LG
Life's Good

MULTI V™ IV

Heat Pump and Heat Recovery
Variable Refrigerant Flow Outdoor Units
6.0 to 42.0 Tons

Service Manual

Heat Pump 208 / 230V, 60Hz, 3-phase and 460V, 60Hz, 3-phase	Heat Recovery 208 / 230V, 60Hz, 3-phase and 460V, 60Hz, 3-phase
ARUN072BTE4 / ARUN072DTE4	ARUB072BTE4 / ARUB072DTE4
ARUN096BTE4 / ARUN096DTE4	ARUB096BTE4 / ARUB096DTE4
ARUN121BTE4 / ARUN121DTE4	ARUB121BTE4 / ARUB121DTE4
ARUN144BTE4 / ARUN144DTE4	ARUB144BTE4 / ARUB144DTE4
ARUN168BTE4 / ARUN168DTE4	ARUB168BTE4 / ARUB168DTE4
ARUN192BTE4 / ARUN192DTE4	ARUB192BTE4 / ARUB192DTE4
ARUN216BTE4 / ARUN216DTE4	ARUB216BTE4 / ARUB216DTE4
ARUN240BTE4 / ARUN240DTE4	ARUB240BTE4 / ARUB240DTE4
ARUN264BTE4 / ARUN264DTE4	ARUB264BTE4 / ARUB264DTE4
ARUN288BTE4/ ARUN288DTE4	ARUB288BTE4 / ARUB288DTE4
ARUN313BTE4 / ARUN313DTE4	ARUB313BTE4 / ARUB313DTE4
ARUN337BTE4 / ARUN337DTE4	ARUB337BTE4 / ARUB337DTE4
ARUN312BTE4 / ARUN312DTE4	ARUB312BTE4 / ARUB312DTE4
ARUN336BTE4 / ARUN336DTE4	ARUB336BTE4 / ARUB336DTE4
ARUN360BTE4 / ARUN360DTE4	ARUB360BTE4 / ARUB360DTE4
ARUN384BTE4 / ARUN384DTE4	ARUB384BTE4 / ARUB384DTE4
ARUN408BTE4 / ARUN408DTE4	ARUB408BTE4 / ARUB408DTE4
ARUN432BTE4 / ARUN432DTE4	ARUB432BTE4 / ARUB432DTE4
ARUN456BTE4 / ARUN456DTE4	ARUB456BTE4 / ARUB456DTE4
ARUN480BTE4 / ARUN480DTE4	ARUB480BTE4 / ARUB480DTE4
ARUN504BTE4 / ARUN504DTE4	ARUB504BTE4 / ARUB504DTE4

PROPRIETARY DATA NOTICE

This document, as well as all reports, illustrations, data, information, and other materials herein are the property of LG Electronics U.S.A., Inc., and are disclosed by LG Electronics U.S.A., Inc., only in confidence. This document is for design purposes only.

Do not throw away, destroy, or lose this manual.

Please read carefully and store in a safe place for future reference.
Content familiarity required for proper installation and safety of personnel and property.

Follow the instructions in this manual to prevent product malfunction, property damage, injury, or death to users or other people. Incorrect operation due to ignoring any instructions can cause harm to personnel, or damage to property or equipment.

For more technical materials such as submittals, engineering databooks, installation manuals, and catalogs, visit www.lghvac.com.

Freight Damage and Unit Replacements	Your LG Manufacturer Representative
Missing Parts	Your LG Manufacturer Representative
Received Wrong Water Source Unit Model	Your LG Manufacturer Representative
Installation, Startup, and Commissioning Technical Assistance	1-888-865-3026

For continual product development, LG Electronics U.S.A., Inc., reserves the right to change specifications without notice.

TABLE OF CONTENTS

The instructions below must be followed to prevent product malfunction, property damage, injury or death to the user or other people. Incorrect operation due to ignoring any instructions will cause harm or damage. The level of seriousness is classified by the symbols described below.

TABLE OF SYMBOLS

⚠DANGER	*This symbol indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.*
⚠WARNING	*This symbol indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.*
⚠CAUTION	*This symbol indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.*
Note	*This symbol indicates situations that may result in equipment or property damage accidents only.*
⃠	*This symbol indicates an action should not be completed.*

INSTALLATION

⚠DANGER

Do not store or use flammable gas or combustibles near the unit.
There is risk of fire, explosion, and physical injury or death.

⚠WARNING

Do not install, remove, or re-install the unit by yourself (end user). Ask the dealer or an authorized technician to install the unit.
Improper installation by the user may result in fire, explosion, electric shock, physical injury or death.

For replacement of an installed unit, always contact an LG trained service provider.
There is risk of fire, electric shock, explosion, and physical injury or death.

Wear protective gloves when handling equipment. Sharp edges may cause personal injury.

Do not change the settings of the protection devices.
If the pressure switch, thermal switch, or other protection device is shorted and forced to operate improperly, or parts other than those specified by LG are used, there is risk of fire, electric shock, explosion, and physical injury or death.

Replace all control box and panel covers.
If cover panels are not installed securely, dust, water and animals may enter the outdoor unit, causing fire, electric shock, and physical injury or death.

Always check for system refrigerant leaks after the unit has been installed or serviced.
Exposure to high concentration levels of refrigerant gas may lead to illness or death.

If the air conditioner is installed in a small space, take measures to prevent the refrigerant concentration from exceeding safety limits in the event of a refrigerant leak.
Consult the latest edition of ASHRAE (American Society of Heating, Refrigerating, and Air Conditioning Engineers) Standard 15. If the refrigerant leaks and safety limits are exceeded, it could result in personal injuries or death from oxygen depletion.

The heat recovery unit must be installed indoors; do not install the heat recovery unit in a highly humid environment.
There is risk of physical injury or death due to electric shock.

Periodically check that the outdoor frame is not damaged.
There is a risk of explosion, physical injury, or death.

Dispose the packing materials safely.
- *Packing materials, such as nails and other metal or wooden parts, may cause puncture wounds or other injuries.*
- *Tear apart and throw away plastic packaging bags so that children may not play with them and risk suffocation and death.*

Install the unit considering the potential for strong winds or earthquakes.
Improper installation may cause the unit to fall over, resulting in physical injury or death.

Install the unit in a safe location where nobody can step on or fall onto it. Do not install the unit on a defective stand.
It may result in an accident that causes physical injury or death.

INSTALLATION, CONTINUED

⚠CAUTION

Be very careful when transporting the product. There is a risk of the product falling and causing physical injury.

- *Use appropriate moving equipment to transport each frame; ensure the equipment is capable of supporting the weights listed above.*
- *Some products use polypropylene bands for packaging. Do not use polypropylene bands to lift the unit.*
- *Suspend the outdoor unit from the base at specified positions. Support the outdoor unit a minimum of four points to avoid slippage from rigging apparatus.*

⚠WARNING

Properly insulate all cold surfaces to prevent "sweating."
Cold surfaces such as uninsulated piping can generate condensate that could drip, causing a slippery surface that creates a risk of slipping, falling, and personal injury.

Note

Do not install the product where it is exposed directly to ocean winds.
Sea salt in the air may cause the product to corrode. Corrosion, particularly on the condenser and evaporator fins, could cause product malfunction or inefficient operation.

When installing the outdoor unit in a low-lying area, or a location that is not level, use a raised concrete pad or concrete blocks to provide a solid, level foundation.
This prevents water damage and abnormal vibration.

Properly insulate all cold surfaces to prevent "sweating."
Cold surfaces such as uninsulated piping can generate condensate that may drip and cause a slippery surface condition and / or water damage to walls.

When installing the unit in a hospital, mechanical room, or similar electromagnetic field (EMF) sensitive environment, provide sufficient protection against electrical noise.
Inverter equipment, power generators, high-frequency medical equipment or radio communication equipment may cause the air conditioner to operate improperly. The unit may also affect such equipment by creating electrical noise that disturbs medical treatment or image broadcasting.

Always check for system refrigerant leaks after the unit has been installed or serviced.
Low refrigerant levels may cause product failure.

The heat recovery box must be installed indoors; do not install the heat recovery box in a highly humid environment.
There is risk of product failure and property damage.

Do not make refrigerant substitutions. Use R410A only.
If a different refrigerant is used, or air mixes with original refrigerant, the unit will malfunction and be damaged.

Do not use the product for mission critical or special purpose applications such as preserving foods, works of art, or other precision air conditioning applications. The equipment is designed to provide comfort cooling and heating.
There is risk of property damage.

Keep the unit upright during installation to avoid vibration or water leakage.

When connecting refrigerant tubing, remember to allow for pipe expansion.
Improper piping may cause refrigerant leaks and system malfunction.

Do not install the outdoor unit or heat recovery unit in a noise-sensitive area.

Take appropriate actions at the end of HVAC equipment life to recover, recycle, reclaim or destroy R410A refrigerant according to applicable U.S. Environmental Protection Agency (EPA) rules.

Periodically check that the outdoor frame is not damaged.
There is a risk of equipment damage.

Install the unit in a safe location where nobody can step on or fall onto it. Do not install the unit on a defective stand.
There is a risk of unit and property damage.

Install the drain hose to ensure adequate drainage.
There is a risk of water leakage and property damage.

Do not store or use flammable gas / combustibles near the unit.
There is a risk of product failure.

WIRING

⚠ DANGER

High voltage electricity is required to operate this system. Adhere to the NEC code and these instructions when wiring.
Improper connections and inadequate grounding can cause accidental injury or death.

Always ground the unit following local, state, and NEC codes.
There is risk of fire, electric shock, and physical injury or death.

Turn the power off at the nearest disconnect before servicing the equipment.
Electrical shock can cause physical injury or death.

Properly size all circuit breakers or fuses.
There is risk of fire, electric shock, explosion, physical injury or death.

⚠ WARNING

The information contained in this manual is intended for use by an industry-qualified, experienced, certified electrician familiar with the U.S. National Electric Code (NEC) who is equipped with the proper tools and test instruments.
Failure to carefully read and follow all instructions in this manual can result in equipment malfunction, property damage, personal injury or death.

All electric work must be performed by a licensed electrician and conform to local building codes or, in the absence of local codes, with the National Electrical Code, and the instructions given in this manual.
If the power source capacity is inadequate or the electric work is not performed properly, it may result in fire, electric shock, physical injury or death.

Refer to local, state, and federal codes, and use power wires of sufficient current capacity and rating.
Wires that are too small may generate heat and cause a fire.

Secure all field wiring connections with appropriate wire strain relief.
Improperly securing wires will create undue stress on equipment power lugs. Inadequate connections may generate heat, cause a fire and physical injury or death.

Properly tighten all power lugs.
Loose wiring may overheat at connection points, causing a fire, physical injury or death.

Do not change the settings of the protection devices.
If the pressure switch, thermal switch, or other protection devices are bypassed or forced to work improperly, or parts other than those specified by LG are used, there is risk of fire, electric shock, explosion, and physical injury or death.

Note

Do not supply power to the unit until all electrical wiring, controls wiring, piping, installation, and refrigerant system evacuation are completed.

OPERATION

⚠DANGER

Do not provide power to or operate the unit if it is flooded or submerged.
There is risk of fire, electric shock, physical injury or death.

Use a dedicated breaker for this product.
There is risk of fire, electric shock, physical injury or death.

Do not operate the disconnect switch with wet hands.
There is risk of fire, electric shock, physical injury or death.

Periodically verify the equipment mounts have not deteriorated.
If the base collapses, the unit could fall and cause physical injury or death.

Use inert (nitrogen) gas when performing leak tests or air purges. Do not use compressed air, oxygen, or flammable gases.
Using these substances may cause fire, explosion, and physical injury or death.

If refrigerant leaks out, ventilate the area before operating the unit.
If the unit is mounted in an ecnlosed, low-lying, or poorly ventilated area, and the the system develops a refrigerant leak, it may cause a fire, electric shock, explosion, physical injury or death.

⚠WARNING

Do not allow water, dirt, or animals to enter the unit.
There is risk of fire, electric shock, physical injury or death.

Do not touch the refrigerant piping during or after operation.
It can cause burns or frostbite.

Do not operate the unit with the panel(s) or protective cover(s) removed; keep fingers and clothing away from moving parts.
The rotating, hot, cold, and high-voltage parts of the unit can cause physical injury or death.

⚠CAUTION

To avoid physical injury, use caution when cleaning or servicing the air conditioner.

Note

Clean up the site after servicing is finished, and check that no metal scraps, screws, or bits of wiring have been left inside or surrounding the unit.

Do not use the product for mission critical or special purpose applications such as preserving foods, works of art, or other precision air conditioning applications. The equipment is designed to provide comfort cooling and heating.
Oil, steam, sulfuric smoke, etc., can significantly reduce the performance of the unit, or damage its parts.

Turn on the power at least six (6) hours before operation begins.
Starting operation immediately after turning on the main power switch can result in severe damage to the compressor(s). Keep the power switch on during the operational season.

Do not turn off the main power switch after operation has been stopped.
Wait at least five (5) minutes before turning off the main power switch, otherwise it may result in product malfunction.

Do not block the inlet or outlet.
Unit may malfunction.

Auto-addressing should be performed after connecting the power of all indoor and outdoor units.
Auto-addressing should also be performed after servicing an indoor unit.

Do not allow water, dirt, or animals to enter the unit.
There is risk of unit failure.

Do not operate the unit with the panel(s) or protective cover(s) removed; keep fingers and clothing away from moving parts.
Non-secured covers can result in malfunction due to dust or water in the service panel.

Periodically verify the equipment mounts have not deteriorated.
If the base collapses, the unit could fall and cause property damage or product failure.

UNIT NOMENCLATURE

Outdoor and Heat Recovery Control Units

Outdoor Units (ODU)

ARU	N	072	B	T	E	4

Family
ARU = Multi V Outdoor Unit (Refrigerant R410A)

Type
N = Inverter Heat Pump
B = Inverter Heat Recovery

Nominal Capacity
(Nominal cooling capacity in Btu/h)

072 = 72,000	192 = 192,000	312/313 = 312,000	432 = 432,000
096 = 96,000	216 = 216,000	336/337 = 336,000	456 = 456,000
121 = 121,000	240 = 240,000	360 = 360,000	480 = 480,000
144 = 144,000	264 = 264,000	384 = 384,000	504 = 504,000
168 = 168,000	288 = 288,000	408 = 408,000	

Electrical Ratings
B = 208–230V/60Hz/3Ph
D = 460V/60Hz/3Ph

Airflow Configuration
T = Top Discharge

Efficiency
E = High Efficiency

Generation
4 = Fourth

Heat Recovery Units (HRU)

PRHR	02	2A

Family
PRHR = Multi V Heat Recovery (HR) unit using R410A refrigerant

Number of Connected Ports
02 = 2 Ports
03 = 3 Ports
04 = 4 Ports

Series Number
2A = Series Number

Normal Operation

Table 1: Normal Operation Functions.

Component	Cooling Operation	Heating Operation	System Not in Operation
Compressor	Fuzzy Logic	Fuzzy Logic	Stop
Fan	Fuzzy Logic	Fuzzy Logic	Stop
Main EEV	Higher: Minimum Pulse Lower: Fully Open	Fuzzy Logic	Minimum Pulse
Subcooling EEV	Fuzzy Logic	• Normal: Vapor injection • Avoiding control of high discharge temperature	Minimum Pulse
Indoor Unit EEV	Superheat Fuzzy Logic	Subcooling Fuzzy Logic	Minimum Pulse

Note

Heating mode does not operate when outside air temperature is >81°F and head pressure is >514 psi.

Compressor Control

Fuzzy logic helps ensure stable system performance by maintaining evaporating temperatures (Te) in cooling mode, and condensing temperatures (Tc) in heating mode. Both cooling and heating modes can be determined at various steps in the installation mode.

- Te: 36~41°F
- Tc: 117~124°F

Note

Te and Tc can be simultaneously determined by setting DIP switches.

Figure 1: Fuzzy Logic Diagram.

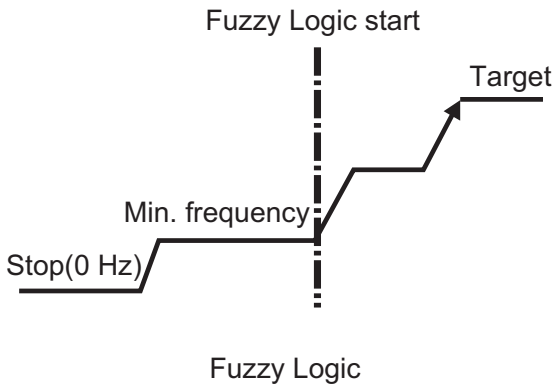
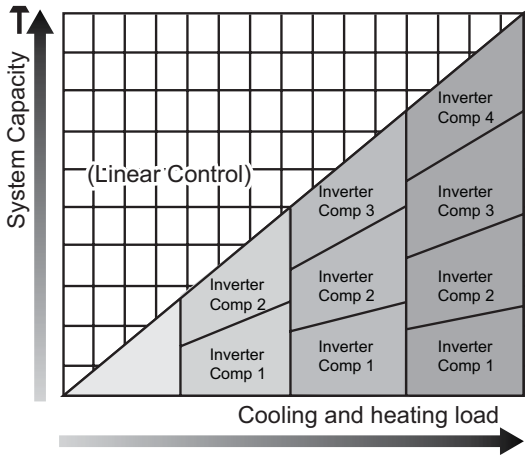


Figure 2: Inverter Linear Control Chart.



Inverter linear control as cooling and heating load increases

Master and Slave Outdoor Unit EEV Control

Main EEV Control

Main EEV operates with fuzzy logic to keep the degree of superheat (about 37°F) at the evaporator outlet stable during heating mode.

Degree of Superheat = Tsuction - Tevaporation

where,

- Tsuction = Temperature measured at the suction pipe sensor (°F).
- Tevaporation = Evaporation temperature equivalent to low pressure (°F).

Subcooling EEV Control

Subcooling EEV operates with fuzzy logic to keep the degree of subcool (about 59°F) at the subcooler outlet stable during cooling mode.

Degree of Subcool = Tcondensation - Tliquid

where,

- Tliquid = Temperature at the outlet of the subcooler (°F).
- Tcondensation = Condensation temperature equivalent to high pressure (°F).

Avoiding Excessively High Discharge Temperatures

After the main EEV opens to a predetermined amount (R410A: 800 pulses), and the discharge temperature is above 185°F (or 85°C) during heating mode, subcooling EEV control may operate to maintain compressor superheat.

Vapor Injection Flow Rate Control During Heating Mode

The degree of Superheat (VI_SH) = Subcooler out (°F) – Subcooler in (°F)

where

- Td ≤ 176°F : VI_SH = 37°F
- 176°F < Td ≤ 194°F : VI_SH = -2 × Td/10 +19
- 194°F < Td : VI_SH = 34°F

Oil Return Control

Oil return operation recovers any oil that has accumulated in the piping and returns it to the compressor. Each component operates as shown in the tables below during oil return.

Oil Return Control in Cooling Mode

Table 2: Outdoor Unit Oil Return Control in Cooling Mode.

Component	Start	During Oil Return Operation	Stop
Inverter Compressor	30Hz	Set Value	30Hz
Fan	Normal Control	Normal Control	Normal Control
Main EEV	Upper: Minimum Pulse Lower: Maximum Pulse	Upper: Minimum Pulse Lower: Maximum Pulse	Upper: Normal Control Lower: Normal Control
Subcooling EEV	Minimum Pulse	20 Pulse	80 Pulse
Four-Way Valve	Off	Off	Off

Table 3: Indoor Unit Oil Return Control in Cooling Mode.

Component	Start	During Oil Return Operation	Stop
Fan	Normal Control	Off	Normal Control
Thermo On Unit EEV	Normal Control	Normal control	Normal Control
Thermo Off Unit EEV	40 Pulse	400 Pulse	40 Pulse
Oil Return Signal	Off	On	Off

- Start: Oil return operation begins when the oil sensor measures low oil levels.
- Oil Return Operation will run for three (3) minutes.
- Stop: Oil Return Operation will end if / when compressor protection control starts.

Oil Return Control in Heating Mode

Table 4: Outdoor Unit Oil Return Control in Heating Mode.

Component	Start	During Oil Return Operation	Stop
Inverter Compressor	30Hz	Set Value	40Hz
Fan	Normal Control	Normal Control	Normal Control
Main EEV	Upper: Minimum Pulse Lower: Maximum Pulse	Upper: Minimum Pulse Lower: Maximum Pulse	Upper: Normal Control Lower: Normal Control
Subcooling EEV	Minimum Pulse	20 Pulse	80 Pulse
Four-Way Valve	On	Off	On

Table 5: Indoor Unit Oil Return Control in Heating Mode.

Component	Start	During Oil Return Operation	Stop
Fan	Normal Control	Off	Normal Control
Thermo On Unit EEV	Normal Control	400~800 Pulse	Normal Control
Thermo Off Unit EEV	80~130 Pulse	400~800 Pulse	80~130 Pulse

- Start: Oil Return Operation begins when the oil sensor measures low oil levels.
- Oil Return Operation will run for three (3) minutes.
- Stop: Oil Return Operation will end if / when compressor protection control starts.

Defrost Control

Defrost Control eliminates ice that has accumulated on the heat exchanger, recovering its performance. Each component operates as shown in the tables below during defrost.

Table 6: Outdoor Unit Defrost Control.

Component	Start	During Defrost Control Operation	Stop
Inverter Compressor	30Hz	Set Value	40Hz
Fan	Stop	High Pressure control	Normal Control
Main EEV	Normal Control	Maximum Pulse	Normal Control
Subcooling EEV	Normal Control	Minimum Pulse	Normal Control
Four-Way Valve	On to Off	Off	On

Table 7: Indoor Unit Defrost Control.

Component	Start	During Defrost Control Operation	Stop
Fan	Off	Off	Off
Thermo On Unit EEV	Normal Control	400~800 Pulse	Normal Control

Defrost Control Stop Operation

1. All heat exchanger pipe temperatures are above set temperatures for thirty (30) seconds.
2. Defrost Control Operation will run for >30% of the total heating time.
3. Defrost Control Operation will stop if / when compressor protection control starts (if a high discharge temperature at the compressor is detected).

Partial Defrost

The heat exchanger in the outdoor unit(s) is divided into a top part and bottom part for partial defrost operation. Partial defrost operation permits the system to defrost the parts of the heat exchanger separately so heating mode can operate continuously. Each component operates as shown on the below table during partial defrost.

Table 8: Outdoor Unit Partial Defrost Control.

Component	Start	During Defrost Control Operation	Stop
Inverter Compressor	Normal Control	Set Value	Normal Control
Fan	Normal Control	Low Pressure control	Normal Control
Main EEV	Normal Control	Normal Control	Normal Control
Subcooling EEV	Normal Control	Normal Control	Normal Control
Four-Way Valve	On	On	On

Table 9: Indoor Unit Partial Defrost Control.

Component	Start	During Defrost Control Operation	Stop
Fan	ON (Setting)	ON (Low)	ON (Setting)
Thermo On Unit EEV	Normal Control	Normal Control	Normal Control

Partial Defrost Control Stop Operation

1. Partial Defrost Control Operation will run for a maximum of twelve (12) minutes.
2. Partial Defrost Control Operation will stop for the top part of the heat exchanger when the temperature rises higher than the set temperature.
3. Partial Defrost Control Operation will stop for the bottom top part of the heat exchanger when the temperature rises above the set temperature.

Stop Operation Control

Stop Operation Control in Cooling Mode

Table 10: Stop Operation Control in Cooling Mode.

Component	Stop Operation	Notes
Inverter Compressor	Off	-
Fan	Stop	-
Main EEV	32 Pulse	-
Subcooling EEV	16 Pulse	Stop (Minimum Pulse)
Four-Way Valve	Off	-

Stop Operation Control in Heating Mode

Table 11: Stop Operation Control in Heating Mode.

Component	Stop Operation	Notes
Inverter Compressor	Off	-
Fan	Stop	-
Main EEV	32 Pulse	-
Subcooling EEV	16 Pulse	Stop (Minimum Pulse)
Four-Way Valve	Off	When air temperature is >30°C (86°F)

Oil Equalizing Control

Oil equalizing control prevents oil imbalance between the inverter compressors. If the oil level sensors detect different oil levels between the compressors, then the oil equalizing EEV will open for five (5) minutes.

Pressure Protection Control

Pressure Control in Cooling Mode

Table 12: High Pressure Control in Cooling Mode.

Pressure Range	Compressor	Fan
Pd ≥ 580 psi 548 psi 519 psi	Stop	Stop
Pd > 548 psi	-15 Hz / 10 seconds	+100 RPM / 10 seconds
Pd ≥ 510 psi	Frequency Hold*	+100 RPM / 10 seconds
Pd ≥ 505 psi	+2 Hz or less / 10 seconds	+100 RPM / 10 seconds
Pd < 505 psi	Normal Control	

** Frequency Hold = Frequency (or RPM) is not increasing (can decrease).*

Table 13: Low Pressure Control in Cooling Mode.

Pressure Range	Compressor	Fan
Ps ≤ 14 psi, One (1) minute After Operation	Stop	Stop
Ps ≤ 118 psi, One (1) minute Before Operation	-15Hz / 10 seconds	-100 RPM / 10 seconds

Pressure Control in Heating Mode

Table 14: High Pressure Control in Heating Mode.

Pressure Range	Compressor	Fan
Pd ≥ 581 psi	Stop	Stop
Pd > 495 psi	-15 Hz / 10 seconds	-50 RPM / 10 seconds

Table 15: Low Pressure Control in Heating Mode.

Pressure Range	Compressor	Fan
Ps ≤ 14 psi	Stop	Stop
Ps ≤ 18 psi	-15 Hz / 10 seconds	+100 RPM / 10 seconds
Ps ≤ 20 psi	Frequency Hold*	+100 RPM / 10 seconds
Ps ≤ 28 psi	+2 Hz or less / 10 seconds	+100 RPM / 10 seconds
Ps ≥ 28 psi	Normal Control	Normal Control

** Frequency Hold = Frequency (or RPM) is not increasing (can decrease).*

Discharge Temperature Control

Table 16: Outdoor Unit Discharge Temperature Control.

Temperature Range	Compressor	Subcooling EEV	Indoor Unit EEV
Tdis > 230°F	Off	SC, SH Decrease Control	SH Decrease Control
Tdis > 226.4°F	-5 Hz / 10 seconds	SC, SH Decrease Control	SH Decrease Control
Tdis ≥ 221°F	Frequency Hold*	SC, SH Decrease Control	SH Decrease Control
Tdis ≤ 212°F	Normal Control	SC, SH Decrease Control	SH Decrease Control
Tdis > 212°F	Normal Control	SC, SH Decrease Control	SH Decrease Control

** Frequency Hold = Frequency (or RPM) is not increasing (can decrease).*
Tdis = Temperature Discharge.
SC = Subcooling.
SH = Superheating.

Inverter Protection Control

The tables below display the amperage where the system will operate normally, the amperage where the inverter protection control will cause the frequency to drop, and the amperage where the inverter protection control will shut the system off. AC input current is measured at the inverter compressor (after the point where the current passes through the noise filter).

Table 17: Inverter Protection Control in Cooling Mode.

	System Voltage Type	Normal System Operation		Frequency Will Drop		System Will Stop Operation	
		4.8 HP	6.8 HP	4.8 HP	6.8 HP	4.8 HP	6.8 HP
Heat Pump Outdoor Units							
AC Input Current	208-230V	less than 19A	less than 28A	more than 19A	more than 28A	more than 24A	more than 32A
	460V	less than 22A	less than 30A	more than 22A	more than 30A	more than 22A	more than 32A
Compressor Current	208-230V	less than 24A	less than 35A	more than 24A	more than 35A	more than 30A	more than 41A
	460V	less than 24A	less than 35A	more than 24A	more than 35A	more than 30A	more than 41A
Heat Recovery Outdoor Units							
AC Input Current	208-230V	less than 19A	less than 28A	more than ≥19A	more than 28A	more than 24A	more than 32A
	460V	less than 22A	less than 30A	more than ≤22A	more than 30A	more than 22A	more than 32A
Compressor Current	208-230V	less than 24A	less than 35A	more than ≥24A	more than 35A	more than 30A	more than 41A
	460V	less than 24A	less than 35A	more than ≤24A	more than 35A	more than 30A	more than 41A

Table 18: Inverter Protection Control in Heating Mode.

	System Voltage Type	Normal System Operation		Frequency Will Drop		System Will Stop Operation	
		4.8 HP	6.8 HP	4.8 HP	6.8 HP	4.8 HP	6.8 HP
Heat Pump Outdoor Units							
AC Input Current	208-230V	less than 19A	less than 28A	more than 19A	more than 28A	more than 24A	more than 32A
	460V	less than 22A	less than 30A	more than 22A	more than 30A	more than 22A	more than 32A
Compressor Current	208-230V	less than 24A	less than 35A	more than 24A	more than 35A	more than 30A	more than 41A
	460V	less than 26A	less than 35A	more than 26A	more than 35A	more than 30A	more than 41A
Heat Recovery Outdoor Units							
AC Input Current	208-230V	less than ≤19A	less than 28A	more than 19A	more than 28A	more than 24A	more than 32A
	460V	less than ≤22A	less than 30A	more than 22A	more than 30A	more than 22A	more than 32A
Compressor Current	208-230V	less than ≤24A	less than 35A	more than 24A	more than 35A	more than 30A	more than 41A
	460V	less than ≤26A	less than 35A	more than 26A	more than 35A	more than 30A	more than 41A

Phase Detection

Most Multi V systems require three-phase power. The product will display the errors listed in the table below if all three phases / wires aren't connected correctly (one [1] or more phases missing).

Table 19: Phase Detection Errors.

Error	Terminal Block			Error No.
	R	S	T	
Missed Phase	X			50
		X		
			X	5

If errors occur simultaneously on two or more combined outdoor units, only the smaller outdoor unit number will be displayed. Example: If Error No. 50 occurs on both the Master and the Slave 1 outdoor units, "501" displays on the LED (Master: ***1, Slave1: ***2).

Pressure Switch

Main PCB has a pressure sensor switch in the wiring between the inverter compressor and the power relay. The pressure sensor switch is normally on, and has a small electric current from 220V AC.

⚠ WARNING

Never touch the terminal, nor short two wires directly. It may cause physical injury or death.

Initial Setup

There are four (4) initial setup steps before operation can begin. All DIP switch settings must be completed before initial setup.

Step 1

Factory set value is displayed on the PCB LED for twenty-four (24) seconds.

Turn power on.

Code for the Master outdoor unit is displayed for three (3) seconds. **14**

Code for the Slave 1 outdoor unit is displayed for three (3) seconds. **12**

Code for the Slave 2 outdoor unit is displayed for three (3) seconds. **10**

Total system capacity is displayed for two (2) seconds. **36**

System type is displayed (2 is default). **2**
- Heat Pump = 2
- Heat Recovery = 3

Electrical requirements are displayed. **46**
- 208 = 22
- Heat Recovery = 46

Model Type. **1**

Step 2

Communication Check: If display follows all sequences as shown above, the communication between the Master and Slave outdoor units is normal. If the LED shows Error Code 104*, check the DIP switch settings and the communication cables between the Master and Slave outdoor units.

Step 3

PCB Error Check: Error check will begin after forty (40) seconds.

Master / Slave unit

- All errors of all the units (including Slave) will be shown on the LED.
- If communication between main PCB and inverter PCB isn't correct, Error Code 52* will be seen on the LED.
- If communication between main PCB and fan PCB isn't normal, Error Code 105* will be seen on the LED.
- If any errors are displayed, check corresponding wires / cables.

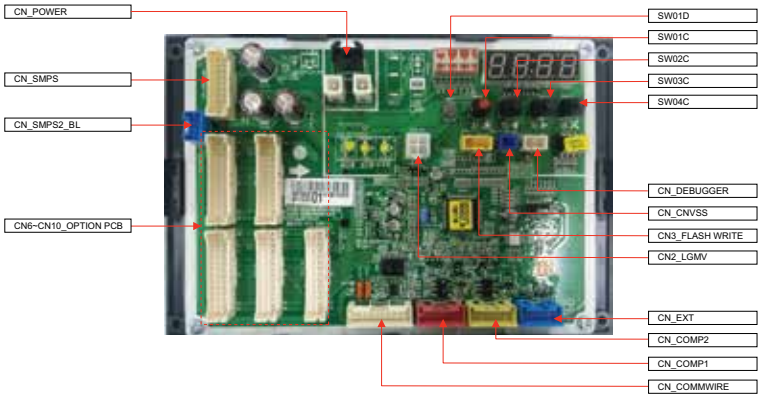
Initial Setup, Continued.

Step 4

Indoor unit auto addressing.

- Auto addressing begins after the red address button on the Main PCB is held for six (6) seconds.
- During auto addressing, the LED on the Main PCB displays "88".
- After auto addressing, the number of indoor units is shown on the LED for thirty (30) seconds. The address of the indoor unit is displayed on each wired remote controller.

Hold red address button down for three (3) seconds.



Auto addressing begins. Auto addressing may last up to fifteen (15) minutes.

46

The number of indoor units is displayed for thirty (30) seconds.

35

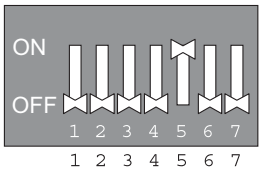
Thirty-five (35) indoor units found.

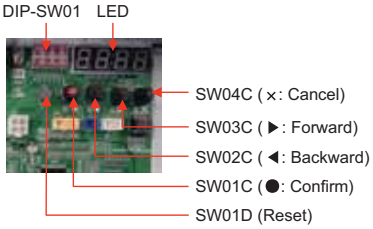
Auto address process is complete. After the number of indoor units has been displayed for thirty (30) seconds, every indoor unit displays its address on a wired remote controller, and the LED on the Main PCB is blank.

Initial Setup, Continued.

Setting the Functions

Select the Mode, Function, Option, or Values using the ◄ and ► buttons. Confirm using the ● button after DIP switch No. 5 is set to on.





Mode		Function		Option			Value		Action		Remarks
Content	Display 1	Content	Display 2	Content		Display 3	Content	Display 4	Implement	Display 5	
FDD	Fdd	Refrigerant Auto Charge (Cooling)	Fn1	-		-	-	-	Operate	Show the Process	-
		Refrigerant Auto Charge (Heating)	Fn2	-		-	-	-	Operate	Show the Process	-
		Refrigerant Auto Amount Judgment (Cooling)	Fn3	-		-	-	-	Operate	Show the Process	-
		Refrigerant Auto Amount Judgment (Heating)	Fn4	-		-	-	-	Operate	Show the Process	-
		ITR (Cooling)	Fn5	-		-	-	-	Operate	Show the Process	-
		ITR (Heating)	Fn6	-		-	-	-	Operate	Show the Process	-
Installation	Func	Cool & Heat Selector	Fn1	oFF	op1~op2	Selected the Option	-	-	Change the Set Value	Blank	Saved in EPROM
		Static Pressure Compensation	Fn2	oFF	op1~op3	Selected the Option	-	-	Change the Set Value	Blank	Saved in EPROM
		Night Low Noise	Fn3	oFF	op1~op12	Selected the Option	-	-	Change the Set Value	Blank	Saved in EPROM
		Overall Defrost	Fn4	on	oFF	Selected the Option	-	-	Change the Set Value	Blank	Saved in EPROM
		Outdoor Unit Address	Fn5	-		-	0~255	Set the Value	Change the Set Value	Blank	Saved in EPROM
		Snow Removal & Rapid Defrost	Fn6	oFF	op1~op3	Selected the Option	-	-	Change the Set Value	Blank	Saved in EPROM
		Adjusting the Indoor Unit Capacity	Fn7	op1~op2		Selected the Option	-	-	Change the Set Value	Blank	Saved in EPROM
		Adjusting Target Pressure	Fn8	op1~op4		Selected the Option	-	-	Change the Set Value	Blank	Saved in EPROM
SVC	SVC	Pump Down	SE1	-		-	-	-	Start Operation	Pd	-
		Pump Out	SE2	-		-	-	-	Start Operation	Po	-
		Vacuum mode	SE3	-		-	-	-	Start Operation	uRcc	-
		Backup	SE4	unit	inv1~inv2	Selected the Option	-	-	Start Operation	on off	Saved in EPROM
		Forced oil return	SE5	-		-	-	-	Start Operation	o1	-
		Forced defrost	SE6	-		-	-	-	Start Operation	dEF	-
		Cycle data view	SE7	op1~op7		-	-	-	Show in LED	Show Each Numerical Value in Process	-

Functions saved in EPROM will be stored indefinitely even if the system power is reset.

Emergency Operation

If an inverter compressor is not operating, the system can still run by using one of two methods.

Automatic Emergency Operation (Automatic Backup Function)

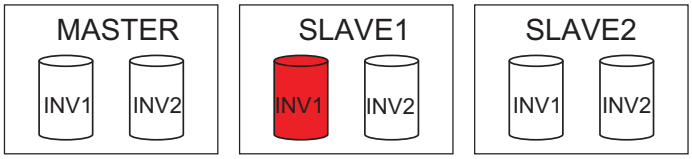
If an outdoor unit detects an inverter compressor error during operation, the automatic backup mode is initiated.

1. Inverter 1 compressor automatic emergency operation.
2. Inverter 2 compressor automatic emergency operation.

Manual Emergency Operation (Manual Backup Function)

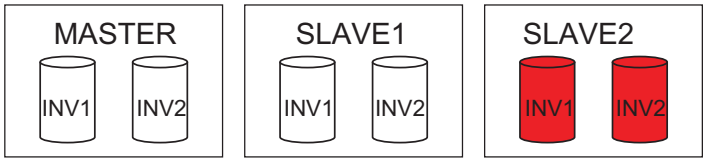
1. Verify which compressor is malfunctioning (refer to the Troubleshooting section in the back of this manual).
2. Turn off the power.
3. Set the DIP switch of the defective outdoor unit following the instructions below.
4. Turn on the power.

If Slave 1 Outdoor Unit Inverter Compressor Fails



1. Ensure Slave 1 Outdoor Unit PCB No. 5 DIP Switch is Set to ON.
2. Select the “SVC” Mode By Using the ► and ◄ Buttons, then Push the ● Button.
3. Select the “Se4” Function By Using the ► and ◄ Buttons, then Push the ● Button.
4. Select the “inv1” Option By Using the ► and ◄ Buttons, then Push the ● Button.
5. Select “Action” By Using the ► and ◄ Buttons, then Push the ● Button.

If Slave 2 Outdoor Unit Fails



1. Ensure Slave 2 Outdoor Unit PCB No. 5 DIP Switch is Set to ON.
2. Select the “SVC” Mode By Using the ► and ◄ Buttons, then Push the ● Button.
3. Select the “Se4” Function By Using the ► and ◄ Buttons, then Push the ● Button.
4. Select the “inv1” Option By Using the ► and ◄ Buttons, then Push the ● Button.
5. Select “Action” By Using the ► and ◄ Buttons, then Push the ● Button.

Backup Mode Cancellation

Select the “off” Action By Using the ► and ◄ Buttons, then Push the ● Button.

Note

- *Do not run the system under emergency operation with an inverter compressor failure for more than 48 hours. It may cause compressor failure within the other outdoor units.*
- *During the emergency operation, cooling / heating capacity may be reduced.*

Fault Detection Diagnosis (FDD) Checklist

1. A test run should be performed before running the automatic address procedure. After installation, recheck the auto addressing.
2. After the power is turned on, the MICOM data is reset, and communications with the indoor units will commence in three (3) minutes.
3. Indoor units must be series seven (7) and higher.
4. The results and errors are displayed only on the Master outdoor unit Main PCB LED for the FDD test run.
5. Change the DIP switch to OFF, then press the black button for two (2) seconds to reset all data and return to operation standby.
6. To reset if the test run must be shut off because of an error, press the SW04C (X: Cancel) and SW01C (●: execute) button simultaneously for more than five (5) seconds.
7. After the test run is finished, the results are displayed for ninety (90) seconds, and all indoor units are turned off.
8. If all FDD functions wish to be applied, first press the main PCB reset button for three (3) minutes.
9. If LGMV version 7.0.3 or later is used, a normal test run can be operated.

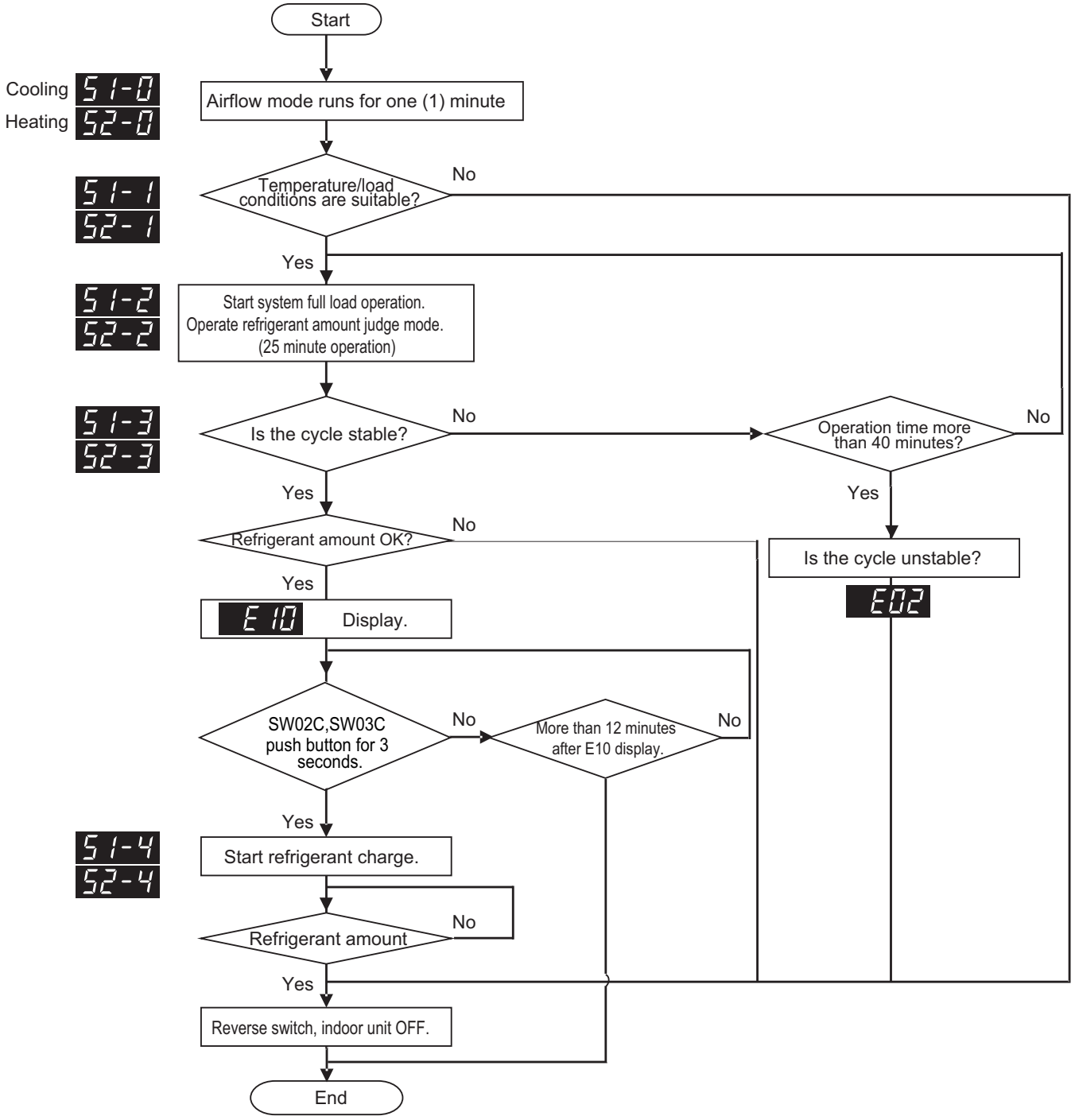
Refrigerant Auto Charge

This function can be used to charge a suitable amount of refrigerant in the system through automatic cycle operation. Use the refrigerant auto charge function if the refrigerant amount is not correct after the system is serviced, if there is a leak in the piping, etc.

Refrigerant charging time can be different depending on the amount necessary. Approximate charge time is about 1.5 minutes per pound.

Note

After installing and servicing the system, calculate and charge the correct amount of refrigerant.



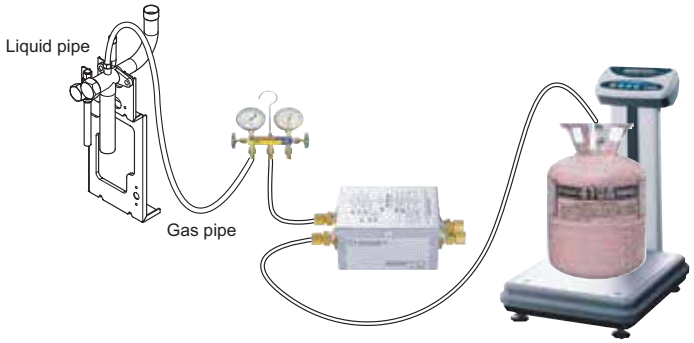
LG

Refrigerant Auto Charge, Continued.

Refrigerant Charge Procedure

1. Prepare manifold, refrigerant, and scale (sold separately).
2. Connect manifold to refrigerant charge ports as seen in the figures.
3. Connect Manifold and refrigerant.
4. Perform the air purge procedure for each manifold hose.
5. When “E10” is displayed, open the valve and charge the system with refrigerant.

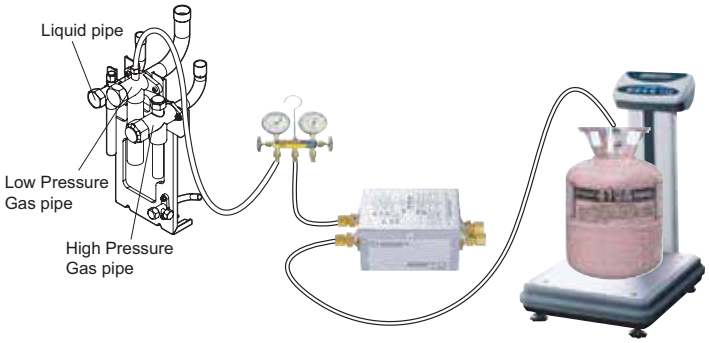
Figure 3: Multi V IV Heat Pump Refrigerant Charge Procedure.



Note

- *Follow the procedures indicated on this page when charging refrigerant.*
- *If ambient conditions are out of the operating temperature range, Auto Charge may not operate properly.*
- *Outdoor Unit Operating Temperature Range: Cooling = 32~109°F; Heating = 14~75°F.*
- *Indoor Unit Operating Temperature Range: Cooling = 65~90°F; Heating = 50~81°F.*
- *If the system continuously turns off because of excessive low pressure levels before “E10” is displayed, the system does not have the appropriate amount of refrigerant. Add about 15% of the estimated refrigerant amount, and try the procedure again.*
- *Press SW04C (X: Cancel) button down and push DIP switch down after the auto refrigerant charge function ends.*

Figure 4: Multi V IV Heat Recovery Refrigerant Charge Procedure.



⚠ WARNING

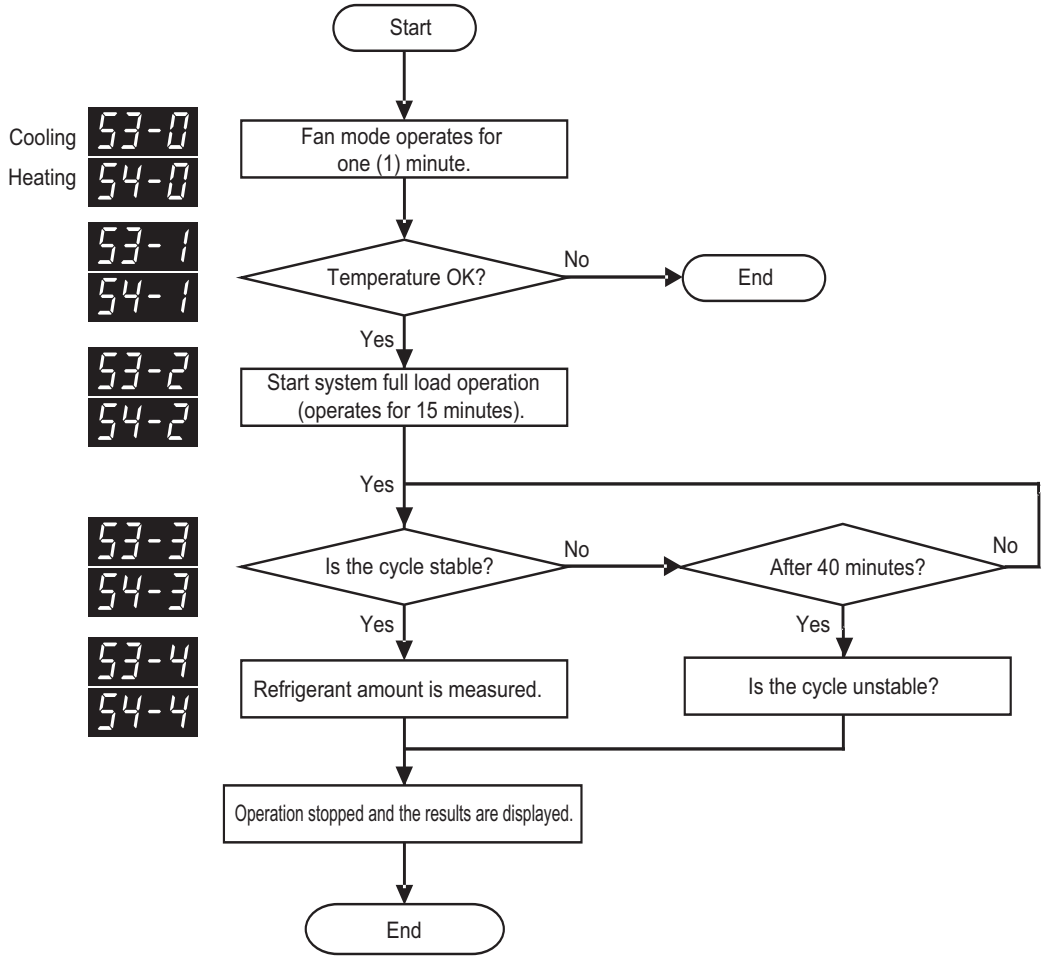
When performing the leak test and air purge, use a vacuum pump or an inert gas such as nitrogen. If oxygen, compressed air, or flammable gas are used, there is a possibility of fire, explosion, personal injury, and death.

Note

- *When you charge refrigerant, use the specified equipment.*
- *Use the wired remote control to set the main unit.*
- *During indoor unit operation, system must be in Thermo on.*
- *If outdoor unit switched to defrost mode while the auto refrigerant charge function was operating, restart function after defrost mode is finished.*

Refrigerant Amount Auto Measure

This function allows the system to automatically measure refrigerant levels through system operation. Refrigerant Amount Auto Measure can be used to see if the system has been overcharged or underchanged, and can be used with the Refrigerant Auto Charge function.



- LED will display if the system has a refrigerant overcharge or a refrigerant undercharge, as well as the percentage of over- or undercharge per the total amount of refrigerant.

Ex. 1: 20 → 20% refrigerant overcharge → need to remove

Ex. 2: -20 → 20% refrigerant undercharge → need to charge

Ex. 3: 0 → No adjustment necessary

Refrigerant Amount Auto Measure function will stop if the indoor unit combination ratio and the operating temperature range are not within manufacturer's allowable parameters.

- Indoor unit combination ratio: 80~130%
- Outdoor unit operating temperature range: Cooling = 32~109°F; Heating = 14~75°F.

Refrigerant Amount Auto Measure function runs for 15 minutes at full load operation; refrigerant levels can be measured directly under special cases.

- Press SW04C (X: Cancel) button and turn the DIP switch to OFF after the function ends.

Initial Test Run (ITR) (Cooling)

ITR (Cooling) function checks for normal cooling operation of certain parts and the overall system. Use LGMV to check and save data.

Manufacturer's Operating Temperature range (Error occurs out of operating temperature range):

- Indoor Units = 65~90°F
- Outdoor Units = 32~109°F

DIP switch 5 enables the function mode. If the function is not used, set DIP switch 5 to off, and reset the power.

Note

If an error occurs with an indoor unit, operate that indoor unit in fan mode, but make sure the auto address number of that indoor unit does not display.

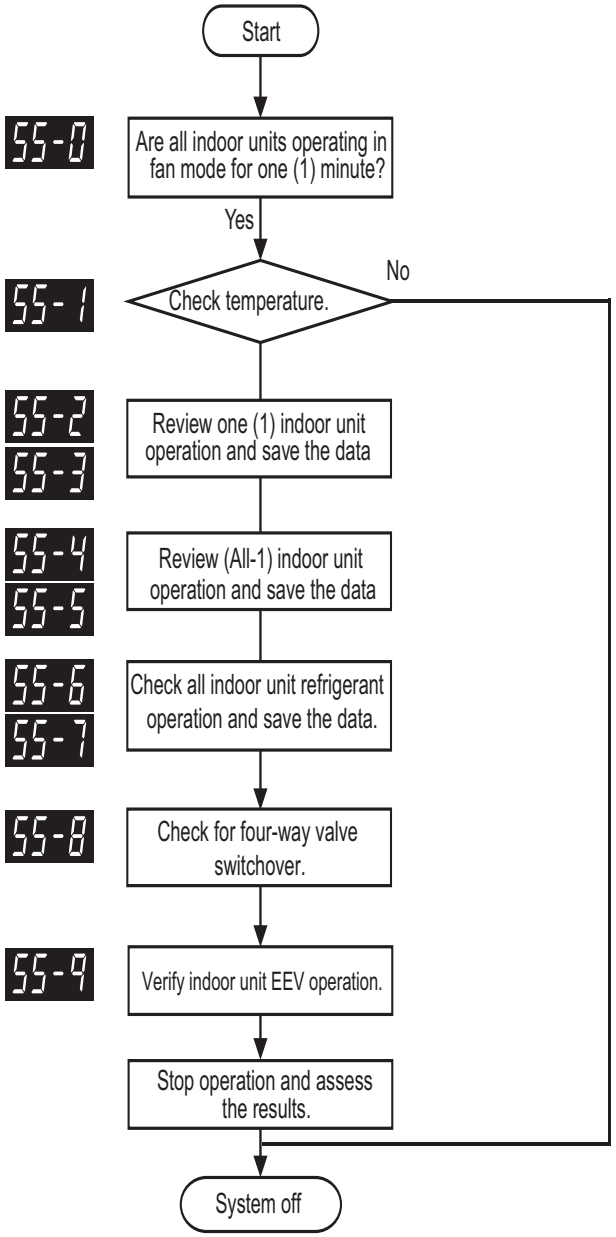


Table 20: ITR (Cooling) Codes.

		Assessment	Code	Display
ITR (Cooling)	Indoor Unit EEV	OK	5-Cn	5-cn
		Not Appropriate	5-C1	5-c1
		Cannot Confirm	5-CF	5-cF
	Refrigerant	More Than Correct Amount	Ex: 20%	20
		Less Than Correct Amount	Ex: -15%	-15
		No Adjustment Required	00	00
		Cannot Confirm	3-CF	3-cF

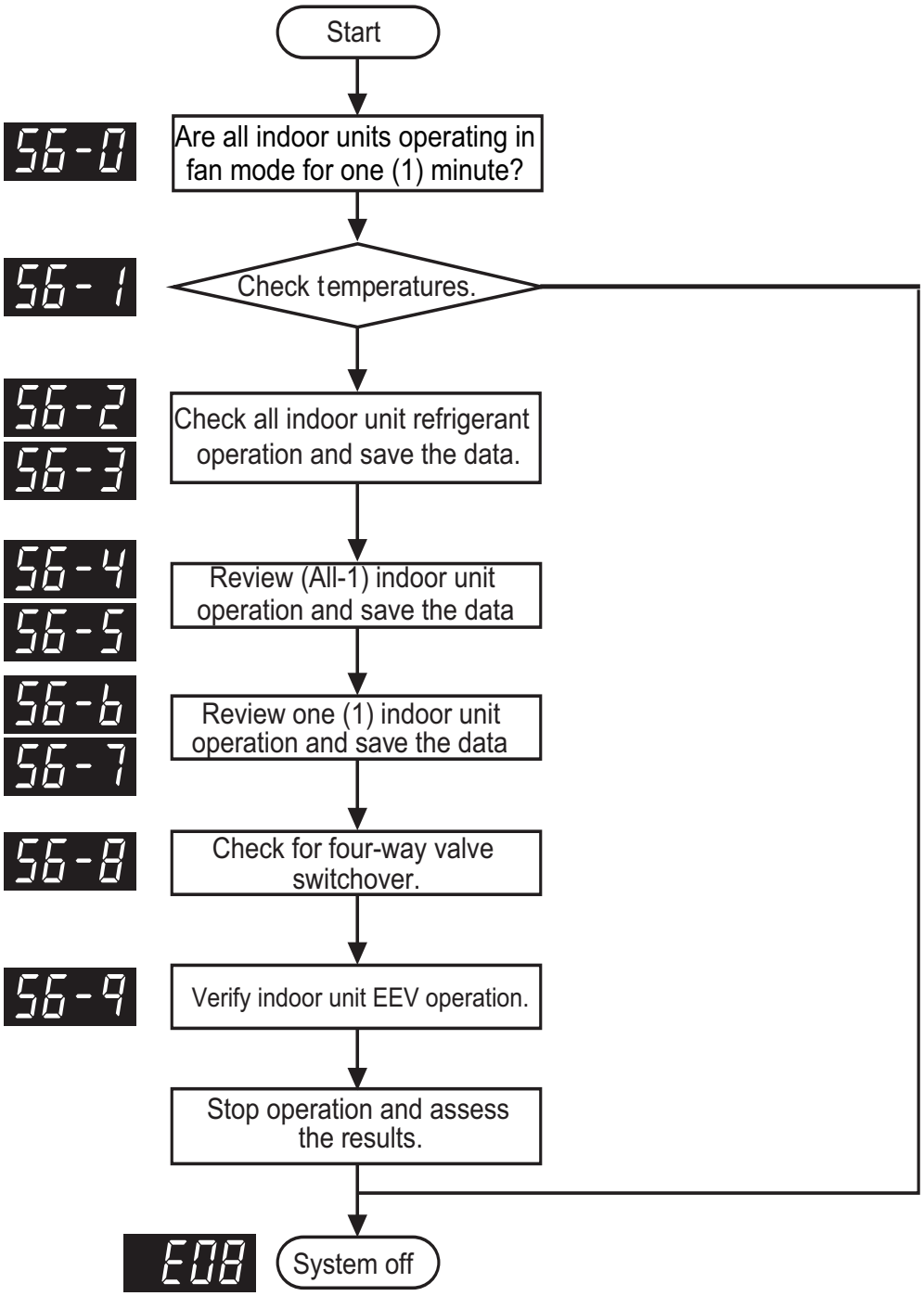
Initial Test Run (ITR) (Heating)

ITR (Heating) function checks for normal heating operation of certain parts and the overall system. Use LGMV to check and save data.

Manufacturer's Operating Temperature range (Error occurs out of operating temperature range):

- Indoor Units = 65~90°F
- Outdoor Units = 14~75°F

DIP switch 5 enables the function mode. If the function is not used, set DIP switch 5 to off, and reset the power.



Initial Test Run (ITR) (Heating), continued.

Table 21: ITR (Heating) Codes.

		Assessment	Code	Display
ITR (Heating)	Indoor Unit EEV	OK	6-Cn	6-cn
		Not Appropriate	6-C1	6-c1
		Cannot Confirm	6-CF	6-cF
	Outdoor Unit Main EEV	OK	7-Cn	7-cn
		Not Appropriate	7-C1	7-c1
		Cannot Confirm	7-CF	7-cF
	Refrigerant	More Than Correct Amount	Ex: 20%	20
		Less Than Correct Amount	Ex: -15%	-15
		No Adjustment Required	00	00
		Cannot Confirm	4-CF	4-cF

Fault Detection Diagnosis (FDD) Codes

Table 22: FDD Error Codes.

Error Codes	Display	Problem
E01	E01	Indoor unit combination capacity is >130% or <80% less than outdoor unit rated capacity.
E02	E02	System is unstable.
E03	E03	Temperature range error.
E04	E04	Can't operate FDD function for defrost.
E05	E05	Error occurs during sensor check function.
E06	E06	Occurs if only one indoor unit is present.
E07	E07	Occurs if the button is not pressed for auto refrigerant charge function.
E08	E08	FDD was forced to terminate or refrigerant auto charge terminated normally.
E09	E09	System off / wait to operate FDD function.
E10	E10	Need additional refrigerant.
System Error	Same as Normal Operation	System error has occured

Multi V ITR Result Report

Multi V Start up Confirmation									
Date									
		Company Name & Address		Telephone			Name		
Project Manager	Installer								
	Consultant								
	Supervisor								
Product		Model		Model No.			Position		
	Outdoor Unit								
	Indoor Unit								
	HR Unit								
Test Run Results									
Operation Mode	%ITR_6	All IDU Operation			1 IDU Operation			STEP	%ITR_122
Check Items		Min.	Max.	Average	Min.	Max.	Average	OK/NG	Criterion For Judgment
Temp. Condition	IDU Air Temp								68~86°F
	ODU Air Temp								221°F
Indoor Unit	IDU pipe inlet Temp								
	IDU pipe outlet temp								
	IDU LEV Openess								
Outdoor Unit	Pressure	High Pressure							522.1 psi↓(Cool) 333.6 psi↓(Heat)
		Low Pressure							188.5 psi ↑(Cool) 29 psi ↑(Heat)
	COMP	**COMP Operate Combination**							
		CT Value	ODU #1 Comp1						24A ↓
			ODU #1 Comp2						
			ODU #2 Comp1						
			ODU #2 Comp2						
			ODU #3 Comp1						
			ODU #3 Comp2						
		Discharge Temp.	ODU #1 Comp1						122~176°F
			ODU #1 Comp2						
			ODU #2 Comp1						
			ODU #2 Comp2						
			ODU #3 Comp1						
			ODU #3 Comp2						
	Main Voltage	R-phase							342~456 V
		T-phase							
	Main Current	R-phase							20A ↓
		T-phase							
	Discharge Superheat	ODU #1							122~176°F, Heat
		ODU #2							
		ODU #3							
	Suction Superheat	ODU #1							33°F ↑, Cool 33~45°F, Heat
		ODU #2							
		ODU #3							
	ODU LEV Open	ODU #1							
		ODU #2							
		ODU #3							
	Refrigerant Check								
	Main EEV Check								
	IDU EEV Check								

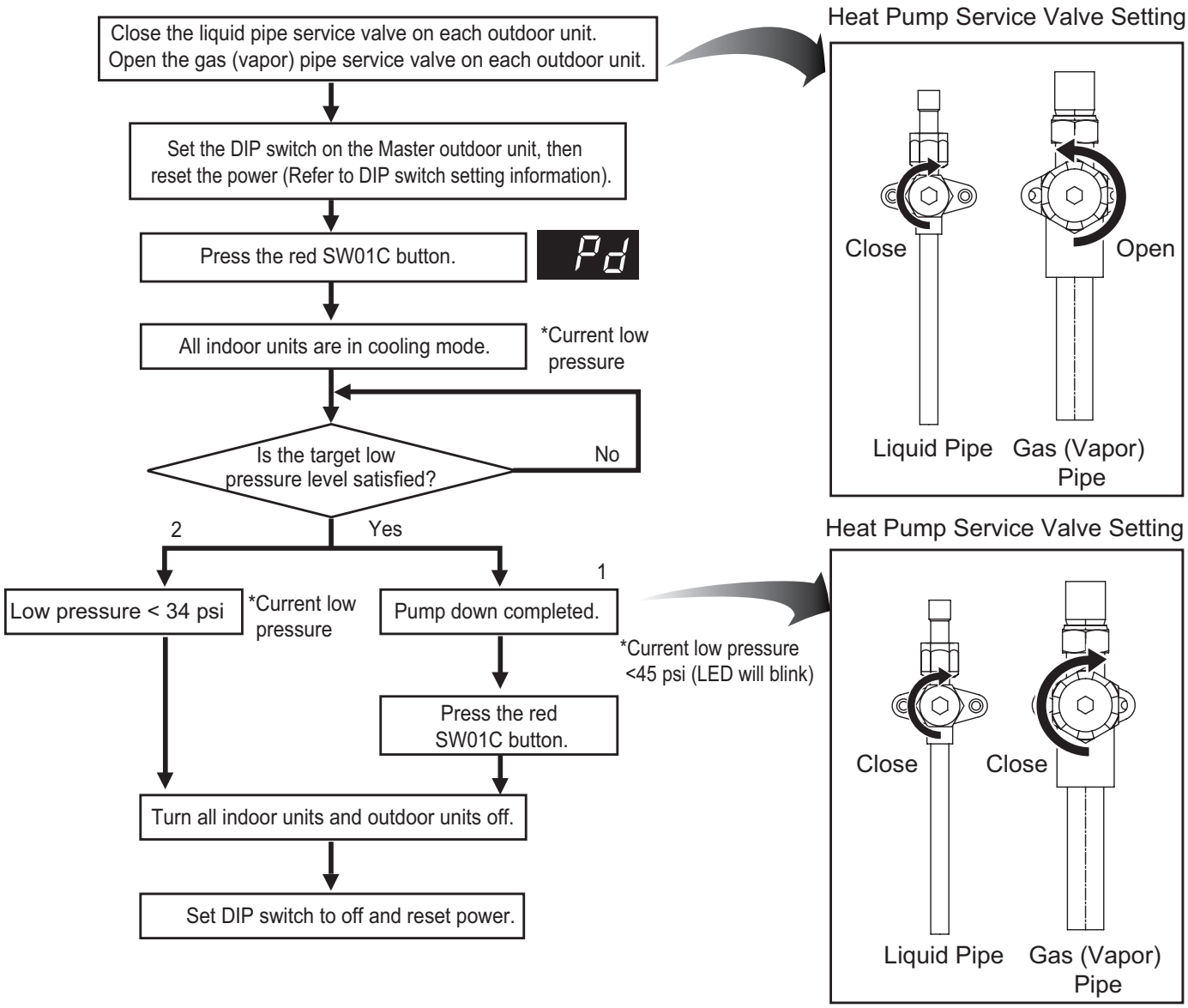
Multi V ITR Result Report, Continued.

Follow the Procedure:

Save html file

Pump Down for Heat Pump Systems

The Pump Down function pulls the refrigerant in the piping system to the outdoor unit(s). Use this procedure to store refrigerant in the system in the outdoor unit in case of a leak or when replacing an indoor unit.



Note

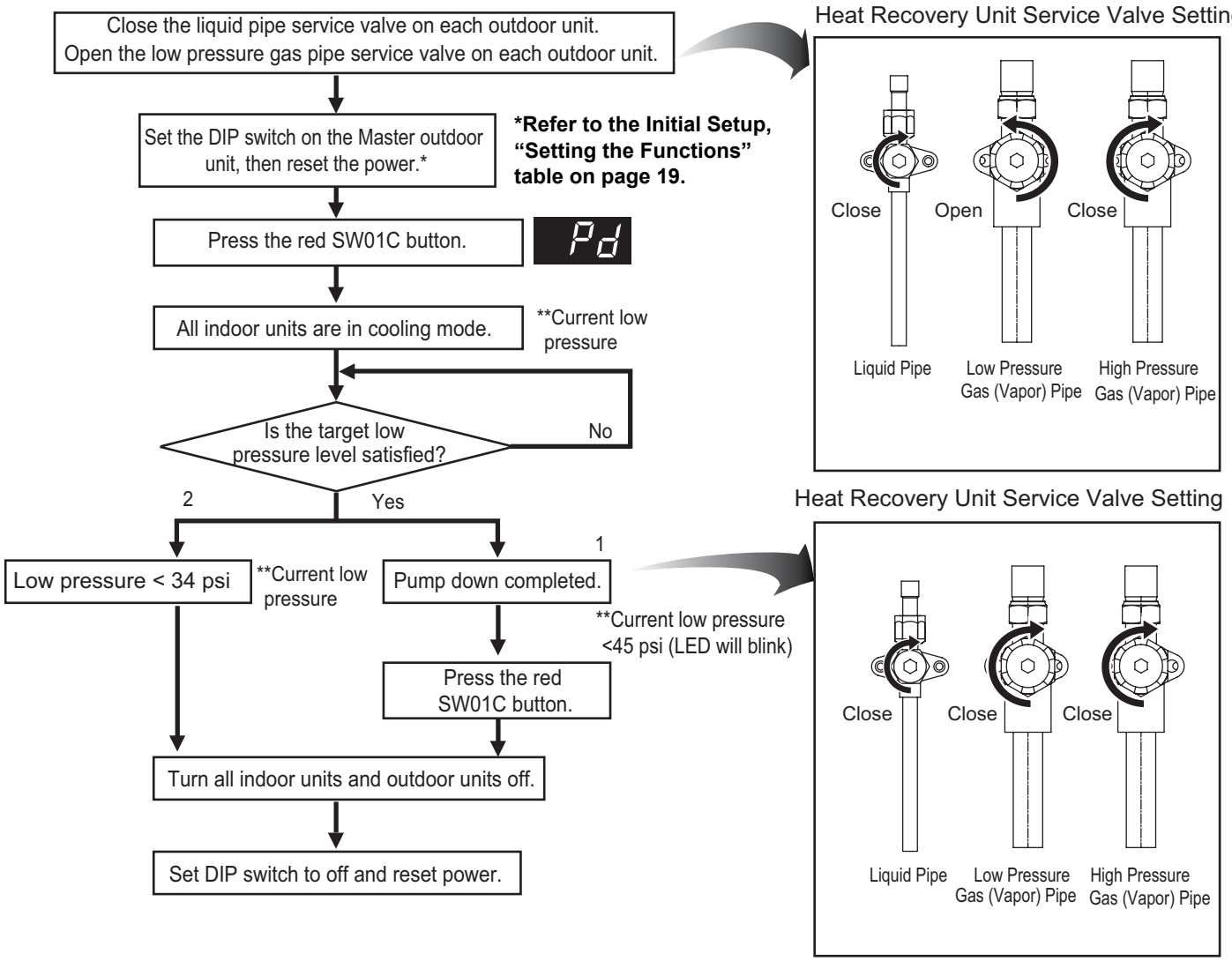
1. *If low pressure falls below 45 psi, immediately close the gas (vapor) pipe service valves on all outdoor units.*
2. *If low pressure falls below 34 psi, the system turns off automatically. Immediately close the gas (vapor) pipe service valves on the outdoor units.*

Note

- *Use the Pump Down function while ambient conditions are within the manufacturer's operating temperature ranges: Indoor Units = 68~90°F; Outdoor Units = 41~104°F.*
- *Ensure that the indoor units do not run in thermo off mode during Pump Down.*
- *Maximum operation time of Pump Down is thirty (30) minutes (in case low pressure does not satisfy target levels immediately).*

Pump Down for Heat Recovery Systems

The Pump Down function pulls the refrigerant in the piping system to the outdoor unit(s). Use this procedure to store refrigerant in the system in the outdoor unit in case of a leak or when replacing an indoor unit.



Note

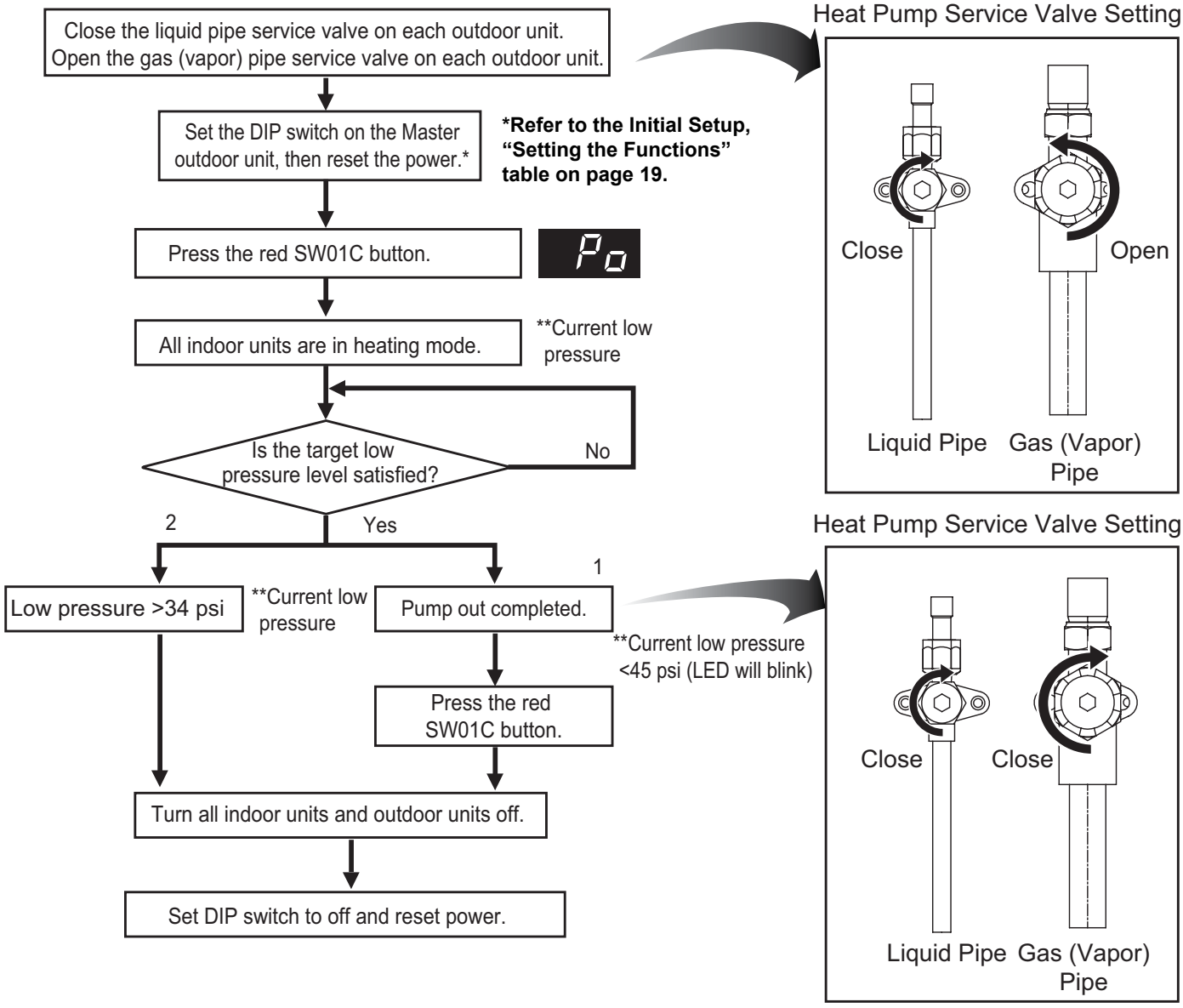
1. *If low pressure falls below 45 psi, immediately close the gas (vapor) pipe service valves on all outdoor units.*
2. *If low pressure falls below 34 psi, the system turns off automatically. Immediately close the gas (vapor) pipe service valves on the outdoor units.*

Note

- *Use the Pump Down function while ambient conditions are within the manufacturer's operating temperature ranges: Indoor Units = 68~90°F; Outdoor Units = 41~104°F.*
- *Ensure that the indoor units do not run in thermo off mode during Pump Down.*
- *Maximum operation time of Pump Down is thirty (30) minutes (in case low pressure does not satisfy target levels immediately).*

Pump Out for Heat Pump Systems

The Pump Out function pushes refrigerant from a malfunctioning outdoor unit to other outdoor units and indoor units. Use this function in the event of an outdoor unit compressor failure, if a part is defective and needs to be replaced, or if there is a leak.



Note

1. *If low pressure falls beiow 45 psi (the LED will blink), close the gas service valves on all outdoor units immediately.*
2. *If low pressure falls below 34 psi, the system turns off automatically. Immediately close the gas (vapor) pipe service valves on the outdoor units.*

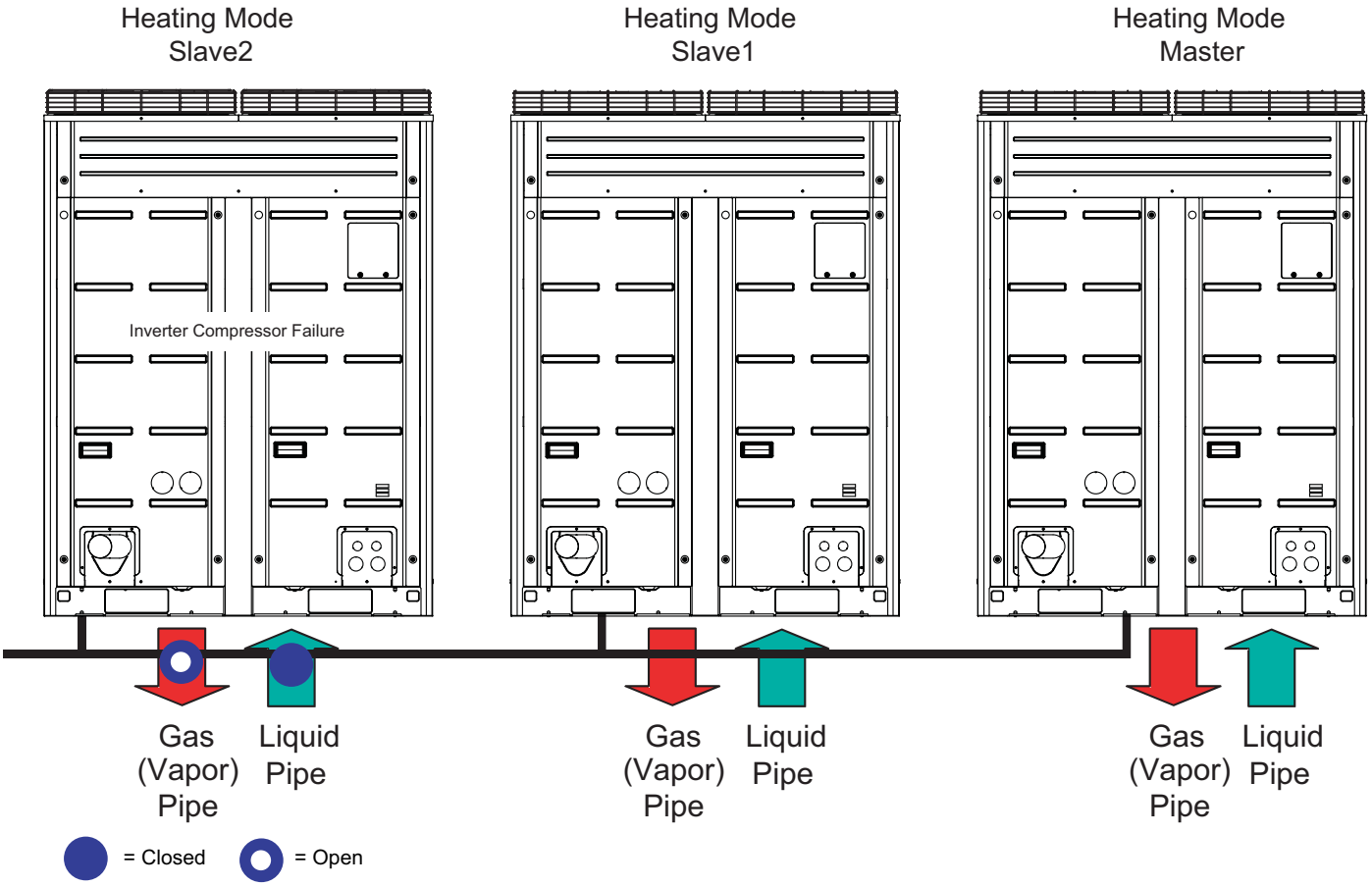
Note

- *Use the Pump Out function while ambient conditions are within the manufacturer's operating temperature ranges: Indoor Units = 50~86°F; Outdoor Units = 41~104°F.*
- *Ensure that the indoor units do not run in thermo off mode during Pump Out (in case low pressure does not satisfy levels).*
- *Maximum operation time of Pump Out takes two (2) to five (5) minutes after the compressor starts.*

LG

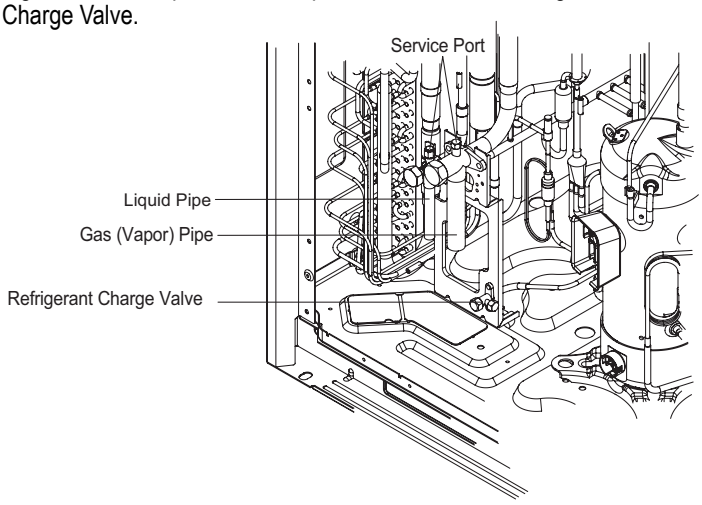
Pump Out for Heat Pump Systems, Continued.

Example of Pump Out Function When Slave2 Outdoor Unit Experiences Inverter Compressor Failure.



1. Close the liquid pipe of the outdoor unit for Pump Out operation. Open the gas valve.
2. Operate Pump Out function.
3. Close the gas (vapor) pipe of unit after Pump Out is complete.
4. Replace Inverter compressor and perform vacuum.
5. Add refrigerant using the Refrigerant Auto Charge Function.

Figure 5: Close Up of Heat Pump Service Ports and Refrigerant Charge Valve.

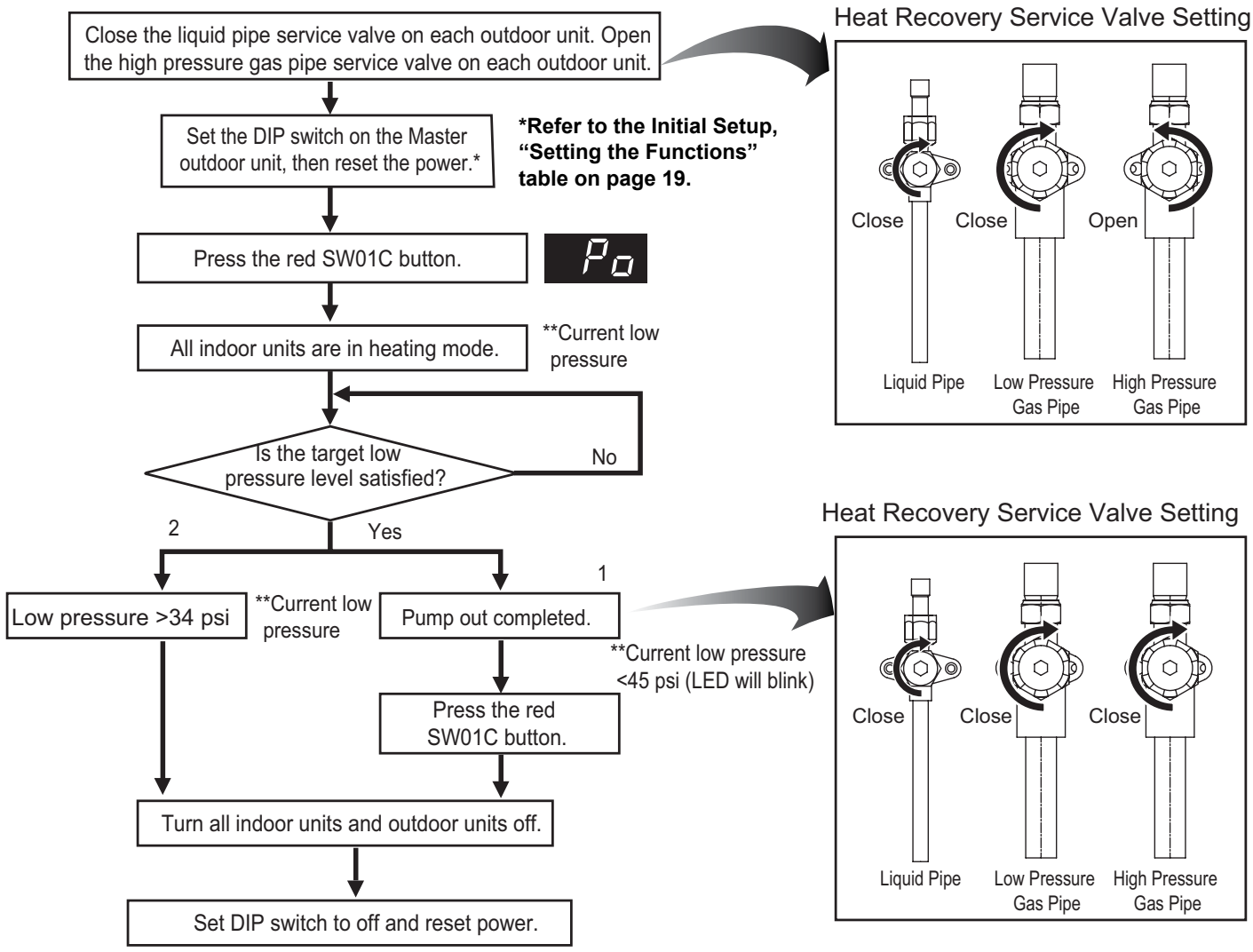


OTHER CONTROLS

Pump Out

Pump Out for Heat Recovery Systems

The Pump Out function pushes refrigerant from a malfunctioning outdoor unit to other outdoor units and indoor units. Use this function in the event of an outdoor unit compressor failure, if a part is defective and needs to be replaced, or if there is a leak.



Note

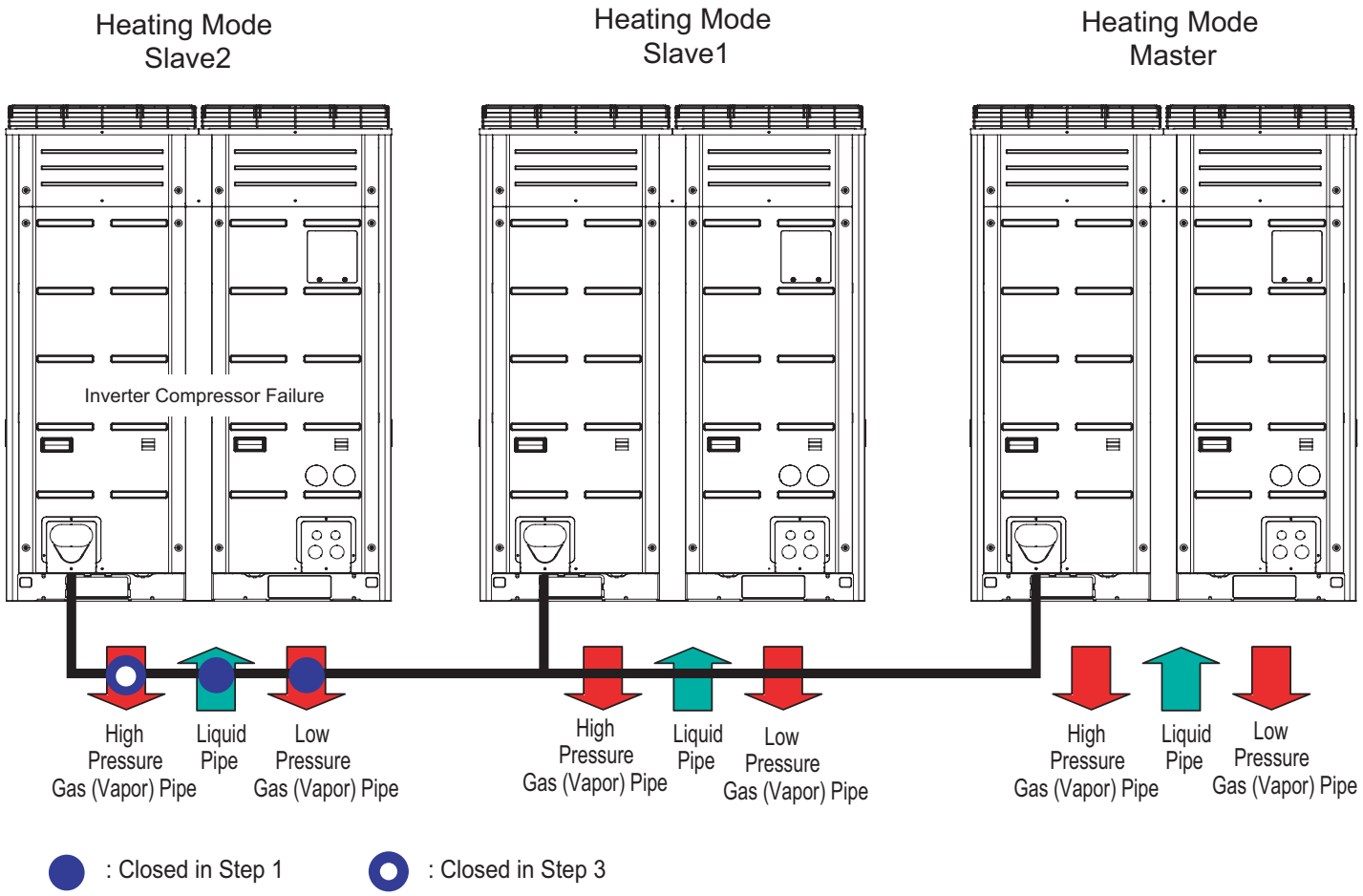
1. *If low pressure falls beiow 45 psi (the LED will blink), close the gas (vapor) service valves on all outdoor units immediately.*
2. *If low pressure falls below 34 psi, the system turns off automatically. Immediately close the gas (vapor) pipe service valves on the outdoor units.*

Note

- *Use the Pump Out function while ambient conditions are within the manufacturer's operating temperature ranges: Indoor Units = 50~86°F; Outdoor Units = 41~104°F.*
- *Ensure that the indoor units do not run in thermo off mode during Pump Out (in case low pressure does not satisfy levels).*
- *Maximum operation time of Pump Out takes two (2) to five (5) minutes after the compressor starts.*

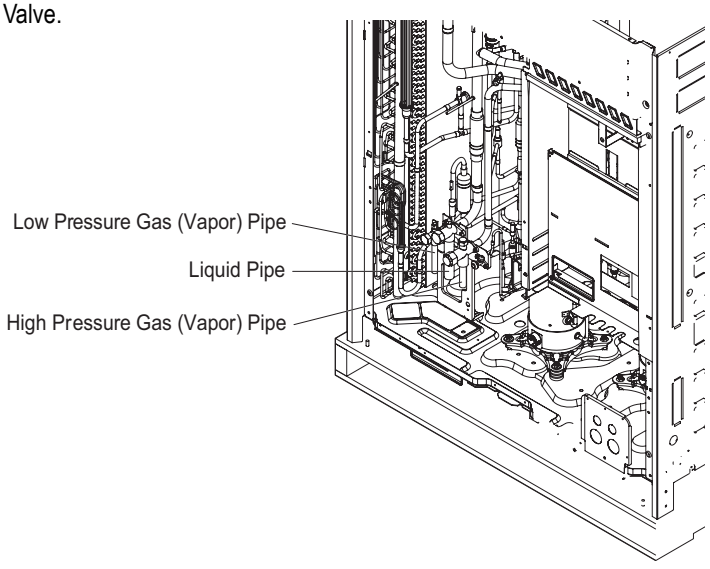
Pump Out for Heat Recovery Systems, Continued.

Example of Pump Out Function When Slave2 Outdoor Unit Experiences Inverter Compressor Failure.



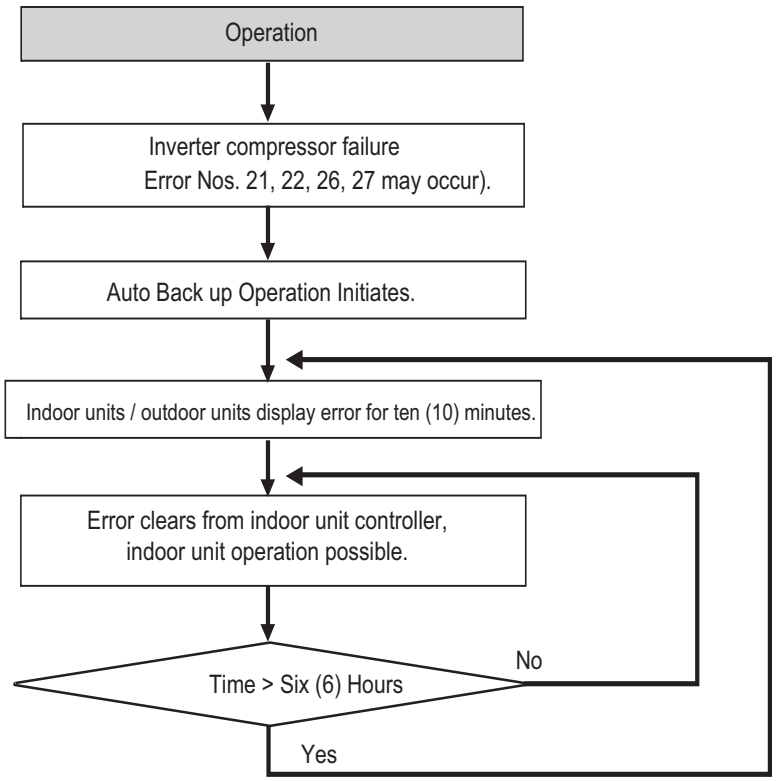
1. Close liquid pipe and low pressure gas pipe of the outdoor unit for Pump Out operation.
2. Operate Pump Out function.
3. Close high pressure gas pipe of unit after Pump Out is complete.
4. Recover refrigerant in suction port after opening the low pressure gas pipe of the corresponding outdoor unit
5. Replace Inverter compressor and perform vacuum.
6. Add refrigerant using the Refrigerant Auto Charge Function.

Figure 6: Close Up of Heat Pump Service Ports and Refrigerant Charge Valve.

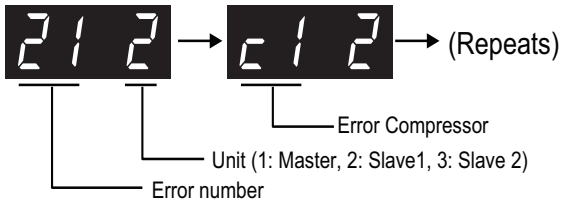


Auto Back Up Function (Inverter Compressor)

The Auto Back Up Function allows the system to operate in case of inverter failure, backing up the compressor (operating on the defective compressor is halted). Error can be displayed every six (6) hours.



Example: Slave1 unit Inverter Compressor 1 start fails (Error No. 21 o



Note

- *Request service immediately if error occurs.*
- *Auto Back Up Function is set up to one inverter compressor.*
- *When Auto Back Up Function begins, the error code(s) display(s) for ten (10) minutes every six (6) hours.*
- *Error will display continuously at the corresponding outdoor unit(s).*

Night Low Sound Function

When in cooling mode, this function makes the outdoor unit fan(s) operate at a low RPM, reducing fan sound.

Setting the Night Low Sound Function

1. Master Outdoor Unit PCB No. 5 DIP Switch to ON.
2. Select the “Func” Mode By Using the ► and ◄ Buttons, then Push the ● Button.
3. Select the “Fn3” Function By Using the ► and ◄ Buttons, then Push the ● Button.
4. Select “op1~op12” Option By Using the ► and ◄ Buttons, then Push the ● Button.
5. Start the Night Low Noise function; save the selected value in the EPROM.

Table 23: RPM / Settings per Hour.

Step	Estimate Time (Hr)	Operation Time (Hr)
op1	8	9
op2	6.5	10.5
op3	5	12
op4	8	9
op5	6.5	10.5
op6	5	12
op7	8	9
op8	6.5	10
op9	5	12
op10	Continuous Operation	
op11		
op12		

Table 24: Sound per Outdoor Unit Capacity.

Heat Pump / Heat Recovery	Capacity	
	6 Ton	8-14 Ton
Step	Sound (dB)	
op1~op3, op10	55	59
op4~op6, op11	52	56
op7~op9, op12	49	53

Note

- *Request installer to set the function during installation.*
- *If this function is not used, set the DIP switch to off and reset the power. If the RPM of the outdoor unit changes, cooling capacity may decrease.*

OTHER CONTROLS

Vacuum Mode / Static Pressure Compensation Mode

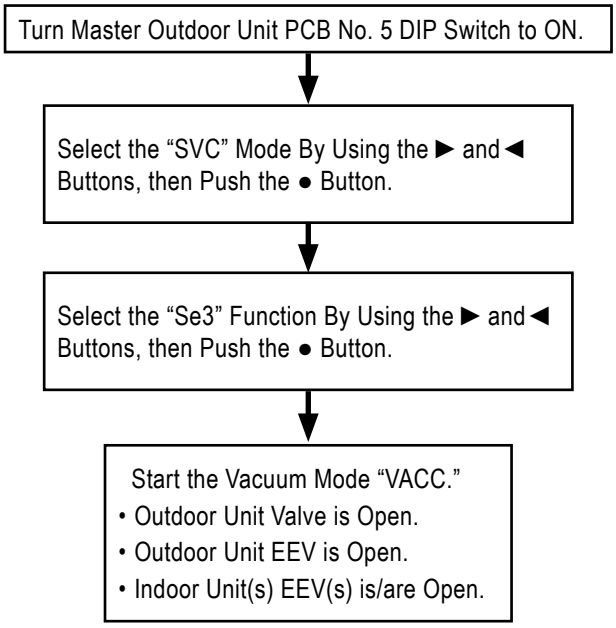
Vacuum Mode

The Vacuum Mode is used for creating vacuum in the system after compressor and / or outdoor unit parts are replaced, or when an indoor unit is added or replaced.

Setting Vacuum Mode

1. Turn Master Outdoor Unit PCB No. 5 DIP Switch to ON.
2. Select the “SVC” Mode By Using the ► and ◄ Buttons, then Push the ● Button.
3. Select the “Se3” Function By Using the ► and ◄ Buttons, then Push the ● Button.
4. Start the Vacuum Mode “VACC”. In Vacuum Mode, the Outdoor Unit Valve is Open, the Outdoor Unit EEV is Open, and the Indoor Unit(s) EEV(s) is/are Open.
5. To Cancel the Vacuum Mode, Push the Reset Button on the Master Unit and Slave Unit(s) PCBs, or Reset the Power on all Outdoor Units (Master and Slave Unit[s]).

Setting Vacuum Mode



Cancelling Vacuum Mode

Push the Reset Button on the Master Unit and Slave Unit(s) PCBs.

<OR>

Reset the Power on all Outdoor Units (Master and Slave Unit[s]).

Note

If vacuum mode is not terminated on all outdoor units (Master and Slave[s]), the system will continue to operate with all EEVs and valves open on the non-vacuum mode terminated slave outdoor units. The refrigerant will flood back to the compressors on those non-vacuum mode terminated slave outdoor units, which will result in poor operation, equipment malfunction and / or compressor damage.

Note

- *Outdoor unit operation stops during Vacuum Mode, therefore, the compressor cannot operate.*
- *Do not operate vacuum mode for more than 48 hours.*

Static Pressure Compensation Mode

The Static Pressure Compensation Mode allows the outdoor unit fan to increase RPM typically for use when the outdoor unit is mounted in a place where more airflow is required (such as when ducted).

Setting the Mode

1. Master Outdoor Unit PCB No. 5 DIP Switch to ON.
2. Select the “Func” Mode By Using the ► and ◄ Buttons, then Push the ● Button.
3. Select the “Fn2” Function By Using the ► and ◄ Buttons, then Push the ● Button.
4. Select “op1,” “op2,” or “op3” Option By Using the ► and ◄ Buttons, then Push the ● Button.
5. Start the Static Pressure Compensation Mode; save the selected option value in the EPROM.

Static Pressure Compensation Mode, continued.

Table 26: Maximum Fan RPM at Each Step.

Capacity		6 Ton	8~14 Tons
Heat Pump 208-230V Outdoor Unit			
Max. RPM	Standard	850	1,050
	Step 1	870	1,080
	Step 2	890	1,110
	Step 3	900	1,120
Heat Pump 460V Outdoor Unit			
Max. RPM	Standard	730	950
	Step 1	760	1,020
	Step 2	780	1,050
	Step 3	800	1,130
Heat Recovery 208-230V Outdoor Unit			
Max. RPM	Standard	850	1,050
	Step 1	870	1,080
	Step 2	890	1,110
	Step 3	900	1,120
Heat Recovery 460V Outdoor Unit			
Max. RPM	Standard	730	950
	Step 1	760	1,020
	Step 2	780	1,050
	Step 3	800	1,130

Mode Selector Switch (Function only compatible with heat pump models)

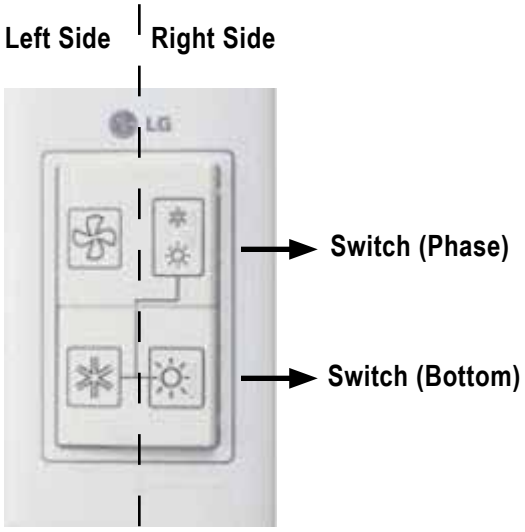
Setting the Mode

1. Master Outdoor Unit PCB No. 5 DIP Switch to ON.
2. Select the “Func” Mode By Using the ► and ◄ Buttons, then Push the ● Button.
3. Select the “Fn1” Function By Using the ► and ◄ Buttons, then Push the ● Button.
4. Select “oFF”,“op1” or “op2” Option By Using the ► and ◄ Buttons, then Push the ● Button.
5. The Mode Selector Switch is Set.

Table 25: Mode / Function Table.

Switch Control		Function		
Switch (Phase)	Switch (Bottom)	oFF	op1 (Mode)	op2 (Mode)
Right	Left	Not Operating	Cooling	Cooling
Right	Right	Not Operating	Heating	Heating
Left	-	Not Operating	Fan Mode	Off

Figure 7: Mode Selector Switch.



Note

- *A qualified service technician must set the Mode Selector Switch.*
- *The Mode Selector Switch must be installed before the functions are set.*
- *If a function is not used, set to Off Mode.*

Cycle Data View

Cycle Data View displays the cycle data of the operating outdoor unit on the LED. Cycle Data View can display 26 different cycle datapoints.

Setting the Cycle Data View Function

1. Master Outdoor Unit PCB No. 5 DIP Switch to ON.
2. Select the “SVC” Mode By Using the ► and ◄ Buttons, then Push the ● Button.
3. Select the “Se3” Function By Using the ► and ◄ Buttons, then Push the ● Button.
4. Select any Option Between “op1~op26” By Using the ► and ◄ Buttons, then Push the ● Button.
5. The Cycle Data View Function Will Display the Datapoint Selected.

Table 27: Cycle Data View Datapoint Options.

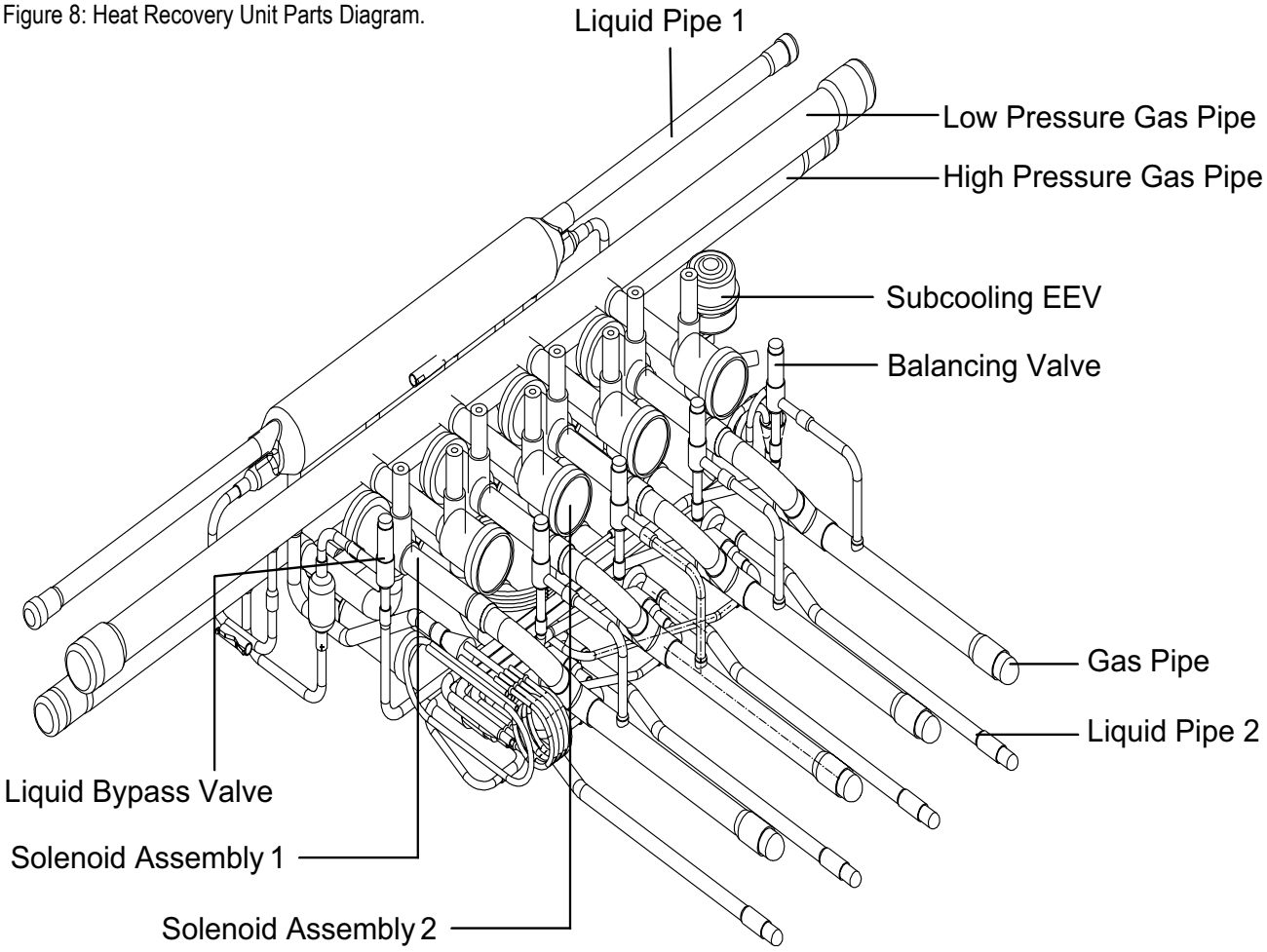
Step	Description	Display	Example	seg_1	seg_2	seg_3	seg_4
op1	Current High Pressure	P1	4,321 kPa (627 psi)	4	3	2	1
op2	Current Low Pressure	P2	1,234 kPa (179 psi)	1	2	3	4
op3	Inv 1 Pulse	h1	120		1	2	0
op4	Inv 2 Pulse	h2	30			3	0
op5	Fan RPMs	h3	110		1	1	0
op6	Degree of Subcooling	T1	5.3			5	3
op7	Degree of Superheating	T2	-4.5		-	4	5
op8	Outdoor Unit Temperature	T3	10		1	0	0
op9	Suction Temperature	T4	43.4		4	3	4
op10	Compressor 1 Discharge Temperature	T5	150		1	5	0
op11	Compressor 2 Discharge Temperature	T6	124		1	2	4
op12	Liquid Pipe Temperature	T7	10		1	0	0
op13	Sc_in	T8	10		1	0	0
op14	Sc_out	T9	10		1	0	0
op15	Hex_total	T10	10		1	0	0
op16	Hex_hi	T11	10		1	0	0
op17	Hex_low	T12	10		1	0	0
op18	Inlet Pipe Temperature of Indoor Unit	T13	-10°	-	1	0	0
op19	Main 1 EEV	PLS1	1,940	1	9	4	0
op20	Main 2 EEV	PLS2	32			3	2
op21	SC EEV	PLS3	16			1	6
op22	Oil EEV	PLS4	50			5	0
op23	vi eev 1	PLS5	1,350	1	3	5	0
op24	vi eev 2	PLS6	8				8
op25	Operation Capacity of Indoor Units	IDU1	24k			2	4
op26	Total Number of Indoor Units	IDU2	10			1	0

HEAT RECOVERY UNIT PARTS FUNCTIONS

Table 28: Heat Recovery Unit Parts Table.

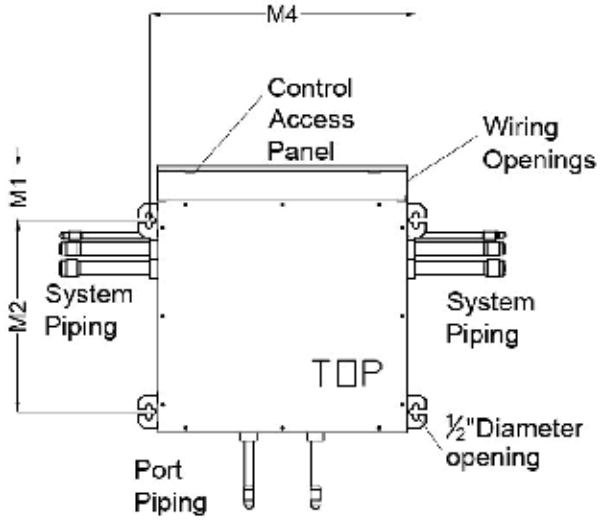
Name	Symbol	Function
Low Pressure Gas (Vapor) Pipe	LPGV	Pipe for Low Pressure Gas (Vapor)
High Pressure Gas (Vapor) Pipe	HPGV	Pipe for High Pressure Gas (Vapor)
Liquid Pipe 1	LP1	Liquid Pipe to the Outdoor Unit(s)
Liquid Bypass Valve	LBV	Prevents Liquid Charge
Solenoid Assembly 1, 2	SOL1, 2	Controls Path for Heating or Cooling
Liquid Pipe 2	LP2	Liquid Pipe to the Indoor Unit(s)
Gas Pipe	GSP	Gas Pipe to the Indoor Units
Balancing Valve	BLV	Controls the Pressure Between High and Low Pressure Pipes During Operation Changeover
Subcooling EEV	SCEEV	Controls Subcooling

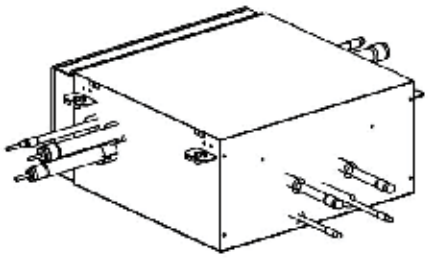
Figure 8: Heat Recovery Unit Parts Diagram.

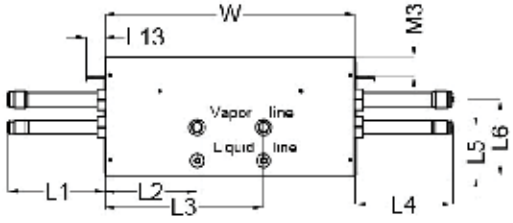


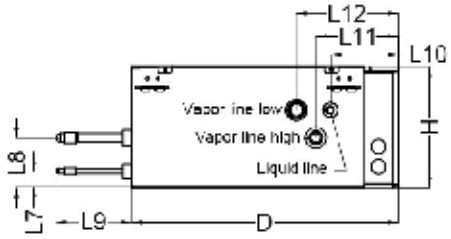
HEAT RECOVERY UNIT DIMENSIONAL DIAGRAMS

PRHR022A Heat Recovery Unit

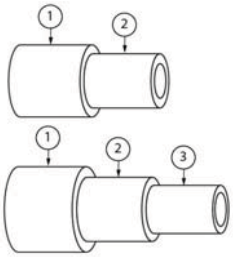








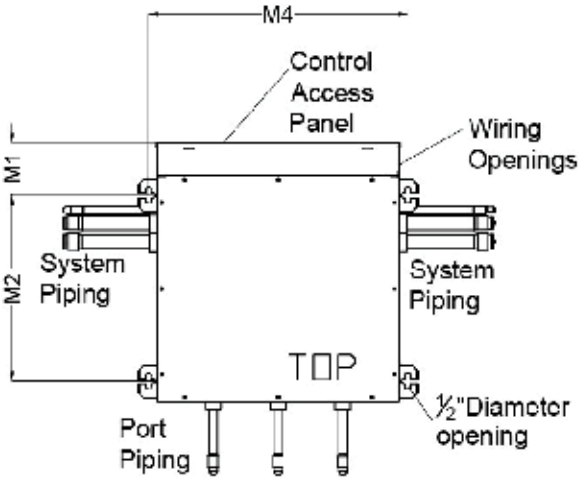
W	17-7/8"
H	8-5/8"
D	18-15/16"
L1	6-7/8"
L2	6-5/8"
L3	11-3/8"
L4	6-7/8"
L5	3-1/2"
L6	5-1/2"
L7	1-3/16"
L8	3-9/16"
L9	5-7/16"
L10	4-3/4"
L11	5-3/4"
L12	7-1/4"
L13	1-1/4"
M1	3-3/4"
M2	13-5/8"
M3	1-1/2"
M4	18-15/16"

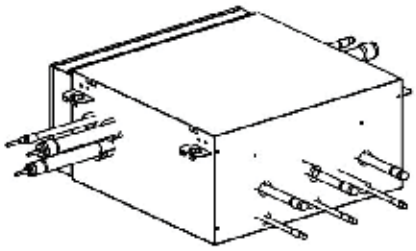


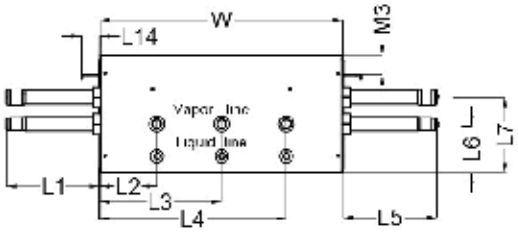
Reducer Dimensions (in)					
		1	2	3	Quantity
Indoor Unit	Liquid Line	3/8 OD	1/4 OD	-	2
	Vapor Line	5/8 OD	1/2 OD	-	2
HR Unit	Liquid Line	3/8 OD	1/4 OD	-	2
	Vapor Line Low	5/8 OD	1/2 OD	-	2
		7/8 OD	3/4 OD	5/8 OD	2
	Vapor Line High	1/2 OD	3/8 OD	-	2
		3/4 OD	5/8 OD	1/2 OD	2

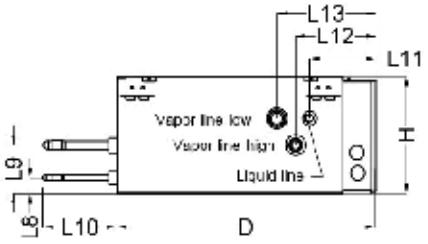
HEAT RECOVERY UNIT DIMENSIONAL DIAGRAMS

PRHR032A Heat Recovery Unit

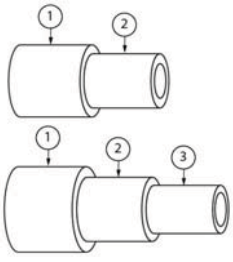








W	17-7/8"
H	8-5/8"
D	18-15/16"
L1	6-7/8"
L2	4-1/4"
L3	9"
L4	13-3/4"
L5	6-7/8"
L6	3-1/2"
L7	5-1/2"
L8	1-3/16"
L9	3-9/16"
L10	5-7/16"
L11	4-3/4"
L12	5-3/4"
L13	7-1/4"
L14	1-1/4"
M1	3-3/4"
M2	13-5/8"
M3	1-1/2"
M4	18-15/16"

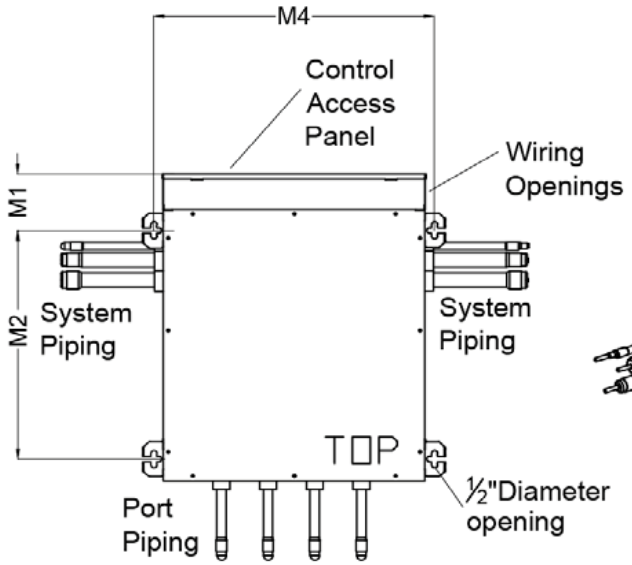


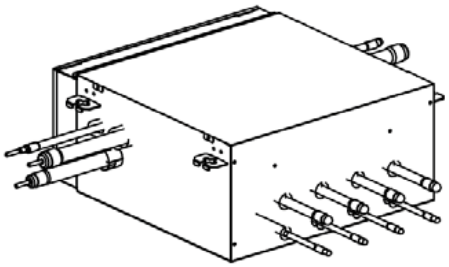
Reducer Dimensions (in)

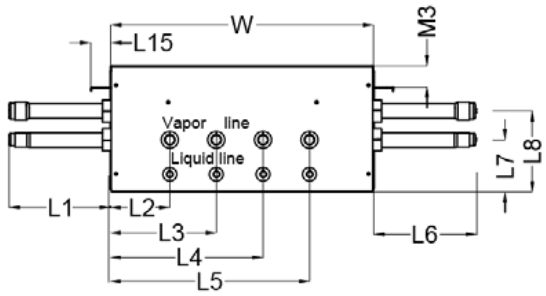
		1	2	3	Quantity
Indoor Unit	Liquid Line	3/8 OD	1/4 OD	-	3
	Vapor Line	5/8 OD	1/2 OD	-	3
HR Unit	Liquid Line	1/2 OD	3/8 OD	-	2
	Vapor Line Low	3/4 OD	5/8 OD	-	2
		1-1/8 OD	7/8 OD	3/4 OD	2
	Vapor Line High	5/8 OD	1/2 OD	-	2
		7/8 OD	3/4 OD	5/8 OD	2

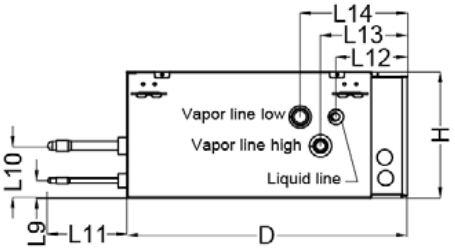
HEAT RECOVERY UNIT DIMENSIONAL DIAGRAMS

PRHR042A Heat Recovery Unit

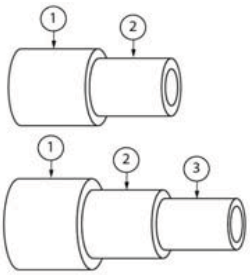








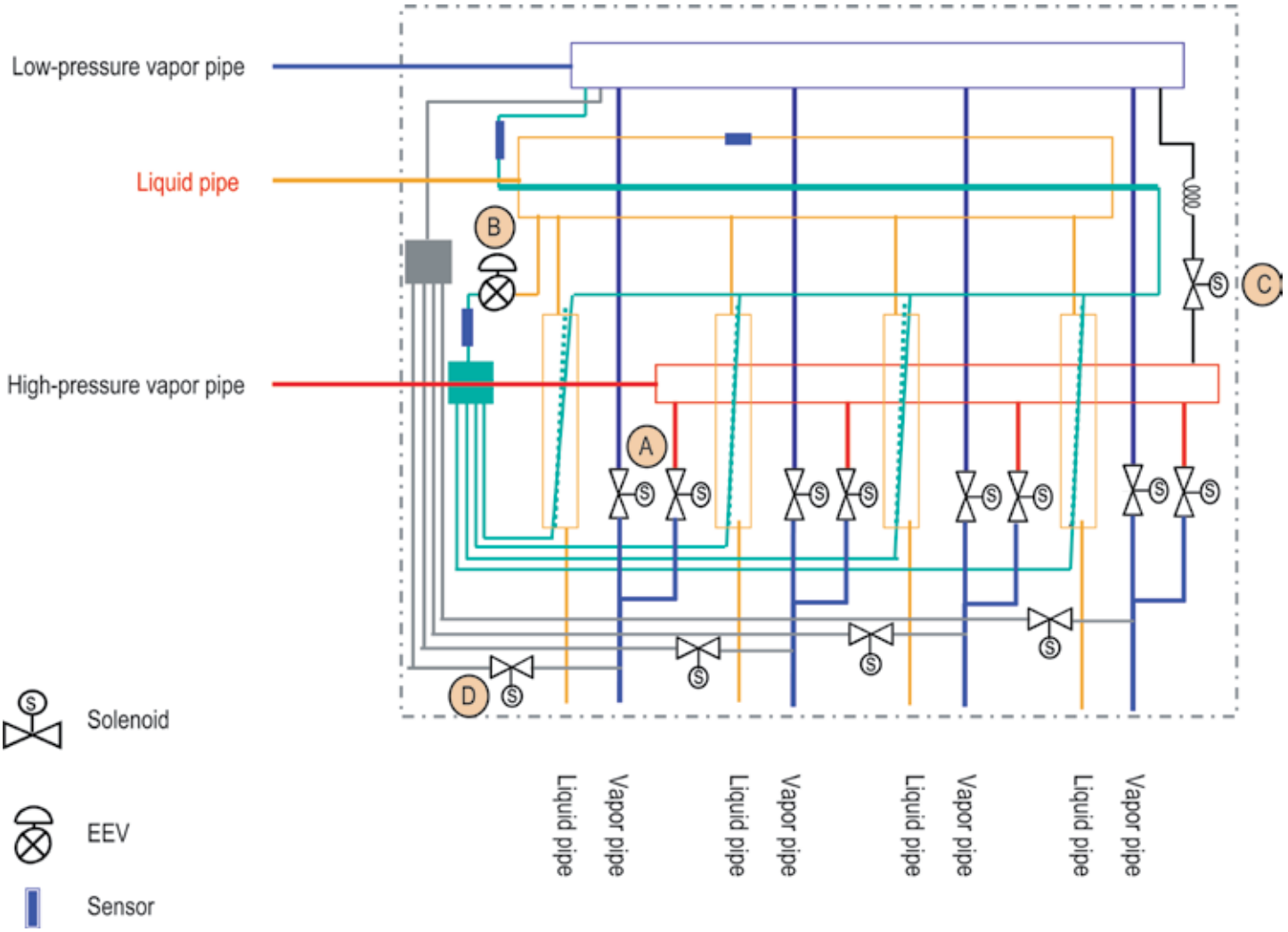
W	17-7/8"
H	8-5/8"
D	18-15/16"
L1	6-7/8"
L2	4-1/4"
L3	7-1/2"
L4	10-1/2"
L5	13-3/4"
L6	6-7/8"
L7	3-1/2"
L8	5-1/2"
L9	1-3/16"
L10	3-9/16"
L11	5-7/16"
L12	4-3/4"
L13	5-3/4"
L14	7-1/4"
L15	1-1/4"
M1	3-3/4"
M2	13-5/8"
M3	1-1/2"
M4	18-15/16"



Reducer Dimensions (in)					
		1	2	3	Quantity
Indoor Unit	Liquid Line	3/8 OD	1/4 OD	-	4
	Vapor Line	5/8 OD	1/2 OD	-	4
HR Unit	Liquid Line	1/2 OD	3/8 OD	-	2
	Vapor Line Low	3/4 OD	5/8 OD	-	2
		1-1/8 OD	7/8 OD	3/4 OD	2
	Vapor Line High	5/8 OD	1/2 OD	-	2
		7/8 OD	3/4 OD	5/8 OD	2

HEAT RECOVERY UNIT REFRIGERANT CIRCUIT DIAGRAM

PRHR022A, 032A, 042A



Ⓐ: Switch operation between cooling and heating.

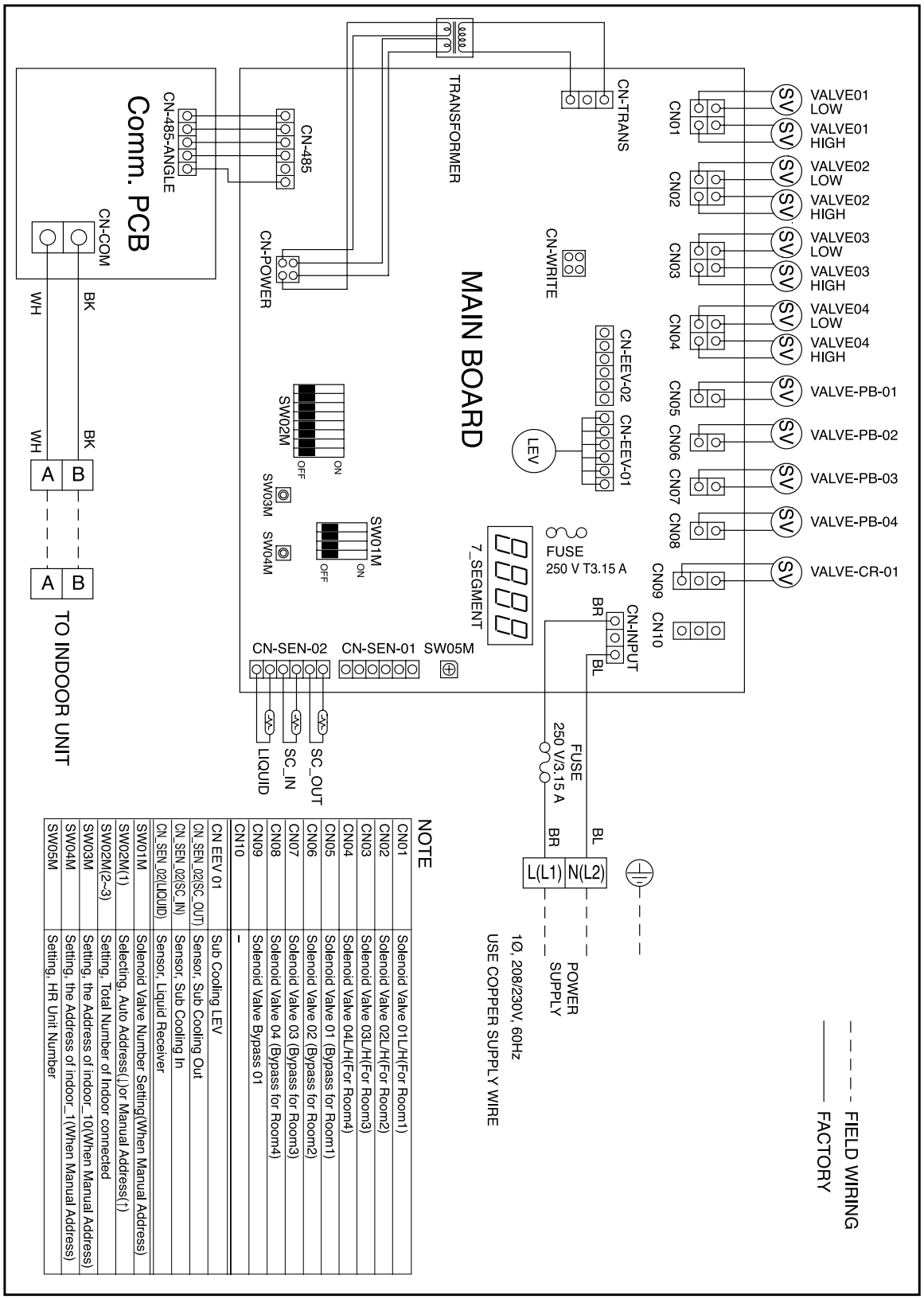
Ⓑ: Decreases noise following subcooling operation between inlet of one indoor unit and outlet of another indoor unit during simultaneous operation.

Ⓒ: Prevents liquid from entering high-pressure vapor valve and heat recovery control unit during cooling mode.

Ⓓ: Controls pressure between the high and low pressure vapor pipes during simultaneous operation.

HEAT RECOVERY UNIT WIRING DIAGRAM

PRHR022A, 032A, 042A



NOTE

CN01	Solenoid Valve 01L/H(For Room1)
CN02	Solenoid Valve 02L/H(For Room2)
CN03	Solenoid Valve 03L/H(For Room3)
CN04	Solenoid Valve 04L/H(For Room4)
CN05	Solenoid Valve 01 (Bypass for Room1)
CN06	Solenoid Valve 02 (Bypass for Room2)
CN07	Solenoid Valve 03 (Bypass for Room3)
CN08	Solenoid Valve 04 (Bypass for Room4)
CN09	Solenoid Valve Bypass 01
CN10	-
CN EEV 01	Sub Cooling LEV
CN_SEN_02(SC_OUT)	Sensor, Sub Cooling Out
CN_SEN_02(SC_IN)	Sensor, Sub Cooling In
CN_SEN_02(LIQUID)	Sensor, Liquid Receiver
SW01M	Solenoid Valve Number Setting(When Manual Address)
SW02M(1)	Selecting, Auto Address(↓)or Manual Address(↑)
SW02M(2~3)	Setting, Total Number of Indoor connected
SW03M	Setting, the Address of indoor_10(When Manual Address)
SW04M	Setting, the Address of indoor_1(When Manual Address)
SW05M	Setting, HR Unit Number

Normal Operation

Table 29: Normal Operation Functions.

Component	Power On	Cooling Operation	Heating Operation	Stop Operation
High Pressure Gas (Vapor) Valve	Close	Close	Open	Keep
Low Pressure Gas (Vapor) Valve	Open after thirty (30) seconds	Open	Close	Keep
Liquid Valve	Close	Open	Close	Close

Start Control (Heating Mode Only)

When the system operates in heating mode, all of the high pressure gas valves in the heat recovery unit are open.

Valve Control

See Mode Change Time Calculations in the "Mode Change Time Calculation" table. How the valves are controlled by the Mode Change Time can be seen in the "Valve Control by Mode Change Time" table.

Table 30: Mode Change Time Calculation.

Previous Mode	Change Mode	Mode Change Time
Stop or Ventilation	Cooling or Heating	120 seconds
Cooling	Heating	180 seconds
Heating	Cooling	120 seconds
Cooling or Heating	Stop or Ventilation	During Heating: 60 seconds During Cooling: 0 seconds

Table 31: Valve Control by Mode Change Time.

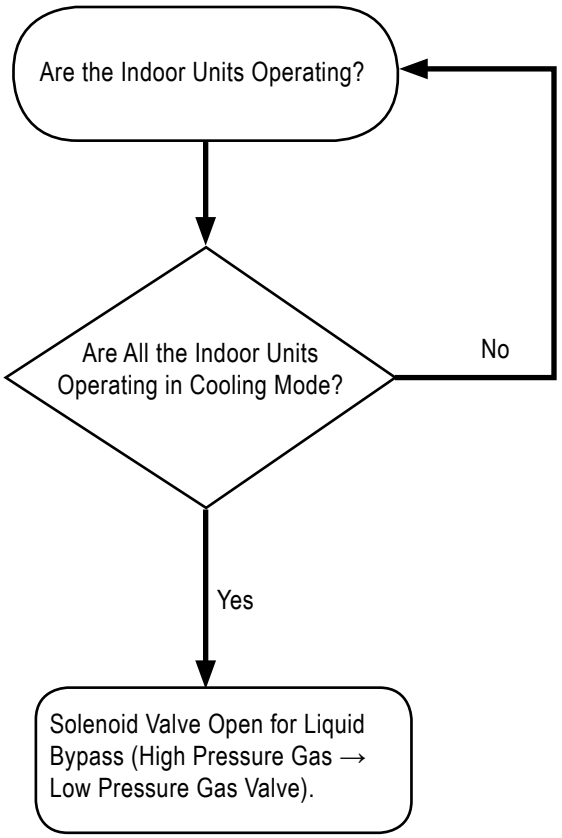
Operation Mode	Mode Change Time	High Pressure Gas (Vapor) Valve	Low Pressure Gas (Vapor) Valve	Balancing Valve
Cooling	120 ≤ Time	Keep	Keep	Close
	0 < Time < 120	Close	Close	Open
	Time = 0	Close	Open	Close
Heating	180 ≤ Time	Keep	Keep	Close
	0 < Time < 180	Close	Close	Close
	Time = 0	Open	Close	Close
Stop or Ventilation	0 < Time < 5	Cooling Mode: Close	Keep	Close
	Time = 0	Heating Mode: Low Pressure Gas Valve → Close	Keep	Close

Oil Return / Defrost Control

Table 32: Oil Return / Defrost Control.

Component	Start	During Operation	Stop
Inverter Compressor	Stop	60 Hz	40Hz
High Pressure Gas (Vapor) Valve	Keep	Close	Open or Close
Low Pressure Gas (Vapor) Valve	Keep	Open	Open or Close
Balancing Valve	Open for 30s	Close	Close

Liquid Bypass Control

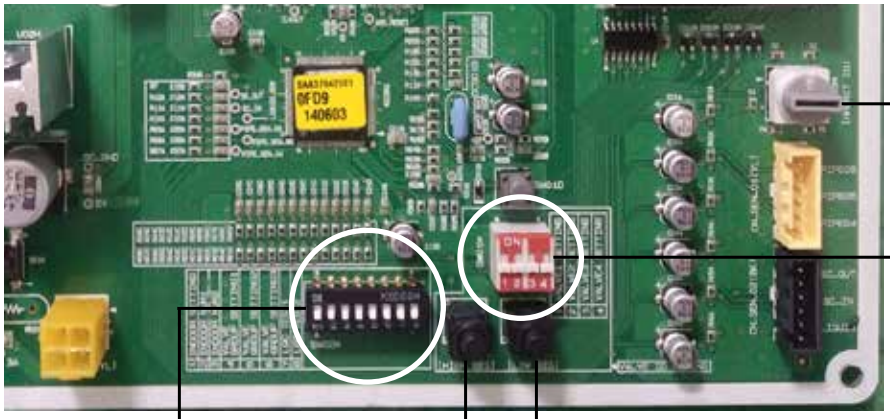


Subcooling EEV Control

Subcooling EEV operates with fuzzy logic to keep the degree of subcool (Target: About 77°F) at the outlet of the subcooler during simultaneous cooling / heating operation.

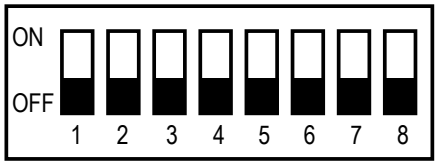
Temperature of Subcooler = T Subcooler Outlet – T Subcooler Inlet

Setting the Heat Recovery Unit PCB DIP Switches



1. Main function of SW02M (Black denotes the switch position).

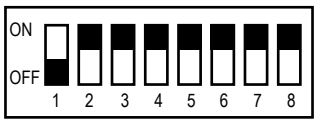
SW02M



ON S/W	Selection	
No. 1	Method for addressing the heat-recovery control unit valves (Auto / Manual)	
No. 2	Model of heat recovery unit	
No. 3	Model of heat recovery unit	
No. 4	Valve group setting	
No. 5	Valve group setting	
No. 6	Valve group setting	
No. 7	Used only in factory production (preset to “OFF”)	Zone setting (“ON”)
No. 8	Used only in factory production (preset to “OFF”)	

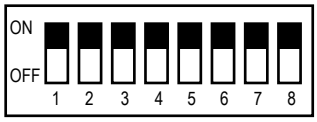
2. Selecting the heat recovery control unit valve addressing method (pipe detection) (Auto / Manual).

Switch No. 1 OFF



Auto

Switch No. 1 ON

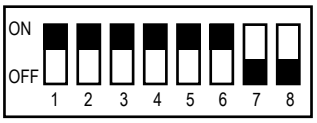
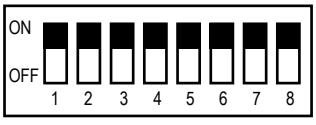
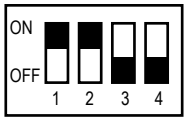


Manual

Note

All other switches are positioned according to connection and piping configuration per tables shown.

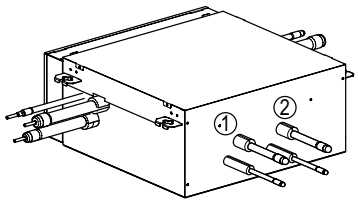
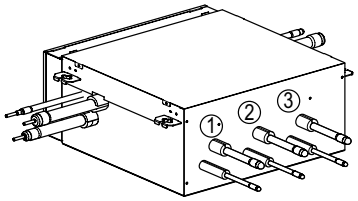
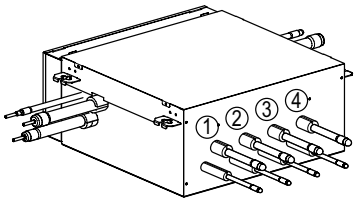
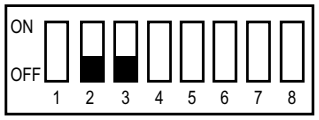
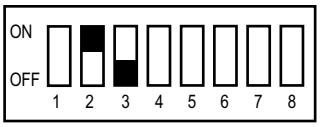
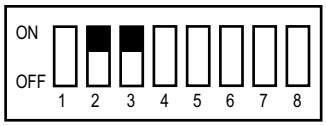
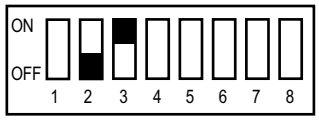
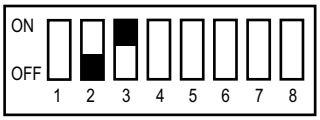
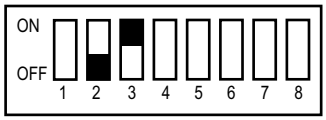
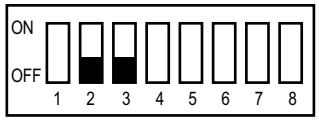
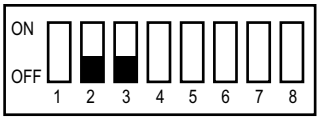
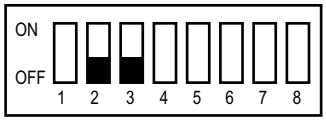
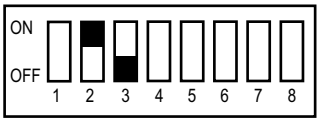
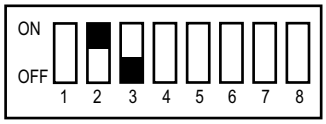
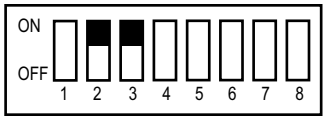
3. Zone control setting.

	DIP Switch Settings	
Normal Control		 SW01M
Zone Control		 SW01M Turn the DIP switch of the zoned branch to ON. Example: Branches one (1) and two (2) are set to zone control.

Configuring the Heat Recovery Unit Settings

1. Identify how many ports are connected (see the table below).
2. Group ports if necessary. If any connected indoor units are “large” capacity models (indoor units with >54,000 Btu/h capacity) two heat recovery ports must be “grouped” to serve a large capacity indoor using an inverted ‘Y” branch.
3. Set DIP Switches as outlined in the table below.

Table 33: Selecting the Heat Recovery Unit Model.

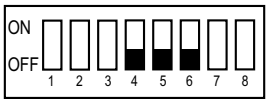
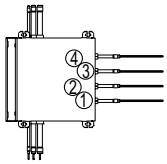
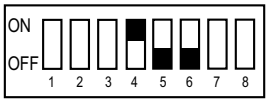
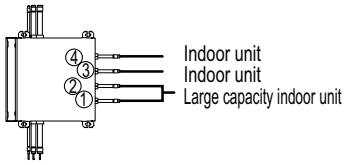
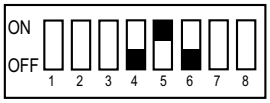
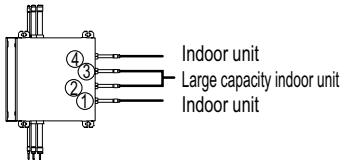
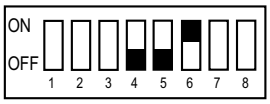
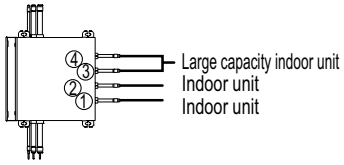
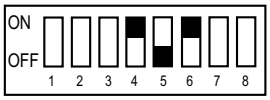
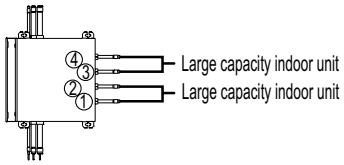
	 PRHR022A (Two [2] ports)	 PRHR032A (Three [3] ports)	 PRHR042A (Four [4] ports)
Factory Setting			
One port connected			
Two ports connected			
Three ports connected			
Four ports connected			

Note

Each heat recovery unit has dip switches No. 2 and No. 3 factory set as shown above in initial setting.

- *To use a PRHR022A Two-Port Heat Recovery Unit for one port, cap off the second pipe, and set the DIP switches on the heat recovery unit for "one port connected" as shown in the table above.*
- *To use a PRHR032A Three-Port Heat Recovery Unit for two ports, cap off the third port, and set the dip switches on the heat recovery unit for "two ports connected" as shown in the table above.*
- *To use a PRHR042A Four-Port Heat Recovery Unit for three ports, cap off the fourth port, and set the dip switches on the heat recovery unit for "three ports connected" as shown in the table above.*
- *To use a PRHR042A Four-Port Heat Recovery Unit for two ports, cap off the third and fourth ports, and set the dip switches on the heat recovery unit for "two ports connected" as shown in the table above.*
- *Any unused port must be sealed with a brazed copper cap, not with a plastic cap.*

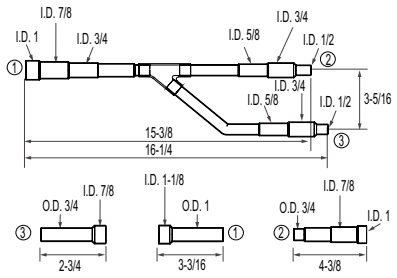
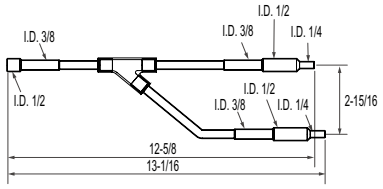
Table 34: Valve Group Settings.

	Dip Switch Setting	Example
No Valve Group Control		
No. 1, 2 Valve Control		
No. 2, 3 Valve Control		
No. 3, 4 Valve Control		
No. 1, 2 Valve Control No. 3, 4 Valve Control		

Note

If large capacity indoor units (larger than 54,000 Btu/h) are installed, the Y-branch pipe shown in the table below should be used to twin the ports.

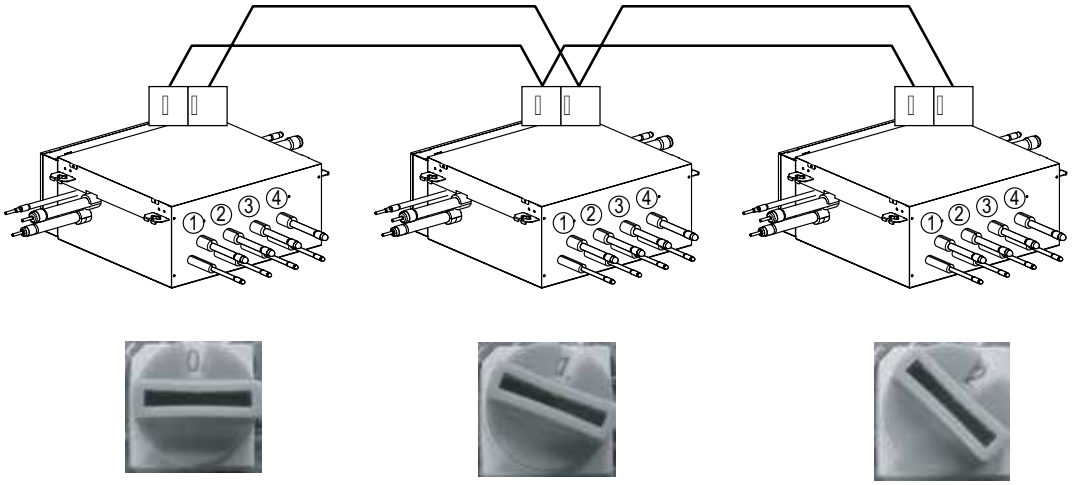
Unit: Inch

Kit Model No.	Vapor Pipe Dimensions	Vapor Pipe Model No.	Liquid Pipe Dimensions	Liquid Pipe Model No.
ARBLN03321		AJR54072906		AJR54072902

SW05M Function (Rotary Switch for Addressing Heat Recovery Units)

- SW05M must be set to "0"' when installing only one heat recovery unit.
- When installing multiple heat recovery units, address each unit with sequentially increasing numbers starting from "0".

Figure 9: Adjusting the Heat Recovery Unit Addresses.



SW01M / SW03M / SW04M DIP Switch and Tact Switch for Manual Heat Recovery Unit Valve Addressing

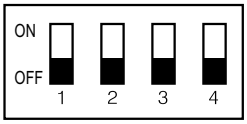
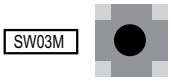
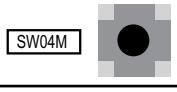
Use to manually address the heat recovery unit valve.

Normal Setting

1. Set the address of the heat recovery control unit valve to the central control address of the connected indoor unit.
   - SW01M: Selects the valve to address.
   - SW03M: Increases the ten (10) digit of the valve address.
   - SW04M: Increases the valve address by one (1).

2. Before performing manual valve pipe addressing, input a central control address to every indoor unit through either a wired or a wireless controller (depending on indoor unit type).

Table 35: Manual Valve Addressing.

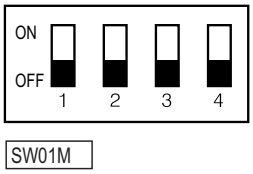
	DIP Switch No.	Setup
 SW01M	No. 1	Manual addressing valve No. 1
	No. 2	Manual addressing valve No. 2
	No. 3	Manual addressing valve No. 3
	No. 4	Manual addressing valve No. 4
 SW03M	SW03M	Increases the ten (10) digit of the valve address
 SW04M	SW04M	Increases the valve address by one (1)

Zone Setting

1. Set the address of the heat recovery control unit valve to the central control address of the connected indoor unit.
   - SW01M: Selects the valve to address.
   - SW03M: Increases the ten (10) digit of the valve address.
   - SW04M: Increases the valve address by one (1).
   - SW05M: Rotary switch.

2. Before performing manual valve pipe addressing, input a central control address to every indoor unit through either a wired or a wireless controller (depending on indoor unit type).

Table 36: Zone Setting.

	Dip Switch No.	Setup
 SW01M	No. 1	Manual addressing valve No. 1
	No. 2	Manual addressing valve No. 2
	No. 3	Manual addressing valve No. 3
	No. 4	Manual addressing valve No. 4
SW03M 	SW03M	Increases the ten (10) digit of the valve address
SW04M 	SW04M	Increases the valve address by one (1)
SW05M 	SW05M	Manual addressing zoned indoor units

Indoor Unit Auto Addressing

⚠ WARNING

Disconnects should only be operated by a properly licensed electrician. Incorrect wiring could cause the disconnect to explode, leading to physical injury or death.

Note

During the pre-commissioning process, do not change any DIP switch settings. All switches should be left in the OFF position on both DIP switches SW01B and SW02B.

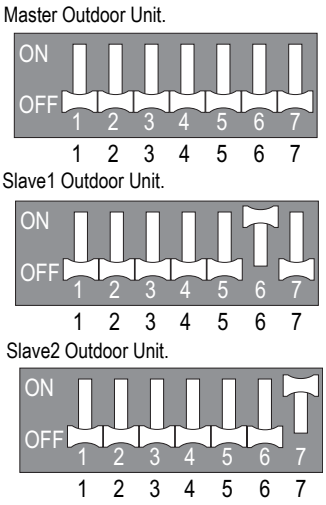
Initiate the Auto Addressing Procedure

Note

- *If the Auto Address Procedure has never been successfully completed for the system, the compressor(s) will not start when power is applied to the unit.*
- *Auto addressing is only possible on the main PCB of the outdoor unit (master unit if dual / triple frame system).*

1. Verify all that all indoor units connected to the system have power to the PCB board AND all zone controller system start buttons are OFF.
2. Remove the maintenance access panel and unit control box cover from the outdoor unit. Place panels and screws in a secure area.
3. Verify that the communications cable between the indoor units and the outdoor unit is terminated at the outdoor unit terminals IDU (A) and IDU (B).
4. Verify the shield on the communications cable is grounded at the outdoor unit.
5. If installing a dual- or triple-frame system, verify which outdoor unit will be the “Master” unit, the Slave1 unit, and the Slave2 unit; check if the DIP switches on DIP-SW01 are set as shown on right. The outdoor unit with the largest capacity must be set as the Master unit.
6. Cycle power on the outdoor unit. Leave disconnect in the "ON" position.
7. Check the outdoor unit(s) current configuration code(s). Observe the unit setup codes using the LED display found on the outdoor units PCB. Each code will display for two (2) seconds.

Figure 10: Master, Slave1, and Slave2 DIP Switch Settings.



Note

While this routine runs, the unit runs a self-diagnostics check. At completion, the LED should be clear and nothing displayed. Diagnostic process should take from three (3) to seven (7) minutes.

LG

Initiate the Auto Addressing Procedure, continued.

1. Know how many indoor units are connected to the system.

2. Press and hold the red SW01C button for about five (5) seconds. Release when “88” appears on the LED. After three (3) to seven (7) minutes, the display will flash a number for about ten (10) seconds indicating how many indoor units the system successfully communicated with.

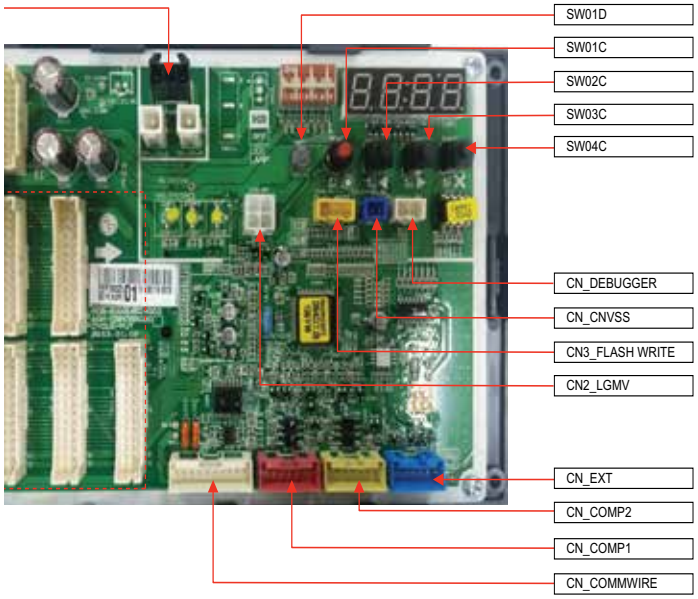
3. This number should match the known installed number of indoor units if the auto addressing procedure was successful. Using LGMV, read the address of each indoor unit.

4. Upon completion of the auto addressing routine, the display will be blank and the system will be in standby waiting for another command.

5. Upon successful completion of the auto address procedure, record the system address assigned to each indoor unit by the auto address procedure.

6. Replace the control panel door.

Figure 11: Auto Address Button Location.

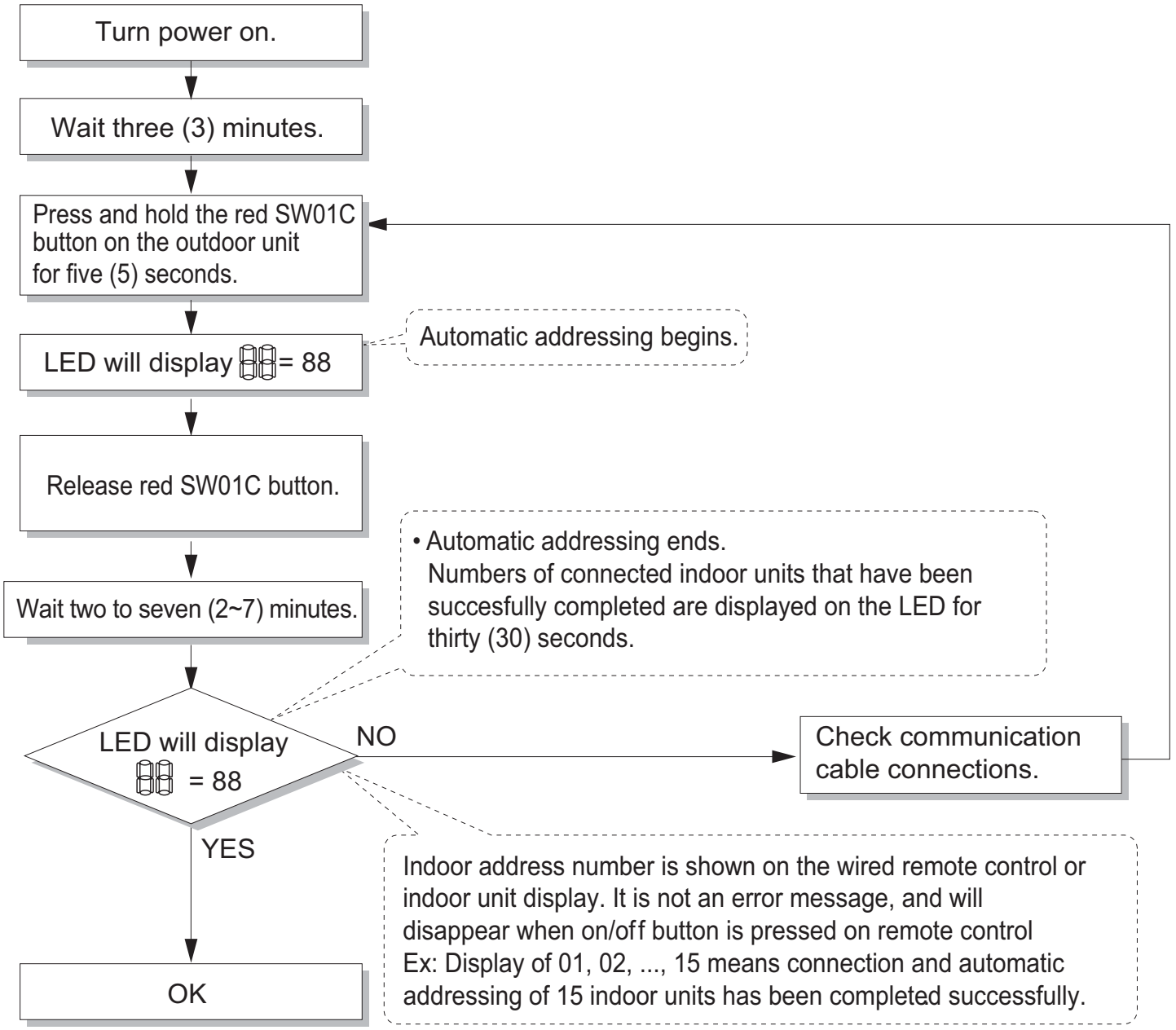


⚠ WARNING

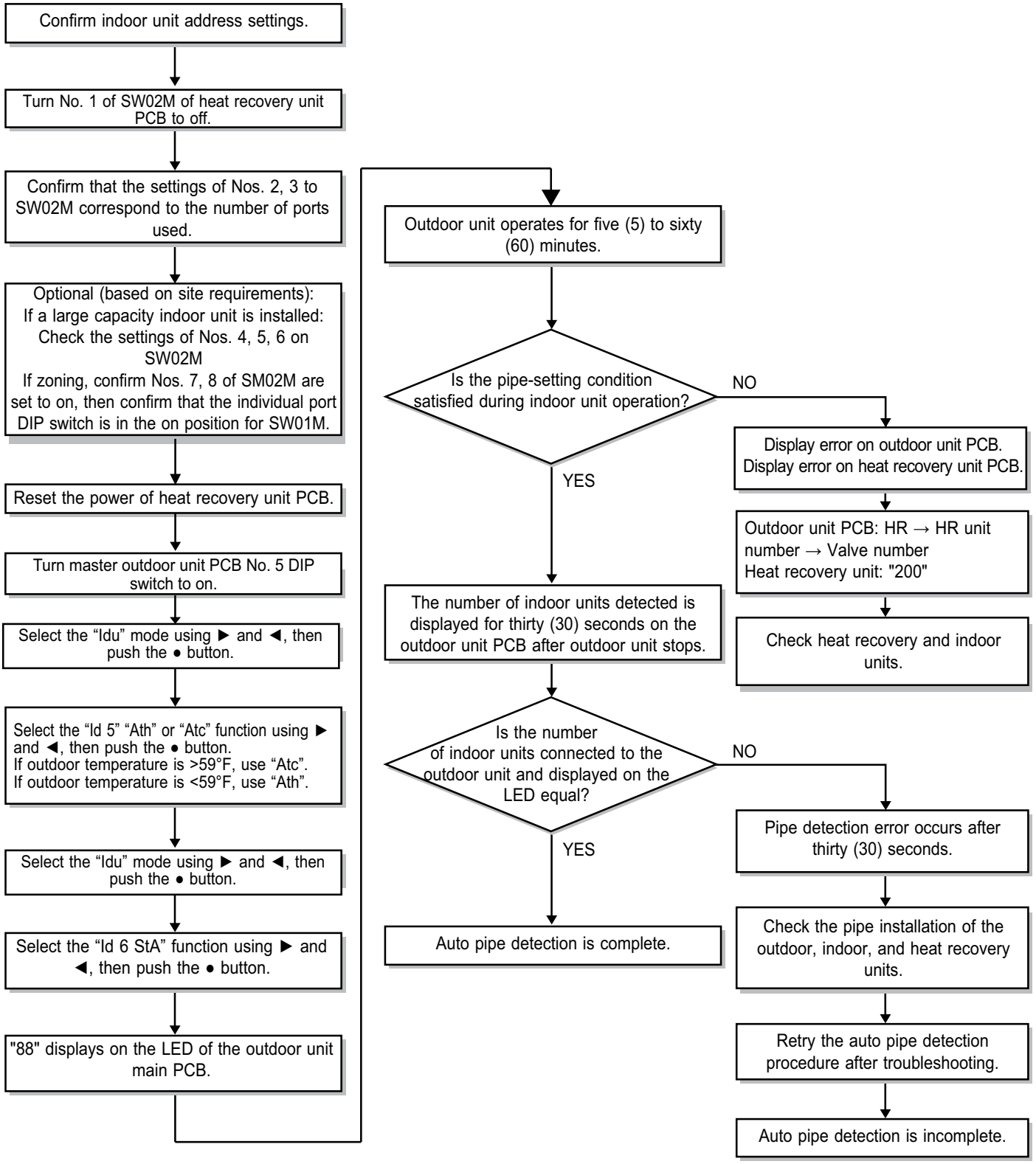
Upon successful completion of the auto addressing function, an unintentional compressor start can occur unless the communications cable to the indoor units is disconnected from the outdoor unit terminals IDU(A) and IDU(B). Do NOT open the service valves or attempt to start outdoor unit compressors until directed by the Commissioning Agent. Major damage to the unit piping and compressors will occur, and there is a risk of explosion, physical injury, and / or death.

INDOOR AND HEAT RECOVERY UNIT ADDRESSING

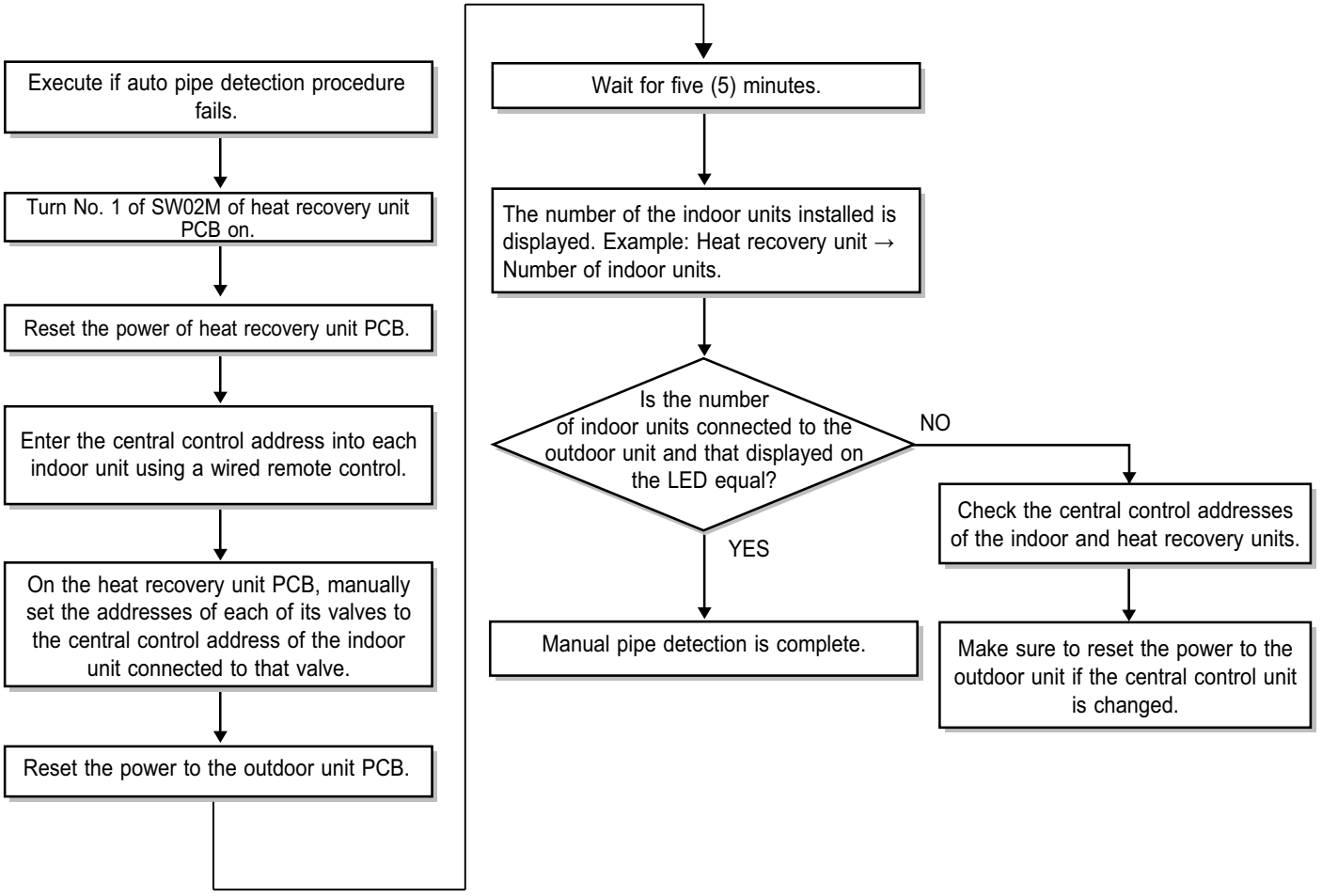
Indoor Unit and Heat Recovery Unit Auto Addressing Procedure Flowchart



Auto Pipe Detection Procedure



Manual Pipe Detection Procedure



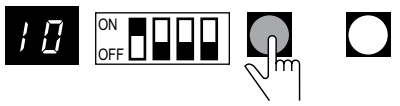
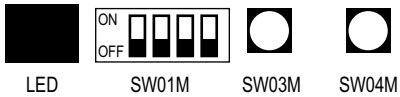
Note

1. *If a central controller is not installed, leave the address data alone until installer sets the central control address as desired.*
2. *If a central controller is installed, the wired remote controller of the indoor units will provide the central control addresses. (In this case, manually set the heat recovery unit pipe address following the central control address of the indoor unit.)*
3. *Central controller addresses must be set manually at each individual controller.*
4. *A pipe that does not have an indoor unit connected to it should be set with a different address than a pipe that does have an indoor unit connected to it. (If addresses are the same, the valves will not operate.)*
5. *Change the manual pipe settings through the heat recovery unit PCB.*
6. *An error indicates that the manual pipe detection procedure was not completed properly.*
7. *To store the pipe detection procedure results automatically, do not turn off the main outdoor unit PCB for five (5) minutes after the procedure has finished.*

Manual Pipe Detection Example (Non-Zone Setting)

An indoor unit with a central control address of "11" is connected to valve "1" of a heat recovery unit.

Before performing manual pipe addressing, input a central control address to every indoor unit through either a wired or a wireless controller (depending on indoor unit type).

No.	Display / Setup	Description
1		Operation: None Display: None
2		Operation: Turn DIP switch No. 1 on to address valve No. 1 (SW01M). Display: Existing value saved in EPROM is displayed on LED.
3		• Operation: Set the “10” digit of the Group High data number of the wired remote control connected to the corresponding indoor unit to the valve No. 1 by pressing left tack switch (SW03M). • Display: Digit increases with the number of times the tack switch is pressed, shown on left LED numeral.
4		• Operation: Set the “1” digit of the Group Low data number of the wired remote control connected to the corresponding indoor unit to the valve No. 1 by pressing right tack switch (SW04M). • Display: Digit increases with the number of times the tach switch is pressed; shown on right LED numeral.
5		• Operation: Turn DIP switch No. 1 off to save the address of valve No. 1 (SW01M0 • Display: “11” displayed on LED disappears

Note

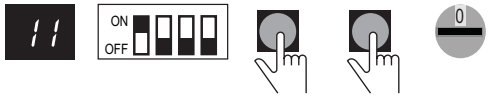
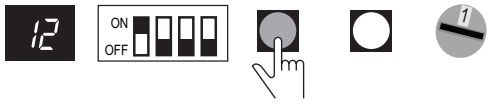
- *The procedure described above must be performed for all heat recovery unit valves.*
- *Valves that do not have indoor units connected to them should be addressed with a number that has not been used. (Valves will not work if the address numbers are the same.)*

Manual Pipe Detection Example (Zone Setting)

Zone control: When two (2) or more indoor units are connected to one valve of the heat recovery unit. For this application, set the controls with multiple indoor connections by using the rotary switch; i.e., only the rotary switch changes from same valve set condition and set indoor units connection.

1. Set the DIP switch on the corresponding valves and the rotary switch to “0”.
2. Set the number by using the tact switch.
3. If additional indoor units are connected to one heat recovery unit valve, increase the rotary switch setting by one (1) and set the number by using the tact switch.
4. To verify the number of the corresponding valve, turn the DIP switch to on and set the number on the rotary switch.
5. One heat recovery unit valve can support up to eight (8) indoor units per port (rotary switch settings 0~7). An error will display if more than eight (8) indoor units per heat recovery valve are set with the rotary switch.
6. Return the rotary switch to its original settings (heat recovery unit number settings) after all pipe settings are complete.
7. The rotary switch setting valve of the number of indoor units connected to “FF” prevents a malfunction. Example: Where three (3) indoor units are connected to valve 1; rotary switch settings are 0,1,2 and 3,4,5,6,7 with “FF” used. (Prerequisite for manual pipe detection: The central control address of each indoor unit must be preset differently using its wired remote control.)

Example: An indoor unit with a central control address of "11” is connected to valve "1" of an heat recovery unit.

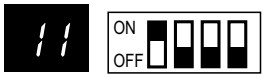
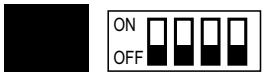
No.	Display / Setup	Description
1		Operation: None Display: None
2		Operation: Turn DIP switch No. 1 on to address valve No. 1. Display: Existing value saved in EPROM is displayed on LED.
3		• Operation: Set the “10” digit of the Group High data number of the wired remote control connected to the corresponding indoor unit to the valve No. 1 by pressing left tact switch. • Display: Digit increases with the number of times the tact switch is pressed, shown on left LED.
4		• Operation: Set SW05M to “1”. • Display: Former set value is shown on LED.
5		• Operation: Set SW03M, SW04M, and SW05M to “1”. • Display: Set value is shown on LED.
6		• Operation: Turn DIP switch No.1 to off to save the address of valve No. 1. • Display : LED is blank.
7		• Operation : Addressing the return valve of the heat recovery unit. • Display: LED is blank.

Note

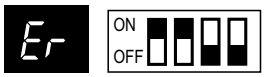
- *The procedure described above must be performed for all heat recovery unit valves.*
- *Valves that do not have connected indoor units should be addressed with a number that has not been used. (Valves will not work if the address numbers are the same.)*

Checking the Pipe Detection Procedure Result at the Heat Recovery Unit

Example: An indoor unit with a central control address of “11” is connected to heat recovery unit valve No. 1.

No.	Display / Setup	Description
1	 LED SW01M	• Operation: Turn DIP switch No. 1 to ON. • Display: “11” displays on LED.
2	 LED SW01M	• Operation: Turn DIP switch No. 1 to OFF. • Display: LED is blank.

Identifying the Manual Valve Address

No.	Display / Setup	Description
1	 LED SW01M	• Operation: More than two (2) DIP switches are on. • Display: LED displays “Er.”

Checks Before Test Run

Table 37: Test Run Checklist.

1	Use the electrical wiring diagram to verify wiring connections, check to see if the power and communication wires are connected, and verify if there are any disconnected or loose communication or power wires. Check for any refrigerant leaks in the piping system.
2	• Power should be OFF. • Check whether L1, L2, L3 power cable connections are installed correctly. • Check the insulation resistance with a DB mega tester device (DC 500V) between the power terminal block and ground terminal. Verify that it is 2.0MΩ or above resistance when measured. If the resistance is 2.0MΩ or less, do not operate the product. **Precautions:** • Never check the insulation resistance for the terminal control board. (The control board can be damaged.) • Compressor must not have the power wires attached to it at the time of testing. • If the system is not turned on immediately after installation, or if the system is off for a long period, refrigerant accumulates in the compressor, and the insulation resistance reduces to less than 2.0MΩ. If the insulation resistance is 2.0MΩ or less, turn the power on, permitting the compressor crankcase heater to operate so that the refrigerant (including oil inside the compressor) can evaporate. The insulation resistance value will then increase to more than 2.0MΩ.
3	Check whether the liquid and gas (vapor) service valves are open. Tighten any caps.
4	• Check if there are any problems in the automatic addressing. • Check / confirm that there are no error messages displayed on the indoor unit or wired controls, or at the LED on the outdoor units. • During test run, after installation, or during the operation after the main power to the outdoor unit is shut off (power outage, etc.), always connect the power six (6) hours to preheat the crankcase heater. If the crankcase heater is not preheated for more than six (6) hours, it does not run when above 50°F. (Heating the bottom part of the compressor with the crankcase heater allows any refrigerant in the oil to evaporate.)

⚠ DANGER

- *High voltage electricity is required to operate this system. Adhere to the NEC code and these instructions when wiring. Improper connections and inadequate grounding can cause accidental injury or death.*
- *Turn the power off before servicing the equipment. Electrical shock can cause physical injury or death.*
- *Do not operate the disconnect switch with wet hands. There is risk of fire, electric shock, physical injury or death.*

⚠ WARNING

- *Disconnects should only be performed by a properly licensed electrician. Incorrect wiring could cause the disconnect to explode, leading to physical injury or death.*
- *Do not operate the unit with the panel(s) or protective cover(s) removed; keep fingers and clothing away from moving parts. The rotating, hot, cold, and high-voltage parts of the unit can cause physical injury or death.*
- *Do not touch the refrigerant piping during or after operation. It can cause burns or frostbite.*

Note

- *If the power wiring and communication cables are not properly connected (connections switched), the communication components will burn out and the system will not operate.*
- *Do not supply power to the unit until all electrical wiring and controls wiring are completed.*

TROUBLESHOOTING MAIN COMPONENT ERRORS

Table 38: Main Component Errors.

Main component	Problem	Cause	Solution
Compressor	Not operating	Motor insulation damaged	Check resistance between terminals and unit frames
		Strainer is clogged	Clean / change the strainer
		Oil is leaking	Check amount of oil
	Stopped during operation	Motor insulation failed	After unwiring the compressor, check resistance between terminals and unit frames
Outdoor Unit Fan	High pressure error when unit operates in cooling mode	Motor failure, bad ventilation around outdoor unit heat exchanger	Check the outdoor unit fan operation to confirm proper motor functioning. Switch OFF the outdoor unit and remove obstacles, if any, around the outdoor unit.
Outdoor Unit EEV	Heating failure, frequent defrost	Bad connector contact	Check connector
	No operation sound after switching on the power supply	Coil failure	Check resistance between terminals
		Low refrigerant pressure	Check refrigerant levels. Add refrigerant as necessary.
	Heating operation failed; outdoor unit heat exchanger is frozen	EEV clogged	Service necessary
	Low pressure error or discharge temperature error		

• When a system error occurs, the error code is displayed on the indoor unit or the wired control.

• If CH05/53/11 error occurs, check if auto-addressing is complete and the communication cables are properly installed.

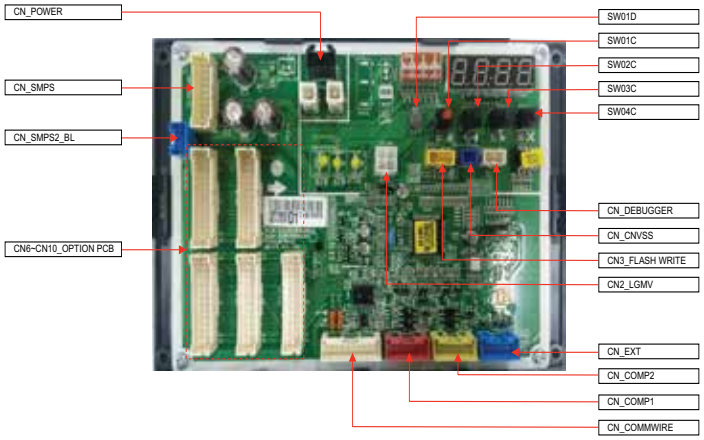
Check DIP Switch Settings

1. Outdoor units settings can be verified using the LED display. DIP switch settings should only be changed when the power is off.
2. The LED displays whether the input is properly performed with or without a bad contact of the DIP switch.

⚠DANGER

- *High voltage electricity is required to operate this system. Adhere to the NEC code and these instructions when wiring. Improper connections and inadequate grounding can cause accidental injury or death.*
- *Turn the power off before servicing the equipment. Electrical shock can cause physical injury or death.*
- *Do not operate the disconnect switch with wet hands. There is risk of fire, electric shock, physical injury or death.*

Figure 12: Outdoor Unit DIP Switches on the Main PCB



⚠WARNING

- *Disconnects should only be performed by a properly licensed electrician. Incorrect wiring could cause the disconnect to explode, leading to physical injury or death.*
- *Do not operate the unit with the panel(s) or protective cover(s) removed; keep fingers and clothing away from moving parts. The rotating, hot, cold, and high-voltage parts of the unit can cause physical injury or death.*
- *Do not touch the refrigerant piping during or after operation. It can cause burns or frostbite.*

Note

- *If the power wiring and communication cables are not properly connected (connections switched), the communication components will burn out and the system will not operate.*
- *Do not supply power to the unit until all electrical wiring and controls wiring are completed.*

Check Outdoor Unit Settings

Outdoor units settings can be verified using the LED. DIP switch settings should only be changed when the power is off.

Check Initial Display

An identification number appears in sequence at the LED after power is applied.

Table 41: Segment Display Sequence (Two [2] seconds per segment following a forty-five [45] second wait).

Sequence	Description		Code(s)
1	Master Outdoor Unit Nominal Capacity (HP-Horsepower)		8 - 14 tons
2	Slave1 Outdoor Unit Nominal Capacity (If applicable; HP-Horsepower)		8 - 24 tons
3	Slave2 Outdoor Unit Nominal Capacity (If applicable; HP-Horsepower)		8 - ~ tons
4	Total Nominal Capacity of System (HP-Horsepower)		8 - ~ tons
5	Unit Type	Heat Pump	2
		Heat Recovery	3
6	Unit Voltage	208-230V / 60Hz / 3Ø	22
		460V / 60Hz / 3Ø	46
7	Not Applicable		1 or 2

Table 39: Display Code Definitions—Outdoor Unit Nominal Capacity.

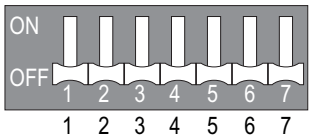
Display Code (Nominal Horsepower)	8	10	12	14	18	20	22	24	26	28	32	34	36
Nominal Mb/h	6	8	10	12	14	16	18	20	22	24	26	28	30

Table 40: Display Code Definitions—Voltage.

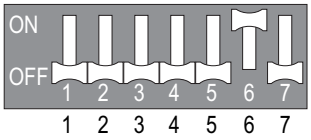
Outdoor Unit Code	22	46
Electrical Requirements	208-230V / 60Hz / 3Ø	460V / 60Hz / 3Ø

Figure 13: Master, Slave1, and Slave2 DIP Switch Settings.

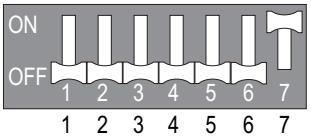
Master Outdoor Unit.



Slave1 Outdoor Unit.



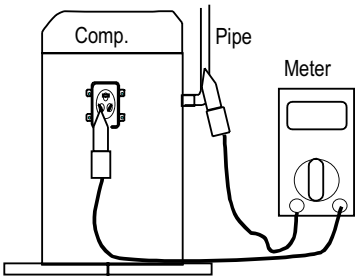
Slave2 Outdoor Unit.

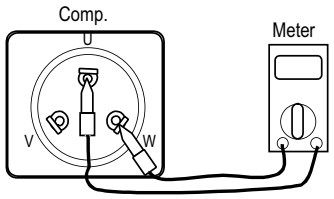


TROUBLESHOOTING MAIN COMPONENT ERRORS

Checking the Compressor

If compressor error, or any error related to the electrical system has occurred, check for the items below and follow procedure listed. See next page for danger, warnings, and notes safety precautions.

<table>
<tr><th>Step Number</th><th>Check for</th><th>Problem</th><th>Solution</th></tr>
<tr><td rowspan="2">1</td><td rowspan="2">How long has power been on during operation?</td><td>Power has been on for ≥12 hours.</td><td>Go to Step 2.</td></tr>
<tr><td>Power has been on for ≤12 hours.</td><td>Go to Step 2 after power has been on for 12 hours.</td></tr>
<tr><td rowspan="3">2</td><td>Does error occur again after starting operation?</td><td>The compressor stops and same error appears again.</td><td>Check IPM may have failed.</td></tr>
<tr><td>Method to Measure Insulation**
 

Note
**Resistance meter reference is to a Mega Ohm-meter, not a traditional Ohm-meter.</td><td>Inverter output voltage is stable (1).</td><td>• Check insulation and coil. If both are normal, restart the unit. If same error occurs again, replace the compressor.
• Insulation resistor: 0.8MΩ or greater measured.
• Coil resistor for 208-230V Heat Pump and Heat Recovery Units
<table><tr><th colspan="2">JQA048MBA</th></tr><tr><th>Temperature</th><th>167°F</th></tr><tr><td>U-V</td><td>0.212 ± 7%Ω (77°F)</td></tr><tr><td>V-W</td><td>0.212 ± 7%Ω (77°F)</td></tr><tr><td>W-U</td><td>0.212 ± 7%Ω (77°F)</td></tr></table>
• Coil resistors for 460V Heat Pump and Heat Recovery Units
<table><tr><th colspan="2">JBA068MAA/JBA068MAC</th></tr><tr><th>Temperature</th><th>167°F</th></tr><tr><td>U-V</td><td>0.195 ± 7%Ω (77°F)</td></tr><tr><td>V-W</td><td>0.195 ± 7%Ω (77°F)</td></tr><tr><td>W-U</td><td>0.195 ± 7%Ω (77°F)</td></tr></table>
<table><tr><th colspan="2">JQA048MAA/JQA048MAC</th></tr><tr><th>Temperature</th><th>167°F</th></tr><tr><td>U-V</td><td>0.255 ± 7%Ω (77°F)</td></tr><tr><td>V-W</td><td>0.255 ± 7%Ω (77°F)</td></tr><tr><td>W-U</td><td>0.255 ± 7%Ω (77°F)</td></tr></table></td></tr>
<tr><td>Method to Measure Coil Resistance
 
</td><td>Inverter output voltage is unstable or 0V (if digital tester is unavailable).</td><td>Check the IPM. If normal, replace the inverter board.

Check coil and insulation resistors.</td></tr>
</table>

***When measuring voltage and current of inverter power circuit, values may appear different depending on tools and circuits, and because voltage, power supply current, or output of the inverter has no sine waveform. Also, output voltage changes when output voltage of the inverter has a pulse wave pattern.**

1. An analog meter should be used when when testing inverter output voltage as it is more accurate than a digital meter.

⚠DANGER

High voltage electricity is required to operate this system. Adhere to the NEC code and these instructions when wiring. Improper connections and inadequate grounding can cause accidental injury or death.

2. Use a rectifier voltmeter (→▶|) if using a commercial frequency tester to measure inverter output values (when measuring absolute values). Accurate measuring values cannot be obtained with a general movable tester (for analog and digital mode).

Checking the Outdoor Unit Fan

If there is a fan error, check the items below and follow the corresponding procedure listed. See below for danger, warnings, and notes safety precautions.

Check	Problem	Solution
1. Fan motor is not operating. (Does fan motor fail again when operation starts?) 2. Fan motor vibration is excessive.	Power supply is not correct.	Fix the connection at the front or back of the breaker.
		• Power supply voltage is beyond permissible specifications—modify.
	Wiring is wrong.	• Check wiring connections. • Check connector contacts. • Check that all components are firmly secured (tighten screws). • Check polarity connection. • Check ground wiring and for short circuits.
	Motor has failed.	Measure the winding resistance of the motor coils. • 14.2 Ω ± 7% (@77°F)
	Fuse is defective.	Replace the fuse (Fuse 800V, 30A).
	Circuit board is defective.	Replace the circuit board following the steps below if errors occur again after resetting the power, and if there are no errors similar to those specified above.(Carefully check both connector and ground wires when replacing the circuit board.) • Replace only the fan control board. If operation begins, then the fan control board was defective. • Replace both the fan control board and the main board. If operation begins, then the main board was defective. • If problems continue to occur even after following procedures above, then both boards are defective.

Be aware of the following safety precautions when Checking the Compressor and Checking the Outdoor Unit Fan.

⚠DANGER

- *High voltage electricity is required to operate this system. Adhere to the NEC code and these instructions when wiring. Improper connections and inadequate grounding can cause accidental injury or death.*
- *Turn the power off before servicing the equipment. Electrical shock can cause physical injury or death.*
- *Do not operate the disconnect switch with wet hands. There is risk of fire, electric shock, physical injury or death.*

⚠WARNING

- *Disconnects should only be performed by a properly licensed electrician. Incorrect wiring could cause the disconnect to explode, leading to physical injury or death.*
- *Do not operate the unit with the panel(s) or protective cover(s) removed; keep fingers and clothing away from moving parts. The rotating, hot, cold, and high-voltage parts of the unit can cause physical injury or death.*
- *Do not touch the refrigerant piping during or after operation. It can cause burns or frostbite.*

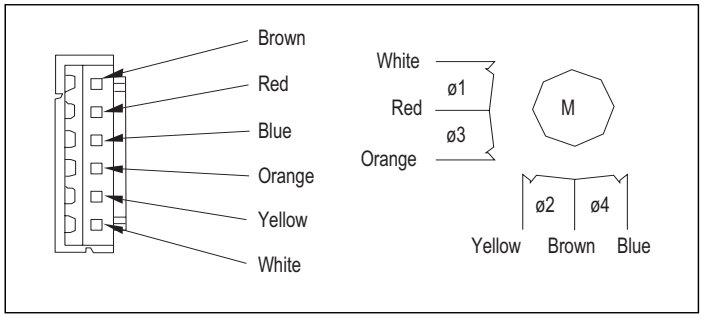
Note

- *If the power wiring and communication cables are not properly connected (connections switched), the communication components will burn out and the system will not operate.*
- *Do not supply power to the unit until all electrical wiring and controls wiring are completed.*

Checking the Electronic Expansion Valves

Table 42: Pulse Signal Output Value and Valve Operation.

Output (ø) No.	Output State			
	1	2	3	4
ø1	ON	OFF	OFF	ON
ø2	ON	ON	OFF	OFF
ø3	OFF	ON	ON	OFF
ø4	OFF	OFF	ON	ON

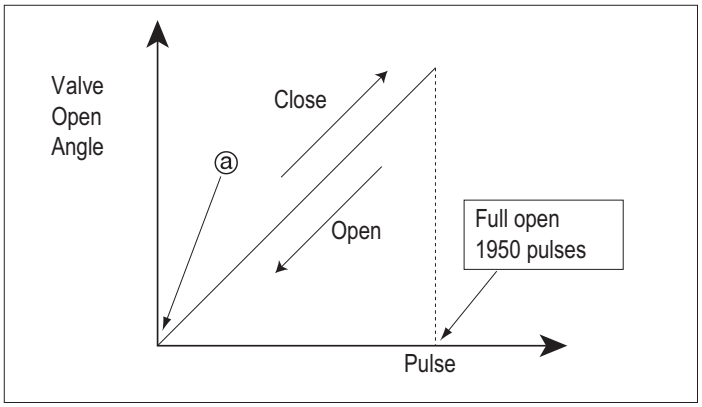


Output Pulse Sequence

- Valve close sequence: 4 → 3 → 2 → 1 → 4.
- Valve open sequence: 1 → 2 → 3 → 4 → 1.

1. If the EEV open angle does not change, output phase will be off.
2. If the output phase is different or continuously on, the motor will start vibrating.

EEV Valve Operation



At power on, open angle signal is 1,400 pulses output, and valve position is set to "A" (see left). When the valve operates properly, noise and vibration will not occur. If the valve is closed, noise will be heard.

⚠DANGER

- *High voltage electricity is required to operate this system. Adhere to the NEC code and these instructions when wiring. Improper connections and inadequate grounding can cause accidental injury or death.*
- *Turn the power off before servicing the equipment. Electrical shock can cause physical injury or death.*
- *Do not operate the disconnect switch with wet hands. There is risk of fire, electric shock, physical injury or death.*

⚠WARNING

- *Disconnects should only be performed by a properly licensed electrician. Incorrect wiring could cause the disconnect to explode, leading to physical injury or death.*
- *Do not operate the unit with the panel(s) or protective cover(s) removed; keep fingers and clothing away from moving parts. The rotating, hot, cold, and high-voltage parts of the unit can cause physical injury or death.*
- *Do not touch the refrigerant piping during or after operation. It can cause burns or frostbite.*

Note

- *If the power wiring and communication cables are not properly connected (connections switched), the communication components will burn out and the system will not operate.*
- *Do not supply power to the unit until all electrical wiring and controls wiring are completed.*

Checking the Electronic Expansion Valves, continued.

Figure 14: EEV Coil and Casing (Outdoor Unit).

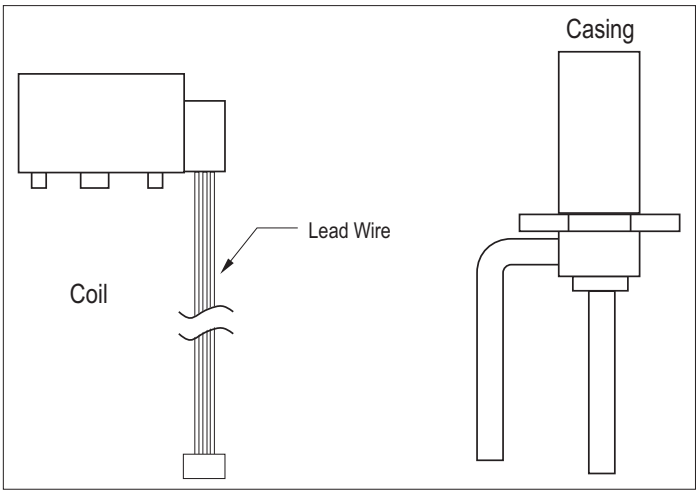
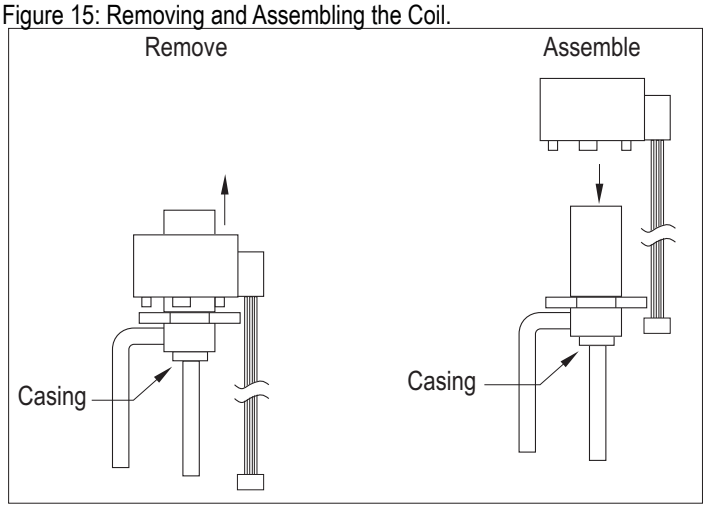


Figure 15: Removing and Assembling the Coil.



- Power off.
- Tightly grip the casing, and pull the coil up.
- During assembly, or when the coil is removed, take care not to bend the casing pipe.

⚠ DANGER

- *High voltage electricity is required to operate this system. Adhere to the NEC code and these instructions when wiring. Improper connections and inadequate grounding can cause accidental injury or death.*
- *Turn the power off before servicing the equipment. Electrical shock can cause physical injury or death.*
- *Do not operate the disconnect switch with wet hands. There is risk of fire, electric shock, physical injury or death.*

⚠ WARNING

- *Disconnects should only be performed by a properly licensed electrician. Incorrect wiring could cause the disconnect to explode, leading to physical injury or death.*
- *Do not operate the unit with the panel(s) or protective cover(s) removed; keep fingers and clothing away from moving parts. The rotating, hot, cold, and high-voltage parts of the unit can cause physical injury or death.*
- *Do not touch the refrigerant piping during or after operation. It can cause burns or frostbite.*

Note

- *If the power wiring and communication cables are not properly connected (connections switched), the communication components will burn out and the system will not operate.*
- *Do not supply power to the unit until all electrical wiring and controls wiring are completed.*

TROUBLESHOOTING MAIN COMPONENT ERRORS

Checking the Electronic Expansion Valves, continued.

Component	Problem	Check	Solution
Indoor Unit / Outdoor Unit	EEV locks up.	Check if EEV is locked, in a no-load state, the driving motor is rotating, and a clicking sound can be heard.	Replace EEV.
Outdoor Unit	EEV motor coil has shorted out or is not connected properly.	• Check the resistance between coil terminals (red-white, red-yellow, red-orange, red-blue). • If the estimated resistance value is 52±3Ω, then the EEV is operating normally.	Replace EEV.
Indoor Unit		• Check the resistance between coil terminals (brown-white, brown-yellow, brown-orange, brown-blue). • If the estimated resistance value is in 150±10Ω, then the EEV is operating normally.	Replace EEV.
	EEV is fully closed and valve is leaking.	• Operate one indoor unit in Fan mode and another in Cooling mode. • Check the liquid pipe temperature of the indoor unit in Fan mode (through the outdoor unit control board. • Check if fan is rotating and EEV is fully closed, if there are any leaks, and if the temperature decreased.	**Leak Test Procedure** 1. Turn indoor unit power OFF, wait ten (10) seconds, then turn indoor unit power ON. Repeat three (3) times. 2. Check for leaks. 3. Change EEV if change has not occurred.

⚠DANGER

- *High voltage electricity is required to operate this system. Adhere to the NEC code and these instructions when wiring. Improper connections and inadequate grounding can cause accidental injury or death.*
- *Turn the power off before servicing the equipment. Electrical shock can cause physical injury or death.*
- *Do not operate the disconnect switch with wet hands. There is risk of fire, electric shock, physical injury or death.*

⚠WARNING

- *Disconnects should only be performed by a properly licensed electrician. Incorrect wiring could cause the disconnect to explode, leading to physical injury or death.*
- *Do not operate the unit with the panel(s) or protective cover(s) removed; keep fingers and clothing away from moving parts. The rotating, hot, cold, and high-voltage parts of the unit can cause physical injury or death.*
- *Do not touch the refrigerant piping during or after operation. It can cause burns or frostbite.*

Note

- *If the power wiring and communication cables are not properly connected (connections switched), the communication components will burn out and the system will not operate.*
- *Do not supply power to the unit until all electrical wiring and controls wiring are completed.*

Checking the Phase Diode Bridge

1. After main power is shut off, wait at least ten (10) minutes until inverter PCB DC voltage is discharged.

⚠ WARNING

Wait for at least ten (10) minutes after switching off the main power supply and verifying that the DC voltage was discharged to check the electrical components of the control box. There is risk of electric shock, physical injury or death.

2. Disconnect all connections to the three-phase diode bridge.
3. Set the multi-tester to diode mode.
4. Measured value should be 0.4V ~ 0.7V as shown in table below.
5. If the measured value is different than what is listed in the table below, set the multi-tester to resistance mode and measure again. If the value is too small (0Ω) or too high (hundreds MΩ), the PCB needs to be replaced.
6. If the diode bridge is damaged, check to see if inverter PCB assembly (IPM) also needs to be replaced.

Figure 16: Simplified Diagram of a Multi V Phase Diode Bridge.

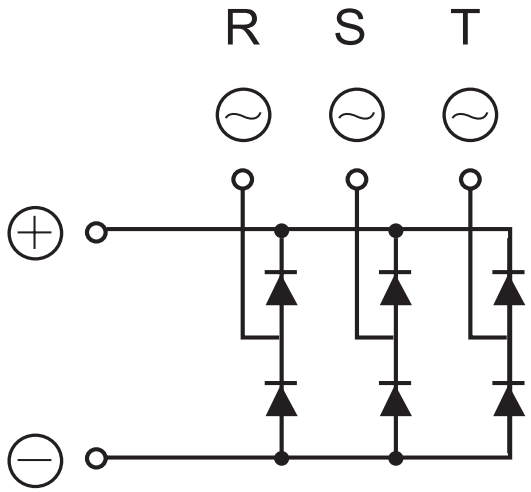


Table 43: Checking the Phase Diode Bridge.

Diode Terminal / Tester Terminal	+ Terminal: black (-)	- Terminal: red (+)
R (~) : Red (+)	0.4V ~ 0.7V	-
S (~) : Red (+)	0.4V ~ 0.7V	-
T (~) : Red (+)	0.4V ~ 0.7V	-
R (~) : Black (-)	-	0.4V ~ 0.7V
S (~) : Black (-)	-	0.4V ~ 0.7V
T (~) : Black (-)	-	0.4V ~ 0.7V

Red (+) and Black (-) are the multi-tester terminals.

⚠ DANGER

- *High voltage electricity is required to operate this system. Adhere to the NEC code and these instructions when wiring. Improper connections and inadequate grounding can cause accidental injury or death.*
- *Turn the power off before servicing the equipment. Electrical shock can cause physical injury or death.*
- *Do not operate the disconnect switch with wet hands. There is risk of fire, electric shock, physical injury or death.*

⚠ WARNING

- *Disconnects should only be performed by a properly licensed electrician. Incorrect wiring could cause the disconnect to explode, leading to physical injury or death.*
- *Do not operate the unit with the panel(s) or protective cover(s) removed; keep fingers and clothing away from moving parts. The rotating, hot, cold, and high-voltage parts of the unit can cause physical injury or death.*
- *Do not touch the refrigerant piping during or after operation. It can cause burns or frostbite.*

Note

- *If the power wiring and communication cables are not properly connected (connections switched), the communication components will burn out and the system will not operate.*
- *Do not supply power to the unit until all electrical wiring and controls wiring are completed.*

TROUBLESHOOTING MAIN COMPONENT ERRORS

Checking the Inverter IPM / IGBT

1. After main power is shut off, wait at least ten (10) minutes until inverter PCB DC voltage is discharged.

⚠ WARNING

Wait for at least ten (10) minutes after switching off the main power supply and verifying that the DC voltage was discharged to check the electrical components of the control box. There is risk of electric shock, physical injury or death.

2. Disconnect the DC link connector, and the U, V, W COMP connectors to the fan Comp PCB.
3. Set the multi-tester to resistance mode.
4. If the value between the P and N terminals of IPM is too small (0Ω) or too large (hundreds MΩ), the IPM is damaged and the PCB needs to be replaced.
5. Measured value in resistance mode should be within 28KΩ ±10% (77°F).
6. If the measured value is different from what is listed in the table below, the PCB is damaged and needs to be replaced.

Note

Image here is representative of system components. Actual component appearance depends on system type.

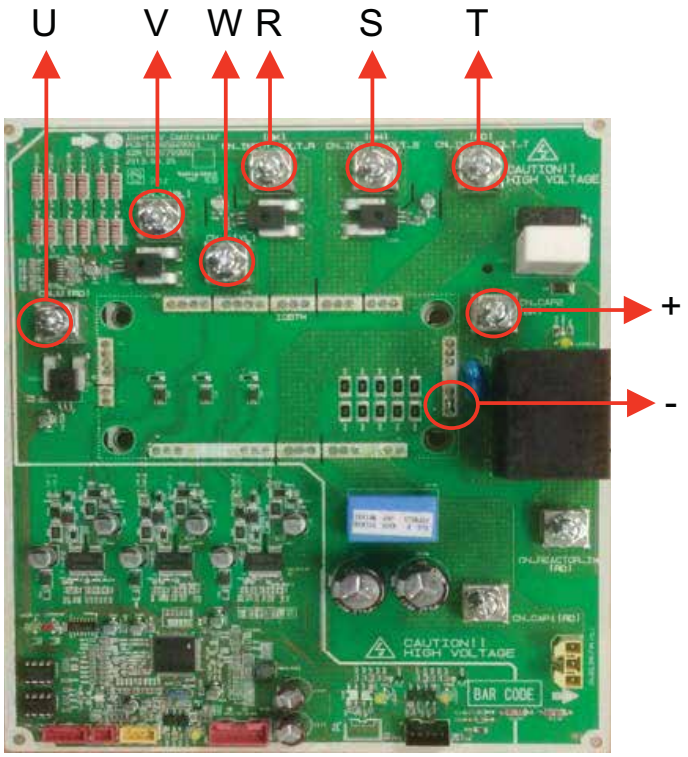


Table 44: Checking the Inverter IPM / IGBT.

	P Terminal: Black (-)	N Terminal: Red (-)
U Terminal : Red (+)	2.3K Ω ± 10% (77°F)	3.0K Ω ± 10% (77°F)
V Terminal : Red (+)	2.3K Ω ± 10% (77°F)	3.0K Ω ± 10% (77°F)
W Terminal : Red (+)	2.3K Ω ± 10% (77°F)	3.0K Ω ± 10% (77°F)
	P Terminal: Red (+)	**N Terminal: Red (+)**
U Terminal : Black (-)	3.0K Ω ± 10% (77°F)	2.3K Ω ± 10% (77°F)
V Terminal : Black (-)	3.0K Ω ± 10% (77°F)	2.3K Ω ± 10% (77°F)
W Terminal : Black (-)	3.0K Ω ± 10% (77°F)	2.3K Ω ± 10% (77°F)

Red (+) and Black (-) are the multi-tester terminals.

⚠ DANGER

- *High voltage electricity is required to operate this system. Adhere to the NEC code and these instructions when wiring. Improper connections and inadequate grounding can cause accidental injury or death.*
- *Turn the power off before servicing the equipment. Electrical shock can cause physical injury or death.*
- *Do not operate the disconnect switch with wet hands. There is risk of fire, electric shock, physical injury or death.*

⚠ WARNING

- *Disconnects should only be performed by a properly licensed electrician. Incorrect wiring could cause the disconnect to explode, leading to physical injury or death.*
- *Do not operate the unit with the panel(s) or protective cover(s) removed; keep fingers and clothing away from moving parts. The rotating, hot, cold, and high-voltage parts of the unit can cause physical injury or death.*
- *Do not touch the refrigerant piping during or after operation. It can cause burns or frostbite.*

Note

- *If the power wiring and communication cables are not properly connected (connections switched), the communication components will burn out and the system will not operate.*
- *Do not supply power to the unit until all electrical wiring and controls wiring are completed.*

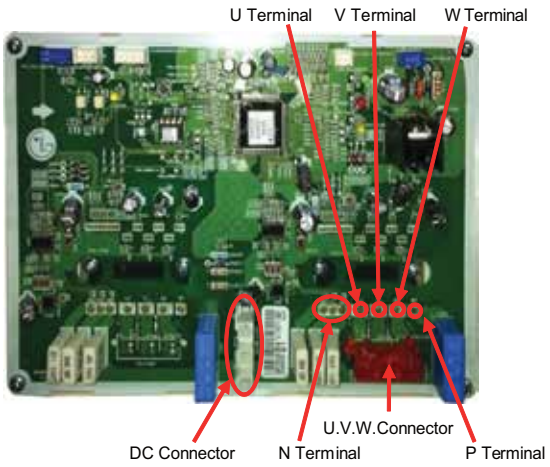
Checking the Fan IPM

1. After main power is shut off, wait at least ten (10) minutes until inverter PCB DC voltage is discharged.

⚠ WARNING

Wait for at least ten (10) minutes after switching off the main power supply and verifying that the DC voltage was discharged to check the electrical components of the control box. There is risk of electric shock, physical injury or death.

2. Disconnect the DC link connector and the U, V, W COMP connectors to the fan comp. PCB.
3. Set the multi-tester to diode mode.
4. Measured value should be the same as shown in respective tables below.
5. If the measured value is different than what is listed in the tables below, set the multi-tester to resistance mode and measure again. If the value is too small or too high, the PCB needs to be replaced.
6. If the measured value is different than what is listed in the tables, the PCB is damaged and needs to be replaced.



Note

Image here is representative of system components. Actual component appearance depends on system type.

Table 45: Checking the Fan IPM - 208-230V Systems.

	P Terminal: Black (-)	N Terminal: Red (-)
U Terminal : Red (+)	0.4V ~ 0.7V	Open
V Terminal : Red (+)	0.4V ~ 0.7V	Open
W Terminal : Red (+)	0.4V ~ 0.7V	Open
	P Terminal: Red (+)	**N Terminal: Red (+)**
U Terminal : Black (-)	Open	0.4V ~ 0.7V
VTerminal : Black (-)	Open	0.4V ~ 0.7V
W Terminal : Black (-)	Open	0.4V ~ 0.7V

Red (+) and Black (-) are the multi-tester terminals.

Table 46: Checking the Fan IPM - 460V Systems.

	P Terminal: Black (-)	N Terminal: Red (-)
U Terminal : Red (+)	2.3K Ω ± 10% (77°F)	3.0K Ω ± 10% (77°F)
V Terminal : Red (+)	2.3K Ω ± 10% (77°F)	3.0K Ω ± 10% (77°F)
W Terminal : Red (+)	2.3K Ω ± 10% (77°F)	3.0K Ω ± 10% (77°F)
	P Terminal: Red (+)	**N Terminal: Red (+)**
U Terminal : Black (-)	3.0K Ω ± 10% (77°F)	2.3K Ω ± 10% (77°F)
V Terminal : Black (-)	3.0K Ω ± 10% (77°F)	2.3K Ω ± 10% (77°F)
W Terminal : Black (-)	3.0K Ω ± 10% (77°F)	2.3K Ω ± 10% (77°F)

⚠ DANGER

- *High voltage electricity is required to operate this system. Adhere to the NEC code and these instructions when wiring. Improper connections and inadequate grounding can cause accidental injury or death.*
- *Turn the power off before servicing the equipment. Electrical shock can cause physical injury or death.*
- *Do not operate the disconnect switch with wet hands. There is risk of fire, electric shock, physical injury or death.*

⚠ WARNING

- *Disconnects should only be performed by a properly licensed electrician. Incorrect wiring could cause the disconnect to explode, leading to physical injury or death.*
- *Do not operate the unit with the panel(s) or protective cover(s) removed; keep fingers and clothing away from moving parts. The rotating, hot, cold, and high-voltage parts of the unit can cause physical injury or death.*
- *Do not touch the refrigerant piping during or after operation. It can cause burns or frostbite.*

Note

- *If the power wiring and communication cables are not properly connected (connections switched), the communication components will burn out and the system will not operate.*
- *Do not supply power to the unit until all electrical wiring and controls wiring are completed.*

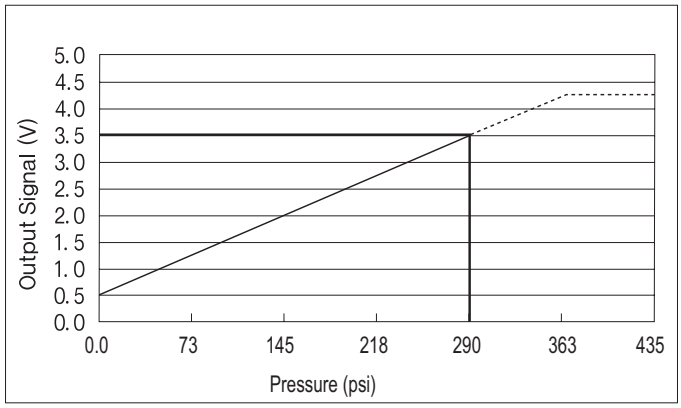
TROUBLESHOOTING MAIN COMPONENT ERRORS

Checking the High / Low Pressure Sensors

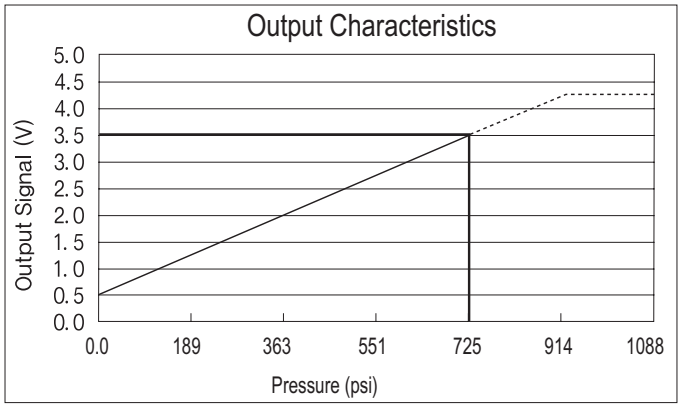
Connect the manifold gauge to the outdoor unit service valve, and compare the high pressure sensor output to the low pressure sensor output. Compare the pressure sensor output to the manifold gauge pressure outlet using the charts below.

Figure 18: Pressure Sensor Charts.

Low Pressure Sensor

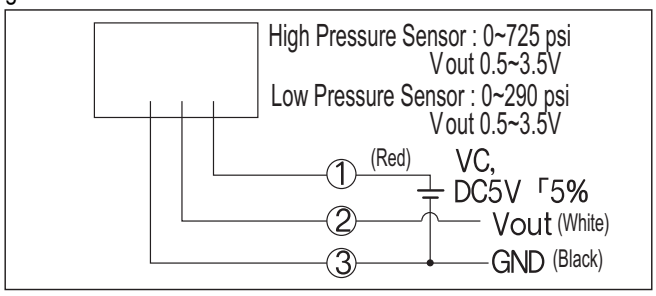


High Pressure Sensor



1. If the manifold gauge reads 14.2 psi, then there is a decrease in pressure due to a refrigerant leak.
2. Find the refrigerant leak and fix it.
3. If the difference between the high and low pressure outputs is ≤14.2 psi, the pressure sensor is operating normally.
4. If the difference between the high and low pressure outputs is ≥14.2 psi, the pressure sensor is not functioning properly and needs to be replaced.

Figure 17: Schematic of a Pressure Sensor Circuit



If DC 5V voltage is carried on the red and black wires, voltage would be made between the white and black wires. See the chart for the equivalent pressure output.

Checking the Outdoor Fan

1. The inverter motor controls the number of rotations on the outdoor unit fan.
2. The high / low pressure sensors control the outdoor unit fan after compressor operation.
3. Even if the compressor is on, the outdoor unit fan may not function due to low capacity operation, or if the outdoor temperature is low. This is normal, and the outdoor unit fan will begin to operate after the system reaches set-point.

⚠DANGER

- *High voltage electricity is required to operate this system. Adhere to the NEC code and these instructions when wiring. Improper connections and inadequate grounding can cause accidental injury or death.*
- *Turn the power off before servicing the equipment. Electrical shock can cause physical injury or death.*
- *Do not operate the disconnect switch with wet hands. There is risk of fire, electric shock, physical injury or death.*

⚠WARNING

- *Disconnects should only be performed by a properly licensed electrician. Incorrect wiring could cause the disconnect to explode, leading to physical injury or death.*
- *Do not operate the unit with the panel(s) or protective cover(s) removed; keep fingers and clothing away from moving parts. The rotating, hot, cold, and high-voltage parts of the unit can cause physical injury or death.*
- *Do not touch the refrigerant piping during or after operation. It can cause burns or frostbite.*

Note

- *If the power wiring and communication cables are not properly connected (connections switched), the communication components will burn out and the system will not operate.*
- *Do not supply power to the unit until all electrical wiring and controls wiring are completed.*

Checking the Solenoid Valves

Compare solenoid valve operation to the control board output.

Oil Solenoid Valves

1. The oil solenoid valve is located at the bottom of the accumulator. The oil solenoid valve starts functioning after the compressor operates for a while to provide oil stored at the bottom of the accumulator.
2. After the compressor starts operating, the oil solenoid valve will function for two (2) minutes. Check for operation noises and piping vibrations on the solenoid valve.
3. The oil solenoid valve will turn on immediately after the compressor stops.
4. The oil solenoid valve also can turn on and off repeatedly due to the cooling or heating cycle. This is normal operation and does not indicate that the outdoor unit is malfunctioning.
5. Using a DC 500V megatester, measure the insulation resistance between the oil solenoid valve connection to the coil. Insulation resistance should be >100MΩ.

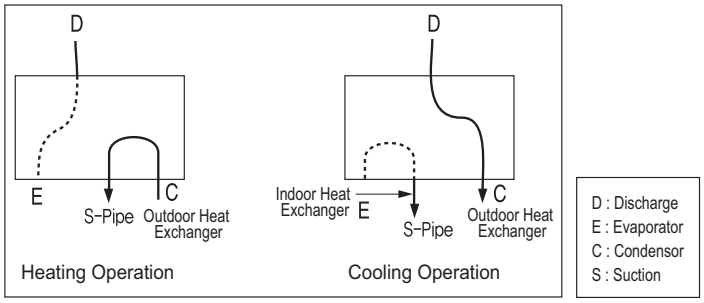
Partial Defrost Solenoid Valve

1. Defrost operation eliminates ice that has accumulated on the heat exchanger, recovering its performance.
2. When partial defrost operation is functioning, two (2) solenoid valves will turn on in sequence for six (6) minutes.
3. Solenoid valves will turn off after partial defrost operation has ended.
4. The change in solenoid valve operation can be checked by measuring the temperature of the bypass piping before and after partial defrost operation, and by the sound of refrigerant.
5. Using a DC 500V megatester, measure the insulation resistance between the partial defrost solenoid valve connection to the coil. Insulation resistance should be >100MΩ.

Four-Way Reverse Valve

1. The four-way reverse valve should be OFF before the outdoor and indoor units are powered up and turned on.
2. The four-way reverse valve should be OFF during cooling, defrost, and oil recovery operation. The four-way reverse valve should be ON during heating operation.
3. When changing from cooling operation to heating operation, valve position changes and unit will restart. Changeover will occur within three (3) minutes.
4. To check if the four-way reverse valve is operating in cooling or heating mode, touch the surface of the low pressure service valve piping.
5. Using a DC 500V megatester, measure the insulation resistance between the four-way reverse valve connection to the coil. Insulation resistance should be >100MΩ.

Figure 19: Refrigerant Flowchart of the Four-Way Reverse Valve.



⚠DANGER

- *High voltage electricity is required to operate this system. Adhere to the NEC code and these instructions when wiring. Improper connections and inadequate grounding can cause accidental injury or death.*
- *Turn the power off before servicing the equipment. Electrical shock can cause physical injury or death.*
- *Do not operate the disconnect switch with wet hands. There is risk of fire, electric shock, physical injury or death.*

⚠WARNING

- *Disconnects should only be performed by a properly licensed electrician. Incorrect wiring could cause the disconnect to explode, leading to physical injury or death.*
- *Do not operate the unit with the panel(s) or protective cover(s) removed; keep fingers and clothing away from moving parts. The rotating, hot, cold, and high-voltage parts of the unit can cause physical injury or death.*
- *Do not touch the refrigerant piping during or after operation. It can cause burns or frostbite.*

Note

- *If the power wiring and communication cables are not properly connected (connections switched), the communication components will burn out and the system will not operate.*
- *Do not supply power to the unit until all electrical wiring and controls wiring are completed.*

TROUBLESHOOTING MAIN COMPONENT ERRORS

Temperature Sensor

- Outdoor Temperature Sensor: TH1
- Pipe Temperature Sensor: TH2
- Discharge Pipe (D-pipe) Temperature Sensor: TH3

1. Check the temperature sensor installation and connection.
2. Check if the connection contact of the temperature sensor is correct.
3. Measure the resistance of temperature sensor.

Table 47: Temperature Sensor Resistance Values.

Temperature Sensor	TH1	TH2	TH3
Resistance	10 KΩ ± 1% @ 77°F	5 KΩ ± 1% @ 77°F	200 KΩ ± 1% @ 77°F
	1.07 KΩ ± 3.3% @ 185°F	535 KΩ ± 3.3% @185°F	28 KΩ ± 7.7% @ 185°F

Electrical Capacitor and Resistor for Voltage Distributor

1. Disconnect terminals of voltage distribution resistor from each DC link on the electrical capacitor.
2. Set the multimeter to resistance mode, and then connect the probe to +,- terminal of the capacitor. If the estimated resistance value continuously increases without shorting (value is 0), then the resistor is normal.
3. Set the multimeter to resistance mode, confirm that the value of the resistor is around 270 kOhm.
4. Check and replace defective components.

⚠ DANGER

- *High voltage electricity is required to operate this system. Adhere to the NEC code and these instructions when wiring. Improper connections and inadequate grounding can cause accidental injury or death.*
- *Turn the power off before servicing the equipment. Electrical shock can cause physical injury or death.*
- *Do not operate the disconnect switch with wet hands. There is risk of fire, electric shock, physical injury or death.*

⚠ WARNING

- *Disconnects should only be performed by a properly licensed electrician. Incorrect wiring could cause the disconnect to explode, leading to physical injury or death.*
- *Do not operate the unit with the panel(s) or protective cover(s) removed; keep fingers and clothing away from moving parts. The rotating, hot, cold, and high-voltage parts of the unit can cause physical injury or death.*
- *Do not touch the refrigerant piping during or after operation. It can cause burns or frostbite.*

Note

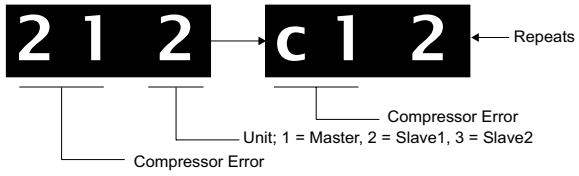
- *If the power wiring and communication cables are not properly connected (connections switched), the communication components will burn out and the system will not operate.*
- *Do not supply power to the unit until all electrical wiring and controls wiring are completed.*

ERROR CODE TABLES

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Error Codes

- Indicate different types of unit failures, assist in self-diagnosis and to track the frequency of occurrence.
- Error codes are shown on the LED of indoor units, wired remote controller, the outdoor unit control board, and on the main screen of the LG Monitoring View (LGMV) Diagnostic Software.
- If two or more errors occur simultaneously, the lower error code number is displayed first.
- After error is resolved, the error code does not display.



Error Display

The first, second, and third number on the LED indicates error number; the fourth number on LED indicates outdoor unit number.

Examples: 211 = Error No. 21 on master unit, 213 = Error No. 21 on slave2 unit, Error No. 105 on master unit on compressor 1

Error Code Nomenclature Definitions

- MICOM: Non-volatile memory chip where unit setup information is stored.
- EPROM: Non-volatile memory chip where device identification, size, and factory defined default component operating parameters are stored.

Table 48: Error Codes.

	Error Code			Description	Details
Indoor Unit	0	1	-	Indoor unit return air or optional remote wall temperature sensor communications error.	Indoor unit air temperature sensor has disconnected or short circuited. (Check the wiring, connection at the CN Room socket on the indoor unit PCB, then check the thermistor.) Use the OHM and voltage check charts in the product service manual.
	0	2	-	Indoor unit inlet pipe temperature sensor communication error.	Indoor unit inlet pipe temperature sensor has disconnected or short circuited. (Check the connection at the CN-PIPE/IN socket on the indoor unit PCB, then check the thermistor.) Use the OHM and voltage check charts in the product service manual.
	0	3	-	Communication error between zone controller and indoor unit.	Indoor unit PCB has not received communications signal from zone controller.
	0	4	-	Condensate float switch error.	Drain pump and/or flow switch is / are malfunctioning. Also, check drain line for obstructions.
	0	5	-	Communication error between outdoor unit and indoor unit.	• Indoor unit has not received communications signal from outdoor unit. • Check indoor unit to outdoor unit communication cable for issues (Check A terminals are connected to indoor unit A and 3 (5 on 3 x 3 cassette) terminals; B connect to B or 4 (6 on 3 x 3 cassette) terminals.
	0	6	-	Indoor unit outlet pipe temperature sensor error.	Indoor unit outlet pipe temperature sensor has disconnected or short circuited. (Check the connection at the CN-PIPE/OUT socket on the indoor unit PCB, then check the thermistor.) Use the OHM and voltage check charts in the product service manual.
	0	7	-	Indoor units are not operating in the same mode.	Different operation modes between indoor units.
	0	9	-	Indoor unit EPROM error.	• Communication error between the indoor unit PCB board and its option card. (The option card is about 1" x 1" and is plugged into the indoor unit PCB board. Check connection between the two.) • Communication error between EPROM chips on indoor unit main PCB. • Indoor unit EPROM data is not available.
	1	0	-	Indoor unit BLDC fan motor communications error.	• Fan motor has been removed or is defective. Use the OHM and voltage check charts in the product service manual. • The system has detected the fan motor is not spinning. • On new installs, verify installation manual and paperwork were removed from fan discharge shroud before unit was installed. • Check the wiring plug and connection at sockets CN-MOTOR1 and CN-MOTOR2 (if used).
Outdoor Unit	2	1	1	Master outdoor unit inverter compressor PCB error.	• Outdoor unit inverter compressor PCB error. • Under voltage • Refrigerant flow restriction from defective LEV. • Refrigerant charge is too high (overcharge).
	2	1	2	Slave1 outdoor unit inverter compressor PCB error.	
	2	1	3	Slave2 outdoor unit inverter compressor PCB error.	

For detailed information on how to troubleshoot each error, see the pages 84 to 149.

ERROR CODE TABLES

⚠ WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Table 49: Error Codes, continued.

	Error Code			Description	Details
Outdoor Unit	2	2	1	Master outdoor unit inverter board input overcurrent (RMS) error.	• Overcurrent of outdoor unit inverter board PCB. • Under voltage • Refrigerant flow restriction from defective LEV. • Refrigerant charge is too high (overcharged).
	2	2	2	Slave1 outdoor unit inverter board input overcurrent (RMS) error.	
	2	2	3	Slave2 outdoor unit inverter board input overcurrent (RMS) error.	
	2	3	1	Low DC voltage sensed at the master outdoor unit inverter compressor DC link.	DC voltage failed to charge on power up. (Start diagnosis at the CN inverter socket on the outdoor unit noise filter PCB.)
	2	3	2	Low voltage to the slave1 outdoor unit inverter compressor DC link.	
	2	3	3	Low voltage to the slave2 outdoor unit inverter compressor DC link.	
	2	4	1	Master outdoor unit high pressure switch error.	System has been turned off by the master outdoor unit high pressure switch.
	2	4	2	Slave1 outdoor unit high pressure switch error.	System has been turned off by the slave1 outdoor unit high pressure switch.
	2	4	3	Slave2 outdoor unit high pressure switch error.	System has been turned off by the slave2 outdoor unit high pressure switch.
	2	5	1	Input voltage to the master outdoor unit is too high or too low.	Master outdoor unit has an input voltage of <180V or >253V (for 208-230V units), or an input voltage of <414V or >528V (for 460V units).
	2	5	2	Input voltage to the slave1 outdoor unit is too high or too low.	Slave1 outdoor unit has an input voltage of <180V or >253V (for 208-230V units), or an input voltage of <414V or >528V (for 460V units).
	2	5	3	Input voltage to the slave2 outdoor unit is too high or too low.	Slave2 outdoor unit has an input voltage of <180V or >253V (for 208-230V units), or an input voltage of <414V or >528V (for 460V units).
	2	6	1	Master outdoor unit inverter compressor operation error.	Inverter compressor start failure.
	2	6	2	Slave1 outdoor unit inverter compressor operation error.	
	2	6	3	Slave2 outdoor unit inverter compressor operation error.	
	2	8	1	Master outdoor unit inverter DC link high voltage error.	Compressor shut off because outdoor unit inverter PCB DC link voltage is too high.
	2	8	2	Slave1 outdoor unit inverter DC link high voltage error.	
	2	8	3	Slave2 outdoor unit inverter DC link high voltage error.	
	2	9	1	Master outdoor unit inverter compressor overcurrent error.	Outdoor unit inverter compressor current draw is too high.
	2	9	2	Slave1 outdoor unit inverter compressor overcurrent error.	
	2	9	3	Slave2 outdoor unit inverter compressor overcurrent error.	
	3	2	1	Excessive increase in master outdoor unit inverter compressor1 gas discharge temperature.	• Shutdown due to excessive discharge gas temperature. • Check the fan and coils.
	3	2	2	Excessive increase in slave1 outdoor unit inverter compressor1 gas discharge temperature.	
	3	2	3	Excessive increase in slave2 outdoor unit inverter compressor1 gas discharge temperature.	
	3	3	1	Excessive increase in master outdoor unit inverter compressor2 gas discharge temperature.	• Shutdown due to excessive discharge gas temperature. • Check the fan and coils.
	3	3	2	Excessive increase in slave1 outdoor unit inverter compressor2 gas discharge temperature.	
	3	3	3	Excessive increase in slave2 outdoor unit inverter compressor2 gas discharge temperature.	
	3	4	1	Master outdoor unit compressor high pressure safety tripped.	• Shutdown due to excessive discharge gas temperature. • Check the fan and coils.
	3	4	2	Slave1 outdoor unit compressor high pressure safety tripped.	
	3	4	3	Slave2 outdoor unit compressor high pressure safety tripped.	

For detailed information on how to troubleshoot each error, see the pages 84 to 149.

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Table 50: Error Codes, continued.

	Error Code			Description	Details
Outdoor Unit	3	5	1	Master outdoor unit low side pressure transducer senses pressure below allowable limits.	Shutdown due to low suction pressure.
	3	5	2	Slave1 outdoor unit low side pressure transducer senses pressure below allowable limits.	
	3	5	3	Slave1 outdoor unit low side pressure transducer senses pressure below allowable limits.	
	3	6	1	Master outdoor unit fell below low condenser (compression) ratio limit.	Master outdoor unit remained below the low condenser ratio limit for three (3) minutes.
	3	6	2	Slave1 outdoor unit fell below low condenser (compression) ratio limit.	Slave1 outdoor unit remained below the low condenser ratio limit for three (3) minutes.
	3	6	3	Slave2 outdoor unit fell below low condenser (compression) ratio limit.	Slave2 outdoor unit remained below the low condenser ratio limit for three (3) minutes.
	4	0	1	Master outdoor unit inverter compressor current transducer (CT) sensor error.	Outdoor unit inverter compressor current transducer (CT) detection sensor has disconnected or short circuited.
	4	0	2	Slave1 outdoor unit inverter compressor current transducer (CT) sensor error.	
	4	0	3	Slave2 outdoor unit inverter compressor current transducer (CT) sensor error.	
	4	1	1	Master outdoor unit inverter compressor1 discharge pipe temperature sensor error.	• Check the connection at the CN-34 socket on the outdoor unit PCB. • Thermistor has disconnected or short circuited.
	4	1	2	Slave1 outdoor unit inverter compressor1 discharge pipe temperature sensor error.	
	4	1	3	Slave2 outdoor unit inverter compressor1 discharge pipe temperature sensor error.	
	4	2	1	Master outdoor unit low pressure transducer error.	• Check the connection at the CN-30 socket on the outdoor unit PCB. • Transducer has disconnected or short circuited.
	4	2	2	Slave1 outdoor unit low pressure transducer error.	
	4	2	3	Slave2 outdoor unit low pressure transducer error.	
	4	3	1	Master outdoor unit high pressure transducer error.	• Check the connection at the CN-31 socket on the outdoor unit PCB. • Transducer has disconnected or short circuited.
	4	3	2	Slave1 outdoor unit high pressure transducer error.	
	4	3	3	Slave2 outdoor unit high pressure transducer error.	
	4	4	1	Master outdoor unit ambient temperature sensor error.	• Check the connection at the CN-33 socket on the outdoor unit PCB. • Thermistor has disconnected or short circuited.
	4	4	2	Slave1 outdoor unit ambient temperature sensor error.	
	4	4	3	Slave2 outdoor unit ambient temperature sensor error.	
	4	5	1	Master outdoor unit heat exchanger pipe temperature sensor (front side, TH_HEX2) error.	• Check suction sensor in cooling mode; check hot gas sensor located near the heat exchanger in heating mode. • Check the connection at the CN-34 socket, connector tag TH_HEX2, on the outdoor unit PCB, then check if thermistor is open or shorted. • Thermistor has disconnected or short circuited.
	4	5	2	Slave1 outdoor unit heat exchanger pipe temperature sensor (front side, TH_HEX2) error.	
	4	5	3	Slave2 outdoor unit heat exchanger pipe temperature sensor (front side, TH_HEX2) error.	
	4	6	1	Master outdoor unit suction pipe temperature sensor error.	• Check the connection at the CN-34 socket on the outdoor unit PCB. • Thermistor has disconnected or short circuited.
	4	6	2	Slave1 outdoor unit suction pipe temperature sensor error.	
	4	6	3	Slave2 outdoor unit suction pipe temperature sensor error.	
	4	7	1	Master outdoor unit inverter compressor2 discharge temperature sensor error.	Disconnection or short circuit of master outdoor unit inverter compressor2 discharge temperature sensor.
	4	7	2	Slave1 outdoor unit inverter compressor2 discharge temperature sensor error.	Disconnection or short circuit of slave1 outdoor unit inverter compressor2 discharge temperature sensor.
	4	7	3	Slave2 outdoor unit inverter compressor2 discharge temperature sensor error.	Disconnection or short circuit of slave2 outdoor unit inverter compressor2 discharge temperature sensor.

For detailed information on how to troubleshoot each error, see the pages 84 to 149.

ERROR CODE TABLES

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Table 51: Error Codes, continued.

	Error Code			Description	Details
Outdoor Unit	4	9	1	Master outdoor unit IPM temperature sensor error.	Disconnection or short circuit of master outdoor unit IPM temperature sensor.
	4	9	2	Slave1 outdoor unit IPM temperature sensor error.	Disconnection or short circuit of slave1 outdoor unit IPM temperature sensor.
	4	9	3	Slave2 outdoor unit IPM temperature sensor error.	Disconnection or short circuit of slave2 outdoor unit IPM temperature sensor.
	5	0	1	Master outdoor unit three-phase power is not connected properly.	One or more of R(L1), S(L2), T(L3) input power line connections is / are missing for the master outdoor unit.
	5	0	2	Slave1 outdoor unit three-phase power is not connected properly.	One or more of R(L1), S(L2), T(L3) input power line connections is / are missing for the slave1 outdoor unit.
	5	0	3	Slave2 outdoor unit three-phase power is not connected properly.	One or more of R(L1), S(L2), T(L3) input power line connections is / are missing for the slave2 outdoor unit.
	5	1	1	Combination ratio is out of range.	The total of the nominal indoor unit capacity is less than 50% or more than 130% of the nominal outdoor unit capacity.
	5	1	2	Total indoor unit capacity exceeds allowable heat recovery unit branch capacity. (Heat Recovery Systems only.)	Value of total indoor unit capacity exceeds allowable heat recovery unit branch capacity specifications. (Heat Recovery Systems only.)
	5	2	1	Communication error between master outdoor unit inverter PCB and main PCB.	• Communication error between inverter PCB CN-MAIN (COM/RD) and main PCB (CN-29). • Check connections at both sockets. • Inspect interconnecting cable for wear.
	5	2	2	Communication error between slave1 outdoor unit inverter PCB and main PCB.	
	5	2	3	Communication error between slave2 outdoor unit inverter PCB and main PCB.	
	5	3	1	Communication error between outdoor unit main PCB and indoor unit(s) PCB.	• Check if outdoor unit to indoor unit(s) communications cable has disconnected or short circuited. • Check A terminals are connected to indoor unit A and 3 (5 on 3 x 3 cassette) terminals; B connect to B or 4 (6 on 3 x 3 cassette) terminals.
	5	4	1	Master outdoor unit power error.	Master outdoor unit three-phase power R(L1), S(L2), T(L3) is not connected properly (reverse phase / phase is missing).
	5	4	2	Slave1 outdoor unit power error.	Slave1 outdoor unit three-phase power R(L1), S(L2), T(L3) is not connected properly (reverse phase / phase is missing).
	5	4	3	Slave2 outdoor unit power error.	Slave2 outdoor unit three-phase power R(L1), S(L2), T(L3) is not connected properly (reverse phase / phase is missing).
	5	7	1	Master outdoor unit main PCB and inverter PCB communication error.	Master outdoor unit inverter PCB is not receiving signal from main PCB.
	5	7	2	Slave1 outdoor unit main PCB and inverter PCB communication error.	Slave1 outdoor unit inverter PCB is not receiving signal from main PCB.
	5	7	3	Slave2 outdoor unit main PCB and inverter PCB communication error.	Slave2 outdoor unit inverter PCB is not receiving signal from main PCB.
	5	9	1	Outdoor unit series installation error.	A smaller outdoor unit is set as the master outdoor unit.
	6	0	1	Master outdoor unit inverter PCB EPROM error.	• Verify the EPROM is present and in the socket correctly. • Check if all pins are in and are not bent. • Check if notch in the chip lines up with the arrow on the socket.
	6	0	2	Slave1 outdoor unit inverter PCB EPROM error.	
	6	0	3	Slave2 outdoor unit inverter PCB EPROM error.	
	6	2	1	High temperature at the master outdoor unit inverter heatsink.	System shut off because of high temperatures at the master outdoor unit inverter heatsink.
	6	2	2	High temperature at the slave1 outdoor unit inverter heatsink.	System shut off because of high temperatures at the slave1 outdoor unit inverter heatsink.
	6	2	3	High temperature at the slave2 outdoor unit inverter heatsink.	System shut off because of high temperatures at the slave2 outdoor unit inverter heatsink.

For detailed information on how to troubleshoot each error, see the pages 84 to 149.

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Table 52: Error Codes, continued.

Error Code				Description	Details
Outdoor Unit	6	5	1	Master outdoor unit inverter heatsink temperature sensor error.	Disconnection or short circuit of master outdoor unit inverter heatsink temperature sensor.
	6	5	2	Slave1 outdoor unit inverter heatsink temperature sensor error.	Disconnection or short circuit of slave1 outdoor unit inverter heatsink temperature sensor.
	6	5	3	Slave2 outdoor unit inverter heatsink temperature sensor error.	Disconnection or short circuit of slave2 outdoor unit inverter heatsink temperature sensor.
	6	7	1	Master outdoor unit fan has locked up.	Master outdoor unit air flow is restricted.
	6	7	2	Slave1 outdoor unit fan has locked up.	Slave1 outdoor unit air flow is restricted.
	6	7	3	Slave2 outdoor unit fan has locked up	Slave2 outdoor unit air flow is restricted.
	7	1	1	Master outdoor unit converter CT sensor error.	Master outdoor unit is restricted.
	7	1	2	Slave1 outdoor unit converter CT sensor error.	Slave1 outdoor unit is restricted.
	7	1	3	Slave2 outdoor unit converter CT sensor error.	Slave2 outdoor unit is restricted.
	7	5	1	Master outdoor unit fan CT sensor error.	Disconnection or short circuit of master outdoor unit fan current detection (CT) sensor.
	7	5	2	Slave1 outdoor unit fan CT sensor error.	Disconnection or short circuit of slave1 outdoor unit fan current detection (CT) sensor.
	7	5	3	Slave2 outdoor unit fan CT sensor error.	Disconnection or short circuit of slave2 outdoor unit fan current detection (CT) sensor.
	7	6	1	Master outdoor unit fan DC link high voltage error.	Master outdoor unit fan DC link high voltage error.
	7	6	2	Slave1 outdoor unit fan DC link high voltage error.	Slave1 outdoor unit fan DC link high voltage error.
	7	6	3	Slave2 outdoor unit fan DC link high voltage error.	Slave2 outdoor unit fan DC link high voltage error.
	7	7	1	Master outdoor unit fan overcurrent error.	Master outdoor unit fan current is >10A (for 208-230V units) or 5A (for 460V units).
	7	7	2	Slave1 outdoor unit fan overcurrent error.	Slave1 outdoor unit fan current is >10A (for 208-230V units) or 5A (for 460V units).
	7	7	3	Slave2 outdoor unit fan overcurrent error.	Slave2 outdoor unit fan current is >10A (for 208-230V units) or 5A (for 460V units).
	7	9	1	Master outdoor unit fan operation failure error.	Master outdoor unit fan is experiencing first position sensor failure.
	7	9	2	Slave1 outdoor unit fan operation failure error.	Slave1 outdoor unit fan is experiencing first position sensor failure.
	7	9	3	Slave2 outdoor unit fan operation failure error.	Slave2 outdoor unit fan is experiencing first position sensor failure.
	8	6	1	Master outdoor unit main PCB onboard EPROM error.	• Verify the EPROM is present and in the socket correctly. • Check if all pins are in and are not bent. • Check if notch in the chip lines up with the arrow on the socket.
	8	6	2	Slave1 outdoor unit main PCB onboard EPROM error.	
	8	6	3	Slave2 outdoor unit main PCB onboard EPROM error.	
	8	7	1	Master outdoor unit fan PCB EPROM error.	• Communication error between master outdoor unit fan MICOM and EPROM. • EPROM is missing.
	8	7	2	Slave1 outdoor unit fan PCB EPROM error.	• Communication error between slave1 outdoor unit fan MICOM and EPROM. • EPROM is missing.
	8	7	3	Slave2 outdoor unit fan PCB EPROM error.	• Communication error between slave2 outdoor unit fan MICOM and EPROM. • EPROM is missing.
	1	0	4	1	Communication error between master outdoor unit and slave outdoor units.	Master outdoor unit main PCB is not receiving signals from slave outdoor units.
	1	0	4	2	Communication error between slave1 outdoor unit and master and slave2 outdoor units.	Slave1 outdoor unit main PCB is not receiving signals from master and slave2 outdoor units.
	1	0	4	3	Communication error between slave2 outdoor unit and master and slave1 outdoor units.	Slave2 outdoor unit main PCB is not receiving signals from master and slave1 outdoor units.

For detailed information on how to troubleshoot each error, see the pages 84 to 149.

ERROR CODE TABLES

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Table 53: Error Codes, continued.

Error Code					Description	Details
Outdoor Unit	1	0	5	1	Master outdoor unit fan PCB to compressor PCB communication error.	Master outdoor unit compressor PCB is not receiving a signal from the fan PCB.
	1	0	5	2	Slave1 outdoor unit fan PCB to compressor PCB communication error.	Slave1 outdoor unit compressor PCB is not receiving a signal from the fan PCB.
	1	0	5	3	Slave2 outdoor unit fan PCB to compressor PCB communication error.	Slave2 outdoor unit compressor PCB is not receiving a signal from the fan PCB.
	1	0	6	1	Master outdoor unit fan IPM error.	Instant overcurrent (peak) of master outdoor unit fan IPM.
	1	0	6	2	Slave1 outdoor unit fan IPM error.	Instant overcurrent (peak) of slave1 outdoor unit fan IPM.
	1	0	6	3	Slave2 outdoor unit fan IPM error.	Instant overcurrent (peak) of slave2 outdoor unit fan IPM.
	1	0	7	1	Master outdoor unit fan DC link low voltage error.	Master outdoor unit fan DC link voltage is <140V (for 208-230V units) or <380V (for 460V units).
	1	0	7	2	Slave1 outdoor unit fan DC link low voltage error.	Slave1 outdoor unit fan DC link voltage is <140V (for 208-230V units) or <380V (for 460V units).
	1	0	7	3	Slave2 outdoor unit fan DC link low voltage error.	Slave2 outdoor unit fan DC link voltage is <140V (for 208-230V units) or <380V (for 460V units).
	1	1	3	1	Master outdoor unit liquid pipe temperature sensor error.	• Check the connection at the CN-32 socket on the outdoor unit PCB. • Thermistor has disconnected or short circuited.
	1	1	3	2	Slave1 outdoor unit liquid pipe temperature sensor error.	
	1	1	3	3	Slave2 outdoor unit liquid pipe temperature sensor error.	
	1	1	4	1	Master outdoor unit subcooling inlet temperature sensor error.	• Check the connection at the CN-35 socket on the outdoor unit PCB. • Thermistor has disconnected or short circuited.
	1	1	4	2	Slave1 outdoor unit subcooling inlet temperature sensor error.	
	1	1	4	3	Slave2 outdoor unit subcooling inlet temperature sensor error.	
	1	1	5	1	Master outdoor unit subcooling outlet temperature sensor error.	• Check the connection at the CN-32 socket on the outdoor unit PCB. • Thermistor has disconnected or short circuited.
	1	1	5	2	Slave1 outdoor unit subcooling outlet temperature sensor error.	
	1	1	5	3	Slave2 outdoor unit subcooling outlet temperature sensor error.	
	1	1	6	1	Master outdoor unit oil level sensor error.	Disconnection or short circuit of master outdoor unit oil level sensor.
	1	1	6	2	Slave1 outdoor unit oil level sensor error.	Disconnection or short circuit of slave1 outdoor unit oil level sensor.
	1	1	6	3	Slave2 outdoor unit oil level sensor error.	Disconnection or short circuit of slave2 outdoor unit oil level sensor.
	1	4	5	1	Communication error between master outdoor unit main board and external board.	Master outdoor unit main board to external board communication failure.
	1	4	5	2	Communication error between slave1 outdoor unit main board and external board.	Slave1 outdoor unit main board to external board communication failure.
	1	4	5	3	Communication error between slave2 outdoor unit main board and external board.	Slave2 outdoor unit main board to external board communication failure.
	1	5	1	1	Master outdoor unit operation mode conversion error.	Pressure imbalance between outdoor units (Not enough pressure difference between high and low).
	1	5	1	2	Slave1 outdoor unit operation mode conversion error.	
	1	5	1	3	Slave2 outdoor unit operation mode conversion error.	
	1	5	3	1	Master outdoor unit upper heat exchanger temperature sensor error.	• Check the connection at the CN-32 socket on the outdoor unit PCB. • Thermistor has disconnected or short circuited.
	1	5	3	2	Slave1 outdoor unit upper heat exchanger temperature sensor error.	
	1	5	3	3	Slave2 outdoor unit upper heat exchanger temperature sensor error.	

For detailed information on how to troubleshoot each error, see the pages 84 to 149.

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Table 54: Error Codes, continued.

	Error Code				Description	Details
Outdoor Unit	1	5	4	1	Master outdoor unit lower heat exchanger temperature sensor error.	• Check the connection at the CN-35 socket on the outdoor unit PCB. • Thermistor has disconnected or short circuited.
	1	5	4	2	Slave1 outdoor unit lower heat exchanger temperature sensor error.	Disconnection or short circuit of slave1 outdoor unit lower heat exchanger temperature sensor.
	1	5	4	3	Slave2 outdoor unit lower heat exchanger temperature sensor error.	Disconnection or short circuit of slave2 outdoor unit lower heat exchanger temperature sensor.
	1	8	2	1	Communication error between master outdoor unit external board main and sub MICOMs.	Master outdoor unit external board main to sub MICOMs communication failure.
	1	8	2	2	Communication error between slave1 outdoor unit external board main and sub MICOMs.	Slave1 outdoor unit external board main to sub MICOMs communication failure.
	1	8	2	3	Communication error between slave2 outdoor unit external board main and sub MICOMs.	Slave2 outdoor unit external board main to sub MICOMs communication failure.
	1	9	3	1	Excessive increase in master outdoor unit fan heatsink temperature.	System has shut off because master outdoor unit fan heatsink temperature is >203°F.
	1	9	3	2	Excessive increase in slave1 outdoor unit fan heatsink temperature.	System has shut off because slave1 outdoor unit fan heatsink temperature is >203°F.
	1	9	3	3	Excessive increase in slave2 outdoor unit fan heatsink temperature.	System has shut off because slave1 outdoor unit fan heatsink temperature is >203°F.
	1	9	4	1	Master outdoor unit fan heatsink temperature sensor error.	Disconnection or short circuit of master outdoor unit fan heatsink temperature sensor.
	1	9	4	2	Slave1 outdoor unit fan heatsink temperature sensor error.	Disconnection or short circuit of slave1 outdoor unit fan heatsink temperature sensor.
	1	9	4	3	Slave2 outdoor unit fan heatsink temperature sensor error.	Disconnection or short circuit of slave2 outdoor unit fan heatsink temperature sensor.
Heat Recovery Unit	-	5	1	C + No. of HR Unit	Capacity of indoor units connected to the heat recovery unit exceeds allowable limits.	Total capacity of indoor unit(s) connected to each heat recovery unit port exceeds allowable limits.
	2	0	0	1	Valve addressing error.	Automatic valve addressing procedure failed.
	2	0	1	C + No. of HR Unit	Heat recovery unit liquid sensor error. (C = Heat recovery unit + Heat recovery unit number).	Disconnection or short circuit of heat recovery unit liquid pipe sensor.
	2	0	2		Heat recovery unit subcooling pipe inlet sensor error. (C = Heat recovery unit + Heat recovery unit number).	Disconnection or short circuit of heat recovery unit subcooling pipe inlet sensor.
	2	0	3		Heat recovery unit subcooling pipe outlet sensor error. (C = Heat recovery unit + Heat recovery unit number).	Disconnection or short circuit of heat recovery unit subcooling pipe outlet sensor.
	2	0	4		Communication error between outdoor unit and heat recovery unit. (C = Heat recovery unit + Heat recovery unit number)	Outdoor unit does not receive signal from heat recovery unit.
	2	0	5		Communication error between heat recovery unit and the 485 modem. (2A Series Heat Recovery Units)	Communication error occurred between the heat recovery unit and the heat recovery unit 485 modem. (2A Series Heat Recovery Units)
	2	0	6		Duplicate address error of the heat recovery unit.	The heat recovery unit address is duplicated for 485 communication. (2A Series Heat Recovery Units)

Note

To use open line 485 communication (9,600 bps communication), you need to use a product that is compatible with all of the "Generation 4" versions of the indoor units, heat recovery units, outdoor units, and accessories.

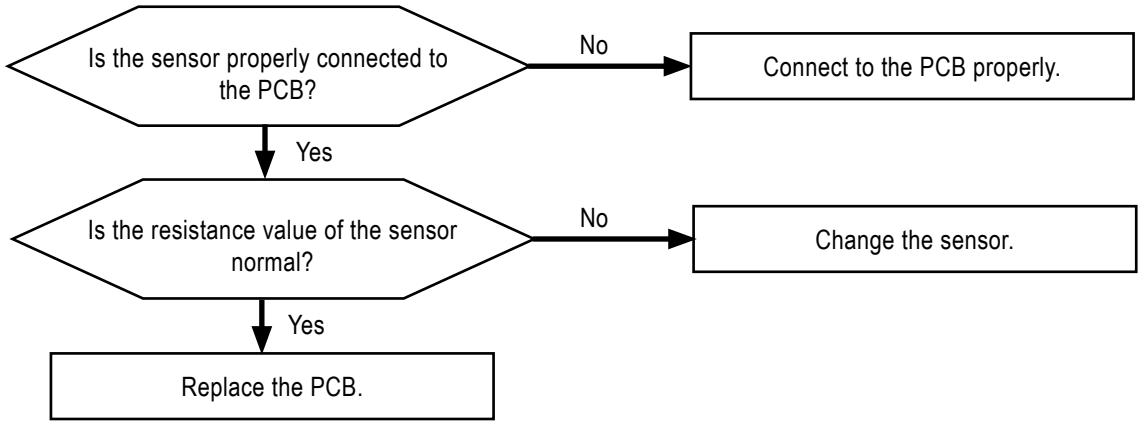
For detailed information on how to troubleshoot each error, see the pages 84 to 149.

SERVICE TROUBLESHOOTING

Error Nos. 01, 02, and 06

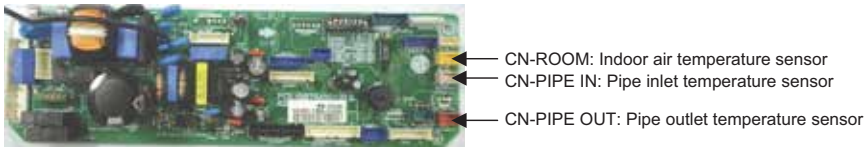
⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Error No.	Description	Details	Causes
01	Indoor unit return air or optional remote wall temperature sensor communications error.	Sensor has disconnected or short circuited. Use the OHM and voltage check charts in the product service manual.	1. Problem with the sensor. 2. Connections on indoor unit PCB are wrong. 3. Indoor unit PCB has failed.
02	Indoor unit inlet pipe temperature sensor communication error.		
06	Indoor unit outlet pipe temperature sensor error.		



Note

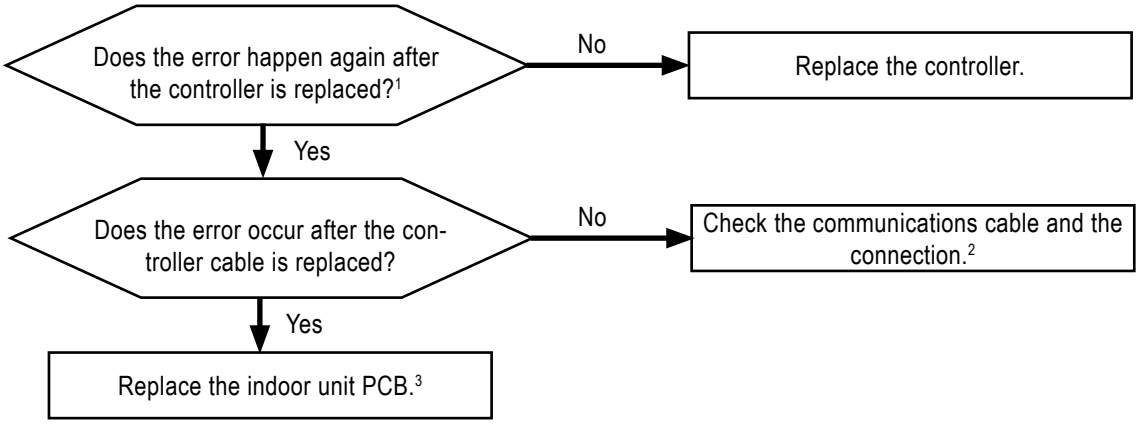
- *If the value is >100kΩ (open) or <100Ω (short), there is an error.*
- *Resistance value may change according to sensor temperature, it displays according to current temperature criteria (±5% margin) → Normal.*
- *Air temperature sensor: 50°F = 20.7kΩ : 77°F = 10kΩ : 122°F = 3.4kΩ.*
- *Pipe temperature sensor: 50°F = 10kΩ : 77°F = 5kΩ : 122°F = 1.8kΩ.*



Error No. 03

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

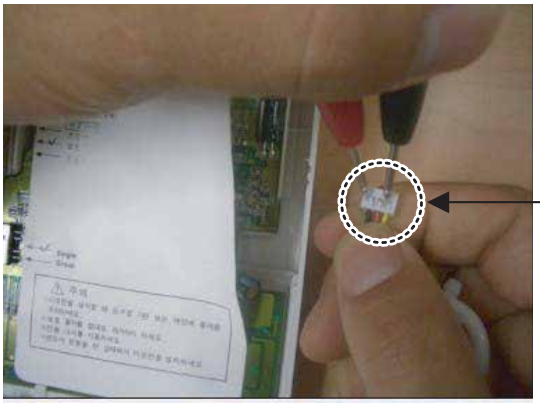
Error No.	Description	Details	Causes
03	Communication error between zone controller and indoor unit	Indoor unit PCB has not received communications signal from zone controller.	1. Zone controller error. 2. Indoor unit PCB error. 3. Connection error or connection wrong. 4. Transmission cable error.



[1]If there isn't a controller to replace, use a controller from another indoor unit.
[2]Check the cable because the connection may be in error or wrong. Also, check distances between the communication and main electrical cables. Ensure that the cables are at safe distances so they are not affected by electromagnetic waves.
[3]After replacing the indoor unit PCB, perform the auto addressing procedure, and input unit addresses if system includes a controller. (All connected indoor units should be turned ON before initiating the auto addressing procedure.)

CN-REMO: Remote controller connection

※ The PCB can differ from model to model.



Checking communication cable connection

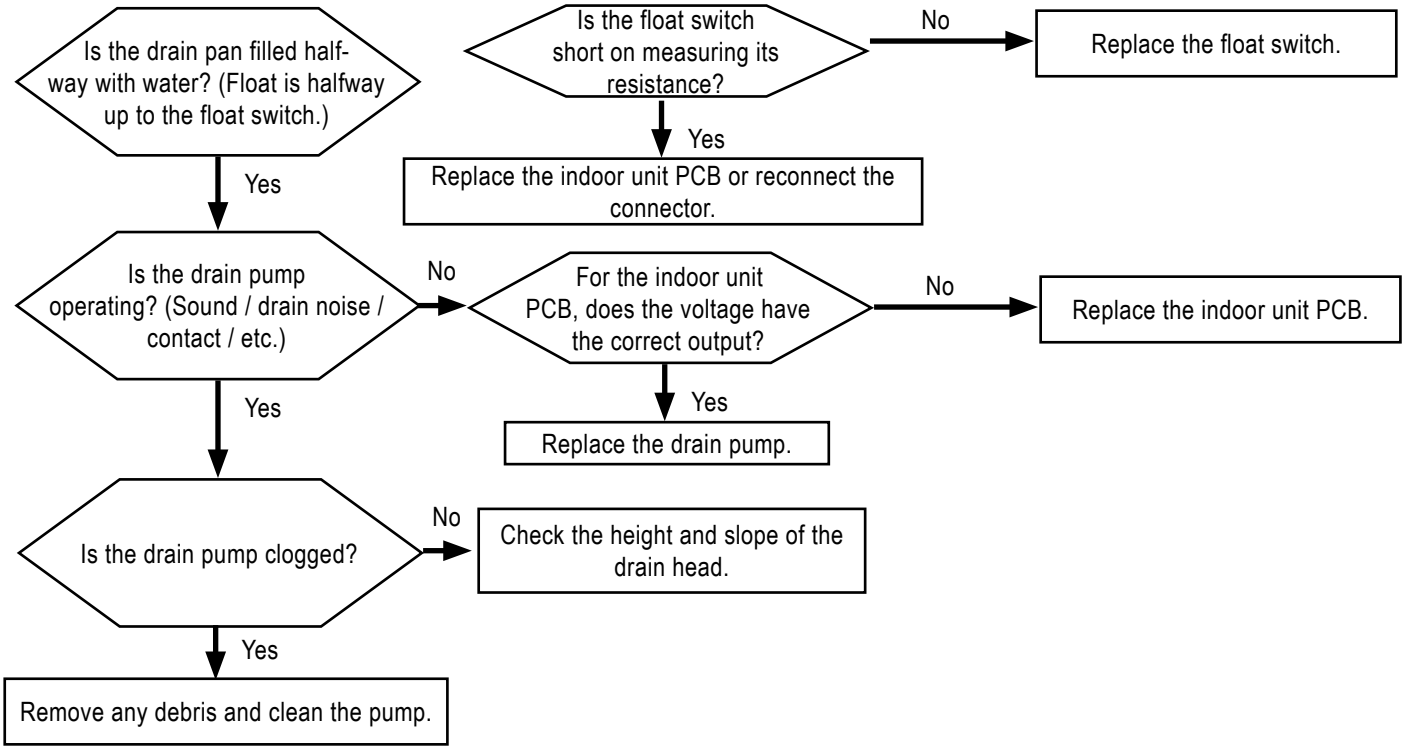
SERVICE TROUBLESHOOTING

MULTI V IV

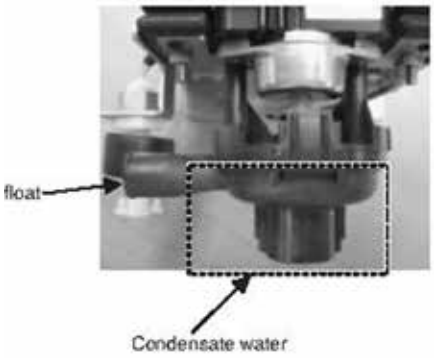
Error No. 04

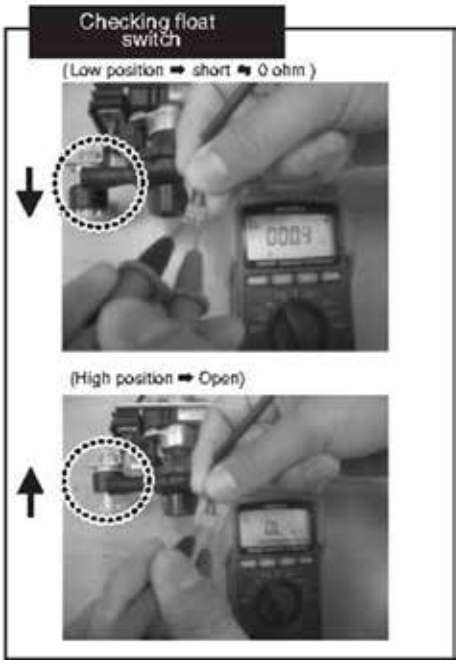
⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Error No.	Description	Details	Causes
04	Indoor unit drain pump error.	Drain pump and / or flow switch is / are malfunctioning. Also check drain line might be obstructed.	1. Drain pump / float switch error. 2. Improper drain pipe location, clogged drain pipe. 3. Indoor unit PCB error.



* If the float rises higher than half its height, then the circuit opens and the unit automatically stops.

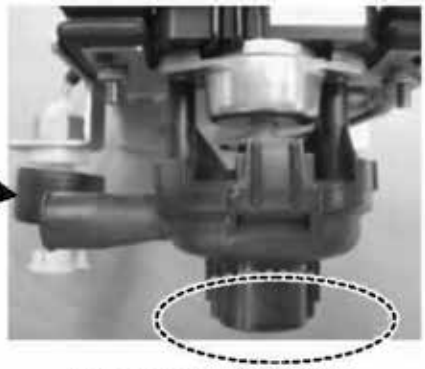




LG

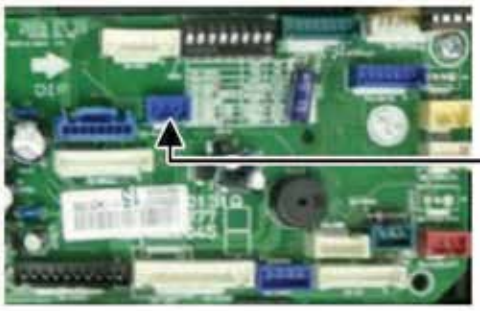
Error No. 04, continued.

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

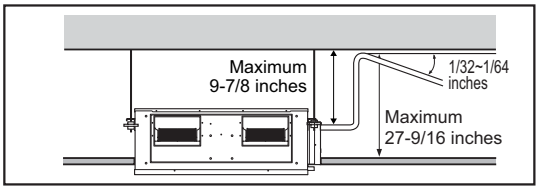


A:Point to check rotating

*** Indoor PCB drain pump connector
(Check input of 220V)
(Marked as **CN-DPUMP**)



Standard Drain Pipe Height / Slope.

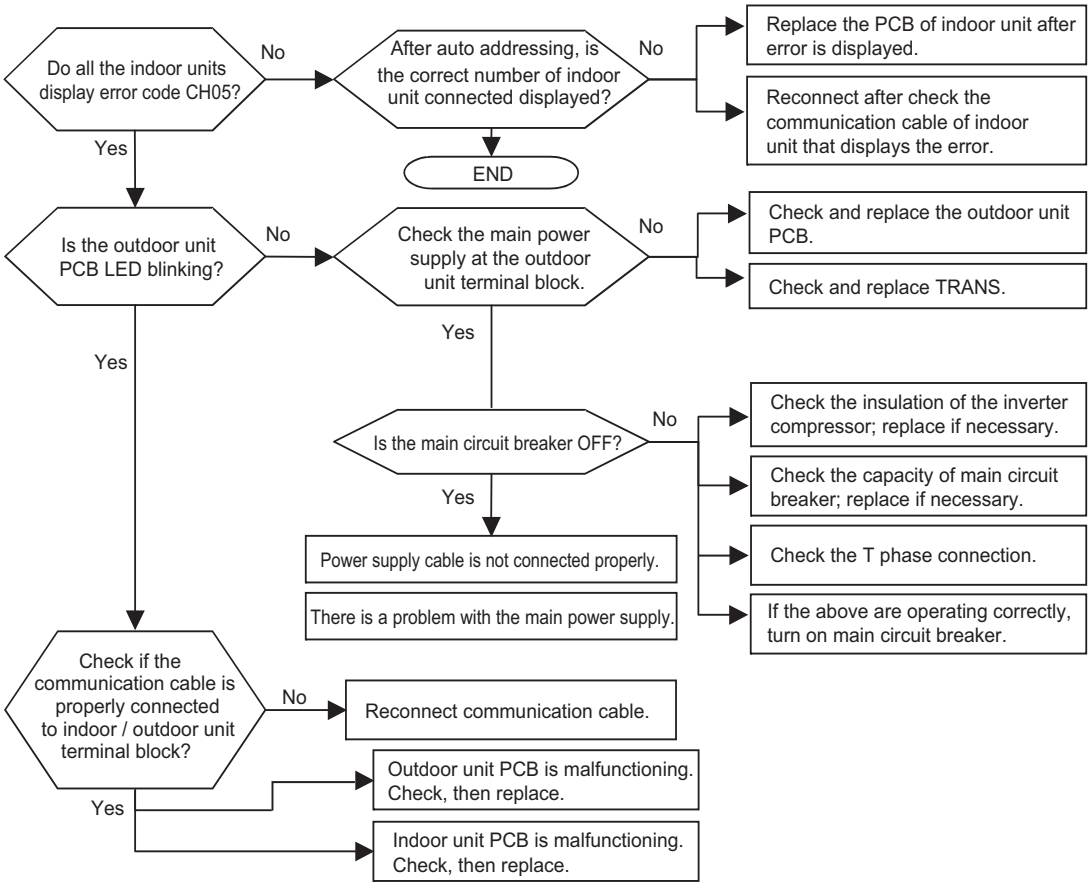


SERVICE TROUBLESHOOTING

Error No. 05

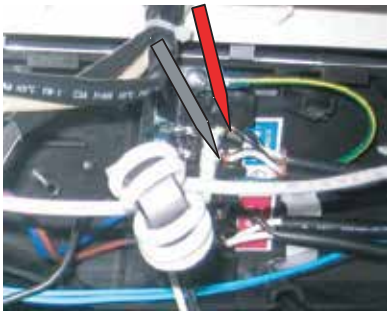
⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Error No.	Description	Details	Causes
05	Communication error between outdoor unit and indoor unit.	Indoor unit PCB has not received signal from outdoor unit for at least five (5) minutes.	1. Auto addressing has not been performed properly. 2. Communication cable is not connected. 3. Communication cable is short circuiting. 4. Indoor unit communication circuit error. 5. Outdoor unit communication circuit error. 6. Not enough physical distance between power and communication cables.



Communication from the indoor unit is normal if voltage fluctuation (-9V ~ +9V) exists (when checking DC voltage of communication terminal between indoor and outdoor units).

If the DC voltage between communication terminal A, B of indoor unit fluctuates within -9V~+9V, then the communication from the outdoor unit is normal.



SERVICE TROUBLESHOOTING

Error No. 09

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

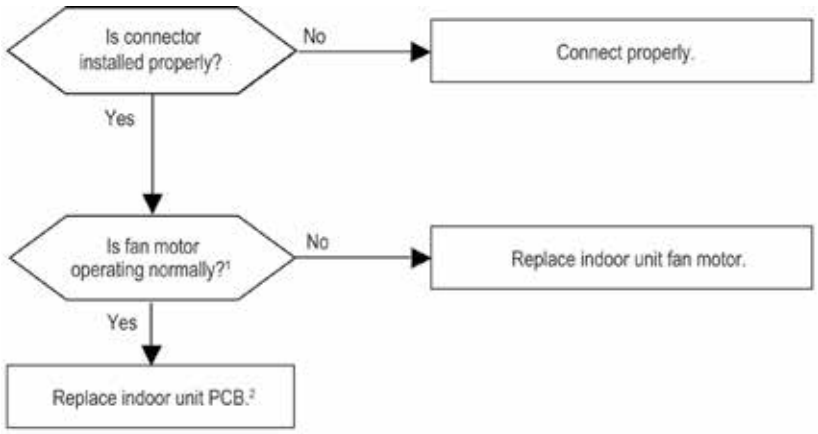
Error No.	Description	Details	Causes
09	Indoor unit EPROM error.	• Serial number on EPROM of indoor unit is 0 or FFFFFF. • Communication error between MICOM and EPROM. • Indoor unit EPROM data is not available.	1. Error developed in transmission between the microprocessor and the EPROM on the indoor unit PCB. 2. EPROM is damaged.

Replace the indoor unit PCB, perform the Auto Addressing procedure, and input the central control addresses.

Error No. 10

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Error No.	Description	Details	Causes
10	Indoor unit BLDC fan motor communications error.	Indoor BLDC fan motor feedback signal has been absent for at least 50 seconds.	1. Fan motor connector has been disconnected or removed. 2. Indoor fan motor lock has failed. 3. Indoor PCB error.

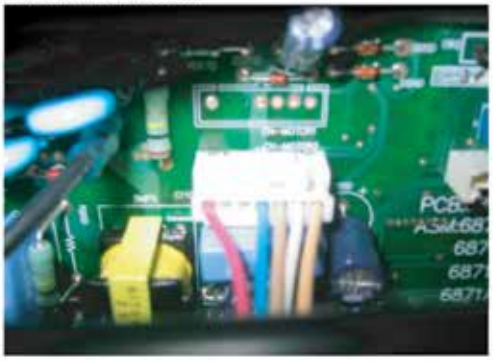


[1]*See below for indoor fan motor sensor connections.*

Tester Terminals

Tester		Normal resistance (10%)	
+	-	TH chassis	TD chassis
①	④	∞	∞
⑤	④	hundreds kΩ	hundreds kΩ
⑥	④	∞	∞
⑦	④	hundreds kΩ	hundreds kΩ

Fan motor connections

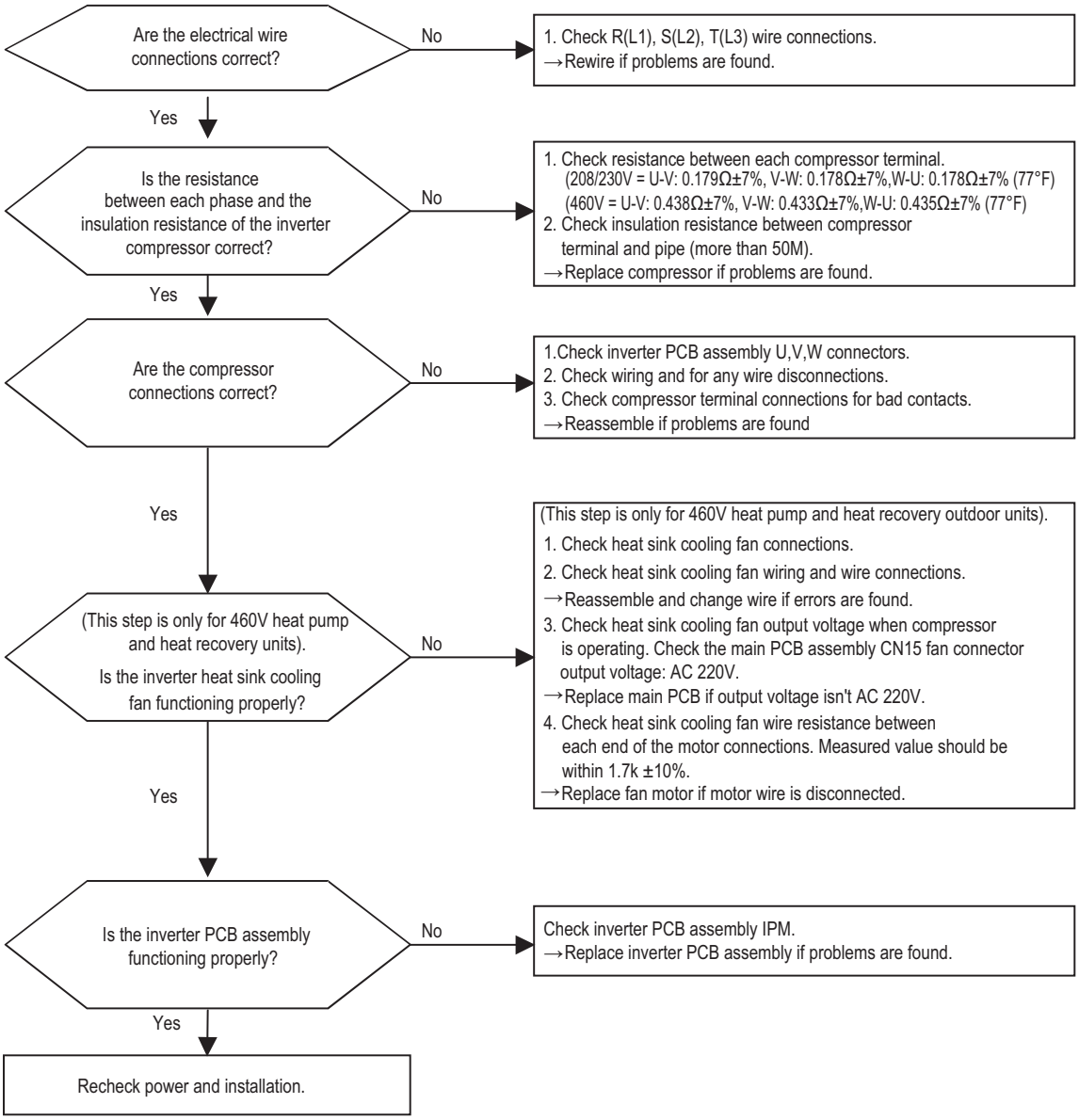


[2]*Replace the indoor unit PCB, and then perfom auto addressing and input the address of the central controller. Power should be OFF to the PCB before connecting the motor terminal.*

Error No. 21

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Error No.	Description	Details	Causes
21 Master: 211 Slave 1: 212 Slave 2: 213	Inverter compressor PCB error.	• IPM has overheated, or has been subjected to overcurrent or undercurrent conditions. • IPM protection circuit has been activated.	1. IPM has overheated due to damage to or disconnection of the heat sink fan, or the heat sink has been disassembled. 2. Overcurrent conditions have been detected at the inverter compressor (U,V,W). 3. Compressor motor or insulation has been damaged. 4. Inverter compressor terminal has been disconnected or loosened. 5. Inverter PCB assembly has been damaged. 6. Low input current to the outdoor unit.



SERVICE TROUBLESHOOTING

Error No. 21, continued.

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

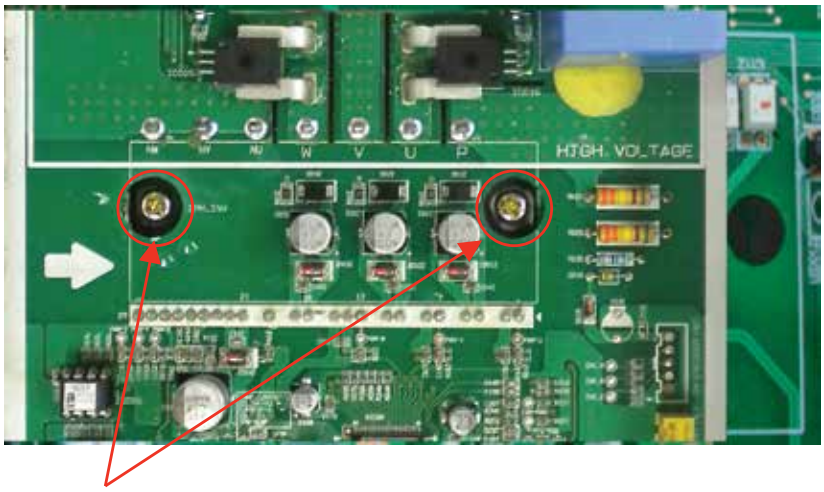
Measure Resistance Between Each Compressor Terminal.

Compressor Wire Connections.

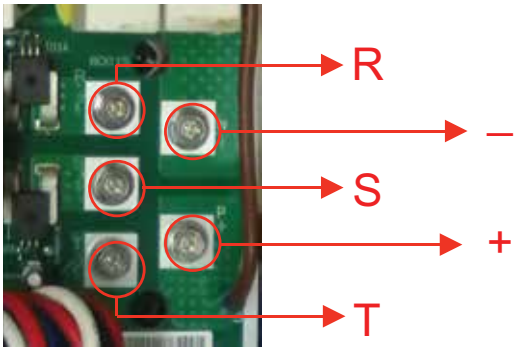
Note

Images here are representative of system components. Actual component appearance depends on system type.

IPM Connections.



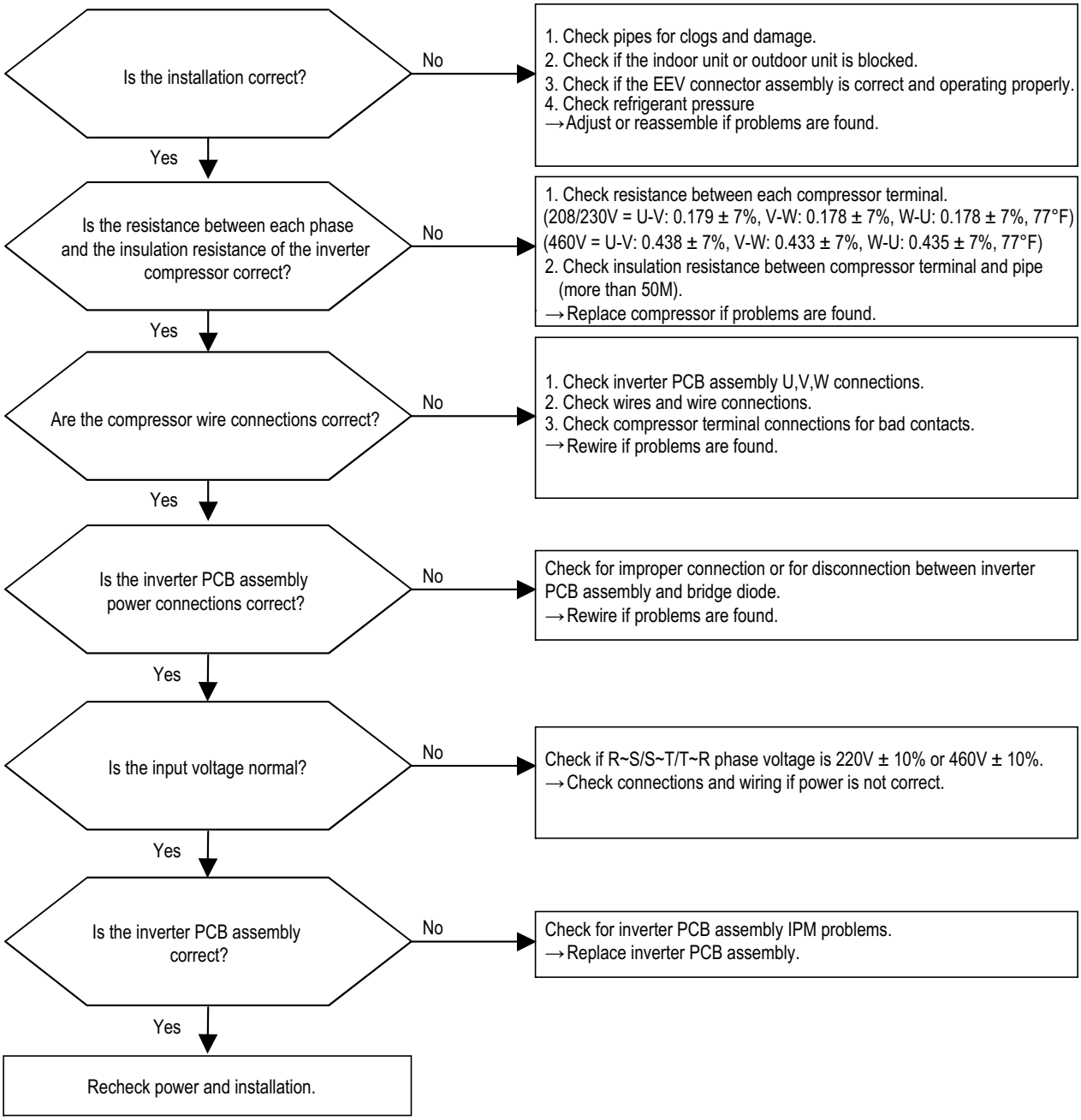
Check Connections.



Error No. 22

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Error No.	Description	Details	Causes
22 Master: 221 Slave 1: 222 Slave 2: 223	Outdoor unit inverter board input overcurrent (RMS) error.	The three-phase input power current for the inverter PCB assembly is >22A.	1. Overload: Pipe has been clogged, EEV is defective, there has been an overcharge in amount of refrigerant. 2. Compressor motor or insulation has been damaged. 3. Input voltage is low. 4. Improper connections in the power wiring. 5. Inverter PCB assembly has been damaged (input current sensor).



Error No. 22, continued.

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Measure Resistance Between Each Compressor Terminal.

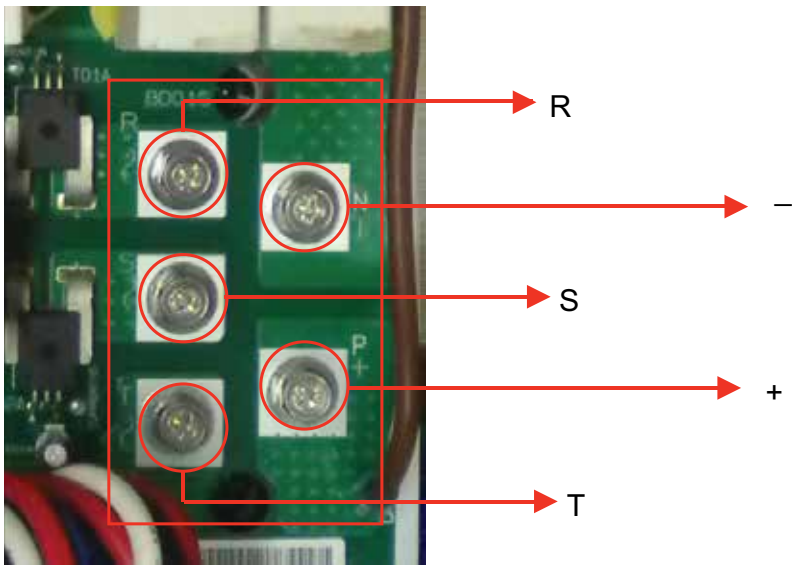
Measure Input Voltage.

Note

Images here are representative of system components. Actual component appearance depends on system type.

Compressor Wire Connections.

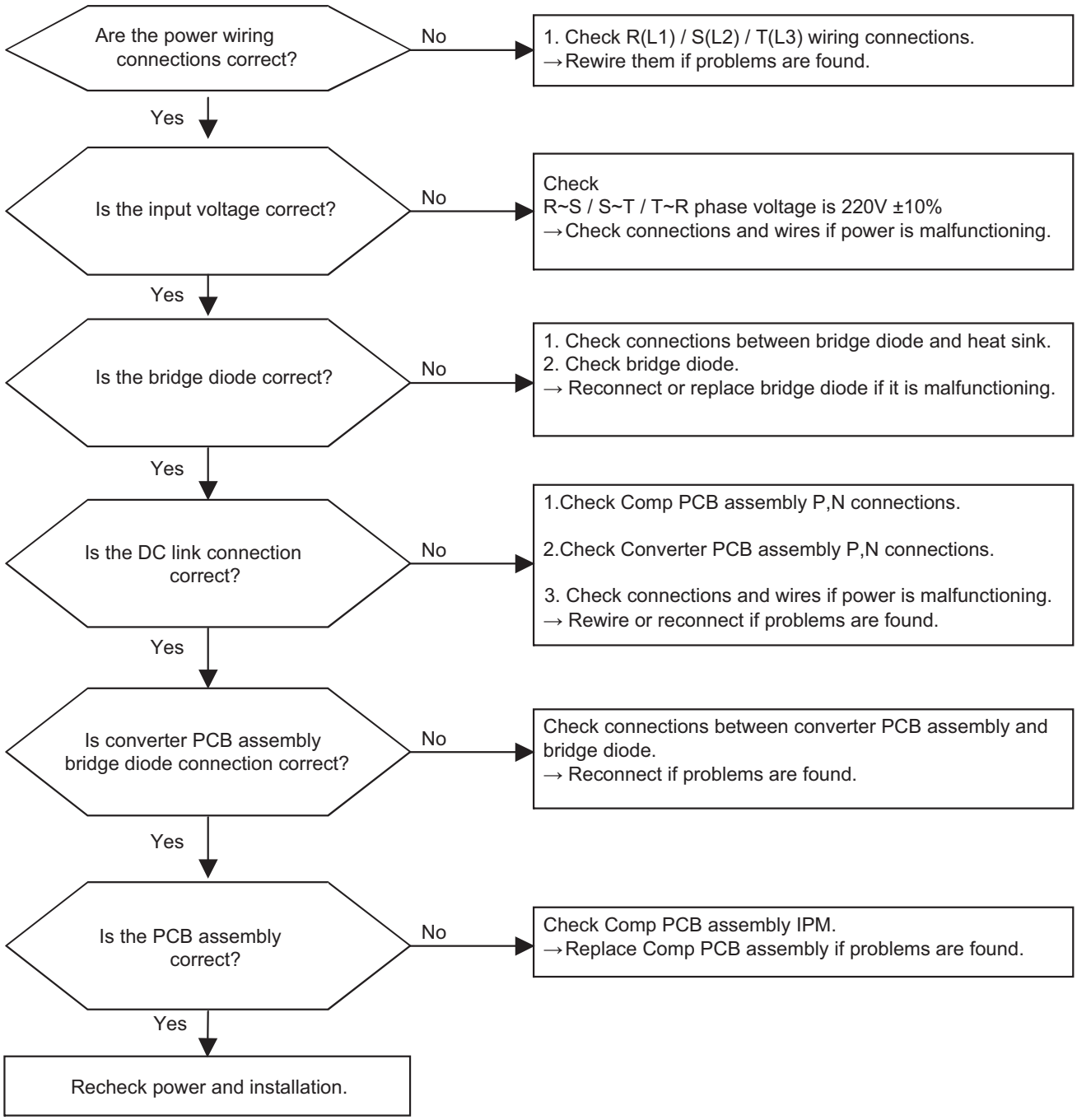
Check DC Link Connections.



Error No. 23

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

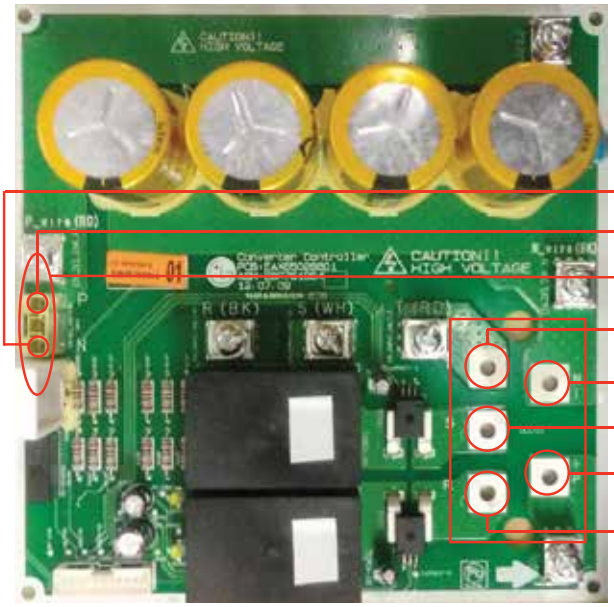
Error No.	Description	Details	Causes
23 Master: 231 Slave 1: 232 Slave 2: 233	Low DC voltage sensed at the outdoor unit inverter compressor DC link.	DC voltage has not charged after operating relay is turned on.	1. DC link terminal is not connected properly; terminal contact error. 2. Starting relay is damaged. 3. Condenser is damaged. 4. Inverter PCB assembly is damaged (DC link voltage sensor component). 5. Input voltage is low.



Error No. 23, continued.

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Check DC Link Connections.



Note

Images here are representative of system components. Actual component appearance depends on system type.

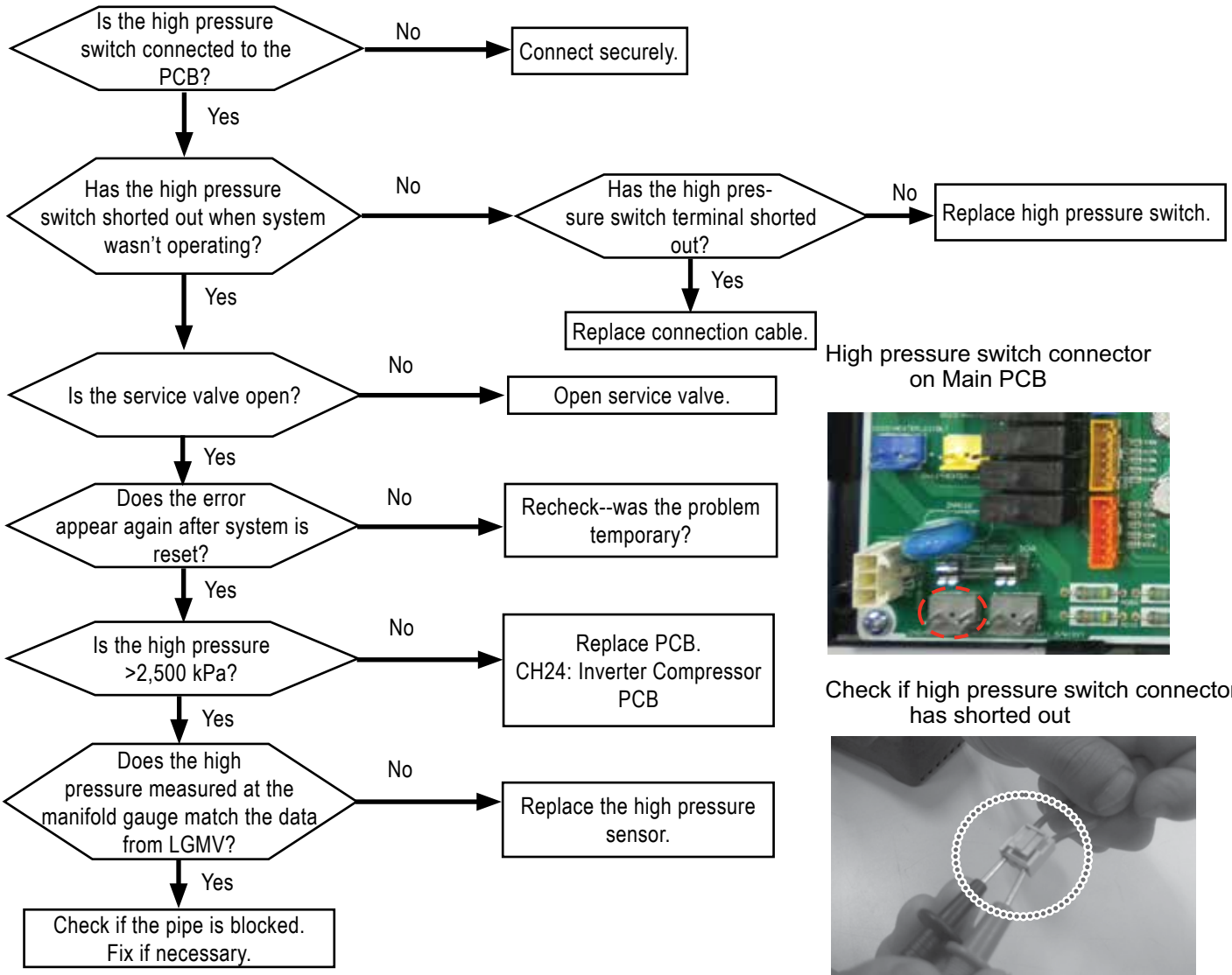
Measure Input Voltage.

SERVICE TROUBLESHOOTING

Error No. 24

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Error No.	Description	Details	Causes
24 Master: 241 Slave 1: 242 Slave 2: 243	Outdoor unit high pressure switch error.	Compressor has been turned off by an outdoor unit high pressure switch. Excessive increase in outdoor unit compressor discharge pressure.	1. High pressure switch is defective. 2. Indoor unit fan or outdoor unit fan is / are defective. 3. Compressor check valve is clogged. 4. Pipe has been damaged. 5. Overcharge of refrigerant. 6. Defective LEV at the indoor or outdoor unit. 7. Outdoor unit is blocked during cooling mode; indoor unit filter is clogged during heating mode. 8. Service valve is clogged. 9. Outdoor unit PCB is defective.



High pressure switch connector on Main PCB

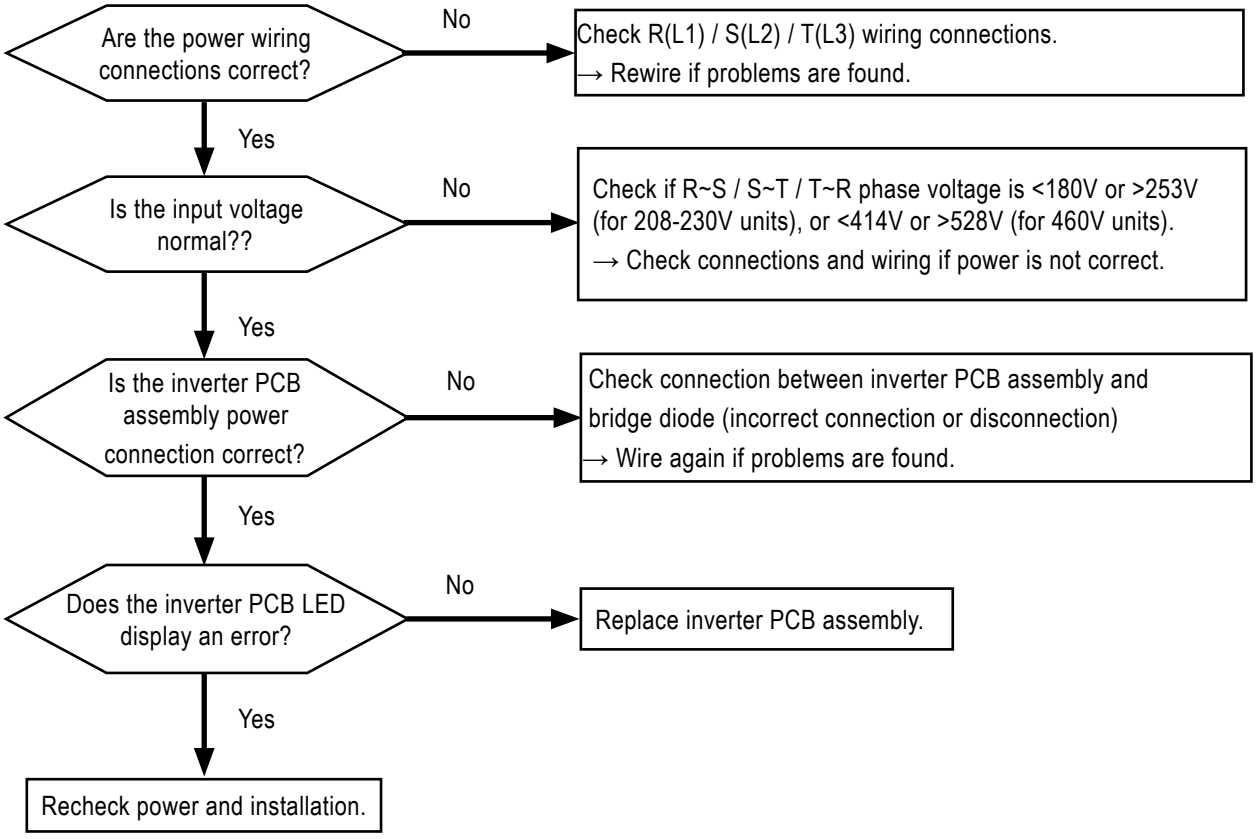
Check if high pressure switch connector has shorted out

SERVICE TROUBLESHOOTING

Error No. 25

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

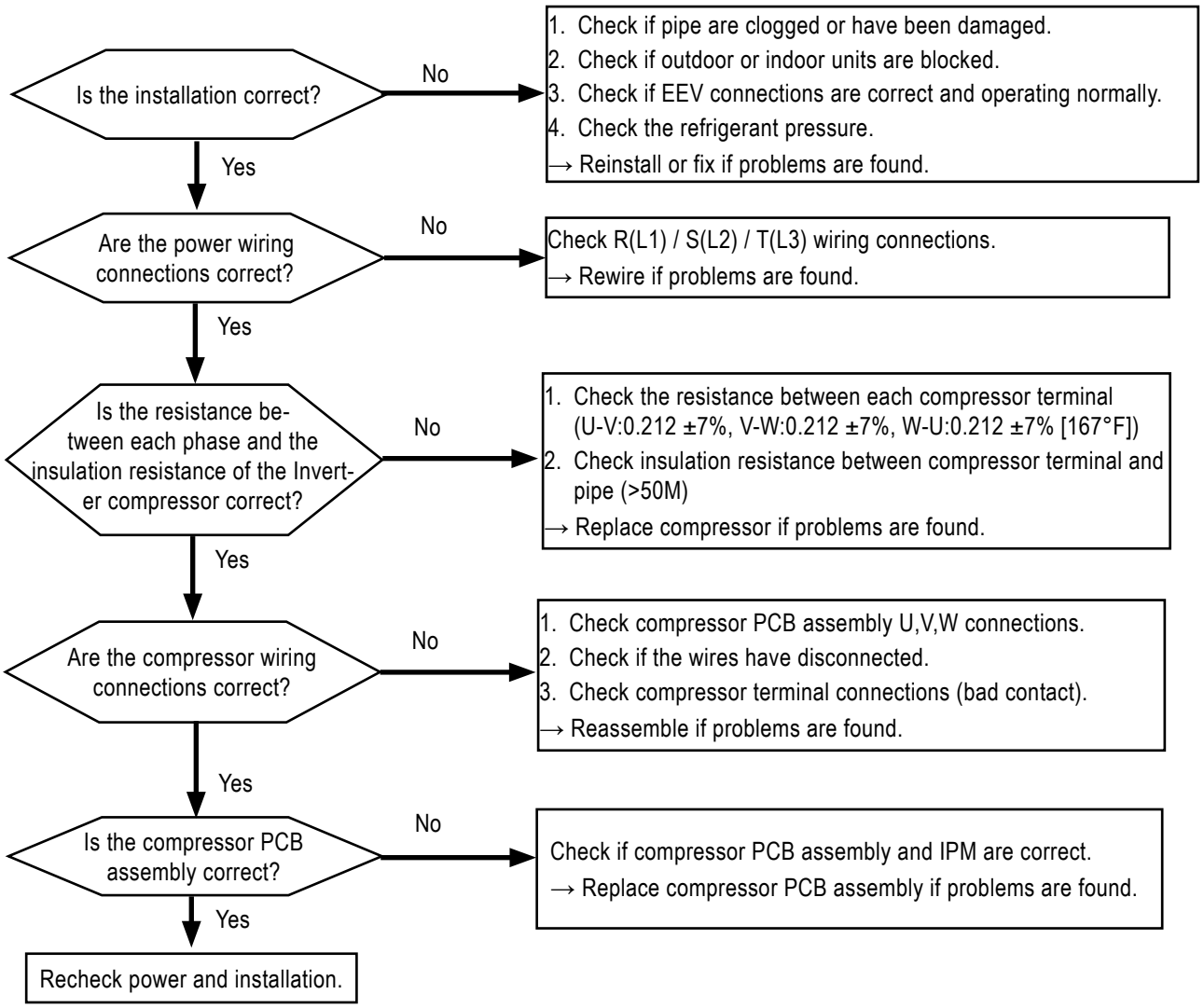
Error No.	Description	Details	Causes
25 Master: 251 Slave 1: 252 Slave 2: 253	Input voltage to the outdoor unit is too high or too low.	Outdoor unit has an input voltage of <180V or >253V (for 208-230V units), or an input voltage of <414V or >528V (for 460V units).	1. Input voltage abnormal. 2. Outdoor unit inverter PCB assembly is damaged (input voltage sensor component).



Error No. 26

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Error No.	Description	Details	Causes
26 Master: 261 Slave 1: 262 Slave 2: 263	Outdoor unit inverter compressor operation error.	Inverter compressor start failure.	1. Overload error: Pipe is clogged, outdoor unit is blocked, EEV is blocked, or there is an overcharge in refrigerant. 2. Compressor insulation and / or motor has been damaged. 3. Compressor wiring error. 4. Outdoor unit inverter PCB has been damaged (CT).



Error No. 26, continued.

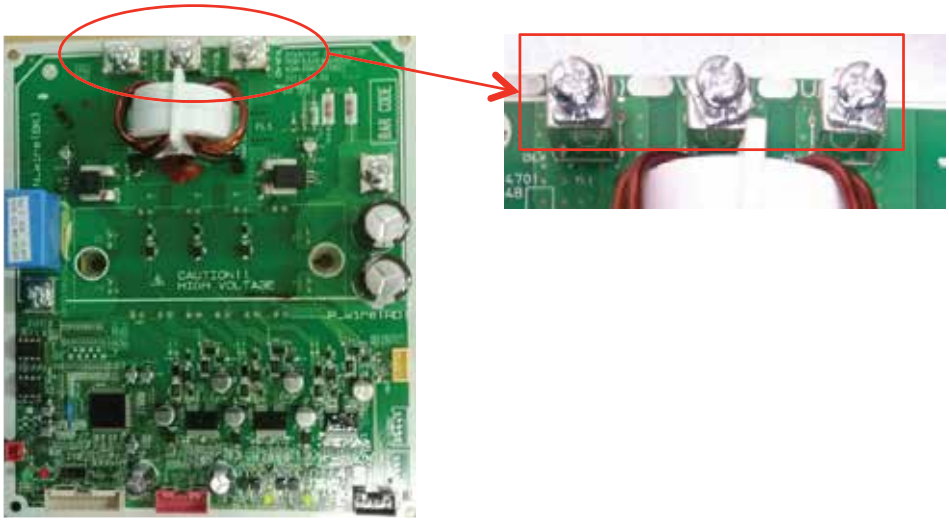
⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Measure Resistance Between the Compressor Terminals.

Note

Images here are representative of system components. Actual component appearance depends on system type.

Compressor Wire Connections.

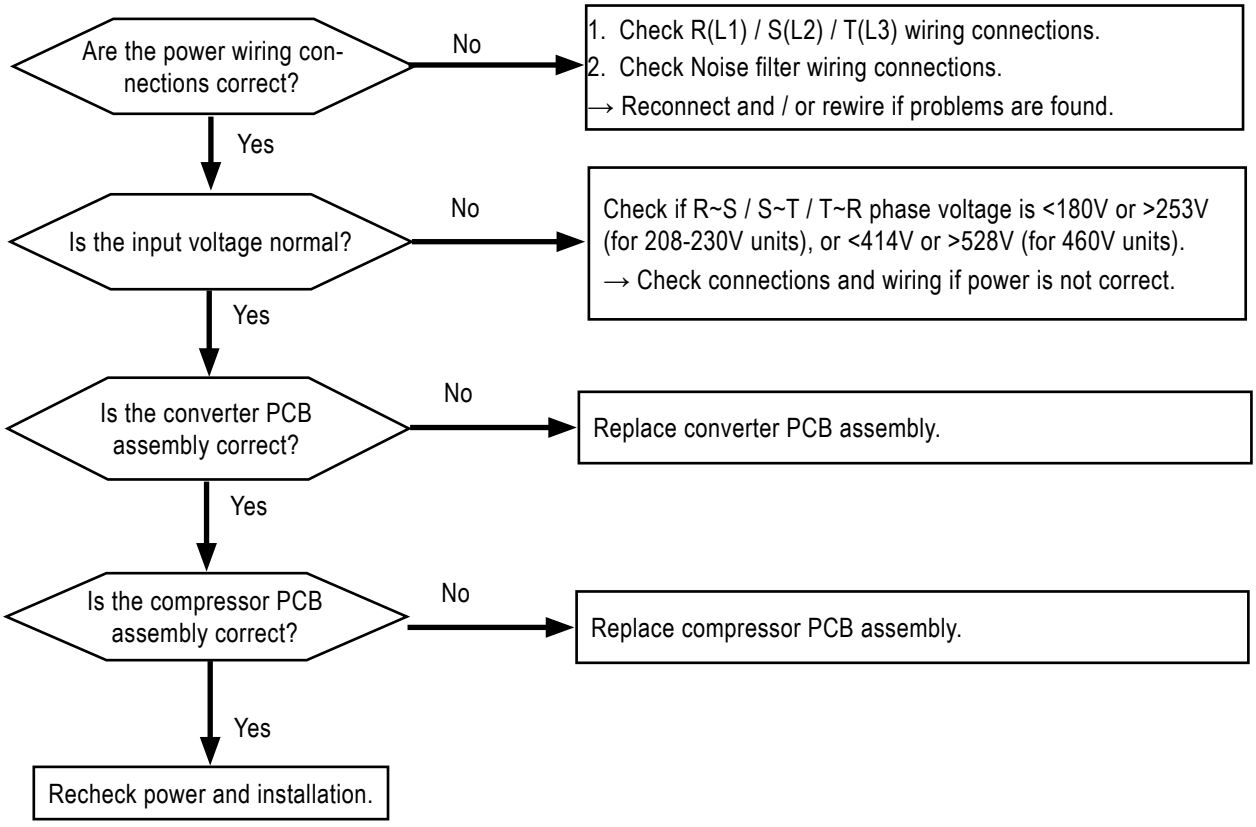


SERVICE TROUBLESHOOTING

Error No. 28

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Error No.	Description	Details	Causes
28 Master: 281 Slave 1: 282 Slave 2: 283	Outdoor unit inverter DC link high voltage error.	System shut off because of an overcurrent in the outdoor unit inverter PCB DC link voltage >780V.	1. Input voltage is not correct R(L1), S(L2), T(L3). 2. Outdoor unit inverter PCB has been damaged (DC link voltage sensor component).



Measure Input Voltage.

Noise Filter Wiring.

Note

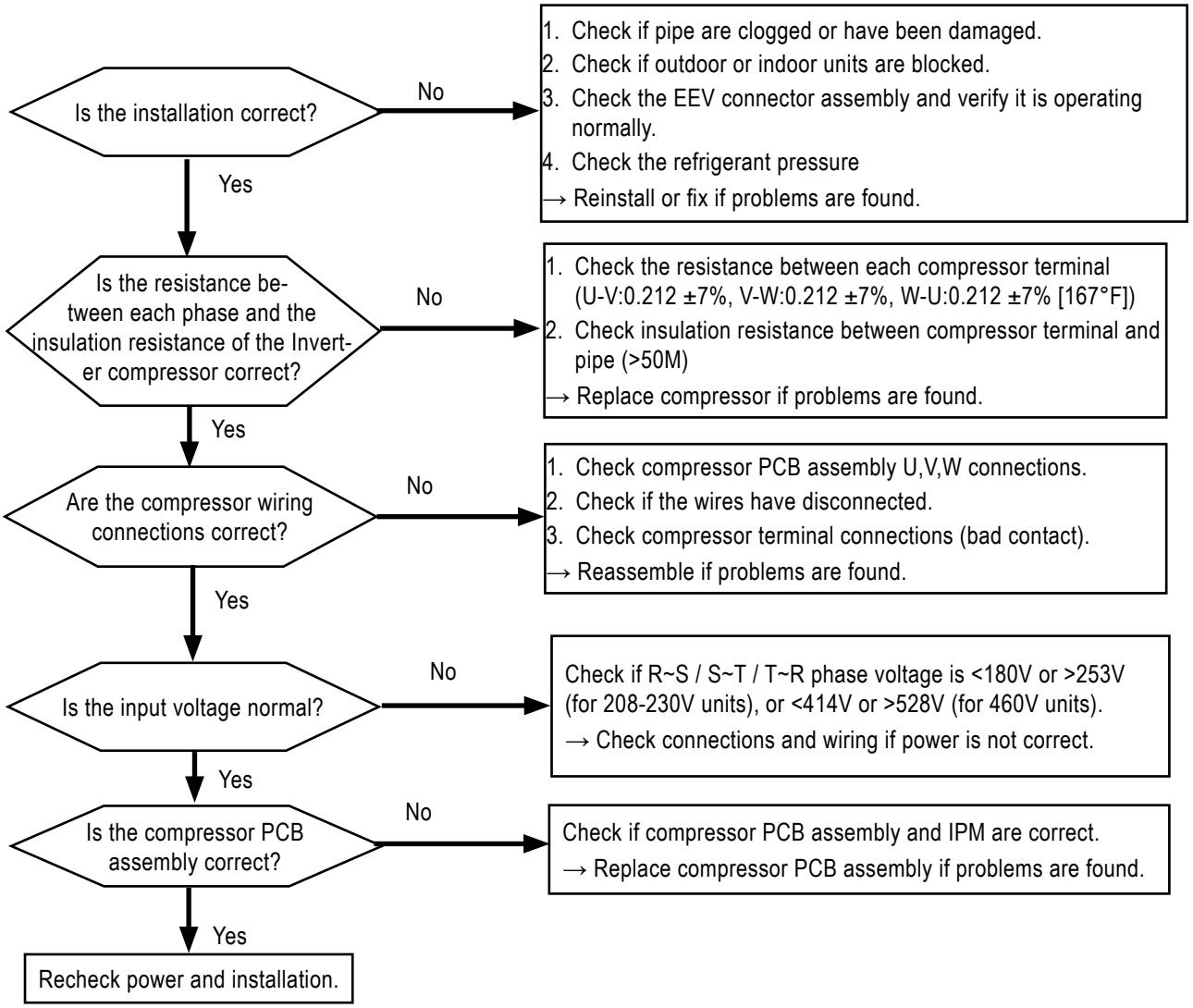
Images here are representative of system components. Actual component appearance depends on system type.

SERVICE TROUBLESHOOTING

Error No. 29

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Error No.	Description	Details	Causes
29 Master: 291 Slave 1: 292 Slave 2: 293	Outdoor unit inverter compressor overcurrent error.	Inverter compressor input current is >30A.	1. Overload operation (pipe is clogged or blocked, EEV is defective, refrigerant is overcharged). 2. Compressor insulation and / or motor is / are damaged. 3. Input voltage is low. 4. Outdoor unit inverter PCB assembly is damaged.



⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

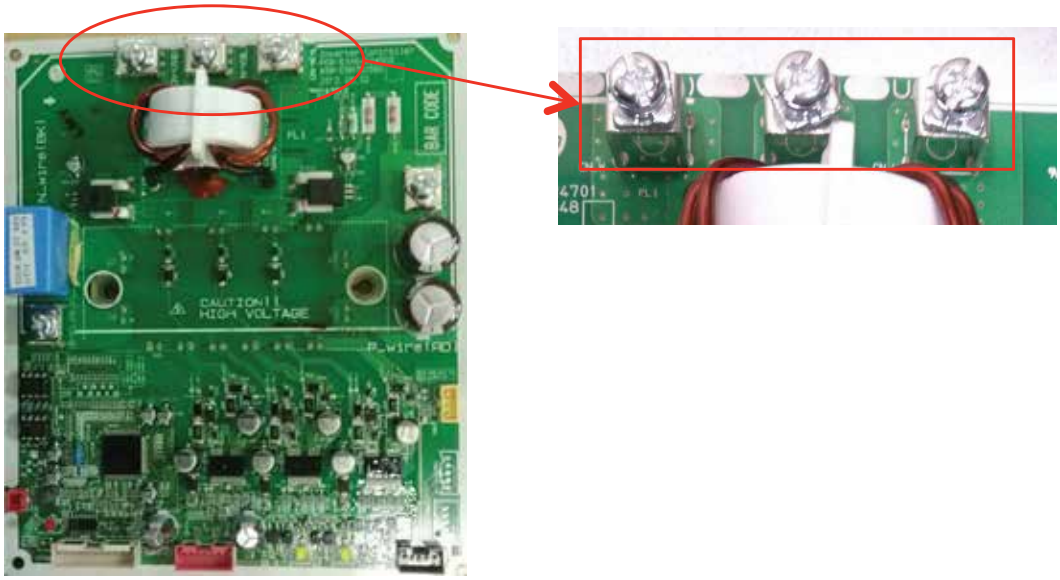
Measure Resistance Between the Compressor Terminals.

Note

Images here are representative of system components. Actual component appearance depends on system type.

Measure Input Voltage.

Compressor Wire Connections.

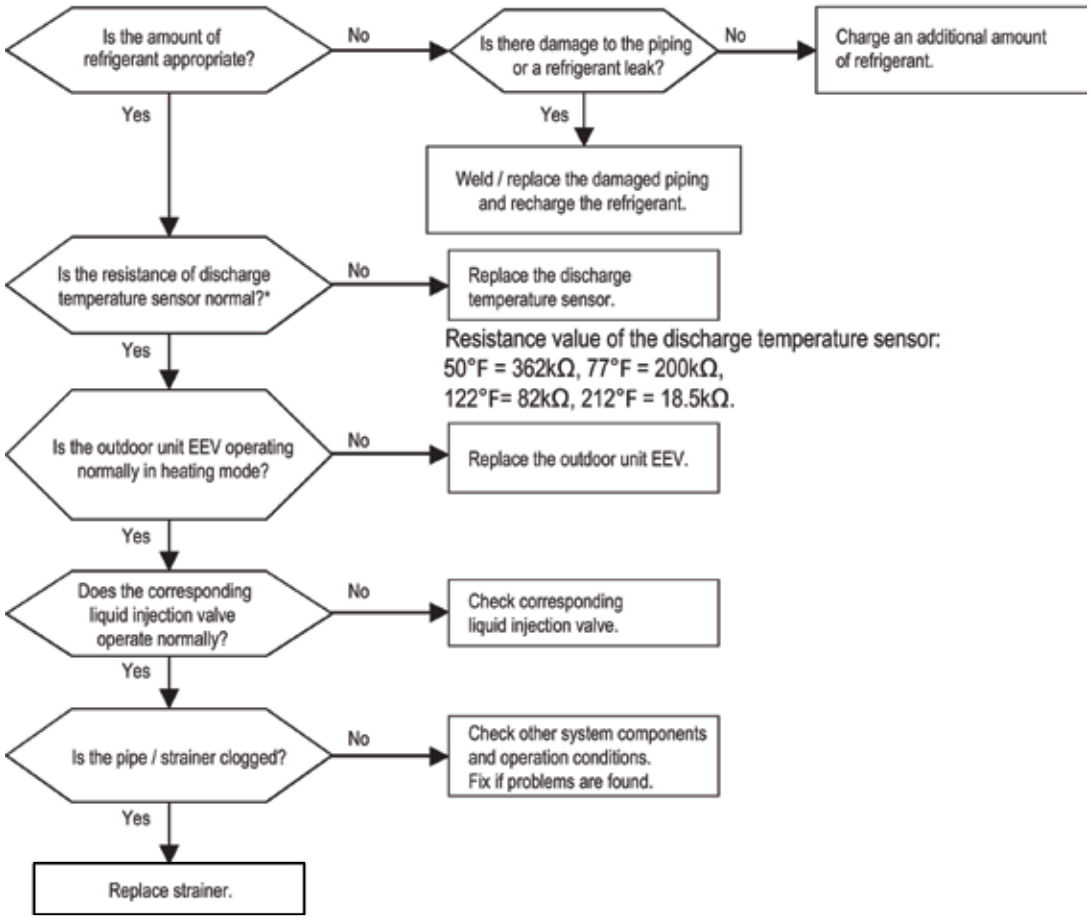


SERVICE TROUBLESHOOTING

Error Nos. 32 and 33

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Error No.	Description	Details	Causes
32 Master: 321 Slave 1: 322 Slave 2: 323	Excessive increase in the discharge temperature at the outdoor unit inverter compressor1.	System / compressor shut off because of a high discharge temperature at the outdoor unit inverter compressor1.	1. Defective compressor1 discharge temperature sensor. 2. Refrigerant is leaking or there is undercharge in refrigerant. 3. EEV has an error. 4. Defective liquid injection valve.
33 Master: 331 Slave 1: 332 Slave 2: 333	Excessive increase in the discharge temperature at the outdoor unit inverter compressor2.	System / compressor shut off because of a high discharge temperature at the outdoor unit inverter compressor2.	1. Defective compressor2 discharge temperature sensor. 2. Refrigerant is leaking or there is undercharge in refrigerant. 3. EEV has an error. 4. Defective liquid injection valve.

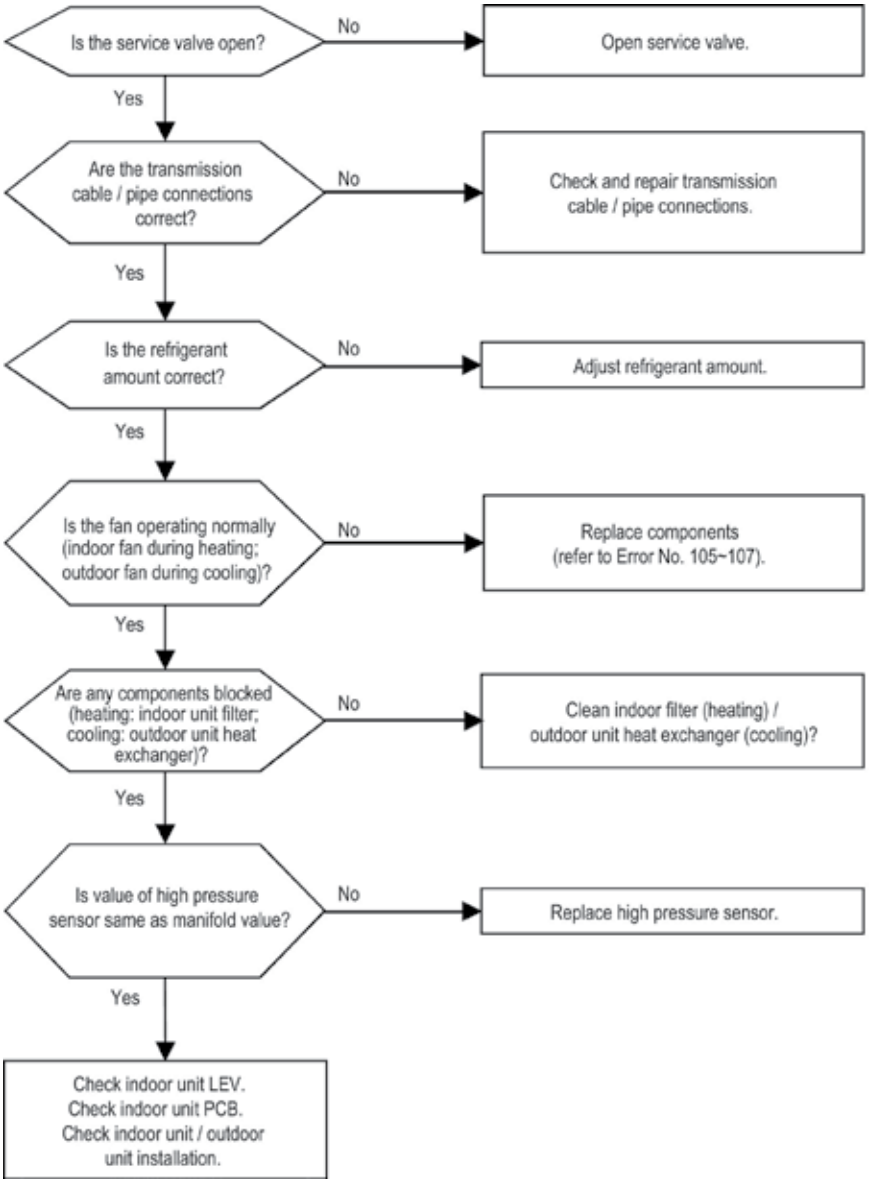


SERVICE TROUBLESHOOTING

Error No. 34

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Error No.	Description	Details	Causes
34 Master: 341 Slave 1: 342 Slave 2: 343	Outdoor unit compressor high pressure safety tripped.	System shut off because of an excessive increase in pressure at the outdoor unit that occurred three consecutive times.	1. High pressure sensor is defective. 2. Indoor unit or outdoor unit fan is defective. 3. Refrigerant is overcharged. 4. Refrigerant pipe is damaged. 5. Defective indoor and / or outdoor unit EEV. 6. Outdoor unit is blocked during cooling, or indoor unit filter is blocked during heating. 7. Service valve is clogged. 8. Outdoor unit PCB is defective. 9. Indoor unit pipe temperature sensor is defective.

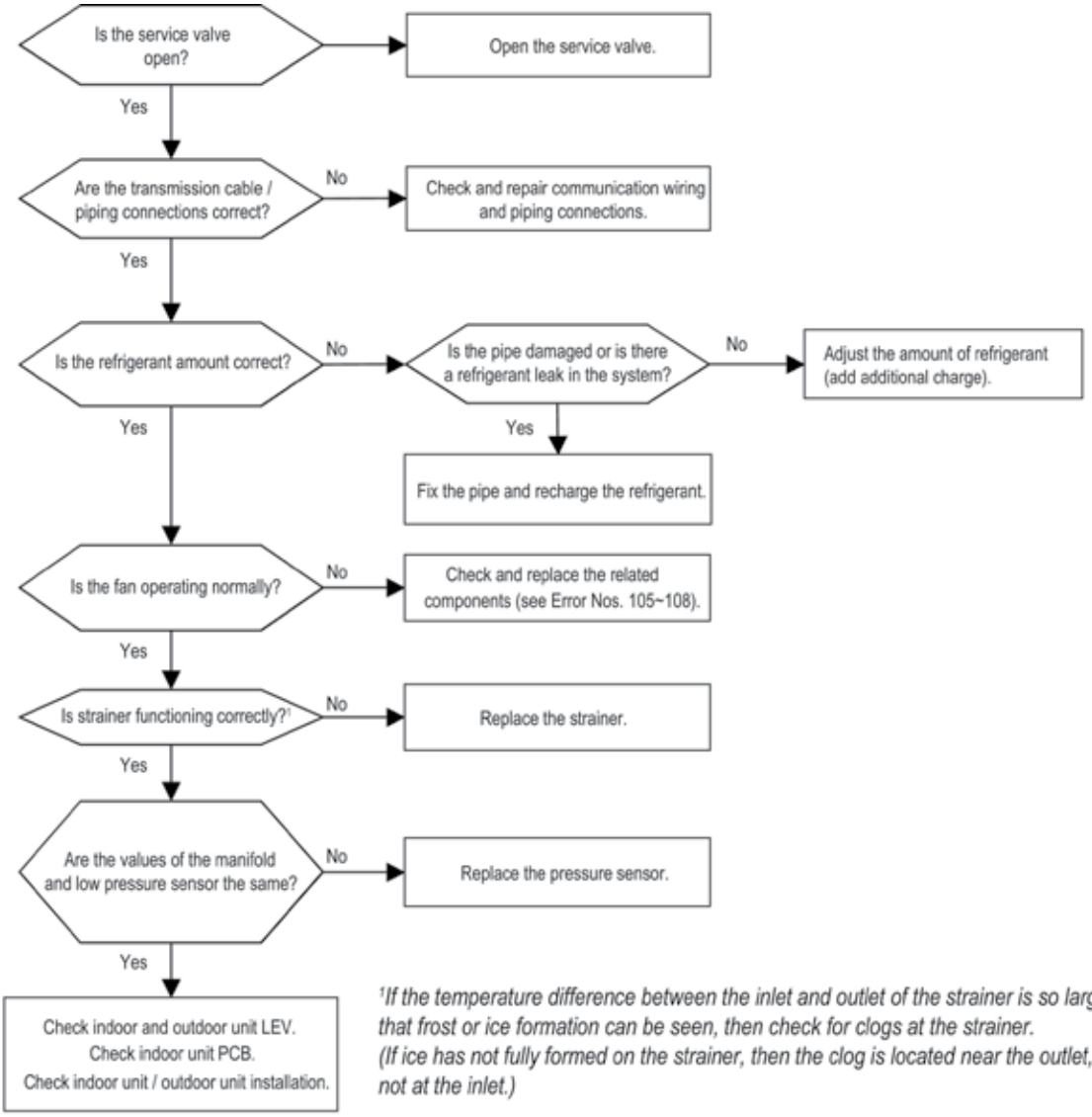


SERVICE TROUBLESHOOTING

Error No. 35

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Error No.	Description	Details	Causes
35 Master: 351 Slave 1: 352 Slave 2: 353	Outdoor unit low side pressure transducer senses pressure below allowable limits.	System shut off because of an excessive decrease in pressure at the outdoor unit that occurred three consecutive times.	1. Low pressure sensor is defective. 2. Indoor unit or outdoor unit fan is defective. 3. Too little refrigerant charge, or there is a refrigerant leak. 4. Refrigerant pipe is damaged. 5. Defective indoor and / or outdoor unit EEV. 6. Outdoor unit is blocked during cooling, or indoor unit filter is blocked during heating. 7. Service valve is clogged. 8. Outdoor unit PCB is defective. 9. Indoor unit pipe temperature sensor is defective.



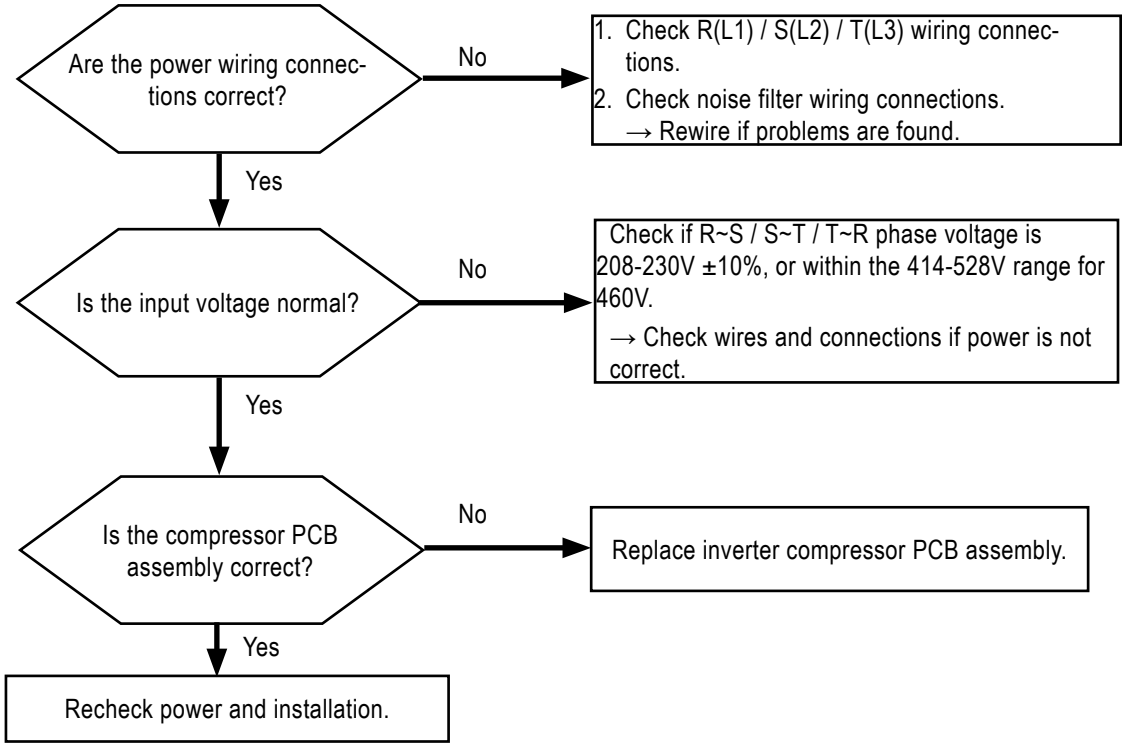
[1]If the temperature difference between the inlet and outlet of the strainer is so large that frost or ice formation can be seen, then check for clogs at the strainer. (If ice has not fully formed on the strainer, then the clog is located near the outlet, not at the inlet.)

SERVICE TROUBLESHOOTING

Error No. 40

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Error No.	Description	Details	Causes
40 Master: 401 Slave 1: 402 Slave 2: 403	Outdoor unit inverter compressor current transducer (CT) sensor error.	Disconnection or short circuit of outdoor unit inverter compressor current detection (CT) sensor. MICOM input voltage is not within 2.5V ±0.3V at initial power up.	1. Input voltage is not correct (T-S). 2. Outdoor unit inverter PCB is damaged (CT sensor component).



Measure Input Voltage.

Compressor PCB Assembly.

Note

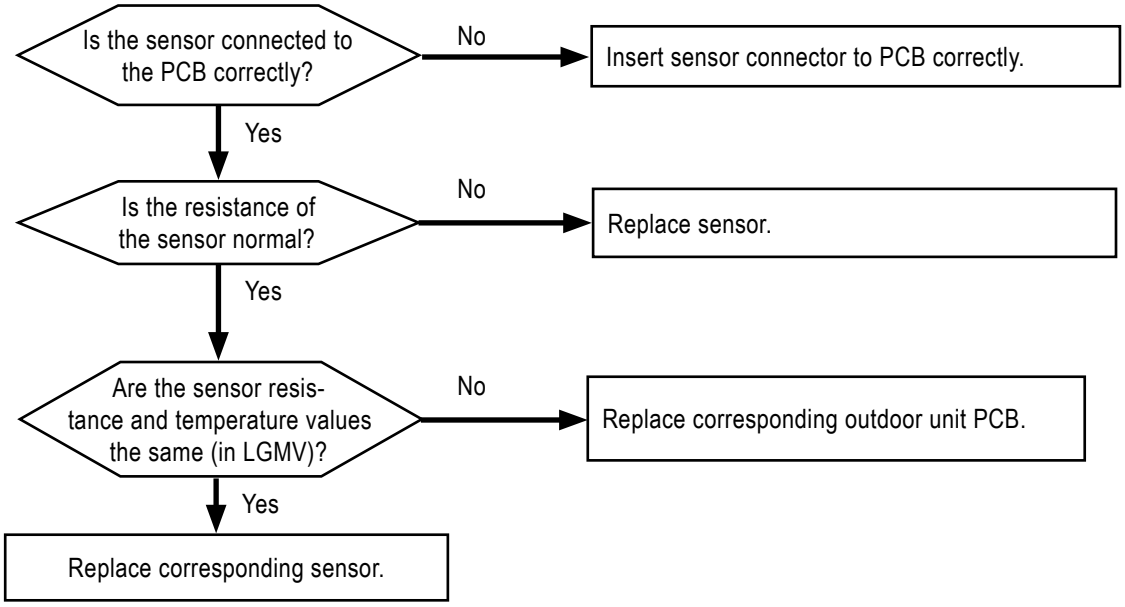
Images here are representative of system components. Actual component appearance depends on system type.

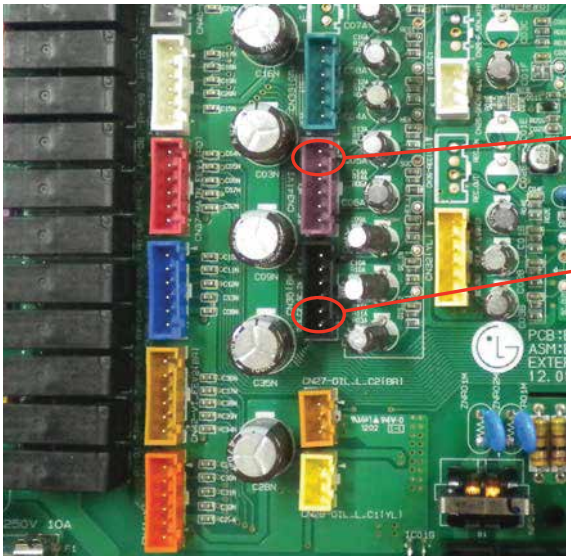
SERVICE TROUBLESHOOTING

Error Nos. 41 and 47

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Error No.	Description	Details	Causes
41 (Inverter Compressor1) Master: 411 Slave 1: 412 Slave 2: 413 47 (Inverter Compressor2) Master: 471 Slave 1: 472 Slave 2: 473	Inverter compressor discharge pipe temperature sensor error.	Disconnection or short circuit of outdoor unit compressor discharge temperature sensor.	1. Compressor discharge pipe temperature sensor is not connected properly. 2. Compressor discharge pipe sensor is defective (disconnected or short circuited). 3. Outdoor unit PCB is defective.





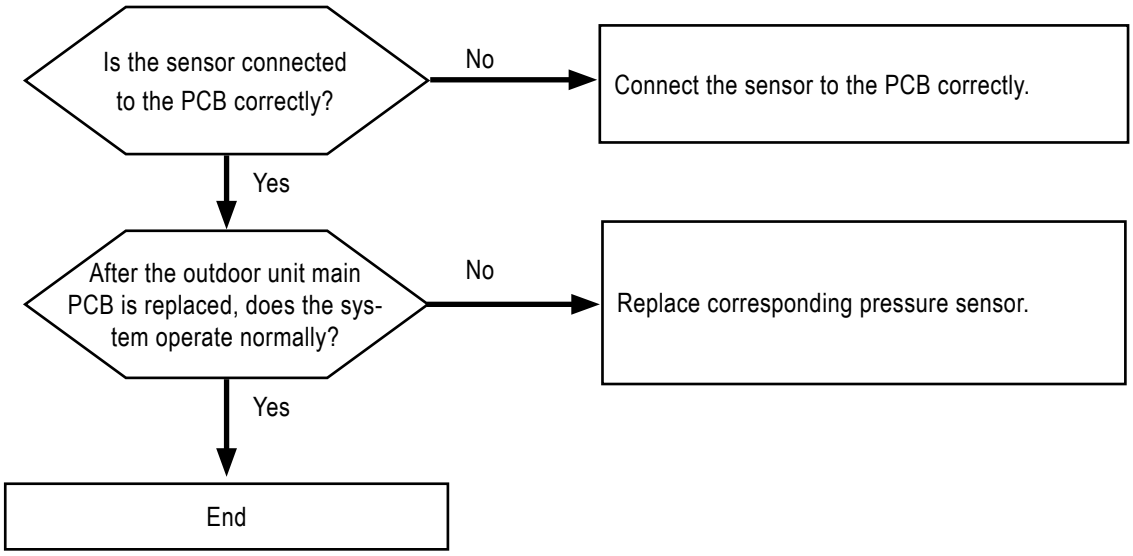
Check the Resistance of the Inverter Compressor Discharge Temperature Sensor.

SERVICE TROUBLESHOOTING

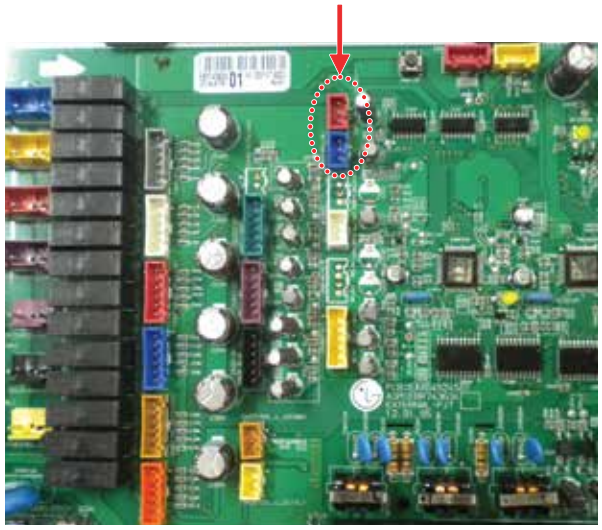
Error Nos. 42 and 43

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Error No.	Description	Details	Causes
42 Master: 421 Slave 1: 422 Slave 2: 423	Low pressure transducer error.	Disconnection or short circuit of outdoor unit low pressure sensor.	1. Bad low pressure sensor connection. 2. Low pressure sensor connector is defective or has malfunctioned (disconnected or short circuited). 3. Outdoor unit PCB is defective.
43 Master: 431 Slave 1: 432 Slave 2: 433	High pressure transducer error.	Disconnection or short circuit of outdoor unit high pressure sensor.	1. Bad high pressure sensor connection. 2. High pressure sensor connector is defective or has malfunctioned (disconnected or short circuited). 3. Outdoor unit PCB is defective.



Pressure sensor connections

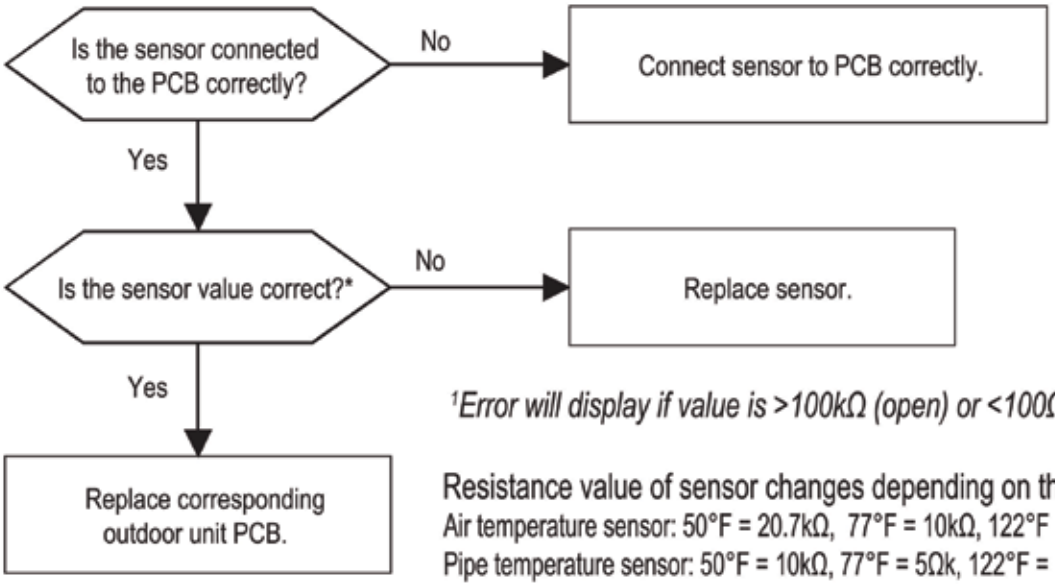


SERVICE TROUBLESHOOTING

Error Nos. 44, 45, 46, 49, 153, and 154

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Error No.	Description	Details	Causes
44 Master: 441 Slave 1: 442 Slave 2: 443	Outdoor unit ambient temperature sensor error.	Disconnection or short circuit of outdoor unit compressor discharge temperature sensor.	1. Outdoor unit air temperature sensor is not connected properly. 2. Outdoor unit air temperature sensor is defective (disconnected or short circuited). 3. Outdoor unit PCB is defective.
45 Master: 451 Slave 1: 452 Slave 2: 453	Outdoor unit front-side heat exchanger temperature sensor error.	Disconnection or short circuit of outdoor unit heat exchanger temperature sensor on the front (A, B).	
46 Master: 471 Slave 1: 472 Slave 2: 473	Outdoor unit compressor suction pipe temperature sensor error.	Disconnection or short circuit of outdoor unit compressor suction temperature sensor.	
49 Master: 491 Slave 1: 492 Slave 2: 493	Outdoor unit IPM temperature sensor error.	Disconnection or short circuit of outdoor unit IPM temperature sensor.	



[1]Error will display if value is >100kΩ (open) or <100Ω (short).

Resistance value of sensor changes depending on the temperature:
Air temperature sensor: 50°F = 20.7kΩ, 77°F = 10kΩ, 122°F = 3.4kΩ.
Pipe temperature sensor: 50°F = 10kΩ, 77°F = 5Ωk, 122°F = 1.8kΩ.

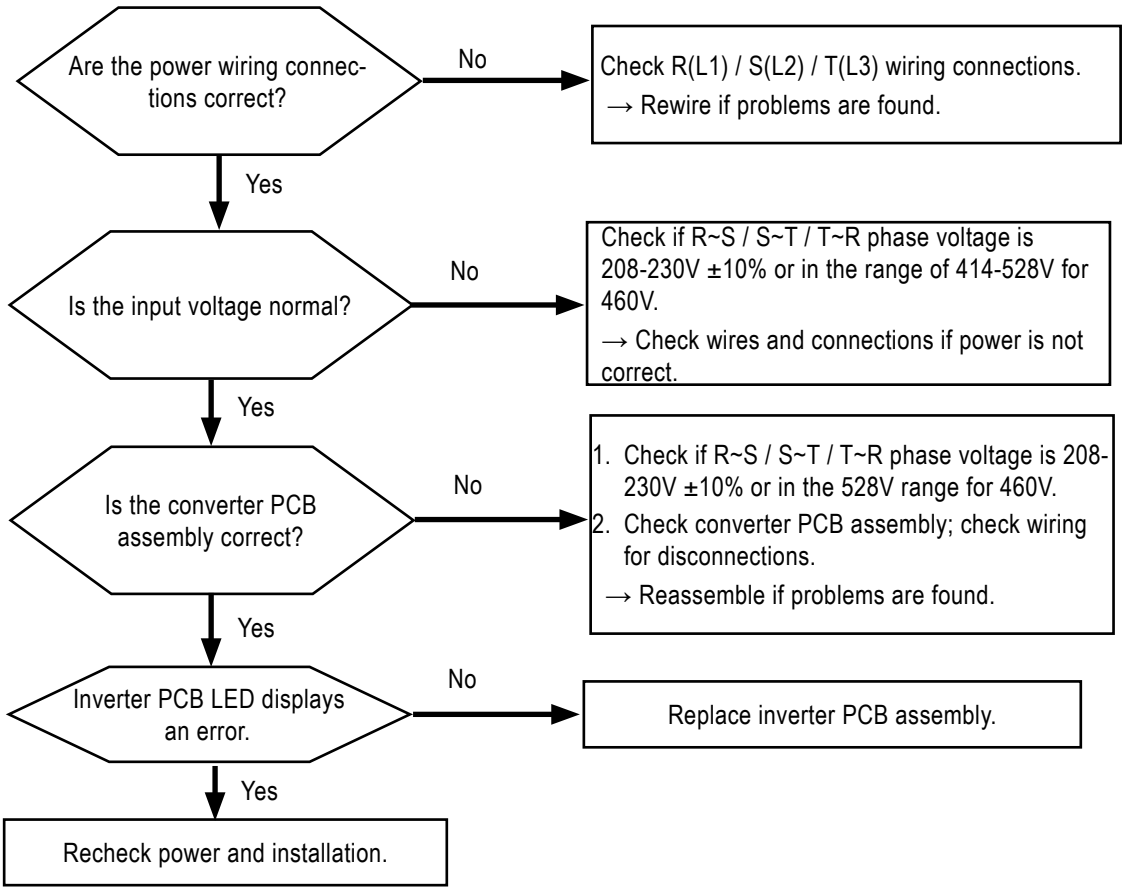
Error No.	Description	Details	Causes
153 Master 11: 531 Slave 1 12: 532 Slave 2 13: 533	Outdoor unit top heat exchanger temperature sensor error.	Disconnection or short circuit of outdoor unit top heat exchanger temperature sensor.	1. Temperature sensor is not connected properly. 2. Temperature sensor is defective (disconnected or short circuited). 3. Outdoor unit main PCB is defective.
154 Master 11: 541 Slave 1 12: 542 Slave 2 13: 543	Outdoor unit bottom heat exchanger temperature sensor error.	Disconnection or short circuit of outdoor unit bottom heat exchanger temperature sensor.	

SERVICE TROUBLESHOOTING

Error No. 50

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

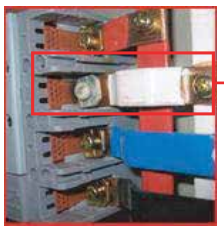
Error No.	Description	Details	Causes
50 Master: 501 Slave 1: 502 Slave 2: 503	Outdoor unit three-phase power is not connected properly.	One or more of R(L1), S(L2), T(L3) input power line connections is / are missing for the outdoor unit.	1. Input voltage is not correct R(L1), S(L2), T(L3). 2. Power line connections may not be correct. 3. Main PCB may be damaged. 4. Inverter PCB input current sensor error.



Measure Input Voltage.

Noise Filter Wiring.

Example of Field Error.



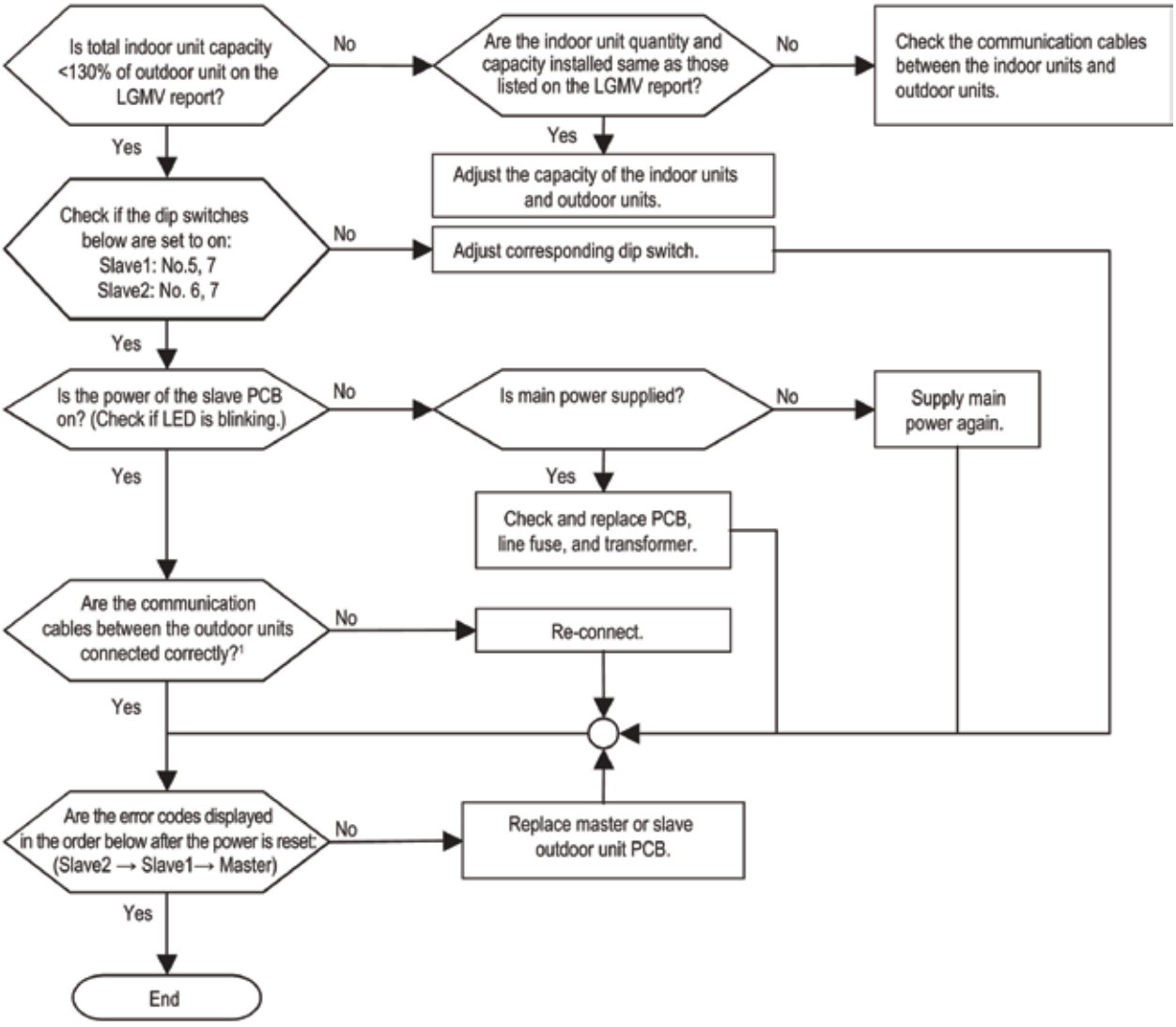
R-Phase Terminal Changed Color.

SERVICE TROUBLESHOOTING

Error No. 51(1)

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Error No.	Description	Details	Causes
51 Master: 511	Combination ratio is out of range.	Value of total indoor unit capacity exceeds allowable outdoor unit capacity specifications.	1. Total indoor unit capacity is more than 130% outdoor unit rated capacity. 2. Wrong transmission cable / piping connections. 3. Control error of slave outdoor unit DIP switches. 4. Defective slave unit PCB power supply. 5. Outdoor unit PCB is defective.



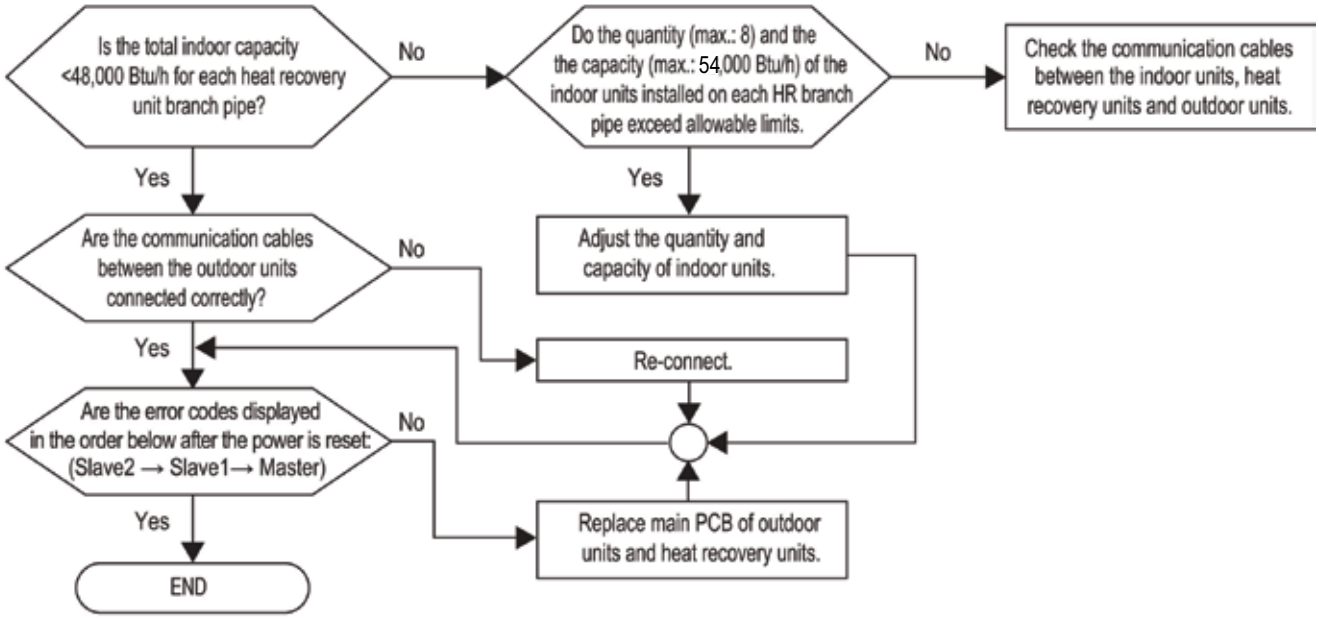
[1]To check the communication cables between the outdoor units, follow the order below: PCB connectors → terminal block → communication cables.

SERVICE TROUBLESHOOTING

Error No. 51(2) (for Heat Recovery Systems only)

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Error No.	Description	Details	Causes
51 Master: 512	Total indoor unit capacity exceeds allowable heat recovery unit branch capacity.	Value of total indoor unit capacity exceeds allowable heat recovery unit branch capacity specifications. Total indoor unit capacity is >54,000 Btu/h for each heat recovery unit branch pipe.	1. Total indoor unit capacity is more than 54,000 Btu/h per each heat recovery unit branch pipe. 2. Total indoor units connected to each heat recovery unit branch pipe is >eight (8). 3. Wrong transmission cable / piping connections. 4. Outdoor unit and heat recovery unit PCB is defective.



[1]To check the communication cables between the outdoor units, follow the order below: PCB connectors → terminal block → communication cables.

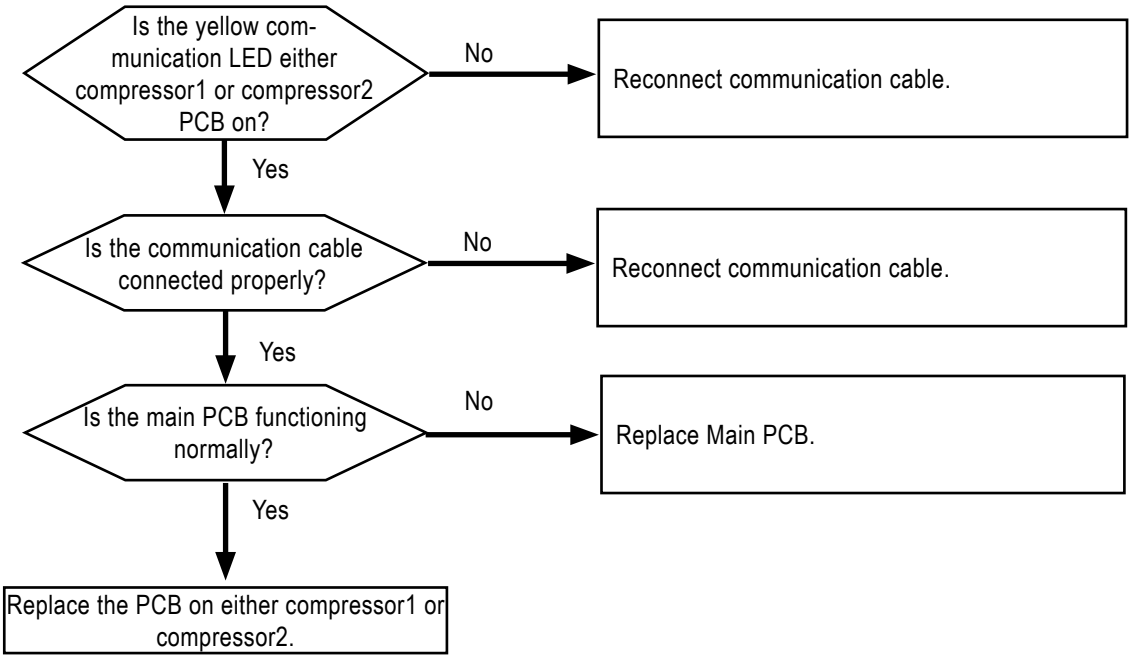
SERVICE TROUBLESHOOTING

MULTI V IV

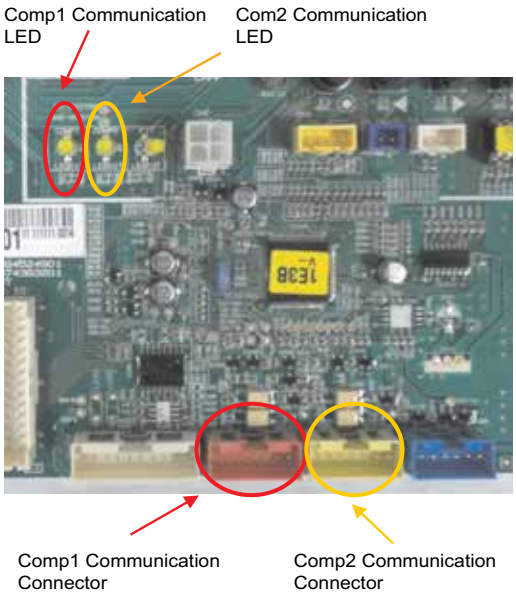
Error No. 52

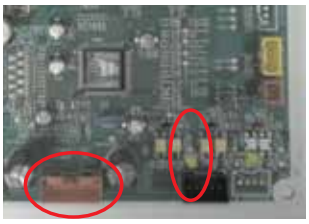
⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Error No.	Description	Details	Causes
52 Master: 521 Slave 1: 522 Slave 2: 523	Communication error between outdoor unit inverter PCB and main PCB.	Outdoor unit main controller cannot receive signal from inverter controller.	1. Power cable or transmission cable is not connected. 2. Defective outdoor unit main fuse / noise filter. 3. Defective outdoor unit main / inverter PCB.

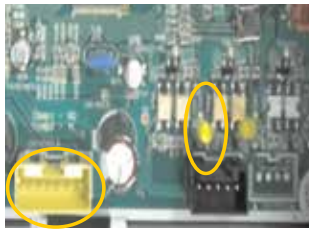


Checking the Main PCB and Comp1/Comp2 PCB (If operating normally, the communication LED will blink)





Communication Connector & LED in Comp1 PCB



Communication Connector & LED in Comp2 PCB

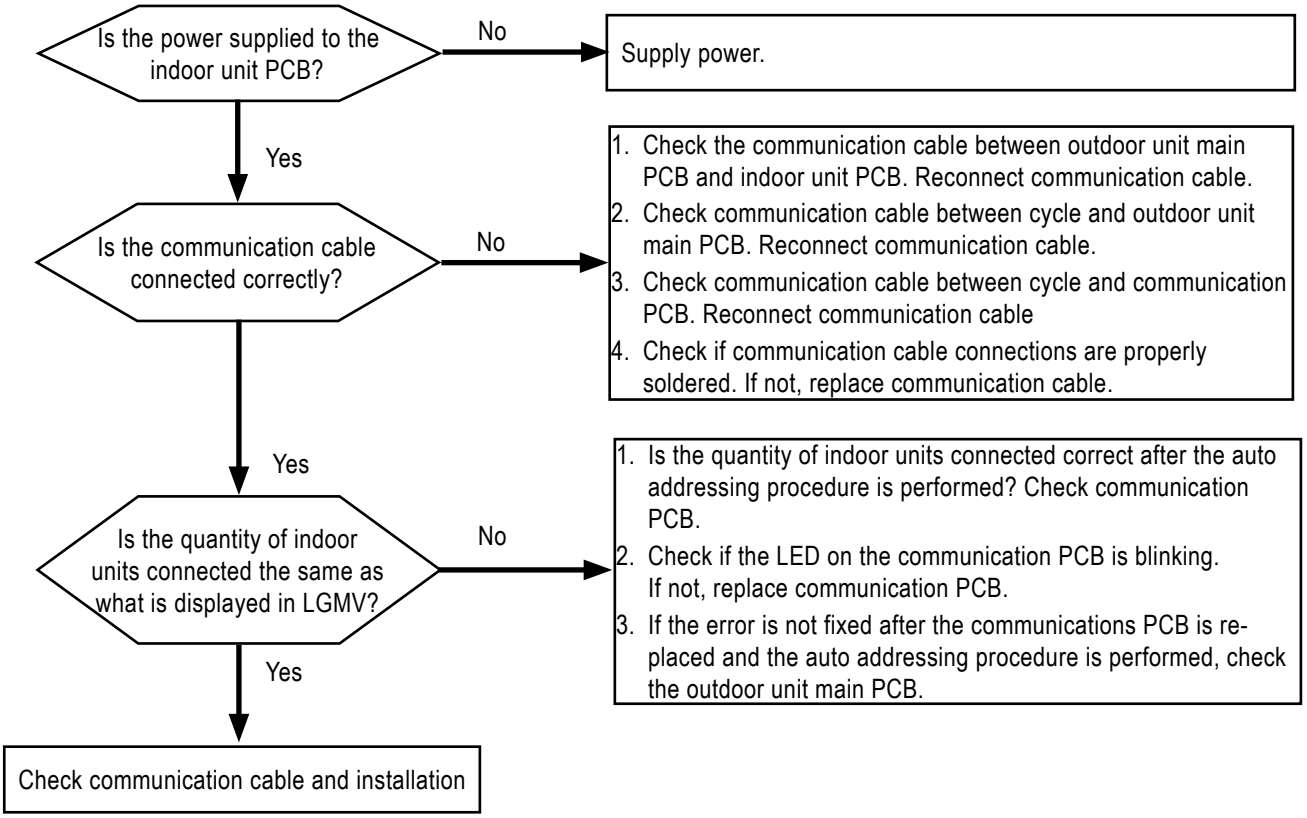
LG

SERVICE TROUBLESHOOTING

Error No. 53(1)

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Error No.	Description	Details	Causes
53(1)	Communication error between outdoor unit main PCB and indoor unit(s) PCB.	Main PCB cannot receive the signal from the indoor unit.	1. Communication cables are not connected. 2. Communications cables are disconnected or have short circuited. 3. Outdoor unit main PCB / indoor unit PCB is defective or damaged. 4. Communication wire connection error.



In addition to the information presented here, see also troubleshooting procedure for Error No. 05.

- If the quantity of installed indoor units matches the LGMV data, there may still be a few indoor units that have not been communicated to LGMV.
- If the quantity of installed indoor units does not match the LGMV data, but if proper auto addressing occurred, then the indoor unit itself may be in error:

1. Wrong transmission or power cable connection.
2. Power / PCB / transmission cable malfunction.
3. Duplicate numbers for indoor units.

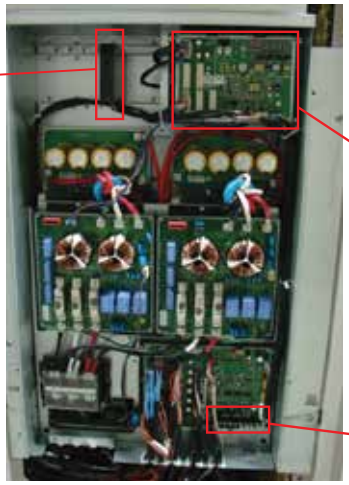
- If the transmission as a whole is not functioning properly, then the auto addressing procedure has not been performed yet.
- If Error No. 53 appears at an indoor unit, and auto addressing has not yet been performed, indoor unit addresses may have been duplicated.
- Auto addressing should be performed after an indoor unit PCB has been replaced. Also, if a central controller is installed, the central controller address should be input.
- If only the transmission PCB is replaced, auto addressing does not need to be performed.

Error No. 53(1), continued.

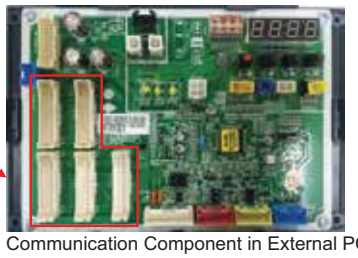
⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Outdoor Unit Communication PCB.

Indoor Communication Component.



Communication Component in Main PCB.



Communication Component in External PCB.

Remark: IDU A / IDU B

Example of Wiring Error.

Indoor Unit Communication PCB.

One (1) Time / Ten (10) Seconds Turn On / Off.

Note

Images here are representative of system components. Actual component appearance depends on system type.

SERVICE TROUBLESHOOTING

Error No. 54

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Error No.	Description	Details	Causes
54 Master: 541 Slave 1: 542 Slave 2: 543	Outdoor unit power error	Three-phase power supply cable is not connected properly (reverse phase / phase is missing).	1. Main PCB is defective. 2. No power is supplied to R (L1), S (L2), T (L3). 3. Cable connections to R (L1), S (L2), T (L3) are wrong. 4. Main PCB fuse has failed.

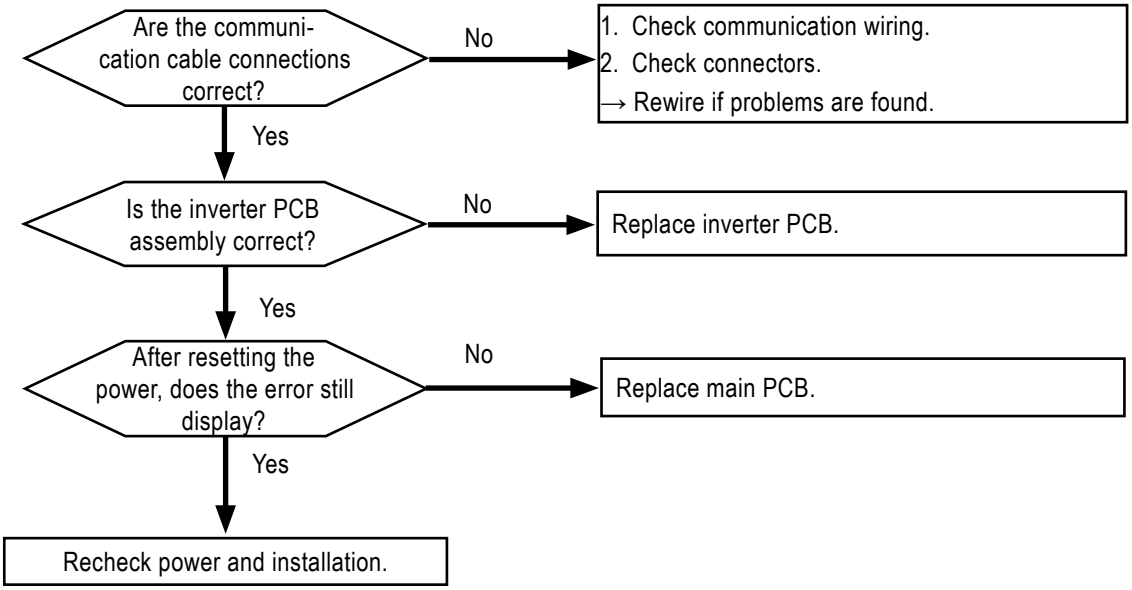
SERVICE TROUBLESHOOTING

MULTI V IV

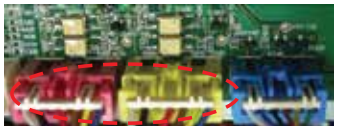
Error No. 57

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

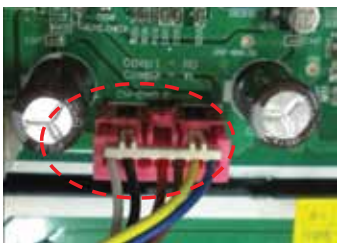
Error No.	Description	Details	Causes
57 Master: 571 Slave 1: 572 Slave 2: 573	Communication error between outdoor unit main PCB and inverter PCB.	Outdoor unit inverter PCB is not receiving signal from main PCB.	1. Bad connection between main and inverter PCBs. 2. Communication Wire Noise Effect. 3. The outdoor unit main PCB is damaged. 4. The outdoor unit inverter PCB is damaged.



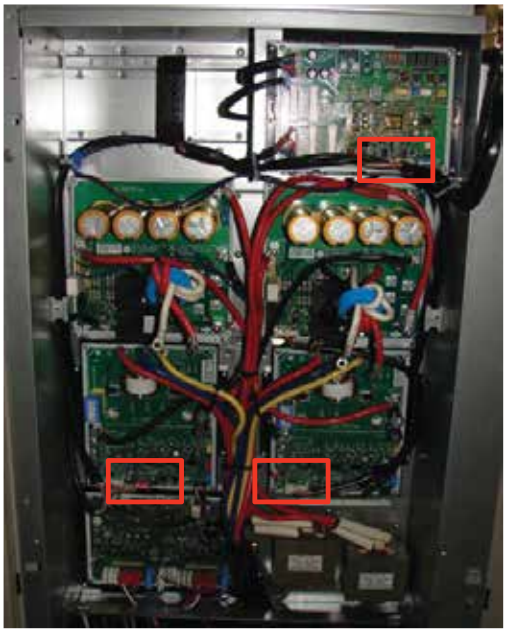
Main PCB.



Comp PCB.



C/Box Bottom.



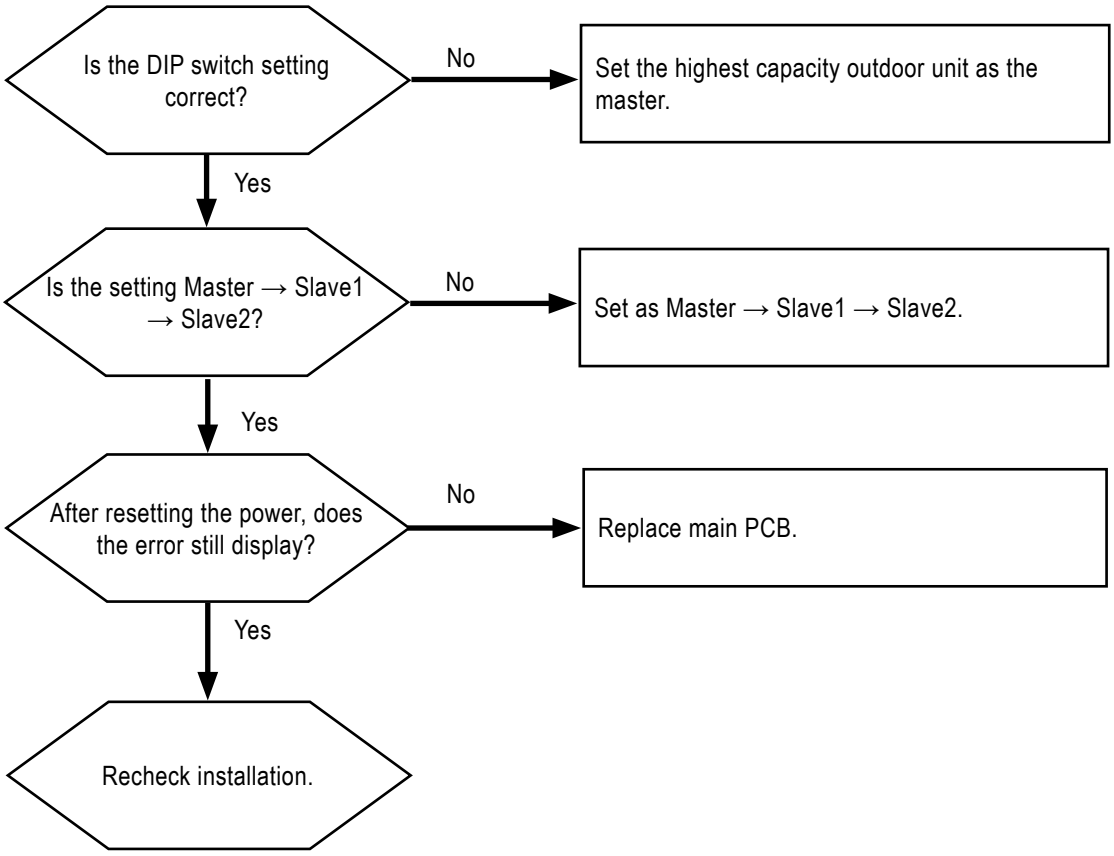
Note

Images here are representative of system components. Actual component appearance depends on system type.

LG

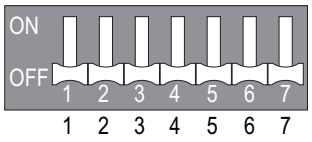
⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Error No.	Description	Details	Causes
59 Master: 591	Outdoor unit series installation error.	A smaller outdoor unit is set as the master outdoor unit.	DIP switch setting error.

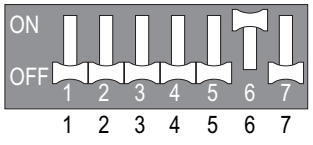


Master, Slave1, and Slave2 DIP Switch Settings

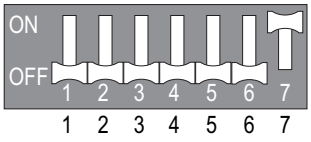
Master Outdoor Unit.



Slave1 Outdoor Unit.



Slave2 Outdoor Unit.



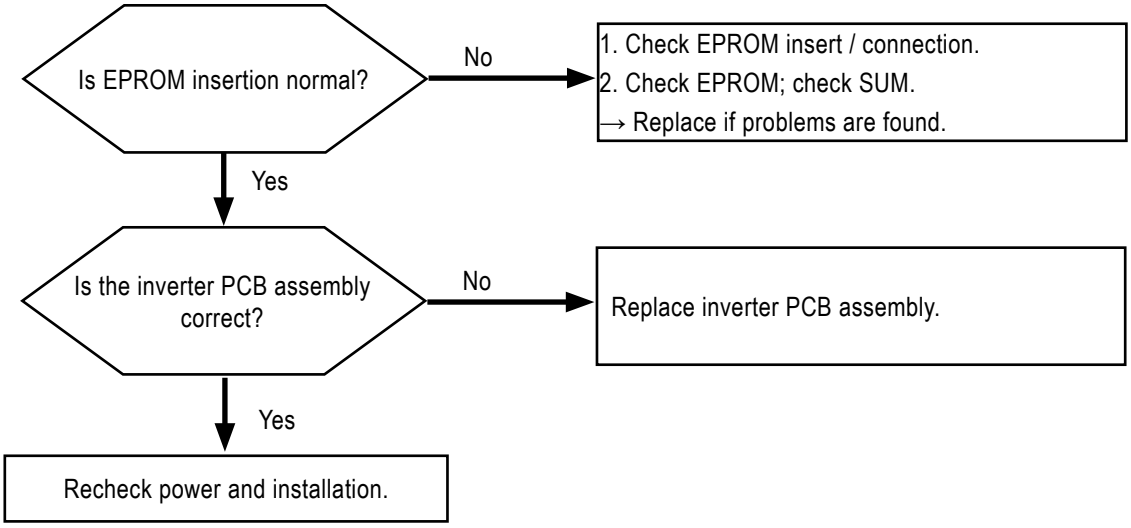
SERVICE TROUBLESHOOTING

MULTI V IV

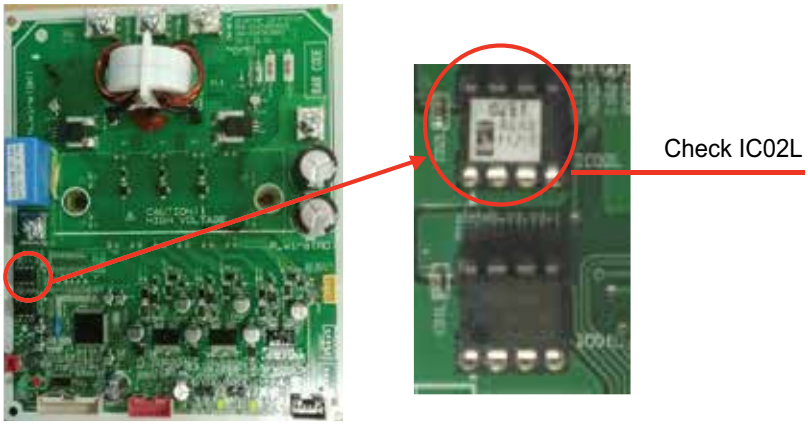
Error No. 60

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Error No.	Description	Details	Causes
60 Master: 601 Slave 1: 602 Slave 2: 603	Outdoor unit inverter PCB EPROM error.	EPROM access and "Check SUM" errors.	1. EPROM contact is defective, or the contact is not inserted correctly. 2. Different EPROM version. 3. Outdoor unit inverter PCB assembly is damaged.



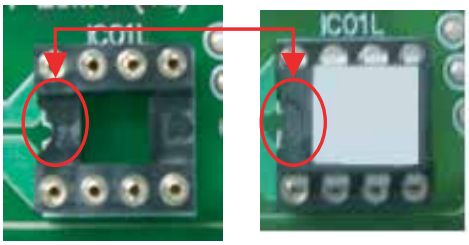
Inverter EPROM Location.



Note

Images here are representative of system components. Actual component appearance depends on system type.

Correct Method of Inserting the Inverter EPROM.



Note: Replace After Power is Shut Off.

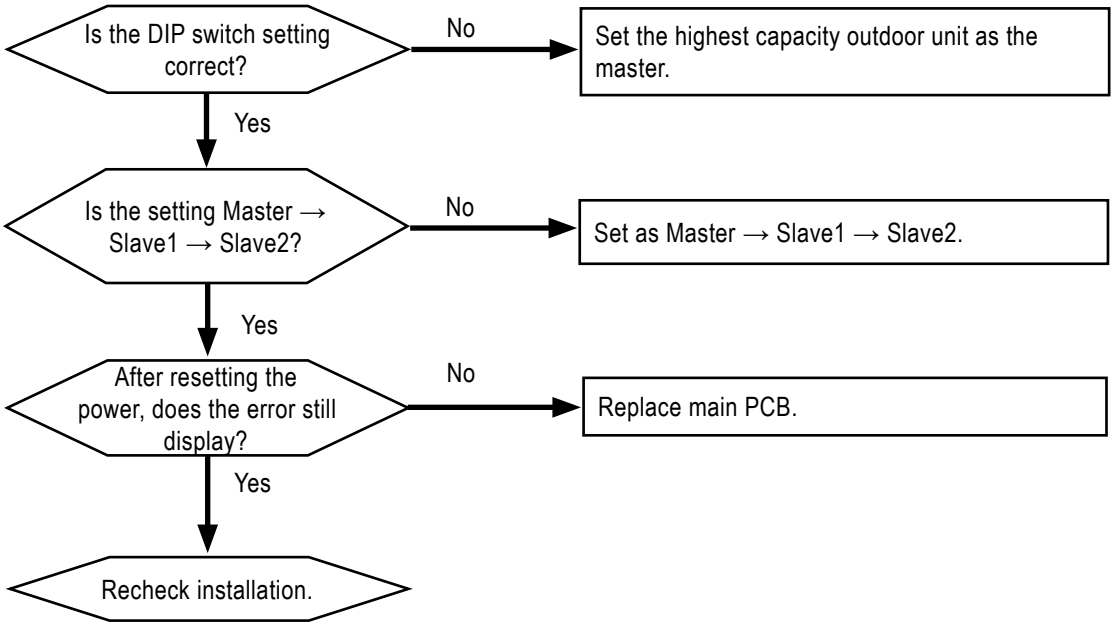
LG

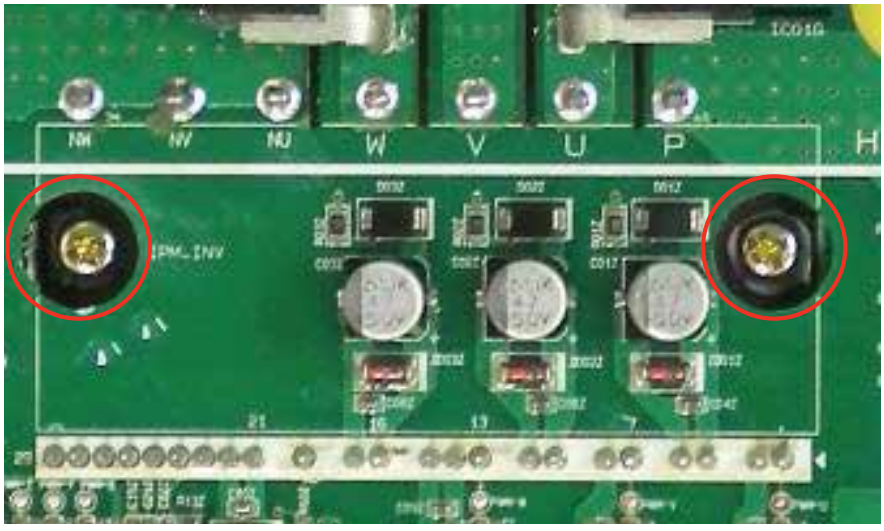
SERVICE TROUBLESHOOTING

Error No. 62

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Error No.	Description	Details	Causes
62 Master: 621 Slave 1: 622 Slave 2: 623	High temperature at the master outdoor unit inverter heatsink.	Heatsink temperature is >194°F.	1. Inverter PCB IPM connection is not correct. 2. Outdoor unit fan motor operation is malfunctioning. 3. Outdoor unit inverter PCB assembly is defective. 4. Overload operation (pipe has clogged, fan is blocked, EEV is defective, overcharge in refrigerant).





Check Terminal Connections.

Note

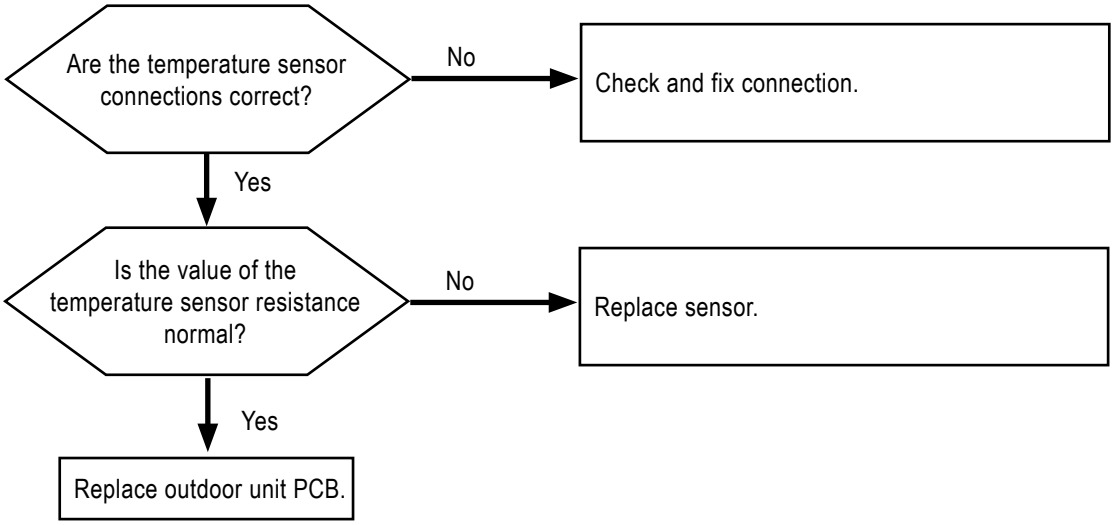
Image here is representative of system components. Actual component appearance depends on system type.

SERVICE TROUBLESHOOTING

Error No. 65

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Error No.	Description	Details	Causes
65 Master: 651 Slave 1: 652 Slave 2: 653	Outdoor unit liquid pipe (condenser) temperature sensor error.	Abnormal sensor resistance value.	1. Defective temperature sensor connection. 2. Defective temperature sensor (sensor has disconnected or has shorted out). 3. Defective outdoor unit PCB.



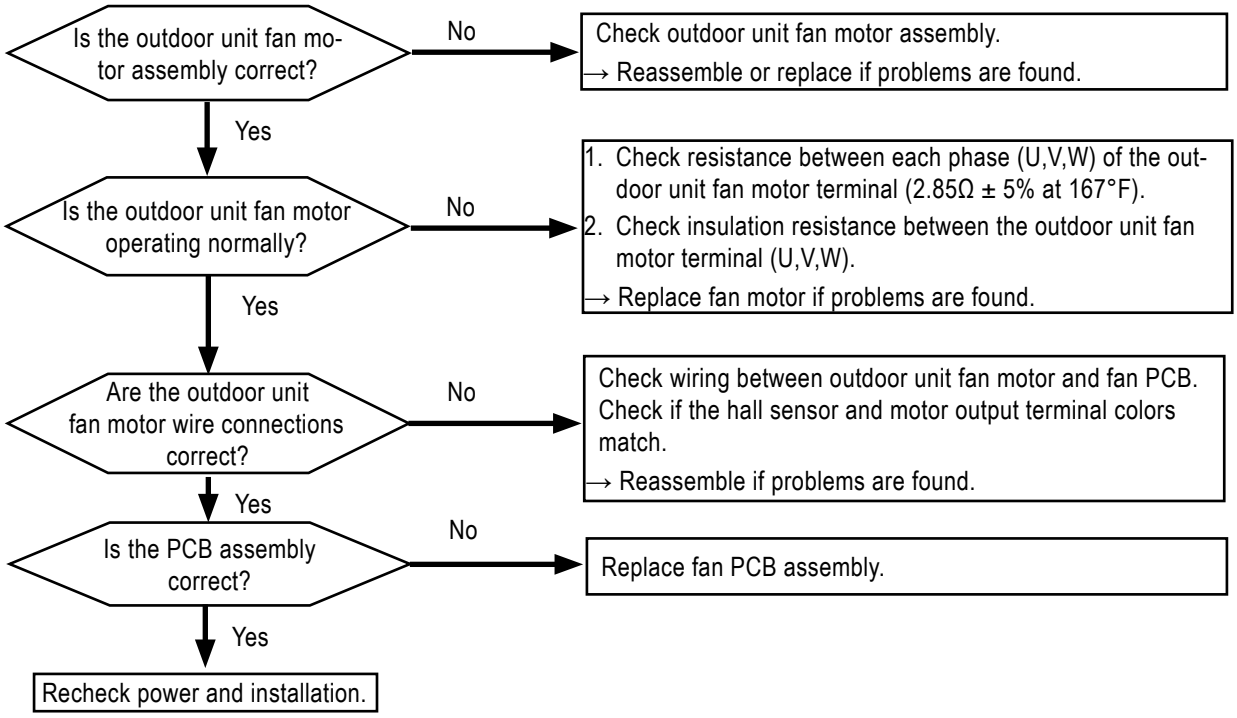
- *If the value is >100kΩ (open) or <100Ω (short), there is an error.*
- *Temperature sensor resistance value may change according to sensor temperature, it displays according to current temperature criteria (±5% margin) → Normal.*
- *Air temperature sensor: 50°F = 20.7kΩ : 77°F = 10kΩ : 122°F = 3.4kΩ.*
- *Pipe temperature sensor: 50°F = 10kΩ : 77°F = 5kΩ : 122°F = 1.8kΩ.*

SERVICE TROUBLESHOOTING

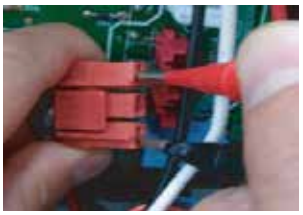
Error No. 67

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Error No.	Description	Details	Causes
67 Master: 671 Slave 1: 672 Slave 2: 673	Outdoor unit fan has locked up.	RPM is ≤10 RPM for five (5) seconds when the outdoor unit fan starts, or ≤40 RPM after fan starts.	1. Fan motor is defective or assembly is not correct. 2. Fan motor connection is wrong (hall sensor, U,V,W output). 3. Rotation has reversed after RPM target is achieved. 4. Fan PCB assembly is defective. 5. Fan air flow is blocked by heavy snowfall.



Measure Fan Motor Resistance Between Each Phase.



Hall Sensor Connections.

Fan Motor Wire Connections.

Note

Images here are representative of system components. Actual component appearance depends on system type.

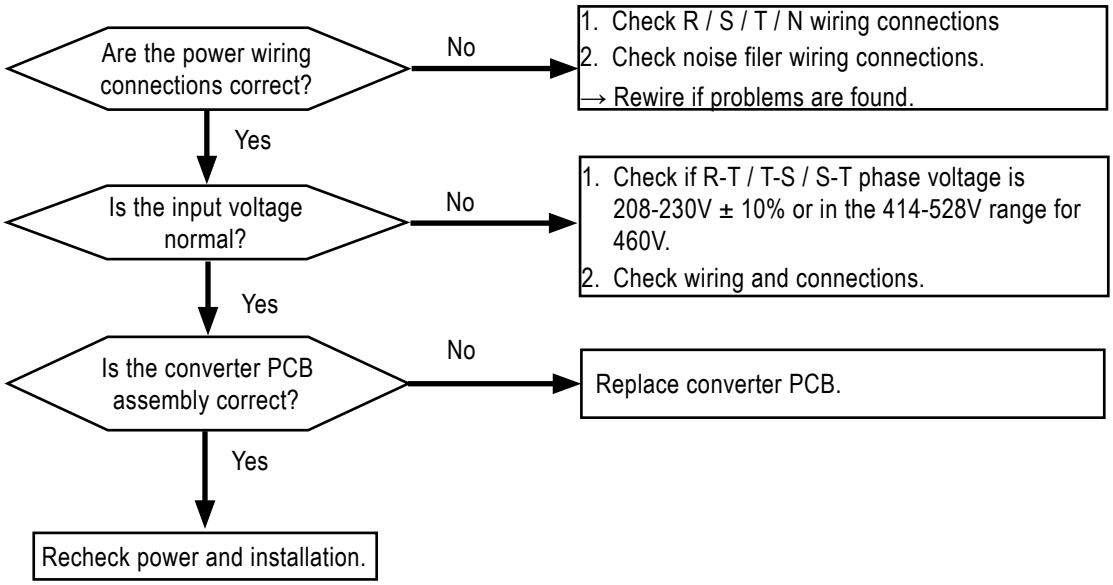
SERVICE TROUBLESHOOTING

MULTI V IV

Error No. 60

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Error No.	Description	Details	Causes
71 Master: 711 Slave 1: 712 Slave 2: 713	Outdoor unit converter CT sensor error.	MICOM input voltage isn't within 2.5V±0.3V at initial power up.	1. Input voltage is not correct (R-T). 2. Damage to the outdoor unit converter PCB (CT sensor component).



Measure Input Voltage.

Converter PCB Assembly.

Note

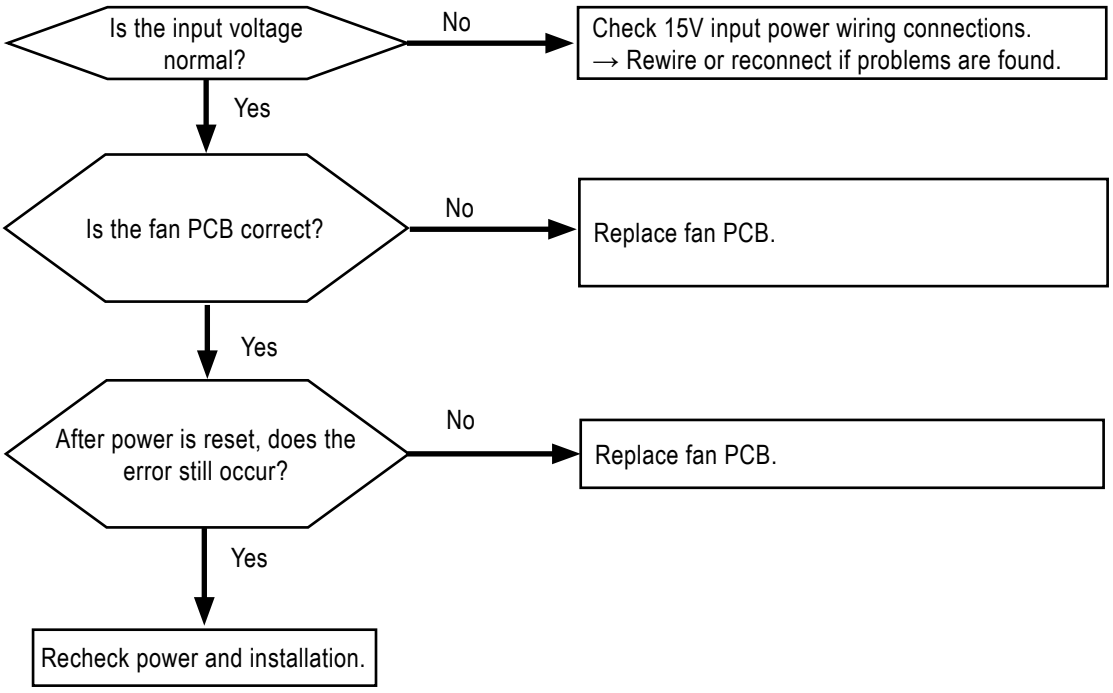
Images here are representative of system components. Actual component appearance depends on system type.

LG

Error No. 75

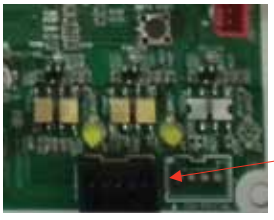
⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Error No.	Description	Details	Causes
75 Master: 751 Slave 1: 752 Slave 2: 753	Fan CT sensor error.	Offset of MICOM; fan motor sensor phase current is not 2.5V.	1. Input voltage is not correct (not 15V). 2. Fan PCB assembly is defective. 3. Power wiring has disconnected or has shorted out. 4. Inverter PCB assembly is defective.



15V Input Power Wiring Connections.

Check if Power Wiring Has Shorted.



15V Input Power on Inverter PCB.

Note

Images here are representative of system components. Actual component appearance depends on system type.

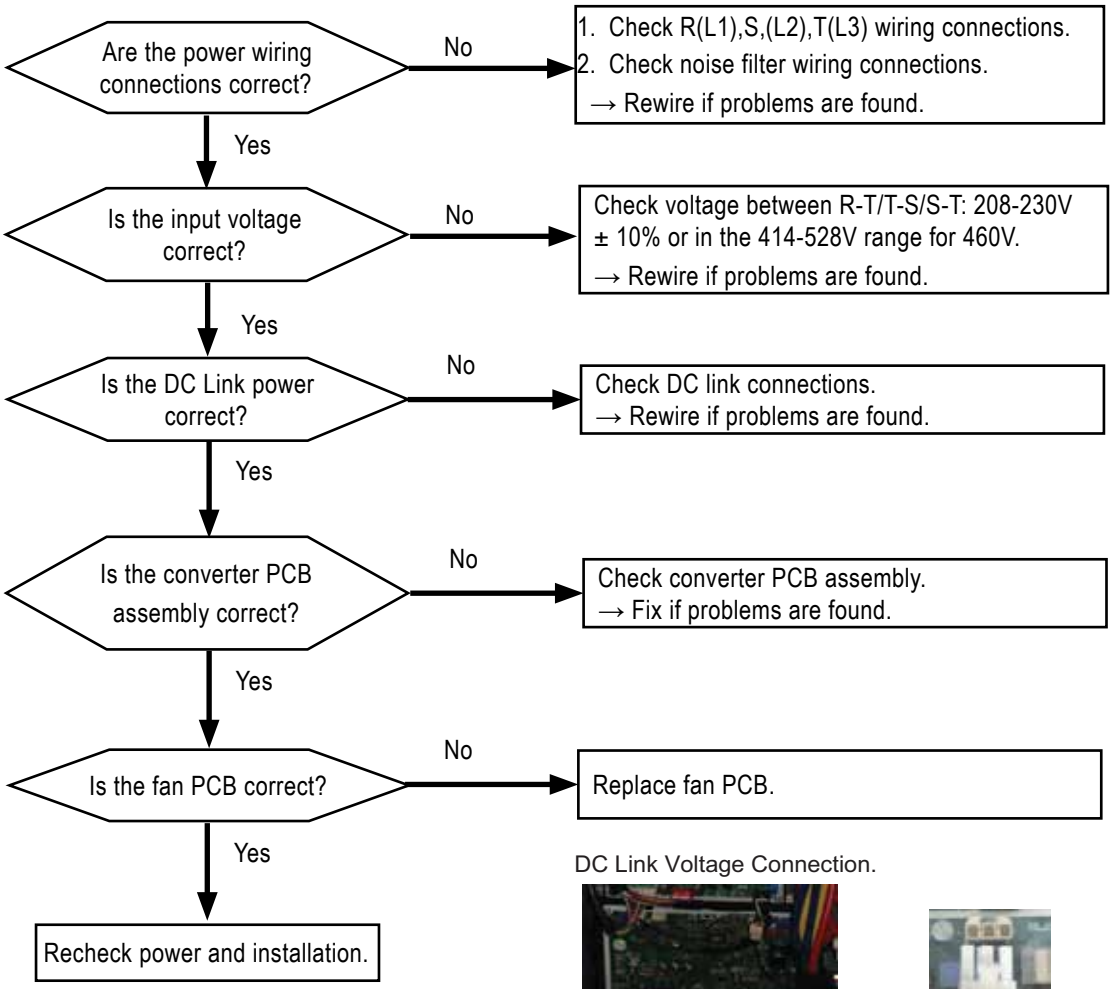
SERVICE TROUBLESHOOTING

MULTI V IV

Error No. 76

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Error No.	Description	Details	Causes
76 Master: 761 Slave 1: 762 Slave 2: 763	Outdoor unit fan DC link high voltage error.	Fan PCB DC link voltage is >420V (208-230V Systems) or >780V (460V Systems).	1. Input voltage is not normal (R, S, T). 2. Fan PCB assembly is defective. 3. Power wiring has a faulty connection.



DC Link Voltage Connection.

Noise Filter Wiring.

Note

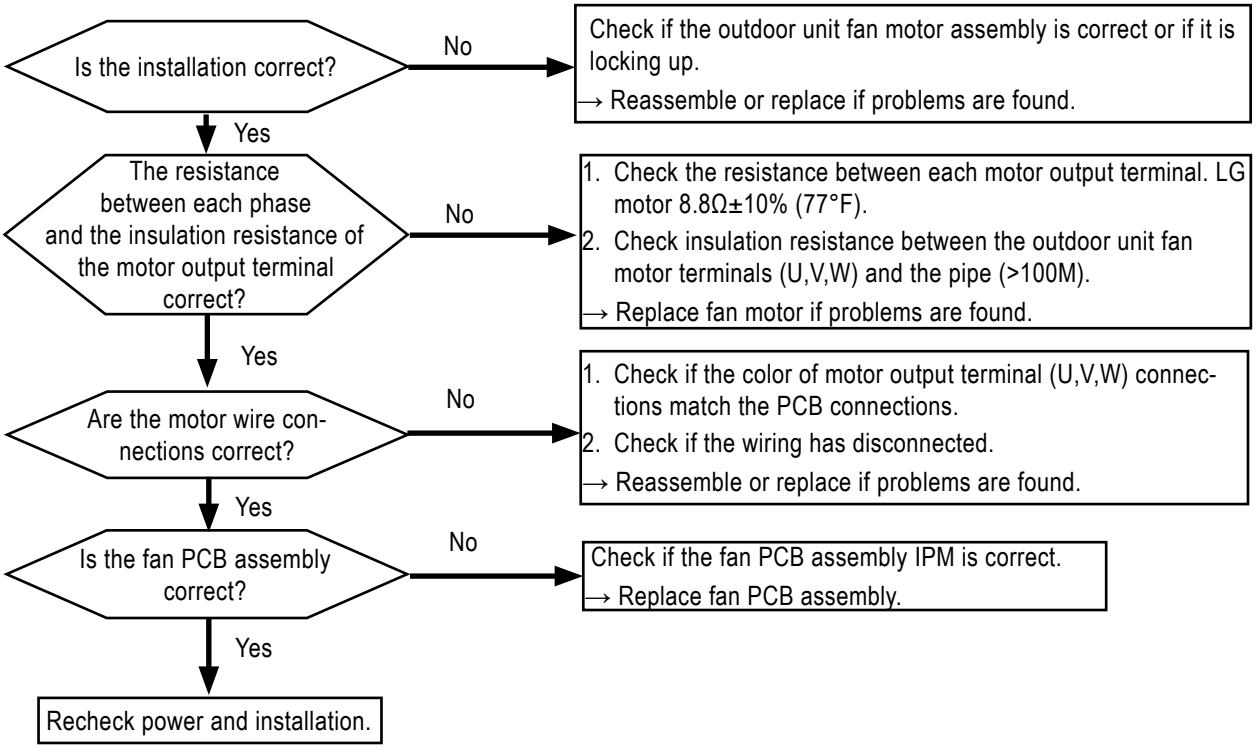
Images here are representative of system components. Actual component appearance depends on system type.

LG

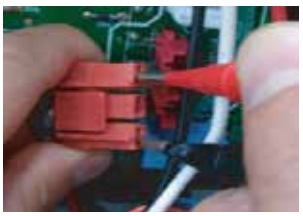
Error No. 77

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Error No.	Description	Details	Causes
77 Master: 771 Slave 1: 772 Slave 2: 773	Outdoor unit fan overcurrent error.	Outdoor unit fan current is >10A (for 208-230V units) or 5A (for 460V units).	1. Overload operation. 2. Fan motor is defective. 3. Fan PCB assembly is defective. 4. Fan motor connector is not inserted correctly. 5. Condenser has iced up or is blocked.



Measure Fan Motor Resistance Between Each Phase.



Hall Sensor Connections.

Fan Motor Wire Connections.

Note

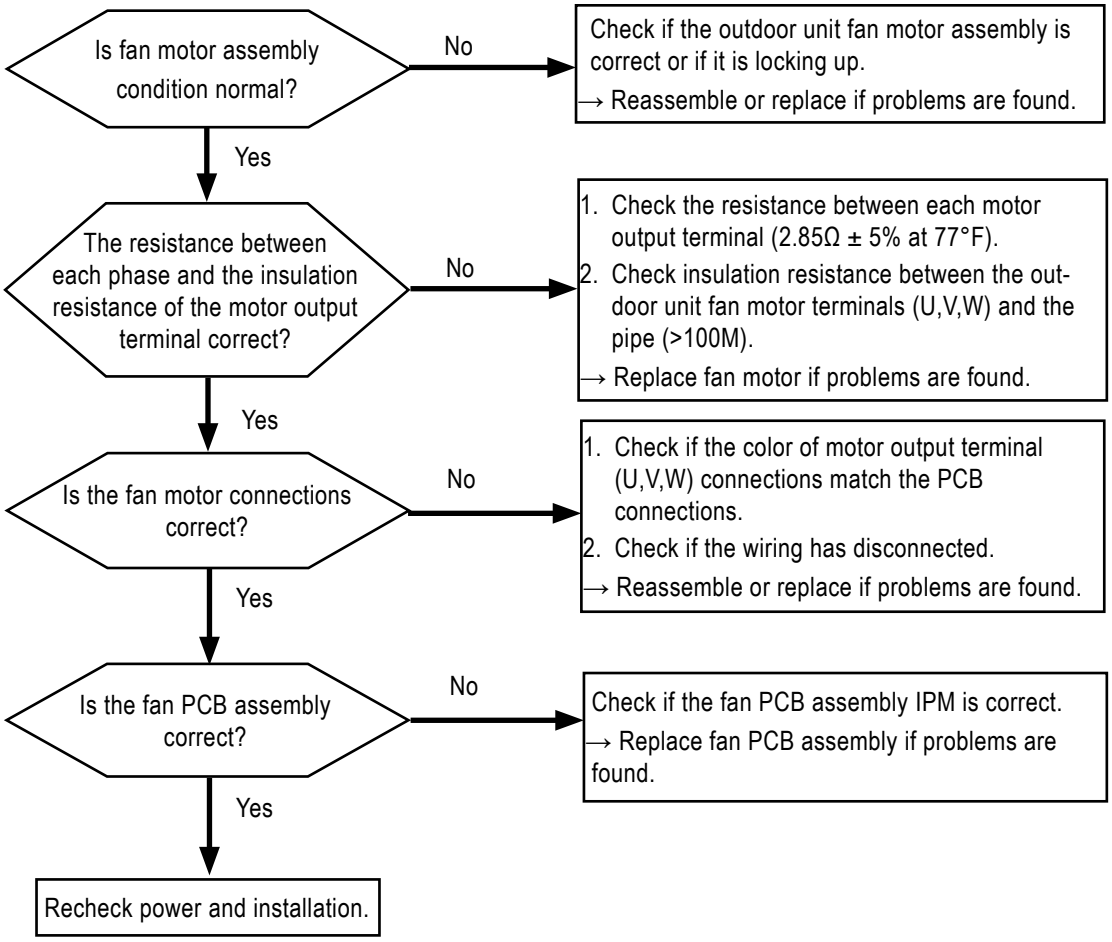
Images here are representative of system components. Actual component appearance depends on system type.

SERVICE TROUBLESHOOTING

Error No. 79

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

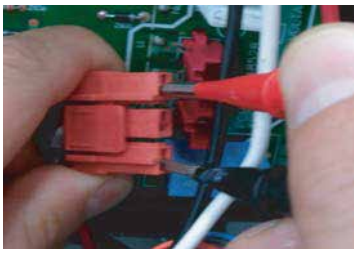
Error No.	Description	Details	Causes
79 Master: 791 Slave 1: 792 Slave 2: 793	Outdoor unit fan operation failure error.	Outdoor unit fan is experiencing first position sensor failure.	1. Fan motor is defective or the assembly is not correct. 2. Fan motor has disconnected (hall sensor, U,V,W output). 3. Fan PCB is defective.



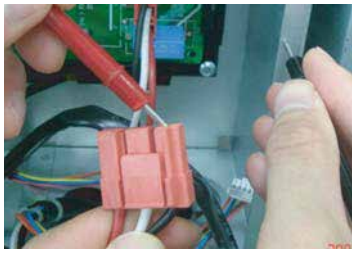
Error No. 79, continued.

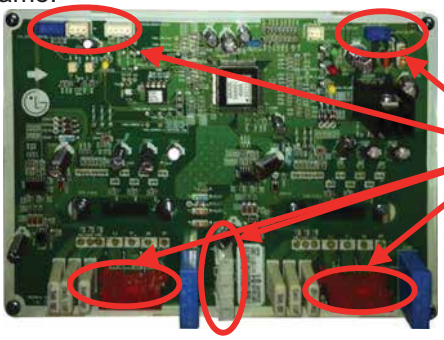
⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Measure Fan Motor Phase Resistance.



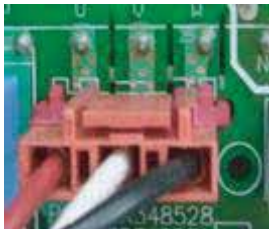
Measure Insulation Resistance Between Fan Terminal and Frame.

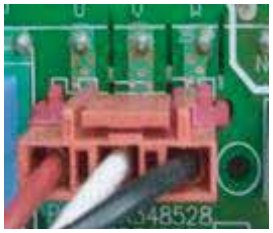




Check Connections.

Fan Motor Wire Connection.





Note

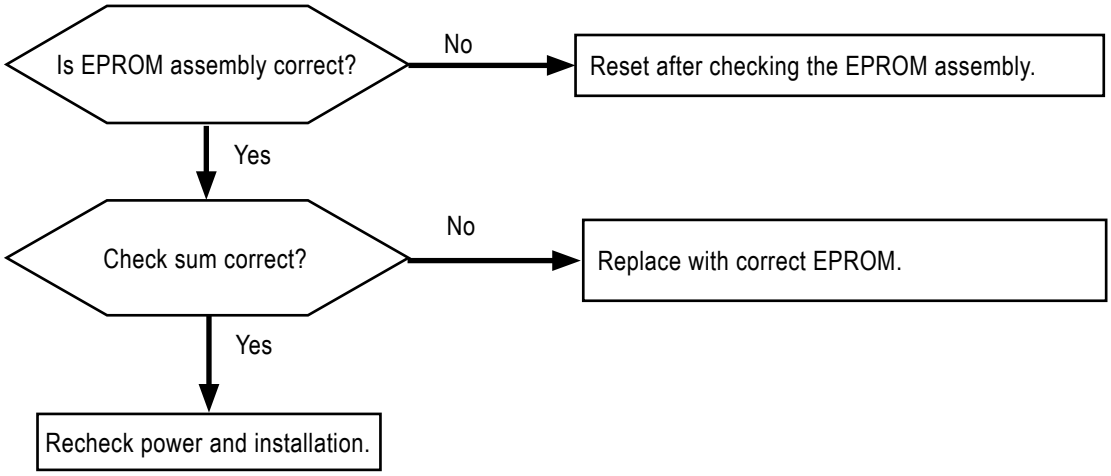
Images here are representative of system components. Actual component appearance depends on system type.

SERVICE TROUBLESHOOTING

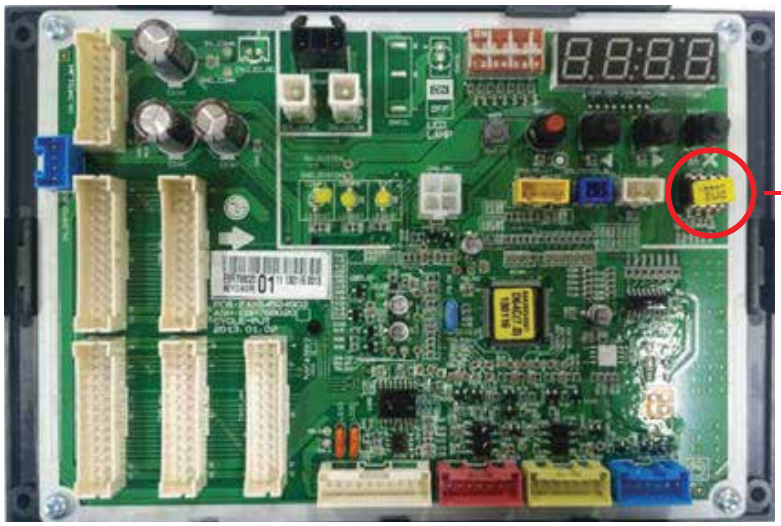
Error No. 86

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Error No.	Description	Details	Causes
86 Master: 861 Slave 1: 862 Slave 2: 863	Outdoor unit main PCB onboard EPROM error.	EPROM access error.	1. No EPROM. 2. EPROM is not inserted properly.



EPROM Installation.



EPROM.

Main PCB.

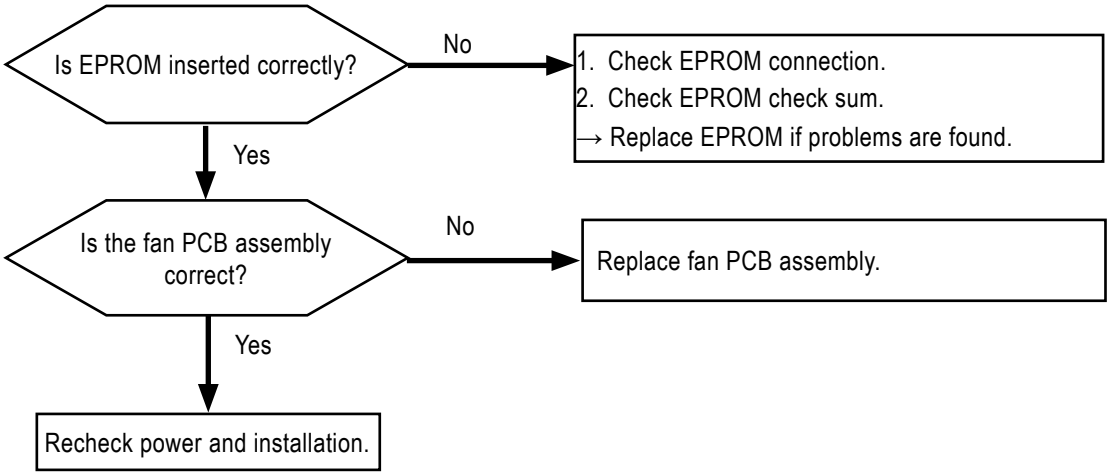
Note: Replace After Power Off.

Same Direction for Both the Socket Hole and the EPROM Hole.

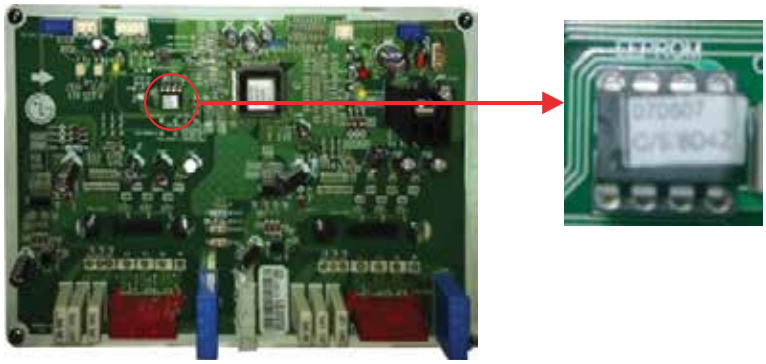
Error No. 87

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Error No.	Description	Details	Causes
87 Master: 871 Slave 1: 872 Slave 2: 873	Outdoor unit fan PCB EPROM error.	Error occurs when checking the EPROM.	1. EPROM has a bad connection or was inserted incorrectly. 2. Version of EPROM is different. 3. Outdoor unit fan PCB assembly may have been damaged after power was turned on.



Fan EPROM Installation.



Note

Images here are representative of system components. Actual component appearance depends on system type.

Inverter EPROM Installation.

Same Direction for Both the Socket Hole and the EPROM Hole.

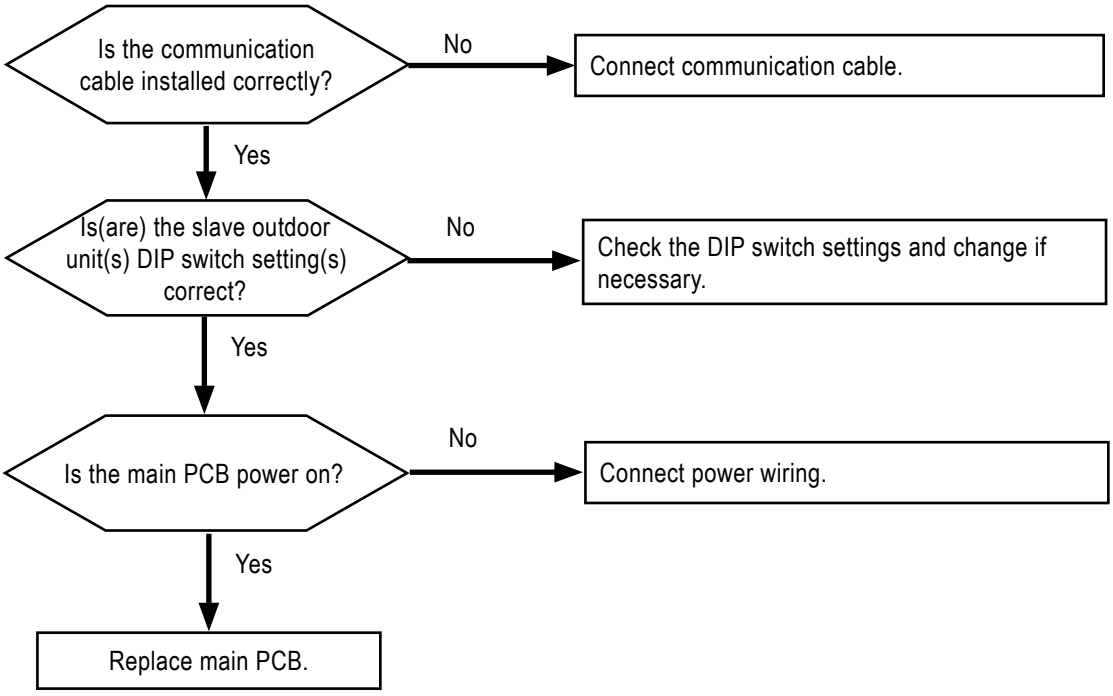
Note: Replace After Power Off.

SERVICE TROUBLESHOOTING

Error No. 104

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Error No.	Description	Details	Causes
104 Master: 1041 Slave 1: 1042 Slave 2: 1043	Communication error between master outdoor unit and slave outdoor units.	Master unit displays outdoor unit number that has not been transmitted; slave unit displays its own error number.	1. Power wiring / communication cable connections are loose. (Connections have disconnected or have shorted out). 2. Each outdoor unit PCB is defective.

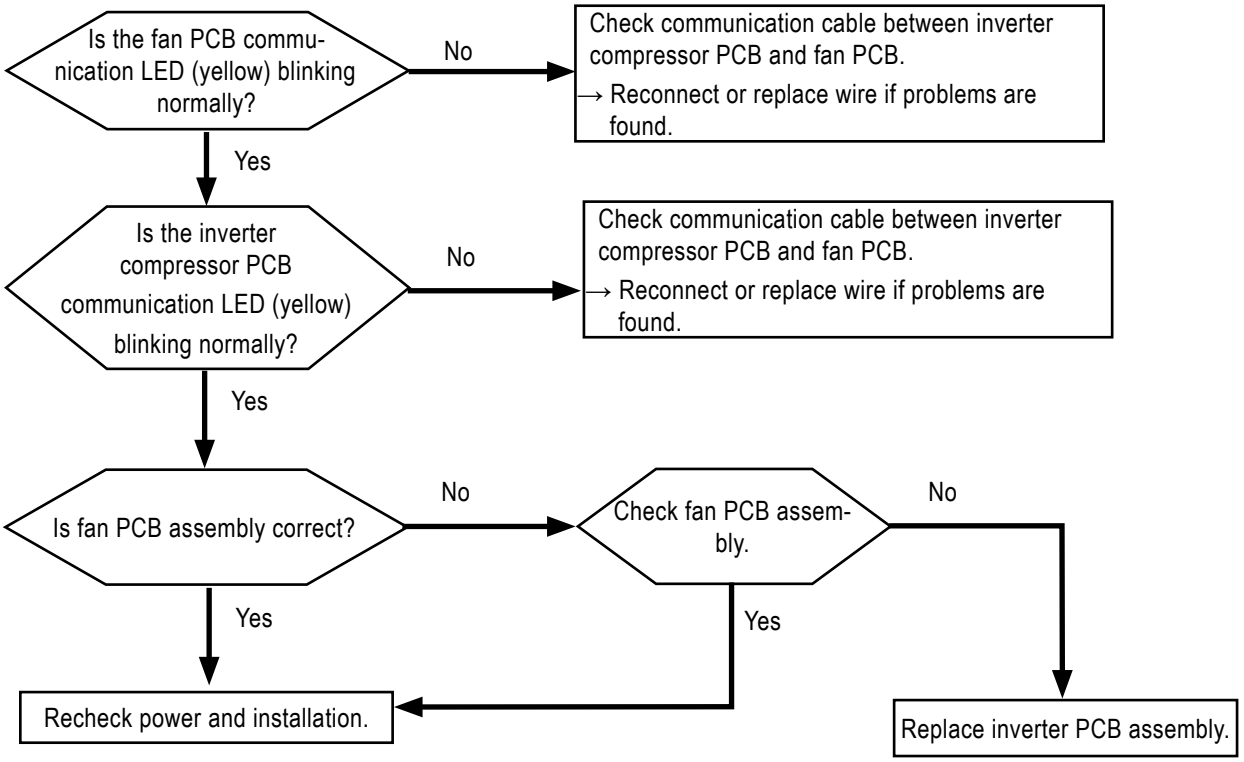


SERVICE TROUBLESHOOTING

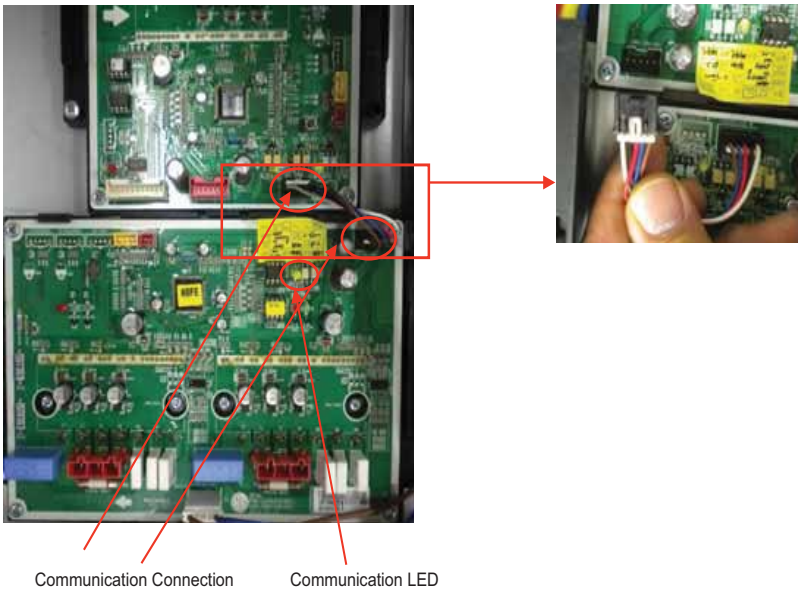
Error No. 105

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Error No.	Description	Details	Causes
105 Master: 1051 Slave 1: 1052 Slave 2: 1053	Communication error between fan PCB to inverter compressor PCB.	Fan PCB did not receive signal from inverter compressor PCB.	1. Inverter compressor PCB and fan PCB connection is not correct. 2. Fan PCB power is not supplied. 3. Outdoor unit inverter fan PCB is defective.



Comp ⟷ Fan Communication Connection



Note

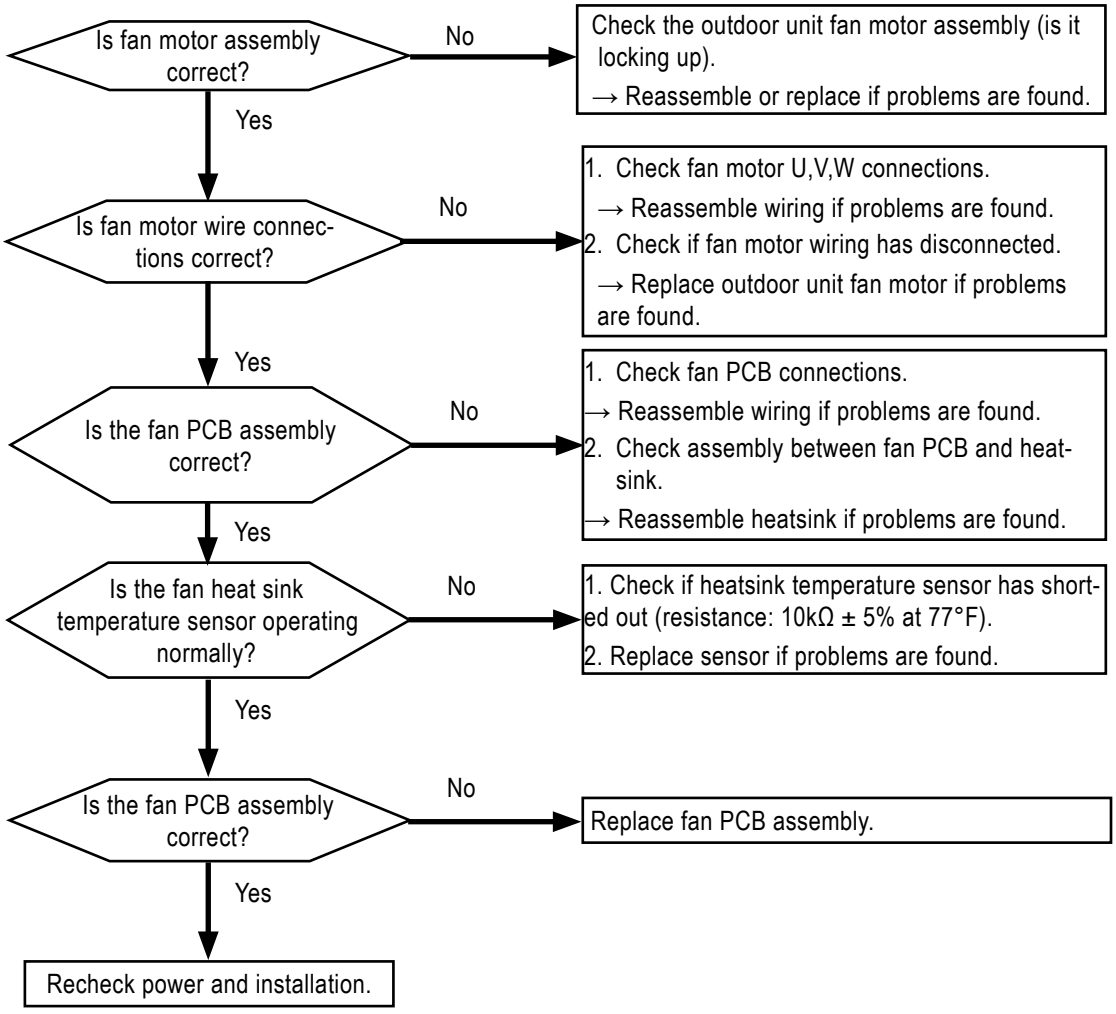
Images here are representative of system components. Actual component appearance depends on system type.

SERVICE TROUBLESHOOTING

Error No. 106

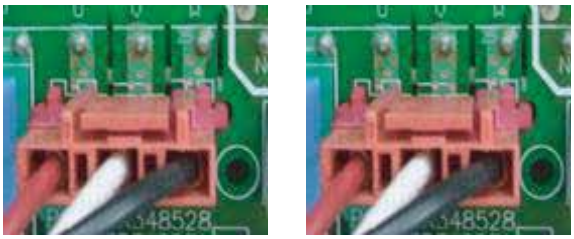
⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Error No.	Description	Details	Causes
106 Master: 11→061 Slave 1: 12→062 Slave 2: 13→063	Outdoor unit fan IPM error.	Instant overcurrent (peak) of outdoor unit fan IPM.	1. Overload operation (pipe clogged, fan is blocked, EEV is defective, refrigerant has been overcharged). 2. Outdoor unit fan motor assembly is not correct (coil is disconnected or has shorted out, insulation has been damaged). 3. Fan PCB heatsink assembly is not correct. 4. Fan PCB assembly is defective.

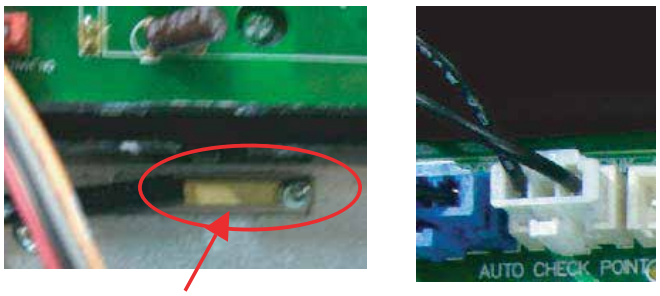


⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Fan Motor Wire Connections.

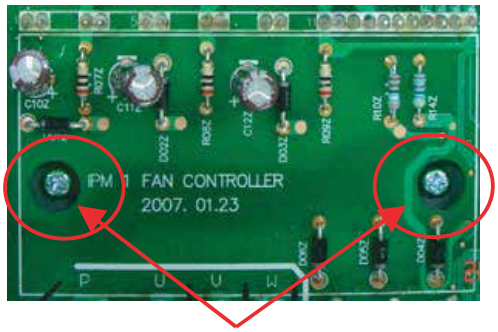


Fan Heatsink Assembly Location.



Check Assembly Installation.

Fan IPM Assembly Location.



Check Assembly Installation.

Note

Images here are representative of system components. Actual component appearance depends on system type.

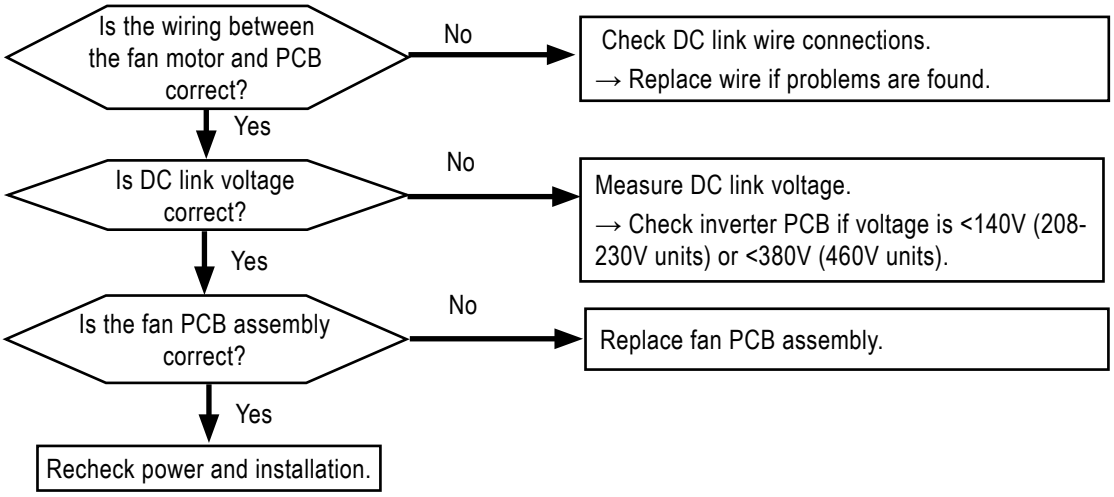
SERVICE TROUBLESHOOTING

MULTI V IV

Error No. 107

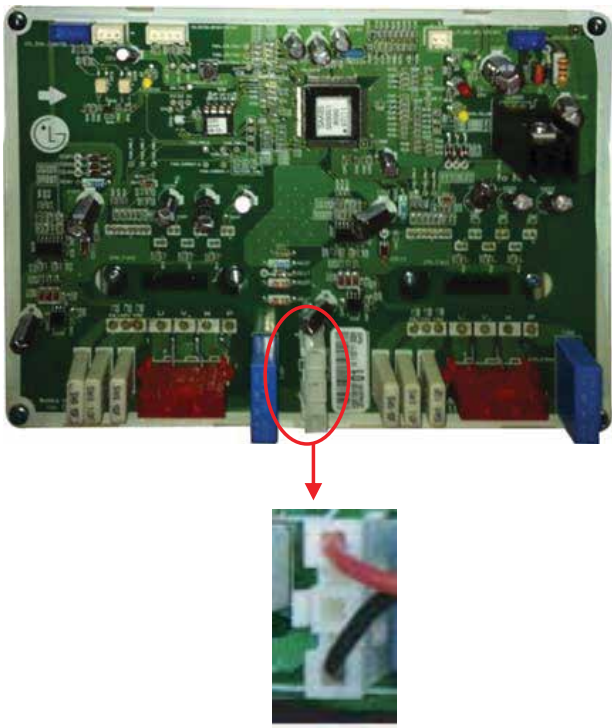
⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Error No.	Description	Details	Causes
107 Master: 11→071 Slave 1: 12→072 Slave 2: 13→073	Fan DC link low voltage error.	Fan PCB DC link voltage supplied is <140V (208-230V units) or <380V (460V units).	1. Wiring is not installed correctly between the inverter PCB and the fan PCB. 2. Fan PCB assembly is defective. 3. Reactor terminal contact is defective. 4. DC link terminal wiring and / or contact is defective. 5. Diode bridge is defective.



208-230V Units

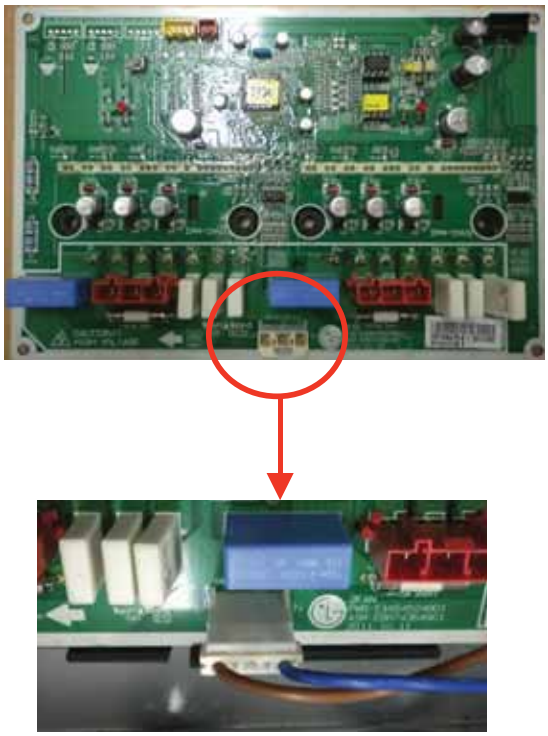
DC voltage connection



DC voltage connected

460V Units

DC voltage connection



DC voltage connected

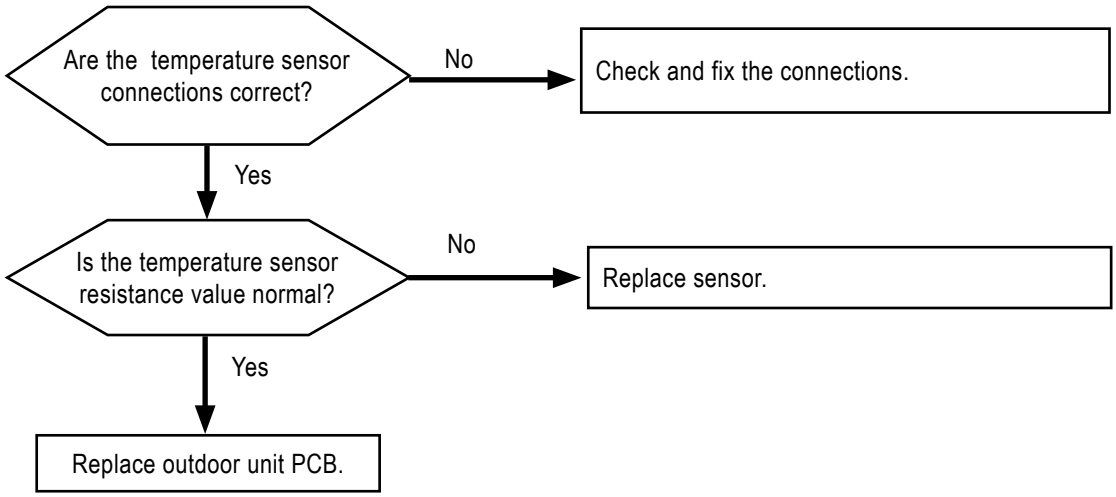
LG

SERVICE TROUBLESHOOTING

Error Nos. 113, 114, and 115

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Error No.	Description	Details	Causes
113 Master: 11→1131 Slave 1: 12→1132 Slave 2: 13→1133	Outdoor unit liquid pipe (condenser) temperature sensor error.	Disconnection or short circuit of outdoor unit liquid pipe (condenser) temperature sensor (sensor value is abnormal).	1. Temperature sensor connection is defective. 2. Temperature sensor has disconnected or short circuited. 3. Outdoor unit PCB is defective.
114 Master: 11→1141 Slave 1: 12→1142 Slave 2: 13→1143	Outdoor unit subcooling inlet temperature sensor error.	Disconnection or short circuit of outdoor unit subcooling inlet temperature sensor (sensor value is abnormal).	
115 Master: 11→1151 Slave 1: 12→1152 Slave 2: 13→1153	Outdoor unit subcooling outlet temperature sensor error.	Disconnection or short circuit of outdoor unit subcooling outlet temperature sensor (sensor value is abnormal).	



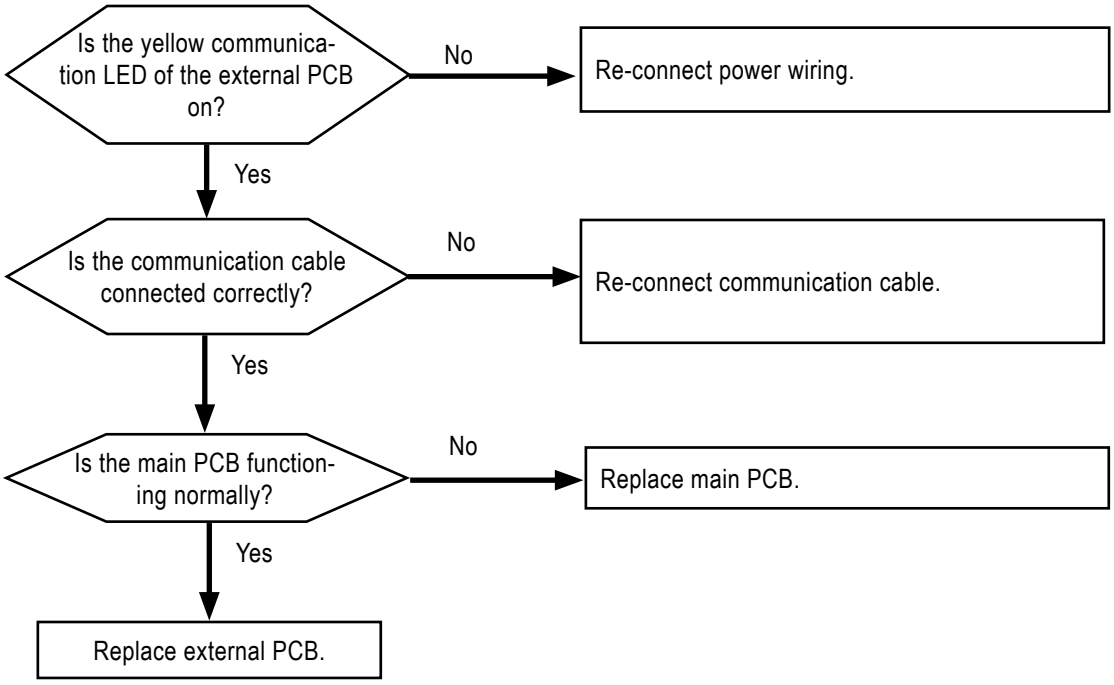
- *If the value is >100kΩ (open) or <100Ω (short), there is an error.*
- *Temperature sensor resistance value may change according to sensor temperature, it displays according to current temperature criteria (±5% margin) → Normal.*
- *Air temperature sensor: 50°F = 20.7kΩ : 77°F = 10kΩ : 122°F = 3.4kΩ.*
- *Pipe temperature sensor: 50°F = 10kΩ : 77°F = 5kΩ : 122°F = 1.8kΩ.*

SERVICE TROUBLESHOOTING

Error No. 145

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Error No.	Description	Details	Causes
145 Master: 11→1451 Slave 1: 12→1452 Slave 2: 13→1453	Communication error between outdoor unit main PCB and external PCB.	Cycle controller of outdoor unit PCB is not receiving signal from the external PCB.	1. Power wiring and / or communication cables is / are not connected. 2. Outdoor cycle controller / external PCB is / are defective.



Checking Main PCB and External PCB (If normal, LED blinks)

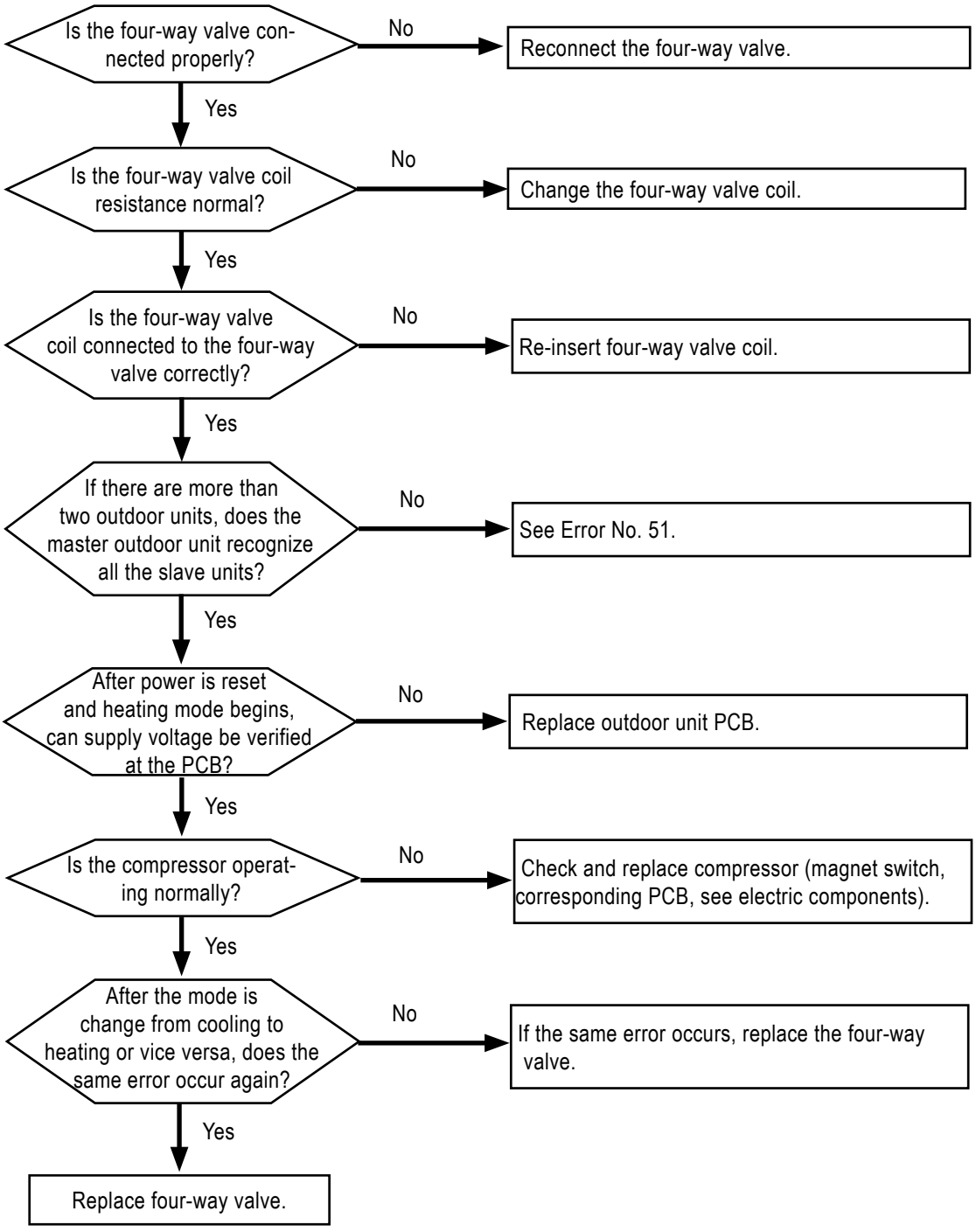
Communication Connector and LED in Main PCB

Communication Connector and LED in External PCB

Error No. 151

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

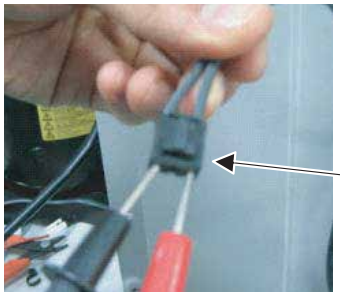
Error No.	Description	Details	Causes
151 Master: 11→1511 Slave 1: 12→1512 Slave 2: 13→1513	Pressure imbalance between outdoor units.	Not enough pressure difference between high and low.	1. Problem with four-way valve operation because of sludge, inflow, etc. 2. No pressure difference because of compressor error. 3. Four-way valve is defective.



Error No. 151, continued

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

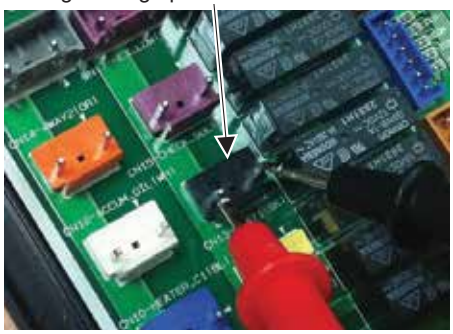
[1]Measure the resistance of the four-way valve.



Location of the four-way valve connection on the main PCB (marked as four-way, CN09).

[2]Confirm that the four-way valve coil is fully inserted.

[4]Check the output voltage of terminal socket during heating operation.

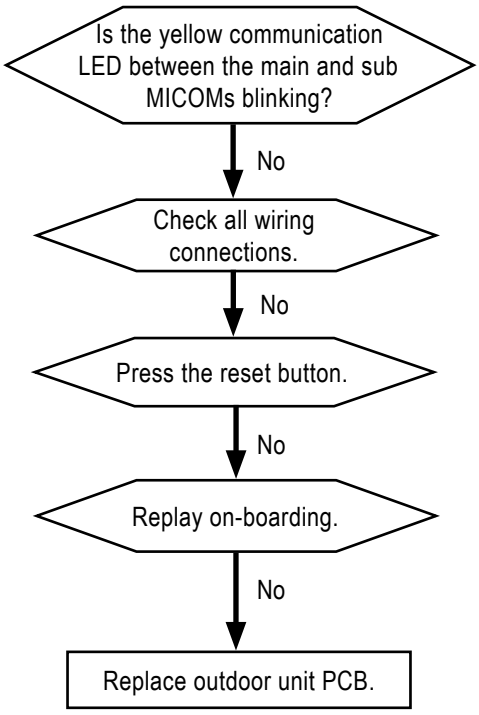


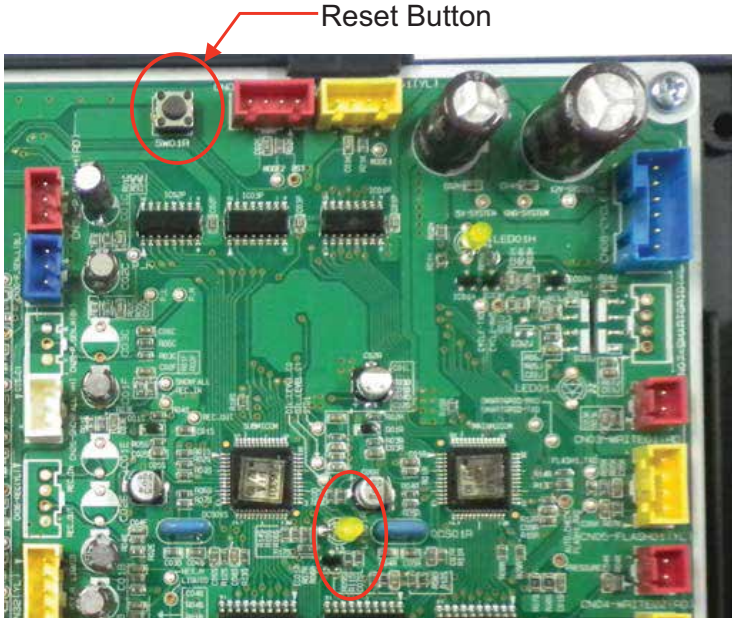
LG

Error No. 182

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Error No.	Description	Details	Causes
182 Master:1821 Slave 1: 1822 Slave 2: 1823	Communication error between outdoor unit external board main and sub MICOMs.	Outdoor unit external board main to sub MICOM communication failure.	Failure to receive signal between main and sub MICOMs.





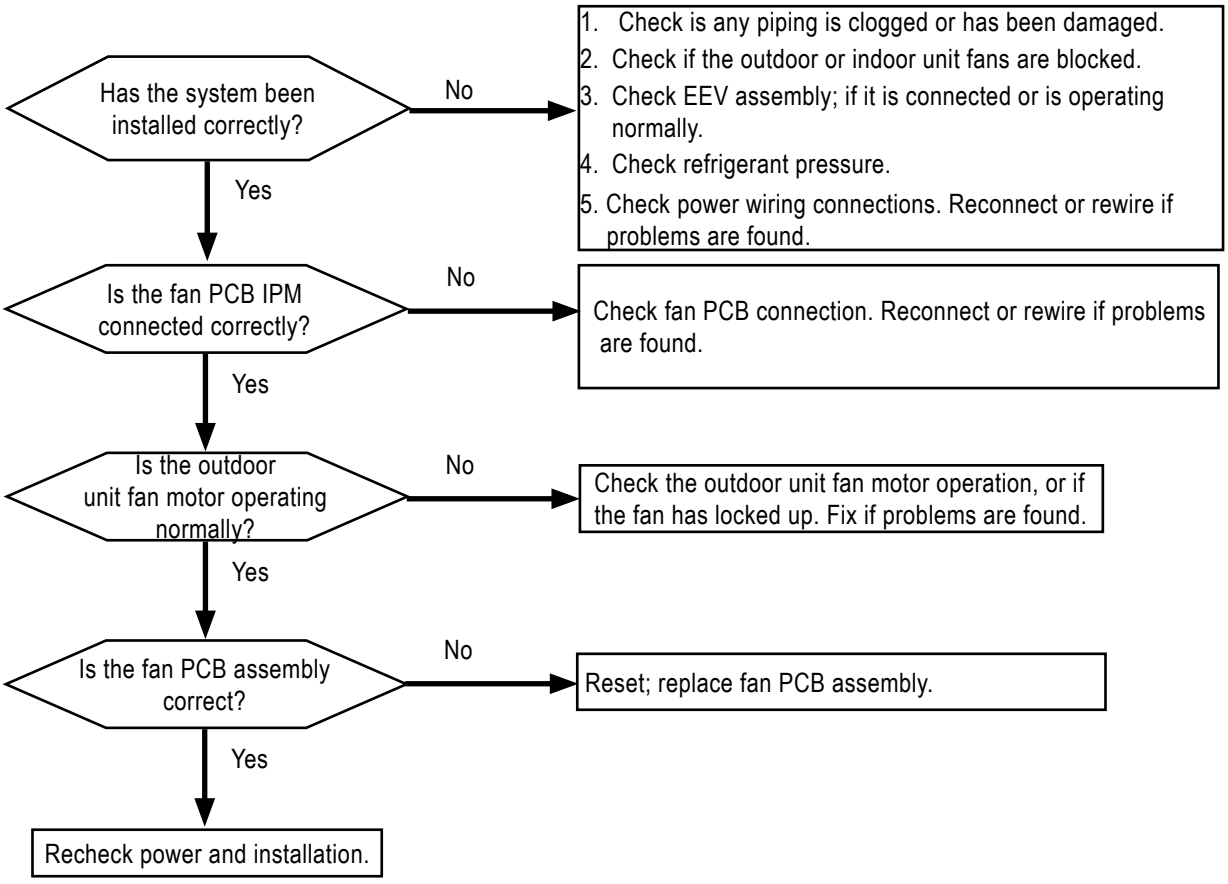
Communication LED
Between Main and Sub MICOMs

SERVICE TROUBLESHOOTING

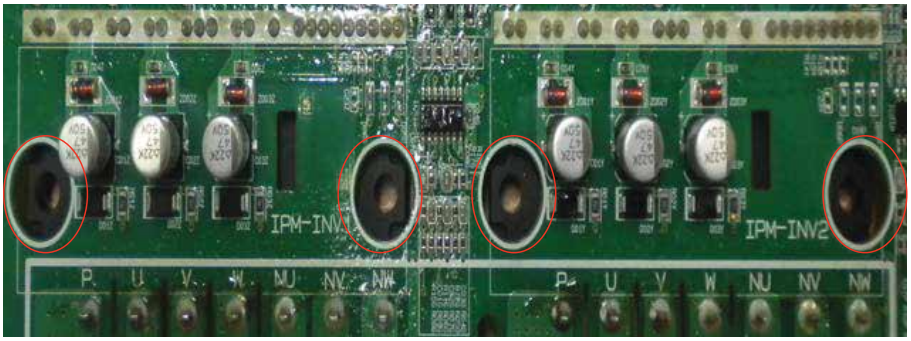
Error No. 193

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Error No.	Description	Details	Causes
193 Master: 1931 Slave 1: 1932 Slave 2: 1933	Excessive increase in outdoor unit fan PCB heatsink temperature.	System has shut off because outdoor unit fan PCB heatsink temperature is >194°F.	1. Fan PCB IPM connection is not correct. 2. Outdoor unit fan motor is not operating correctly. 3. Outdoor unit fan PCB assembly is defective. 4. Overload operation (piping has clogged, fan is blocked, EEV is defective, overcharge in refrigerant).



Check Fan PCB Connections



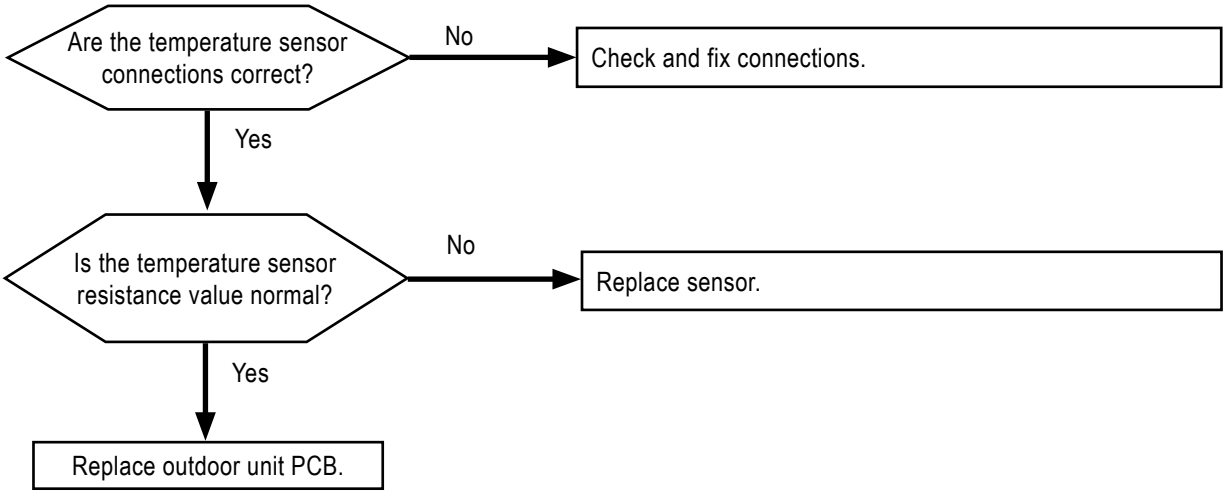
Check connections.

SERVICE TROUBLESHOOTING

Error No. 194

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Error No.	Description	Details	Causes
194 Master: 1941 Slave 1: 1942 Slave 2: 1943	Outdoor unit fan heatsink temperature sensor error.	Disconnection or short circuit of outdoor unit fan heatsink temperature sensor.	1. Defective temperature sensor connection. 2. Defective temperature sensor (sensor has disconnected or has shorted out). 3. Defective outdoor unit PCB.



- *If the value is >100kΩ (open) or <100Ω (short), there is an error.*
- *Temperature sensor resistance value may change according to sensor temperature, it displays according to current temperature criteria (±5% margin) → Normal.*
- *Air temperature sensor: 50°F = 20.7kΩ : 77°F = 10kΩ : 122°F = 3.4kΩ.*
- *Pipe temperature sensor: 50°F = 10kΩ : 77°F = 5kΩ : 122°F = 1.8kΩ.*

Error No. 51 C

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Error No.	Description	Details	Causes
51 C+ No. (#) of Heat Recovery Unit	Capacity of indoor units connected to the heat recovery unit exceeds allowable limits.	Total capacity of indoor unit(s) connected to each heat recovery unit port exceeds allowable limits.	1. Communication cable or piping is not connected properly. 2. Heat recovery PCB DIP switch is not set correctly. 3. The indoor unit connected on each heat recovery unit port exceed the allowable capacity limit.

SERVICE TROUBLESHOOTING

Error No. 2001

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Error No.	Description	Details	Causes
2001 Master: 21→001	Pipe detection error.	After auto operation, the number of the indoor units detected is different from the number of communicating indoor units.	1. The power wiring or the communications cable to the heat recovery unit is defective. 2. After auto-addressing, indoor unit has the wrong address (defective indoor unit PCB and / or power wiring / communications cable). 3. The heat recovery unit rotary or DIP switch setting(s) is (are) wrong. 4. The heat recovery unit PCB is defective.

1. Check if the green communication LED is blinking on the heat recovery units.
2. After the green communication LED blinking consistently:
   - Check input power of the heat recovery units (± 10%).
   - After reset the power to the outdoor unit, wait more than 30 minutes for the temperature of the piping to decrease, then run the auto addressing procedure.
   - When the power to the heat recovery unit is on, check the display for the total number of indoor units (See Error No. 05).
3. After the green communication LED of the heat recovery units starts to blink consistently, check the rotary and DIP switch settings. Reset the power to the outdoor and heat recovery units, wait more than 30 minutes for the temperature of the piping to decrease, then run the auto addressing procedure.
4. If the number of indoor units installed is different than what was detected, check the piping installation. (Outdoor unit ↔ Heat Recovery unit ↔ Indoor units.
5. If an indoor unit has not been connected to the first valve on the heat recovery unit, set number one valve of heat recovery unit, set pipes of heat recovery unit manually.
6. If it is not applied as above, set pipes of heat recovery unit as manual.
7. Check display method of outdoor main PCB LED display.
8. “88” indoor unit quantity when checked through auto-addressing; “88” indoor unit quantity when checked through pipe checking.

SERVICE TROUBLESHOOTING

Error Nos. 201C, 202C

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Error No.	Description	Details	Causes
201 C+ No. (#) of Heat Recovery Unit	Heat recovery unit liquid piping temperature sensor error.	Abnormal sensor value (sensor has disconnected or has shorted out).	1. Temperature sensor connection is defective. 2. Defective temperature sensor (sensor has disconnected or has shorted out). 3. Outdoor unit PCB is defective.
202 C+ No. (#) of Heat Recovery Unit	Heat recovery unit subcooling inlet piping temperature sensor error.		
203 C +No. (#) of Heat Recovery Unit	Heat recovery unit subcooling discharge piping temperature sensor error.		

1. Check the connections of the temperature sensor and the lead cable.
2. Is the value of temperature sensor normal? If not, replace sensor (pipe temperature sensor: 50°F = 10kΩ : 77°F = 5kΩ : 122°F = 1.8kΩ).
3. If the sensor connection and values are correct, replace the outdoor unit PCB.

Heat Recovery Unit	HR No. 1	HR No. 2	HR No. 3	HR No. 4	HR No. 5	HR No. 6	HR No. 7	HR No. 8	HR No. 9	HR No. 10	HR No. 11	HR No. 12	HR No. 13	HR No. 14	HR No. 15	HR No. 16
Error Displayed	C01	C02	C03	C04	C05	C06	C07	C08	C09	C10	C11	C12	C13	C14	C15	C16

Example of Heat Recovery R unit Error

- #16 Heat Recovery Unit Subcooling Inlet Piping Temperature Sensor Error 200→C16 (Repeated).
- C = Heat Recovery Unit
- # = Heat Recovery Unit Number

SERVICE TROUBLESHOOTING

Error No. 204 C

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Error No.	Description	Details	Causes
204 C+ No. (#) of Heat Recovery Unit	Communication error between outdoor unit and heat recovery unit.	Outdoor unit does not receive signal from heat recovery unit.	1. Heat recovery unit power wiring and / or communication cable connections are defective. 2. The heat recovery unit rotary or DIP switch setting(s) is (are) wrong. 3. Heat recovery unit PCB is defective.

1. Check power wiring and communication cable connections. Check if the green communication LED on the heat recovery unit is blinking.
2. If the green communication LED is blinking normally, check the rotary and DIP switch settings on the heat recovery unit (See Error No. 200). Reset the power to the outdoor and heat recovery units. (If there is a heat recovery unit communication error, it can't be released until the power to the outdoor unit is reset.)
3. If the green communication LED of the heat recovery unit is not blinking (just on continuously), check the communication condition of total indoor units (See Error No. 05). If the green communication LED of the heat recovery unit is not blinking (just on continuously), and even if communications to the indoor unit is functioning, replace the heat recovery unit PCB.

⚠DANGER

- *High voltage electricity is required to operate this system. Adhere to the NEC code and these instructions when wiring. Improper connections and inadequate grounding can cause accidental injury or death.*
- *Turn the power off before servicing the equipment. Electrical shock can cause physical injury or death.*
- *Do not operate the disconnect switch with wet hands. There is risk of fire, electric shock, physical injury or death.*

⚠WARNING

- *Disconnects should only be performed by a properly licensed electrician. Incorrect wiring could cause the disconnect to explode, leading to physical injury or death.*
- *Do not operate the unit with the panel(s) or protective cover(s) removed. The hot, cold, and high-voltage parts of the unit can cause physical injury or death.*
- *Do not touch the refrigerant piping during or after operation. It can cause burns or frostbite.*

Note

- *If the power wiring and communication cables on the heat recovery unit are not properly connected (connections switched), the communication components will burn out and the system will not operate.*
- *Do not supply power to the unit until all electrical wiring and controls wiring are completed.*

Error No. 205 C

⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Error No.	Description	Details	Causes
205 C+ No. (#) of Heat Recovery Unit	Communication error between heat recovery unit and the 485 modem. (2A Series Heat Recovery Units)	Communication error occurred between the heat recovery unit and the heat recovery unit 485 modem. (2A Series Heat Recovery Units)	1. Incorrect wiring between heat recovery unit and 485 modem. 2. The 485 PCB modem is defective. 3. The heat recovery unit PCB is defective.

1. Check the communication cable connection between the heat recovery unit (2A Series) and the 485 modem. Check to see if the red LED is on.
2. If the red LED on the 485 modem is on, reset the outdoor unit and the power of the heat recovery unit.
3. If the red LED is flashing, replace the 485 modem.
4. If the red LED still flashes even after the 485 modem is replaced, replace the heat recovery unit PCB.

SERVICE TROUBLESHOOTING

Error No. 206 C

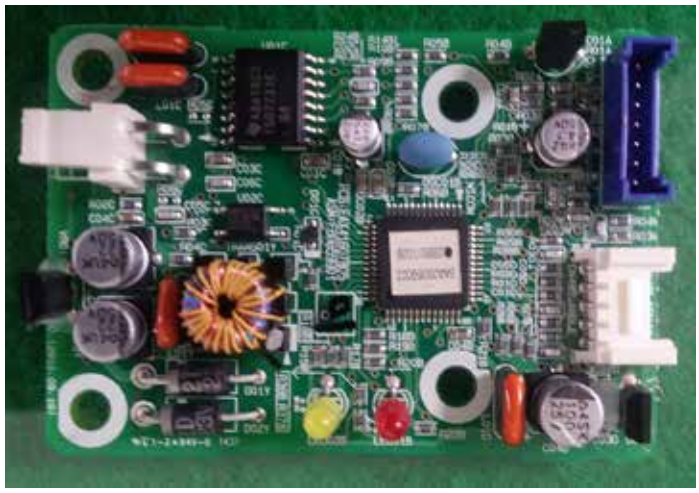
⚠WARNING *Please refer to the Safety Precautions on pages 4-7 for more detail to prevent injury or death regarding the operation and service troubleshooting of the Multi V IV product.*

Error No.	Description	Details	Causes
206 C+ No. (#) of Heat Recovery Unit	Duplicate address error of the heat recovery unit.	The heat recovery unit address is duplicated for 485 communication. (2A Series Heat Recovery Units)	1. The power wiring and / or the communication cable connection of the heat recovery unit is defective. 2. Error of the address rotary switch settings on the heat recovery unit. 3. The heat recovery unit PCB is defective.

1. Check if the rotary switch settings on each heat recovery unit PCB are set correctly. If not, set the rotary switches again, verifying that the settings are different on the different heat recovery units.
2. Reset the outdoor unit and the power of the heat recovery unit.
3. After Step No. 2 is complete, perform auto addressing again.
4. If the error occurs again even after auto addressing is complete, replace the corresponding heat recovery PCB.

- Error Code 206C only occurs on heat recovery units with a 485 modem (2A Series heat recovery units; 9,600 bps communication).
- Refer to the outdoor unit installation manual for heat recovery unit rotary switch address settings.

485 Modem on 2A Series Heat Recovery Units



LG Electronics U.S.A., Inc.
Commercial Air Conditioning Division
11405 Old Roswell Road
Alpharetta, Georgia 30009
www.lg-vrf.com

LG Customer Information Center, Commercial Products
1-888-865-3026 USA
Follow the prompts for commercial A/C products.