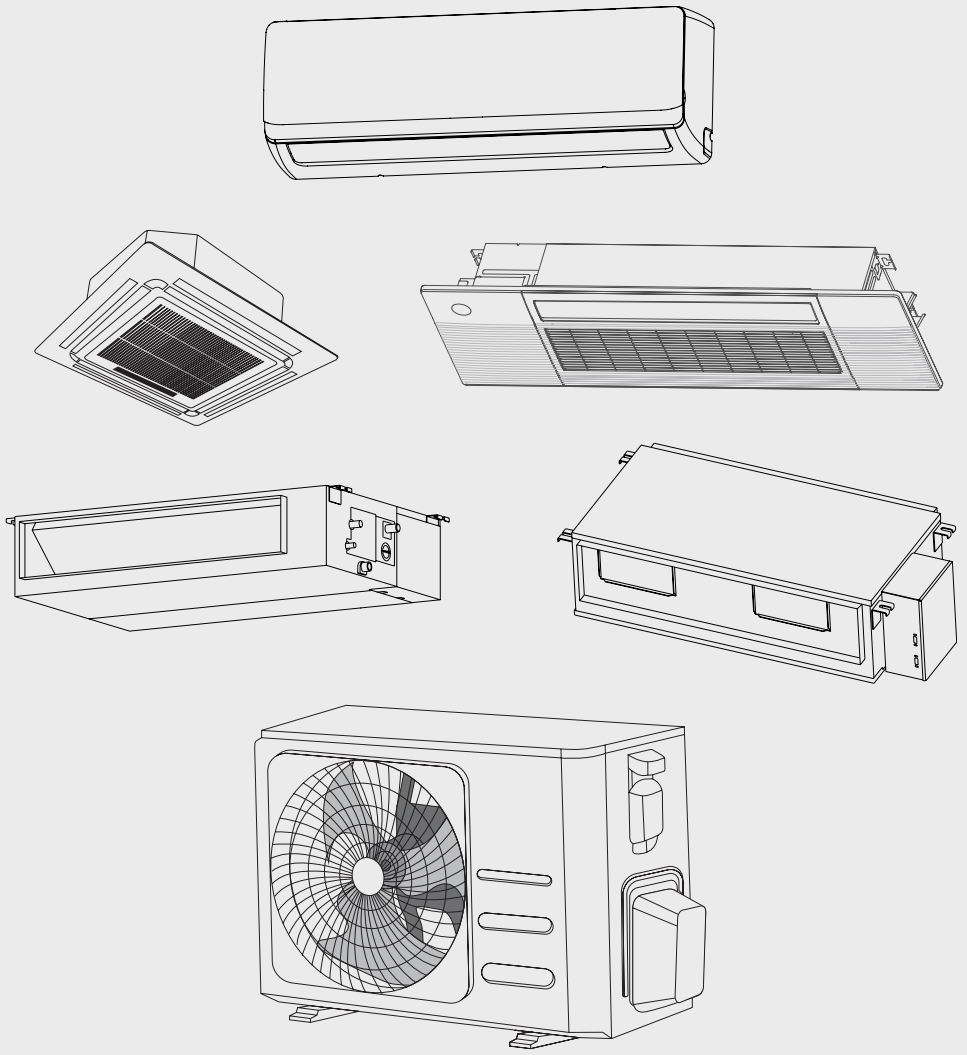
BOSCH

Service Manual

Multi Zone Ductless Air Conditioner/Heat Pump

Climate 5000 Series - Gen 4



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1 Key to Symbols and Safety Instructions

1.1 Key to Symbols

Warnings

In warnings, signal words at the beginning of a warning are used to indicate the type and seriousness of the ensuing risk if measures for minimizing danger are not taken.

The following keywords are defined and can be used in this document:

DANGER

DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

CAUTION indicates a hazardous situation which, if not avoided, could result in minor to moderate injury.

NOTICE

NOTICE is used to address practices not related to personal injury.

Important information

The info symbol indicates important information where there is no risk to people or property.

1.2 Explanation of Symbols Displayed on the Indoor Unit / Outdoor Unit

Symbol	
	WARNING This symbol shows that this appliance used a flammable refrigerant. If the refrigerant is leaked and exposed to an external ignition source, there is a risk of fire.
	CAUTION This symbol shows that the operation manual should be read carefully.
	CAUTION This symbol shows that a service personnel should be handling this equipment with reference to the installation manual.
	
	CAUTION This symbol shows that information is available such as the operating manual or installation manual.

Table 1

1.3 Safety

Please read safety precautions before installation

Incorrect installation due to ignoring instructions can cause serious damage or injury.

WARNING

Improper or dangerous operation!

Installation must be performed by a licensed contractor, and per the instructions in the installation manual. Improper installation can cause water leakage, electrical shock, or fire.

In North America, installation must be performed in accordance with the requirement of NEC (National Electric Code) and CEC (Canadian Electric Code) by licensed and qualified personnel only.

Only contact a licensed contractor for repair or maintenance of this unit.

WARNING

Electrical hazard!

Do not modify the length of the power supply cord or use an extension cord to power the unit.

Do not share the electrical outlet with other appliances. Improper or insufficient power supply can cause fire or electrical shock.

WARNING

Contains lead!

This product can expose you to chemicals including Lead and Lead components, which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

WARNING

Installation requirements!

Installation must be performed by a licensed contractor, and per the instructions in the installation manual. Improper installation can cause water leakage, electrical shock, or fire.

In North America, installation must be performed in accordance with the requirement of NEC (National Electric Code) and CEC (Canadian Electric Code) by licensed and qualified personnel only.

Only contact a licensed contractor for repair or maintenance of this unit.

Only use the included accessories, parts, and specified parts for installation. Using non-standard parts can cause water leakage, electrical shock, fire, and can cause the unit to fail.

Install the unit in a solid location that can support the unit's weight. If the chosen location cannot support the unit's weight, or the installation is not done properly, the unit may drop and cause serious injury and/or damage.

WARNING

Electrical hazard!

For all electrical work, follow all local and national wiring standards, regulations, and the Installation Manual. The power supply to the outdoor unit requires a service disconnect at the unit. Only use a dedicated circuit. Never share a power source connected to this system. Insufficient electrical capacity or defects in electrical work can cause electrical shock or fire.

For all electrical work, use the specified cables. Connect cables tightly, and clamp them securely to prevent external forces from damaging the terminal. Improper electrical connections can overheat and cause fire, and may also cause shock.

All wiring must be properly arranged to ensure that the control board cover can close properly. If the control board cover is not closed properly, it can lead to corrosion and cause the connection points on the terminal to heat up, catch fire, or cause electrical shock.

In certain functional environments, such as kitchens, server rooms, etc., the use of specially designed air-conditioning units is highly recommended.

If the power supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons such as a licensed electrician in order to avoid a hazard.

The product must be properly grounded at the time of installation, or electrical shock may occur.

If connecting power to fixed wiring, an all-pole disconnection device which has at least 3mm clearances in all poles, and have a leakage current that may exceed 10mA, the residual current device(RCD) having a rated residual operating current not exceeding 30mA, and disconnection must be incorporated in the fixed wiring in accordance with the wiring rules.

CAUTION

Fire hazard!

For units that have an auxiliary electric heater, do not install the unit within 1 meter (3 feet) of any combustible materials.

Do not install the unit in a location that may be exposed to combustible gas leaks. If combustible gas accumulates around the unit, it may cause fire.

Do not operate your air conditioner in a wet room such as a bathroom or laundry room. Too much exposure to water can cause electrical components to short circuit.

NOTICE

Property damage!

Install condensate drainage piping according to the instructions in this manual. Improper condensate drainage may cause water damage to your home and property.

CAUTION

Contains refrigerant!

This air-conditioning unit contains fluorinated gases. For specific information on the type of gas and the amount, please refer to the relevant label on the outdoor unit itself.

Installation, service, maintenance and repair of this unit must be performed by a certified technician.

Product removal and recycling must be performed by a certified technician.

If the system has a leak-detection system installed, it must be checked for leaks at least every 12 months.

When the unit is checked for leaks, proper record-keeping of all checks is strongly recommended.

NOTICE

Product damage!

Fuse specifications: The air conditioner's circuit board (PCB) is designed with a fuse to provide overcurrent protection. The specifications of the fuse are printed on the circuit board , for example : T3.15AL/250VAC, T5AL/250VAC, T3.15A/250VAC, T5A/250VAC, T20A/250VAC, T30A/250VAC,etc.

Only blast-proof ceramic fuses can be used.

WARNING

Flammable refrigerant!

Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.

The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance or an operating electric heater).

Do not pierce or burn.

Be aware that refrigerants may not contain an odor.

CAUTION

Fire, personal injury, product damage!

Remove all static electricity before touching units.

NOTICE

Improper operation, product damage!

R454B refrigerant models cannot be combined with models from previous Mini-Split generations (R410A refrigerant).

In addition, you must ONLY use R454B if additional refrigerant needs to be added into the system. Do NOT use any other refrigerant type.

1.3.1 For R454B refrigerant charge amount and minimum room area

Requirments for room area limits using R454B refrigerant in unventilated areas: Our Multizone Systems are all confirmed to meet the requirement of Enhanced Tightness Refrigerating Systems. Units installed at a height not exceeding 1.8m above the ground are equipped with an A2L refrigerant sensor, which minimum room area (A_{min}) of operating or storage should be determined according to refrigerant charge (m_c) or releasable charge (m_{rel}) of system, as specified in the following table. The values on the table below are applicable for units installed between 5.9ft/1.8m and 7.2ft/2.2m.

Capacity (Btu/h)	Multizone ODU
18K	BMS500-AAM018-1CSXRD BMS500-AAM018-1CSXHD
27K	BMS500-AAM027-1CSXRD BMS500-AAM027-1CSXHD
36K	BMS500-AAM036-1CSXRD BMS500-AAM036-1CSXHD
48K	BMS500-AAM048-1CSXRD BMS500-AAM048-1CSXHD

Table 2

For releasable charge limited system:

SAFETY SHUT-OFF VALVES are used in some multizone outdoor units, as shown in the following table, for the purposes of limiting the releasable charge, which are activated by a leak detection system.

WARNING

Fire, Personal injury, product damage!

SAFETY SHUT-OFF VALVES default to fully closed position when the appliance is de-energised, so refrigerant will not be completely released even when it was dismantled. Ensure the complete release of refrigerant through one of following methods before repairing the machine.

- Method 1: Release refrigerant while the machine is powered on.
- Method 2: Remove the coil of safety shut-o valve before power-o.
- Method 3: Manually open the safety shut-o valve using a magnetic ring.

Model	Outdoor unit	Releasable charge limited system
18K Regular	BMS500-AAM018-1CSXRD	No
18K Max Performance	BMS500-AAM018-1CSXHD	Yes
27K Regular	BMS500-AAM027-1CSXRD	Yes
27K Max Performance	BMS500-AAM027-1CSXHD	Yes
36K Regular	BMS500-AAM036-1CSXRD	Yes
36K Max Performance	BMS500-AAM036-1CSXHD	Yes
48K Regular	BMS500-AAM048-1CSXRD	Yes
48K Max Performance	BMS500-AAM048-1CSXHD	Yes

Table 3

Releasable charge (m_{rel}) of a multi zone system should be calculated based on internal volume of all indoor units and connecting pipes. Each indoor units correspond to a releasable charge as shown in the following table. Add them up based on the combination of indoor units, and then add to the basic releasable charge of 204g. You will then get the total releasable charge of system.

The calculation is based on the standard connection pipe length of 24.6ft/7.5m for each indoor units, an extra releasable charge should be added for per meter exceeding 24.6ft/7.5m.

WARNING

Fire, property damage, personal injury, or death!

The minimum area for installation must be met. The minimum room area or minimum room area of conditioned space is based on releasable charge and total system refrigerant charge.

Model	Indoor unit	Releasable charge for each unit	Basic releasable charge	Extra releasable charge	Total releasable charge
6K	BMS500-AAU006-1AHWXD	393 g	204 g (Leakage at a rate of 6.8 g/s for 30 s)	0 g when connection pipe length for each indoor units are within 24.6ft/7.5 m. 20 g per meter exceeding 24.6ft/7.5 m for each 6K/9K/12K/18K units. 50 g per meter exceeding 24.6ft/7.5 m for each 24K/36K units.	Add 3 parts of releasable charge based on the combination of indoor units, you will get the total releasable charge of system.
9K	BMS500-AAU009-1AHWXD	393 g			
12K	BMS500-AAU012-1AHWXD	393 g			
18K	BMS500-AAU018-1AHWXD	482 g			
24K	BMS500-AAU024-1AHWXD	1025 g			
36K	BMS500-AAU036-1AHWXD	1025 g			

Table 4

Amin[sqft/m^2]	hinst [ft/m]					
mc or mREL [oz/kg]	6.0-7.3/1.8-2.2	7.5/2.3	7.9/2.4	8.5/2.6	9.2/2.8	9.8/3.0
≤62.7/1.776		12/1.10				
63.5/1.8	60/5.53	57/5.29	55/5.07	50/4.68	47/4.34	44/4.05
70.5/2	67/6.15	63/5.88	61/5.63	56/5.2	52/4.83	48/4.50
77.6/2.2	73/6.76	70/6.46	67/6.19	62/5.72	57/5.31	53/4.95
84.6/2.4	80/7.38	76/7.05	73/6.76	67/6.24	62/5.79	58/5.41
91.7/2.6	86/7.99	82/7.64	79/7.32	73/6.76	67/6.27	63/5.86
98.8/2.8	93/8.60	89/8.23	85/7.88	78/7.28	73/6.76	68/6.31
105.8/3	100/9.22	95/8.81	91/8.45	84/7.8	78/7.24	73/6.76
112.9/3.2	106/9.83	101/9.4	97/9.01	90/8.32	83/7.72	78/7.21
119.9/3.4	113/10.45	107/9.99	103/9.57	95/8.84	88/8.2	82/7.66
127/3.6	120/11.06	114/10.58	109/10.14	101/9.36	94/8.69	87/8.11
134/3.8	126/11.68	120/11.16	115/10.7	106/9.88	99/9.17	92/8.56
141.1/4	133/12.29	126/11.75	121/11.26	112/10.4	104/9.65	97/9.01
148.1/4.2	139/12.90	133/12.34	127/11.82	117/10.91	109/10.14	102/9.46
155.2/4.4	146/13.52	139/12.93	133/12.39	123/11.43	114/10.62	107/9.91
162.2/4.6	153/14.13	145/13.51	139/12.95	129/11.95	119/11.1	111/10.36
169.3/4.8	159/14.75	152/14.1	145/13.51	134/12.47	125/11.58	116/10.81
176.4/5	166/15.36	158/14.69	152/14.08	140/12.99	130/12.07	121/11.26

Table 5

***Amin**: the required minimum room area in ft² /m²*

***mc**: the actual refrigerant charge in the system in oz/kg*

***mREL**: the refrigerant releaseable charge in oz/kg*

***hinst**: the height of the bottom of the appliance relative to the floor of the room after installation.*

Installation (where refrigerant pipes are allowed)

- Any person who is involved with working on or breaking into a refrigerant circuit should hold a current valid certificate from an industry-accredited assessment authority, which authorises their competence to handle refrigerants safely in accordance with an industry recognised assessment specification.
- Maintenance and repair requiring the assistance of other skilled personnel shall
  be carried out under the supervision of the person competent in the use of flammable refrigerants.
- That the installation of pipe-work shall be kept to a minimum.
- That pipe-work shall be protected from physical damage.
- Where refrigerant pipes shall be compliance with national gas regulations.
- That mechanical connections shall be accessible for maintenance purposes.
- Be more careful that foreign matter (oil, water,etc) does not enter the piping. Also, when storing the piping, securely seal the opening by pinching, taping, etc.
- All working procedure that affects safety means shall only be carried by competent persons.
- Appliance shall be stored in a well ventilated area where the room size corresponds to the room area as specifiec for operation.
- Joints shall be tested with detection equipment with a capability of 5 g/ year of refrigerant or better, with the equipment in standstill and under operation or under a pressure of at least these standstill or operation conditions after installation. Detachable joints shall NOT be used in the indoor side of the unit (brazed, welded joint could be used).
- In cases that require mechanical ventilation, ventilation openings shall be kept clear of obstruction.
- LEAK DETECTION SYSTEM installed. Unit must be powered except for service. For the unit with refrigerant sensor, when the refrigerant sensor detects refrigerant leakage, the indoor unit will display a error code (EL0C) and emit a buzzing sound, the compressor of outdoor unit will immediately stop, and the indoor fan will start running. The service life of the refrigerant sensor is 15 years. When the refrigerant sensor malfunctions, the indoor unit will display the error code “FHCC”. The refrigerant sensor can not be repaired and can only be replaced by the manufacture. It shall only be replaced with the sensor specified by the manufacture.

Flammable Refrigerant

When a FLAMMABLE REFRIGERANT is used, the requirements for installation space of appliance and/or ventilation requirements are determined according to:

- the mass charge amount(M) used in the appliance,
- the installation location,
- the type of ventilation of the location or of the appliance.
- piping material, pipe routing, and installation shall include protection from physical damage in operation and service, and be in compliance with national and local codes and standards, such as ASHRAE 15, IAPMO Uniform Mechanical Code, ICC International Mechanical Code, or CSA B52. All field joints shall be accessible for inspection prior to being covered or enclosed.
- that protection devices, piping, and fittings shall be protected as far as possible against adverse environmental effects, for example, the danger of water collecting and freezing in relief pipes or the accumulation of dirt and debris;
- that piping in refrigeration systems shall be so designed and installed to minimize the likelihood of hydraulic shock damaging the system;
- that steel pipes and components shall be protected against corrosion with a rustproof coating before applying any insulation;
- that precautions shall be taken to avoid excessive vibration or pulsation;
- the minimum floor area of the room shall be mentioned in the form of a table or a single figure without reference to a formula;
- after completion of field piping for split systems, the field pipework shall be pressure tested with an inert gas and then vacuum tested prior to refrigerant charging, according to the following requirements:
  a. The minimum test pressure for the low side of the system shall be the low side design pressure and the minimum test pressure for the high side of the system shall be the high side design pressure, unless the high side of the system can not be isolated from the low side of the system in which case the entire system shall be pressure tested to the low side design pressure.
  b. The test pressure after removal of pressure source shall be maintained for at least 1 h with no decrease of pressure indicated by the test gauge, with test gauge resolution not exceeding 5% of the test pressure.
  c. During the evacuation test, after achieving a vacuum level specified in the manual or less, the refrigeration system shall be isolated from the vacuum pump and the pressure shall not rise above 500 microns within 10 min. The vacuum pressure level shall be specified in the manual, and shall be the lessor of 500 microns or the value required for compliance with national and local codes and standards, which may vary between residential, commercial,and industrial buildings. - field-made
- field-made refrigerant joints indoors shall be tightness tested according to the following requirements: The test method shall have a sensitivity of 5 grams per year of refrigerant or better under a pressure of at least 0.25 times the maximum allowable pressure. No leak shall be detected.

Qualification of Workers

Any maintenance, service and repair operations must be required qualification of the working personnel. Every working procedure that aects safety means shall only be carried out by competent persons that joined the training and achieved competence should be documented by a certificate. The training of these procedures is carried out by national training organizations or manufacturers that are accredited to teach the relevant national competency standards that may be set in legislation. All training shall follow the ANNEX HH requirements of UL 60335-2-40 4th Edition. Examples for such working procedures are:

- breaking into the refrigerating circuit;
- opening of sealed components;
- opening of ventilated enclosures.

Ventilated area

Ensure that the area is in the open or that it it adequately ventilated before breaking into the system or conducting any hot work. A degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.

Cabling or Electrical Wiring

Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental eects. The check shall also take into account the effects of aging or continual vibration from sources such as compressors or fans.

Detection of Flammable Refrigerants

Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) shall not be used. The following leak detection methods are deemed acceptable for refrigerant systems. Electronic leak detectors may be used to detect refrigerant leaks but, in the case of FLAMMABLE REFRIGERANTS, the sensitivity may not be adequate, or may need re-calibration. (Detection equipment shall be calibrated in a refrigerantfree area.) Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed, and the appropriate percentage of gas (25 % maximum) is confirmed. Leak detection fluids are also suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work.

Examples of leak detection fluids are:

- bubble method
- fluorescent method agents

If a leak is suspected, all naked flames shall be removed/extinguished.
If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak. See the following instructions of removal of refrigerant.

Removal and Evacuation

When breaking into the refrigerant circuit to make repairs or for any other purpose conventional procedures shall be used. However, for flammable refrigerants it is important that best practice be followed, since flammability is a consideration. The following procedure shall be adhered to:

Safely remove refrigerant following local and national regulations purge the circuit with inert gas (optional for A2L) evacuate (recommended for A2L) continuously flush or purge with inert gas when using flame to open circuit; and open the circuit.

The refrigerant charge shall be recovered into the correct recovery cylinders. For appliances containing flammable refrigerants, the system shall be purged with oxygen-free nitrogen to render the appliance safe for flammable refrigerants. This process might need to be repeated several times. Compressed air or oxygen shall not be used for purging refrigerant systems.

For appliances containing flammable refrigerants, refrigerants purging shall be achieved by breaking the vacuum in the system with oxygen-free nitrogen and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum (optional for A2L). This process shall be repeated until no refrigerant is within thesystem (optional for A2L). When the final oxygen-free nitrogen charge is used, the system shall be vented down to atmospheric pressure to enable work to take place. The outlet for the vacuum pump shall not be close to any potential ignition sources, and ventilation shall be available.

Charging Procedures

In addition to conventional charging procedures, the following requirements shall be followed: Works shall be undertaken with appropriate tools only (In case of uncertainty, please consult the manufacturer of the tools for use with flammable refrigerants) Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimize the amount of refrigerant contained in them. Cylinders shall be kept upright. Ensure that the refrigeration system is earthed prior to charging the system with refrigerant. Label the system when charging is complete(if not already). Extreme care shall be taken not to overfill the refrigeration system. Prior to recharging the system it shall be pressure tested with oxygen free nitrogen (OFN). The system shall be leak tested on completion of charging but prior to commissioning. A follow up leak test shall be carried out prior to leaving the site.

Use ONLY R454B refrigerant with this product. All other refrigerant types, and the mixing of refrigerant types, is strictly prohibited.

Recovery

When removing refrigerant from a system, either for servicing or decommissioning, it is recommended good practice that all refrigerants are removed safely. When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct number of cylinders for holding the total system charge is available. All cylinders to be used are designatedAll cylinders to be used are designated for the recovered refrigerant and labelled for that refrigerant (i. e. special cylinders for the recovery of refrigerant). Cylinders shall be complete with pressure-relief valve and associated shut-o valves in good working order. Empty recovery cylinders are evacuated and, if possible,cooled before recovery occurs.

The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of the flammable refrigerant. If in doubt, the manufacturer should be consulted. In addition, a set of calibrated weighing scales shall be available and in good working order. Hoses shall be complete with leak-free disconnect couplings and in good condition.

The recovered refrigerant shall be processed according to local legislation in the correct recovery cylinder, and the relevant waste transfer note arranged. Do not mix refrigerants in recovery units and especially not in cylinders.

If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant. The compressor body shall not be heated by an open flame or other ignition sources to accelerate this process. When oil is drained from a system, it shall be carried out safely.

Transportation, Marking and Storage for Units

1. Transport of equipment containing flammable refrigerants: Must be in compliance with the transport regulations.
2. Marking of equipment using signs: Must be in compliance with local regulations.
3. Disposal of equipment using flammable refrigerants: Must be in compliance with national regulations.
4. Storage of equipment/appliances: The storage of equipment should be in accordance with the manufacturer's instructions.
5. Storage of packed (unsold) equipment: The storage package protection should be constructed such that mechanical damage to the equipment inside the package will not cause a leak of the refrigerant charge. The maximum number of pieces of equipment permitted to be stored together will be determined by local regulations.

2 Part Names and Model Numbers

2.1 Outdoor Models

Power supply	Capacity	Max Zone	Regular Outdoor Units	Max Performance Outdoor Units
208/230V 60Hz, 1Phase	18K	3	BMS500-AAM018-1CSXRD	BMS500-AAM018-1CSXHD
	27K	4	BMS500-AAM027-1CSXRD	BMS500-AAM027-1CSXHD
	36K	5	BMS500-AAM036-1CSXRD	BMS500-AAM036-1CSXHD
	48K	6	BMS500-AAM048-1CSXRD	BMS500-AAM048-1CSXHD

Table 6

2.2 Indoor Models

Power Supply	Capacity	Wall Mounted Indoor Units	4-Way Cassette Indoor Units	One-Way Cassette Indoor Units	Ducted Indoor Units
208/230V 60Hz, 1Phase	6K	BMS500-AAU006-1AHWXD	–	–	–
	9K	BMS500-AAU009-1AHWXD	BMS500-AAU009-1AHCXD	BMS500-AAU009-1AHZXD	BMS500-AAU009-1AHDXD
	12K	BMS500-AAU012-1AHWXD	BMS500-AAU012-1AHCXD	BMS500-AAU012-1AHZXD	BMS500-AAU012-1AHDXD
	18K	BMS500-AAU018-1AHWXD	BMS500-AAU018-1AHCXD	BMS500-AAU018-1AHZXD	BMS500-AAU018-1AHDXD
	24K	BMS500-AAU024-1AHWXD	BMS500-AAU024-1AHCXD	–	BMS500-AAU024-1AHDXD
	30K	BMS500-AAU030-1AHWXD	–	–	–
	36K	BMS500-AAU036-1AHWXD	–	–	–
	48K	–	–	–	–
	60K	–	–	–	–

Table 7

For Indoor Units, please refer to Indoor Unit Service Manual.

2.3 Multizone Configurations

2.3.1 Regular Performance

Multi Zone Pairing Information	1 ZONE	2 ZONE	3 ZONE	4 ZONE	5 ZONE
BMS500-AAM018-1CSXRD	12	6+6	6+6+6		
	18	6+9	6+6+9		
		6+12	6+9+9		
		6+18			
		9+9			
		9+12			
		12+12			

Table 8

Multi Zone Pairing Information	1 ZONE	2 ZONE	3 ZONE	4 ZONE	5 ZONE
BMS500-AAM027-1CSXRD	18	6+6	6+6+6	6+6+6+6	
	24	6+9	6+6+9	6+6+6+9	
		6+12	6+6+12	6+6+6+12	
		6+18	6+6+18	6+6+9+9	
		6+24	6+6+24	6+6+9+12	
		9+9	6+9+9	6+9+9+9	
		9+12	6+9+12	6+9+9+12	
		9+18	6+9+18	9+9+9+9	
		9+24	6+12+12		
		12+12	6+12+18		
		12+18	9+9+9		
		12+24	9+9+12		
		18+18	9+9+18		
			9+12+12		
			12+12+12		

Table 9

Multi Zone Pairing Information	1 ZONE	2 ZONE	3 ZONE		4 ZONE		5 ZONE
BMS500-AAM036-1CSXRD	24	6+18	6+6+6	9+9+24	6+6+6+6	6+9+9+24	6+6+6+6+6
	30	6+24	6+6+9	9+12+12	6+6+6+9	6+9+12+12	6+6+6+6+9
		9+9	6+6+12	9+12+18	6+6+6+12	6+9+12+18	6+6+6+6+12
		9+12	6+6+18	9+12+24	6+6+6+18	6+12+12+12	6+6+6+6+18
		9+18	6+6+24	9+18+18	6+6+6+24	6+12+12+18	6+6+6+9+9
		9+24	6+9+9	12+12+12	6+6+9+9	9+9+9+9	6+6+6+9+12
		12+12	6+9+12	12+12+18	6+6+9+12	9+9+9+12	6+6+6+9+18
		12+18	6+9+18	12+12+24	6+6+9+18	9+9+9+18	6+6+9+9+9
		12+24	6+9+24	12+18+18	6+6+9+24	9+9+12+12	6+6+9+9+12
		18+18	6+12+12		6+6+12+12	9+9+12+18	6+6+9+9+18
			6+12+18		6+6+12+18	9+12+12+12	6+9+9+9+9
			6+12+24		6+6+12+24	12+12+12+12	6+9+9+9+12
			6+18+18		6+6+18+18		6+9+9+9+18
			9+9+9		6+9+9+9		9+9+9+9+9
			9+9+12		6+9+9+12		9+9+9+9+12
			9+9+18		6+9+9+18		

Table 10

Multi Zone Pairing Information	1 ZONE	2 ZONE	3 ZONE			4 ZONE			5 ZONE			6 ZONE	
BMS500-AAM048-1CSXRD	30	6+24	6+6+18	9+9+18	12+18+24	6+6+6+6	6+9+12+24	9+12+12+24	6+6+6+6+6	6+6+9+12+18	6+9+12+18+18	6+6+6+6+6+6	6+6+9+9+12+12
	36	6+30	6+6+24	9+9+24	12+18+30	6+6+6+9	6+9+18+18	9+12+18+18	6+6+6+6+9	6+6+9+12+24	6+12+12+12+12	6+6+6+6+6+9	6+6+9+9+12+18
		6+36	6+6+30	9+9+30	18+18+18	6+6+6+18	6+9+18+24	9+12+18+24	6+6+6+6+12	6+6+9+18+18	6+12+12+12+18	6+6+6+6+6+12	6+6+9+12+12+12
		9+18	6+6+36	9+9+36		6+6+6+24	6+12+12+12	9+18+18+18	6+6+6+6+18	6+6+9+18+24	9+9+9+9+9	6+6+6+6+6+18	6+6+9+12+12+18
		9+24	6+9+12	9+12+12		6+6+9+9	6+12+12+18	12+12+12+12	6+6+6+6+24	6+6+12+12+12	9+9+9+9+12	6+6+6+6+9+9	6+6+9+9+9+9
		9+30	6+9+18	9+12+18		6+6+9+12	6+12+12+24	12+12+12+18	6+6+6+9+9	6+6+12+12+18	9+9+9+9+18	6+6+6+6+9+12	6+6+9+9+9+12
		9+36	6+9+24	9+12+24		6+6+9+18	6+12+18+18	12+12+12+24	6+6+6+9+12	6+6+12+12+24	9+9+9+9+24	6+6+6+6+9+18	6+6+9+9+9+18
		12+12	6+9+30	9+12+30		6+6+9+24	6+12+18+24	12+12+18+18	6+6+6+9+18	6+6+12+18+18	9+9+9+12+12	6+6+6+6+12+12	6+6+9+9+12+12
		12+18	6+9+36	9+12+36		6+6+12+12	9+9+9+9		6+6+6+9+24	6+9+9+9+9	9+9+9+12+18	6+6+6+6+12+18	6+6+9+9+12+18
		12+24	6+12+18	9+18+18		6+6+12+18	9+9+9+12		6+6+6+12+12	6+9+9+9+12	9+9+9+12+24	6+6+6+9+9+9	6+6+9+12+12+12
		12+30	6+12+24	9+18+24		6+6+12+24	9+9+9+18		6+6+6+12+18	6+9+9+9+18	9+9+9+18+18	6+6+6+9+9+12	9+9+9+9+9+9
		12+36	6+12+30	9+18+30		6+6+18+18	9+9+9+24		6+6+6+12+24	6+9+9+9+24	9+9+12+12+12	6+6+6+9+9+18	9+9+9+9+9+12
		18+18	6+12+36	9+18+36		6+6+18+24	9+9+12+12		6+6+6+18+18	6+9+9+12+12	9+9+12+12+18	6+6+6+9+12+12	9+9+9+9+9+18
		18+24	6+18+18	12+12+12		6+9+9+9	9+9+12+18		6+6+6+18+24	6+9+9+12+18	9+12+12+12+12	6+6+6+9+12+18	9+9+9+9+12+12
		18+30	6+18+24	12+12+18		6+9+9+12	9+9+12+24		6+6+9+9+9	6+9+9+12+24	9+12+12+12+18	6+6+6+12+12+12	9+9+9+12+12+12
		18+36	6+18+30	12+12+24		6+9+9+18	9+9+18+18		6+6+9+9+12	6+9+9+18+18	12+12+12+12+12	6+6+6+12+12+18	
		24+24	6+18+36	12+12+30		6+9+9+24	9+9+18+24		6+6+9+9+18	6+9+12+12+12		6+6+9+9+9+9	
		24+30	9+9+9	12+12+36		6+9+12+12	9+12+12+12		6+6+9+9+24	6+9+12+12+18		6+6+9+9+9+12	
		24+36	9+9+12	12+18+18		6+9+12+18	9+12+12+18		6+6+9+12+12	6+9+12+12+24		6+6+9+9+9+18	

Table 11

2.3.2 Max Performance

Multi Zone Pairing Information	1 ZONE	2 ZONE	3 ZONE		4 ZONE	5 ZONE
BMS500-AAM018-1CSXHD	18	6+6	6+6+6			
	24	6+9	6+6+9			
		6+12	6+6+12			
		6+18	6+6+18			
		6+24	6+6+24			
		9+9	6+9+9			
		9+12	6+9+12			
		9+18	6+9+18			
		9+24	6+12+12			
		12+12	6+12+18			
		12+18	9+9+9			
		12+24	9+9+12			
		18+18	9+9+18			
			9+12+12			
			12+12+12			

Table 12

Multi Zone Pairing Information	1 ZONE	2 ZONE	3 ZONE		4 ZONE		5 ZONE
BMS500-AAM027-1CSXHD	24	6+18	6+6+6	9+9+12	6+6+6+6	6+9+9+18	
	30	6+24	6+6+9	9+9+18	6+6+6+9	6+9+9+24	
		9+9	6+6+12	9+9+24	6+6+6+12	6+9+12+12	
		9+12	6+6+18	9+12+12	6+6+6+18	6+9+12+18	
		9+18	6+6+24	9+12+18	6+6+6+24	6+12+12+12	
		9+24	6+9+9	9+12+24	6+6+9+9	6+12+12+18	
		12+12	6+9+12	9+18+18	6+6+9+12	9+9+9+9	
		12+18	6+9+18	12+12+12	6+6+9+18	9+9+9+12	
		12+24	6+9+24	12+12+18	6+6+9+24	9+9+9+18	
		18+18	6+12+12	12+12+24	6+6+12+12	9+9+12+12	
			6+12+18	12+18+18	6+6+12+18	9+9+12+18	
			6+12+24		6+6+12+24	9+12+12+12	
			6+18+18		6+6+18+18	12+12+12+12	
			6+18+24		6+9+9+9		
			9+9+9		6+9+9+12		

Table 13

Multi Zone Pairing Information	1 ZONE	2 ZONE	3 ZONE		4 ZONE			5 ZONE	
BMS500-AAM036-1CSXHD	30	6+24	6+6+12	9+9+9	6+6+6+6	6+9+9+18	9+9+9+24	6+6+6+6+6	6+9+9+12+12
	36	6+30	6+6+18	9+9+12	6+6+6+9	6+9+9+24	9+9+12+12	6+6+6+6+9	9+9+9+9+9
		6+36	6+6+24	9+9+18	6+6+6+12	6+9+12+12	9+9+12+18	6+6+6+6+12	9+9+9+9+12
		9+18	6+6+30	9+9+24	6+6+6+18	6+9+12+18	9+9+12+24	6+6+6+6+18	
		9+24	6+6+36	9+9+30	6+6+6+24	6+9+12+24	9+9+18+18	6+6+6+9+9	
		9+30	6+9+9	9+12+12	6+6+9+9	6+9+18+18	9+9+18+24	6+6+6+9+12	
		9+36	6+9+12	9+12+18	6+6+9+12	6+9+18+24	9+12+12+12	6+6+6+9+18	
		12+12	6+9+18	9+12+24	6+6+9+18	6+12+12+12	9+12+12+18	6+6+6+12+12	
		12+18	6+9+24	9+18+18	6+6+9+24	6+12+12+18	9+12+12+24	6+6+6+12+18	
		12+24	6+9+30	9+18+24	6+6+12+12	6+12+12+24	9+12+18+18	6+6+9+9+9	
		12+30	6+12+12	12+12+12	6+6+12+18	6+12+18+18	9+18+18+18	6+6+9+9+12	
		12+36	6+12+18	12+12+18	6+6+12+24	6+12+18+24	12+12+12+12	6+6+9+9+18	
		18+18	6+12+24	12+12+24	6+6+18+18	6+18+18+18	12+12+12+18	6+6+9+12+12	
		18+24	6+12+30	12+18+18	6+6+18+24	9+9+9+9	12+12+12+24	6+6+12+12+12	
		18+30	6+18+18	12+18+24	6+9+9+9	9+9+9+12	12+12+18+18	6+9+9+9+9	
		24+24	6+18+24	18+18+18	6+9+9+12	9+9+9+18		6+9+9+9+12	

Table 14

Multi Zone Pairing Information	1 ZONE	2 ZONE	3 ZONE			4 ZONE		
BMS500-AAM048-1CSXHD	30	6+24	6+6+18	9+9+9	12+12+36	6+6+6+6	6+9+12+18	9+9+18+24
	36	6+30	6+6+24	9+9+12	12+18+18	6+6+6+9	6+9+12+24	9+12+12+12
		6+36	6+6+30	9+9+18	12+18+24	6+6+6+12	6+9+18+18	9+12+12+18
		9+18	6+6+36	9+9+24	12+18+30	6+6+6+18	6+9+18+24	9+12+12+24
		9+24	6+9+9	9+9+30	12+18+36	6+6+6+24	6+12+12+12	9+12+18+18
		9+30	6+9+12	9+9+36	18+18+18	6+6+9+9	6+12+12+18	9+12+18+24
		9+36	6+9+18	9+12+12		6+6+9+12	6+12+12+24	9+18+18+18
		12+12	6+9+24	9+12+18		6+6+9+18	6+12+18+18	12+12+12+12
		12+18	6+9+30	9+12+24		6+6+9+24	6+12+18+24	12+12+12+18
		12+24	6+9+36	9+12+30		6+6+12+12	6+18+18+18	12+12+12+24
		12+30	6+12+12	9+12+36		6+6+12+18	6+18+18+24	12+12+18+18
		12+36	6+12+18	9+18+18		6+6+12+24	9+9+9+9	12+12+18+24
		18+18	6+12+24	9+18+24		6+6+18+18	9+9+9+12	12+18+18+18
		18+24	6+12+30	9+18+30		6+6+18+24	9+9+9+18	
		18+30	6+12+36	9+18+36		6+9+9+9	9+9+9+24	
		18+36	6+18+18	12+12+12		6+9+9+12	9+9+12+12	
		24+24	6+18+24	12+12+18		6+9+9+18	9+9+12+18	
		24+30	6+18+30	12+12+24		6+9+9+24	9+9+12+24	
		24+36	6+18+36	12+12+30		6+9+12+12	9+9+18+18	

Table 15

Multi Zone Pairing Information	5 ZONE				6 ZONE			
BMS500-AAM048-1CSXHD	6+6+6+6+6	6+6+9+12+18	6+9+9+18+24	9+9+9+18+18	6+6+6+6+6+6	6+6+6+12+12+12	6+9+9+9+9+24	9+9+9+12+12+18
	6+6+6+6+9	6+6+9+12+24	6+9+12+12+12	9+9+9+18+24	6+6+6+6+6+9	6+6+6+12+12+18	6+9+9+9+12+12	9+9+12+12+12+12
	6+6+6+6+12	6+6+9+18+18	6+9+12+12+18	9+9+12+12+12	6+6+6+6+6+12	6+6+6+12+12+24	6+9+9+9+12+18	9+9+12+12+12+18
	6+6+6+6+18	6+6+9+18+24	6+9+12+12+24	9+9+12+12+18	6+6+6+6+6+18	6+6+9+9+9+9	6+9+9+9+12+24	9+12+12+12+12+12
	6+6+6+6+24	6+6+12+12+12	6+9+12+18+18	9+9+12+12+24	6+6+6+6+6+24	6+6+9+9+9+12	6+9+9+12+12+12	12+12+12+12+12+12
	6+6+6+9+9	6+6+12+12+18	6+9+12+18+24	9+9+12+18+18	6+6+6+6+9+9	6+6+9+9+9+18	6+9+9+12+12+18	
	6+6+6+9+12	6+6+12+12+24	6+9+18+18+18	9+9+12+18+24	6+6+6+6+9+12	6+6+9+9+9+24	6+9+9+12+12+24	
	6+6+6+9+18	6+6+12+18+18	6+12+12+12+12	9+9+18+18+18	6+6+6+6+9+18	6+6+9+9+12+12	6+9+12+12+12+12	
	6+6+6+9+24	6+6+12+18+24	6+12+12+12+18	9+12+12+12+12	6+6+6+6+9+24	6+6+9+9+12+18	6+9+12+12+12+18	
	6+6+6+12+12	6+6+18+18+18	6+12+12+12+24	9+12+12+12+18	6+6+6+6+12+12	6+6+9+9+12+24	6+12+12+12+12+12	
	6+6+6+12+18	6+6+18+18+24	6+12+12+18+18	9+12+12+12+24	6+6+6+6+12+18	6+6+9+12+12+12	6+12+12+12+12+18	
	6+6+6+12+24	6+9+9+9+9	6+12+18+18+18	9+12+12+18+18	6+6+6+6+12+24	6+6+9+12+12+18	9+9+9+9+9+9	
	6+6+6+18+18	6+9+9+9+12	9+9+9+9+9	12+12+12+12+12	6+6+6+9+9+9	6+6+9+12+12+24	9+9+9+9+9+12	
	6+6+6+18+24	6+9+9+9+18	9+9+9+9+12	12+12+12+12+18	6+6+6+9+9+12	6+6+12+12+12+12	9+9+9+9+9+18	
	6+6+9+9+9	6+9+9+9+24	9+9+9+9+18	12+12+12+12+24	6+6+6+9+9+18	6+6+12+12+12+18	9+9+9+9+9+24	
	6+6+9+9+12	6+9+9+12+12	9+9+9+9+24	12+12+12+18+18	6+6+6+9+9+24	6+6+12+12+12+24	9+9+9+9+12+12	
	6+6+9+9+18	6+9+9+12+18	9+9+9+12+12		6+6+6+9+12+12	6+9+9+9+9+9	9+9+9+9+12+18	
	6+6+9+9+24	6+9+9+12+24	9+9+9+12+18		6+6+6+9+12+18	6+9+9+9+9+12	9+9+9+9+12+24	
	6+6+9+12+12	6+9+9+18+18	9+9+9+12+24		6+6+6+9+12+24	6+9+9+9+9+18	9+9+9+12+12+12	

Table 16

3 Unit Mounting Dimensions

The following is a list of different outdoor unit sizes and the distance between their mounting feet. Prepare the installation base of the unit according to the dimensions below.

NOTICE

Product damage!

Never mount this unit directly on the ground. It must be anchored according to the guidance provided in these instructions, and/or local building codes.

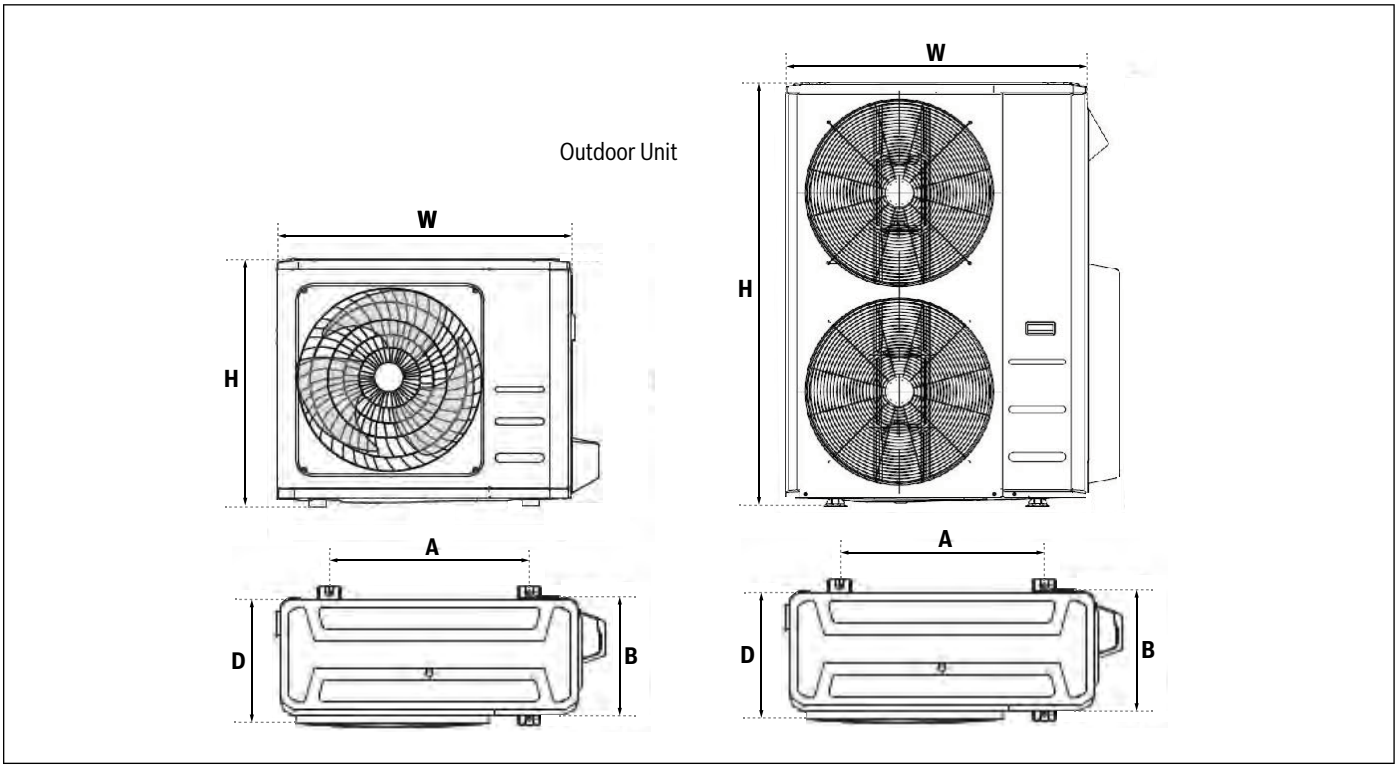


Figure 1

Outdoor Model	Outdoor Unit Dimensions in (mm)	Mounting Dimensions	
	W x H x D	Distance A in (mm)	Distance B in (mm)
BMS500-AAM018-1CSXHD, BMS500-AAM018-1CSXRD	35.0 x 26.5 x 13.6 (890 x 673 x 342)	26.1 (663)	13.9 354
BMS500-AAM027-1CSXRD, BMS500-AAM027-1CSXHD	37.44 x 38.39 x 16.34 (980 x 975 x 415)	26.5 (673)	15.9 (403)
BMS500-AAM036-1CSXRD, BMS500-AAM036-1CSXHD	37.2 x 31.9 x 16.14 (946 x 810 x 410)	26.5 (673)	15.87 (403)
BMS500-AAM048-1CSXRD, BMS500-AAM048-1CSXHD	37.5 x 52.5 x16.34 (952 x 1333 x 415)	25.0 (634)	15.9 (404)

Table 17

4 Refrigerant Cycle Diagrams - Outdoor Models

4.1 For Model: 18K Multi Zone Regular System BMS500-AAM018-1CSXRD

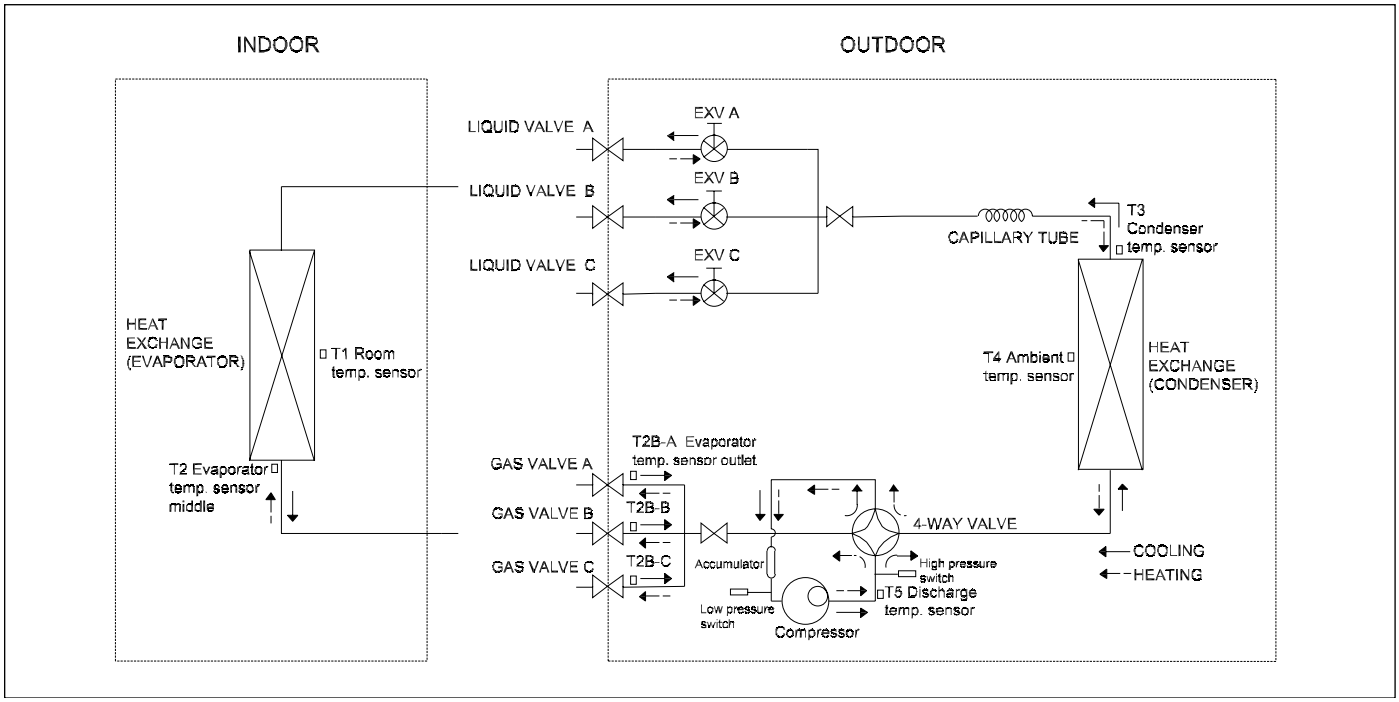


Figure 2

4.2 For Model: 18K Multi ZoneMax Performance System BMS500-AAM018-1CSXHD

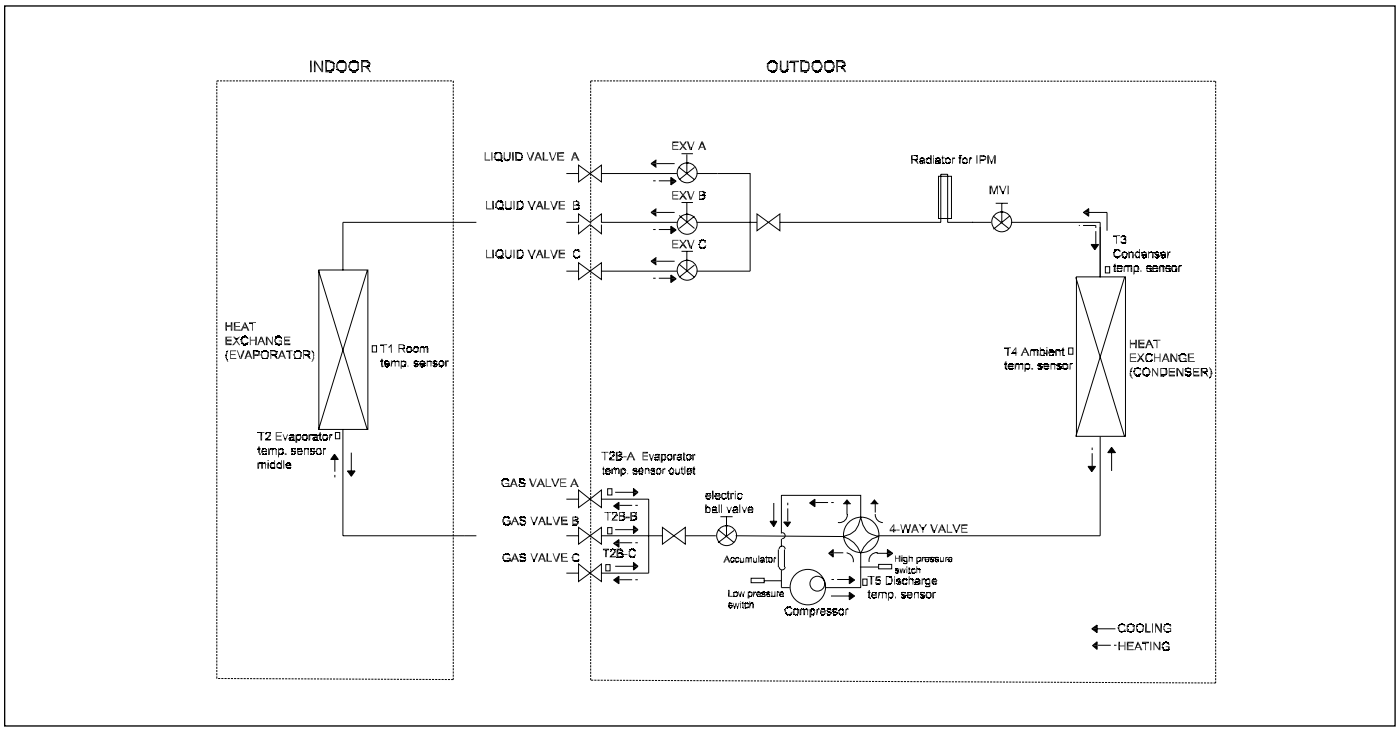


Figure 3

4.3 For Models: 27K Multi Zone Regular, 27K Multi Zone Max Performance System BMS500-AAM027-1CSXRD, BMS500-AAM027-1CSXHD

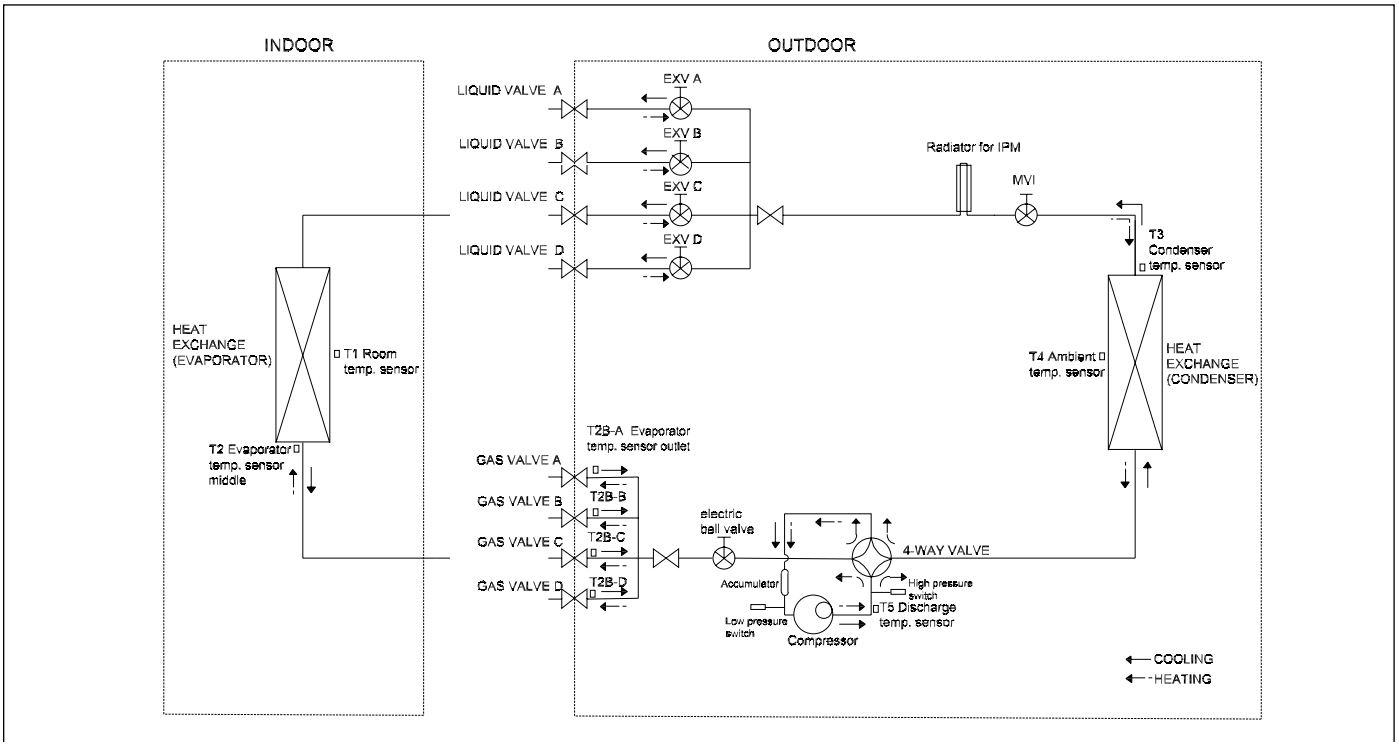


Figure 4

4.4 For Models: 36K Multi Zone Regular System BMS500-AAM036-1CSXRD

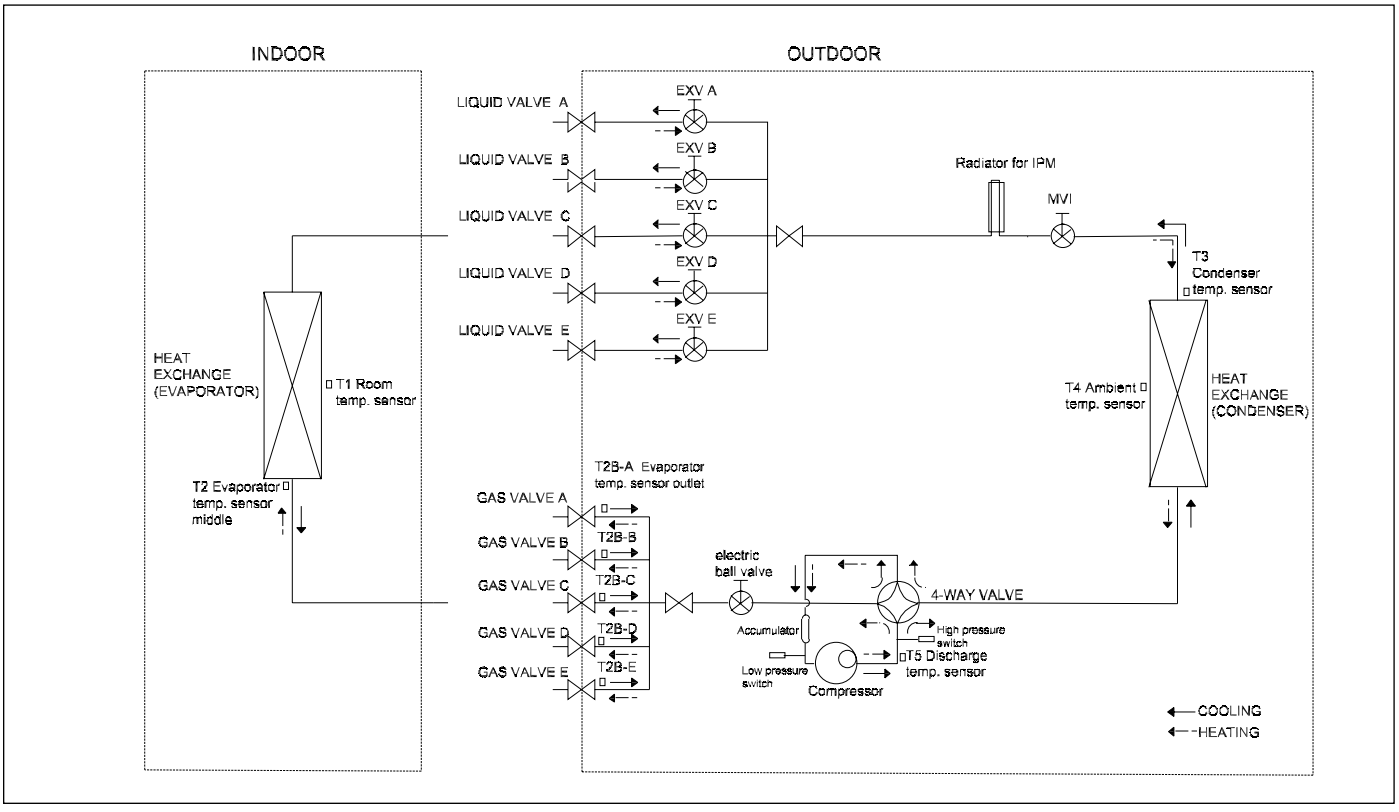


Figure 5

4.5 For Model: 36K Multi Zone Max Performance System BMS500-AAM036-1CSXHD

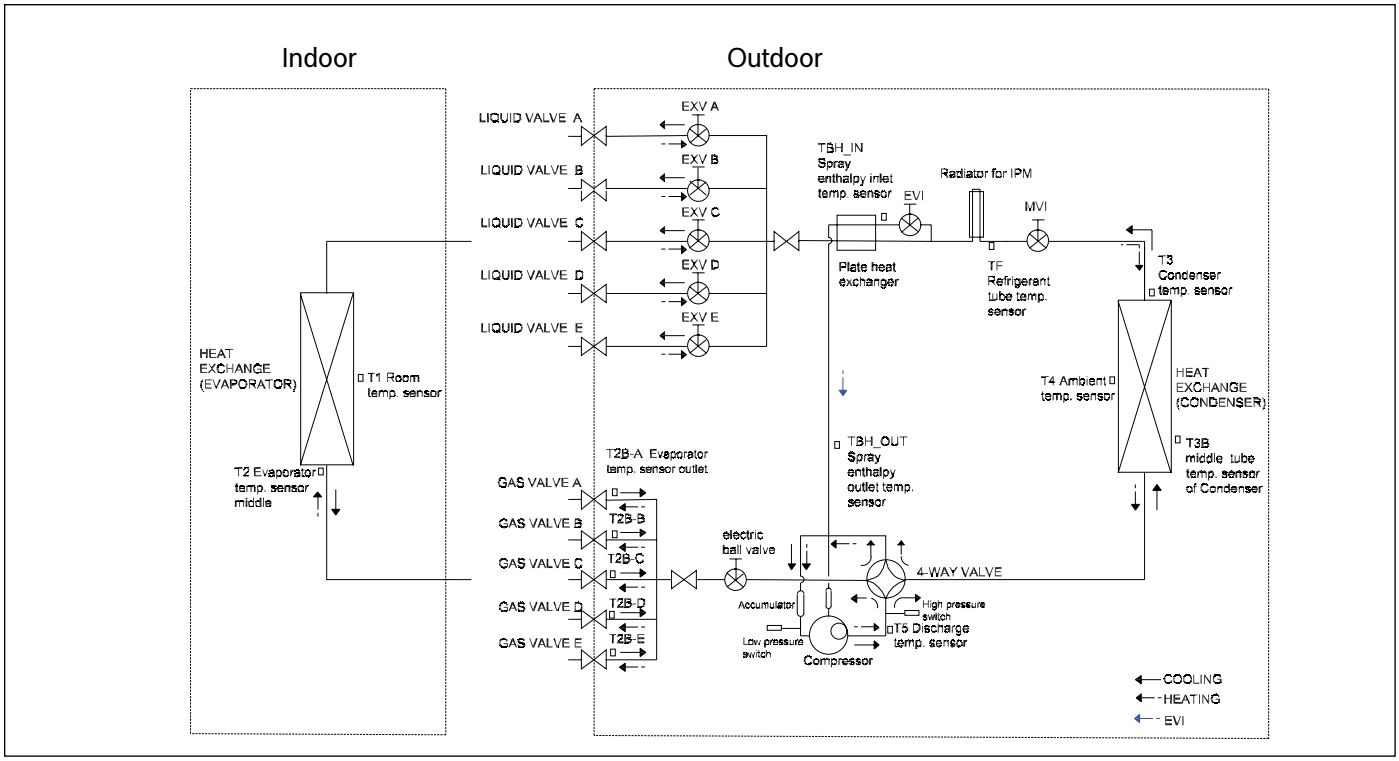


Figure 6

4.6 For Model: 48K Multi Zone Regular System BMS500-AAM048-1CSXRD

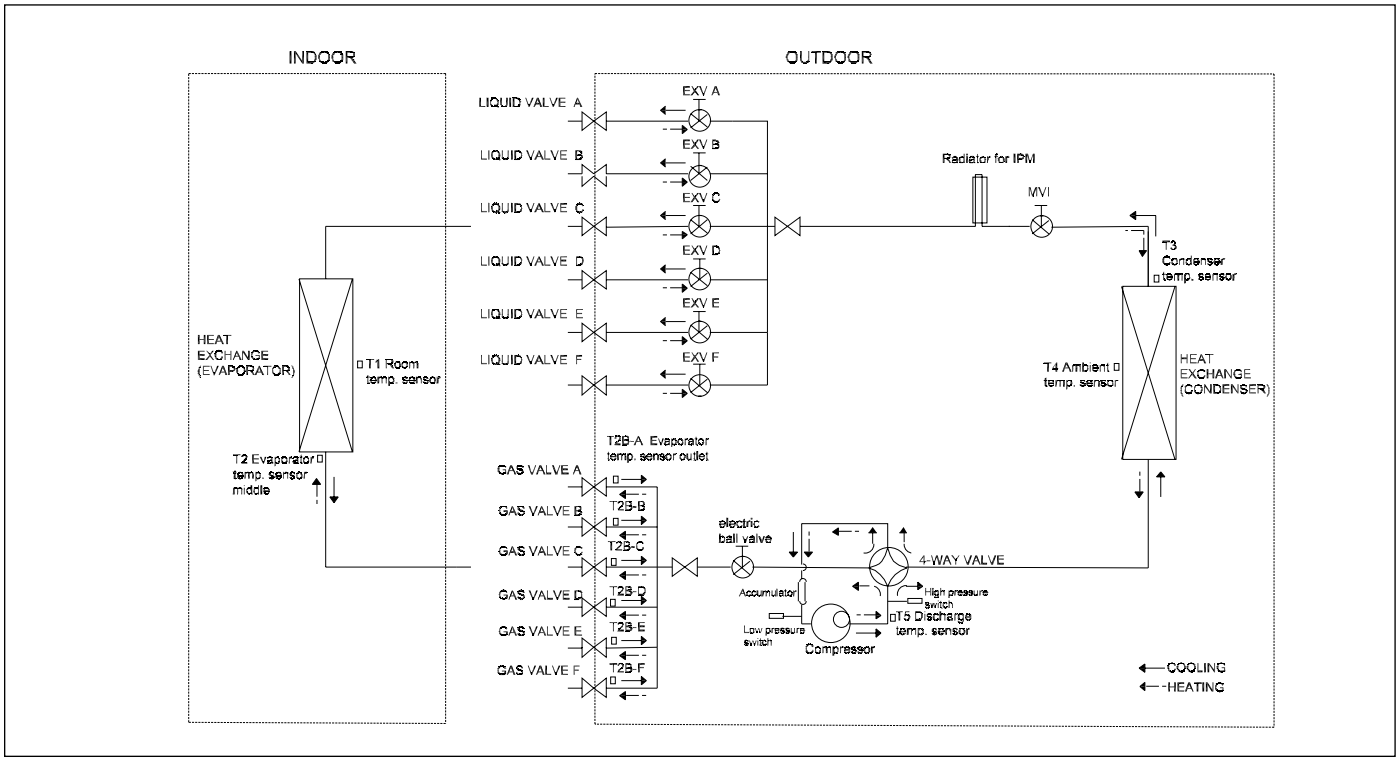


Figure 7

4.7 For Model: 48K Multi Zone Max Performance System BMS500-AAM048-1CSXHD

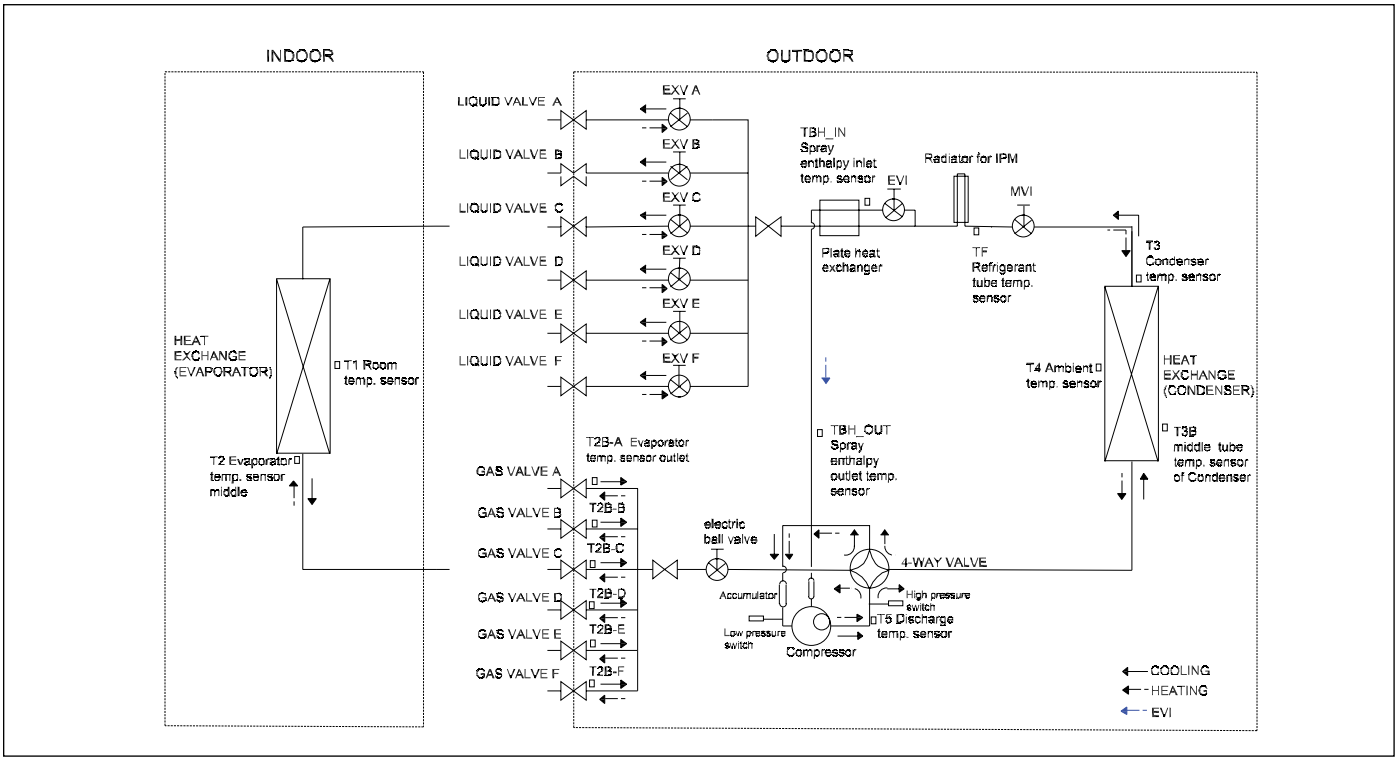
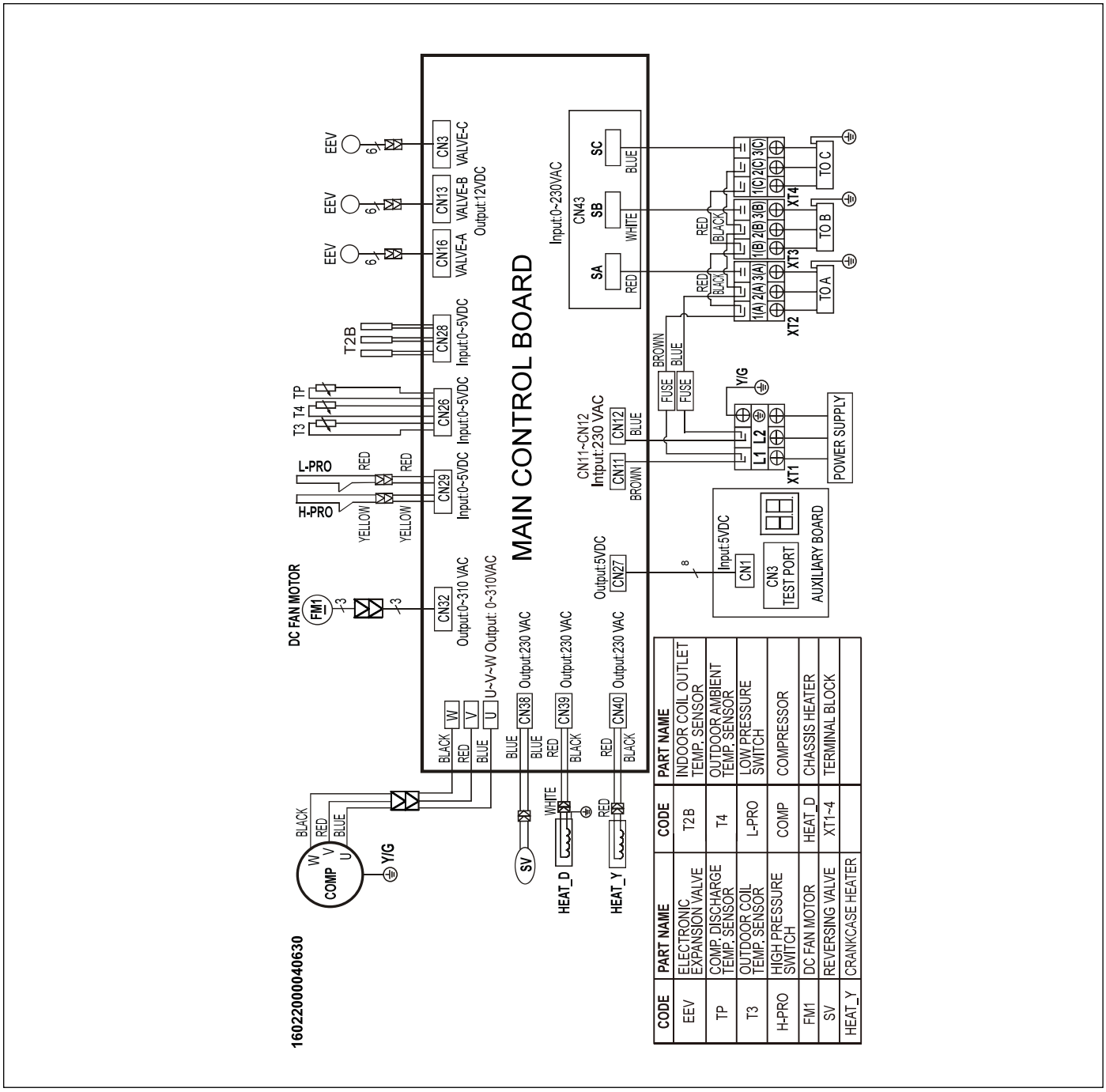


Figure 8

5 Wiring Diagrams

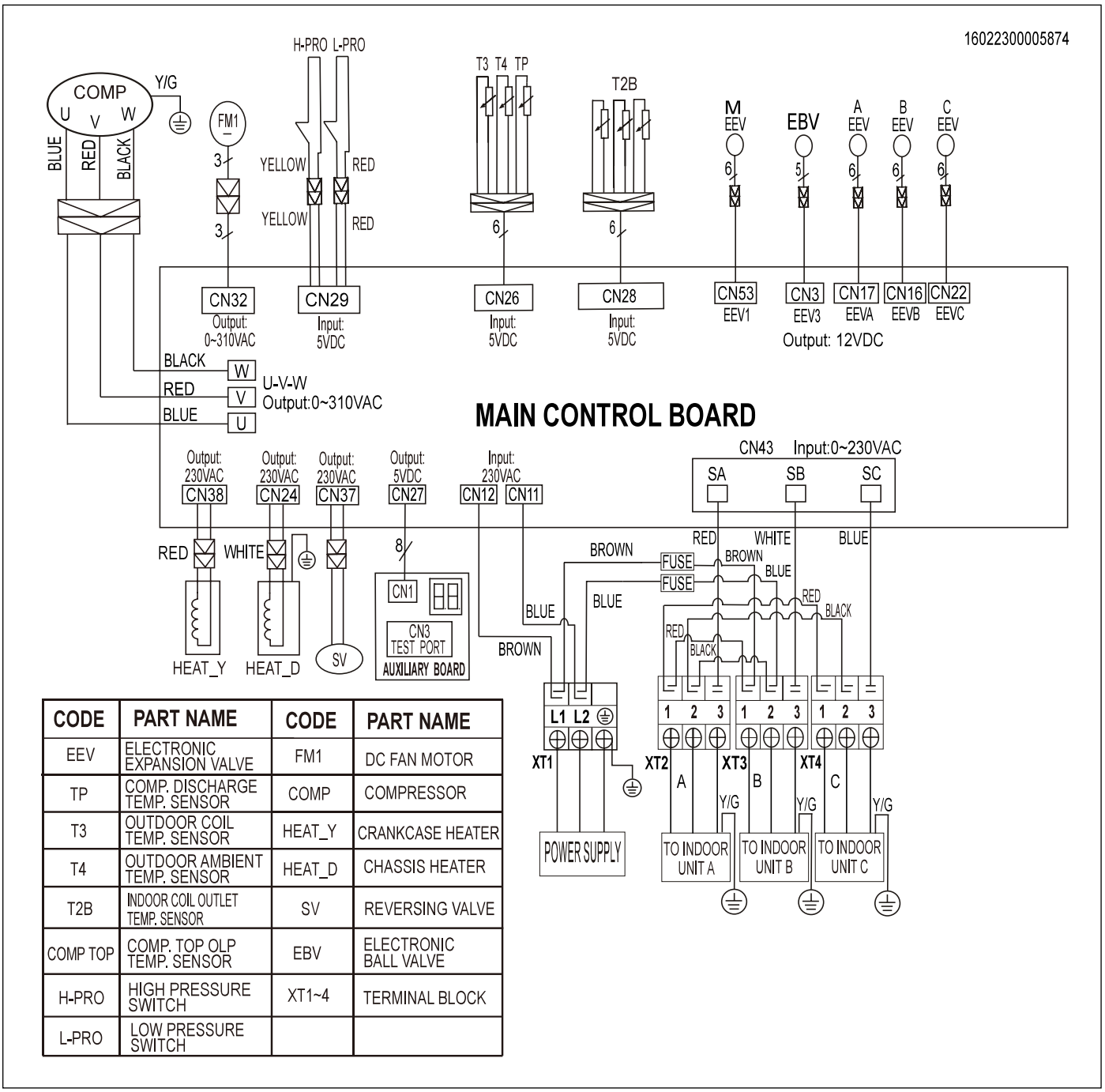
5.1 For Model: 18K Multi Zone Regular System BMS500-AAM018-1CSXRD



CODE	PART NAME	CODE	PART NAME
EEV	ELECTRONIC EXPANSION VALVE	T2B	INDOOR COIL OUTLET TEMP. SENSOR
TP	COMP. DISCHARGE TEMP. SENSOR	T4	OUTDOOR AMBIENT TEMP. SENSOR
T3	OUTDOOR COIL TEMP. SENSOR	L-PRO	LOW PRESSURE SWITCH
H-PRO	HIGH PRESSURE SWITCH	COMP	COMPRESSOR
FM1	DC FAN MOTOR	HEAT_D	CHASSIS HEATER
SV	REVERSING VALVE	XT1~4	TERMINAL BLOCK
HEAT_Y	CRANKCASE HEATER		

Figure 9

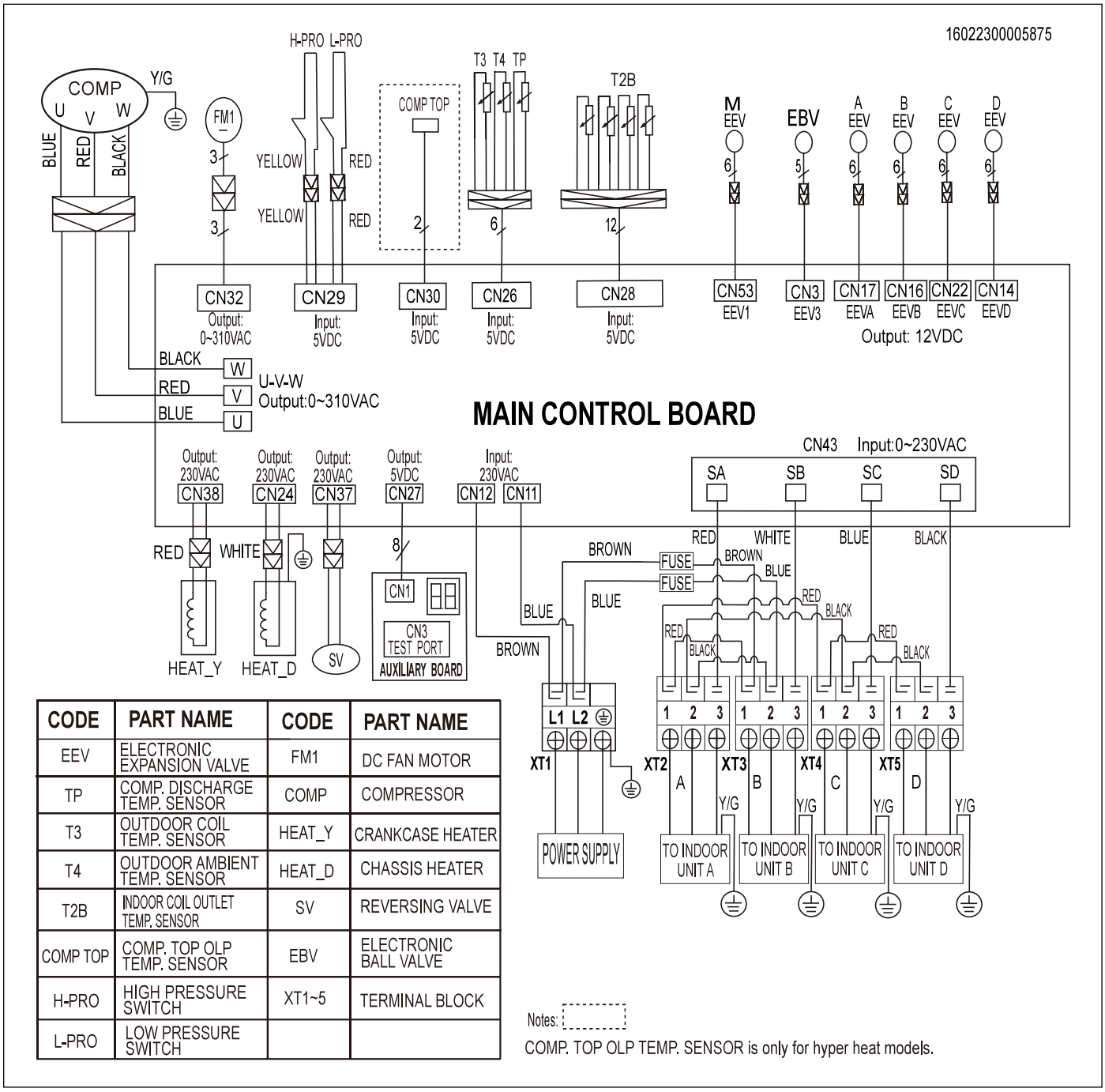
5.2 For Model: 18K Multi Zone Max Performance System BMS500-AAM018-1CSXHD



CODE	PART NAME	CODE	PART NAME
EEV	ELECTRONIC EXPANSION VALVE	FM1	DC FAN MOTOR
TP	COMP. DISCHARGE TEMP. SENSOR	COMP	COMPRESSOR
T3	OUTDOOR COIL TEMP. SENSOR	HEAT_Y	CRANKCASE HEATER
T4	OUTDOOR AMBIENT TEMP. SENSOR	HEAT_D	CHASSIS HEATER
T2B	INDOOR COIL OUTLET TEMP. SENSOR	SV	REVERSING VALVE
COMP TOP	COMP. TOP OLP TEMP. SENSOR	EBV	ELECTRONIC BALL VALVE
H-PRO	HIGH PRESSURE SWITCH	XT1~4	TERMINAL BLOCK
L-PRO	LOW PRESSURE SWITCH		

Figure 10

5.3 For Models: 27K Multi Zone Regular Heat & Max Performance System BMS500-AAM027-1CSXRD, BMS500-AAM027-1CSXHD

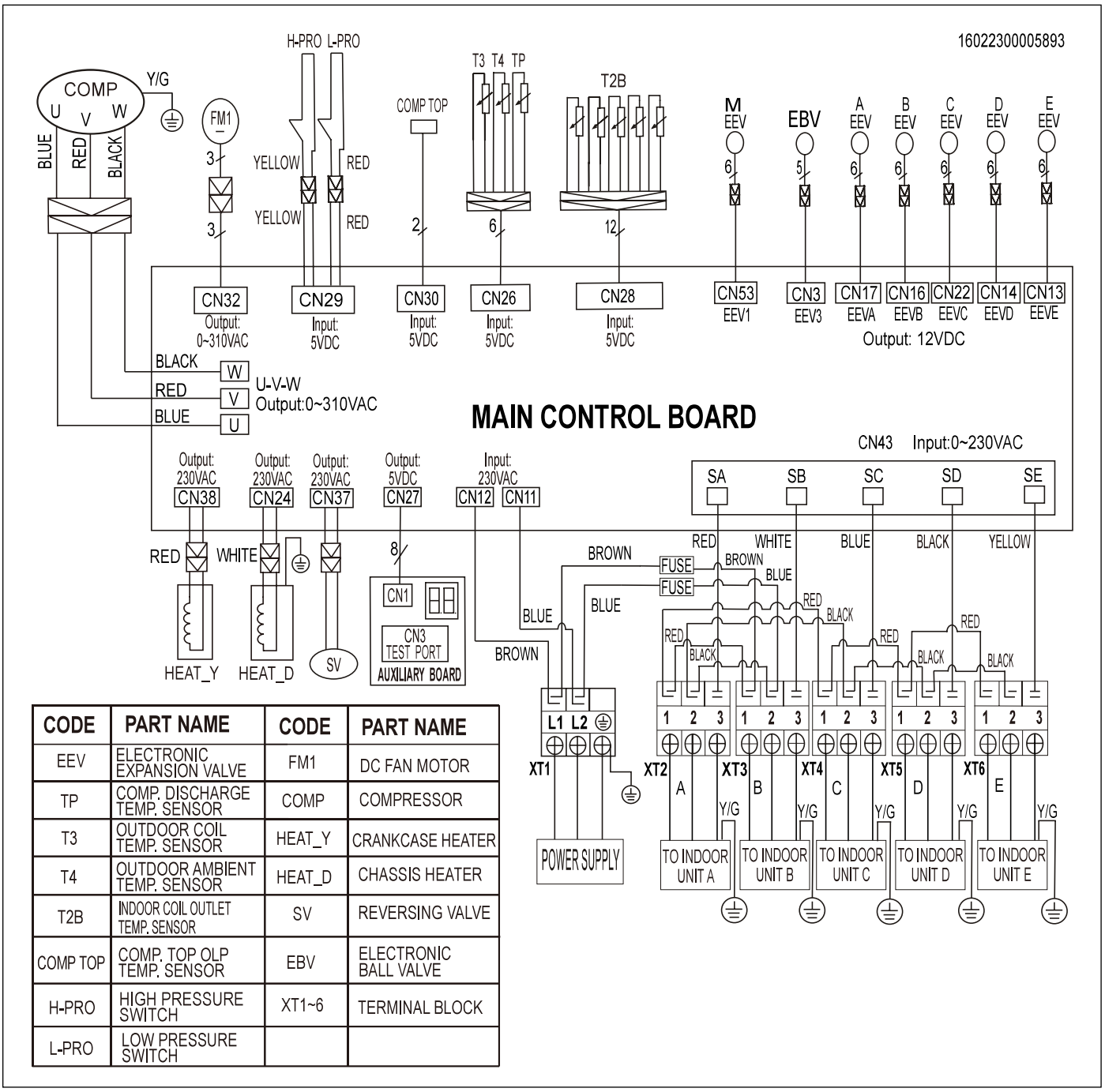


CODE	PART NAME	CODE	PART NAME
EEV	ELECTRONIC EXPANSION VALVE	FM1	DC FAN MOTOR
TP	COMP. DISCHARGE TEMP. SENSOR	COMP	COMPRESSOR
T3	OUTDOOR COIL TEMP. SENSOR	HEAT_Y	CRANKCASE HEATER
T4	OUTDOOR AMBIENT TEMP. SENSOR	HEAT_D	CHASSIS HEATER
T2B	INDOOR COIL OUTLET TEMP. SENSOR	SV	REVERSING VALVE
COMP TOP	COMP. TOP OLP TEMP. SENSOR	EBV	ELECTRONIC BALL VALVE
H-PRO	HIGH PRESSURE SWITCH	XT1~5	TERMINAL BLOCK
L-PRO	LOW PRESSURE SWITCH		

Notes:
COMP. TOP OLP TEMP. SENSOR is only for hyper heat models.

Figure 11

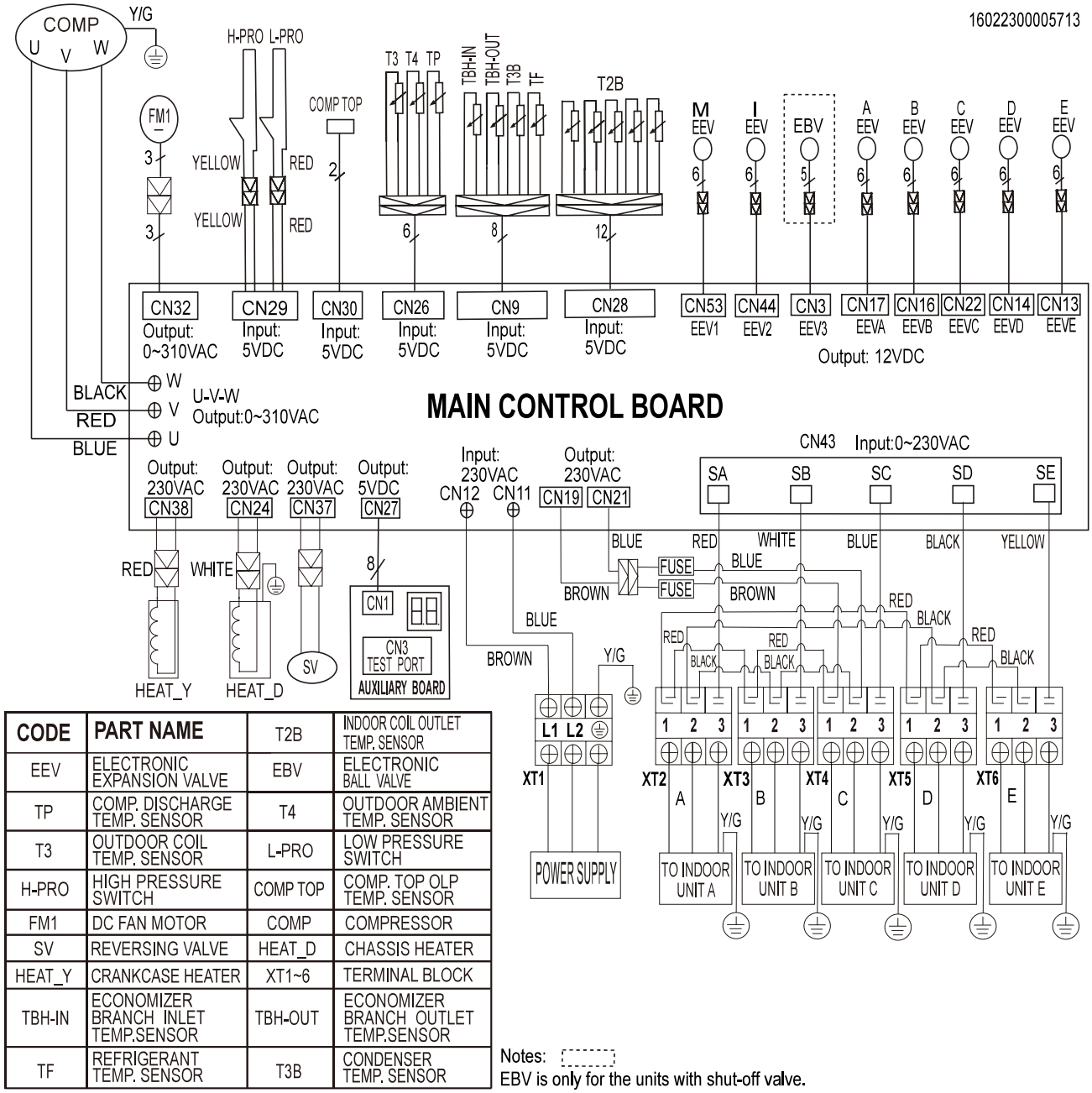
5.4 For Model: 36K Multi Zone Regular System BMS500-AAM036-1CSXRD



CODE	PART NAME	CODE	PART NAME
EEV	ELECTRONIC EXPANSION VALVE	FM1	DC FAN MOTOR
TP	COMP. DISCHARGE TEMP. SENSOR	COMP	COMPRESSOR
T3	OUTDOOR COIL TEMP. SENSOR	HEAT_Y	CRANKCASE HEATER
T4	OUTDOOR AMBIENT TEMP. SENSOR	HEAT_D	CHASSIS HEATER
T2B	INDOOR COIL OUTLET TEMP. SENSOR	SV	REVERSING VALVE
COMP TOP	COMP. TOP OLP TEMP. SENSOR	EBV	ELECTRONIC BALL VALVE
H-PRO	HIGH PRESSURE SWITCH	XT1~6	TERMINAL BLOCK
L-PRO	LOW PRESSURE SWITCH		

Figure 12

5.5 For Model: 36K Multi Zone Max Performance System BMS500-AAM036-1CSXHD

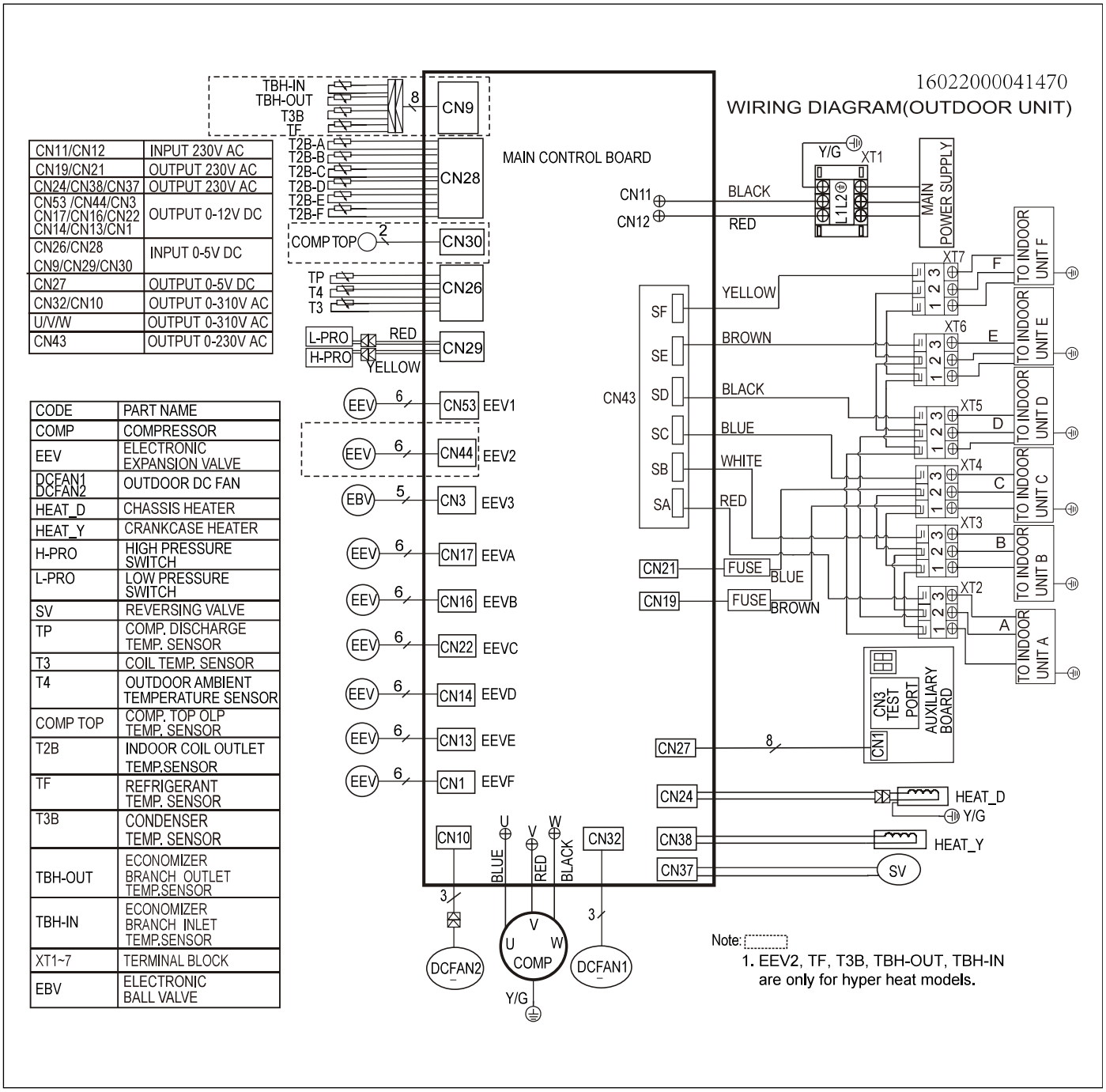


CODE	PART NAME	T2B	INDOOR COIL OUTLET TEMP. SENSOR
EEV	ELECTRONIC EXPANSION VALVE	EBV	ELECTRONIC BALL VALVE
TP	COMP. DISCHARGE TEMP. SENSOR	T4	OUTDOOR AMBIENT TEMP. SENSOR
T3	OUTDOOR COIL TEMP. SENSOR	L-PRO	LOW PRESSURE SWITCH
H-PRO	HIGH PRESSURE SWITCH	COMP TOP	COMP. TOP OLP TEMP. SENSOR
FM1	DC FAN MOTOR	COMP	COMPRESSOR
SV	REVERSING VALVE	HEAT_D	CHASSIS HEATER
HEAT_Y	CRANKCASE HEATER	XT1~6	TERMINAL BLOCK
TBH-IN	ECONOMIZER BRANCH INLET TEMP.SENSOR	TBH-OUT	ECONOMIZER BRANCH OUTLET TEMP.SENSOR
TF	REFRIGERANT TEMP. SENSOR	T3B	CONDENSER TEMP. SENSOR

Notes:
EBV is only for the units with shut-off valve.

Figure 13

5.6 For Model: 48K Multi Zone Regular & Max Performance System BMS500-AAM048-1CSXRD, BMS500-AAM048-1CSXHD



CN11/CN12	INPUT 230V AC
CN19/CN21	OUTPUT 230V AC
CN24/CN38/CN37	OUTPUT 230V AC
CN53 /CN44/CN3 CN17/CN16/CN22 CN14/CN13/CN1	OUTPUT 0-12V DC
CN26/CN28 CN9/CN29/CN30	INPUT 0-5V DC
CN27	OUTPUT 0-5V DC
CN32/CN10	OUTPUT 0-310V AC
U/V/W	OUTPUT 0-310V AC
CN43	OUTPUT 0-230V AC

CODE	PART NAME
COMP	COMPRESSOR
EEV	ELECTRONIC EXPANSION VALVE
DCFAN1 DCFAN2	OUTDOOR DC FAN
HEAT_D	CHASSIS HEATER
HEAT_Y	CRANKCASE HEATER
H-PRO	HIGH PRESSURE SWITCH
L-PRO	LOW PRESSURE SWITCH
SV	REVERSING VALVE
TP	COMP. DISCHARGE TEMP. SENSOR
T3	COIL TEMP. SENSOR
T4	OUTDOOR AMBIENT TEMPERATURE SENSOR
COMP TOP	COMP. TOP OLP TEMP. SENSOR
T2B	INDOOR COIL OUTLET TEMP.SENSOR
TF	REFRIGERANT TEMP. SENSOR
T3B	CONDENSER TEMP. SENSOR
TBH-OUT	ECONOMIZER BRANCH OUTLET TEMP.SENSOR
TBH-IN	ECONOMIZER BRANCH INLET TEMP.SENSOR
XT1~7	TERMINAL BLOCK
EBV	ELECTRONIC BALL VALVE

Figure 14

6 Installation Details

6.1 Torque Requirements

Pipe Diameter inch (mm)	Torque lb•ft (N•m)
1/4 (6.35)	13.3~14.8 (18~20)
3/8 (9.52)	23.6~28.8 (32~39)
1/2 (12.7)	36.1~43.5 (49~59)
5/8 (15.9)	42.0~52.4 (57~71)
3/4 (19)	49.4~74.5 (67~101)
7/8 (22)	62.7~81.1 (85~110)

Table 18

6.2 Connecting the Cables

The power cord should be selected according to the following specifications sheet.

- Cable type: SOOW type

Capacity	AWG Wire Size
≤ 7	18
7 - 13	16
13 - 18	14
18 - 25	12
25 - 30	10

Table 19

For IDU and ODU connection, use 16 AWG for all applications.

The cable sizes are determined by the maximum current indicated on the nameplate which is located on the side panel of the unit. Please refer to the nameplate before selecting the cable, fuse and switch. A means of disconnecting the power, should be within 10 feet of the outdoor unit.

6.3 Pipe Length and the Elevation

Maximum Piping Length and Height Difference

	3 Zones	4 Zones	5 Zones	6 Zones
Max. length for all rooms (m)	197ft (60)	262ft (80)	262ft (80)	262ft (80)
Max. length for one IDU (m)	98ft (30)	115ft (35)	115ft (35)	115ft (35)
Max. height difference between IDU and ODU (m)	49ft (15)	49ft (15)	49ft (15)	49ft (15)
Max. height difference between IDUs (m)	33ft (10)	33ft (10)	33ft (10)	33ft (10)

Table 20

Capacity	Pipe size	
	Liquid Side Diameter (in / mm)	Gas Side Diameter (in / mm)
18k	(3x) 1/4" (3x) 6.35 Dia.	(3x) 3/8" (3x) 9.52 Dia.
27k	(4x) 1/4" (4x) 6.35 Dia.	(3x) 3/8" + (1x) 1/2" (3x) 9.52 Dia. + (1x) 12.7 Dia.
36k	(5x) 1/4" (5x) 6.35 Dia.	(4x) 3/8" + (1x) 1/2" (4x) 9.52 Dia. + (1x) 12.7 Dia.
48k	(6x) 1/4" (6x) 6.35 Dia.	(4x) 3/8" + (2x) 1/2" (4x) 9.52 Dia. + (2x) 12.7 Dia.

Table 21

When refrigerant pipe diameter is different from the outdoor unit union , additional transfer connector needs to be used on outdoor unit.

Additional Refrigerant Charge

Pipe Size	Additional charge for each unit length
6.35 Dia. (1/4") liquid pipe	15 g/m (0.16 oz/ft)
9.52 Dia. (3/8") liquid pipe	30 g/m (0.32 oz/ft)

Table 22

For indoor units piping information, check correspondence indoor unit manual.

6.4 Components

The air conditioning / heat pump system installation requires the following components. Use all of the installation parts and components to install the air conditioner. Improper installation may result in water leakage, electrical shock and fire, or equipment failure.

Name			Quantity
Drain joint			1
Seal ring			1
Connecting pipe assembly	Liquid side	6.35 Dia. (1/4")	Parts not included. Piping kits are available as an accessory.
		9.52 Dia. (3/8")	
	Gas side	9.52 Dia. (3/8")	
		12.7 Dia. (1/2")	
		16 Dia. (5/8")	
Multi-zone installation manual			1
Refrigerant pipe adaptor NOTE: Pipe sizes may vary between air handler and condensing section connections. To meet different pipe size requirements, it may be necessary to install an adapter (transfer connector) on the outdoor unit connection.			Included. Varies by model. Refer to Table 17
Power cable for connection with external power supply			Not included (see section 7 for cable requirements)

Table 23

Product	Model number	Model name	Adapter (inch)	Adapter quantity
Regular	8-733-962-695	BMS500-AAM018-1CSXRD	3/8"-->1/2"	2
	8-733-962-696	BMS500-AAM027-1CSXRD	3/8"-->1/2"	3
	8-733-962-697	BMS500-AAM036-1CSXRD	3/8"-->1/2"	3
			1/2"-->3/8"	1
			1/4"-->3/8"	1
			1/2"-->5/8"	1
	8-733-962-698	BMS500-AAM048-1CSXRD	1/2"-->3/8"	2
			1/4"-->3/8"	2
			1/2"-->5/8"	2
			3/8"-->1/2"	1
Max Performance	8-733-962-699	BMS500-AAM018-1CSXHD	3/8"-->1/2"	3
	8-733-962-700	BMS500-AAM027-1CSXHD	3/8"-->1/2"	3
			1/2"-->3/8"	1
			1/4"-->3/8"	1
			1/2"-->5/8"	1
	8-733-962-701	BMS500-AAM036-1CSXHD	3/8"-->1/2"	2
			1/2"-->3/8"	2
			1/4"-->3/8"	2
			1/2"-->5/8"	2
	8-733-962-702	BMS500-AAM048-1CSXHD	1/2"-->3/8"	2
			1/4"-->3/8"	2
			1/2"-->5/8"	2
			3/8"-->1/2"	1

Table 24

7 Wiring

WARNING

Electrical hazard !

Before performing electrical work, read these regulations:

1. All wiring must comply with local and national electrical codes, and must be installed by a licensed electrician.
2. All electrical connections must be made according to the Electrical Connection Diagram located on the panels of the indoor and outdoor units.
3. If there is a serious safety issue with the power supply, stop work immediately. Explain your reasoning to the client and refuse to install the unit until the safety issue is properly resolved.
4. Power voltage should be within 90-110% of rated voltage. Insufficient power supply can cause malfunction, electrical shock, or fire.
5. When connecting power to fixed wiring, install a surge protector and main power switch with a capacity of 1.5 times the maximum current of the unit.
6. When connecting power to fixed wiring, a switch or circuit breaker that disconnects all poles and has a contact separation of at least 1/8in (3mm) must be incorporated in the fixed wiring. The licensed electrician must use an approved/listed circuit breaker.
7. Only connect the unit to an individual branch /dedicated circuit. Do not connect another appliance to that circuit.
8. Make sure to properly ground the outdoor unit.
9. Every wire must be firmly connected. Loose wiring can cause the terminal to overheat, resulting in product malfunction and possible fire.
10. Do not let wires touch or rest against refrigerant tubing, the compressor, or any moving parts within the unit.

7.1 Outdoor Unit Wiring

DANGER

Electrical hazard !

Before performing any electrical or wiring work, turn off the main power to the system.

1. Prepare the cable for connection:
   a. You must first choose the right cable size before preparing it for connection. Be sure to use H07RN-F/SOOW type cables.

Appliance Amps (A)	Cable Size - AWG
≤ 7	18
7 - 13	16
13 - 18	14
18 - 25	12
25 - 30	10

Table 25

   b. Using wire strippers, strip the rubber jacket from both ends of signal/power cable to reveal about 5.9 in (15 cm) of the wires inside.
   c. Strip the insulation from the ends of the wires.
   d. Using wire crimper, crimp u-type lugs on the ends of the wires.

WARNING

Electrical hazard !

While crimping wires, make sure you clearly distinguish the Live (“L”) Wire from other wires.

WARNING

Electrical hazard !

All wiring must be performed strictly in accordance with the wiring diagram located on the inside of the indoor unit's wire cover.

2. Remove the electric cover of the outdoor unit. If there is no cover on the outdoor unit, disassemble the bolts from the maintenance board and remove the protection board.

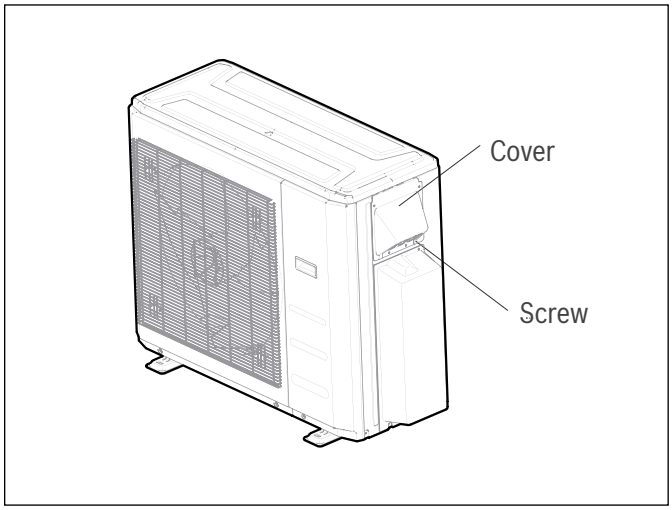


Figure 15

3. Connect the fork terminals to the terminals. Match the wire labels on the indoor unit with the labels on the outdoor unit, and firmly screw the fork terminal of each wire to its corresponding terminal.
4. Secure the cable with designated cable clamp.

7.2 Wiring Diagrams

WARNING

Electrical hazard !

Connect the connective cables to the terminals, as identified, with their matching numbers on the terminal block of the indoor and outdoor units. For example, in the US models shown in the following diagram, terminal 1 of the outdoor unit must connect with terminal 1 on the indoor unit.

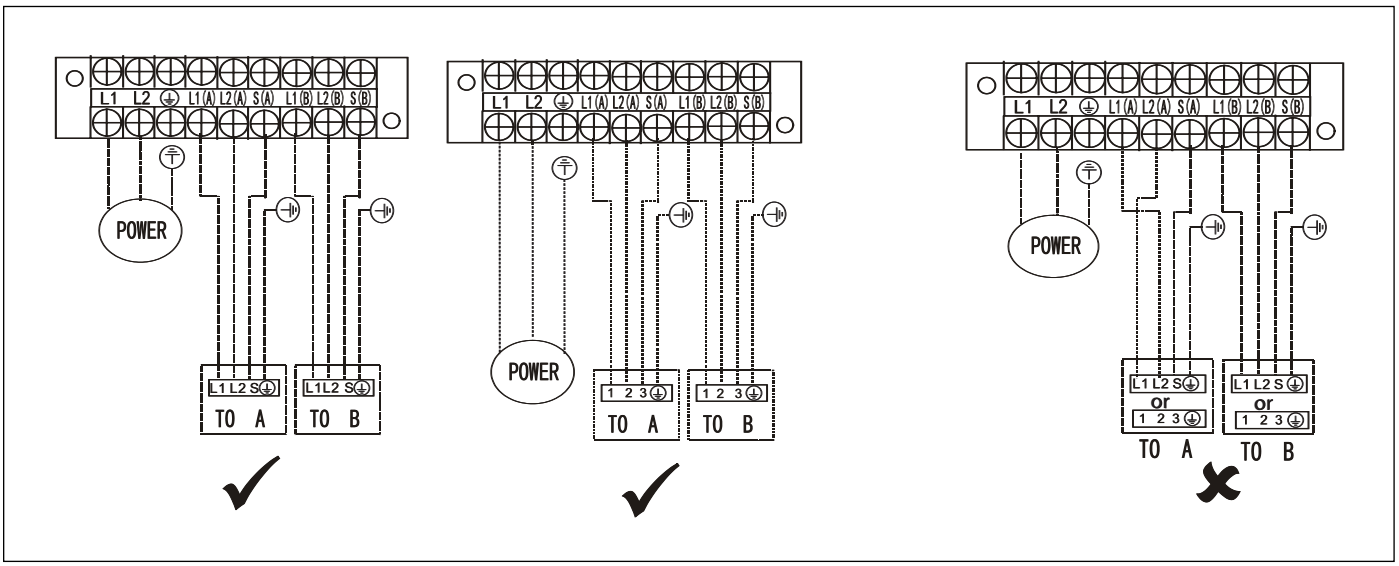
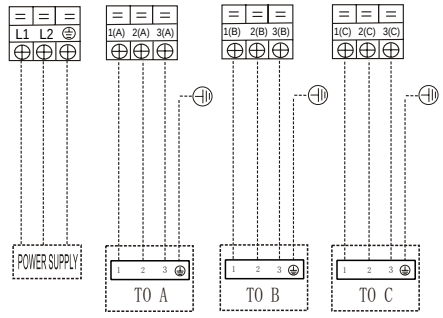


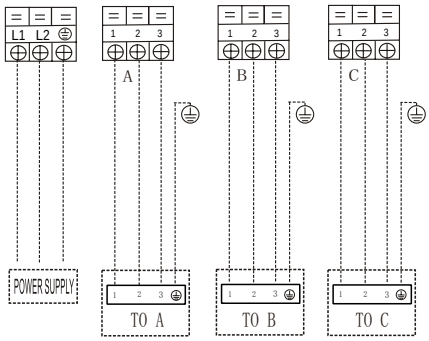
Figure 16

Refer to the following figures for unit wiring . Run the main power cord through the lower line-outlet of the cord clamp.

One-three models:

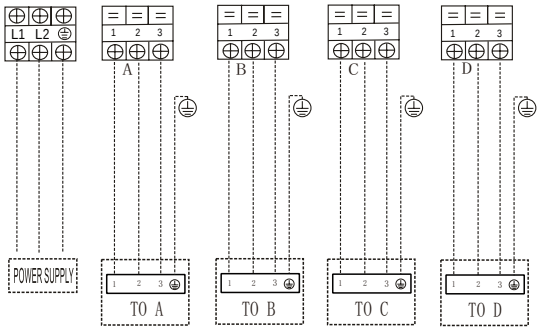


Model A

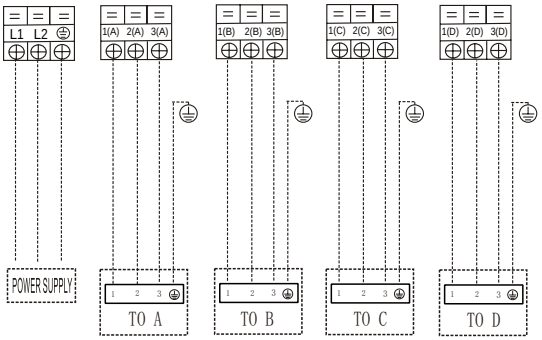


Model B

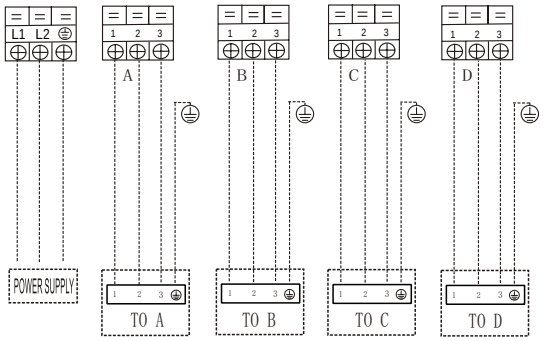
One-four models:



Model A



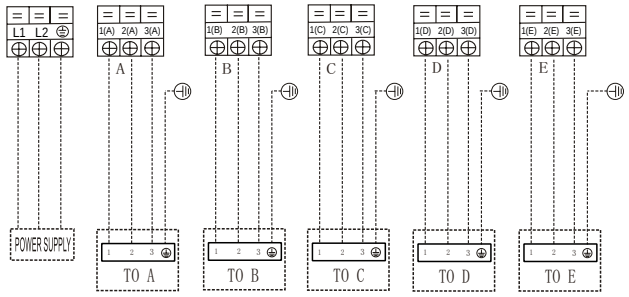
Model B



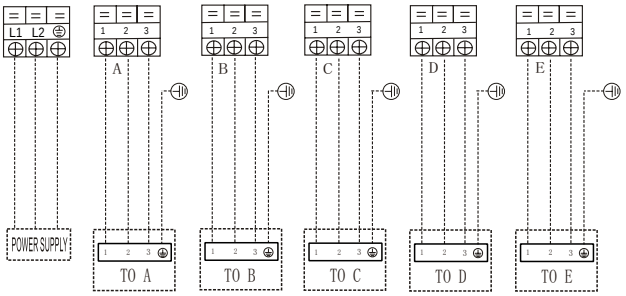
Model C

Figure 17

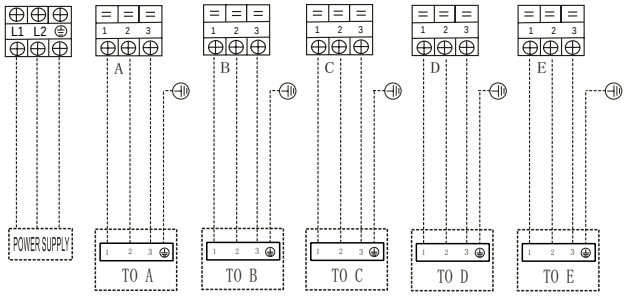
One-five models:



Model A

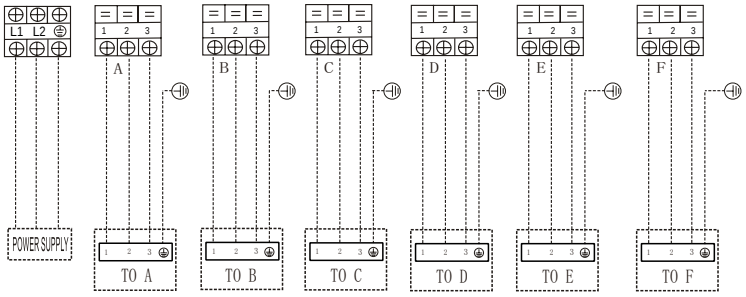


Model B



Model C

One-six models:



Model A

Figure 18

8 First Time Installation

8.1 Air Purging With Vacuum Pump

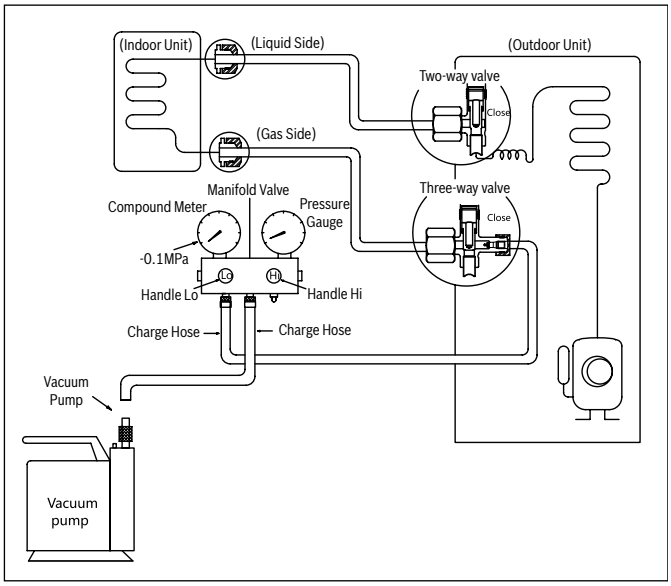


Figure 19

1. Tighten the flare nuts of the indoor and outdoor units, and confirm that both the 2- and 3-way valves are closed.
2. Connect the charge hose with the push pin of Handle Low to the gas service port of the 3-way valve.
3. Connect another charge hose to the vacuum pump.
4. Fully open the Handle Low manifold valve.
5. Evacuate until the micron gauge reads no higher than 350 microns, then close the valve to the vacuum pump.

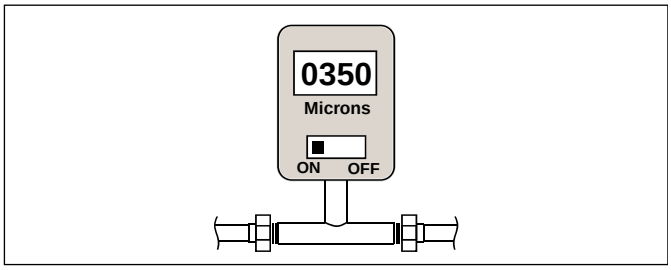


Table 26

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

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

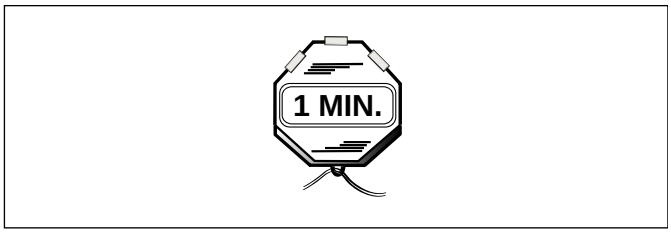


Table 27

7. Fully open the 2- and 3-way valves and tighten the cap of the 2- and 3-way valves.

Gas leak check:

- Required after completion of refrigerant line set installation
- Unit service valves remain closed to isolate refrigerant into
- outdoor unit (condensing section)
- Line set and coil should be pressurized to at least 150 PSIG
- using dry nitrogen
- Check for leaks using bubble solution at each braze joint

8.2 Adding the Refrigerant to an Existing System

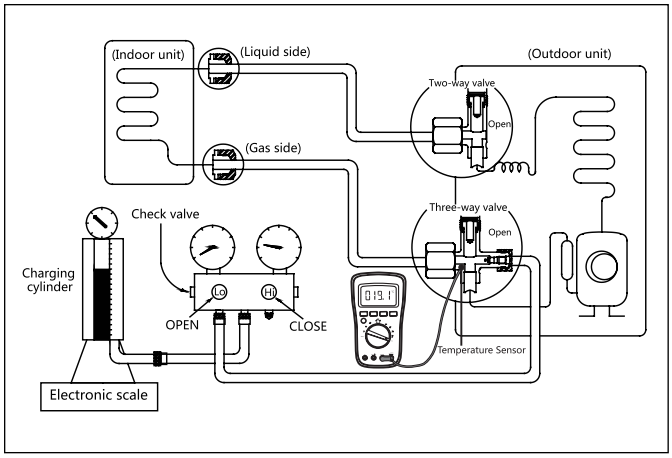


Figure 20

Procedure

1. Close both 2- and 3-way valves.
2. Slightly connect the Handle Lo charge hose to the 3-way service port.
3. Connect the charge hose to the valve at the bottom of the cylinder.
4. Open the valve at the bottom of the cylinder for 5 seconds to purge the air in the charge hose, then fully tighten the charge hose with push pin Handle Lo to the service port of 3-way valve.
5. Place the charging cylinder onto an electronic scale and record the starting weight.
6. Fully open the Handle Low manifold valve, 2- and 3-way valves.
7. Operate the air conditioner in cooling mode to charge the system with liquid refrigerant.
8. When the electronic scale displays the correct weight (refer to the gauge and the pressure of the low side to confirm, the value of pressure refers to chapter Appendix), turn off the air conditioner, then disconnect the charge hose from the 3-way service port immediately.
9. Mount the caps of service port and 2- and 3-way valves.
10. Use a torque wrench to tighten the caps to a torque of 18 N.m.
11. Check for gas leakage.

Recover the refrigerant as per Refrigerant Recovery and Recycling Equipment manufacturers' specification.

8.3 Re-Installation While the Outdoor Unit Needs to Be Repaired

Evacuation for the whole system

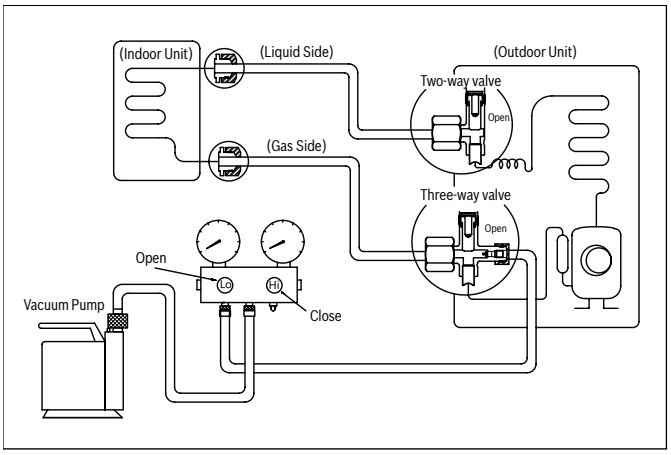


Figure 21

Procedure:

1. Confirm that the 2- and 3-way valves are opened.
2. Connect the vacuum pump to the 3-way valve's service port.
3. Evacuate the system at 350 micron or for 1 minute, if it does not rise above 500 micron in 1 minute, it is leak free.
4. Close the valve (Low side) on the charge set and turn off the vacuum pump.
5. Disconnect the charge hose from the vacuum pump.
6. Mount the caps of service port and 2- and 3-way valves.
7. Use a torque wrench to tighten the caps to a torque of 18 N.m.

For model: BMS500-AAM048-1CSXHC

For above models, there is a set of master valves, which will allow installer to vacuum and recycle the refrigerant at a faster speed. Ensure master valves are fully open prior to system operation.

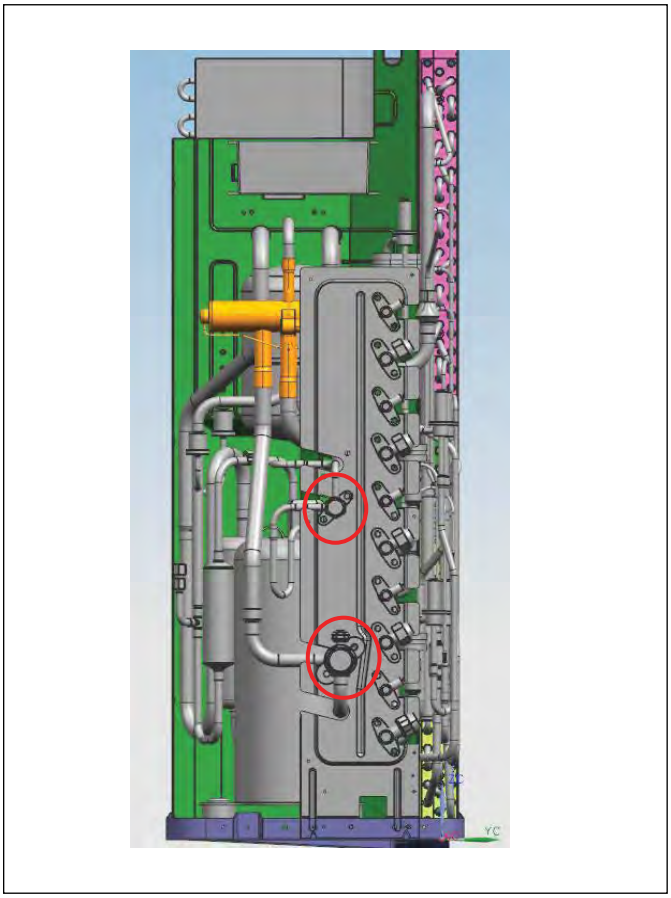


Figure 22

8.4 Operation Characteristics

			COOL operation	HEAT operation	DRY operation
Room Temperature			63ºF - 90ºF 17ºC - 32ºC	32ºF - 86ºF 0ºC - 30ºC	50ºF - 90ºF 10ºC - 32ºC
Outdoor Temperature	Regular	BMS500-AAM018-1CSXRD BMS500-AAM027-1CSXRD BMS500-AAM036-1CSXRD BMS500-AAM048-1CSXRD	-13ºF - 122ºF -25ºC - 50ºC	-13ºF - 75ºF -25ºC - 24ºC	32ºF - 122ºF 0ºC - 50ºC
	Max Performance	BMS500-AAM018-1CSXHD BMS500-AAM027-1CSXHD BMS500-AAM036-1CSXHD BMS500-AAM048-1CSXHD	-22ºF - 122ºF -30ºC - 50ºC	-22ºF - 75ºF -30ºC - 24ºC	32ºF - 122ºF 0ºC - 50ºC

Table 28

Equation to convert Celsius to Fahrenheit

(ºF) = 1.8 x (ºC) + 32

NOTICE

If the system is used beyond the above conditions, certain safety protection features may come into operation and cause the unit to operate abnormally.

NOTICE

Product damage!

- The room relative humidity should be less than 80%. If the air conditioner operates beyond this figure, the surface of the air conditioner may attract condensation. Please set the vertical air flow louver to its maximum angle (vertically to the floor) and set to HIGH fan mode.
- The optimum performance will be achieved during this operating temperature zone.

9 Electronic Functions

9.1 Abbreviation

T1: Indoor ambient temperature

T2: Middle indoor heat exchanger coil temperature

T2B: Indoor heat exchanger exhaust coil temperature (located on the outdoor unit)

T3: Outdoor heat exchanger pipe temperature

T4: Outdoor ambient temperature

TP: Compressor discharge temperature

Max Performance Only:

T3B: Condenser middle temperature.

T5: Refrigerant Pipe inlet temperature.

T6A: Economizer branch inlet temperature.

T6B: Economizer branch outlet temperature.

9.2 Electric Control Working Environment

Input voltage	230V
Input power frequency	60Hz
Indoor fan standard working amp.	<1A
Outdoor fan standard working amp.	<1.5A
Four-way valve standard amp.	<1A

Table 29

9.3 Main Protection

9.3.1 Compressor Restart Delay

The compressor takes 1 minute to start up the first time. Further restarts take 3 minutes.

9.3.2 Temperature Protection of Compressor Discharge

When the discharge temperature of the compressor rises, the running frequency is limited. If discharge temperature is too high, the compressor stops and then restart until discharge temperature reduced to normal range.

9.3.3 Inverter Module Protection

The inverter module has an automatic shutoff mechanism based on the unit's current and temperature. If automatic shutoff is initiated, the corresponding error code is displayed and the unit ceases operation.

9.3.4 Low Voltage Protection

If low voltage protection triggers and voltage is not restored to normal within 3 minutes, the protection remains active even after a machine restart.

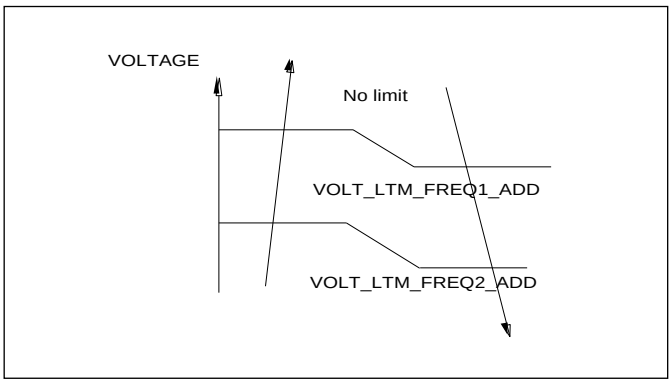


Figure 23

If low voltage protection triggers and voltage is not restored to normal within 3 minutes, the protection remains active even after a machine restart.

9.3.5 Sensor Redundancy and Automatic Shutoff

If one temperature sensor (T3, T4, T2B, TP) malfunctions, the unit ceases operation and displays the corresponding error code.

9.3.6 Automatic Shutoff Based on Fan

If the outdoor fan speed is operating outside of the normal range, fan lack of phase or fan zero speed failure, the unit ceases operation.

9.3.7 Indoor / Outdoor Units Communication Protection

If the indoor units do not receive the feedback signal from the outdoor units for 2 consecutive minutes or the outdoor units do not receive the feedback signal from any one of indoor units for 3 consecutive minutes, the unit ceases operation. The unit displays the failure code.

9.3.8 Automatic Shutoff Based on Compressor

If the compressor speed has been out of control, compressor lack of phase or voltage too low failure, the unit ceases operation.

9.3.9 Evaporator Anti-Freezing Protection

The T2 sent from the indoor unit to the outdoor unit is low, and the unit limits the compressor to run at a low frequency.

9.3.10 Oil Return

1) If the unit runs at low frequency for a long time, the unit will run the oil return program to increase the frequency of the compressor.

2) After the unit runs continuously for a period of time, the unit will run the oil return program to increase the compressor frequency.

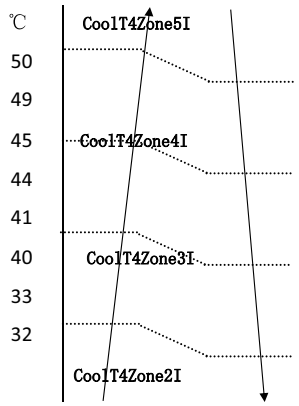
9.3.11 EEPROM Parameter Error

If main chip does not receive feedback from EEPROM chip or parameter check error, the unit ceases operation.

9.3.12 Compressor Current Limit Protection

The temperature interval for the current limit is the same as the range of the T4 frequency limit.

Cooling mode:

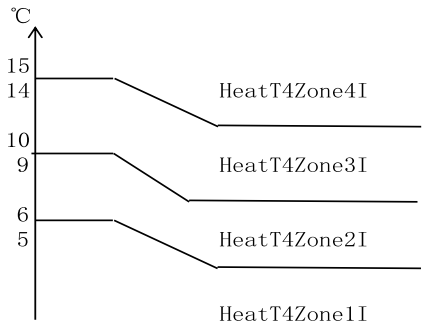


CoolReturnI	The difference between current limit and shutdown current
CoolT4Zone5I	Cooling T4≥50℃ current limit value
CoolT4Zone4I	Cooling 49＞T4≥45℃ current limit value
CoolT4Zone3I	Cooling 44＞T4≥41℃ current limit value
CoolT4Zone2I	Cooling 40 > T4≥33℃ current limit value
CoolT4Zone1I	Cooling 32＞T4℃current limit value
CoolStopI	Cooling stop protection current value

Figure 24

Heating mode:

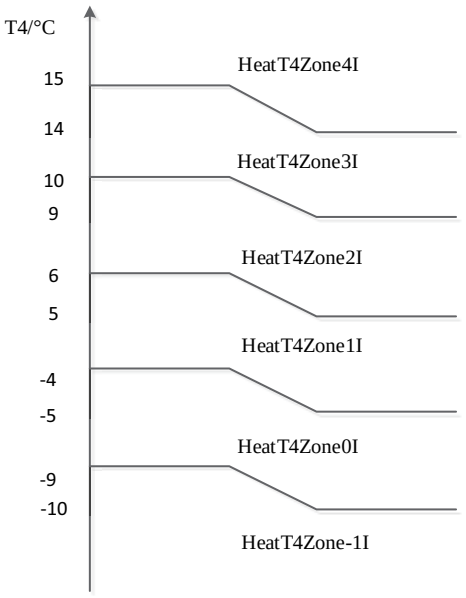
For other models:



HeatReturnI	The difference between current limit and shutdown current
HeatT4Zone4I	Heating T4≥15℃ current limit value
HeatT4Zone3I	Heating 14＞T4≥10℃ current limit value
HeatT4Zone2I	Heating 9 ＞T4≥6℃ current limit value
HeatT4Zone1I	Heating 5 ＞T4℃current limit value
HeatStopI	Heating stop protection current

Figure 25

For Max Performance 36K and 48K, and Regular 48K Systems:



HeatReturnI	The difference between current limit and shutdown current
HeatT4Zone4I	Heating T4≥15℃ current limit value
HeatT4Zone3I	Heating 14℃＞T4≥10℃ current limit value
HeatT4Zone2I	Heating 9℃＞T4≥6℃ current limit value
HeatT4Zone1I	Heating 5℃＞T4℃current limit value
HeatT4Zone0I	Heating -5℃＞T4≥-9℃current limit value
HeatT4Zone-1I	Heating -10℃＞T4 current limit value
HeatStopI	Heating stop protection current value

Figure 26

9.3.13 High Condenser Coil Temp. Protection

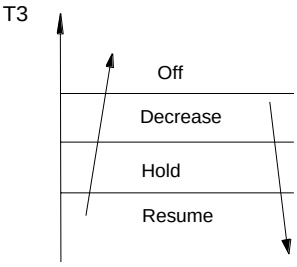


Figure 27

9.3.14 Low Outdoor Ambient Temperature Protection

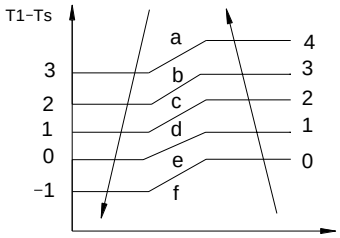
- When the compressor is off and T4 is lower than -31℉ (-35℃) for 10 seconds, the unit stops and displays “LP” or “PC0L.”
- When the compressor is on and T4 remains lower than -40℉ (-40℃) for 10 seconds, the unit stops and displays “LP” or “PC0L.”
- When T4 is no lower than -25.6℉ (-32℃) for 10 seconds, the unit exits protection.

9.4 Control and Functions

9.4.1 Capacity Request Calculation

Total capacity Request=Σ(Norm code × HP) /40×modify rate+correction.

Cooling Mode:



Capacity area	a	b	c	d	e	f
Norm code (N)	3	2	1.5	1	0.5	0

Figure 28

Model	9K	12K	18K	24K
HP	1.0	1.2	1.5	2.5

Table 30

The final result is an integer.

Use the following table and final capacity request to confirm the operating frequency.

Frequency (Hz)	0	COOL_F1	COOL_F2	------	COOL_F24	COOL_F25
Amendatory capacity demand.	0	1	1	------	24	25

Table 31

The maximum running frequency is adjusted according to the outdoor ambient temperature.

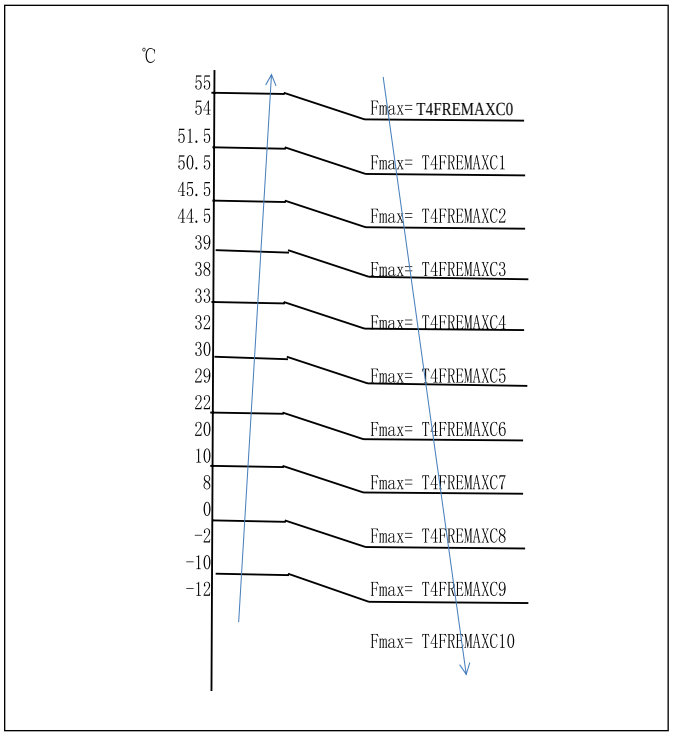
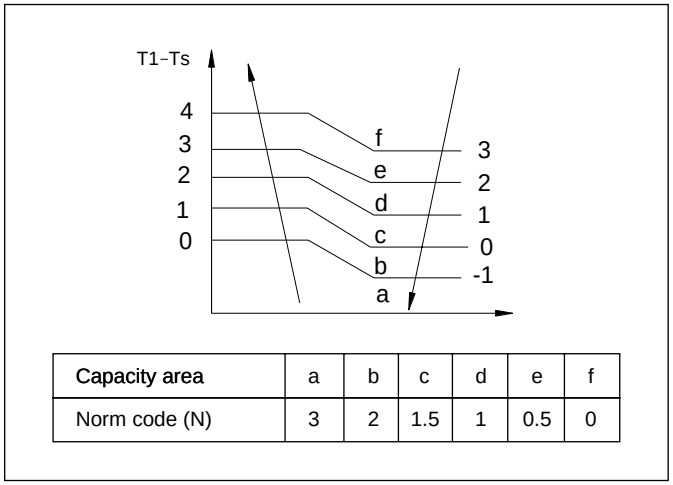


Figure 29

Heating Mode:



Capacity area	a	b	c	d	e	f
Norm code (N)	3	2	1.5	1	0.5	0

Figure 30

Model	9K	12K	18K	24K
HP	1.0	1.2	1.5	2.5

Table 32

The final result is an integer.

Then modify it according to a T2 average (correction):

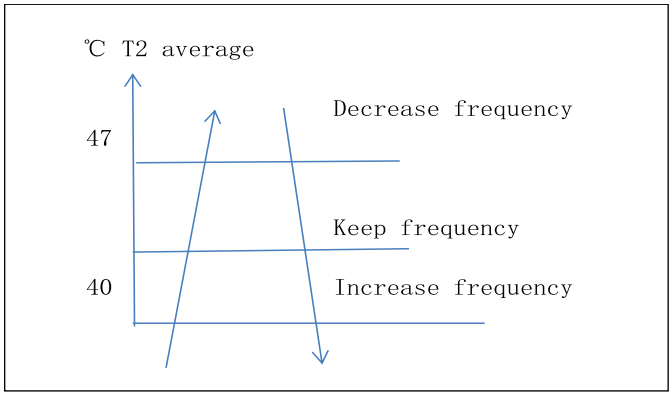


Figure 31

Use the following table and final capacity request to confirm the operating frequency.

Frequency (Hz)	0	HEAT_ F1	HEAT_ F2	--- ---	HEAT__ F24	HEAT__ F25
Amendatory capacity demand.	0	1	2	--- ---	24	25

Table 33

The maximum running frequency is adjusted according to the outdoor ambient temperature.

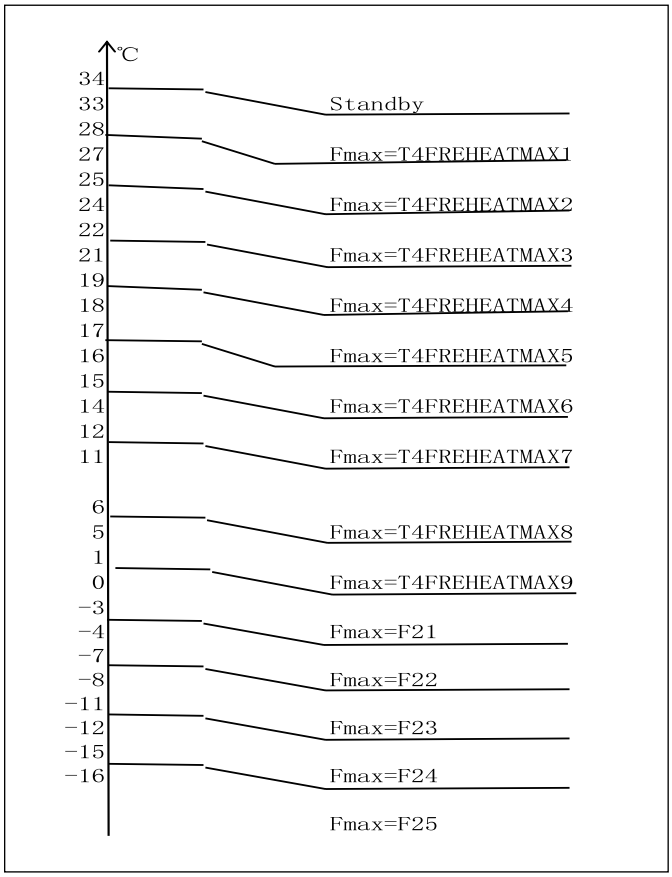


Figure 32

9.4.2 Defrost Control

Conditions for Defrosting:

After the compressor starts and enters normal operation, mark the minimum value of T3 from the 10th to 15th minute as T30.

If any one of the following conditions is satisfied, the unit enters defrost mode:

1. If the compressor's cumulative running time reaches 29 minutes and T3 < TCDI1 and T3 + T30SUBT3ONE ≤ T30.
2. If the compressor cumulative running time reaches 35 minutes and T3 < TCDI2 and T3 + T30SUBT3TWO ≤ T30.
3. If the compressor cumulative running time reaches 40 minutes and T3 < -11.2℉ (-24℃) for 3 minutes.
4. If the compressor cumulative running time reaches 120 minutes and T3 < 5℉ (-15℃).
5. If the air conditioner is shut down from heating mode, it will enter defrost if any of the following conditions are met (this condition can be shielded by parameters):
   a. The continuous operation time of the press exceeds 30 minutes, and T3<-7 degrees;
   b. The continuous operation time of the press is more than 30 minutes, and T30<-15 degrees;
6. For the first defrosting when the machine is turned on, after the compressor has been running for 30 minutes, when T4-T3> (0.5T4 + KDELTT_ADD) and T3 <TCDIN5_ADD, it will immediately enter the defrosting action. After performing this defrosting action once, this rule will be invalid until the next restarting operation.
7. If any one of the following conditions is satisfied, the unit enters defrosting mode,
   a. If T3 or T4 is lower than 26.6℉ (-3℃) for 30 seconds,Ts-T1 is lower than 41℉ (5℃)and compressor running time is more than DEFROST_COND6_IN_TIM.
   b. If T3 or T4 is lower than 26.6℉ (-3℃) for 30 seconds and compressor running time is more than DEFROST_COND6_IN_TIM +30.

Defrost Stop Conditions

If any one of the following conditions is satisfied, defrost mode ends and the unit returns to normal heating mode:

- T3 rises above than TCDE1℃.
- T3 remains at TCDE2℃ or above for 80 seconds.
- The machine runs for 10 consecutive minutes in defrost mode.

Defrosting Action:

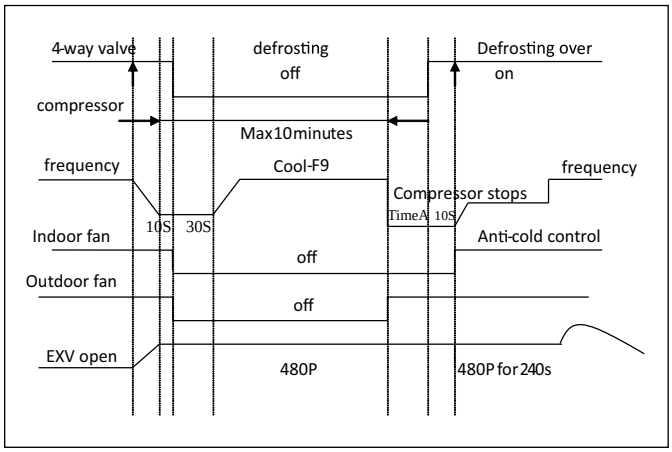


Figure 33

9.4.3 Outdoor Fan Control

9.4.3.1 Cooling Mode

Under normal operating conditions, the system chooses the running fan speed according to the ambient temperature:

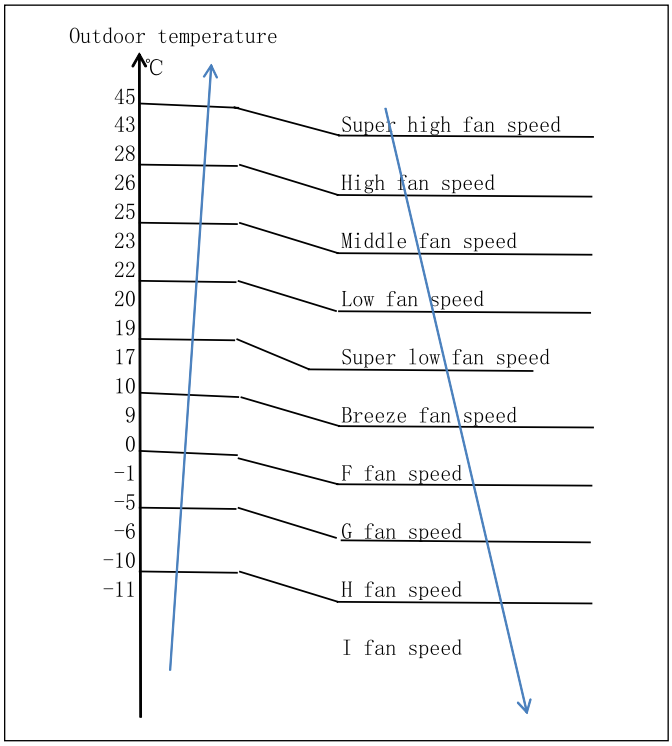


Figure 34

9.4.4 Point check function (engineering troubleshooting mode)

A check switch is included on the outdoor PCB. Push SW1 to check the unit's status while running. The digital display shows the following codes each time the SW1 is pushed.

Number of Presses	Display	Remark
0	Normal display	Displays running frequency, running state, or malfunction code
1	Quantity of indoor units with working connection	-
2	Outdoor unit running mode code	Off: 0,Fan only: 1, Cooling: 2, Heating: 3, Forced cooling: 4. Forced defrost:A
3	Indoor unit A capacity	The capacity unit is horse power. If the indoor unit is not connected, the digital display shows the following: "—" (9K:1HP,12K:1.2HP,18K:1.5HP,24K:2.0HP, 36K: 3.2 HP)
4	Indoor unit B capacity	
5	Indoor unit C capacity	
6	Indoor unit D capacity	
7	Indoor unit E capacity	
8	Indoor unit A capacity demand code	Norm code*HP (9K: 1HP,12K: 1.2HP,18K: 1.5HP,24K:2.0HP, 36K: 3.2 HP)
9	Indoor unit B capacity demand code	
10	Indoor unit C capacity demand code	
11	Indoor unit D capacity demand code	
12	Indoor unit E capacity demand code	
13	Outdoor unit amendatory capacity demand code	
14	The frequency corresponding to the total indoor units' amendatory capacity demand	
15	The frequency after the frequency limit	
16	The frequency sending to compressor control chip	
17	Indoor unit A evaporator outlet temperature (T_2B A)	If the temperature is lower than -9 °C, the digital display shows "-9." If the temperature is higher than 70 °C, the digital display shows "70." If the indoor unit is not connected, the digital display shows: "—"
18	Indoor unit A evaporator outlet temperature (T_2B B)	
19	Indoor unit A evaporator outlet temperature (T_2B C)	
20	Indoor unit A evaporator outlet temperature (T_2B D)	
21	Indoor unit A evaporator outlet temperature (T_2B E)	
22	Indoor unit A room temperature (T1A)	If the temperature is lower than 0 °C, the digital display shows "0." If the temperature is higher than 50 °C, the digital display shows "50." If the indoor unit is not connected, the digital display shows: "—"
23	Indoor unit A room temperature (T1B)	
24	Indoor unit A room temperature (T1C)	
25	Indoor unit A room temperature (T1D)	
26	Indoor unit A room temperature (T1E)	
27	Indoor unit A evaporator temperature (T2A)	If the temperature is lower than -9 °C, the digital display shows "-9." If the temperature is higher than 70 °C, the digital display shows "70." If the indoor unit is not connected, the digital display shows: "—"
28	Indoor unit A evaporator temperature (T2B)	
29	Indoor unit A evaporator temperature (T2C)	
30	Indoor unit A evaporator temperature (T2D)	
31	Indoor unit A evaporator temperature (T2E)	
32	Condenser pipe temperature (T3)	
33	Outdoor ambient temperature (T4)	
34	Compressor discharge temperature (TP)	The display value is between 30–129 °C. If the temperature is lower than 30 °C, the digital display shows "30." If the temperature is higher than 99 °C, the digital display shows single and double digits. For example, if the digital display shows "0.5", the compressor discharge temperature is 105 °C.
35	AD value of current	The display value is hex number. For example: the digital display tube shows "Cd" so $C*16^1+d*16^0=12*16+13=205$, it means AD value is 205. AD value is detected by the chip for 36K Max Performance, actual AD value is AD value. plus 60.
36	AD value of voltage	
37	AD Value of DC Voltage	

Number of Presses	Display	Remark		
38	EXV open angle for A indoor unit	Actual data/4. If the value is higher than 99, the digital display shows single and double digits. For example, if the digital display shows “2.0”, the EXV open angle is 120×4=480p.		
39	EXV open angle for B indoor unit			
40	EXV open angle for C indoor unit			
41	EXV open angle for D indoor unit			
42	EXV open angle for E indoor unit			
43	MVI open angle (for some models)			
44	EXI open angle (for some models)			
45	Frequency limit symbol	Bit7	Reserved	The display value is a hexidecimal number. For example, the digital display show 2A, then Bit5=1, Bit3=1, and Bit1=1. This means that a frequency limit may be caused by the current, IPM or T3.
		Bit6	Frequency limit caused by voltage	
		Bit5	Frequency limit caused by current	
		Bit4	Reserved	
		Bit3	Frequency limit caused by IPM	
		Bit2	Frequency limit caused by T5 (Compressor discharge temperature)	
		Bit1	Frequency limit caused by T3 (ODU heat exchanger pipe temp)	
		Bit0	Frequency limit caused by T2 (Middle IDU heat exchanger coil temp)	
46	T2B Fault	00:No fault,01:T2B-A fault, ,02:T2B-B fault ,03:T2B-C fault,04:T2B-D fault, 05:T2B-E fault, 06:T2B-F fault (The display priority is A-B-C-D-E-F)		
47	Average value of T2	(Sum T2 value of all indoor units)/(number of indoor units in good connection)		
48	Outdoor unit fan motor state	Off: 0, Super high speed:1, High speed:2, Med speed: 3, Low speed: 4, Breeze:5, Super breeze: 6		
49	Reason of stop			
50-59	Reserved			
60	Air injection enthalpy inlet temperature (Max Performance only)	If the temperature is lower than -9℃, the digital display shows “-9”. If the temperature is higher than 70℃, the digital display shows “70.” If the indoor unit is not connected, the digital display shows: “--”		
61	Air injection enthalpy outlett temperature (Max Performance only)			
62	Condenser coil middle temperature (Max Performance only)			
63	Refrigerant tube inlet temperature (Max Performance only)			
64	Target discharge temperature	The display value is between 0–199℃. If the temperature is lower than 30℃, the digital display shows “30.” If the temperature is higher than 99℃, the digital display shows single and double digits. For example, If the display shows 0.5, so 0.5 multipled by 10 to become 5, then added to 100 to become 105℃.		
65	Indoor Unit F capacity	The capacity unit is horse power. If the indoor unit is not connected, the digital display shows the following: “--”		
66	Indoor unit F capacity demand code	Norm code*HP (9K: 1HP,12K: 1.2HP,18K: 1.5HP)		
67	Indoor unit F evaporator outlet temperature (T2BF)	"If the temperature is lower than -9℃, the digital display shows “-9.” If the temperature is higher than 70℃, the digital display shows “70.” If the indoor unit is not connected, the digital display shows: “--”		
68	Indoor unit F room temperature (T1F)	If the temperature is lower than 0℃, the digital display shows “0.” If the temperature is higher than 70℃, the digital display shows “70.” If the indoor unit is not connected, the digital display shows: “--”		

Number of Presses	Display	Remark
69	Indoor unit F evaporator temperature (T2F)	If the temperature is lower than -9℃, the digital display shows “-9.” If the temperature is higher than 70℃, the digital display shows “70.” If the indoor unit is not connected, the digital display shows: “--”
70	EXV open angle for F indoor	Actual data/4. If the value is higher than 99, the digital display shows single and double digits.
71	IPM module temperature	The display value is between 0–199℃. If the temperature is higher than 99℃, the digital display shows single and double digits. For example, If the display shows 5.0, so 5.0 multipled by 10 to become 50, then added to 100 to become 150℃.
72	The high pressure sensor detects the pressure corresponding to the condensation temp (Tc)	The digital display shows: “--”
73	Reserved	
74		

Table 34

10 Troubleshooting

Safety

WARNING

Electrical hazard!

Electrical power is still kept in capacitors even though power supply is shut off. Do not forget to discharge the electricity in capacitor.

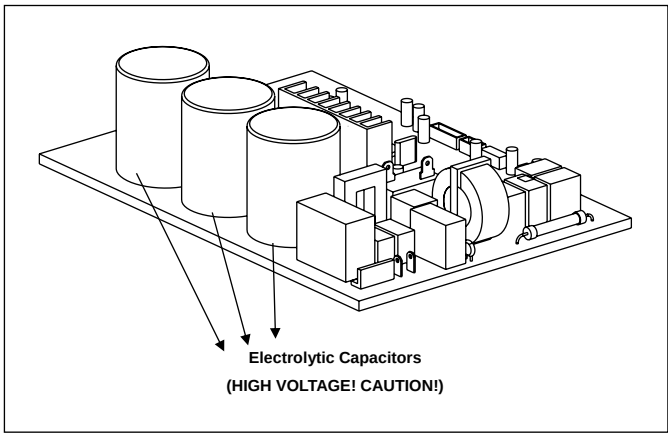


Figure 35

The value of resistance is between 1500Ω to 2000Ω.
The voltage in P3 and P4 in outdoor PCB is approximately 310V.
The voltage in P5 and P6 in outdoor PCB is approximately 310V.

10.1 Quick Check by Error Code

Cause	Error Code											
	EL01	EC50	EC51	EC52	EC53	EC54	EC55	EC56	EC57	EC5A	EC5b	EC5E
IDU PCB	●											
ODU PCB	●	●	●	●	●	●	●	●	●	●	●	●
ODU Coil Temp. Sensor		●		●								
COMP. Discharge temp. Sensor		●			●							
IPM Module temp. Sensor							●					
IDU Coil temp. Sensor								●				
Refrigerant pipe temp. Sensor									●			
Enthalpy inlet temp. Sensor										●		
Enthalpy outlet temp. Sensor											●	
Condenser temp. Sensor												●
Reactor	●											
IPM Module board	●											

Table 35

Cause	Error Code									
	EC5C	EHC1	EC07/EC71	PC00	PC01/PC10/ PC11/PC12	PC02	PC08/PC44/ PC46/PC49	PC13	PCAI	PCOF
ODU PCB	●		●	●	●	●	●	●	●	●
ODU Fan Motor			●	●			●			
Reactor or Inductance				●	●		●			●
Compressor				●						
IPM Module board				●	●		●			
Bridge Rectifier				●	●		●			
Pressure Sensor	●									
PFC Module										●
Additional Refrigerant		●								
Overload protector						●				
ODU Ambien Temp. Sensor									●	
Refrigerant Pipe Temp. Sensor									●	

Table 36

Cause	Error Code							
	PC40	EC72	PC43	PC45	PC06	PC0A	PC30	PC31
ODU PCB	●	●	●		●	●	●	●
ODU Fan Motor		●				●	●	●
ODU Coil Temp. Sensor						●		
COMP. Discharge temp. Sensor					●			
Compressor			●					
IPM Module board				●				
Additional Refrigerant					●	●		●
Electric Control Box	●							
High pressure switch							●	
Low pressure switch								●

Table 37

10.2 ODU PCB & IPM

10.2.1 PCB: Multi Zone Regular 18K BMS500-AAM018-1CSXRD

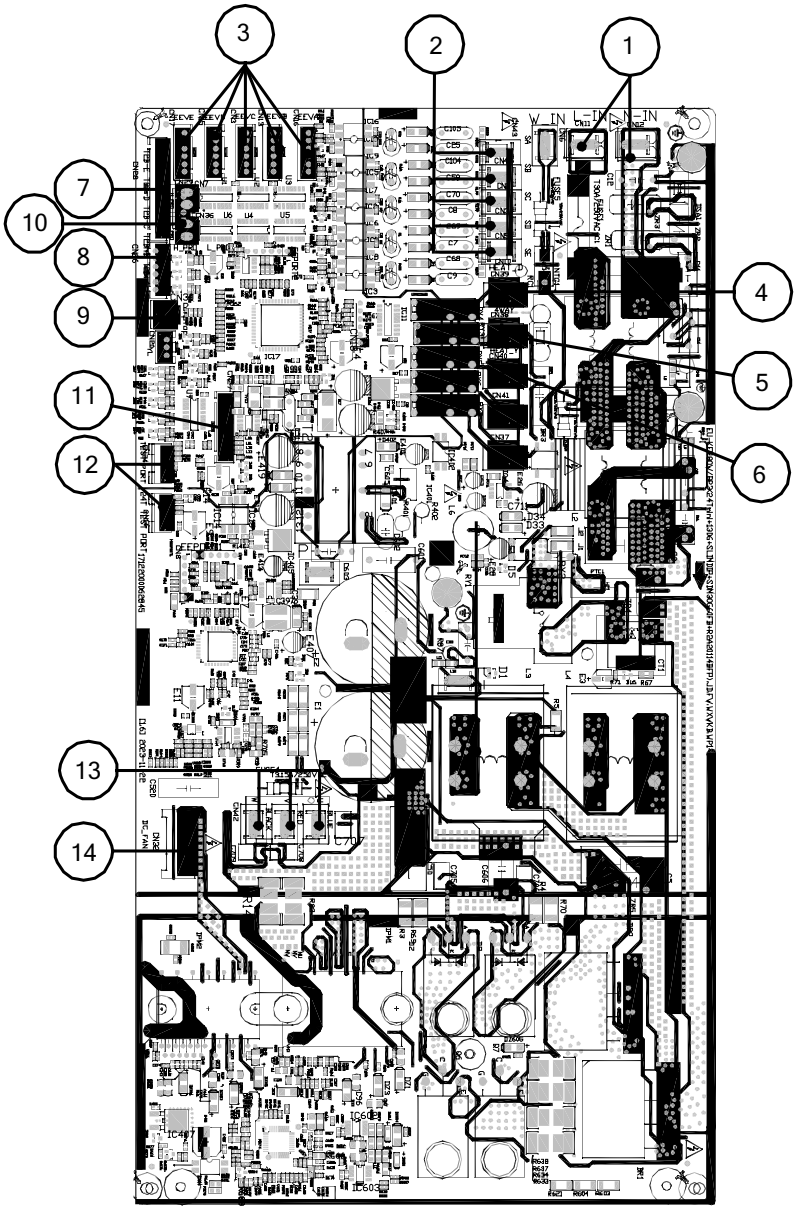
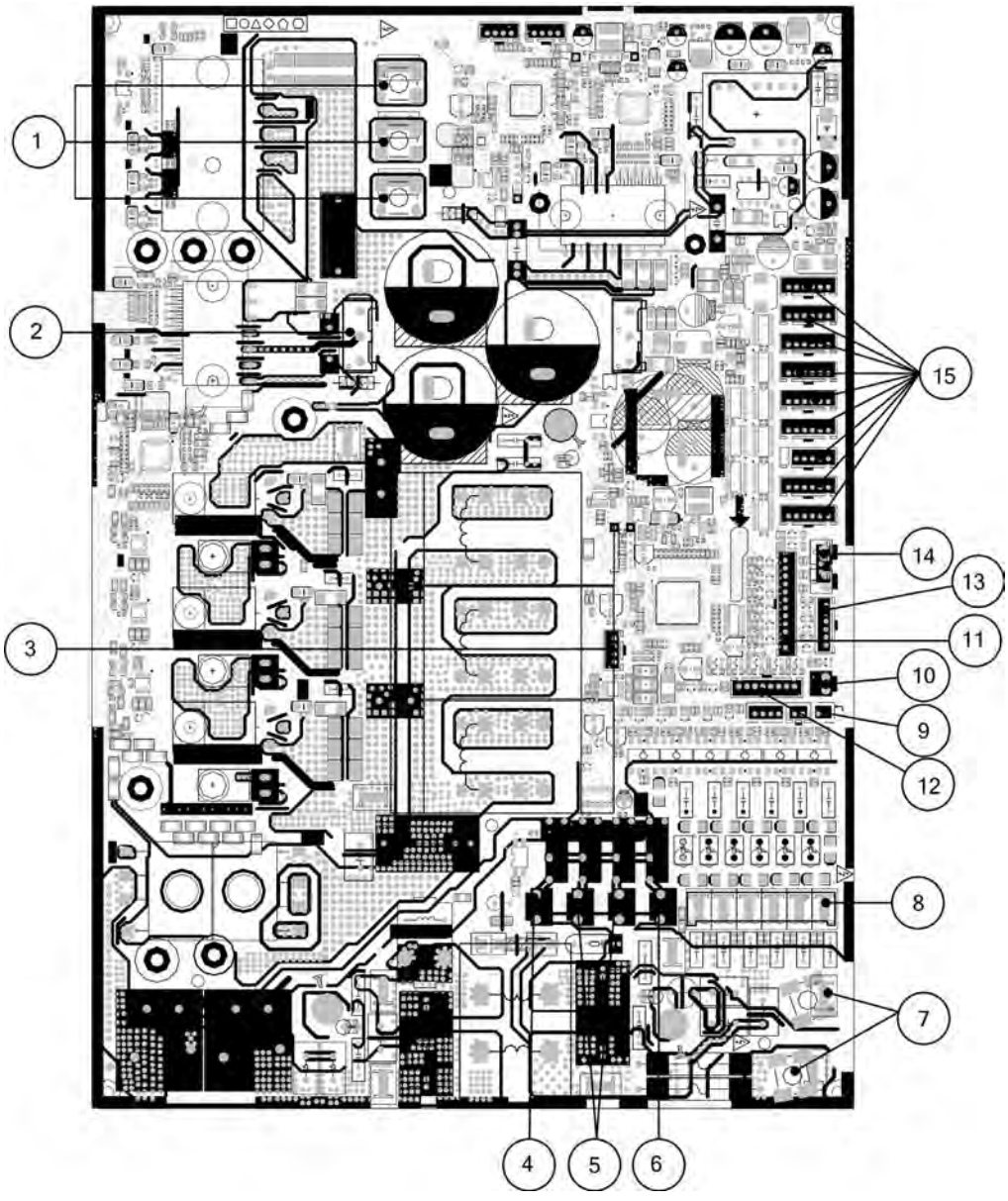


Figure 36

No.	LED STATUS	CN#	Meaning
1	Power Supply	CN11	L_in: connect to N-line (208-230V AC input)
		CN12	N_in: connect to L-line (208-230V AC input)
2	S-A	CN4	S: connect to indoor unit communication(pin1-pin2: 24VDC Pulse wave; pin2-pin3: 208-230V AC input)
	S-B	CN2	
	S-C	CN34	
	S-D	CN5	
	S-E	CN10	
3	EEV-A	CN10	Connect to Electric Expansion Valve
	EEV-B	CN13	
	EEV-C	CN3	
	EEV-D	CN15	
	EEV-E	CN17	
4	HEAT_D	CN39	Connect to chassis heater, 208-230V AC when is ON
5	4-way	CN38	Connect to 4 way valve, 208-230V AC when is ON.
6	HEAT_Y	CN40	Connect to compressor heater, 208-230V AC when is ON
7	T2B	CN28	Connect to evaporator coil outlet temperature sensor T2B
8	T3 T4 TP	CN26	Connect to pipe temp. sensor T3, ambient temp. sensor T4, exhaust temp. sensor TP
9	OLP TEMP. SENSOR	CN30	Connect to compressor top temp. sensor (5VDC Pulse wave)
10	H-PRO,L-RPO	CN29	Connect to high and low pressure swtich(pin1-pin2&pin3-pin4:5VDC pulse wave)
11	/	CN27	Connect to key board CN1
12	TESTPORT	CN24/CN14	Used for testing
13	COMPRESSOR	U	Connect to compressor; 0V AC (Standy), 10-200V AC (Running)
		V	
		W	
14	DC-FAN	CN32	Connect to DC Fan

Table 38

10.2.2 PCB: Multi Zone Regular 27K, 36K, 48K & Max Performance 18K, 27K, 36K, 48K, BMS500-AAM027-1CSXRD, BMS500-AAM036-1CSXR, BMS00 AAM048-1CSXRD, BMS500-AAM018-1CSXHD, BMS500-AAM027-1CSXHD, BMS500-AAM036-1CSXHD, BMS500-AAM048-1CSXHD



MaxP 18K, Regular & MaxP 27K, Regular 36K & Max P, Regular & MaxP 48K

Figure 37

No.	Name	CN#	Meaning
1	COMPRESSOR	W	Connect to compressor; 0V AC (Standby); 10-310V AC (running)
		V	
		U	
2	DC-FAN	CN32	Connect to DC Fan
3	TESTPORT	CN45	Used for testing
4	HEAT-Y	CN38	Connect to compressor heater, 208-230V AC when is ON
5	4-WAY	CN37	Connect to 4 way valve 1, 208-230V AC when is ON.
		CN25	Connect to 4 way valve 2, 208-230V AC when is ON.
6	HEAT-D	CN24	Connect to chassis heater, 208-230V AC when is ON.
7	Power Supply	CN11	N_in: connect to N-line (208-230V AC input)
		CN12	L_in: connect to L-line (208-230V AC input)
8	S-A	CN43	S: Connect to indoor unit communication (pin1-pin2: 24VDC Pulse Wave; pin2-pin3: 208-230V AC Input)
	S-B		
	S-C		
	S-D		
	S-E		
	S-F		
9	TBH-IN TBH-OUT T3B TF	CN9	Connect to Cold Plate inlet temperature sensor TBH-IN, Cold Plate outlet temperature sensor TBH-OUT, condenser coil middle temperature sensor T3B, refrigerant tube inlet temperature sensor TF
10	OPL TEMP. SENSOR	CN30	Connect to compressor top temperature sensor (5VDC Pulse Wave)
11	T2B	CN28	Connect to evaporator coil outlet temperature sensor T2B
12	/	CN27	Connect to Key Board CN1
13	T3 T4 TP	CN26	Connect to condenser coil temperature sensor T3, ambient temperature sensor T4, exhaust temperature sensor TP
14	H-PRO, L-PRO	CN29	Connect to High and Low pressure switch (pin1-pin2&pin3-pin4: 5VDC pulse wave)
15	EEV-A	CN17	Connect to Electric Expansion Valve
	EEV-B	CN16	
	EEV-C	CN22	
	EEV-D	CN14	
	EEV-E	CN13	
	EEV-F	CN1	
	EEV-1	CN53	
	EEV-2	CN44	
	EEV-3	CN3	

Table 39

10.3 Outdoor Unit Display

10.3.1 Outdoor Unit Point Check Function

A check switch is included on the outdoor PCB. Push SW1 to check the unit's status while running. The digital display shows the following codes each time the SW1 is pushed. See Table XX and Table XX.

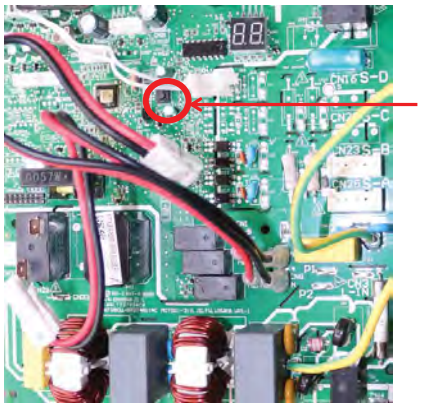


Figure 38

<table>
<tr><th>Number of Presses</th><th>Display</th><th>Remark</th></tr>
<tr><td>0</td><td>Normal display</td><td>Displays running frequency, running state, or malfunction code</td></tr>
<tr><td>1</td><td>Quantity of indoor units with working connection</td><td>Actual data<table><tr><th>Display</th><th>Number of indoor unit</th></tr><tr><td>1</td><td>1</td></tr><tr><td>2</td><td>2</td></tr><tr><td>3</td><td>3</td></tr><tr><td>4</td><td>4</td></tr><tr><td>5</td><td>5</td></tr></table></td></tr>
<tr><td>2</td><td>Outdoor unit running mode code</td><td>Off: 0, Fan only: 1, Cooling: 2, Heating: 3, Forced cooling: 4. Forced Defrost: A</td></tr>
<tr><td>3</td><td>Indoor unit A capacity</td><td rowspan="5">Current capacity/horse power
If the indoor unit is not connected,
the digital display shows the following: “——”
(9K:1HP,12K:1.2HP,18K:1.5HP,24K:2.0HP)</td></tr>
<tr><td>4</td><td>Indoor unit B capacity</td></tr>
<tr><td>5</td><td>Indoor unit C capacity</td></tr>
<tr><td>6</td><td>Indoor unit D capacity</td></tr>
<tr><td>7</td><td>Indoor unit E capacity</td></tr>
<tr><td>8</td><td>Indoor unit A capacity demand code</td><td rowspan="5">Norm code*HP
(9K: 1HP,12K: 1.2HP,18K: 1.5HP,24K:2.0HP)</td></tr>
<tr><td>9</td><td>Indoor unit B capacity demand code</td></tr>
<tr><td>10</td><td>Indoor unit C capacity demand code</td></tr>
<tr><td>11</td><td>Indoor unit D capacity demand code</td></tr>
<tr><td>12</td><td>Indoor unit E capacity demand code</td></tr>
<tr><td>13</td><td>Outdoor unit amendatory capacity demand code</td><td>—</td></tr>
<tr><td>14</td><td>The frequency corresponding to the total indoor units' amenda-tory capacity demand</td><td>—</td></tr>
<tr><td>15</td><td>The frequency after the frequency limit</td><td></td></tr>
<tr><td>16</td><td>The frequency sent to compressor control chip</td><td></td></tr>
<tr><td>17</td><td>Indoor unit A evaporator outlet temperature (T2BA)</td><td rowspan="5">If the temperature is lower than -9 °C, the digital display shows “-9.”
If the temperature is higher than 70 °C, the digital display shows “70.”
If the indoor unit is not connected, the digital display shows: “——”</td></tr>
<tr><td>18</td><td>Indoor unit B evaporator outlet temperature (T2BB)</td></tr>
<tr><td>19</td><td>Indoor unit C evaporator outlet temperature (T2BC)</td></tr>
<tr><td>20</td><td>Indoor unit D evaporator outlet temperature (T2BD)</td></tr>
<tr><td>21</td><td>Indoor unit E evaporator outlet temperature (T2BE)</td></tr>
</table>

Table 40

Number of Presses	Display	Remark		
22	Indoor unit A room temperature (T_1A)	If the temperature is lower than 0 ℃, the digital display shows “0.” If the temperature is higher than 70 ℃, the digital display shows “70.” If the indoor unit is not connected, the digital display shows: “—”		
23	Indoor unit B room temperature (T_1B)			
24	Indoor unit C room temperature (T_1C)			
25	Indoor unit D room temperature (T_1D)			
26	Indoor unit E room temperature (T_1E)			
27	Indoor unit A evaporator temperature (T_2A)	If the temperature is lower than -9 ℃, the digital display shows “-9.” If the temperature is higher than 70 ℃, the digital display shows “70.” If the indoor unit is not connected, the digital display shows: “—”		
28	Indoor unit B evaporator temperature (T_2B)			
29	Indoor unit C evaporator temperature (T_2C)			
30	Indoor unit D evaporator temperature (T_2D)			
31	Indoor unit E evaporator temperature (T_2E)			
32	Condenser pipe temperature (T3)			
33	Outdoor ambient temperature (T4)			
34	Compressor discharge temperature (TP)	The display value is between 30–129 ℃. If the temperature is lower than 30 ℃, the digital display shows “30.” If the temperature is higher than 99 ℃, the display will show a decimal point. For example, if the digital display shows “0.5”, the compressor discharge temperature is 105 ℃.		
35	AD value of current	The display value is a hex number. For example, the digital display tube shows “Cd”, it means AD value is 205. AD value is detected by the chip for Regular & Max Performance 36K, actual AD value is AD value plus 60.		
36	AD value of AC voltage			
37	AD value of DC voltage			
38	EXV open angle for A indoor unit	Actual data/4. If the value is higher than 99, the digital display will show a decimal point. For example, if the digital display shows “2.0”, the EXV open angle is 120×4=480 pulse.		
39	EXV open angle for B indoor unit			
40	EXV open angle for C indoor unit			
41	EXV open angle for D indoor unit			
42	EXV open angle for E indoor unit			
43	MVI open angle (for some models)			
44	EXI open angle (for some models)			
45	Frequency limit symbol	Bit7	Reserved	The display value is a hexidecimal number. For example, the digital display show 2A, then Bit5=1, Bit3=1, and Bit1=1. This means that a frequency limit may be caused by current, IPM or T3.
		Bit6	Frequency limit caused by voltage	
		Bit5	Frequency limit caused by current	
		Bit4	Reserved	
		Bit3	Frequency limit caused by IPM	
		Bit2	Frequency limit caused by Compressor Discharge Temperature T5.	
		Bit1	Frequency limit caused by Outdoor Heat Exchanger pipe temperature T3.	
		Bit0	Frequency limit caused Middle Indoor Heat Exchanger Coil temp. T2	
46	T2B fault	00: No Fault, 01: T2B-A fault, 02: T2B-B, 03: T2B-C Fault, 04: T2B-D Fault, 05: T2B-E Fault, 06: T2B-F Fault (The display priority is A-B-C-D-E-F)		

Number of Presses	Display	Remark
47	Average value of T2	(Sum T2 value of all indoor units)/(number of indoor units with good connection)(The heating is the average value of T2, and the cooling is the average value of T2B) If the temperature is lower than -9℃, the display shows "-9".
48	Outdoor unit fan motor state	Off: 00, >600 RPM: 02, >300 RPM & <=600 RPM: 03, <=300 RPM: 04
49	Reason of Stop	
50-59	Reserved	
61	Air Injection Enthalpy Inlet Temperature (for Max Performance Models)	If the temperature is lower than -9℃, the digital display shows "-9". If the temperature is higher than 70℃, the digital display shows "70". If the indoor unit us not connected, the digital display shows: "--"
62	Air Injection Enthalpy Outlet Temperature (for Max Performance Models)	
63	Condenser Coil Middle Temperature (for Max Performance Models)	
64	Refrigerant Tube Inlet Temperature (for Max Performance Models)	
65	F indoor unit capacity	The capacity unit is horse power. If the indoor unit is not connected, the digital display shows the following: "--"
66	F indoor unit capacity demand code	Norm code*HP (9K: 1HP, 12K: 1.2HP, 18K: 1.5HP)
67	F indoor unit evaporator outlet temperature ($T_{2B}F$)	If the temperature is lower than -9℃, the digital display shows "-9". If the temperature is higher than 70℃, the digital display shows "70". If the indoor unit us not connected, the digital display shows: "--"
68	F indoor unit room temperature (T_1F)	If the temperature is lower than -0℃, the digital display shows "0". If the temperature is higher than 70℃, the digital display shows "70". If the indoor unit us not connected, the digital display shows: "--"
69	F indoor unit evaporator temperature (T_2F)	If the temperature is lower than -9℃, the digital display shows "-9". If the temperature is higher than 70℃, the digital display shows "70". If the indoor unit us not connected, the digital display shows: "--"
70	EXV open angle for F indoor unit	Actual data/4. If the value is higher than 99, the digital display will show a decimal point. For example, if the digital display shows "2.0", the EXV open angle is 120×4=480 pulse.
71	IPM Module Temperature	The display value is between 0-199℃. If the temperature is higher than 99℃, the digital display shows single and double digits. For example, if the display shows 5.0, so 5.0 multiplied by 10 to become 50, then added to 100 to become 150℃.
72	The high pressure sensor detects the pressure corresponding to the condensation temperature (Tc)	The digital display shows: "--"
73	Reserved	
74		

Table 41

10.4 Diagnosis and Solution

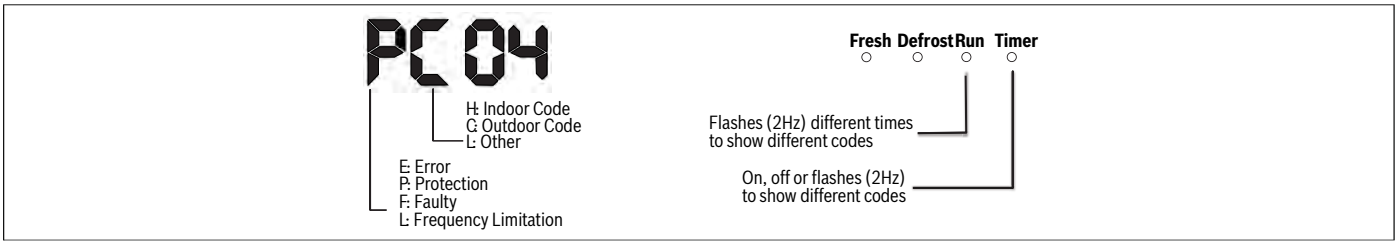


Figure 39

Display	LED Status
dF	Outdoor EEPROM malfunction
FC	Indoor / outdoor units communication error
EC 07	Outdoor fan speed has been out of control
EC 50	ODU temperature sensor error (T3, T4, TP)
EC 51	ODU EEPROM parameter error
EC 52	ODU coil temperature sensor (T3) error
EC 53	ODU ambient temperature sensor (T4) error
EC 54	COMP. Discharge temperature sensor (TP) error
EC 55	ODU IPM module temperature sensor malfunction
EC 56	IDU coil outlet temperature sensor (T2B) error
EC 57	Refrigerant pipe temperature sensor error
EC 71	Over current failure of outdoor DC fan motor
EC 72	Lack phase failure of outdoor DC fan motor
EC 5A	Failure of enthalpy inlet temperature sensor
EC 5b	Failure of enthalpy outlet temperature sensor
EC 5C	Pressure sensor failure
EC 5E	Condenser temperature sensor(T3B) failure
EH C1	Refrigerant sensor detects leakage
EL 01	IDU & ODU communication error
PC 00	IPM module protection
PC 02	Compressor top(or IPM) temp. protection
PC 06	Discharge temperature protection of compressor
PC 08	Outdoor overcurrent protection
PC 10	ODU low AC voltage protection
PC 11	ODU main control board DC bus high voltage protection
PC 12	ODU main control board DC bus high voltage protection /341 MCE error
PC 13	The AC power is cut off or the AC voltage detection circuit fails
PC 30	System high pressure protection
PC 31	System high pressure protection
PC 40	Communication error between ODU main chip and compressor driven chip
PC 43	ODU compressor lack phase protection
PC 44	Outdoor unit zero speed protection
PC 45	Outdoor unit IR chip drive failure
PC 46	Compressor speed has been out of control
PC 49	Compressor overcurrent failure
PC 0A	High temperature protection of condenser
PC 0F	PFC module protection
PC 0L	Low ambient temperature protection
PC A1	Condensation protection of refrigerant pipe
LC 06	High temperature protection of Inverter module (IPM) TS32

Table 42

10.4.1 (EC 51) - EEPROM parameter error

Error Code	EC 51
Malfunction decision conditions	Outdoor PCB main chip does not receive feedback from EEPROM chip.
Supposed causes	• Incorrect installation of indoor to outdoor control wire or line voltage wiring • PCB faulty

Table 43

Troubleshooting:

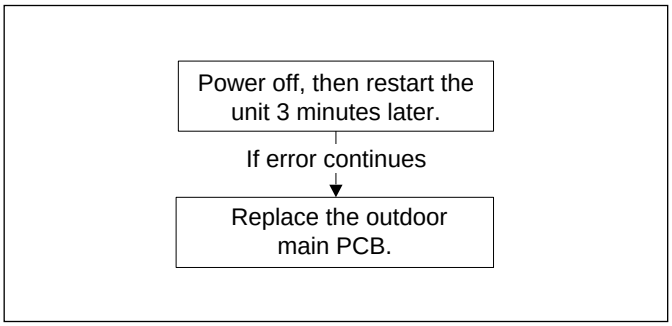


Figure 40

EEPROM: a read-only memory whose contents can be erased and reprogrammed using a pulsed voltage. For the location of EEPROM chip, please refer to the below photos.

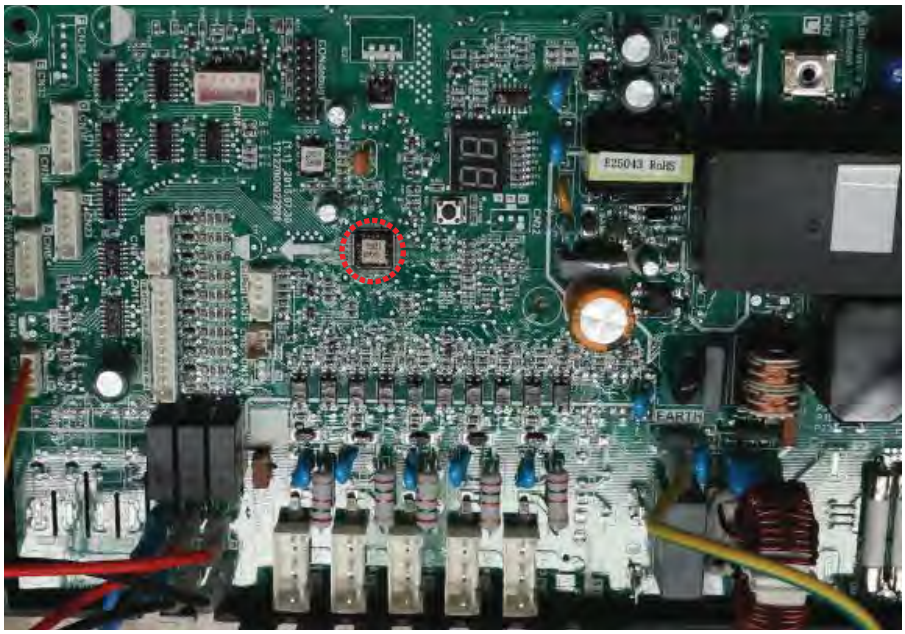


Figure 41

The photo above is for reference only, it may not be identical to the PCB shipped with your equipment.

10.4.2 (EL 01) - Indoor / outdoor communication error

Error Code	EL 01
Malfunction decision conditions	Indoor unit does not receive the feedback from outdoor unit for 110 seconds and this condition happens 4 times continously.
Supposed causes	• Incorrect installation of indoor to outdoor control wire • Indoor or outdoor PCB faulty • IPM Module board faulty • Reactor is faulty

Table 44

Troubleshooting:

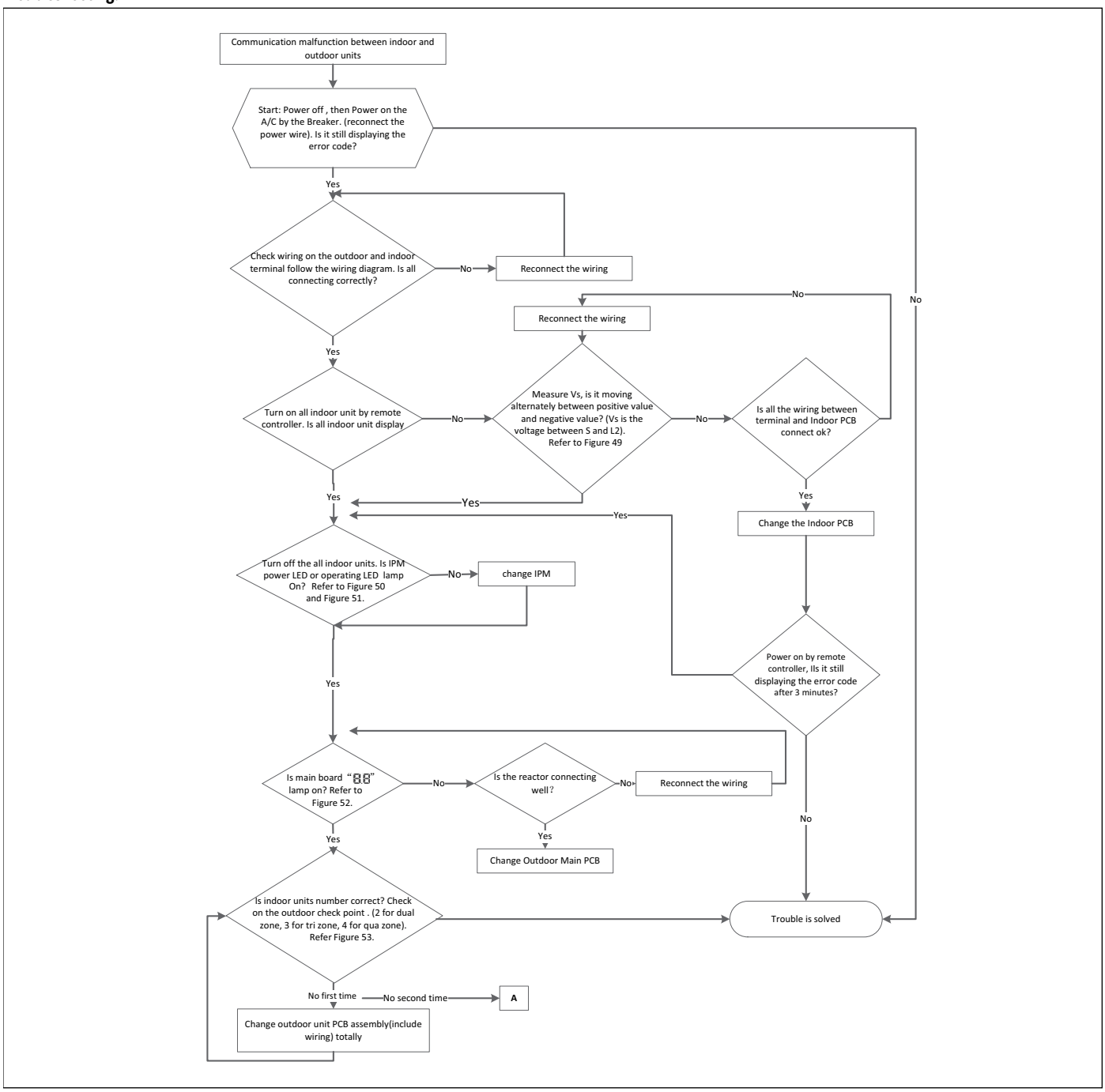


Figure 42

Note:

- Use a multimeter to test the DC voltage between 2 (old: L2) port and 3 port of outdoor unit. The red pin of multimeter connects with 2 (old: L2) port while the black pin is for 3 port. When AC is normal running, the voltage will move alternately between positive value and negative value.

This pictures are only for reference, actual condition and specific values may vary.

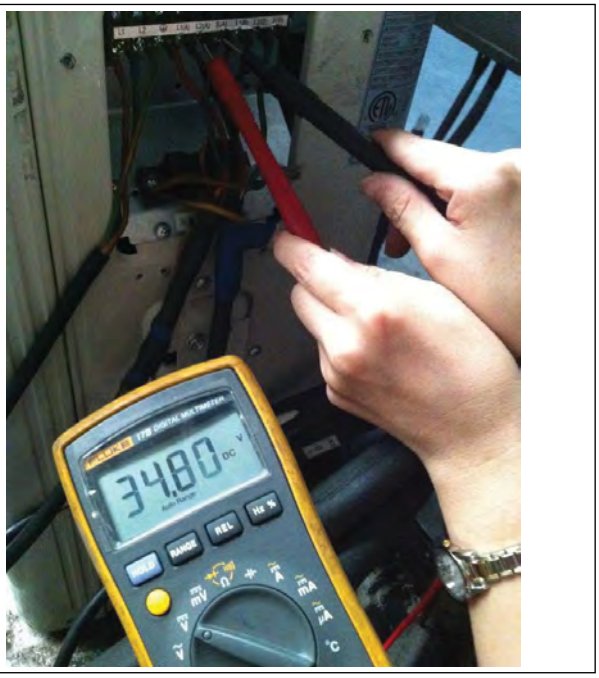


Figure 43

IPM board (18K & 27K Models):

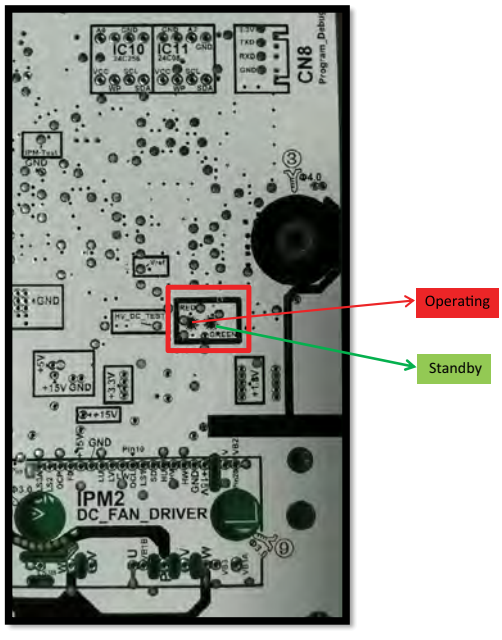


Figure 44

IPM board - Regular: 36K & 48K Models / Max Performance: 27K & 36K Models

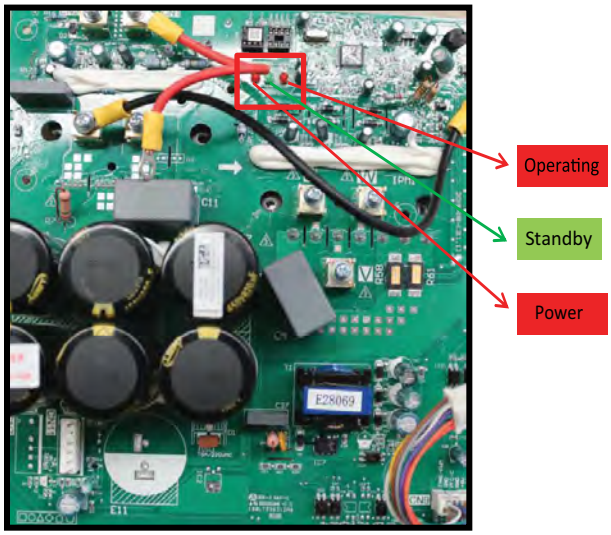


Figure 45

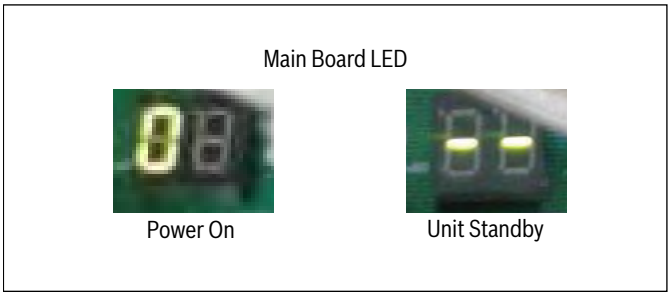


Figure 46

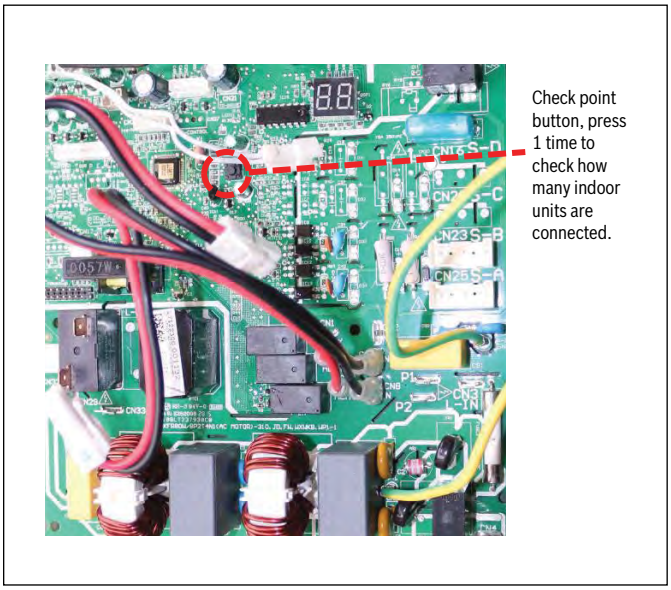


Figure 47

10.4.3 (PC 40) - IPM board and outdoor main control board communication error

Error Code	PC 40
Malfunction decision conditions	PCB main chip does not receive feedback from IPM module for 60 seconds.
Supposed causes	• Improper / Incorrect Wiring • Outdoor PCB faulty • IPM Module board faulty • Electric control box faulty

Table 45

Troubleshooting:

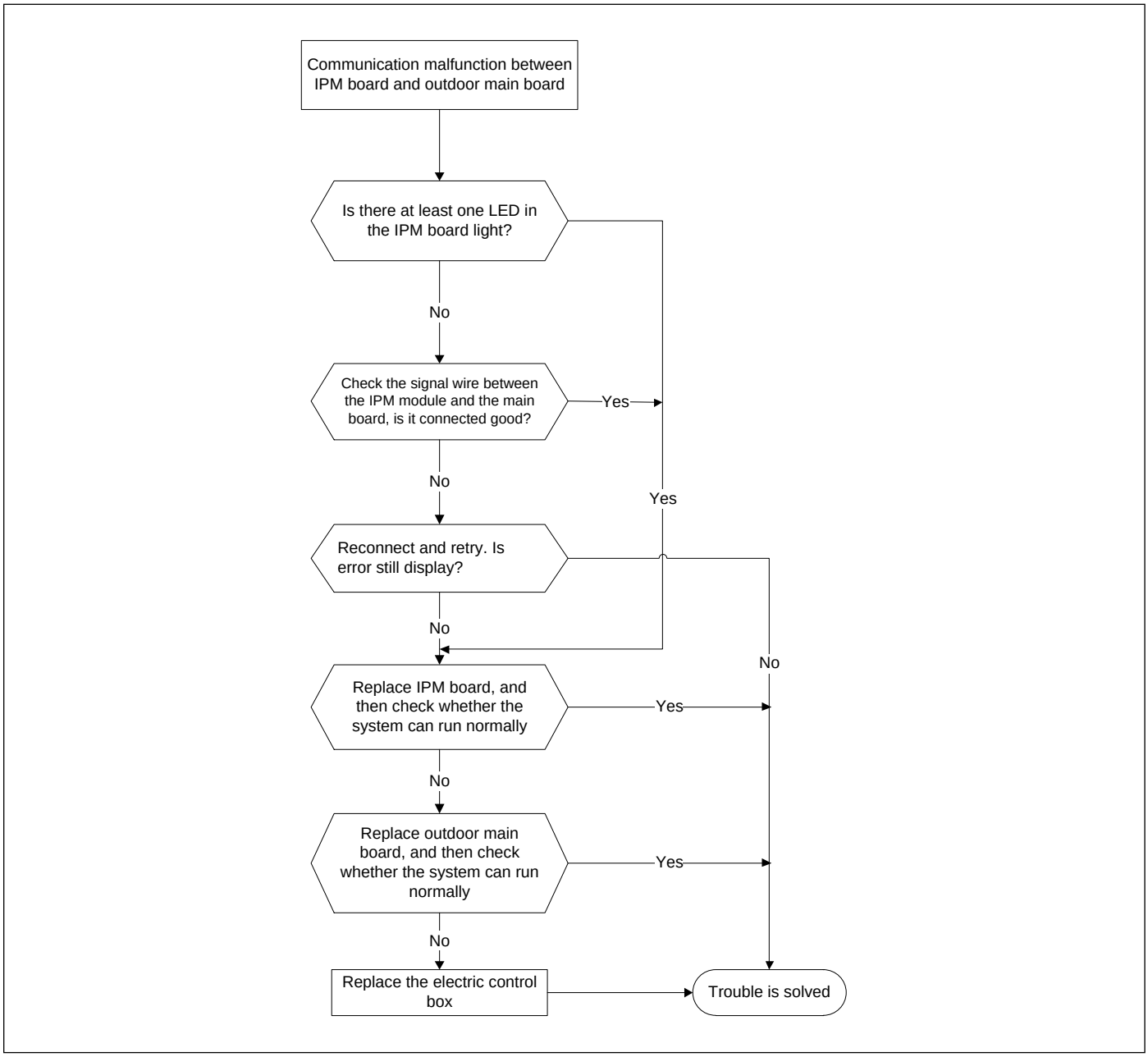


Figure 48

Note:

- Use a multimeter to test the DC voltage between black pin and white pin of signal wire. The normal value should be around 5V.

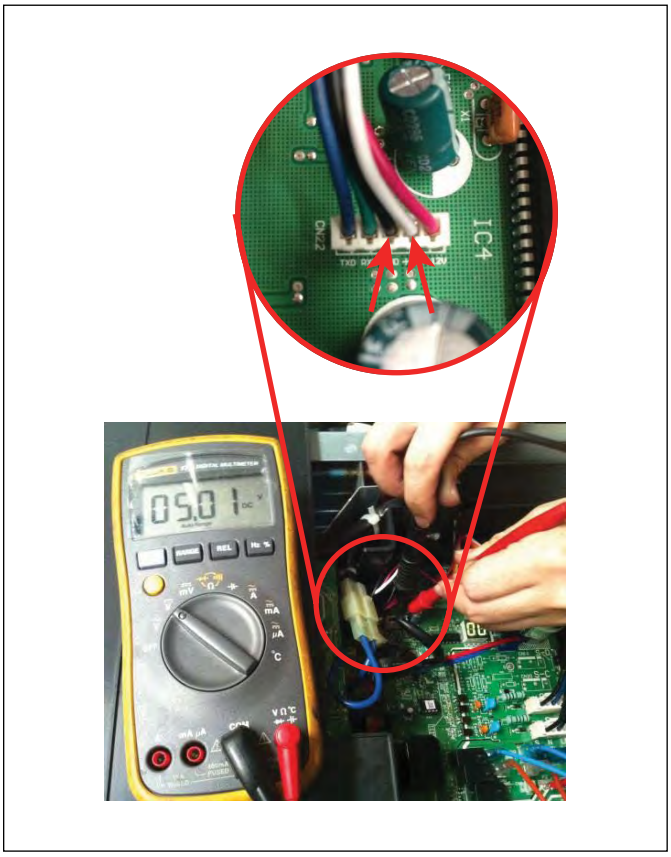


Figure 49

- Use a multimeter to test the DC voltage between black pin and red pin of signal wire. The normal value should be approximately 12V.

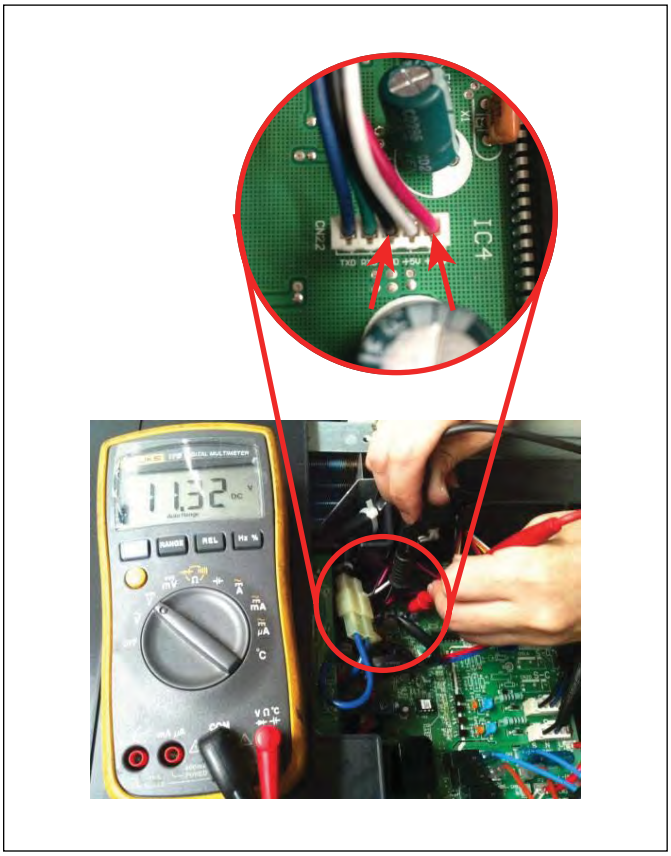


Figure 50

10.4.4 (EC 52/EC 53/EC 54/EC 56/EC 50) - Outdoor temperature sensor (coil sensor T3,ambient sensor T4,Compressor discharge sensor T5 indoor coil outlet pipe sensor T2B malfunction)

Error Code	EC 52/EC 53/EC 54/EC 56/EC 50
Malfunction decision conditions	If the sampling voltage is lower than 0.06V or higher than 4.94V, the LED will display the failure.
Supposed causes	• Improper / Incorrect Wiring • Sensor faulty • Indoor / Outdoor PCB faulty

Table 46

Troubleshooting:

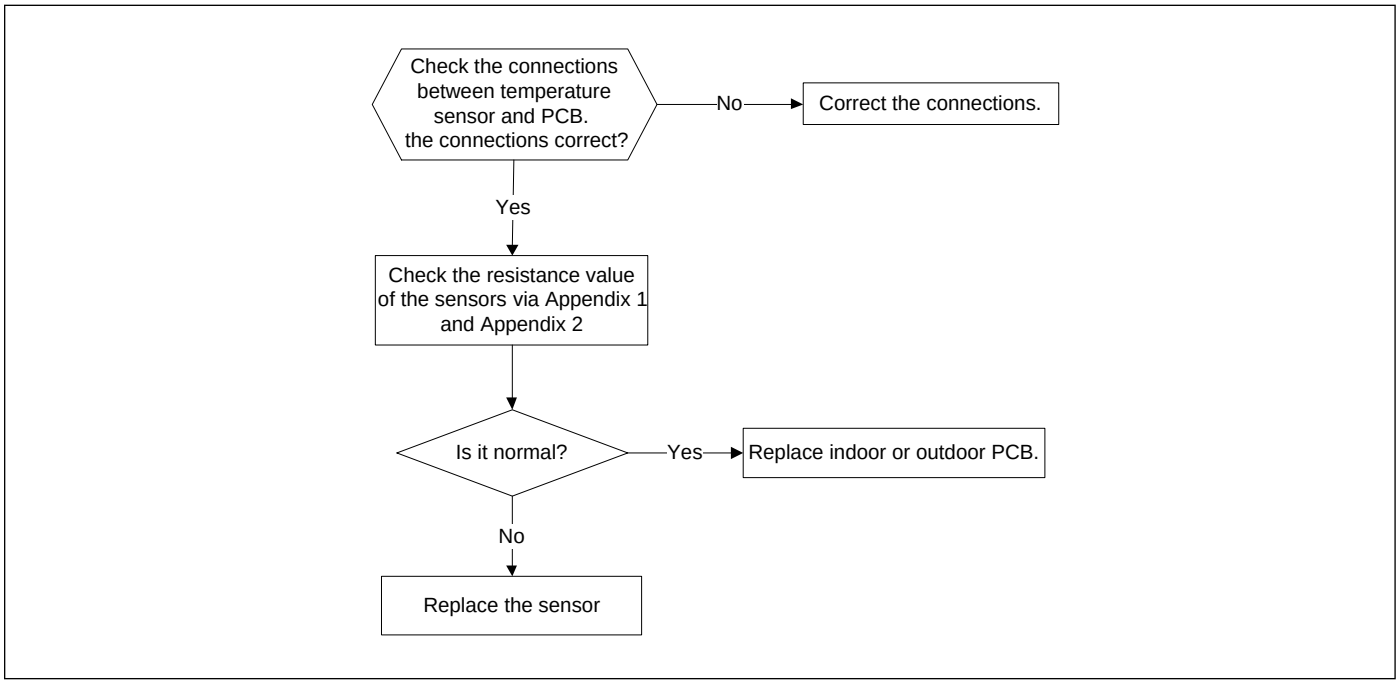


Figure 51

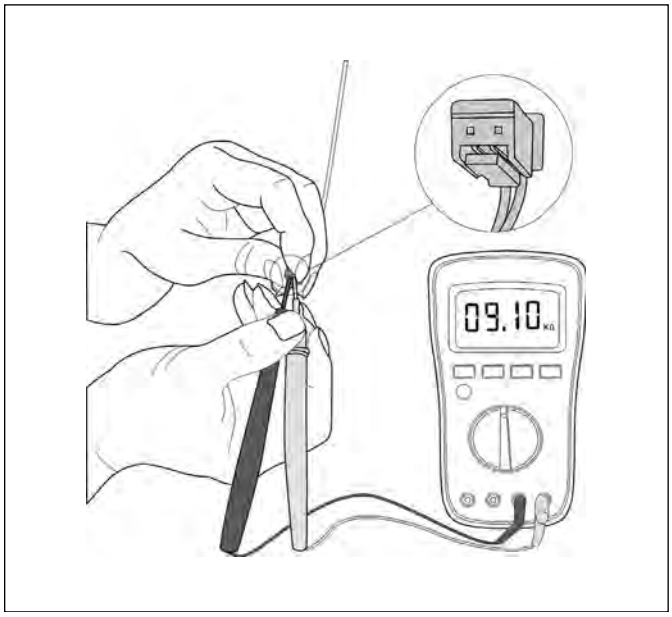


Figure 52

- Outdoor room temperature sensor T4 is in open circuit or has short circuited (EC 53)
- Compressor discharge temperature sensor T5 is in open circuit or has short circuited (EC 54)
- Evaporator coil outlet temperature sensor T2B is in open circuit or has short circuited (EC 56)

10.4.5 (PC 01/ PC 10/PC 11/PC 12) - Over-voltage or under-voltage protection

Error Code	PC 01/ PC 10/PC 11/PC 12
Malfunction decision conditions	An abnormal voltage rise or drop is detected by checking the specified voltage detection circuit.
Supposed causes	• Power supply problems • System problems, such as leakage or blockage • Outdoor PCB faulty • Bridge rectifier faulty • PFC circuit or reactor faulty

Table 47

Troubleshooting:

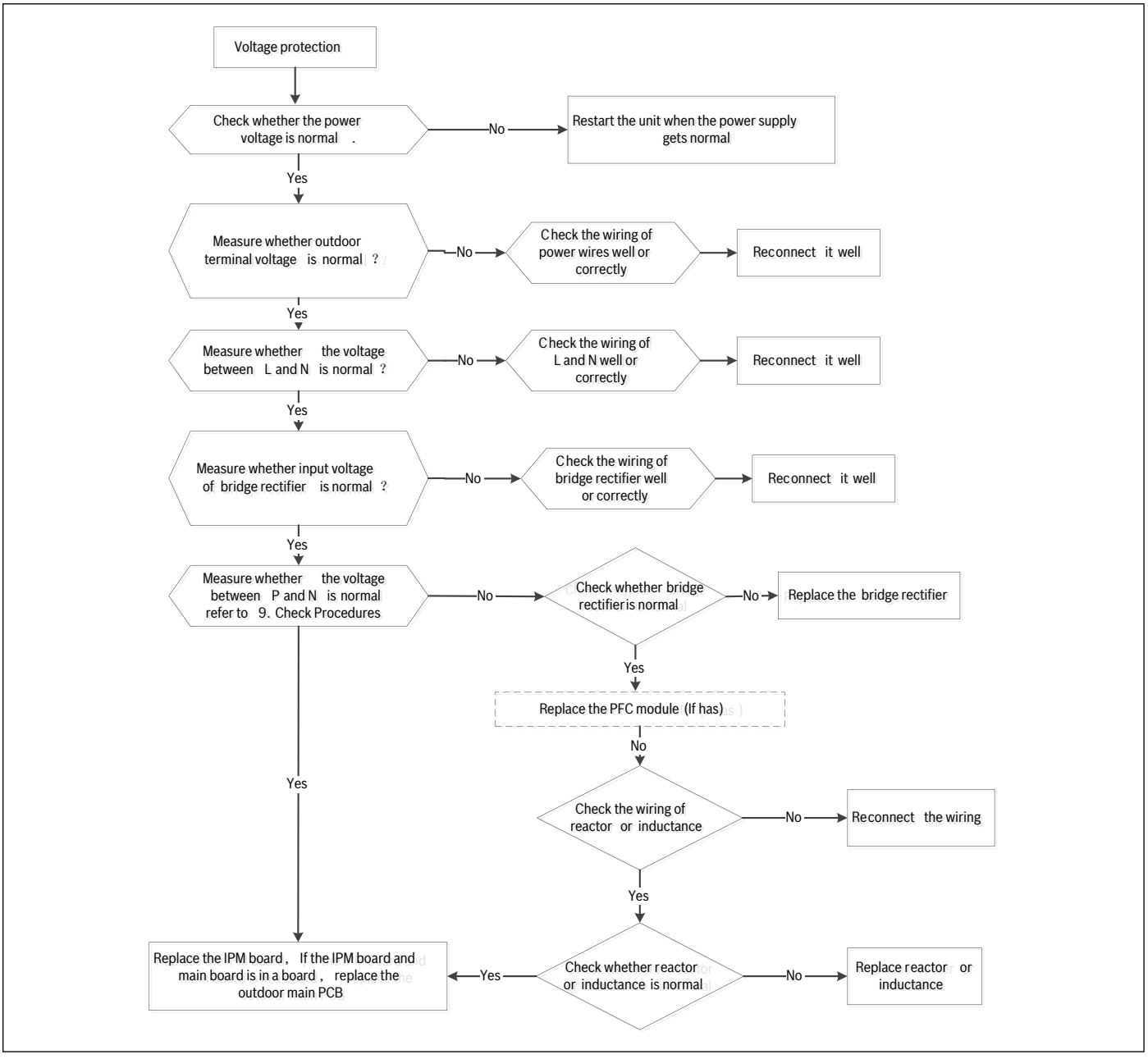


Figure 53

10.4.6 (PC 0F) - PFC module protection error

Error Code	PC 0F
Malfunction decision conditions	Outdoor PCB detects PFC signal has low voltage or DC voltage is lower than 340V for 6s when doing a quick check
Supposed causes	• Improper / Incorrect Wiring • Outdoor PCB faulty • PFC module inductance faulty • PFC module faulty

Table 48

Troubleshooting:

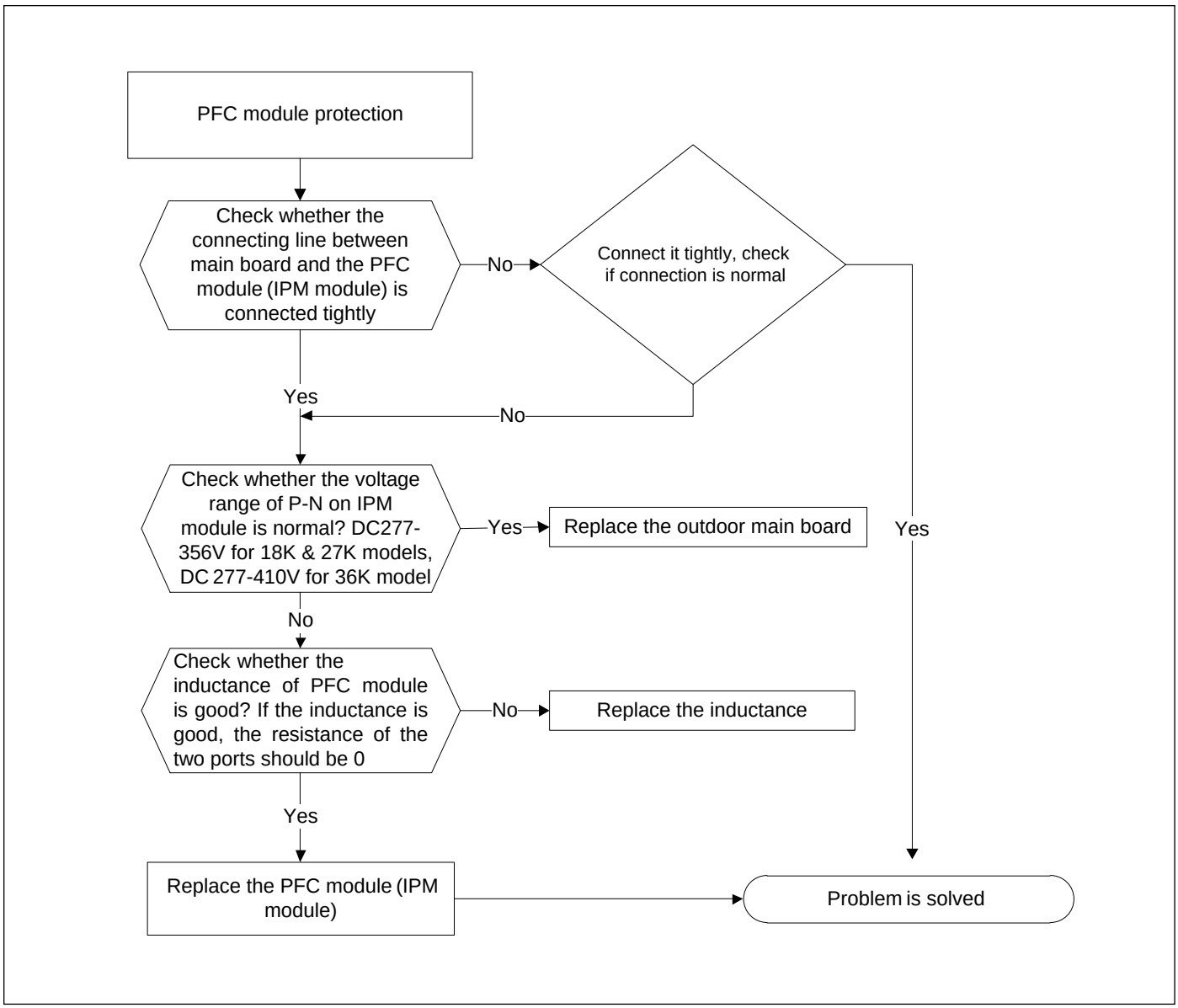


Figure 54

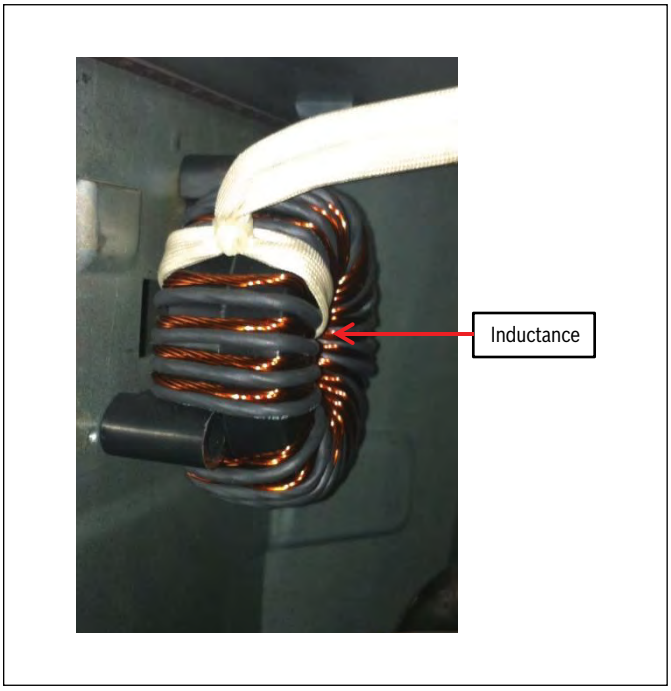


Figure 55

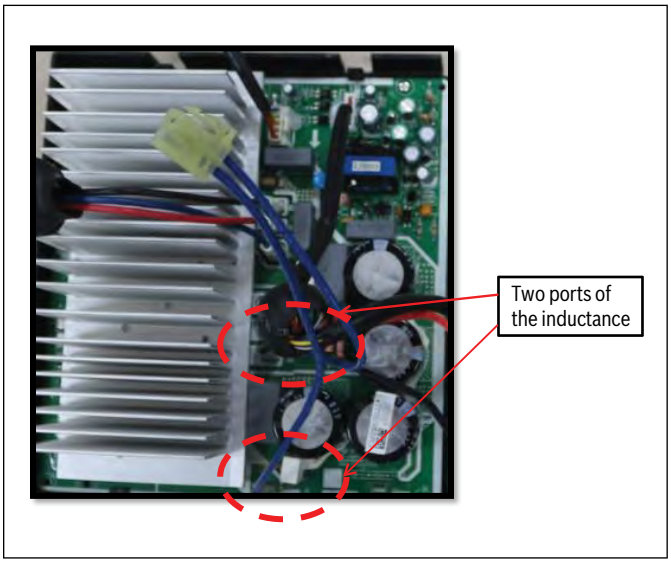


Figure 56

10.4.7 (EC 07) - Outdoor fan speed malfunction, (EC 71) - Over current failure of outdoor DC fan motor

Error Code	EC 07/ EC 71
Malfunction decision conditions	When outdoor fan speed keeps too low (300RPM) or too high(2400RPM) for certain time, the unit will stop and the LED will display the failure.
Supposed causes	• Improper / Incorrect Wiring • Faulty Fan assembly • Faulty Fan motor • Outdoor PCB faulty

Table 49

Troubleshooting:

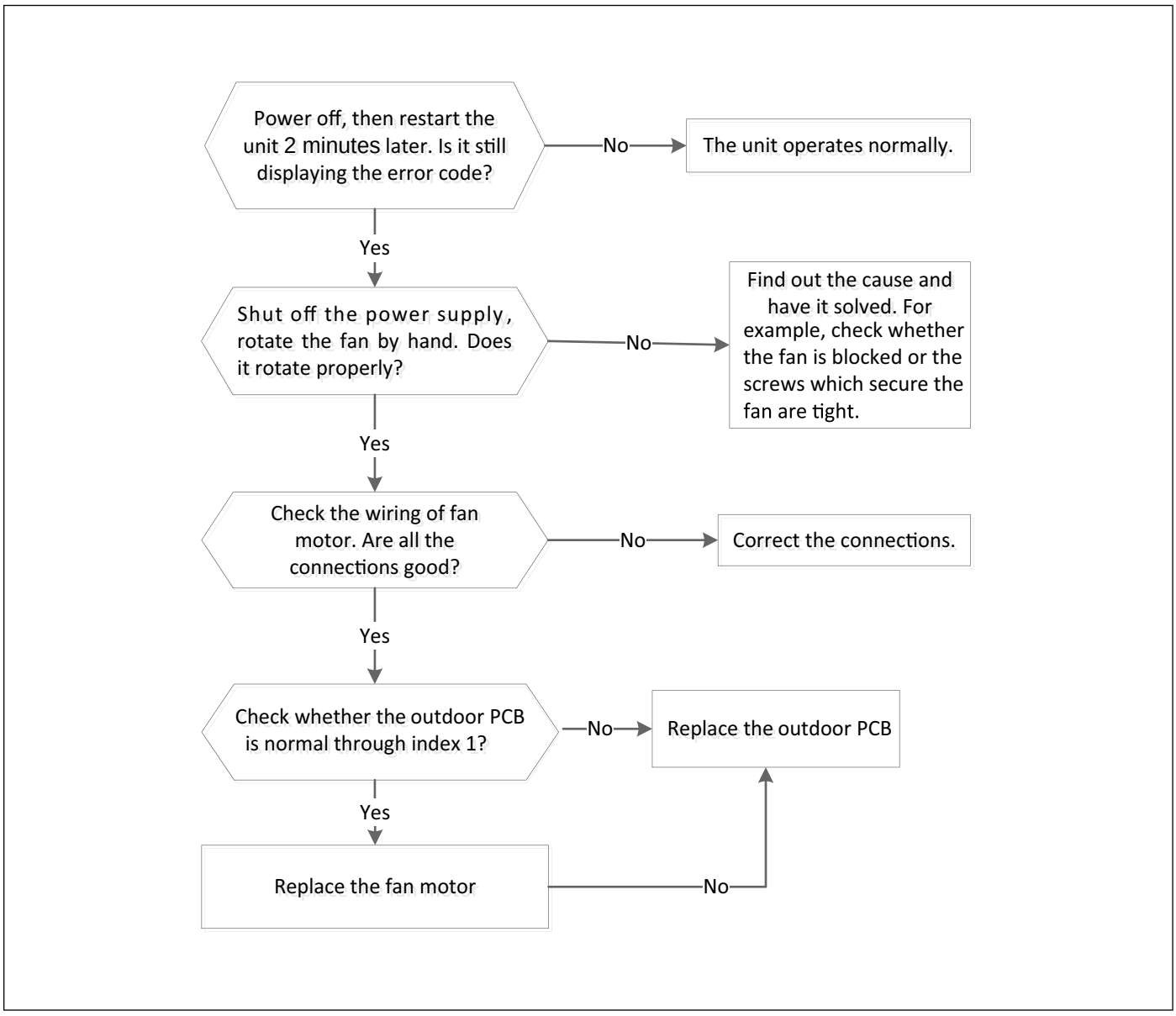


Figure 57

Index 1:

1. DC fan motor(control chip is inside fan motor)

Power on and when the unit is in standby, measure the voltage of pin1-pin3, pin3-pin4 in fan motor connector. If the value of the voltage is not in the range showing in below table, the PCB must have problems and need to be replaced.

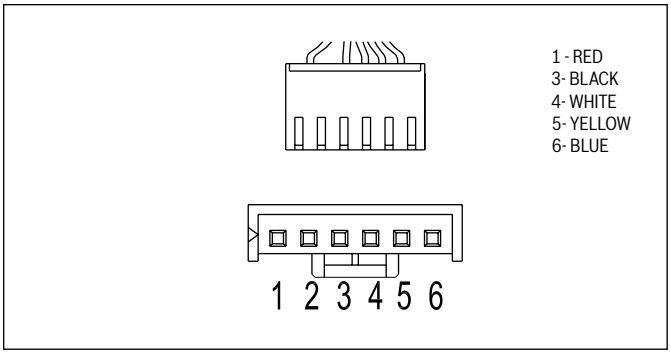


Figure 58

DC motor voltage input and output

NO.	Color	Signal	Voltage
1	Red	Vs/Vm	192V-380V
2	---	---	---
3	Black	GND	0V
4	White	Vcc	13.5~16.5V
5	Yellow	Vsp	0~6.5V
6	Blue	FG	13.5~16.5V

Table 50

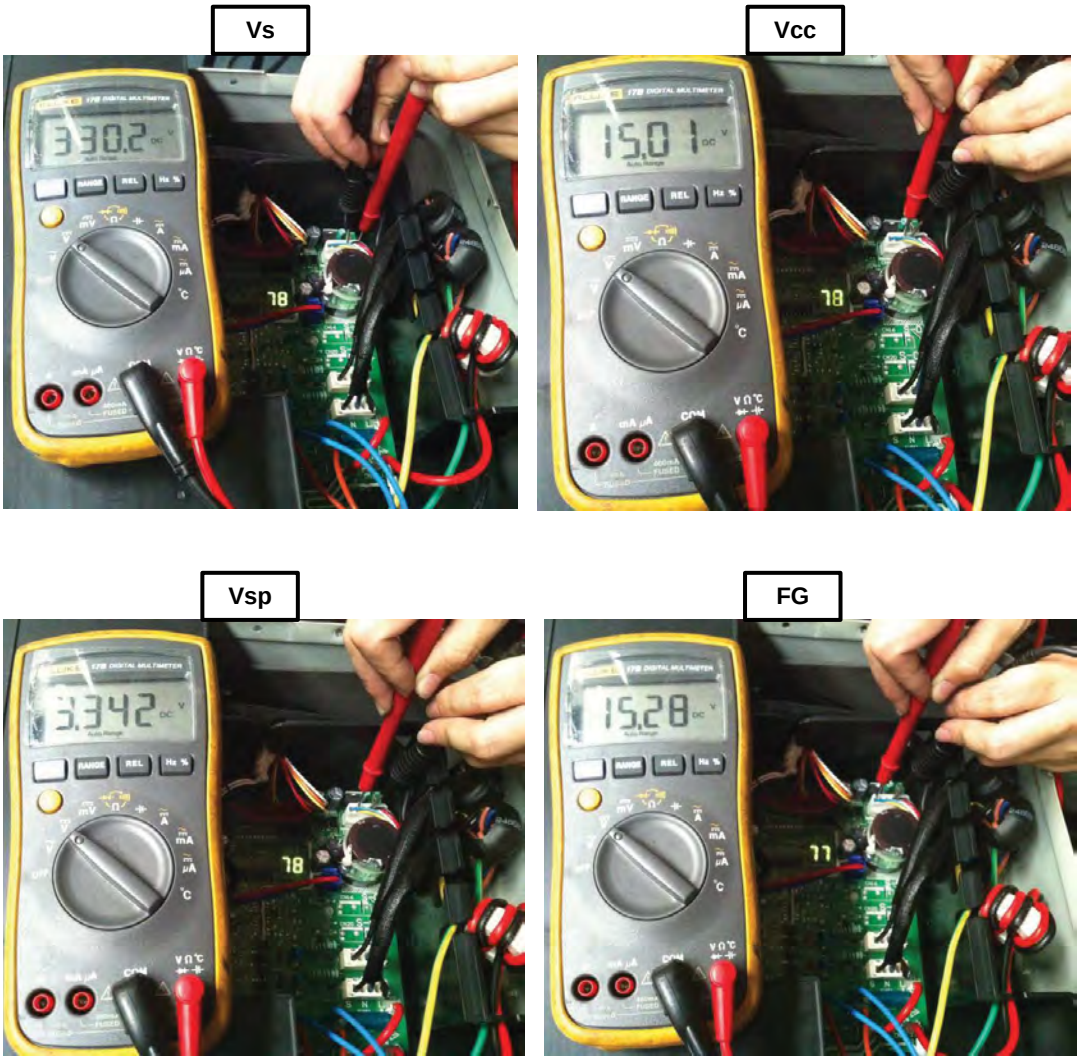


Figure 59

2. DC Fan Motor (control chip is in PCB)

Release the UVW connector. Measure the resistance of U-V, U-W, and V-W. If the resistances are not equal to each other, the fan motor may be experiencing problems and need to be replaced. Otherwise, the PCB must has problems and need to be replaced.

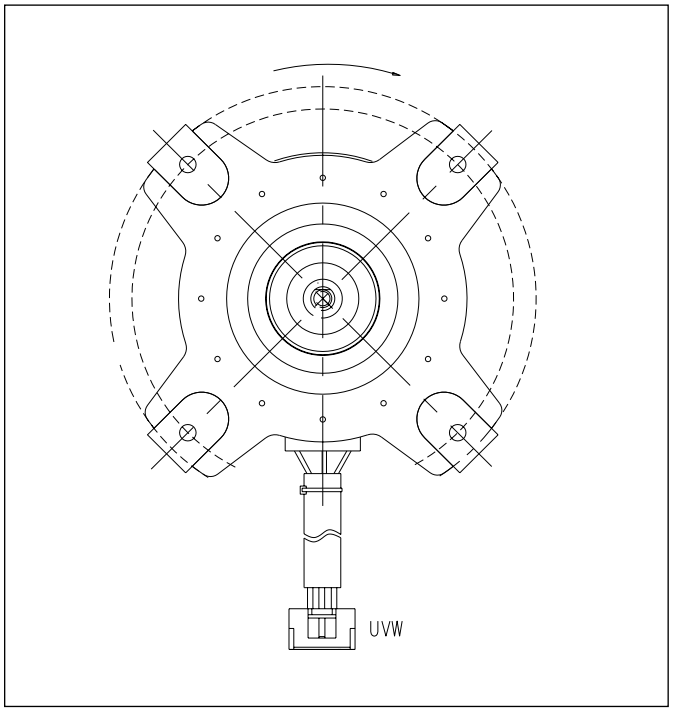


Figure 60

10.4.8 (PC 30) - High pressure protection

Error Code	PC 30
Malfunction decision conditions	Outdoor pressure switch out off the system because high pressure is higher than 4.4 MPa.
Supposed causes	• Improper / Incorrect Wiring • Pressure switch faulty • System blockage • Outdoor PCB faulty

Table 51

Troubleshooting:

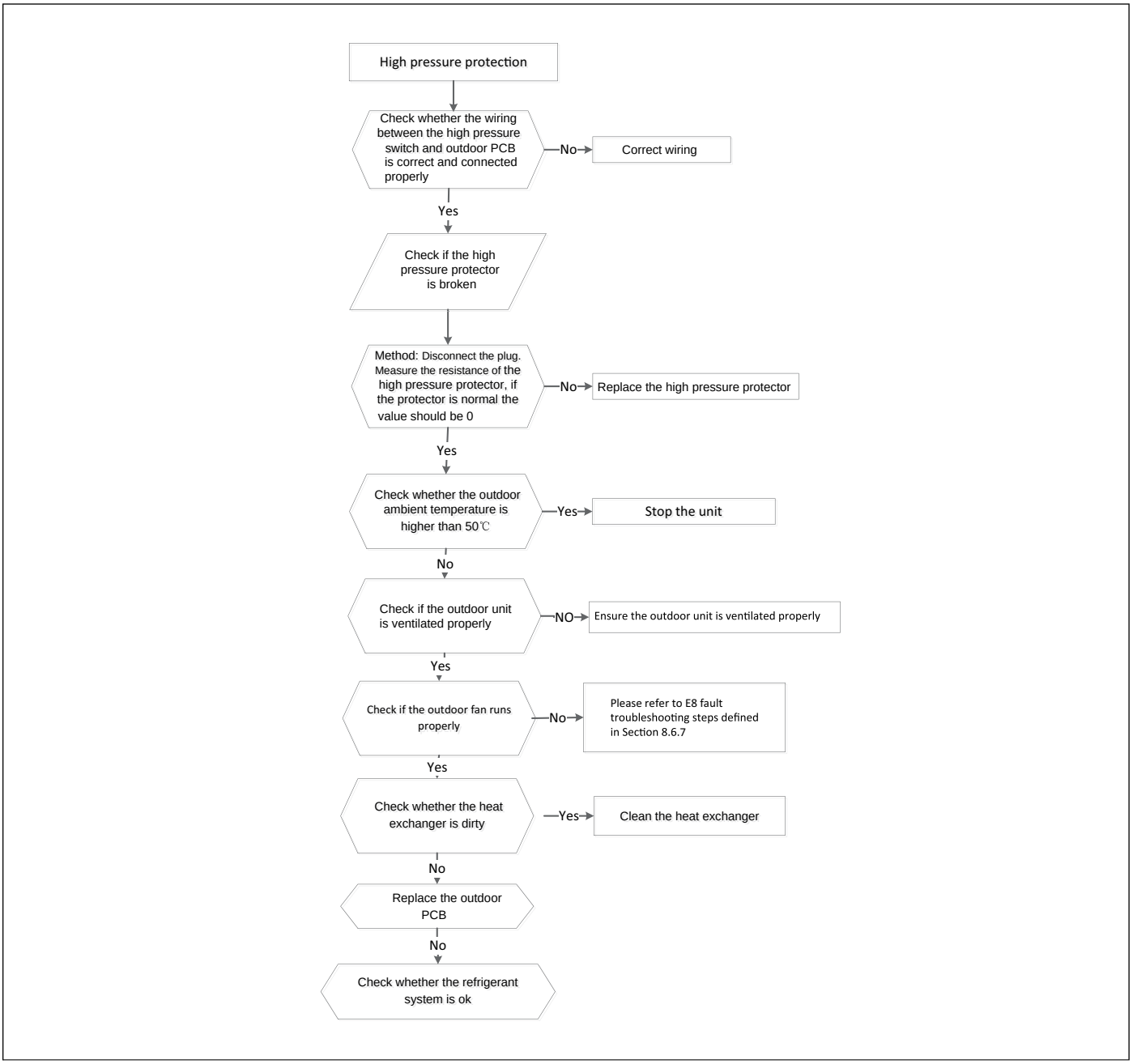
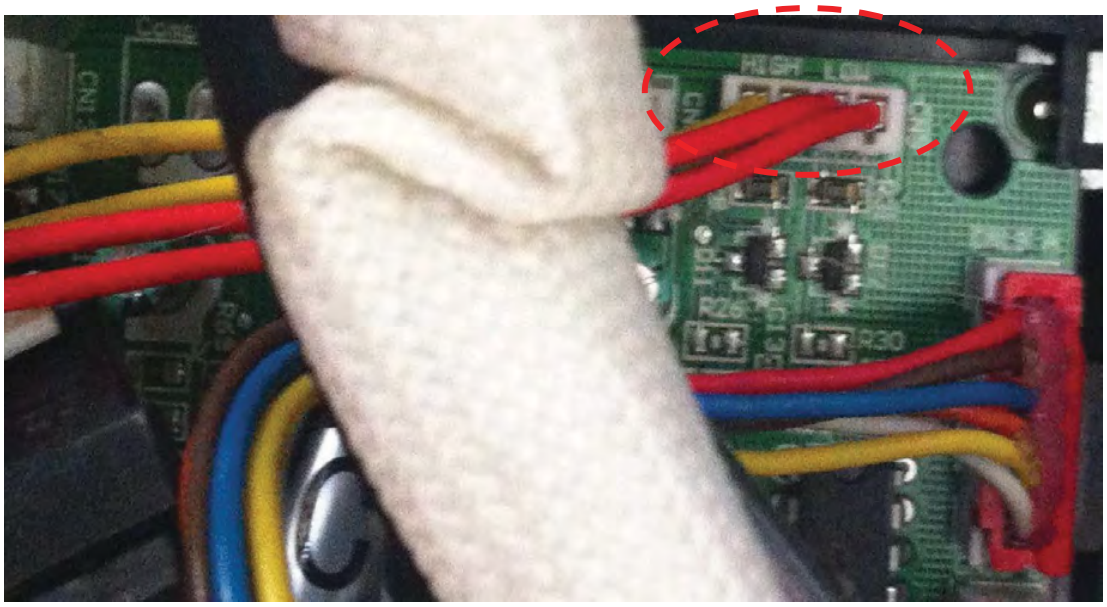


Figure 61



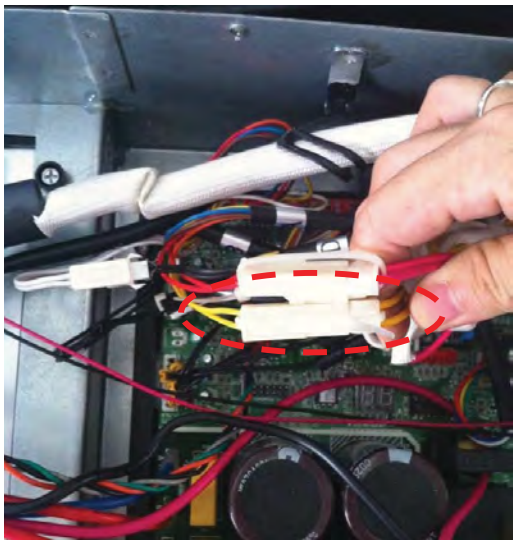


Figure 62

10.4.9 (PC 31) - Low pressure protection

Error Code	PC 31
Malfunction decision conditions	Outdoor pressure switch cut off the system because the low pressure reads lower than 0.13 MPa, the LED displays the failure code.
Supposed causes	• Improper / Incorrect Wiring • Low pressure protector faulty • System blockage • Outdoor PCB faulty

Table 52

Troubleshooting:

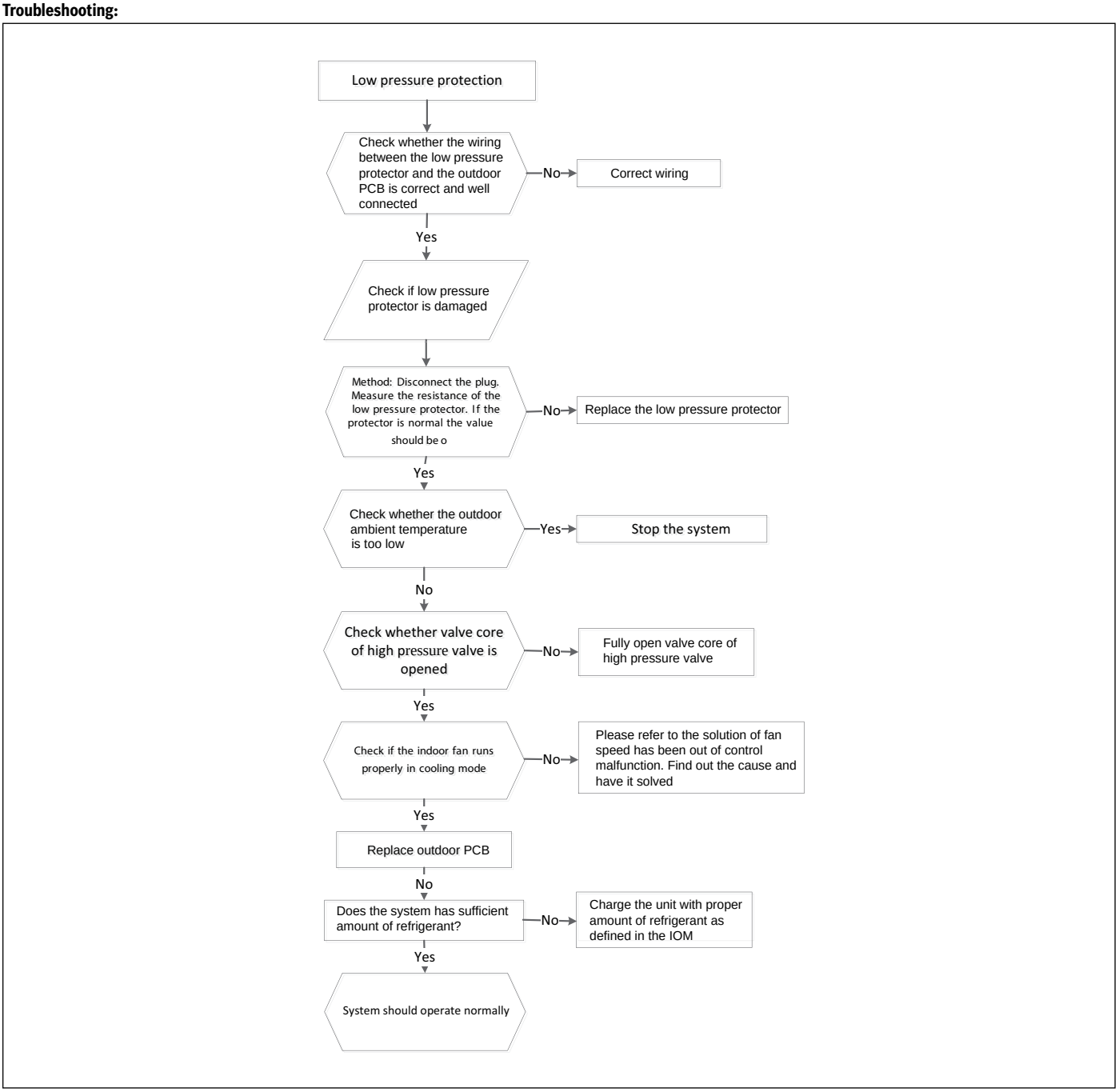


Figure 63

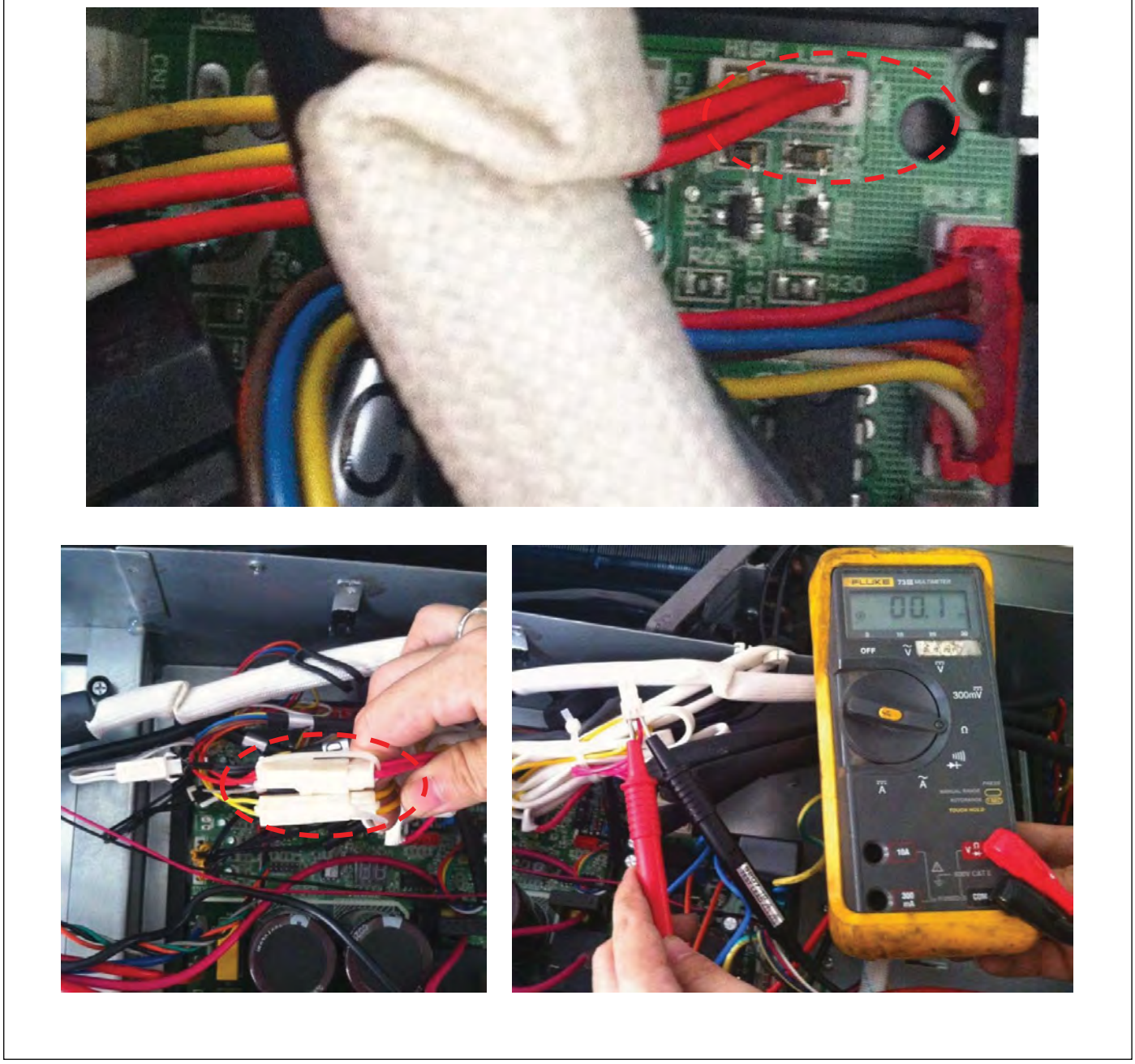


Figure 64

10.4.10 (PC 08) - Current overload protection, (PC 44) - Outdoor unit zero speed protection, (PC 46) - Compressor speed has been out of control, (PC 49) Compressor overcurrent failure

Error Code	PC 08/PC 44/PC 46/PC 49
Malfunction decision conditions	If the outdoor current exceeds the current limit value, the LED will display the failure.
Supposed causes	• Improper / Incorrect Wiring • Over load protector faulty • System blockage • Outdoor PCB faulty • Bridge rectifier faulty • PFC circuit or reactor faulty • Pressure switch faulty • IPM module board faulty

Table 53

Troubleshooting:

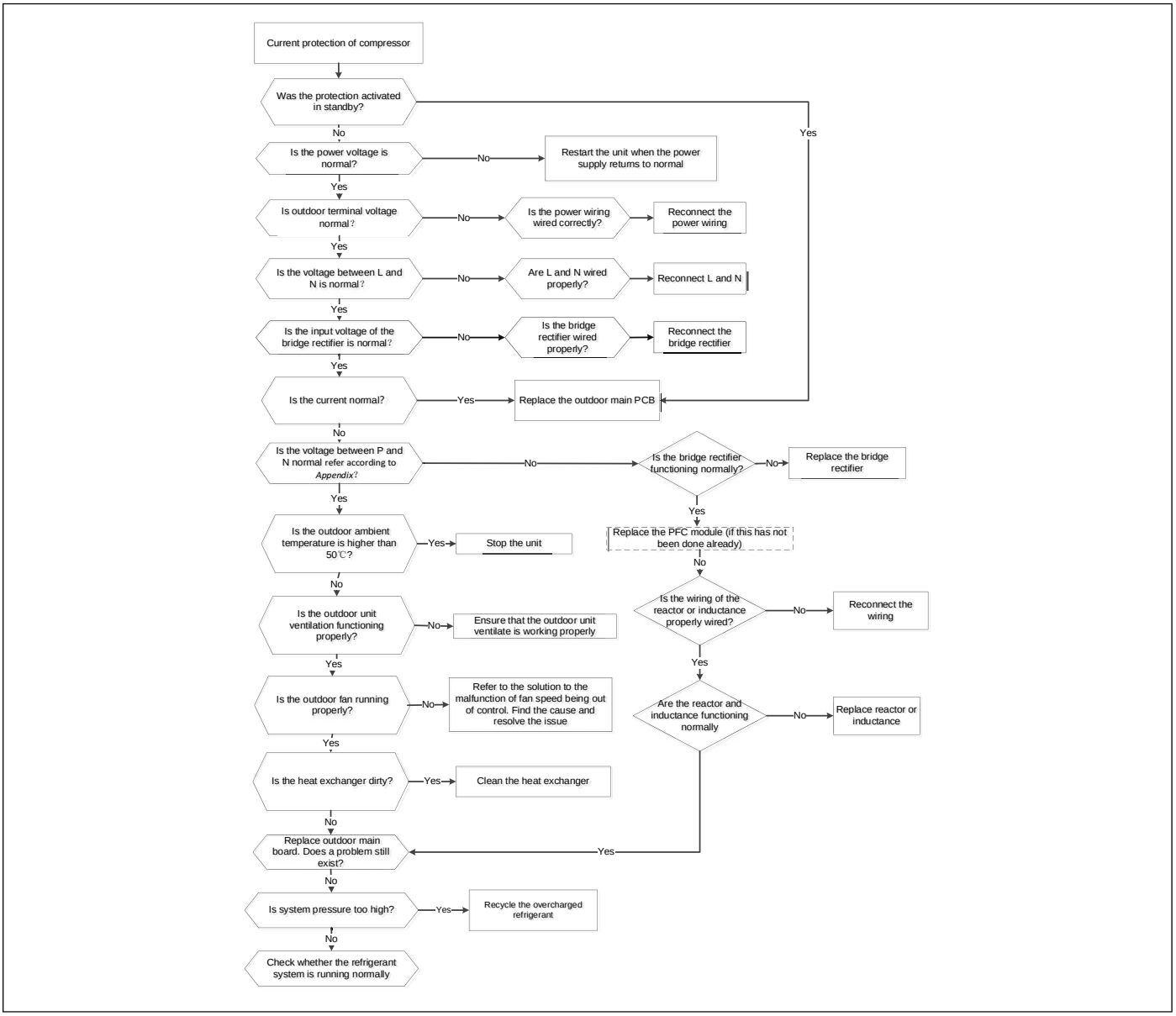


Figure 65

10.4.11 (PC 06) - Temperature protection of compressor discharge

Error Code	PC 06
Malfunction decision conditions	When the compressor discharge temperature(T5) is more than 115℃ for 10 seconds, the compressor will stop and restart when T5 is less than 90℃.
Supposed causes	• Improper / Incorrect Wiring • System refrigerant leakage • Discharge temperature (T5) sensor faulty • Outdoor PCB faulty

Table 54

Troubleshooting:

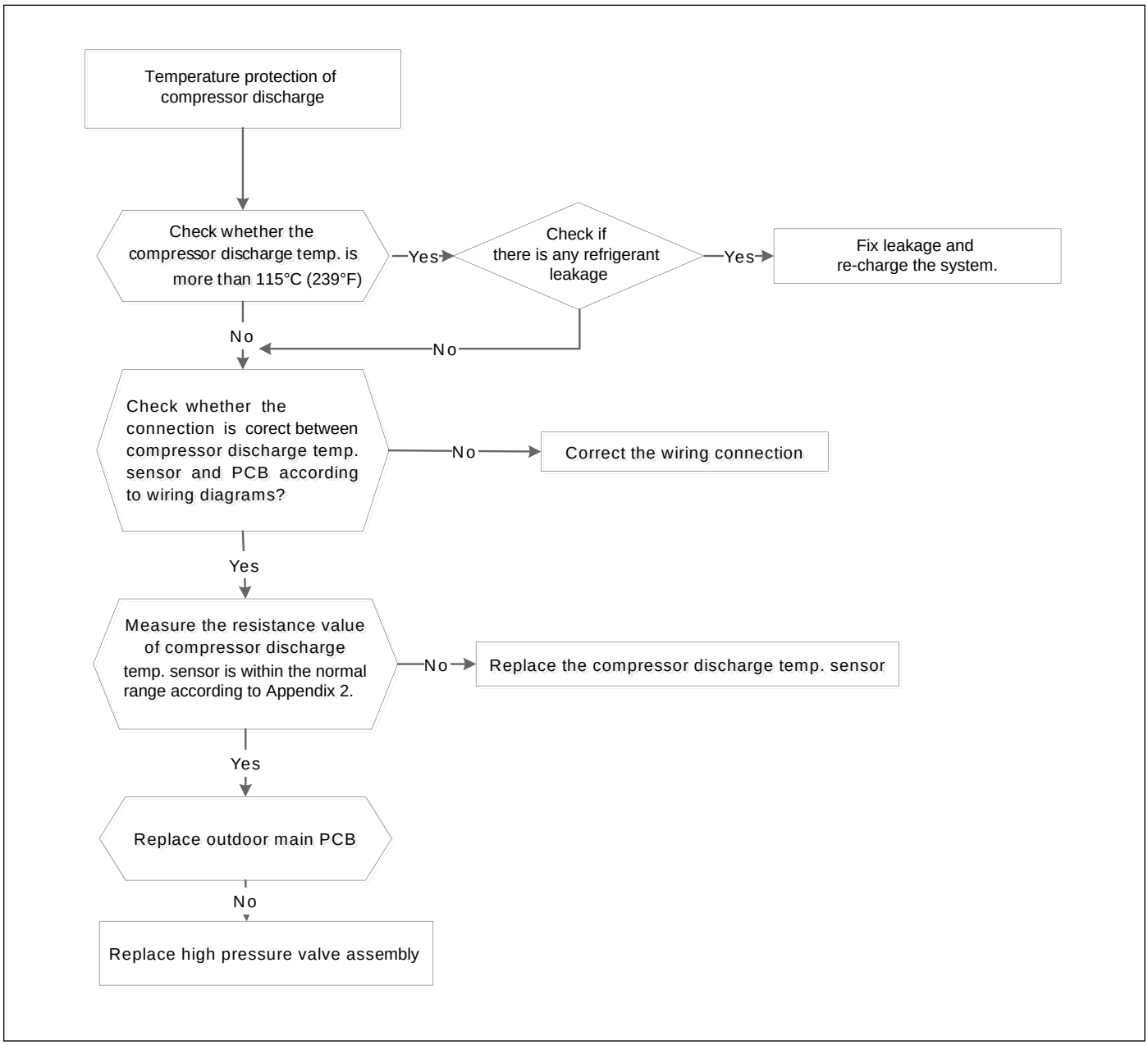


Figure 66

10.4.12 (PC 0A) - High temperature protection of condenser

Error Code	PC 0A
Malfunction decision conditions	When the outdoor pipe temperature is more than 65°C, the system will stop. The system will operate again when outdoor pipe temperature is less than 52°C.
Supposed causes	• Condenser temperature sensor (T3) faulty • Dirty heat exchanger • System leakage or blockage • Incorrect wiring • ODU fan faulty • ODU main PCB faulty

Table 55

Troubleshooting:

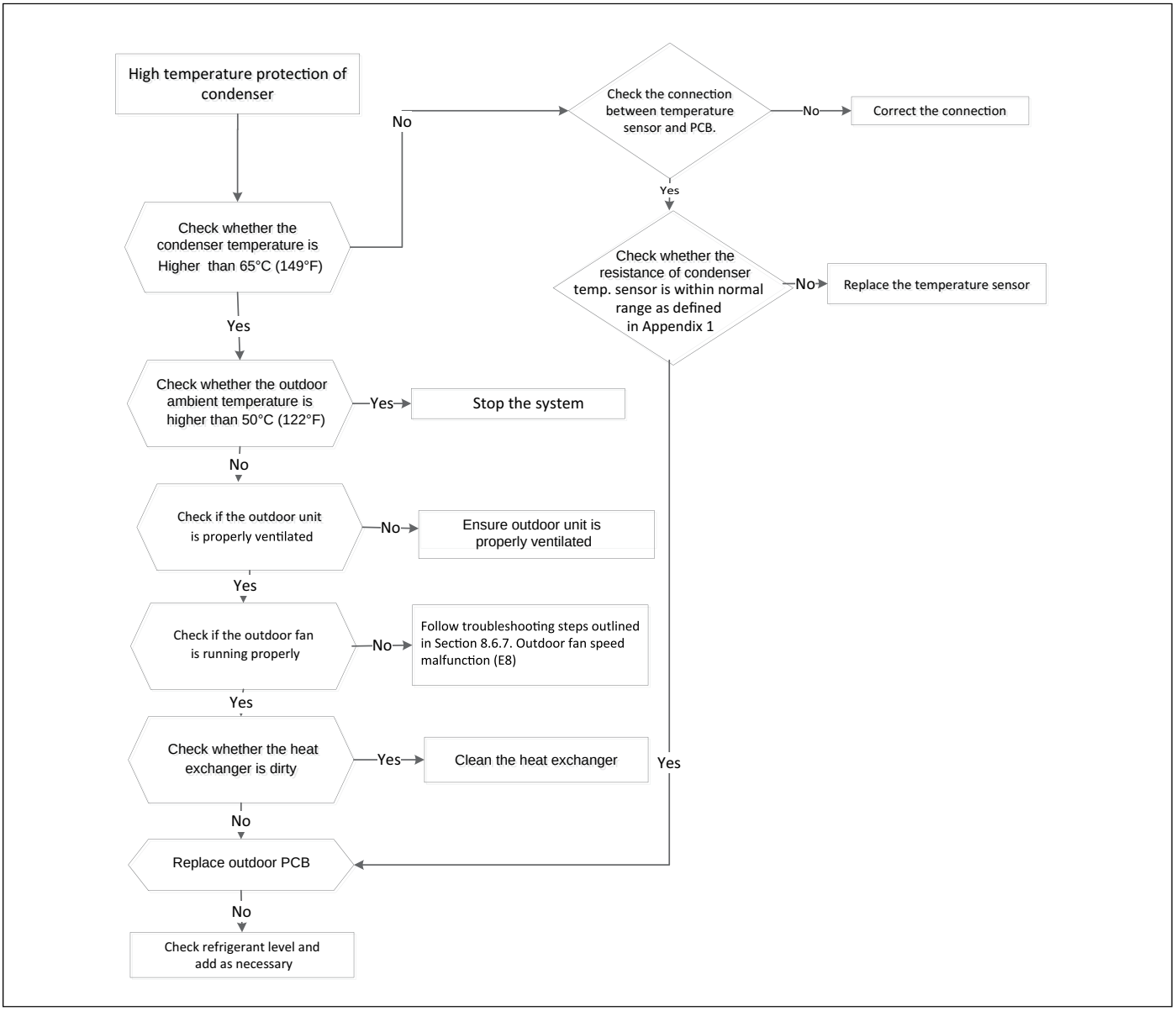


Figure 67

10.4.13 (PC 00) - Inverter module (IPM) malfunction

Error Code	PC 00
Malfunction decision conditions	When the voltage signal that IPM send to compressor drive chip is abnormal, the display LED will show "PC 00" and AC will turn off.
Supposed causes	• Improper / Incorrect Wiring • IPM malfunction • Outdoor fan assembly faulty • Compressor malfunction • Outdoor PCB faulty • Reactor or inductance faulty • Bridge rectifier faulty

Table 56

Troubleshooting:

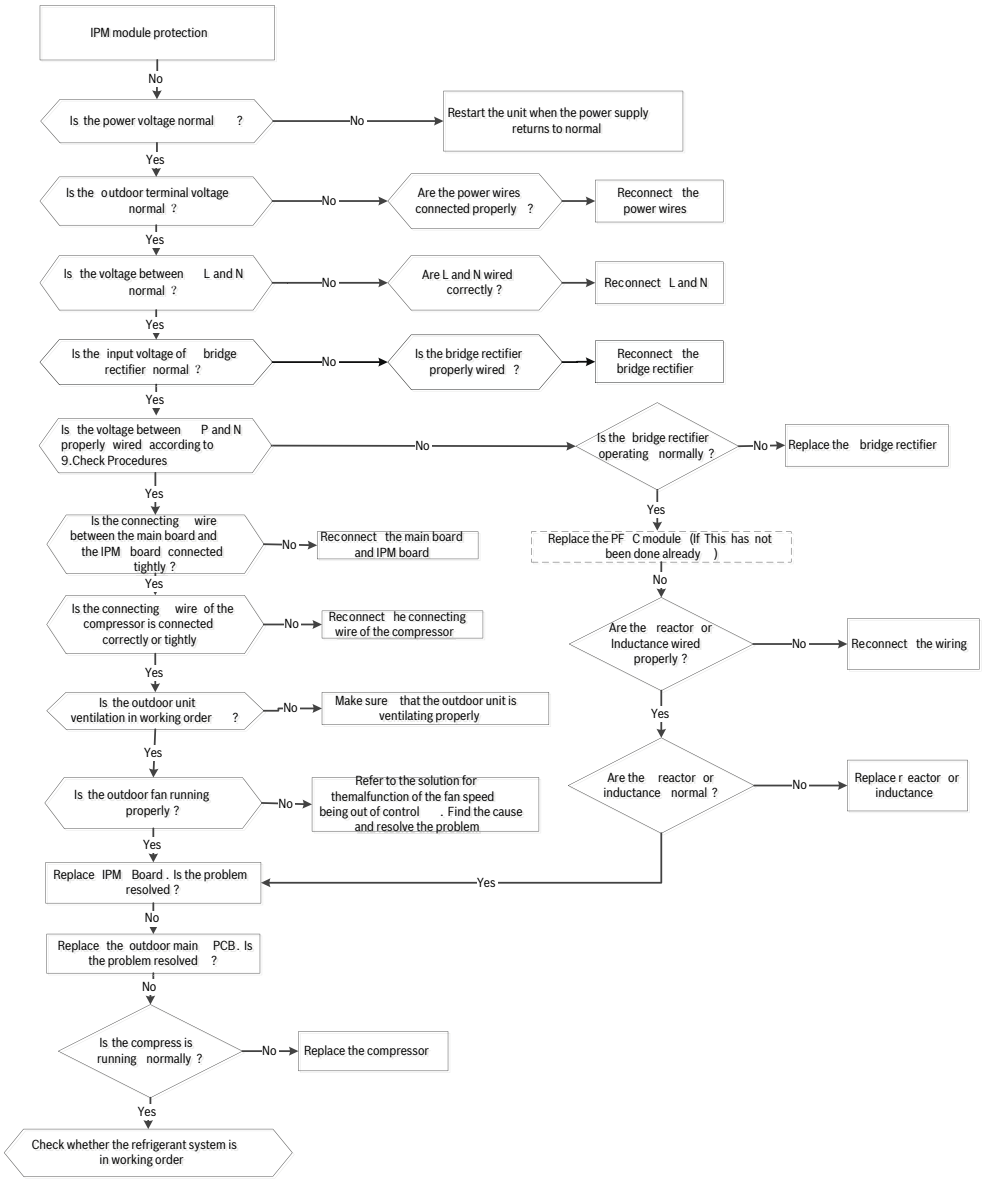


Figure 68

10.4.14 (PC 02/ LC 06) - High temperature protection of compressor top

Error Code	PC 02/ LC 06
Malfunction decision conditions	If the sampling voltage is not 5V, the LED will display the failure.
Supposed causes	• Improper / Incorrect Wiring • Over load protector faulty • System leakage or blockage • Outdoor PCB faulty

Table 57

Troubleshooting:

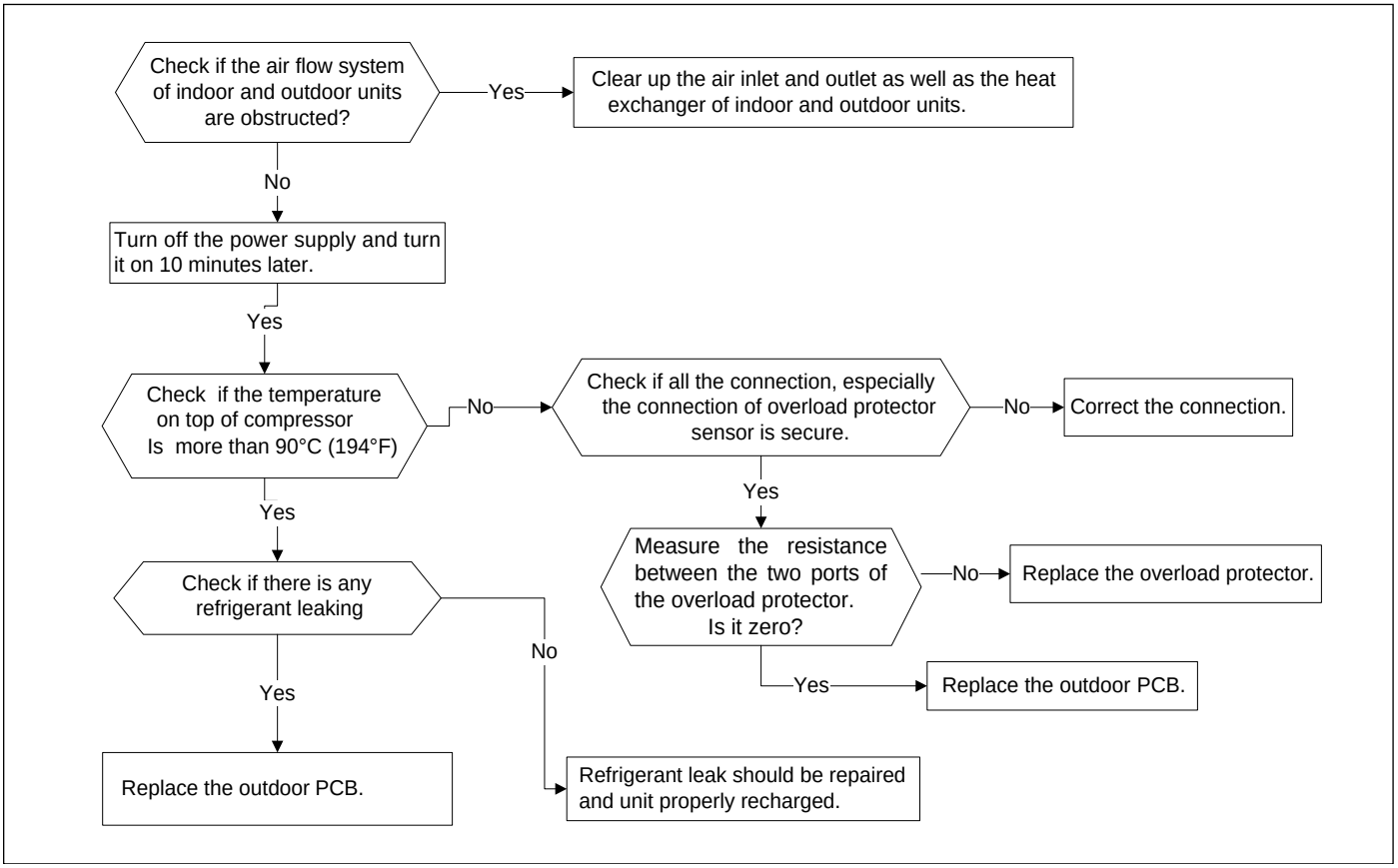


Figure 69

10.4.15 (EC 72) - Lack phase failure of outdoor DC fan motor

Error Code	EC 72
Malfunction decision conditions	When the three-phase sampling current of the compressor is abnormal, especially when the current of one or more phases is always small and almost 0, the LED displays the failure code.
Supposed causes	• Incorrect wiring • Fan motor faulty • ODU PCB faulty

Table 58

Troubleshooting

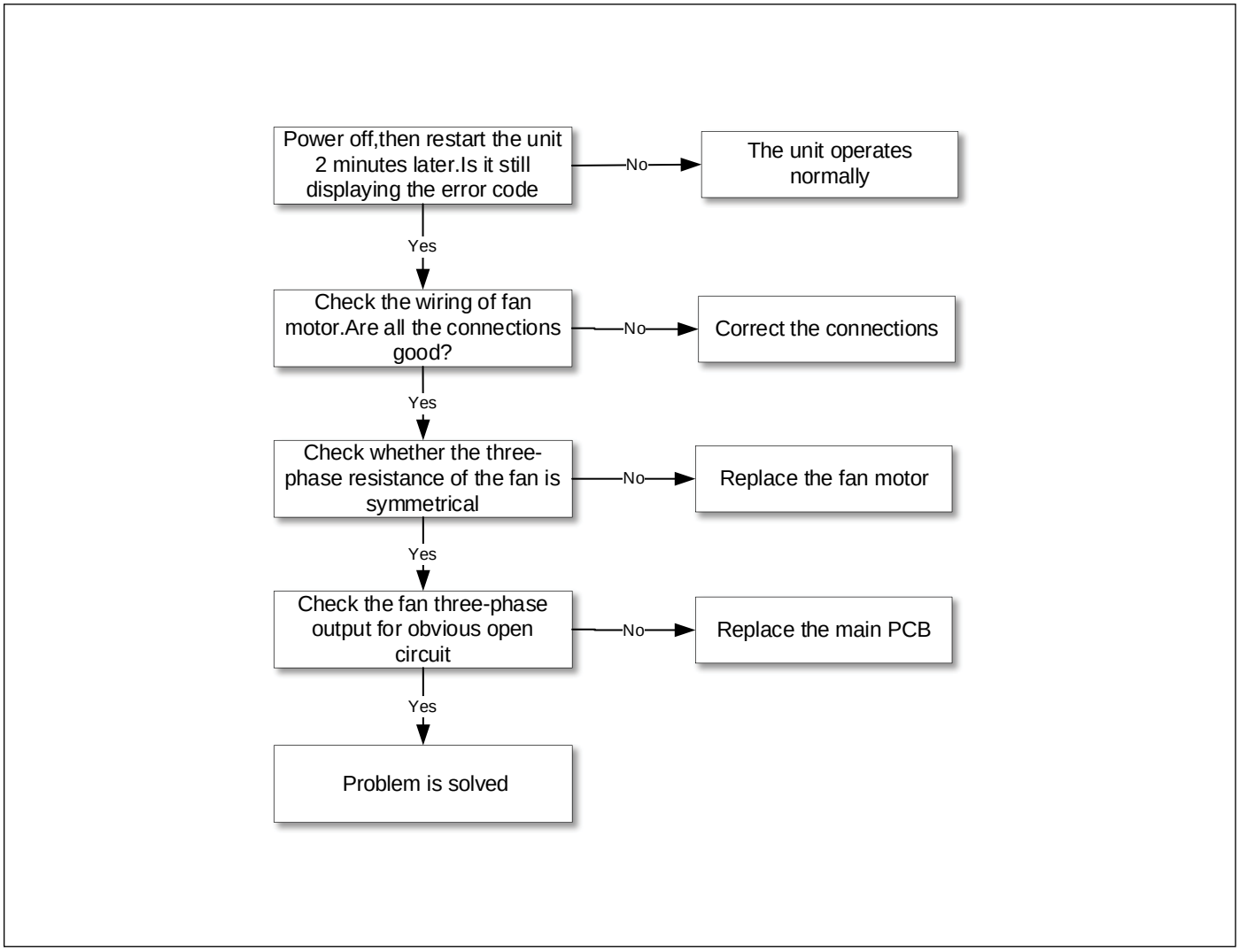


Figure 70

10.4.16 (PC 43) - Outdoor compressor lack phase protection

Error Code	PC 43
Malfunction decision conditions	When the three-phase sampling current of the compressor is abnormal, especially when the current of one or more phases is always small and almost 0, the LED displays the failure code.
Supposed causes	• Incorrect wiring • System blockage • ODU PCB faulty

Figure 71

Troubleshooting

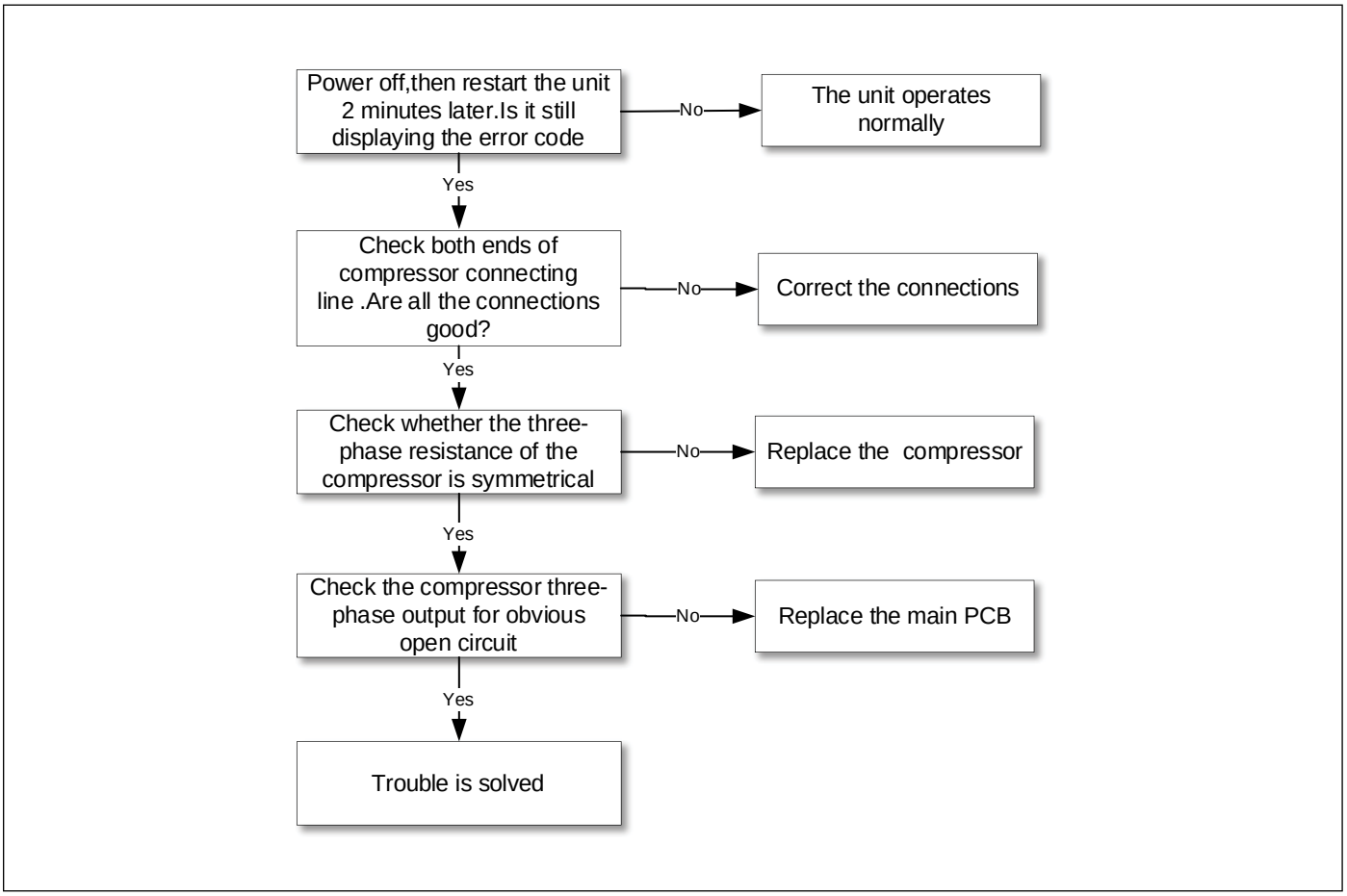


Figure 72

10.4.17 (PC 45) - Outdoor unit IR chip drive failure

Error Code	PC 45
Malfunction decision conditions	When the IR chip detects its own parameter error, the LED displays the failure code when the power is on.
Supposed causes	• Inverter module of PCB faulty

Table 59

Troubleshooting

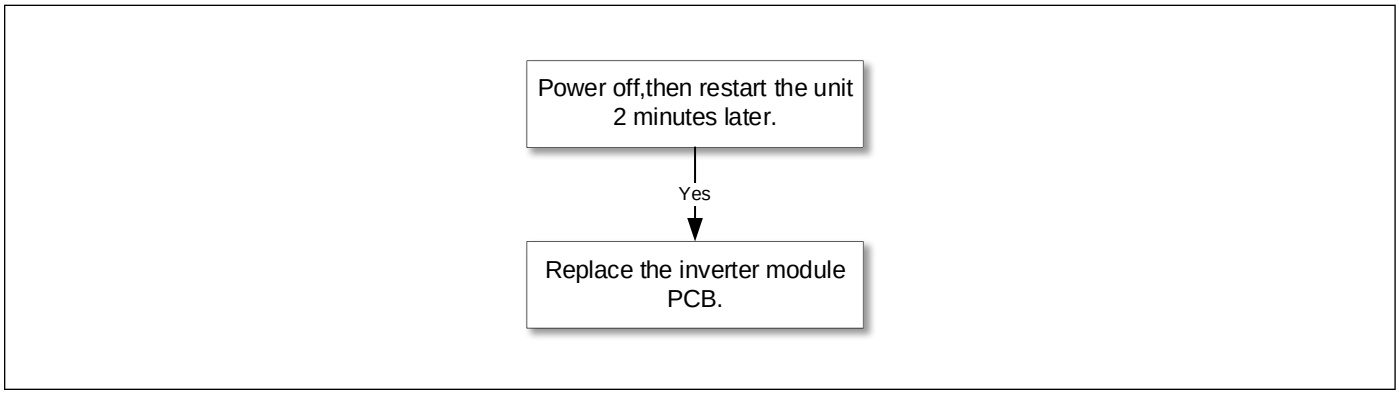


Figure 73

10.4.18 (PC A1) - Condensation protection of refrigerant pipe

Error Code	PC A1
Malfunction decision conditions	If outdoor ambien temperature is higher than a certain value of the refrigerant pipe temperature for a period of time, the LED displays the failure code.
Supposed causes	• Temperature sensor T4 and/or T5 faulty • Main EXV faulty • ODU PCB faulty

Table 60

Troubleshooting

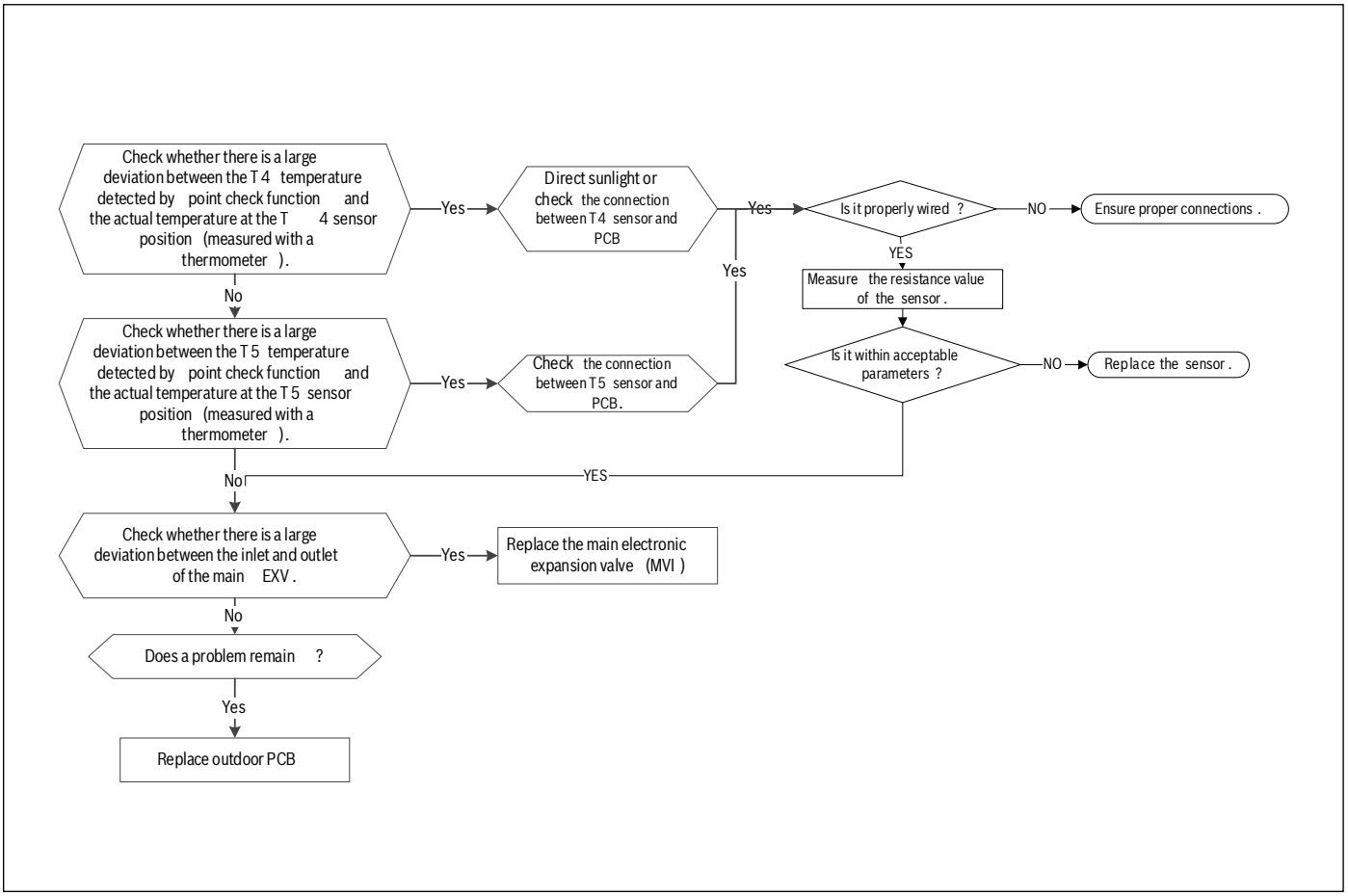


Figure 74

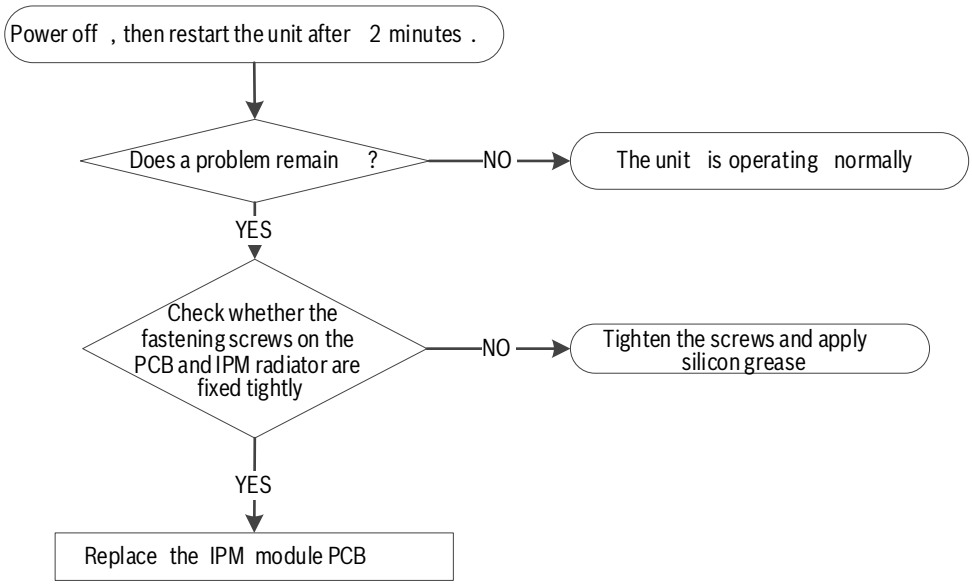
10.4.19 (EC 55) - ODU IPM Module temperature malfunction

Error Code	EC 55
Malfunction decision conditions	If the sampling voltage is 0V or 5V, the LED displays the failure code.
Supposed causes	• IPM module of PCB faulty • Incorrect wiring • Sensors faulty • ODU main PCB faulty

Table 61

Troubleshooting

If the radiator has no sensor, follow the steps below to resolve,



If the radiator has a sensor(TH), follow the steps below to resolve,

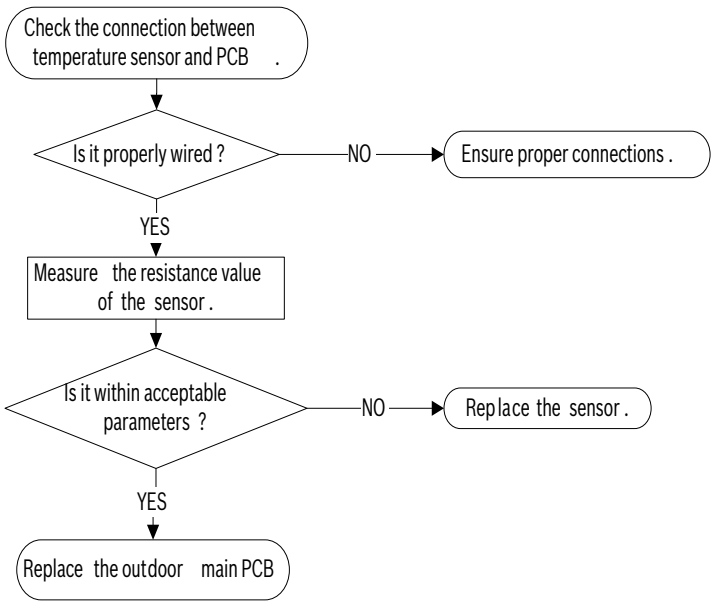


Figure 75

10.4.20 (EC 5C) - Pressure sensor failure

Error Code	EC 5C
Malfunction decision conditions	If the sampling voltage is lower than 2V or higher than 254V.
Supposed causes	• Incorrect wiring • Sensor faulty • ODU PCB faulty

Table 62

Troubleshooting

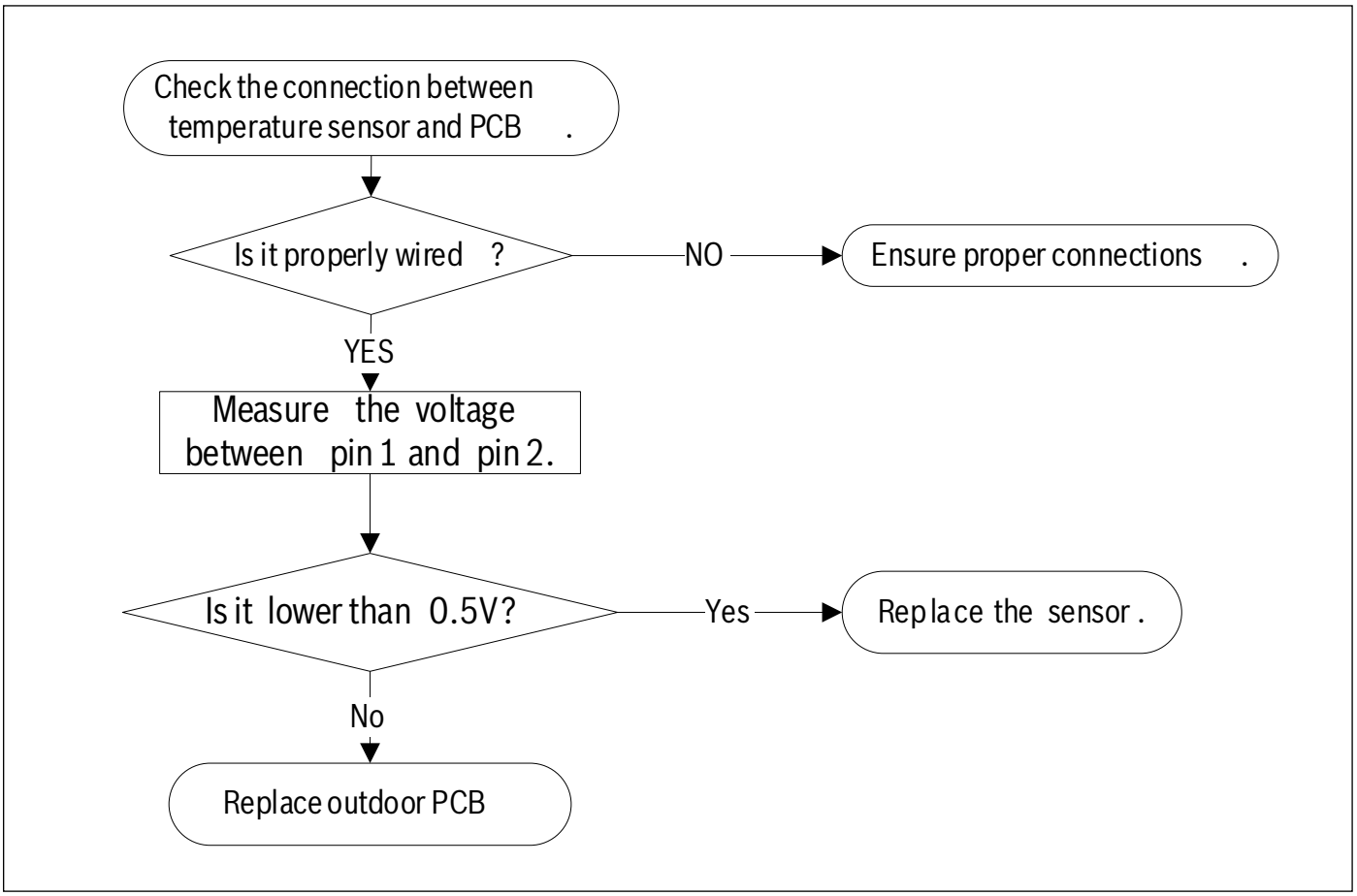


Figure 76

10.4.21 (EH C1) - Refrigerant sensor detects leakage or working condition of the refrigerant sensor is out of range and leakage is detected

Error Code	EH C1
Malfunction decision conditions	The refrigerant sensor detects a concentration higher than or equal to 10%*LFL for 10 seconds or the refrigerant sensor detects a concentration higher than or equal to 20%*LFL or the multi model receives the refrigerant leakage protection fault sent by the outdoor unit.
Supposed causes	• Additional refrigerant

Table 63

Troubleshooting

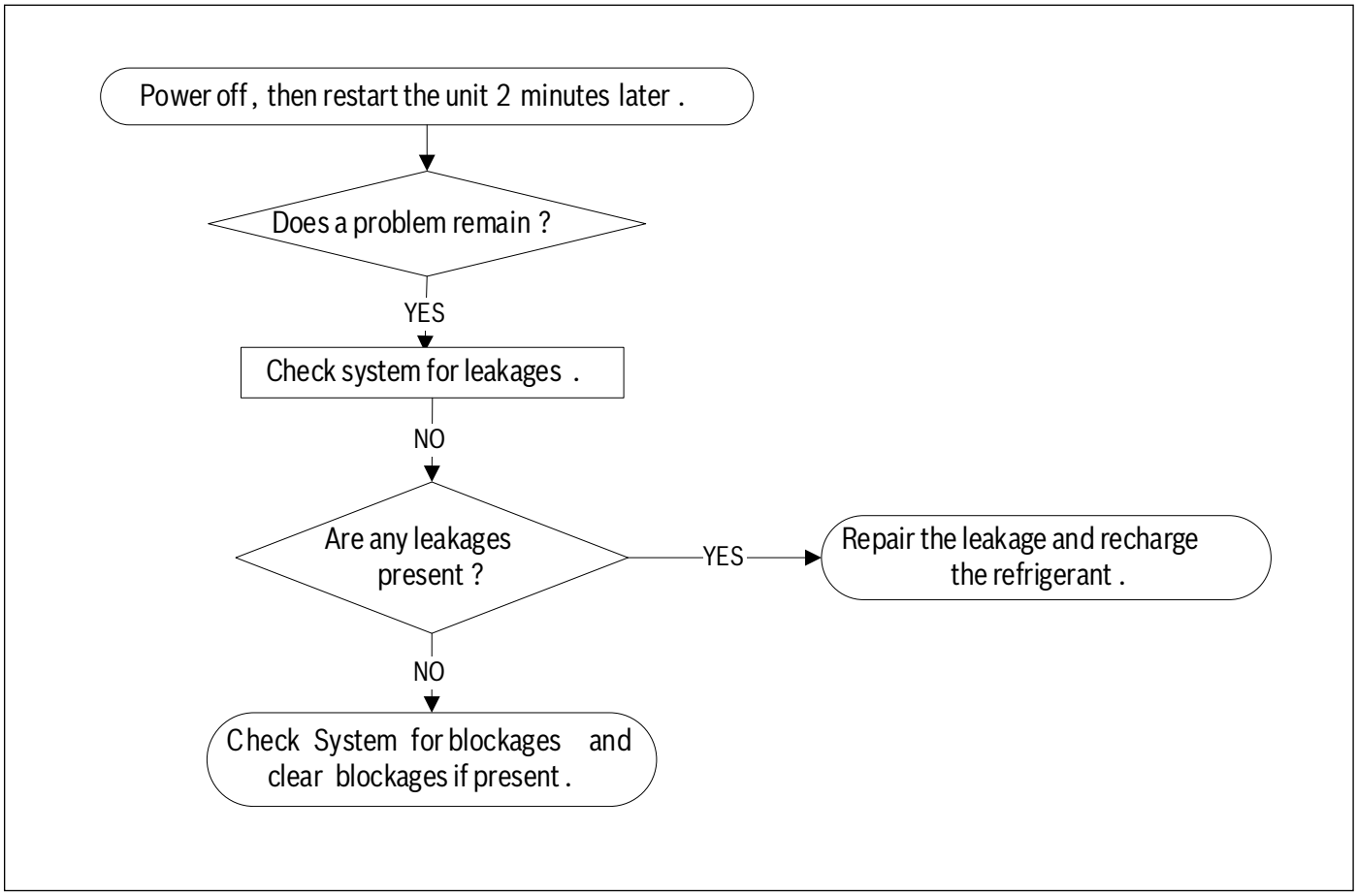


Figure 77

10.4.22 (PC02 / LC 06) - Compressor top (or IPM) temperature protection

Error Code	PC 02 / LC 06
Malfunction decision conditions	For some models with overload protector, if the sampling voltage is not 5V, the LED will display the failure code. If the temperature of IPM module is higher than a certain value, the LED displays the failure code. Models without overload protector should be diagnosed according to the second flowchart.
Supposed causes	• Incorrect wiring connection • ODU PCB faulty • IPM module board faulty • High pressure protector faulty • System blockage

Table 64

Troubleshooting

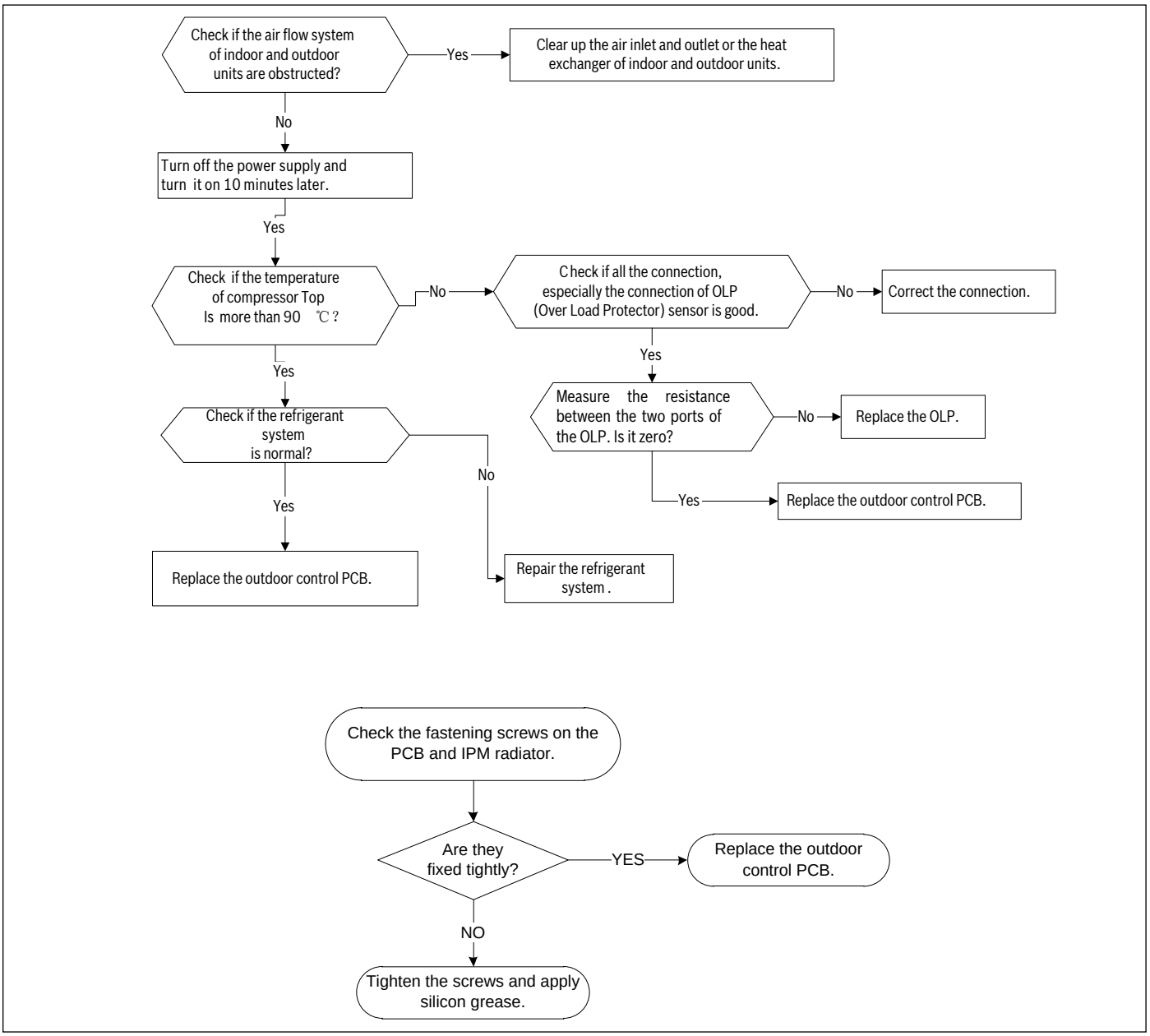


Figure 78

10.4.23 (PC 13) - The AC power is cut off or the AC voltage detection circuit fails

Error Code	PC 13
Malfunction decision conditions	The machine equipped with a safety shut-off valve has detected a power outage from the mains.
Supposed causes	• ODU PCB faulty

Table 65

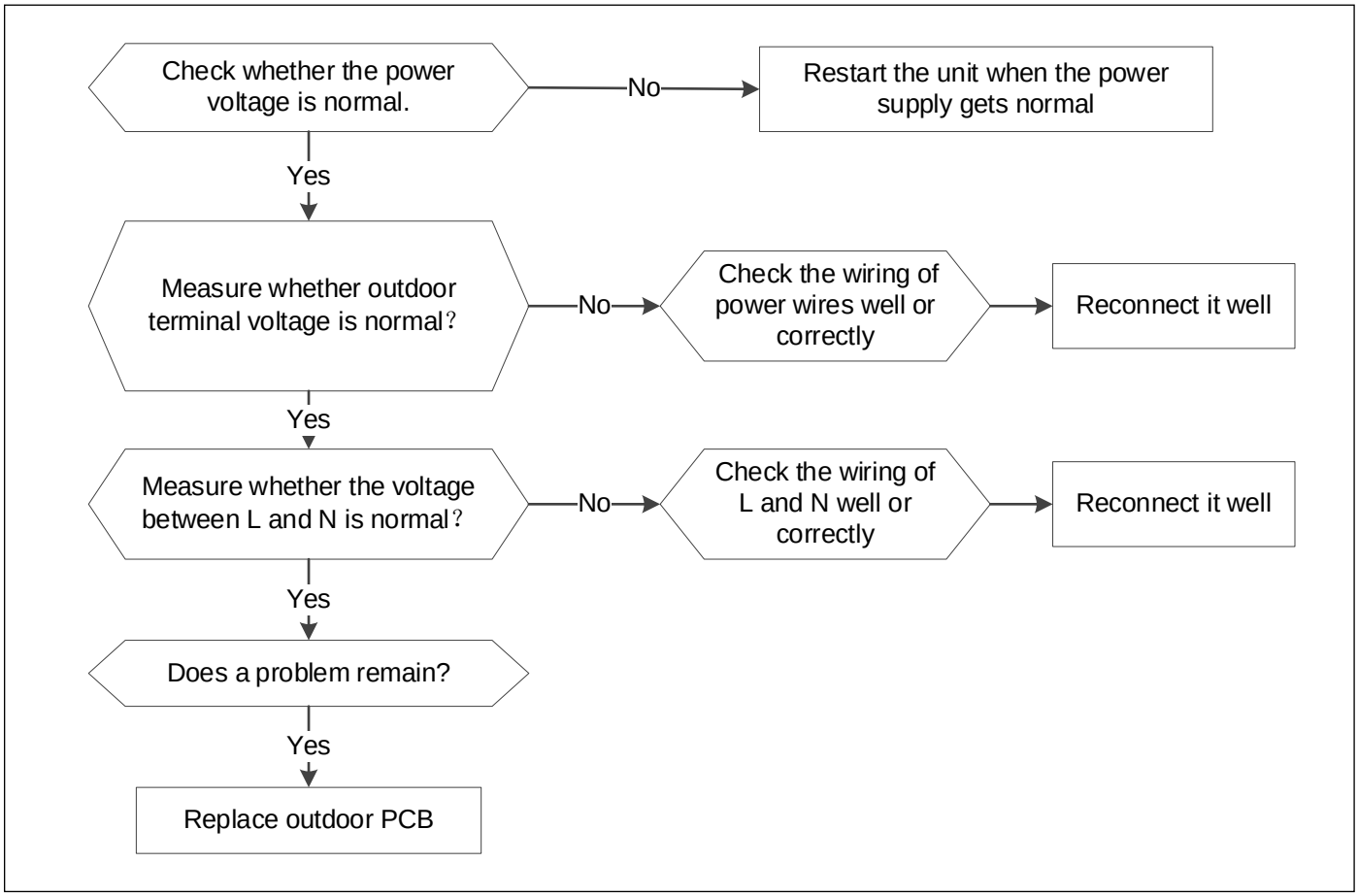


Figure 79

10.4.24 Main Parts Check

1. Temperature sensor check

WARNING

Electrical hazard!

- Be sure to turn off all power supplies or disconnect all wires to avoid electric shock.
- Operate after compressor and coil have returned to normal temperature to avoid injury.

- Disconnect the temperature sensor from PCB.
- Measure the resistance value of the sensor using a multi-meter.
- Check corresponding temperature sensor resistance value table (Appendix 1).

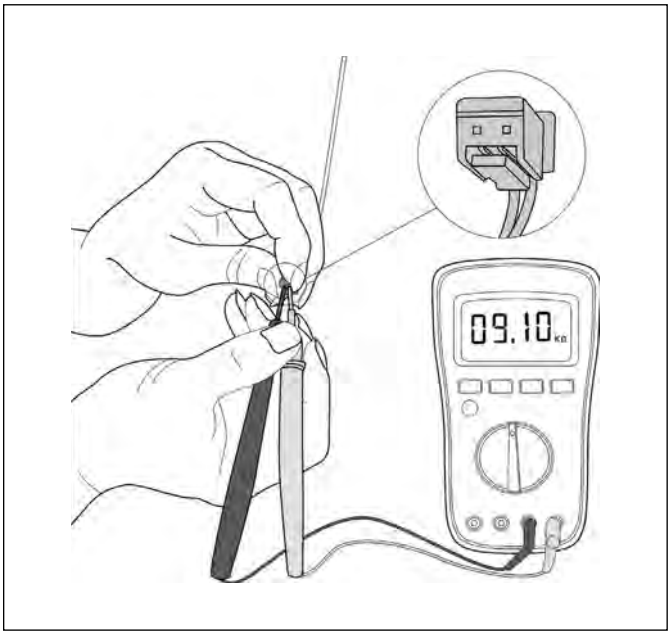


Figure 80

The photo above is for reference only, it may not be identical to the PCB shipped with your equipment.

Temperature sensors:

- Room temp.(T1) sensor,
- Indoor coil temp.(T2) sensor,
- Outdoor coil temp.(T3) sensor,
- Outdoor ambient temp.(T4) sensor,
- Compressor discharge temp.(T5) sensor.

Appendix 1 Resistance to Temperature value table for resistive sensors: T1,T2,T3,T4 (°C/°F/K Ohm)

°C	°F	K Ohm	°C	°F	K Ohm	°C	°F	K Ohm	°C	°F	K Ohm
-20	-4	115.266	20	68	12.6431	60	140	2.35774	100	212	0.62973
-19	-2	108.146	21	70	12.0561	61	142	2.27249	101	214	0.61148
-18	0	101.517	22	72	11.5	62	144	2.19073	102	216	0.59386
-17	1	96.3423	23	73	10.9731	63	145	2.11241	103	217	0.57683
-16	3	89.5865	24	75	10.4736	64	147	2.03732	104	219	0.56038
-15	5	84.219	25	77	10	65	149	1.96532	105	221	0.54448
-14	7	79.311	26	79	9.55074	66	151	1.89627	106	223	0.52912
-13	9	74.536	27	81	9.12445	67	153	1.83003	107	225	0.51426
-12	10	70.1698	28	82	8.71983	68	154	1.76647	108	226	0.49989
-11	12	66.0898	29	84	8.33566	69	156	1.70547	109	228	0.486
-10	14	62.2756	30	86	7.97078	70	158	1.64691	110	230	0.47256
-9	16	58.7079	31	88	7.62411	71	160	1.59068	111	232	0.45957
-8	18	56.3694	32	90	7.29464	72	162	1.53668	112	234	0.44699
-7	19	52.2438	33	91	6.98142	73	163	1.48481	113	235	0.43482
-6	21	49.3161	34	93	6.68355	74	165	1.43498	114	237	0.42304
-5	23	46.5725	35	95	6.40021	75	167	1.38703	115	239	0.41164
-4	25	44	36	97	6.13059	76	169	1.34105	116	241	0.4006
-3	27	41.5878	37	99	5.87359	77	171	1.29078	117	243	0.38991
-2	28	39.8239	38	100	5.62961	78	172	1.25423	118	244	0.37956
-1	30	37.1988	39	102	5.39689	79	174	1.2133	119	246	0.36954
0	32	35.2024	40	104	5.17519	80	176	1.17393	120	248	0.35982
1	34	33.3269	41	106	4.96392	81	178	1.13604	121	250	0.35042
2	36	31.5635	42	108	4.76253	82	180	1.09958	122	252	0.3413
3	37	29.9058	43	109	4.5705	83	181	1.06448	123	253	0.33246
4	39	28.3459	44	111	4.38736	84	183	1.03069	124	255	0.3239
5	41	26.8778	45	113	4.21263	85	185	0.99815	125	257	0.31559
6	43	25.4954	46	115	4.04589	86	187	0.96681	126	259	0.30754
7	45	24.1932	47	117	3.88673	87	189	0.93662	127	261	0.29974
8	46	22.5662	48	118	3.73476	88	190	0.90753	128	262	0.29216
9	48	21.8094	49	120	3.58962	89	192	0.8795	129	264	0.28482
10	50	20.7184	50	122	3.45097	90	194	0.85248	130	266	0.2777
11	52	19.6891	51	124	3.31847	91	196	0.82643	131	268	0.27078
12	54	18.7177	52	126	3.19183	92	198	0.80132	132	270	0.26408
13	55	17.8005	53	127	3.07075	93	199	0.77709	133	271	0.25757
14	57	16.9341	54	129	2.95896	94	201	0.75373	134	273	0.25125
15	59	16.1156	55	131	2.84421	95	203	0.73119	135	275	0.24512
16	61	15.3418	56	133	2.73823	96	205	0.70944	136	277	0.23916
17	63	14.6181	57	135	2.63682	97	207	0.68844	137	279	0.23338
18	64	13.918	58	136	2.53973	98	208	0.66818	138	280	0.22776
19	66	13.2631	59	138	2.44677	99	210	0.64862	139	282	0.22231

Table 66

Appendix 2 Resistance to Discharge Temperature value table: T5 (°C/°F/K Ohm)

℃	℉	K Ohm	℃	℉	K Ohm	℃	℉	K Ohm	℃	℉	K Ohm
-20	-4	542.7	20	68	68.66	60	140	13.59	100	212	3.702
-19	-2	511.9	21	70	65.62	61	142	13.11	101	214	3.595
-18	0	483	22	72	62.73	62	144	12.65	102	216	3.492
-17	1	455.9	23	73	59.98	63	145	12.21	103	217	3.392
-16	3	430.5	24	75	57.37	64	147	11.79	104	219	3.296
-15	5	406.7	25	77	54.89	65	149	11.38	105	221	3.203
-14	7	384.3	26	79	52.53	66	151	10.99	106	223	3.113
-13	9	363.3	27	81	50.28	67	153	10.61	107	225	3.025
-12	10	343.6	28	82	48.14	68	154	10.25	108	226	2.941
-11	12	325.1	29	84	46.11	69	156	9.902	109	228	2.86
-10	14	307.7	30	86	44.17	70	158	9.569	110	230	2.781
-9	16	291.3	31	88	42.33	71	160	9.248	111	232	2.704
-8	18	275.9	32	90	40.57	72	162	8.94	112	234	2.63
-7	19	261.4	33	91	38.89	73	163	8.643	113	235	2.559
-6	21	247.8	34	93	37.3	74	165	8.358	114	237	2.489
-5	23	234.9	35	95	35.78	75	167	8.084	115	239	2.422
-4	25	222.8	36	97	34.32	76	169	7.82	116	241	2.357
-3	27	211.4	37	99	32.94	77	171	7.566	117	243	2.294
-2	28	200.7	38	100	31.62	78	172	7.321	118	244	2.233
-1	30	190.5	39	102	30.36	79	174	7.086	119	246	2.174
0	32	180.9	40	104	29.15	80	176	6.859	120	248	2.117
1	34	171.9	41	106	28	81	178	6.641	121	250	2.061
2	36	163.3	42	108	26.9	82	180	6.43	122	252	2.007
3	37	155.2	43	109	25.86	83	181	6.228	123	253	1.955
4	39	147.6	44	111	24.85	84	183	6.033	124	255	1.905
5	41	140.4	45	113	23.89	85	185	5.844	125	257	1.856
6	43	133.5	46	115	22.89	86	187	5.663	126	259	1.808
7	45	127.1	47	117	22.1	87	189	5.488	127	261	1.762
8	46	121	48	118	21.26	88	190	5.32	128	262	1.717
9	48	115.2	49	120	20.46	89	192	5.157	129	264	1.674
10	50	109.8	50	122	19.69	90	194	5	130	266	1.632
11	52	104.6	51	124	18.96	91	196	4.849			
12	54	99.69	52	126	18.26	92	198	4.703			
13	55	95.05	53	127	17.58	93	199	4.562			
14	57	90.66	54	129	16.94	94	201	4.426			
15	59	86.49	55	131	16.32	95	203	4.294			
16	61	82.54	56	133	15.73	96	205	4.167			
17	63	78.79	57	135	15.16	97	207	4.045			
18	64	75.24	58	136	14.62	98	208	3.927			
19	66	71.86	59	138	14.09	99	210	3.812			

Table 67

2. Compressor check

Measure the resistance value of each winding by using the tester.

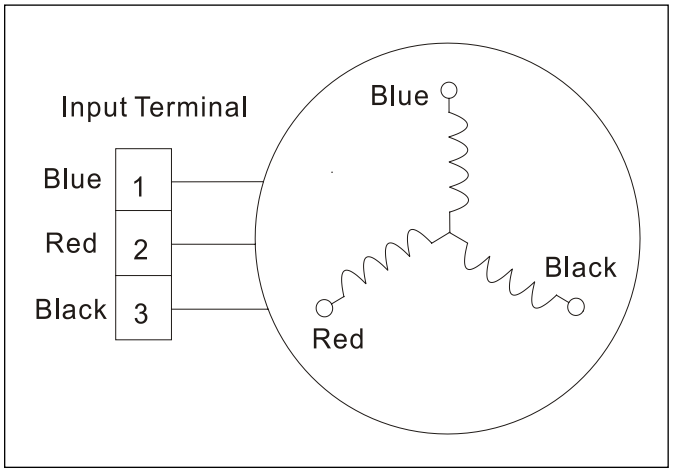


Figure 81

Figure 82

Position	Resistance Value per Compressor Model			
	18K Regular	27K Regular 18K Max Performance	36K Regular 27K Max Performance	48K Regular 36K Max Performance
Blue - Red	1.02 Ω	1.04 Ω	0.65Ω	0.37Ω
Blue - Black				
Red - Black				

Table 68

3. IPM continuity check

WARNING

Electrical hazard!

Electricity remains in capacitors even when the power supply is off. Ensure the capacitors are fully discharged before troubleshooting.

Turn off the power, let the large capacity electrolytic capacitors discharge completely, then dismount the IPM. Use a digital tester to measure the resistance between P and UVWN; UVW and N.

Digital tester		Normal resistance value	Digital tester		Normal resistance value
(+)Red	(-)Black		(+)Red	(-)Black	
P	N	∞ (Several MΩ)	U	N	∞ (Several MΩ)
	U		V		
	V		W		
	W		(+)Red		

Table 69

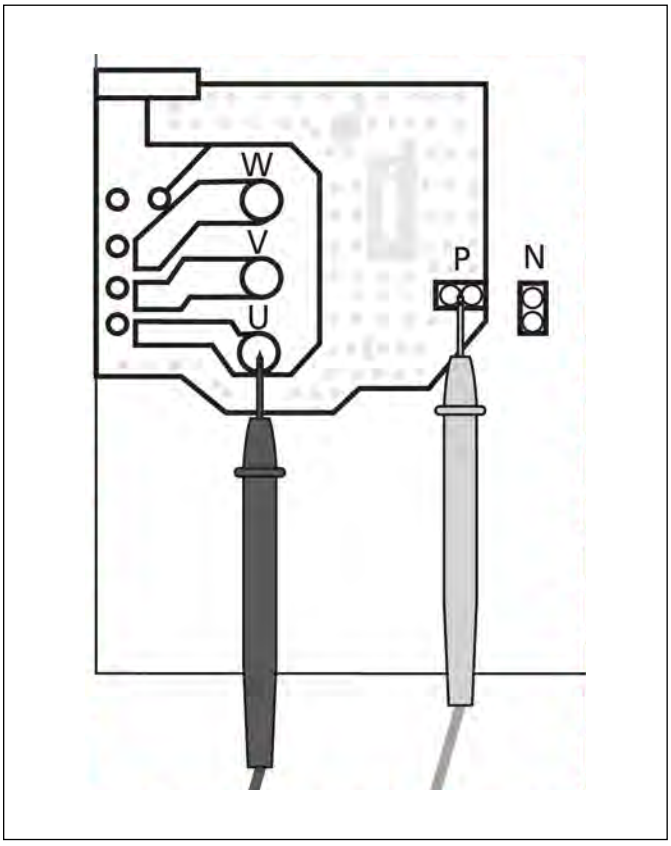


Figure 83

4. Four - Way Valve

Step 1. Power on, use a digital tester to measure the voltage. When the unit operates in cooling mode, value should be 0V. When the unit operates in heating mode, the value should be approximately 230VAC.

If the value of the voltage is not in the range, the PCB may have problems and need to be replaced.

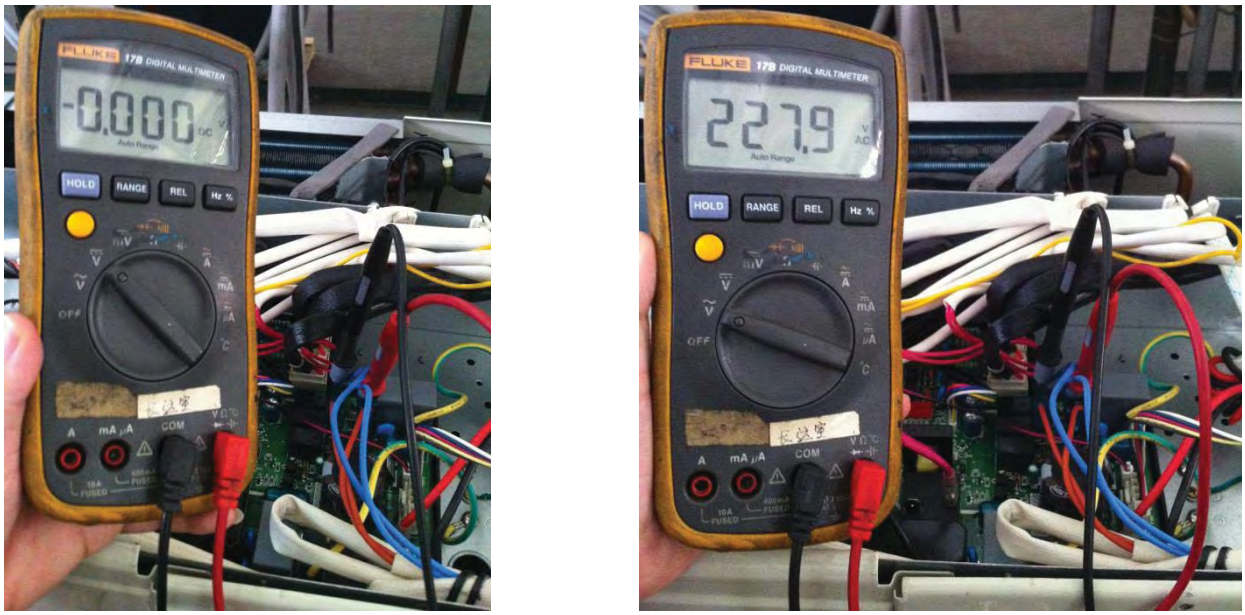


Figure 84

Step 2. Turn off the power, use a digital tester to measure the resistance. The value should be between 1.8~2.5 KΩ.

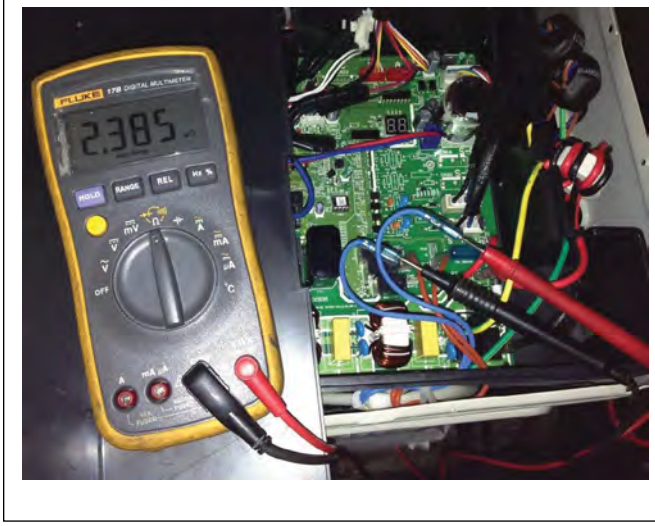


Figure 85

5. EXV check

Step 1. Disconnect EXV connectors from PCB

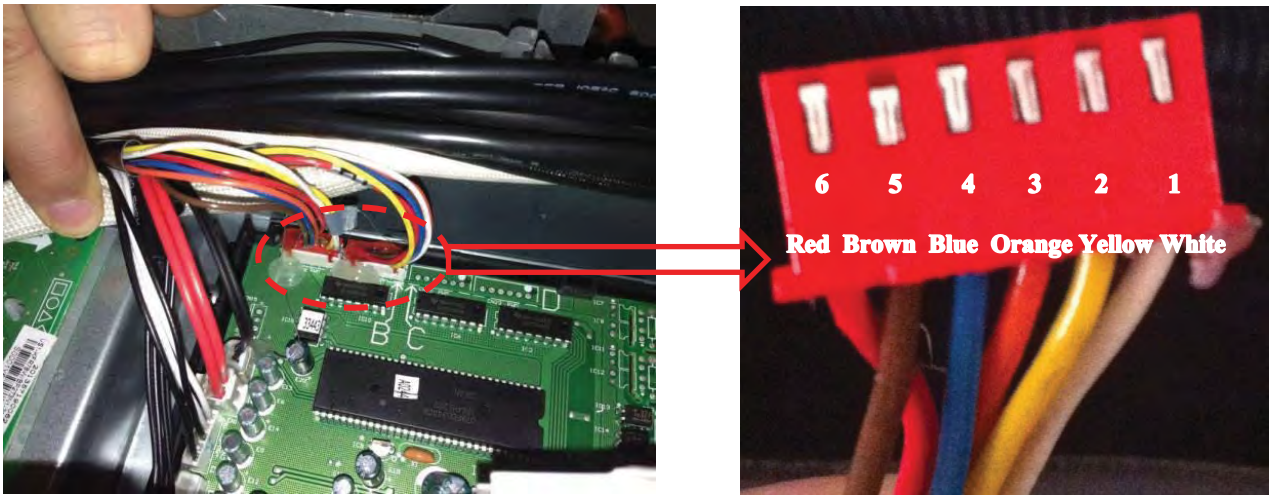


Figure 86

Step 2. Check the resistance value on EXV coil

Color of lead wire	Normal Value
Red- Blue	Approximately 50Ω
Red - Yellow	
Brown-Orange	
Brown-White	

Table 70 +

6. Reactor check

Measure the resistance and voltage (to ground) of the reactor. The normal resistance should be around 0.1 ohm. Otherwise,the reactor must have malfunctioned.

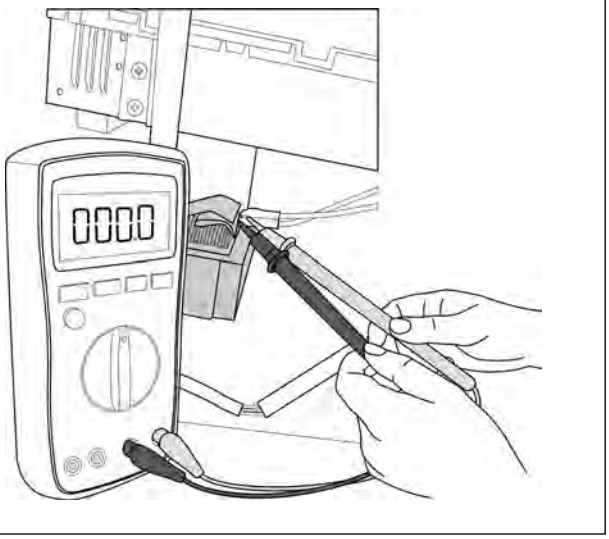


Figure 87

11 Disassembly Guide

11.1 Panel Plate

11.1.1 Outdoor Unit - BMS500-AAM018-1CSXRD

This section is for reference only. Actual unit appearance may vary.

1. Turn off the air conditioner and the power breaker.
2. Remove the screws of big handle assembly and water collector then remove them.(6 screws)

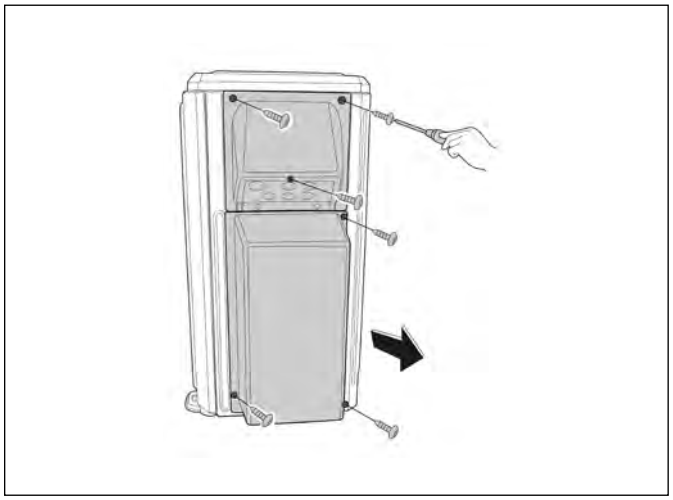


Figure 88

3. Remove the screws of the top cover and then remove the top cover (3 screws). One of the screws is located underneath the big handle.

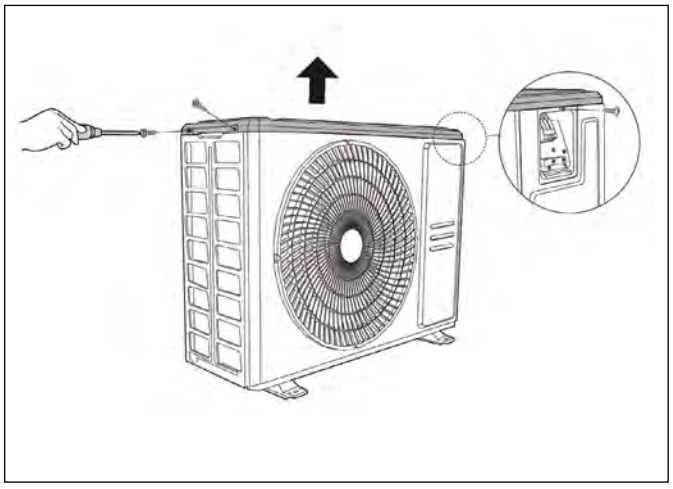


Figure 89

4. Remove the screws of the front panel and then remove the front panel (7 screws)

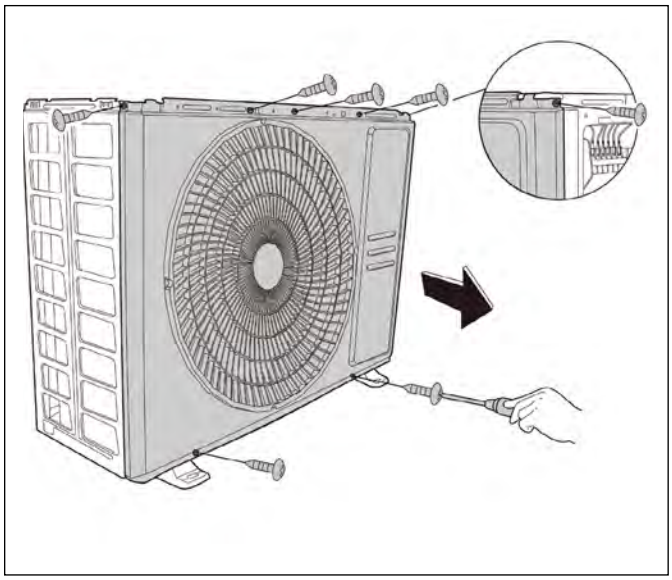


Figure 90

5. Remove the screws of the right panel and then remove the right panel (14 screws, two of them are used to fix the optional rear net)

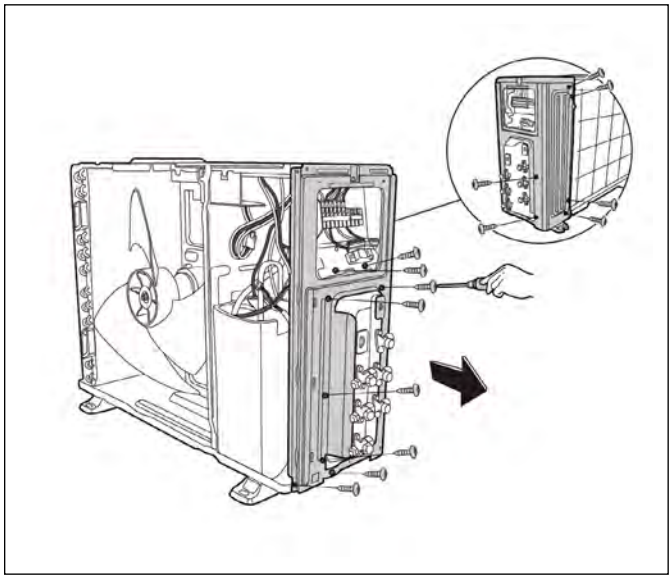


Figure 91

11.1.2 Outdoor Units - BMS500-AAM018-1CSXHD, BMS500-AAM027-1CSXRD, BMS500-AAM027-1CSXHD, BMS500-AAM036-1CSXRD, BMS500-AAM036-1CSXHD

1. Turn off the air conditioner and thepower breaker.
2. Remove four screws and then remove the big handle.
3. Remove three screws and then remove the water collecting cover.

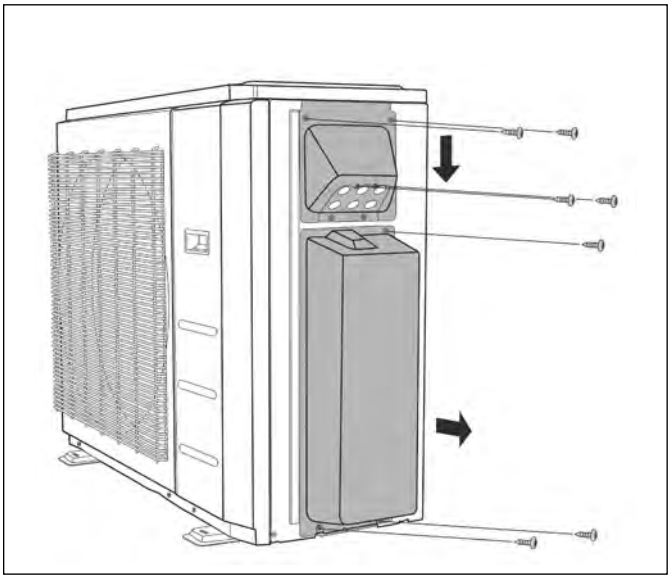


Figure 92

4. Remove the screws of the top cover and then remove the top cover (4 screws). Two of the screws is located underneath the big handle.

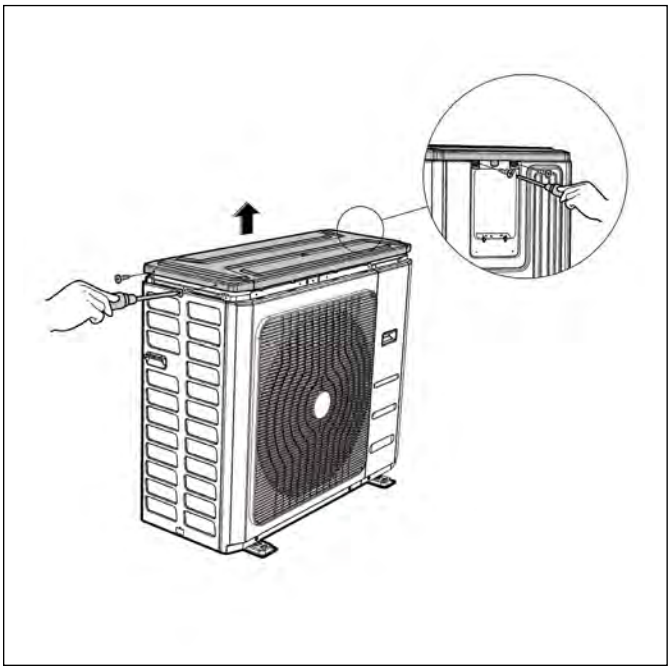


Figure 93

5. Remove the screws of the front right panel and then remove the front right panel (2 screws)

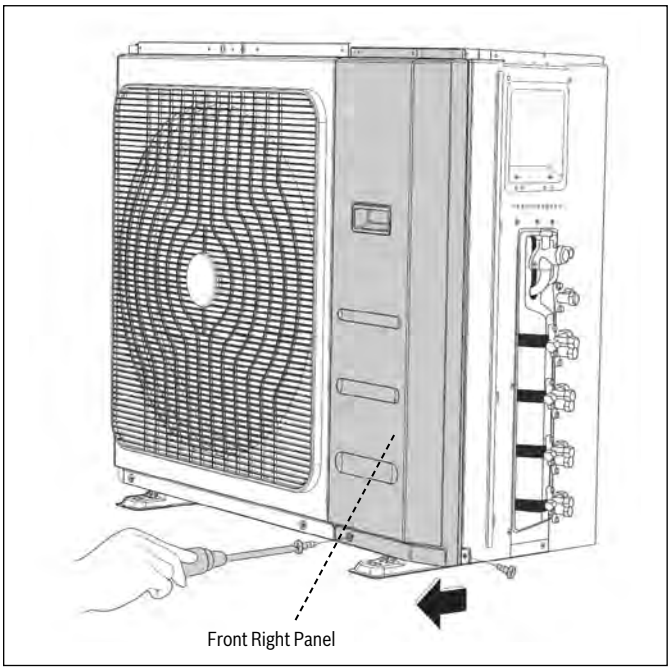


Figure 94

6. Remove the screws of the front panel and then remove the front panel (9 screws).

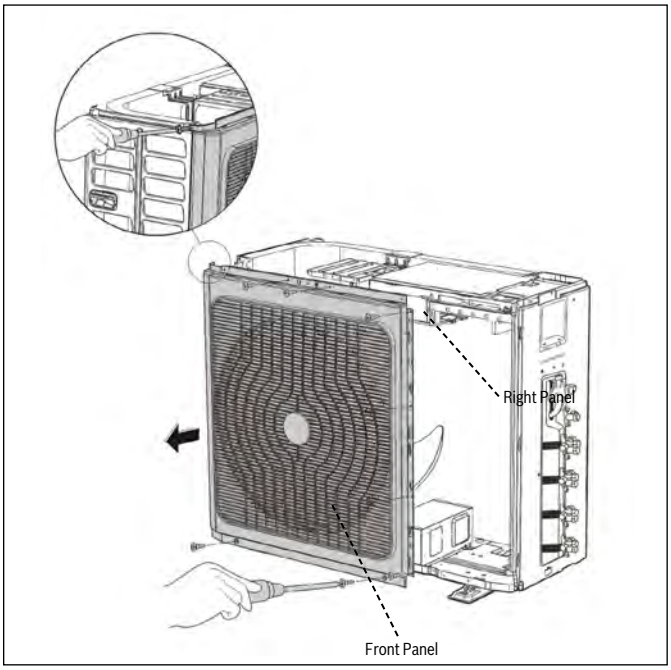


Figure 95

7. Remove the screws of the rear net and then remove the rear net (6 screws) (for some models).

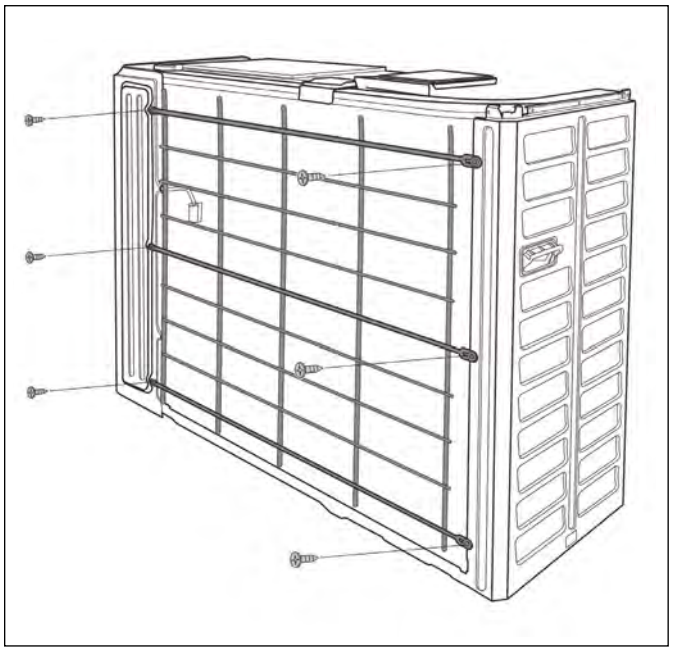


Figure 96

8. Remove the screws of the right panel and then remove the right panel (12 screws).

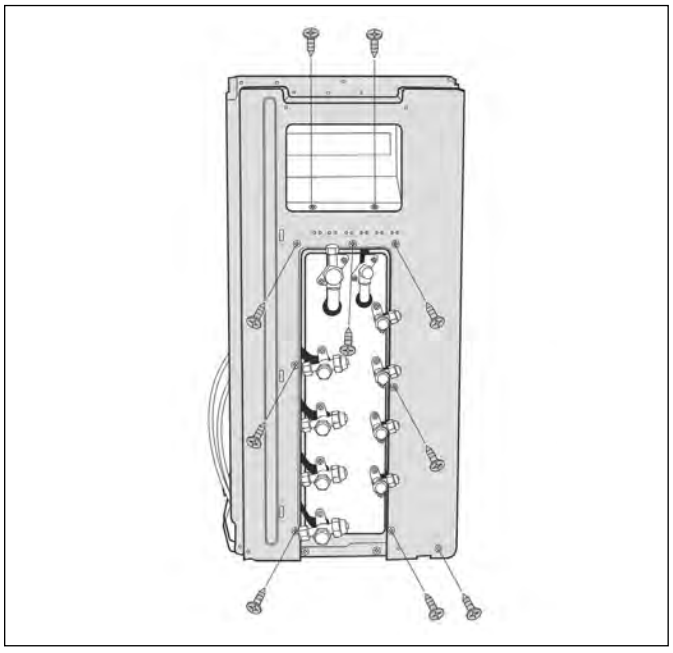


Figure 97

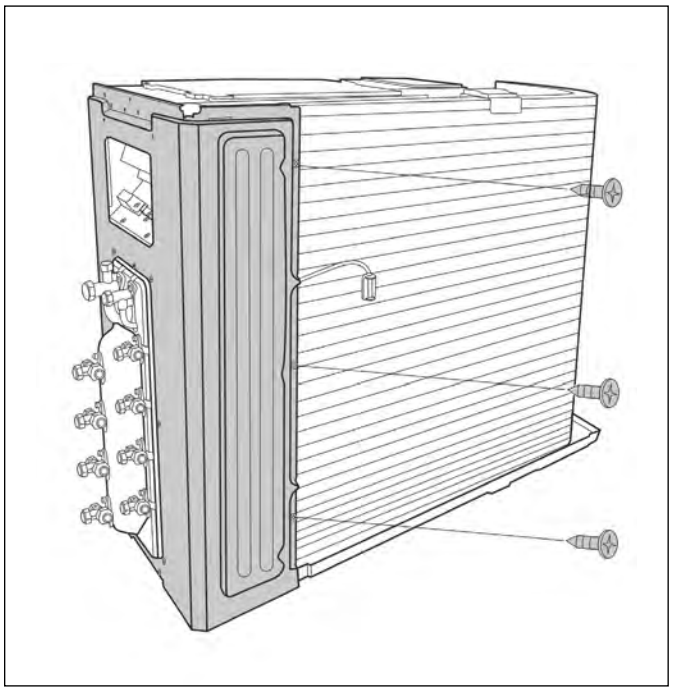


Figure 98

11.1.3 Outdoor Units - BMS500-AAM048-1CSXRD, BMS500-AAM048-1CSXHD

1. Turn off the air conditioner and the power breaker.
2. Remove the screws of the big handle and then remove it (3 screws).
3. Remove the screws of the water collecting cover and then remove it (3 screws).

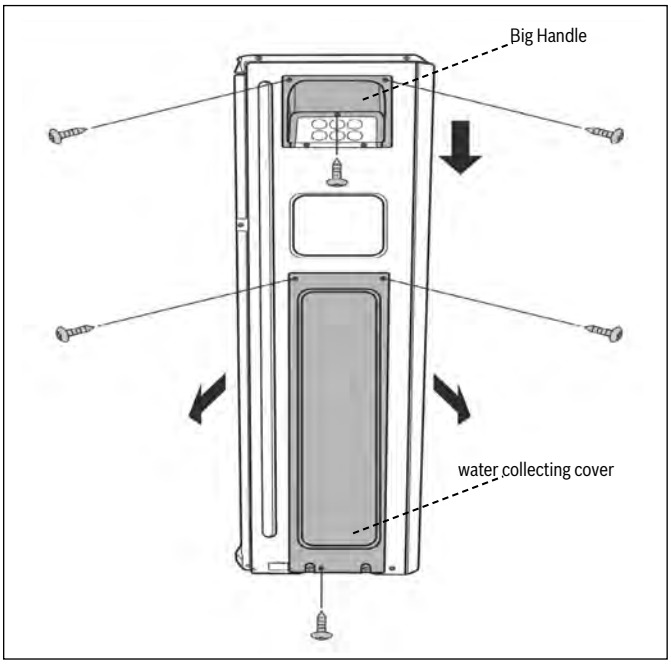


Figure 99

4. Unfix the four screws of the top cover and then remove it.

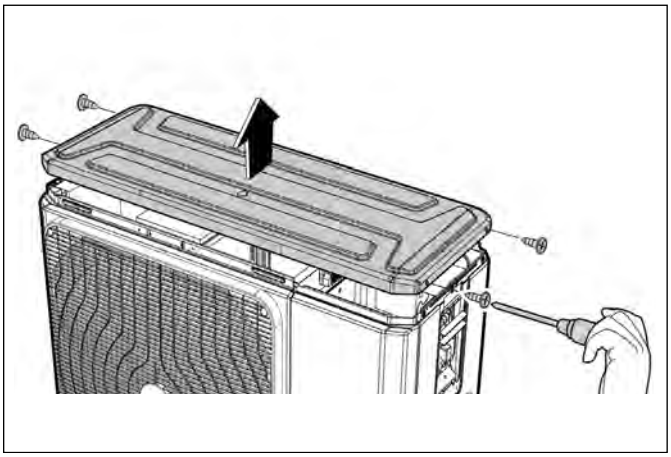


Figure 100

5. Remove the two screws of the right front panel and then push it down to unhook the right front panel from the nine hooks.

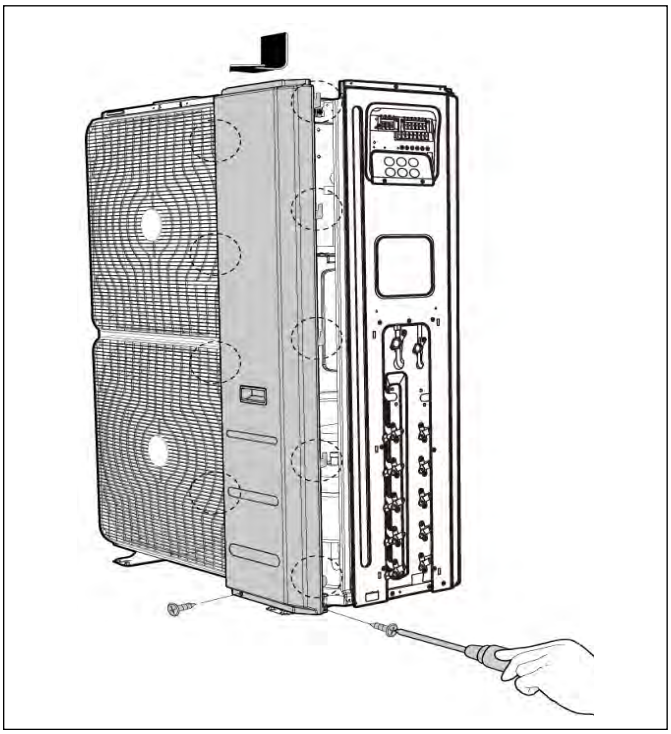


Figure 101

6. Remove the seven screws of the front panel and then remove the front panel.

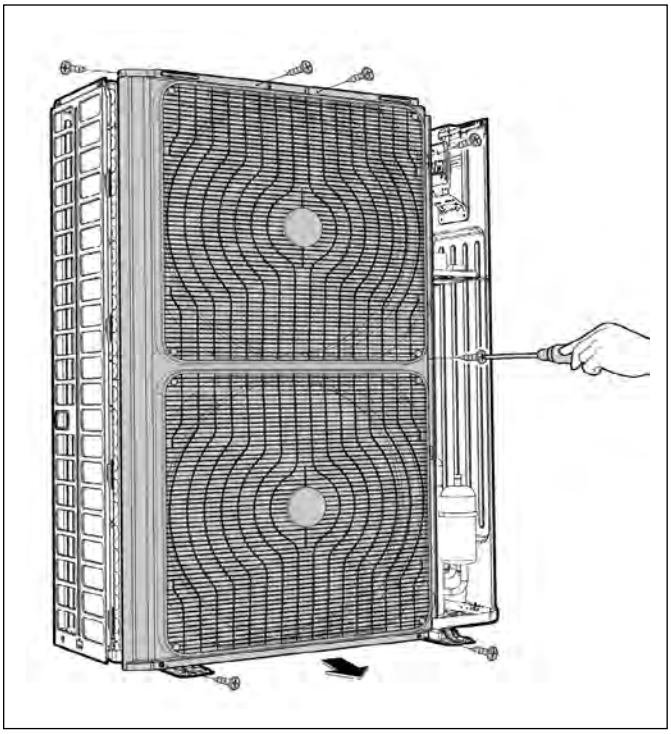


Figure 102

7. Unfix the screws on the right side of the right panel.(9 screws)

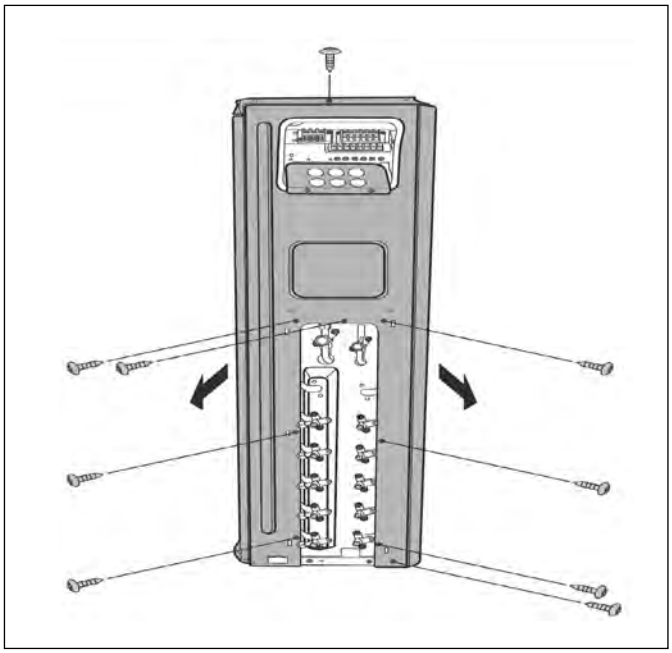


Figure 103

8. Remove the screws on the back of the right panel and then remove the right panel and rear net.(9 screws)

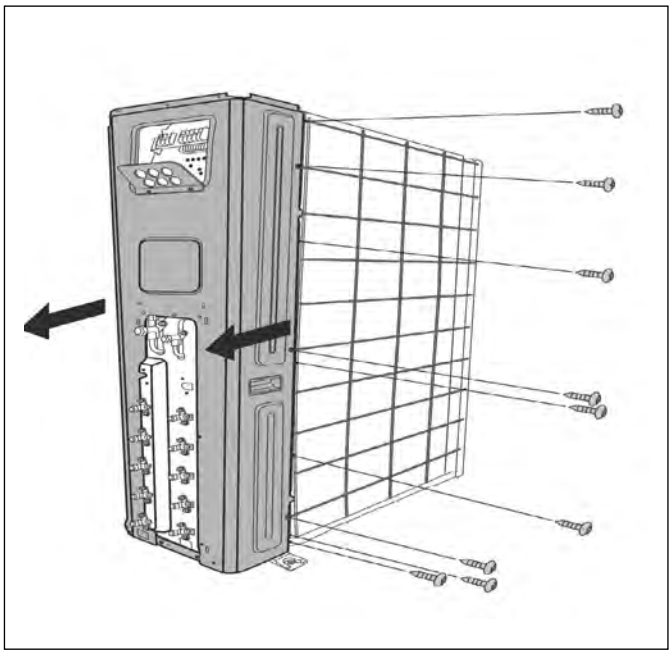


Figure 104

11.2 Electrical Parts

11.2.1 Outdoor Unit - BMS500-AAM018-1CSXRD

1. Remove 5 screws of electrical control box cover and remove it.

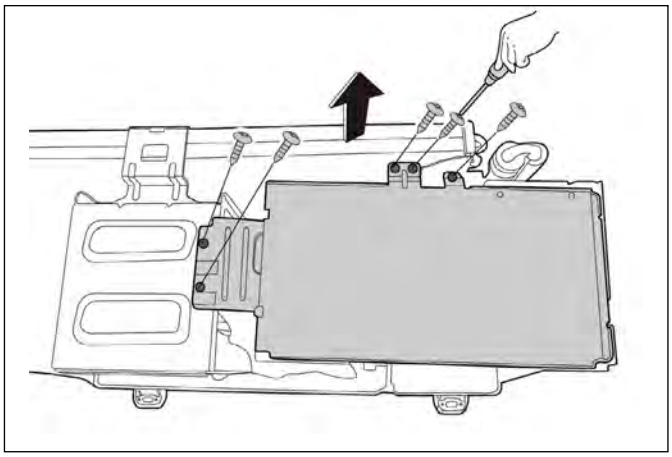


Figure 105

2. Cut the ribbon by a shear and disconnect the 4-way valve connector.

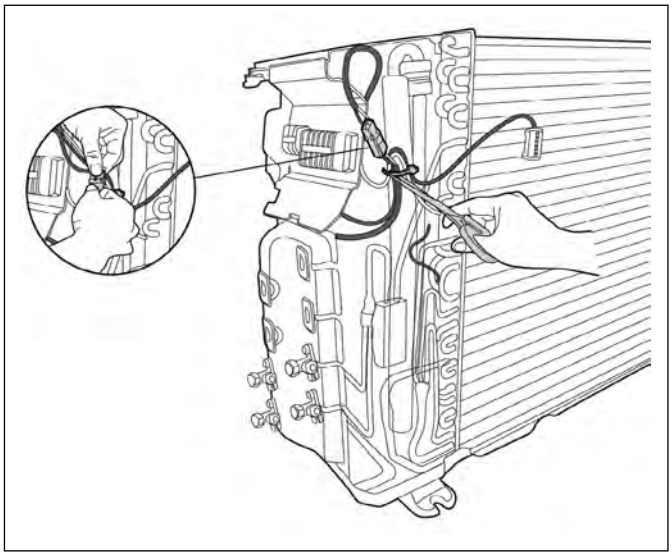


Figure 106

3. Ture over the electronic control box subassembly.

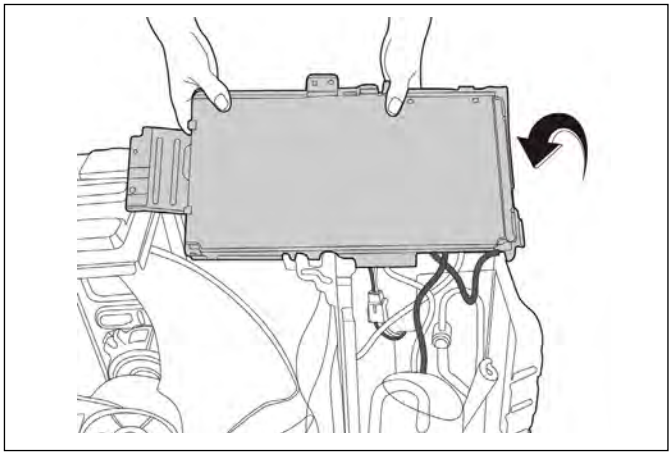


Figure 107

4. Remove the electronic installing box subassembly (4 hooks).

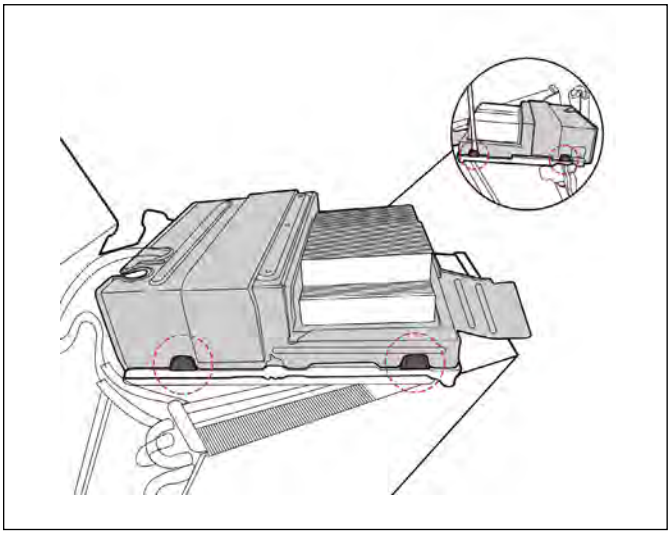


Figure 108

5. Remove the support of electronic control box.

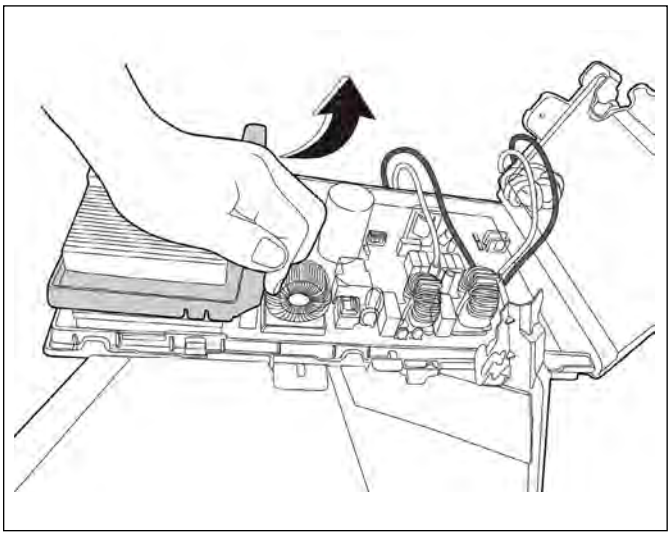


Figure 109

6. Disconnect the connectors from the electronic control board.
7. Remove 4 screws and then remove the electronic control board.

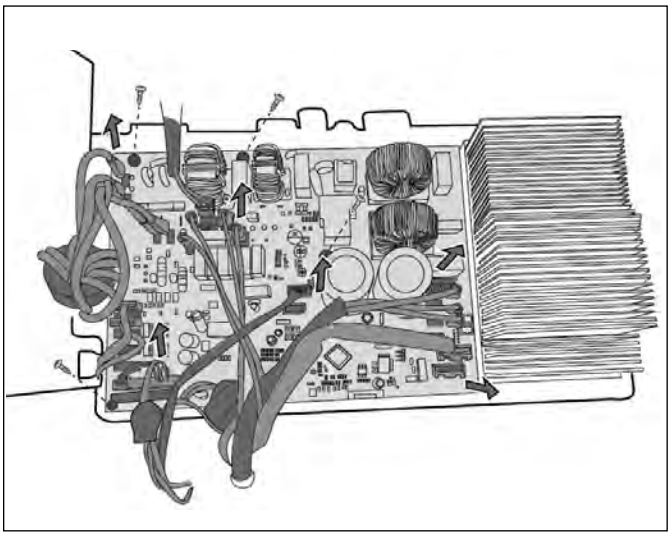


Figure 110

8. Pull out the connector, remove one screw and then remove the keyboard subassembly on terminal board.

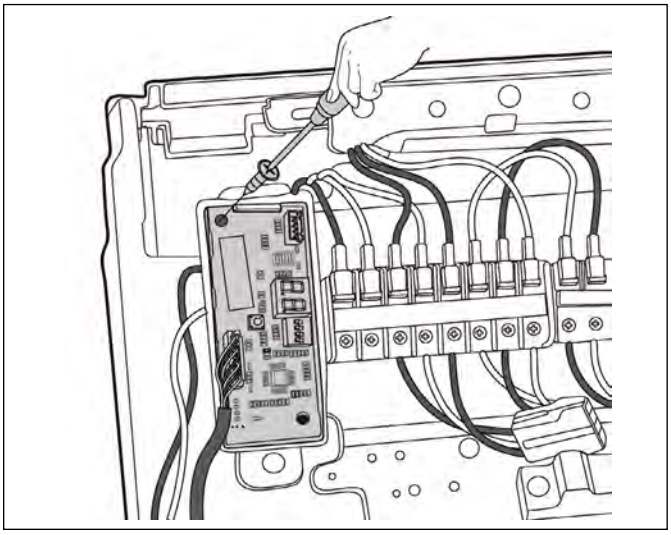


Figure 111

11.2.2 Outdoor Units - BMS500-AAM018-1CSXRD, BMS500-AAM027-1CSXRD, BMS500-AAM027-1CSXHD, BMS500-AAM036-1CSXRD

1. Remove the cover of electrical control box.

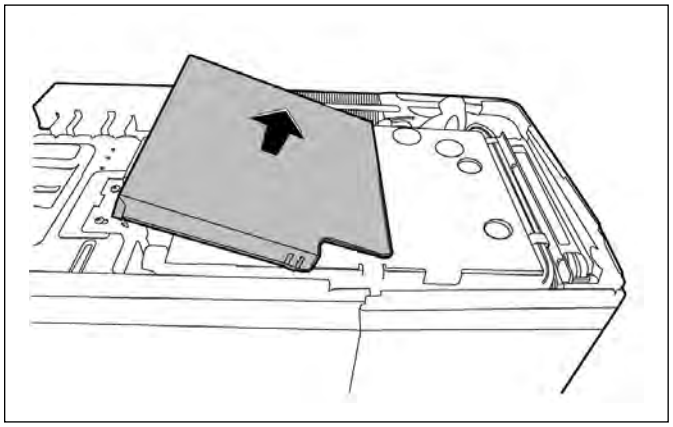


Figure 112

2. Disconnect the fan motor connector.

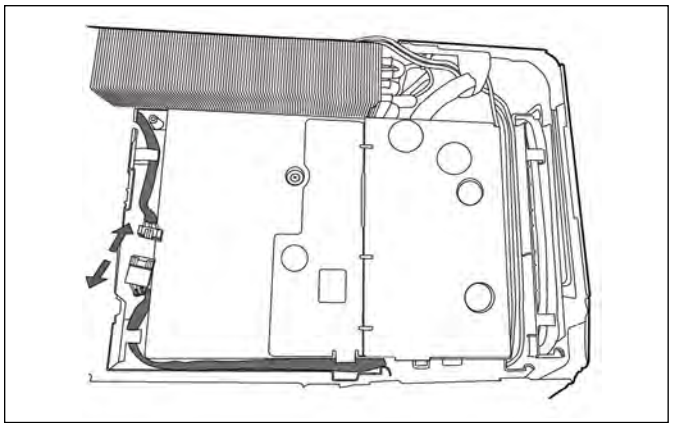


Figure 113

3. Remove 8 fixing screws.
4. Turn over the electronic control box subassembly.

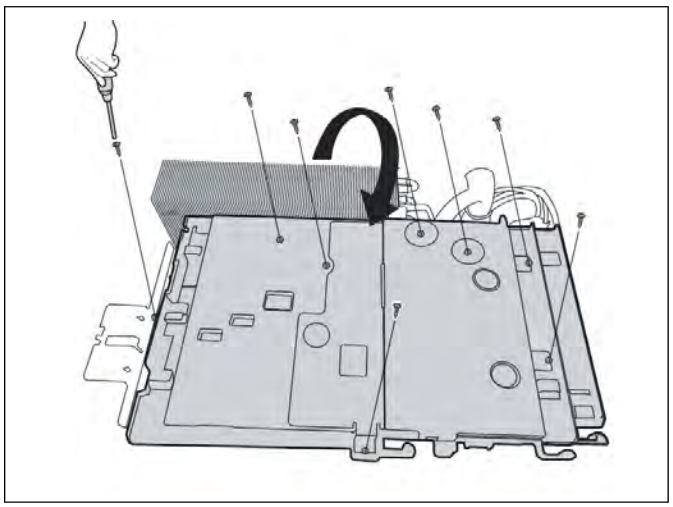


Figure 114

5. Remove 3 screws and then remove the bracket.
6. Disconnect the connectors from the electronic control board.
7. Remove 3 screws and then remove the electronic control board.

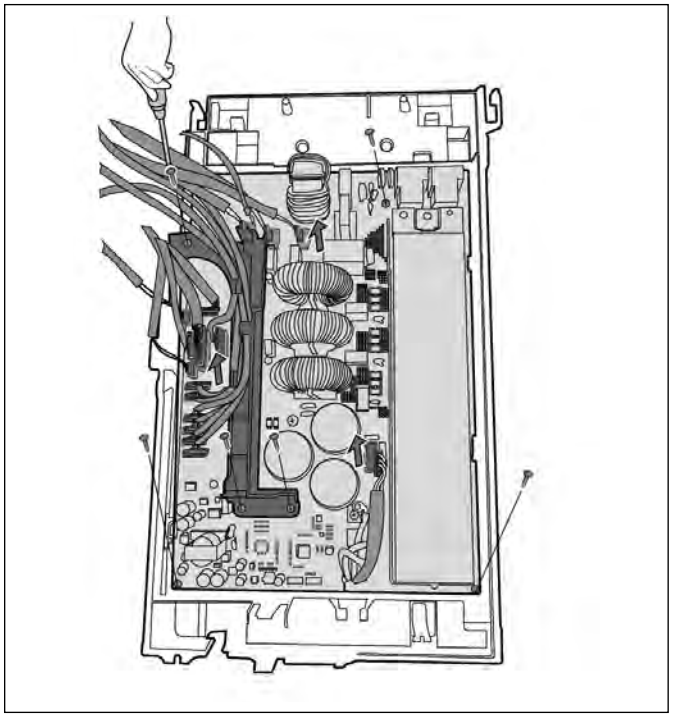


Figure 115

8. Pull out the connector, remove one screw and then remove the keyboard subassembly on terminal board.

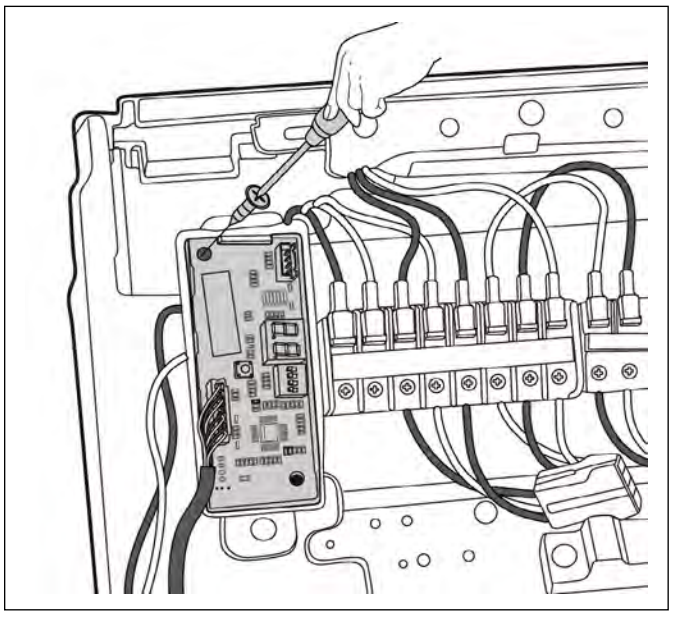


Figure 116

11.2.3 Outdoor Units - BMS500-AAM048-1CSXRD, BMS500-AAM048-1CSXHD

9. Disconnect the connectors from the electronic control board.
10. Remove 3 screws and then remove the electronic control board.

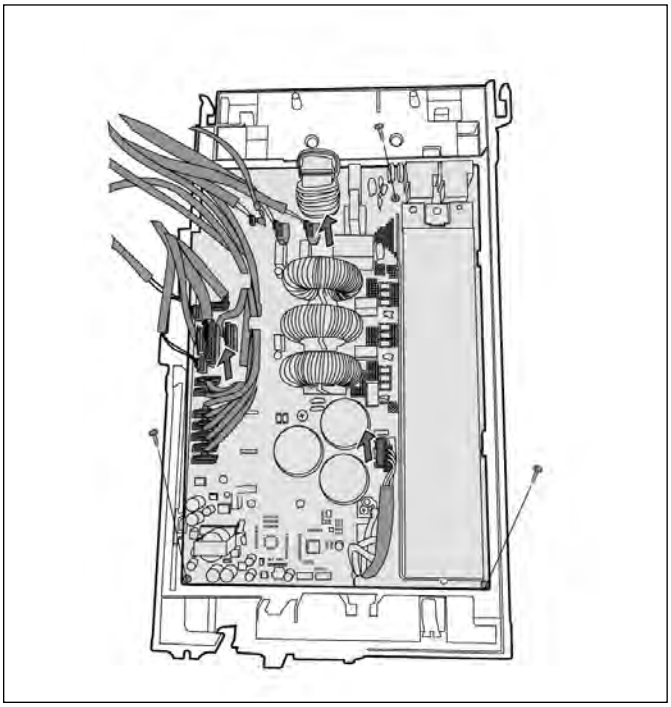


Figure 117

11. Pull out the connector, remove one screw and then remove the keyboard subassembly on terminal board.

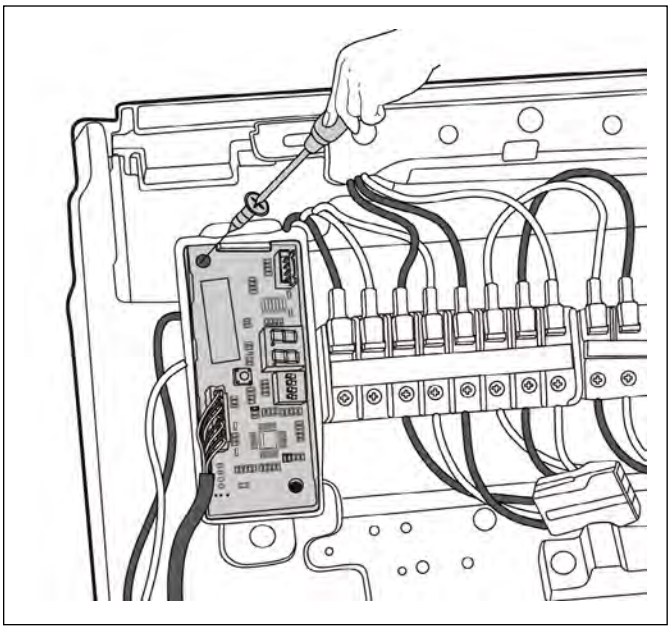


Figure 118

11.3 Fan Assembly

Remove the panel plate (refer to XXX) before disassembling fan.

1. Remove the nut securing the fan with a spanner.
2. Remove the fan.

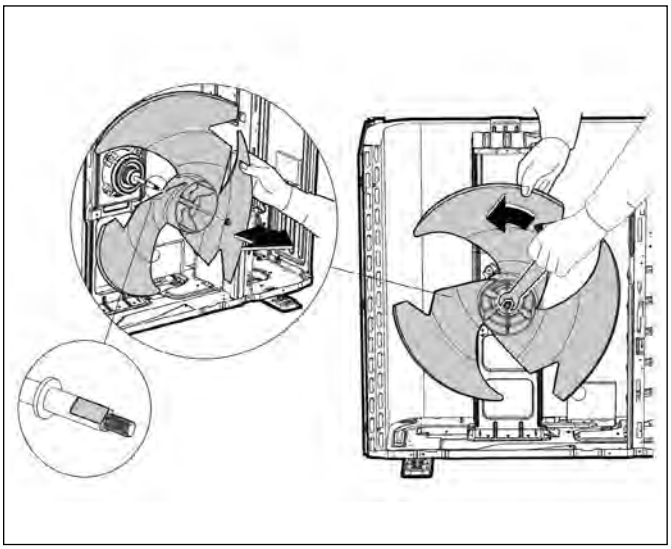


Figure 119

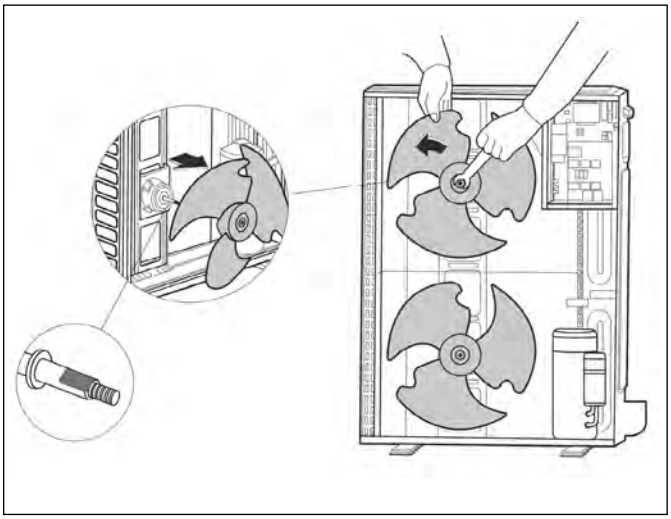


Figure 120

11.4 Fan Motor

Remove the panel plate and the connection of fan motor on PCB (refer to XXX and XXX) before disassembling fan motor.

3. Remove the fixing screws of the fan motor (4 screws)
4. Remove the fan motor.

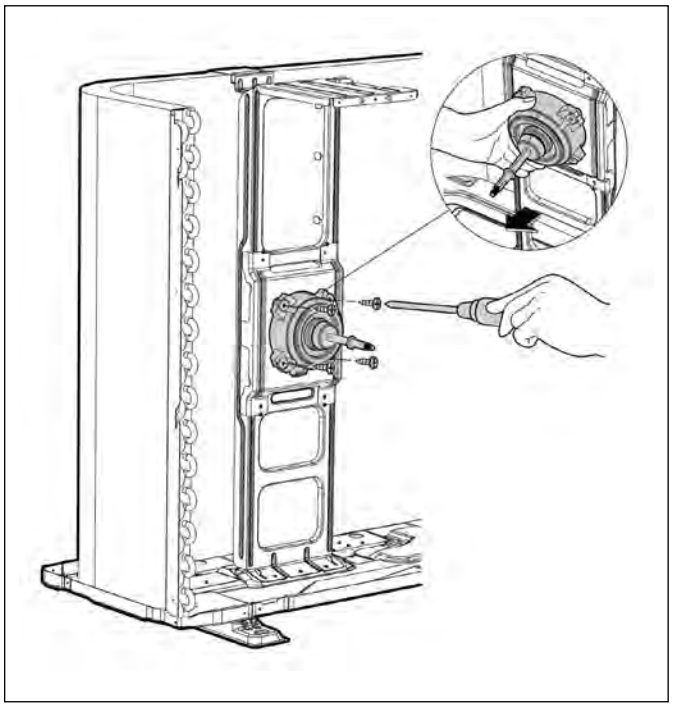


Figure 121

11.5 Sound blanket

Remove the panel plate (refer to XXX) before disassembling sound blanket.

1. Remove the sound blanket (side and top).

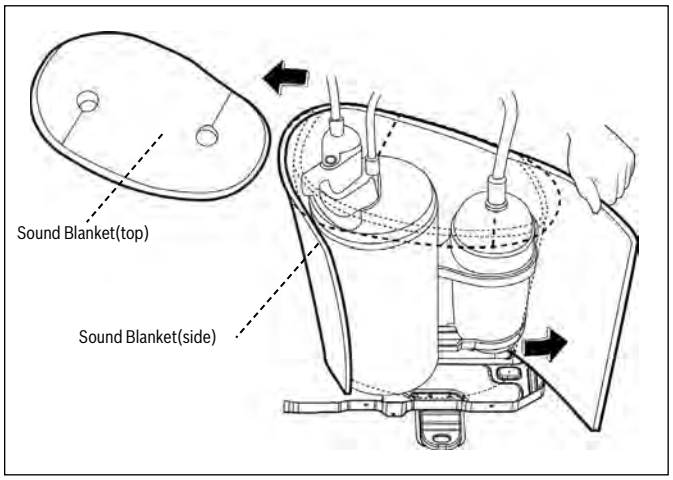


Figure 122

11.6 Four-way valve (for heat pump models)

WARNING

F!

Evacuate the system and confirm that there is no refrigerant left in the system before removing the four-way valve and the compressor. (You should evacuate the system with the vacuum pump; flush the system with nitrogen; then repeat the two steps before heating up the brazed parts. The operations above should be implemented by professionals.)

Remove the panel plate, connection of four-way valve on PCB (refer to XXX) before disassembling sound blanket.

1. Heat up the brazed parts and then detach the the four-way valve and the pipe.
2. Remove the four-way valve assembly with pliers.

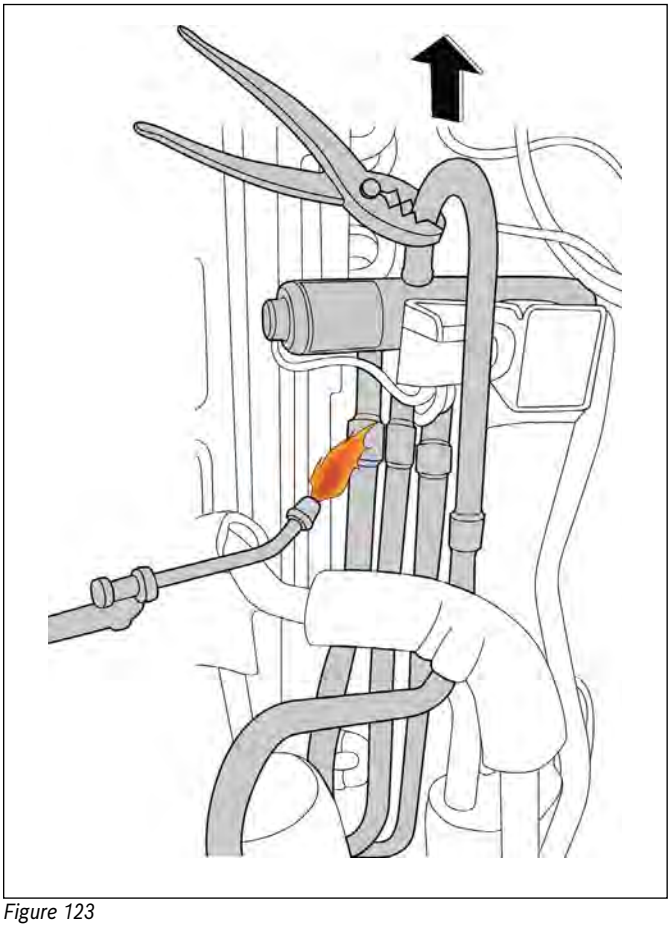


Figure 123

11.7 Compressor

WARNING

F!

Evacuate the system and confirm that there is no refrigerant left in the system before removing the four-way valve and the compressor. (You should evacuate the system with the vacuum pump; flush the system with nitrogen; then repeat the two steps before heating up the brazed parts. The operations above should be implemented by professionals.)

Remove the panel plate, connection of compressor on PCB (refer to XXX and XXX) before disassembling sound blanket.

1. Remove the flange nut of terminal cover and remove the terminal cover.

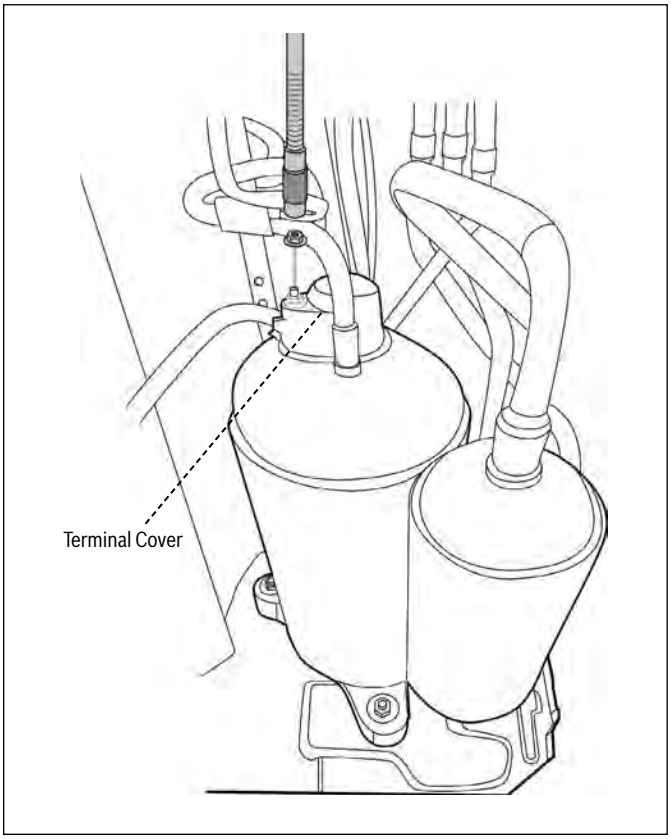


Figure 124

2. Disconnect the connectors.

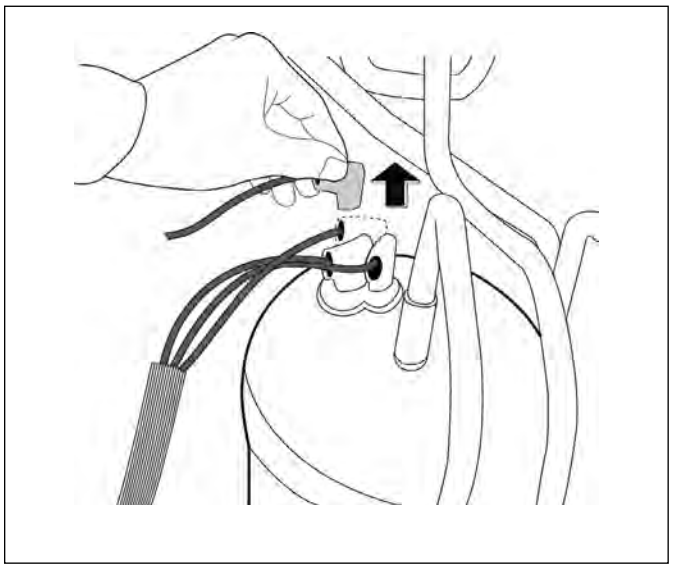


Figure 125

3. Remove the hex nuts and washers securing the compressor, located on the bottom plate.

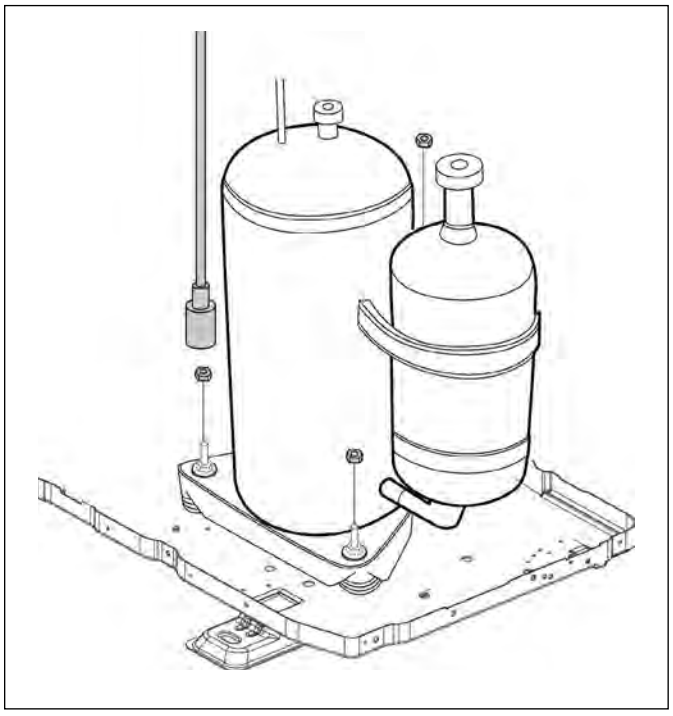


Figure 126

4. Heat up the brazed parts and then remove the the discharge pipe and the suction pipe.
5. Lift the compressor from the base pan assembly with pliers.

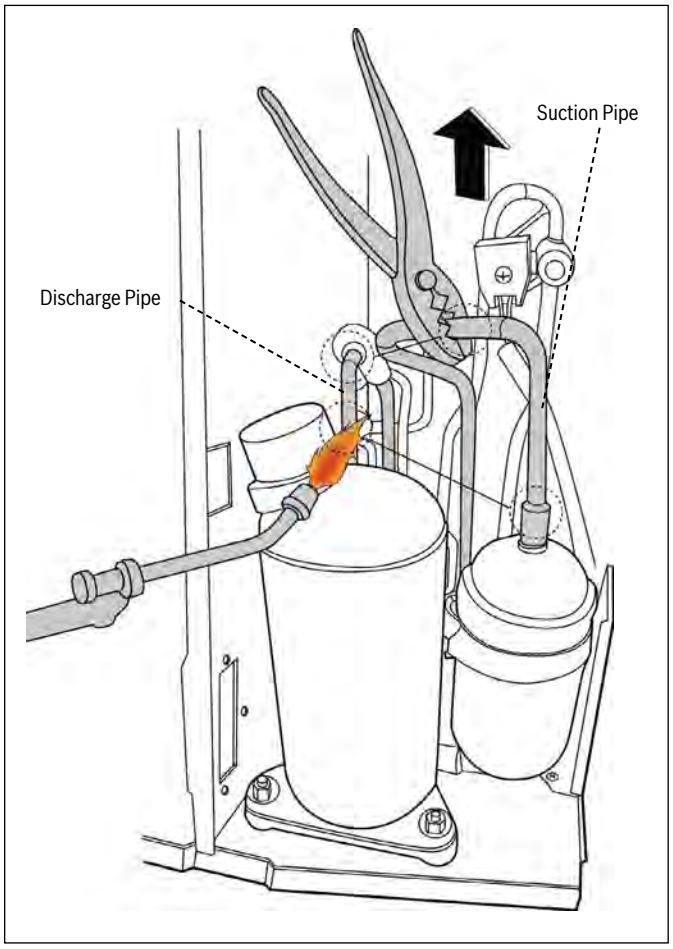


Figure 127

Online Help Resources

Alternatively, please visit our Service & Support webpage to find FAQs, videos, service bulletins, and more; www.bosch-homecomfort.us/service or use your cellphone to scan the code below.

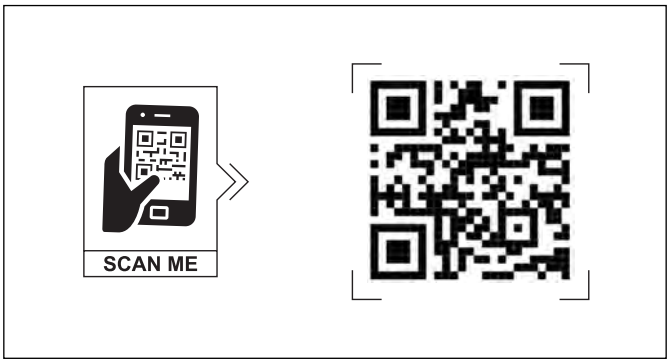


Figure 128

NOTES:

NOTES:

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