TOYOTOMI

Service Manual

MODEL: MUL36INV- 4 MUL42INV- 5
MUL CON Series
MUL FWCA Series
MUL DTA Series

CONTENTS

PRODUCT

PRODUCT

1 MODELS LIST

1.1 Outdoor Unit

Units Series	Model	Capacity		Ref.	Power Supply	Appearance
		Cooling (kW)	Heating (kW)			
Outdoor Unit	MUL36INV- 4	9.789	11	R410A	220~ 240V-1Ph-50Hz	
	MUL42INV- 5	11.6	13			

1.2 Indoor Unit

1.2.1 Duct type

Units Series	Model	Capacity		Ref.	Power Supply	Appearance
		Cooling (kW)	Heating (kW)			
Duct Type Indoor Unit	MUL09- DTA	2,5	2.80	R410A	220~ 240V -1Ph-50Hz	
	MUL12- DTA	3,5	3,85			
	MUL18- DTA	5	5,50			
	MUL21- DTA	6.0	6.60			
	MUL24- DTA	7.1	8.00			

1.2.2 Cassette type

Units Series	Model	Capacity		Ref.	Power Supply	Appearance
		Cooling (kW)	Heating (kW)			
Cassette Type Indoor Unit	MUL12- FWCA	3,5	3,85	R410A	220~ 240V -1Ph-50Hz	
	MUL18- FWCA	5	5.50			
	MUL24- FWCA	7,1	8.00			

1.2.3 Floor ceiling type

Units Series	Model	Capacity		Ref.	Power Supply	Appearance
		Cooling (kW)	Heating (kW)			
Floor Ceiling Type Indoor Unit	MUL09- CON	2.5	2.80	R410A	220~ 240V -1Ph-50Hz	
	MUL12- CON	3.5	3.85			
	MUL18- CON	5.0	5.50			
	MUL24- CON	7.1	8.00			

2 NOMENCLATURE

NO.	Description	Options
1	Name	Model
2	Product Type	DTA: Duct type FWCA: Cassette type CON: Floor type
3	Cooling Heating	: H: Heat pump
4	Cooling Capacity	12 represents 12000Btu/h 1 kW = 3,412KBtu
5	Series	Series code
6	Power Supply	Voltage: 220-240V - 1Ph - 50Hz
7	Refrigerant	R410A
8	Compressor Frequency	DC inverter type

3 FUNCTION

Function		Duct type	Cassette type	Floor ceiling type
For Comfortable Air Conditioning	Fan operation Mode	●	●	●
	Auto Swing Controller	-	●	●
	Timer Selector	●	●	●
	Auto Mode Operation	●	●	●
	Cool Mode Operation	●	●	●
	Heat Mode Operation	●	●	●
	Dry Mode Operation	●	●	●
	Fan Mode Operation	●	●	●
	Sleep mode setting	●	●	●
	Drain Pump	●	●	-
For Flexible Control	Wired Controller	●	●	●
	Wiredless Remote Controller	●	●	●

●:Have Functions
- :No Functions

4 PRODUCT DATA

4.1 Product data of outdoor

Model	Heat pump		MUL36 INV- 4	MUL42 INV- 5
	Code			
Capacity	Cooling	kW	9.789	11.6
	Heating	kW	11	13
Capacity adjustment range		%	23% ~ 150%	19%~ 150%
EER		kW/kW	3.23	3.23
COP		kW/kW	3.65	3.67
Power supply		V-Ph-Hz	220~2400-1-50	220~2400-1-50
Refrigerant	Type		R410a	R410a
	Charge volume	kg	3.6	4.8
Compressor	Brand		MITSUBISHI	MITSUBISHI
	Type		DC inverter rotor type	DC inverter rotor type
	Quantity		1	1
Moisture protection			IP×4	IP×4
Wiring connection	Area*quantity	mm^2	6*3	6*3
Connecting pipe	Connection method		Brazing Connection	Brazing Connection
Sound pressure level		dB(A)	54	54
Outline dimension	W×D×H	mm	950×412×840	1015×440×1103
Package dimension	W×D×H	mm	1100×450×905	1155×490×1220
Net weight		kg	75	79
Gross weight		kg	80	88
Maximum drive IDU NO.		unit	4	5
Max. equivalent connection pipe length		m	70	80
Loading quantity		20'GP	52	52
		40' GP	108	48
		40' HQ	108	48

Notes:

a. The rated cooling capacity data is measured under the following work condition: Indoor Temperature is 27℃ DB, 1 9℃ WB. Outdoor Temperature is 35℃ DB.The rated heating capacity data is measured under the following work condition: Indoor Temperature is 20℃ DB. Outdoor Temperature is 7℃ DB, 6℃ WB.

b. The data will change with the change of products. Refer to those parameters listed on nameplate.

c. Noise was tested in semi-silenced room, so the actual noise value will be a little higher for change of ambient.

4.2 Product data of indoor

4.2.1 Duct Type

Model	Heat pump		MUL09- DTA	MUL12- DTA	MUL18- DTA
Capacity	Cooling	kW	2.5	3.5	5.0
	Heating	kW	2.80	3.85	5.50
Power supply		V-Ph-Hz	220 ~ 240-1- 50	220 ~ 240-1- 50	220 ~ 240-1- 50
Motor power input		kW	0.075	0.065	0.08
Air flow volume		m^3/h	450	500	700
		CFM	265	294	412
Sound pressure level(H/L)		dB(A)	37/31	39/32	40/33
Fan motor	Output	kW	0.041	0.036	0.044
	Running current	A	0.406	0.348	0.428
Connecting pipe	Gas	inch	3/8″(9.52mm)	1/2″(Φ12.7mm)	1/2″(Φ12.7mm)
	Liquid	inch	1/4″(Φ6.35mm)	1/4″(Φ6.35mm)	1/4″(Φ6.35mm)
	Connection method		Flare Connection	Flare Connection	Flare Connection
Drain pipe	External dia.	mm	Φ20	Φ20	Φ20
	Thickness	mm	1.5	1.5	1.5
Outline dimension	W×D×H	mm	700×200×615	700×200×615	900×200×615
Package dimension	W×D×H	mm	890×290×740	890×290×740	1120×290×740
Net Weight		kg	22	24	25
Gross weight		kg	27	29	30
Loading quantity		20'GP	108	108	90
		40' GP	234	234	192
		40' HQ	234	234	192

Model	Heat pump		MUL21- DTA	MUL24- DTA
Capacity	Cooling	kW	6.0	7.1
	Heating	kW	6.60	8.00
Power supply		V-Ph-Hz	220~2400-1-50	220~2400-1-50
Motor power input		kW	0.11	0.11
Air flow volume		m^3/h	1000	1000
		CFM	588	588
Sound pressure level(H/L)		dB(A)	42/34	42/34
Fan motor	Output	kW	0.061	0.061
	Running current	A	0.588	0.588
Connecting pipe	Gas	inch	5/8″(Φ15.9mm)	5/8″(Φ15.9mm)
	Liquid	inch	3/8″(9.52mm)	3/8″(9.52mm)
	Connection method		Flare Connection	Flare Connection
Drain pipe	External dia.	mm	Φ20	Φ20
	Thickness	mm	1.5	1.5
Outline dimension	W×D×H	mm	1100×200×615	1100×200×615
Package dimension	W×D×H	mm	1320×290×740	1320×290×740
Net Weight		kg	29	29
Gross weight		kg	35	35
Loading quantity		20'GP	72	72
		40' GP	162	162
		40' HQ	162	162

4.2.2 Cassette type

Model	Heat pump		MUL12- FWCA	MUL18- FWCA	MUL24- FWCA
Capacity	Cooling	kW	3.5	5	7.1
	Heating	kW	3.85	5.5	8
Power supply		V-Ph-Hz	220~240-1-50	220~240-1-50	220~240-1-50
Motor power input		kW	0.07	0.07	0.1
Air flow volume		m^3/h	680	680	1180
		CFM	400	400	694
Sound pressure level(H/L)		dB(A)	42/38	42/38	45/41
Fan motor	Output	kW	0.0385	0.0385	0.055
	Running current	A	0.374	0.374	0.535
Connecting pipe	Gas	inch	3/8″(9.52mm)	1/2″(Φ12.7mm)	5/8″(Φ15.9mm)
	Liquid	inch	1/4″(Φ6.35mm)	1/4″(Φ6.35mm)	3/8″(Φ9.52mm)
	Connection method		Flare Connection	Flare Connection	Flare Connection
Drain pipe	External dia.	mm	31	31	31
	Thickness	mm	3	3	3
Outline Dimension	Body(W×D×H)	mm	840×840×190	840×840×190	840×840×240
	Panel(W×D×H)	mm	950×950×60	950×950×60	950×950×60
Package Dimension	Body(W×D×H)	mm	960×960×257	960×960×257	960×960×310
	Panel(W×D×H)	mm	1040×1025×115	1040×1025×115	1040×1025×115
Net Weight	Body	kg	25	25	30
	Panel	kg	6.5	6.5	6.5
Gross Weight	Body	kg	33	33	38
	Panel	kg	10	10	10
Loading quantity		20'GP	72	72	72
		40' GP	144	144	144
		40' HQ	144	144	144

4.2.3 Floor ceiling type

Model	Heat pump		MUL09- CON	MUL12- CON
Capacity	Cooling	kW	2.5	3.5
	Heating	kW	2.8	3.85
Power supply		V-Ph-Hz	220~240-1-50	220~240-1-50
Motor power input		kW	0.055	0.055
Air flow volume		m^3/h	650.0	650.0
		CFM	383.0	383.0
Sound pressure level(H/L)		dB(A)	40/36	40/36
Fan motor	Output	kW	0.3	0.3
	Running current	A	0.297	0.297
Connecting pipe	Gas	inch	3/8″(9.52mm)	1/2″(Φ12.7mm)
	Liquid	inch	1/4″(Φ6.35mm)	1/4″(Φ6.35mm)
	Connection method		Flare Connection	Flare Connection
Drain pipe	External dia.	mm	17	17
	Thickness	mm	1.75	1.75
Outline dimension	W×D×H	mm	1220×700×225	1220×700×225
Package dimension	W×D×H	mm	1340×820×300	1340×820×300
Net Weight		kg	40.0	40.0
Gross weight		kg	50.0	50.0
Loading quantity		20'GP	66	66
		40' GP	132	132
		40' HQ	132	132

Model	Heat pump		MUL18- CON	MUL24- CON
Capacity	Cooling	kW	5	7.1
	Heating	kW	5.5	8
Power supply		V-Ph-Hz	220~240-1-50	220~240-1-50
Motor power input		kW	0.11	0.11
Air flow volume		m^3/h	950.0	1250
		CFM	559.0	736
Sound pressure level(H/L)		dB(A)	45/40	48/40
Fan motor	Output	kW	0.061	0.061
	Running current	A	0.588	0.588
Connecting pipe	Gas	inch	1/2″(Φ12.7mm)	5/8″(Φ15.9mm)
	Liquid	inch	1/4″(Φ6.35mm)	3/8″(9.52mm)
	Connection method		Flare Connection	Flare Connection
Drain pipe	External dia.	mm	17	17
	Thickness	mm	1.75	1.75
Outline dimension	W×D×H	mm	122×700×225	1220×700×225
Package dimension	W×D×H	mm	1340×820×300	1340×820×300
Net Weight		kg	40.0	45
Gross weight		kg	50.0	54
Loading quantity		20'GP	66	66
		40' GP	132	132
		40' HQ	132	132

Notes:

a. The rated cooling capacity data is measured under the following work condition: Indoor Temperature is 27℃ DB, 1 9℃ WB. Outdoor Temperature is 35℃ DB.The rated heating capacity data is measured under the following work condition: Indoor Temperature is 20℃ DB. Outdoor Temperature is 7℃ DB, 6℃ WB.

b. The data will change with the change of products. Refer to those parameters listed on nameplate.

c. Noise was tested in semi-silenced room, so the actual noise value will be a little higher for change of ambient.

4.3 Working Temperature Range

	Indoor side state		Outdoor side stae	
	Dry bulb temp. ℃	Wet bulb temp. ℃	Dry bulb temp. ℃	Wet bulb temp. ℃
Rated Cooling	27	19	35	24
Max. cooling	32	23	48	26
Min. cooling	21	15	18	—
Rated Heating	20	15	7	6
Max. heating	27	—	24	18
Min. heating	20	15	－ 15	－ 16

Notes：

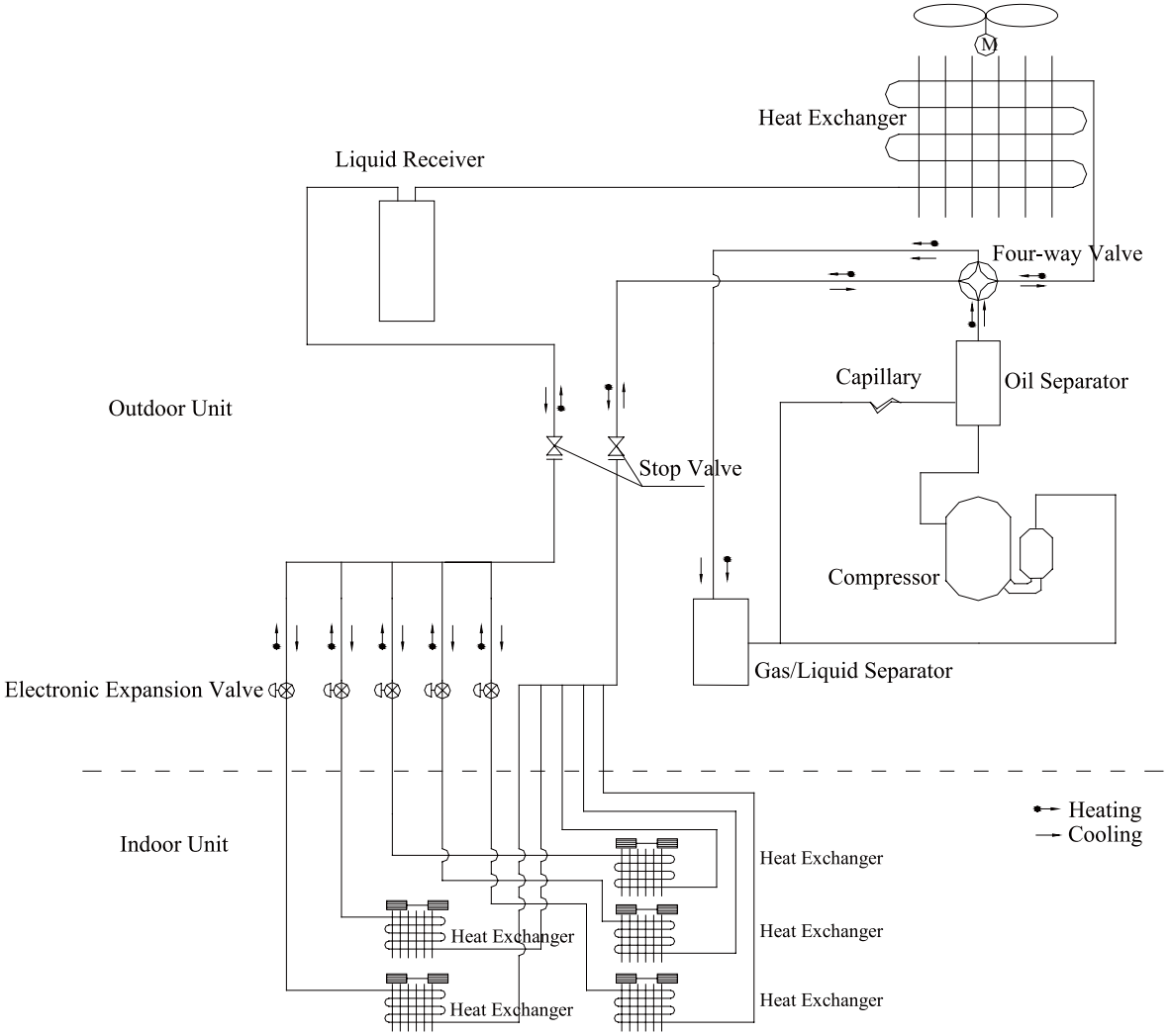
a. The heating/cooling capacity and noise listed below are all measured before the shipment.

b. All parameters listed below are measured under the standard working conditions. If there is any change, the parameters marked on the nameplate always prevail.

c. The heating capacity of the indoor unit just involves that of the heat pump but apart from that of the auxiliary electric heater.

5 PIPING DIAGRAM

Schematic Diagram of Multisplit Inverter Heat Pump



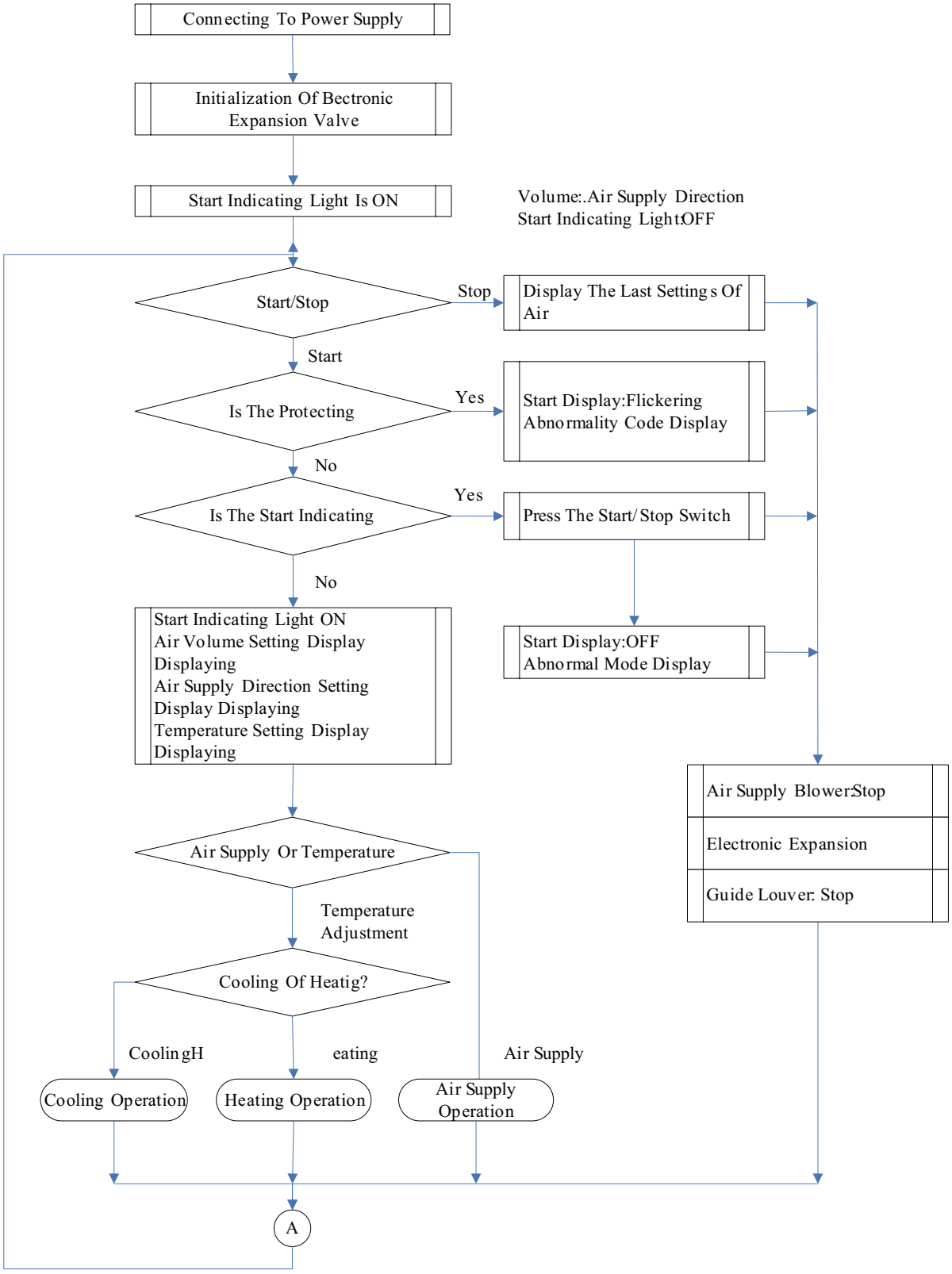
Schematic Diagram of Multisplit Inverter Heat Pump

The outdoor and indoor units start to work once the power is switched on. During the cooling operation, the low temperature, low pressure refrigerant gas from the heat exchanger of each indoor unit gets together and then is taken into the compressor to be compressed into high temperature, high pressure gas, which will soon go to the heat exchanger of the outdoor unit to exchange heat with the outdoor air and then is turned into refrigerant liquid. After passing through the throttling device, the temperature and pressure of the refrigerant liquid will further decrease and then go the main valve. After that, it will be divided and go to the heat exchanger of each indoor unit to exchange heat with the air which needs to be conditioned. Consequently, the refrigerant liquid become low temperature, low pressure refrigerant gas again. Such a refrigeration cycle goes round and round to achieve the desired refrigeration purpose. During the heating operation, the four-way valve is involved to make the refrigeration cycle run reversely. The refrigerant radiates heat in the heat exchanger of the indoor unit (so do the electric heating devices) and absorb heat in the heat exchanger of the outdoor unit for a heat pump heating cycle so as to achieve the desired heating purpose.

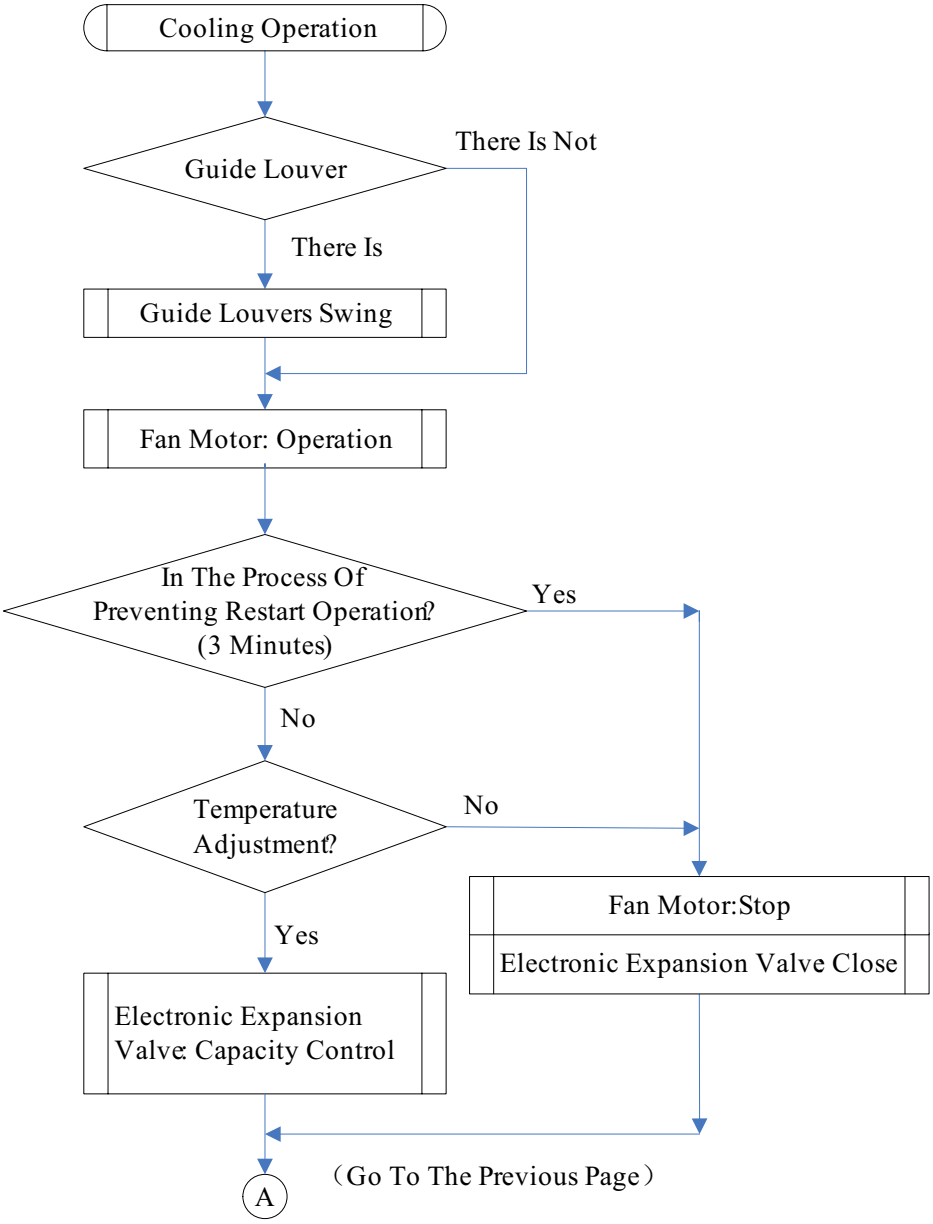
CONTROL

CONTROL

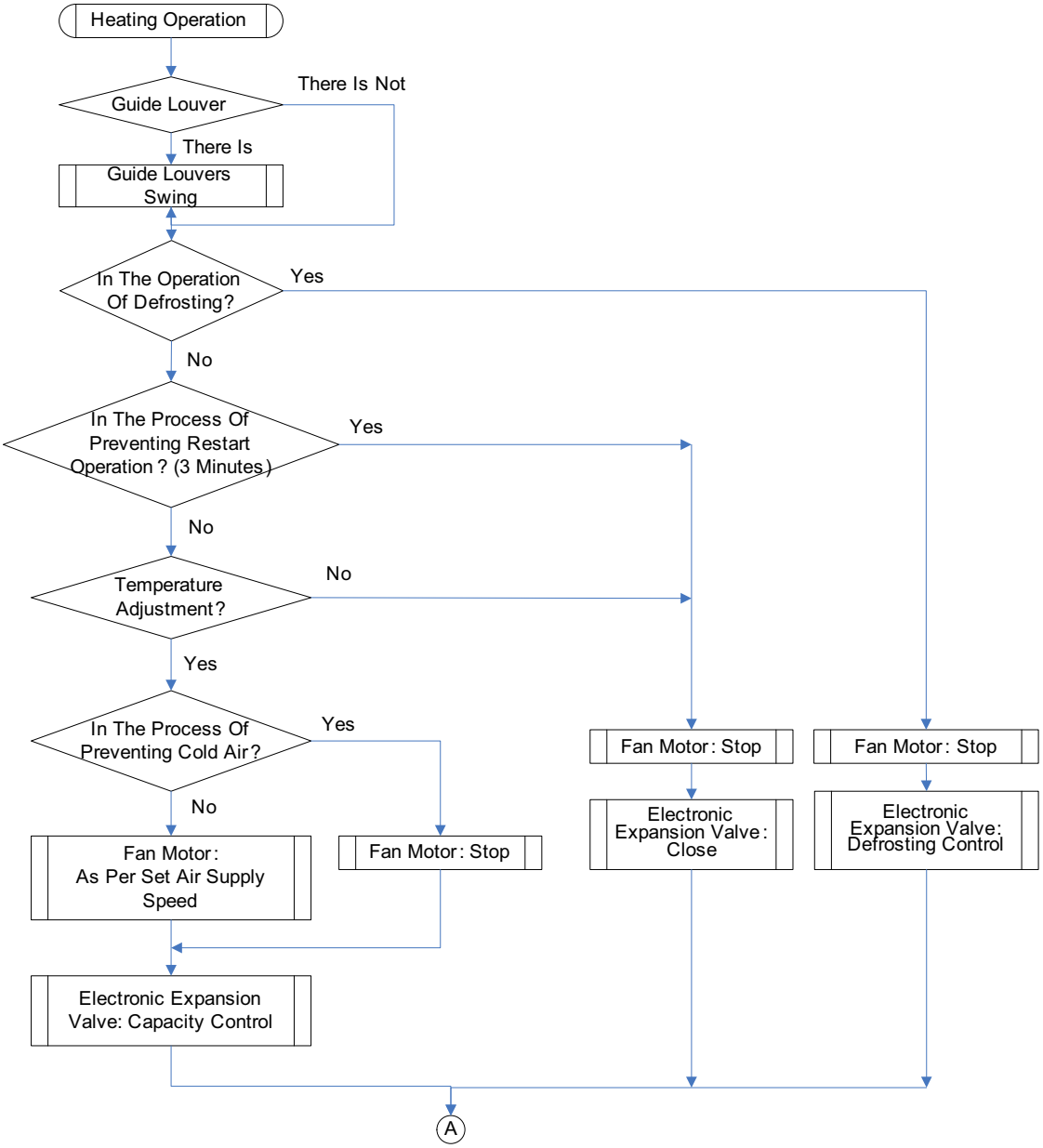
1 OPERATION FLOWCHART



1.1 Cooling/Dehumidfying Operation



1.2 Heating Operation



2 MAIN LOGIC

2.1 Control Function of Outdoor Unit

2.1.1 Cooling Mode

a. Cooling conditions and process:

If the compressor is in stop status and start the unit for cooling operation, when one of the indoor units reaches the cooling operation condition, the unit start cooling operation; in this case, the electronic expansion valve, the outdoor fan and the compressor start operation.

b. Stop in cooling operation

a) Compressor stops

The compressor stops gradually, the outdoor fan stops after 1min.

b) Some of the indoor units reach the stop condition (the compressor does not stop) The compressor operates according to the required frequency. For the indoor unit with no requirement, the corresponding electronic expansion valve is closed to 0P.

c. Cooling mode transfers to heating mode

When the unit transfers to heating mode, the 4-way valve is energized after the compressor runs for 40s. The other disposals are the same as stopping in cooling mode.

d. 4-way valve:

In this mode, the 4-way valve is closed.

e. Outdoor fan control in cooling mode

The outdoor fan starts before 5s of the starting of compressor. The outdoor fan will run in high speed for 3min after starting and then it will run in set speed.

The fan shall run at every speed for at least 80s. (When the quantity of running indoor unit is changed, the unit will enter the control described in 1.3.5.1 and 1.3.5.2); When the compressor stops, the outdoor fan runs at present speed and stops after 1min.

2.1.2 Dry Mode

a. The dry conditions and process are the same as those in cooling mode;

b. The status of 4-way valve: closed;

c. The temperature setting range: 16 ~ 30℃ ;

d. Protection function: the same as those in cooling mode;

e. In dry mode, the maximum value A of the capacity requirement percentage of single unit is 90% of that in cooling mode. The open condition of the electronic expansion valve, outdoor fan and compressor is the same as those in cooling mode.

2.1.3 Heating Mode

a. Heating conditions and process: When one of the indoor units reaches the heating operation condition, the unit starts heating operation.

b. Stop in heating operation:

a) When all the indoor units reach the stop condition, the compressor stops and the outdoor fan stops after 1min;

b) Some of the indoor units reach the stop condition The compressor reduces the frequency immediately and operates according to the required frequency;

c) Heating mode transfers to cooling mode(dry mode), fan mode

The compressor stops;

The outdoor fan stops after 1min;

The status of 4-way valve: energized;

c. Outdoor fan control in heating mode

The outdoor fan starts before 5s of the starting of compressor and then it will run in high speed for 40s; The fan shall run at every speed for at least 80s; When the compressor stops, the outdoor fan stops after 1min.

d. Defrosting function

When the defrosting condition is met, the compressor stops; the electronic expansion valve of all indoor units open in big angle; the outdoor fan stops after the stop of the 4-way valve, meanwhile, the 4-way valve reverses the direction; after the 4-way valve reverses the direction, the compressor starts; then begin to calculate the time of defrosting, the frequency of the compressor rises to reach the defrosting frequency.

e. Oil-returned control in heating mode

a) Oil-returned condition

The whole unit is operating in low frequency for a long time

b) Oil-returned process in heating mode

The indoor unit displays “H1”

c) Oil-returned finished condition in heating mode

The duration reaches 5min

2.1.4 Fan Mode

The compressor, the outdoor fan and the 4-way valve are closed; temperature setting range is 16 ～ 30℃ .

2.2 Protection Function

2.2.1 Mode Conflict Protection of indoor unit

When the setting mode is different of different indoor unit, the unit runs in below status:

a. The mode of the first operating indoor unit is the basic mode, then compare the mode of the other indoor units to see if there is a conflict. Cooling mode (dry mode) is in conflict with heating mode.

b. Fan mode is in conflict with heating mode and the heating mode is the basic mode. No matter which indoor unit operates first, the unit will run in heating mode.

2.2.2 Overload Protection Function

When the tube temperature is a little low, the compressor raises the operation frequency; when the tube temperature is a little high, the compressor frequency is restricted or lows down the operation frequency; when the tube temperature is too high, the compressor protection stops running. If the discharge temperature protection continuously appears for 6 times, the compressor can't resume running. The compressor can resume running after cutting off the power and then putting through the power. (if the running time of the compressor is longer than 7min, the protection times record will be cleared)

2.2.3 Discharge Protection Function

When the discharge temperature is a little low, the compressor raises the operation frequency; when the discharge temperature is a little high, the compressor frequency is restricted or lows down the operation frequency; when the discharge temperature is too high, the compressor protection stops running. If the discharge temperature protection continuously appears for 6 times, the compressor can't resume running. The compressor can resume running after cutting off the power and then putting through the power. (if the running time of the compressor is longer than 7min, the protection times record will be cleared)

2.2.4 Communication malfunction

Detection of the quantity of installed indoor units: After 3min of energizing, if the outdoor unit does not receive the communication data of certain indoor unit, the outdoor unit will judge that indoor unit is not installed and will treat it as it is not installed. If the outdoor unit receives the communication data of that indoor unit later, the outdoor unit will treat that unit as it is installed.

2.2.5 Compressor high-pressure protection

a. When the high-pressure switch is detected cut off for 3s continuously, the compressor will enter high-pressure protection as it stops when reaching set temperature. Meanwhile, the outdoor unit will send the signal of "high-pressure protection" to the indoor units;

b. After the appearance of high-pressure protection, when the high-pressure switch is detected closed for 6s continuously twice an hour, the compressor can resume running only after cutting off the power and then putting through the power.

2.2.6 Compressor low-pressure protection

a. Low Pressure Protection for Shutdown

After the compressor stops for five minutes, if it is detected that the low pressure protection switch is opened, then a low pressure protection signal will be send out.

If it is detected continuously for three seconds that the low pressure protection switch is opened after the compressor stops for less than five minutes, then a low pressure protection signal will be send out. However, if the low pressure protection occurs twice in one hour, then it becomes unrecoverable and has to be recovered by powering the outdoor unit again.

b. Low Pressure Protection during the Operation

a) When it is detected continuously for three seconds that the low pressure protection switch is opened, then the whole unit should be shut off and a low pressure protection signal should be sent to the indoor unit.

b) On condition that a low pressure protection error occurs and the whole unit has stopped for more than three minutes and it is detected continuously for six seconds that the low pressure protection switch is closed, then this error can be eliminated. However, if the low pressure protection occurs twice in one hour, then it has to eliminate the error by powering the outdoor unit again.

2.2.7 Compressor overload protection

If the compressor overload switch is detected having movement, the indoor unit will display the corresponding malfunction as it stops when the indoor temperature reaching set temperature. When the compressor stops for more than 3min and the compressor overload switch is reset, the unit will resume operation status automatically. If the protection appears for more than 6 times (if the running time of the compressor is longer than 30min, the protection times record will be cleared), the unit can not resume operation status automatically, but can resume running only after cutting off the power and then putting through the power.

2.2.8 Drive Error

When the system is powered on and starts to run for the first time, let all indoor units on line run under the “Fan” mode, and they will go to the piping test through the preset mode after they has run at the high fan speed for six minutes.

2.2.9 Refrigerant Recovery

The refrigerant can be recovered from either the indoor unit or the outdoor unit.

From the outdoor unit: it is available to recover the refrigerant from the outdoor unit by pressing “SW3”for a long time period.

From the indoor unit: when the unit is powered on and runs under the COOL mode, it is available within five minute to go the refrigerant recovery mode by pressing three times the “LIGHT” button on the wireless controller in three seconds with “F0”displayed.

How to quit the refrigerant recovery:

When the refrigerant recovery has started, it will quit when the “SW3” is pressed down for a long time period or there is a signal from the wireless controller or it has run for ten minutes.

2.2.10 Forcible Defrosting

How to activate this function: when indoor unit runs under the heating mode and at 16 ℃ , it will activate the forcible defrosting by pressing the “+”and “-” buttons alternately three times in five seconds.

How to quit this function: the function will quit when the mode of indoor units conflicts.

2.2.11 Switchover of the Defrosting Modes

Under the unit is under the “Off” status, if “H1” is not displayed on the wireless controller, then the unit will go to the defrosting mode 1 when it is turned on through the wireless controller.

Under the unit is under the “Off” status, if “H1” is displayed on the wireless controller, the unit will go the defrosting mode 2 when it is turned on through the wireless controller.

Under the unit is under the “Off” status, it is available to switch over the defrosting mode 1 and defrosting mode 2 by pressing the “Mode” and “Blow” buttons simultaneously.

2.3 Control Function of Indoor Unit

2.3.1 Running Mode

1.COOL 2.DRY 3.HEAT 4.AUTO 5 FAN

2.3.2 Basic Functions of the System

a. COOL Mode

Under this mode, the fan and swing function goes as the set conditions, and the set temperature range is 16℃ ~30℃ .

b. DRY Mode

Under this mode, the fan will run at the low speed and the swing function is performed under the set conditions. The set temperature range is 16~30℃ .

c. FAN Mode

Under this mode, only the fan of the indoor unit runs. And if the auto speed is set, the fan will run under the same condition as the COOL mode.

d. HEAT Mode

a) Under this mode, the set temperature rang is 16℃ ~30℃ .

b) The defrosting symbol “H1” will be displayed when the defrosting signal is received from the outdoor unit.

e. AUTO Mode

a) When the ambient temperature is higher than 25℃ , the unit will run as the COOL mode.

b) For the cooling and heating unit, if the ambient temperature is or lower than2 0℃ (72 ℉), the unit will run as the HEAT mode.

c) When the indoor ambient temperature is higher than 20℃ but lower than 25℃ , the unit which starts to work under the AUTO or DRY mode will shift to the FAN mode, while the unit which starts to work under other mode will

keep the current running mode.

f. Mode Conflict

When the running modes of the unit which is started just now and unit which has run conflict, the former one will show the error code “E7”.

2.3.3 Other Control

a. Beeper Control

When the controller is powered on or it receives a valid either press button signal or remote control signal, the beeper will utter a warning tone.

b. Auto Speed Control

Under the HEAT mode:

If the ambient temperature is equal or higher than the set temperature, the fan will run at the low speed;

If the ambient temperature minus 3℃ is equal or lower than the set temperature, the fan will run at the medium speed;

If the ambient temperature minus 3℃ is lower than the set temperature minus 3℃ , the fan will run at the high speed.

Under the COOL mode:

If the ambient temperature is equal to or lower than the set temperature, the fan will run at the low speed;

If the ambient temperature is between the set temperature and the set temperature minus 3℃ , the fan will run at the medium speed;

If the ambient temperature is higher than the set temperature plus 3℃ , the fan will run at the high speed.

Under the FAN mode:

The fan will run at the medium speed constantly.

Once the fan starts, its speed can not be changed unit it has run for at least 30 seconds at the currently set speed.

c. AUTO Press Button

The whole unit will run under the AUTO mode by pressing this button when the unit is off. In this condition, the fan of the indoor unit will run at the auto speed with the swing function activated. When the unit is on, it will be turned off by pressing this button. This button is unavailable to the floor/ceiling unit.

d. Sleep

a) Under this mode, the proper sleep curve will be adopted in accordance with different set temperatures.

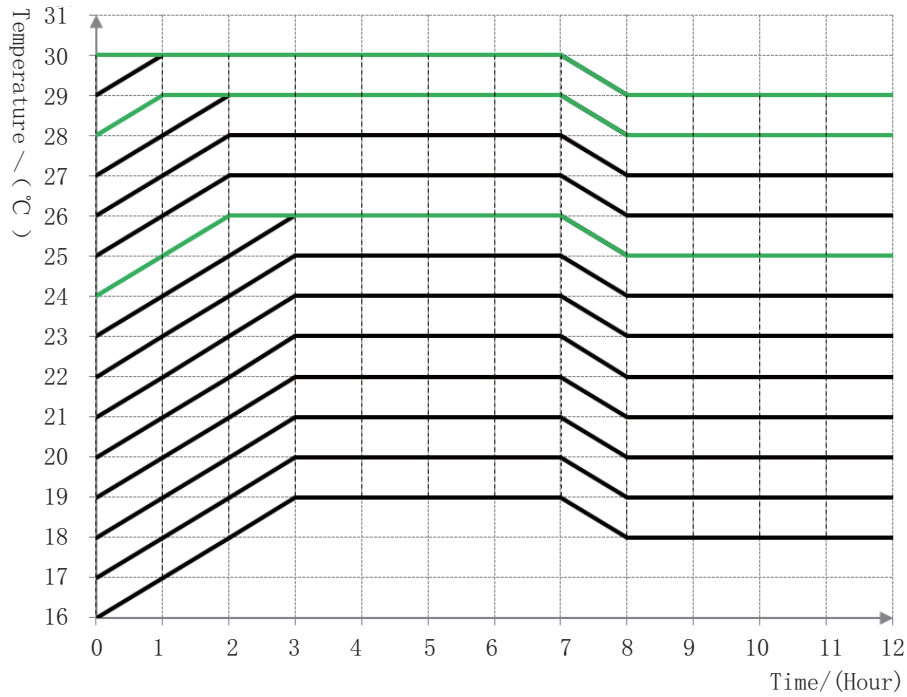
b) Sleep 1

Under the COOL mode or the DRY mode, the temperature will go up by 1℃ after one hour and by another 1℃ after another hour, after that, the temperature will be kept on.

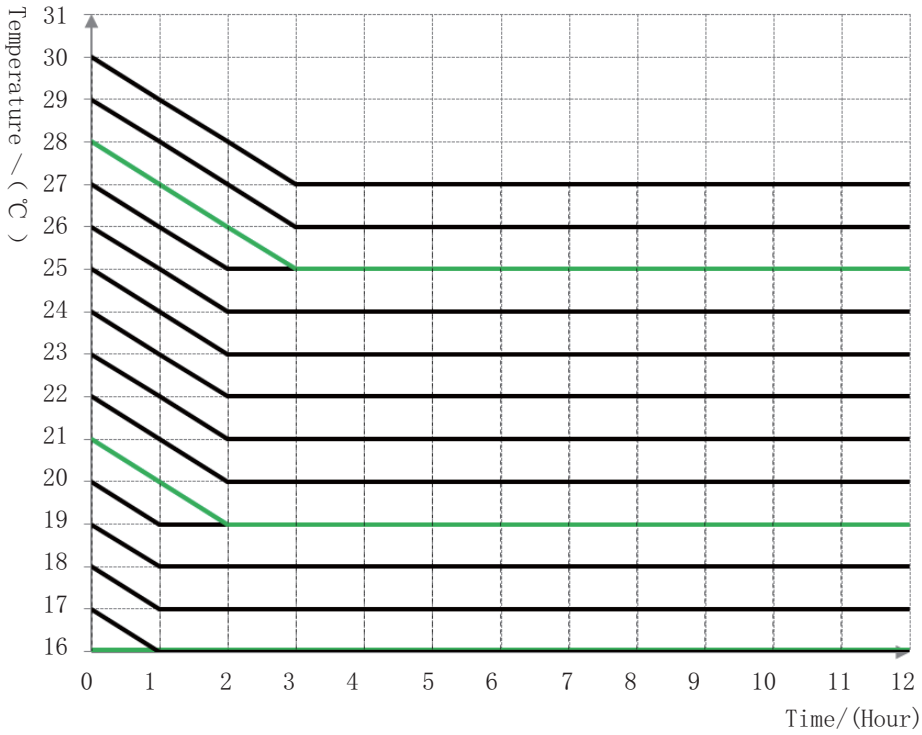
Under the HEAT mode, the temperature will go down by 1 ℃ after one hour and by another 1 ℃ after another hour, after that, the temperature will be kept on.

c) Sleep 2

Sleep Curve under the COOL mode



Sleep Curve under the HEAT mode



d) Sleep 3 (Self-Defined Sleep Mode)

How to set the sleep 3 curve:

1)When the sleep 3 mode is selected, press the “Timer” button to go to the setting status with “1 Hour” displayed and the corresponding temperature of the sleep curve set last time displayed at the temperature area.

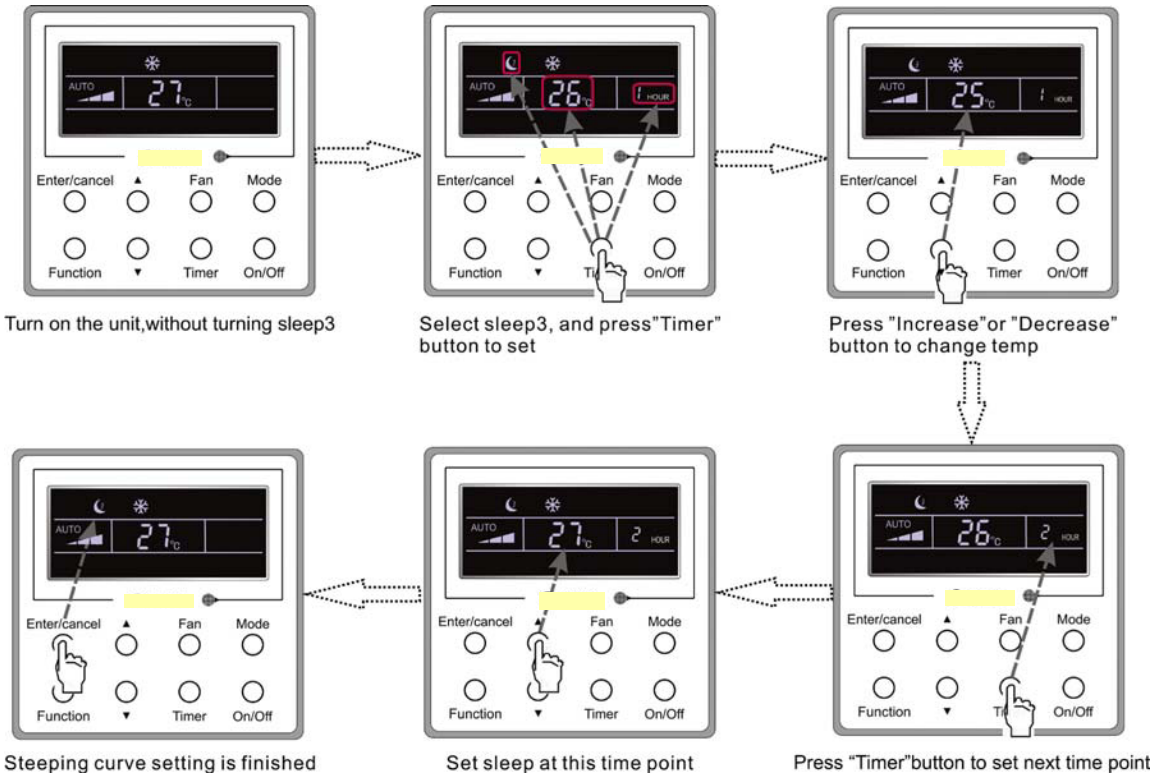
2)Press “▲”and “▼” to change the set temperature.

3)Press the “Timer” button to increase the time by one hour, and the sleep curve temperature set last time will be displayed at the temperature area.

4)Repeat the step 2 and step 3 until the temperature of eight hours has been set.

5)Press “Enter/Cancel” to make a confirmation to this setting.

See the figures below for how to set the sleep 3 curve:



e. Quiet

Quite Function: It is divided into the “Quiet” mode and “Auto Quiet” mode.

a) Under the “Quiet” mode, the low fan speed will be kept and is unchangeable.

b) Under the “Auto Quiet” mode, the fan speed changes in accordance with the difference of the indoor ambient temperature and the set temperature.

f. Timer

a)Timer On

When the unit is powered on but in the idle condition, it is available to set when to start the unit. Then, when the unit starts, it will run as the previously set mod. The set range of the timer is 0.5 ～ 24 hours with a interval of 0.5 hour.

b) Timer Off

When the unit is on, it is available to set when to stop the unit. The set range of timer is 0.5 ～ 24 hours with a interval of 0.5 hour.

g. Memory

a) Memorizing Objects: modes (AUTO, COO, DRY, FAN, HEAT), swing, set temperature, set fan speed, etc.

b) When the indoor unit works without the wired controller, it will resume the working condition as the power failure occurs after it is powered on again. When the indoor unit is with the wired controller, it is available to set the memory function by pressing the corresponding buttons of the wired controller.

c) When the indoor unit works without the wired controller, if the timer is not set for the last remote control instruction, the system will memorize this last instruction and works following it ; if the timer is set, it will be canceled as the power failure occurs and will have to be reset.

d) When the indoor unit works with the wired controller, it will wok as the message sent by the wired controller after it is powered on again.

h. Forcible Defrosting

When the unit is on and runs under the HEAT mode and at 16℃ set temperature, the indoor unit will go to the forcible defrosting by pressing the “+”and“-”buttons alternatively on the wireless controller for five seconds and meanwhile a forcible defrosting signal will be sent to the outdoor unit.

When the indoor unit receives a forcible defrosting signal from the outdoor unit, it will quit the forcible defrosting setting and cease to sending the forcible defrosting single to the outdoor unit.

i. Selection of the Indoor Temperature Sensor

a)For the duct type indoor unit: Under the COOL, HEAT, DRY, or FAN mode, the return air temperature sensor is adopted; while under the HEAT mode, it is the receiver temperature sensor.

For the cassette type, floor/ceiling type indoor unit: Under all modes, the return air temperature sensor is adopted.

b) When the duct type, cassette type, or the floor/ceiling type indoor unit works with the wired controller, the ambient temperature sensor can be set in the following four ways:

① 01:The indoor temperature sensor is set for the return air.

② 02:The indoor temperature sensor is set for the wired controller.

③ 03:The indoor temperature sensor is set for the wired controller under the HEAT mode, and for the return air under any other mode.

④ 04:The indoor temperature sensor is set for the return air under the HEAT mode, and for the wired controller under any other mode.

c) Setting of the Ambient Temperature Sensor of the New Screen-Touch Wired Controller

When the unit is off, it is available to go to the debugging status by pressing the “Function” and “Timer” buttons for five seconds, and the corresponding code will be displayed on the temperature area of the wired controller. There are four kinds of codes which can be adjusted through the “▼” /“▲ ”button.

The third one is the default code. The setting of the ambient temperature sensor of the wired controller should be memorized.

The “Enter/Cancel” button shall be pressed to confirm and leave the setting. If there is no response to the last button press within 20 seconds, then the system will quit the setting and go to the normal “Off” status but with the setting still saved.

j. Switchover of the Defrosting Mode

On condition that the unit is off, if “H1” is not displayed on the wireless controller, then the unit will go to the setting status of the “Defrosting Mode 1”as it is turned on through the wired controller. Then, once the indoor unit receives this signal, it will soon send it to the outdoor unit. In contract, if “H1”is displayed, the unit will go the setting status of the “Defrosting Mode 2”, and the indoor unit also will send this signal to the outdoor unit as soon as it receives it.

On condition that the unit is off, it is available to switch over the “Defrosting Mode 1” and “Defrosting Mode 2” by pressing the “MODE” and “BLOW” buttons simultaneously.

k. Turbo

As soon as the controller receives the “Turbo” instruction, the fan of the indoor unit will run at the extreme high speed and the fan of the outdoor unit will run at high cooling/heating frequency.

l. Blow

Blow Function:It is a function to automatically blow off the moist inside the exchanger of the indoor unit to prevent mould growing after the unit is shut off.

a) On condition that this function is activated, when the “On/Off” press button is operated, the fan of the indoor unit will still run for ten minutes (with the symbol “BLOW” displayed). At this time, the fan will stop as this function is deactivated.

b) This function is unavailable under the AUTO, FAN, and HEAT modes.

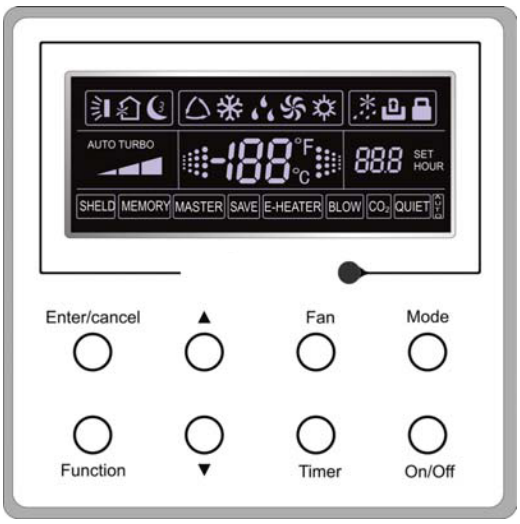
3 REMOTE CONTROLLER

3.1 Wired Remote Controller

3.1.1 Wired Controller XK19

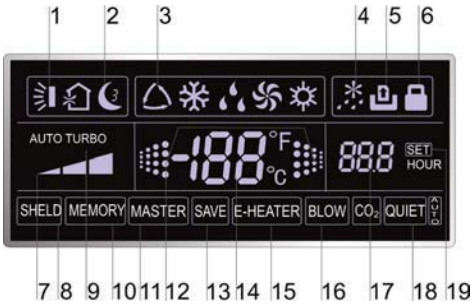
It is optional for the cassette type, wall-mounted, and floor ceiling indoor units.

Outside View of the Wired Controller



Outside View of the Wired Controller

LCD of the Wired Controller

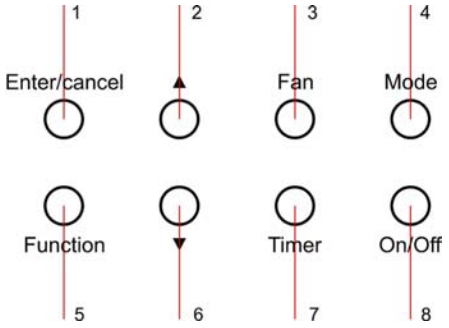


LCD of the Wired Controller

No.	Symbols	Description
1		Swing function.
2		Sleep function (3 types: sleep 1,sleep2 and sleep 3).
3		Running modes of the indoor unit (Cooling, Dry, Fan and Heating).
4		Defrosting function for the outdoor unit.
5		Gate-control function (this function is yet unavailable for this unit).
6		Lock function.
7		High, middle, low or auto fan speed of the indoor unit.
8	SHIELD	Shield functions (buttons, temperature, On/Off, Mode or Save is shielded or Save is shielded by the remote monitor.
9	TURBO	Turbo function.
10	MEMORY	Memory function (The indoor unit resumes the original setting state after power failure and then power recovery).
11	MASTER	Master wired controller (this function is yet unavailable for this unit).
12		It blinks under on state of the unit without operation of any button.
13	SAVE	Energy-saving function.
14		Ambient/preset temperature value.
15	E-HEATER	Electric auxiliary heating function.
16	BLOW	Blow function.
17		Timing value.
18	QUITE	Quiet function (two types: quiet and auto quiet).
19	SET	It will be displayed under the debugging mode.

3.1.2 Buttons

Buttons on the Wired Controller



Buttons on the Wired Controller

Function of the Buttons

No.	Name	Function
1	Enter/cancel	① Function selection and cancellation. ② Press it for 5s to examine the outdoor ambient temperature.
2	▲	① Running temperature setting of the indoor unit, range:16 ～ 30℃ . ② Timer setting, range:0.5-24 hr. ③ Switchover between quiet/auto quiet or among sleep1/sleep2/sleep 3.
6	▼	
3	Fan	Setting of the high/middle/low/auto fan speed.
4	Mode	Setting of the Cooling/Heating/Fan/Dry mode of the indoor unit.
5	Function	Switchover among the functions of Swing/Sleep/Turbo/Save/E-heater/Blow /Quiet etc.
7	Timer	Timer setting.
8	On/Off	Turn on/off the indoor unit.
4+2	▲+Mode	Press them for 5s under off state of the unit to enter/cancel the Memory function (If memory is set, indoor unit after power failure and then power recovery will resume the original setting state.If not, the indoor unit is defaulted to be off after power recovery. Memory off is default before delivery.).
3 +6	Fan+▼	By pressing them at the same time under off state of the unit, will be displayed on the wired controller for the cooling only unit, while will be displayed on the wired controller for the cooling and heating unit.
2 +6	▲+▼	Upon startup of the unit without malfunction or under off state of the unit,press them at the same time for 5s to enter the lock state, in which case, any other buttons won't respond the press. Repress them for 5s to quit this state.

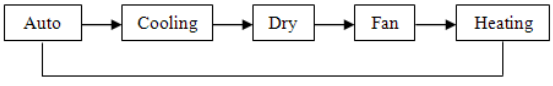
3.1.3 Operation Instructions

◆ **On/Off**

Press On/Off to turn on the unit and turn it off by another press.

◆ **Mode Setting**

Under the "On" state of the unit, press Mode to switch the operation modes as the following sequence: Cooling-Dry-Fan-Heating.



◆ **Temperature Setting**

Press ▲or ▼ to increase/decrease the preset temperature. If press either of them continuously, the temperature will be increased or decreased by 1℃ every 0.5s.

In the Cooling, Dry or Heating mode, the temperature setting range is 16℃～ 30℃ .

In the Fan mode, the setting temperature is fixed at 26℃ .

In the Auto mode, the setting temperature is unadjustable.

◆ **Fan Setting**

Under the "On"/"Off" state of the unit, press Fan and then fan speed of the indoor unit will change circularly.

◆ **Timer Setting**

Under the "On"/"Off" state of the unit, press Timer to set timer off/on.

Timer on setting: press Timer, and then LCD will display "xx.x hour", with "hour" blinking. In this case, press ▲or ▼ to adjust the timing value. Then press Enter/cancel to confirm the setting.

Timer off setting: press Timer, if LCD won't display xx.x hour, and then it means the timer setting is canceled.

Timer range: 0.5-24hr. Every press of ▲or ▼ will make the set time increased or decreased by 0.5hr. If either of

them is pressed continuously, the set time will increase/ decrease by 0.5hr every 0.5s.

◆ **Swing Setting**

Swing On: Press Function under on state of the unit to activate the swing function. In this case,  will blink. After that, press Enter/cancel to make a confirmation.

Swing Off: When the Swing function is on, press Function to enter the Swing setting interface, with  blinking. After that, press Enter/cancel to cancel this function.

Note:

m. Sleep, Save, Turbo, Blow or Quiet setting is the same as the Swing setting.

n. After the setting has been done, it has to press the key "Enter/cancel" to back to the setting status or quit automatically five seconds later.

◆ **Sleep Setting**

Sleep on: Press Function under on state of the unit till the unit enters the Sleep setting interface. Then press ▲or ▼ to switch among Sleep 1, Sleep 2 and Sleep 3. After that, press Enter/cancel to confirm the setting.

Sleep off: When the Sleep function is activated, press Function to enter the Sleep setting interface. After that, press Enter/cancel to can this function.

Sleep off is default after power failure and then power recovery, and the sleep functions is unavailable under the fan mode.

There are three Sleep modes: Sleep 1, Sleep 2 and Sleep 3.

1) Sleep 1

In the Cooling or Dry mode, the temperature will increase by 1℃ after the unit runs under Sleep 1 for 1hr and 1℃ after another 1hr.After that, the unit will run at this temperature.

In the Heating mode, the temperature will decrease by 1℃ after the unit runs under Sleep 1 for 1hr and 1℃ after another 1hr. After that, the unit will run at this temperature.

1) Sleep 2

In the Cooling mode, the temperature may be set between 16℃ -23℃ , 24℃ - 27℃ or 28℃ - 29℃ or at 30℃ . (Note: The curve is only for reference, the actual temperature is subject to the time point.).

For example: The temperature in the Cooling mode is set at 25℃ . Under the mode of Sleep 2, the temperature will increase by 1 ℃ every 1hr. After it increases by 2 ℃ in total, it will keep at 27 ℃ . 7 hours later, it will decrease by1℃ , i.e. 26℃ .After that, the unit will keep running at 26℃ .

In the Heating mode, the temperature may be set at 16℃ or between 17℃ - 20℃ , 21℃ -27℃ or 28℃ - 30℃ .

For example, the temperature in the Heating mode is set at 22℃ .Under the mode of Sleep2, the temperature will decrease by 1℃ every 1hr. After it decreases by 2℃ in total, i.e. 20℃ ,the unit will keep running at 20℃ .

1) Sleep 3

Sleep curve setting under Sleep 3(DIY mode)

Under the mode of Sleep 3, press Timer to enter the Sleep setting. In this case, "1 HOUR" is displayed where the timing value once is displayed and the corresponding temperature with the last Sleep curve setting is displayed where the ambient/preset temperature once in displayed.

Press ▲or ▼ to change the corresponding temperature setting.

Press Timer, time will automatically increase by 1hr, and the corresponding temperature with the last Sleep curve setting is displayed where the ambient/preset temperature once is displayed.

Repeat step 2 and step 3 till 8 HOUR Sleep setting is finished.

Press Enter/cancel to confirm the setting.

Notes:

a. During the above setting, if Function is pressed down or there is not any operation within 5s, sleep curve setting will be canceled.

b. 26℃ is the default Sleep curve temperature before delivery. The wired controller will automatically memorize the Sleep curve after the setting.

◆ **Turbo Setting**

Turbo function: The unit at the high fan speed can realize quick cooling or heating so that the room temperature can quickly approach the setting value.

In the Cooling or Heating mode, press Function till the unit enters the Turbo setting interface and then press Enter/ Cancel to confirm the setting.

When the Turbo function is activated, press Function to enter the Turbo setting interface and then press Enter/ Cancel to cancel this function.

Notes:

a. When the Turbo function is activated, if the difference between the room temperature and set temperature is at or below 2℃ (detected in successive 1 min.), the Turbo function will be automatically deactivated.

b. Turbo function is unavailable in the Dry and Fan mode. And the Turbo function is off after power failure and then power recovery. If Quiet function is on, Turbo function will be canceled subsequently.

◆ **Save Setting**

Save: Energy saving which will result the air conditioner runs in smaller temperature range is realized by setting

lower limited value in the Cooling or Dry mode and upper limited value in the Heating mode.

Save Setting for Cooling:

Under the "On" state and in the Cooling or Dry mode of the unit, press Function to enter the Save setting interface and then press ▲or ▼ to adjust the lower limited value in the Cooling mode. After that, press Enter/Cancel to activate the Save function. The initial lower limited value in the Cooling mode is 26℃ .

When the Save function is activated, press Function to enter the Save setting interface and then press Enter/cancel to cancel this function.

Save Setting for Heating:

Under on state or in the Heating mode of the unit, press Function to enter the Save setting interface and then press ▲or ▼ to adjust upper limited value in the Heating mode. After that, press Enter/Cancel to activate the Save function for heating. The upper initial limited value in the Heating mode is 20℃ .

After the Saving function is activated, press Function to enter the Save setting interface and then press Enter/Cancel to cancel this function.

Notes:

a. If press Function on the Save setting interface or if there is not any operation for 5s after last button press, the Save setting will be canceled automatically by the system, with memorizing the present setting data.

b. When power is on after the power failure, the Save function will be memorized.

◆ **E-heater Setting**

E-heater (auxiliary electric heating function): In the Heating mode, E-heater is allowed to be turned on for improvement of efficiency.

Once the wired controller or the remote controller enters the Heating mode, this function will be turned on automatically.

Press Function in the Heating mode to enter the E-heater setting interface and then press Enter/cancel to cancel this function.

Press Function to enter the E-heater setting interface, if the E-heater function is not activated, and then press Enter/Cancel to turn it on.

◆ **Blow Setting**

Blow function: After the unit is turned off, the water in evaporator of indoor unit will be automatically evaporated to avoid mildew.

In the Cooling or Dry mode, press Function till the unit enters the Blow setting interface and then press Enter/Cancel to active this function.

When the Blow function is activated, press Function to the Blow setting interface and then press Enter/Cancel to cancel this function.

Notes:

a. When the Blow function is activated, if turning off the unit by pressing On/Off or by the remote controller, the indoor fan will run at the low fan speed for 10 min, with "BLOW" displayed on the LCD. While, if the Blow function is deactivated, the indoor fan will be turned off directly.

b. Blow function is unavailable in the Fan or Heating mode.

◆ **Quiet Setting**

Quiet function consists of two kinds: quiet and auto quiet.

Press Function till the unit enters the Quite setting interface, with "Quiet" or "Auto" blinking. In this case, press ▲or ▼ to switch between Quiet and Auto and then press Enter/cancel to make a confirmation.

When the Quiet function is activated, press Function till the unit enters the Quite setting interface, with "Quite" or "Auto" blinking. Then press Enter/cancel to cancel this function.

Notes:

a. When the Quite function is activated, the fan speed is low and un-adjustable.

b. When the Auto Quite function is activated, the unit will run according to the difference between the room temperature and the setting temperature. In this case, the fan speed is adjustable.

Difference between the room temperature and the setting temperature: the fan speed will keep its current state if the temperature difference ≥ 4℃ ; the fan speed will reduce one grade if 2℃≤ the temperature difference ≤ 3℃ ; the fan speed will be at min. grade if the temperature difference ≤ 1℃ .

c. When the Auto Quiet function is on, the fan speed can not be raised but reduced. If the high fan speed is manually adjusted, the function will quit automatically.

d. There is not Auto Quiet function in the Fan or Dry mode. Quiet off is default after power failure and then power recovery.

◆ **Other Functions**

1) Lock

Upon startup of the unit without malfunction or under the "Off" state of the unit, press ▲ and ▼ at the same time for 5s till the wired controller enters the Lock function. In this case, LCD displays 🔒. After that, repress these two buttons at the same time for 5s to quit this function.

Under the Lock state, any other button press won't get any response.

2) Memory

Memory switchover: Under the “Off” state of the unit, press Mode and ▲ at the same time for 5s to switch memory states between memory on and memory off. When this function is activated, Memory will be displayed. If this function is not set, the unit will be under the “Off” state after power failure and then power recovery.

Memory recovery: If this function has been set for the wired controller, the wired controller after power failure will resume its original running state upon power recovery. Memory contents: On/Off, Mode, set temperature, set fan speed, Save function and Lock function.

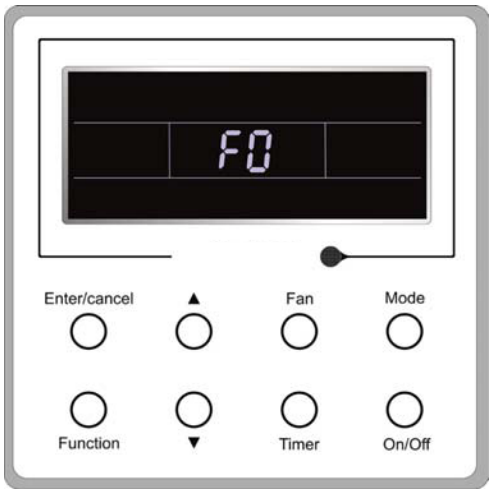
3) Enquiry of the Outdoor Ambient Temperature

Under the “On” or “Off” state of the unit, press Enter/Cancel for 5s, and the outdoor ambient temperature will be displayed after a sound of click. This enquiry state will quit by pressing Function or On/Off or during the temperature adjustment. If there is not any operation for 10s, it will also quit automatically.

3.1.4 Errors

If there is an error occurring during the operation of the system, the error code will be displayed on the LCD. If multi errors occur at the same time, their codes will be displayed circularly.

Note: In event of any error, please turn off the unit and contact the professionally skilled personnel.



Error	Error Code
High pressure protection	E1
Low pressure protection	E3
Discharge protection	E4
Over-current protection	P5
Communication error	E6
Indoor water overflow protection	E9
Mode conflict	E7
Anti-freezing protection	E2
Defrosting or oil returning for heating	H1
Indoor ambient temperature sensor open/short circuit	F1
Evaporator temperature sensor open/short circuit	F2
Indoor unit (liquid valve) refrigerant pipe inlet temperature sensor error	b5
Indoor unit (gas valve) refrigerant pipe outlet temperature sensor error	b7
Condenser coil inlet temperature sensor open/short circuit	A5
Condenser coil midway temperature sensor error	F4
Condenser coil outlet temperature senor open/short circuit	A7
Discharge air temperature sensor error	F5
Outdoor ambient temperature sensor error	F3
Module temperature sensor error	oE
Outdoor unit overall error	oE

3.2 Wireless Remote Controller

Wireless Remote Controller YT1F

Notes:

a. Be sure that there are no obstructions between the receiver and the remote controller;

b. Do not drop or throw the remote controller;

c. Do not let any liquid into the remote controller and expose the remote controller to direct sunlight or any place where is very hot.

d. This is a general use remote controller. If press some button which is not available for the corresponding function, the unit will keep the original running status.

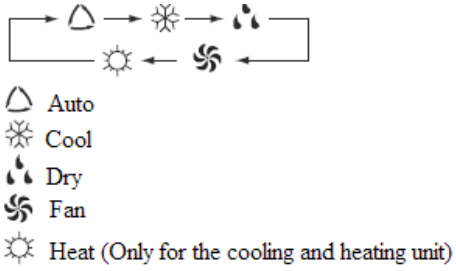
3.2.1Function of Press Buttons:

◆ ON/OFF (⏻)

Press this button to turn on/off the unit. After that, the sleep function will be canceled but the preset time is still remained.

◆ MODE

Auto, Cool, Dry Fan, Heat modes can be selected circularly by pressing this button. Auto mode is the default after power on. Under Auto mode, the temperature will not be displayed. Under Heat mode, the initial value is 28℃ (82 ℉); Under other modes, the initial value is 25℃ (77 ℉).

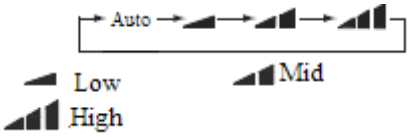


◆ SLEEP

Sleep On and Sleep Off can be selected by pressing this button. After powered on, the default is Sleep Off. After the unit is turned off, the Sleep function is canceled. When the sleep function is set already, the symbol will be displayed. And at this time, the time of timer can be adjusted. Under Fan and Auto modes, this unction is not available.

◆ FAN

Auto, Low, Middle, or High fan speed can circularly selected by pressing this button. After powered on, the default is Auto speed. Under Dehumidifying mode, only Low fan speed is available.



◆ CLOCK

The clock can be set up by pressing this button, with the symbol displayed and blinking. In such a case, pressing ＋ or － within 5 seconds can adjust the value. If the button is pressed down for more than 2 seconds, the value on ten's place will increase by 1 in every 0.5 seconds. After that, repressing this button and then symbol stops blinking, which indicates the setting is made successfully. After powered on, the default value is 12:00 with displayed. Once the symbol is displayed, the current time is the Clock value; otherwise it is the Timer value.

◆ LIGHT

Light On and Light Off can be set by pressing this button when the unit is at On or Off status. After powered on,

the default is Light On.

◆ TURBO

In Cool or Heat mode, pressing this button can activate or deactivate this function. When this function is on, its symbol will be displayed. Any change of either mode or fan speed will make this function canceled automatically.

◆ BLOW

BlOW On and BLOW Off can be set by pressing this button. In Cool and Dehumidifying modes, press this button to activate this function and then "BLOW" will be displayed. After that, it can be canceled by repressing this button. After powered on, the default is Blow Off. If the ON/OFF button is operated or the unit is switched to the Cool or Dehumidifying mode, it will keep its original status. When the unit is turned off, Only Blow Off is available. Under Auto, Fan or Heat mode, this function is unavailable.

◆ －

The preset temperature can be decreased by pressing this button. If the button is pressed down for more than 2 seconds, the temperature will be decreased quickly until it is released, with ℃ (℉) displayed al the time. Under Auto mode, the temperature adjustment is unavailable.

◆ ＋

The preset temperature can be increased by pressing this button. If the button is pressed down for more than 2 seconds, the temperature will be increased quickly until it is released, with ℃ (℉) displayed all the time. Under Auto mode, the temperature adjustment is unavailable. The setting range is 16-30 ℃ or 61-86 ℉

◆ TEMP

It can be decided by pressing this button which temperature will be displayed, indoor set temperature, or indoor ambient temperature. When the indoor unit is powered on, the indoor set temperature will be displayed, while if the status is changed to , the indoor ambient temperature will be displayed. However, the indoor set temperature will be displayed again when the controller receives other remote controls signals. Without setting this function, the default is the indoor set temperature.

◆ SWING UP/DOWN ( )

The swing angle which circularly changes as below can be selected by pressing this button:

This kind of remoter controller is universal. And the three swing statuses of are the same as that of .

If the swing function is deactivated when the air guide louver is swing up and down, it will stop at the current position.

indicates that the air guide louver swings up and down among all five positions.

◆ AIR ( )

AIR ON or Air OFF can be selected by pressing this button.

◆ TIMER ON

"ON" will be displayed and blink for 5 seconds by pressing this button, and soon adjust the time by pressing ＋ or － within 5 seconds. Each press will make the time increased or decreased by 1 minute. If the button is pressed down for more than 2 seconds, the time will be changed quickly in such a way: firstly the value on the one's place is changed and then is the value on the ten's place. Once Timer ON has been set already, it can be canceled by repressing it. Before the setting, please adjust the CLOCK to the current actual time.

◆ TIMER OFF

TIME OFF can be activated by pressing this button, with "OFF" blinking. The method of setting is the same as that for TIMER ON.

◆ HEALTH ( )

This function can be activated or deactivated by pressing this button. After the unit is turned on, the default is HEALTH ON.

◆ I FEEL

This function can be activated by pressing this button and canceled by another press. When this function is on, the I FEEL information will be sent out in 200ms after each operation on the controller and the remote controller will send the temperature information to the main controller every 10 minutes.

3.2.2 Guide for General Operation

1) After powered on, press ON/OFF and then the unit will start to run. (Note: when powered off, the guide louver of the main unit will close automatically).

2) Press MODE to select the desired running mode.

3) Press ＋ or － to set the desired temperature (it is unnecessary to set the temperature under the AUTO mode.)

4) Press FAN to set the fan speed, AUTO, LOW, MID, or HIGH.

5) Press to select the swing angle.

3.2.3 Guide for Optional Operation

◆ About BLOW

This function indicates that moisture in the evaporator of the indoor unit will be dried after the unit is stopped to avoid mould.

a. BLOW ON: When press the ON/OFF button to turn off the unit, the indoor fan will continue running for about another 10 minutes at the low speed. In this case, the indoor fan can be stopped directly by pressing the button BLOW.

b. BLOW OFF: When press the ON/OFF button to turn off the unit, the whole unit will be stopped completely.

◆ About AFTERHEAT BLOW

Under the Heat mode or Auto Heat mode, if the unit is turned off, the compressor and outdoor fan will stop running immediately and the upper and lower guide board will rotate to the horizontal position, while the indoor fan will still run at the low fan speed. Then, 10 seconds later, the unit will stop completely.

◆ About AUTO RUN

When AUTO RUN is selected, the setting temperature will not be displayed on the LCD and the unit will choose the suitable running mode automatically in accordance with the room temperature.

◆ About TURBO

If this function is activated, the unit will run at super-high fan speed to cool or heat quickly so that the ambient temperature will approaches the preset temperature as soon as possible.

MAINTENANCE

MAINTENANCE

1 TROUBLE TABLE

⚠ WARNING !

a. In the event of abnormal conditions (like, stinky smell), please shut off the main power supply immediately and then contact the appointed service center; otherwise the continuous abnormal running would damage the air conditioning unit and also would cause electric shock or fire hazard etc.

b. Do not repair the air conditioning personally but instead contact the professionally skilled personnel at the Toyotomi service center, as the incorrect repair would cause electric shock or fire hazard etc.

1.1 Please check the following items before contact the maintenance service man

Conditions	Causes	Corrective Actions
The unit does not run	Broken fuse or opened breaker	Change the fuse or close the breaker
	Power off	Restart the unit when power on
	Loosened power supply plug.	Plug the power supply properly.
	Insufficient batteries voltage of the remote controller	Change new batteries
	Remoter controller out of the control scope	Keep the control distance within 8 meters.
The unit stops soon after it starts	Clogged inlet/outlet of the indoor/outdoor unit	Clear the obstacle
Cooling/Heating is abnormal	Clogged inlet/outlet of the indoor/outdoor unit	Clear the obstacle
	Improperly set temperature	Adjust the setting of the remote or wired controller.
	Too low set fan speed	Adjust the setting of the remote or wired controller.
	Incorrect air direction	Adjust the setting of the remote or wired controller.
	Opened door and window	Close the door and window
	Direct sunlight	Hang a curtain or blinds over the window.
	Too much people in the room	
	Too much heat sources in the room	Reduce the heat sources
	Dirty filter screen	Clean the filter screen

Note:

If the air conditioner still runs abnormally after the above check and handling, please contact the maintenance serviceman at the local appointed service center and also give a description of the error occurred as well as the model of the unit

1.2 The conditions listed below are not classified into errors

Conditions		Causes
The unit does not run	When restart the unit soon after it is stopped.	The overload protection switch of the unit let the startup delayed for three minutes.
	As soon as power is on.	The unit will stand by for approximate one minute.
The unit blows out mist	When the cooling operation starts.	The hi-humidity air indoor is cooled quickly.
The unit generates noise	The unit “clatters” as soon as it starts running.	It is the sound generated during the initialization of the electronic expansion valve.
	The unit “swishes” during the cooling operation.	It the sound when the refrigerant gas runs inside the unit.
	The unit “swishes” when it is started or stopped.	It is the sound when the refrigerant gas stops running.
	The unit “swishes” when in it is and after the running.	It is the sound when the draining system is operating.
	The unit “squeaks” when it is in and after the running.	It is the sound of frication generated by the skin plate etc which swells due to the temperature change.
The unit blows out dust.	When the unit restarts after it is not used for a long time.	The dust inside the unit is blown out again.
The unit emits odors.	When the unit is running.	The odors absorbed in are blown out again.

1.3 Error description

If some error occurs when the unit is running, the error code will be displayed on the wired controller and the main board 88 of the outdoor unit.See the table before for more details about the meaning of each error.

Residential AC Errors	Commerical AC Errors	Outdoor Unit "88" Display	Indicating Lamp			Lamp Panel "88" Display (Floor Ceiling Type)	Wired Controller Display
			Running	Cooling	Heating		
/	Defrosting mode 1	08	/	/	/	/	/
/	Defrosting mode 2	0A	/	/	/	/	/
/	heating overload protection	0C	Flash 3 times	Flash 3 times	Flash 3 times	/	oE
/	Normal running	ON	/	/	/	/	/
Short/open circuit of the liquid valve temperature sensor	Short/open circuit of he liquid valve temperature sensor	Shown as Table 16	/	Flash 19 times	/	b5	b5
Short/open circuit of the gas valve temperature sensor	Short/open circuit of the gas valve temperature sensor	Shown as Table 16	/	Flash 22 times	/	b7	b7
Refrigerant insufficiency or blockage protection (available for the residential outdoor unit)	Refrigerant insufficiency or blockage protection (available for the residential outdoor unit)	F0	/	Flash 10 times	/	oE	oE
Short/open circuit of the indoor ambient temperature sensor	Short/open circuit of the indoor ambient temperature sensor	Shown as Table 16	/	Flash once	/	F1	F1
Short/open circuit of the indoor evaporator	Short/open circuit of the indoor evaporator	Shown as Table 16	/	Flash twice	/	F2	F2
Short/open circuit of the of the outdoor ambient temperature sensor	Short/open circuit of the of the outdoor ambient temperature sensor	F3	/	Flash 3 times	/	F3	F3
Short/open circuit of the temperature sensor at the midway of the condenser coil (for the commercial unit)	Short/open circuit of the temperature sensor at the midway of the condenser coil (for the commercial unit)	F4	/	Flash 4 times	/	F4	F4
Short/open circuit of the outdoor discharge temperature sensor	Short/open circuit of the outdoor discharge temperature sensor	F5	/	Flash 5 times	/	F5	F5
Oil returning in cooling	Oil returning in cooling	F7	/	/	/	/	/
System high pressure protection	System high pressure protection	E1	Flash once	/	/	E1	E1
Anti-freezing protection	Anti-freezing protection	E2	Flash twice	/	/	E2	E2
System low pressure protection (reserved)	System low pressure protection	E3	Flash 3 times	/	/	E3	E3
Compressor discharge high temperature protection	Compressor discharge high temperature protection	E4	Flash 4 times	/	/	E4	E4
Whole unit over-current protection	Whole unit over-current protection	E5	Flash 3 times	Flash 3 times	Flash 3 times	oE	oE
Communication error between the indoor and outdoor units	Communication error between the indoor and outdoor units	Shown as Table 16	Flash 6 times	/	/	E6	E6
Mode conflict	Mode conflict	Shown as Table 16	Flash 7 times	/	/	E7	E7
Overload protection	Overload protection	E8	Flash 3 times	Flash 3 times	Flash 3 times	oE	oE
Anti cold blow protection	/	E9	/	/	/	/	/
/	Indoor unit water overflow error		/	Flash	Flash	E9	E9
Trial run/trial operation	Trial run/trial operation	dd	Quick flash	Quick flash	Quick flash	dd	dd
Refrigerant recovery mode	Refrigerant recovery mode	Fo	Quick flash	Quick flash	/	Fo	Fo
Drive module resetting (for the commercial unit)	IPM Drive module resetting	P0	Flash 3 times	Flash 3 times	Flash 3 times	oE	oE
Min. cooling/heating (capability test code)	Cooling IPLV test	P0	/	Quick flash	/	P0	P0
	Cooling IPLV test		/	/	Quick flash	P0	

Mid. Cooling/heating (capability test code)	Cooling level AA performance test	P3	/	Quick flash	/	P3	P3
	Level AA cooling performance test		/	/	Quick flash	P3	
Phase over-current protection	Compressor over-current protection	P5	Flash 3 times	Flash 3 times	Flash 3 times	oE	oE
Drive board communication error(for the commercial unit)	Communication error between the inverter driver to the main controller	P6	Flash 3 times	Flash 3 times	Flash 3 times	oE	oE
Short/open circuit of the of the module temperature sensor	Short/open circuit of the of the module temperature sensor	P7	Flash 3 times	Flash 3 times	Flash 3 times	oE	oE
Module temperature protection	Module temperature protection	P8	Flash 3 times	Flash 3 times	Flash 3 times	oE	oE
AC contact protection (for the commercial unit)	AC contact protection	P9	Flash 3 times	Flash 3 times	Flash 3 times	oE	oE
Circuit sensor error	Circuit sensor error	Pc	Flash 3 times	Flash 3 times	Flash 3 times	oE	oE
Transducer connection protection (for the commercial unit)	Transducer connection protection	Pd	Flash 3 times	Flash 3 times	Flash 3 times	oE	oE
AC current protection(input side)	AC current protection(input side)	PA	Flash 3 times	Flash 3 times	Flash 3 times	oE	oE
Temperature drift protection (for the commercial unit)	Temperature drift protection	PE	Flash 3 times	Flash 3 times	Flash 3 times	oE	oE
Drive board ambient temperature sensor error (for the commercial unit)	Drive board ambient temperature sensor error	PF	Flash 3 times	Flash 3 times	Flash 3 times	oE	oE
DC link high voltage protection	DC link low voltage protection	PL	Flash 3 times	Flash 3 times	Flash 3 times	oE	oE
DC link low voltage protection	DC link high voltage protection	PH	Flash 3 times	Flash 3 times	Flash 3 times	oE	oE
/	Abnormal AC input voltage	PP	Flash 3 times	Flash 3 times	Flash 3 times	oE	oE
Capacitor charging error	Capacitor charging error	PU	Flash 3 times	Flash 3 times	Flash 3 times	oE	oE
Jumper terminal error protection	Jumper terminal error protection	C5	Flash 3 times	Flash 3 times	Flash 3 times	oE	oE
Defrosting or oil returning in heating	Defrosting or oil returning in heating	H1	/	/	Flash once	H1	Defrosting symbol displayed
/	Forcible defrosting	H1	Quick flash	/	/	H1	H1
Compressor thermal overload protection.	Compressor overload protection.	H3	Flash 3 times	Flash 3 times	Flash 3 times	oE	oE
Modulecurrent protection (namely IPM protection)	IPM Module current protection	H5	Flash 3 times	Flash 3 times	Flash 3 times	oE	oE
Compressor desynchronizing	Compressor desynchronizing	H7	Flash 3 times	Flash 3 times	Flash 3 times	oE	oE
PFC Protection	PFC Protection	HC	Flash 3 times	Flash 3 times	Flash 3 times	oE	oE
Too high power protection (available for the residential outdoor unit)	Too high power protection (available for the residential outdoor unit)	L9	Flash 20 times	/	/	oE	oE
Compressor startup failure	Compressor startup failure	Lc	Flash 3 times	Flash 3 times	Flash 3 times	oE	oE
Compressor phase failure/ reverse protection	Compressor phase failure/ reverse protection	Ld	Flash 3 times	Flash 3 times	Flash 3 times	oE	oE
Compressor rotation failure(for the commercial unit)	Compressor rotation failure(for the commercial unit)	LE	Flash 3 times	Flash 3 times	Flash 3 times	oE	oE
Over speed (for the commercial unit)	Over speed	LF	Flash 3 times	Flash 3 times	Flash 3 times	oE	oE
Short/open circuit of the temperature sensor at the inlet of the condenser coil (for the commercial unit)	/	A5	/	/	/	/	/
Short/open circuit of the temperature sensor at the outlet of the condenser coil (for the commercial unit)	/	A7	/	/	/	/	/
Memory card error	/	EE	/	/	/	/	/

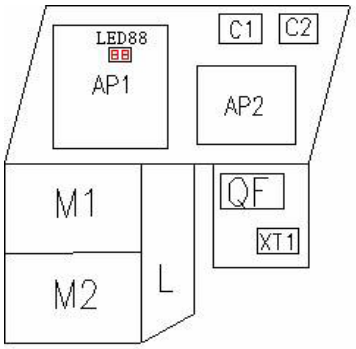
Frequency limitation/ degradation for module circuit protection (for phase circuit)	/	En	/	/	/	/	/
Frequency limitation/ degradation for module temperature protection	/	EU	/	/	/	/	/
Frequency limitation/ degradation for overload	/	F6	/	Flash 6 times	/	/	/
Frequency limitation /degradation for circuit protection of the whole unit	/	F8	/	Flash 8 times	/	/	/
Frequency limitation/ degradation for module circuit protection (for phase circuit)	/	F9	/	Flash 9 times	/	/	/
Frequency limitation/ degradation for anti-freezing protection	/	FH	/	Flash 2 times	Flash 2 times	/	/
No indoor fan motor	/	H6	Flash 11 times	/	/	/	/
Compressor demagnetizing protection	/	HE	/	/	Flash 14 times	/	/
Indoor and outdoor units unmatched	/	LP	Flash 19 times	/	/	/	/
Compressor phase circuit detection error	/	U1	/	/	Flash 12 times	/	/
DC link voltage drop error	/	U3	/	/	Flash 20 times	/	/
Zero detection circuit error	/	U8	Flash 17 times	/	/	/	/
Nominal cooling/heating (capability test code)	/	P1	/	/	/	/	/
Max. cooling/heating (capability test code)	/	P2	/	/	/	/	/

The words in gray means the corresponding function is unavailable.

Error Code	Error Description	Error Code	Error Description	Error Code	Error Description
13	Unit A indoor unit pipe outlet temperature sensor error	23	Unit B indoor unit pipe outlet temperature sensor error	33	Unit C indoor unit pipe outlet temperature sensor error
14	Unit A indoor pipe inlet temperature sensor error	24	Unit B indoor pipe inlet temperature sensor error	34	Unit C indoor pipe inlet temperature sensor error
15	Unit A indoor ambient temperature sensor error	25	Unit B indoor ambient temperature sensor error	35	Unit C indoor ambient temperature sensor error
16	Unit A mode conflict	26	Unit B mode conflict	36	Unit C mode conflict
17	Unit A anti-freezing protection	27	Unit B anti-freezing protection	37	Unit C anti-freezing protection
41	Unit D communication error	46	Unit D mode conflict	54	Unit E indoor pipe inlet temperature sensor error
42	Unit D indoor pipe midway temperature sensor error	47	Unit D anti-freezing protection	55	Unit E indoor ambient temperature sensor error
43	Unit D indoor unit pipe outlet temperature sensor error	51	Unit E communication error	56	Unit E mode conflict
44	Unit D indoor pipe inlet temperature sensor error	52	Unit E indoor pipe midway temperature sensor error	57	Unit E anti-freezing protection
45	Unit D indoor ambient temperature sensor error	53	Unit E indoor unit pipe outlet temperature sensor error	C5	Jumper terminal error

Error description of outdoor refrigerant pipe detection function

Wiring error or component error	Unit which is detecting	Unit which isn't detecting
5E	01	**
5E	02	**
5E	03	**
5E	04	**
5E	05	**
Indoor unit gas pipe connection error or component error	**Unit which is detecting**	--
5P	01	--
5P	02	--
5P	03	--
5P	04	--
5P	05	--



Outdoor Unit: MUL36INV- 4 and MUL42INV- 5

(Note: Refer to the real products for the exact position of each component.)

Once errors are displayed on the controller, please shut off the air conditioning unit and contact the professionally skilled personnel for troubleshooting.

2 FLOW CHART OF TROUBLESHOOTING

Service personnel shall collect the malfunction information as much as possible and research them thoroughly, list these electrical parts which may cause malfunction, service personnel shall be able to determine the specific reason and solve the faulted parts.

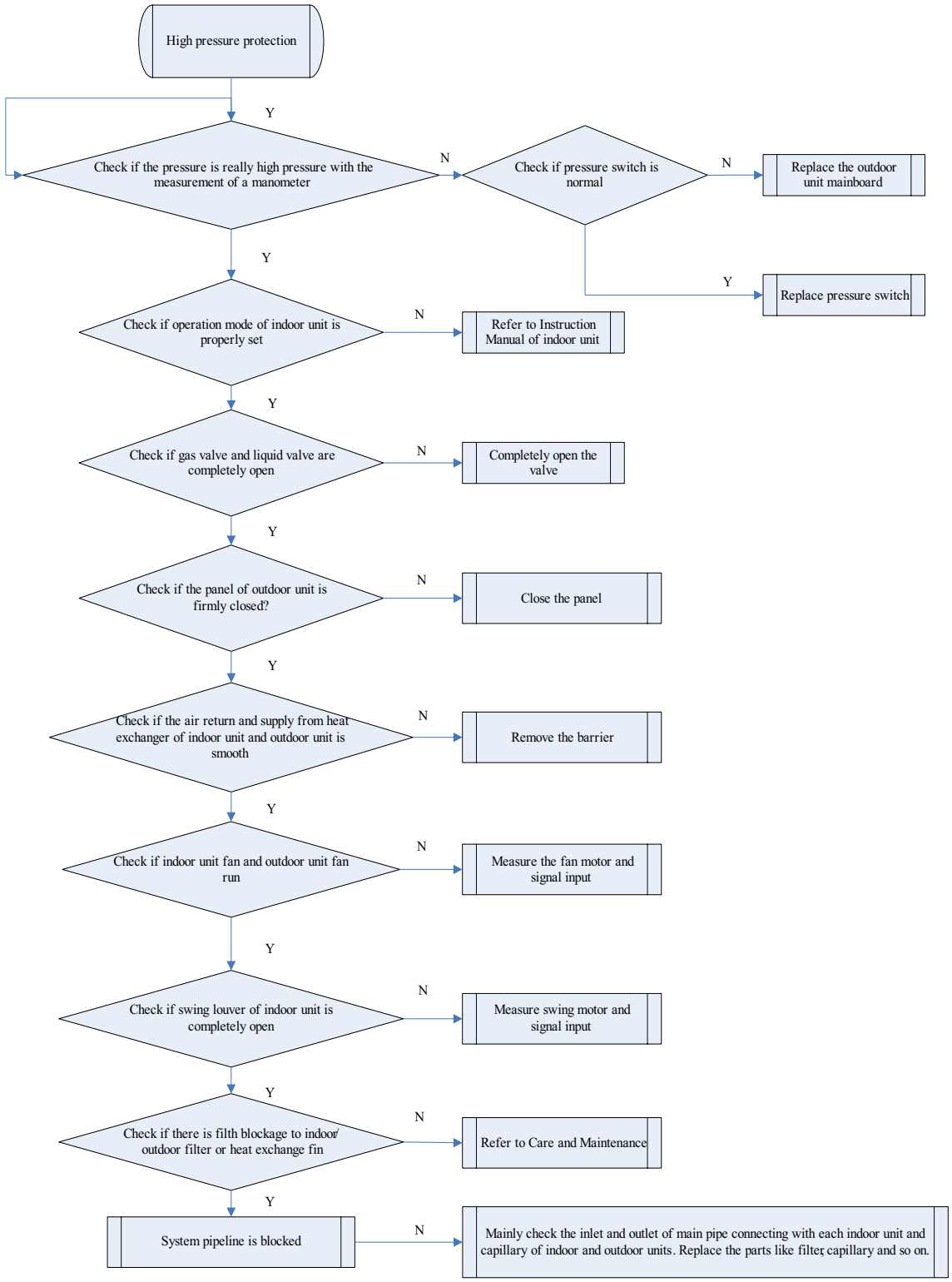
Observe the status of the complete device and do not observe the partial

It is advised to start from the simple operation during analyzing ,judging and confirming malfunction reason, then conduct the complicated operations such removal of device, part replacement and refrigerant filling.

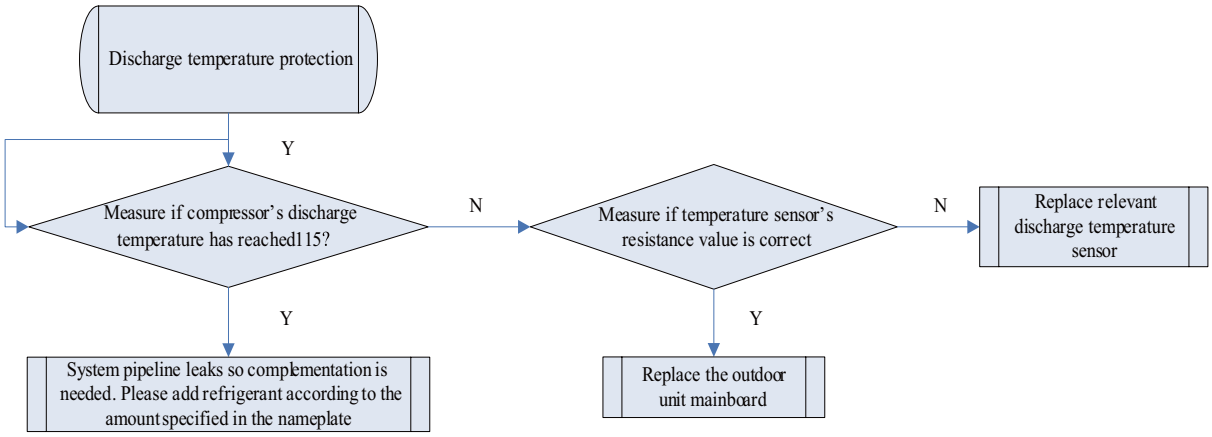
Find the malfunction reason carefully as unit may occur several malfunction at the same time and one malfunction may develop into several malfunction, so entire system analysis shall be established to make the judged result exact and credible.

◆ Malfunction display: E1 Compressor High Pressure Protection

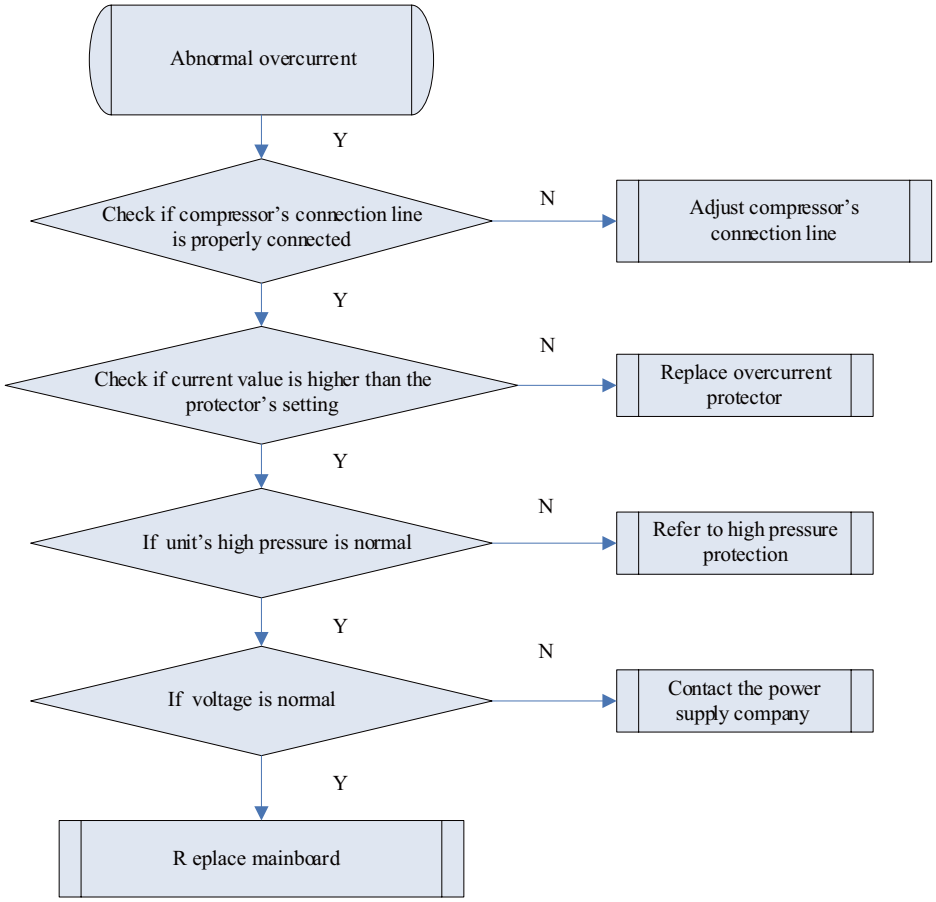
◆ Malfunction display: E3 Compressor Low Pressure Protection



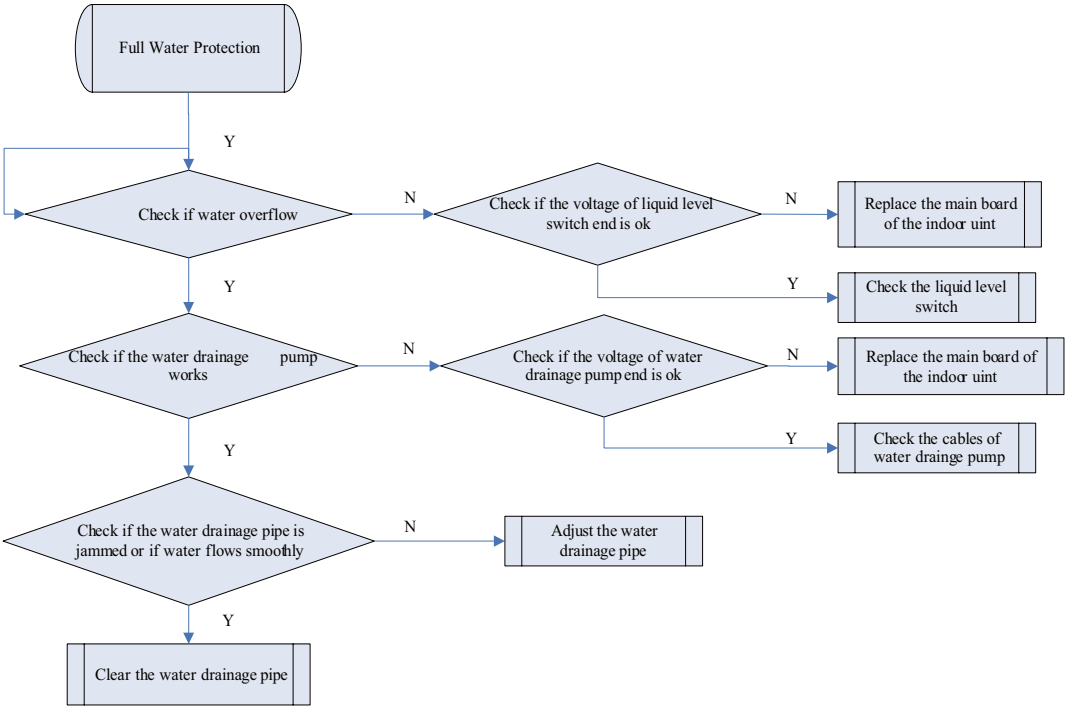
◆ Malfunction display: E4 Compressor Exhaust High Temperature Protection



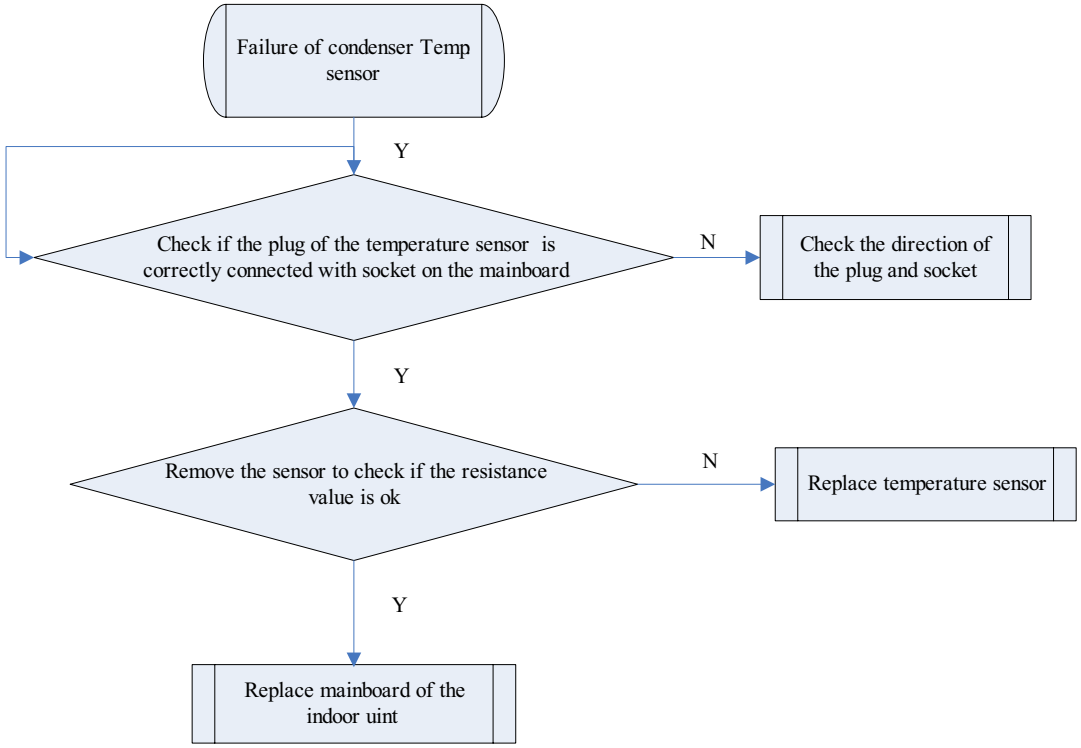
◆ Malfunction display: E5 Compressor Overheat



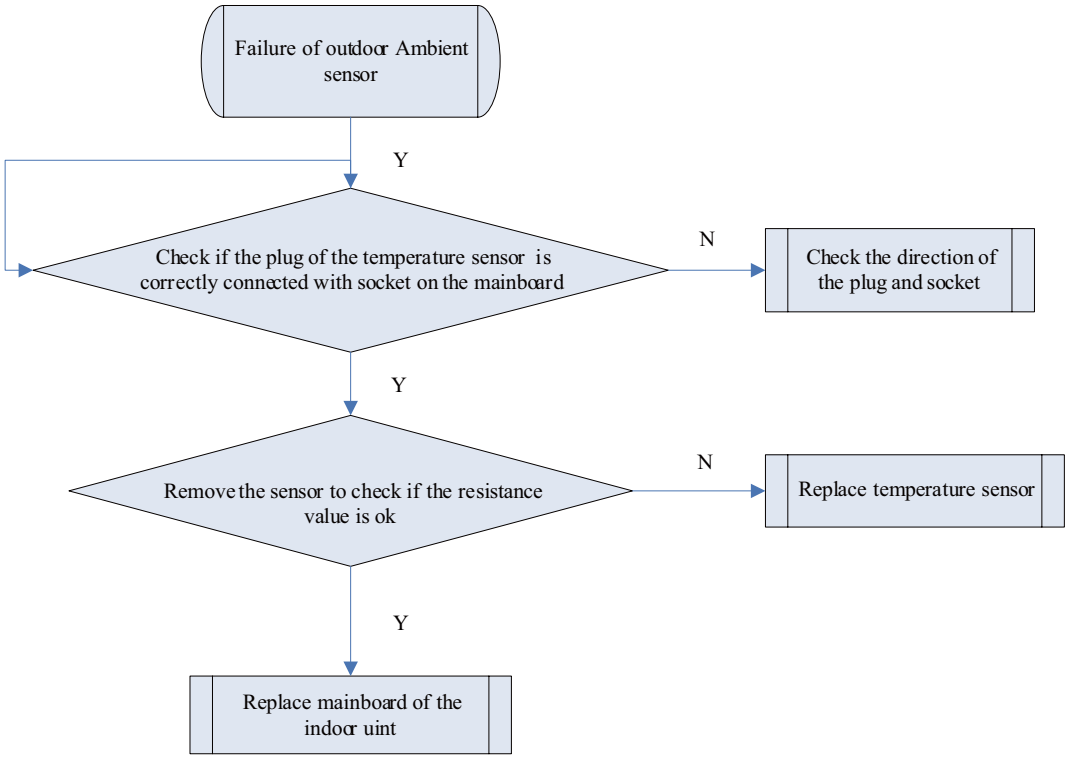
◆ Malfunction display: E9 Full Water Protection



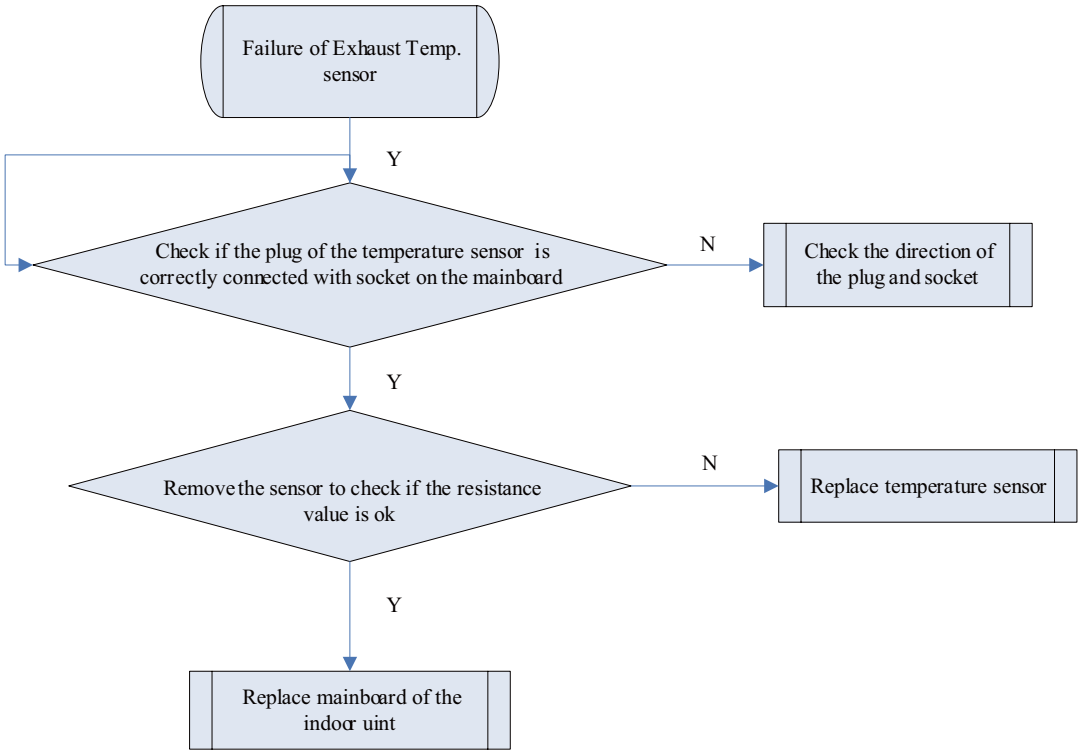
◆ Malfunction display: F2 Failure of Evaporator Temp. Sensor



◆ Malfunction display: F3 Failure of Outdoor Ambient Sensor



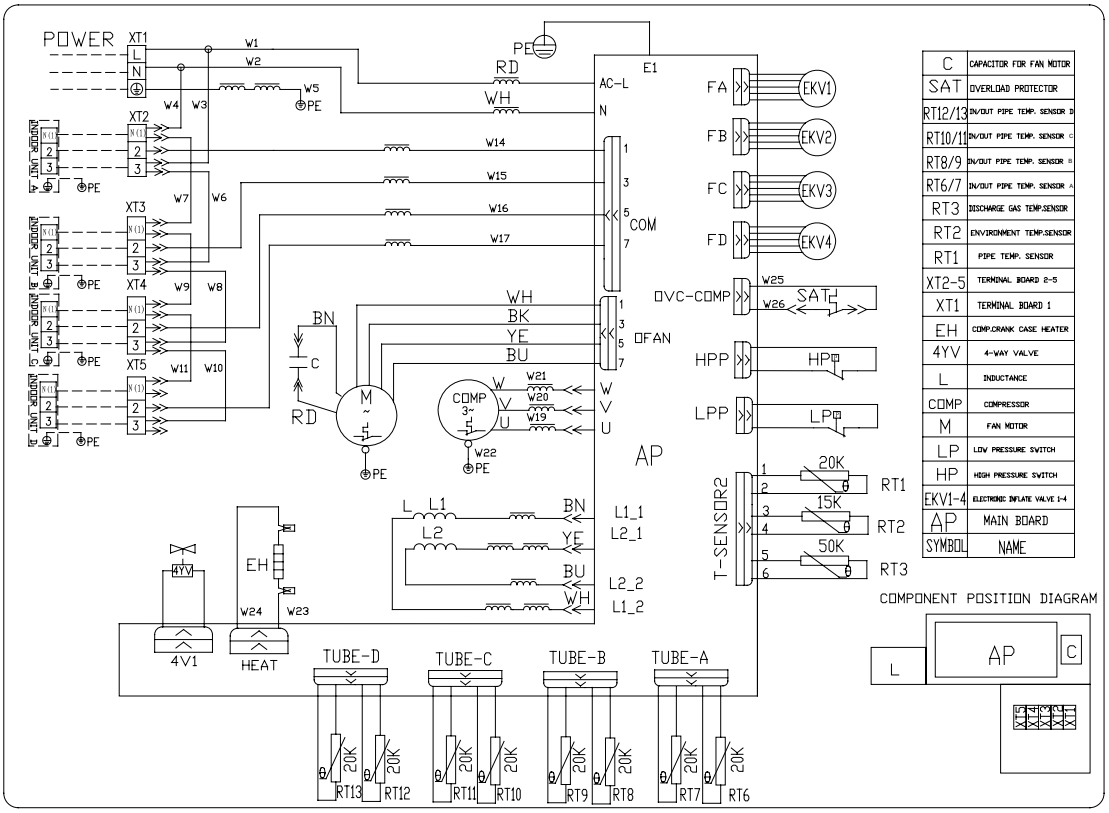
◆ Malfunction display: F5 Failure of Exhaust Temp. Sensor



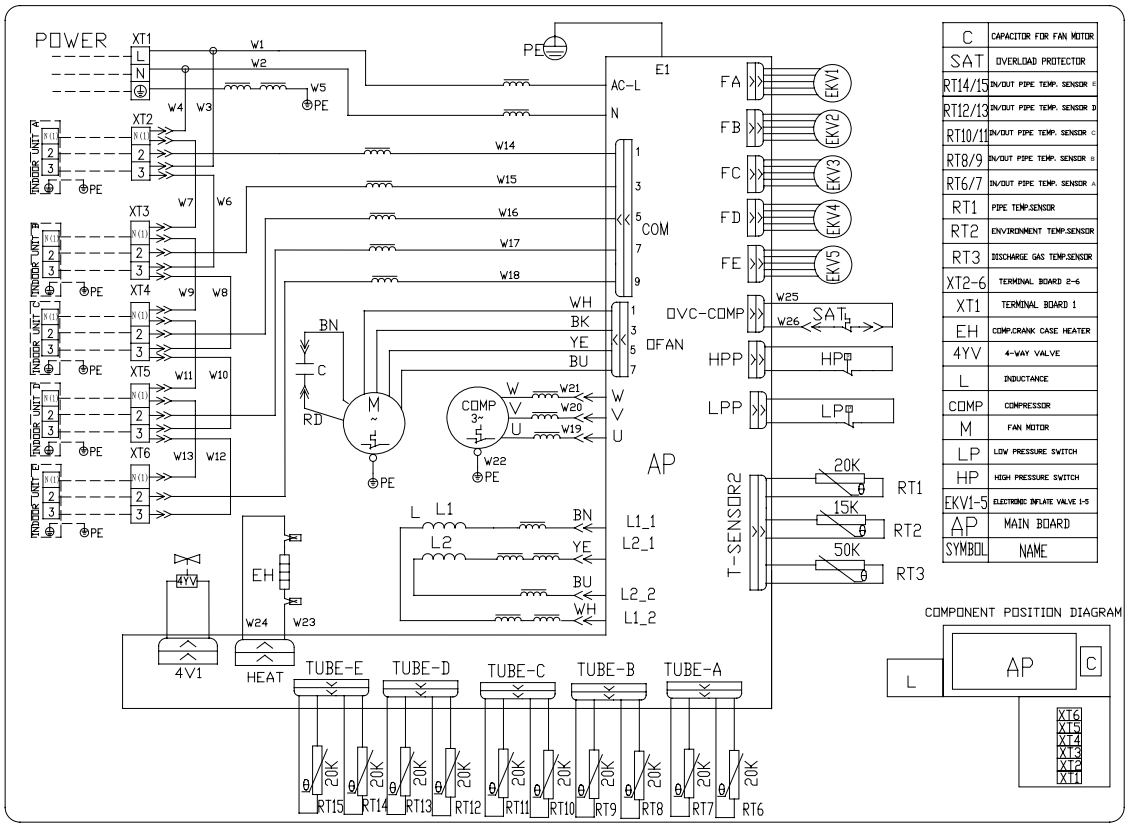
3 WIRING DIADRAM

3.1 Outdoor unit

MUL36INV- 4



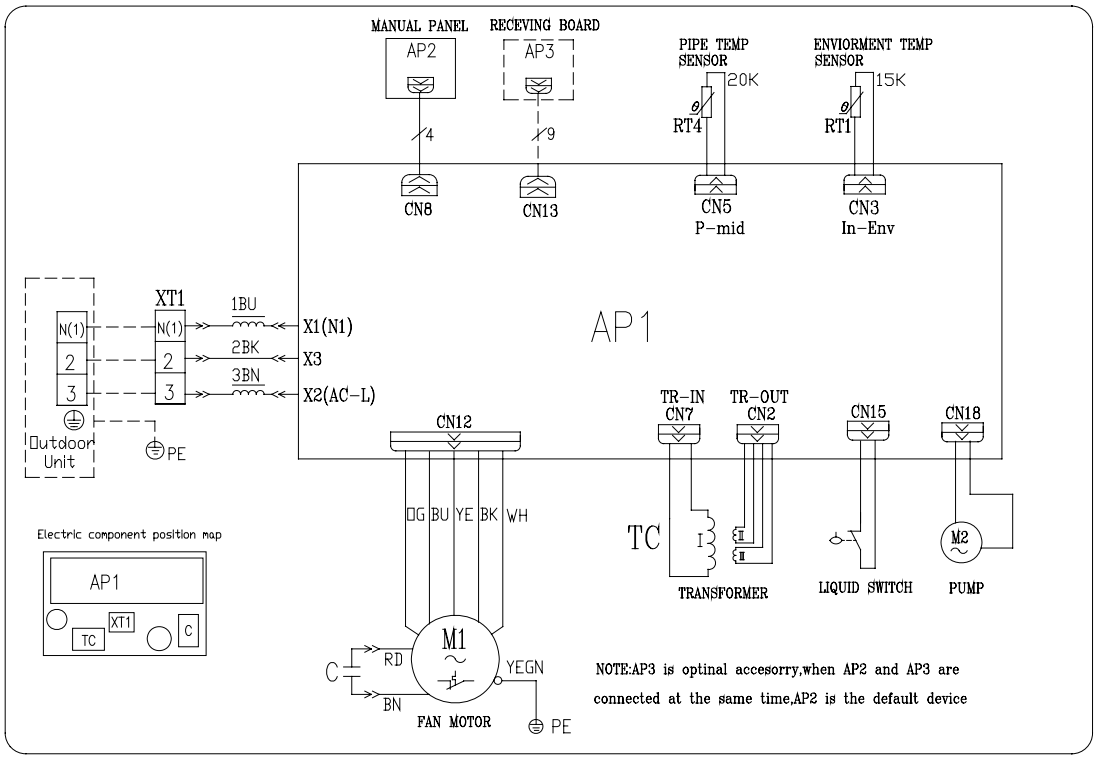
MUL42INV- 5



3.2 Indoor unit

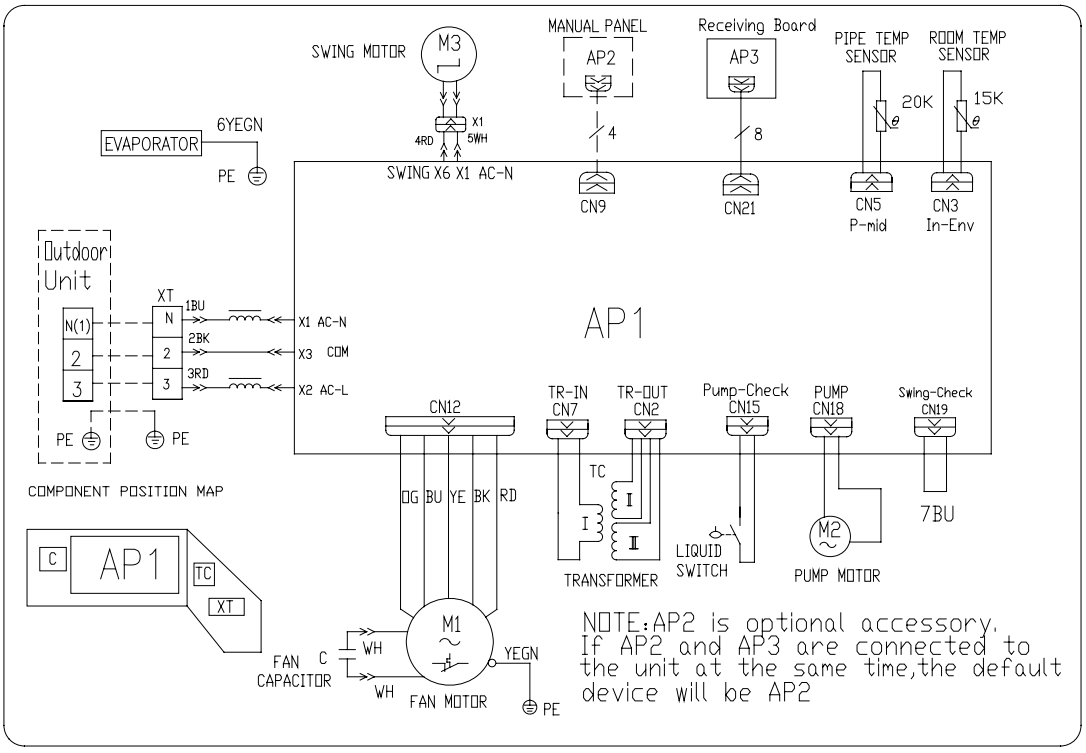
3.2.1Duct type

MUL09- DTA, MUL12- DTA, MUL18- DTA; MUL21- DTA; MUL24- DTA



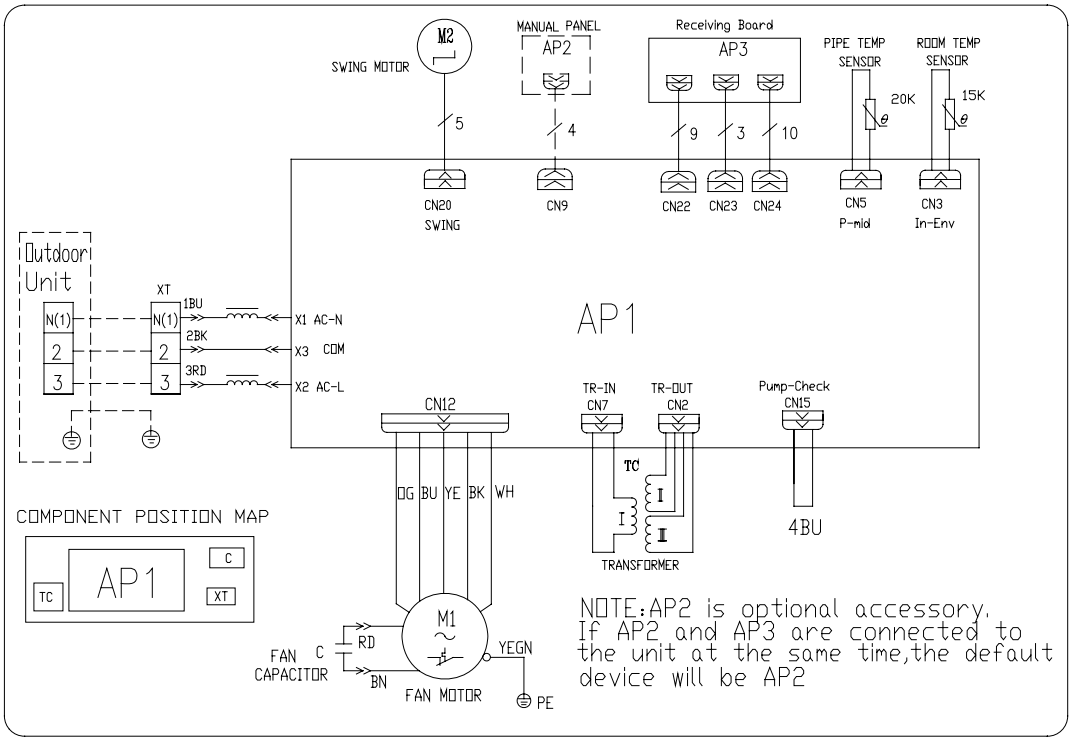
3.2.2 Cassette type

MUL12- FWCA, MUL18- FWCA; MUL24FWCA



3.2.3 Floor ceiling type

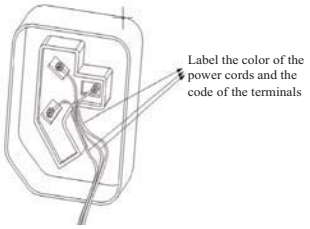
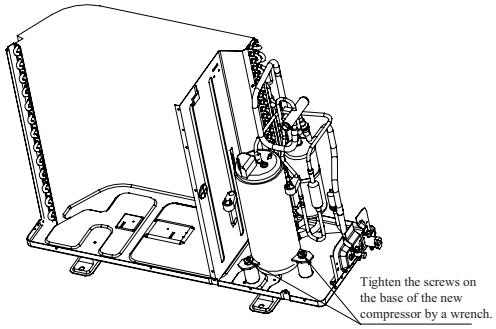
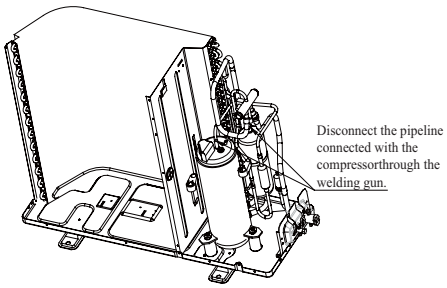
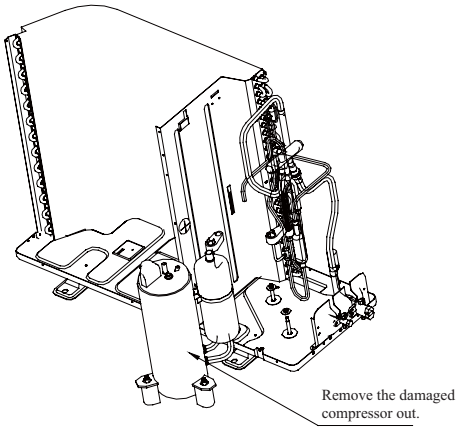
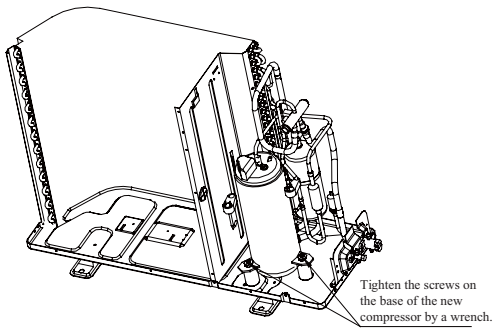
MUL09- CON, MUL12- CON, MUL18- CON; MUL24- CON

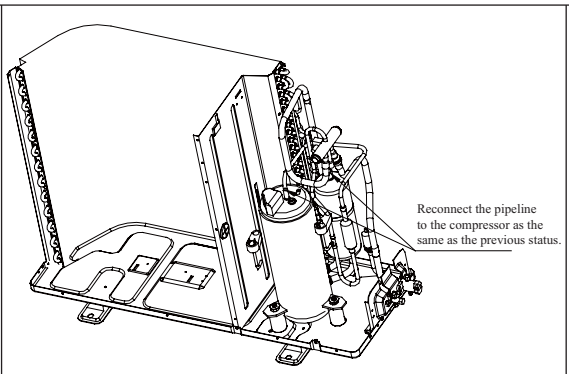
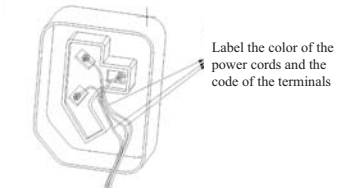


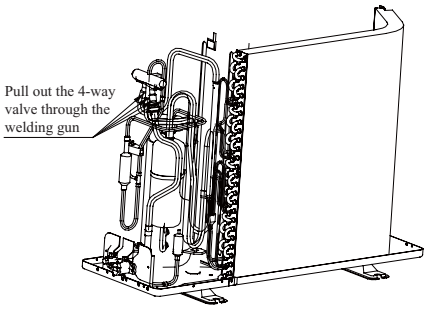
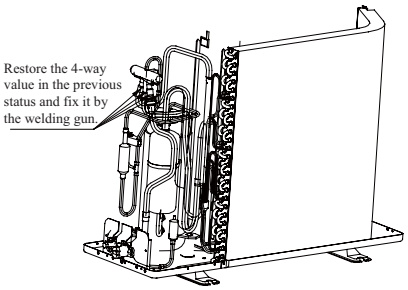
4 DISASSEMBLY AND ASSEMBLY PROCEDURE OF MAIN PARTS

4.1 Outdoor Unit

Side Discharge Indoor Unit

Assembly and Disassembly of the Compressor		
Remarks: Prior to the assembly of the compressor, make sure there is no refrigerant in the pipeline and the power supply is cut off.		
Steps	Illustrations	Operation Instructions
1.Remove the power cords away		●Loosen the screws used to fix the power cord with a screw driver. ●Pull out the power cord. Note: when removing the power cord, please label the power cord and the terminals to avoid misconnecting next time.
2.Loosen the screws used to fix the base of the compressor		●Loosen the screws on the base of the compressor with a wrench.
3.Separate the compressor with the connecting pipe		● Burn the joint of the connecting pipe of the compressor. ●Pull out the connecting pipe. Note: neverr let the flame contact any other componnet.
4.Remove the compressor away from the seating.		●Remove and replace the compressor Note: never let the flame touch any other component during the replacement.
5.Fix the new compressor on the seating.		● Tighten the screws on the seating of the new compressor

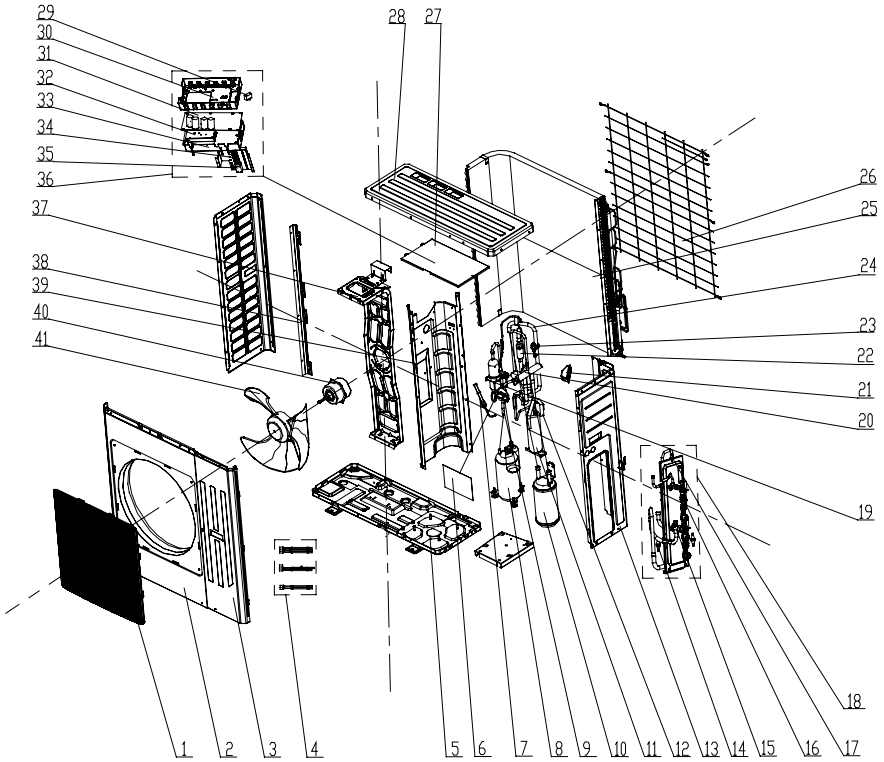
6.Connect the pipeline with the suction and discharge ports of the compressor		●Burn the joint of the connecting pipe and then connect the pipeline wit the compressor. Note: never let the flame touch any other component.
7. Reconnect the power cord		● Tight the screws used to fix the power cord with a screwdriver. ●Reconnect the power cord. Note: reconnect the power cord in accordance with the labeled color and terminals.
8.Put the electric heating belt and the discharge temperature sensor etc. in place.		
9.Check if the compressor runs reversely and if the lubricant leaks.		

Assembly and Disassembly of the 4-Way Valve		
Steps	Illustrations	Operation Instructions
1. Take out the coil of the 4-way valve.	/	●Loosen the screws used to fix the coil of the 4-way valve with a screw driver
2. Separate the 4-way valve away from the connecting pipe.		●Burn the four joints of the 4-way valve with a welding gun and then pull out the connecting pipe. Note: never let the flame touch any other component.
3. Replace the 4-way valve and reconnect the 4-way valve with the connecting pipe.		●Replace the 4-way valve and weld the four joints of the 4-way valve with a welding gun. Note: never let the flame touch any other component.
4. Put the coil of the 4-way valve in place.	/	●Tighten the screws used to fix the coil of the 4-way valve with a screwdriver

5 EXPLODED VIEWS AND PART LIST

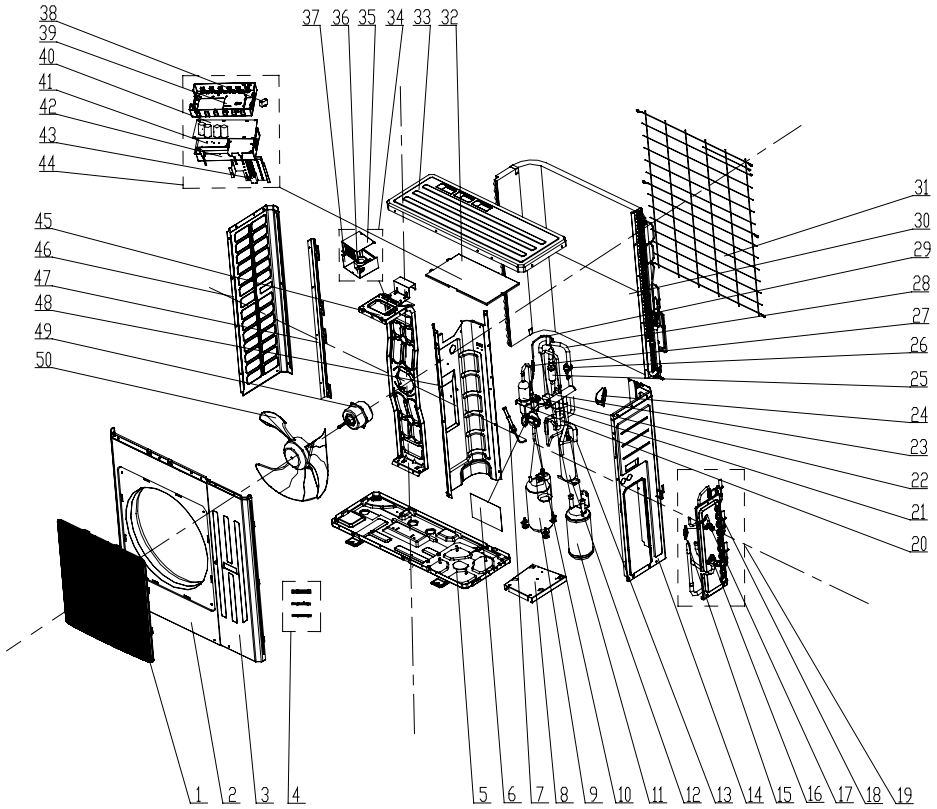
5.1 Outdoor Unit

MUL36INV- 4



NO.	Description	MUL36INV- 4	
		Code	Qty
1	Front Grill	01473001	1
2	Cabinet	01433011	1
3	Front Side Plate Sub-Assy	01305247	1
4	Sensor sub-assy	39008072	1
5	Chassis Sub-assy	01194310P	1
6	Insulated board (cover of electric box)	20113003	1
7	Pressure Protect Switch	4602001555	1
8	Compressor and fittings	00105036	1
9	Connection Pipe	05034405	1
10	Gas-liquid Separator	07220030	1
11	Bidirection Accumulator	07228741	1
12	connecting pipe of "U"shape	05034397	1
13	Right Side Plate Sub-Assy	01314181P	1
14	StrainerA	07210022	1
15	Cut-off Valve	07334403	1
16	Cut-off Valve	07334402	1
17	Strainer	07212121	1
18	Valve support assy	01804398	1
19	Oil Separator	07424118	1
20	4-way Valve	43000411	1
21	Handle	26235253	1
22	4-way Valve Assy	04144307	1
23	Pressure Protect Switch	4602000902	1
24	Inhalation Tube Sub-Assy	04674615	1
25	Condenser Assy	0112418801	1
26	Rear Grill	01475252	1
27	Electric Box Cover	01424271	1
28	Top Cover	01255013P	1
29	Capacitor	33010027	1
30	Electric Box	26905211	1
31	Main Board	30226252	1
32	Radiator	49018029	1
33	Electric Box Sub-Assy	02404128	1
34	Terminal Board	420111041	1
35	Terminal Board	42010270	1
36	Electric Box Assy	02404619	1
37	Motor Support Sub-Assy	01703087	1
38	Condenser support plate	01175401	1
39	Clapboard	0123303901	1
40	Fan Motor	1501350202	1
41	Axial Flow Fan	10335253	1

MUL42INV- 5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NO.	Description	MUL42INV- 5	
		Code	Qty
1	Front Grill	22415005	1
2	Cabinet	01435007P	1
3	Front Side Plate Sub-Assy	01305508	1
4	Sensor sub-assy	39008066	1
5	Chassis Sub-assy	01194141P	1
6	Insulated board (cover of electric box)	20113003	1
7	Pressure Protect Switch	4602000902	1
8	Compressor Mounting Plate Sub-Assy	01324238	1
9	Compressor and fittings	00205230	1
10	Connection Pipe	05034302	1
11	Gas-liquid Separator Sub-Assy	07225018	1
12	Bidirection Accumulator	07228741	1
13	connecting pipe of "U"shape	05034290	1
14	Right Side Plate Sub-Assy	01314304	1
15	StrainerA	07210022	1
16	Cut-off Valve	07334403	1
17	Cut-off Valve	07334402	1
18	StrainerA	07210022	1
19	Valve support assy	01804238	1
20	Oil Separator	07228302	1
21	Tube Clip	0214000521	1
22	StrainerA	07210022	1
23	4-way Valve	43000338	1
24	Handle	26235253	2
25	4-way Valve Assy	04144185	1
26	Pressure Protect Switch	4602001555	1
27	Discharge Tube Sub-Assy	04634310	1
28	Inhalation Tube Sub-Assy	04674230	1
29	Capillary Sub-Assy(Oil Separator)	04104239	1
30	Condenser Assy	01124179	1
31	Rear Grill	01475012	1
32	Electric Box Cover	01424263	1
33	Top Cover	01255009	1
34	Reactor Sub-Assy	02404111	1
35	Cover of Reactor box	01424260	1
36	PFC Inductance	43128003	1
37	Reactor Box	01424258	1
38	Capacitor	33010009	1
39	Electric Box	26905211	1
40	Main Board	30226254	1
41	Radiator	49018112	1
42	Electric Box Sub-Assy	02404112	1
43	Terminal Board	42010270	1
44	Electric Box Assy	02404113	1
45	Motor Support Sub-Assy	01805402	1
46	Left Side Plate	01305064P	1
47	Condenser support plate	01895309	1
48	Clapboard	01244141	1
49	Fan Motor	1570522801	1
50	Axial Flow Fan	10335010	1