MINI-SPLIT
DUAL – TRI - QUAD ZONE
SERVICE MANUAL

Indoor Unit	Outdoor Unit
MZG409HP16230EA MZG412HP16230EA MZG418HP16230EA	MZG424HP16230CA MZG434HP16230CA
9MH46ZIGX 12MH46ZIGX 18MH46ZIGX	24MH46ZOGX 34MH46ZOGX

REFRIGERANT	R410A

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TECHNICAL SPECIFICATIONS FOR DUAL ZONE OUTDOOR UNIT

Model Number		[TZ] 241-0024-C MZG424HP16230CA [SB] 241-1024-C 24MH46ZOGX
Rated Voltage & Frequency and Phase		208-230 / 1PH
Circuit Breaker Size (A)		25A
Total Current (RLA) cooling (A)		15.9
Total Current (RLA) heating (A)		15.9
High Efficiency Working Temperature Range (cooling °F)		41 to 118
High Efficiency Working Temperature Range (heating °F)		5 to 75
Refrigerant (R410A), (lbs)		5.5
Cooling	Rated Capacity (BTU)	24,000
	Capacity Invert Range (BTU)	10,000 / 28,000
	Input / Actual Input (W)	1100 / 2250
	Max. Power (W)	3300
	Max Current (A)	16.9
	SEER	16
Heating	Rated Capacity (BTU)	28,000
	Capacity Invert Range (W)	9,000 / 33,000
	Input / Actual Input (W)	1250 / 2600
	Max. Power (W)	3500
	Max Current (A)	17.6
	Declared COP / Actual COP (w/w.h.)	8.2
Fan Motor	Model	FW60C
	Output (W)	60
	Capacitor (UFD)	3
	Fan Motor FLA (A)	0.65
	Fan Speed (RPM) (H-M-L)	780/ 620 / 600
	Fan Type	Axial Fan
Outdoor Fan	Fan Blade Diameter (in)	18.11
	Air Flow Volume of Outdoor Unit (CFM)	2000
Compressor	Model	C-7RZ233H1A
	TYPE	Rotary
	Brand	SANYO
	Capacity (W)	7110
	Input (W)	1760
Condenser	Number of Rows	2
	Tube Pitch x Row Pitch (in)	1 / 0.87
	Fin spacing (in)	0.0551
	Fin Type	Aluminum, Louvered
	Tube Outside Dia. (in)	0.375
	Coil Length x Height x Width (in)	26.9 x 32 x 1.7
	Number of circuits	2
Dimensions & Weight	Unit Dimensions (W x D x H) (in)	37.4 x 33.07 x 16.54
	Packing Dimensions (W x Dx H) (in)	43.31 x 17.72 x 35.63
	Net / Gross Weight (lb)	149.9 / 160.9
Connection	Flare Fitting Liquid line	1/4 "
	Flare Fitting Suction line	1/2" [*3]
	Service Port Fitting	5/16”
	High Pressure (psi)	500
	Low Pressure (psi)	235
	Design Length (ft)	24.6 (each indoor unit)
	Max Line Set Vertical Height (ft)	16.4 (each indoor unit) [*4]
	Max Line Set Length (ft)	65.6 (total)
	Charge over Design Length (oz. / ft)	0.16 [*1]
	Design Pressure (PSI)	130.5 / 435.1 [*2]
	Wiring (Indoor to Outdoor)	4C- 16 AWG
	Wiring (Outdoor unit to Power Disconnect)	3C- 10 AWG

*1. When the total length of liquid line is over 49.2 ft, the additional refrigerant charge is required.
*2. Design Pressure is rated under the following conditions: Indoor: Dry Bulb 80 °F, Wet-Bulb 67 °F; Outdoor: Dry-Bulb 95 °F, 75 °F.
*3. Dual Zone uses 1/2" to 3/8” adaptor for 9K indoor unit. Not required for 12K BTU indoor unit.
*4. Each unit's height, not accumulative. Example: 2 indoor units, each unit can be a maximum of 16.4 ft vertical. (NOTE: Outdoor unit must connect to TWO indoor units.)
*5 The units will operate at temperatures outside the working range - the efficiency will be decreased. As an example when in the cooling mode and the outside temperature is at 14°F it may be 40% lower in efficiency, depending on outdoor conditions.

TECHNICAL SPECIFICATIONS FOR QUAD ZONE OUTDOOR UNIT

Model Number		[TZ] 241-0034-C MZG434HP16230CA [SB] 241-1034-C 34MH46ZOGX
Rated Voltage & Frequency and Phase		208-230 / 1PH
Circuit Breaker Size (A)		40
Total Current (RLA) cooling		20.5 / 20.9 A
Total Current (RLA) heating		20.1 / 19.7 A
High Efficiency Working Temperature Range (cooling °F)		41 to 118
High Efficiency Working Temperature Range (heating °F)		5 to 75
Refrigerant (R410A), (lbs)		7.28
Cooling	Rated Capacity (Btu)	27,000
	Capacity Invert Range (Btu)	10,000 / 34,000
	Input / Actual Input (W)	900 / 2600
	Max. Power (W)	4700
	Max Current (A)	21
	SEER	16
Heating	Rated Capacity (Btu)	29,000
	Capacity Invert Range (W)	9,000 / 37,000
	Input / Actual Input (W)	800 / 2500
	Max. Power (W)	3000
	Max Current (A)	17.8
	Declared COP / Actual COP (w/w.h.)	8.2
Fan Motor	Model	FW68E
	Output (W)	68
	Capacitor (UFD)	3
	Fan Motor FLA (A)	0.68
	Fan Speed (RPM)	840 / 740 / 640
	Fan Type	Axial Fan
Outdoor Fan	Fan Blade Diameter (in)	18.11
	Air Flow Volume of Outdoor Unit (CFM)	N/A
Compressor	Model	C-7RZ233H1A
	TYPE	Rotary
	Brand	SANYO
	Capacity (W)	7110
	Input (W)	1760
Condenser	Number of Rows	2
	Tube Pitch x Row Pitch (in)	1 / 0.87
	Fin spacing (in)	0.055
	Fin Type	Aluminum, Louvered
	Tube Outside Dia.(in)	0.375
	Coil Length x Height x Width (in)	31.73 x 32 x 1.73
	Number of circuits	4
Dimensions & Weight	Unit Dimensions (W x D x H) (in)	37.4 x 33.07 x 16.54
	Packing Dimensions (W x Dx H) (in)	43.31 x 17.72 x 35.63
	Net / Gross Weight (lb)	165.3 / 176.4
Connection	Flare Fitting Liquid line	1/4 "
	Flare Fitting Suction line	3/8" [*3]
	Service Port Fitting	5/16”
	High Pressure (psi)	500
	Low Pressure (psi)	235
	Design Length (ft)	32.8 (each indoor unit)
	Max Line Set Vertical Height (ft)	32.8 (each indoor unit) [*4]
	Max Line Set Length (ft)	229 (total)
	Charge over Design Length (oz. / ft)	0.24 [*1]
	Design Pressure (PSI)	130.5 / 435.1 [*2]
	Wiring (Indoor to Outdoor)	4C- 16 AWG
	Wiring (Outdoor unit to Power Disconnect)	3C- 8 AWG

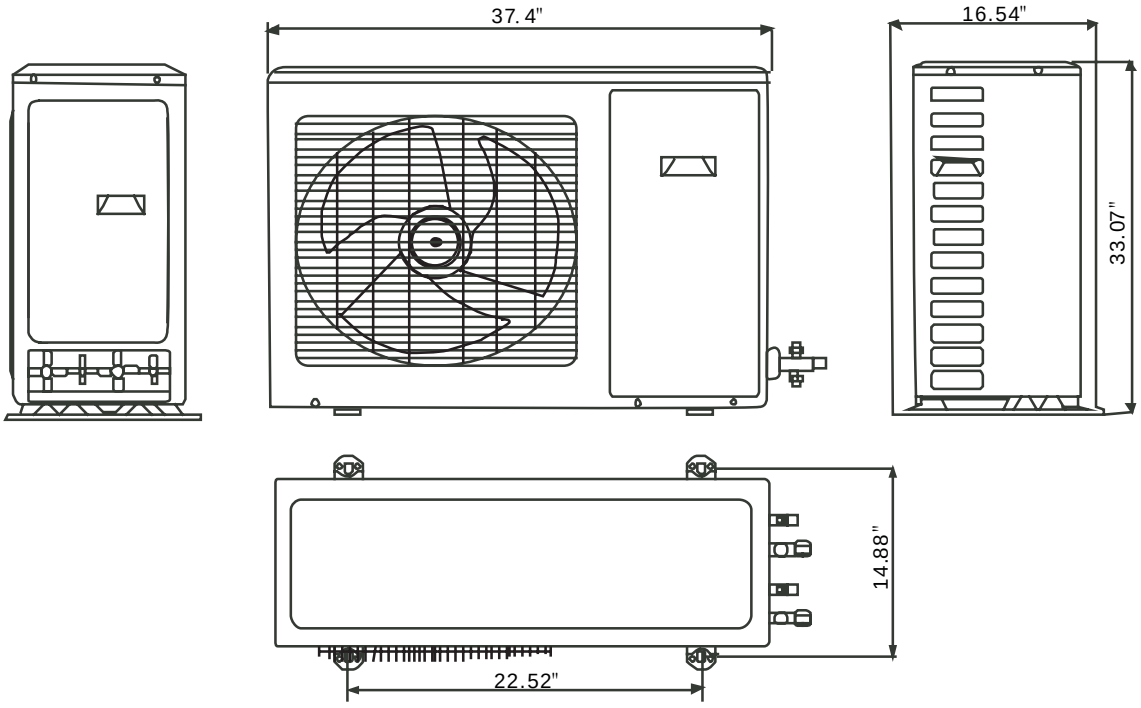
*1. When the total length of liquid line is over 131 ft, the additional refrigerant charge is required.
*2. Design Pressure is rated under the following conditions: Indoor: Dry Bulb 80 °F, Wet-Bulb 67 °F; Outdoor: Dry-Bulb 95 °F, 75 °F.
*3. Quad Zone uses 3/8" to 1/2” adaptor for 12K and 18K indoor units. Not required for 9K BTU indoor unit.
*4. Each unit's height, not accumulative. Example: 2 indoor units, each unit can be a maximum of 32.8 ft vertical. An oil trap to be installed if the indoor unit is over 16.4 feet in height from the outdoor unit, and the installed oil trap should be checked annually. The cooling capacity will be reduced when the height is over 19 feet. (NOTE: Outdoor unit must connect to TWO indoor units.)
*5 The units will operate at temperatures outside the working range - the efficiency will be decreased. As an example when in the cooling mode and the outside temperature is at 14°F it may be 40% lower in efficiency, depending on outdoor conditions.

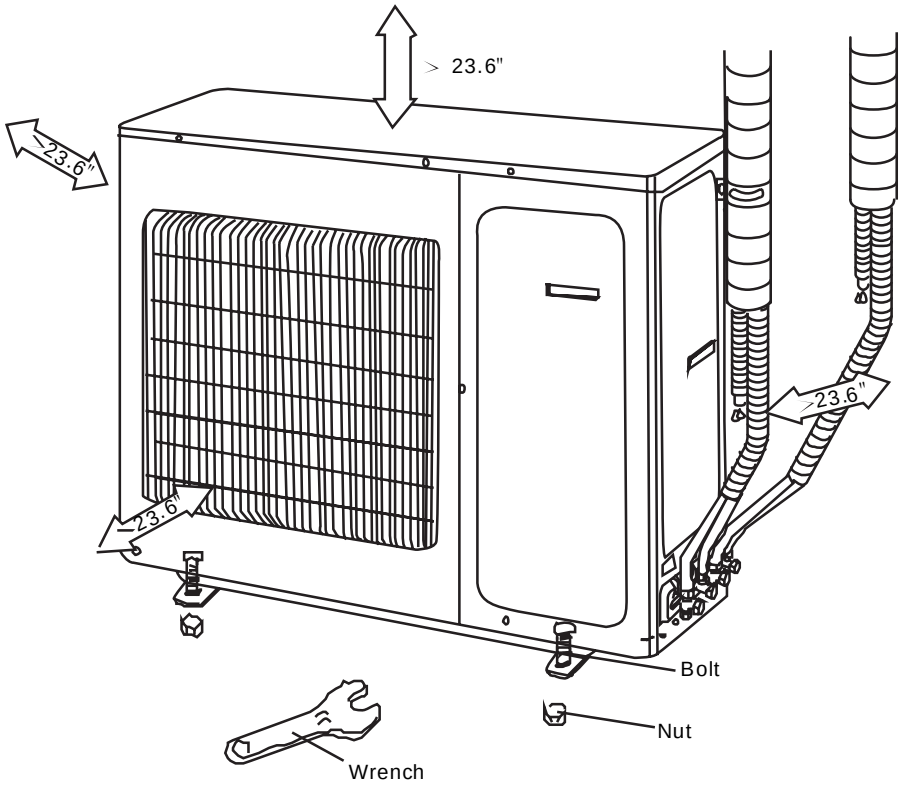
TECHNICAL SPECIFICATIONS FOR HIGH EFFICIENCY INDOOR UNIT

	Thermal Zone Models	241-0009-E MZG409HP16230EA	241-0012-E MZG412HP16230EA	241-0018-E MZG418HP16230EA
	Sea Breeze Models	**241-1009-E 9MH46ZIGX**	**241-1012-E 12MH46ZIGX**	**241-1018-E 18MH46ZIGX**
Performance & Electrical	Rated Voltage & Frequency	208-230 / 1PH	208-230 / 1PH	208-230 / 1PH
	Total Input Current (A)	0.17	0.17	0.278
	Cooling BTU	9000	12000	18000
	Heating BTU	10000	13500	19500
	Dehumidifying Volume (pt/hr)	1.7	2.5	5.3
Fan Motor	Output (W)	10	10	20
	Fan Motor RLA (A)	0.17	0.17	0.278
	Fan Motor Capacitor (MFD/V)	1	1	1
	Speed (Hi/Med/Low) (RPM)	1150 / 1000 / 850	1150 / 1050 / 900	1150 / 1050 / 950
	Speed (turbo) (RPM)	1250	1350	1380
Evaporator	Number of rows	2	2	2
	Tube pitch row / pitch (in)	0.5 / 0.75	0.5 / 0.75	0.5 / 0.75
	Fin spacing (in)	0.063	0.055	0.059
	Fin Type	Aluminum, Louvered	Aluminum, Louvered	Aluminum, Louvered
	Tube outside dia.(in) / Type	0.276	0.276	0.276
	Coil Length x height x width (in)	23.74 x 10.39 x 1	25.87 x 11.22 x 1	29.13 x 11.85 x 1
	Liquid Line	1/4"	1/4"	1/4"
	Suction Line	3/8"	1/2”	1/2”
Design Data	Air Flow (Turbo/Hi/Med/Low) (CFM)	265 / 231 / 190 / 163	300 / 252 / 223 / 195	488 / 394 / 352
	Sound Pressure Level dB(A) (H / M / L)	38 / 35 / 32 / 29	40 / 35 / 33 / 30	46 / 43 / 38 / 34
	Sound Power Level dB(A) (H / M / L)	48 / 45 / 42 / 39	50 / 45 / 43 / 40	56 / 53 / 48 / 44
	Fan Type	Cross flow fan	Cross flow fan	Cross flow fan
	Fan Diameter (in)	3.35	3.35	3.86
	Fan Length (in)	24.21	26.3	28.86
	Design Pressure (PSI)	130.5 / 435.1	130.5 / 435.1	130.5 / 435.1
	High Pressure (PSI)	500	500	500
	Low Pressure (PSI)	235	235	235
	Remote	Yes	Yes	Yes
	Auto-restart	Yes	Yes	Yes
Dimensions & Weight	Unit Dimensions (W x H x D) (in)	32.09 x 10.51 x 6.50	34.33 x 11.14 x 7.01	37.80 x 11.81 x 7.68
	Packing Dimensions (W x H x D) (in)	35.04 x 13.54 x 10.24	36.81 x 14.72 x 10.24	40.75 x 15.35 x 11.02
	Net / Gross Wt (lbs)	22.05 / 28.66	24.25 / 33.07	28.66 / 39.68

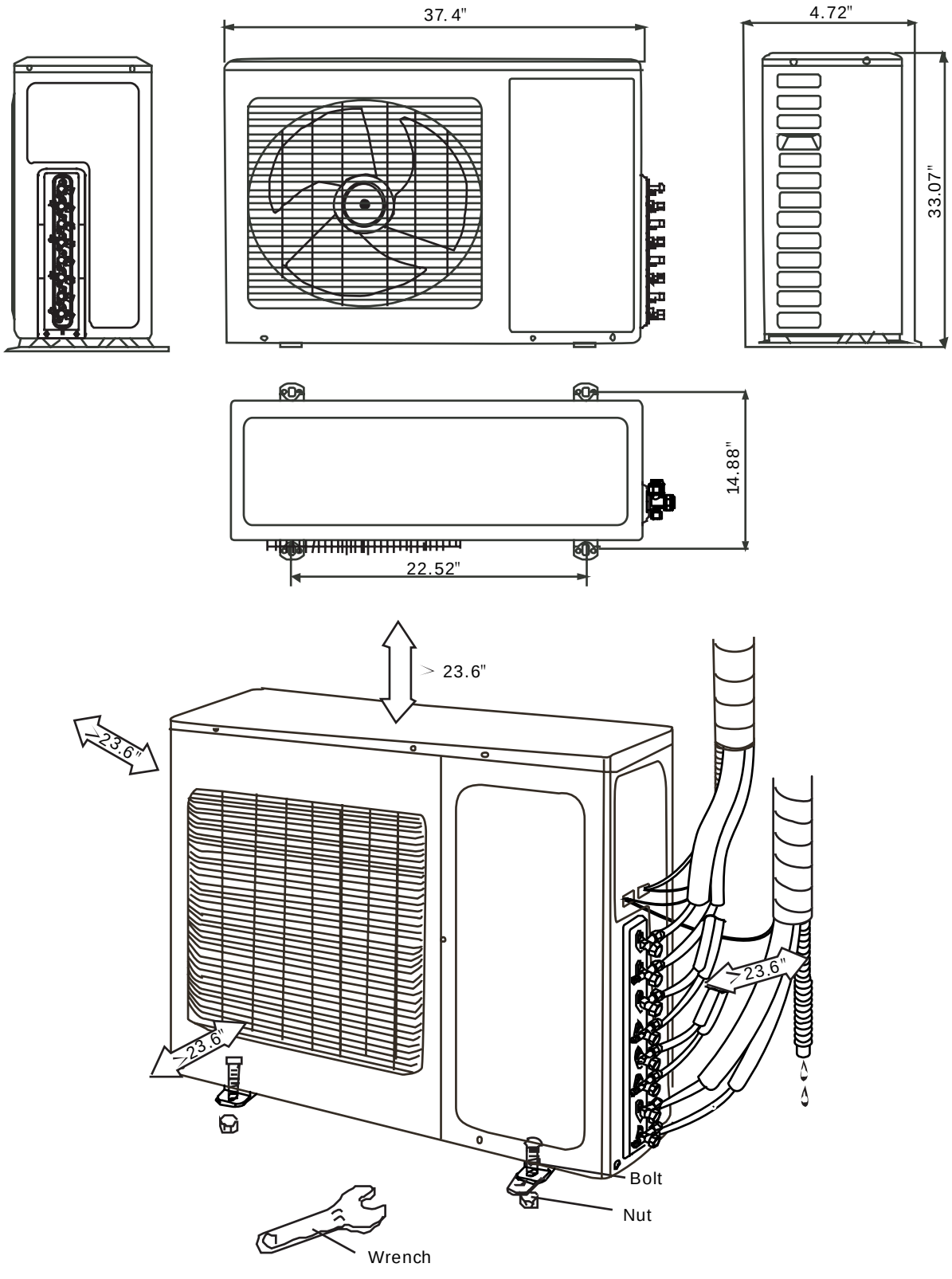
OUTLINE AND DIMENSIONS

OUTDOOR UNIT: MZG424HP16230CA and 24MH46ZOGX

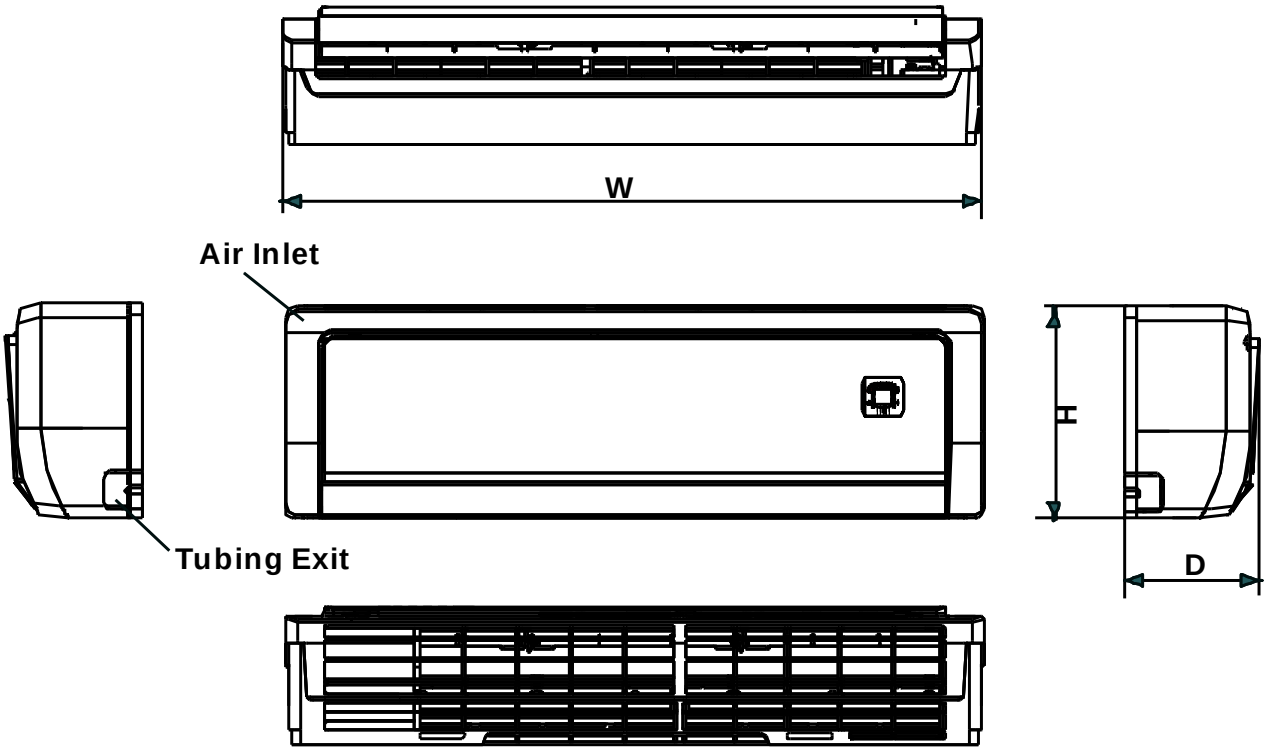


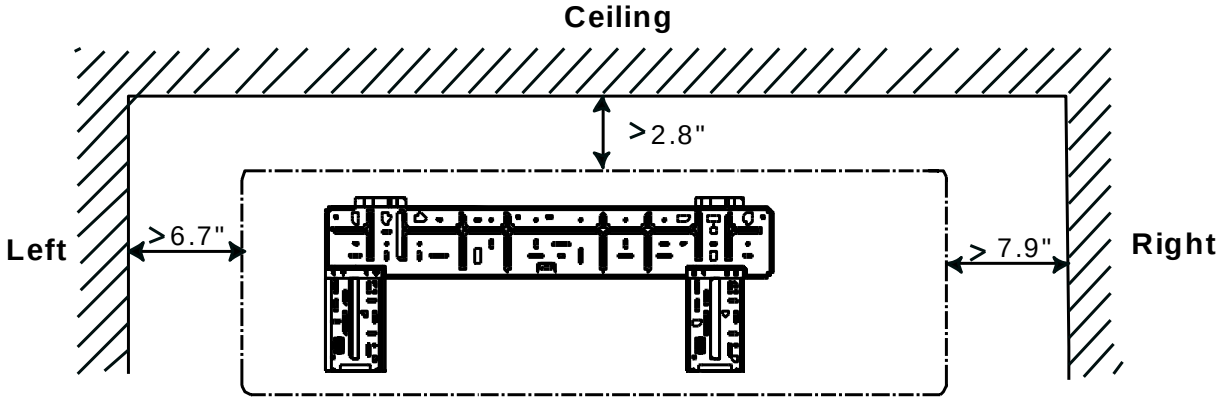


OUTDOOR UNIT: MZG434HP16230CA and 34MH46ZOGX



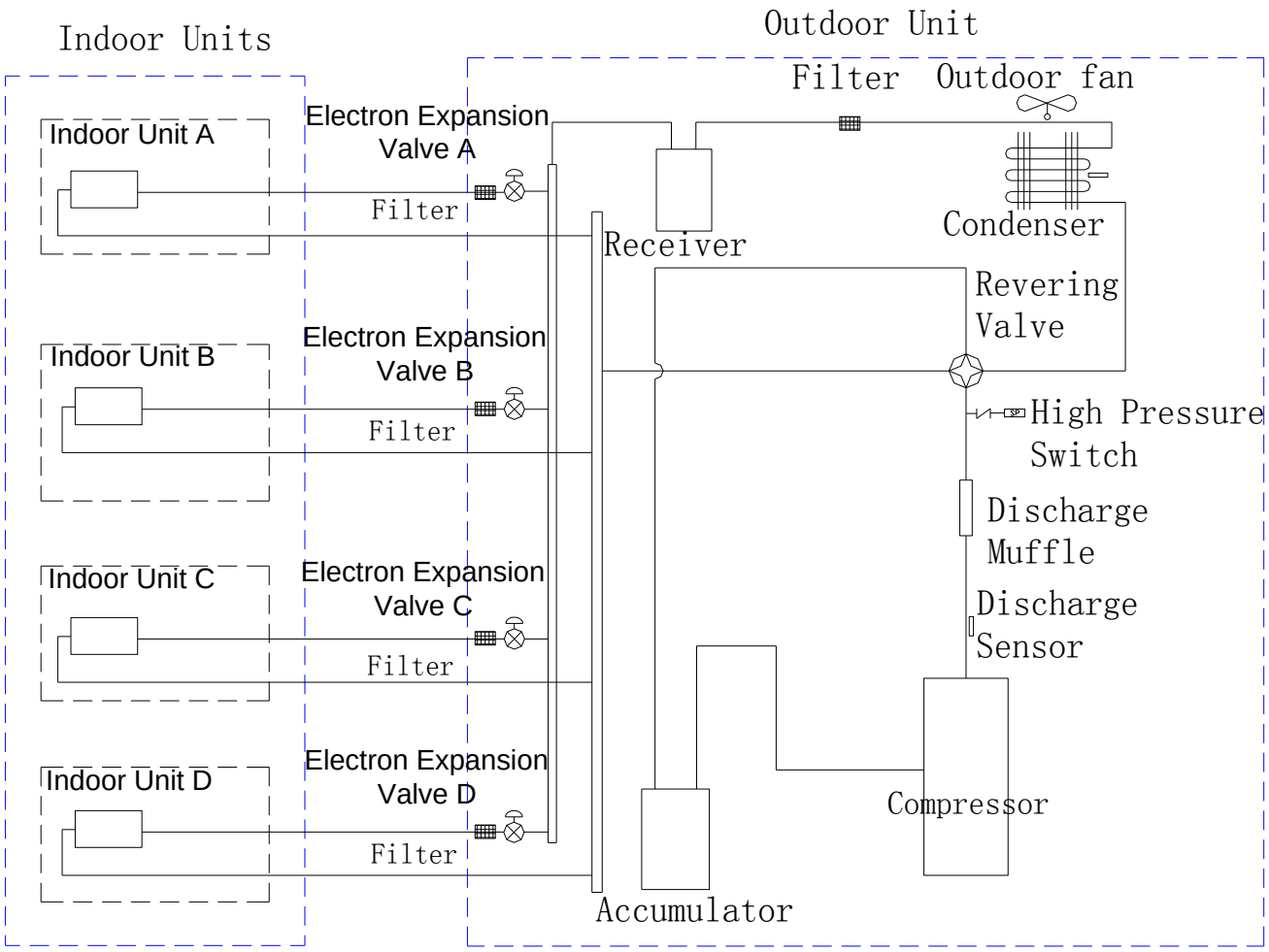
INDOOR UNIT: MZG409HP16230EA, MZG412HP16230EA, MZG418HP16230EA
9MH46ZIGX, 12MH46ZIGX, 18MH46ZIGX





Catalog Number	W	H	D
MZG409HP16230EA 9MH46ZIGX	32.09”	10.51”	6.5”
MZG412HP16230EA 12MH46ZIGX	34.33”	11.14”	7.01”
MZG418HP16230EA 18MH46ZIGX	37.8”	11.81”	7.68”

REFRIGERATION SYSTEM DIAGRAM



OPERATING PRINCIPLE

According to the outdoor and indoor ambient temperature, the setting temperature and all indoor units' nominal capacity, Quad / Tri Zone and Dual Zone will figure out the complete unit's load and confirm the working frequency of inverter compressor; The outdoor fan is separated into 4 (3 or 2) independent systems and each system is controlled by a electronic expansion valve (opening angle: 95P～480P). The refrigerant allocation quantity of indoor fan is controlled by the opening angle of the valve.

When the cooling indoor fan is turned off or stopped, the electronic expansion valve is closed, the refrigerant flow quantity is 0 and the indoor unit's refrigerant quantity is 0.

When heating indoor fan is turned off or stopped, the electronic expansion valve will maintain a certain opening angle to make sure that the refrigerant in the heat exchanger can be returned into the compressor, and there's still a small quantity of heat in the indoor fan.

1. To control the speed of compressor

- Set the Max. and Min. running frequency according to the indoor ambient temperature, setting temperature and the quantity and size of indoor fan.
- Figure out compressor's running frequency by Power Input calculating.
- In order to improve the effect of cooling, heating and comfort, the compressor's running frequency will be controlled vaguely according to indoor setting temperature and tube temperature.

2. Refrigerant flow distribution

a) Cooling mode: control the opening by degree of superheat (SH) of the evaporator temp sensor of inlet and outlet to realize the highest heat exchange efficiency and EER.

If SH actual > SH target then the expansion valve is opened.

If SH actual < SH target then the expansion valve is closed.

• Notice: Cooling hasn't put into use or the corresponding electronic expansion valve for turning off indoor fan is at off status.

b) Heating mode: in heating mode, the indoor flux distribution during heating will be optimized according to the actual demand of heat, based on the discharge temperature, Δ Ti pipe of different indoor unit system, temperature parameter of different indoor ambient temperature, and the corresponding opening of electronic expanding valve for each indoor unit.

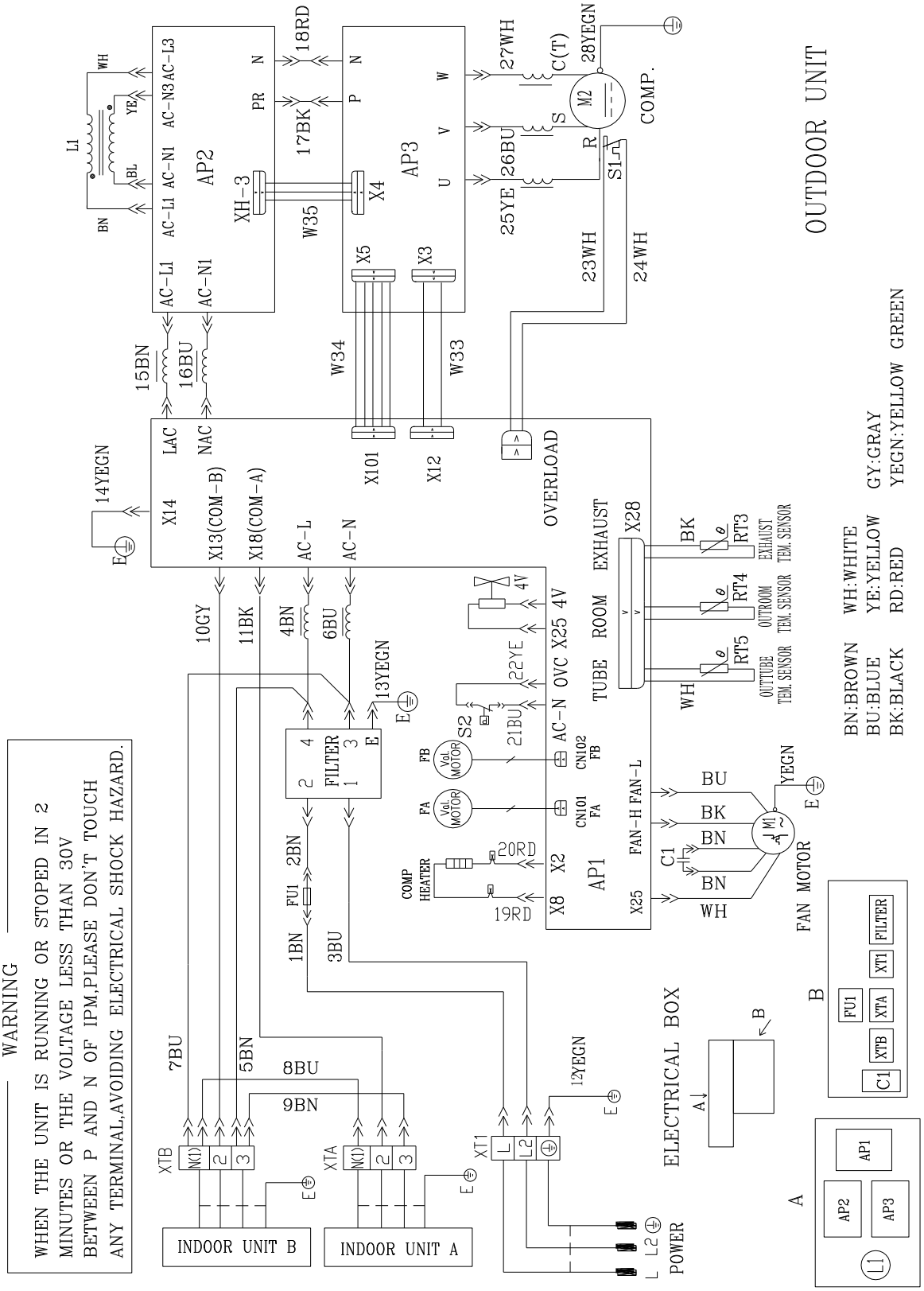
IF Δ Ti > ΔT average, then the expansion valve is closed.

IF Δ Ti < ΔT average, then the expansion valve is opened.

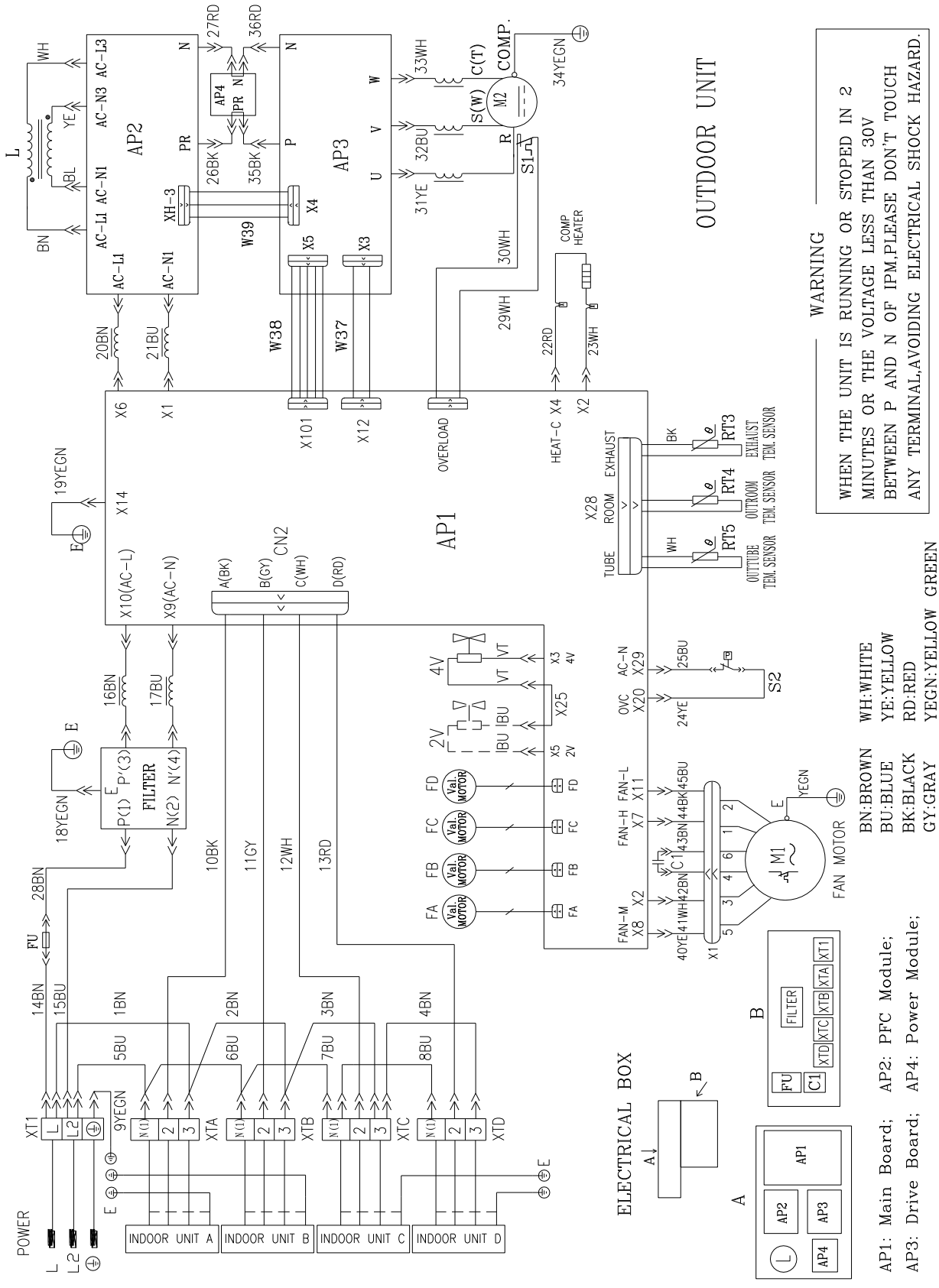
• Notice: Even some indoor unit is turned off which the room temperature is satisfied, it's electronic expanding valve will maintain a certain opening.

WIRING DIAGRAM

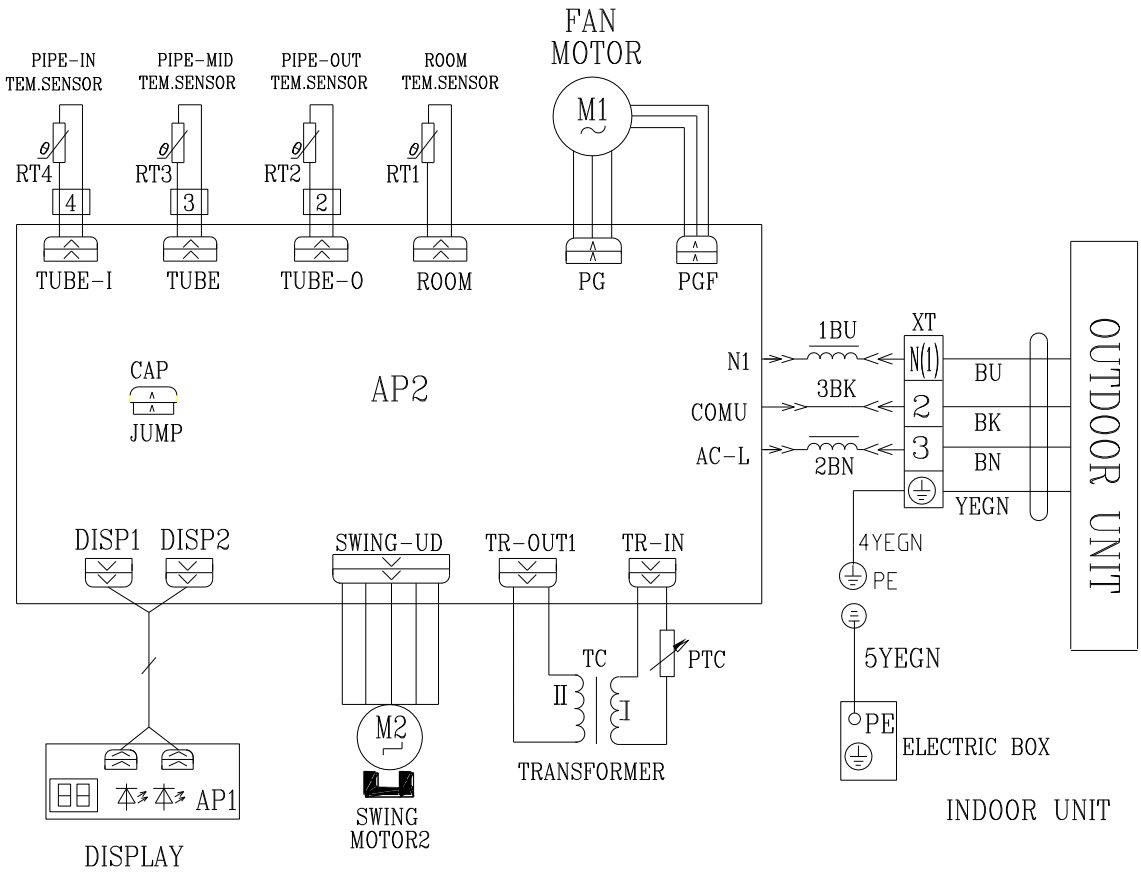
OUTDOOR UNIT: MZG424HP16230CA and 24MH46ZOGX



OUTDOOR UNIT: MZG434HP16230CA and 34MH46ZOGX



INDOOR UNIT: MZG409HP16230EA, MZG412HP16230EA, MZG418HP16230EA
9MH46ZIGX, 12MH46ZIGX, 18MH46ZIGX



These wiring diagrams are subject to change without notice, please refer to the one supplied with the unit.

FUNCTIONS

1. Temperature Parameters

- Indoor ambient temperature (Tindoor amb.)
- Indoor setting temperature (Tset)
- Outdoor ambient sensor temperature (Tout amb.)
- Outdoor heat exchanger tube sensor temperature (Tout tube)

2. System Energized

After energized, the side valve will be powered on, each electron expansion valve will be turned off orderly. Then side valve will be powered off, all the electron expansion valve should be turned to a certain angle, the unit is on standby.
Under each modes, once the compressor starts up, at least running for 7mins the unit will stop (not including malfunction protection, modes shift the compressor needed to stop running);
Once compressor stopped, the unit will start up after 3mins delay (Heating oil return or defrosting except).

2.1 Cool Mode

2.1.1 Working condition and procedure of cooling operation

If the compressor is on standby or cooling mode, if one indoor unit's (T indoor amb.-Tset) ≥1℉, cooling will be activated; Meanwhile, the electronic expansion valve, the outdoor fan and the compressor start to run. The compressor will run at current speed according to the capacity required.

2.1.2 Stop for Cooling

2.1.2.1 When the compressor stops running, the Outdoor fan motor will stop 1 min later. The by-pass valve will be energized when all electronic expansion valves start to close to 0P, and then it will be de-energized when all expansion valves open completely to 480P.

2.1.2.2 When part of room temperature is satisfied, the corresponding electronic expansion valve will be turned off 5 seconds later. The compressor will keep running and figure out the frequency according to the cooling capacity requirement.

2.1.3 Switching from Cooling Mode to Heating Mode

Turning the unit from cooling mode to heating mode, the Compressor will stop, and 4-way valve will activated after 2 min later, and then follow the same procedure as 2.1.1.

2.1.4 4-Way valve control

Under the cooling mode, 4-way valve closes.

2.1.5 Outdoor unit fan motor control in Cooling Mode

When the compressor starts up for cooling, the outdoor fan motor starts 5 seconds later and runs in high speed for 3 minutes. And then, the compressor runs according to the total capacity of the indoor units required and the outdoor ambient temperature, the outdoor fan will automatically run at High, Mid or Low speeds.

Other control: When another indoor unit is call for cooling, outdoor fan motor will run at high fan speed for 40 seconds, and then the fan speed will be adjusted according to the control logic. Fan motor of each stage runs at least 80 seconds, and the fan speed will be changed according to how many indoor units are operating and how much capacity requests. When compressor stops running, the Outdoor fan motor will stop 1 minute later. When the compressor operates in oil return procedure under cooling, the compressor frequency rises up to 70Hz, the outdoor fan motor will run at the current fan speed and then stop 1 min later.

2.1.6 Oil return procedure in Cooling Mode

The procedure lasts 5 minutes and the fan speed will be adjusted automatically.

2.1.7 Anti – freezing protection

If only some indoor units are under anti-freezing protection, the corresponding electronic expansion valve will be adjusted at the angle of 0p (shut off completely), and the indoor unit's capacity is set to 0. If all running indoor units are at anti-freezing protection, the compressor will stop and outdoor fan will stop after 30 seconds, but the indoor fan will keep running in the original mode. When anti-freezing protection is eliminated and the compressor has stopped for 3 minutes with "E2" error code, and then the compressor will resume running in the original mode.

2.2 Dry Mode

- The working conditions and process of drying is same as that of cooling mode.
- The protection function of drying is same as that of cooling.
- Under this mode, 4-way valve closes.
- Under this mode, the Max. capacity is 90% of which under cooling mode. The indoor fan will be at the "Low" speed.
- The start-up condition of the outdoor fan and compressor is same as that of cooling mode.

2.3 Heat Mode

2.3.1 Working condition and procedure of heating operation

When one room temperature -$T_{indoor\ amb.}$ ≤ T_{set} + 4.5°F, the compressor will be started and the unit starts running in heating mode.

2.3.2 Stop for Heating

2.3.2.1 All room temperature is satisfied. The compressor and all indoor fans will be stopped and the outdoor fan will also be stopped after 1min delayed; the by-pass valve will be energized when all electronic expansion valves start to close to 0P, and then it will be de-energized when all expansion valves open to 480P.

2.3.2.2 Part of room temperature is satisfied. The compressor will figure out the frequency to run according to the capacity requirement, the corresponding electronic valve for which indoor unit's capacity requirement is 0 won't be closed completely after restoration. When the compressor's frequency starts to change, the corresponding electronic expansion valve of the running indoor fan will resume to the original status.

2.3.3 Switching from Heating Mode to Cooling (Dehumidifying), Fan Modes.

Compressor will stop running and the four-way valve will be turned off 2 minutes later; the outdoor fan will be turned off 1min later; 4-way valve will be energized again then. All expansion valve will turn to 0P for adjusting, the side valve will be energized; the expansion valve will turn to 480P, then side valve will be power off.

2.3.4 Outdoor unit fan motor control in Heating Mode

When the compressor starts up for heating, the outdoor fan motor starts up 5 seconds later and runs in high speed for 80 seconds. And then, according to the total capacity of the indoor units required and the outdoor ambient temperature, the outdoor fan will automatically run at High, Mid or Low speeds.

Other control: When another indoor unit calls for heating, outdoor fan motor will run at high speed for 40s right away, and then the fan speed will be adjusted according to the control logic. Fan motor of each stage runs 80s at least, and the fan speed will be changed according to how many indoor units are operating and how much capacity requests. When compressor stops running, outdoor fan motor will stop after 1min later.

2.3.5 Defrosting

When the defrosting condition is satisfied, the system will turn to defrost and the compressor will be stopped. The outdoor fan will be stopped 40 seconds later after the compressor stopped. Meanwhile the four-way valve is reversing and then the electronic expansion valve is turned to 150P. Keep on opening the electronic expansion valves until they are fully opened at 480P, the compressor starts up and runs by increasing the frequency (during this time, effect of limiting and decreasing frequency is valid). The defrosting will be finished when it reaches the certain conditions.

2.3.6 Oil return procedure in heating mode

When unit runs in heating mode and reaches to oil return condition, the compressor will stop running, and all electron expansion valves will turn to 480P. Then the by-pass valve will be turned on); The compressor stops 40s later, 4-way valve will be reversed. Outdoor fan runs at high speed for the first 40 seconds. The 4-way valve sets back, all electron expansion valves will turn to 150P; The expansion valves will be turn to preset position then, the compressor will start up and runs at high frequency in a certain frequency. This procedure lasts 5 minutes.

2.3.7 Anti-cold-wind protection

In heat mode, in order to prevent the indoor unit from blowing out cold wind, the indoor fan will delay 3 minutes after the compressor starts up. The indoor fan speed will be adjusted automatically when room temperature is low.

2.4 System protection function

2.4.1 Indoor unit modes confliction protection

If the indoor units are preset differently, the operation will be as followings:

It will be the master indoor unit which operates firstly. Other indoor units should be running in the relevant mode, otherwise the mode confliction will occurs with “E7”. Cooling mode, Dry mode and Fan mode conflict with heating mode.

2.4.2 Overload protection (High temperature resistant protection)

When the tube temperature of condenser is low, the running speed of compressor can be risen up. If this temperature is high, the running speed might be limited or the running speed will drop. If this temperature is extremely high, the compressor will stop running with “H3”.

And if this protection comes out 6 times, the compressor will not restart. The whole unit can be resumed only when it’s powered on after de-energizing. After restarts up and operating 7 minutes later, the overload protection record will be cleared.

2.4.3 Exhaust temperature protection

If the exhaust temperature is high, the running speed of compressor will be limited. If the exhaust temperature is very high, the running speed of compressor will drop. If exhaust temperature is extremely high, the compressor will stop running with “E4”.

And if this protection comes out 6 times, the compressor will not restart. The whole unit can be resumed only when it’s powered on after de-energizing. After restarts up and operating 7 minutes later, the overload protection record will be cleared.

2.4.4 Communication malfunction

The outdoor PC board will test how many indoor units are installed in the first 3 minute after the whole unit is energized. If there is not any single from one of the indoor unit in this 3 minute, then this indoor unit will be ignored as uninstalled.

If the outdoor PC board does not received the correct signal from all installed indoor units in 3 minutes continuously, or there is not a right signal from the drive board in 10 seconds, the outdoor unit will stop running with Communication malfunction “E6”.

2.4.5 Module protection

When the IPM module is over heat or the wiring connection of the IPM module isn’t correct, or the compressor is blocked, the module protection will be activated and the whole unit stops with “H5” error code. When this protection comes out over 6 times, the compressor will not restart. The whole unit can be resumed only when it’s powered on after de-energizing. After restarts up and operating 7 minutes later, the protection record will be cleared.

2.4.6 High pressure protection

If the pressure of system is very high in 3 seconds, the high pressure switch will open for high pressure protection with “E1” error code. When this protection comes out over 6 times, the compressor will not restart. The whole unit can be resumed only when it’s powered on after de-energizing.

2.4.7 Over current protection

If the total current is a little high, the compressor will run in limited frequency. If the total current is very high, the compressor will stop, the outdoor fan will delay 30 seconds to stop with indoor unit displayed “E5” and outdoor yellow light will blink 5 times. The unit can restart 3 minutes later after this protection. But if this protection comes out over 6 times, the compressor will not restart. The whole unit can be resumed only when it’s powered on after de-energizing. After restarts up and operating 7 minutes later, the protection record will be cleared.

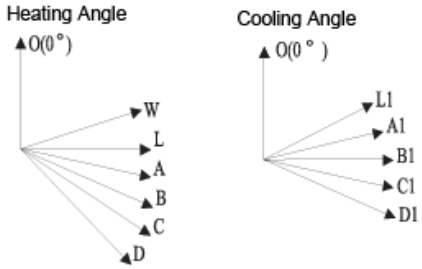
2.4.8 Sensor malfunction testing

- It will not detect any sensor when the unit is in standby situation.
- In the heat mode, it will detect the exhaust sensor after the compressor runs 3 minutes later. In other modes, it will detect all sensors.
- In the heat mode, it will not detect the outdoor tube sensor in 10 minutes when compressor starts up or after defrosting or oil return procedure
- All outdoor sensors will be detect every 30 seconds during the normal operation.

Indoor ambient sensor (15K sensor, 15K voltage divide)	≤ -40 °F	≥ 287.6 °F
Indoor tube sensor (20K sensor, 20K voltage divide)	≤ -40 °F	≥ 276.8 °F
Outdoor ambient sensor (15K sensor, 15K voltage divide)	≤ -40 °F	≥ 287.6 °F
Outdoor tube sensor (20K sensor, 20K voltage divide)	≤ -40 °F	≥ 276.8 °F
Outdoor air exhaust sensor (50K sensor, 15K voltage divide)	≤ -14.8 °F	≥ 284 °F

2.4.9 Swing (up and down) Control

After energized, the step motor for up and down swing will rotate the guide louver to position 0 to close air outlet. If the swing function has not been selected after the unit is turned on, the guide louver will clockwise turn to position D under heating mode, or clockwise turn to level position L1 under other modes. If the unit is turned on with swing function selected, guide louver will swing between L and D. There are 7 positions of guide louver. The space is equal between the position L, A, B, C and D. The guide louver will be closed to position 0 when the unit was turned off. Swing will be activated only when swing function is selected and indoor fan is running.



2.4.10 Indoor unit error codes

Malfunction Name	Display	Running LED	Heating LED	Cooling LED
System Overload or indoor units cross wiring	H4		4 Flashes	
Compressor Overload Protection	H3		3 Flashes	
IPM Protection	H5		5 Flashes	
High Pressure Protection	E1	1 Flash		
Anti-Freezing Protection	E2	2 Flashes		
Exhaust Protection	E4	4 Flashes		
Over Current Protection	E5	5 Flashes		
Mode Conflict	E7	7 Flashes		
Communication Malfunction	E6	6 Flashes		
Defrost or Oil Return of Heat, see pg 14 (2.3.6)	H1		1 Flash	
Indoor Ambient Sensor Malfunction	F1			1 Flash
Indoor Tube Sensor Malfunction	F2			2 Flashes
Outdoor Ambient Sensor Malfunction	F3			3 Flashes
Outdoor Tube Sensor Malfunction	F4			4 Flashes
Outdoor Exhaust Sensor Malfunction	F5			5 Flashes
Indoor Fan Motor Malfunction	H6			
Failure Startup	H7		7 Flashes	
PFC Malfunction	HC		6 Flashes	
High current protection for compressor – Demagnetizing protection, page 41	HE		14 Flashes	
Jumper missing or Indoor PC board failed	C5			
Below the malfunctions will be displayed by pressing the SLEEP button on the Remote Control 6 times in 3 sec. The malfunction will be automatically cleared in 5 min.				
Frequency Drop for Overload	F6			6 Flashes
Frequency Drop for Over Current Protection	F8			8 Flashes
Frequency Drop for Exhaust Protection	F9			9 Flashes
Frequency Drop for Heating High Temperature Protection	H0		10 Flashes	
Anti-Cold Protection	E9	9 Flashes		

Oil Return of Cooling	F7			7 Flashes

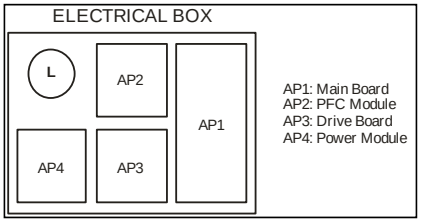
2.4.11 Flash codes on the PC board of outdoor unit

Dual Zone

Flash Codes Outdoor Unit - Models: MZG424HP16230CA, 24MH46ZOGX					
D101	**Definition**	**D102**	**Definition**	**D103**	**Definition**
1 Blink	Compressor runs	1 Blink	A unit communication malfunction (cannot receive correct data within 3 mins.)	1 Blink	B unit communication malfunction (cannot receive correct data within 3 mins.)
2 Blinks	Unit stop for compressor high pressure protection	2 Blinks	A unit indoor sensor malfunction	2 Blinks	B unit indoor sensor malfunction
3 Blinks	Unit stop for air exhaust protection	3 Blinks	A unit indoor unit outlet sensor malfunction	3 Blinks	B unit indoor unit outlet sensor malfunction
4 Blinks	Unit stopped for communication malfucntion (includes indoor unit and drive board)	4 Blinks	A unit indoor unit inlet sensor malfunction	4 Blinks	B unit indoor unit inlet sensor malfunction
5 Blinks	Unit stop for module protection	5 Blinks	A unit indoor unit ambient sensor malfunction	5 Blinks	B unit indoor unit ambient sensor malfunction
6 Blinks	Unit stop for over current protection	6 Blinks	A unit modes confliction (V1.6)	6 Blinks	B unit modes confliction (V1.6)
7 Blinks	Unit stop for cooling overload	7 Blinks	A unit anti-freezing protection	7 Blinks	B unit anti-freezing protection
8 Blinks	Unit stop for heating anti-high temperature	8 Blinks	A unit anti-high temperature protection	8 Blinks	B unit anti-high temperature protection
9 Blinks	Unit stop for refrigerant anti-freezing				
10 Blinks	Unit stop for sensor malfunction				
11 Blinks	Unit stop for compress overload protection				
12 Blinks	Unit stop for compressor low pressure protection	**D104**	**Definition**	**D105**	**Definition**
13 Blinks	Unit stop for DC bus current protection	1 Blink	Air exhaust protection, drop frequency	1 Blink	Air exhaust protection limit frequency
14 Blinks	EEPROM fault	2 Blinks	Over current protection, drop frequency	2 Blinks	Over current protection limit frequency
15 Blinks	DC power supply short circuit	3 Blinks	Refrigerant overload, drop frequency	3 Blinks	Refrigerant overload limit frequency
LED1	**Red Drive**	4 Blinks	Heating A unit anti-high temp., drop frequency	4 Blinks	Heating A unit anti-high temp. limit frequency
Dark	Normal, reset unit stop	5 Blinks	Heating B unit anti-high temp., drop frequency	5 Blinks	Heating B unit anti-high temp. limit frequency
1 Blink	Compressor normally runs	6 Blinks	phase-current protection, drop frequency	6 Blinks	Oil return
2 Blinks	Unit stop for abnormal	7 Blinks	A anti-freezing protection, drop frequency	7 Blinks	A anti-freezing protection limit frequency
3 Blinks	IPM protection	8 Blinks	B anti-freezing protection drop frequency	8 Blinks	B anti-freezing protection limit frequency
4 Blinks	Demagnetization protection	9 Blinks	Defrosting	9 Blinks	
5 Blinks	PFC protection	**D106**	**Definition**	**D107**	**Definition (SIPM information)**
6 Blinks	10 times tried to start - failure	1 Blink	Outdoor ambient sensor malfunction	1 Blink	Reset and stop
7 Blinks	Startup failure	2 Blinks	Outdoor tube sensor malfunction	2 Blinks	Instantaneous overcurrent or 17V voltage is too low
8 Blinks	Startup failure	3 Blinks	Outdoor air exhaust sensor malfunction	3 Blinks	Abnormal low speed
9 Blinks	Startup failure	4 Blinks		4 Blinks	Shift failure
10 Blinks	Pressure lack	5 Blinks	Drive board communication malfunction (cannot receive correct data within 10 sec.)	5 Blinks	Overload stop
11 Blinks	Over pressure	6 Blinks		6 Blinks	OH over temperature
LED2	**LED2 Green-Drive**	7 Blinks		7 Blinks	OH or FIN sensor abnormal
Bright	Communication malfunction (no data received in 10 sec.)	8 Blinks		**D108**	**Definition**
Blink	Communication normal	9 Blinks		1 Blink	Received verified and correct indoor data
				2 Blink	The communication is normal.

Quad Zone

Flash Codes Outdoor Unit - Models: MZG434HP16230CA, 34MH46ZOGX					
D101 / red	**Malfunction**	**D102 / yel**	**Malfunction**	**D103 / grn**	**Malfunction**
1 Blink	Compressor runs	1 Blink	Frequency drop for exhaust protection	1 Blink	Frequency limit for exhaust protection
2 Blinks	Unit stop for compressor high pressure protection	2 Blinks	Frequency drop for cooling overload	2 Blinks	Frequency limit for cooling overload
3 Blinks	Unit stop for air exhaust protection	3 Blinks	Frequency drop for over current protection	3 Blinks	Frequency limit for over current protection
4 Blinks	Unit stopped for communication malfucntion (includes indoor unit and SIPM)	4 Blinks	Frequency drop for phase current protection	4 Blinks	Frequency limit for phase current protection
5 Blinks	Unit stopped for IPM protection	5 Blinks	Frequency drop for heating unit A high temp protection	5 Blinks	Frequency limit for heating unit A high temp protection
6 Blinks	Unit stopped for over current protection	6 Blinks	Frequency drop for heating unit B high temp protection	6 Blinks	Frequency limit for heating unit B high temp protection
7 Blinks	Unit stopped for cooling overload	7 Blinks	Frequency drop for heating unit C high temp protection	7 Blinks	Frequency limit for heating unit C high temp protection
8 Blinks	Unit stopped for high temp protection of each indoor unit	8 Blinks	Frequency drop for heating unit D high temp protection	8 Blinks	Frequency limit for heating unit D high temp protection
9 Blinks	Unit stopped for anti-freezing protection of each indoor unit	9 Blinks	Defrost	9 Blinks	Oil return
10 Blinks	Unit stopped for outdoor unit sensor malfunction or indoor sensor malfunction				
11 Blinks	Unit stopped for compressor overload protection				
12 Blinks	Unit stopped for compressor low pressure protection				
13 Blinks	Unit stopped for phase current protection	**D105 / yel**	**Malfunction**	**D106 / grn**	**Malfunction**
14 Blinks	Unit stopped for Incorrect read of EEPROM	1 Blink	A unit communication malfunction (cannot receive correct data within 3 mins.)	1 Blink	B unit communication malfunction (cannot receive correct data within 3 mins.)
15 Blinks	Unit stopped for DC power supply short circuit	2 Blinks	A unit indoor middle sensor malfunction	2 Blinks	B unit indoor middle sensor malfunction
		3 Blinks	A unit indoor unit outlet pipe sensor malfunction	3 Blinks	B unit indoor unit outlet pipe sensor malfunction
D104 / red	**Malfunction**	4 Blinks	A unit indoor unit inlet pipe sensor malfunction	4 Blinks	B unit indoor unit inlet pipe sensor malfunction
1 Blink	Outdoor ambient sensor malfunction	5 Blinks	A unit indoor unit ambient sensor malfunction	5 Blinks	B unit indoor unit ambient sensor malfunction
2 Blinks	Outdoor tube sensor malfunction	6 Blinks	A unit modes confliction	6 Blinks	B unit modes confliction
3 Blinks	Outdoor air exhaust sensor malfunction	7 Blinks	A unit anti-freezing protection	7 Blinks	B unit anti-freezing protection
4 Blinks	Drive board communication malfunction (cannot receive correct data within 10 sec.)	8 Blinks	A unit high temperature protection	8 Blinks	B unit high temperature protection
D107 / red	**Malfunction**	**D108 / yel**	**Malfunction**	**D109 / grn**	**Malfunction**
1 Blink	C unit communication malfunction (cannot receive correct data within 3 mins.)	1 Blink	D unit communication malfunction (cannot receive correct data within 3 mins.)	1 Blink	Flash once after receiving correct communication data
2 Blinks	C unit indoor middle sensor malfunction	2 Blinks	D unit indoor middle sensor malfunction		
3 Blinks	C unit indoor unit outlet pipe sensor malfunction	3 Blinks	D unit indoor unit outlet pipe sensor malfunction	**LED1 / red**	**Malfunction**
4 Blinks	C unit indoor unit inlet pipe sensor malfunction	4 Blinks	D unit indoor unit inlet pipe sensor malfunction	1 Blink	Compressor runs normal
5 Blinks	C unit indoor unit ambient sensor malfunction	5 Blinks	D unit indoor unit ambient sensor malfunction	2 Blinks	Unit stopped for abnormity
6 Blinks	C unit modes confliction	6 Blinks	D unit modes confliction	3 Blinks	IPM protection
7 Blinks	C unit anti-freezing protection	7 Blinks	D unit anti-freezing protection	4 Blinks	Demagnetization protection
8 Blinks	C unit high temperature protection	8 Blinks	D unit high temperature protection	5 Blinks	PFC protection
				6 Blinks	Start up for 5 successive times
				7 Blinks	Start up failure
		LED2 / grn	**Malfunction**	8 Blinks	DC bus voltage is under 350V during start up of compressor
		1 Blink	Communication failure (cannot receive correct data within 10 sec.)	9 Blinks	DC bus voltage is above 420V
		2 Blinks	Normal communication	10 Blinks	IPM over heat protection
				11 Blinks	DC bus voltage is under 320V during running
				12 Blinks	IPM temp detects short or open circuit of thermister



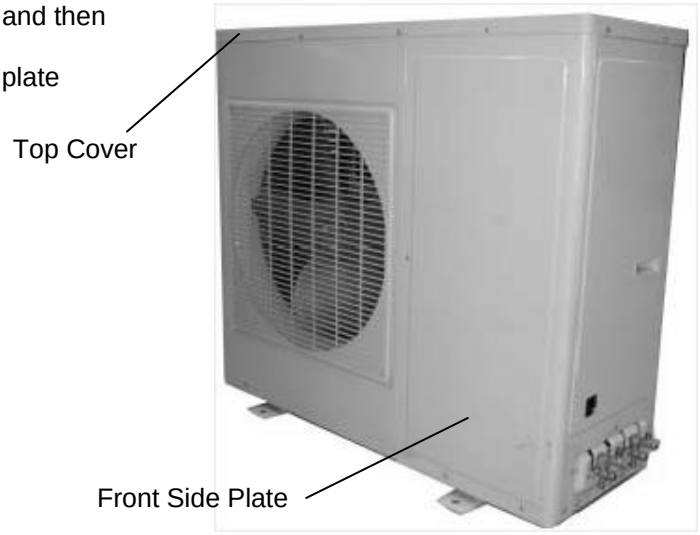
Note: D101-D109, LED1 and LED2 are all indicators for malfunctions, in which D101-D109 are on the main board AP1 and LED1 and LED2 are on the drive board AP3.

DISASSEMBLY PROCEDURE

DUAL ZONE OUTDOOR UNIT

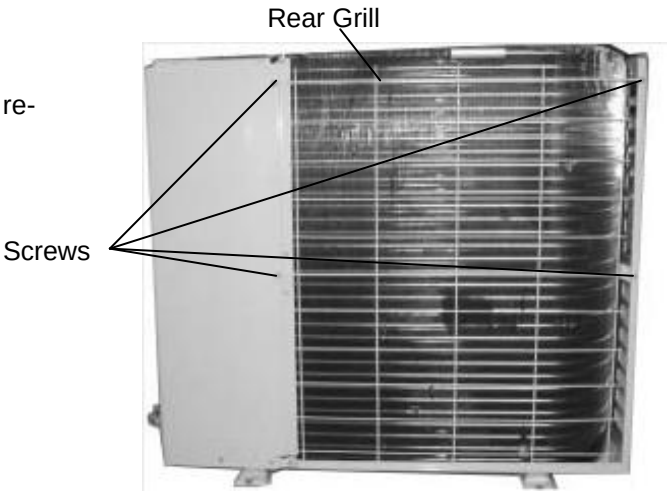
1. Disassemble the Top Cover and Front Side Plate

Unscrew the screws fixing the top cover, and then lift the top cover to remove it.
Unscrew the screws fixing the front side plate to remove it.



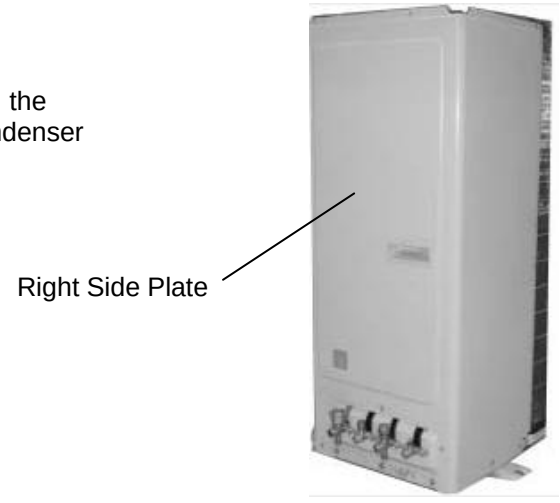
2. Disassemble the Rear Grill

Unscrew the 4 screws fixing the rear grill to remove it.



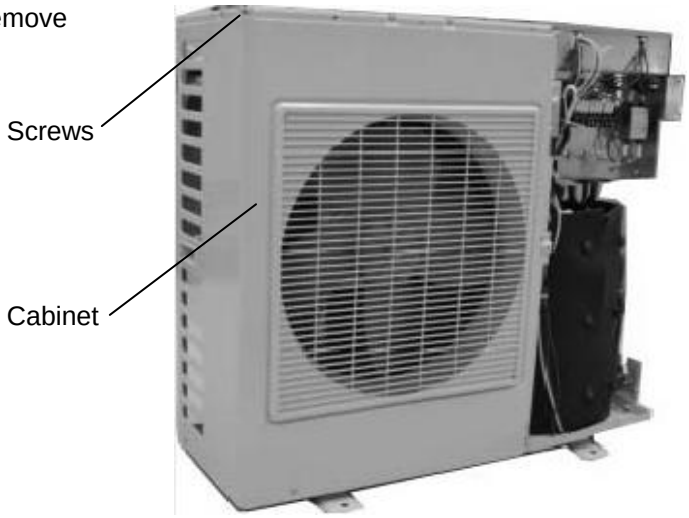
3. Disassemble the Right Side Plate

Unscrew the screws at the right side plate, the valve support and the side plate of the condenser to remove the right side plate.



4. Disassemble the Cabinet

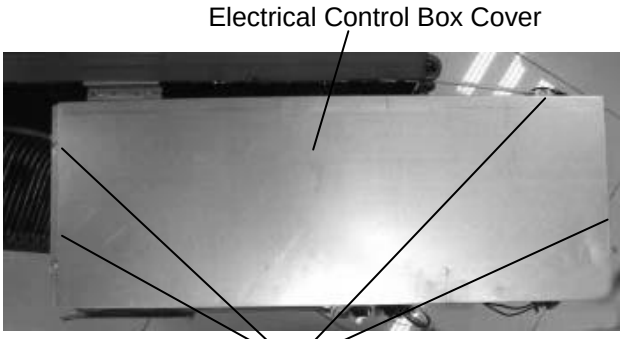
Unscrew the screws fixing the cabinet to remove it.

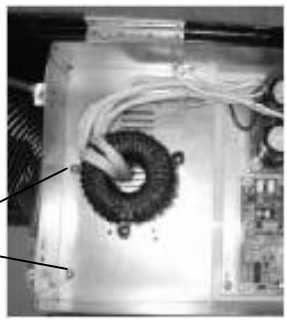


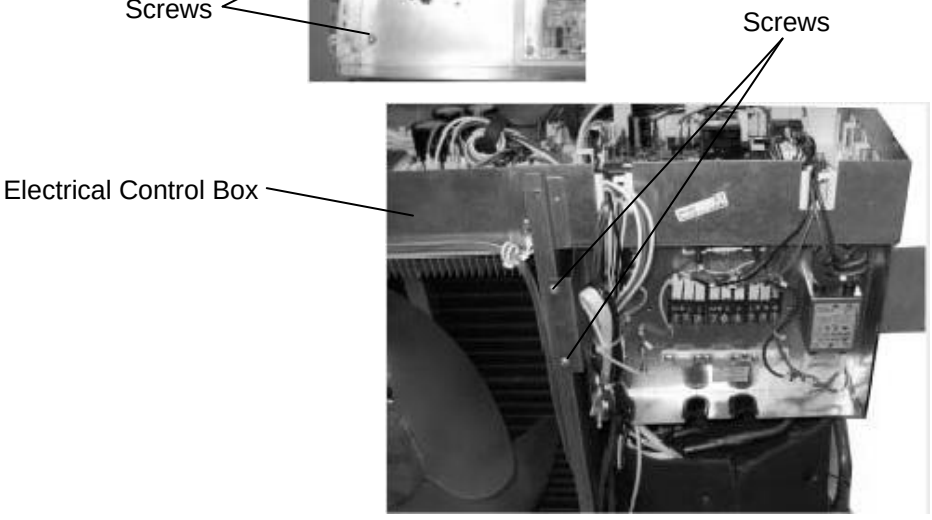
5. Disassemble the Electrical Control Box

Unscrew the 4 screws fixing the Electrical Control Box Cover to remove it. And then unscrew the 4 screws fixing the Electrical Control Box.

Disconnect all lead wires from Electrical Control Box, and then remove it.

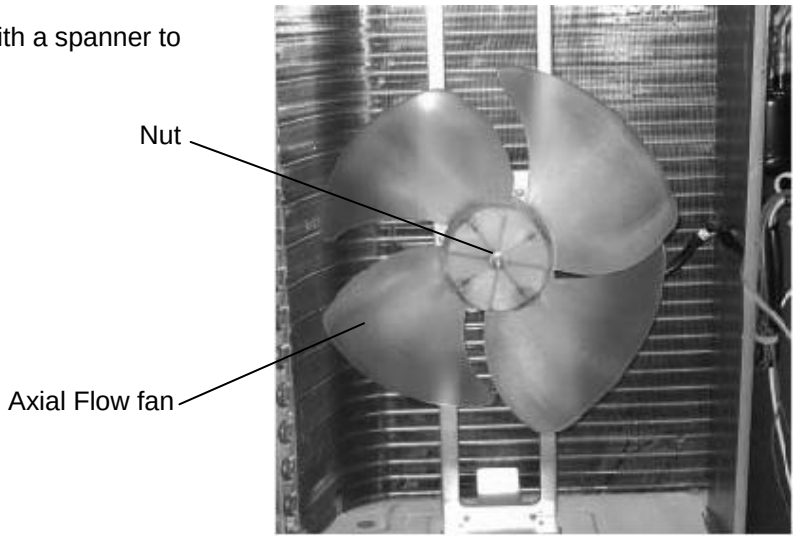






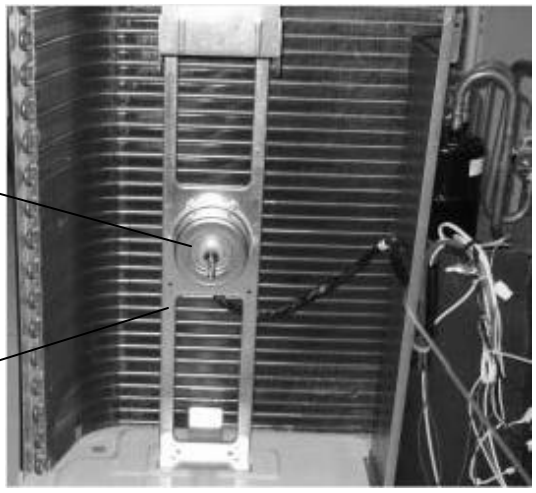
6. Disassemble the Axial Flow Fan

Unscrew the nut fixing the fan with a spanner to take out the fan



7. Disassemble the Fan Motor

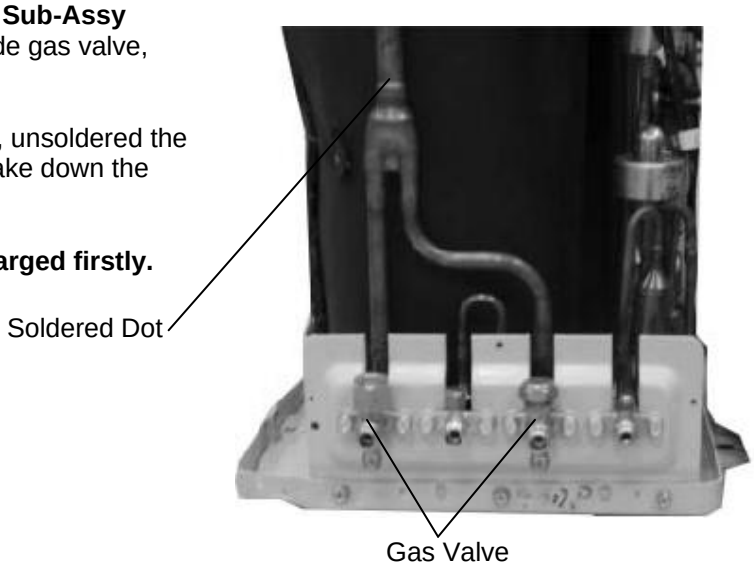
Unscrew the screws fixing the Motor Support, and then lift it upwards to remove it.
Unscrew the screws fixing the motor to remove it.



8. Disassemble the Connection Pipe Sub-Assy
(The connection pipe sub-assy include gas valve, connection pipe, diffluent meter.)

Unscrew the bolts fixing the gas valve, unsoldered the soldered dots on the diffluent meter, take down the connection pip sub-assy.

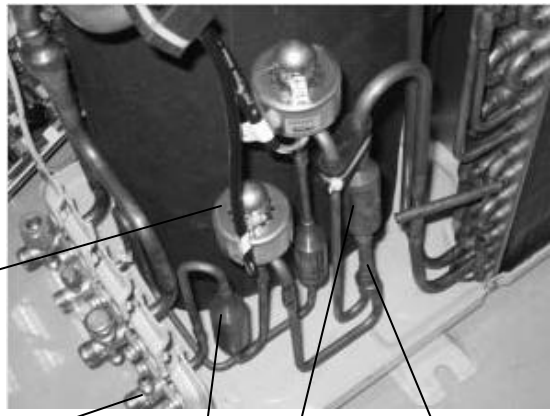
Note: Refrigerant should be discharged firstly.



9. Disassemble the Electron Expansion Valve Sub-Assy

(The Electron Expansion Valve Sub-Assy should include liquid valve, filter and distributor.)

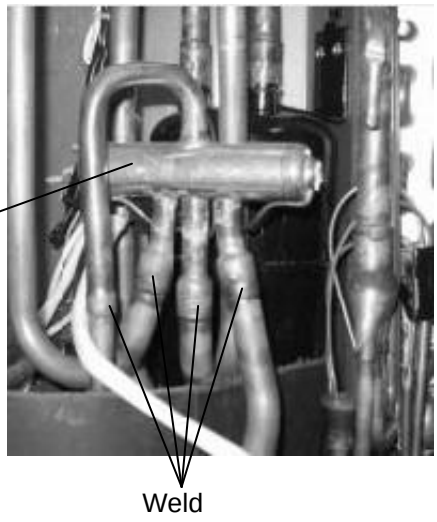
Screw off the bolts fixing the liquid valve, unsoldered the soldered dot between distributor and bidirectional filter, take off the electron expansion valve sub-assy.



10. Disassemble the Four-Way Valve

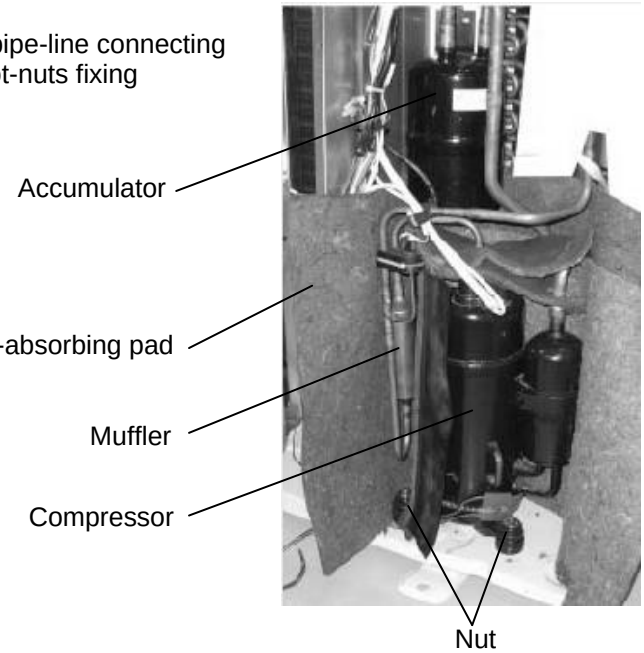
Wrap the four-way valve with wet cotton and unsolder the 4 weld connecting the four-way valve to take it out.

Note: Welding process should be as quick as possible and keep wrapping cotton wet all the time. Be sure not to burn out the lead-out wire of the compressor.



11. Disassemble the Compressor

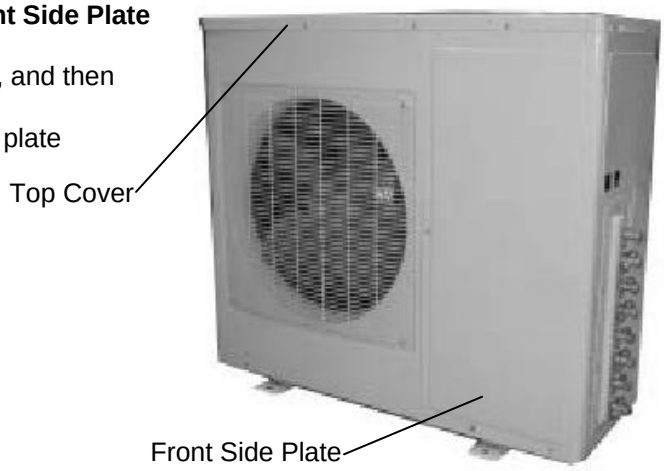
Open the sound-absorbing pad, unsolder the pipe-line connecting to the compressor, and then unscrew the 3 foot-nuts fixing compressor to remove it.



QUAD ZONE OUTDOOR UNIT

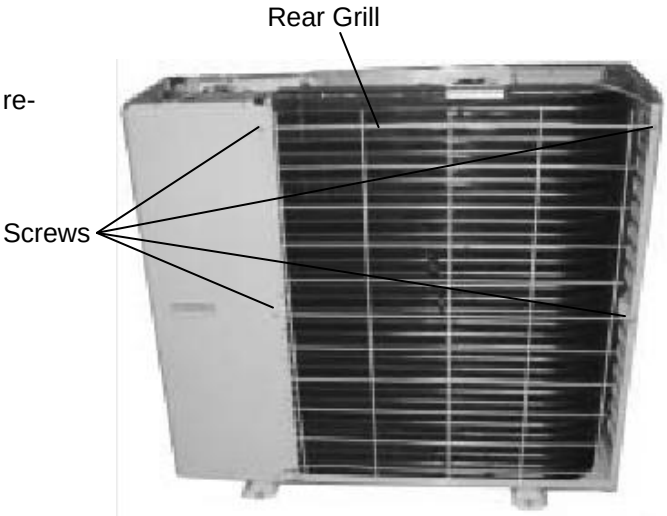
1. Disassemble the Top Cover and Front Side Plate

Unscrew the screws fixing the top cover, and then lift the top cover to remove it.
Unscrew the screws fixing the front side plate to remove it.



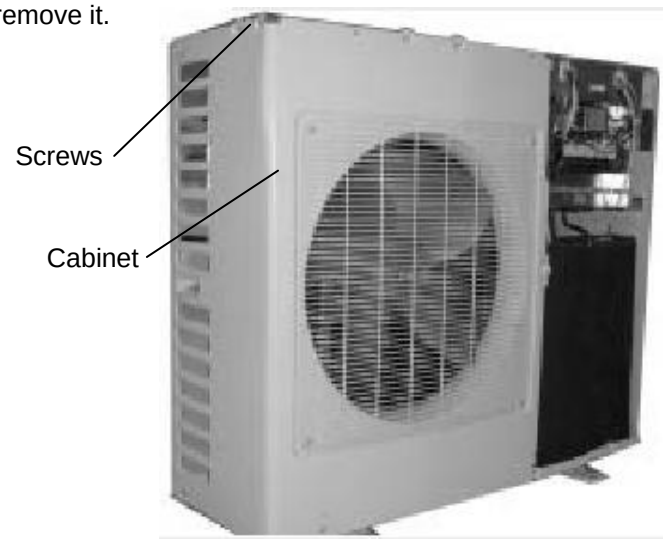
2. Disassemble the Rear Grill

Unscrew the 4 screws fixing the rear grill to remove it.



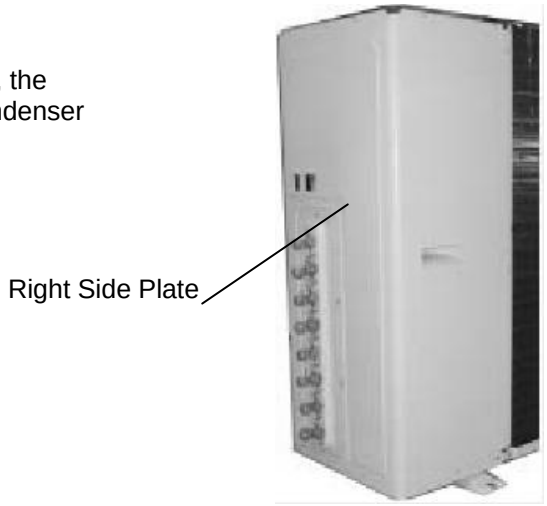
3. Disassemble the Cabinet

Unscrew the screws fixing the cabinet to remove it.



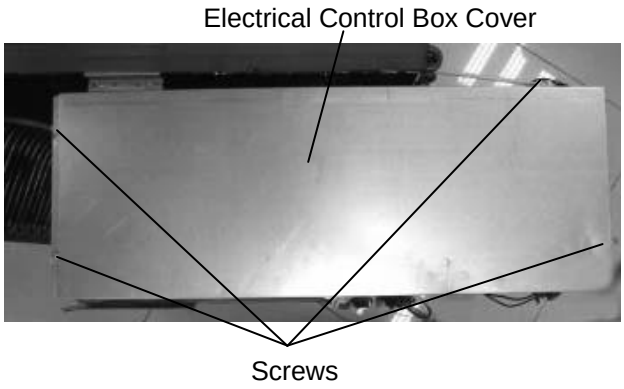
4. Disassemble the Right Side Plate

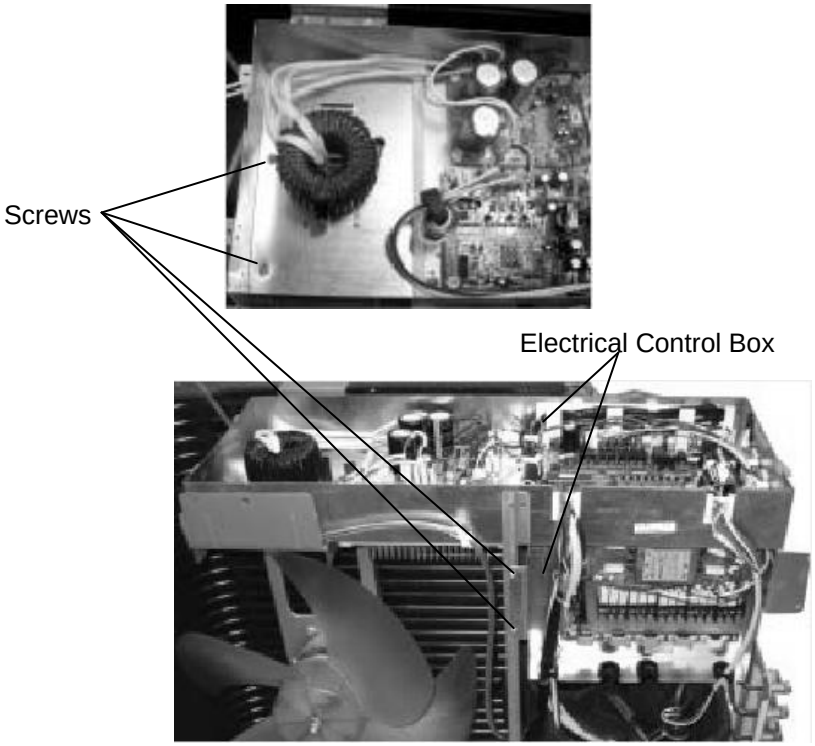
Unscrew the screws at the right side plate, the valve support and the side plate of the condenser to remove the right side plate.



5. Disassemble the Electrical Control Box

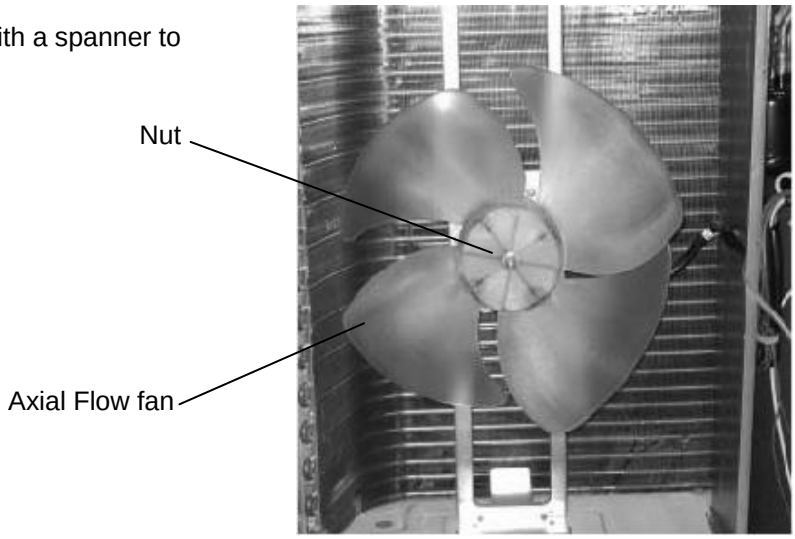
Unscrew the 4 screws fixing the Electrical Control Box Cover to remove it. And then unscrew the 4 screws fixing the Electrical Control Box.
Disconnect all lead wires from Electrical Control Box, and then remove it.





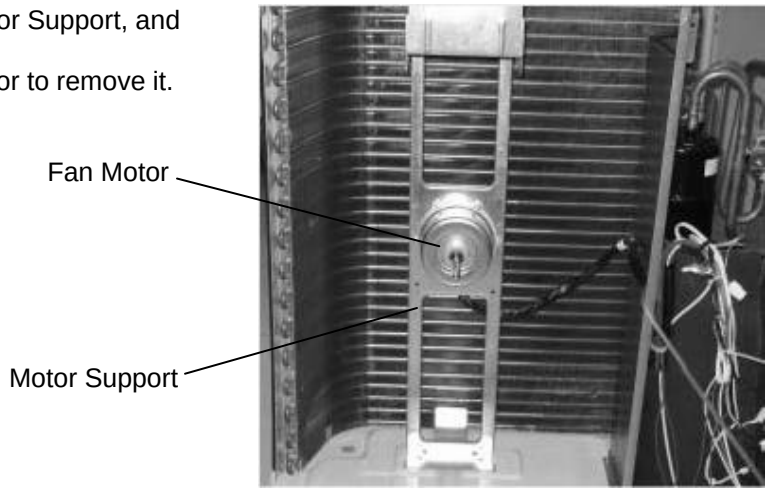
6. Disassemble the Axial Flow Fan

Unscrew the nut fixing the fan with a spanner to take out the fan



7. Disassemble the Fan Motor

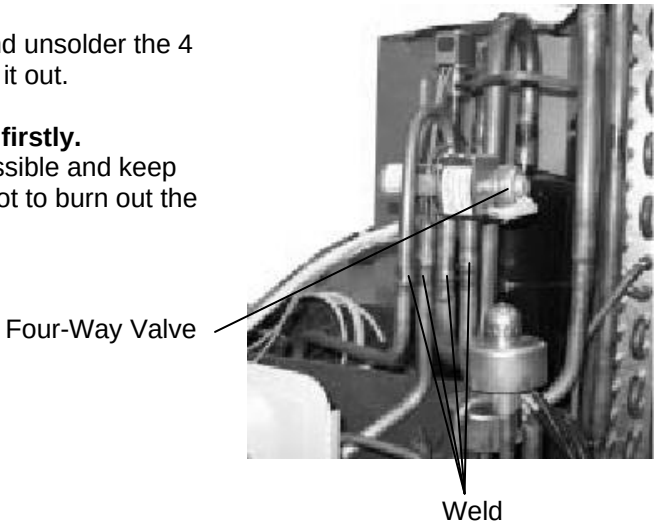
Unscrew the screws fixing the Motor Support, and then lift it upwards to remove it.
Unscrew the screws fixing the motor to remove it.



8. Disassemble the Four-Way Valve

Wrap the four-way valve with wet cotton and unsolder the 4 weld connecting the four-way valve to take it out.

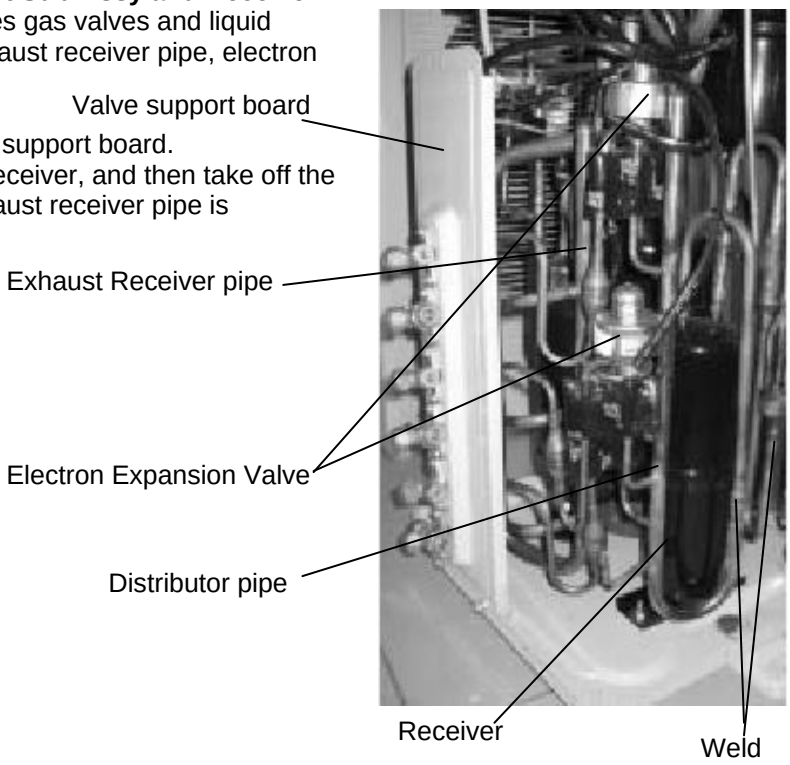
Note: Refrigerant should be discharged firstly.
Welding process should be as quick as possible and keep wrapping cotton wet all the time. Be sure not to burn out the lead-out wire of the compressor.



9. Disassemble the Valve Support Sub-Assy and Receiver

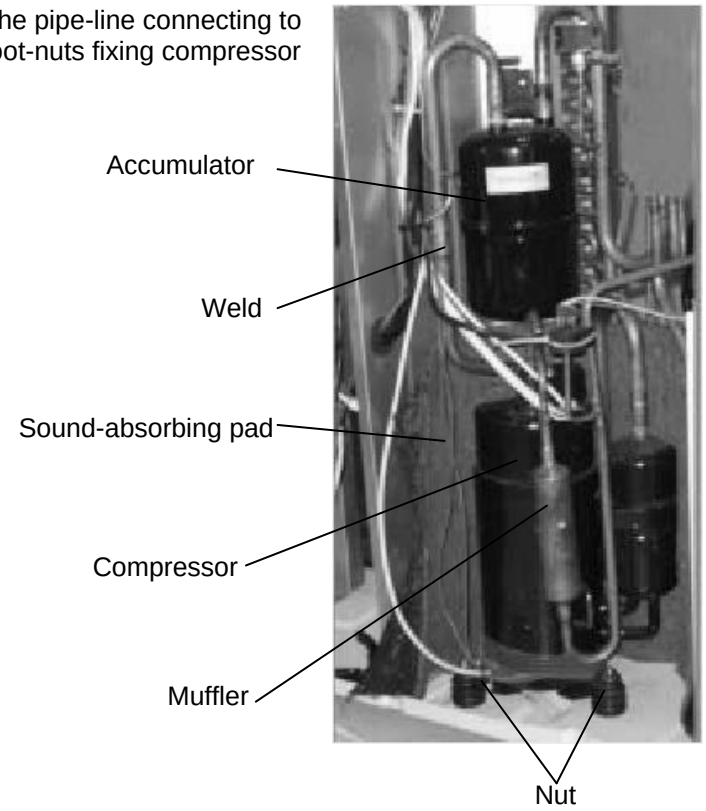
(The Valve Support-Assy includes gas valves and liquid valves, valve support board, exhaust receiver pipe, electron expansion valve and distributor.)

Unscrew the bolts fixing the valve support board.
Unsolder the soldered points on receiver, and then take off the valve support sub-assy. (The exhaust receiver pipe is connected with 4-way valve.)



10. Disassemble the Compressor

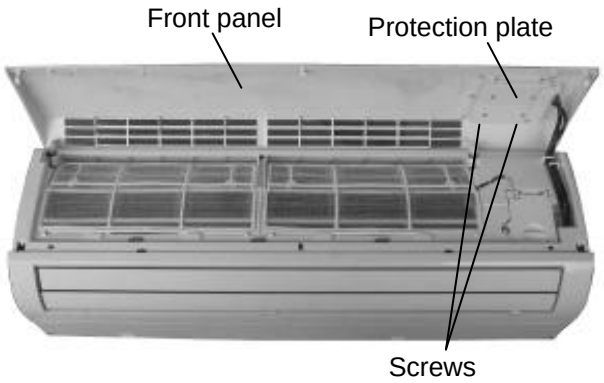
Open the sound-absorbing pad, unsolder the pipe-line connecting to the compressor, and then unscrew the 3 foot-nuts fixing compressor to remove it.



INDOOR UNIT

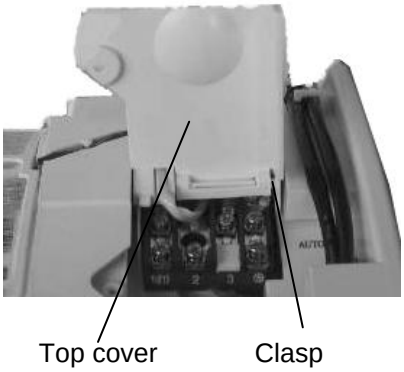
1. Disassemble the Front Panel

Lift the front panel upward. Firstly, unscrew the 4 screws fixing the upper protection plate at the receiving window and remove the protection plate. Then, disconnect the wiring. Pull the panel outward with force along the groove fixing the panel to remove the panel.



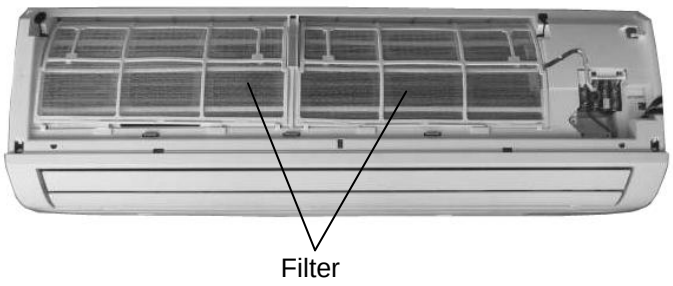
2. Disassemble the Top Cover of Electric control box

Unscrew the screw fixing the top cover of electric control box, open the cover and then remove by loosening the clasp



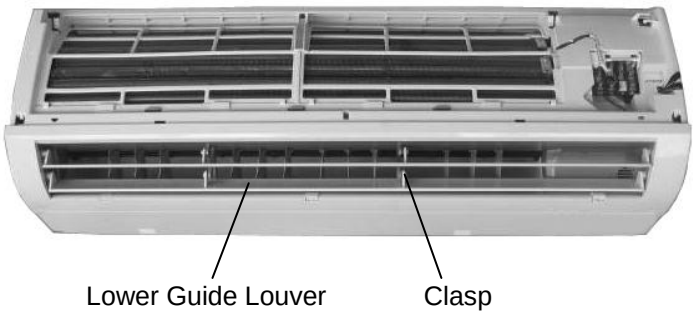
3. Disassemble the Filter

Push the filter inward, and then pull it upward to remove it.



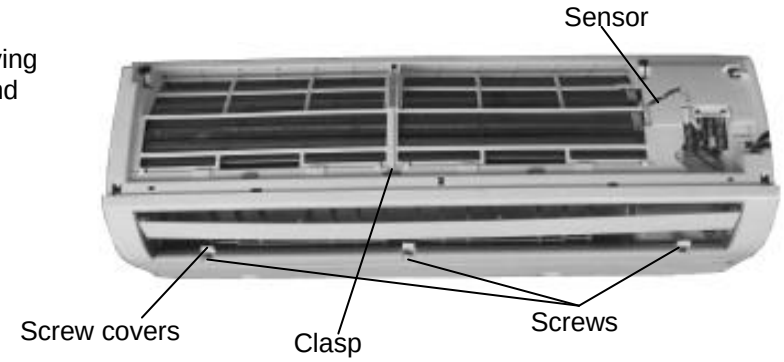
4. Disassemble the Lower Guide Louver

Manually bend the lower guide louver to loosen the clasp at the guide louver. Remove the lower guide louver.
Note: To remove the upper guide louver, you have to open the front case first, then unscrew the screws fixing the upper guide louver and the water tray, bend the upper guide louver and remove the upper guide louver.



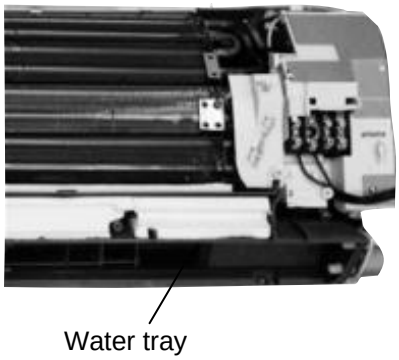
5. Disassemble the Front Case

Unscrew the three screws after removing the screw covers on the front case, and then remove the front case.



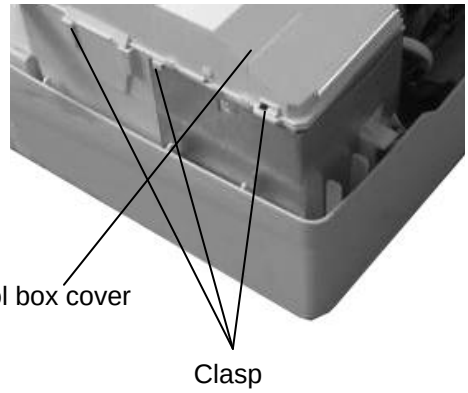
6. Disassemble the Water Tray

Unscrew the screws fixing the water tray with a screw driver. Loosen the clasp at the other end side. Pull out the terminal board of the step motor. Pull upward the water tray and take it out. Remove the water tray.



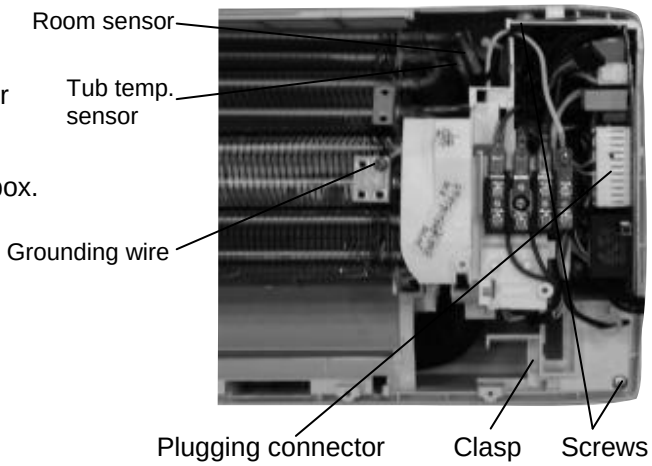
7. Disassemble the Cover of Electric control box

Loosen the three clasps, and pull upward to remove the cover of the electric control box.



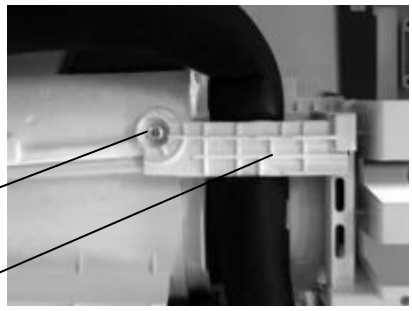
8. Disassemble the Electric control box

Remove the grounding wire of the evaporator.
Take out the tube temp. sensor.
Unplug the plugging connector of the indoor motor beside the electric control box, use screwdriver to unscrew the screws fixing the electric control box, loosen the clasp and remove the electric control box.



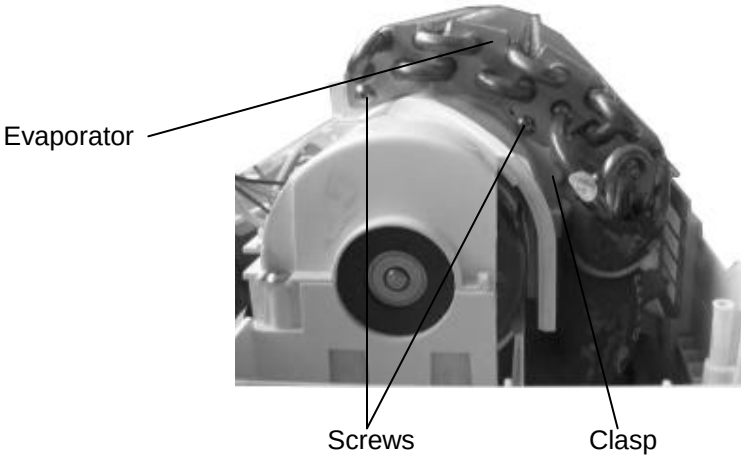
9. Disassemble the Evaporator

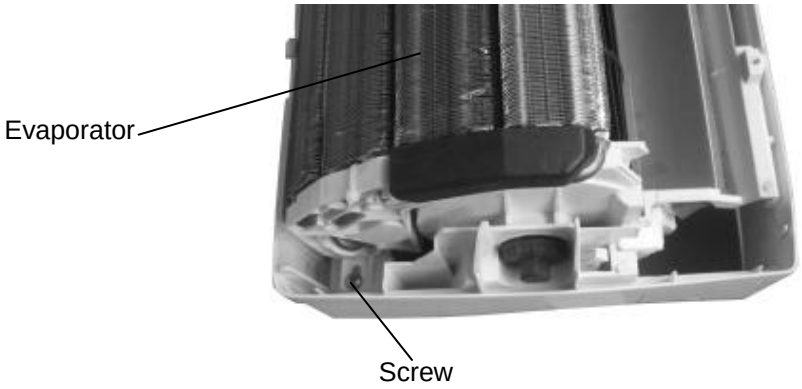
Unscrew the screw fixing the Rear pipe clamp. Take down the Rear pipe clamp.
Unscrew the 4 screws fixing the left and right side of the evaporator, and then elevate the left side of the evaporator to remove it backward.



CAUTION:

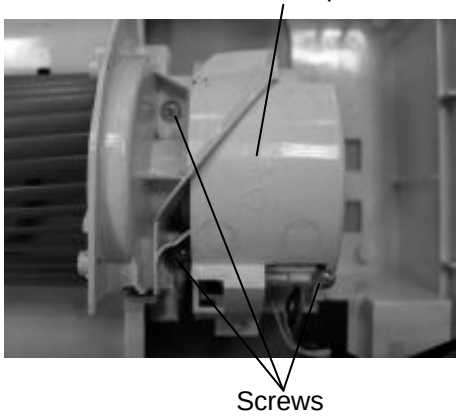
Take out the evaporator carefully and pay attention to the connecting pipe to prevent the connection pipe from any damage during repairing.

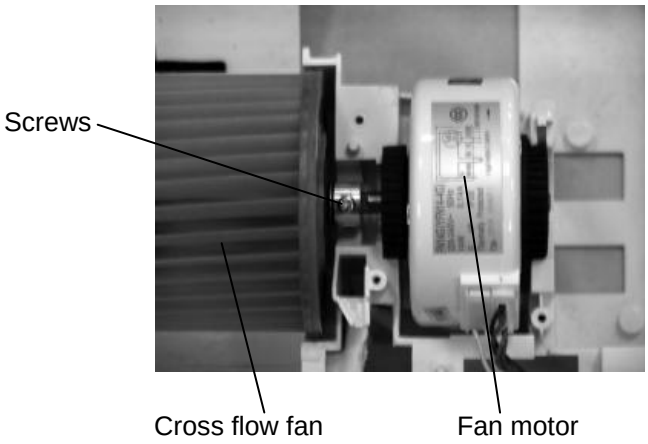




10. Disassemble the fan motor

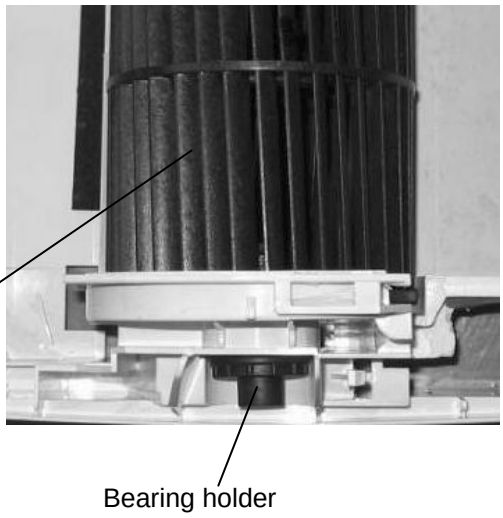
Unscrew the two screws fixing the motor clamp, and then remove the motor clamp.
Unscrew the three holding screws at the shaft sleeve, and then remove the fan motor.





11. Disassemble the cross flow fan

Pull out the cross flow fan from the left bearing holder after remove the motor.



TROUBLESHOOTING

1. Preparations before repair

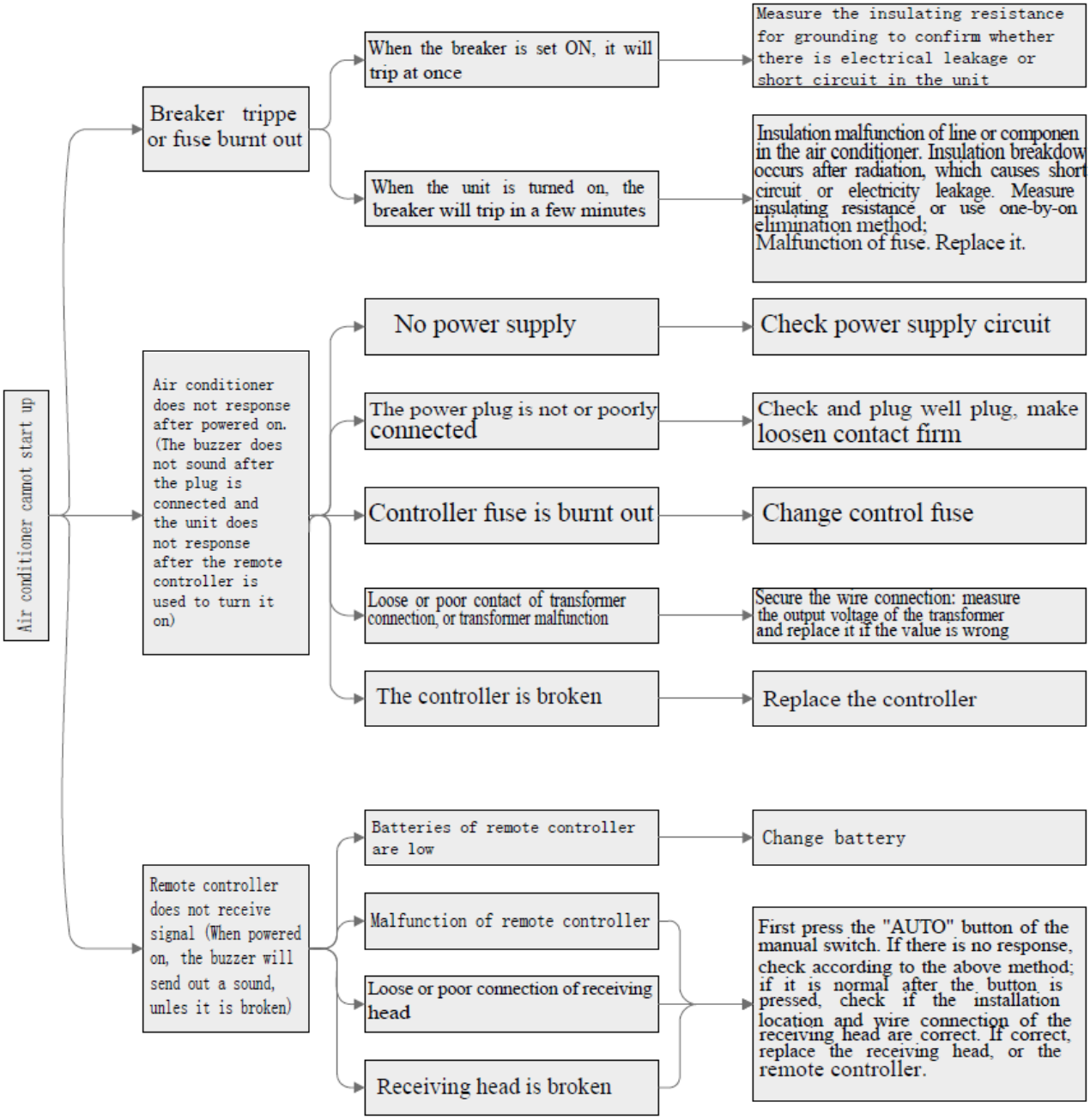
Step 1: Firstly, check the model of unit to be repaired and find out the model number and spare parts number of the main damageable components, particularly the outdoor PC boards.

Step 2: According to the fault described by the user, make a preliminary judgment on the possible components that might be replaced. Bring them with you for repair.

Step 3: To repair the unit, please bring the multimeter and clamp on ampere meter with you besides the usual tools as screwdriver and spanner.

Notice:

1. To avoid electric shock during repair, do not touch any terminal before it is measured that the voltage between module P and N is less than 50V.
2. Before or after the maintenance, you have to check the power socket, wiring board of indoor and outdoor units, verify all wiring connections on the main PC board are good.

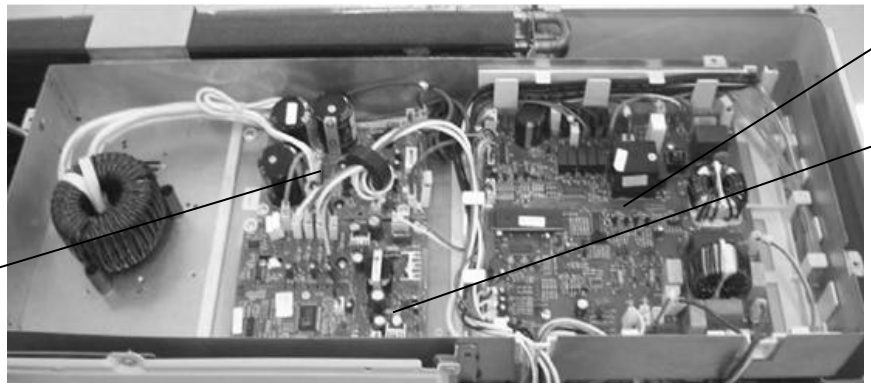


2. Conditions that appear to be abnormal but are not operational problems

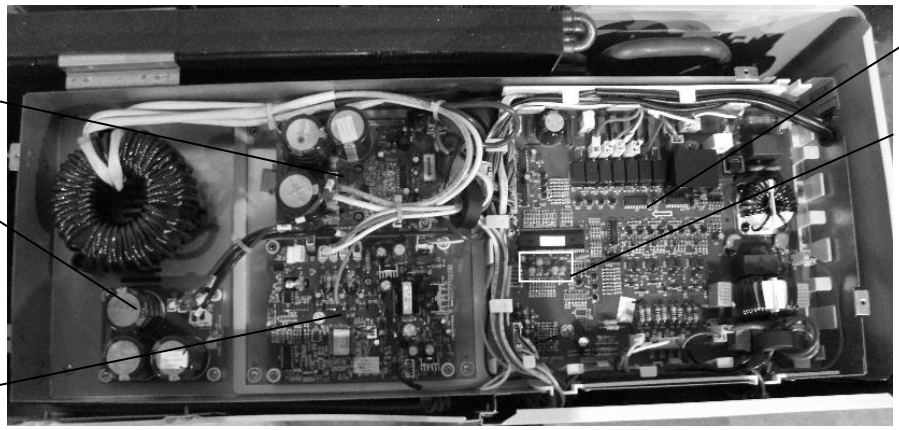
Case	Explanation
Operation does not start quickly. ▪ When ON / OFF button was pressed soon after operation was stopped. ▪ When the mode was reselected.	▪ This is to protect the air conditioner. You have to wait for about 3 minutes.
Hot air does not flow out soon after the start of heating operation.	▪ The air conditioner is warming up. You have to wait for 1 to 4 minutes. (The system is designed to start discharging air only after it has reached a certain temperature.)
The heating operation stops suddenly and a flowing sound is heard.	The system is taking away the frost on the outdoor unit. You have to wait for about 3 to 8 minutes.
The outdoor unit emits water or steam.	In Heating mode ▪ The frost on the outdoor unit melts into water or steam when the air conditioner is in defrost operation. In Cooling mode ▪ Moisture in the air condenses into water on the cool surface of outdoor unit piping and drips.
Mist comes out of the indoor unit.	This happens when the air in the room is cooled into mist by the cold airflow during cooling operation.
The indoor unit gives out odor.	This happens when smells of the room, furniture, or cigarettes are absorbed into the unit and discharged with airflow.
The outdoor fan rotates while the air conditioner is not in operation	After operation is stopped, the outdoor fan keeps rotating for another 60 seconds for system protection.
The operation stopped suddenly. (OPERATION LED is on.)	For system protection, the air conditioner may stop operating on a sudden large voltage fluctuation. It automatically resumes operation in about 3 minutes.

3. Outdoor PC boards

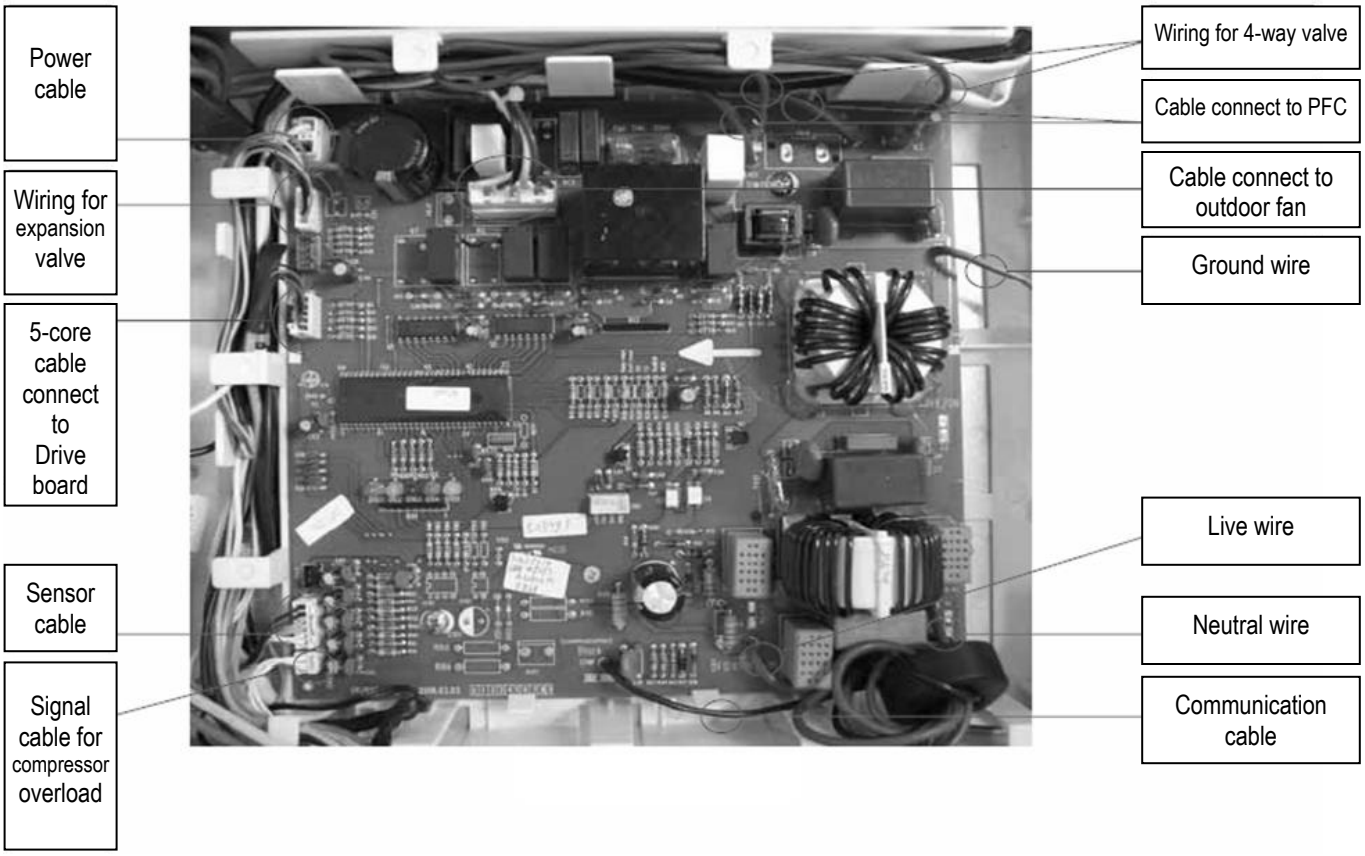
Dual Zone



Quad Zone



Main board wiring



PFC board and Power board wiring

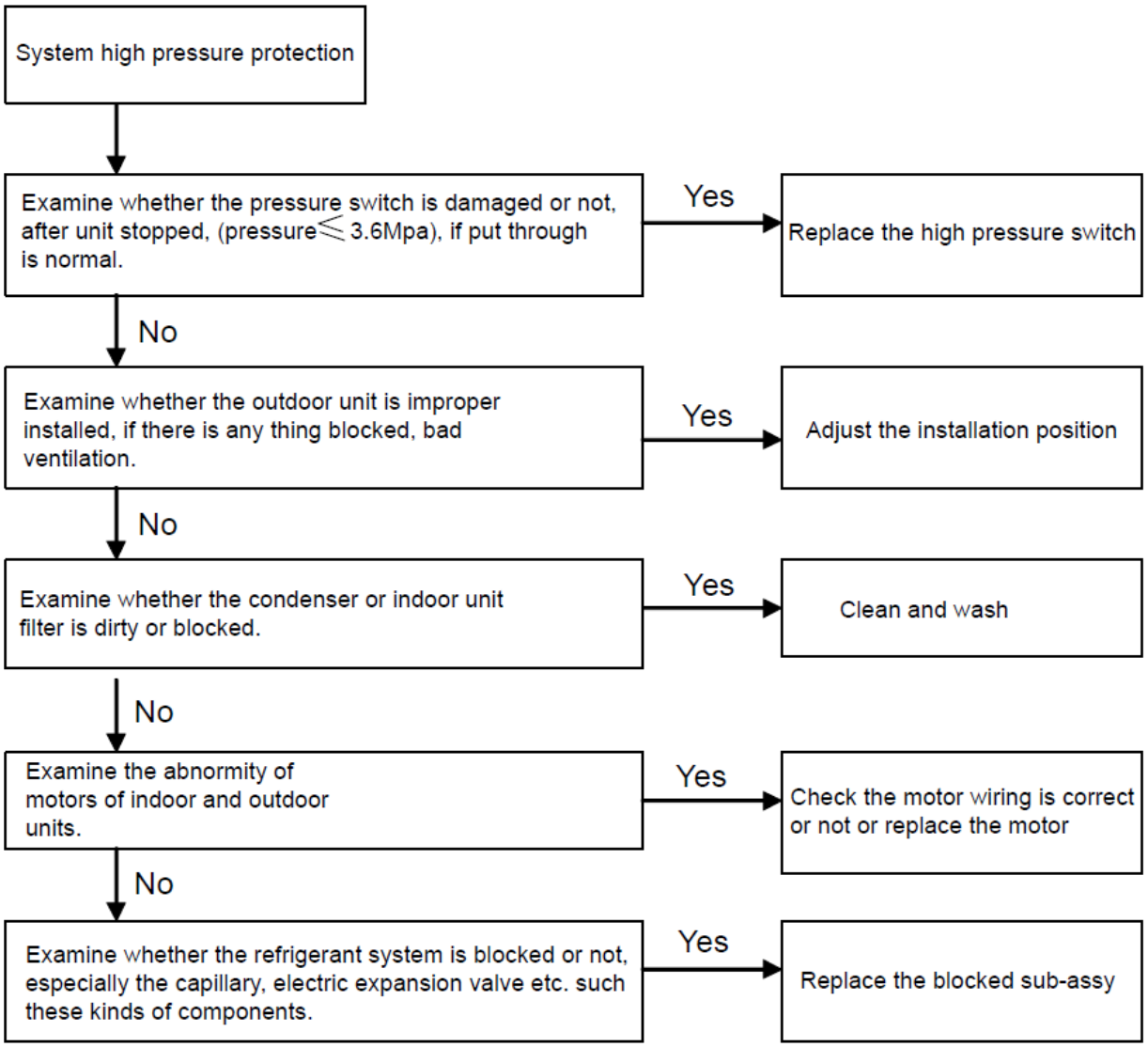
4. Malfunction and correction

Note: The first step in troubleshooting is to disconnect power for 30 seconds to allow the unit to reset. If this does not rectify the problem proceed with the troubleshooting.

When air conditioner has malfunction or protection, indoor unit displayer or indicator will display the corresponding codes; indicators on outdoor unit main PC board will flash at the same time. Please refer to the contents described in 2.4.9 and 2.4.10 chapters.

For the detail information of some malfunction, please check the troubleshooting chart below.

System high pressure protection **E1** or running indicator extinguishes 3 second and blinks one time.



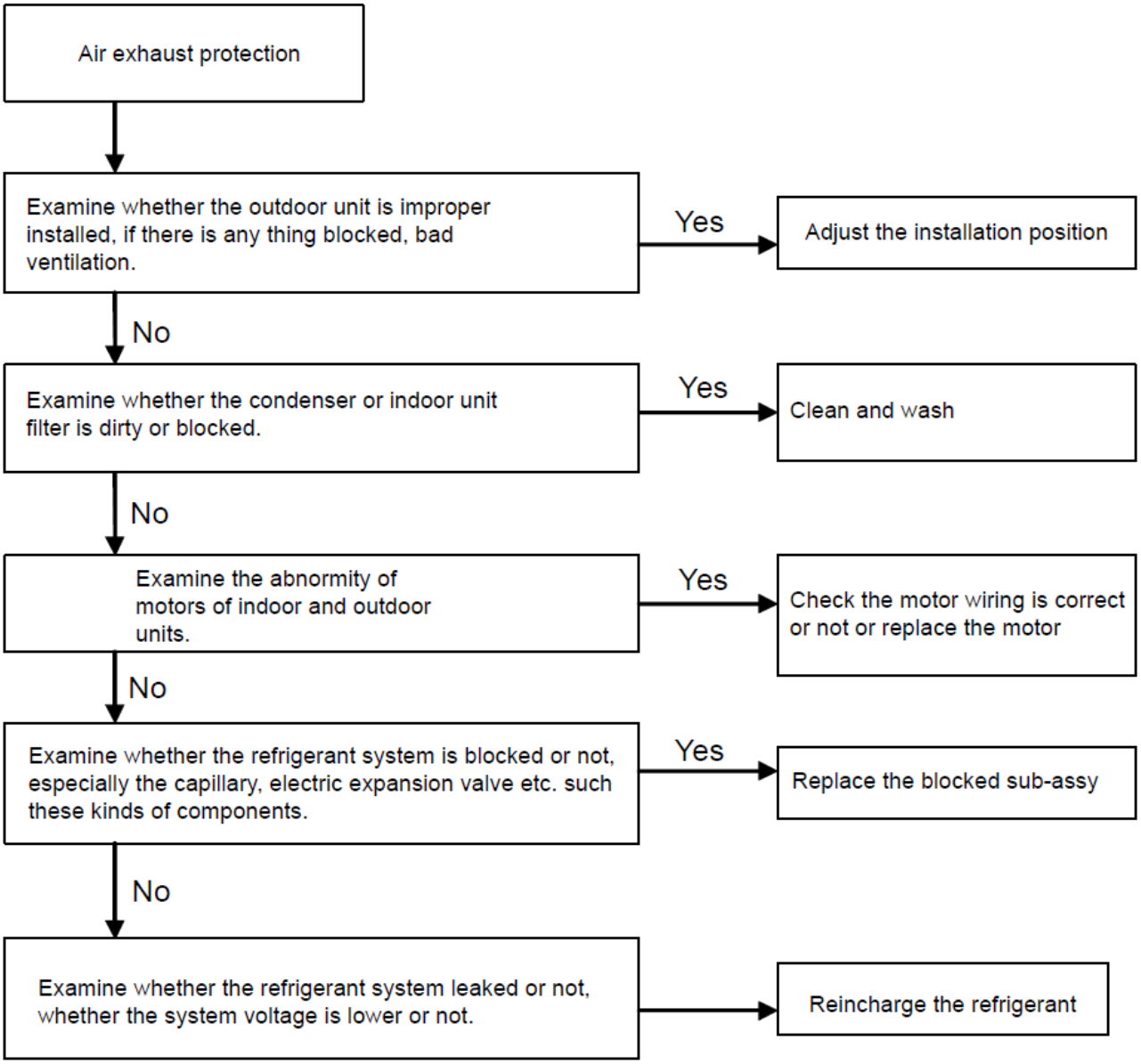
"E1" may be also caused by the following reasons:
- Outdoor PC board failed, especially at the connection between the pressure switch and PC board.
- Refrigerant is overfull or shortage.
- Outdoor ambient temperature is excessive.

Anti-Freezing Protection **E2**

- Check the air flow; make sure it is not blocked.
- Check the air filter and evaporator, make sure they are clean.

▪ Check the indoor tube sensor F2 by referring the value on page 33.If it is broken, then replace the sensor. If the sensor is good, then replace the indoor PC board.

Exhaust protection of the compressor **E4** or running indicator extinguishes 3 second blinks 4 times.



Over Current Protection **E5**

An input over current is detected by checking the input current value with the compressor running. It may result from wrong internal wiring. If the system is interrupted by an input over current, take the following procedure.

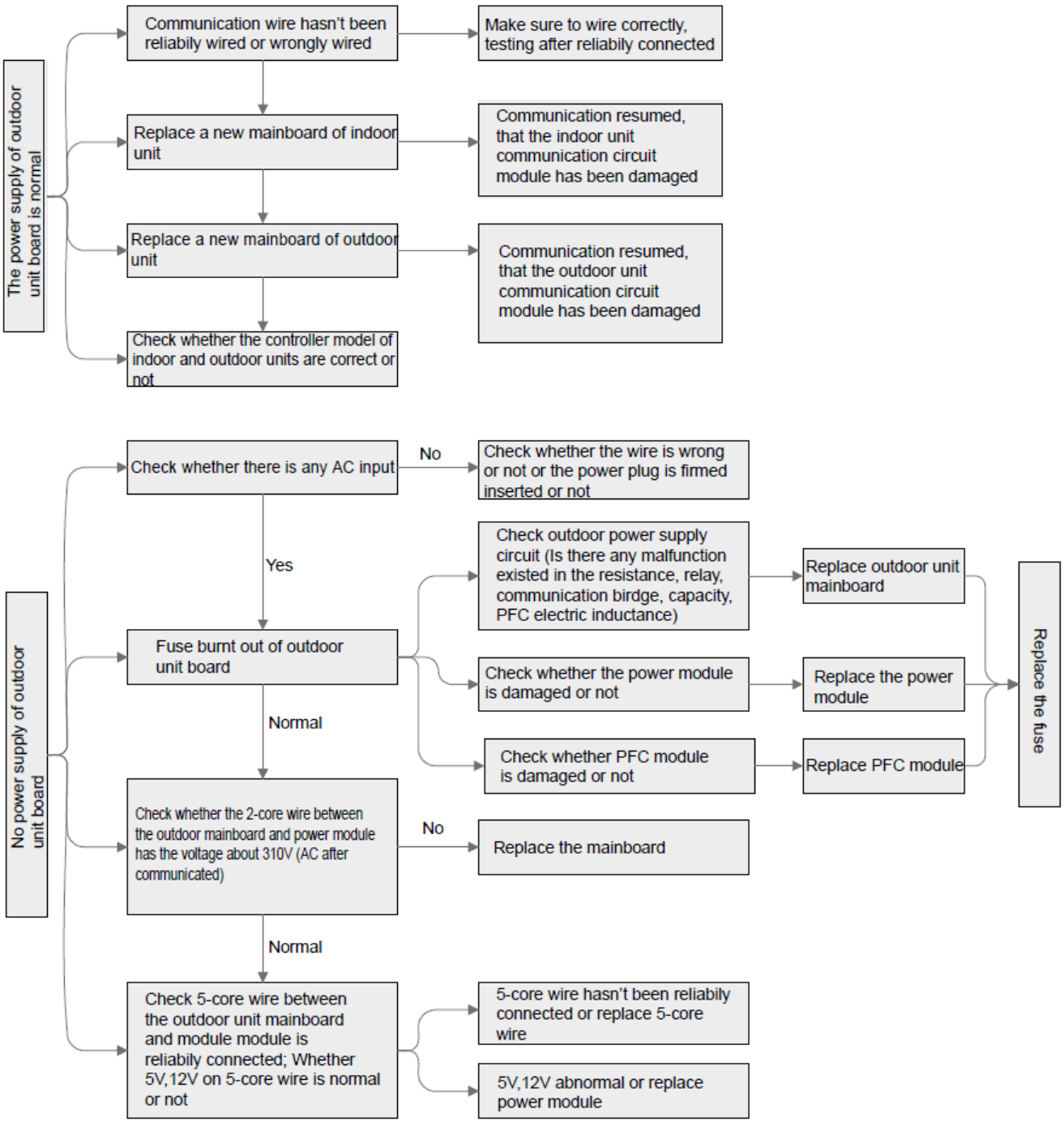
▪ Restart and measure the input current. Confirm input current flowing above its stop level.

If it does not, then replace the outdoor PC board.
If it does, then go to the following steps.

▪ Check the discharge pressure.

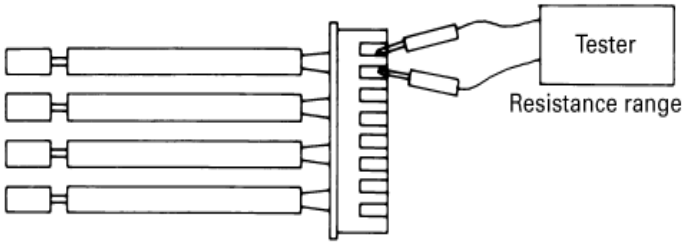
▪ Check the installation condition.

Communication malfunction **E6** or running indicator extinguishes 3 second blinks 6 times



Temperature sensor **F1, F2, F3, F4, F5** or cooling indicator extinguishes 3 second blinks once, extinguishes 3 second blink twice, extinguishes 3 second blinks three times, extinguishes 3 second blinks four times, extinguishes 3 second and blinks five times.

- Check the resistance value of corresponding sensor.
- Check the position of corresponding sensor; make sure the connection is good.
- Check the wiring.
- If above are OK, the PC board may have to be replaced.



Ambient Sensor (indoor and outdoor) **F1, F3** Resistance

Temp. (°F)	Resistance (kΩ)	Temp. (°F)	Resistance (kΩ)	Temp. (°F)	Resistance (kΩ)
-0.4	128.600	69.8	17.930	140	3.711
6.8	102.900	77	15.000	147.2	3.217
14	82.750	84.2	12.600	154.4	2.797
21.2	66.880	91.4	10.630	161.6	2.439
28.4	54.310	98.6	9.003	168.8	2.133
35.6	44.310	105.8	7.653	176	1.871
42.8	36.320	113	6.529	183.2	1.645
50	29.900	120.2	5.589	190.4	1.451
57.2	24.730	127.4	4.802	197.6	1.282
64.4	20.540	134.6	4.139	204.8	1.136

Tube Sensor (indoor and outdoor) **F2, F4** Resistance

Temp. (°F)	Resistance (kΩ)	Temp. (°F)	Resistance (kΩ)	Temp. (°F)	Resistance (kΩ)	Temp. (°F)	Resistance (kΩ)
-0.4	171.400	69.8	23.900	140	4.948	210.2	1.386
6.8	137.200	77	20.000	147.2	4.289	217.4	1.233
14	110.300	84.2	16.800	154.4	3.729	224.6	1.099
21.2	89.170	91.4	14.180	161.6	3.252	231.8	0.983
28.4	72.410	98.6	12.000	168.8	2.844	239	0.880
35.6	59.080	105.8	10.200	176	2.495	246.2	0.770
42.8	48.420	113	8.705	183.2	2.194	253.4	0.710
50	39.870	120.2	7.453	190.4	1.934	260.6	0.640
57.2	32.980	127.4	6.403	197.6	1.710	267.8	0.577
64.4	27.390	134.6	5.519	204.8	1.515	275	0.521

Outdoor Exhaust Sensor **F5** Resistance

Temp. (°F)	Resistance (kΩ)	Temp. (°F)	Resistance (kΩ)	Temp. (°F)	Resistance (kΩ)	Temp. (°F)	Resistance (kΩ)
-18.4	799.800	51.8	93.420	122	17.650	192.2	4.609
-11.2	620.800	59	77.350	129.2	15.170	199.4	4.079
-4	486.500	66.2	64.330	136.4	13.090	206.6	3.619
3.2	384.500	73.4	53.740	143.6	11.320	213.8	3.220
10.4	306.200	80.6	45.070	150.8	9.827	221	2.872
17.6	245.600	87.8	37.960	158	8.555	228.2	2.568
24.8	198.300	95	32.090	165.2	7.470	235.4	2.302
32	161.000	102.2	27.230	172.4	6.542	242.6	2.069
39.2	131.500	109.4	23.190	179.6	5.746	249.8	1.863
46.4	108.000	116.6	19.810	186.8	5.060	257	1.682

Compressor overload protection **H3** or heating indicator extinguishes 3 second and blinks 3 times

1. If the error code is display immediately on startup, then it may due to the defect of compressor overload switch or bad wire connection.
   - Check the overload switch by using a multi-meter. Replace if it is damaged.
   - Check the wiring of temperature sensors and resistance according the above tables for resistance value.
   - If the problem cannot be solved after above actions, mainboard should be replaced.
2. If the error code is displayed after the unit runs for some time, reasons may be as below:
   - Check the fan motor; replace the motor if it is broken.
   - Check the expansion valve and 4-way valve; replace them if they are failed.
   - Refrigerant leaks. Check for leakage and repair. Then charge the refrigerant according to the specification on page 2 or page 3.
   - Mainboard failed. Replace the mainboard.
   - Compressor failed. Replace the compressor.

System abnormal **H4** or heating indicator extinguishes 3 second and blinks 4 times

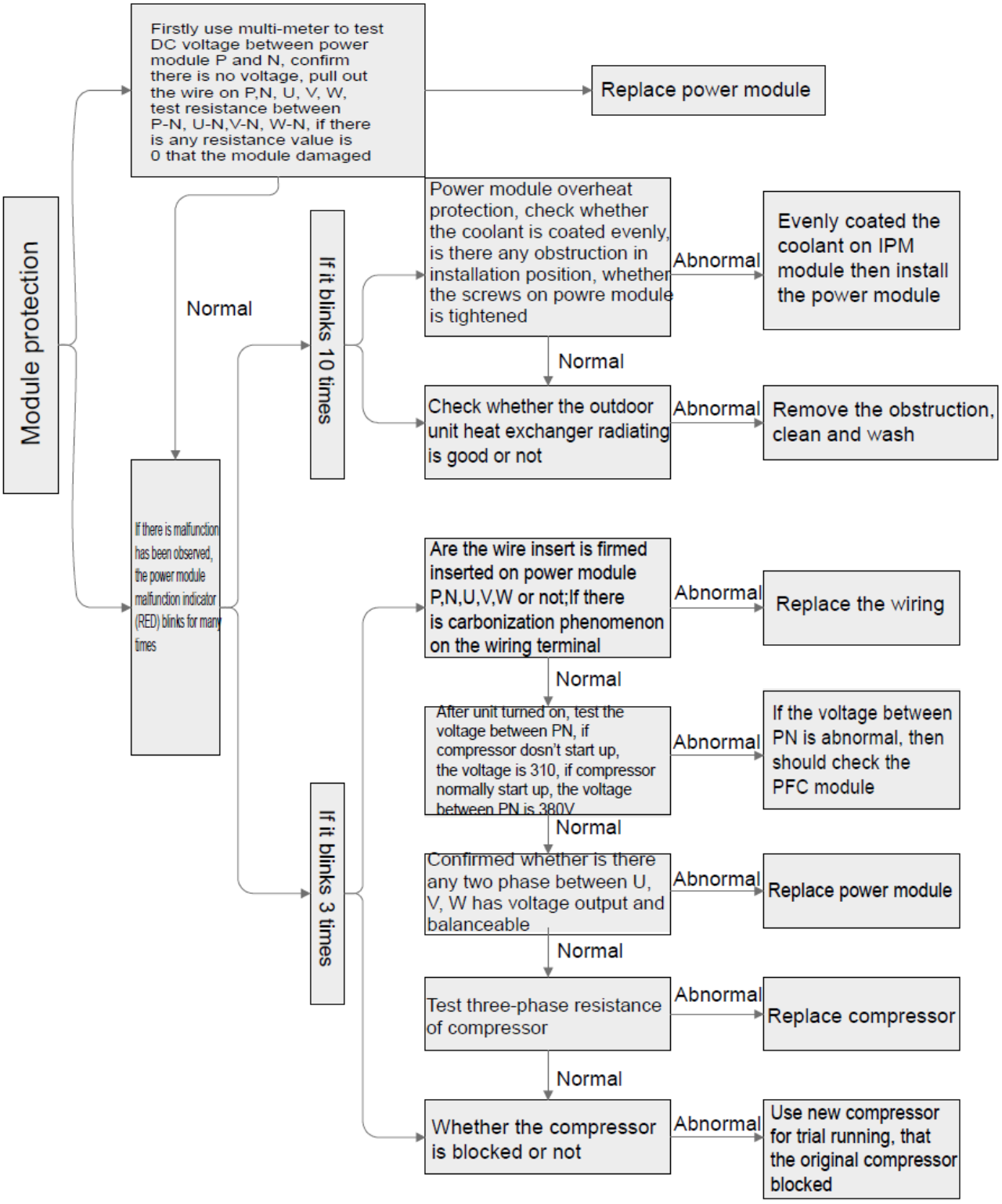
- System is overload. That means the outdoor tube is very hot in cooling mode or the indoor tube is very hot in heating mode.
  a) Check the outdoor ambient temperature; make sure it is not out of the operation range.
  b) Check the outdoor unit; make sure the ventilation is good. If the outdoor fan is failed, then replace it.
  c) Check the refrigerant charge.
  d) Check the expansion valve. If it is failed then replace it. If it is good, you may have to replace the outdoor main board.
  e) Check the indoor and outdoor tube sensor (F2, F4). If the resistance value does not match the table above, then replace the sensor. If they are good, you may have to replace the outdoor main board.
- Crossing wire between the indoor units

  Check the wiring during cooling mode as following procedure.

  a) Turn on one indoor unit, but others off.

  b) Check the suction pipe by touching it. If the suction pipe of indoor unit which is turned on is not cold, oppositely, the suction pipe of other indoor units is very cold, that means the wiring is reversed.

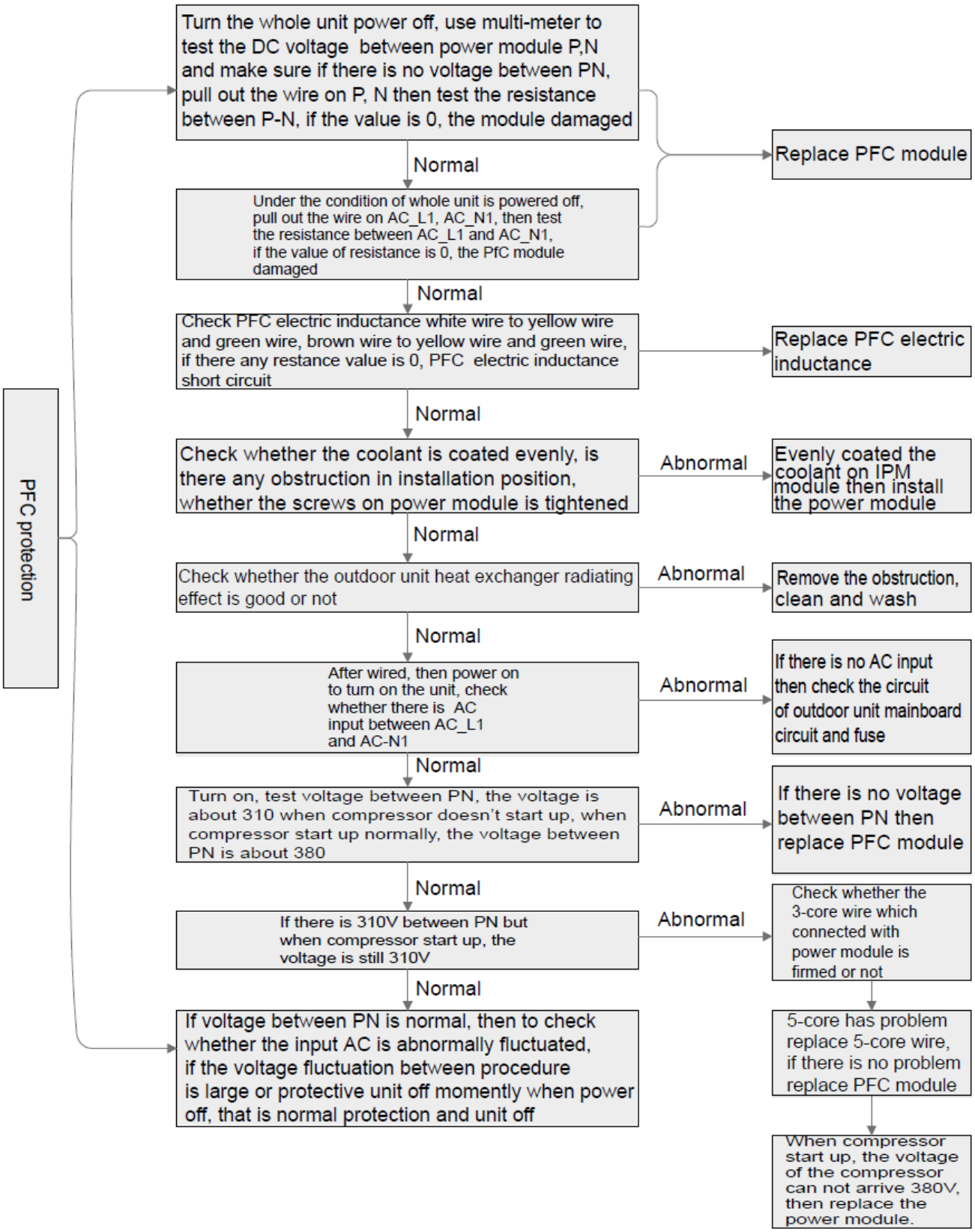
IPM protection **H5** or heating indicator extinguishes 3 second and blinks 5 times



Indoor fan motor malfunction **H6**

- Check the wiring of the indoor fan motor; make sure the cable is not broken.
- Check the connection between the fan motor and indoor PC board.
- If above are OK, then replace the fan motor.

PFC protection **HC** or heating indicator extinguishes 3 second and blinks 6 times



Start up failure

▪ Phenomenon 1：Compressor will not start after several false starts, the driver board LED1 (red) flashes 6 times.

Processing method:

a) Check the wiring of compressor and PC boards.
b) Check the drive board - AP3. If IPM module is failed, then replace it.
c) Compressor failed. Replaced the compressor.

▪ Phenomenon 2：Compressor starting current is too high and cause demagnetization protection, driver board LED1 flashes 4 times or indoor displays **HE**

Processing method:

a) Check the service valves at the outdoor unit; make sure they are all opened.
b) Check the electronic expansion valve; make sure it is working normally.
c) Check the current of drive board and the resistance of RES1 and RES2, replace the drive board (IPM module) if failed.
d) Check the voltage between P and N on the power module with the unit turned on. The correct voltage should be around 380V.
e) The over-current may be also caused by the incorrect internal wiring, make sure there is no crossing wiring between indoor units.
f) Compressor failure, replace the compressor

Communication failure between the main board of outdoor unit and power module

▪ Phenomenon：LED D104 on the main board blinks 4 times or LED 2 (green) blinks once (light on – for dual zone unit)

a) Check the wiring between the outdoor main PC board – AP1 and power module – AP4 with the 5-core wire.
b) Check the main PC board by replacing a new power module. If the unit can operate normally after replacement, then it means the old power module is failed. If not, the malfunction PC board is failed and has to be replaced.

Short circuit of DC power supply

▪ Phenomenon：LED D101 on the main board of outdoor unit blinks 15 times.
Refer to the malfunction of PFC protection **HC** above (on page 34).

Troubleshooting for trip after powered on