GE APPLIANCES
a Haier *company*

Service Manual

2U18MS2HDA
3U24MS2HDA
4U36MS2HDA
ASH218JCDDA
ASH324JCDDA
ASH436JCDDA

- Please read this manual before using the heat pump.
- **Keep this user manual for future reference.**

Table of Contents

Type	Model #	Appearance
Outdoor Unit	2U18MS2HDA 3U24MS2HDA ASH218JCDDA ASH324JCDDA	
	4U36MS2HDA ASH436JCDDA	

Safety & Precautions

- Read these Safety Precautions carefully to ensure correct installation.
- This manual classifies the precautions by WARNING and CAUTION.
- Follow all precautions below. They are all important for ensuring safety and preventing property/equipment damage.

⚠ **WARNING:** Failure to follow any of **WARNING** is likely to result in grave consequences such as death or serious injury.

⚠ **CAUTION:** Failure to follow any of **CAUTION** may, in some cases, result in grave consequences.

- The following safety symbols are used throughout this manual:

Observe this instruction	Establish an earth connection	Never attempt

- After completing installation, test the unit to check for installation errors. Give the user adequate instructions concerning the use and cleaning of the unit according to the Operation Manual.

⚠ **WARNING**
• Installation should be performed by the dealer or another professional. Improper installation may cause water leakage, electrical shock, or fire.
• Install the heat pump according to the instructions given in this manual. Incomplete installation may cause water leakage, electrical shock, or fire.
• Use only the supplied or specified installation parts. Use of other parts may cause the unit to come lose, water leakage, electrical shock, or fire.
• Install the heat pump on a solid base that can support the unit's weight. An inadequate base or incomplete installation may cause injury in the event the unit falls off the base.
• Electrical work should be carried out in accordance with the installation manual and national/local electrical wiring codes and rules of practice. Insufficient capacity or incomplete electrical work may cause electrical shock or fire.
• Use a dedicated power circuit. Never use a power supply shared by another appliance.
• For wiring, use a cable long enough to cover the entire distance with no splices. Do not use an extension cord. Do not put other loads on the power supply, use a dedicated power circuit. (Failure to do so may cause abnormal heat, electric shock or fire.)
• Use only the specified wire types for electrical connections between the indoor and outdoor units. Firmly clamp the interconnecting wires so they receive no external stresses. Incomplete connections or clamping may cause terminal over-heating or fire.
• After completing interconnecting and supply wiring connections, shape the cables so that they do not put undue force on the electrical covers or panels. Install covers over the wires. Incomplete cover installation may cause terminal overheating, electrical shock, or fire.
• If any refrigerant has leaked out during the installation work, ventilate the room. (The refrigerant produces a toxic gas if exposed to flame.)
• After all installation is complete, check for and repair any system refrigerant leaks. (The refrigerant produces a toxic gas if exposed to flames.)
•When installing or relocating the system, keep the refrigerant circuit free from substances other than the specified refrigerant (R410A), such as air. (The presence of air or other foreign substance in the refrigerant circuit causes an abnormal pressure rise or rupture, resulting in injury.)
• During pump-down, stop the compressor before removing the refrigerant piping. If the compressor is still running, and the stop valve is open during pump-down, air will be sucked into the system while the compressor is running. This will cause abnormal pressure and noncondensables added to the system.
• Be sure to establish a ground. Do not ground the unit to a utility pipe, arrester, or telephone earth. An complete earth may cause electrical shock, or fire. A high surge current from lightning or other sources may cause damage to the heat pumpheat pump.

⚠ **CAUTION**
• Do not install the heat pump in a place where there is danger of exposure to flammable gas. If the gas builds up around the unit, it may catch fire.
• Install drain piping according to the instructions of this manual. Inadequate piping may cause flooding.
•Tighten the flare nut according to the specified torque using a torque wrench. If the flare nut is overtightened, the flare nut may eventually crack and cause refrigerant leakage.
• Provide adequate measures to prevent the outdoor unit from being used as a shelter by rodents. Rodents making contact with electrical parts can cause malfunctions, smoke or fire. Please instruct the customer to keep the area around the unit clean.

Electronic Controls

Outdoor Unit Introduction

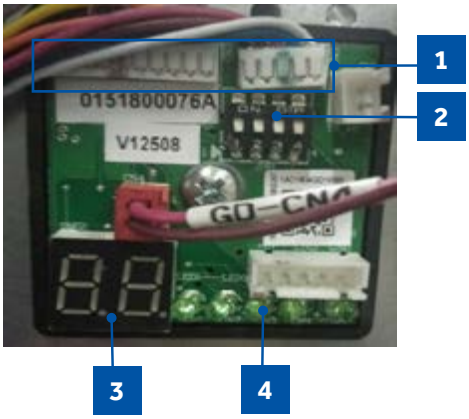
The outdoor unit features a variable speed, rotary type compressor that delivers refrigerant flow to up to 4 individual indoor units. The system uses R-410A refrigerant mixed with PVE oil, and is 208/230 VAC, 60 Hz, single phase.

Compatible indoor units are High wall, Cassette, and Ducted with remote control, cassette with either remote or wired control, and ducted with wired control only.

The indoor units will maintain individualized room temperatures as set on each controller, provided all units are in the same mode. If the first unit to be turned on is set to the heating mode, all units will heat. If the first unit to be turned on is set to the cooling mode, all units will cool.

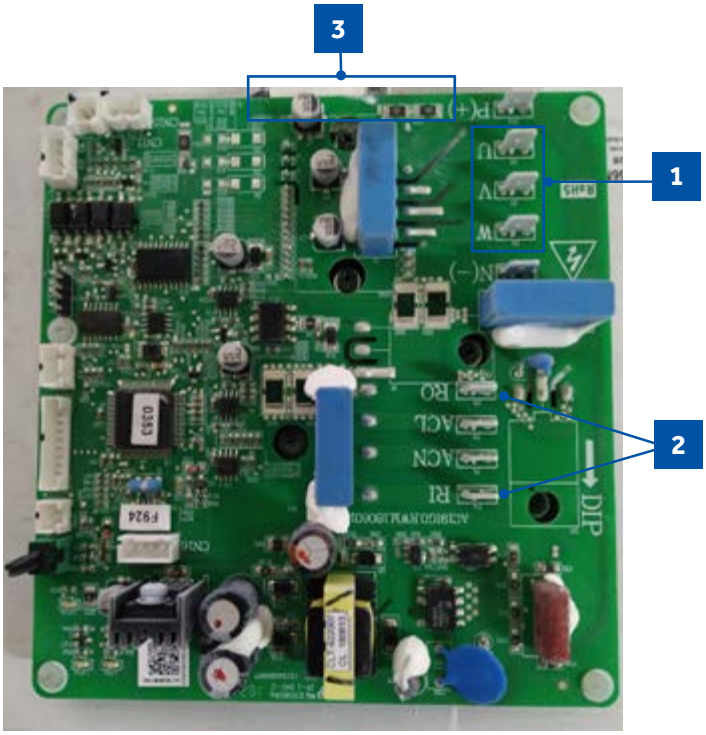
Service Monitor Board (SMB) Overview

The SMB has important features including operational DIP switches, error code display, compressor speed, and diagnostic capabilities.



1. The SMB is connected to the PCB via connections CN-2 and CN-3.
2. The SW1 DIP switches are OFF (default position for normal operation).
3. The digital display will indicate operating frequency of the compressor when no error code is present, or will flash an error code if present.
4. A solid green LED indicates that the A, B, C, D or E unit is successfully communicating with the outdoor unit.

Inverter Power Module (IPM) Overview



1. The Inverter Power Module generates 3-phase VAC power to operate the variable speed compressor. The compressor is connected to the IPM via terminals U, V and W.
2. A Reactor Coil is connected to the IPM at terminals RI and RO. The Reactor Coil will filter electrical noise generated at high frequency operation that could cause damage to the compressor windings.
3. IPM generates a large amount of heat during operation. This heat is transfered to a heat sink behind the board, then mixed with the outdoor air. The Tm temperature sensor protects the IPM from excessive temperatures.

PCB Overview

2U18MS2HDA
3U24MS2HDA
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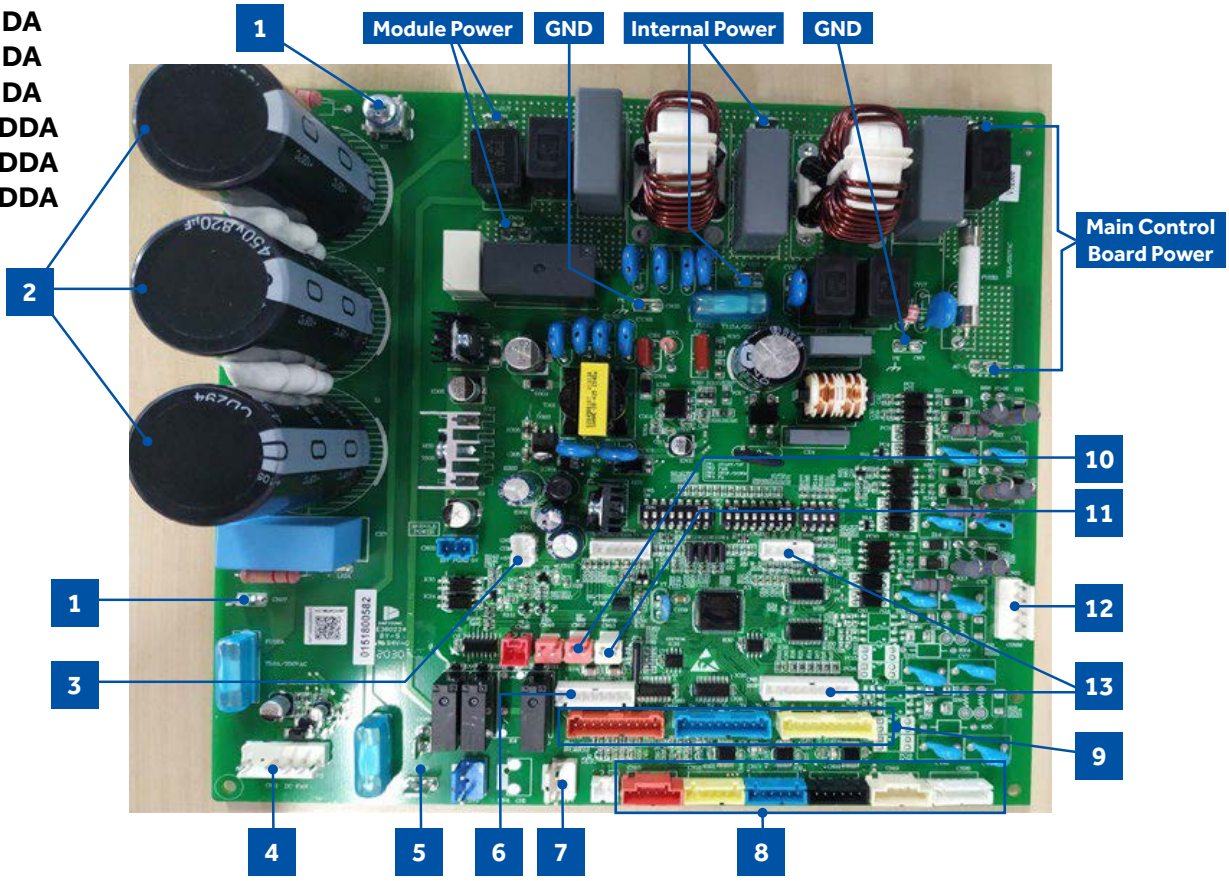


1 CN26/CN27--Reactor filter the harmonic in the current, it connects to main PCB via CN26 and CN27.

2 There will only be 2 capacitors on the board, not 3 as shown.

3 CN9--Communication port between main control board and module board.

4 CN11--The Outdoor Fan Motor is a DC voltage, variable speed type.

5 CN8/CN9--The Crankcase Heater is energized via a connection at terminals CN-9 and CN-8 on the PCB.

6 CN47--The RJ45 is a small board that connects the PC and the main control board for the use of GE3.0 port.

7 CN5--The 4-Way Valve is energized by line voltage from a connection via Plug CN-5. This valve is energized in HEAT MODE.

8 CN15-CN18--The EEV coils for the outdoor unit and each indoor unit are connected at terminals CN-15 through CN-18. These EEV coils include the connection for the HEAT MODE EEV coil.

9 CN14/CN24/CN25-- There are system temperature sensors that monitor refrigerant line temperature and outdoor air temperatures, and the temperature of the refrigerant entering and leaving each circuit.

10 **11** CN12/CN13--The system has two refrigerant pressure switches, a Low Pressure Switch and a High Pressure Switch. These switches are connected to the PCB via Plugs CN-12(HP) and CN-13(LP).

12 CN21--Plug CN-21 connects the data path between each indoor unit and the PCB.

13 CN8/CN23--The Service Monitor Board connects to plugs CN-23 and CN-8. When these cables are connected to the Service Monitor Board, the SMB digital display should be illuminated.

ENERGY STAR 6.1 Start-Up System Check

All new ENERGY STAR certified product lines released as of February of 2022 will comply with the new 6.1 standards (see ENERGY STAR 6.1 requirements). When the system is first powered up after installation, the system will now perform a start-up system check. See the following sequence of operation:

1. Indoor and outdoor units with '88' displays, will have 'CC' displayed for 5 seconds.

2a. When the outdoor ambient temperature is 14~75°F (-10~24°C), the system will run heating and cooling mode for 10 minutes each, the indoor and our door display will show 'n2' and 'n3' accordingly.

2b. When the outdoor ambient temperature is -4~14°F (-20~10°C), the system will only run heating mode for 15 minutes, indoor and outdoor display will show 'n2'.

2c. When the outdoor ambient temperature is 75~115°F (-24~46°C), the system will only run cooling mode for 15 minutes, indoor and outdoor display will show 'n3'.

3. Upon finishing and passing all test, the indoor and outdoor display will show 'PS'. The unit can now be used normally.

If the system does not pass any of the checks, the indoor and outdoor display will show an error code and the testing will stop. Please refer to the service manual for this model to correct the error. The automatic testing will need to be manually initiated by following the steps:

Set the remote controller to Cool, High Fan speed, 60°F (16°C), and then press the 'Sleep' button 4 times within 5 seconds. The indoor will beep 5 times and display 'CC' and run the same tests as above.

NOTE: The system may display erroneous error codes when outdoor ambient temperature is below -4°F or above 115°F. When these conditions exist the start-up test may be bypassed and rescheduled for a time when outdoor temperatures return to more favorable conditions. NOTE: When the outdoor control board has been replaced for service reasons, the start-up test may be bypassed.

Bypassing start-up test: Within 5 seconds of applying power to the system, while 'CC' is displayed on the indoor, set the indoor to Dry and 68°F (20°C). The indoor display will change to 'BP' for 5 seconds then go into stand-by mode. The unit can then be used normally.

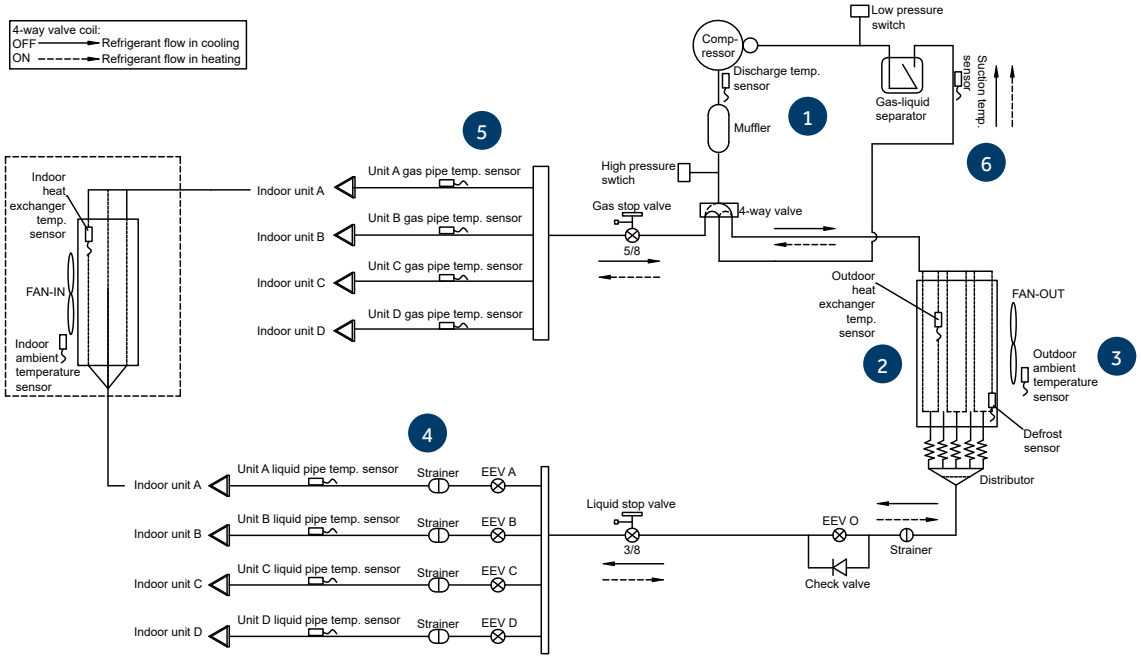
NOTE: The start-up test cannot be bypassed if the display reads 'n2' or 'n3'. The power may be cycled prior to finishing the test and another attempt can be made to bypass.

Run the system for 20 minutes to check the parameters' range per table below.

Model	Mode	Check parameters	Suction temp.	Exhaust temp.	IDU coil temp	IDU outlet temp.
2U18MS2HDA ASH218JCDDA	Cooling	Ambient temp < 50F	46-64°°F	86-122°F	52-63°F	54-64°F
		50F < Ambient temp < 86F	50-68°F	95-158°F	52-63°F	54-64°F
		Ambient >86F	54-68°F	104-185°F	52-68°F	52-70°F
	Heating	Ambient temp 23F	0-19°F	102-131°F	81-88°F	75-84°F
		23F < Ambient temp < 50F	21-45°F	104-167°F	82-100°F	79-93°F
		Ambient >50F	41-75°F	104-185°F	86-115°F	86-100°F
3U24MS2HDA ASH324JCDDA	Cooling	Ambient temp < 50F	46-64°F	86-122°F	52-63°F	54-64°F
		50F < Ambient temp < 86F	50-68°F	95-158°F	52-63°F	54-64°F
		Ambient >86F	54-68°F	104-185°F	52-68°F	52-70°F
	Heating	Ambient temp 23F	0-14°F	95-140°F	79-97°F	79-93°F
		23F < Ambient temp < 50F	14-45°F	104-158°F	86-102°F	82-100°F
		Ambient >50F	32-77°F	131-176°F	90-113°F	86-109°F

Sequence of Operation & Operational Parameters

Cooling Mode Sequence of Operation



On a call for cooling, the indoor unit will send the room temperature and set-point requirement to the outdoor unit PCB via the data signal wire path. The indoor louvers will open and the indoor fan motor will start.

The outdoor unit will energize the EEVs that are controlling refrigerant flow to the calling indoor units. The position of the EEVs will be set to an initial position based upon the outdoor air temperature.

The 4-way valve is de-energized. After a 3-minute time delay, the outdoor fan motor will be energized. Shortly after the outdoor fan motor turns on, the compressor will start in low frequency. The operating frequency of the compressor will be displayed on the Service Monitor Board.

Cooling Mode Sequence of Operation

1 Temperature Sensor Td

The temperature of the compressor discharge hot gas will be monitored by the Discharge Temperature Sensor. If the sensor reads too hot or cool, the frequency/status of the operation will be adjusted accordingly.

The hot gas will leave the oil separator and enter the 4-way valve, which directs the hot gas to the outdoor coil. The refrigerant will condense in the outdoor coil and be subcooled. The refrigerant is now in a liquid state.

2 Temperature Sensor Tc

This sensor monitors the temperature of the outdoor coil during condensing operation. If abnormal condensing temperature is detected, the outdoor fan motor speed or compressor frequency may be adjusted.

3 Temperature Sensor Ta

The outdoor air temperature will be monitored by the PCB. If the outdoor air temperature rises or falls, the speed of the outdoor fan may be changed.

4 Temperature Sensor Tc2

The Liquid Pipe Sensor will monitor the temperature of the refrigerant leaving the EEV.

The low pressure low temperature refrigerant will enter the mixed phase liquid line and travel to the indoor unit. Heat from the indoor air passing across the evaporator coil will transfer to the cold refrigerant, sending cool air into the space and changing the liquid refrigerant into a cool vapor.
The cold vapor will travel down the vapor line and return to the outdoor unit via a path through the gas stop valve.

5 Temperature Sensor Tc1

The Gas Pipe Sensor will monitor the temperature of the gas pipe to calculate the difference between Liquid Pipe Temperature and Gas Pipe Temperature. If a change in EEV port opening size is needed, the EEV will make a small adjustment.

The vaporized refrigerant enters the 4-way valve and travels to the vapor line accumulator. The accumulator will trap any liquid refrigerant if present to prevent it from entering the compressor.

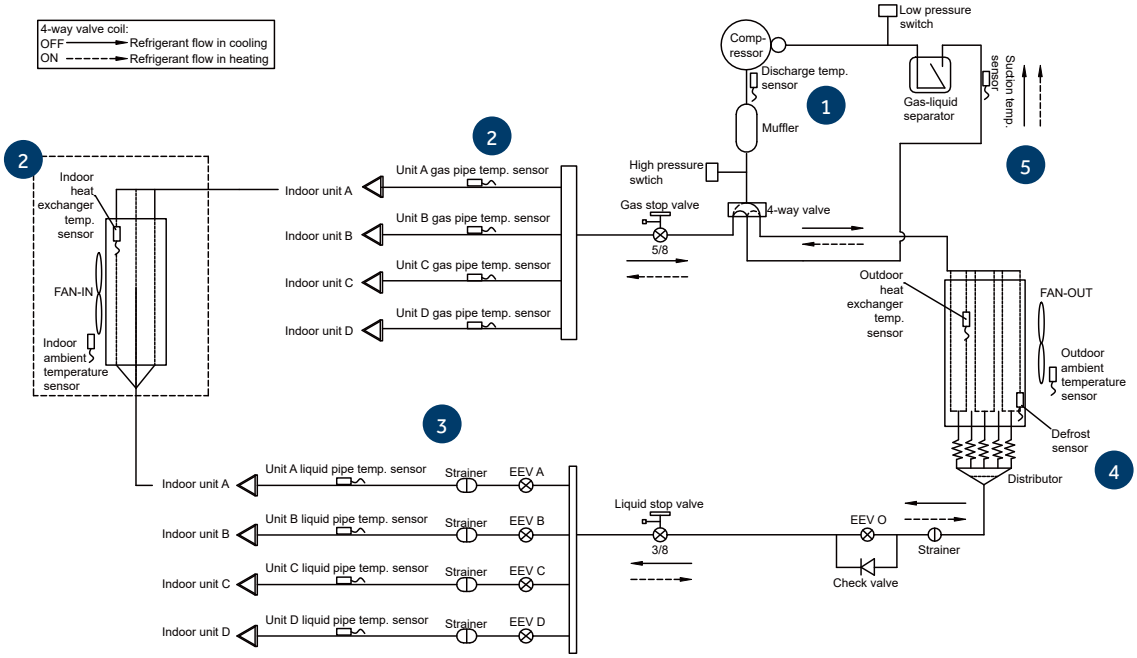
The vapor will exit the accumulator and enter the compressor. This cycle will repeat until the demand for cooling ends.

6 Temperature Sensor Ts

The temperature of the suction gas entering the compressor is monitored by the Suction Temperature Sensor. Before stopping operation, the EEV may open to feed more refrigerant or close to warm up the line.

The demand becomes less as the indoor temperature drops toward the desired temperature, so the compressor will reduce speed. When the set temperature is reached, the compressor and outdoor fan will shut off. The circulating fan of each indoor unit continues to run.

Heating Mode Sequence of Operation



On a call for heating, the indoor unit will send the room temperature and set-point requirement to the outdoor unit PCB via the data signal wire path. The indoor unit louvers will open. The fan will not start until the coil has warmed sufficiently to avoid cold drafts.

EEVs serving indoor circuits will step to the standard opening. The outdoor EEV opens to a position based upon the outdoor air temperature.

The 4-way valve will energize and the outdoor fan will start. The compressor starts at a slow speed and will increase based upon demand. The indoor fan starts after the indoor coil is warm enough to avoid circulating cool air.

With the compressor operating, refrigerant will begin to flow throughout the refrigeration circuit.

The operating frequency of the compressor will be displayed on the Service Monitor Board.

Heating Mode Sequence of Operation

1 Temperature Sensor Td

The temperature of the compressor discharge hot gas will be monitored by the Discharge Temperature Sensor. If the sensor reads too hot or cool, the frequency/status of the operation will be adjusted as needed.

The hot gas will leave the oil separator and enter the 4-way valve. The 4-way valve will direct the hot gas to ALL of the indoor coils.

Note: Any indoor unit that is in heating mode will have it's louver open and indoor fan running. Non-calling indoor units will receive hot gas but their fans will remain on very low speed with the louver open. When demand for heat increases, the indoor fan will speed up to meet the increased demand.

2 Temp. Sensor Tc1 & Indoor Heat Exchanger Temp. Sensor

The temperature of Tc1 should now be hot. This will indicate the 4-way valve is directing hot gas to the indoor coils. If it is not, there is a problem with the 4-way valve. The PCB will detect the temperature difference and generate an Error Code.

The indoor heat exchanger temperature sensor will monitor the temperature of the indoor coil to ensure it is hot enough to prevent blowing cold air. Once adequately warm temperature is sensed at the indoor coil, the PCB will increase the fan speed if needed to meet the demand.

The hot gas entering the indoor coil will condense into a saturated mix and then be subcooled. The refrigerant will return to the outdoor unit via the liquid line.

3 Temperature Sensor Tc2

This sensor monitors the temperature of the refrigerant liquid returning from the indoor coil. The indoor EEV opening angle is fixed.

The liquid will enter the Liquid Line Strainer and will pass through the OPEN EEV.

The refrigerant liquid now enters a receiver where excess refrigerant will be stored.

After the liquid leaves the Liquid Receiver, it will enter the restriction of the OUTDOOR UNIT's EEV, which changes the liquid refrigerant to a lower pressure and temperature as it enters the outdoor coil.

As the outdoor coil absorbs heat from the surrounding air, the very cold liquid refrigerant boils off and changes to a superheated vapor. This vapor travels through the 4-way valve to the accumulator.

4 Temperature Sensor Te

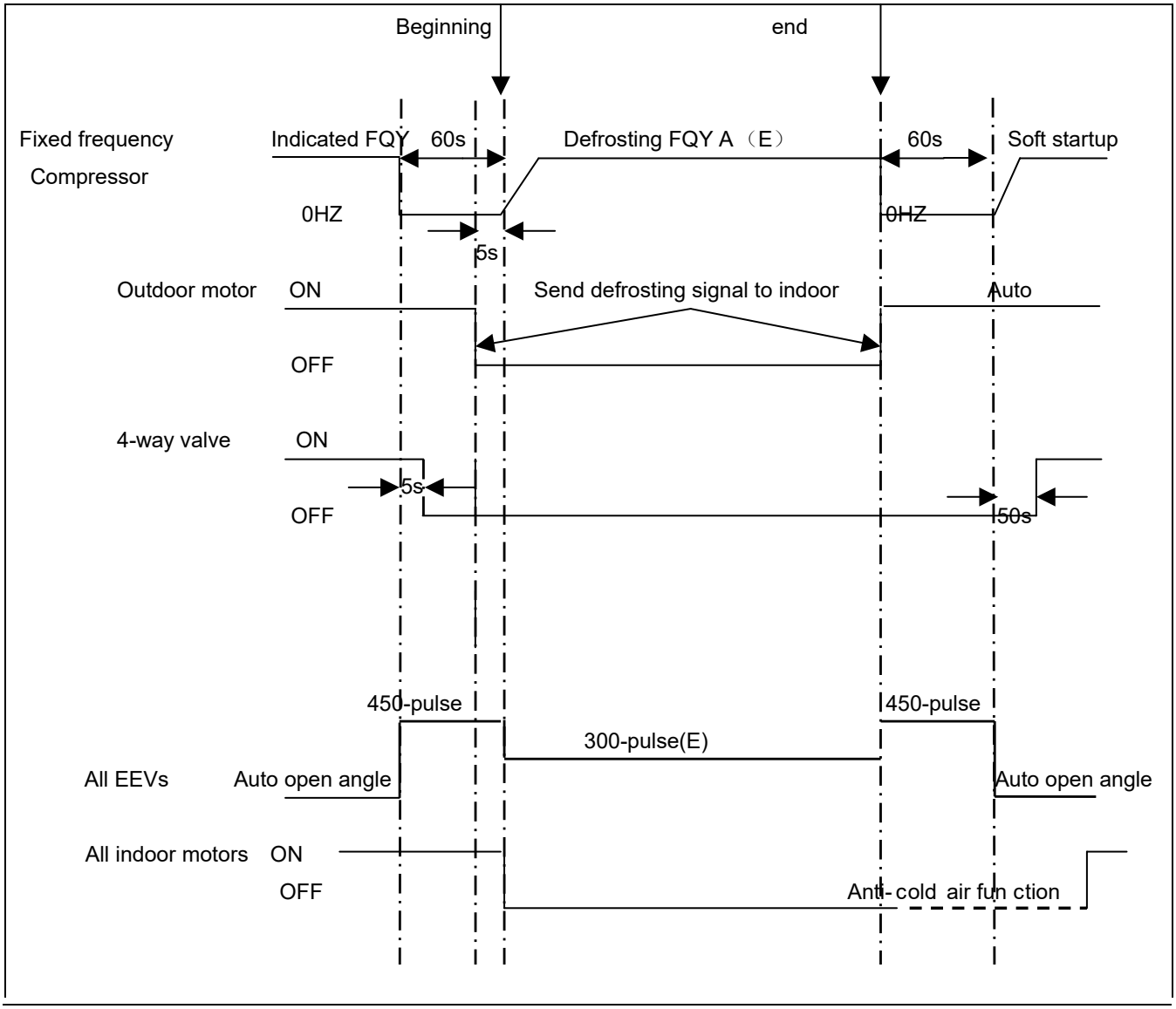
The outdoor coil temperature will be sensed by the Defrost Sensor. The sensor will use this temperature to adjust EEV open angle and to calculate when a defrost cycle is necessary.

5 Temperature Sensor Ts

The temperature of the suction gas entering the compressor is monitored by the Suction Temperature Sensor.

As the demand becomes less while the indoor temperature rises toward the desired temperature, the compressor will reduce speed. The compressor and outdoor fan will shut off when the set temperature is reached. The circulating fan of each indoor unit continues to run.

Multi:


Beginning
end
Fixed frequency Compressor
Indicated FQY
60s
Defrosting FQY A（E）
60s
Soft startup
0HZ
0HZ
5s
Outdoor motor
ON
Send defrosting signal to indoor
Auto
OFF
4-way valve
ON
5s
OFF
50s
450-pulse
450-pulse
300-pulse(E)
All EEVs
Auto open angle
Auto open angle
All indoor motors
ON
OFF
Anti- cold air fun ction

Operating Parameters

Electronic Expansion Valve (EEV) Control

Electronic characteristics

Max. open angle	480 pulses
Driving speed	PPS

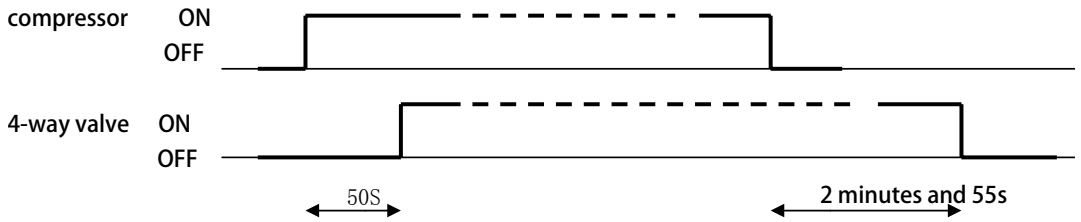
Open angle limitation of EEV

	Unit stop	Max. open angle	Thermostat OFF	Min. open angle
Cool/ dry	5 pulses	470 pulses	5 pulses	80 pulses
Heat	50 pulses	470 pulses	50 pulses	80 pulses

The EEV routinely opens and closes to maintain the compressor discharge temperature within an acceptable range.

4-Way Valve Heating Control

There is a 1-minute delay before power is applied to the 4-way valve to switch the flow of hot refrigerant to the indoor coil when the compressor starts in the heating mode. A 3-minute delay will occur before the 4-way valve is powered down and switches back to the at-rest (cooling) position when the call for heat is satisfied and the compressor shuts off.



After 15 minutes of compressor run time and the indoor coil temperature is below 41°F/5°C, the compressor will stop and the unit will display a 17-flash error code on the outdoor PCB if the 4-way valve does not switch into the heating mode.

Compressor Sump Heater

The sump (crankcase) heater keeps refrigerant at a higher temperature than the coldest part of the system. This prevents refrigerant from mixing with the compressor oil and also dries condensed refrigerant inside the sump. The sump heater will be energized when the ambient temperature is below 81°F/27°C and will be off when the ambient is 90°F/32°C.

	Heater OFF	Heater ON*min
Ta>50°F(10°C) OR Td>=68°F(20°C)	100%*60min	0
41°F(5 °C<Ta ≤50°F(10°C)and Td<68°F(20°C)	50%*60min	50%*60min
32°F(0°C)<Ta ≤41°F(5 °C)and Td<68°F(20°C)	33%*60min	66%*60min
32°F(0°C)>=Ta andTd<68°F(20°C)	0	100%*60min

Operating Parameters

Defrost Control

In the heating mode and along with the ambient sensor, the defrost sensor monitors the temperature of the outdoor coil to determine if defrost is needed. If the compressor has been running for 10 minutes continuously and for 45 minutes overall, the difference between the ambient sensor (Ta) and the defrost sensor (Te) will be checked. The system will initiate the defrost cycle if the following conditions can be met for 5 continuous minutes:

Te ≤ C x Ta-A
Te: Defrost temperature sensor
Ta: Ambient temperature
C: 0.80 if Ta < 32°F/0°C 0.60 if Ta ≥ 32°F/0°C
A: 8, moderate climate (factory setting) 6, severe climate (alternate setting)

End defrosting: The defrost cycle will terminate if the defrost sensor (Te) detects the temperature of the outdoor coil is above 44°F(7°C) for 60 seconds or is above 54°F(12°C) for 30 seconds. The defrost cycle will automatically terminate in 10 minutes if these temperatures cannot be reached.

Timed defrost option:
• When the outdoor ambient temperature sensor detects Ta is less than 32°F(0°C)
• In heating mode, compressor runs continuously for 60 minutes or for 240 minutes in all.
The system will defrost when the above conditions are met. Defrosting frequency is 68 HZ, with a defrosting time of 8 minutes.

Base Pan Heater Control Logic

When the compressor starts in the heating mode, the following conditions will apply:

Outdoor Temperature	Pan Heater
>37°F(3°C)	OFF
28°F(-2°C) to 34°F(1°C)	OFF 20min. ON 10min.
10°F(-12°C) to 25°F(-4°C)	OFF 15min. ON 15min.
<10°F(-12°C)	ON

Troubleshooting the base pan heater error:
STEP1: Check the pan heater for an open circuit or shirt circuit. Unplug the connector from main control PCB. Test the resistance between the two pins of the pan heater connector. It should be 0.28-0.379KΩ. If out of range, change the pan heater. If normal go step 2.

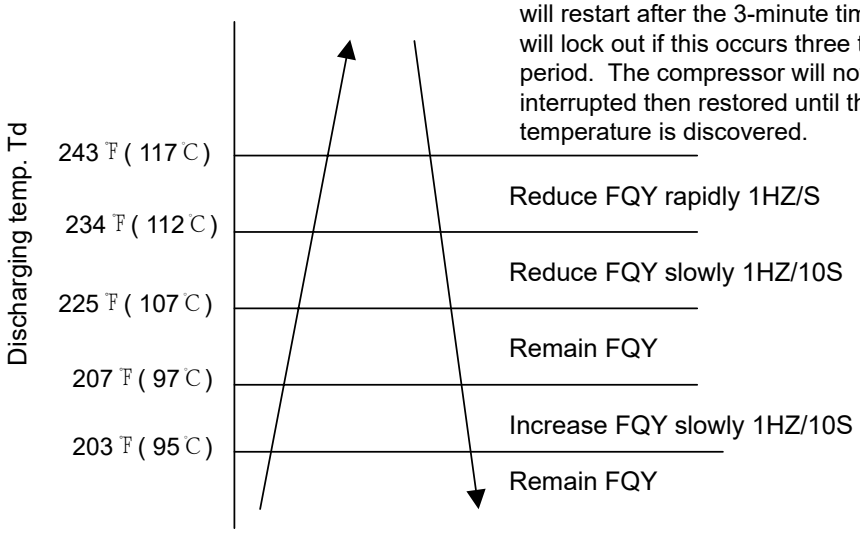
STEP 2: Check the main control board pan heater output port . Unplug the connector from main control PCB. Run the ODU with manually forced heating (Set the display board SW 1-1 as ON). Test the voltage between the two pins at CN4, it should be 208-230Vac.

Operating Parameters

Discharge Sensor Protection

If the discharge temperature is higher than normal, the compressor will slow down to lower the temperature.

Multi:

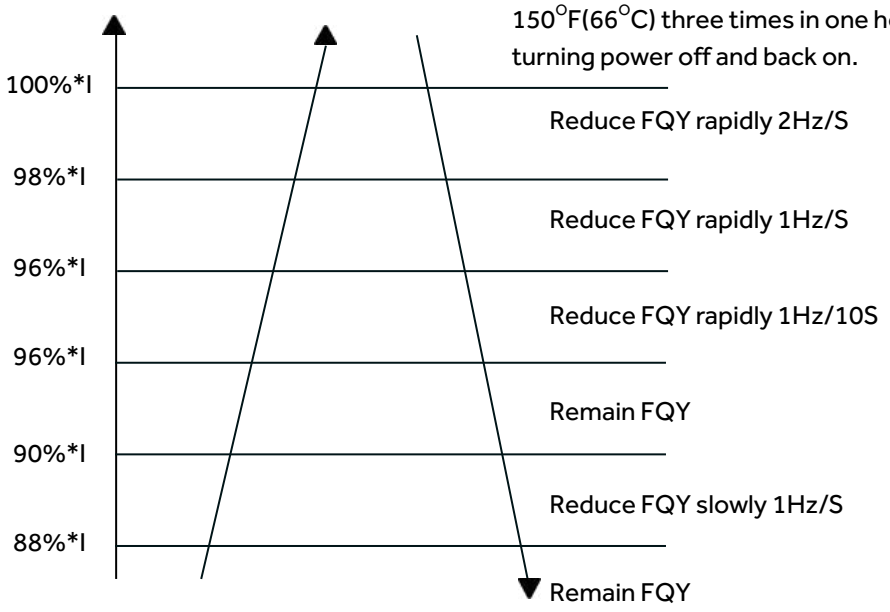


The compressor will shut off if the discharge temperature sensor reaches 243F for 10 seconds. The compressor will restart after the 3-minute time delay. The compressor will lock out if this occurs three times in a 60-minute period. The compressor will not restart until the power is interrupted then restored until the cause of the high temperature is discovered.

High Current Protection

The following table lists the outdoor unit and compressor current protection levels.

Model	MCA	MOP	CT
2U18MS2HDA ASH218JCDDA	19.0A	30A	15.5A
3U24MS2HDA ASH324JCDDA	22.0A	30A	15.5A
4U36MS2HDA ASH436JCDDA	26.0A	30A	15.5A
Note: The compressor current is for reference only, and the actual installation should reference the maximum current value.			

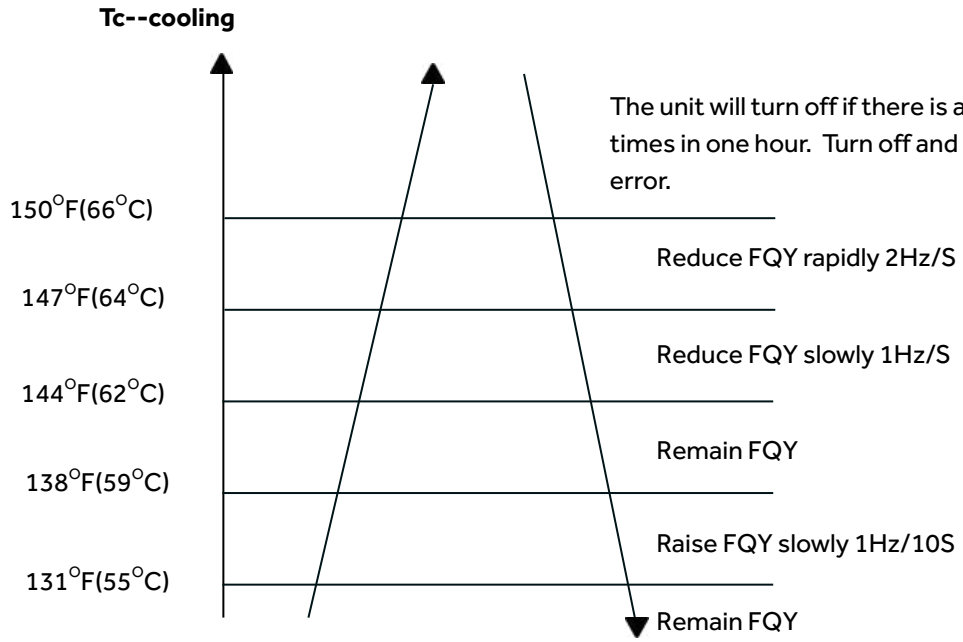


The system will lock out if the temperature reaches 150°F(66°C) three times in one hour. Reset by turning power off and back on.

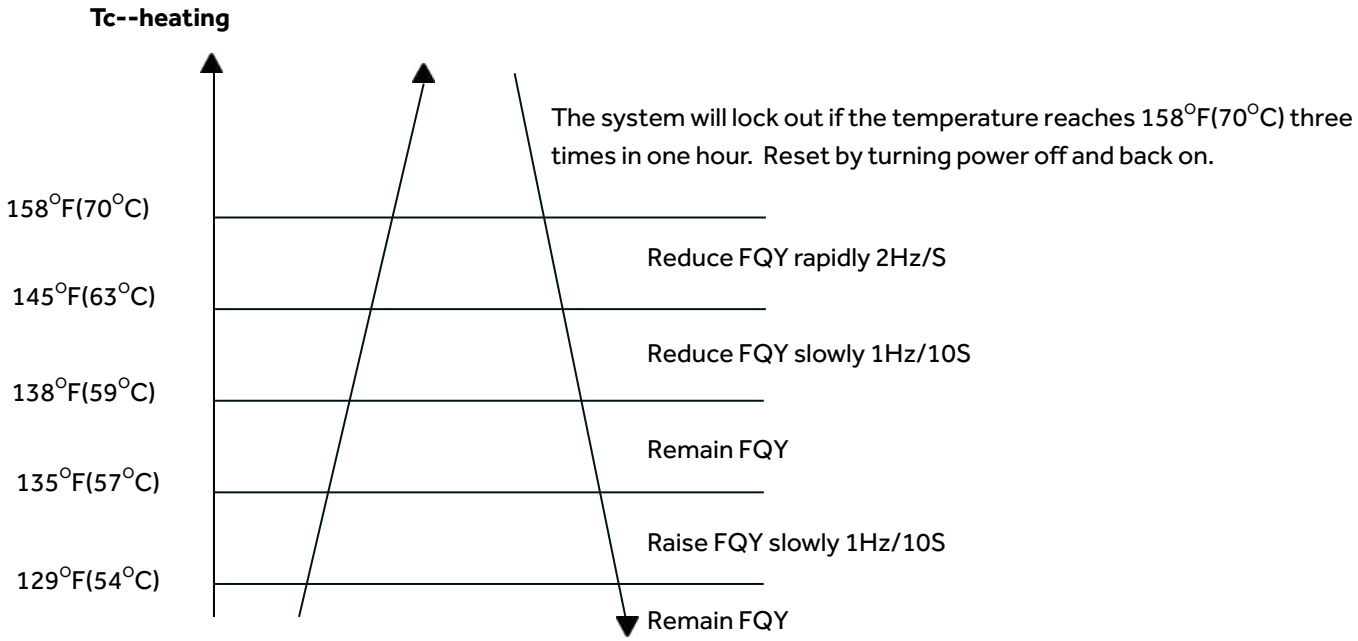
Operating Parameters

High Pressure Protection

High Pressure Protection in Cooling



High Pressure Protection In Heating



Operating Parameters

Low Pressure Protection

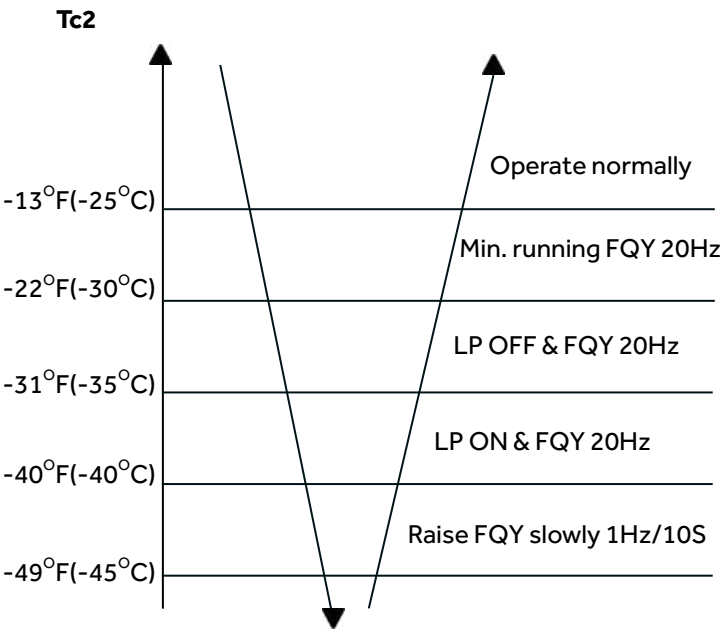
The compressor will stop running if the low pressure switch opens for one minute.
The compressor will lock out and a low pressure error code will be displayed at the indoor unit if this condition occurs 3 times in an hour. A low pressure error code will be displayed if the compressor is not running and the switch opens for 30 seconds.

The low pressure switch does not stop compressor operation or signal an error code during the following conditions:

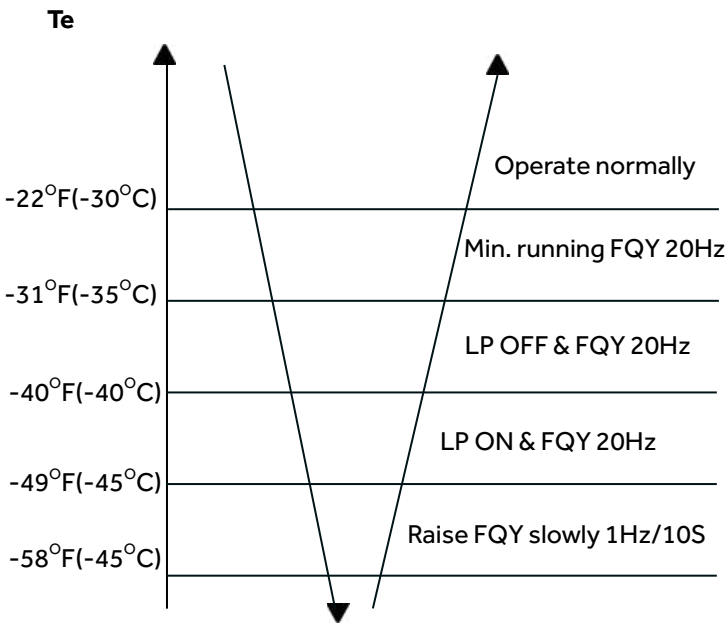
- The first 8 minutes of run time when the compressor starts a new cycle
- During defrost
- When the ambient temperature is below 32°F/0°C
- Following the termination of an oil return cycle

Low pressure protection is provided by the coil temperature sensors in both heating (Te) and cooling (Tc2) modes when any of the above 4 conditions are present.

Low Pressure Protection in Cooling Mode:



Low Pressure Protection in Heating Mode:



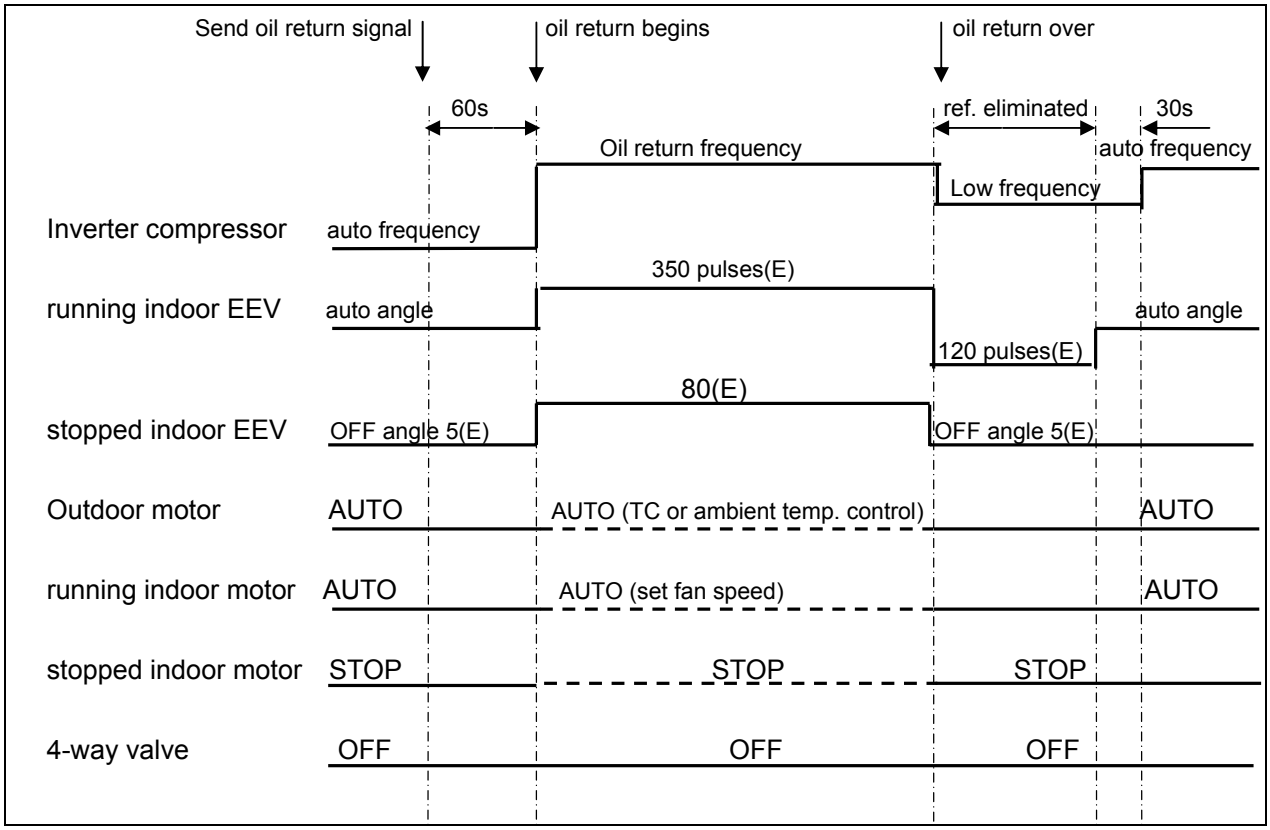
Oil Return Cycle

The system will enter the oil return cycle when the compressor is operating at low load conditions, or the operating frequency has been below 70Hz continuously for 4 hours. This will ensure that oil which may be trapped within the system at low loads will return to the compressor crankcase.

The oil return procedure initiates by automatically ramping up the compressor speed to at least 85Hz for a pre-set time, up to a 9-minute maximum if a 4-hour low speed run time has occurred. The higher speed will wick hiding oil into the now faster-moving refrigerant and deposit it in the compressor crankcase. The indoor fan shuts off to avoid occupant discomfort when the oil return cycle is active.

The oil return cycle timing will resume when the error code has been cleared when an error code results in a system shutdown.

Oil Return in Cooling Mode

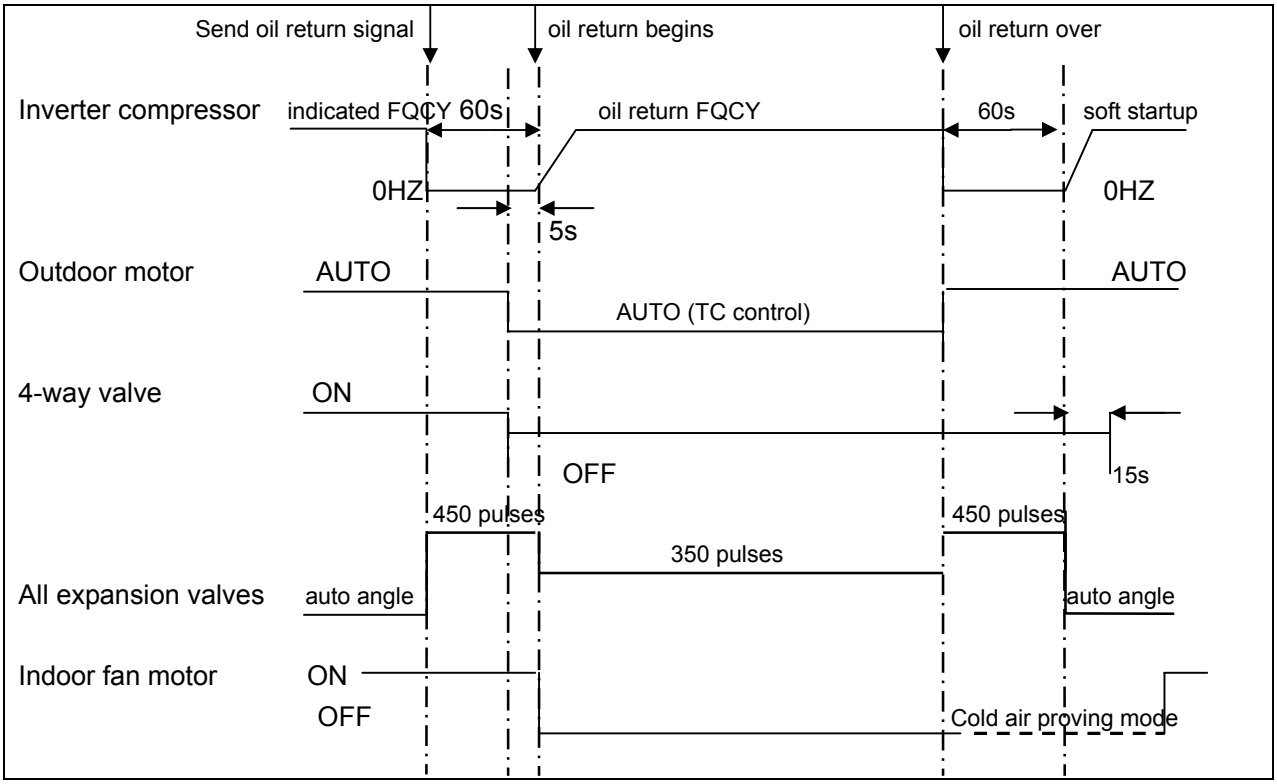


Oil Return Exit Conditions, Cooling:

OR
- & (1 minute later after oil return is over)
  - OR
    - Td - Tc＞86℉ (30 ℃)
    - Ts - Tc2AVE＞86℉ (30 ℃)
    - Tc2AVE＜-31℉ (-35 ℃)
- Max. 10 minutes

Oil Return in Heating Mode

Oil Return in Heating Mode



Oil Return Exit Conditions, Heating:

- OR
  - Max. 9 minutes (E)
  - OR
    - Td - Tc＜68℉(20℃) for 30s continuously(5 minutes later, begin to count)
    - Ts - Tc2AVE＜59℉(15℃) for 30s continuously(5 minutes later, begin to count)
  - &
  - Running for min. 5 minutes

Error Codes & Troubleshooting

Component Testing

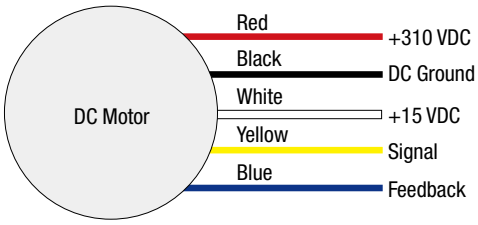
Outdoor Fan Motor

Check that the wiring and plug connections are in good condition.
Check the following voltages at connector CN11 on the outdoor unit PCB if the outdoor unit fan motor does not run, or the Service Monitor Board indicates an error code of 09. Set the meter to read DC volts with a minimum voltage range of 350 volts. All voltage values are approximate. Initiate forced cooling.

1. DC voltage between the Red and Black wires on the CN11 plug should read 310 ~ 334 VDC. This is the main voltage for powering the fan motor.
2. DC voltage between the White and Black wires on the CN11 plug should read 15VDC. This is the voltage for powering the electronic circuit of the fan motor.
3. DC voltage between the Yellow and Black wires on the CN11 plug should read 4VDC. The voltage will read 0VDC when the fan is not being called to operate. This is the control voltage for regulating the speed of the fan motor.
4. DC voltage between the Blue and Black wires on the CN11 plug should read 8VDC. The voltage will read 14VDC when the fan is not being called to operate. (This is the feedback voltage to the PCB for determining the speed of the fan motor)

PCB design may vary by model number

The feedback circuit is not functioning if the outdoor fan initially runs, increases speed then stops, and the Service Monitor Board indicates an error code of 09. Check that the wiring and plug connections are in good condition.

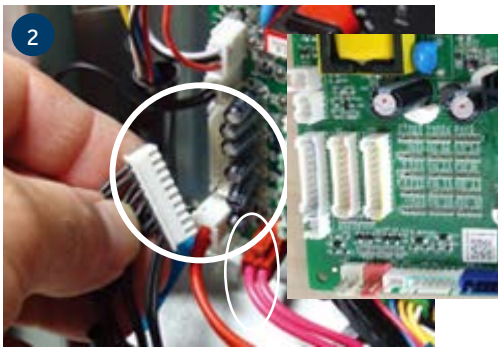


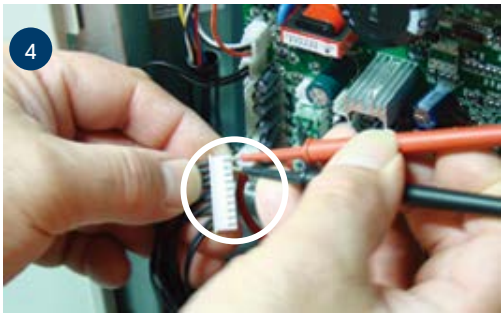
Temperature Sensor

The temperature sensors are negative coefficient thermistors in which resistance decreases as temperature rises. The PCB will generate an appropriate error code should the sensors fail.

To check the calibration of the sensors:

1. Shut off power to the outdoor unit.
2. Disconnect the sensor at the circuit board plug.
3. Measure the temperature of the air surrounding the sensor.
4. Measure the electrical resistance of the sensor using needle probes. Do not force standard probes into the sensor plug.
5. Compare the measured resistance of the sensor against the resistance/ temperature specifications (refer to Reference Information section for sensor tables).
6. Replace the sensor if the sensor resistance is outside of the specification tolerances shown on the resistance/temperature table.





PCB design may vary by model number

Component Testing

4-Way Valve

The 4-way valve will control the direction of hot gas discharge via an internal slide assembly. The valve has a line voltage solenoid that is energized in heat mode. The solenoid will direct the internal slide to send the hot gas to the indoor coil. During cooling mode de-energized operation, the internal slide will direct compressor hot gas to the outdoor coil.

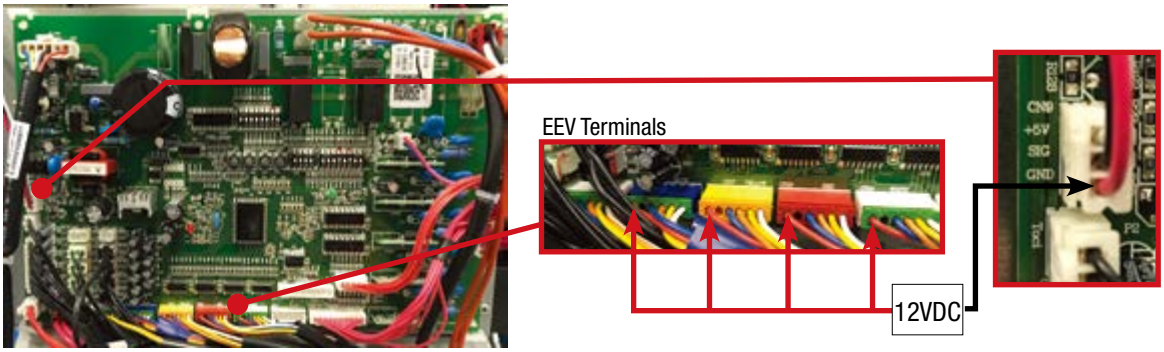
4-way valves may have a failure of the electrical solenoid that prevents the valve from shifting, or they may become stuck due to debris lodging inside the valve body. If the valve fails to direct the hot gas in the proper direction, temperature sensors within the outdoor unit will detect the problem and generate an error code.

Perform the following if the valve fails to shift the hot gas to the proper coil, or it only partially shifts:

1. Check for correct refrigerant charge, and that all other operating parameters have been met.
2. The solenoid will shift after a short time delay in the heating mode. Check for line voltage to the solenoid coil.
3. Shut the system down and unplug the 4-way valve from the PCB plug if the valve has voltage but fails to shift the hot gas to the indoor coil.
4. Use an ohmmeter to check continuity through the solenoid coil. If the coil resistance does not match the chart in this manual, or if a winding shows open or shorted, the solenoid coil must be replaced.
5. Use a magnet along the valve body to determine the location of the piston if the coil resistance is within the tolerance. It is stuck and the valve must be replaced if one end of the piston is against the end of the valve body.
6. Partial shifting of the valve can be detected by measuring the temperature of the suction gas where it enters the reversing valve and then comparing that temperature to the temperature of the suction gas exiting the 4-way valve. There should be no more than 3F difference. Excessive temperature rise through the suction gas path is an indication of a stuck piston. The valve will require replacement if the piston will not become free by switching from heating to cooling several times, a slight tapping on the valve body, or by using a powerful magnet.

Electronic Expansion Valve (EEV)

1. Check to see if the Electronic expansion valve (EEV) connector is correctly and firmly inserted in the PCB.
2. Cycle the power off, then back on
3. Check to see whether the EEV produces a repositioning sound. This sound will start after approx 2 min. Disconnect the connector and check the resistance (refer to resistance tables on following page) if the EEV doesn't make the repositioning sound.
4. The PCB may be at fault if the resistance is OK.



PCB design may vary by model number

2U18MS2HDA / ASH218JCDDA
3U24MS2HDA / ASH324JCDDA

EEV (6-pin, 5 wire)

	White	Yellow	Orange	Blue	X	Red
White	-	92 Ω	92 Ω	92 Ω	-	46 Ω
Yellow	-	-	92 Ω	92 Ω	-	46 Ω
Orange	-	-	-	92 Ω	-	46 Ω
Blue	-	-	-	-	-	46 Ω
X	-	-	-	-	-	-
Red	-	-	-	-	-	-

EEV (6-pin, 6 wire)

	White	Yellow	Orange	Blue	Brown	Red
White	-	OL	92 Ω	OL	46 Ω	OL
Yellow	-	-	OL	92 Ω	OL	46 Ω
Orange	-	-	-	OL	46 Ω	OL
Blue	-	-	-	-	OL	46 Ω
Brown	-	-	-	-	-	OL
Red	-	-	-	-	-	-

4U36MS2HDA / ASH436JCDDA

EEV (6-pin, 5 wire)

	White	Yellow	Orange	Blue	X	Red
White	-	46 Ω	46 Ω	46 Ω	-	46 Ω
Yellow	-	-	46 Ω	46 Ω	-	46 Ω
Orange	-	-	-	46 Ω	-	46 Ω
Blue	-	-	-	-	-	46 Ω
X	-	-	-	-	-	-
Red	-	-	-	-	-	-

EEV (6-pin, 6 wire)

	White	Yellow	Orange	Blue	Brown	Red
White	-	OL	46 Ω	OL	46 Ω	OL
Yellow	-	-	OL	46 Ω	OL	46 Ω
Orange	-	-	-	OL	46 Ω	OL
Blue	-	-	-	-	OL	46 Ω
Brown	-	-	-	-	-	OL
Red	-	-	-	-	-	-

Error Codes

Error Code	Diagnosis
1	Outdoor PCB EEPROM fault
2	IPM fault
4	Communication failure between IPM and PCB
5	Compressor overload protection
6	Unreliable power input
8	Compressor discharge temperature too high
9	Outdoor fan motor fault
10	Defrost sensor fault
11	Compressor suction temperature sensor fault
12	Outdoor ambient temperature sensor fault
13	Compressor discharge temperature sensor fault
15	Communication fault between indoor and outdoor unit
16	Lack of refrigerant
17	4-way valve switching failure
18	Compressor out of synchronism
20	Indoor thermal overload
21	Indoor coil frosted
23	IPM temperature too high
24	Compressor start failure
25	IPM current too high
26	PCB reset
27	IPM current detect circuit malfunction
28	Indoor unit A liquid pipe temperature sensor malfunction
29	Indoor unit B liquid pipe temperature sensor malfunction
30	Indoor unit C liquid pipe temperature sensor malfunction
31	Indoor unit D liquid pipe temperature sensor malfunction
32	Indoor unit A gas pipe temperature sensor malfunction
33	Indoor unit B gas pipe temperature sensor malfunction
34	Indoor unit C gas pipe temperature sensor malfunction
35	Indoor unit D gas pipe temperature sensor malfunction
36	Indoor unit E gas pipe temperature sensor malfunction
38	IPM temperature sensor fault/momentary power failure detected
39	Condensing temperature sensor malfunction
40	Indoor unit E liquid pipe temperature sensor malfunction
41	'Toci' temperature sensor malfunction
42	High pressure switch open
43	Low pressure switch open
44	High pressure detected in system
45	Low pressure detected in system
Lo	Ambient sensor low temperature detection

Precautions For Adding Refrigerant

1. This system must use refrigerant R410A.
2. Add refrigerant 0.2 oz/ft when the total piping length exceeds the total pipe length of factory charge, but make sure that the total liquid piping length is less than the max value.

Outdoor Unit	Std. Value	Max Value
2U18MS2HDA ASH218JCDDA	50 ft.	98 ft.
3U24MS2HDA ASH324JCDDA	75 ft.	197 ft.
4U36MS2HDA ASH436JCDDA	131 ft.	230 ft.

Notes:

1. No addressing is necessary. All indoor wiring connections must match the outdoor connections, or a communication failure will result.
2. Set SW5-8 to ON for Quiet Operation if desired. Maximum capacity may be slightly reduced.
3. Do not change any switch settings unless directed to do so.

* PCB: Printed Circuit Board
* IPM: Inverter Power Module
* EEV: Electronic Expansion Valve

Outdoor Unit Error Codes

Error codes are displayed on the service monitor board, the PCB LED-1 and the indoor display panel.

Temperature Sensor Error Codes

The easiest problems to solve will involve codes that are related to potential failure of temperature sensors. Common problems may include loose connections, open or shorted, and out of calibration. Checking the condition of the sensors requires a temperature probe and an ohmmeter.

The Reference Section of this manual contains temperature resistance tables that can be used to check the calibration of the sensors. The measured resistance must be within the tolerances located in the tables.

There are 16 potential Error Codes that can be generated by the PCB to indicate a failure of an outdoor unit temperature sensor.

Error Code 10

This code indicates an electrical failure of the sensor that is used to sense the temperature of the outdoor coil during defrost. This sensor is connected to the PCB via a connection at Plug CN-14.

Error Code 11

This code indicates an electrical failure of the sensor that is used to sense the temperature of the suction gas that enters the compressor. The sensor is connected to the PCB via two wires at Plug CN-14.

Error Code 12

This code indicates an electrical failure of the sensor that is used to sense the temperature of the outdoor air. The sensor is connected to the PCB via two wires at Plug CN-14.

Error Code 13

This code indicates an electrical failure of the sensor that is used to sense the temperature of the compressor hot gas discharge line. The sensor is connected to the PCB via two wires at Plug CN-14.

Error Code 28-36

These codes indicate a failure of either a Liquid or Gas Temperature Sensor that is part of either the A, B, C, or D indoor unit EEV circuit. Refer to the outdoor unit Error Code Decal for specific identification of the malfunctioning temperature sensor. These sensors connect to the PCB at connection plugs near the center of the circuit board. (Note that if the sensor has failed, and there is an unused port on the unit available, the sensor from the unused port can be used to temporarily fix the problem.)

Error Code 38

This code indicates a potential failure of the IPM temperature sensor. This sensor connects to the IPM via Plug CN-8. This sensor is mounted near the heat sink.

Error Code 39

This code indicates an electrical failure of the sensor that is used to sense the condensing temperature of the outdoor coil. The sensor is connected to the PCB via two wires at Plug CN-14.

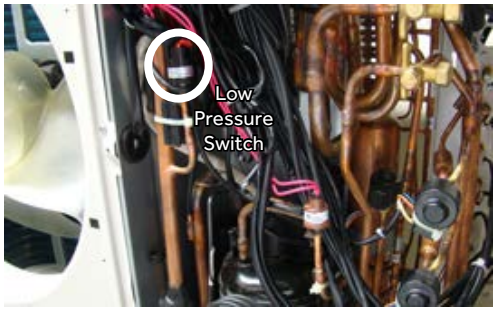
Error Code 41

This code indicates an electrical failure of the 'Toci' sensor, which ensures there is no drop in hot gas temperature through the 4-way valve. The sensor is connected to the PCB via two wires at Plug CN-7.

Outdoor Unit Error Codes

Pressure-Related Error Codes

To protect the compressor, the PCB has a low pressure switch connection at CN13, and a high pressure switch connection at CN12.



Error Code 42 & 43

The low pressure switch will generate an Error Code 43 if open. An open high pressure switch will show an Error Code 42.

Testing Procedure

Check the continuity of the switch to ensure it is not open or shorted If the system generates either of these two codes. High or low pressures are usually related to dirt in the coils, dirt in the air filter, or incorrect refrigerant charge.

There are no pressure ports that can be accessed to measure low pressure in heat mode nor high pressure in cool mode. If the system trips on one of these errors, it will be necessary to remove the refrigerant and re-charge to confirm low or high charge is not causing the problem.

Error Code 44

The system is operating at excessive refrigerant pressure. It is likely that the charge is too high if the system is a new installation. Note the weigh-in method is the ONLY way to charge this system.

Typical Causes of High Pressure in Cooling Mode:
- Overcharge
- Dirty outdoor coil
- Restriction

Typical Causes of High Pressure in Heating Mode:
- Overcharge
- Undersized refrigerant lines or excessive length
- Restriction

Note: Replace the defective pressure switch if the refrigerant pressures are correct, yet the system does not close the error reporting pressure switch.

Error Code 45

This code is indicating that system pressure is too low.

Typical Causes of Low Pressure in Cooling Mode:
- Lack of charge
- Low Heat on Indoor coil
- Restrictions, air flow, or dirt
- Low indoor load

Typical Causes of Low Pressure in Heating Mode:
- Cold outdoor air
- Lack of charge
- Restriction

Communication Error Code

Error Code 15

Data travels between the units on the terminal block connections 3/C and 1. A correct connection for each unit is indicated by a solid green LED on the Service Monitor Board. If an LED is flashing or not on, make sure the 14/4 stranded copper communication cable connections are tight and on the correct terminals. Additionally, ensure there are no splices in the 3/C wire, and that the PCB connections at CN21 are in good order. An incomplete or inadequate ground can easily be an issue.

Outdoor Unit Error Codes

Error Codes Caused by Abnormal Refrigerant Circuit Conditions

Error Code 8

This code indicates the temperature of the compressor hot gas is too high. This error occurs after the PCB has attempted to correct high temperature by reducing the compressor speed, adjusting the fan speed, or opening the EEV. Causes of this type of condition are typically a lack of refrigerant in the system, excessive heat in the conditioned space, or a restriction in the refrigeration circuit.

Error Code 16

This error code indicates the system may lack refrigerant. Recover and check the system charge.

Outdoor Error Code Related to Indoor Unit

Error Code 21

This code indicates the indoor coil has frosted. This condition can be due to a lack of heat in the conditioned space, operating the indoor unit at excessively cold air temperature, a blockage of air flow to the indoor unit, or an issue with the indoor fan motor. This condition will cause the system to enter an anti-freezing cycle.

Error Code Related to the PCB

Error Code 1

The EEPROM of the PCB cannot read or write data. Replace the PCB.

Error Codes Related to the IPM

Error Code 2

The IPM has either failed or has detected excessive current. Before replacing the IPM, check these potential causes of high current:

- Overcharge
- Dirty outdoor coil
- Hot conditioned space
- High temperature or excessive load
- Refrigeration circuit restriction
- Seized compressor
- Faulty wiring or wiring connections

Error Code 4

This code indicates the IPM is not communicating with the PCB. Check the wiring and the connections CN9 on the PCB and CN15 on the IPM. If the connections are good, yet the boards do not communicate and the code will not clear, check for correct voltage at the IPM CN15 connection. If the communication voltage is correct and the high voltage input is present, replace the IPM. If the communication voltage is not correct, replace the PCB.

Error Code 5

The IPM is protecting the compressor from overload, which can be caused by low building power supply, restrictions, a non-condensible in the system, a plugged coil, an excessive load, or a refrigerant overcharge.

Error Code 6

This code indicates the operating voltage of the system is either too high or too low. Check line voltage for proper limits. The line voltage supplied to the outdoor unit should be no lower than 187VAC when the compressor starts. The running voltage should be no lower than 197VAC. The incoming line voltage to the outdoor unit should never be higher than 253VAC. Check the supply voltage circuit from the building for correct wire size and good connections if improper voltage is present. Contact the power company to have the service corrected if the voltage is still outside operating limits.

Check the output voltage of the Power Filter if the line voltage from the power company is correct. This voltage connects to the IPM at terminals ACL and ACN. Replace the PFB if the voltage is not within specifications shown above.

Error Code 18

There is a loss of synchronization among the U, V, and W compressor windings during frequency changes as they slow down or speed up the compressor.

Possible causes include:

- Unstable power supply
- Internal compressor fault
- IPM fault
- Compressor terminal wiring incorrect
- Poor wiring condition
- Loose compressor wiring connection

Outdoor Unit Error Codes

Error Code 23

This code indicates an IPM thermal overload. This error was generated by a temperature sensor located in the IPM heat sink. Causes of overheating are typically overcharge of refrigerant, excessively plugged coil, sensor open or shorted, or a non-condensable in system.

Error Code 26

Module reset indicates possible PCB power anomalies. This usually occurs when low line voltage conditions are present.

Error Code 27

The IPM has detected that the compressor current is too high.

Possible Causes:
- Overcharge
- Dirty outdoor coil
- Hot conditioned space temperature or high load
- Refrigeration circuit restriction
- Seized compressor
- Defective IPM

Error Codes Related to Compressor, Outdoor Fan & 4-Way Valve

Error Code 9

This code indicates the outdoor fan motor is not running. The fault is detected very quickly by the PCB. The system will shut off and display this error code. If this error occurs, refer to the outdoor fan motor test procedure.

Error Code 17

This error code indicates that the 4-way valve is not directing hot gas to the proper coil. Refer to the 4-way valve testing procedure.

Error Code 24

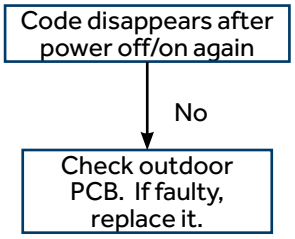
This error code indicates the compressor failed to start when a call for operation occurred. Refer to the compressor testing procedure.

Troubleshooting

[1] Outdoor EEPROM malfunction

EEPROM communication error; EEPROM data check error (model ID, checksum, etc.); EEPROM data logic error (wider data range, wrong order, etc.)

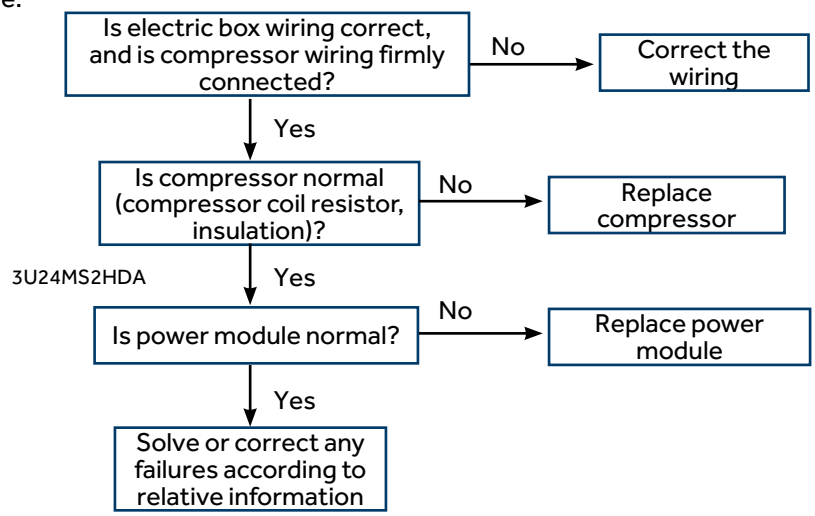
Possible causes:
- EEPROM is bad
- Loose EEPROM wiring



[2] Outdoor IPM over current or short circuit

Input over current detected by PIM's hardware.

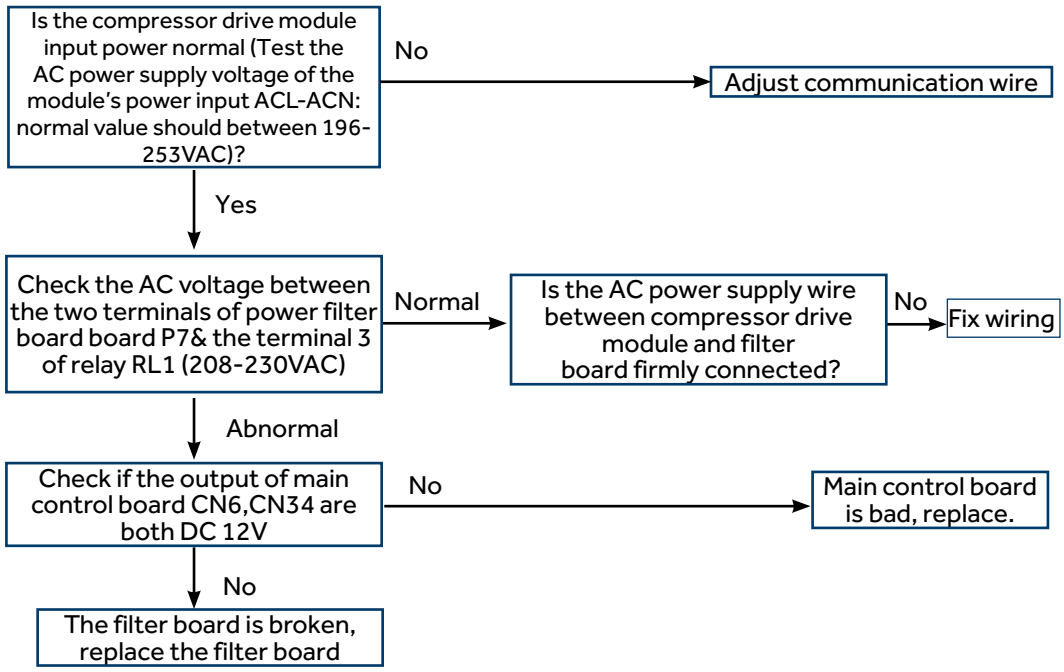
Possible causes:
- The IPM is bad
- Loose compressor wire
- The compressor is bad



[4] Communication abnormal between PCB and IPM

Control board can not communicate with the compressor driver module for over 4 minutes

Possible causes:
- The communication wire is bad
- The PCB is bad
- The power module is bad



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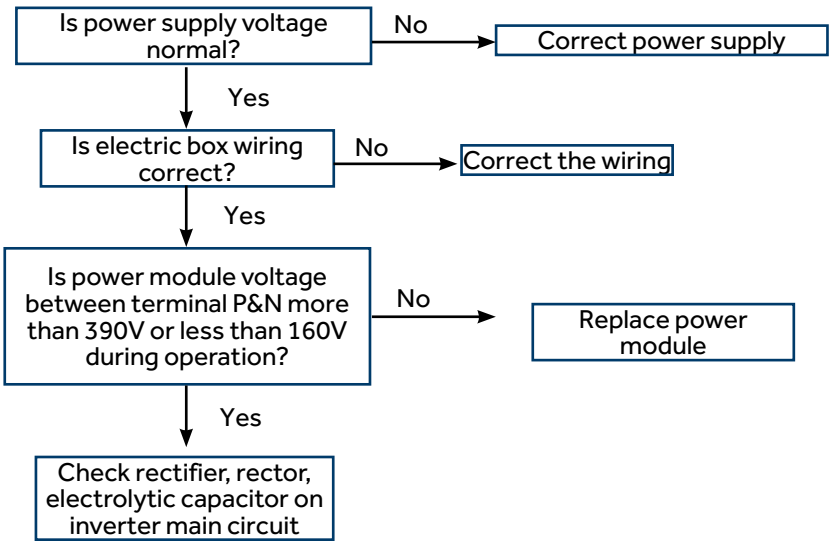
[6] DC voltage or AC voltage high

Driver module AC power supply voltage over 280VAC, or driver module DC-BUS voltage over 390VDC.

Possible causes:
- The power supply is abnormal
- Incorrect wiring
- Power module is bad

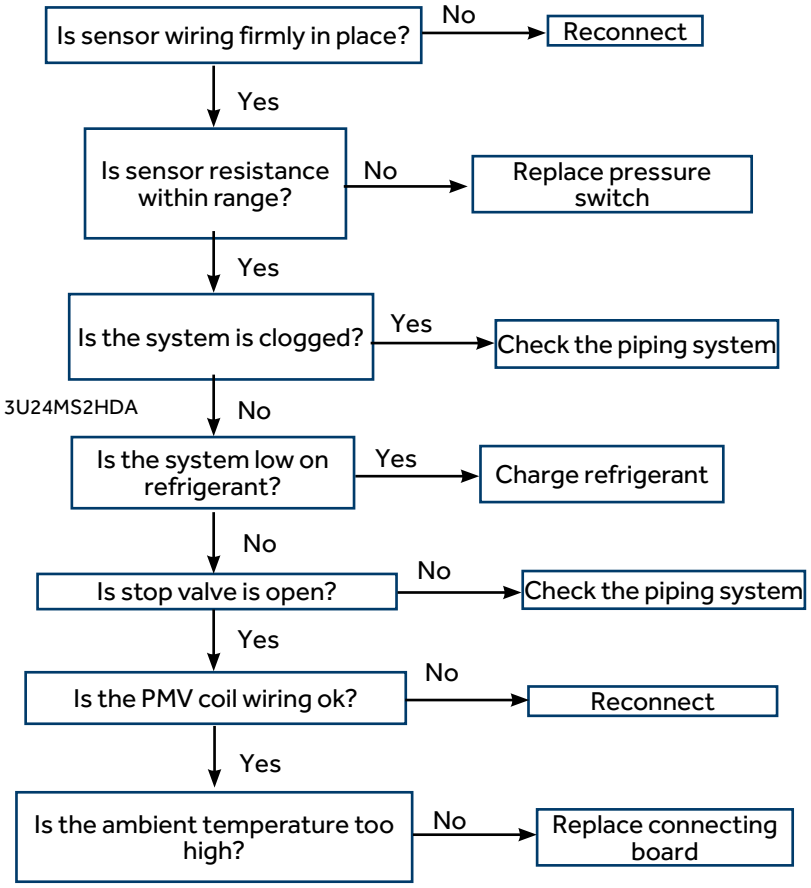


Troubleshooting

[8] Discharge temperature too high protection

Compressor discharge temperature over 115°C. Error clears within 3 minutes if temperature lowers below 115°C. Error status lock if it occurs 3 times in 1 hour.

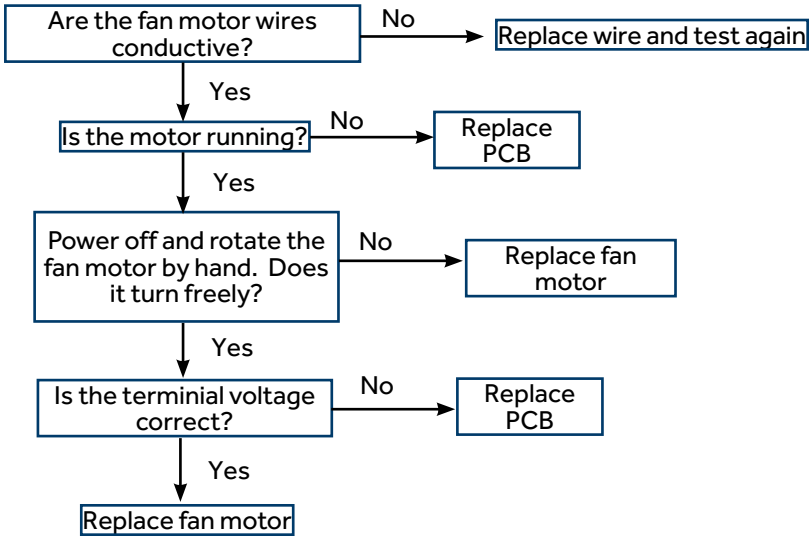
Possible causes:
- The sensor is bad or fixed bad
- The system is clogged
- The system lack of refrigerant
- The valve opening is wrong



[9] DC fan motor fault

DC fan motor damaged, not connected, or related circuit broken. Error status confirms and locks if occurs 3 times within 30 minutes.

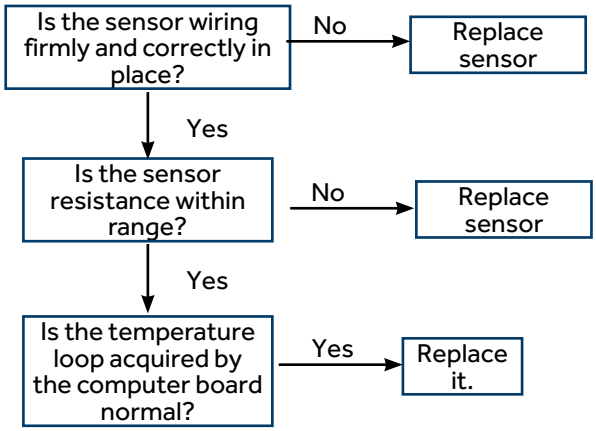
Possible causes:
- Loose motor wiring
- The motor is bad
- The PCB is bad



[10] Outdoor defrosting temperature sensor Te abnormal
[11] Suction temperature sensor Ts abnormal
[12] Outdoor ambient temperature sensor Ta abnormal
[13] Discharging temperature sensor Td abnormal

Sensor temperature has been detected below or higher than expected, or has been detected as a shorted or open circuit
(for expected temperature, refer to part failure code)

Possible causes:
- Bad sensor connection
- The sensor is bad
- Sensor resistance drift
- The temperature acquired by PCB is not accurate



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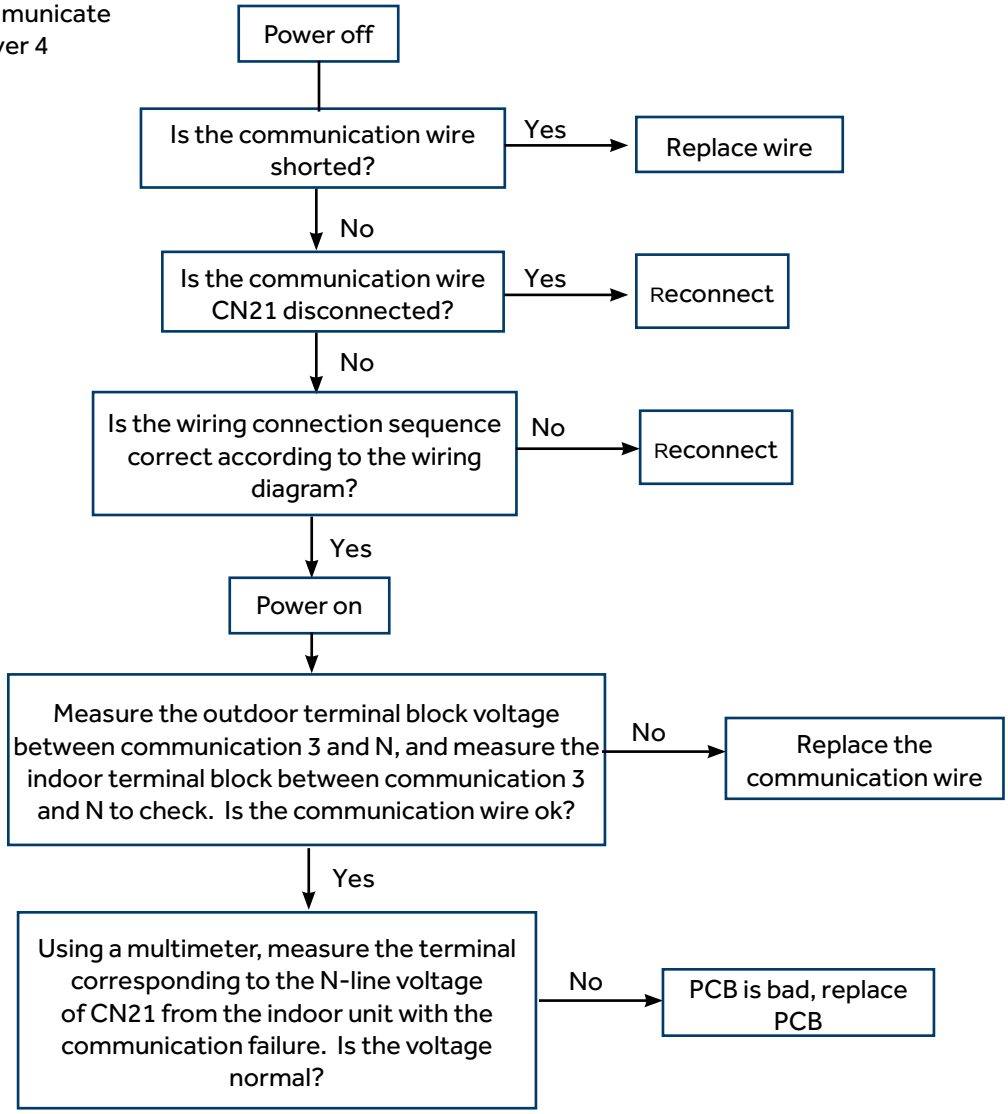
[15] Communication abnormal between indoor unit and outdoor unit

Outdoor unit control board cannot communicate with the indoor unit control board for over 4 minutes.

Possible causes:
- Bad communication wiring
- The PCB is bad

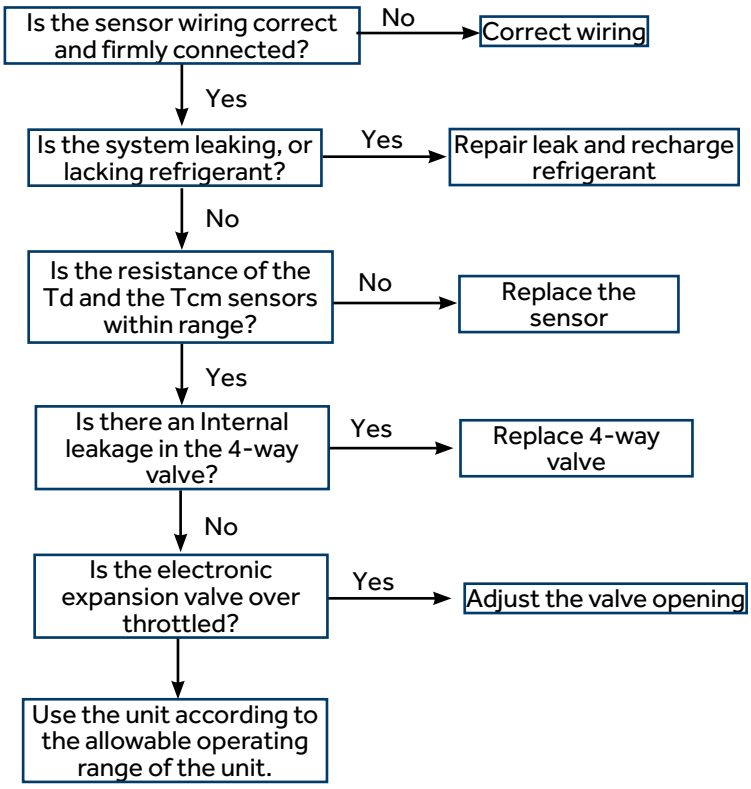


Troubleshooting

[16] Lack of refrigerant or discharging pipe blocked

Discharge & suction temperature Td-Ts≥80°C 10 minutes after compressor start. Error status locks if it occurs 3 times in 1 hour.

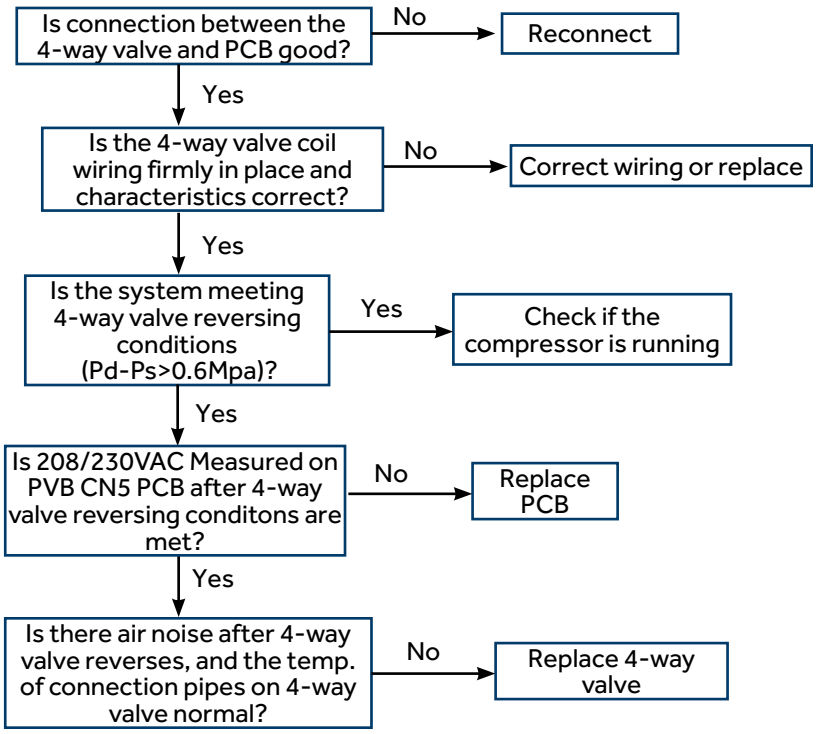
Possible causes:
- Wrong sensor connection
- Lack of refrigerant
- The senor is bad
- The 4-way valve is bad
- The electronic expansion valve is bad
- Out of the operating range



[17] 4-way valve reversing failure

Indoor pipe & indoor ambient temperature Tm-Tai≥5°C 10 minutes after compressor started. Error status locks if it occurs 3 times in 1 hour.

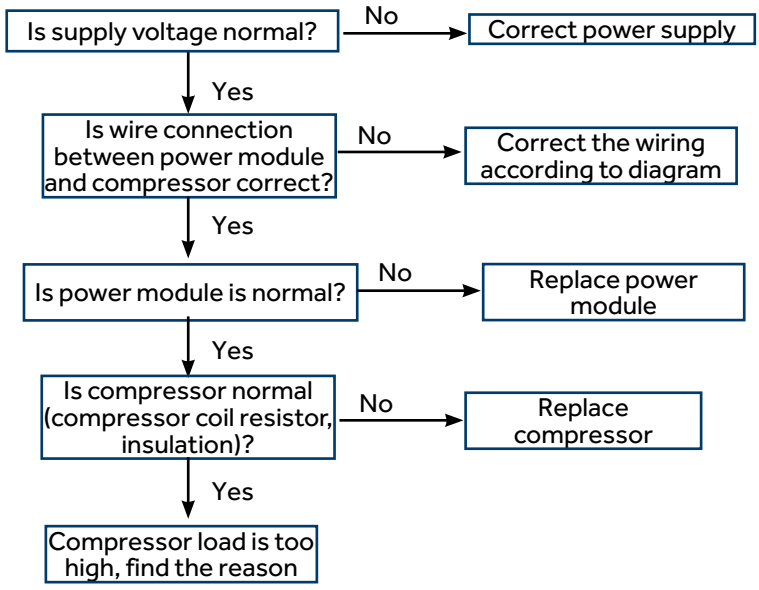
Possible causes:
- The 4-way valve is bad
- The PCB is bad
- The 4-way valve coil connection is bad
- The system pressure difference is too small.



[18] Compressor motor desynchronizing

Motor desynchronizing occurred. Caused by overload, load sharply fluctuating, abnormal compressor current sensor circuit, or one of the inverter gate drive signals is missing.

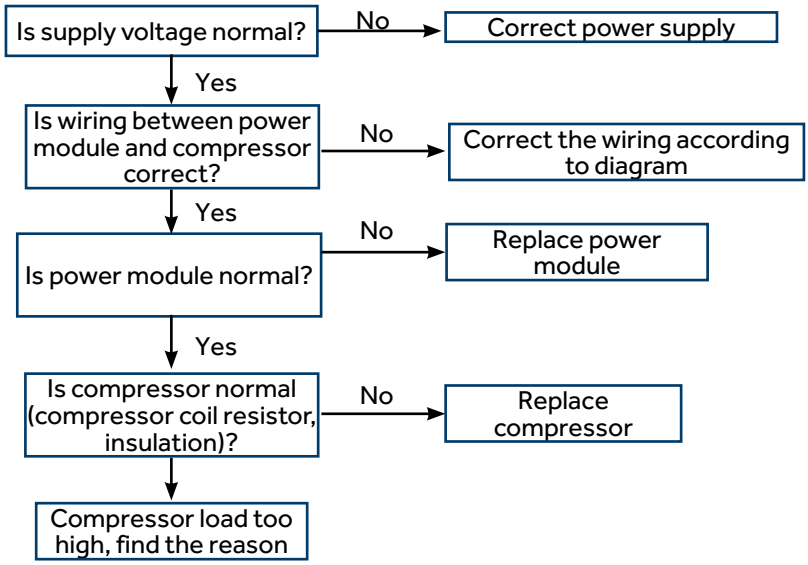
Possible causes:
- The power supply is abnormal
- Incorrect compressor wiring
- The power module is bad
- The compressor is bad
- The system is overload



[24] Compressor startup failure

Compressor start failure has been detected by driver module.

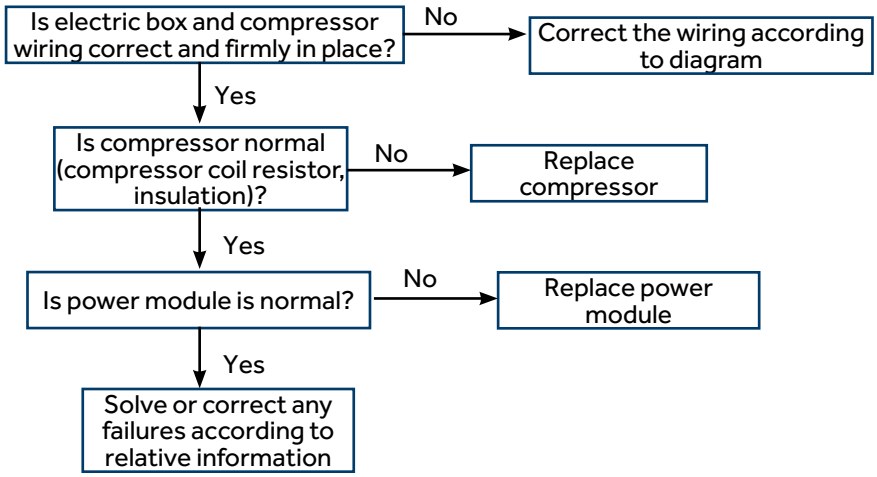
Possible causes:
- The power supply is abnormal
- Incorrect compressor wiring
- The power module is bad
- The compressor is bad
- System overload



[25] Input overcurrent of the drive module

Compressor drive module input current higher than 32A (double fan model), or 27A (single fan). Locks if it occurs 3 times in 1 hour.

Possible causes:
- Incorrect compressor wiring
- The power module is bad
- The compressor is bad

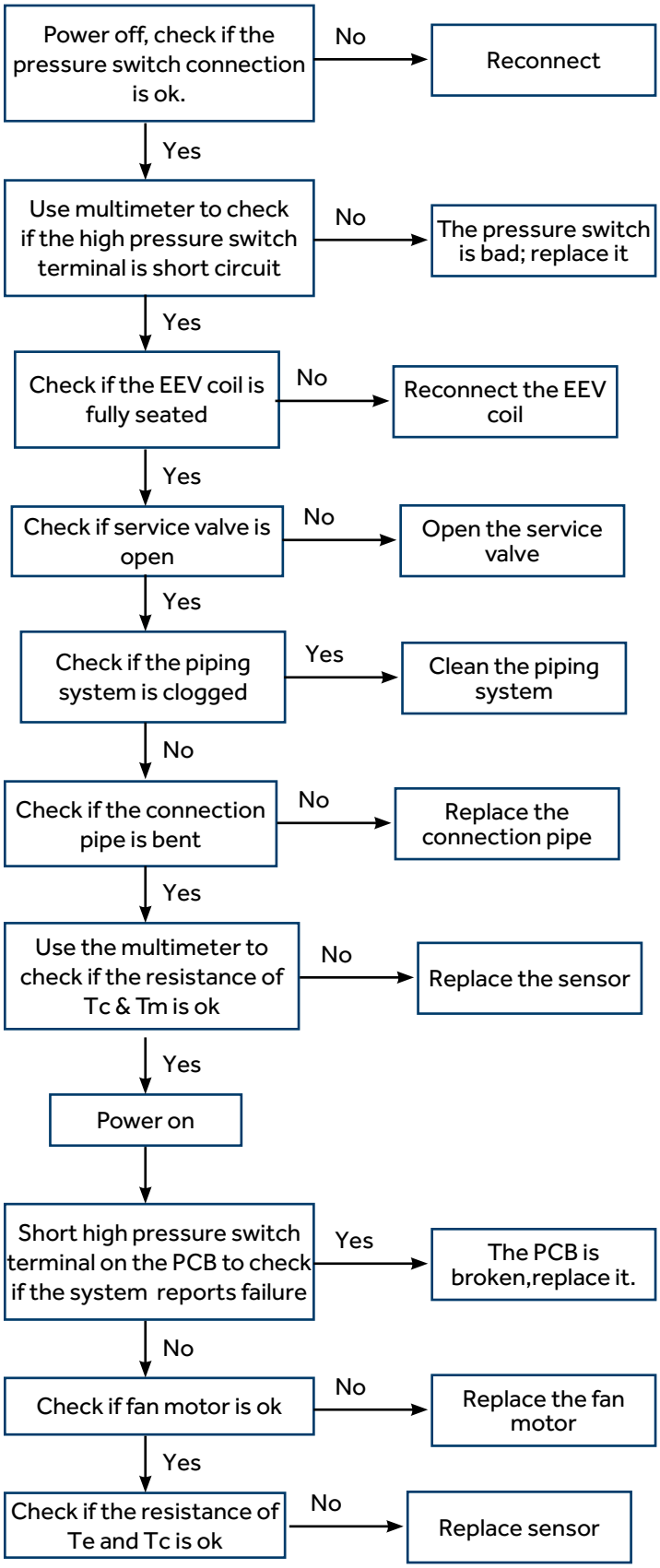


[42] Open high pressure switch

High pressure switch: Switch circuit has been detected open for 30 seconds (after 3 minute of compressor run time). Error locks if it occurs 3 times in 1 hour.

Possible causes:

- Incorrect pressure switch wiring
- Abnormal system pressure
- System is clogged
- Incorrect refrigerant charge
- Bad valve
- Pressure switch is bad
- PCB is bad

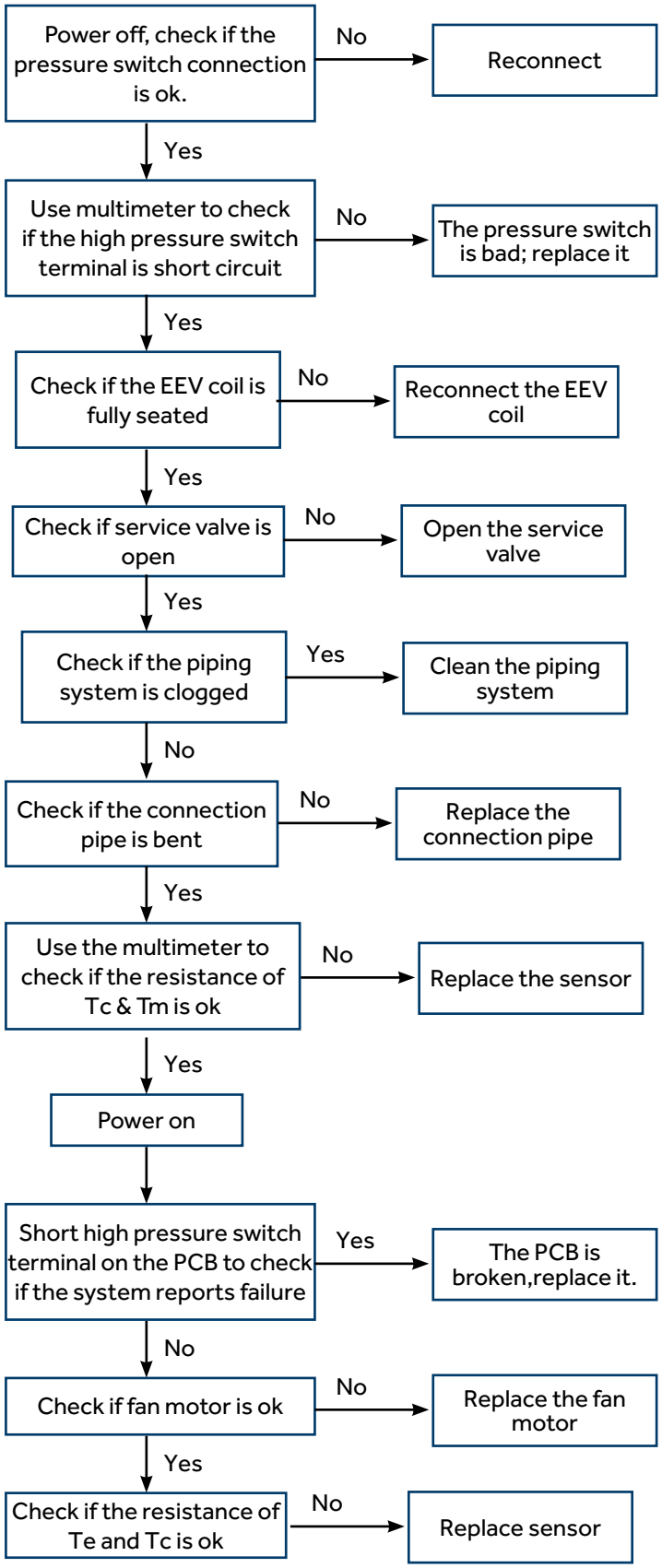


[43] Open low pressure switch

Low pressure switch: Switch has been detected open for 60 seconds (after 3 minute of compressor run time) or open for 30 seconds during standby.

Possible causes:

- Incorrect pressure switch wiring
- Abnormal system pressure
- System is clogged
- Incorrect refrigerant charge
- Bad valve
- Pressure switch is bad
- PCB is bad

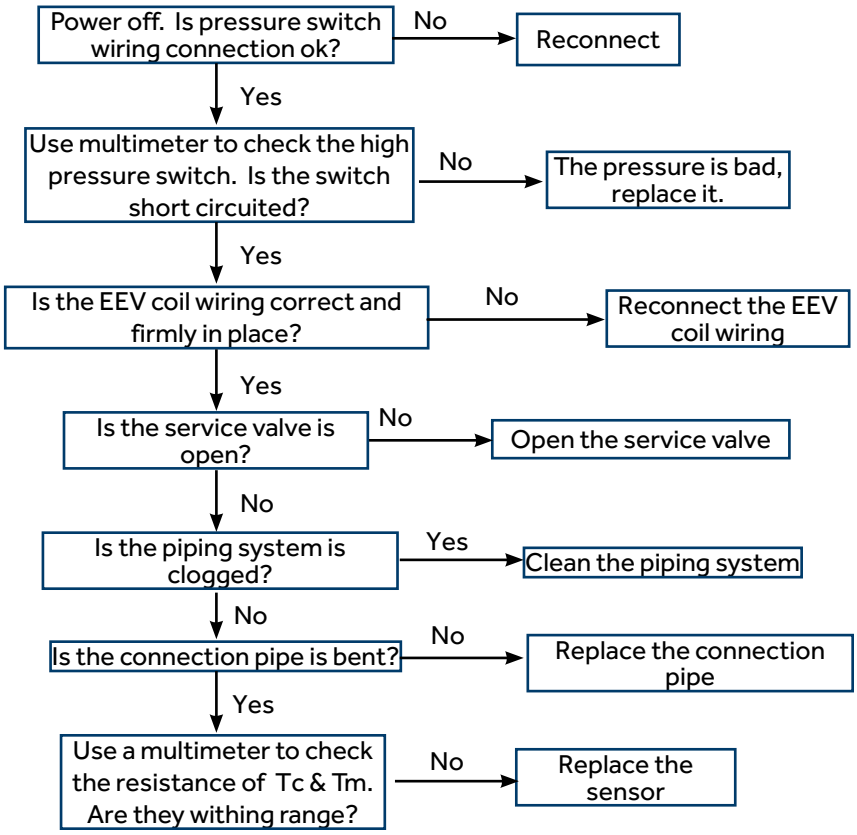


Troubleshooting

[44] High pressure detected in system

The minimum temperature value of indoor pipe Tm and outdoor Ts is lower than -45 °C during cooling mode, or minimum temperature value of outdoor Tc and outdoor Te is lower than -45 °C.

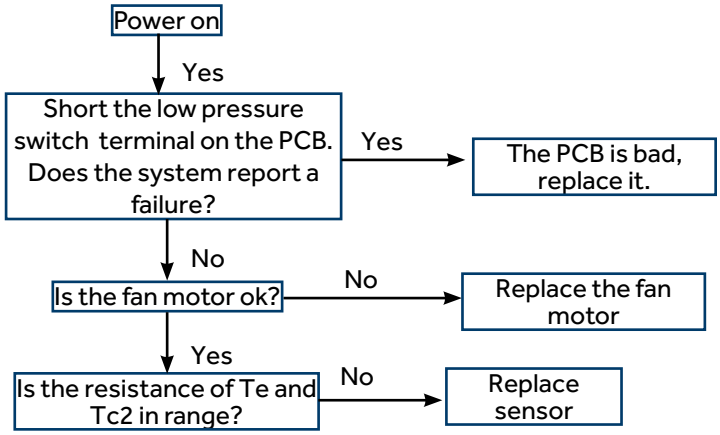
Possible causes:
- High pressure sensor detection value is incorrect
- Refrigerant overcharge
- Blocked liquid line piping
- The outdoor unit cannot be turned on normally due to failure to open outdoor heat exchanger electronic expansion valve when heating.
- The operation environment is beyond the allowed range.



[45] Low pressure detected in system

The minimum temperature value of indoor pipe Tm and outdoor Ts is lower than -45 °C during cooling mode, or minimum temperature value of outdoor Tc and outdoor Te is lower than -45 °C.

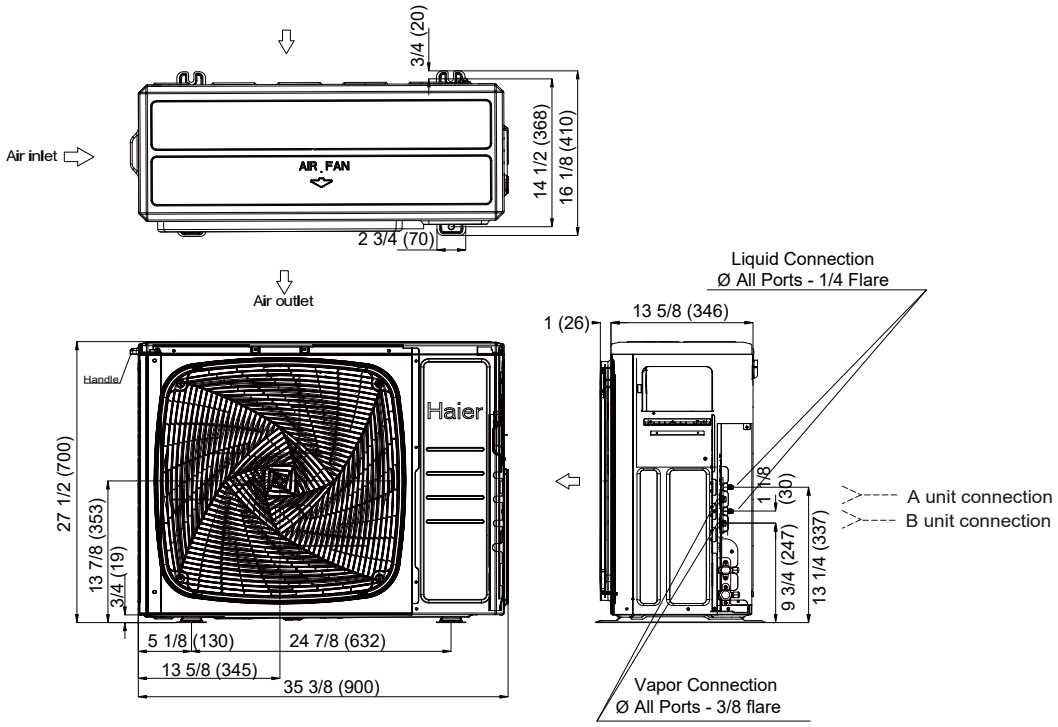
Possible causes:
- Low pressure sensor detection value is incorrect
- Low refrigerant charge
- System air leakage
- Blocked low pressure or liquid line piping
- The outdoor unit cannot be turned on normally due to failure to open outdoor heat exchanger electronic expansion valve when heating.
- The operation environment is beyond the allowed range.



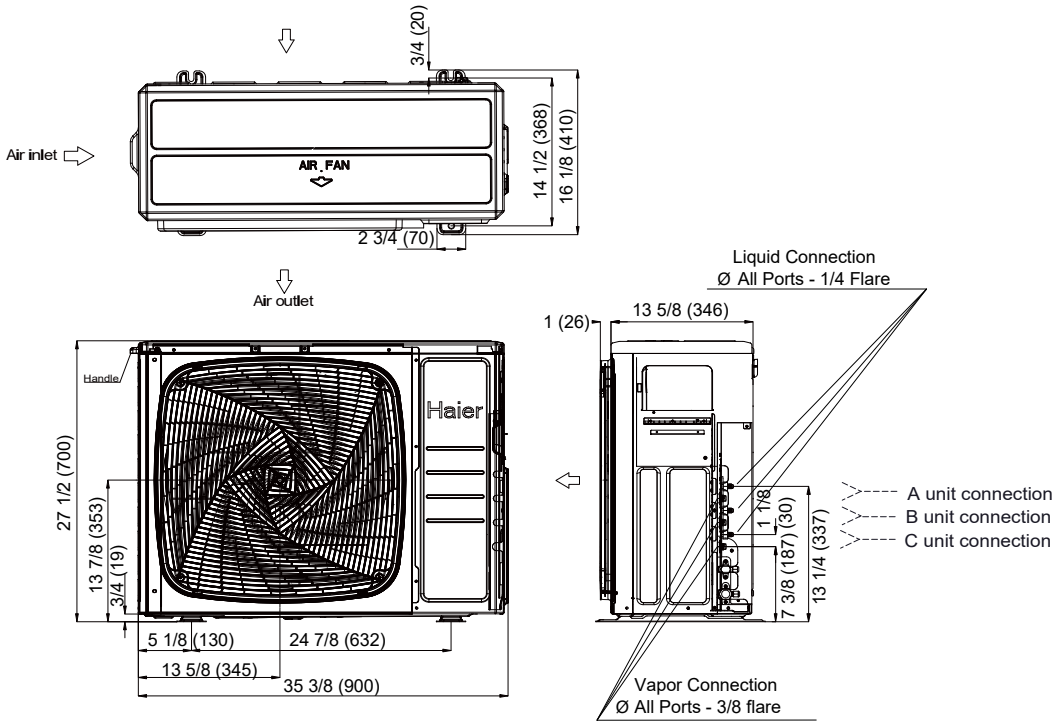
Reference Information

Dimensions

2U18MS2HDA
ASH218JCDDA

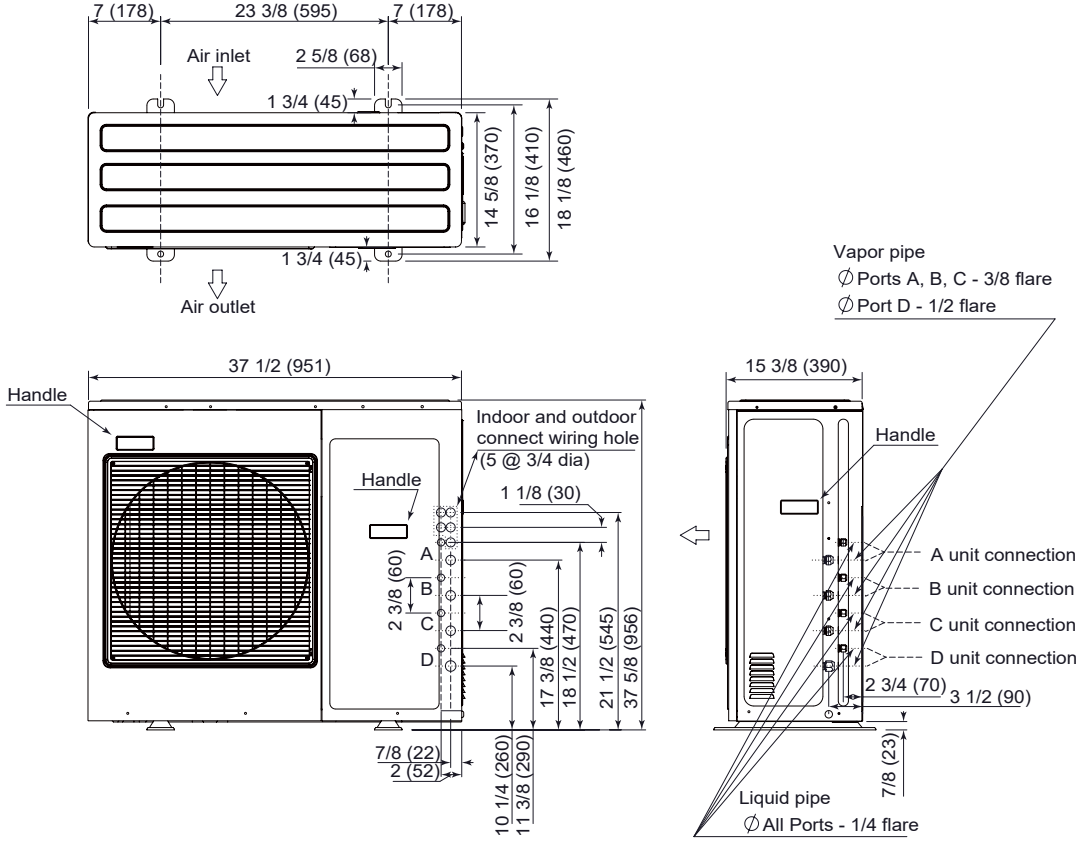


3U24MS2HDA
ASH324JCDDA

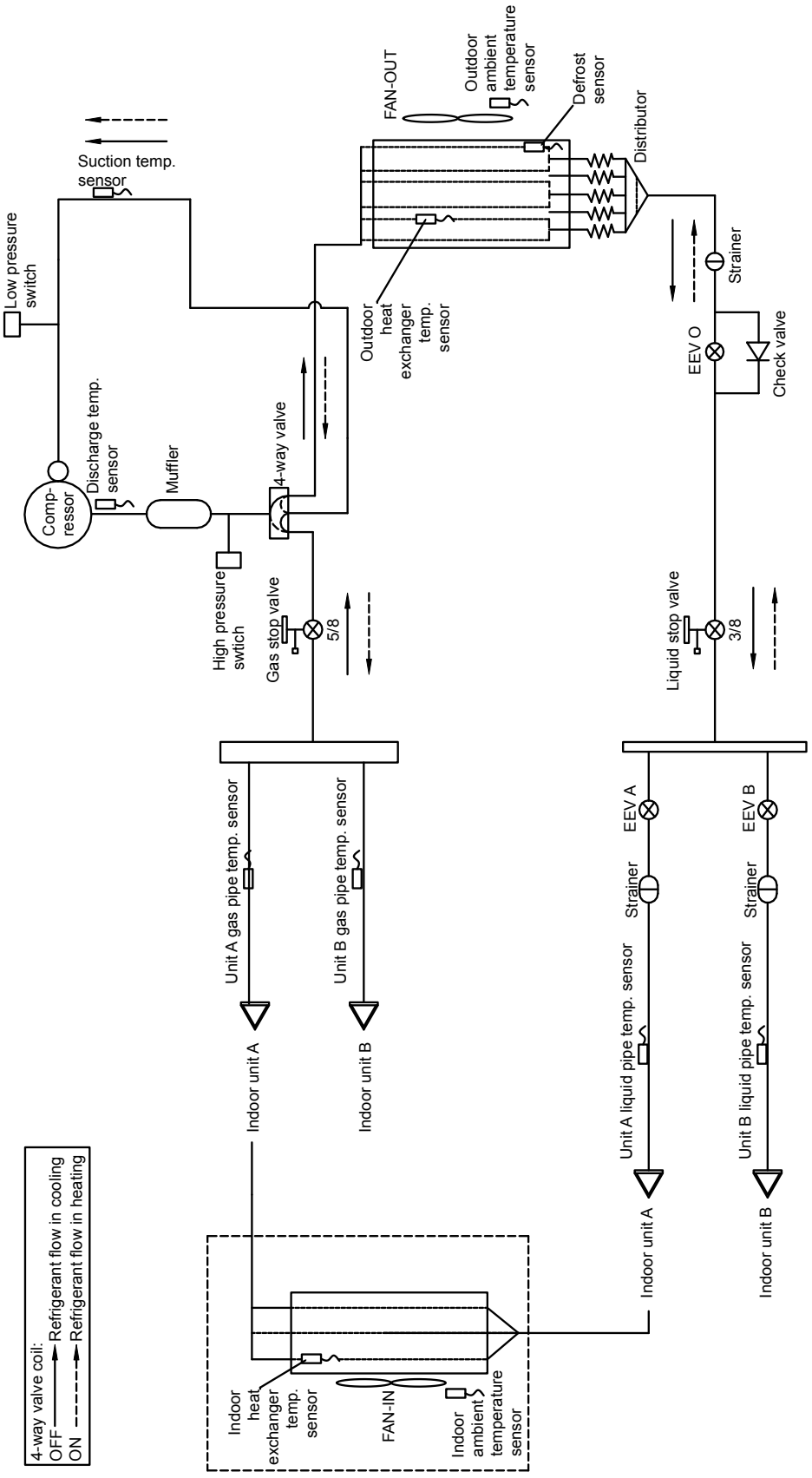


Dimensions

4U36MS2HDA
ASH436JCDDA

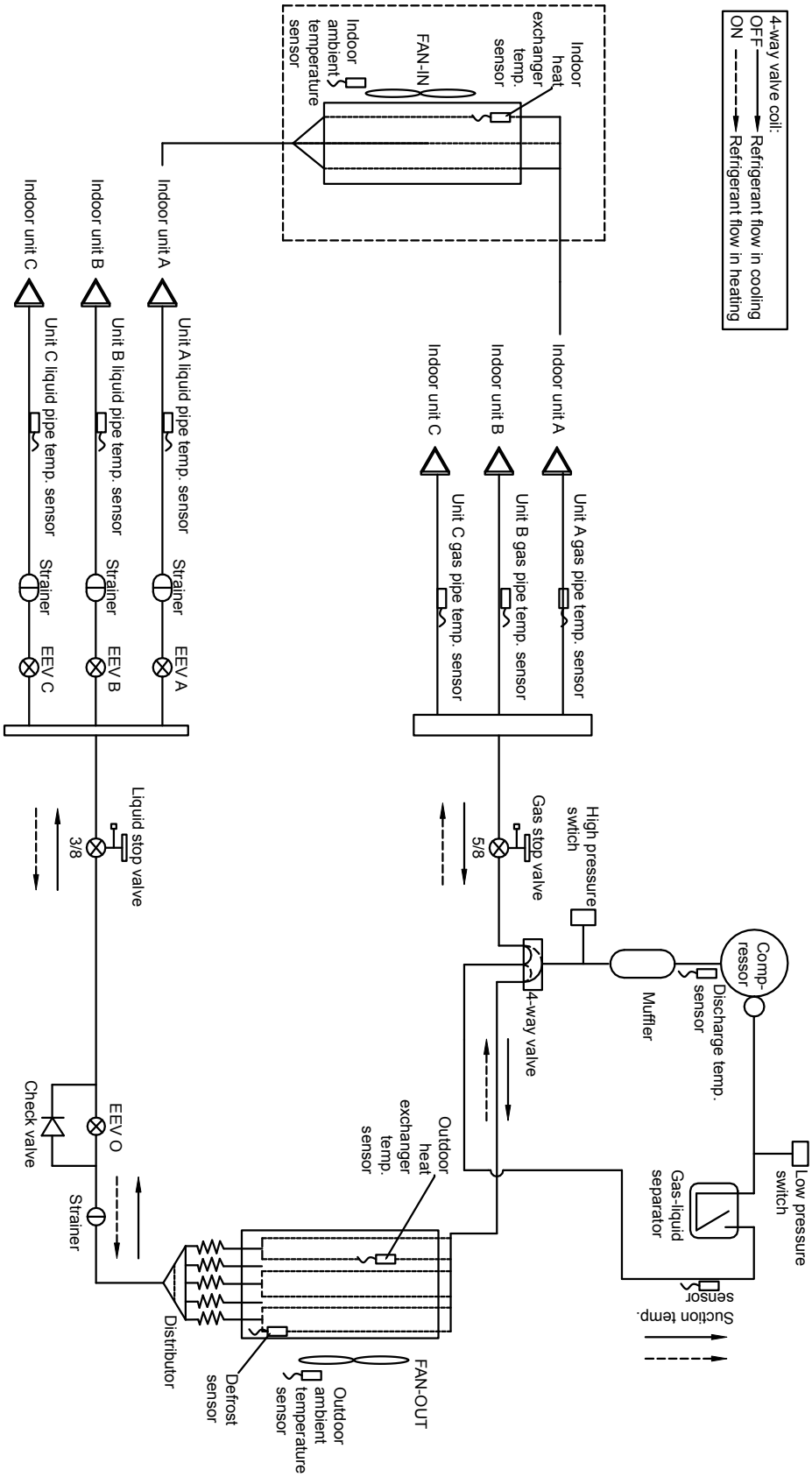


2U18MS2HDA
ASH218JCDDA

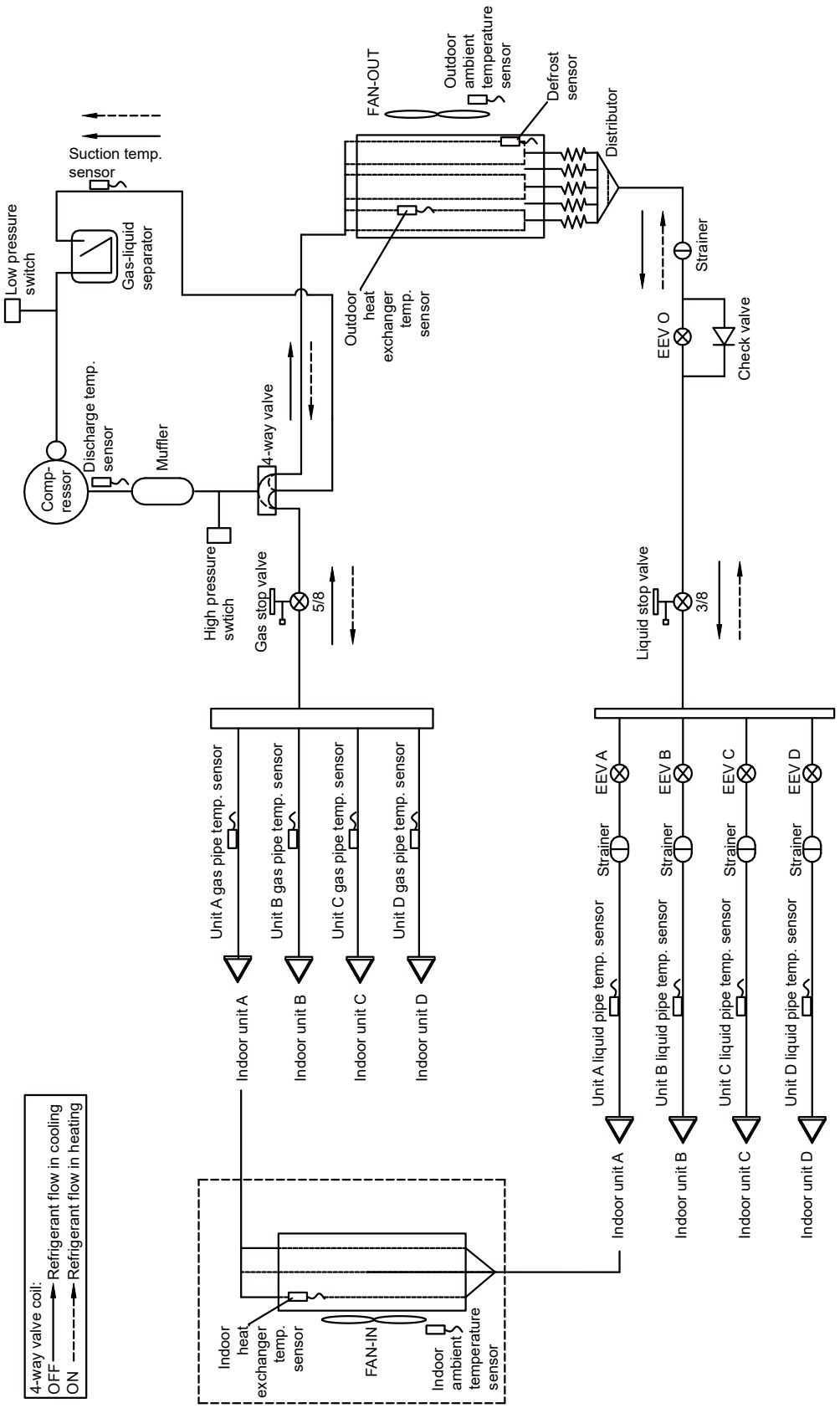


Piping Diagrams

3U24MS2HDA
ASH324JCDDA



4U36MS2HDA
ASH436JCDDA



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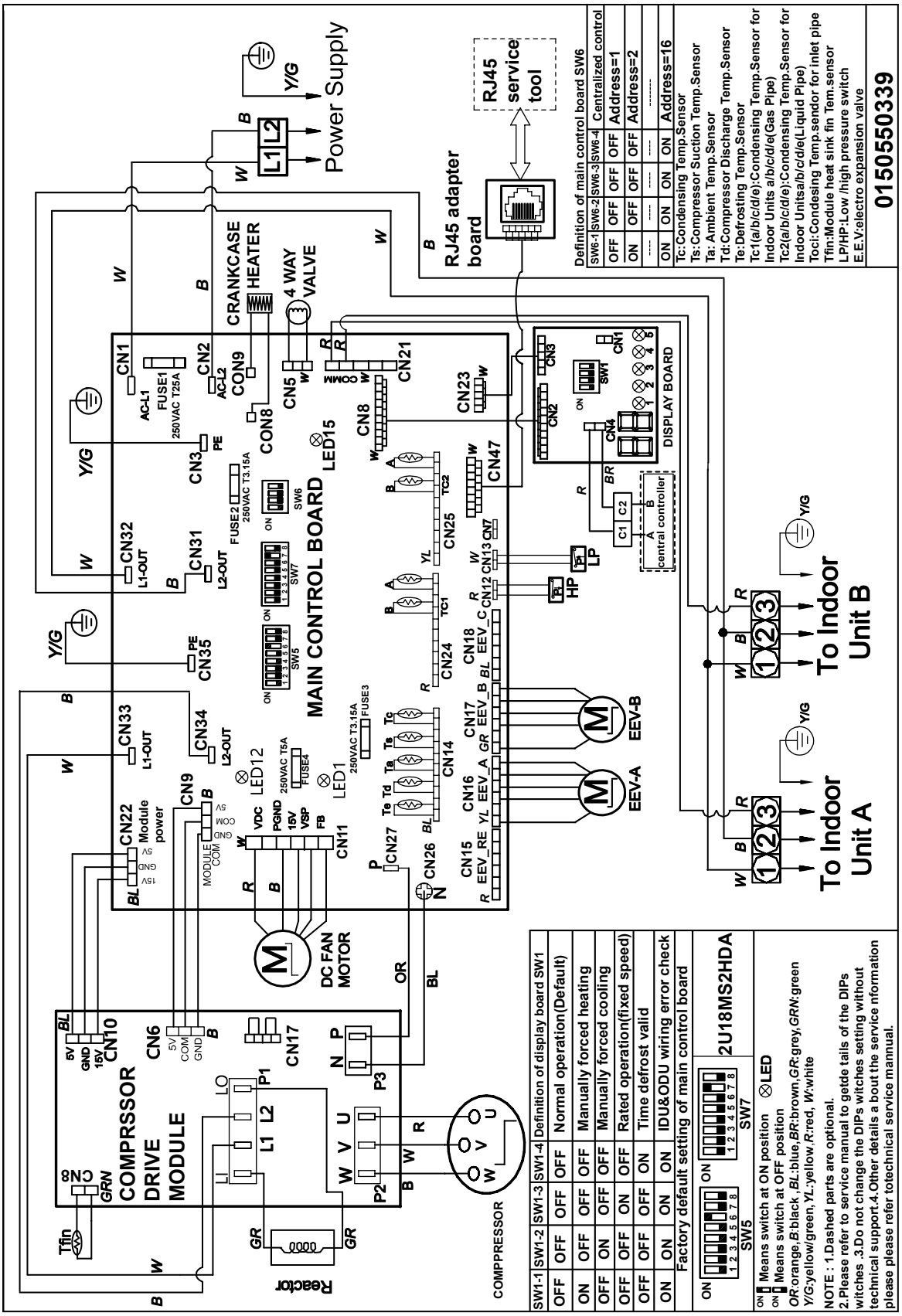
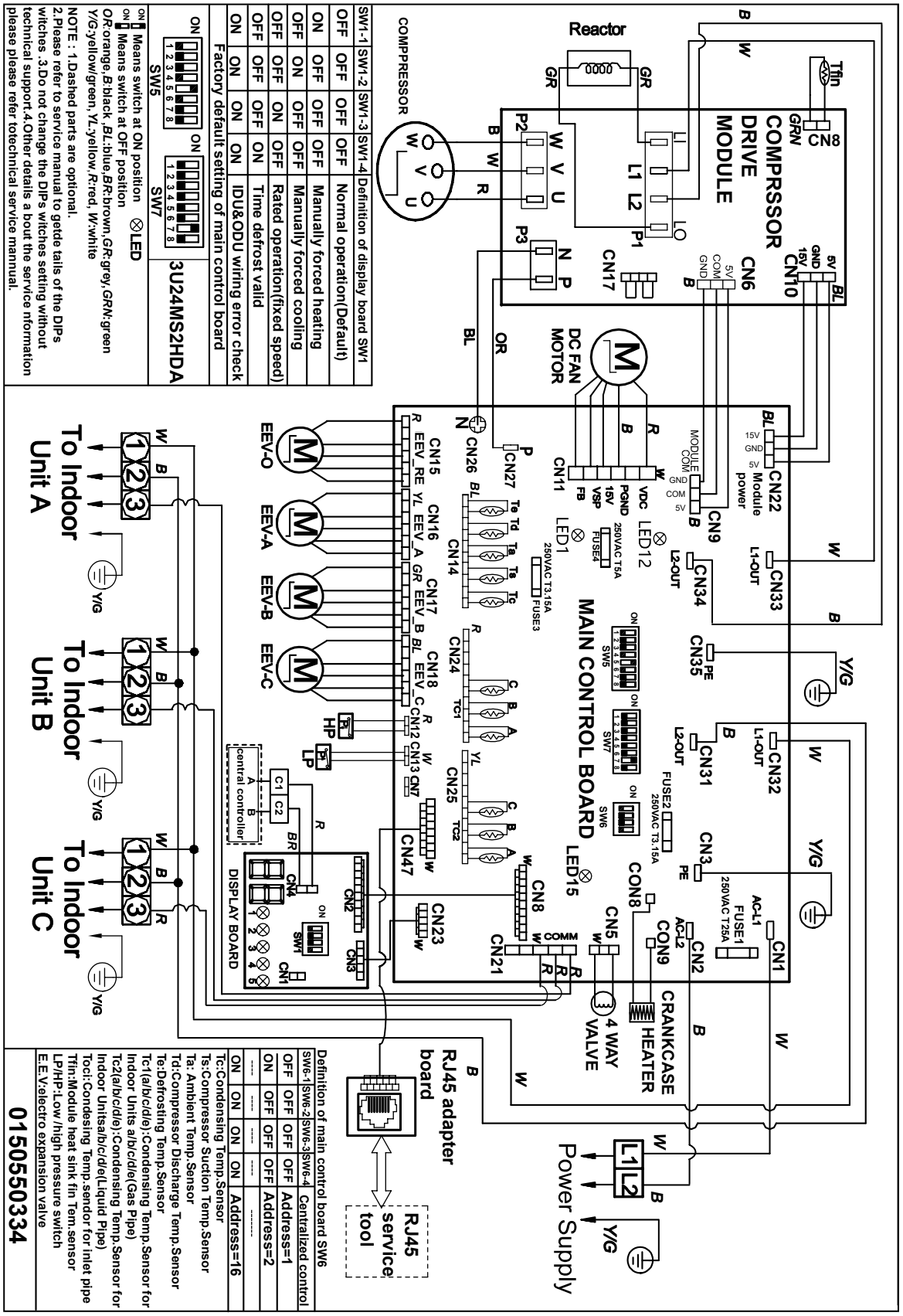
ASH218JCDDA



3U24MS2HDA
ASH324JCDDA



SW1-1	SW1-2	SW1-3	SW1-4	Definition of display board SW1
OFF	OFF	OFF	OFF	Normal operation(Default)
ON	OFF	OFF	OFF	Manually forced heating
OFF	ON	OFF	OFF	Manually forced cooling
OFF	OFF	ON	OFF	Rated operation(fixed speed)
OFF	OFF	OFF	ON	Time defrost valid
ON	ON	ON	ON	IDU&ODU wiring error check
Factory default setting of main control board				

SW5 SW7 3U24MS2HDA

ON Means switch at ON position ⊗LED
Means switch at OFF position

OR:orange,*B*:black,*BL*:blue,*BR*:brown,*GR*:grey,*GRN*:green
Y/G:yellow/green,*YL*:yellow,*R*:red, *W*:white

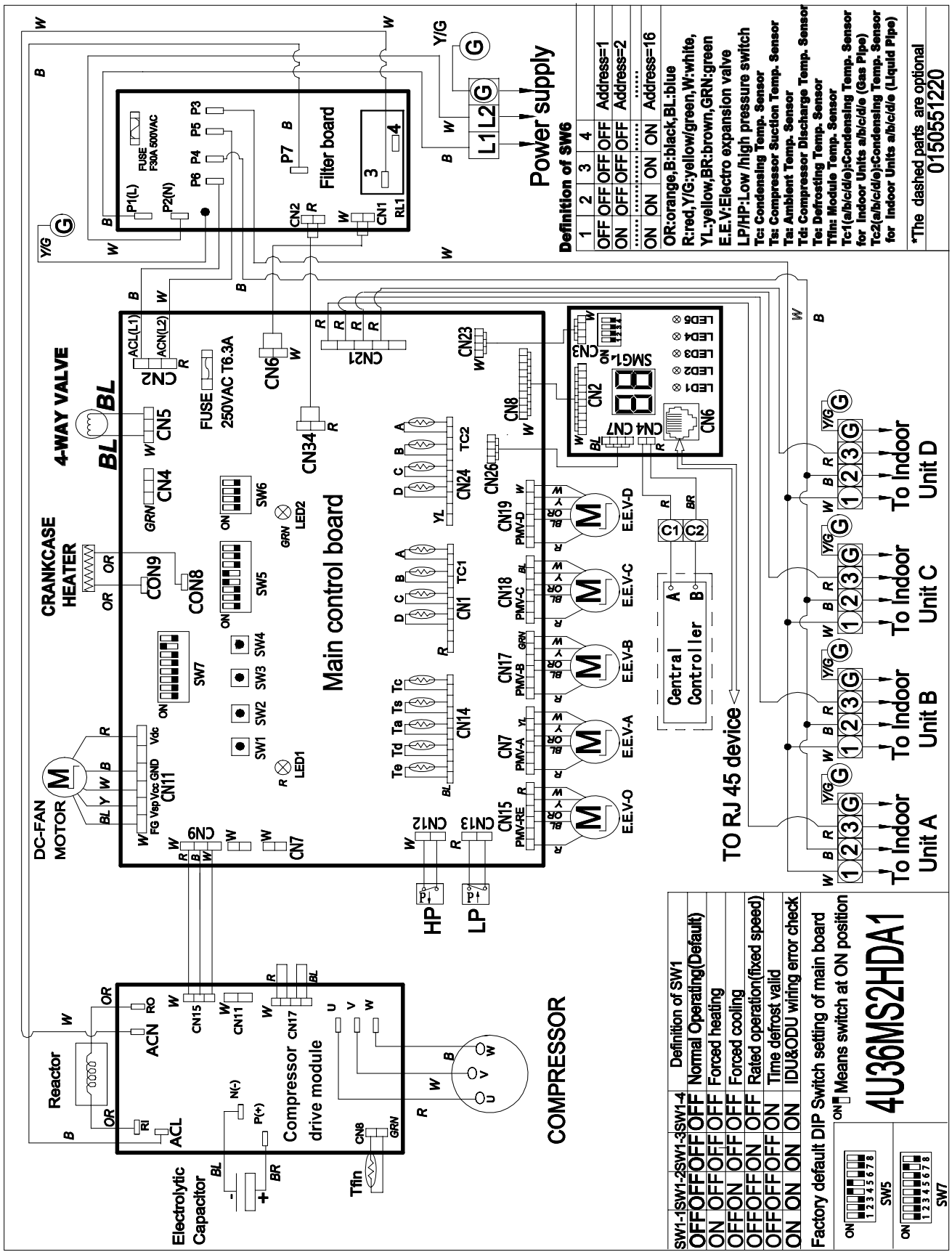
NOTE : 1.Dashed parts are optional.
2.Please refer to service manual to getde tails of the DIPs witches .3.Do not change the DIP's witches setting without technical support.4.Other details a bout the service nformation please please refer totechnical service mannual.

Definition of main control board SW6				
SW6-1	SW6-2	SW6-3	SW6-4	Centralized control
OFF	OFF	OFF	OFF	Address=1
ON	OFF	OFF	OFF	Address=2
----	----	----	----	----------
----	----	----	----	----------
ON	ON	ON	ON	Address=16

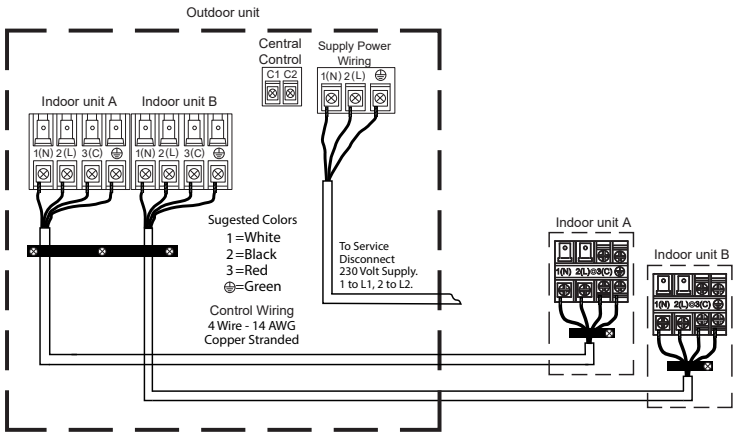
Tc:Condensing Temp.Sensor
Ts:Compressor Suction Temp.Sensor
Ta: Ambient Temp.Sensor
Td:Compressor Discharge Temp.Sensor
Te:Defrosting Temp.Sensor
Tc1(a/b/c/d/e):Condensing Temp.Sensor for Indoor Units a/b/c/d/e(Gas Pipe)
Tc2(a/b/c/d/e):Condensing Temp.Sensor for Indoor Unitsa/b/c/d/e(Liquid Pipe)
Toci:Condesing Temp.sendor for inlet pipe
Tfin:Module heat sink fin Tem.sensor
LP/HP:Low /high pressure switch
E.E.V:electro expansion valve

015055033 4

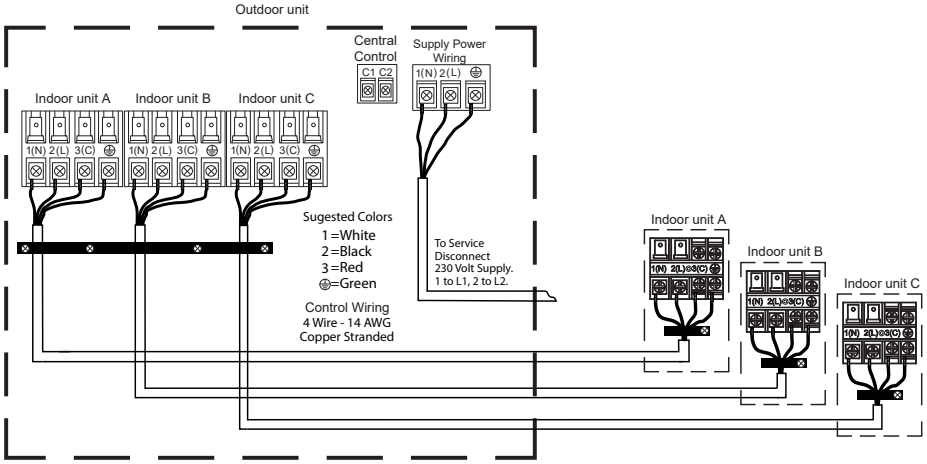
4U36MS2HDA
ASH436JCDDA



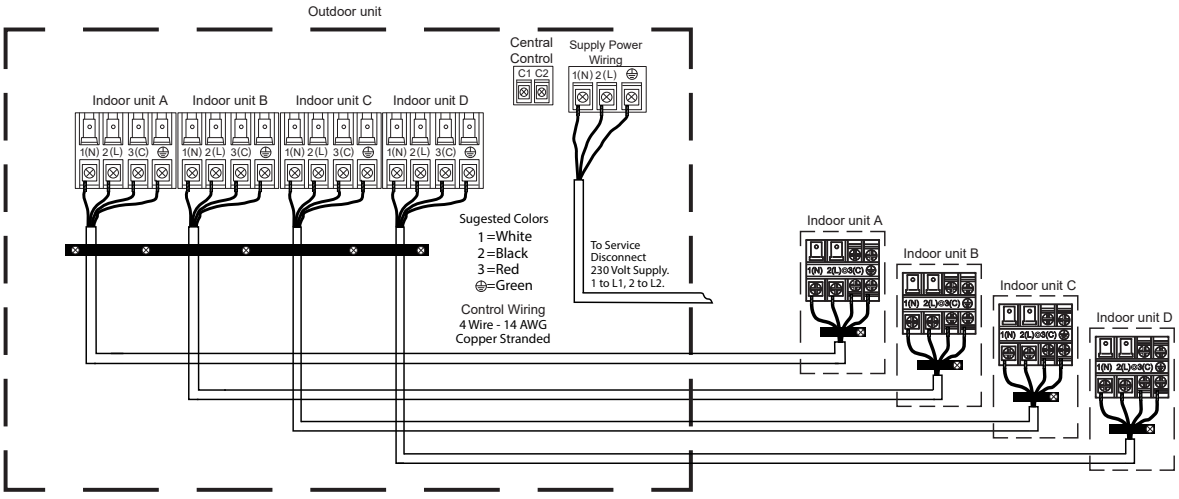
2U18MS2HDA
ASH218JCDDA



3U24MS2HDA
ASH324JCDDA



4U36MS2HDA
ASH436JCDDA



Sensor Resistance Table

Model	Sensor Name	Resistance
2U18MS2HDA 3U24MS2HDA 4U36MS2HDA ASH218JCDDA ASH324JCDDA ASH436JCDDA	Branch Vapor Sensor (Tc1)	10KΩ @ 77°F
	Branch Liquid Sensor (Tc2)	
	Outdoor Ambient Sensor (Ta)	
	Condensing Sensor (Tc)	
	Compressor Suction Sensor (Ts)	
	Defrost Sensor (Te)	
	Inverter Module Sensor (Tfin)	
	Compressor Discharge (Td)	50KΩ @ 176°F

Sensor Resistance Tables

10KΩ Sensors					
T (°F)	T (°C)	KΩ	T (°F)	T (°C)	KΩ
-4.0	-20	90.79	87.8	31	7.83
-2.2	-19	85.72	89.6	32	7.52
-0.4	-18	80.96	91.4	33	7.23
1.4	-17	76.51	93.2	34	6.95
3.2	-16	72.33	95.0	35	6.68
5.0	-15	68.41	96.8	36	5.43
6.8	-14	64.73	98.6	37	5.60
8.6	-13	61.27	100.4	38	5.59
10.4	-12	58.02	102.2	39	5.73
12.2	-11	54.97	104.0	40	5.52
14.0	-10	52.10	105.8	41	5.32
15.8	-9	49.40	107.6	42	5.12
17.6	-8	46.86	109.4	43	4.93
19.4	-7	44.46	111.2	44	4.90
21.2	-6	42.21	113.0	45	4.58
23.0	-5	40.08	114.8	46	4.42
24.8	-4	38.08	116.6	47	4.26
26.6	-3	36.19	118.4	48	4.11
28.4	-2	34.41	120.2	49	3.97
30.2	-1	32.73	122.0	50	3.83
32.0	0	31.14	123.8	51	3.70
33.8	1	29.64	125.6	52	3.57
35.6	2	28.22	127.4	53	3.45
37.4	3	26.40	129.2	54	3.33
39.2	4	25.61	131.0	55	3.22
41.0	5	24.41	132.8	56	3.11
42.8	6	23.27	134.6	57	3.11
44.6	7	22.20	136.4	58	2.90
46.4	8	21.18	138.2	59	2.81
48.2	9	20.21	140.0	60	2.72
50.0	10	19.30	141.8	61	2.63
51.8	11	18.43	143.6	62	2.54
53.6	12	17.61	145.4	63	2.49
55.4	13	16.83	147.2	64	2.38
57.2	14	16.09	149.0	65	2.30
59.0	15	15.38	150.8	66	2.23
60.8	16	14.71	152.6	67	2.16
62.6	17	14.08	154.4	68	2.09
64.4	18	13.48	156.2	69	2.03
66.2	19	12.90	158.0	70	1.96
68.0	20	12.36	159.8	71	1.90
69.8	21	11.84	161.6	72	1.85
71.6	22	11.34	163.4	73	1.79
73.4	23	10.87	165.2	74	1.73
75.2	24	10.43	167.0	75	1.68
77.0	25	10.00	168.8	76	1.63
78.8	26	9.59	170.6	77	1.58
80.6	27	9.21	172.4	78	1.54
82.4	28	8.84	174.2	79	1.49
84.2	29	8.48	176.0	80	1.45
86.0	30	8.15			

Sensor Resistance Tables

50KΩ Sensors					
T (°F)	T (°C)	KΩ	T (°F)	T (°C)	KΩ
32.0	0	1877.0	89.6	32	366.0
33.8	1	1775.0	91.4	33	349.3
35.6	2	1680.0	93.2	34	333.5
37.4	3	1590.0	95.0	35	318.4
39.2	4	1506.0	96.8	36	304.1
41.0	5	1426.0	98.6	37	290.5
42.8	6	1351.0	100.4	38	277.6
44.6	7	1280.0	102.2	39	265.3
46.4	8	1214.0	104.0	40	253.6
48.2	9	1151.0	105.8	41	242.5
50.0	10	1092.0	107.6	42	232.0
51.8	11	1036.0	109.4	43	221.9
53.6	12	983.2	111.2	44	212.3
55.4	13	933.4	113.0	45	203.2
57.2	14	886.4	114.8	46	194.5
59.0	15	841.9	116.6	47	186.3
60.8	16	800.0	118.4	48	178.4
62.6	17	760.8	120.2	49	170.9
64.4	18	722.8	122.0	50	163.7
66.2	19	687.3	123.8	51	155.9
68.0	20	653.8	125.6	52	150.4
69.8	21	622.0	127.4	53	144.2
71.6	22	592.0	129.2	54	138.3
73.4	23	553.6	131.0	55	132.7
75.2	24	536.6	132.8	56	127.3
77.0	25	511.1	134.6	57	122.1
78.8	26	486.9	136.4	58	117.2
80.6	27	464.0	138.2	59	112.5
82.4	28	442.3	140.0	60	108.0
84.2	29	421.7	141.8	61	103.8
86.0	30	402.1	143.6	62	99.7
87.8	31	383.6			

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GE APPLIANCES
a Haier company

SYJS-04-2019REV.D

Model#:
2U18MS2HDA
3U24MS2HDA
4U36MS2HDA
ASH218JCDDA
ASH324JCDDA
ASH436JCDDA

Rev Date: Mar. 2022

GE Appliances, A Haier Company
Appliance Park, Louisville, KY 40225