YN-M SERIES MULTI SPLIT SYSTEM MULTI CIRCUIT OUTDOOR UNITS

(2, 3 AND 4 ZONES) SERVICE MANUAL

PRE 2014 MODELS (Pre 50130047 Serials)

R-410A DC Inverter

CONDENSING UNITS

Revision B: ODMI-C2-1310

Parker Davis HVAC International, Inc.

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Model Numbers:

YN018GMFI16M2D (Dual)
YN027GMFI16M3D (Trio) **YN036GMFI16M4D (Quad)**

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WARNING

- Installation MUST conform with local building codes or, in the absence of local codes, with the National Electrical Code NFPA70/ANSI C1-1993 or current edition and Canadian Electrical Code Part1 CSA C.22.1.
- The information contained in the manual is intended for use by a qualified service technician familiar with safety procedures and equipped with the proper tools and test instruments
- Installation or repairs made by unqualified persons can result in hazards to you and others.
- Failure to carefully read and follow all instructions in this manual can result in equipment malfunction, property damage, personal injury and/or death.

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Product Specifications

Model				**YN018GMFI16M2D**	**YN027GMFI16M3D**	**YN036GMFI16M4D**
Power supply			Ph-V-Hz	230V~ 60Hz, 1Ph	230V~ 60Hz, 1Ph	230V~ 60Hz, 1Ph
MINIMUM CIRCUIT AMPACITY			A	11.0	15.0	23.0
MAX.FUSE			A	15.0	20.0	35.0
Starting current			A	-----	-----	--
Compressor	Model		DA130S1C-20FZ	DA150S1C-20FZ	TNB306FPGMC-L	TNB306FPGMC-L
	Type		Twin-rotary	Twin-rotary	Twin-rotary	Twin-rotary
	Brand		GMCC	GMCC	MITSUBISHI	MITSUBISHI
	Capacity		13170	15286	33711	33711
	Input		990	1150	3010	3010
	Rated current(RLA)		4.97	9.7	13.5	13.5
	Locked rotor Amp(LRA)		-----	----	-----	-----
	Thermal protector		1NT01L-4639 or KSD301	----	-----	-----
	Thermal protector position		-----	----	-----	-----
	Capacitor		30	-----		- -
	Refrigerant oil/oil charge		ESTER OIL VG74/500	ESTER OIL VG74/500	FV50S/1070	FV50S/1070
Outdoor fan motor	Model		YDK70-6FB	YDK70-6FB	YDK180-8GB	WZDK180-38G
	Brand		Welling	Welling	Welling	Shibaura
	Input		166/105	166/105	299/223	180(Output)
	RLA	0.74	0.74	1.3	0.74	1.3
	LRA	0.95	0.95	2	0.9	/
	Winding Resistance	56/76	56/76	24.5/19	88.5/138	/
	Capacitor		3	3	10	- -
	Speed		800/600	800/600	750 / -- / 615	850
Outdoor air flow			m3/h	2500	2500	3800
Outdoor noise level			dB(A)	53	55	61
Outdoor unit	Dimension(W*D*H)		845x320x700	845x320x700	990x345x965	990x345x965
	Dimension(W*D*H)		33.27x12.6x27.56	33.27x12.6x27.56	38.98x13.58x37.99	38.98x13.58x37.99
	Packing (W*D*H)		965x395x755	965x395x755	1120x435x1100	1120x435x1100
	Packing (W*D*H)		37.99x15.55x29.72	37.99x15.55x29.72	44.09x17.13x43.31	44.09x17.13x43.31
	Net/Gross weight		53.5/57	57/60.5	86 / 90	77 / 81
	Net/Gross weight		117.95/125.66	125.66/133.38	189.6/198.42	169.76/178.57
Refrigerant type			oz	R410A/51	R410A/71	R410A/95
Design pressure			PSIG	550/340	550/340	550/340
Refrigerant piping	Liquid side/ Gas side		2 X Φ6.35/Φ9.52(1/4"/3/8")	3 X Φ6.35/Φ9.52(1/4"/3/8")	4 X Φ6.35/Φ9.52(1/4"/3/8")	4 x Φ6.35/Φ9.52(1/4"/3/8")
	Max. length for all rooms		30	45	60	60
	Max. length for all rooms		98	148	197	197
	Max. length for one indoor unit		20	25	30	30
	Max. length for one indoor unit		66	82	98	98
	Max. height difference between indoor and outdoor unit	10	10	10	10	10
		33	33	33	33	33
		15	15	15	15	15
		49	49	49	49	49
	Max. height difference between indoor units		10	10	10	10
	Max. height difference between indoor units		33	33	33	33
Connection wiring				NO	NO	NO
Plug type				NO	NO	NO
Thermostat type				Remote control	Remote control	Remote control
Operation temperature	cooling		0～50	0～50	0～50	-15～50
	cooling		32～122	32～122	32～122	5～122
	heating		-15～24	-15～24	-15～24	-15～24
	heating		5～75.2	5～75.2	5～75.2	5～75.2

1. Indoor Unit Combination

Multi DC Outdoor Unit	Nominal capacity	Suggested Combination	Limit
DUAL ZONE (18K Nominal)	5.2kW	9	None
		12	
		9+9	
		9+12	
		12+12(*)	

Multi DC Outdoor Unit	Nominal capacity	Suggested Combination	Limit
TRIPLE ZONE (27K Nominal)	7.5kW	9	There should be only one Floor Ceiling or Duct unit.
		12	
		18	
		9+9	
		9+12	
		9+18	
		12+12	
		12+18	
		9+9+9	
		9+9+12	
		9+12+12	
		12+12+12(*)	

Multi DC Outdoor Unit	Nominal capacity	Suggested Combination	Limit
QUAD ZONE (36K Nominal)	10.5kW	9	None
		12	
		18	
		9+9	
		9+12	
		9+18	
		12+12	
		12+18	
		18+18	
		9+9+9	
		9+9+12	
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		9+9+12+12	
		9+9+12+18	
		9+12+12+12	
		9+12+12+18	
		12+12+12+12	

(*): NOTICE: This combination results in slightly reduced performance. We recommend going one size up for the outdoor section for obtaining fully rated performance.

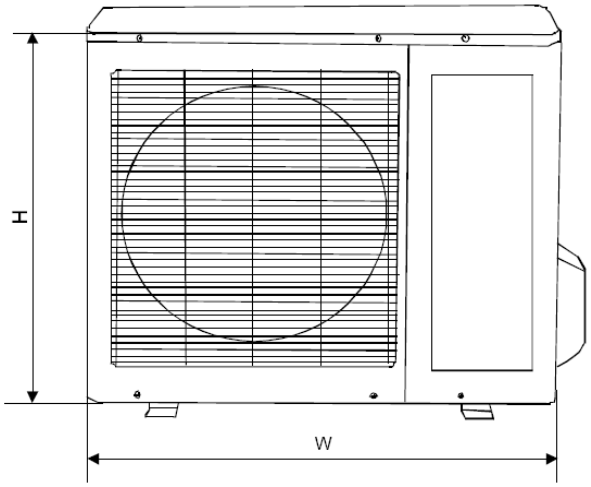
2. Suggested Indoor Unit Model Numbers

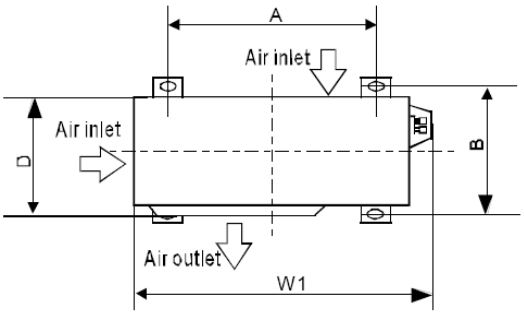
		SUGGESTED INDOOR UNIT
YN018GMFI 16M2D	9K	WB009GMFI16MLD
	12K	WB012GMFI16MLD
		CB012GLFI16MLD
		RB012GMFI16MLD
		UB012GMFI16MLD
		FB012CMFI16MLD

		SUGGESTED INDOOR UNIT
YN027GMFI 16M3D	9K	WB009GMFI16MLD
	12K	WB012GMFI16MLD
		CB012GLFI16MLD
		RB012GMFI16MLD
		UB012GMFI16MLD
		FB012CMFI16MLD
	18K	WB018GMFI16MLD
		CB018GLFI16MLD
		RB018GMFI16MLD
		UB018GMFI16MLD

		SUGGESTED INDOOR UNIT
YN036GMFI 16M4D	9K	WB009GMFI16MLD
	12K	WB012GMFI16MLD
		CB012GLFI16MLD
		RB012GMFI16MLD
		UB012GMFI16MLD
		FB012CMFI16MLD
	18K	WB018GMFI16MLD
		CB018GLFI16MLD
		RB018GMFI16MLD
		UB018GMFI16MLD

3. Dimensions Of the Outdoor Units:

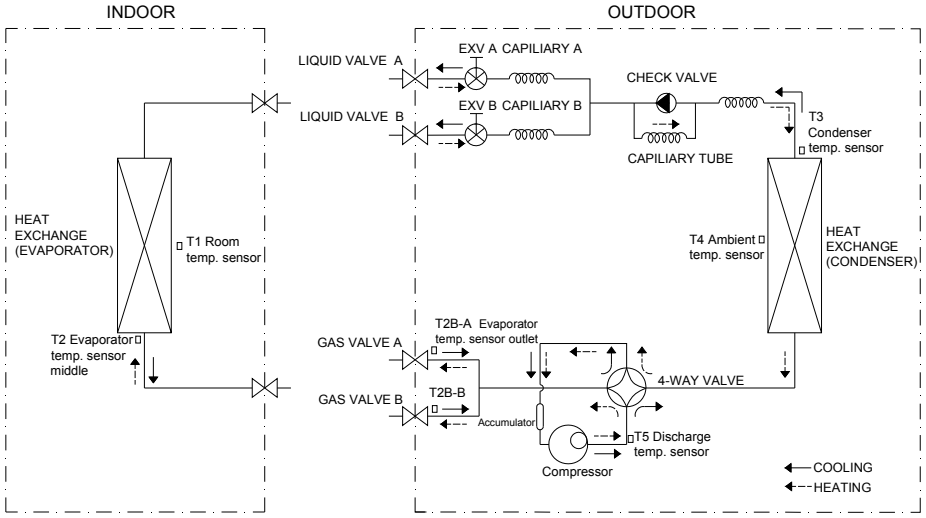




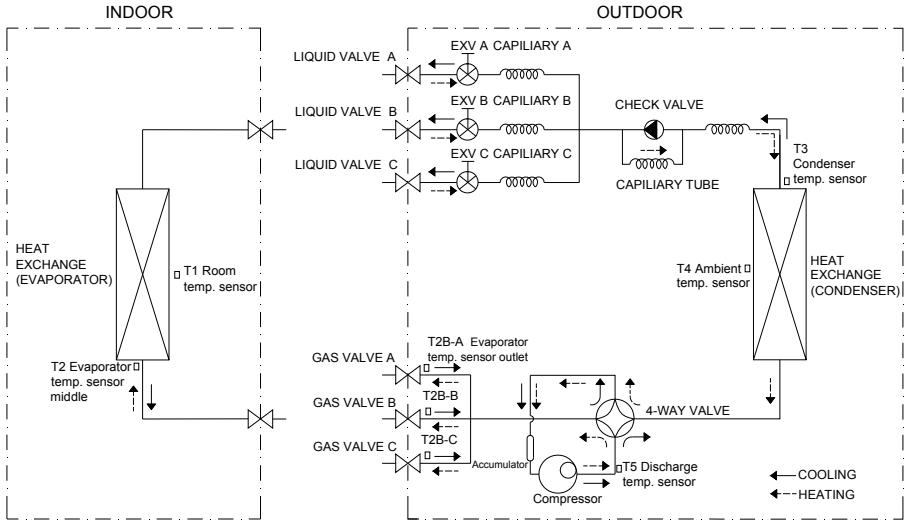
Model	Dimension mm (In.)					
	W	D	H	W1	A	B
YN018GMFI16M2D	845 (33.3)	320 (12.6)	700 (27.6)	908 (35.7)	560 (22)	335 (13.2)
YN027GMFI16M3D						
YN036GMFI16M4D	990 (39)	345 (13.6)	965 (38)	1075 (42.3)	624 (24.6)	366 (14.4)

4. Refrigerant Cycle Diagram

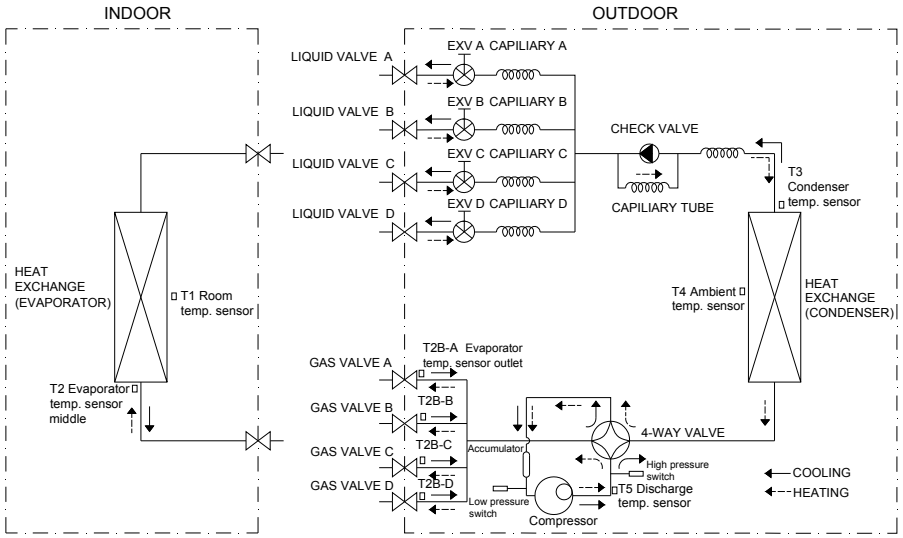
5.1Refrigeration circuit drawing of inverter dual zone (2 zones)



5.2 Refrigeration circuit drawing of inverter triple zone (3 zones)



5.3 Refrigeration circuit drawing of inverter quad zone (4 zones)



5. Installation Details

6.1 Wrench torque sheet for installation

Outside diameter		Torque	Additional tightening torque
Φ6.35mm	1/4in	1500N.cm (11 Lbf.Ft).	1600N.cm (12 Lbf.Ft.)
Φ9.52mm	3/8in	2500N.cm (18 Lbf.Ft.)	2600N.cm (19 Lbf.Ft)
Φ12.7mm	1/2in	3500N.cm (26 Lbf.Ft)	3600N.cm (27 Lbf.Ft)

6.2 Connecting the cables

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

Unit	AWG
Dual-zone (18K outdoor unit)	14
Tri-zone (27K/30K outdoor unit).	14
Quad-zone (36K outdoor unit)	12

For indoor unit and outdoor unit connection wire, 16AWG is used for all connections.

6.3 Pipe length and the elevation

Maximum piping length and height difference

		Dual	Trio	Quad
Max. length for all zones		30 (100ft)	45 (150ft)	60 (200ft)
Max. length for each zone		20 (65ft)	25 (80ft)	30 (100ft)
Max. height difference between IU and OU	OU higher than IU	10 (33ft)	10 (33ft)	10 (33ft)
	OU lower than IU	15 (50ft)	15 (50ft)	15 (50ft)
Max. height difference between Indoor Units		10 (33ft)	10 (33ft)	10 (33ft)

Additional refrigerant charge

		Dual	Triple	Quad
Pre-charged for total pipe length		15 (50ft)	22.5 (75ft)	30 (100ft)
Additional refrigerant charge	g	15g per Additional Meter	15g per Additional Meter	15 x (length for all rooms - 30)
	oz	0.16 Ozs per Additional Foot	0.16 Ozs per Additional Foot)	0.16 Ozs per Additional Foot

Caution:

- Refrigerant pipe diameter differs according to indoor unit connected. When extending the pipes, refer to the tables below.
- When refrigerant pipe diameter is different from that of outdoor unit union (for 12K and 18K indoor units), additional brass adapter union (supplied) needs to be used on outdoor unit union to change the size.

Indoor unit			Extension pipe diameter (mm/inch)	
Model	Pipe diameter (mm/inch)			
9K	Liquid	6.35 (1/4)	Liquid	6.35 (1/4)
	Gas	9.52 (3/8)	Gas	9.52 (3/8)
12K 18K	Liquid	6.35 (1/4)	Liquid	6.35 (1/4)
	Gas	12.7 (1/2)	Gas	12.7 (1/2)
Outdoor unit union diameter (mm/inch)				
Indoor unit A/B/C/D			Liquid	6.35 (1/4)
			Gas	9.52 (3/8)

6.4 Installation for the first time

Air and moisture in the refrigerant system will create undesirable effects as listed below:

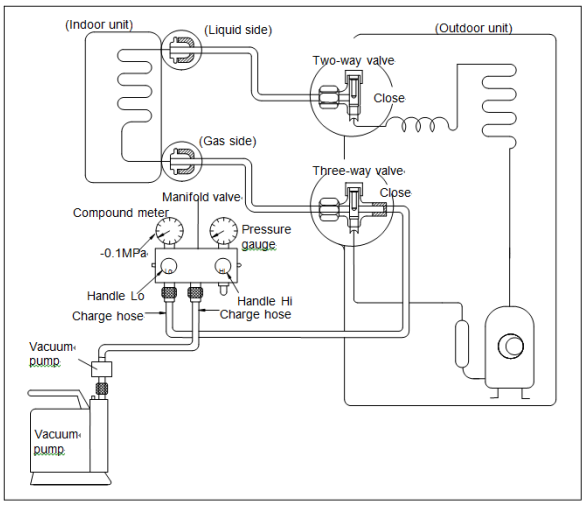
- Pressure in the system rises.
- Operating current rises.
- Cooling or heating efficiency drops.
- Moisture in the refrigerant circuit may freeze and block capillary tubing.
- Moisture may lead to corrosion of parts in the refrigerant system (compressor failure!).

Therefore, the indoor units and the pipes between indoor and outdoor units must be leak tested and fully evacuated to remove the air and moisture from the system.

Leak Check (Soap and Water Method):

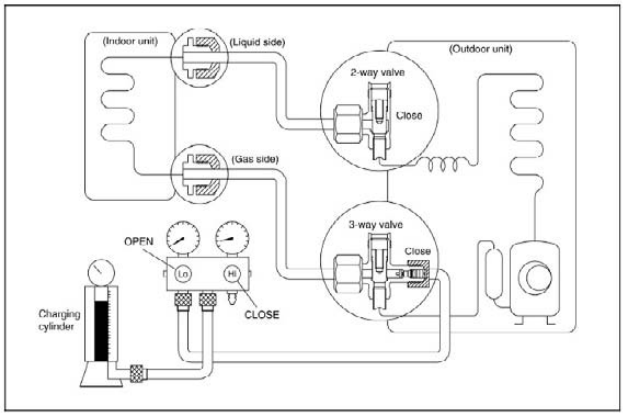
Apply soap water or a liquid natural detergent on the indoor unit connections and outdoor unit connections by a soft brush to check for leakage of the connecting points of the piping. If bubbles exist, the pipes have leakage.

1. Evacuation using a vacuum pump



1. Completely tighten the flare nuts of the indoor and outdoor units, confirm that both the 2-way and 3-way valves are set to the fully closed position.
2. Connect the low side hose of the charging manifold set to the 3-way valve's gas service port.
3. Connect the Middle hose of the charging manifold set to the vacuum pump.
4. Fully open the Low side valve of the charging manifold set.
5. Operate the vacuum pump to evacuate.
6. Make evacuation for 30 minutes and check whether the pressure gauge indicates as low as -0.1Mpa (14.5Psi). If the meter does not indicate -0.1Mpa (14.5Psi) after pumping 30 minutes, keep the pump on for 20 minutes more. If the pressure reading can not be obtained as low as -0.1Mpa (14.5Psi) after pumping for 50 minutes, please check if there is any leakage points. After vacuuming, fully close the low side valve of the charging manifold set and than turn off the vacuum pump. Confirm that the pressure gauge needle does not move (within approximately 15 minutes after turning off the vacuum pump).
7. Turn on the core of the 3-way valve (using a properly sized Allen Wrench) about 45° counterclockwise for 6 or 7seconds and observe the sound of the refrigerant coming out. Than re-tighten the valve core. Make sure the pressure indicated on the low side pressure gauge is a little higher than the atmospheric pressure. Then remove the charging hose from the service port of the 3 way valve.
8. Fully open the valve cores of both 2 way valve and 3 way valves and then securely tighten the brass valve cover caps.

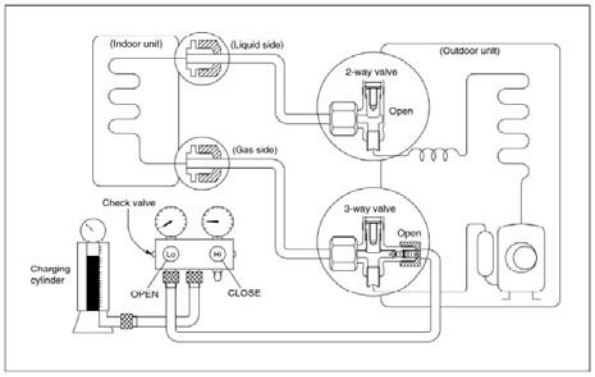
2. Air purging by refrigerant



Procedure:

1). Confirm that both the 2-way and 3-way service valves are set to the closed position.
2). Connect the charging set and a charging cylinder to the service port of the 3-way valve.
3). Air purging:
Open the valves on the charging cylinder and the charging manifold set. Purge the air by loosening the flare nut on the 2-way valve approximately 45’ for 3 seconds then closing it for 1 minute; repeat this for 3 additional times.
After purging the air, use a torque wrench to tighten the flare nut on the 2-way valve.
4). Check for any gas leakage:
Check all flare connections for gas leakage.
5). Discharge the refrigerant:
Close the valve on the charging cylinder and discharge the refrigerant by loosening the flare nut on the 2-way valve approximately 45’ until the gauge indicates approximately 0.3Mpa (45Psi) to 0.5 Mpa (70Psi).. Tighten the flare nut fully.
6). Disconnect the charge set and the charging cylinder and open both cores of the the 2-way and 3-way valves to fully open position.
Be sure to use a proper size hexagonal (Allen) wrench to operate the valve stems.
7). Mount the valve stem caps and the service port cap.
Be sure to use a torque wrench to tighten the service port cap to a torque 18N·m.
Be sure to check the for gas leakages.

3. Adding refrigerant if the pipe length exceeds length for factory pre-charge pipe length value.



Procedure:

1). Connect the charging hose to the charging cylinder, open both the 2-way valve and the 3-way valve.

Connect the charging hose which you disconnected from the vacuum pump to the valve at the bottom of the cylinder. If the refrigerant is R410A, make sure the cylinder is upside down to ensure liquid charge.

2). Purge the air from the charging hose.

Open the valve at the bottom of the cylinder and press the check valve on the charge set to purge the air (be careful of the liquid refrigerant).

3) Put the charging cylinder onto an electronic scale and record the weight.

4) Operate the air conditioner at the cooling mode.

5) Open the valves (Low side) on the charging set and charge the system with liquid refrigerant.

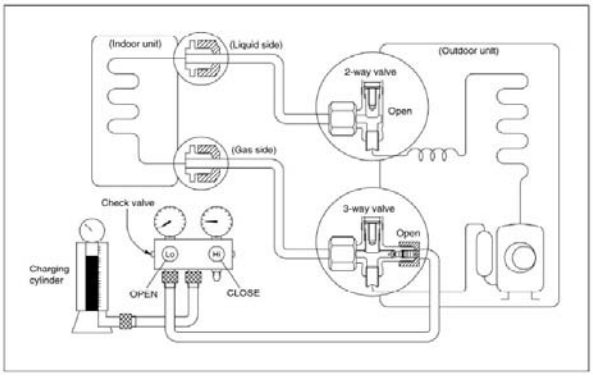
6).When the electronic scale displays the proper weight (refer to the table), disconnect the charge hose from the 3-way valve's service port immediately and turn off the air conditioner

7). Mount the valve stem caps and the service port cap.

Be sure to use a torque wrench to tighten the service port cap to a torque 18N·m.

Be sure to check the gas leakages.

6.5 Adding the refrigerant after running the system for many years (Recommended only if the refrigerant being added does not exceed 10% of the total refrigerant amount. Otherwise, remove the remaining refrigerant entirely and recharge fully).



Procedure

1). Connect the charging hose to the 3-way service port, open the 2-way valve and the 3-way valve.

Connect the charge hose to the valve at the bottom of the cylinder. If the refrigerant is R410A, make the cylinder is upside down to ensure liquid charge.

2). Purge the air from the charge hose.

Open the valve at the bottom of the cylinder and press the check valve on the charge set to purge the air (be careful of the liquid refrigerant).

3) Put the charging cylinder onto an electronic scale and record the weight.

4) Operate the system at the cooling mode.

5) Open the valve (Low side) on the charging set and charge the system with liquid refrigerant.

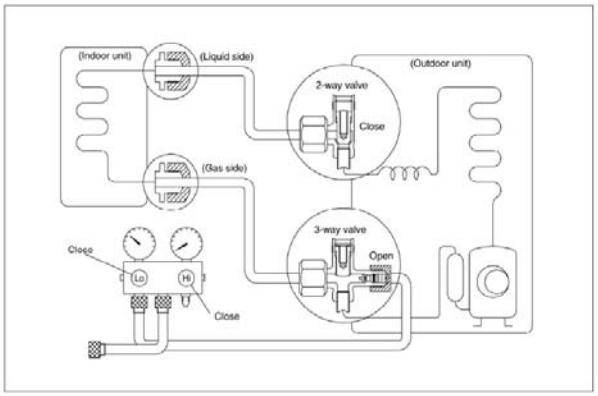
6).When the electronic scale displays the proper weight (refer to the gauge and the pressure of the low side), disconnect the charging hose from the 3-way valve's service port immediately and turn off the air conditioner before disconnecting the hose.

7). Mount the valve stem caps and the service port cap. Use torque wrench to tighten the service port cap to a torque of 18N.m.

Be sure to check for any gas leakages.

6.6 Re-installation while the indoor unit needs to be repaired

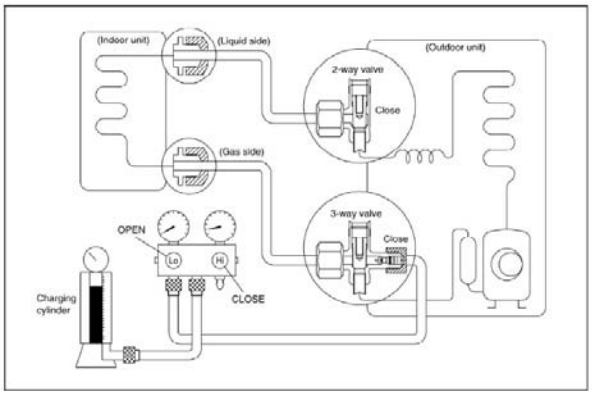
1. Collecting the refrigerant into the outdoor unit.



Procedure

1). Confirm that both the 2-way and 3-way valves are set to the opened position:
Remove the valve stem caps and confirm that the valve stems are in the opened position.
Be sure to use a properly sized hexagonal (Allen) wrench to operate the valve stems.
2). Connect the low side hose of the charging manifold to the 3-way valve's gas service port.
3). Air purging the charging hose.
Open the handle Lo side valve of the manifold slightly to purge air from the charging hose for 5 seconds and then close it quickly.
4). Set the 2-way valve core to fully closed position.
5). Operate the air conditioner at the cooling cycle and stop it when the gauge indicates 0.1Mpa (14.5Psi)..
6). Set the 3-way valve core to the fully closed position immediately
Do this quickly so that the gauge ends up indicating 0.3Mpa (43.5Psi) to 0.5 Mpa (72.5Psi).
Disconnect the charging set and tighten the 2-way and 3-way valve's stem caps.
Use a torque wrench to tighten the 3-way valve's service port cap to a torque of 18N.m.
Be sure to check for gas leakage.

2. Air purging by the refrigerant

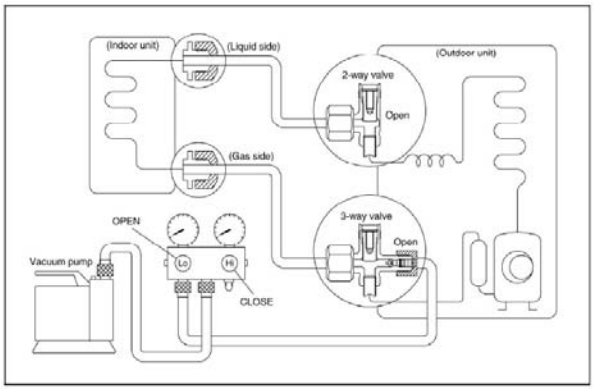


Procedure:

1). Confirm that both the 2-way and 3-way valve cores are set to fully closed position.
2). Connect the charging set and a charging cylinder to the service port of the 3-way valve.
Leave the valve on the charging cylinder closed.
3). Air purging:
Open the valve on the charging cylinder and valve of the charging set. Purge the air by loosening the flare nut on the 2-way valve approximately 45' for 3 seconds then closing it for 1 minute; repeat this for 3 more times.
After purging the air, use a torque wrench to tighten the flare nut on the 2-way valve.
4). Check for any gas leakage:
Check the flare connections for gas leakage.
5). Discharge the refrigerant:
Close the valve on the charging cylinder and discharge the refrigerant by loosening the flare nut on the 2-way valve approximately 45' until the gauge indicates 0.3Mpa (45Psi) to 0.5 Mpa (70Psi)..
6). Disconnect the charging set and the charging cylinder and set the 2-way and 3-way valve cores to the fully open position
Be sure to use a proper size hexagonal (Allen) wrench to operate the valve stems.
7). Mount the valve stem caps and the service port cap
Be sure to use a torque wrench to tighten the service port cap to a torque 18N.m.
Be sure to check the gas leakage.

6.7 Re-installation while the outdoor unit needs to be repaired

1. Evacuating the entire system



Procedure:

1). Confirm that both the 2-way and 3-way valves are set to fully opened position.

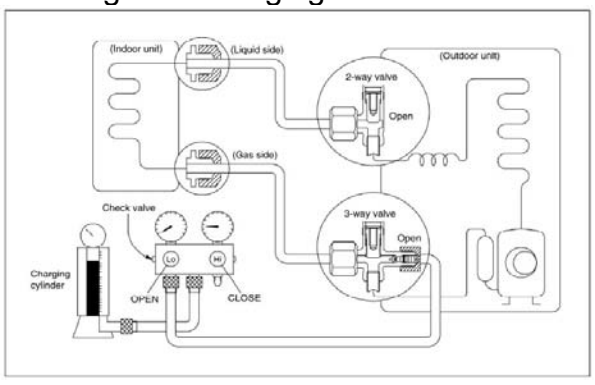
2). Connect the vacuum pump to 3-way valve's service port.

3). Evacuate for approximately one hour. Confirm that the low side pressure gauge indicates -0.1Mpa (14.5 Psi).

4). Close the valve (Low side) on the charging set, turn off the vacuum pump and confirm that the gauge needle does not move (within approximately 15 minutes after turning off the vacuum pump).

5). Disconnect the charging hose from the vacuum pump.

2. Refrigerant charging



Procedure:

1). Connect the charging hose to the charging cylinder, open the 2-way valve and the 3-way valves.
Connect the charging hose which you disconnected from the vacuum pump to the valve at the bottom of the cylinder. If the refrigerant is R410A, set the cylinder upside down to ensure liquid charge.

2). Purge the air from the charging hose.
Open the valve at the bottom of the cylinder and press the check valve on the charge set to purge the air (be careful of the liquid refrigerant).

3) Put the charging cylinder onto an electronic scale and record the weight.

4). Open the valve (Low side) on the charge set and charge the system with liquid refrigerant
If the system cannot be charged fully with the specified amount of refrigerant, or can only be charged with little amount at a time, (approx. 150g (5 Ozs) each time), while operating the air conditioner in the cooling cycle, wait approx. 1 minute and then repeat the procedure.

5).When the electronic scale displays the proper weight, disconnect the charge hose from the 3-way valve's service port immediately
If the system has been charged with liquid refrigerant while operating the air conditioner, turn off the air conditioner before disconnecting the hose.

6). Mount the valve stem caps and the service port cap. Use torque wrench to tighten the
service port cap to a torque of 18N.m. Be sure
to check for gas leakages.

6. Electronic Function

7.1 Abbreviation

T1: Indoor ambient temperature

T2: Coil temperature of indoor heat exchanger's mid point.

T2B: Coil temperature of indoor heat exchanger's outlet.

T3: Pipe temperature of outdoor heat exchanger

T4: Outdoor ambient temperature

Tp: Compressor discharge temperature

7.2 Electric control working environment.

7.2.1 Input voltage: 230V.

7.2.2 Input power frequency: 60Hz.

7.2.3 Indoor fan normal working amp. is less than 1A.

7.2.4 Outdoor fan. Normal working amp. is less than 1.5A.

7.2.5 Four-way valve normal working amp. is less than 1A.

7.3 Main Protection

7.3.1 Three Minute Time Delay at restart of the compressor.

---- 1min delay for the 1st time start-up and 3 minutes delay for subsequent starts.

7.3.2 Temperature protection of compressor discharge.

When the compressor discharge temp. rises, the running frequency will be limited per the below rules:

----If 102℃<Tp<115℃, decrease the frequency to the lower level every 2 minutes till reaching F1.

---If Tp>115℃ for 10 seconds, the compressor will stop and restart when Tp<90℃.

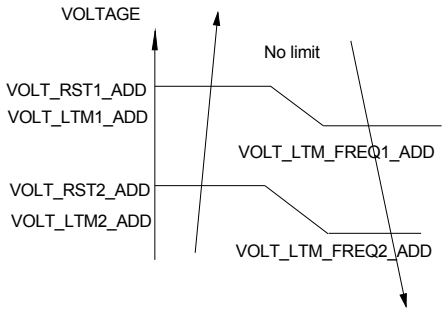
7.3.3 Fan Speed is out of control (DC fan motor).

---- When outdoor fan motor speed is lower than 300RPM or higher than 2400RPM for 60 seconds, the whole unit stops and LED displays failure.

7.3.4 Inverter module Protection.

----Inverter module protection has protection functions against current, voltage and temperature. If these protections are triggered, the corresponding code will display on indoor unit LED and A/C will stop. The unit will recover 3min after the protection conditions disappear.

7.3.5 Low voltage protection



Note: if the low voltage protection is triggered and not corrected within 3min, it will keep the protection even after restarting the machine.

7.3.6 Compressor current limit protection

If the compressor current exceeds the current limit value for 10 seconds, the compressor frequency will be limited as per the below table.

Cooling mode:

Current frequency(Hz)	Current limit value(A)	Frequency limit
COOL_F16	ICOOLLMT12	Decrease the frequency to COOL_F4 and run at COOL_F4 for 3 minutes. After that, the frequency will be adjusted according to the capacity demand and rise to the upper level every 3 minutes (When the frequency>COOL_F4 via capacity demand).
COOL_F15	ICOOLLMT11	
COOL_F14	ICOOLLMT10	
COOL_F13	ICOOLLMT9	
COOL_F12	ICOOLLMT8	
COOL_F11	ICOOLLMT7	
COOL_F10	ICOOLLMT6	
COOL_F9	ICOOLLMT5	
COOL_F8	ICOOLLMT4	
COOL_F7	ICOOLLMT3	
COOL_F6	ICOOLLMT2	
COOL_F5	ICOOLLMT1	
If the current frequency is lower than COOL_F4, the frequency will not be limited. After 10s of the compressor start, if the current>ICOOL, the AC will display the failure for 30 seconds and stop. The AC will restart 3 minutes later.		

Heating mode:

Current frequency(Hz)	Current limit value(A)	Frequency limit
HEAT_F16	IHEATLMT12	Decrease the frequency to HEAT_F4 and run at HEAT_F4 for 3 minutes. After that, the frequency will be adjusted according to the capacity demand and rise to the upper level every 3 minutes (When the frequency>Heat_F4 via capacity demand).
HEAT_F15	IHEATLMT11	
HEAT_F14	IHEATLMT10	
HEAT_F13	IHEATLMT9	
HEAT_F12	IHEATLMT8	
HEAT_F11	IHEATLMT7	
HEAT_F10	IHEATLMT6	
HEAT_F9	IHEATLMT5	
HEAT_F8	IHEATLMT4	
HEAT_F7	IHEATLMT3	
HEAT_F6	IHEATLMT2	
HEAT_F5	IHEATLMT1	
If the current frequency is lower than HEAT_F4, the frequency will not be limited. After 10s of the compressor start, if the current>IHEAT, the AC will display the failure for 30 seconds and stop. The AC will restart 3 minutes later.		

7.3.7 Indoor / outdoor unit communication protection

If the indoor units cannot receive the feedback signal from the outdoor unit for 2 minutes, the system will stop and display the failure.

7.3.8 High condenser coil temp. protection.

When T3>65℃ for 3 seconds, the compressor will stop while the indoor fan and outdoor fan will continue running.

When T3<52℃, the protection will reset and the compressor will restart after 3 minutes.

7.3.9 Outdoor unit anti-freezing protection

When T2B<0℃ for 250 seconds, the indoor unit capacity demand will be set as zero and reset to normal when T2B>10℃.

7.3.10 Oil return

Running rules:

1.If the compressor frequency stays lower than RET_OIL_FREQ1_ADD for RET_OIL_TIME1_ADD, the system will rise the running frequency to RET_OIL_FREQ2_ADD for RET_OIL_TIME2_ADD and then resume back to former frequency.

2.During the oil return process, the EXV will stay at 300p setting while the indoor units will keep the current running mode.

7.3.11 Compressor preheating functions

----Preheating permitting condition:

If T4 (outdoor ambient temperature)＜3℃ when newly powered on or if T4＜3℃ and compressor had stopped for over 3 hours, the compressor heating cable will be activated.

----Preheating mode:

A weak current flows through the windings of the compressor through its wiring terminal, then the compressor stays heated while it is off.

----Preheating release condition:

If T4＞5℃ or the capacity demand isn't zero, preheating function will stop.

7.3.12 Compressor crankcase heater

----Preheating permitting condition:

① When T4<3℃ within 5 seconds of being plugged in, the crankcase heater will be active.

② When T4<3℃ and the compressor is not running for 3 hours, the crankcase heater will be active.

----Preheating release condition:

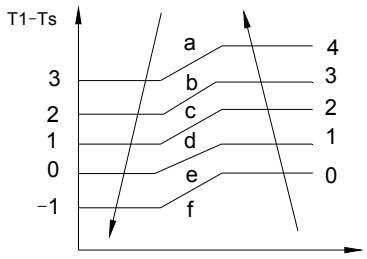
When T4≧5℃ or the indoor has any capacity demand, the crankcase heater will stop working.

7.4 Control and Functions

7.4.1 Capacity Request Calculation

Total capacity Request=Σ(Norm code × HP) /10× modify rate+ correction

Cooling mode:



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

Model	9K	12K	18K
HP	1.0	1.2	1.5

Note: The final result is an integer.

Plus all the indoor capacity requests together, then modify it by T4

When there is only one indoor unit

Cooling	Outdoor temperature (T4)		
	＞29℃	18℃ ~ 29℃	<17℃
Modify rate	100%	60%	40%

When there are more than one indoor units

Cooling	Outdoor temperature (T4)		
	＞25℃	17℃ ~ 25℃	<17℃
Modify rate	100%	80%	40%

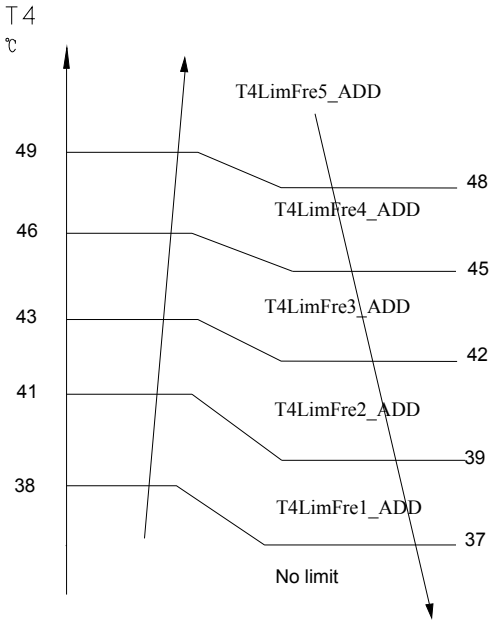
Note: The final result is integer.

In low ambient cooling mode, modify rate is fixed at 40%.

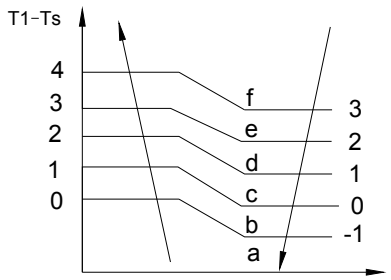
According to the final capacity request to confirm the operating frequency, as per the following table.

Frequency (Hz)	0	COOL_F1	COOL_F2	……	COOL_F15	COOL_F16
Amendatory capacity demand.	0	1	2	……	15	16

Meanwhile the maximum running frequency will be adjusted according to the outdoor ambient temp.



Heating mode



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

Model	9K	12K	18K
HP	1.0	1.2	1.5

Plus all the indoor capacity requests together, then modify it by T4

When there is only one indoor unit

Heating	Outdoor temperature (T4)			
	＜0℃	＜12℃	12℃ ~ 17℃	≥17℃
Modify rate	120%	80%	40%	20%

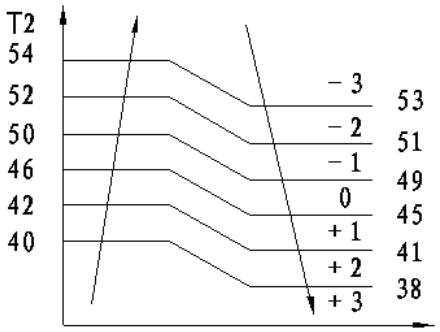
When there are more than one indoor units

Heating	Outdoor temperature (T4)			
	＜0℃	＜12℃	12℃ ~ 17℃	≥17℃
Modify rate	120%	100%	80%	60%

Note: The final result is integer.

Then modify it according to T2 average (correction):

Note: Average value of T2：Sum T2 value of all indoor units / indoor units number



According to the final capacity request to confirm the operating frequency, as per the following table.

Frequency (Hz)	0	HEAT _F1	HEAT _F2	…	HEAT _F15	HEAT _F16
Amendatory capacity demand.	0	1	2	…	15	16

Heating capacity improvement in low ambient heating

In heating mode, when T2<T2_ExitT4LowFre_ADD , and T4<-4 ℃, there's frequency elevation:

elevated frequency= Recent frequency * 110%

When T2> T2_ExitT4LowFre_ADD-2 and T4>-6, the highest frequency can't exceed F17

When T2> T2_ExitT4LowFre_ADD-4 and T4>-8, the highest frequency can't exceed F18

When T2> T2_ExitT4LowFre_ADD-6 and T4>-10, the highest frequency can't exceed F19

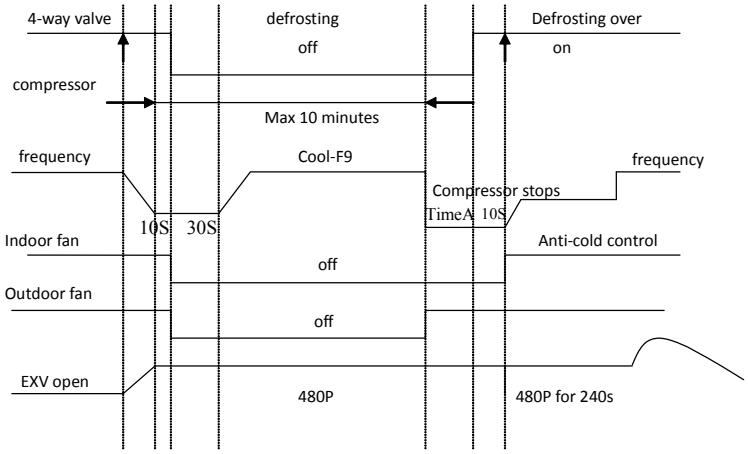
For all other conditions, the highest frequency is F20

7.4.2 Defrost control

Condition of defrosting:

T3≦TempEnterDefrost_ADD ℃ and lasts for 40 minutes.

Defrosting action：



Condition of ending defrost mode:

If any one of following items is satisfied, defrosting will stop and the system will switch to normal heating mode.

① T3 > TempQuitDefrost_ADD ℃;.

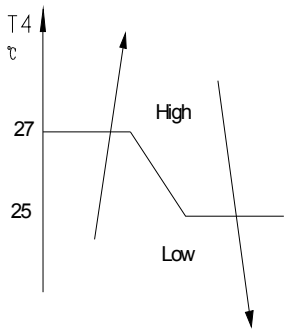
② The defrosting time reaches 10min.

③ Turning any other modes on or off.

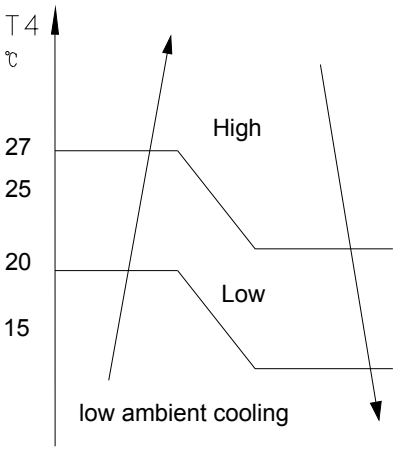
7.4.3 Outdoor fan control

7.4.3.1 Cooling mode

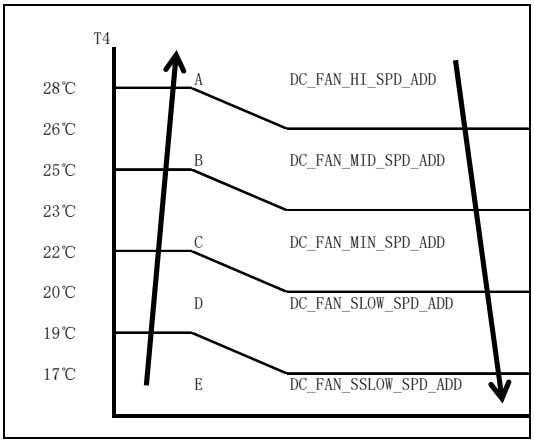
For YN027GMFI16M3D:



When low ambient cooling is valid:



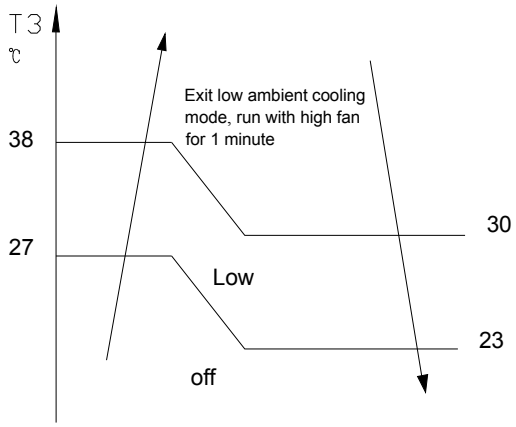
For YN018GMFI16M2D, YN030GMFI16M3D and YN036GMFI16M4D:



Outdoor fan speed control logic (low ambient cooling)

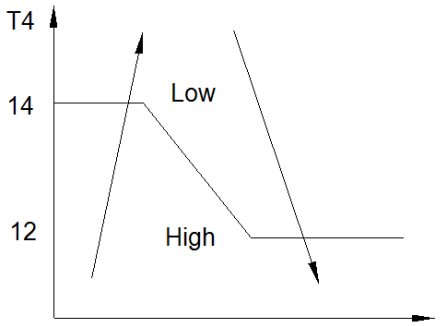
When T4 <15 ℃ and T3 < 30 ℃, the unit will enter into low ambient cooling mode. The outdoor fan will choose its speed according to T3.

When T3≥38 ℃ or when T4≥20 ℃, the outdoor fan will choose its speed according to T4 again.

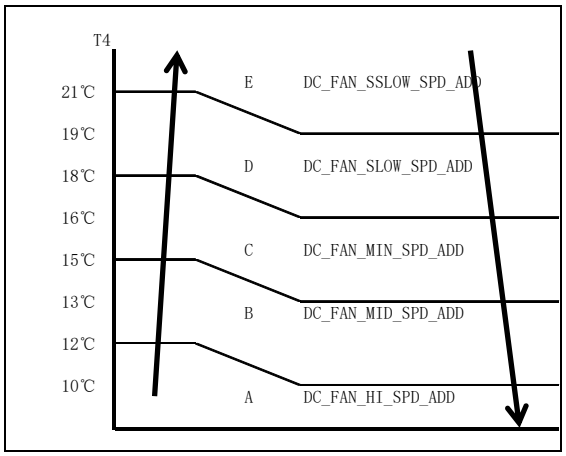


7.4.3.2 Heating mode

For YN027GMFI16M3D:



For YN018GMFI16M2D, YN030GMFI16M3D and YN036GMFI16M4D:



7.4.4 Electronic Expansion Valve (EXV) Control

1.EXV will be fully closed when the power is first turned on. Then EXV will stay at standby with 350P open and will open to target angle after compressor starts.
2.EXV will close with -160P when compressor stops. Then EXV will stay at standby with 350P open and will open to target angle after compressor starts.
3.The action priority of the EXVs is A-B-C-D.
4.Compressor and outdoor fan start operation only after EXV is initialized.

7.4.4.1 Cooling mode

The initial open angle of EXV is 250P, adjustment range is 100-350p. When the unit starts to work for 3 minutes, the outdoor will receive indoor units' (of capacity demand) T2B information and calculate an average of them. After comparing each indoor's T2B with the average, the outdoor gives the following modification commands:
If the T2B＞average, the relevant valve needs 16p more open;
If the T2B= average, the relevant valve's open range remains;
If the T2B＜average, the relevant valve needs 16p more close.
This modification will be carried out every 2 minutes.

7.4.4.2 Heating mode

The initial open angle of EXV is 250P, adjustment range is 100-350p.. When the unit starts to work for 3minutes, the outdoor will receive indoor units' (of capacity demand) T2 information and calculate the average of them. After comparing each indoor's T2 with the average, the outdoor gives the following modification commands:
If the T2＞average+2, the relevant valve needs 16p more close;
If average+2≥the T2≥ average-2, the relevant valve's open range remains;
If the T2＜average-2, the relevant valve needs 16p more open.
This modification will be carried out every 2 minutes.

7.4.5 Four-way valve control

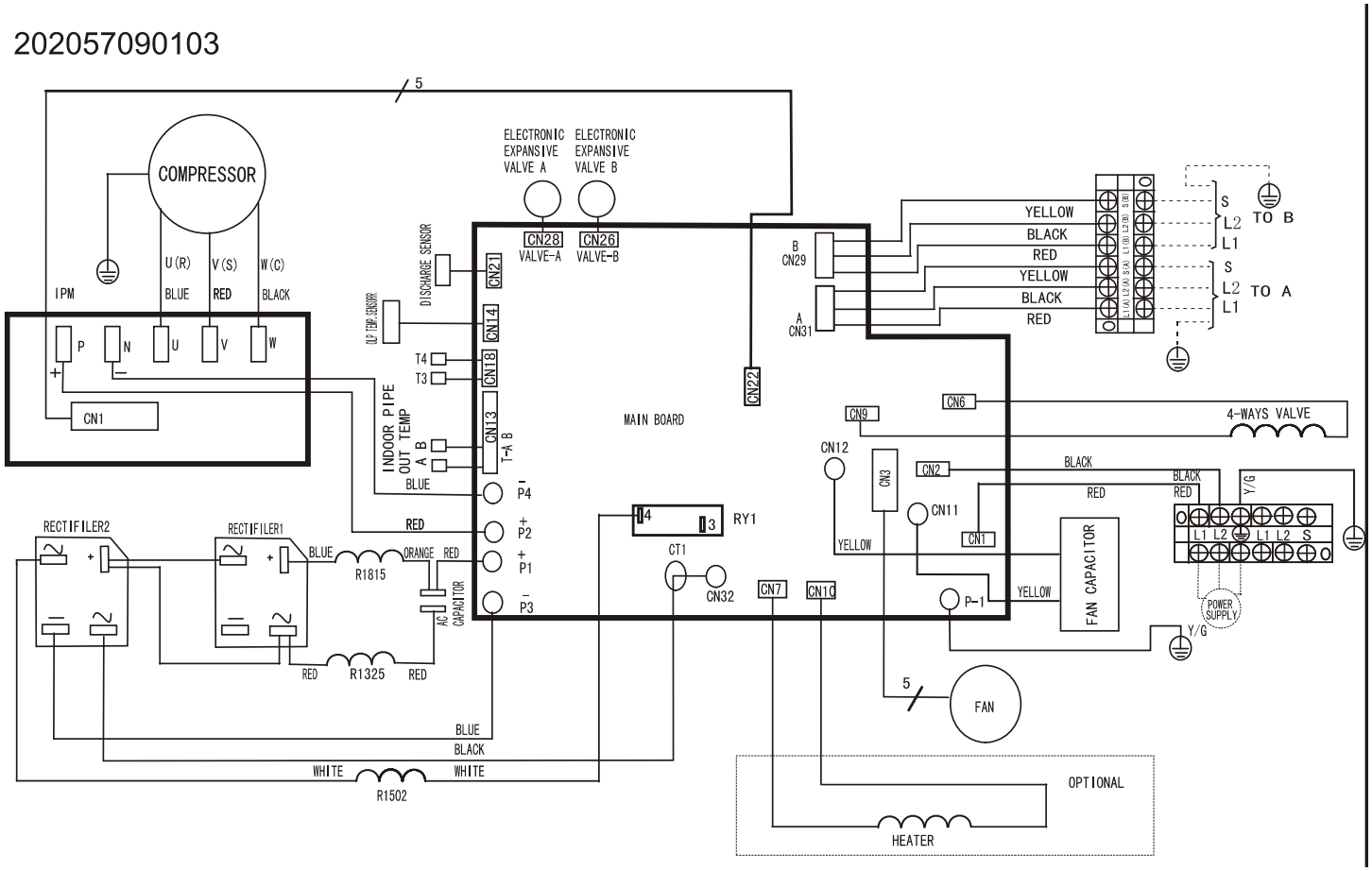
In heating mode, four-way valve is activated. In defrosting, four-way valve operates in according to defrosting action. In other modes, four-way valve is deactivated. When the heating mode to other modes, the four-way valve goes off after compressor is off for 2 minutes. Failure or protection (not including discharge temperature protection, high and low pressure protection), four-way valve immediately turns off.

7. Wiring Diagrams

Wiring diagram of DUAL Circuit Outdoor Unit

YN018GMFI16M2D

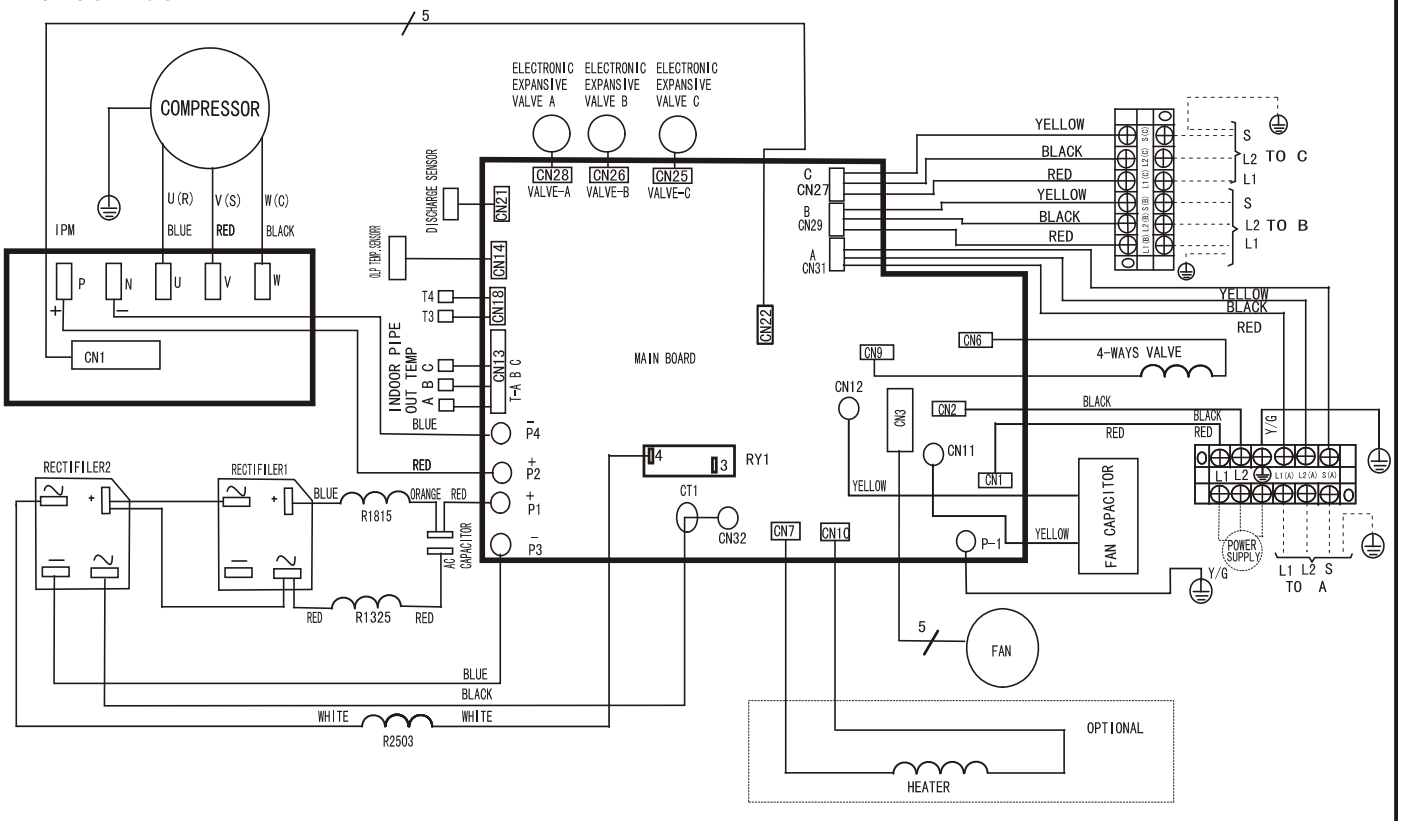
202057090103



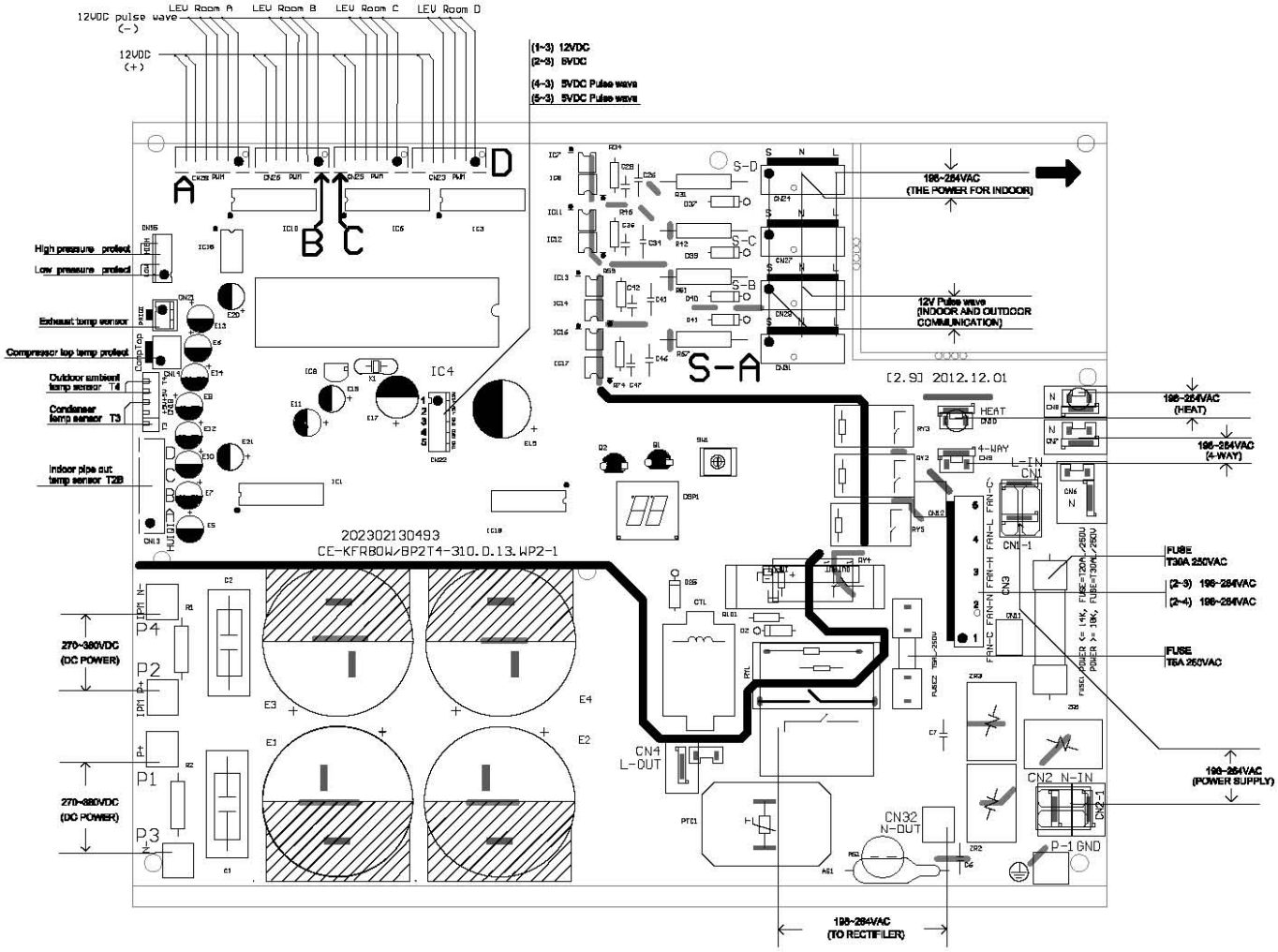
8.2 Wiring diagram of TRIPLE Circuit Outdoor Unit

YN027GMFI16M3D

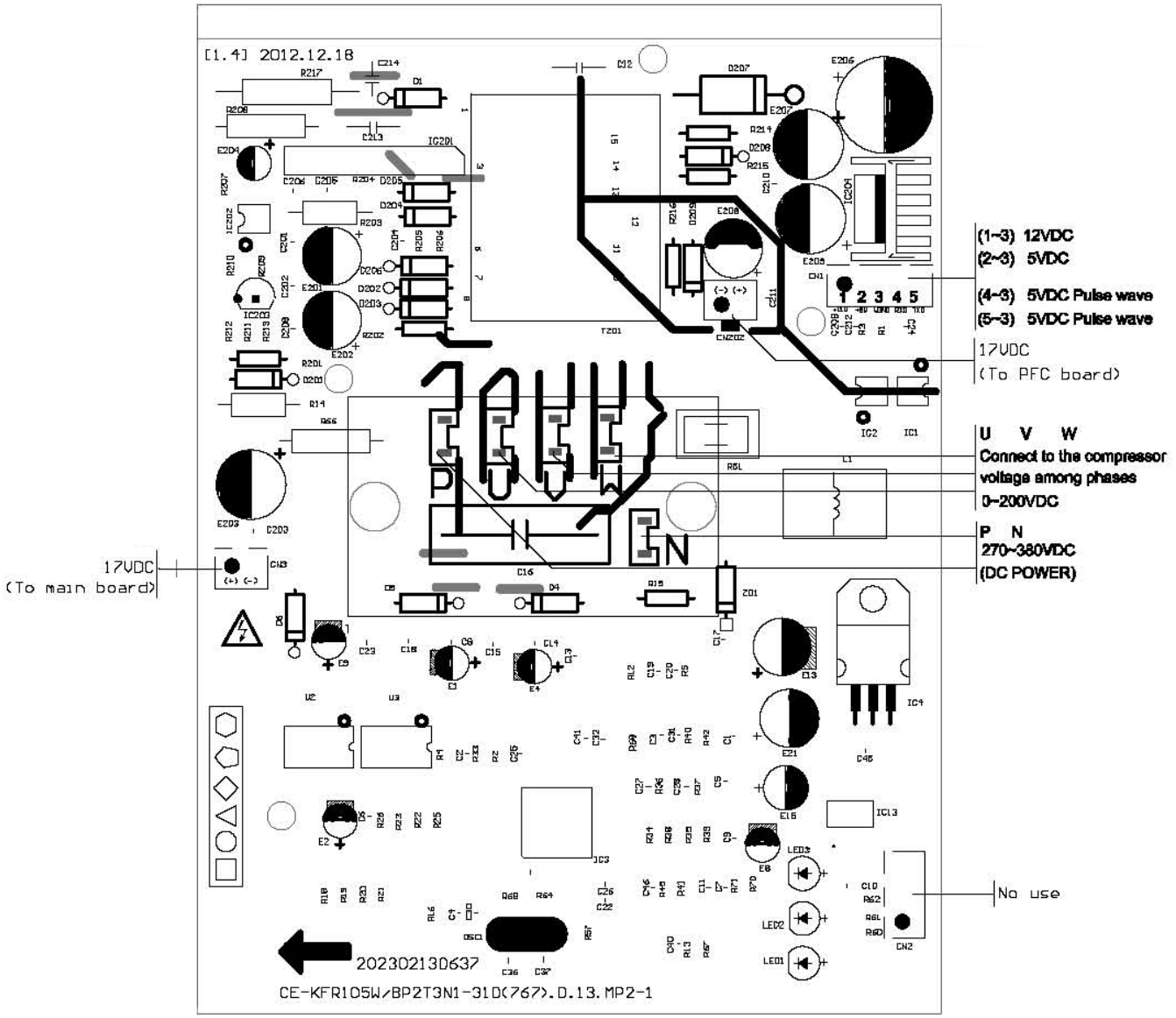
202057190114



PCB board of YN018GMFI16M2D and YN027GMFI16M3D



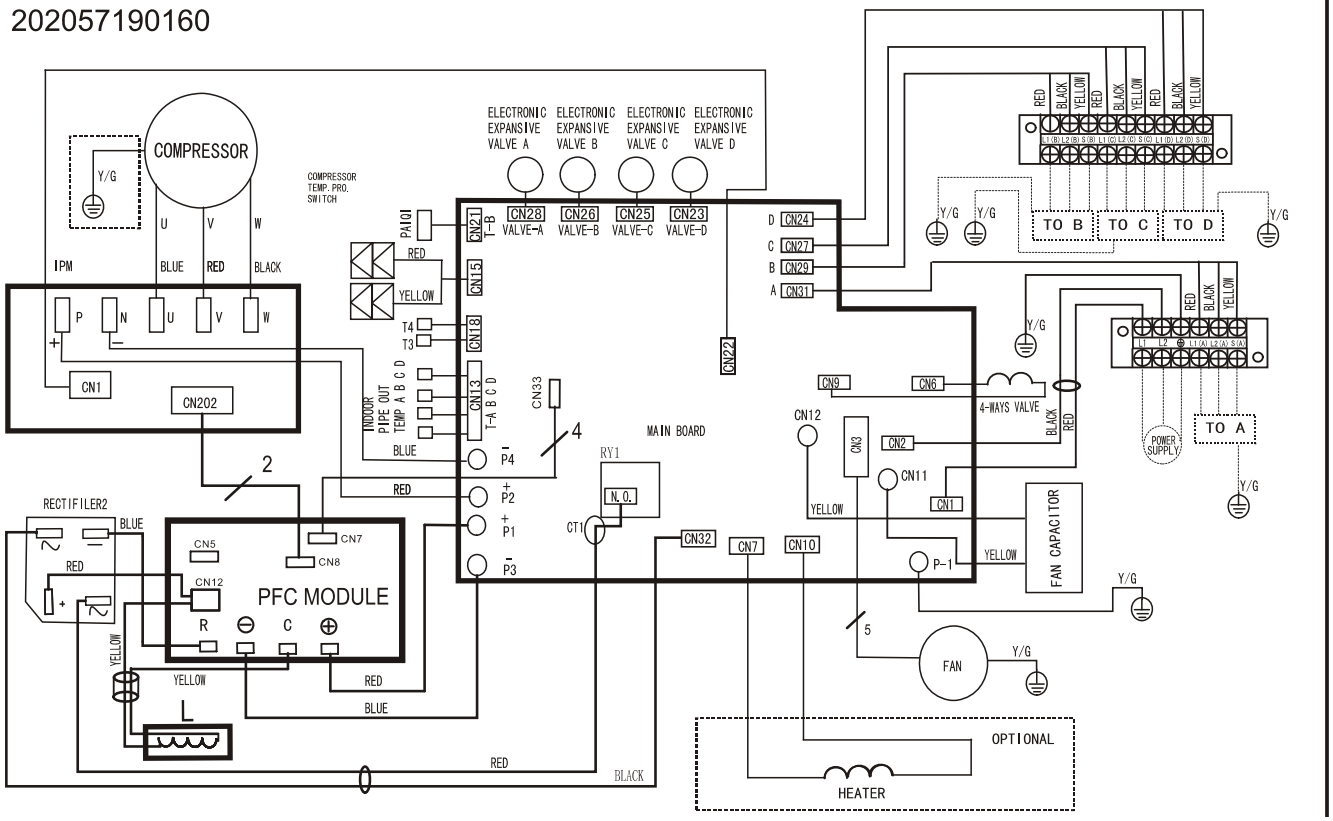
IPM board of YN018GMFI16M2D and YN027GMFI16M3D



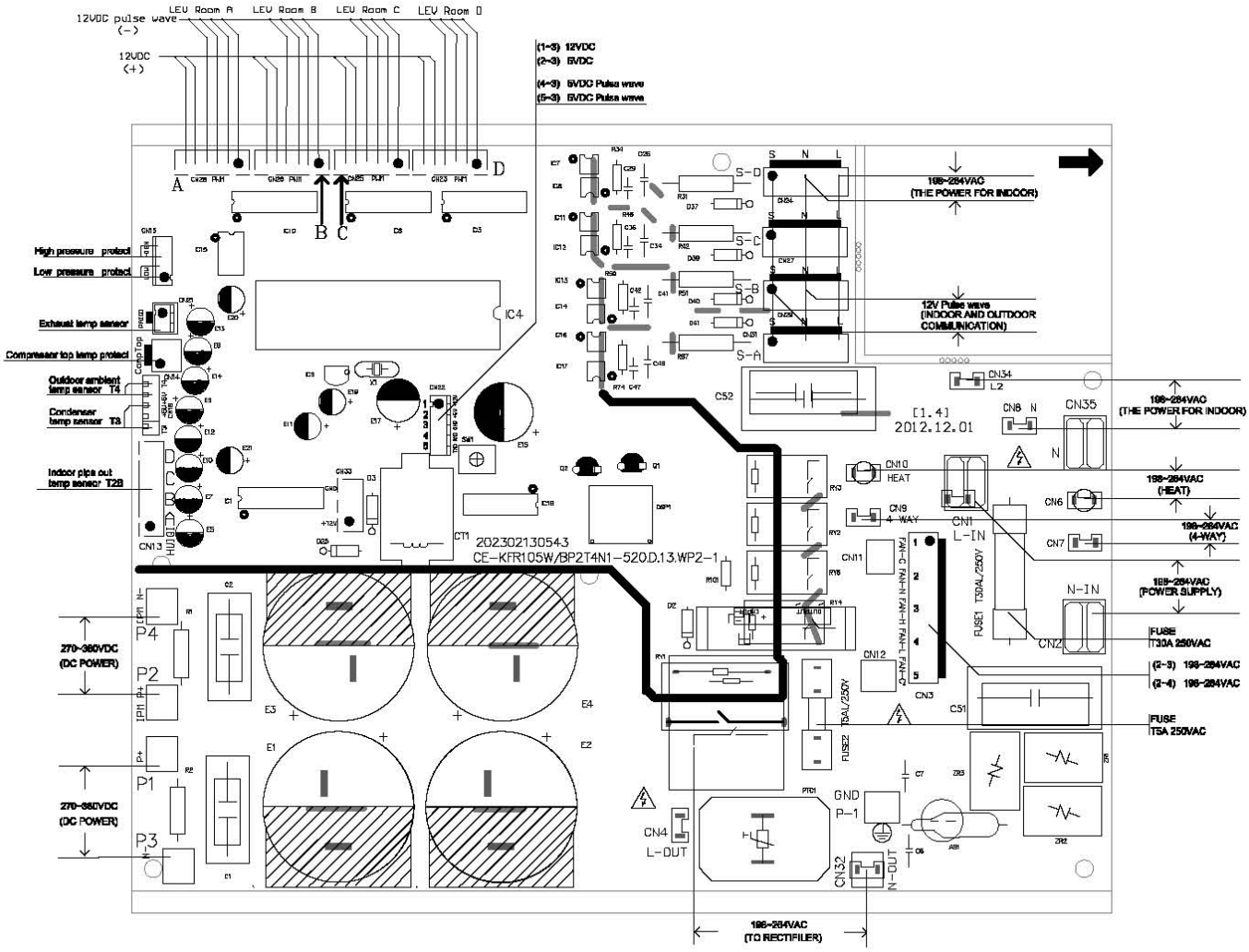
8.3 Wiring diagram of QUAD (4) Circuit Outdoor Units

YN036GMFI16M4D

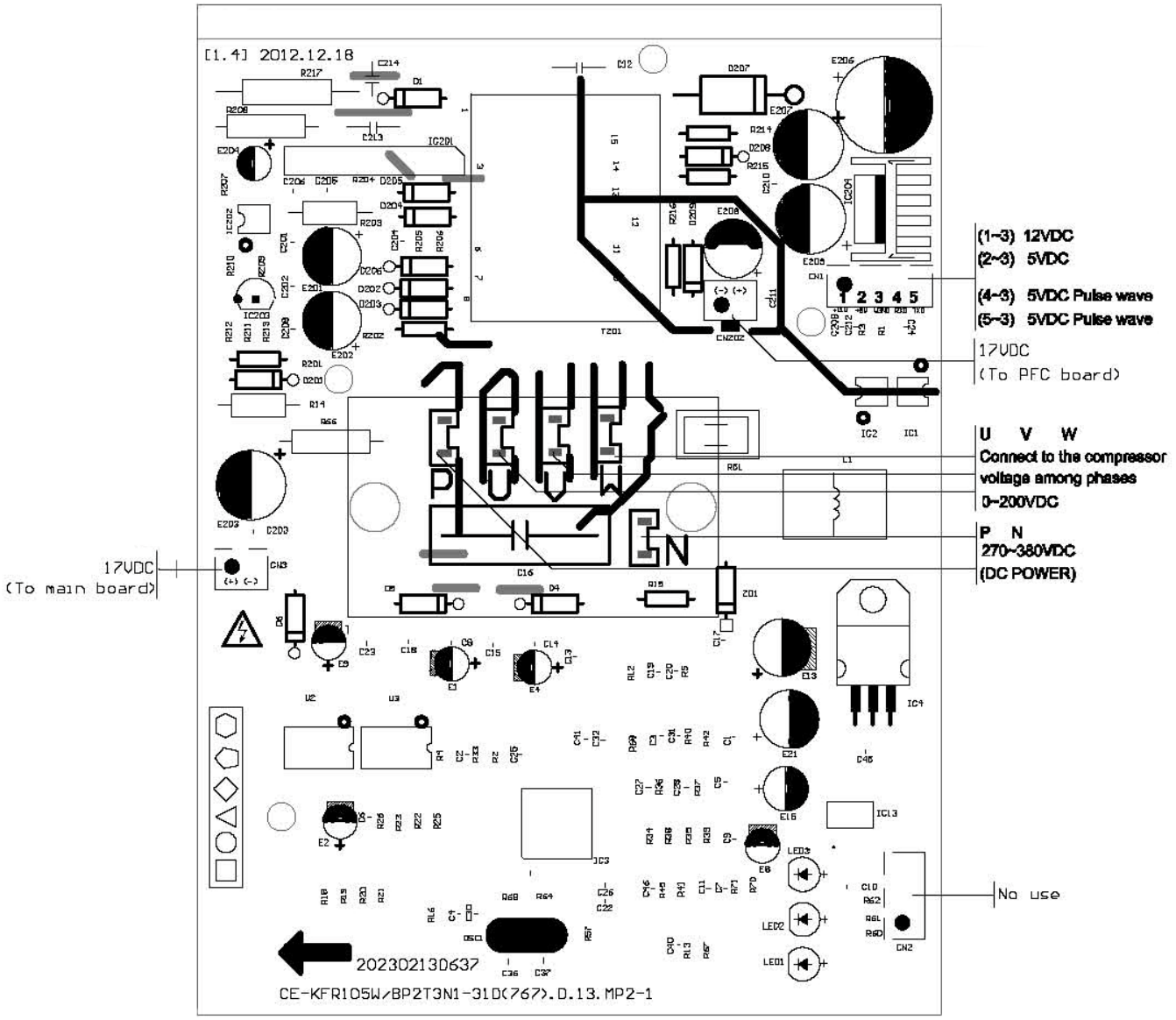
202057190160



PCB board of YN036GMFI16M4D



IPM board of YN036GMFI16M4D

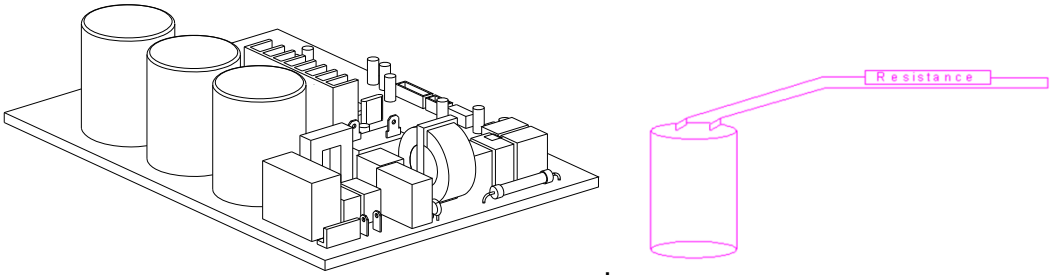


8. Troubleshooting

9.1Safety

Because there are capacitors on the PCBs and relative circuitry in outdoor units, even after shutting down the power supply, electrical power remain charged in those capacitors. Do not forget to discharge the electrical power remaining in the capacitors before servicing.

The value of resistance used for discharging the power should be about 1500 ohms to 2000 ohms



Electrolytic Capacitors

(HIGH VOLTAGE! CAUTION!)

Bulb (25 - 40W)

The voltage in P3 and P4 in outdoor PCB is high voltage, about 310V

The voltage in P5 and P6 in outdoor PCB is high voltage, about 310V

8.2 Indoor Unit Error Display

WB series Wall Mount Indoor Units:

Display	Failure	ODU Error code
E0	Indoor EEPROM malfunction	——
E1	Indoor/ outdoor units communication error	——
E2	Zero-crossing signal error	——
E3	Indoor fan speed has been out of control	——
E5	Open circuit or short circuit of outdoor temperature sensor or outdoor EEPROM malfunction	E0,E4
E6	Open circuit or short circuit of T1 or T2 temperature sensor	——
P0	IPM module protection or IGBT over-strong current protection	P4
P1	Voltage protection	E5
P2	Temperature protection of compressor top	P0
P3	Outdoor temperature is lower than -15°C （optional function）	——
P4	Inverter compressor drive protection	P7
P5	Mode conflict	——

FB Series Floor Console Indoor Units

Operation	Timer	De-frost	Failure
★	X	X	Open or short circuit of T1 temperature sensor
X	X	★	Open or short circuit of T2 temperature sensor
X	★	X	Indoor / outdoor units communication error
★	★	X	Indoor EEPROM malfunction
X	★	●	Outdoor fan speed has been out of control
★	X	★	IPM module protection
★	★	★	Open or short circuit of T3 or T4 temperature sensor or Outdoor unit EEPROM parameter error
★	●	X	Temperature protection of compressor top
★	◎	X	Inverter compressor drive protection
★	X	●	Mode conflict
★	●	★	Indoor fan speed has been out of control

★ flash at 5/sec ● light ON, X extinguished, ◎flash at 0.5/sec

For CB Series Ceiling Cassette, RB Series Ceiling Concealed (Ducted) and UB Series Floor-Ceiling (Flex Mount) Indoor Units:

Operation	Timer	De-frost	Alarm	Failure	Display	ODU Error code
★	X	X	X	Open or short circuit of T1 temperature sensor	E0	——
X	X	★	X	Open or short circuit of T2 temperature sensor	E1	——
X	★	X	X	Indoor / outdoor units communication error	E2	——
X	X	X	★	Full-water malfunction	E3	——
★	★	X	X	Indoor EEPROM malfunction	E4	——
★	X	X	●	IPM module protection	E5	P4
★	●	X	X	Open or short circuit of T3 or T4 temperature sensor or outdoor EEPROM malfunction	E6	E0,E4
★	●	★	X	Outdoor fan has been out of control	E7	——
★	●	●	X	Indoor fan speed has been out of control	F5	——
★	●	X	●	Voltage protection	P0	E5
★	X	●	X	Temperature protection of compressor top.	P1	P0
★	★	★	X	Outdoor unit over-current protection	P2	P3
★	◎	X	X	Inverter compressor drive protection	P4	P7
★	X	●	●	Mode conflict	P5	——

★ flash at 2.5/sec, ● light ON, X extinguished, , ◎flash at 0.5/sec

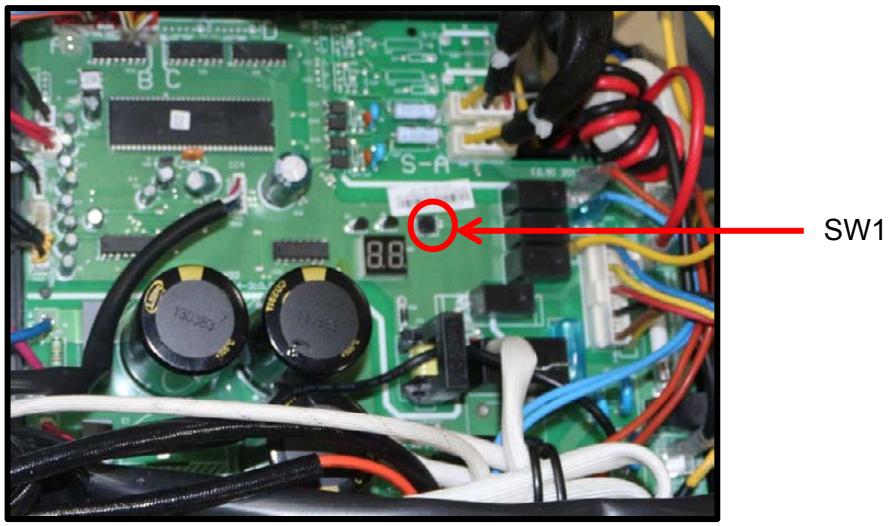
Note: Digital display is only available for duct type.

9.3 Outdoor Unit Display

9.3.1 Outdoor unit error code function

There is a system check switch on the outdoor PCB.

Push the switch SW1 to check the states of unit when the unit is running. The digital display will display the follow procedure when push SW1 each time.



	Display	Remark
1	Indoor unit capacity demand code	
2	Outdoor unit running mode code	Off:0, Cooling:1, Heating:2
3	Amendatory capacity demand code	
4	Outdoor unit fan motor state	Off:0, Low speed:1, High speed:2
5	Evaporator outlet temp. for 1# indoor unit	Actual data,(If the temp. is lower than -9 degree, the digital display tube will show “-9”.If the temp. is higher than 70 degree, the digital display tube will show “70”. If the indoor unit is not connected, the digital display tube will show: “——”)
6	Evaporator outlet temp. for 2# indoor unit	
7	Evaporator outlet temp. for 3# indoor unit	
8	Evaporator outlet temp. for 4# indoor unit	
9	Condenser pipe temp. (T3)	
10	Outdoor ambient temp.(T4)	
11	Compressor discharge temp.(Tp)	Actual data (If the temp. is lower than 0 degree, the digital display tube will show “0”.If the temp. is higher than 99 degree, the digital display tube will show single digit and tens digit. (For example, the digital display tube show “0.5”,it means the compressor discharge temp. is 105 degree. If the indoor unit is not connected, the digital display tube will show: “——”)
12	AD value of current	AD data(decimal numeral)
13	EXV open angle for A indoor unit	Actual data times 8
14	EXV open angle for B indoor unit	Actual data times 8
15	EXV open angle for C indoor unit	Actual data times 8
16	EXV open angle for D indoor unit	Actual data times 8
17	AD value of voltage	AD data(AD data*472/255=actual data) If AD data is higher than 99V, the digital display tube will show single digit and tens digit.

<table>
<tr><td>18</td><td>Indoor unit number</td><td>The indoor unit can communicate with outdoor unit well.<table><tr><td>Display</td><td>Number of indoor unit</td></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></table></td></tr>
<tr><td>19</td><td>The last error or protection code</td><td>00 means no malfunction</td></tr>
<tr><td>20</td><td>frequency value</td><td>Actual data</td></tr>
<tr><td>21</td><td>A indoor unit room temp.(T_1A)</td><td>Actual data</td></tr>
<tr><td>22</td><td>A indoor unit evaporator temp.(T_2A)</td><td>Actual data</td></tr>
<tr><td>23</td><td>B indoor unit room temp.(T_1B)</td><td>Actual data</td></tr>
<tr><td>24</td><td>B indoor unit evaporator temp.(T_2B)</td><td>Actual data</td></tr>
<tr><td>25</td><td>C indoor unit room temp.(T_1C)</td><td>Actual data</td></tr>
<tr><td>26</td><td>C indoor unit evaporator temp.(T_2C)</td><td>Actual data</td></tr>
<tr><td>27</td><td>D indoor unit room temp.(T_1D)</td><td>Actual data</td></tr>
<tr><td>28</td><td>D indoor unit evaporator temp.(T_2D)</td><td>Actual data</td></tr>
<tr><td>29</td><td>——</td><td>Check point over</td></tr>
</table>

9.3.2 Outdoor unit's digital display digits

There is a digital display tube in outdoor PCB.

Digital display tube display function

- In standby , the LED displays "- -"
- In compressor operation, the LED display the running frequency,
- In defrosting mode, The LED displays "dF" or alternative displays between running frequency and "dF"(each displays 2s)
- In compressor pre-heating, The LED displays "- -"
- In protection or malfunction, the LED displays error code or protection code.

9.3.3 Outdoor unit error display

Display digital tube	LED STATUS	IDU Error (Wall Mount)	IDU Error (Others)
E0	Outdoor EEPROM malfunction	E5	E6
E1	No A Indoor unit coil outlet temp. sensor or connector of sensor is defective	——	——
E2	No B Indoor unit coil outlet temp. sensor or connector of sensor is defective	——	——
E3	No C Indoor unit coil outlet temp. sensor or connector of sensor is defective	——	——
E6	No D Indoor unit coil outlet temp. sensor or connector of sensor is defective	——	——
E4	Open or short circuit of outdoor temperature sensor(T4)	E5	E6
E5	Voltage protection	P1	P0
E7	Communication malfunction between IPM board and outdoor main board	——	——
P0	Temperature protection of compressor discharge (Temperature protection of compressor top(only for M2OC-18HRDN1-M&M3OC-27HRDN1-M))	P2	P3(P1)
P1	High pressure protection (Only for M4OC-36HRDN1-M)	——	——
P2	Low pressure protection(Only forM4OC-36HRDN1-M)	——	——
P3	Current protection of compressor	——	——(P2)
P4	IPM module protection	P0	E5
P6	High temperature protection of condenser	——	——
P7	Inverter compressor drive protection	P4	P4
PF	PFC module protection (Only for YN036GMFI16M4D)	——	——

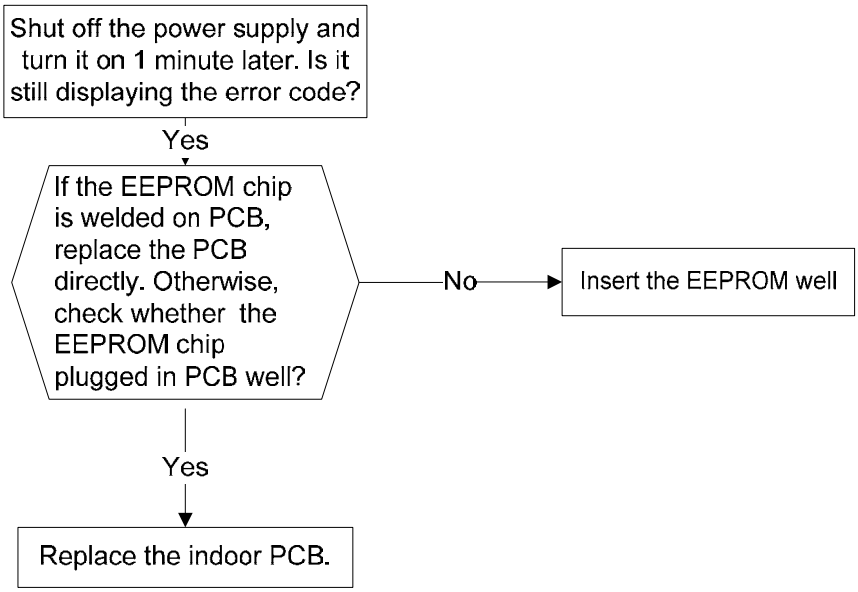
9.4 Diagnosis and Solution

9.4.1 Indoor unit trouble shooting

9.4.1.1 Indoor EEPROM malfunction diagnosis and solution.

Malfunction decision conditions	PCB main chip does not receive feedback from EEPROM chip
	● Installation mistake ● PCB faulty

Trouble shooting:



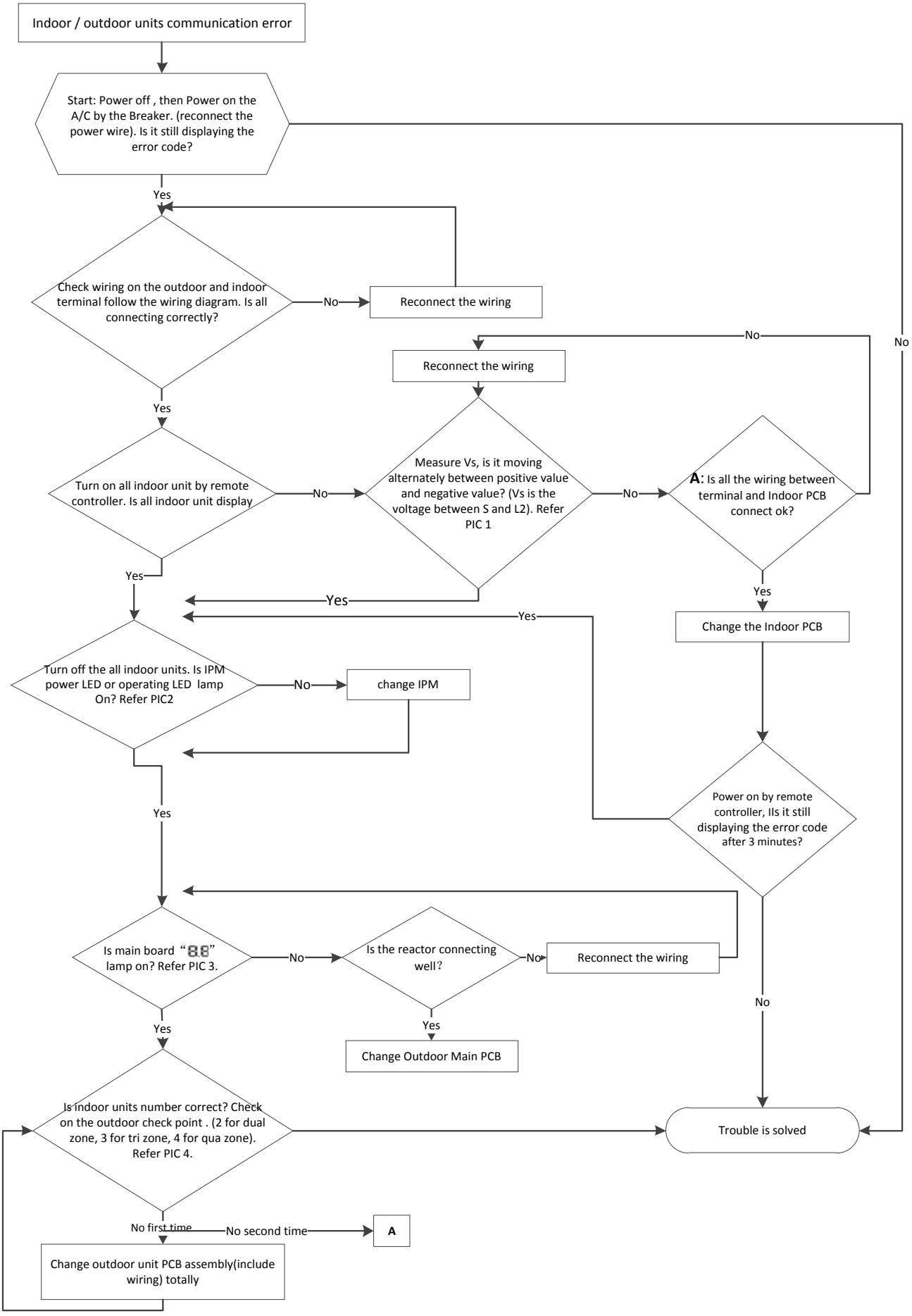
Supposed causes

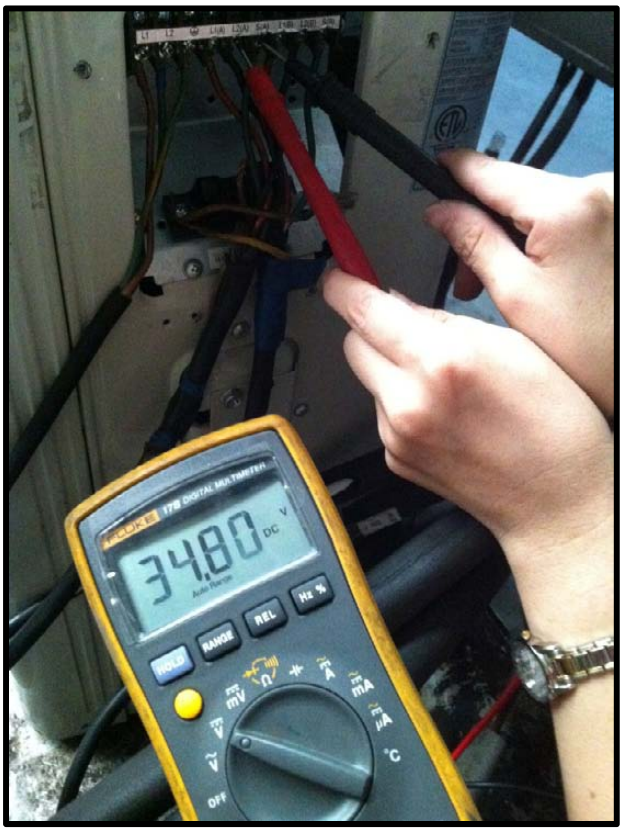
EEPROM: a read-only memory whose contents can be erased and reprogrammed using a pulsed voltage. For the location of EEPROM chip, please refer to the below photos.

9.4.1.2 Indoor / outdoor unit communication error diagnosis and solution.

Malfunction decision conditions	Indoor unit does not receive the feedback from outdoor unit during 120 seconds.
Supposed causes	● Wiring mistake ● Indoor or outdoor PCB faulty

Trouble shooting:

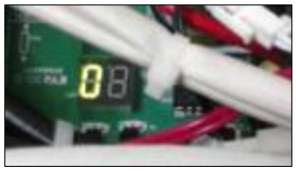

Indoor / outdoor units communication error
Start: Power off , then Power on the A/C by the Breaker. (reconnect the power wire). Is it still displaying the error code?
Yes
No
Check wiring on the outdoor and indoor terminal follow the wiring diagram. Is all connecting correctly?
No
Reconnect the wiring
Yes
Reconnect the wiring
No
Turn on all indoor unit by remote controller. Is all indoor unit display
No
Measure Vs, is it moving alternately between positive value and negative value? (Vs is the voltage between S and L2). Refer PIC 1
No
A: Is all the wiring between terminal and Indoor PCB connect ok?
Yes
Yes
Yes
Yes
Change the Indoor PCB
Turn off the all indoor units. Is IPM power LED or operating LED lamp On? Refer PIC2
No
change IPM
Power on by remote controller, IIs it still displaying the error code after 3 minutes?
Yes
Is main board "88" lamp on? Refer PIC 3.
No
Is the reactor connecting well?
No
Reconnect the wiring
No
Yes
Yes
Change Outdoor Main PCB
Is indoor units number correct? Check on the outdoor check point . (2 for dual zone, 3 for tri zone, 4 for qua zone). Refer PIC 4.
Trouble is solved
No first time
No second time
A
Change outdoor unit PCB assembly(include wiring) totally



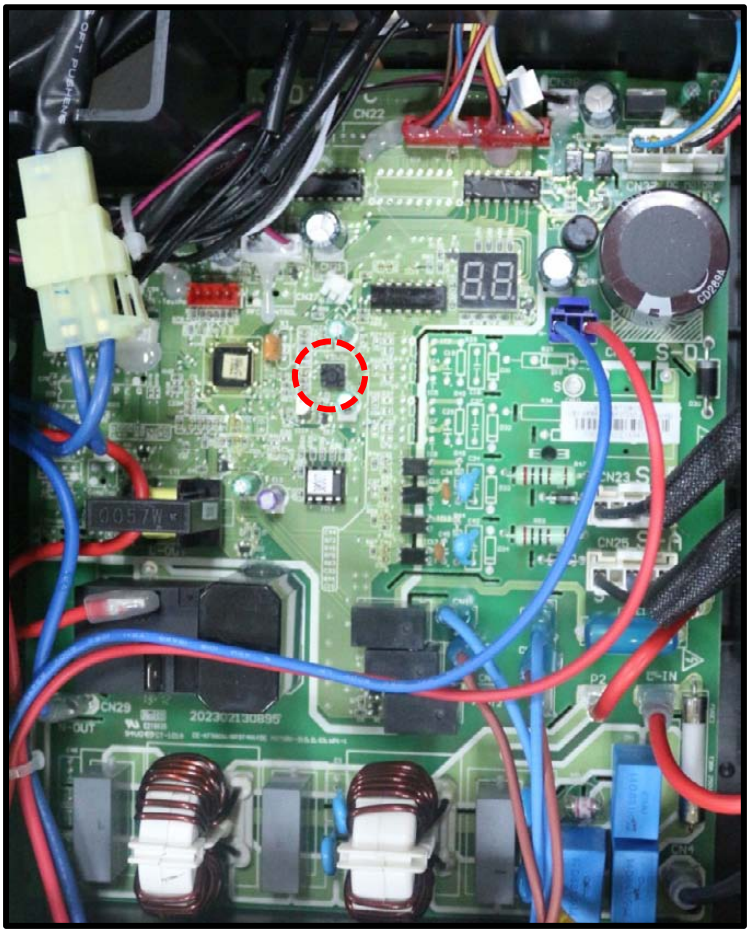
Pic 1:Use a multimeter to test the DC voltage between L2 port and S port of outdoor unit. The red pin of multimeter connects with L2 port while the black pin is for S port.

When AC is running normally, the voltage will move alternately between positive value and negative value.

Pic 2: :IPM (for dual/tri/quad-zone)



PIC3 :Main board LED when power on and unit standby.

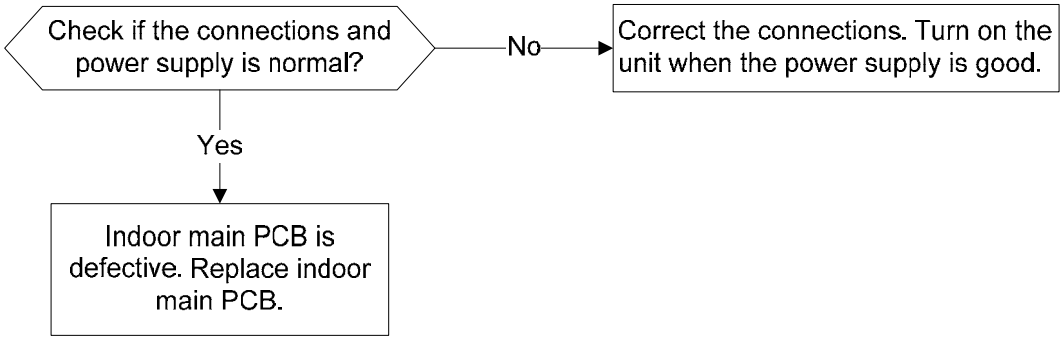


PIC 4: Check point button, press 18 times for check how many indoor units are connected.

9.4.1.3 zero-crossing signal error diagnosis and solution.

Malfunction decision conditions	When PCB does not receive zero crossing signal feedback for 4 minutes or the zero crossing signal time interval is abnormal.
Supposed causes	● Connection mistake ● PCB faulty

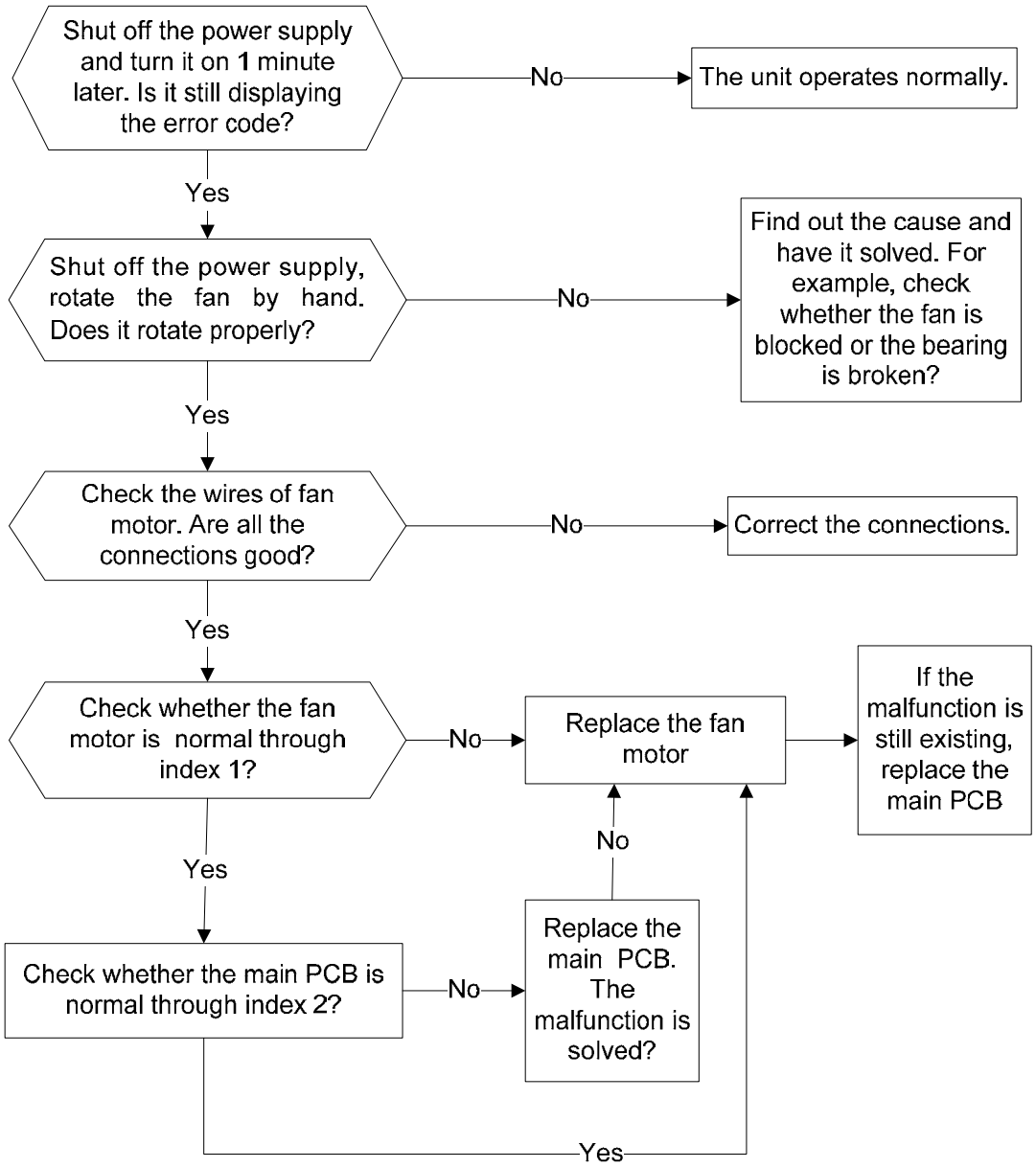
Trouble shooting:



9.4.1.4 Indoor fan speed has been out of control diagnosis and solution.

Malfunction decision conditions	When indoor fan speed stays too low (300RPM) for certain time, the unit will stop and the LED will display the failure.
Supposed causes	● Wiring mistake ● Fan ass'y faulty ● Fan motor faulty ● PCB faulty

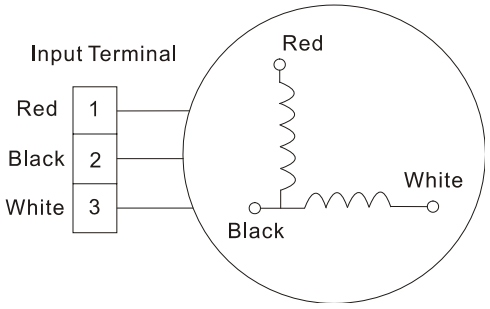
Trouble shooting:



Index 1:

1.Indoor AC fan motor

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

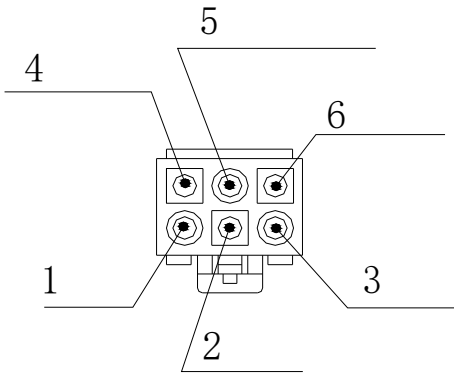


For the definite value of the resistance, refer to 9.5 Trouble Criterion Of Main Parts

- 2. Indoor DC fan motor(control chip is inside fan motor)

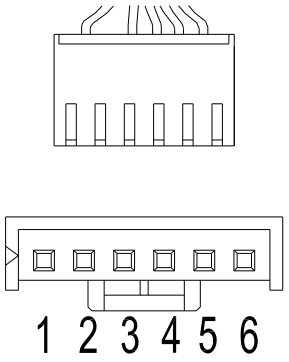
Measure the resistance value of each winding by using the tester. If any resistance value is zero, the fan motor must have problems and need to be replaced.

For console:



NO.	Color
1	Red
2	---
3	White
4	Blue
5	Yellow
6	Black

For other models:

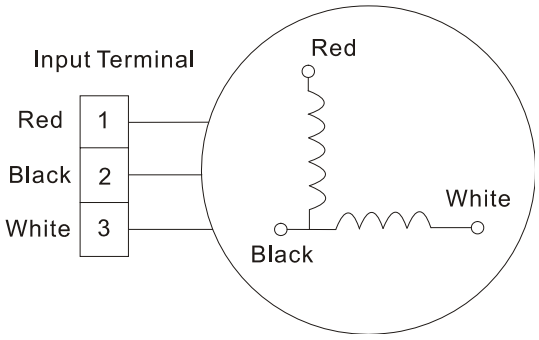


NO.	Color
1	Red
2	---
3	Black
4	White
5	Yellow
6	Blue

Index2:

1: Indoor AC fan motor

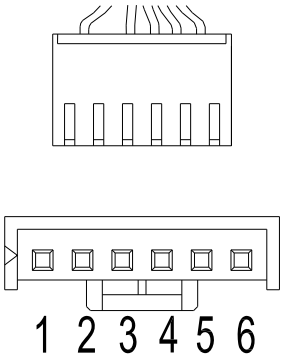
Power on and set the unit running in fan mode at high fan speed. After running for 15 seconds, measure the voltage of pin1 and pin2. If the value of the voltage is less than 100V(208~240V power supply)or 50V(115V power supply), the PCB must have problems and need to be replaced.



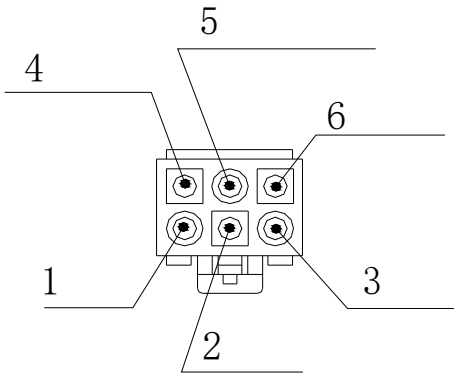
2. Indoor DC fan motor (control chip is inside fan motor)

Power on and when the unit is in standby, measure the voltage of pin1-pin3, pin4-pin3 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.

For other models:



For console:



DC motor voltage input and output

For light commercial (except console):

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	15V

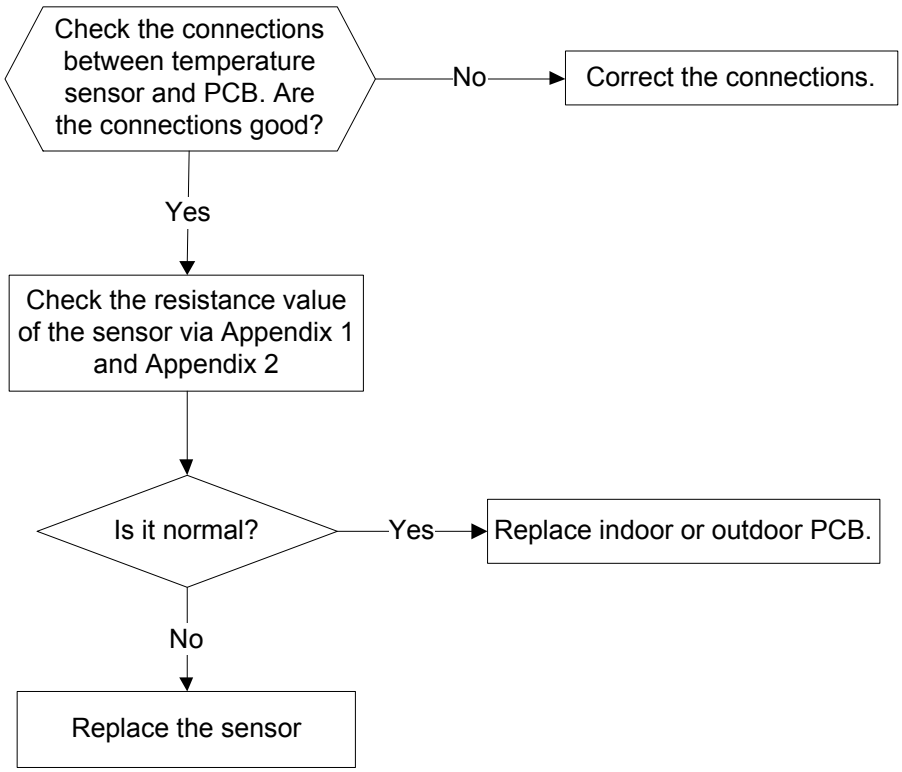
For console:

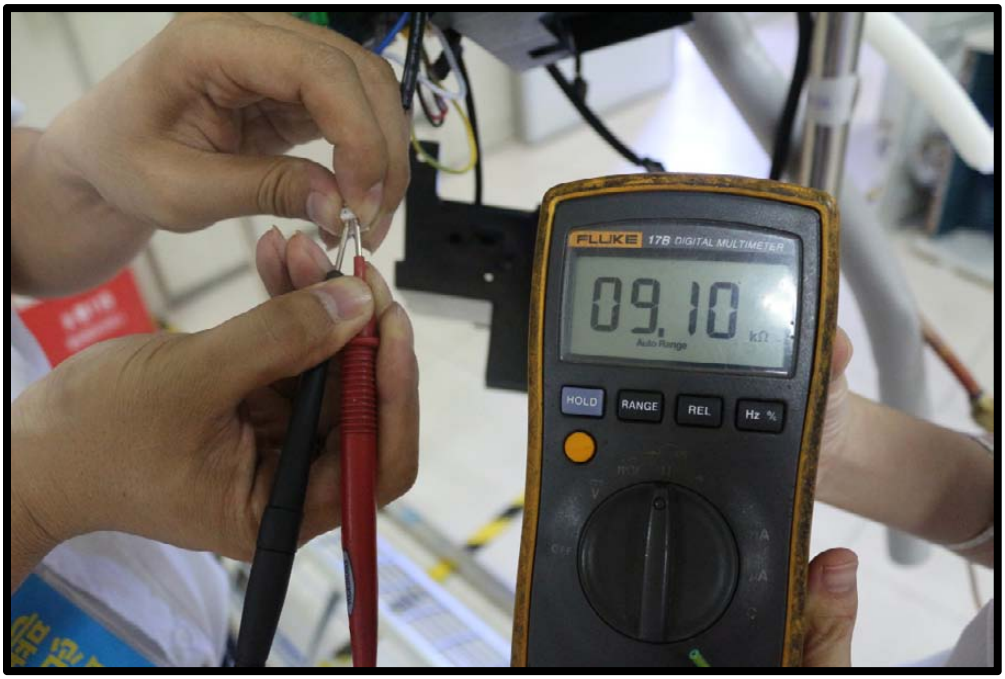
NO.	Color	Signal	Voltage
1	Red	VDC	310V
2	---	---	---
3	White	Vcc	15V
4	Blue	FG	15V
5	Yellow	Vsp	0-7.5V
6	Black	GND	0V

9.4.1.5 open or short circuit of temperature sensor diagnosis and solution.

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	● Wiring mistake ● Sensor faulty ● PCB faulty

Trouble shooting:

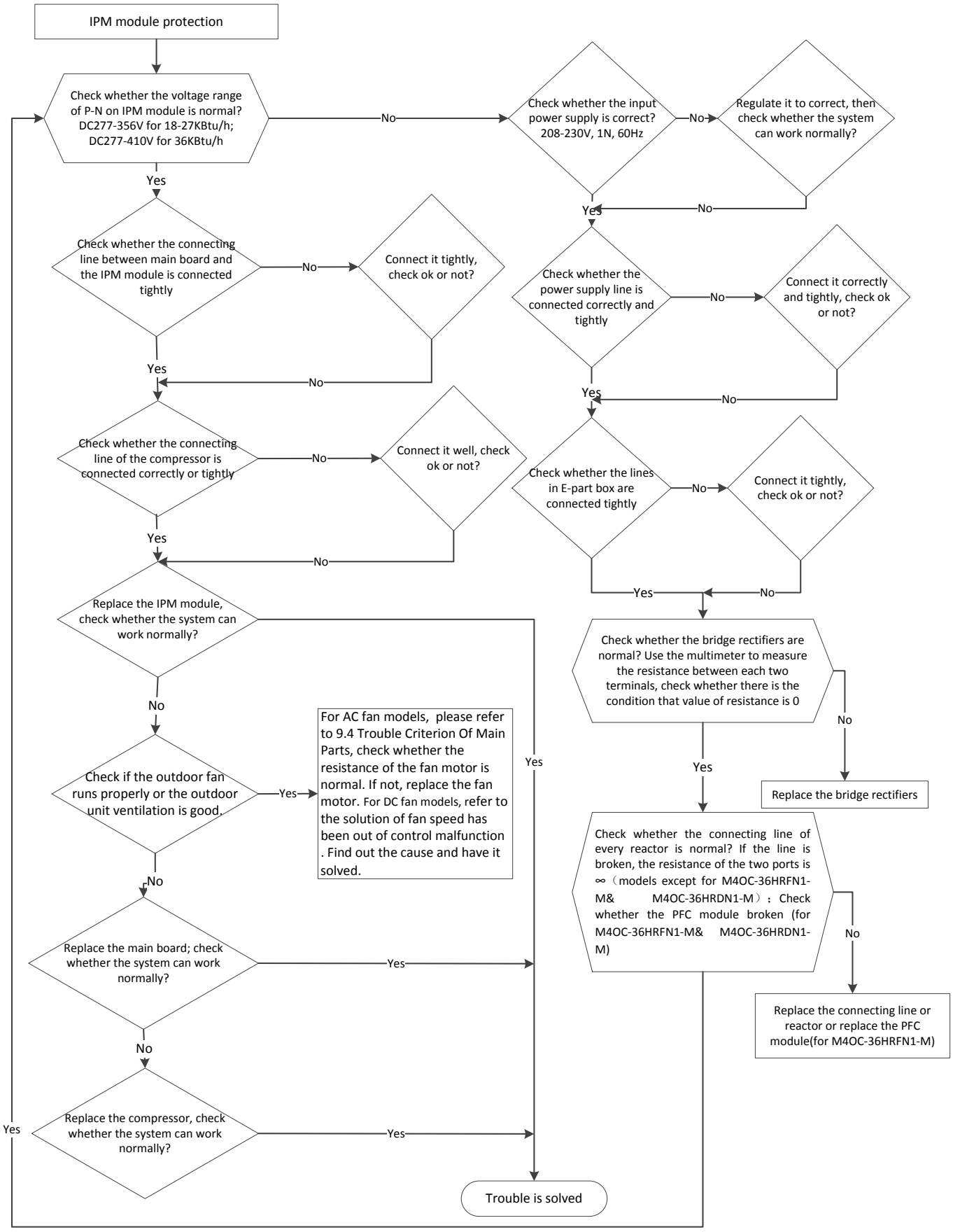




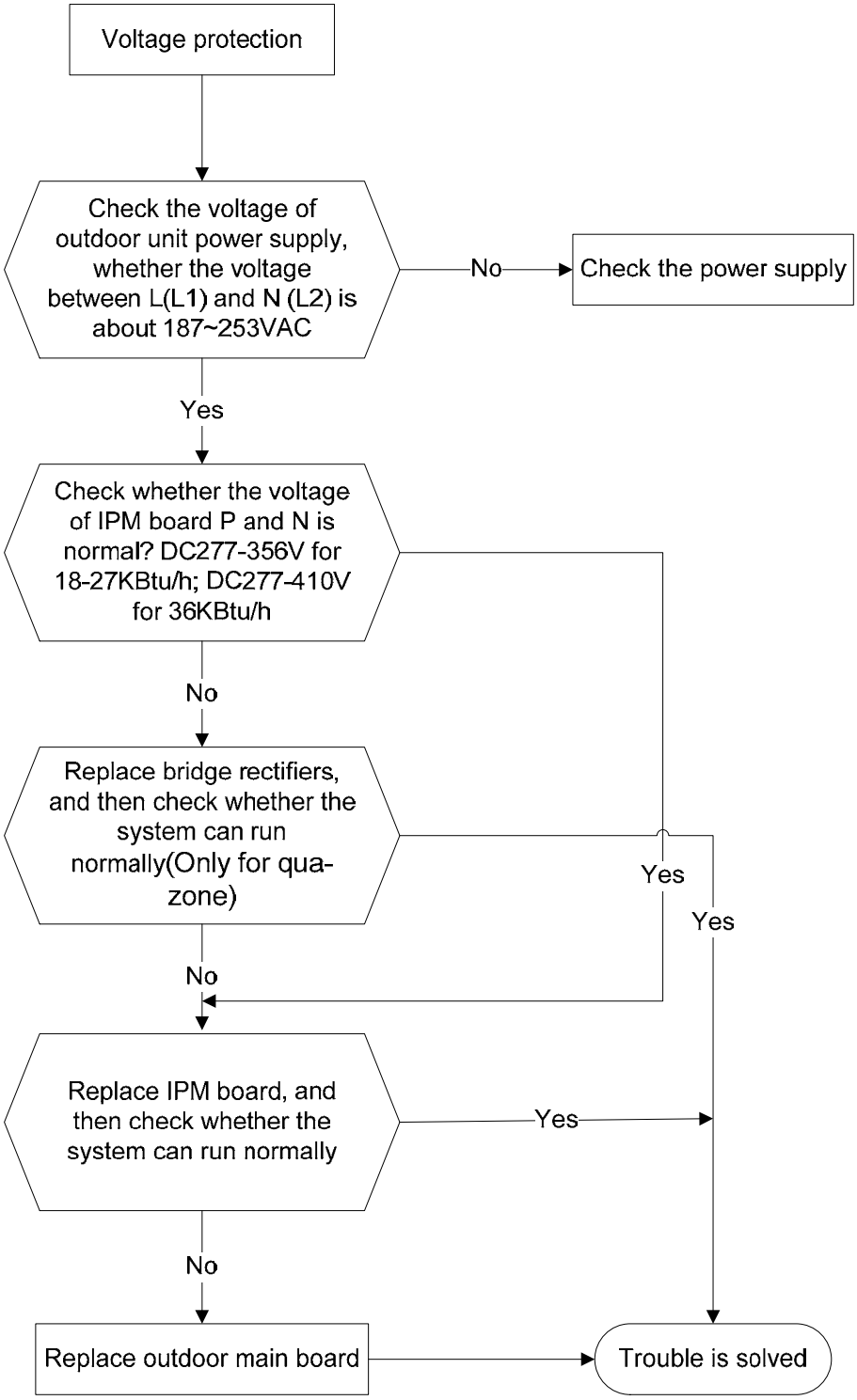
9.4.1.6 IPM module or IGBT over-strong current protection diagnosis and solution.

Malfunction decision conditions	When the voltage signal that IPM send to compressor drive chip is abnormal, the display LED will show “P6” and AC will turn off.
Supposed causes	● Wiring mistake ● IPM malfunction ● Outdoor fan ass’y faulty ● Compressor malfunction ● Outdoor PCB faulty

Trouble shooting:

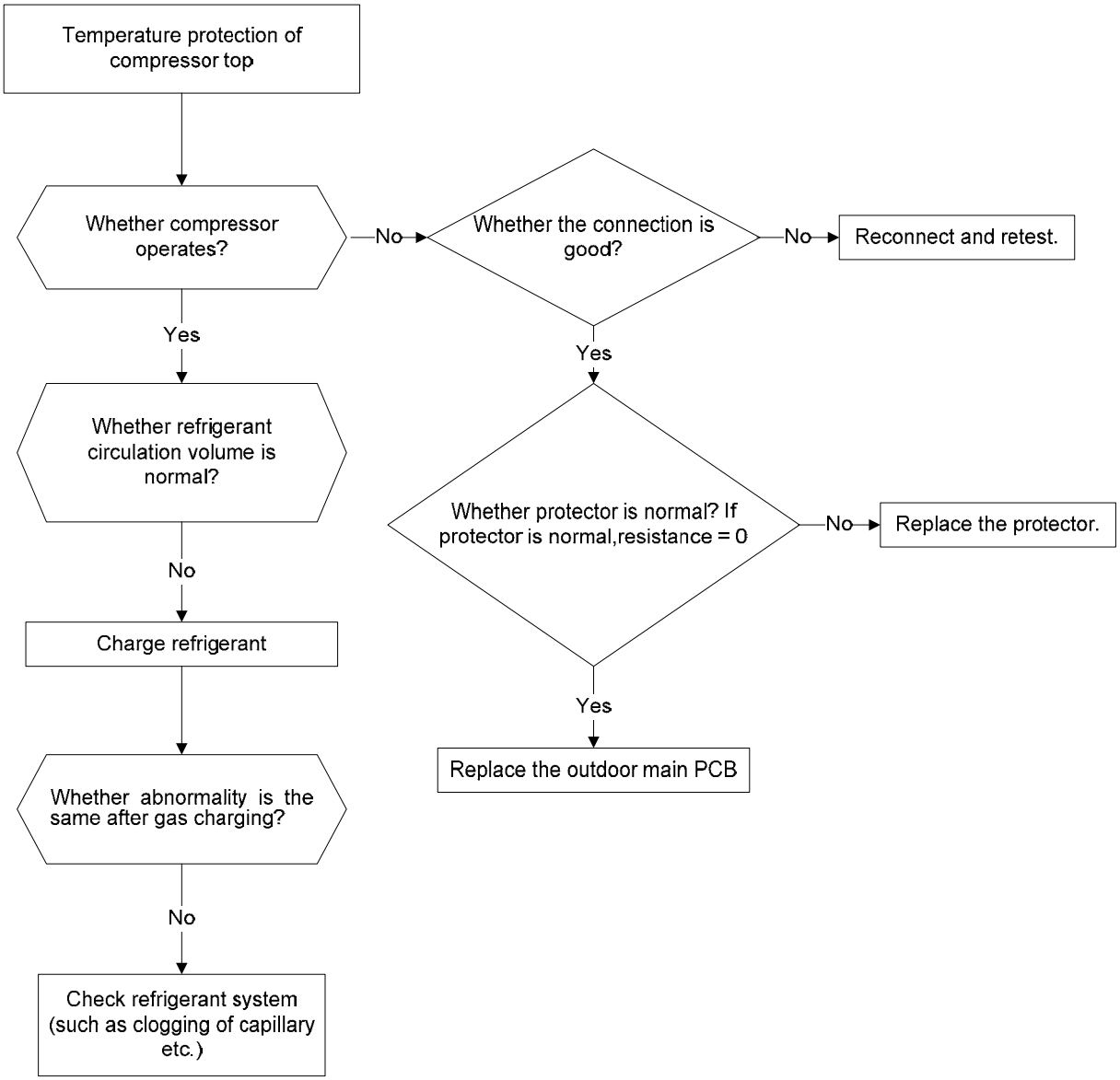

IPM module protection
Check whether the voltage range of P-N on IPM module is normal? DC277-356V for 18-27KBtu/h; DC277-410V for 36KBtu/h
No
Check whether the input power supply is correct? 208-230V, 1N, 60Hz
No
Regulate it to correct, then check whether the system can work normally?
No
Yes
Yes
Check whether the connecting line between main board and the IPM module is connected tightly
No
Connect it tightly, check ok or not?
Yes
No
Check whether the power supply line is connected correctly and tightly
No
Connect it correctly and tightly, check ok or not?
Yes
No
Check whether the connecting line of the compressor is connected correctly or tightly
No
Connect it well, check ok or not?
Yes
No
Check whether the lines in E-part box are connected tightly
No
Connect it tightly, check ok or not?
Yes
No
Replace the IPM module, check whether the system can work normally?
Yes
Check whether the bridge rectifiers are normal? Use the multimeter to measure the resistance between each two terminals, check whether there is the condition that value of resistance is 0
No
Replace the bridge rectifiers
Yes
No
Check if the outdoor fan runs properly or the outdoor unit ventilation is good.
Yes
For AC fan models, please refer to 9.4 Trouble Criterion Of Main Parts, check whether the resistance of the fan motor is normal. If not, replace the fan motor. For DC fan models, refer to the solution of fan speed has been out of control malfunction . Find out the cause and have it solved.
Yes
Check whether the connecting line of every reactor is normal? If the line is broken, the resistance of the two ports is ∞（models except for M4OC-36HRFN1-M& M4OC-36HRDN1-M）; Check whether the PFC module broken (for M4OC-36HRFN1-M& M4OC-36HRDN1-M)
No
Replace the connecting line or reactor or replace the PFC module(for M4OC-36HRFN1-M)
No
Replace the main board; check whether the system can work normally?
Yes
No
Replace the compressor, check whether the system can work normally?
Yes
Yes
Trouble is solved

9.4.1.7 Over voltage or too low voltage protection diagnosis and solution.



9.4.1.8 Temperature protection of compressor top diagnosis and solution.

Malfunction decision conditions	If the sampling voltage is not 5V, the LED will display the failure.
Supposed causes	● Wiring mistake ● Over load protector faulty ● System block ● Outdoor PCB faulty

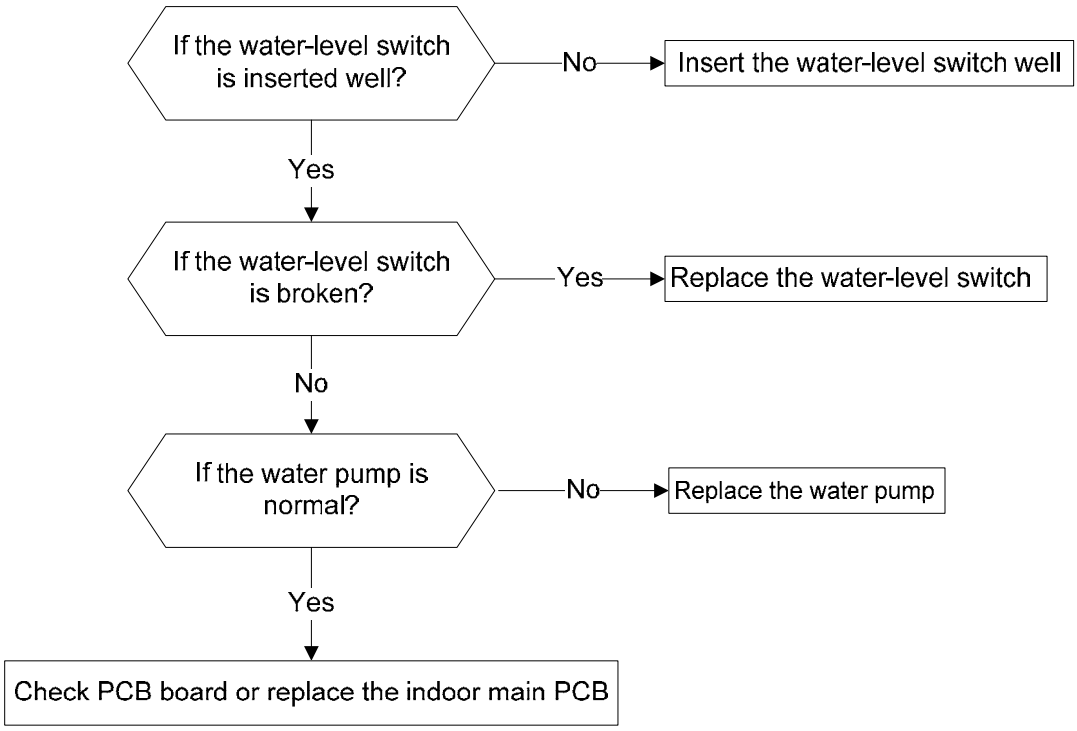


9.4.1.9 Inverter compressor drive error diagnosis and solution

The trouble shooting is same with one of IPM module protection(P0).

9.4.1.10 Full-water malfunction diagnosis and solution (For Cassette / Concealed duct)

Malfunction decision conditions	If the sampling voltage is not 5V, the LED will display the failure.
Supposed causes	● Wiring mistake ● Water-level switch faulty ● Water pump faulty ● Indoor PCB faulty



9.4.1.11 Mode conflict.

Error Code	P5
Malfunction decision conditions	The indoor units cannot work cooling mode and heating at same time. Heating mode has a priority.
Unit action	● When Indoor unit A is working in cooling mode or fan mode, and indoor unit B is set to heating mode, then A will change to off and B will work in heating mode. ● When Indoor unit A is working in heating mode, and indoor unit B is set to cooling mode or fan mode, then B will change to stand by and A will be no change.

	Cooling mode	Heating Mode	Fan	Off
Cooling mode	No	**Yes**	No	No
Heating Mode	**Yes**	No	**Yes**	No
Fan	No	**Yes**	No	No
Off	No	No	No	No

No: No mode conflict;

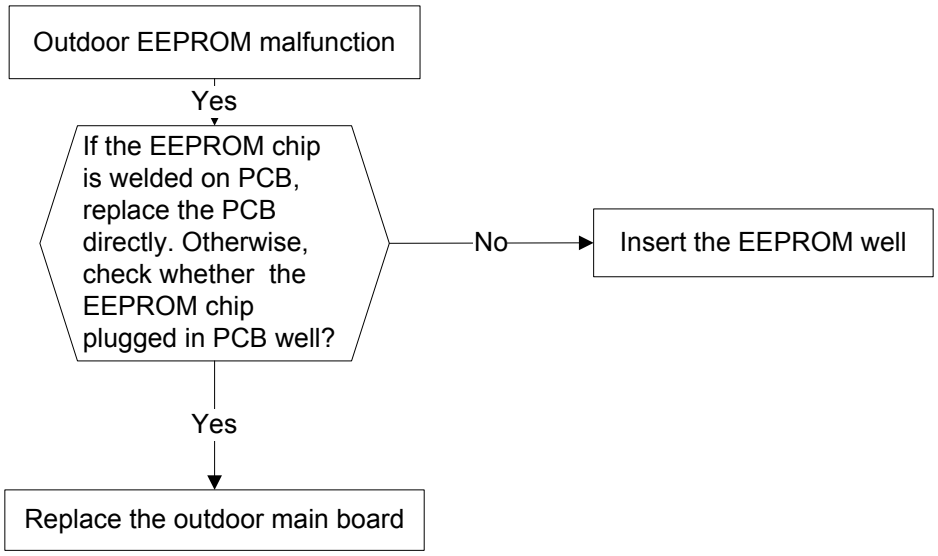
Yes: Mode conflict

9.4.2 Outdoor unit trouble shooting

9.4.2.1 E0 (Outdoor EEPROM malfunction) error diagnosis and solution

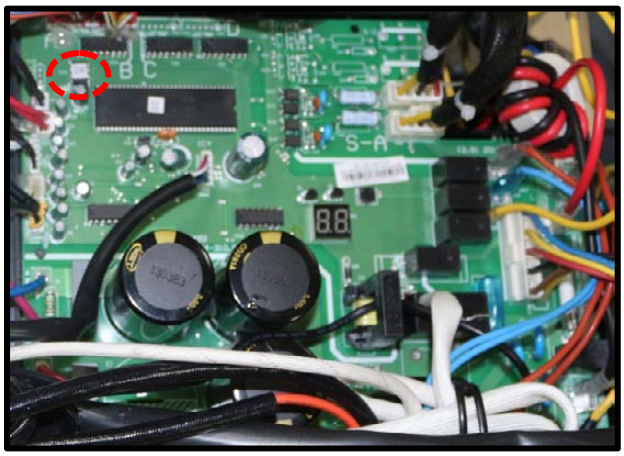
Error Code	E0
Malfunction decision conditions	PCB main chip does not receive feedback from EEPROM chip
Supposed causes	● Installation mistake ● PCB faulty

Trouble shooting:



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.



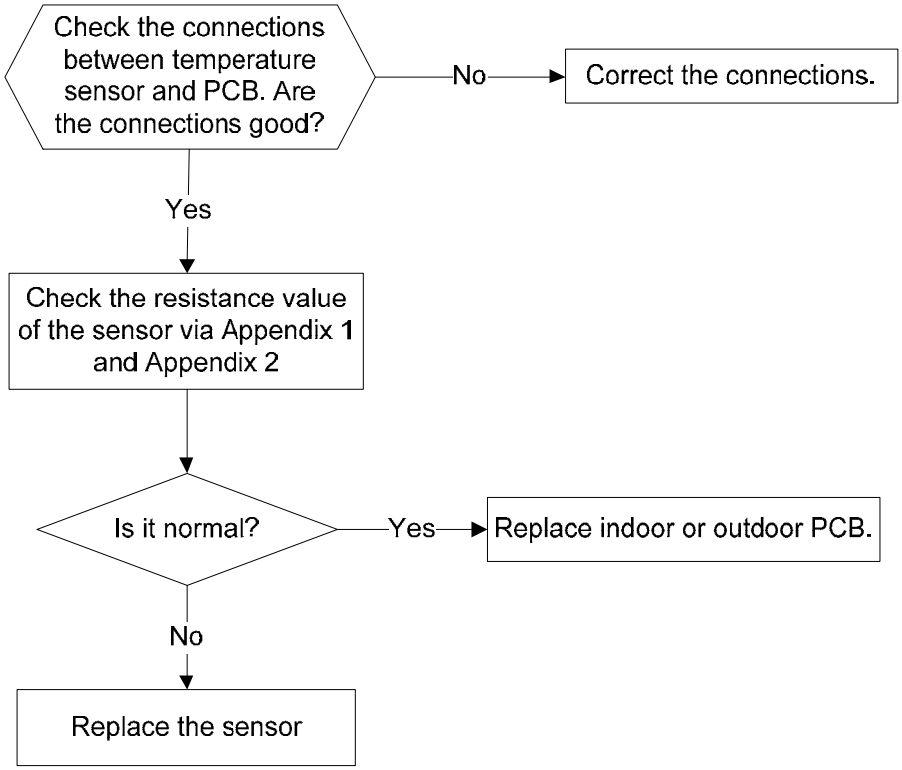
Outdoor PCB (YN018GMFI16M2D)

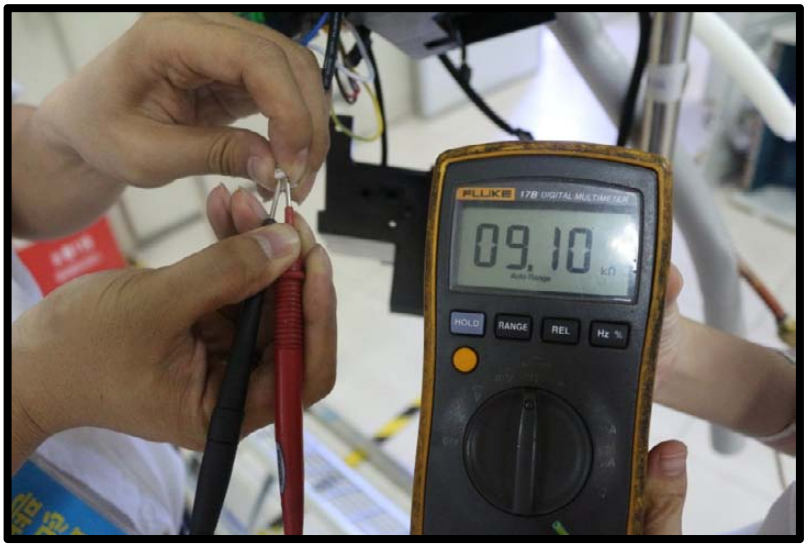
9.4.2.2 E4(open or short circuit of outdoor temperature sensor) diagnosis and solution

E1/E2/E3/E6 (open or short circuit of indoor coil temperature sensor) diagnosis and solution.

Error Code	E1/E2/E3/E4/E6
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	● Wiring mistake ● Sensor faulty ● PCB faulty

Trouble shooting:

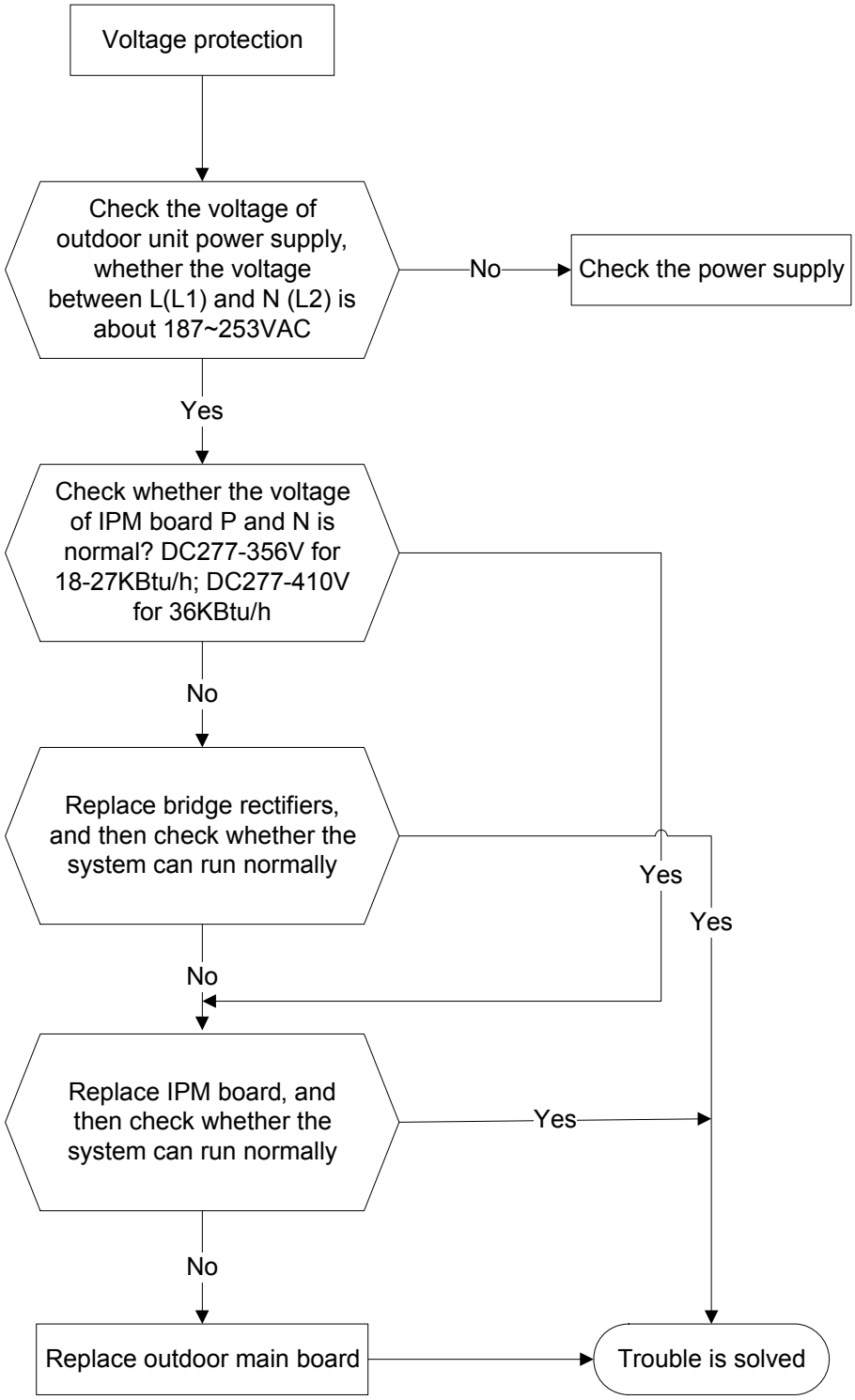


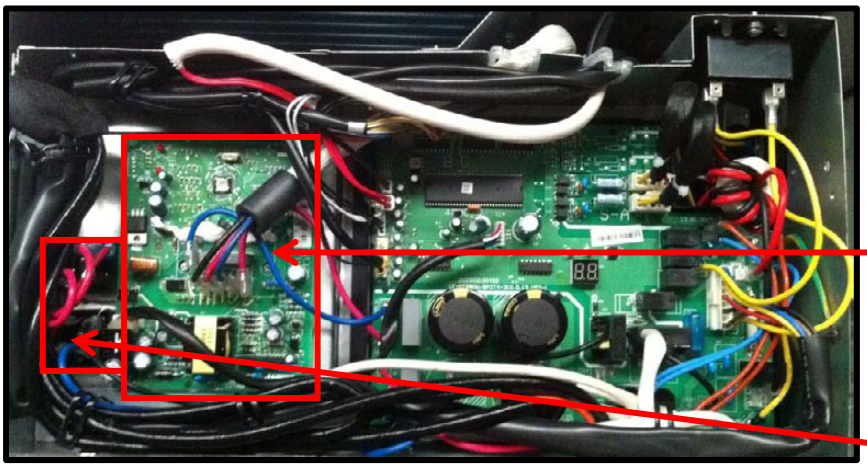


9.4.2.3 E5 (Voltage protection) error diagnosis and solution.

Error Code	E5
Malfunction decision conditions	An abnormal voltage rise or drop is detected by checking the specified voltage detection circuit.
Supposed causes	● Power supply problems. ● System leakage or block ● PCB faulty

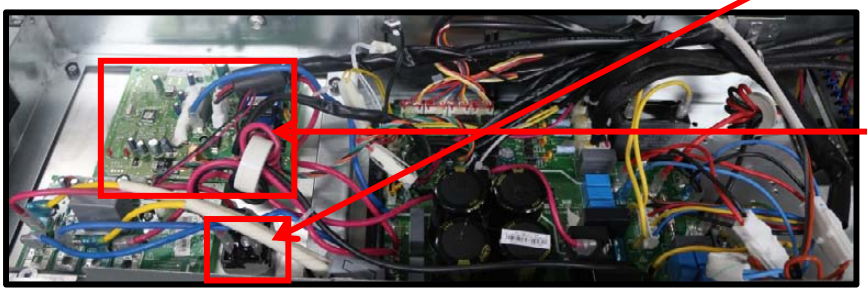
Trouble shooting:



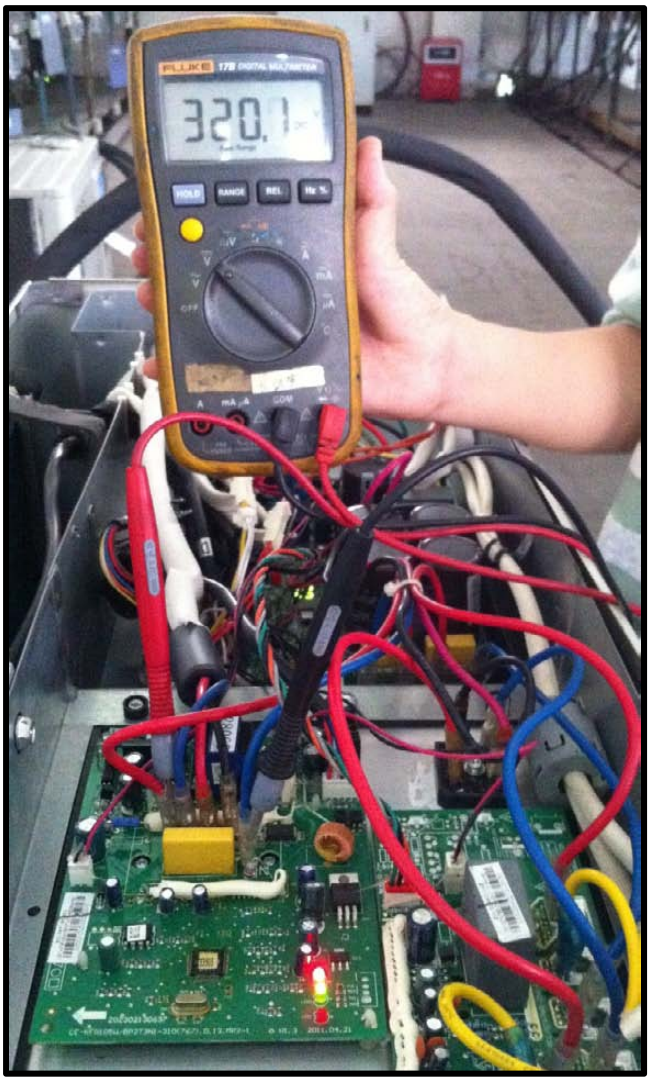


IPM (for dual/trio-zone)

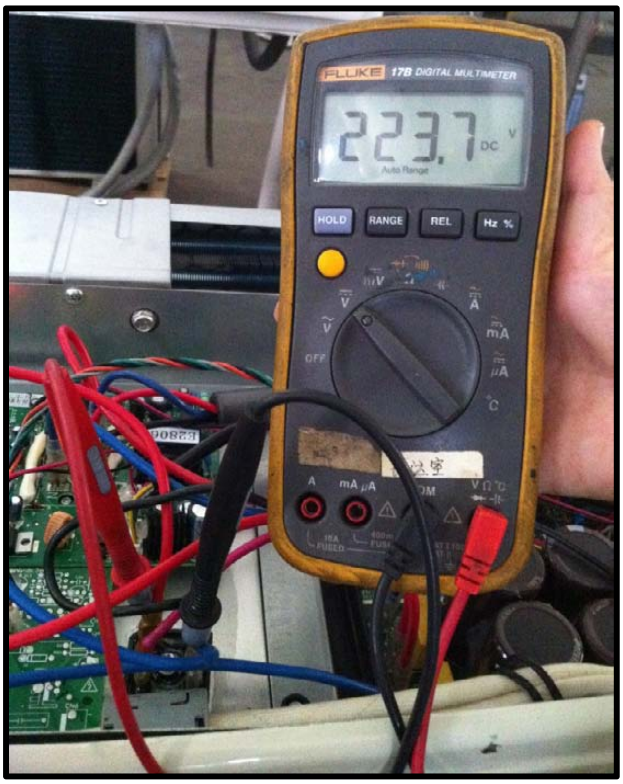
bridge rectifier



IPM (for quas-zone)



P-N



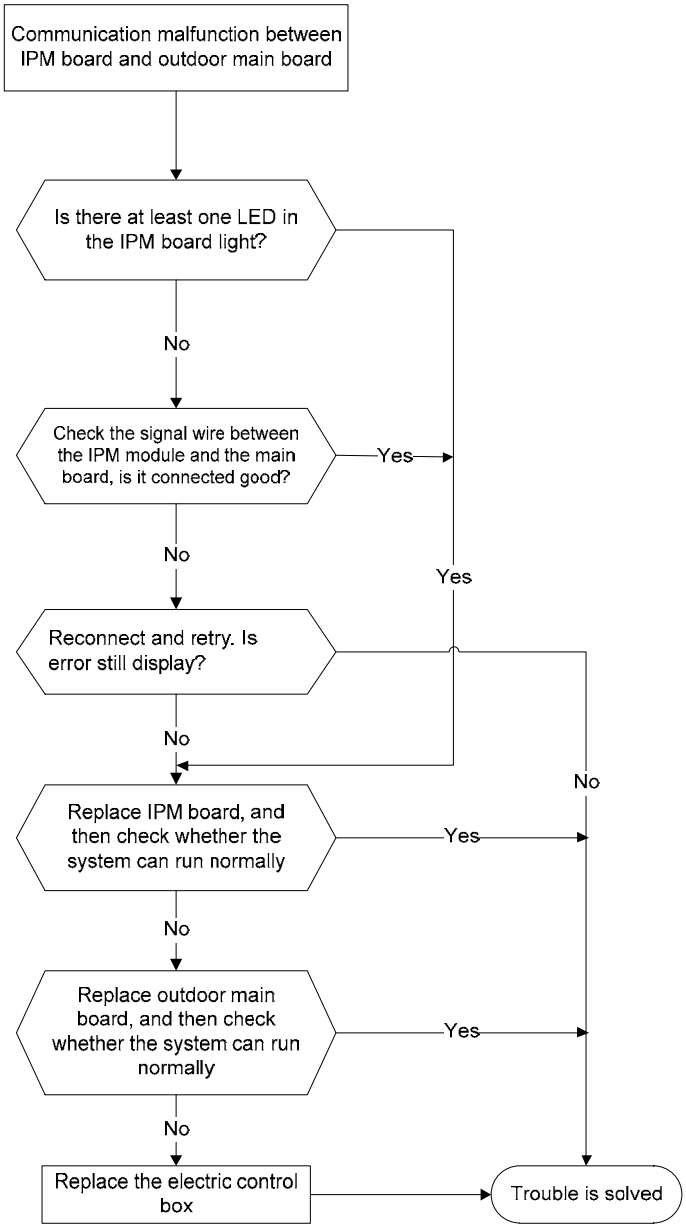
Remark:

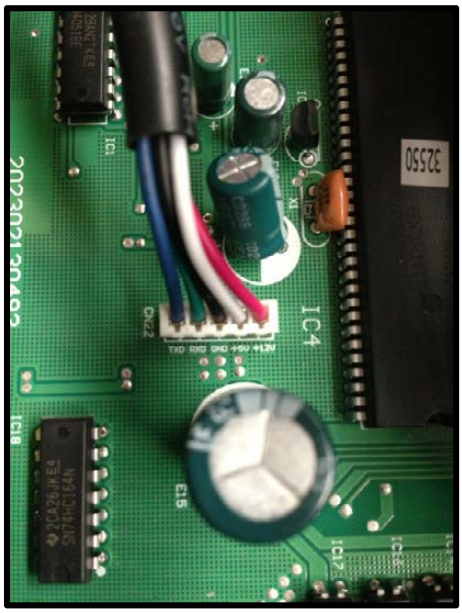
Measure the DC voltage between + and - port. The normal value should be 190V~250V.

9.4.2.4 E7 (Communication malfunction between IPM board and outdoor main board) error diagnosis and .

Error Code	E7
Malfunction decision conditions	PCB main chip does not receive feedback from IPM module during 60 seconds.
Supposed causes	● Wiring mistake ● PCB faulty

Trouble shooting:

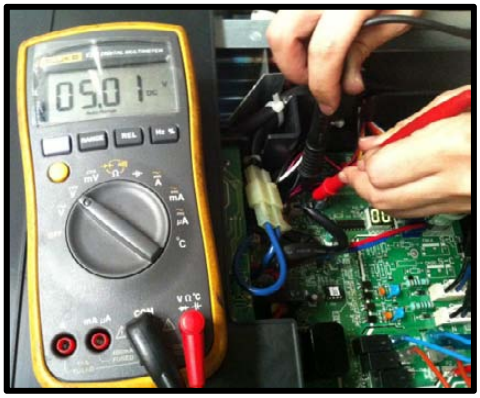


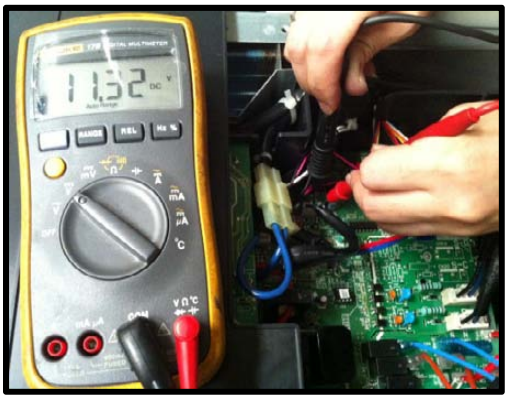


Remark:

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

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

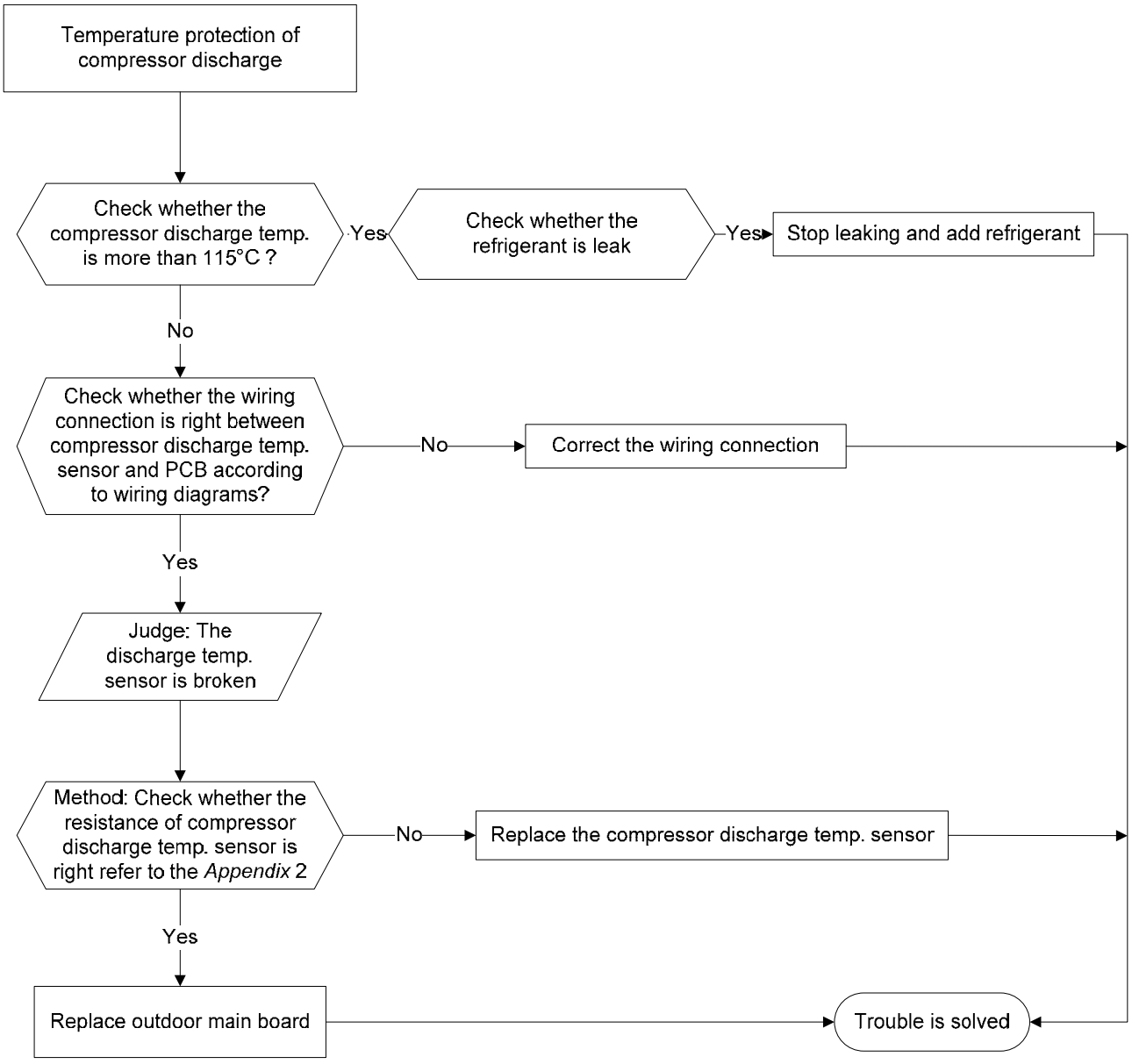




9.4.2.5 P0 (Temperature protection of compressor discharge) error diagnosis and solution.

Error Code	P0
Malfunction decision conditions	When the compressor discharge temperature(Tp) is more than 115℃ for 10 seconds, the compressor will stop and reset when Tp is less than 90℃.
Supposed causes	● Refrigerant leakage ● Wiring mistake ● The discharge temperature sensor faulty ● Outdoor PCB faulty

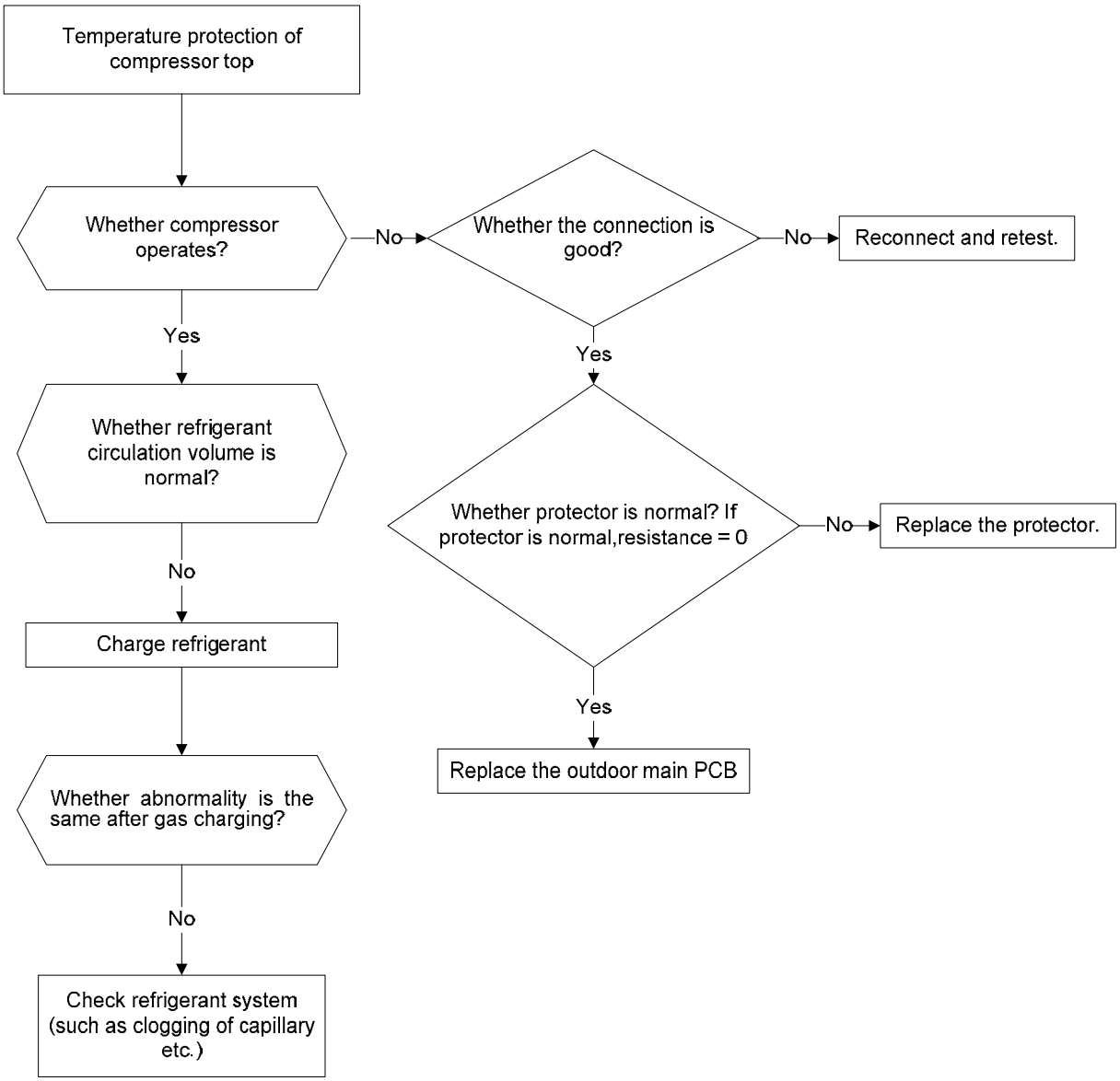
Trouble shooting:

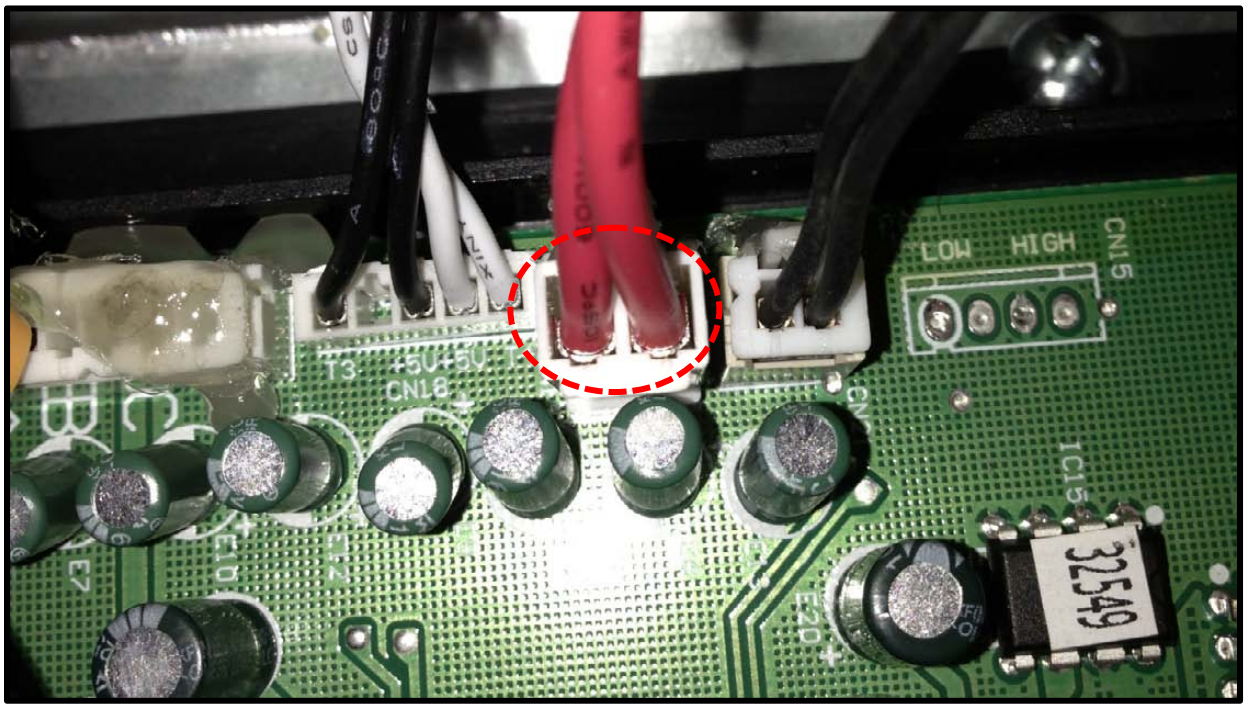


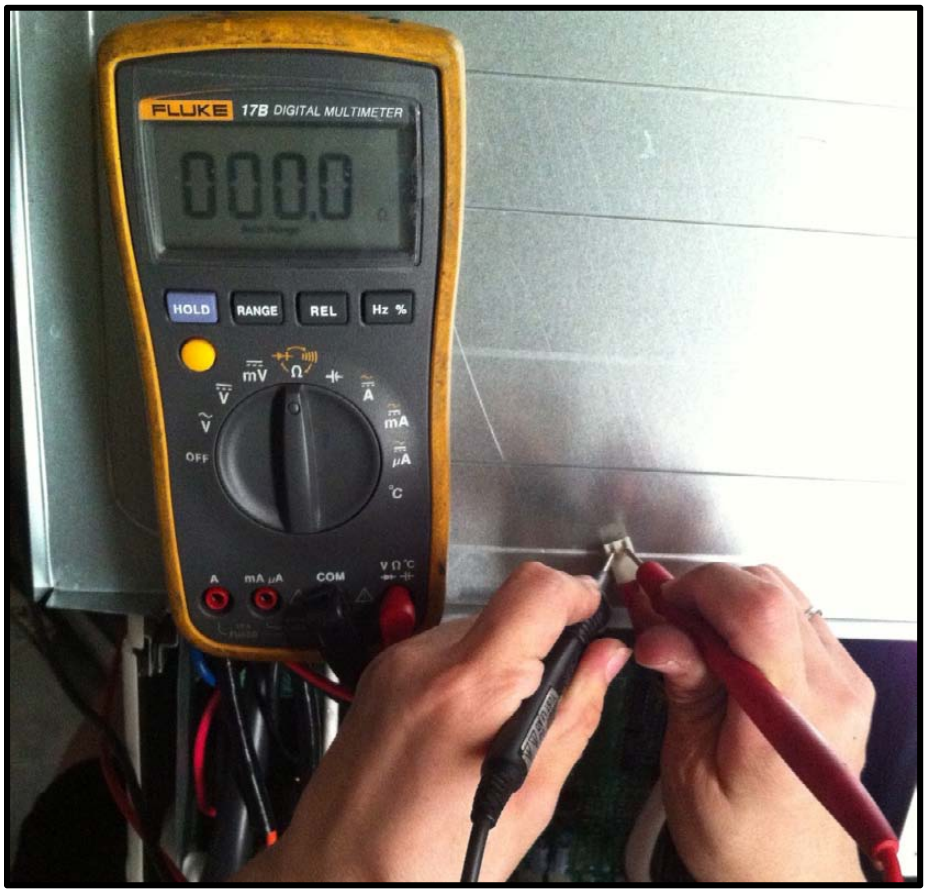
9.4.2.6 P0 (Temperature protection of compressor top) error diagnosis and solution. (Only for YN018GMFI16M2D and YN027GMFI16M3D)

Error Code	P0
Malfunction decision conditions	If the sampling voltage is not 5V, the LED will display the failure.
Supposed causes	● Wiring mistake ● Over load protector faulty ● System block ● Outdoor PCB faulty

Trouble shooting:



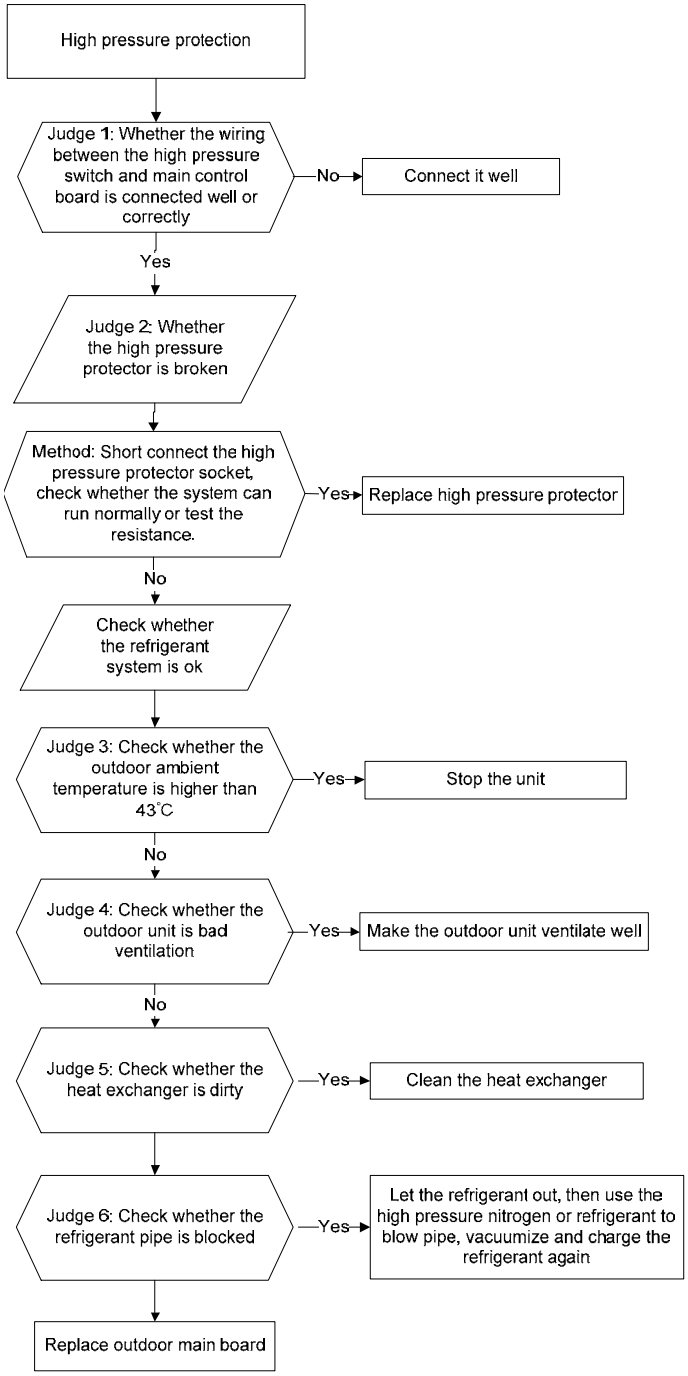

LOW
HIGH
CN15
T3
+5V+5V
CN16
IC15
32549

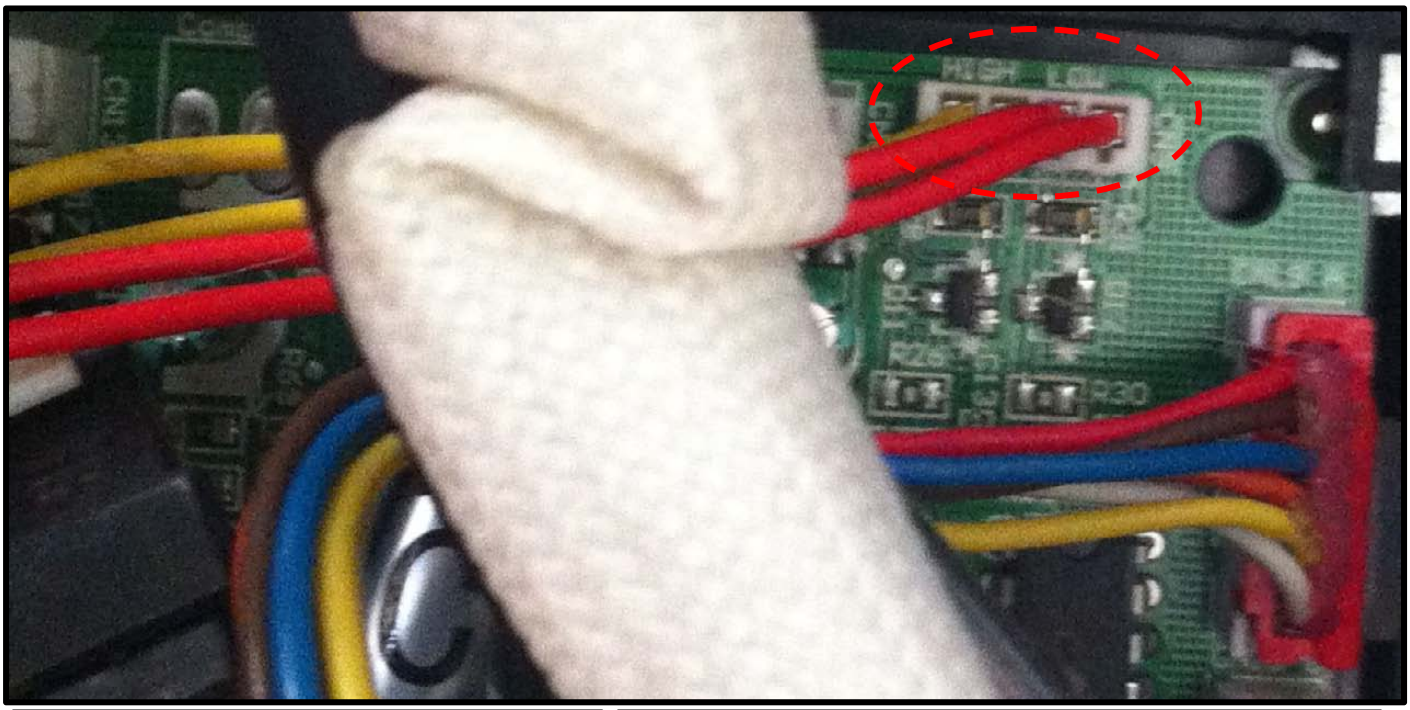

FLUKE 17B DIGITAL MULTIMETER
000.0
HOLD
RANGE
REL
Hz %
OFF
COM

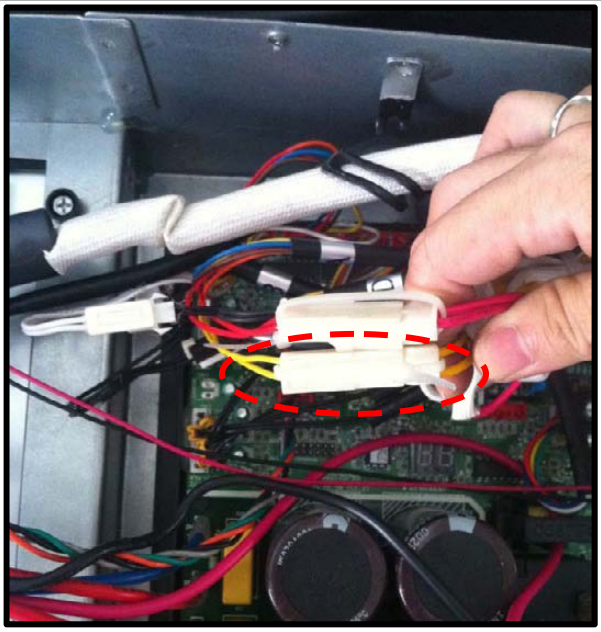
9.4.2.7 P1 (High pressure protection) error diagnosis and solution. (Only for YN036GMFI16M4D)

Error Code	P1
Malfunction decision conditions	If the sampling voltage is not 5V, the LED will display the failure.
Supposed causes	● Wiring mistake ● Over load protector faulty ● System block ● Outdoor PCB faulty

Trouble shooting:




HIGH
LOW
R30

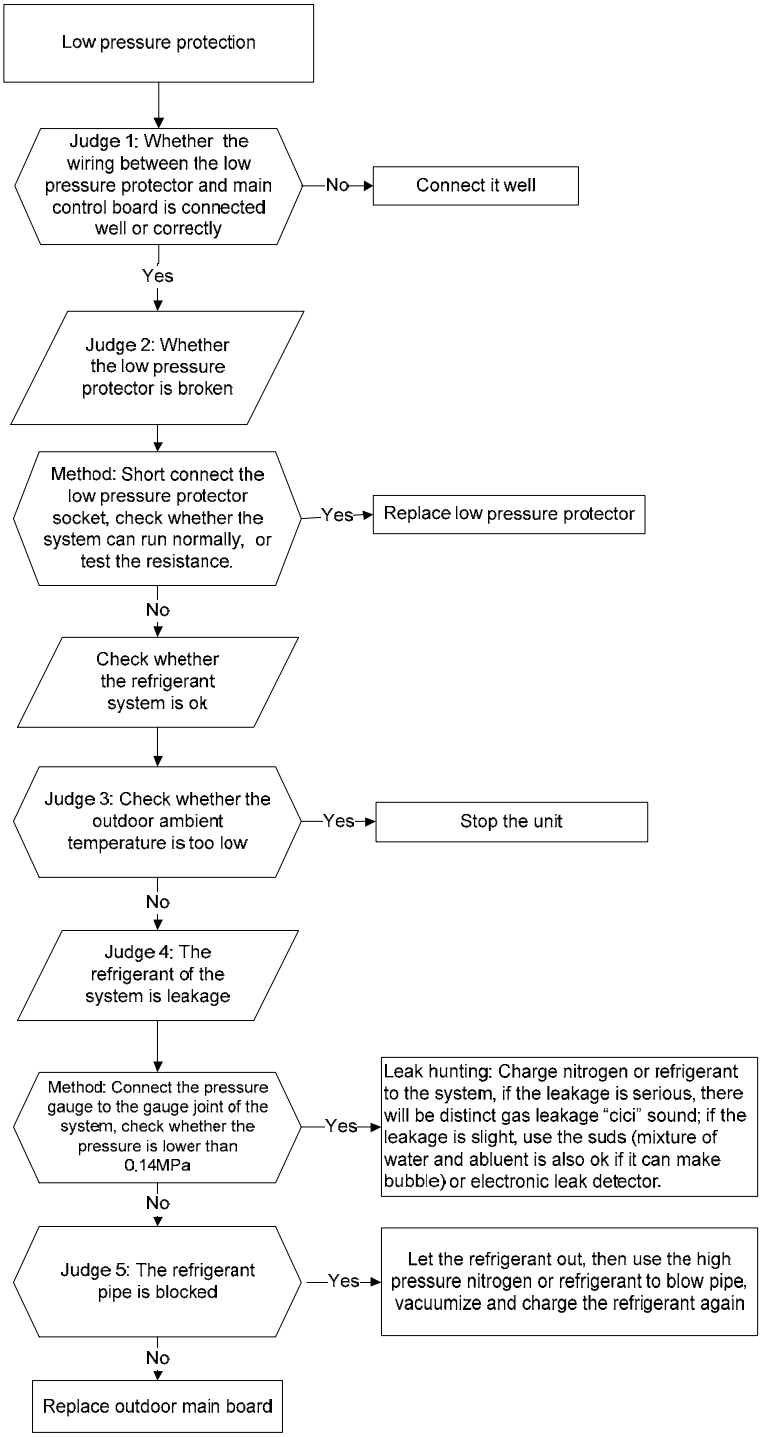


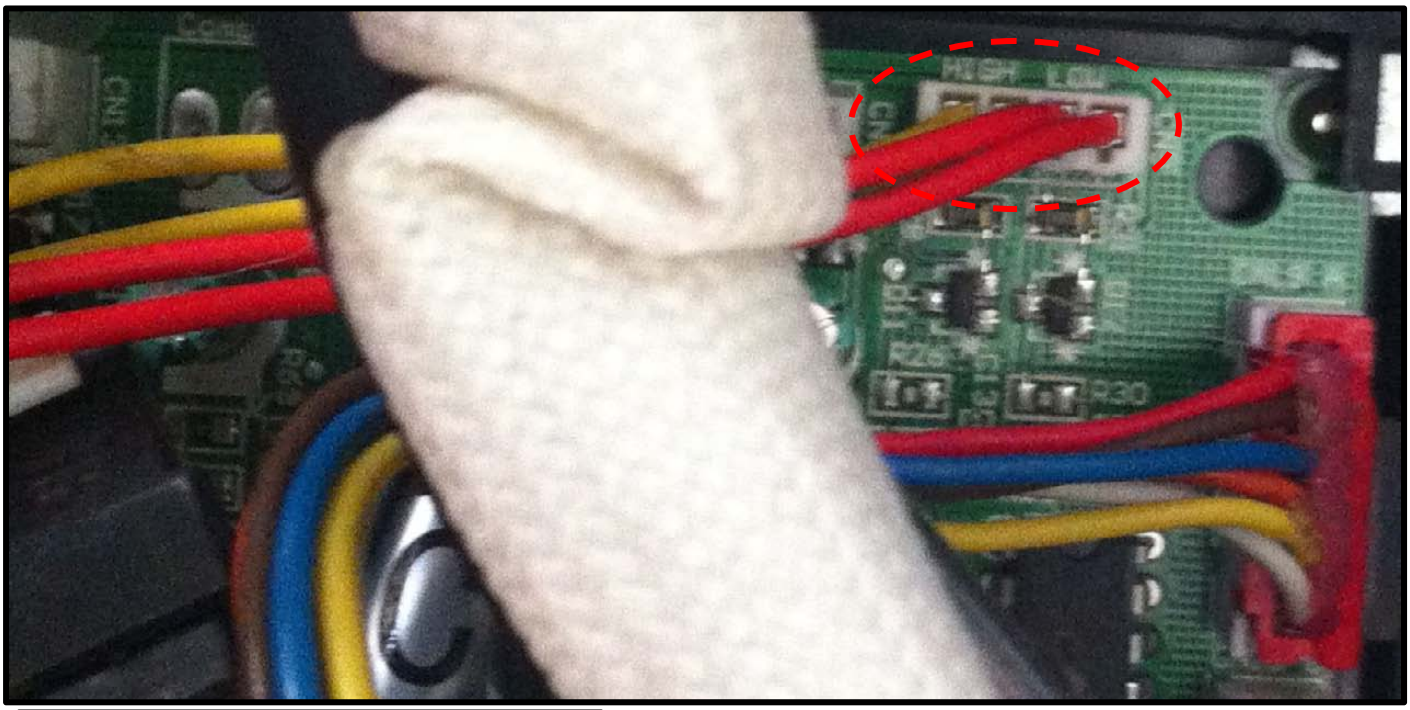

FLUKE
00.2
OFF
300mV
10A

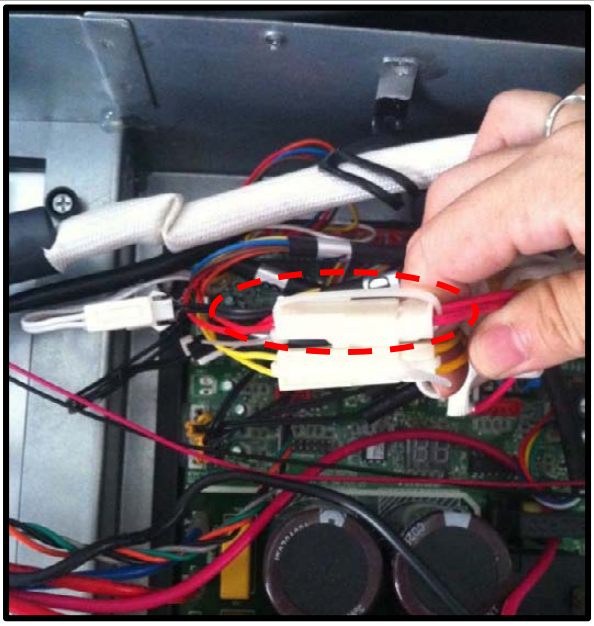
9.4.2.8 P2 (Low pressure protection) error diagnosis and solution. (Only for YN036GMFI16M4D)

Error Code	P2
Malfunction decision conditions	If the sampling voltage is not 5V, the LED will display the failure.
Supposed causes	● Wiring mistake ● Over load protector faulty ● System block ● Outdoor PCB faulty

Trouble shooting:




HIGH
LOW
R30

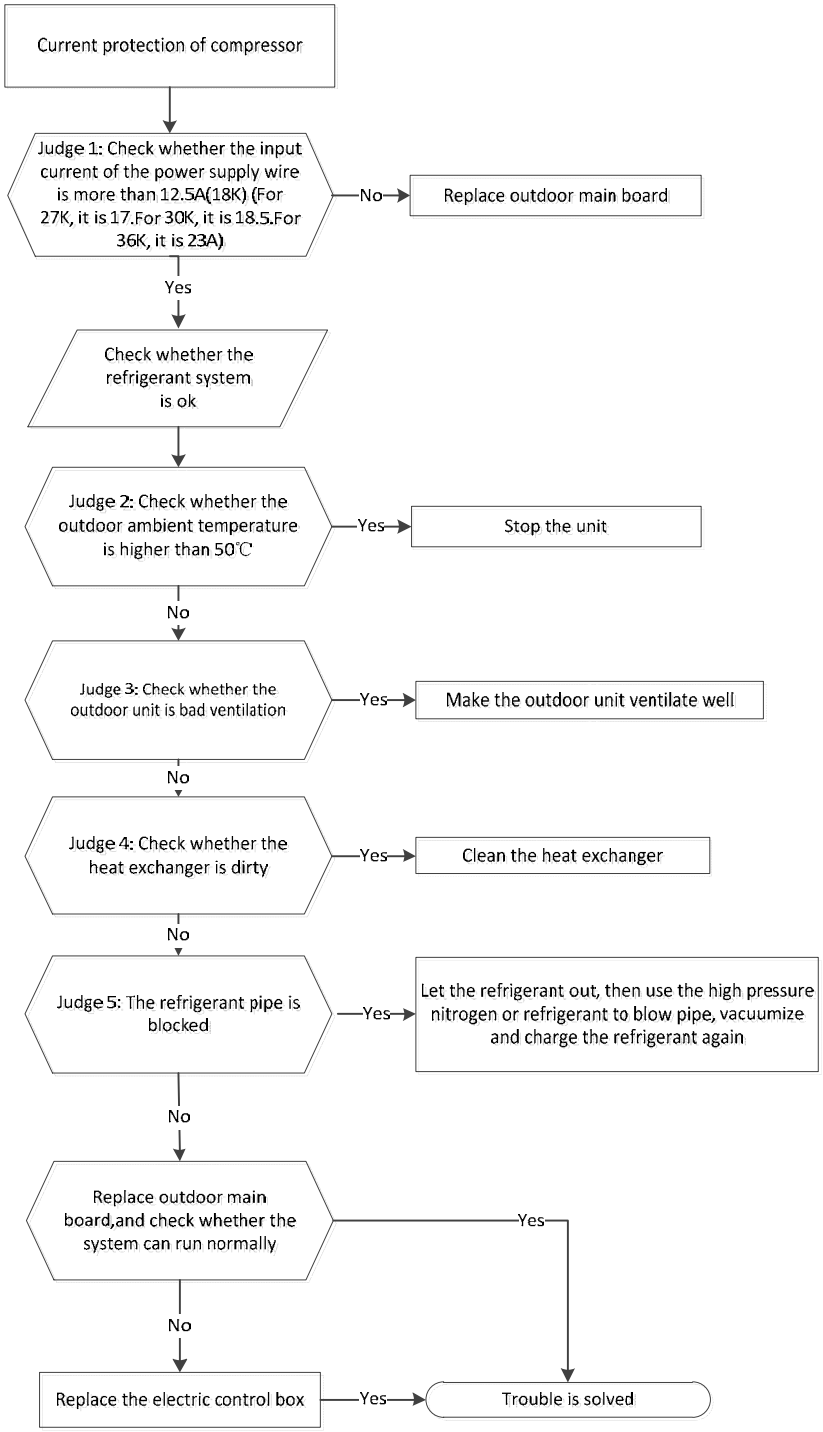



FLUKE
OFF
300mV
10A
COM

9.4.2.9 P3 (Current protection of compressor) error diagnosis and solution.

Error Code	P3
Malfunction decision conditions	If the compressor current exceeds the current limit value for 10 seconds, the LED will display the failure.
Supposed causes	● Wiring mistake ● Over load protector faulty ● System block ● Outdoor PCB faulty

Trouble shooting:



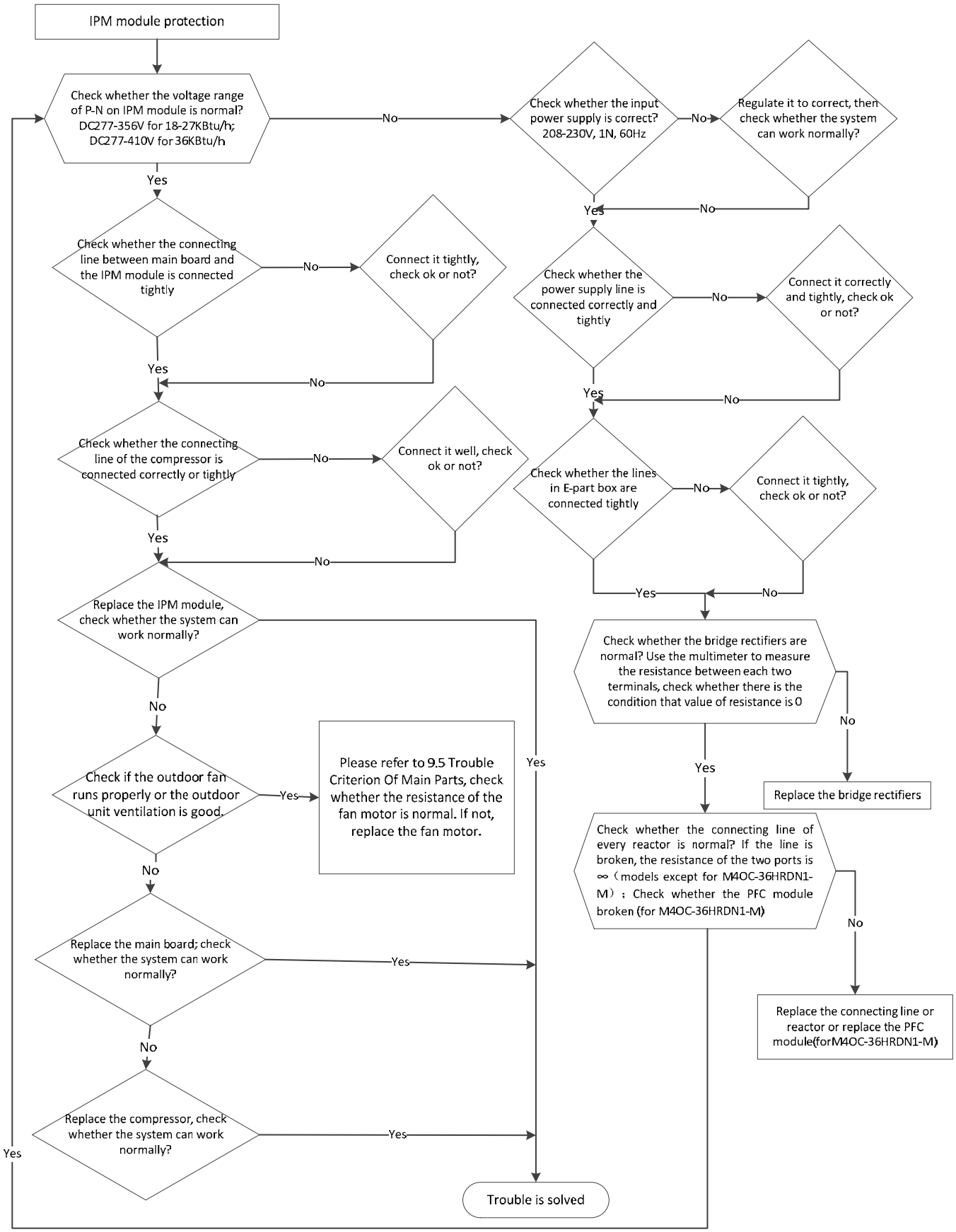

RANGE
HOLD
HIOKI 3282
6.53
DIGITAL CLAMP ON HITESTER
CAT IV
600V
COM
TEMP


RANGE
HOLD
HIOKI 3282
6.61
DIGITAL CLAMP ON HITESTER
CAT IV
600V
COM
TEMP

9.4.2.10 P4 (IPM module protection) error diagnosis and solution.

Error Code	P4
Malfunction decision conditions	When the voltage signal that IPM send to compressor drive chip is abnormal, the display LED will show “P4” and AC will turn off.
Supposed causes	● Wiring mistake ● IPM malfunction ● Outdoor fan ass’y faulty ● Compressor malfunction ● Outdoor PCB faulty

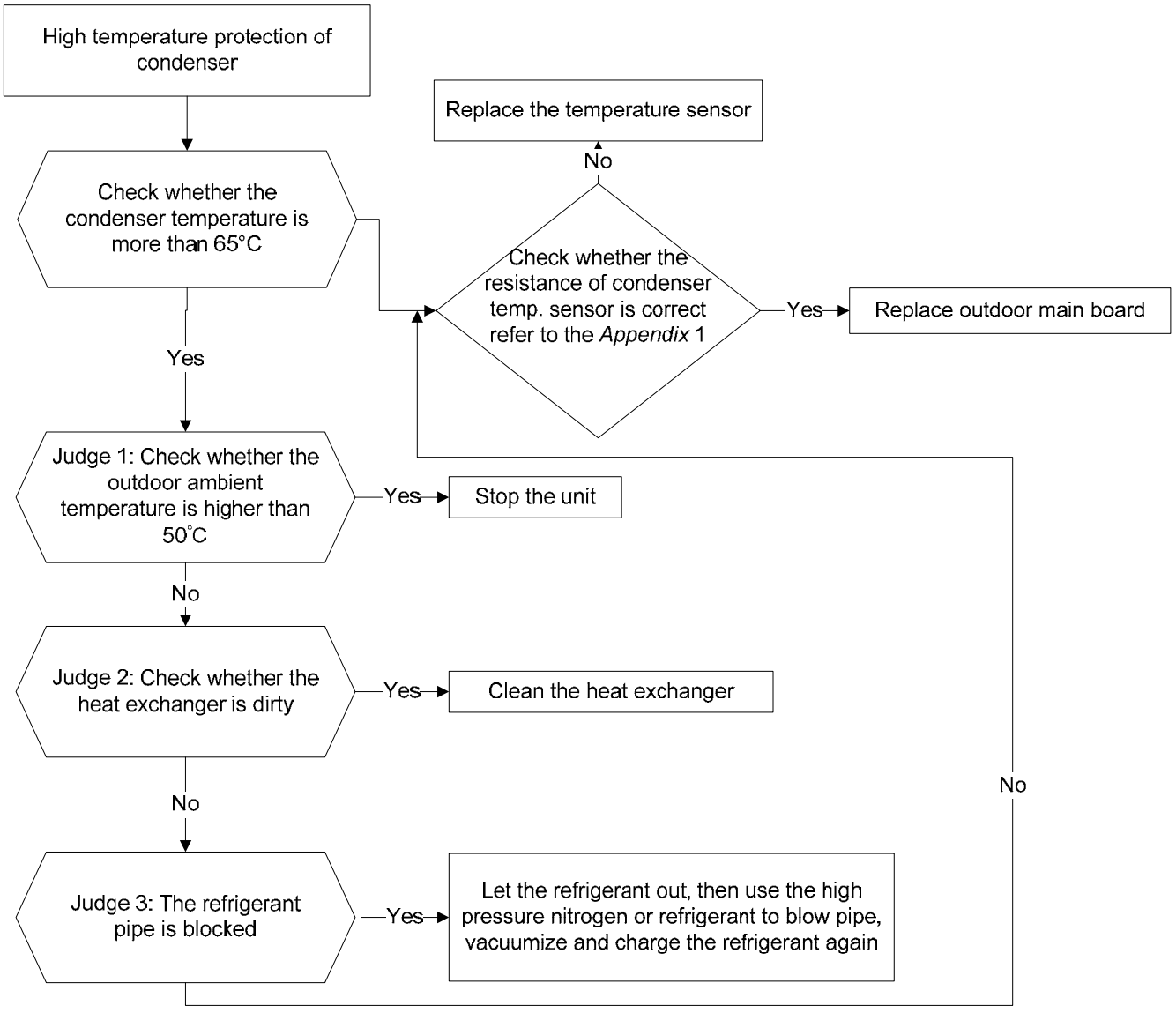
Trouble shooting:


IPM module protection
Check whether the voltage range of P-N on IPM module is normal? DC277-356V for 18-27KBtu/h; DC277-410V for 36KBtu/h
No
Check whether the input power supply is correct? 208-230V, 1N, 60Hz
No
Regulate it to correct, then check whether the system can work normally?
No
Yes
Yes
Check whether the connecting line between main board and the IPM module is connected tightly
No
Connect it tightly, check ok or not?
Check whether the power supply line is connected correctly and tightly
No
Connect it correctly and tightly, check ok or not?
Yes
No
Yes
No
Check whether the connecting line of the compressor is connected correctly or tightly
No
Connect it well, check ok or not?
Check whether the lines in E-part box are connected tightly
No
Connect it tightly, check ok or not?
Yes
No
Yes
No
Replace the IPM module, check whether the system can work normally?
Yes
Check whether the bridge rectifiers are normal? Use the multimeter to measure the resistance between each two terminals, check whether there is the condition that value of resistance is 0
No
Replace the bridge rectifiers
No
Check if the outdoor fan runs properly or the outdoor unit ventilation is good.
Yes
Please refer to 9.5 Trouble Criterion Of Main Parts, check whether the resistance of the fan motor is normal. If not, replace the fan motor.
Yes
Yes
Check whether the connecting line of every reactor is normal? If the line is broken, the resistance of the two ports is ∞（models except for M4OC-36HRDN1-M）; Check whether the PFC module broken (for M4OC-36HRDN1-M)
No
Replace the connecting line or reactor or replace the PFC module(forM4OC-36HRDN1-M)
No
Replace the main board; check whether the system can work normally?
Yes
No
Replace the compressor, check whether the system can work normally?
Yes
Yes
Trouble is solved

9.4.2.11 P6 (High temperature protection of condenser) error diagnosis and solution.

Error Code	P6
Malfunction decision conditions	When outdoor pipe temperature is more than 65°C, the unit will stop, and unit runs again when outdoor pipe temperature is less than 52°C
Supposed causes	● The condenser temperature sensor faulty ● Heat exchanger dirty ● System block

Trouble shooting:



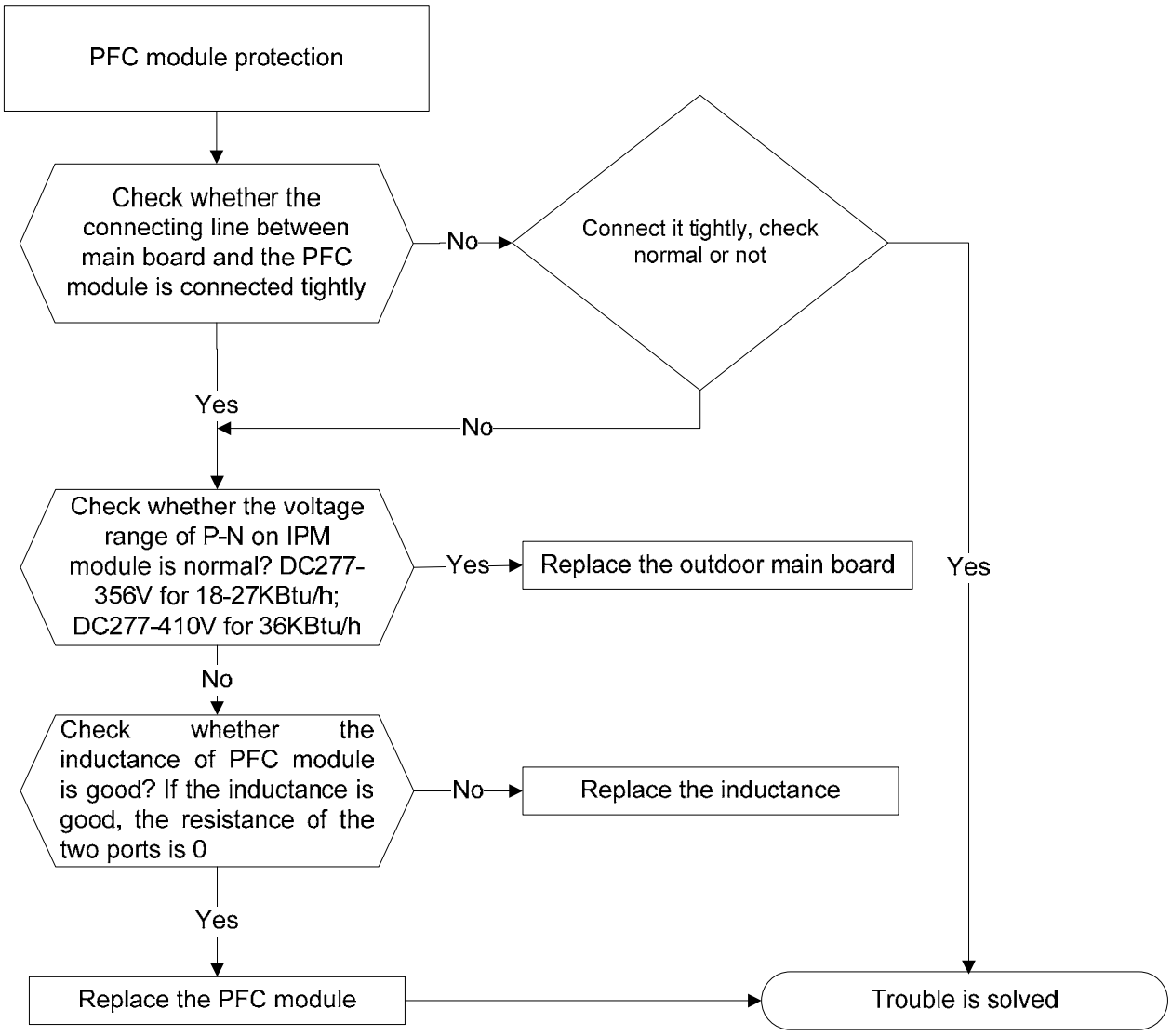
9.4.2.12 P7 (Inverter compressor drive protection) error diagnosis and solution.

The same as P4 (IPM module protection)

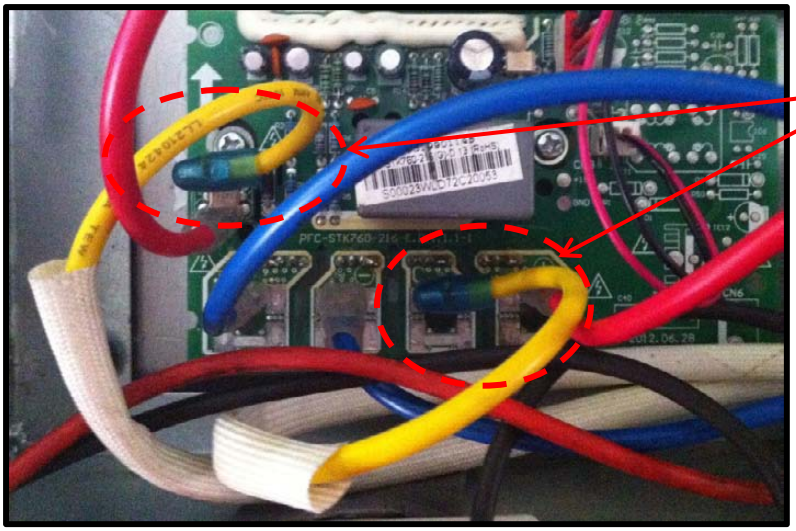
9.4.2.13 PF(PFC module protection) error diagnosis and solution. (Only for YN036GMFI16M4D)

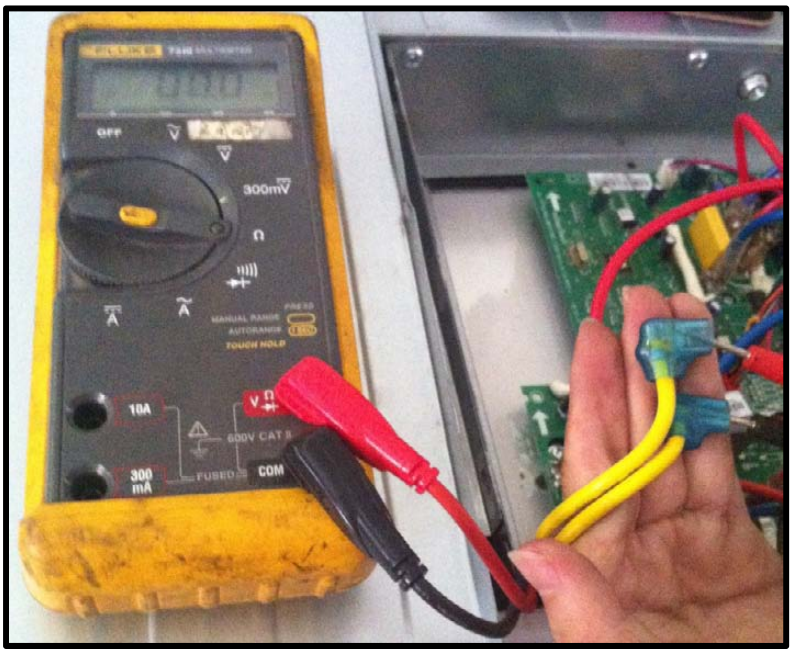
Error Code	PF
Malfunction decision conditions	When the voltage signal that PFC sends to main control board is abnormal, the display LED will show “PF” and AC will turn off.
Supposed causes	● Wiring mistake ● Outdoor PCB faulty ● Inductance of PFC module faulty ● PFC module malfunction

Trouble shooting:




Inductance


Two ports of the inductance


OFF
300mV
MANUAL RANGE
AUTORANGE
TOUCH HOLD
10A
600V CAT II
300 mA
FUSED
COM

9.4.2.14 The cooling operation or heating operation does not operate.

Supposed causes	● 4-way valve faulty

Check of 4-way, please refer to part 5 in 9.5 Trouble Criterion Of Main Parts.

9.4.2.15 When cooling, heat exchanger of non-operating indoor unit freezes.

When heating, non-operating indoor unit get warm.

Supposed causes	● EXV faulty ● Wire and tubing connected in reverse.

Check of EXV, please refer to part 6 in 9.5 Trouble Criterion Of Main Parts.

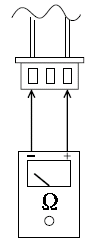
9.5 Trouble Criterion Of Main Parts.

Spec.

Indoor unit				
Model		9k Wall	12k Wall	18k Wall
Indoor fan motor		RPG20B	RPG20B	RPG28H
Model			12K Ducted	18K Ducted
Indoor fan motor			YSK27-4G	YSK68-4B
Model			12K Cassette	18K Cassette
Indoor fan motor			WZDK37-38G	WZDK37-38G
Model			12K Floor-Ceiling	18K Floor-Ceiling
Indoor fan motor			WZDK55-38GS-W	WZDK55-38GS-W
Model			12K Floor Console	
Indoor fan motor			RD-280-20-8A	
Outdoor unit				
Model		YN018GMFI16M2D	YN027GMFI16M3D	YN036GMFI16M4D
Compressor		DA130S1C-20FZ	DA150S1C-20FZ	TNB306FPGMC-L
Outdoor fan motor		YDK70-6FB	YDK53-6FB(B)	YDK180-8GB

1.Temperature sensor checking

Disconnect the temperature sensor from PCB, measure the resistance value with a tester.



Tester

Temperature Sensors.

Room temp.(T1) sensor,

Indoor coil temp.(T2) sensor,

Outdoor coil temp.(T3) sensor,

Outdoor ambient temp.(T4) sensor,

Compressor discharge temp.(Tp) sensor.

Measure the resistance value of each winding by using the multi-meter.

Appendix 1 Temperature Sensor Resistance Value Table (℃--K)

℃	K Ohm	℃	K Ohm	℃	K Ohm	℃	K Ohm
-20	115.266	20	12.6431	60	2.35774	100	0.62973
-19	108.146	21	12.0561	61	2.27249	101	0.61148
-18	101.517	22	11.5000	62	2.19073	102	0.59386
-17	96.3423	23	10.9731	63	2.11241	103	0.57683
-16	89.5865	24	10.4736	64	2.03732	104	0.56038
-15	84.2190	25	10.000	65	1.96532	105	0.54448
-14	79.3110	26	9.55074	66	1.89627	106	0.52912
-13	74.5360	27	9.12445	67	1.83003	107	0.51426
-12	70.1698	28	8.71983	68	1.76647	108	0.49989
-11	66.0898	29	8.33566	69	1.70547	109	0.48600
-10	62.2756	30	7.97078	70	1.64691	110	0.47256
-9	58.7079	31	7.62411	71	1.59068	111	0.45957
-8	56.3694	32	7.29464	72	1.53668	112	0.44699
-7	52.2438	33	6.98142	73	1.48481	113	0.43482
-6	49.3161	34	6.68355	74	1.43498	114	0.42304
-5	46.5725	35	6.40021	75	1.38703	115	0.41164
-4	44.0000	36	6.13059	76	1.34105	116	0.40060
-3	41.5878	37	5.87359	77	1.29078	117	0.38991
-2	39.8239	38	5.62961	78	1.25423	118	0.37956
-1	37.1988	39	5.39689	79	1.21330	119	0.36954
0	35.2024	40	5.17519	80	1.17393	120	0.35982
1	33.3269	41	4.96392	81	1.13604	121	0.35042
2	31.5635	42	4.76253	82	1.09958	122	0.3413
3	29.9058	43	4.57050	83	1.06448	123	0.33246
4	28.3459	44	4.38736	84	1.03069	124	0.32390
5	26.8778	45	4.21263	85	0.99815	125	0.31559
6	25.4954	46	4.04589	86	0.96681	126	0.30754
7	24.1932	47	3.88673	87	0.93662	127	0.29974
8	22.5662	48	3.73476	88	0.90753	128	0.29216
9	21.8094	49	3.58962	89	0.87950	129	0.28482
10	20.7184	50	3.45097	90	0.85248	130	0.27770
11	19.6891	51	3.31847	91	0.82643	131	0.27078
12	18.7177	52	3.19183	92	0.80132	132	0.26408
13	17.8005	53	3.07075	93	0.77709	133	0.25757
14	16.9341	54	2.95896	94	0.75373	134	0.25125
15	16.1156	55	2.84421	95	0.73119	135	0.24512
16	15.3418	56	2.73823	96	0.70944	136	0.23916
17	14.6181	57	2.63682	97	0.68844	137	0.23338
18	13.9180	58	2.53973	98	0.66818	138	0.22776
19	13.2631	59	2.44677	99	0.64862	139	0.22231

Appendix 2

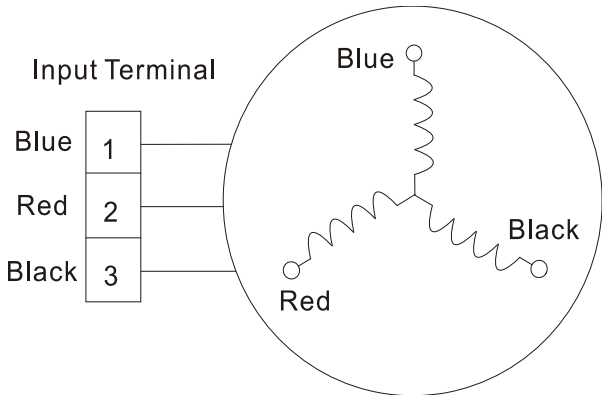
Unit: ℃---K			Discharge temp. sensor table				
-20	542.7	20	68.66	60	13.59	100	3.702
-19	511.9	21	65.62	61	13.11	101	3.595
-18	483	22	62.73	62	12.65	102	3.492
-17	455.9	23	59.98	63	12.21	103	3.392
-16	430.5	24	57.37	64	11.79	104	3.296
-15	406.7	25	54.89	65	11.38	105	3.203
-14	384.3	26	52.53	66	10.99	106	3.113
-13	363.3	27	50.28	67	10.61	107	3.025
-12	343.6	28	48.14	68	10.25	108	2.941
-11	325.1	29	46.11	69	9.902	109	2.86
-10	307.7	30	44.17	70	9.569	110	2.781
-9	291.3	31	42.33	71	9.248	111	2.704
-8	275.9	32	40.57	72	8.94	112	2.63
-7	261.4	33	38.89	73	8.643	113	2.559
-6	247.8	34	37.3	74	8.358	114	2.489
-5	234.9	35	35.78	75	8.084	115	2.422
-4	222.8	36	34.32	76	7.82	116	2.357
-3	211.4	37	32.94	77	7.566	117	2.294
-2	200.7	38	31.62	78	7.321	118	2.233
-1	190.5	39	30.36	79	7.086	119	2.174
0	180.9	40	29.15	80	6.859	120	2.117
1	171.9	41	28	81	6.641	121	2.061
2	163.3	42	26.9	82	6.43	122	2.007
3	155.2	43	25.86	83	6.228	123	1.955
4	147.6	44	24.85	84	6.033	124	1.905
5	140.4	45	23.89	85	5.844	125	1.856
6	133.5	46	22.89	86	5.663	126	1.808
7	127.1	47	22.1	87	5.488	127	1.762
8	121	48	21.26	88	5.32	128	1.717
9	115.2	49	20.46	89	5.157	129	1.674
10	109.8	50	19.69	90	5	130	1.632
11	104.6	51	18.96	91	4.849		
12	99.69	52	18.26	92	4.703		
13	95.05	53	17.58	93	4.562		
14	90.66	54	16.94	94	4.426		
15	86.49	55	16.32	95	4.294	B(25/50)=3950K	
16	82.54	56	15.73	96	4.167		
17	78.79	57	15.16	97	4.045	R(90℃)=5KΩ±3%	
18	75.24	58	14.62	98	3.927		
19	71.86	59	14.09	99	3.812		

Appendix 3:

℃	10	11	12	13	14	15	16	17	18	19	20	21	22
℉	48	50	52	54	56	58	60	62	64	66	68	70	72
℃	23	24	25	26	27	28	29	30	31	32	33	34	35
℉	74	76	78	80	82	84	86	88	90	92	94	96	98

2.Compressor check

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



Position		Resistance Value		
	DA130S1C-20FZ	DA150S1C-20FZ	DA250S2C-30MT	TNB306FPGMC-L
Blue - Red	0.95Ω(20℃)	0.95Ω(20℃)	0.55Ω(20℃)	0.53Ω(20℃)

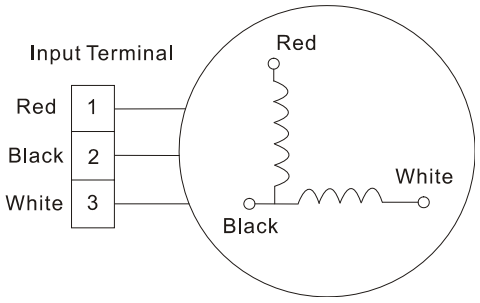
3.IPM continuity check

Turn off the power, let the large capacity electrolytic capacitors discharge completely, and 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		

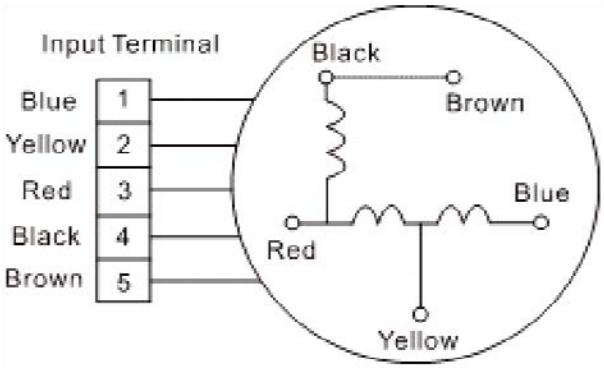
4. AC Fan Motor.

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



Position	Resistance Value			
	RPG20B		RPG28H	
Black - Red	381Ω±8% (20℃) (Brand: Weiling)	342Ω±8% (20℃) (Brand: Dayang)	183.6Ω±8% (20℃) (Brand: Weiling)	180Ω±8% (20℃) (Brand: Wolong)
White - Black	267Ω±8% (20℃) (Brand: Weiling)	253Ω±8% (20℃) (Brand: Dayang)	206Ω±8% (20℃) (Brand: Weiling)	190Ω±8% (20℃) (Brand: Wolong)

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

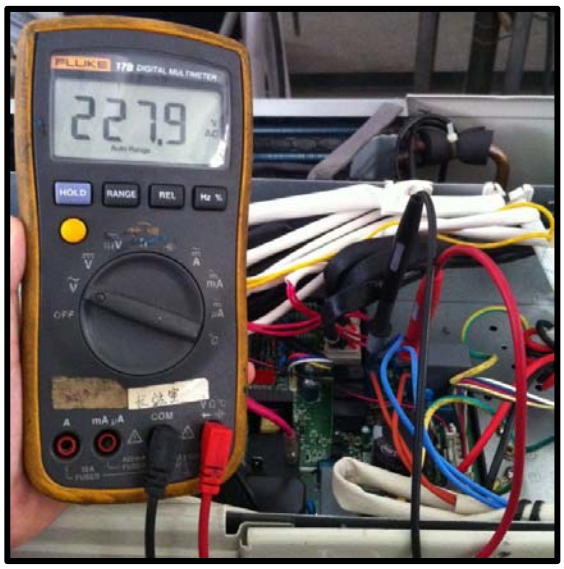


Position	Resistance Value						
	YDK70-6FB	YDK180-8GB	YSK27-4G	YSK68-4B	YDK45-6B	YSK25-6L	YDK53-6FB(B)
Black - Red	56Ω±8% (20℃)	24.5Ω±8% (20℃)	317Ω±8% (20℃)	145Ω±8% (20℃)	345Ω±8% (20℃)	627Ω±8% (20℃)	88.5Ω±8% (20℃)
Red - Yellow	76Ω±8% (20℃)	19Ω±8% (20℃)	252Ω±8% (20℃)	88Ω±8% (20℃)	150Ω±8% (20℃)	374.3Ω±8% (20℃)	138Ω±8% (20℃)
Yellow - Blue	76Ω±8% (20℃)	19Ω±8% (20℃)	252Ω±8% (20℃)	88Ω±8% (20℃)	150Ω±8% (20℃)	374.3Ω±8% (20℃)	138Ω±8% (20℃)

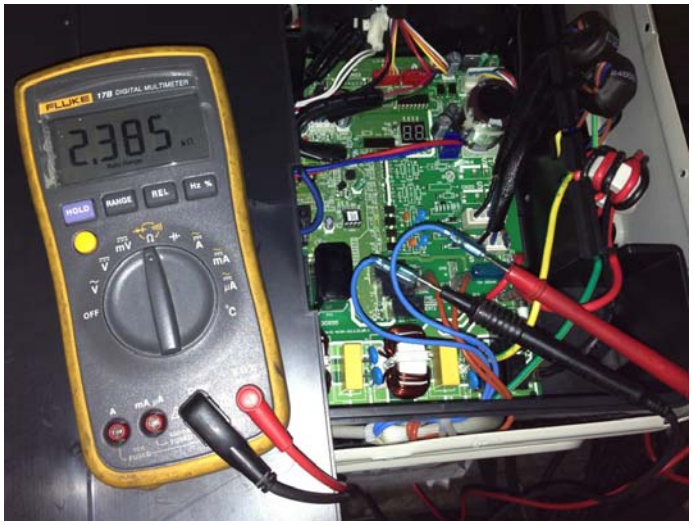
5.4-way valve

1. Power on, use a digital tester to measure the voltage, when the unit operates in cooling, it is 0V. When the unit operates in heating, it is about 230VAC.

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

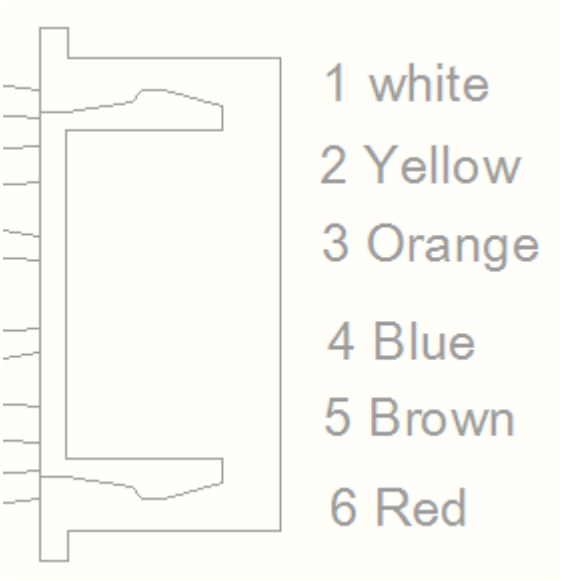


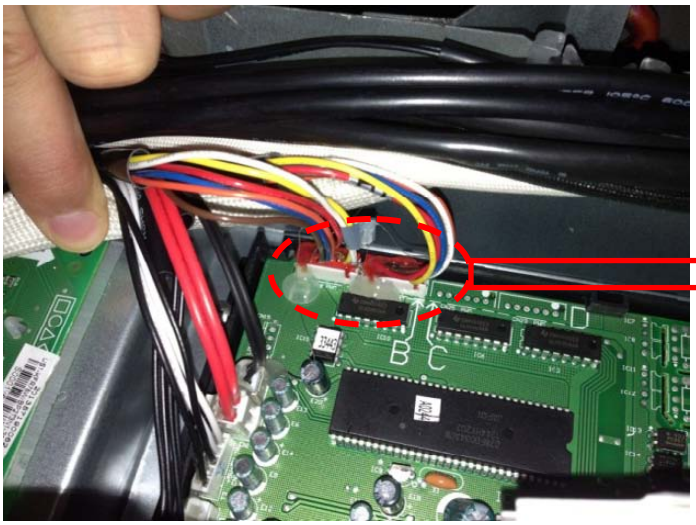
2 Turn off the power, use a digital tester to measure the resistance. The value should be 1.8~2.5 KΩ.

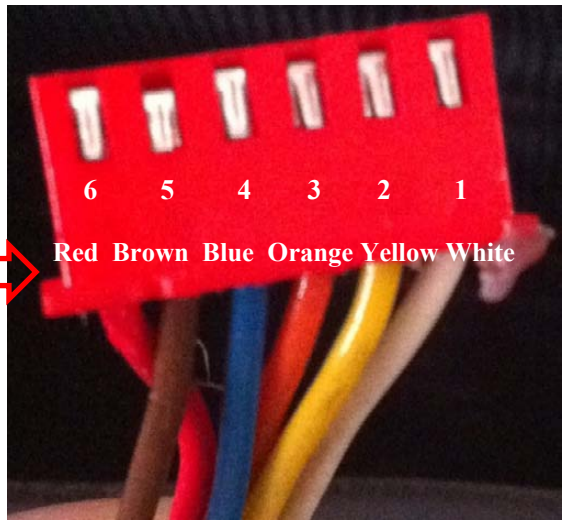


6.EXV check

Disconnect the connectors.

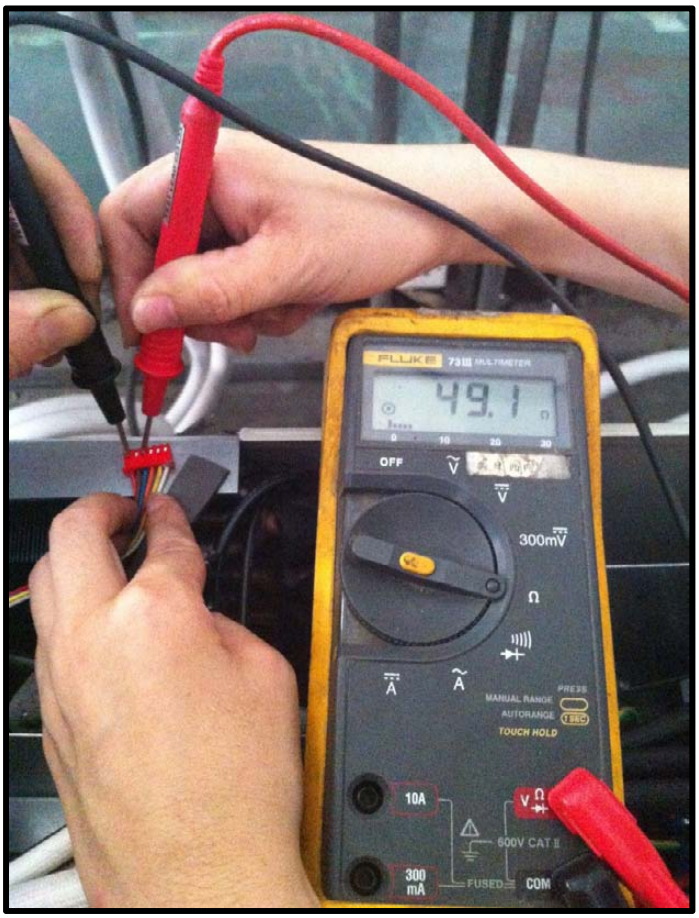




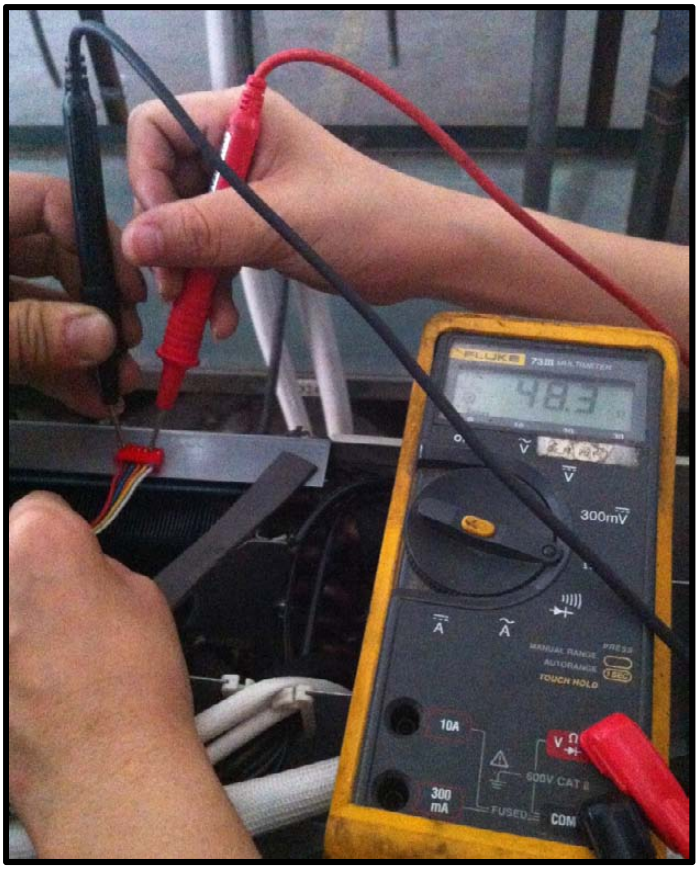


Resistance to EXV coil

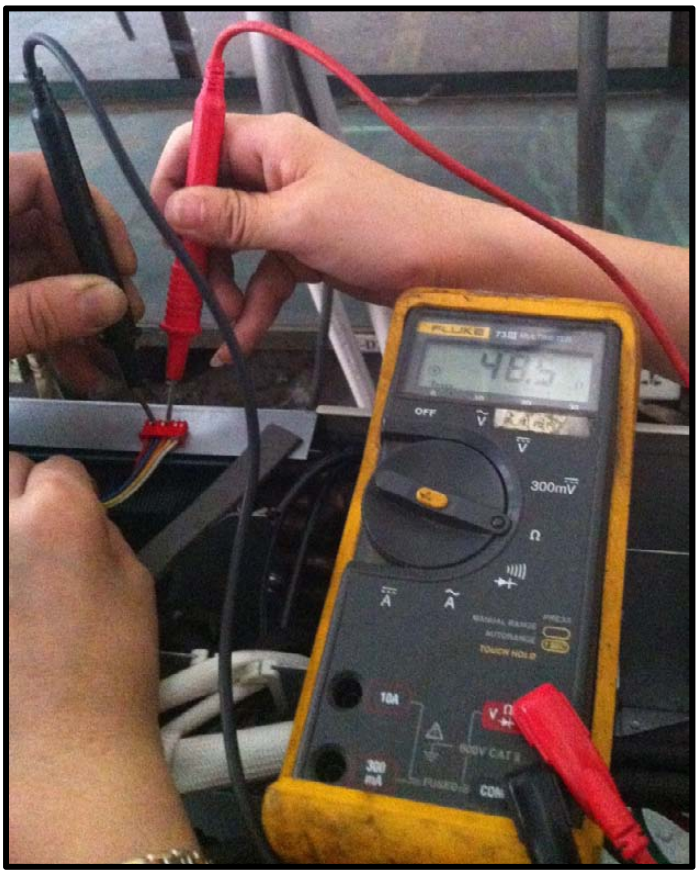
Color of lead wire	Normal Value
Red- Blue	About 50Ω
Red - Yellow	
Brown-Orange	
Brown-White	



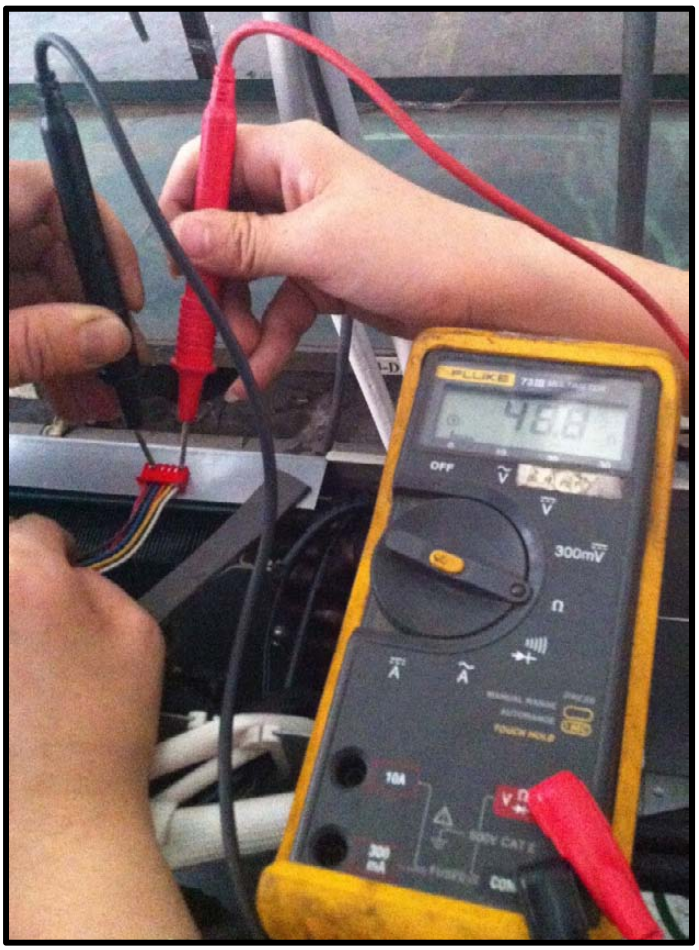
Red- Blue



Red - Yellow



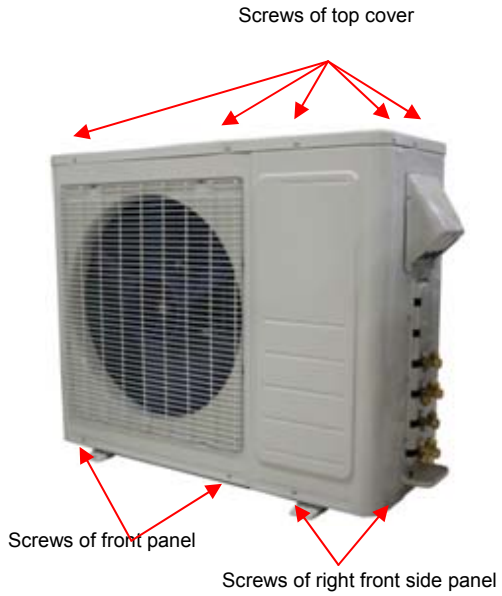
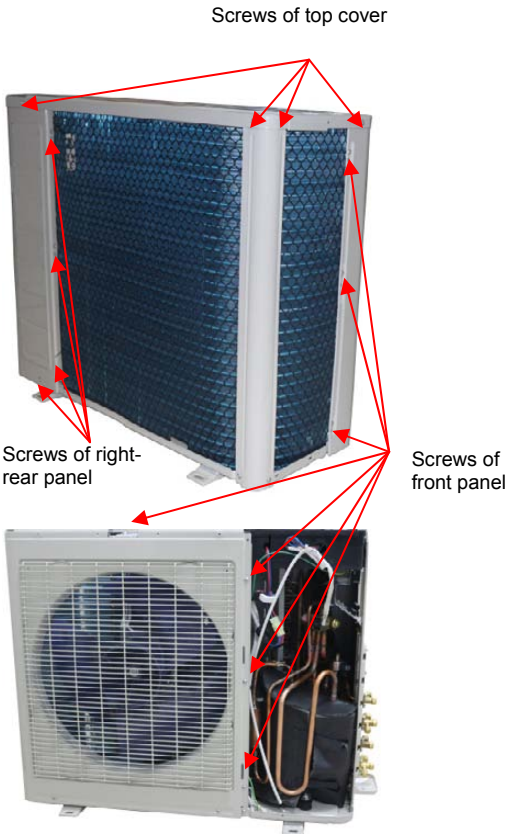
Brown-Orange

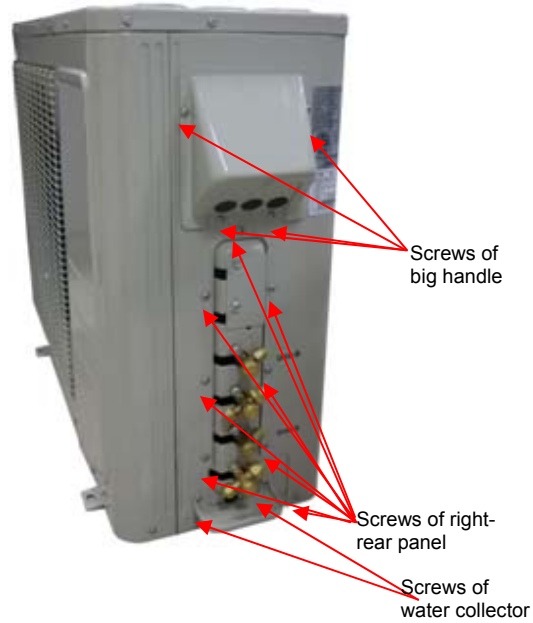


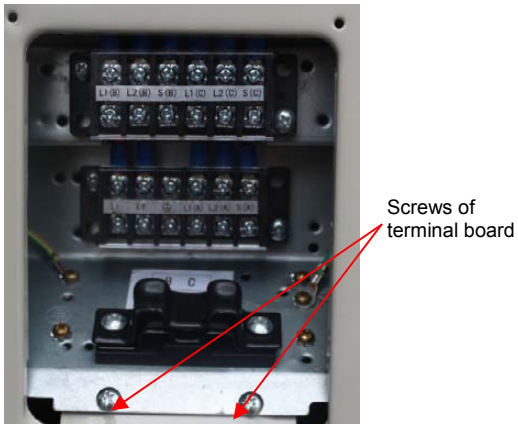
Brown-White

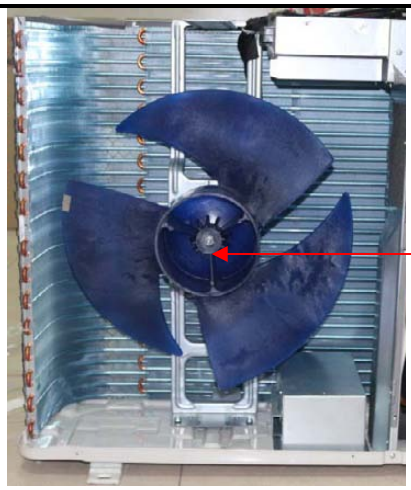
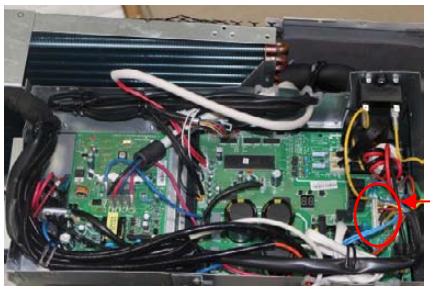
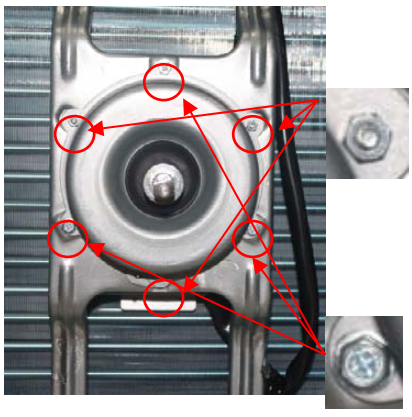
9. Disassembly Instructions

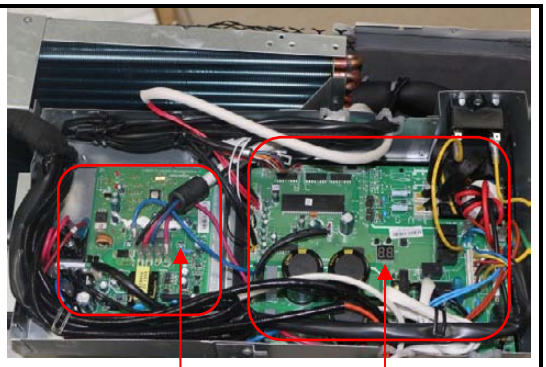
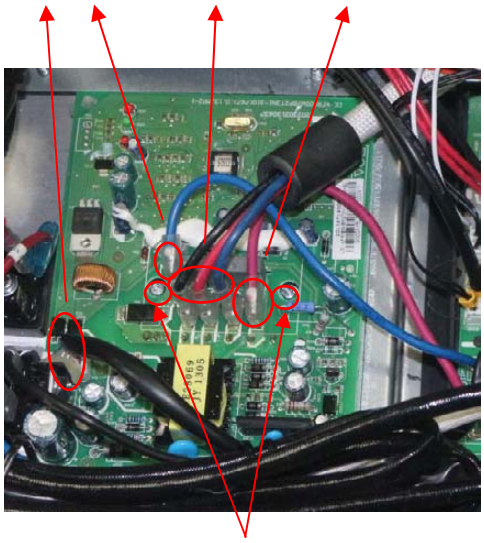
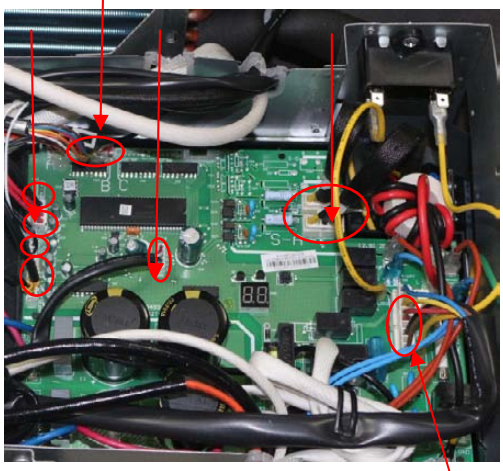
➢ **Model: YN018GMFI16M2D**

No.	Part name	Procedures	Remarks
1	Panel plate	How to remove the panel plate. 1) Stop operation of the air conditioner and turn “OFF” the power breaker. 2) Remove the screws of top cover, and remove the top cover. (9 screws) 3) Remove the screws of right front side panel, and remove the right front side panel (2 screws) 4) Remove the screws of front panel, and remove the front panel. (9 screws) 5) Remove the screws of big handle, and remove the big handle.(4 screws) 6) Remove two screws of terminal board, two screws of water collector and twelve screws of right-rear panel, and remove the right-rear panel.	 


Screws of
big handle
Screws of right-
rear panel
Screws of
water collector


Screws of
terminal board

2	Fan ass'y	How to remove the fan ass'y. 1) Remove the top cover, right front side panel and front panel from item 1.step 1~4 2) Remove the hex nut fixing the fan. 3) Remove the fan. 4) Remove the two fixing screws and then open the electrical control box cover. 5) Disconnect the fan motor connector CN3(5p,white) from the PCB board. 6) Remove the fan motor after unfastening six fixing screws. Note: There are two kinds of screws. Please pay attention to it when install the fan motor.	 ② ④   ⑤ 

3	Electrical parts	How to remove the electrical parts. 1) Perform work of item 1,2. 2) Disconnect following connection wires and connectors between IPM and PCB. P: (+, red), connected to P2 on PCB. N: (-, blue), connected to P4 on PCB. UVW: (blue-red-black) , connected to compressor. CN1: (5p, white),connected to CN22 on PCB. 3) Remove the IPM board after removing the two screws. 4) Disconnect the connectors and wires connected from PCB and other parts. Connectors: CN13:T-A,B temp. sensor (2p/2p,white) CN18:T3/T4 temp. sensor (2p/2p,white) CN14: Top temp. sensor (2p, white) CN21: Tdischarge temp. sensor (2p,white) CN26/CN28: Electronic expansive	 IPM board PCB board CN1 N UVW to compressor P  Screws of IPM CN21 CN26/CN28 CN14 CN22 CN29/  CN3

valve A,B (6p/6p,red/red)

CN29/CN31: S-A,S-B (3p/3p,white/white)

Wires:

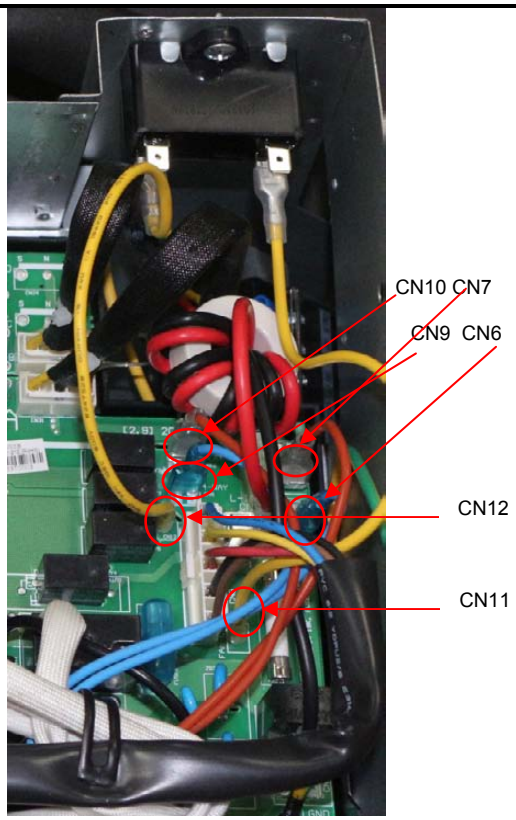
CN6/CN9: 4-way valve (blue-blue)

CN7/CN10: Crankcase heating cable (red-red)

CN11/CN12: Fan capacitor(yellow-yellow)

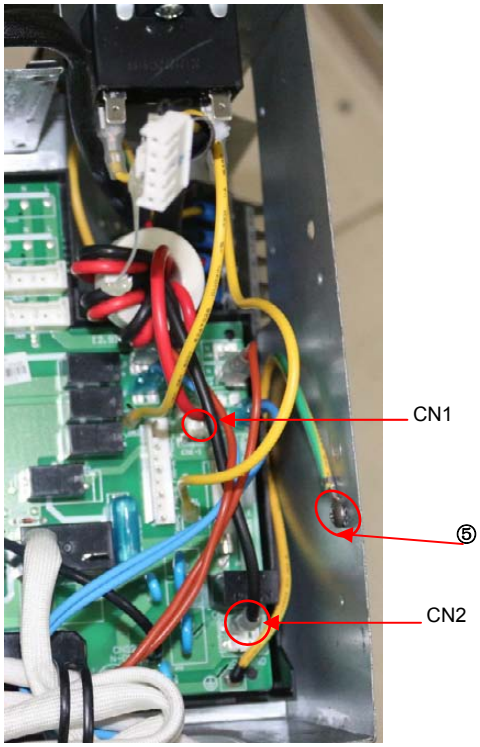
CN1:L-IN (red)

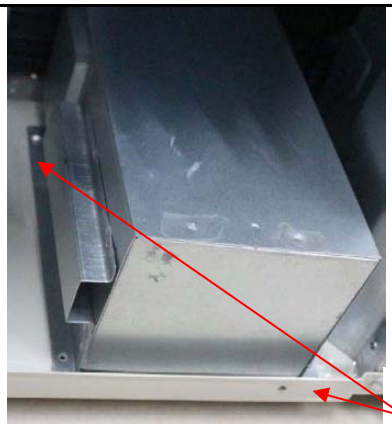
CN2:N-IN (black)

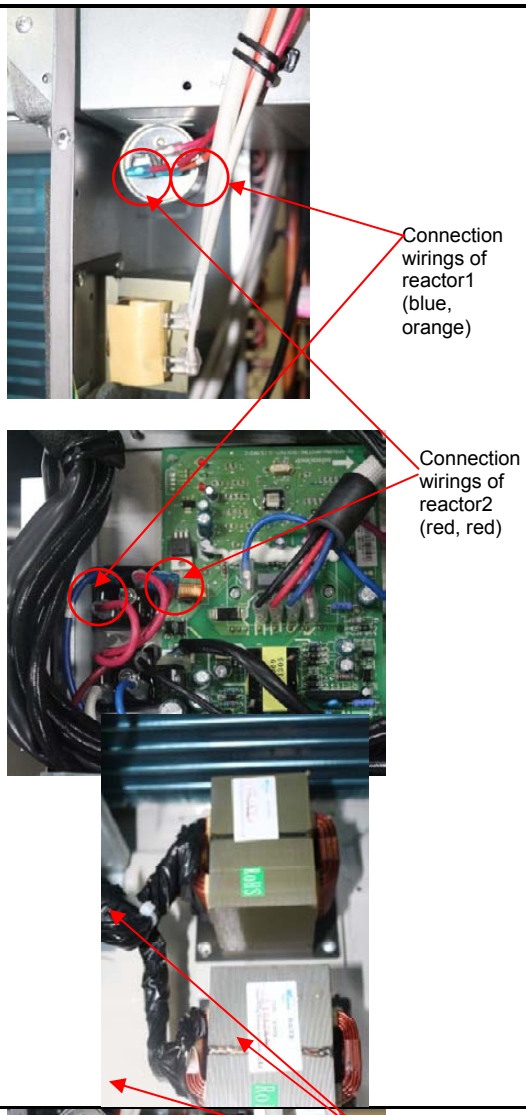
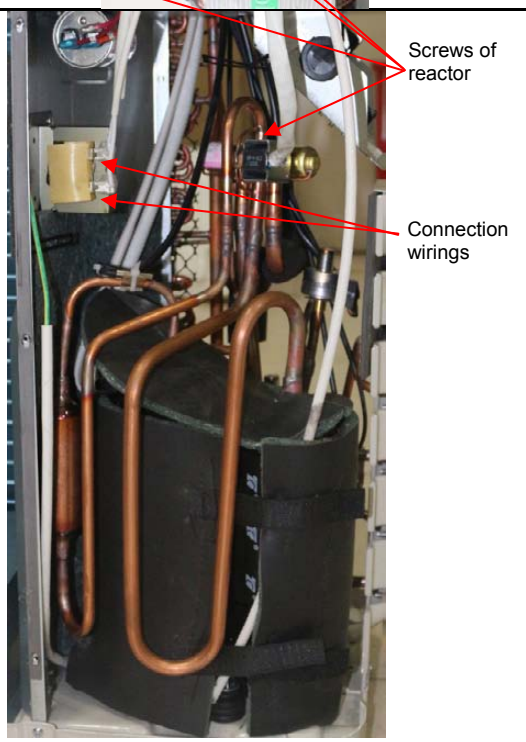


5) Disconnect the grounding wires (yellow-green).

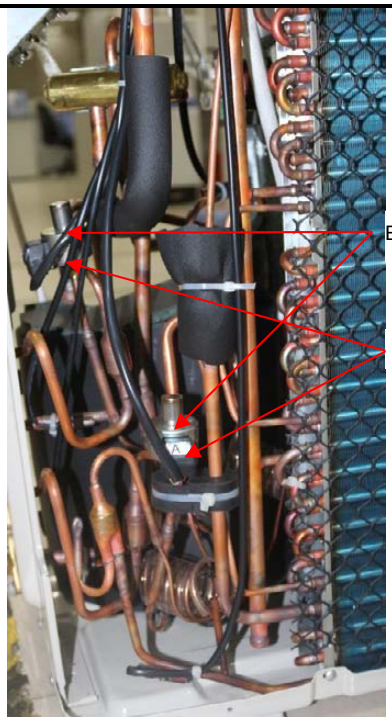
6) Remove the PCB board.



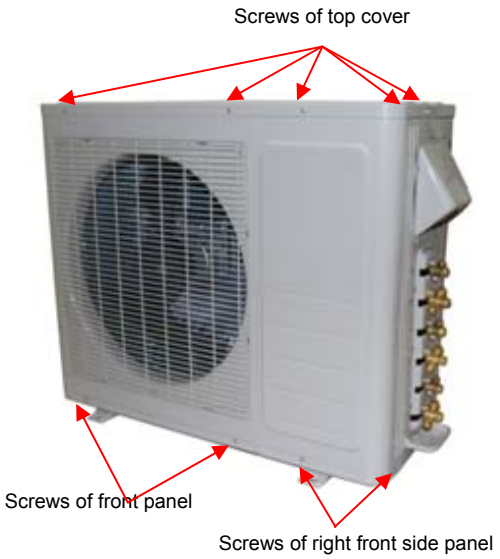
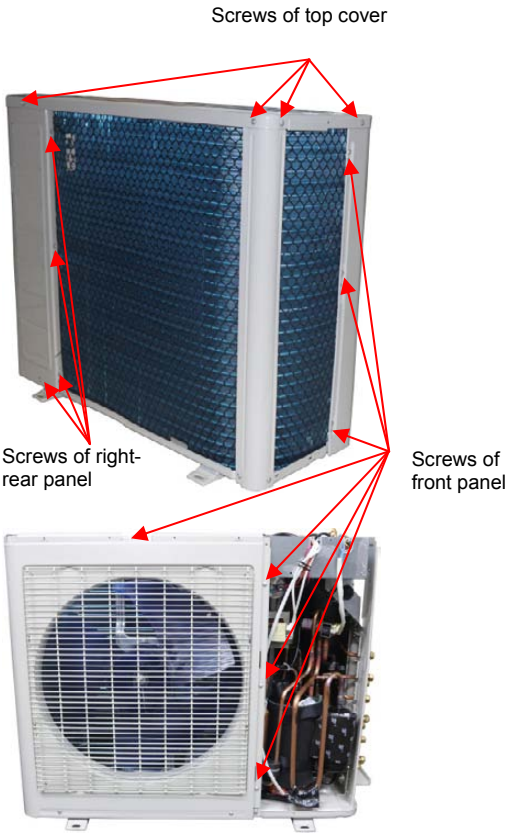
4	Compressor	How to remove the compressor. 1) Perform work of item 1,2,3. 2) Remove the electrical control box and partition plate. 3) Extract refrigerant gas. 4) Remove the sound insulation material and crankcase heating cable. 5) Remove terminal cover of compressor, and disconnect wires of compressor thermo and compressor from the terminal. 6) Remove the discharge pipe and suction pipe with a burner. 7) Remove the hex nuts and washers fixing the compressor to bottom plate. 8) Lift the compressor.	 
5	Reactor1、2	How to remove the reactor 1) Perform work of item 1 2) Remove two screws of cover of inductance, and remove the cover of inductance 3) Disconnect two pieces of connection wirings between reactor and capacitor and connection	

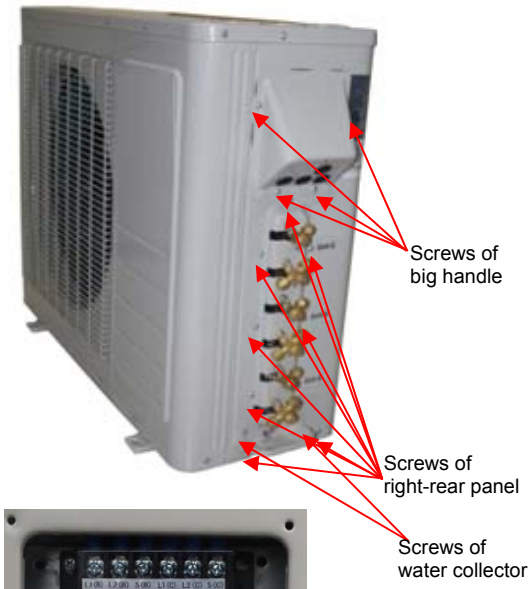
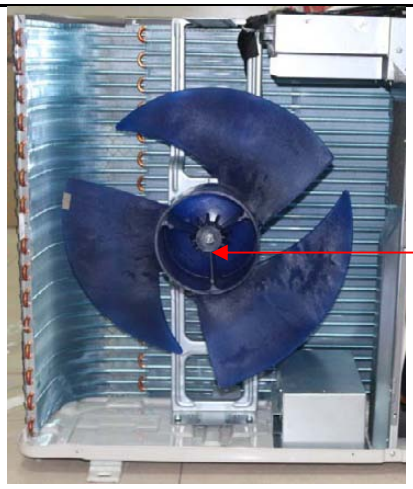
		wirings between reactor and rectifier. 4) Remove two screws of each reactor, and remove the reactor.	
6	Reactor3	How to remove the reactor 1) Perform work of item 1 2) Disconnect two pieces of connection wirings. 3) Remove two screws of each reactor, and remove the reactor.	

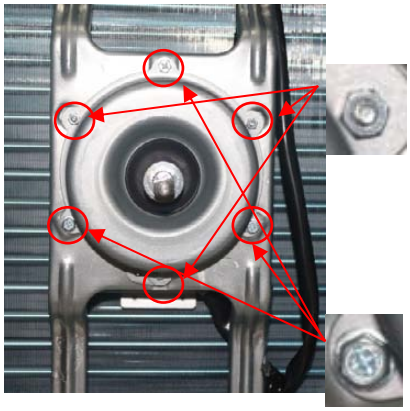
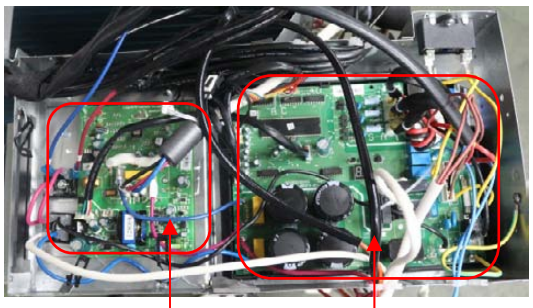
			
7	The 4-way valve	How to remove the 4-way valve 1) Perform work of item 1,2. 2) Extract refrigerant gas. 3) Remove the electrical parts from item 3. 4) Remove fixing screw of the coil, and remove the coil. 5) Detach the welded parts of 4-way valve and pipe.	

8	The expansion valve	How to remove the expansion valve 1) Perform work of item 1,2. 2) Remove the electrical parts from item 3.. 3) Remove the coils. 4) Detach the welded parts of expansion valves and pipes.	

➢ **Model: YN027GMFI16M3D**

No.	Part name	Procedures	Remarks
1	Panel plate	How to remove the panel plate. 1) Stop operation of the air conditioner and turn “OFF” the power breaker. 2) Remove the screws of top cover, and remove the top cover. (9 screws) 3) Remove the screws of right front side panel, and remove the right front side panel (2 screws) 4) Remove the screws of front panel, and remove the front panel. (9 screws) 5) Remove the screws of big handle, and remove the big handle.(4 screws) 6) Remove two screws of terminal board, two screws of water collector and twelve screws of right-rear panel, and remove the right-rear panel.	 

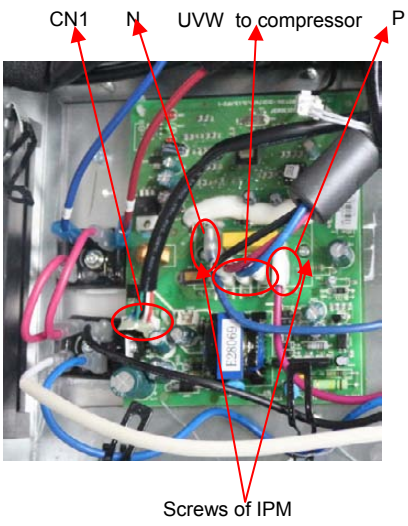
			  
2	Fan ass'y	How to remove the fan ass'y. 1) Remove the top cover, right front side panel and front panel from item 1.step 1~4 2) Remove the hex nut fixing the fan. 3) Remove the fan.	

		4) Remove the two fixing screws and then open the electrical control box cover. 5) Disconnect the fan motor connector CN3(5p,white) from the PCB board. 6) Remove the fan motor after unfastening six fixing screws. Note: There are two kinds of screws. Please pay attention to it when install the fan motor.	  
3	Electrical parts	How to remove the electrical parts. 1) Perform work of item 1,2. 2) Disconnect following connection wires and connectors between IPM and PCB. P: (+, red), connected to P2 on PCB.	

N: (-, blue), connected to P4 on PCB.

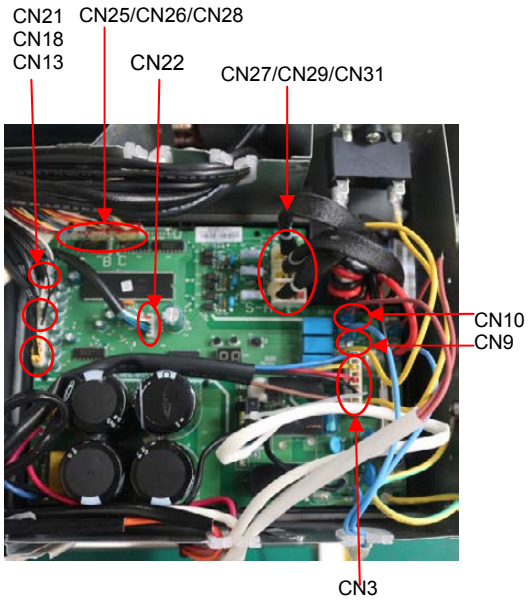
UVW: (blue-red-black) , connected to compressor.

CN1: (5p, white),connected to CN22 on PCB.



3) Remove the IPM board after removing the two screws.

4) Disconnect the connectors and wires connected from PCB and other parts.



Connectors:

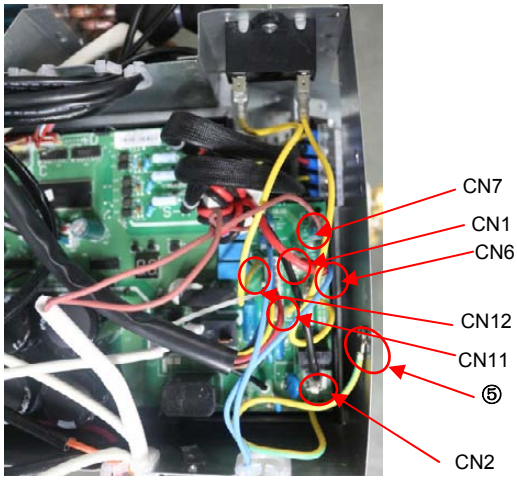
CN13:T-A,B,C temp. sensor (2p/2p/2p,white)

CN18:T3/T4 temp. sensor (2p/2p,white)

CN21: Tdischarge temp. sensor (2p,white)

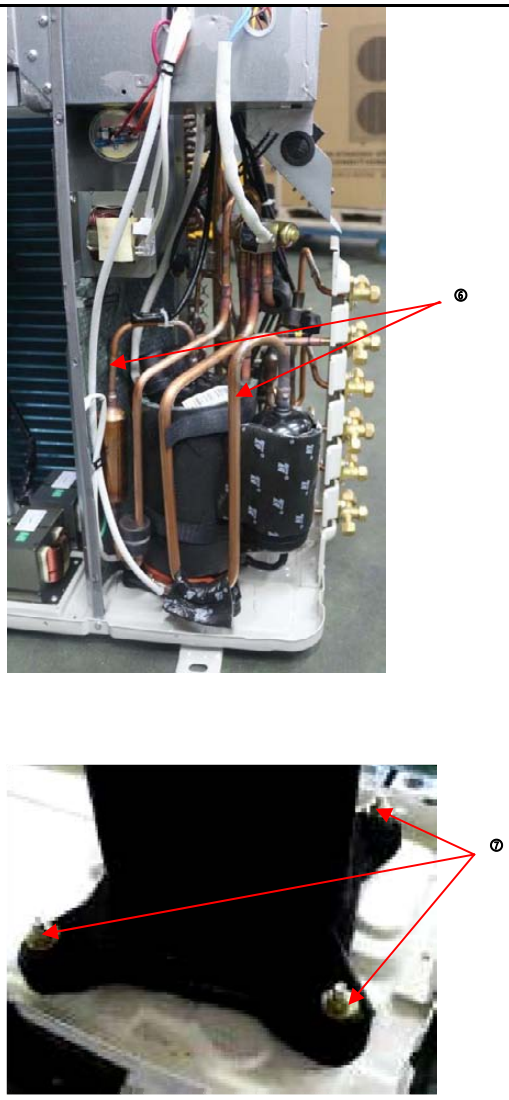
CN28/CN26/CN25: Electronic expansive valve A,B,C (6p/6p/6p,red/red/red)

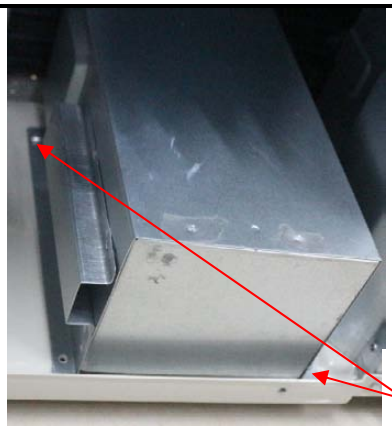
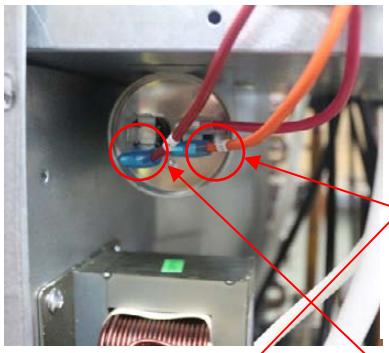
CN31/CN29/CN27: S-A,S-B,S-C (3p/3p/3p,white/white/white)

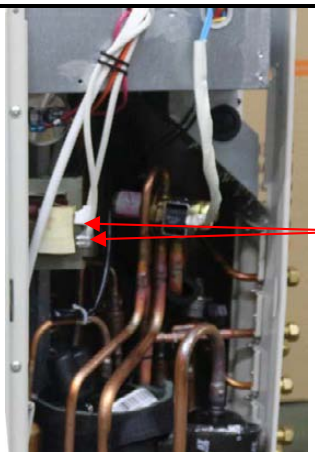
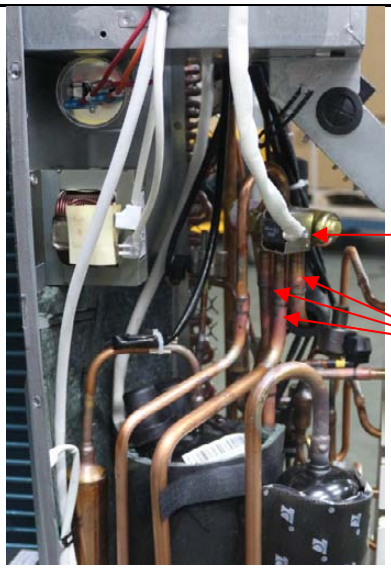


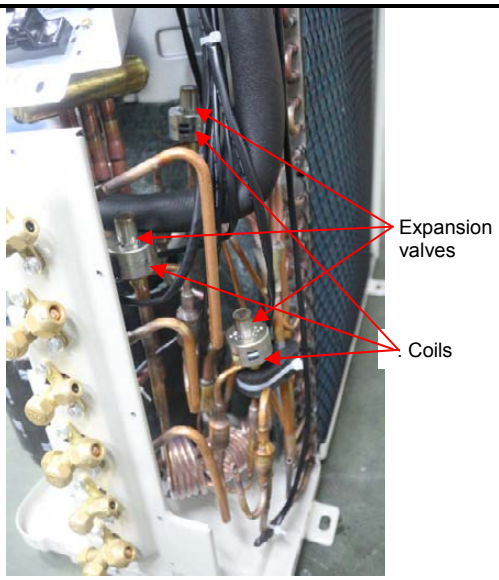
Wires:

CN6/CN9: 4-way valve (blue-blue)

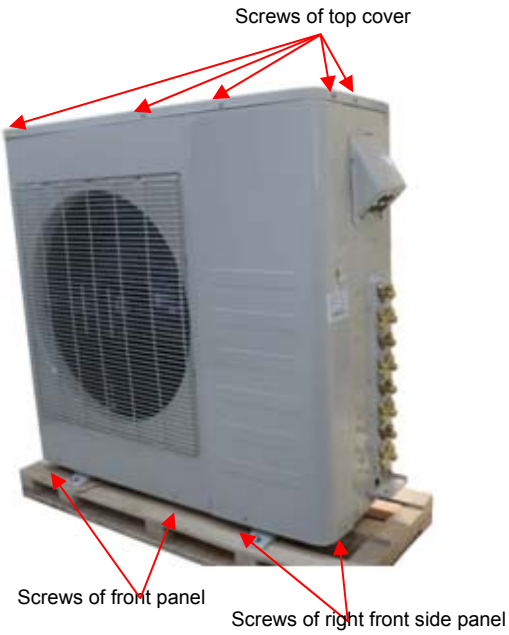
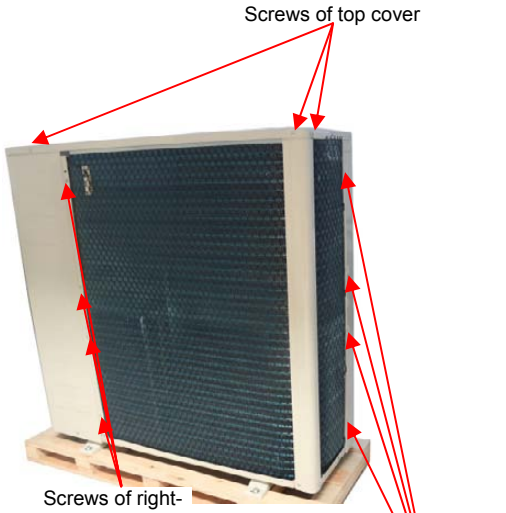
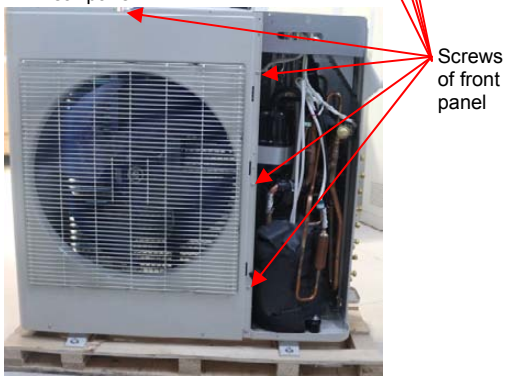
		CN7/CN10: Crankcase heating cable (red-red) CN11/CN12: Fan capacitor(yellow-yellow) CN1:L-IN (red) CN2:N-IN (black) 5) Disconnect the grounding wires (yellow-green). 6) Remove the PCB board.	
4	Compressor	How to remove the compressor. 1) Perform work of item 1,2,3. 2) Remove the electrical control box and partition plate. 3) Extract refrigerant gas. 4) Remove the sound insulation material and crankcase heating cable. 5) Remove terminal cover of compressor, and disconnect wires of compressor thermo and compressor from the terminal. 6) Remove the discharge pipe and suction pipe with a burner. 7) Remove the hex nuts and washers fixing the compressor to bottom plate. 8) Lift the compressor.	

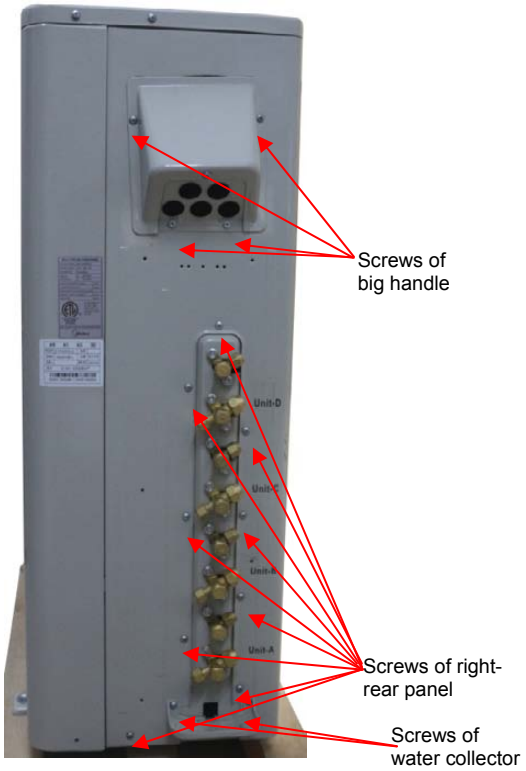
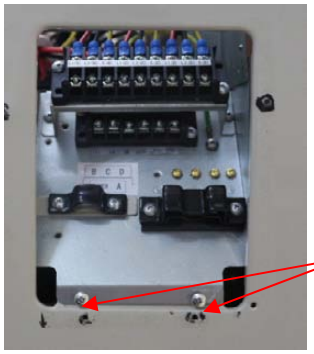
5	Reactor1、2	How to remove the reactor 1) Perform work of item 1 2) Remove two screws of cover of inductance, and remove the cover of inductance 3) Disconnect two pieces of connection wirings between reactor and capacitor and connection wirings between reactor and rectifier. 4) Remove two screws of each reactor, and remove the reactor.	 Screws of cover of inductance  Connection wirings of reactor1 (blue, orange)  Connection wirings of reactor2 (red, red)  Screws of reactor

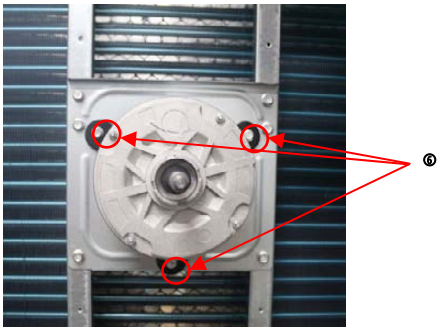
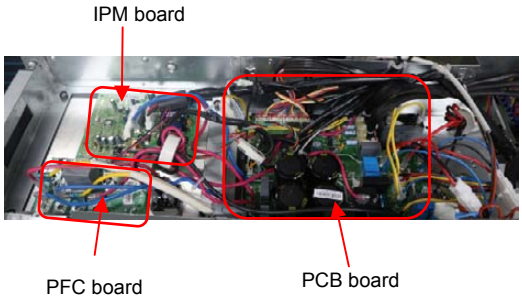
6	Reactor3	How to remove the reactor 1) Perform work of item 1 2) Disconnect two pieces of connection wirings. 3) Remove two screws of each reactor, and remove the reactor.	 
6	The 4-way valve	How to remove the 4-way valve 1) Perform work of item 1,2. 2) Extract refrigerant gas. 3) Remove the electrical parts from item 3. 4) Remove fixing screw of the coil, and remove the coil. 5) Detach the welded parts of 4-way valve and pipe.	

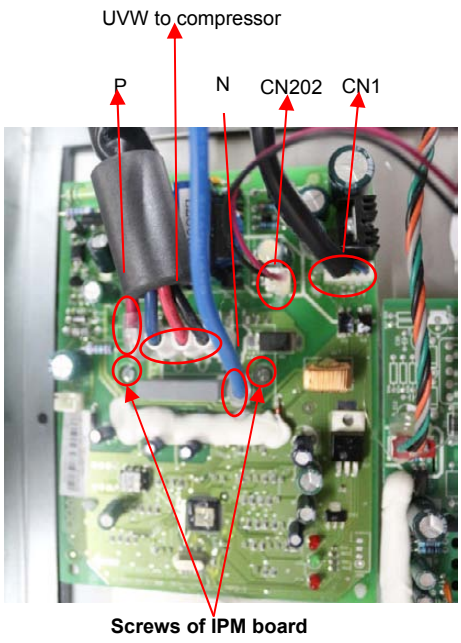
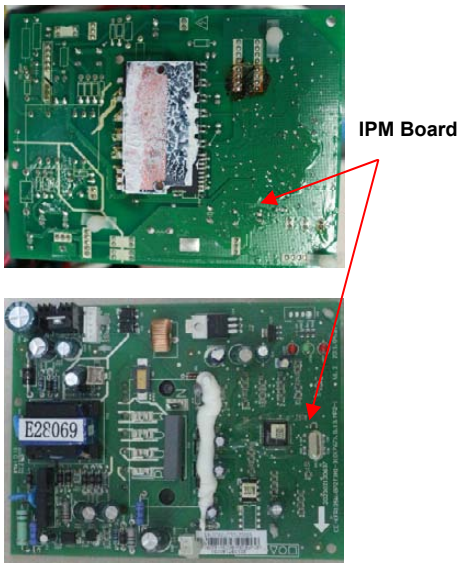
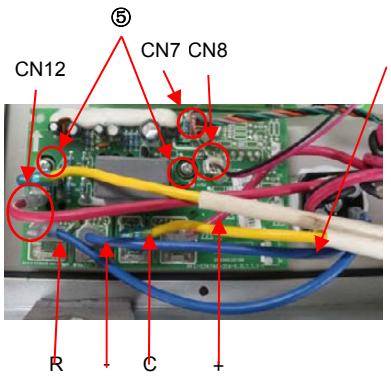
7	The expansion valve	How to remove the expansion valve 1) Perform work of item 1,2. 2) Remove the electrical parts from item 3. 3) Remove the coils. 4) Detach the welded parts of expansion valves and pipes.	

➢ **Model: YN036GMFI16M4D**

No.	Part name	Procedures	Remarks
1	Panel plate	How to remove the panel plate. 1) Stop operation of the air conditioner and turn "OFF" the power breaker. 2) Remove the screws of top cover, and remove the top cover. (8 screws) 3) Remove the screws of right front side panel, and remove the right front side panel (2 screws) 4) Remove the screws of front panel, and remove the front panel. (10 screws) 5) Remove the screws of big	  

		handle, and remove the big handle.(4 screws) 6) Remove two screws of terminal board, two screws of water collector and thirteen screws of right-rear panel, and remove the right-rear panel.	  

2	Fan ass'y	How to remove the fan ass'y. 1) Remove the top cover, right front side panel and front panel from item 1.step 1~4. 2) Remove the hex nut fixing the fan. 3) Remove the fan. 4) Remove the electrical control box cover after remove 5 screws. 5) Disconnect the fan motor connector CN3(5p,white) on the PCB board. 6) Remove the fan motor after unfastening three fixing screws.	  
3	Electrical parts	How to remove the electrical parts. 1) Perform work of item 1, 2. 2) Disconnect the following connection wires and connectors on the IPM. P: (+, red), connected to P2 on PCB. N: (-, blue), connected to P4 on PCB. UVW: (blue-red-black), connected to compressor. CN1: (5p, white),connected to CN22 on PCB. CN202:(2p, white),connected to CN8 on PFC.	

		3) Remove the IPM board after removing the two screws. 4) Disconnect following connection wires and connectors on the PFC. C and CN12: (yellow-yellow), connected to PFC inductance. R and CN12: (blue-red), connected to rectifier. + and - : (red-blue), connected to P1 and P3 on PCB. CN7: (4p,red), connected to CN33 on PCB. CN8: (2p,white), connected to CN202 on IPM. 5) Remove the PFC board after remove the two screws. 6) Disconnect four wires (red-	  

blue from PFC and black-red from PCB), then the rectifier can be removed.

7) Disconnect following connection wires and connectors between PCB and other components.

P4: (blue), connected to N on IPM.

P2: (red), connected to P on IPM.

P1: (red), connected to + on PFC.

P3: (blue), connected to – on PFC.

RY1: (red), connected to rectifier.

CN32: (black), connected to rectifier.

CN22: (5p, white), connected to CN1 on IPM.

CN33: (4p, red), connected to CN7 on PFC.

CN11/CN12: (yellow/yellow), connected to fan capacity.

CN6/CN9: (blue/blue), connected to 4 way valve.

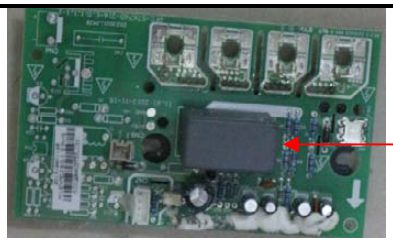
CN7/CN10: (black/red), connected to crankcase heating cable.

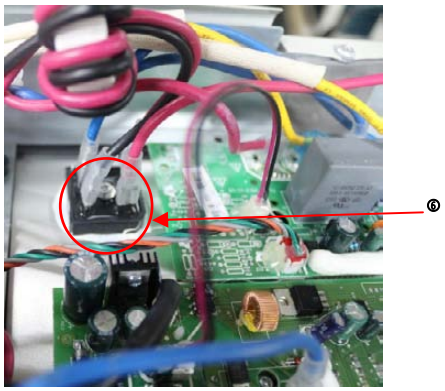
CN13: T2B-A,B,C,D temp. sensor (2p/2p/2p/2p, white)

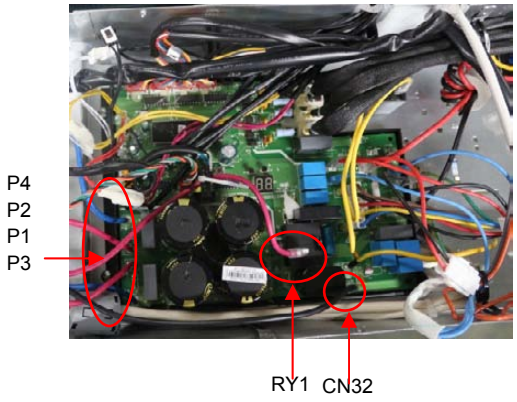
CN21: Tdischarge temp. sensor

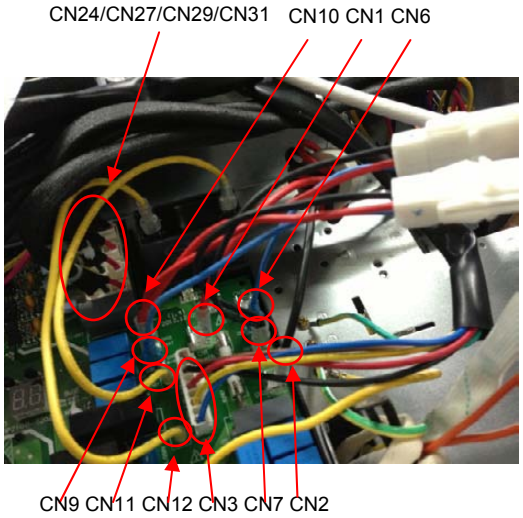
(2p, white)

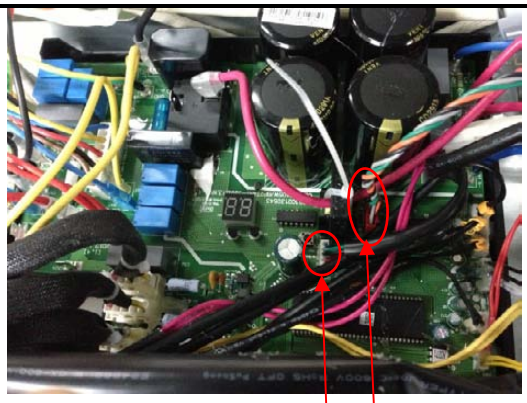
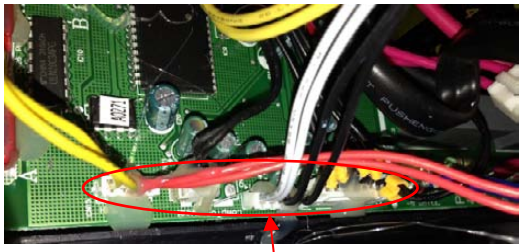
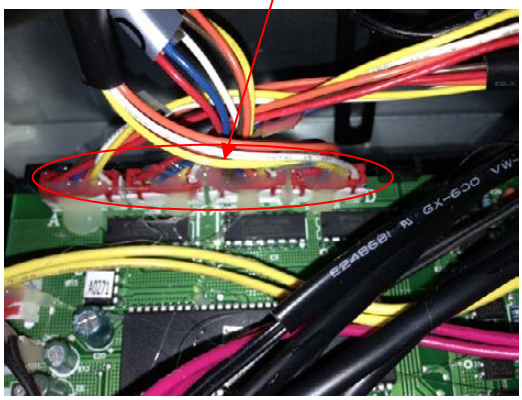
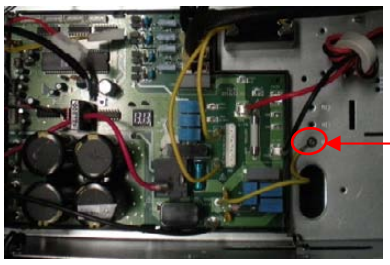
CN18: T3/T4/T3/T4 temp. sensor

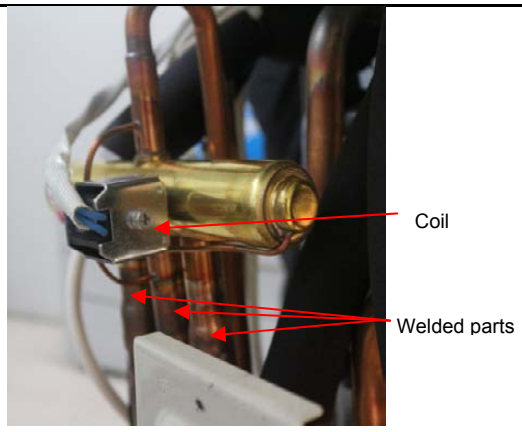


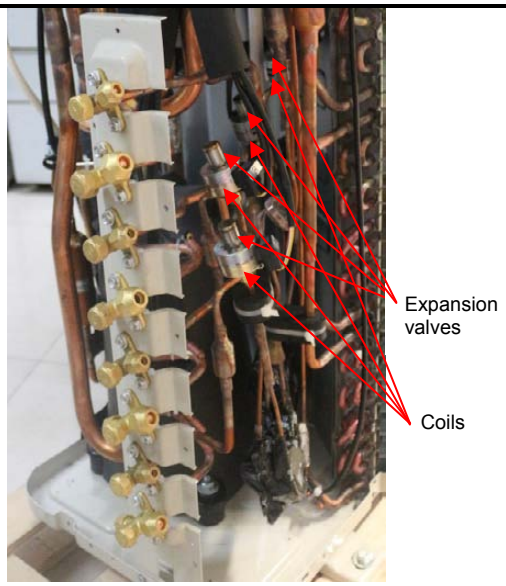






		(2p/2p, white) CN15: High and low pressure switch (2p/2p, white) CN28/CN26/CN25/CN23: electronic expansive valve A,B,C,D (6p/6p/6p/6p,red/red/red/red) CN31/CN29/CN27/CN24: S-A,B,C,D (3p/3p/3p/3p,white/white/white/white) CN1-CN2: (red-black), connected to power terminal P-1: (yellow-green), grounding wires of PCB. 8) Remove the PCB board after remove the fixing screws.	 CN22 CN33  CN15 CN21 CN18 CN13 CN28/CN26/CN25/CN23   P-1
4	Compressor	How to remove the compressor.	

		1) Perform work of item 1,2,3 2) Remove the electrical control box and partition plate. 3) Extract refrigerant gas. 4) Remove the sound insulation material and crankcase heating cable. 5) Remove terminal cover of compressor, and disconnect wires of compressor thermo and compressor from the terminal. 6) Remove the discharge pipe and suction pipe with a burner. 7) Remove the hex nuts and washers fixing the compressor to bottom plate. 8) Lift the compressor.	
5	The 4-way valve	How to remove the 4-way valve 1) Perform work of item 1,2. 2) Extract refrigerant gas. 3) Remove the electrical parts from item 3. 4) Remove fixing screw of the coil, and remove the coil. 5) Detach the welded parts of 4-way valve and pipe.	

6	The expansion valve	How to remove the expansion valve 1) Perform work of item 1,2. 2) Remove the electrical parts from item 3.. 3) Remove the coils. 4) Detach the welded parts of expansion valves and pipes.	

10. Exploded Views:

Available under a separate document file.