	Btu/h, W	10.8
	SEER		17.5
Compressor	Type	Twin-rotary DC	
Outdoor Dimension	Packing (WxHxD)	Inch	32-5/8 x 32-5/8 x 79-5/8

(Outdoor Unit) Model		SHRDZ-60 (5 Ton)	
Outdoor Weight	Net - Lbs (kg)	301 (137)	
	*Gross - Lbs (kg)	306 (139)	
Electrical Data 208/230 1φ	Minimum Circuit Ampacity	36.5 A	
	Max. Overcurrent Protection	60 A	
Electrical Data 208/230 3φ	Minimum Circuit Ampacity	21.09 A	
	Max. Overcurrent Protection	30 A	
Outdoor Noise Level (dB(A))		79	
Operation Temperatures (°F)		5 - 118	

Note:
 Unit should be UL 1995 listed
 Unit should be OG-100 Certified to the Solar certification on ICC901/SRCC100
Note: Face solar panels south for optimal performance.

* Gross = Net Weight + Shipping Box



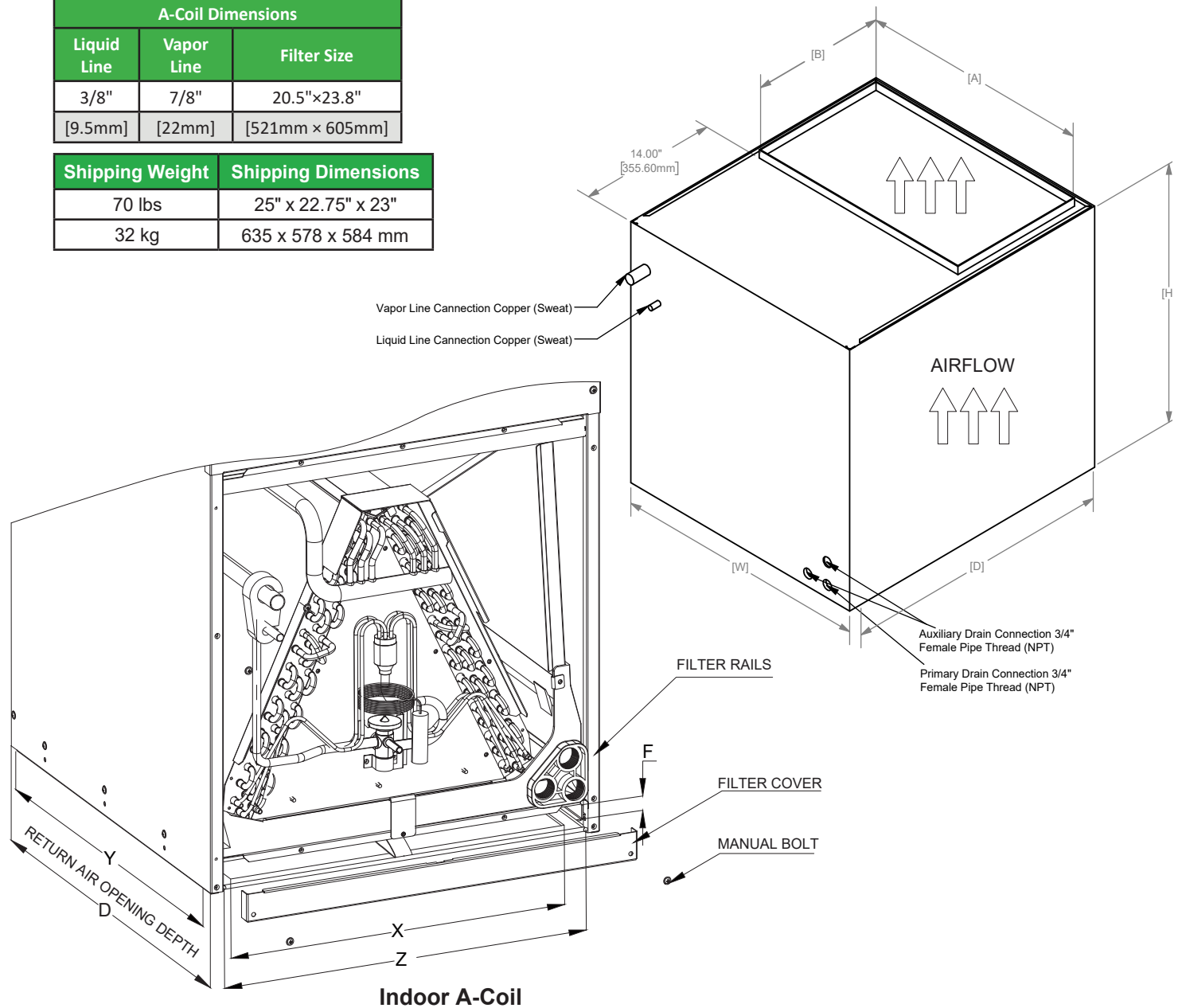
Model "Z" 5 Ton Gas A-Coil AHU Dimensions

Evap Coil Specs.	Type	Puron Refrigerant	Nominal Cooling Capacity	CFM	Ext. Static Pressure	Indoor Noise Level
	Inner Groove	TXV	56,000	1750	0.20	68

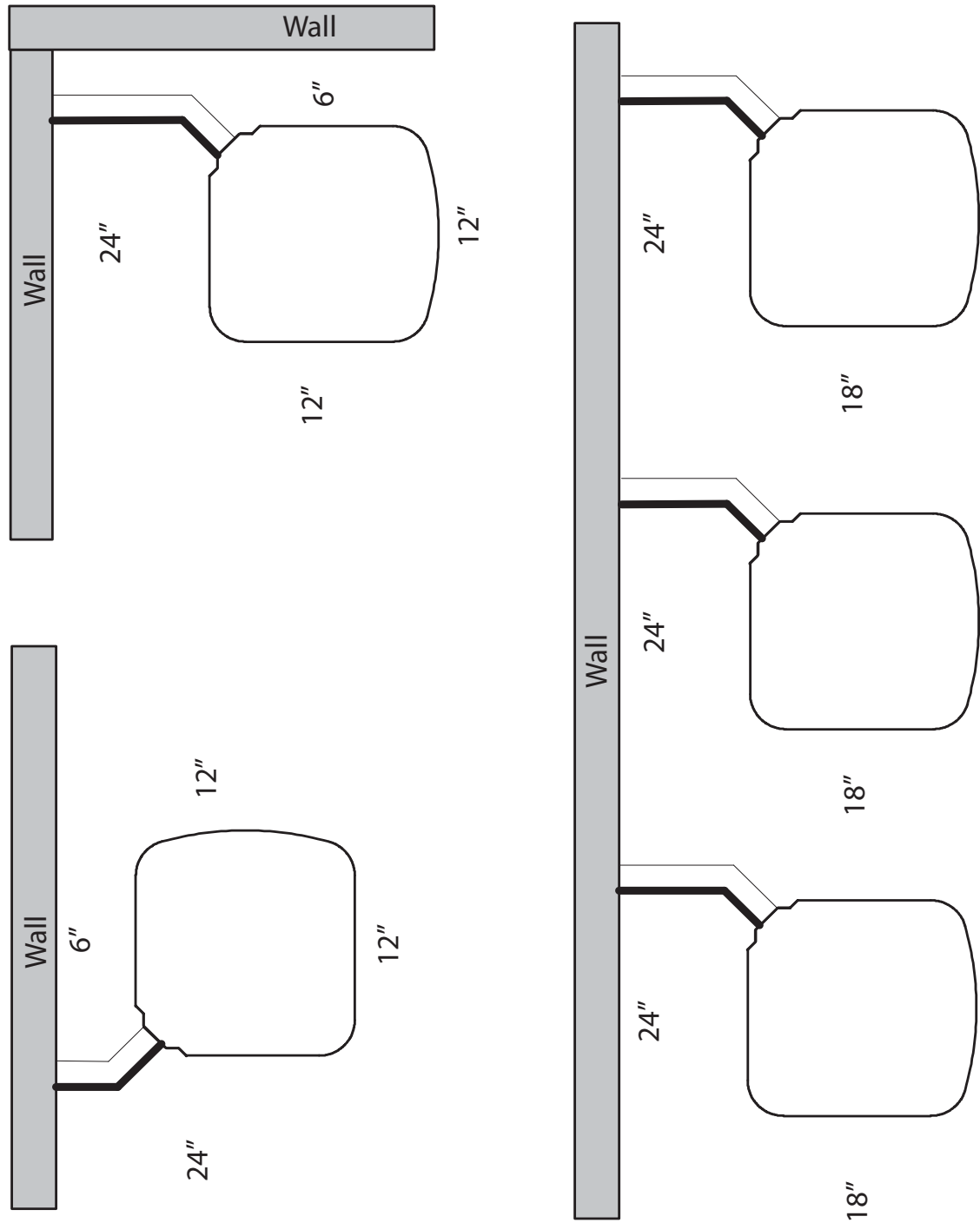
Zero 60k AHU Dimensions								
Supply Duct "A"	Supply Duct "B"	Length "D"	Width "W"	Height "H"	Return Duct "X"	Return Duct "Y"	Filter "Z"	Filter "F"
19.5"	10.5"	24.5"	22"	26.5"	18.8"	23"	20.7"	1"
[495mm]	[267mm]	[622mm]	[559mm]	[673mm]	[478mm]	[584mm]	[526mm]	[25mm]

A-Coil Dimensions		
Liquid Line	Vapor Line	Filter Size
3/8"	7/8"	20.5" x 23.8"
[9.5mm]	[22mm]	[521mm x 605mm]

Shipping Weight	Shipping Dimensions
70 lbs	25" x 22.75" x 23"
32 kg	635 x 578 x 584 mm



Model "Z" Condenser Clearances

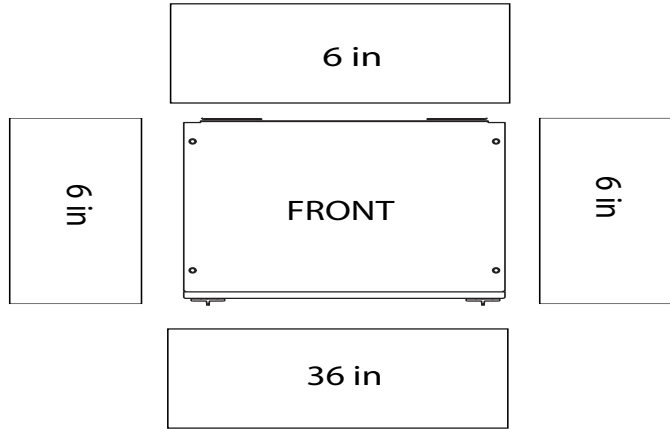


* - Unit Type Gas (G)

** - BTU's - x 1000 (24, 36, 48, 60)

Model "A" A-Coil AHU Clearances

SHR*-A-Coil AHU Clearances | v 1.00 | 07/22/24

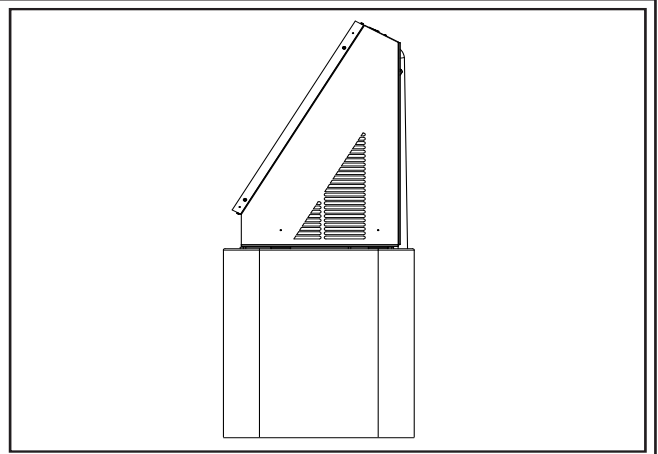


Unit Location Considerations

Dimensions

The unit's weight values is on the carton box.

When mounting the outdoor unit on a roof, be sure the roof will support the unit's weight. Property selected isolation is recommended to prevent sound or vibration transmission to the building structure.



Refrigerant Piping Limits

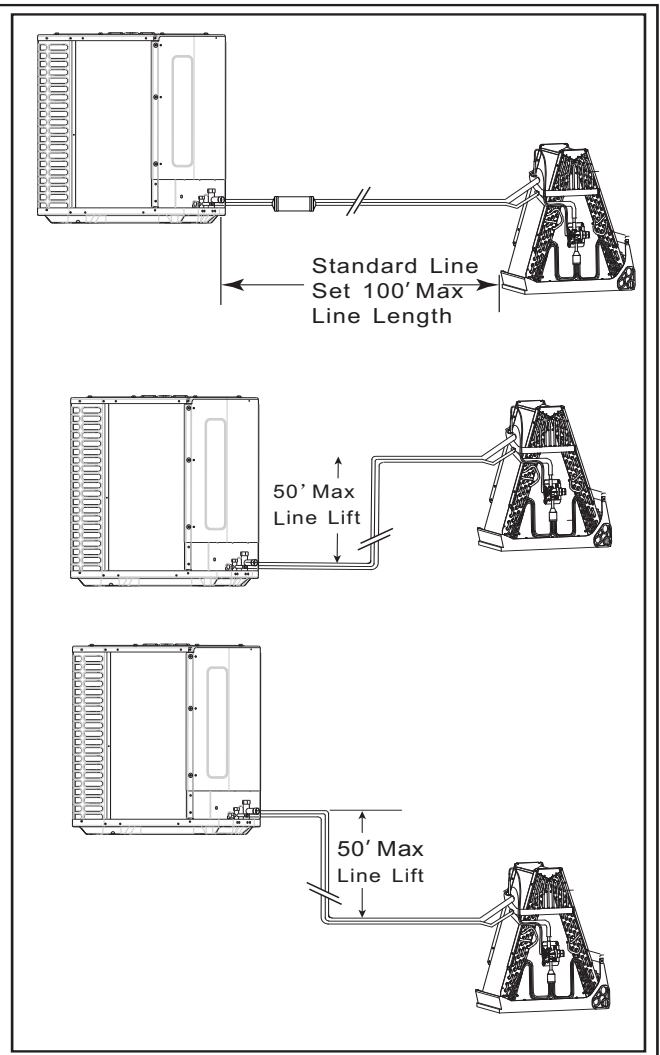
Maximum line length = 100 feet.

Maximum vertical length = 50 feet.

Compressor crankcase heat is required for line lengths over 50 feet.

Use only the line diameters indicated in Table 5. 1.

Such as the connecting tube is more than 60 feet, does not use large Suction line than recommend.



Unit Location Considerations (cont'd)

Location Restrictions

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

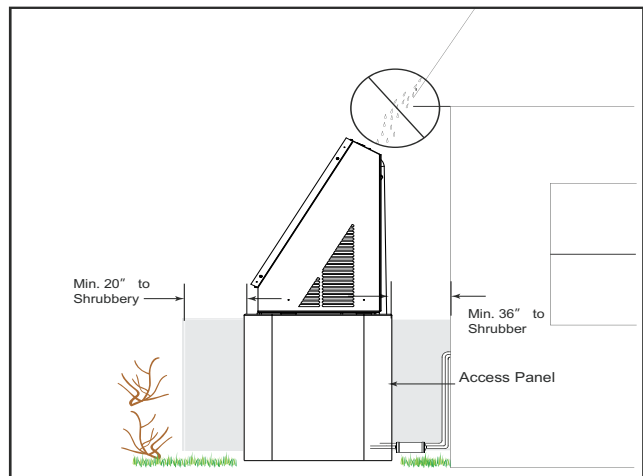
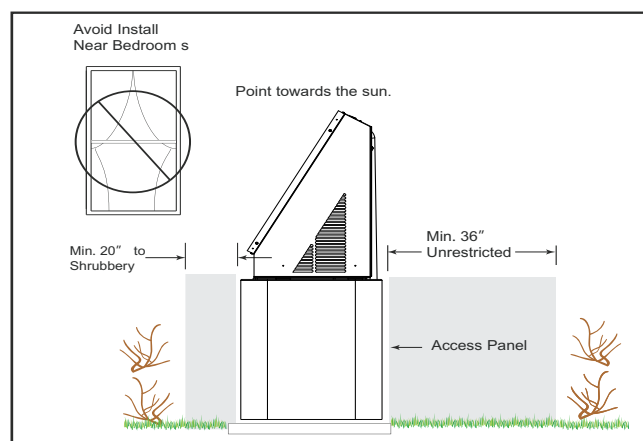
Clearance must be provided in front of the control box (access panels) and any other side requiring service.

Do not locate close to bedrooms, operational sounds may be objectionable.

Position the outdoor unit a minimum of 20 inches from any wall or surrounding shrubbery to ensure adequate airflow.

Outdoor unit location must be far enough away from any structure to prevent excess roof runoff water from pouring directly on the unit.

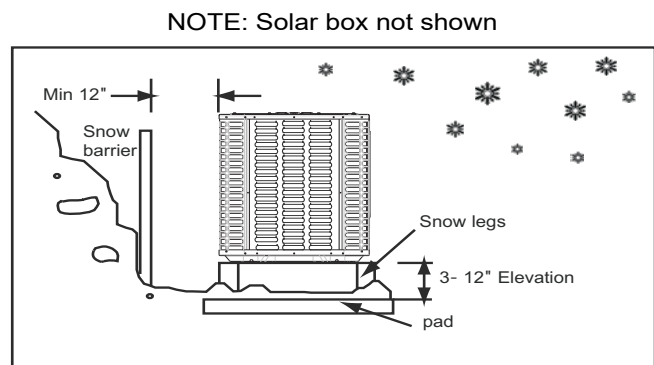
This unit meets Miami-Dade wind rating and seismic zone 5 requirements.



Cold Climate Considerations (Heat Pump Only)

Note: It is recommended that these precautions 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.
- 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.

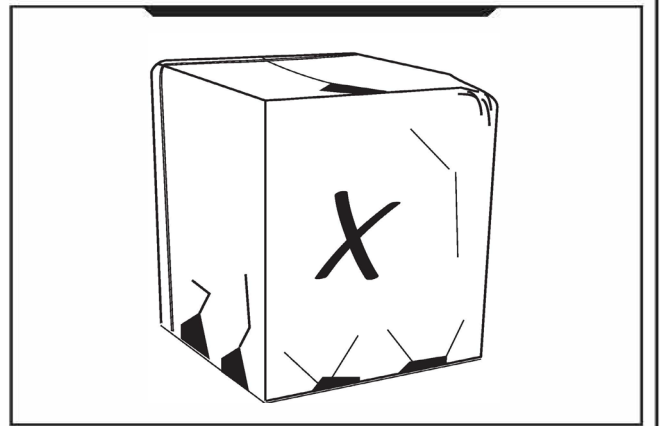


Unit Preparation

Prepare The Unit For Installation

STEP 1 - Check for damage and report promptly to the carrier any damage found to the unit.

The charge port can be used to check to be sure the refrigerant charge has been retained during shipment.



Setting the Unit

Pad Installation

When installing the unit on a support pad, such as a concrete slab, consider the following:

The pad should be at least 1-2" larger than the unit on all sides.

The pad must be separate from any structure.

The pad must be level.

The pad should be high enough above grade to allow for drainage.

The pad location must comply with National, State, and Local codes.

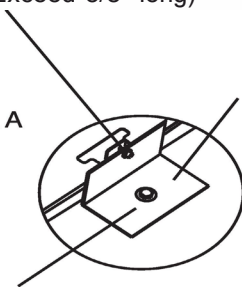
IMPORTANT NOTE:

These instructions are intended to provide a method to tie-down system to cement slab as a securing procedure for high wind areas. It is recommended to check Local Codes for tie-down methods and protocols.

#10 X 3/8" Self Tapping Screws
(Don't Exceed 3/8" long)

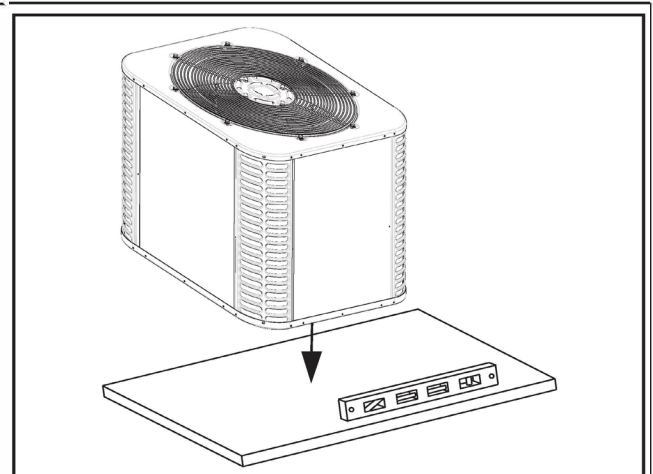
Brackets:
2" width, 3/64", 14 ga
thickness, height as required;
provided by distributor.

DETAIL A

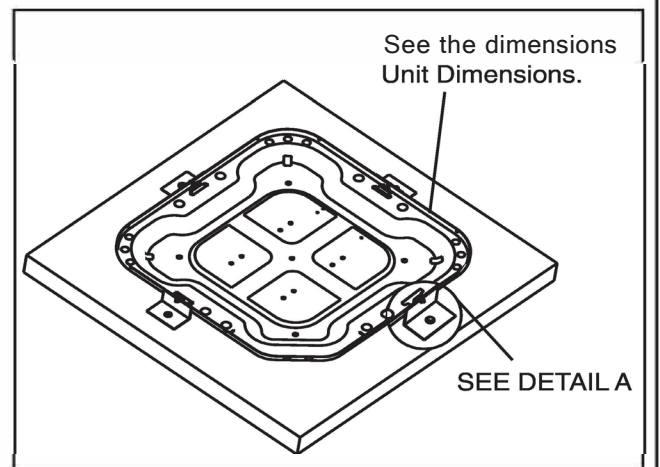


7/16" X 3" Hex Washer Head Concrete Screws
(7/16" Pilot Hole Needed. Pilot Hole Should Be 1/4"
Deeper Than The Fastener Embedment. This unit meets
Miami-Dade wind rating and seismic zone 5 requirements.)

NOTE: Solar box not shown



See the dimensions
Unit Dimensions.



SEE DETAIL A

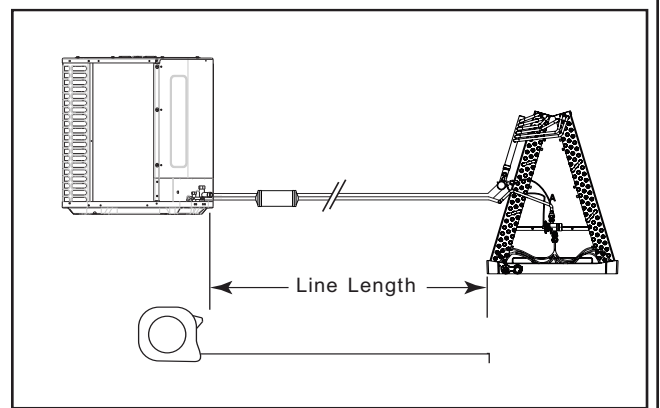
Refrigerant Line Considerations

Refrigerant Line and Service Valve Connection Sizes

Model	Line Sizes		Service Valve Connection Sizes	
	Suction Line	Liquid Line	Suction Line Connection	Liquid Line Connection
24/36	3/4	3/8	3/4	3/8
48/60	7/8	3/8	7/8	3/8

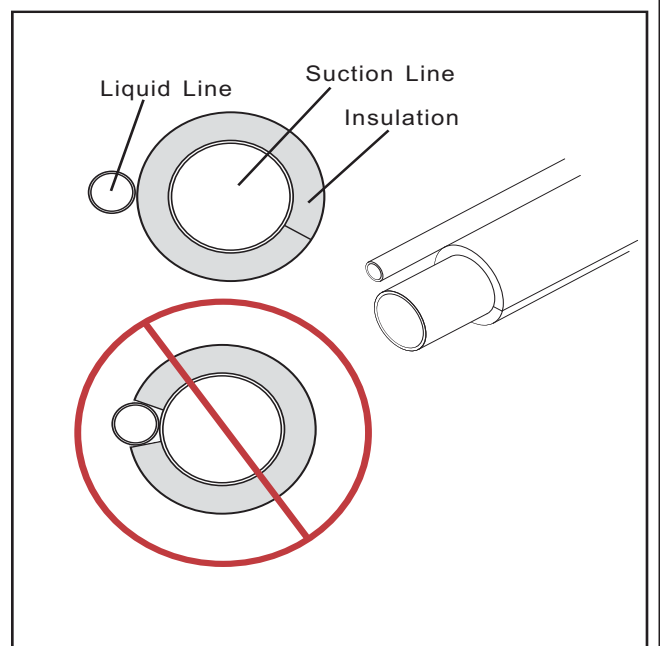
Required Refrigerant Line Length

Determine the required line length.



Refrigerant Line Insulation

Important: The Suction Line must always be insulated. DO NOT allow the Liquid Line and Suction Line to come in direct (metal to metal) contact.



Refrigerant Line Considerations (cont'd)

Reuse Existing Refrigerant Lines

⚠ CAUTION

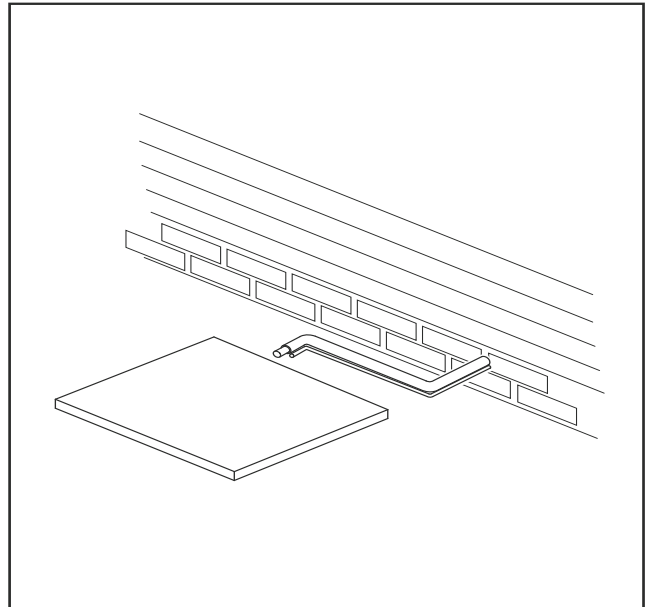
If using existing refrigerant lines make certain that all joints are brazed, not soldered.

For retrofit applications, where the existing refrigerant lines will be used, the following precautions should be taken:

Ensure that the refrigerant lines are the correct size. Refer to Section 2.2 listed and Table 5.1.

Ensure that the refrigerant lines are free of leaks, acid, and oil.

Note: The manufacturer recommends installing only approved matched indoor and outdoor systems. All of the manufacturer's split systems are A.H.R.I. rated only with TXV indoor systems. Some of the benefits of installing approved matched indoor and outdoor split systems are maximum efficiency, optimum performance and the best overall system reliability.



Refrigerant Line Routing

Precautions

Important: Take precautions to prevent noise within the building structure due to vibration transmission from the refrigerant lines.

For Example:

When the refrigerant lines have to be fastened to floor joists or other framing in a structure, use isolation type hangers.

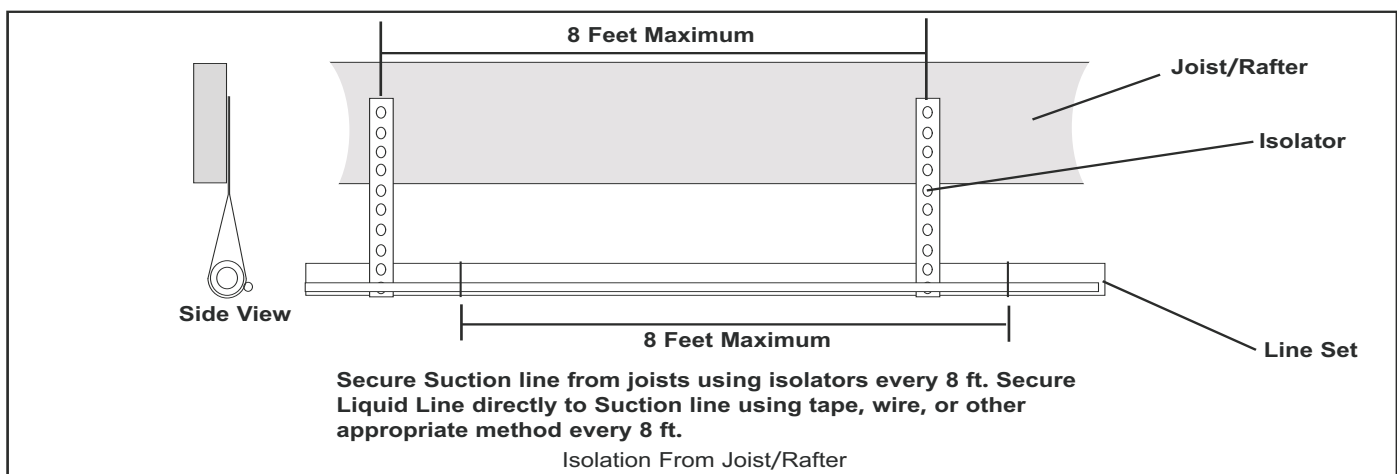
Isolation hangers should also be used when refrigerant lines are run in stud spaces or enclosed ceilings.

Where the refrigerant lines run through a wall or sill, they should be insulated and isolated.

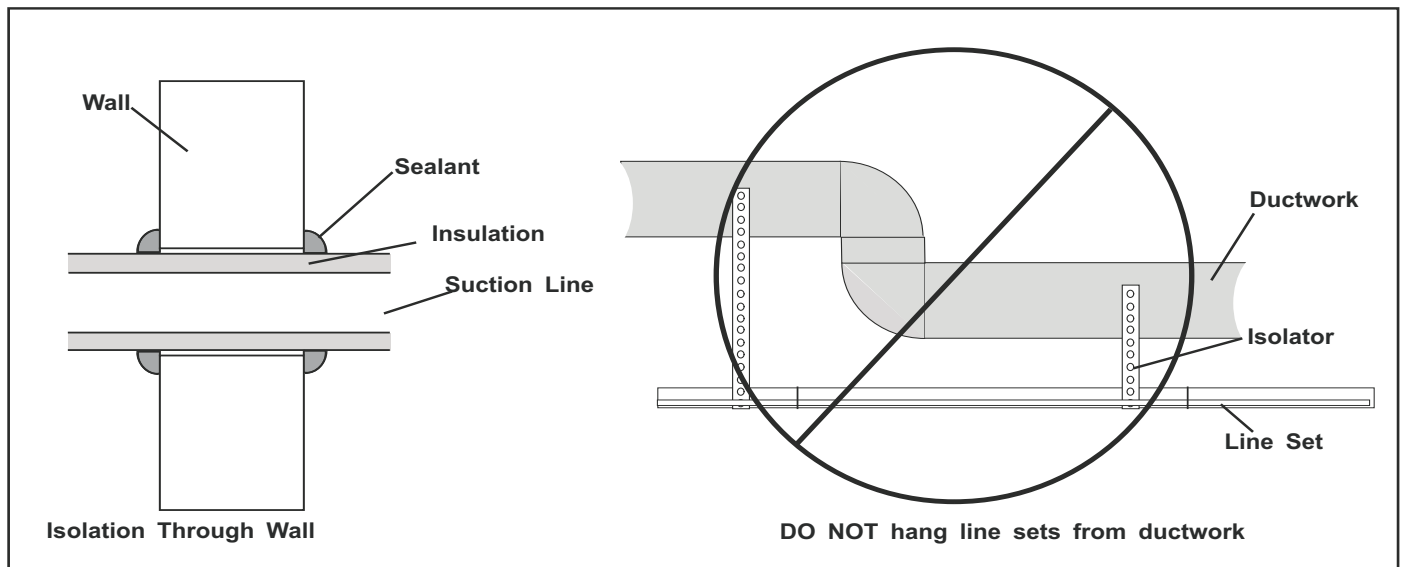
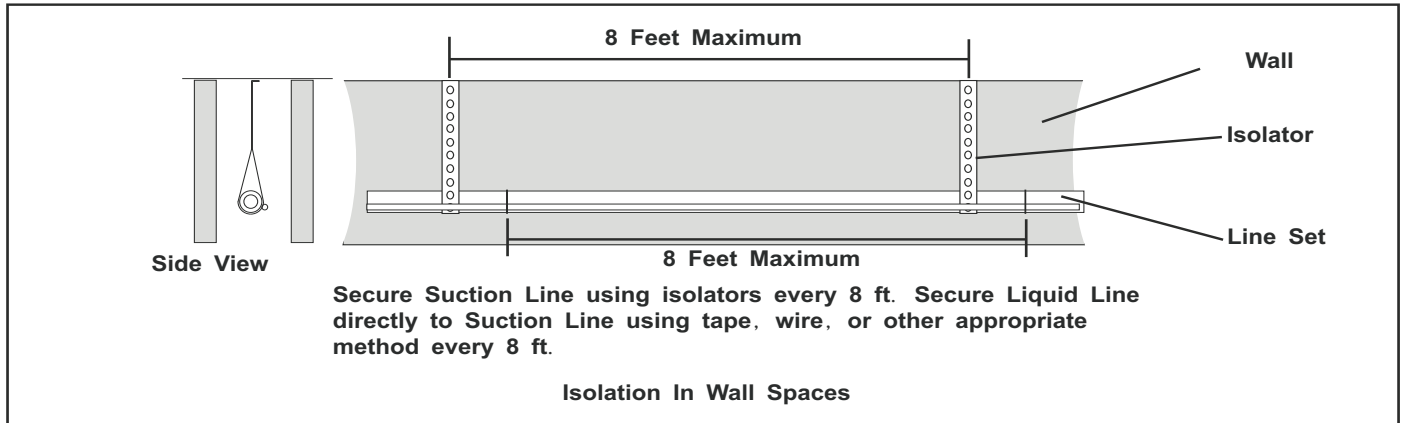
Isolate the lines from all ductwork.

Minimize the number of 90° turns.

Comply with National, State, and Local Codes when isolating line sets from joists, rafters, walls, or other structural elements.



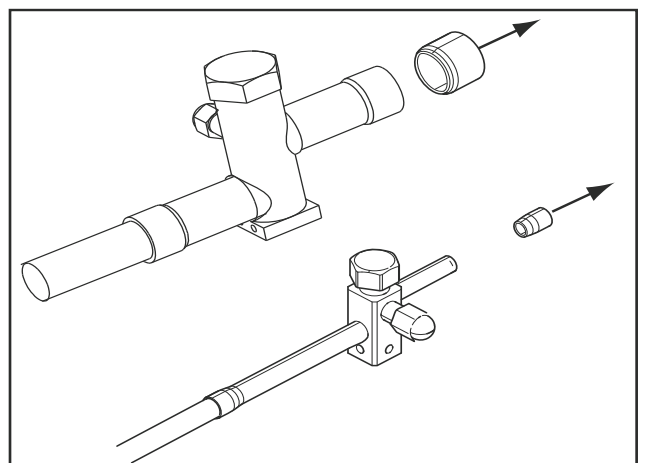
Refrigerant Line Considerations (cont'd)



Refrigerant Line Brazing

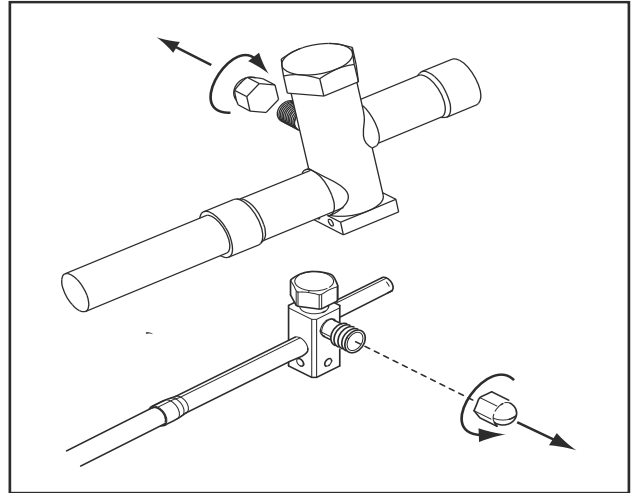
Braze The Refrigerant Lines

STEP 1 – Remove caps or plugs. Use a deburring tool to deburr the pipe ends. Clean both internal and external surfaces of the tubing using an emery cloth.



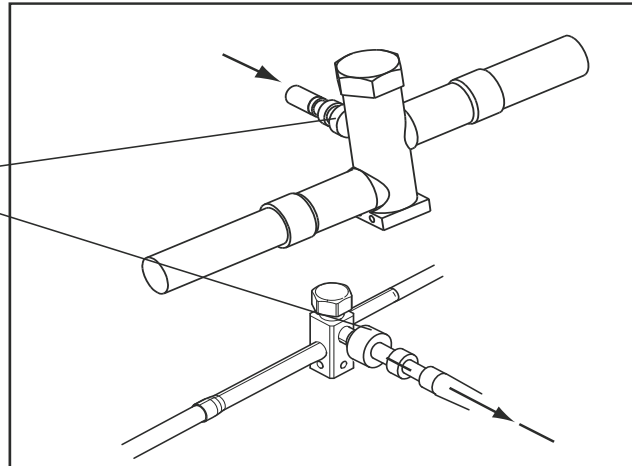
Refrigerant Line Considerations (cont'd)

STEP 2 - Remove the pressure tap cap from both service valves.



STEP 3 - Purge the refrigerant lines and indoor coil with dry nitrogen.

This pipe must have a thimble



STEP 4 - Wrap a wet rag around the valve body to avoid heat damage and continue the dry nitrogen purge.

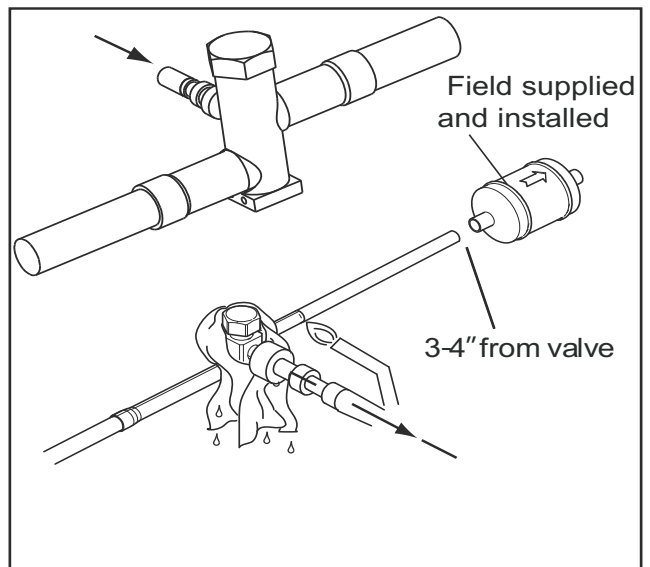
Braze the refrigerant lines to the service valves.

Check liquid line filter drier's directional flow arrow to confirm correct direction of refrigeration flow (away from outdoor unit and toward evaporator coil) as illustrated. Braze the filter drier to the Liquid Line.

Continue the dry nitrogen purge. Do not remove the wet rag until all brazing is completed.

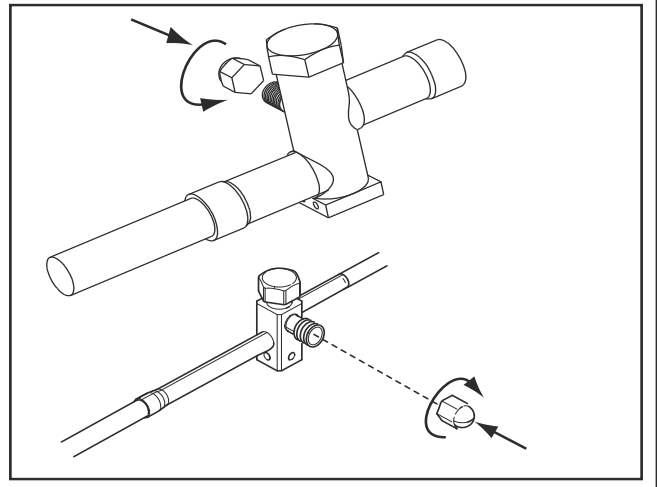
Important: Remove the wet rag before stopping the dry nitrogen purge.

Note: Install drier in Liquid Line.



Refrigerant Line Considerations (cont'd)

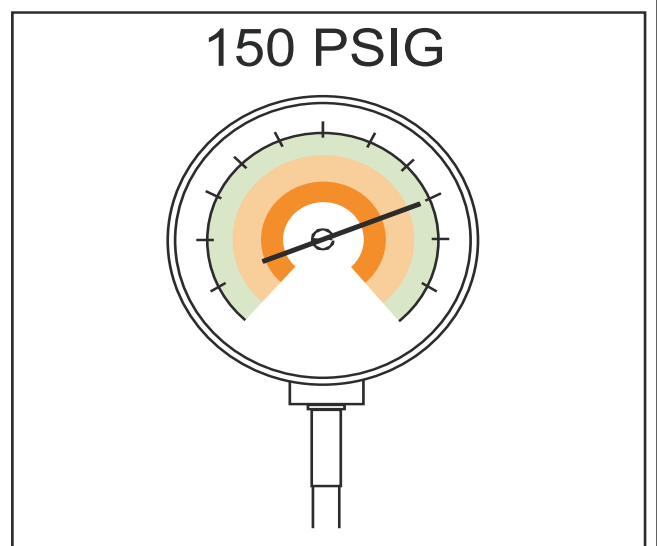
STEP 5 - Replace the pressure tap caps after the service valves have cooled.



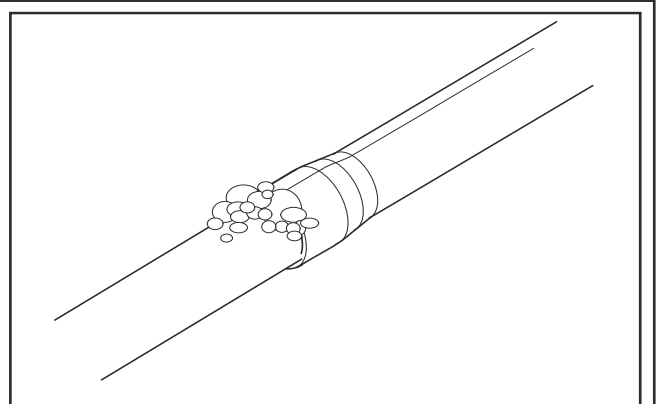
Refrigerant Line Leak Check

Check For Leaks

STEP 1 - Pressurize the refrigerant lines and evaporator coil to 150 PSIG using dry nitrogen.



STEP 2 - Check for leaks by using a soapy solution or bubbles at each brazed location.



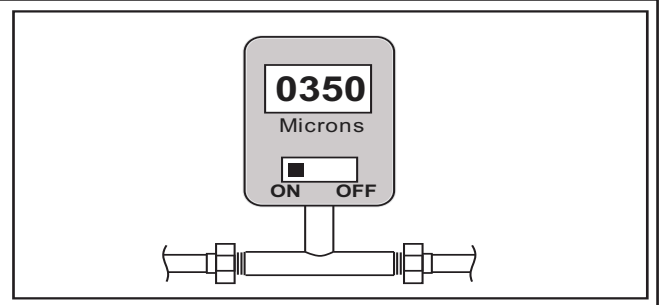
Refrigerant Line Considerations (cont'd)

Evacuation

Evacuate the Refrigerant Lines and Indoor Coil

Important: Do not open the service valves until the refrigerant lines and indoor coil leak check and evacuation are complete.

STEP 1- Evacuate until the micron gauge reads no higher than 350 microns, then close the valve to the vacuum pump.



STEP 2- Observe the micron gauge. Evacuation is complete if the micron gauge does not rise above 500 microns in one (1) minute.

Once evacuation is complete blank off the vacuum pump and micron gauge, and close the valves on the manifold gauge set.



Service Valves

Open the Service Valves

⚠ WARNING

Extreme caution should be exercised when opening the Liquid Line Service Valve. Turn counterclockwise until the valve stem just touches the rolled edge. No torque is required. Failure to follow this warning will result in abrupt release of system charge and may result in personal injury and /or property damage.

Important: Leak check and evacuation must be completed before opening the service valves.

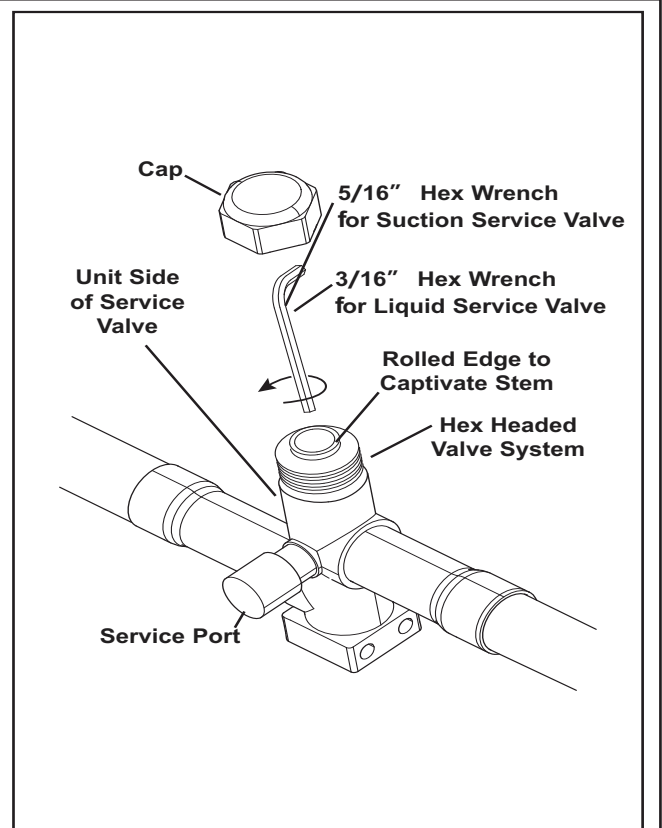
Important: The Suction Service Valve must be opened first BEFORE opening the Liquid Service Valve!

STEP 1 - Remove service valve cap.

STEP 2 - Fully insert hex wrench into the stem and back out counterclockwise until valve stem just touches the rolled edge (approximately five (5) turns.)

STEP 3 - Replace the valve stem cap to prevent leaks. Tighten finger tight plus an additional 1/6 turn.

STEP 4 - Repeat STEPS 1 - 3 for Liquid Service Valve.



Electrical - Low Voltage

Low Voltage Maximum Wire Length

Table 11.1 defines the maximum total length of low voltage wiring from the outdoor unit, to the indoor unit, and to the thermostat.

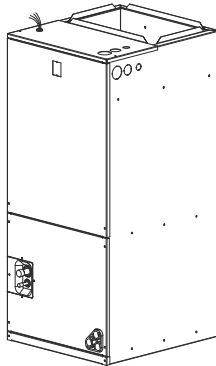
Field provided bushing or strain relief is required at the low voltage wire entry point.

Table 11.1

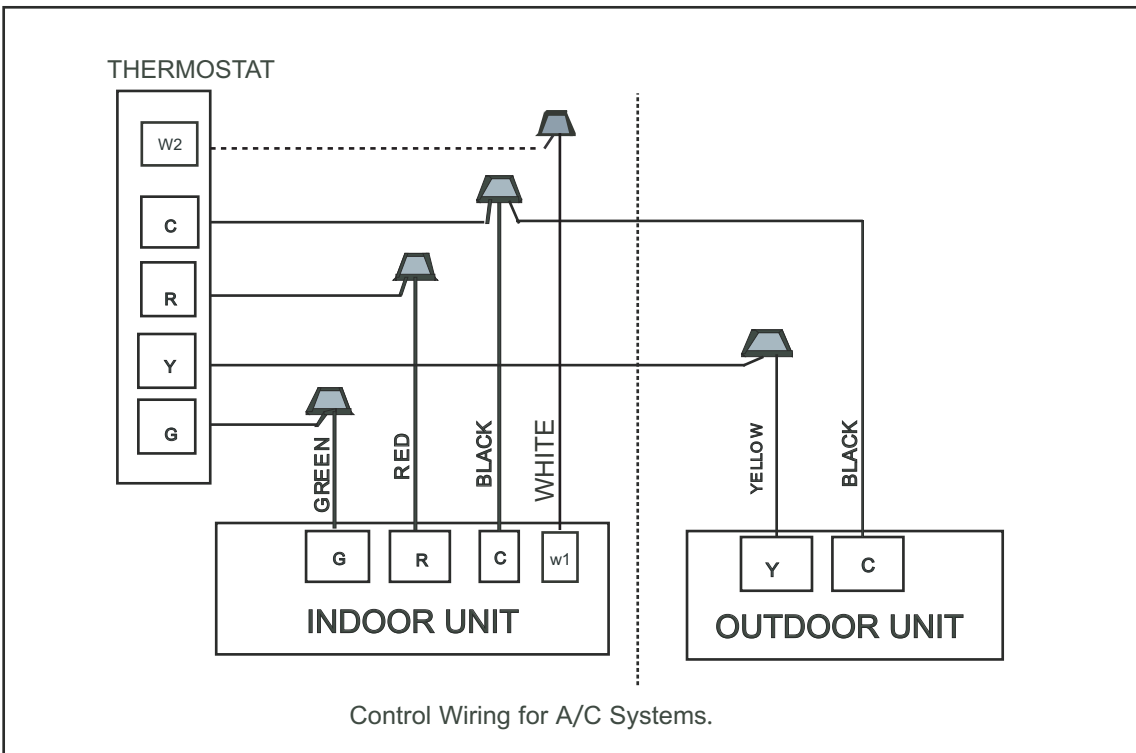
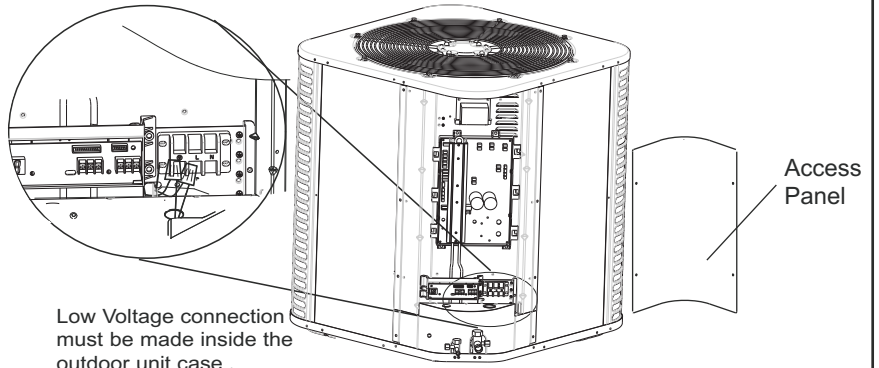
24 VOLTS	
WIRE SIZE	MAX.WIRE LENGTH
18 AWG	150 Ft.
16 AWG	225 Ft.
14 AWG	300 Ft.

Low Voltage Hook-up Diagrams

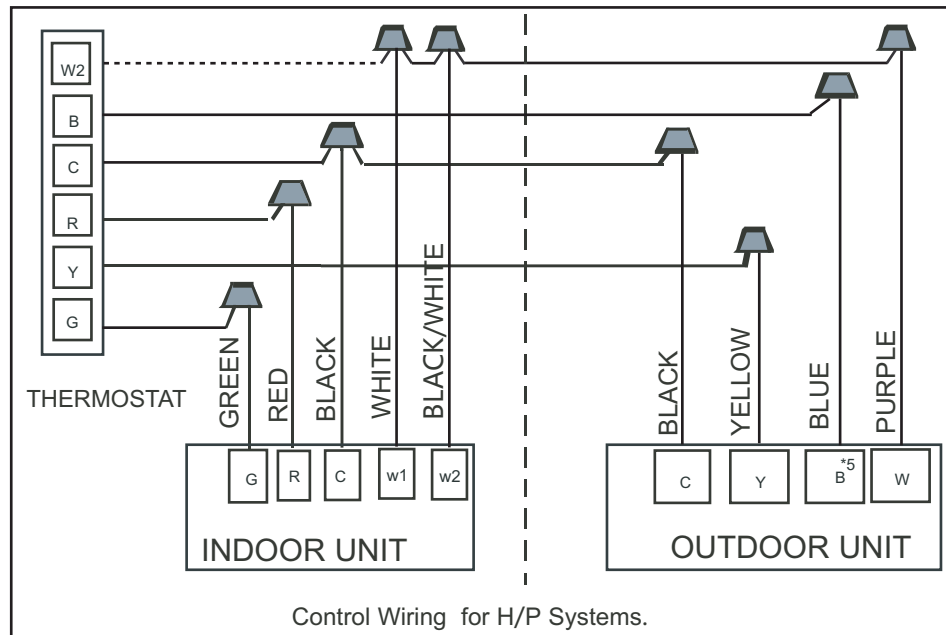
Air Handler Hook-up Diagram



NOTE: Solar box not shown



Electrical - Low Voltage (cont'd)



Notes:

1. Be sure power supply agrees with equipment nameplate.
2. Power wiring and grounding of equipment must comply with local codes.
3. Low voltage wiring to be No. 18 AWG minimum conductor.
4. "-----" The electric auxiliary heat connection.
5. Heat Pump Operations uses Signal [B] (in lieu of [O])

Electrical - High Voltage

High Voltage Power Supply

⚠ WARNING

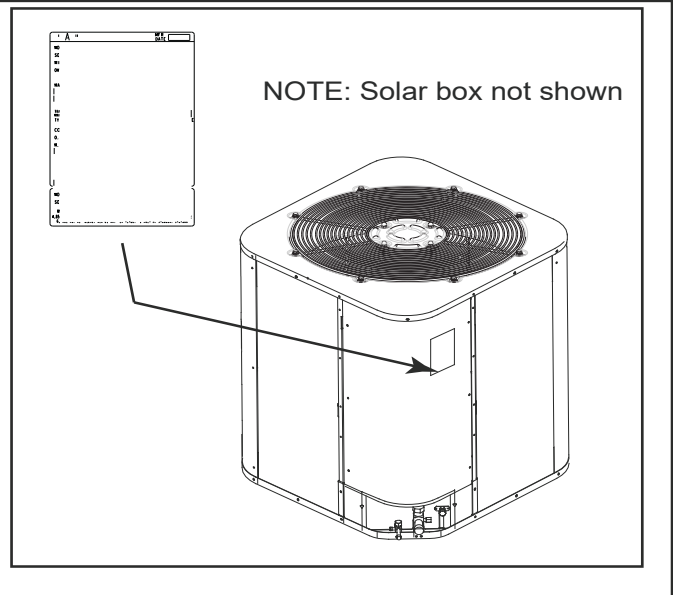
LIVE ELECTRICAL COMPONENTS!

During installation, testing, servicing, and troubleshooting of this product, it may be necessary to work with live electrical components. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.

The high voltage power supply must agree with the equipment nameplate.

Power wiring must comply with national, state, and local codes.

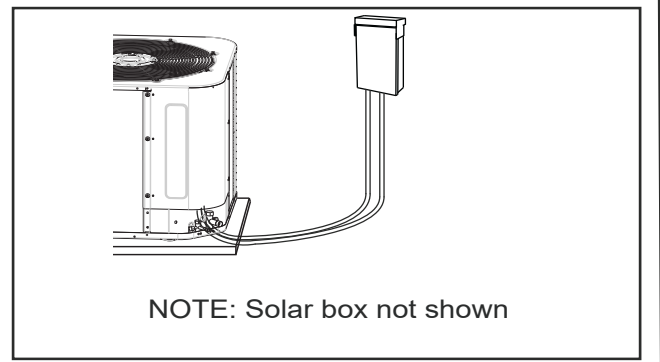
Follow instructions on unit wiring diagram located on the inside of the control box cover and in the Service Facts document included with the unit.



High Voltage Disconnect Switch

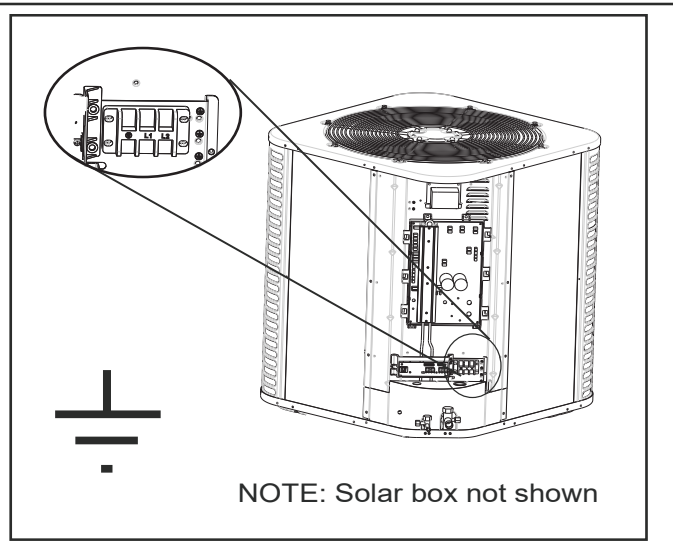
Install a separate disconnect switch at the outdoor unit.

Field provided flexible electrical conduit must be used for high voltage wiring.



High Voltage Ground

Ground the outdoor unit per national, state, and local code requirements.

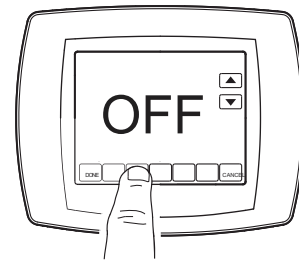


Start Up

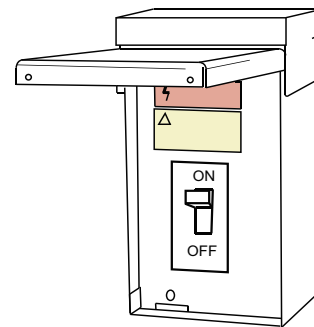
System Start Up

STEP 1 - Ensure Sections 6, 7, 8, 9, 10, 11, and 12 have been completed.

STEP 2 - Set System Thermostat to OFF.



STEP 3 - Turn on disconnect to apply power to the indoor and outdoor units.

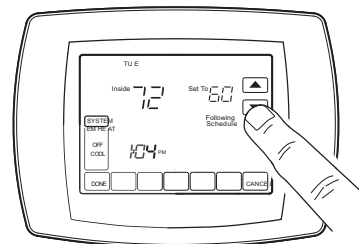


STEP 4 - Wait five (5) minutes before moving to Step 5 if no crankcase heater accessory is used,

Wait one (1) hour before starting the unit if compressor crankcase heater accessory is used and the Outdoor Ambient Temperature is below 70 °F.



STEP 5 - Set system thermostat to ON.
If Heat Pump, set signal to [B] (in lieu of [O]).



System Charge Adjustment

charging: weigh-In Method

weigh-In Method can be used for the Initial installation, or anytime a system charge is being replaced. weigh-In Method can also be used when power is not available to the equipment site or operating conditions (indoor/Outdoor temperatures) are not In range to verify with the subcooling charging method.

A	B	C
Model	Factory Charge	charge multiplier for interconnecting refrigerant tube length
All models	(The data on nameplate)	0.6 oz/ft

Note: The factory charge in the outdoor unit is sufficient for 15 feet of standard size interconnecting liquid line.

Table 19. New Installations — calculating charge using the weigh-In method

<ol style="list-style-type: none"> 1. Measure in feet the distance between the outdoor unit and the indoor unit and record on (Line 1). Include the entire length of the line from the service valve to the IDU. 2. Enter the charge multiplier from column C. 3. Multiply the total length of refrigerant tubing (Line 1) times the value on step 2. Record the resulting value. 4. This is the amount of refrigerant to weigh-in prior to opening the service valves. 	<p>New Installation weigh-In Method worksheet</p> <ol style="list-style-type: none"> 1. Line Length (ft) _____ 2. value from Column C x _____ 3. Refrigerant((Step1-15) x Step2) = _____ <p>Note: If line length is Less than 15 feet , Refrigerant=0,don' t charge.</p>
---	---

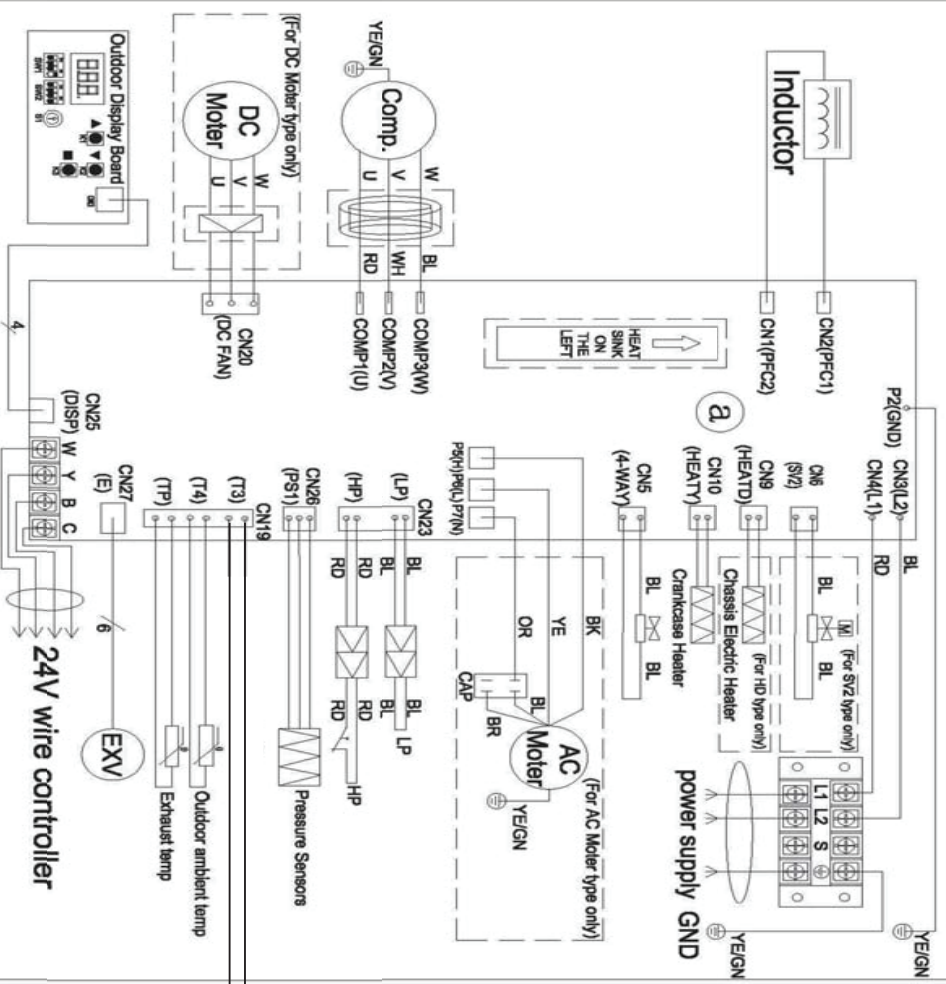
Table 20. Sealed-System Repairs — calculating charge using the weigh-In method.

<ol style="list-style-type: none"> 1. Measure in feet the distance between the outdoor unit and the indoor unit and record on (Line 1). Include the entire length of the line from the service valve to the IDU. 2. Enter the charge multiplier from column C. 3. Multiply the total length of refrigerant tubing (Line 1) times the value on (Line 2). Record the result on (Line 3) of the worksheet. 4. Record the value in column B to Line 4 of the worksheet. 5. Add the values from step 3, step 4, and record the resulting value on Line 5. This is the amount of refrigerant to weigh-in. 	<p>New Installation weigh-In Method worksheet</p> <ol style="list-style-type: none"> 1. Line Length (ft) _____ 2. value from Column C x _____ 3. (Step1-15) x step 2 = _____ 4. Factory charge (column B) + _____ 5. Refrigerant (steps 3+4) = _____ <p>Note: If line length is Less than 15 feet , Refrigerant=factory charge</p>
--	---

Note: The only mode approved for setting validating system charge is using Charging Mode-cooling. Outdoor Temperature must be between 55°F and 120°F with Indoor Temperature kept between 70°F and 80°F.

Solar HVAC Wiring Diagram (SCH-0029-E v01.01)

ELECTRICAL WIRING DIAGRAM



SW1 & SW2 For Outdoor Display Board switch setting:

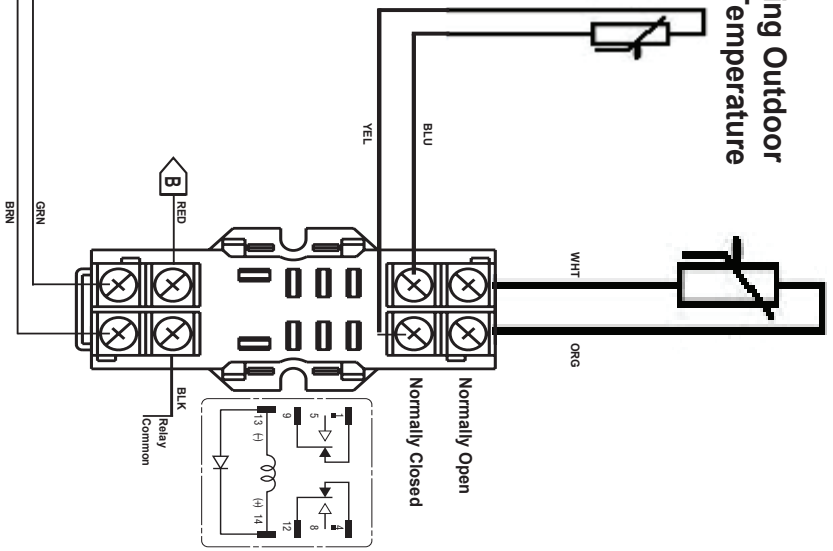
1#	2#	3#	Model	4#	Model
OFF	OFF	OFF	Tra0=0-A, between A+X and A-X; Tra0=B, between B+X and B-X	ON	Cooling Spool Throttling (Indoor)
OFF	OFF	ON	Tra0=A-1'X, between A and 2 (A>2); Tra0=B+1'X, between B+2'X and B	OFF	Cooling Spool Throttling (Outdoor)
OFF	ON	OFF	Tra0=A, Tra0=B; system waiting until the switch change		
OFF	ON	ON	Tra0=A-1'X, Tra0=B+1'X; system waiting until the switch change		
ON	ON	ON	Tra0=A-2'X, Tra0=B+2'X; system waiting until the switch change		

SW2 DIP switch setting

1#	2#	3#	4#
ON	Manual defrost	OFF	Automatic defrost
ON	Celsius (°C)	OFF	Fahrenheit (°F)
		ON	Heating Spool throttling
		OFF	Heating EXV throttling
			No defined

Added Outdoor Coil Temperature

Existing Outdoor Coil Temperature

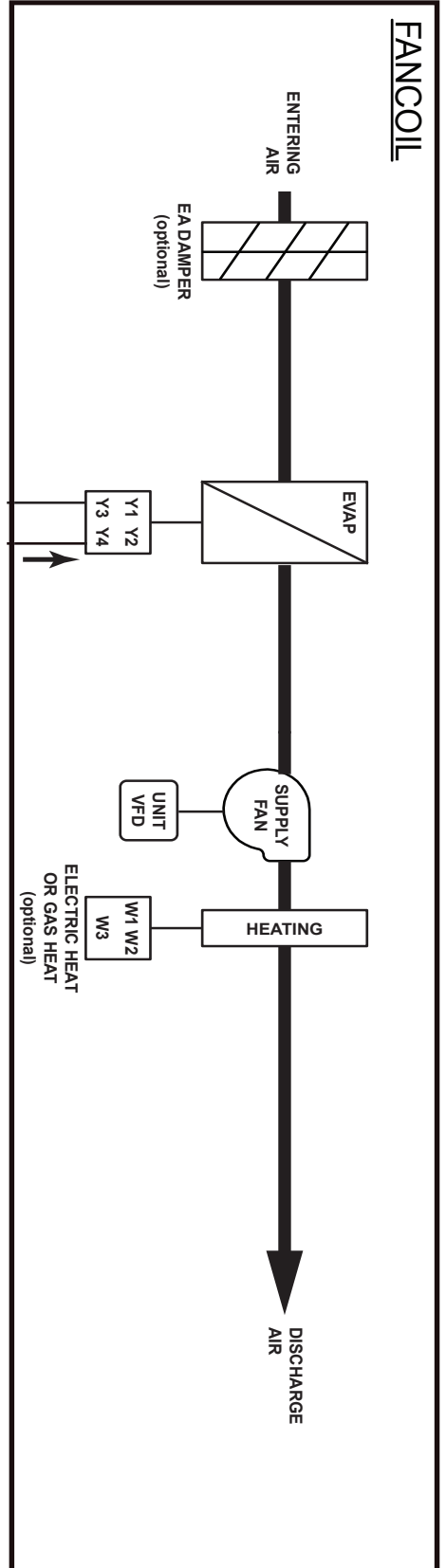


Solar HVAC Check Table

Check Table			
NUM	Display content		
		16	Frequency increase (Shift ; Actual value)
01	Outdoor power(Model)	17	ΔEV (step ; Actual value)
02	Run mode (0: Standby mode; 2:In cooling mode ; 3: In heating mode)	18	---
		19	IPM modular temp Tfin (°F ; Actual value)
03	Arget frequency (Hz ; Actual value)	20	Oil output (CC ; Actual value / 8)
04	Running frequency (Hz ; Actual value)	21	Target temp Tes/Tcs (°F ; Actual value)
05	Actual frequency (Hz ; Actual value)	22	Pressure value (PSI ; Actual value * 25)
06	Fan speed (High / low ; Actual value)	23	Pressure valve transform by T3 (PSI ; Actual value * 25)
07	Temp transform by pressure sensor (°F ; Actual value)	24	---
08	T3 condensing temp (°F ; Actual value)	25	Target superheat (°F ; Actual value)
09	T4 outdoor ambient temp (°F ; Actual value)	26	Discharge temp superheat (°F ; Actual value)
10	T5 exhaust temp (°F ; Actual value)	28	Abillty test mode (1-40 ; Mode gear)
11	AC current (A ; Actual value)	29	Software version number (1-255)
12	Compressor current	31	Enter PI conrtio sign (0 or 1)
13	AC voltage (VAC ; Actual value * 2)	34	Frequency limit item
14	DC voltage (VDC ; Actual value / 2)	37	Last failure or protection code
15	EXV opening degree (step ; Actual value / 4)		
Failure and Protection			
Code	Failure or protection definition	Code	Failure or protection definition
E4	T4 outdoor air temperature sensor fault	P4	Exhaust overheating protection
E6	T3 Condensate temperature sensor failure	P5	T3 condenser sensor high temp protection(In cooling mode)
E5	T5 Exhaust temperature sensor fault	P6	IPM protection
E9	AC overvoltage/undervoltage protection	P8	IPM high temperature protection (Ft)
E10	EEPROM failure	P9	DC fan motor error
E12	IPM modular sensor error	P12	Wet operation error
E13	Pressure sensor error	P13	High pressure abnormal error(In heating mode)
E14	T3 or T5 sensor disconnect error	P14	High compression ratio protection
E15	High pressure switch error	P15	Low compression ratio protection
H0	Communication fault of master board and driver chip	L1	DC cable bus low voltage protection
H1	T3 sensor high temperature error(In cooling mode) (20 times P5 error within 180mins)	L2	DC cable bus high voltage protection
		L4	MCE fault / sync / closed loop
H2	High pressure switch error(20 times P1 error within 150 mins)	L5	Zero speed protection
H3	High pressure abnormal in heating mode (20 times P13 error within 180 mins)	L7	Compressor phase loss protection ratio protection
		L8	Compressor stalls
H4	IPM modular high temp error (20 times P8 within 120 mins)	L9	Frequency limitation or decline by high pressure
H5	Low pressure error (20 times P2 within 100 mins)	LA	Frequency limitation by voltage
H6	Discharge temperature abnormal error(20 times P4 within 100 mins)	LC	Frequency limitation by condenser temp
H7	Wet operation error (20 times P12 within 200 mins)	LD	Frequency limitation by discharge temp
H8	T3 condenser sensor disconnect error (20 times E14 within 100 mins)	LE	Frequency limitation by IPM modular high temp
H12	Discharge temp sensor disconnect error(20 times E14 within 180 mins)	LF	Frequency limitation by current
P1	High pressure protection	d0	Oil return
P2	Low pressure protection	dF	Defrost
P3	inverter overcurrent protection	dH	Force cooling

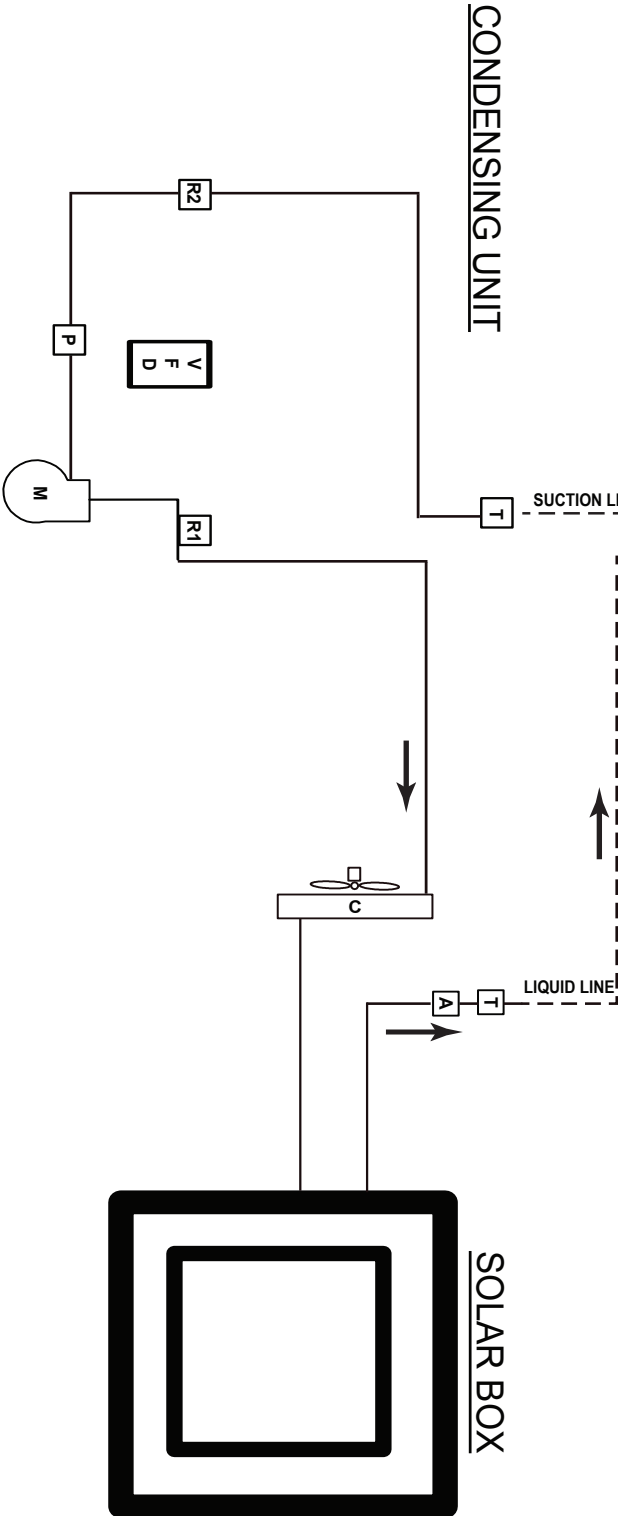
Solar HVAC Gas Heat Plumbing Diagram (SCH-0006-P v01.03)

PLUMB PER CURCUIT



FIELD SUPPLIED PLUMBING ON SPLIT SYSTEMS ONLY

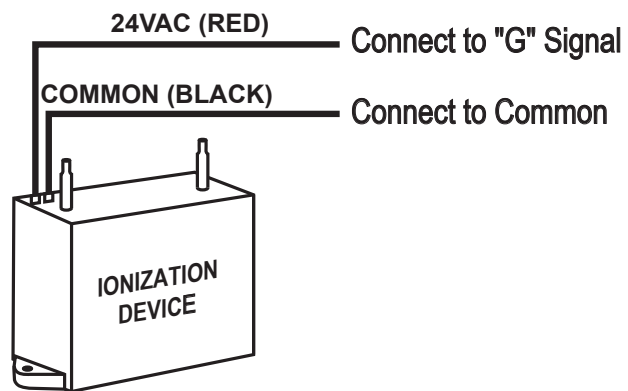
REFGT FLOW DIRECTION FOR COOLING OPERATION



- A - FILTER DRIER
- C - CONDENSER COIL
- M - COMPRESSOR
- P - PRESSURE TRANSDUCER

- R1 - FACTORY HIGH PRESSURE SWITCH (Cooling)
- R2 - FACTORY HIGH PRESSURE SWITCH (Heat)
- T - FACTORY MAINTENANCE VALVE
- V - VALVE

Ionization Option Wiring (SCH-0001-O v05.01)



Dirty Filter Switch Option Wiring (SCH-0003-O v06.01)



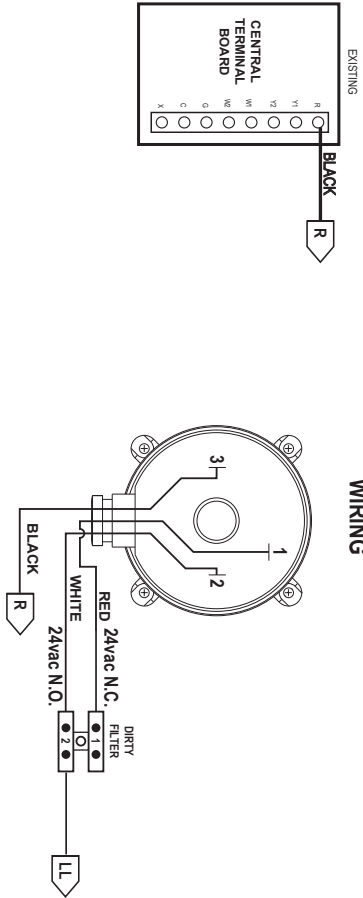
DIRTY FILTER SWITCH OPTION WIRING

SCH-0003-O

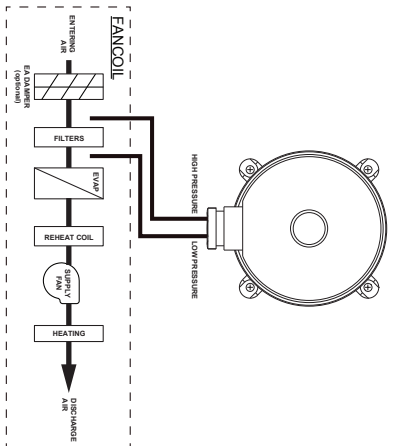
REVISION: V06.01

Installing with IAIRE Control Types A,B,D,E,F,P,S,U,V

WIRING



PRESSURE TUBES



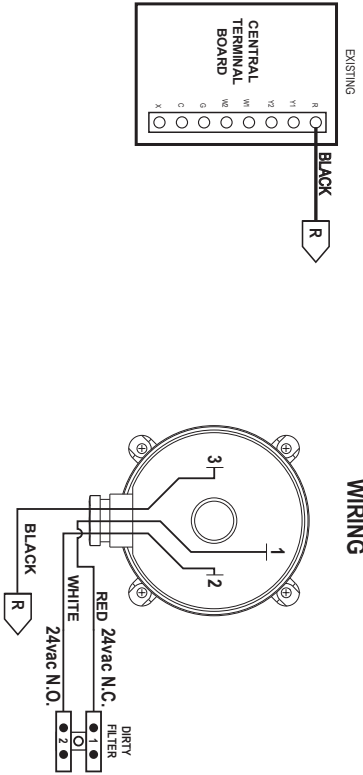
DIRTY FILTER SWITCH OPTION WIRING

SCH-0003-O

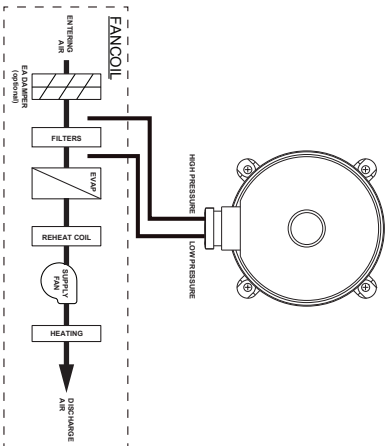
REVISION: V06.01

Installing with IAIRE Control Types C,H,T, and No Controls

WIRING



PRESSURE TUBES



Water Guard Option Wiring (SCH-0007-O v05.04)

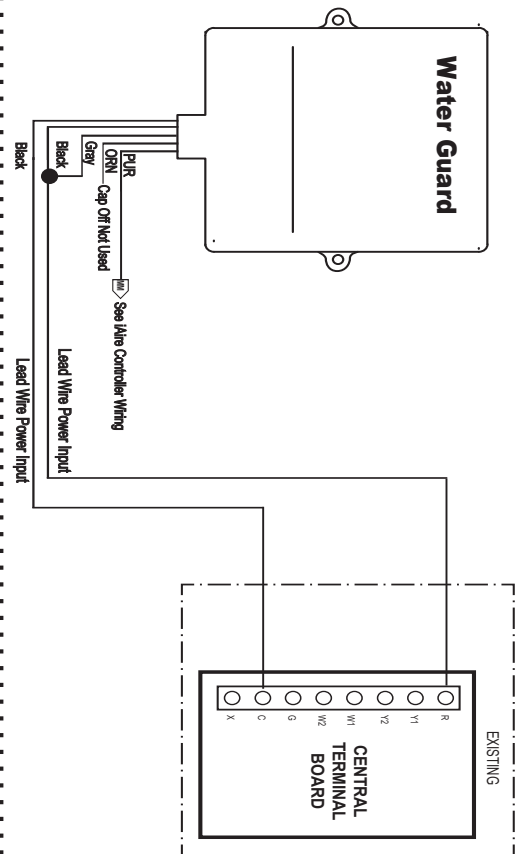


WATER GUARD OPTION WIRING

SCH-0007-O

REVISION: v05.04

Installing with iAIRE Control Types A,B,D,E,F,P,S,U,V



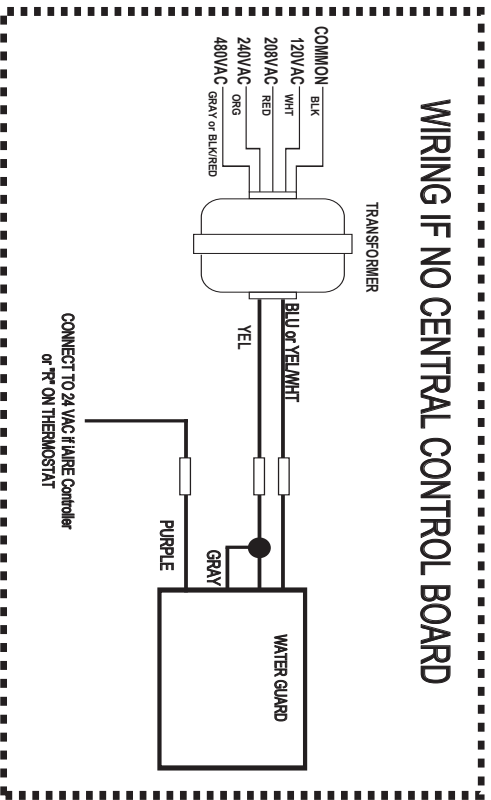
WATER GUARD OPTION WIRING

SCH-0007-O

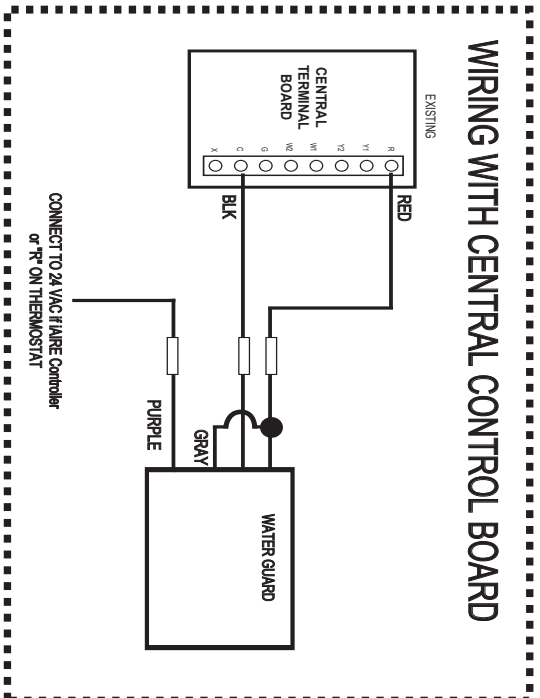
REVISION: v05.04

Installing with iAIRE Control Types C,H,I,T, and No Controls

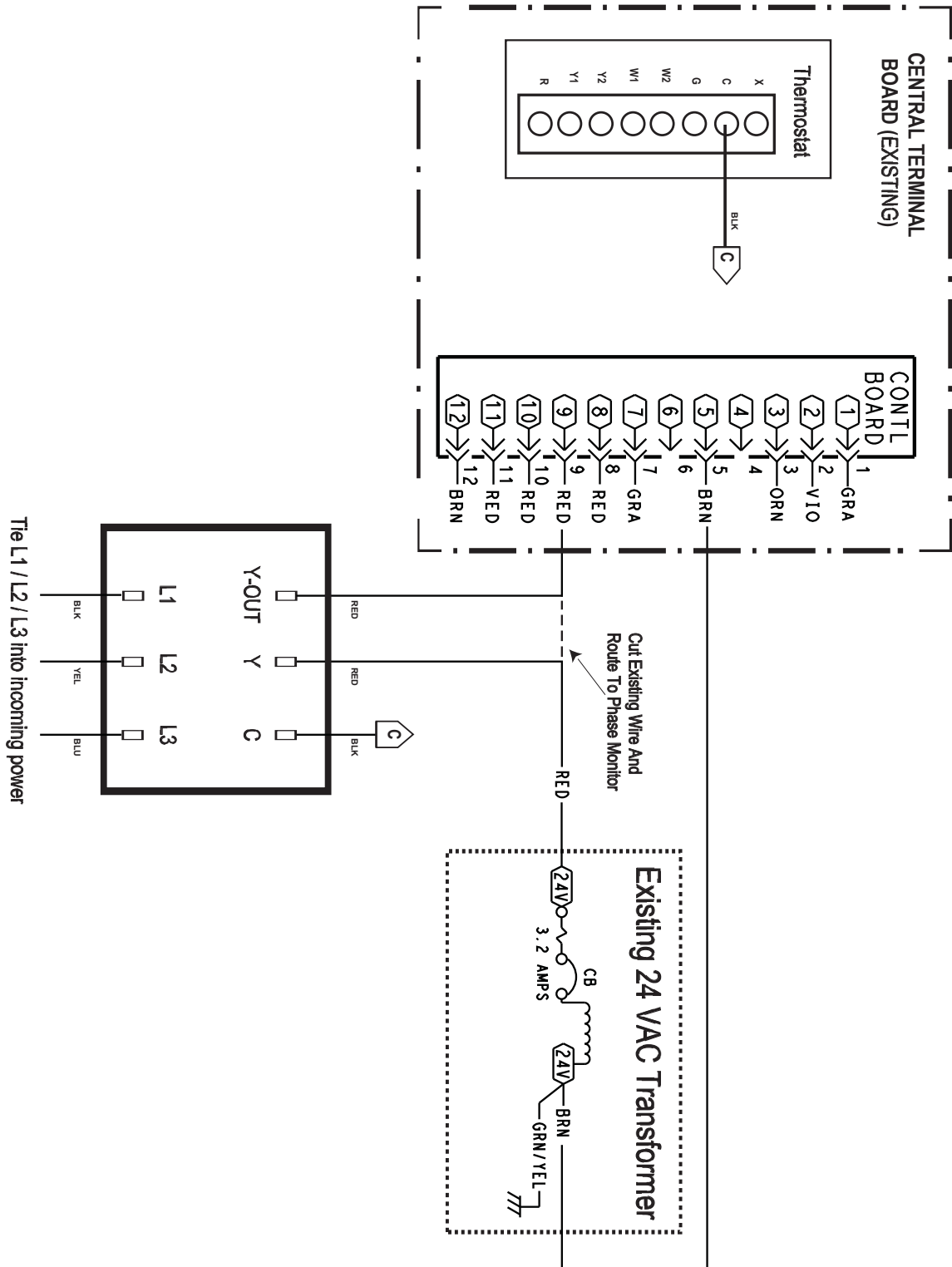
WIRING IF NO CENTRAL CONTROL BOARD



WIRING WITH CENTRAL CONTROL BOARD



RTU Phase Monitor Wiring (SCH-0035-O v05.01)



Troubleshooting

9. Troubleshooting

9.1. Control logic description

1. Display board button function

▲ button: check button、setting button“+”

▼ button: check button、setting button“-”

■ button:

A、Short press: force cooling mode, display board will show “dH”;

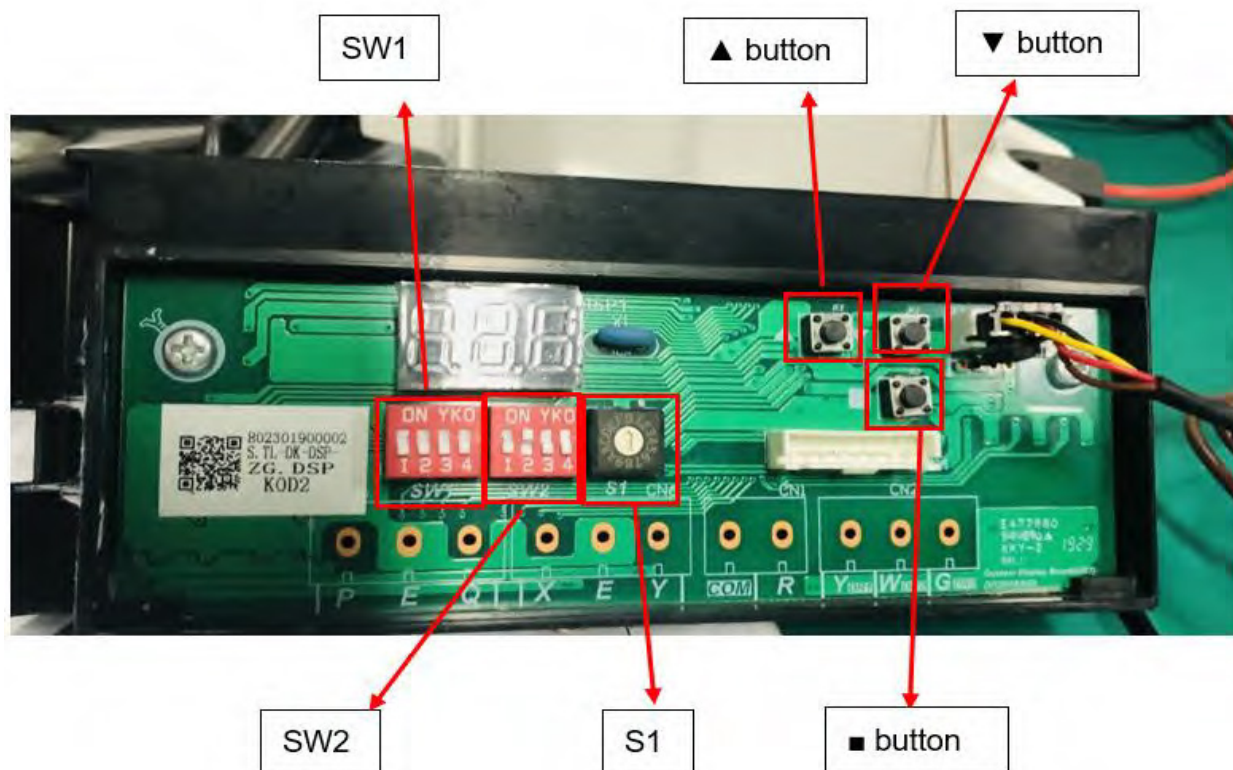
B、Long press: entering test mode, and you can change unit parameter manually:

When it show “Sc.”, then you can set Compressor Frequency manually, using “▲” and “▼”to change frequency.

Then press “■” button, display board will show “SF.”, then you can set fan speed manually, using “▲” and “▼”to change fan speed.

Then press “■” button, display board will show “SL.”, then you can set expansion valve open degree manually, using “▲” and “▼”to change expansion valve opening degree.

Then press “■” button, display board will show “SP.”, then you can set PFC switch manually, (0 means OFF, 1 means ON), using “▲” and “▼” to set PFC switch ;



Troubleshooting (cont'd)

SW1:

1st bit	2nd bit	3rd bit	4th bit
Outdoor unit control logic(target evaporator temperature and target condensation temperature) setting, manufacture only.			ON: EXV throttling in cooling mode OFF: Piston throttling in cooling mode The function will be active after unit power off and power on.

SW2:

1st bit	2nd bit	3rd bit	4th bit
ON: Manually defrost. OFF: Automatic defrost The function will be active immediately after bit change.	ON: Display as Fahrenheit OFF: Display as Celsius The function will be active after unit power off and power on.	Reserved	ON: EXV throttling in heating mode OFF: Piston throttling in heating mode The function will be active after unit power off and power on.

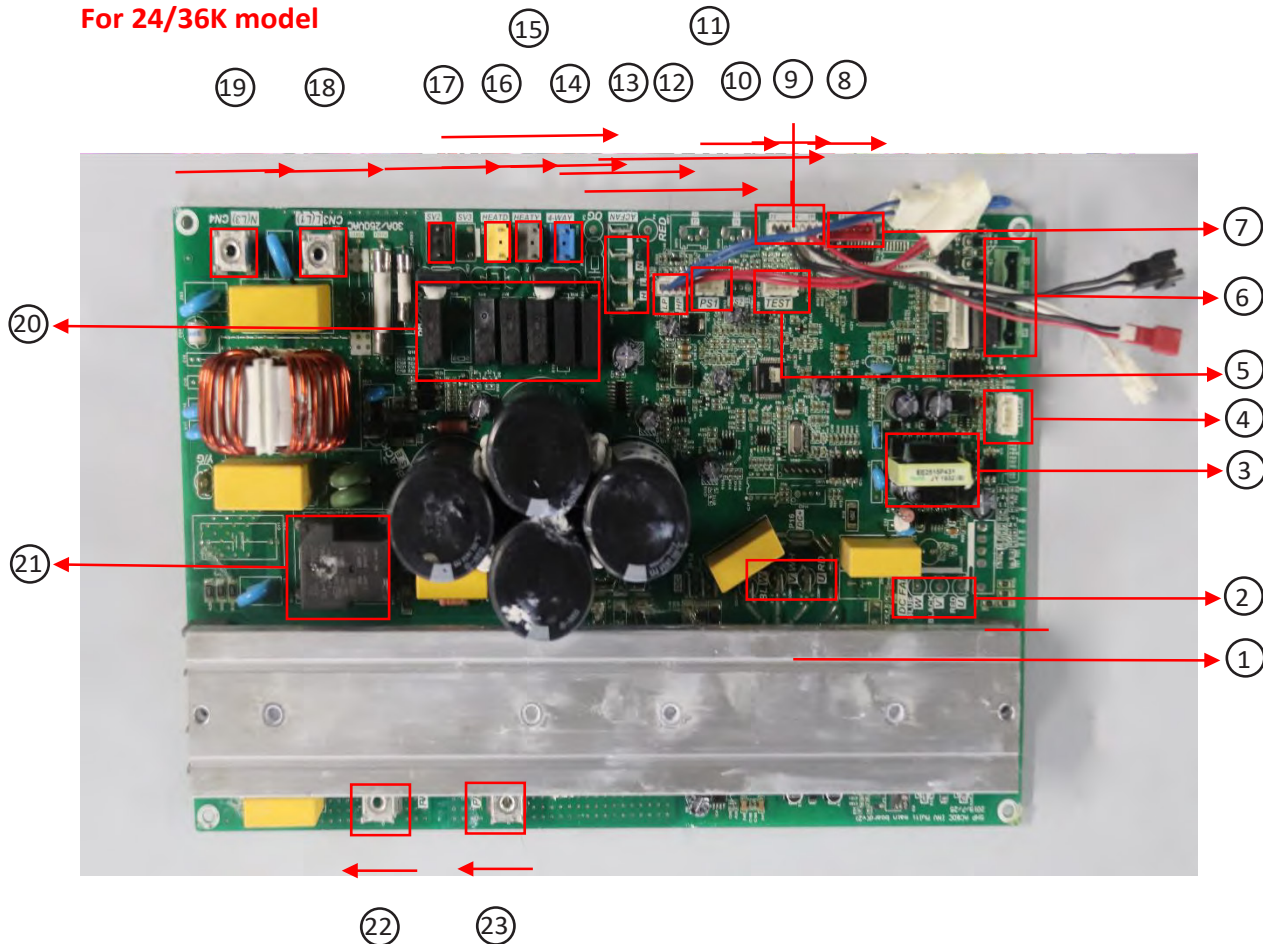
S1: Reserved

Troubleshooting (cont'd)

9.2 Parameter point check table

1). Top discharge outdoor unit

For 24/36K model

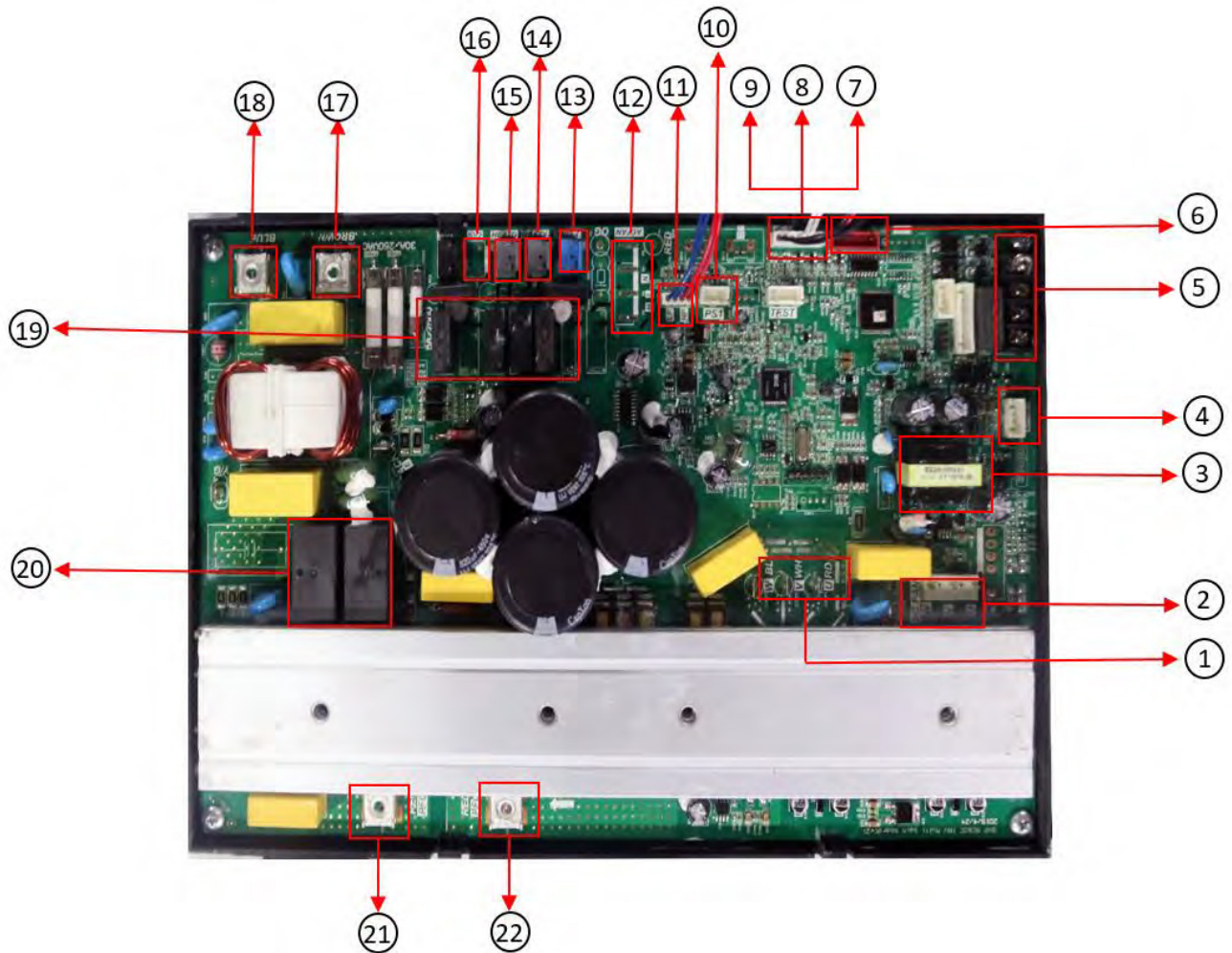


Function description for the corresponding position:

No.	Content	No.	Content
1	Compressor wiring terminal	12	High/Low pressure switch ports
2	DC fan motor wiring terminal	13	AC fan motor wiring terminal
3	Transformer	14	Four-way valve control port
4	Outdoor display board wiring terminal	15	Crankcase Heating zone control terminal
5	Reserved	16	Chassis Electric Heater control terminal
6	24V wire controller interface	17	Solenoid valve2 control terminal
7	EXV drive port	18	Power supply connecting terminal
8	Exhaust temperature sensor port(T5)	19	Power supply connecting terminal
9	Outdoor ambient temperature sensor port(T4)	20/21	Relay
10	Condenser temperature sensor port(T3)	22	Inductor wiring terminal 1
11	Pressure sensors ports	23	Inductor wiring terminal 2

Troubleshooting (cont'd)

For 48/60K model



Function description for the corresponding position:

No.	Content	No.	Content
1	Compressor wiring terminal	12	AC fan motor wiring terminal
2	DC fan motor wiring terminal	13	Four-way valve control port
3	Transformer	14	Crankcase Heating zone control terminal
4	Outdoor display board wiring terminal	15	Chassis Electric Heater control terminal
5	24V wire controller interface	16	Solenoid valve control terminal
6	EXV drive port	17	Power supply connecting terminal
7	Exhaust temperature sensor port(T5)	18	Power supply connecting terminal
8	Outdoor ambient temperature sensor port(T4)	19	Relay
9	Condenser temperature sensor port(T3)	20	Relay
10	Pressure sensors ports	21	Inductor wiring terminal 1
11	High/Low pressure switch ports	22	Inductor wiring terminal 2

Troubleshooting (cont'd)

9.3 Error codes

CODE	FAULT DESCRIPTION
E4	T4 Outdoor ambient temperature sensor error
E5	T5 Discharge temperature sensor error
E6	T3 Condenser temperature sensor error
E9	AC under voltage protection
E10	EEPROM error
E12	IPM modular sensor error
E13	HLP Pressure sensor error
E14	T3 or T5 sensor disconnect error
E15	High pressure switch error
H0	Communication error of main chip and IPM chip
H1	T3 sensor high temperature error(In cooling mode) (20 times P5 error within 180mins)
H2	High pressure switch error(20 times P1 error within 150 mins)
H3	High pressure abnormal in heating mode (20 times P13 error within 180 mins)
H4	IPM modular high temp error (20 times P8 within 120 mins)
H5	Low pressure error (20 times P2 within 100 mins)
H6	Discharge temperature abnormal error(20 times P4 within 100 mins)
H7	Wet operation error (20 times P12 within 200 mins)
H8	T3 condenser sensor disconnect error (20 times E14 within 100 mins)
H12	Discharge temp sensor disconnect error(20 times E14 within 180 mins)
P1	High pressure protection
P2	Low pressure protection
P3	DC over current protection
P4	T5 Discharge temperature abnormal error
P5	T3 Condenser sensor high temp protection(In cooling mode)
P6	IPM module protection
P8	IPM high temperature protection (Ft)M high temperature protection (Ft)
P9	DC fan motor error
P12	Wet operation error
P13	High pressure abnormal error(In heating mode)
P14	High compression ratio protection
P15	Low compression ratio protection
L1	DC cable bus low voltage protection

Troubleshooting (cont'd)

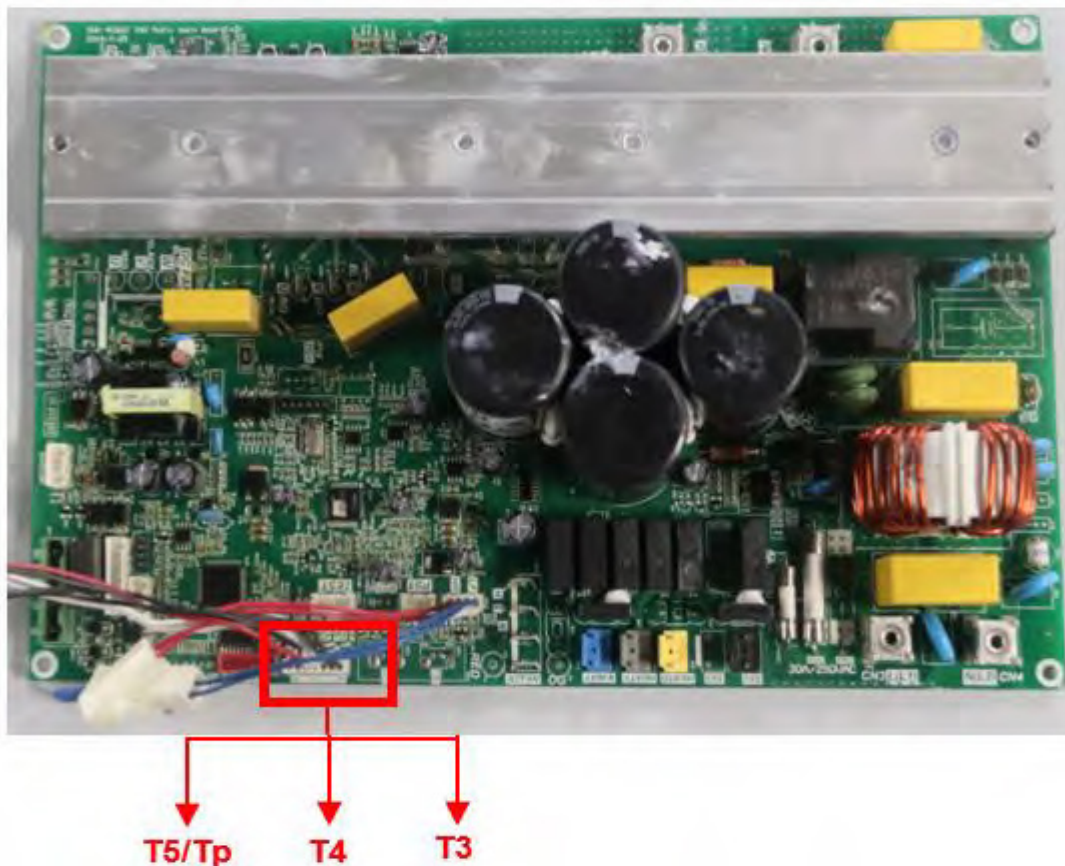
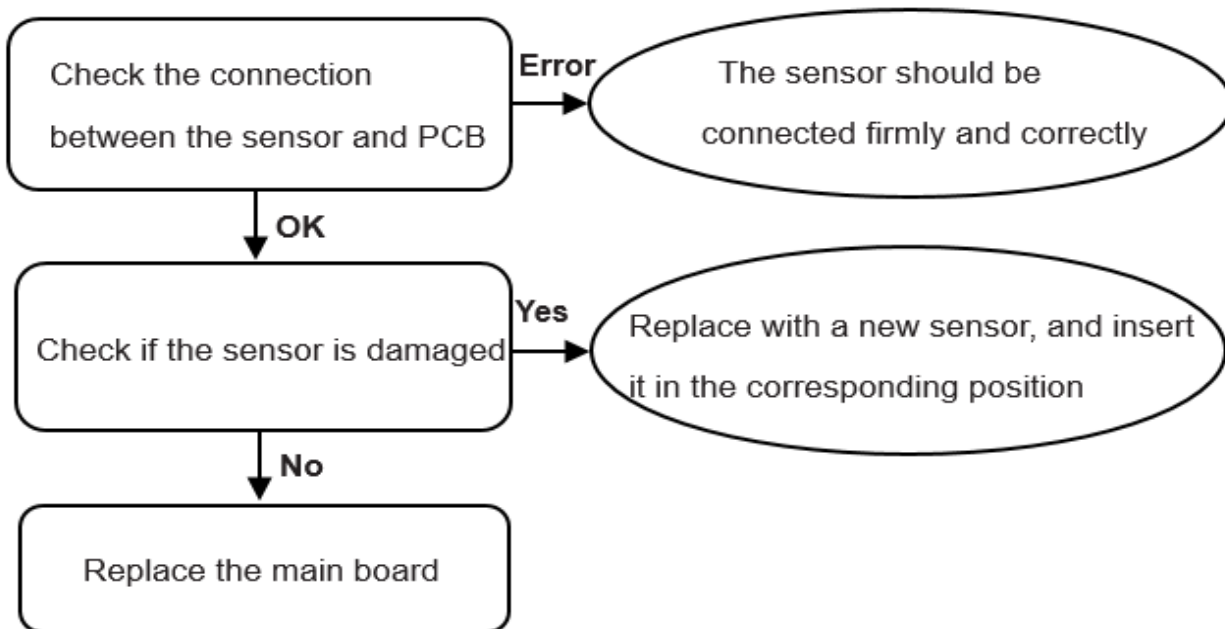
9.3 Error codes continued

L2	DC cable bus high voltage protection
L4	MCE fault / sync / closed loop
L5	Zero speed protection
L7	Compressor phase loss protection ratio protection
L8	Compressor stalls
L9	Frequency limitation or decline by high pressure
LA	Frequency limitation by voltage
LC	Frequency limitation by condenser temp.
LD	Frequency limitation by discharge temp
LE	Frequency limitation by IPM modular high temp
LF	Frequency limitation by current
d0	Oil return
dF	Defrost
dH	Force cooling

Troubleshooting (cont'd)

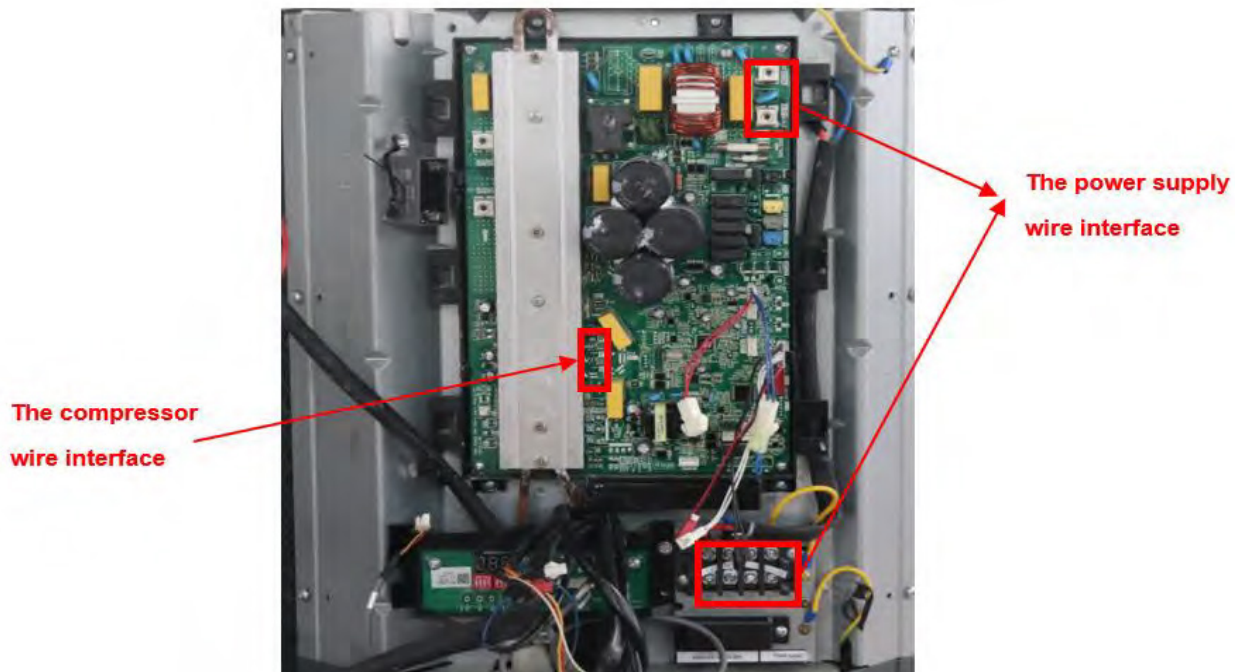
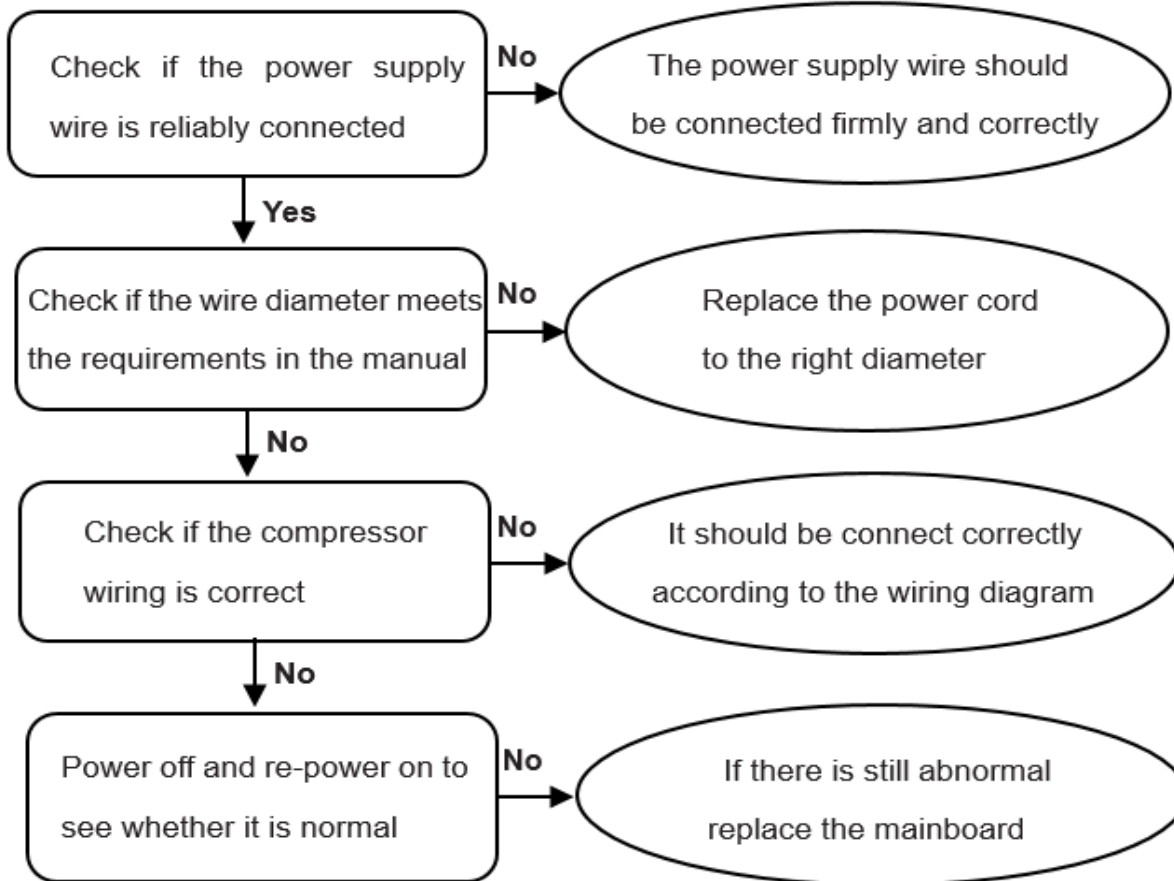
9.4 Troubleshooting guidelines

E4/E5/E6 (T4/T5/T3 temperature sensors error)



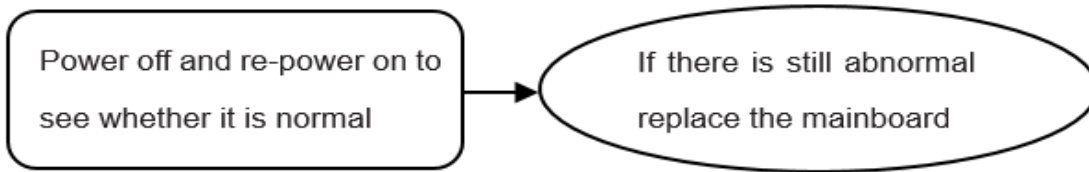
Troubleshooting (cont'd)

E9 (AC under voltage protection)

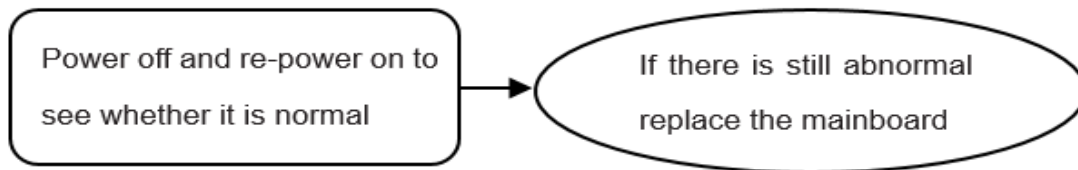


Troubleshooting (cont'd)

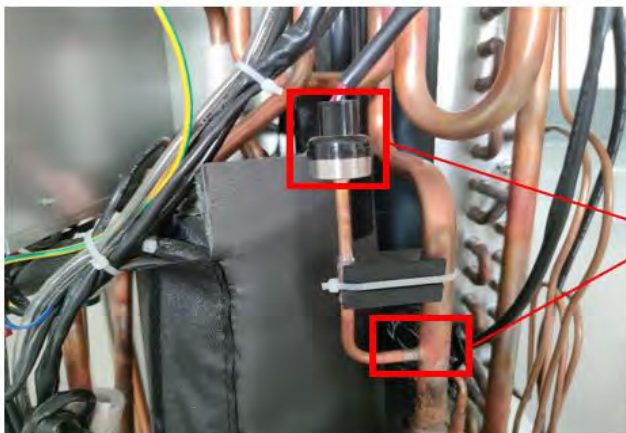
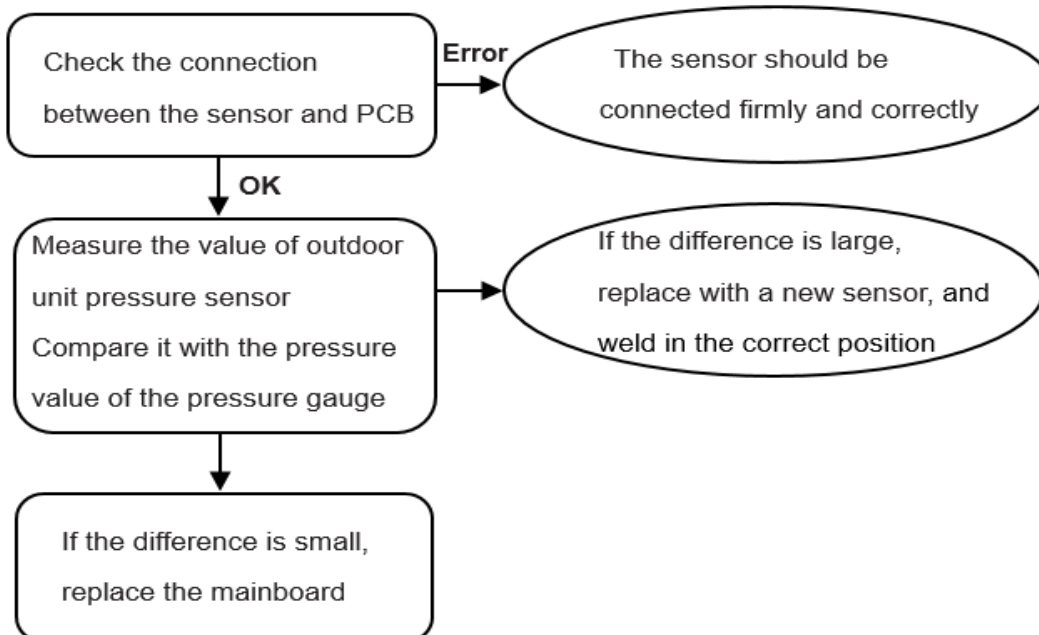
E10 (EEPROM failure)



E12 (IPM modular sensor error)



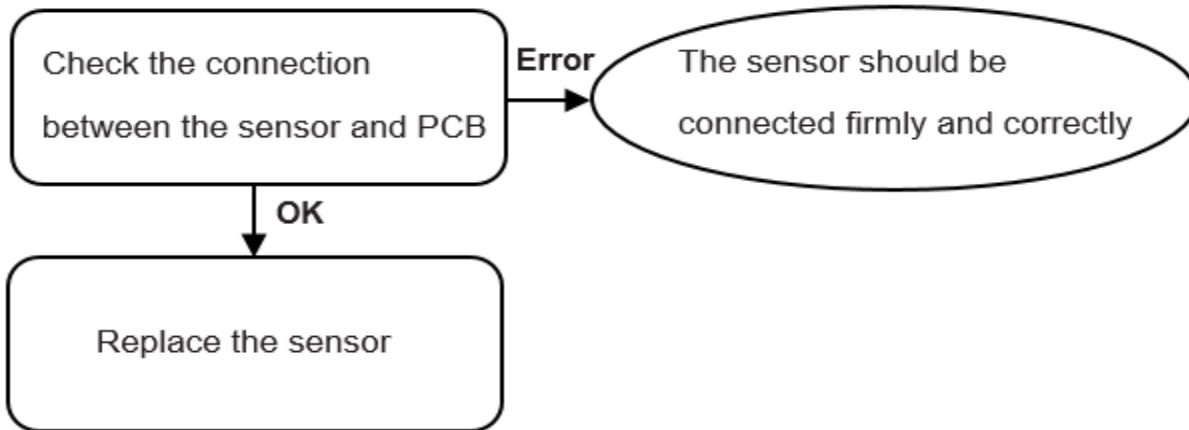
E13 (HLP Pressure sensor error)



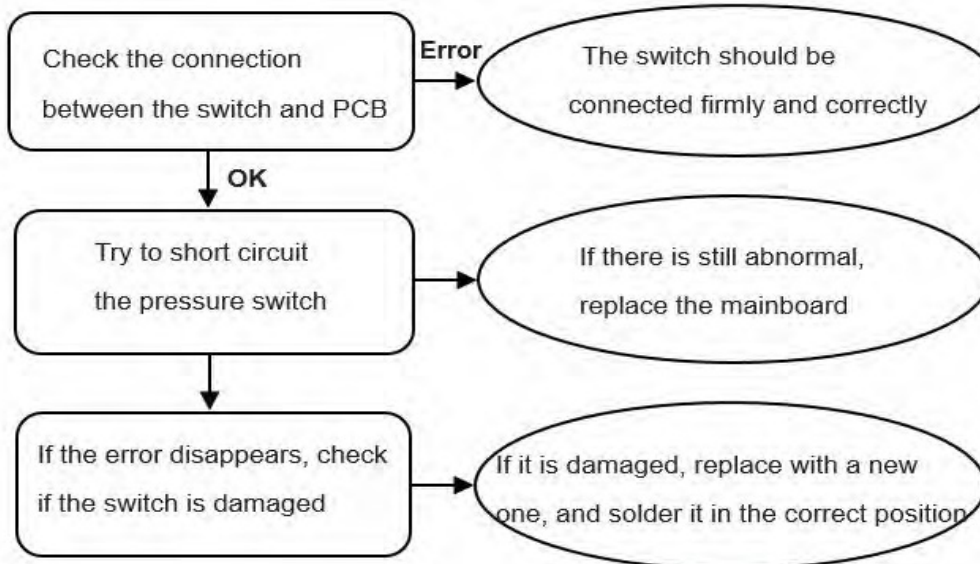
The pressure sensor should be soldered in the correct position

Troubleshooting (cont'd)

E14/H8/H12 (T3 or T5 sensor disconnect error)



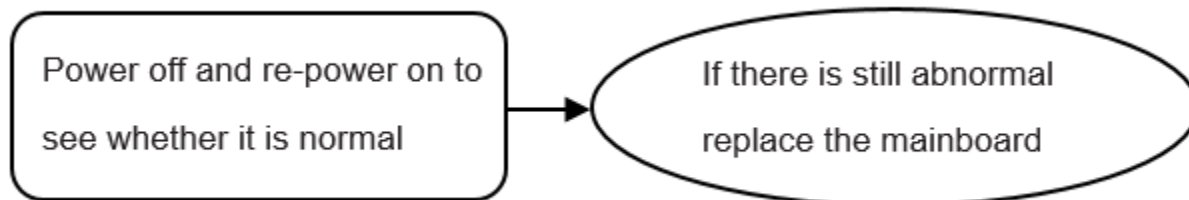
E15 (High pressure switch error)



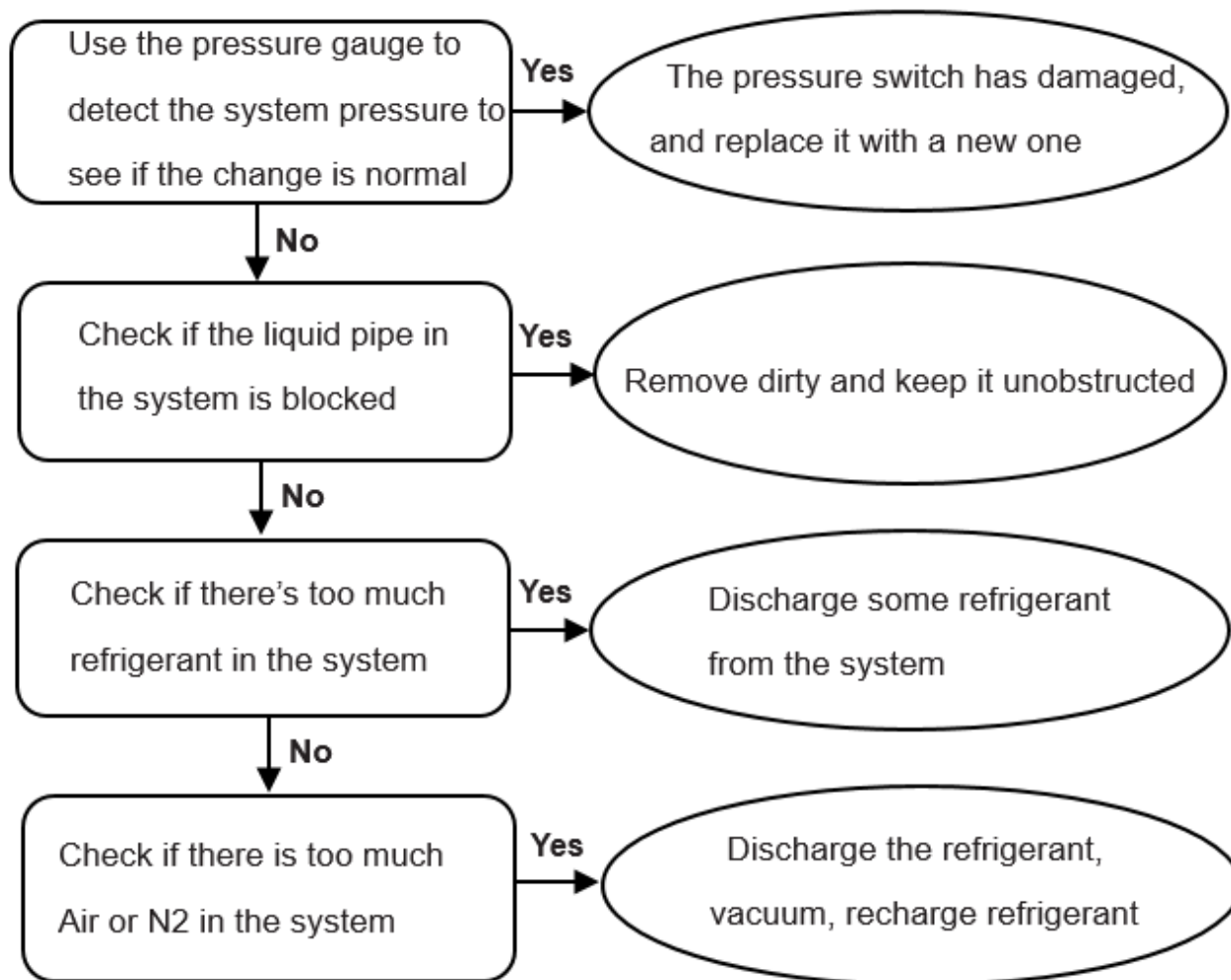
The high pressure switch should be soldered in the correct position

Troubleshooting (cont'd)

H0 (Communication error of main chip and IPM chip)

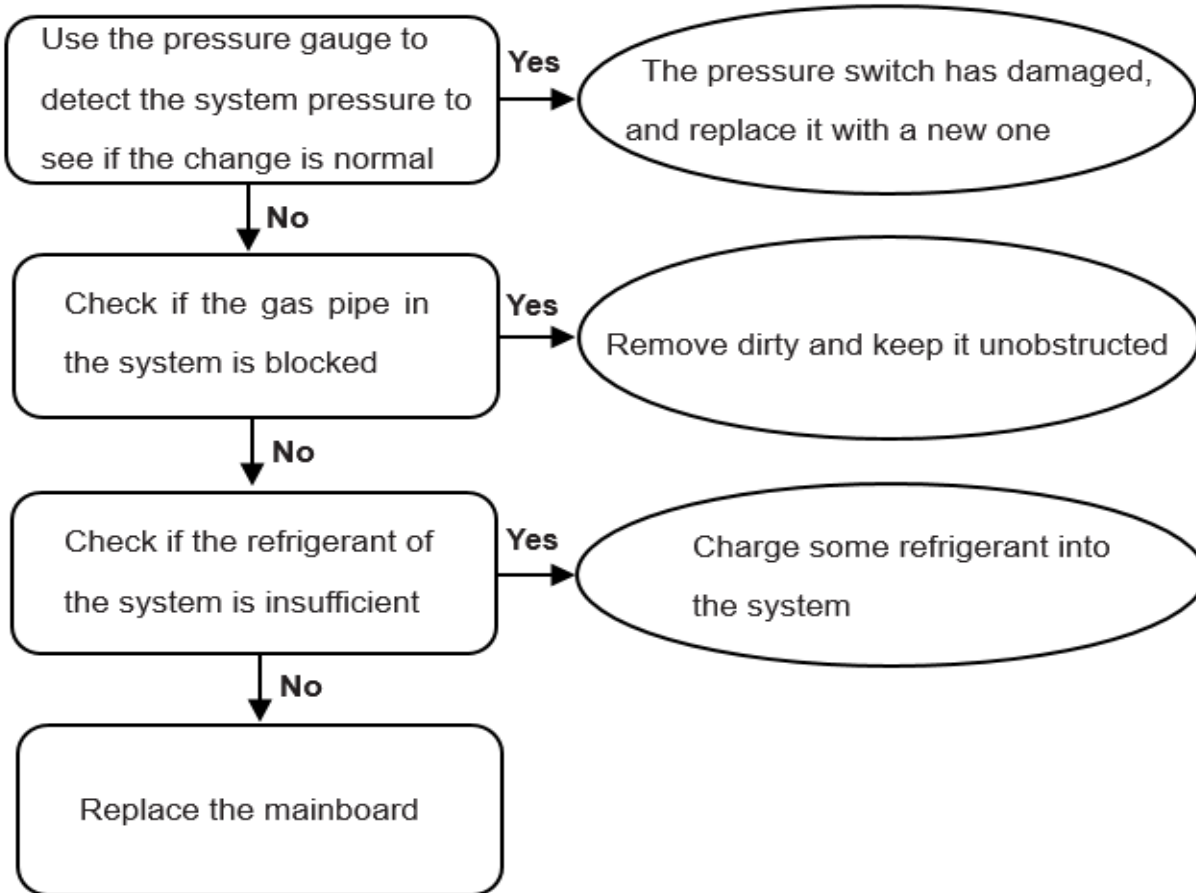


P1/H2 (High pressure switch protection)

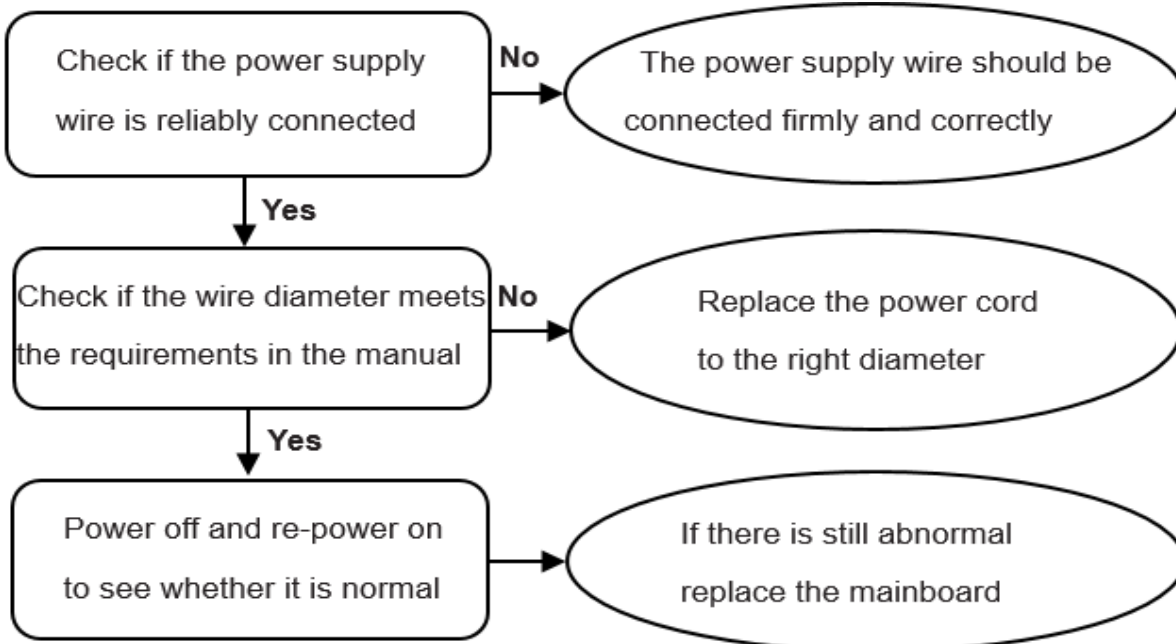


Troubleshooting (cont'd)

P2/H5 (Low pressure switch protection)

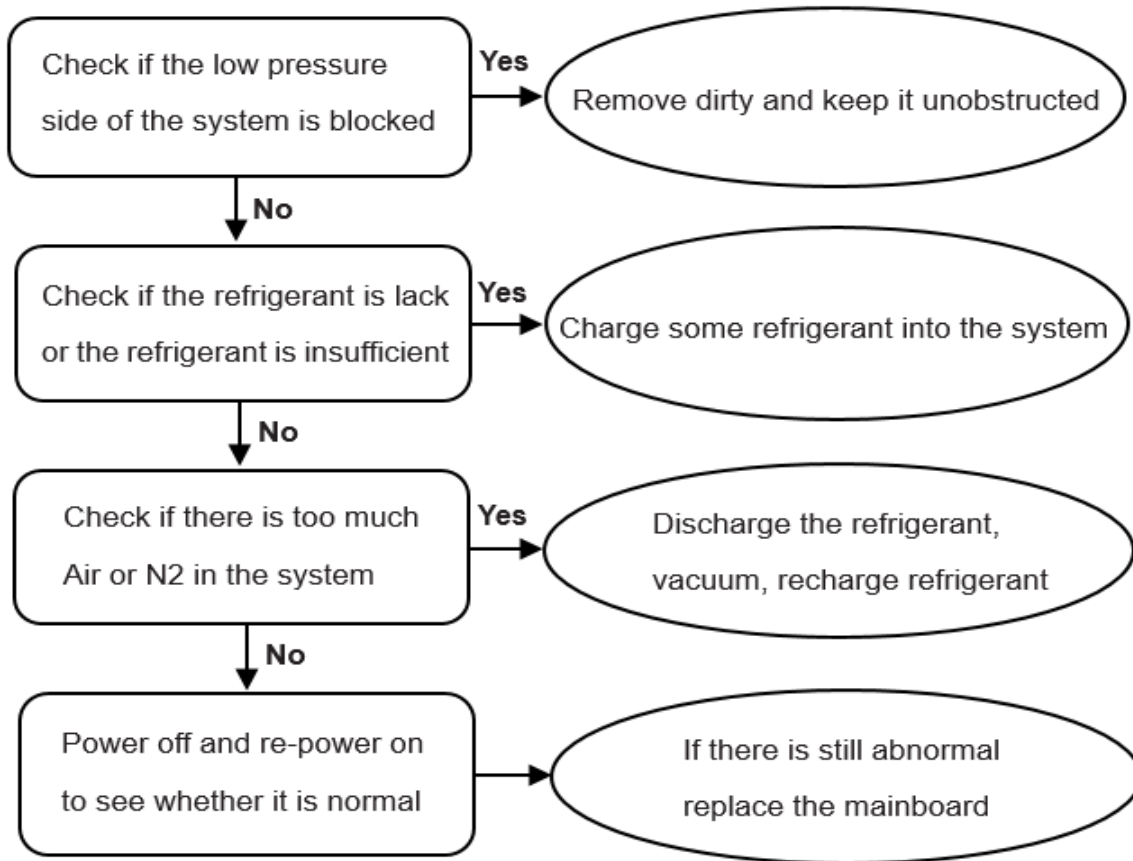


P3 (Inverter over current protection)

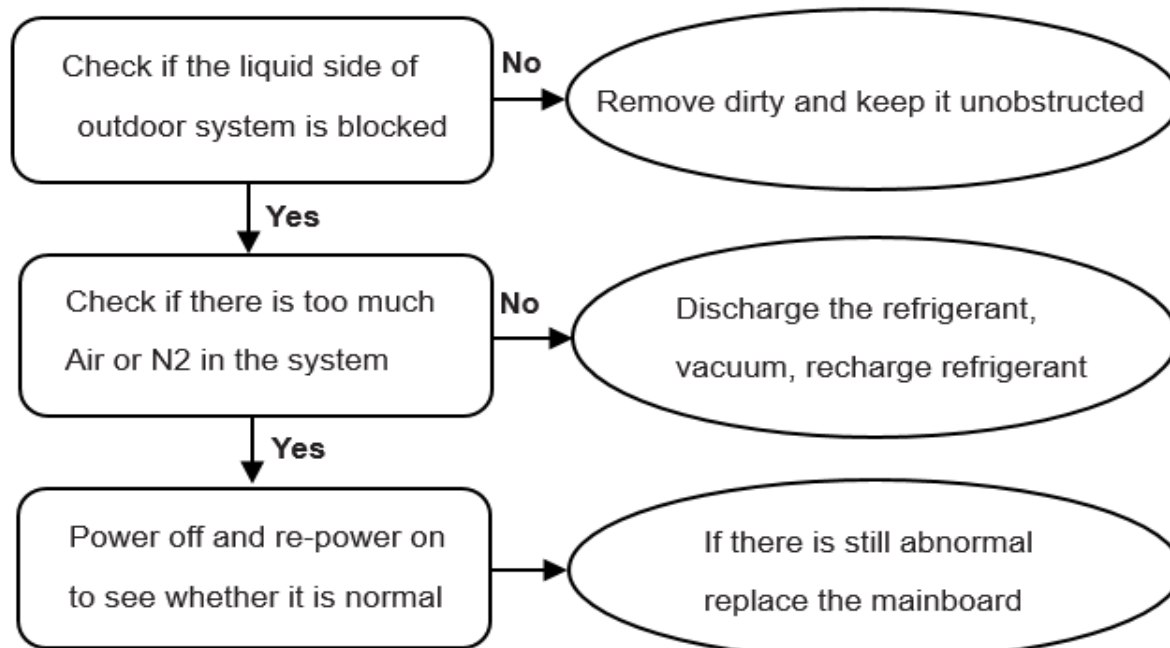


Troubleshooting (cont'd)

P4/H6 (T5 Discharge temperature abnormal error)

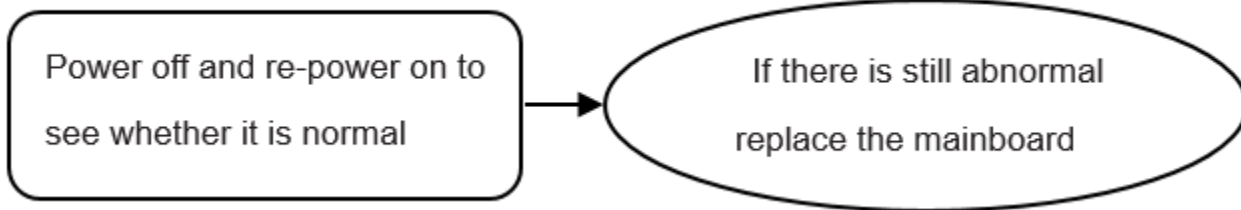


P5/H1 (T3 condenser sensor high temp protection)

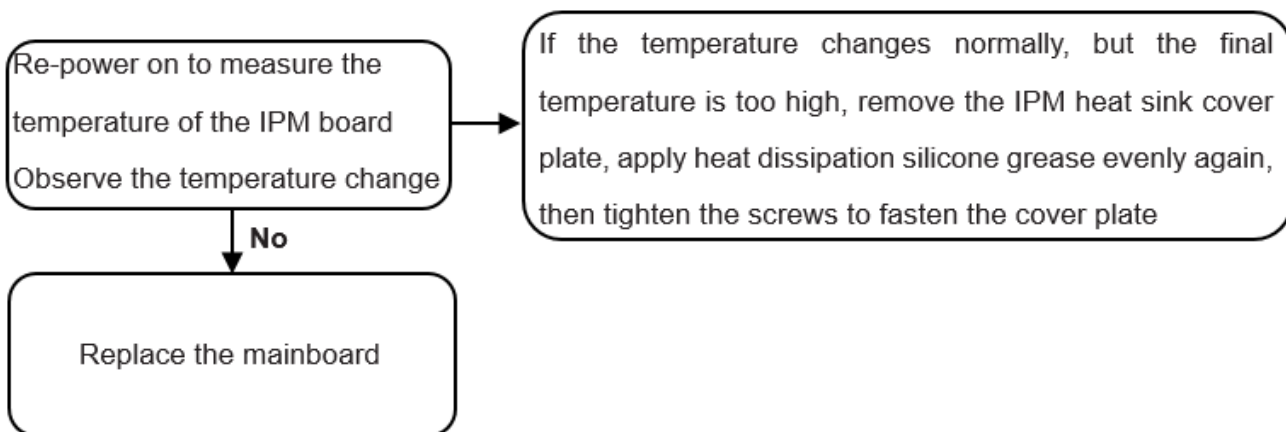


Troubleshooting (cont'd)

P6 (IPM module protection)



P8/H4 (IPM high temperature protection)

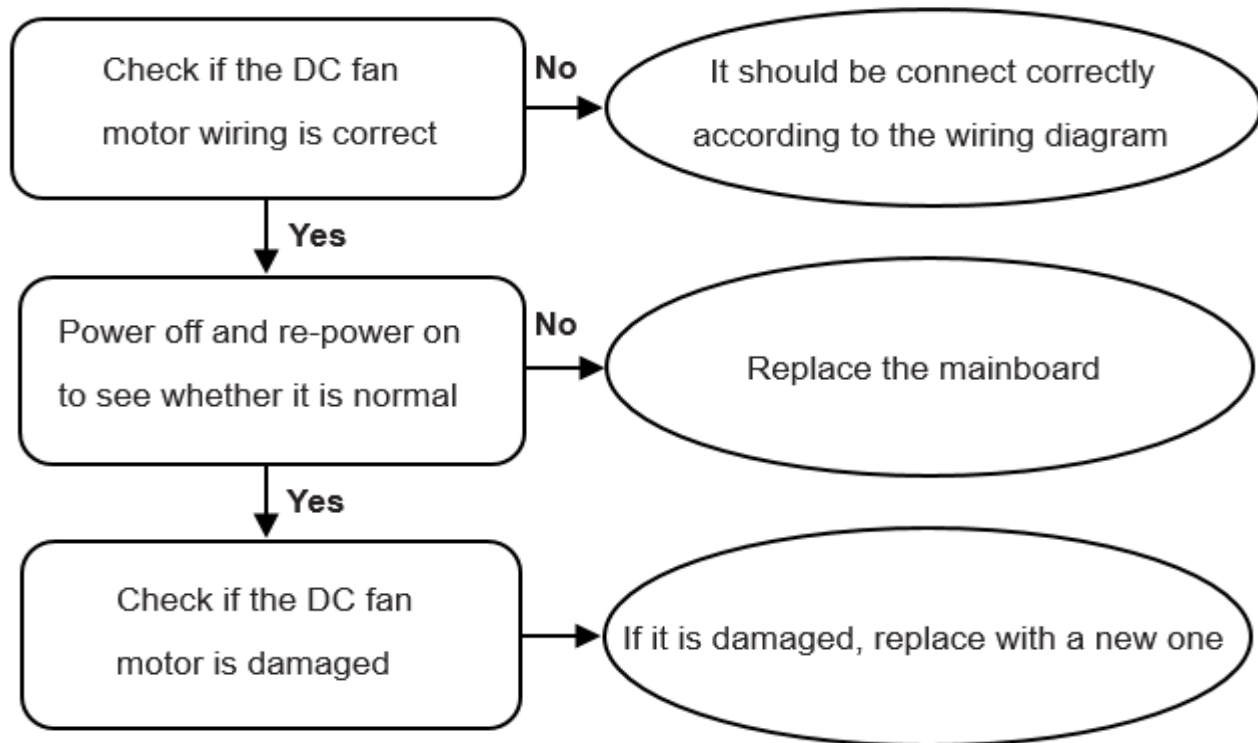


**IPM heat sink cover plate
should be fastened**

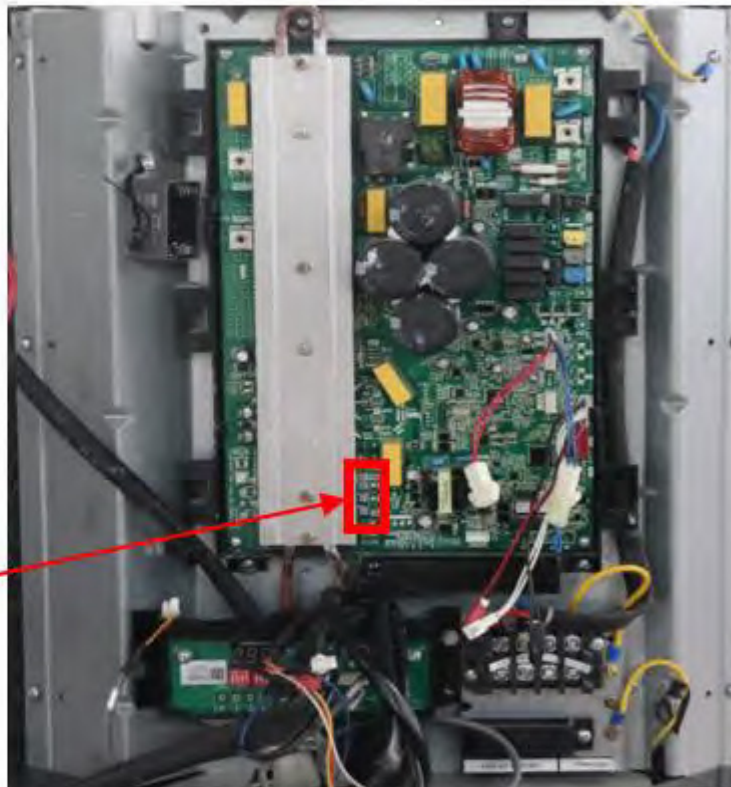


Troubleshooting (cont'd)

P9 (DC fan motor error)

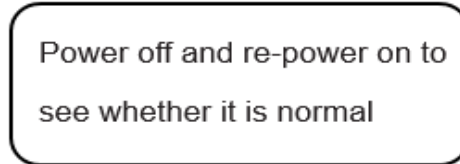


**The DC fan motor
wire interface**

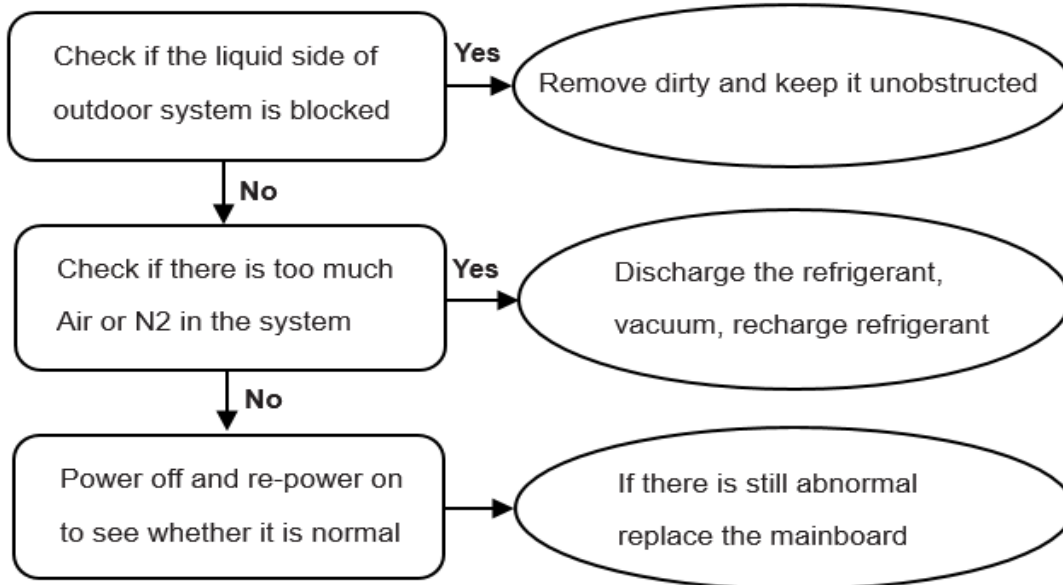


Troubleshooting (cont'd)

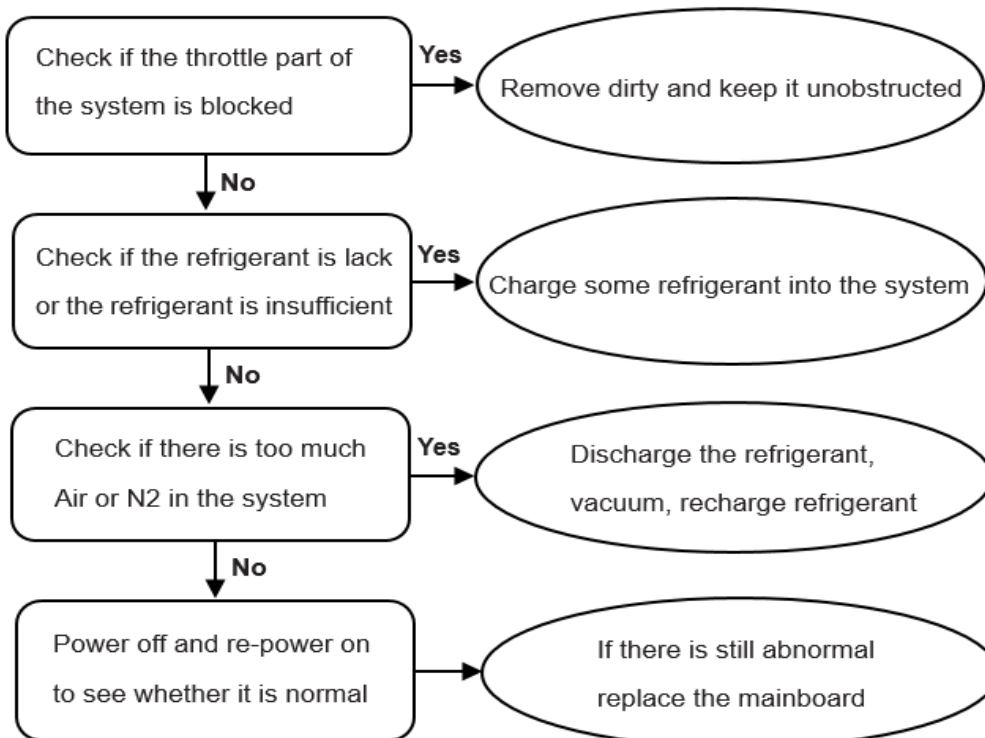
P12/H7 (Wet operation error)



P13/H3 (High pressure abnormal error-In heating mode)

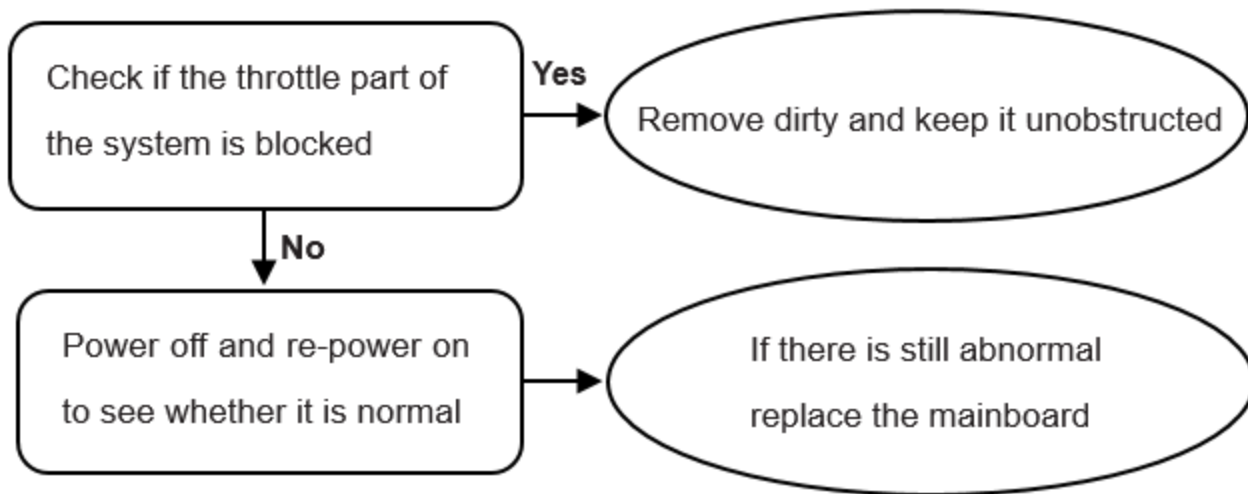


P14 (High compression ratio protection)

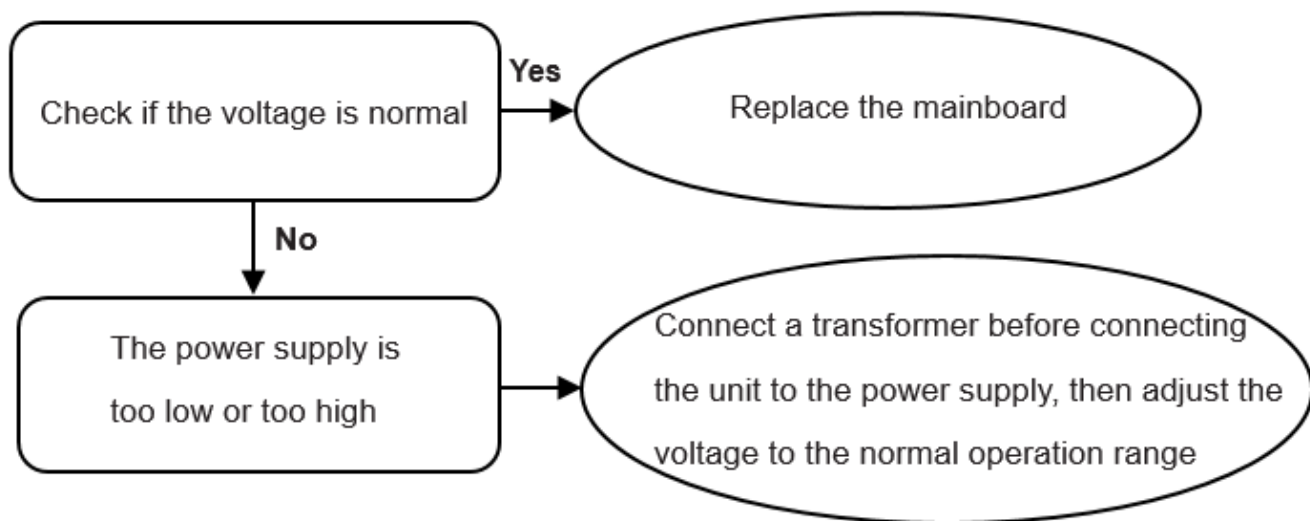


Troubleshooting (cont'd)

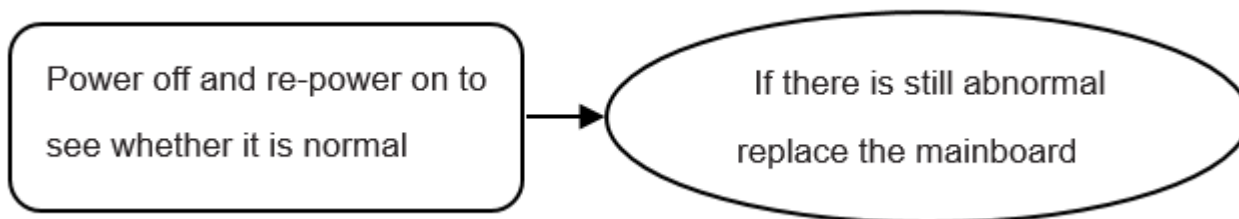
P15 (Low compression ratio protection)



L1/L2(DC cable bus low/high voltage protection)



L4-L8 (IPM module subdivision protection)



L9-LE (Frequency limitation protection, not error)