Duct Type Split Air Conditioner

Service Manual

Cooper&Hunter International Corporation

CONTENTS

PRODUCT

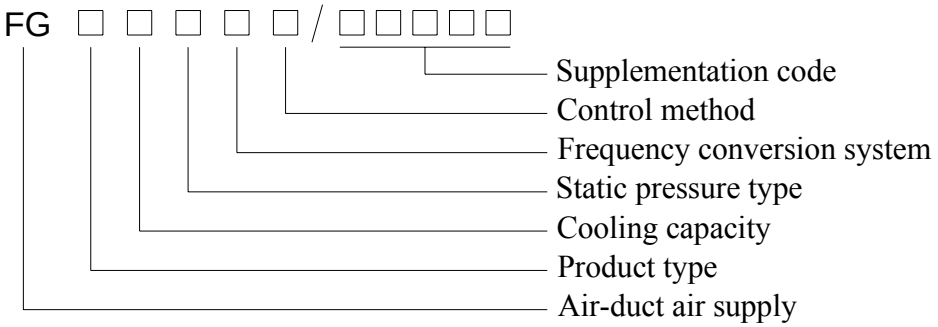
PRODUCT

1 MODELS LIST

Units Series	Model Name	Capacity (kW/Ton)		Ref	Appearance	
		Cooling	Heating		Outdoor	Indoor
Duct Type	FGR20/C-M	19.5/5.5	22.5/6.4	R22		
	FG20/C-M	19.5/5.5	/			
	FGR25/C-M	24.5/6.9	27.5/7.8	R22		
	FG25/C-M	24.5/6.9	/			
	FGR30/C-M	29.5/8.4	32.5/9.3	R22		
	FG30/C-M	29.5/8.4	/			
	FGR40/C-M	38/10.8	41/11.7	R22		
	FG40/C-M	38/10.8	/			

Note:1Ton =12000Btu/h = 3.517kW

2 NOMENCLATURE



Meaning of standard model before"/"	
Meaning	Expression method
FG	Air-duct air supply
Unit type	Cooling only type-omitted
	Heat pump auxiliary electric heat type-R
	Auxiliary hot water plate and pipe type-W
Cooling capacity	Nominal cooling capacity (kW)
Static pressure type	Common type-omitted
	High static pressure-H
	The outdoor unit is not expressed.
Frequency conversion system	Fixed frequency-omitted
	Frequency conversion-P
Control method	Routine -omitted
	Remote monitoring-Y

Meaning of supplementation code after "/"	
Meaning	Expression method
Design No.	Arranged based on A, B, C…
Refrigerant	R22-omitted
	R407-N
	R410a-Na
	Others to be applied for when they are used
Production method	Self-control-omitted
Power type	380V 3Ph～,50Hz -M
	(The unit to be exported must be expressed)
Indoor and outdoor unit code	Outdoor unit-（O）
	Indoor unit-（I）
	The entire unit is not expressed.

3 FUNCTION

Features-outdoor units

Features	Description
Quality condenser coil	The coil is constructed of golden aluminum sheet and inner groove copper pipe
Coil protected	Coils are protected from damage by a metal grill
Protected compressor	High/low pressure protection, discharge high temperature protection, overload protection, reverse (open) phase protection, sensor malfunction alarm
Resisting corrosion	Cabinet is made of pre-painted steel. The pre-treated flat galvanized steel provides a better paint to steel bond, which resists corrosion and rust creep. Special primer formulas ensure minimal fading when exposed to sunlight
Low operating	Low noise fan and low noise compressor with isolator

sound level	
Low maintenance	Quality compressor and motor are used
Factory tested	All units are factory tested prior to dispatch to verify system operation and control functioning before shipment

Features-indoor units

features	Description
Flexible installation	Condensing water tube and refrigerant tube are in same direction, it's better for installation
Long-distance duct air supply	It adopts high static pressure design, so air is centralized handling in the indoor unit and implant long-distance duct air supply
The capacity range	The capacity range is 20kW to 40kW
Convenient operation	Simple controller and intelligent remote controller make unit more convenient operation
Good indoor air quality	It can connect many supply-air outlet to the duct, so that it can make the temperature and humidity of the whole room equality, meanwhile, it can lead in fresh air, makes well indoor unit air quality. All units are provided with filters that are easily accessible from the rear of the unit.
Microcomputer control	The controls provide for compressor delay protection, Remote control function, temperature setting, fan function, sleep function, memory function, self-diagnosis with alarm function.
Quality evaporator	Evaporator coils are constructed of inner groove copper tube and hydrophilic aluminum sheet
Low operating sound	The fan motors are resilient mounted to minimize vibration and noise

4 PRODUCT DATA

4.1 Product Data at Rated Condition

Models		Indoor Unit	FGR/C-M(I)		
			20	25	30
		Outdoor Unit	FGR/C-M(O)		
			20	25	30
Nominal Capacity At Rated ESP	Cooling	Btu/h	66537	83598	100658
		kW	19.5	24.5	29.5
	Heating	Btu/h	76773	93834	110895
		kW	22.5	27.5	32.5
Power Supply		V/Ph/Hz	380/3/50		
Power Consumption	Cooling	kW	8.5	10.2	12.1
	Heating		6.8	9	10.1
Running Current	Cooling	A	15.8	18.9	21.8

		Heating		12.5	16.8	19.2
Refrigerant Type				R22		
Refrigerant Charge			kg	7	7	8.5
Indoor Unit	Power Supply		V/Ph/Hz	380/3/50		
	Fan	Type		Centrifugal / Belt Drive		
		Air flow	CFM	2354	2825	3237
			m3/h	4000	4800	5500
		Input Power	W	1500	1500	1500
		Running Current	A	3.2	3.4	3.6
		Rated ESP	in.wg	0.36	0.44	0.52
			Pa	90	110	130
		Fan Motor Protection	—	Overload protection		
		Sound Pressure Level (H/M/L/SL)	dB(A)	54	54	57
	Coil	Tube	Material	—	Inner Groove Copper Tube	
			Diameter	mm	9.52	7.94	9.52
		Fin	Material	—	Aluminum		
			No.of Rows/FPI	—	2/16	3/16	4/16
	Coil Area			Sqm	0.66	0.63	0.66
	Dimensions (Outline/Package)		Height	mm	500/673	500/673	500/673
			Width		1500/1840	1500/1840	1500/1840
			Depth		1000/1200	1000/1200	1000/1200
	Weight(Net/Gross)			kg	150/200	150/200	150/200
	System Operation Control			—	Wired Control with LED Display + Wireless Controller		
	Condensate Drainage(O.D)			mm	25.4		
	Air Filter			—	Standard Washable Synthetic		

Models			Indoor Unit	FGR/C-M(I)		
				20	25	30
			Outdoor Unit	FGR/C-M(O)		
				20	25	30
Outdoor Unit	Power Supply		V/Ph/Hz	380/3/50		
	Compressor	Compressor Type		Scroll		
		Nominal Current	A	12.21	15.27	15.5
		L.R.A		98	142	111
		Vibration Isolator		Rubber		
		Protection Device		Auto Reset Thermal Overload		
	Fan	Fan Type/Drive		Inner Groove Copper Tube		
		Fan Speed	rpm	850	850	660
		Blade Material		Plastic		
		Diameter	mm	524	524	750
	Coil	Tube Material		Inner Groove Copper Tube		

		Fin	Material		Aluminum		
			No.of Rows/FPI		2/15	2/15	2/14
	Coil Area			Sqm	1.22	1.49	2.08
	Sound Pressure Level			dB(A)	66	66	67
	Dimension (Outline/Package)		Height	mm	1350/1460	1600/1715	1772/1950
			Width		1150/1305	1150/1305	990/1162
			Depth		360/502	360/502	880/980
	Weight(Net/Gross)			kg	180/195	185/200	250/280
	Pipe sizes		Suction	mm	Φ28		
			Liquid		Φ16		

Models				Indoor Unit	FG/C-M(I)		
					20	25	30
				Outdoor Unit	FG/C-M(O)		
					20	25	30
Nominal Capacity At Rated ESP			Cooling	Btu/h	66537	83597	100658
				kW	19.5	24.5	29.5
			Heating	Btu/h	/	/	/
				kW	/	/	/
Power Supply				V/Ph/Hz	380/3/50		
Power Consumption			Cooling	kW	8.5	10.2	12.1
			Heating		/	/	/
Running Current			Cooling	A	15.8	18.9	21.8
			Heating		/	/	/
Refrigerant Type					R22		
Refrigerant Charge				kg	7	6.6	10
Indoor Unit	Power Supply			V/Ph/Hz	380/3/50		
	Fan	Type			Centrifugal / Belt Drive		
		Air flow		CFM	2354	2825	3237
				m3/h	4000	4800	5500
		Input Power		W	1500	1500	1500
		Running Current		A	3.2	3.4	3.6
		Rated ESP		in.wg	0.36	0.44	0.52
				Pa	90	110	130
		Fan Motor Protection		—	Overload protection		
		Sound Pressure Level (H/M/L/SL)		dB(A)	54	54	57
	Coil	Tube	Material	—	Inner Groove Copper Tube		
			Diameter	mm	9.52	7.94	9.52
		Fin	Material	—	Aluminum		
			No.of Rows/FPI	—	2/16	3/16	4/16

	Coil Area		Sqm	0.66	0.63	0.66
	Dimensions (Outline/Package)	Height	mm	500/673	500/673	500/673
		Width		1500/1840	1500/1840	1500/1840
		Depth		1000/1200	1000/1200	1000/1200
	Weight(Net/Gross)		kg	150/200	150/200	150/200
	System Operation Control		—	Wired Control with LED Display + Wireless Controller		
	Condensate Drainage(O.D)		mm	25.4		
	Air Filter		—	Standard Washable Synthetic		

Models				Indoor Unit	FG/C-M(I)		
					20	25	30
				Outdoor Unit	FG/C-M(O)		
					20	25	30
Outdoor Unit	Power Supply			V/Ph/Hz	380/3/50		
	Compressor	Compressor Type			Scroll		
		Nominal Current		A	12.21	15.27	15.5
		L.R.A			98	142	111
		Vibration Isolator			Rubber		
		Protection Device			Auto Reset Thermal Overload		
	Fan	Fan Type/Drive			Inner Groove Copper Tube		
		Fan Speed		rpm	850	850	660
		Blade Material			Plastic		
		Diameter		mm	524	524	750
	Coil	Tube Material			Inner Groove Copper Tube		
		Fin	Material		Aluminum		
			No.of Rows/FPI		2/15	2/15	2/14
	Coil Area			Sqm	1.22	1.49	2.08
	Sound Pressure Level			dB(A)	66	66	67
	Dimension (Outline/Package)	Height		mm	1350/1460	1600/1715	1772/1950
		Width			1150/1305	1150/1305	990/1162
		Depth			360/502	360/502	880/980
	Weight(Net/Gross)			kg	180/195	185/200	250/280
	Pipe sizes	Suction		mm	Φ28		
		Liquid			Φ16		

Models			Indoor Unit	FGR/C-M(I)
				40
			Outdoor Unit	FGR/C-M(O)
				40
Nominal Capacity At Rated ESP		Cooling	Btu/h	129675
			kW	38
		Heating	Btu/h	139912
			kW	41
Power Supply			V/Ph/Hz	380/3/50
Power Consumption		Cooling	kW	16
		Heating		13.5
Running Current		Cooling	A	30.5
		Heating		25.7
Refrigerant Type				R22
Refrigerant Charge			kg	11
Indoor Unit	Power Supply		V/Ph/Hz	380/3/50
	Fan	Type		Centrifugal / Belt Drive
		Air flow	CFM	4120
			m^3/h	7000
		Input Power	kW	2.2
		Running Current	A	4.2
		Rated ESP	in.wg	0.60
			Pa	150
		Fan Motor Protection	—	Overload protection
		Sound Pressure Level (H/M/L/SL)	dB(A)	58
	Coil	Tube	Material	—	Inner Groove Copper Tube
			Diameter	mm	9.52
		Fin	Material	—	Aluminum
			No.of Rows/FPI	—	3/16
	Coil Area			Sqm	0.86
	Dimensions (Outline/Package)		Height	mm	650/835
			Width		1700/1890
			Depth		1100/1460
	Weight(Net/Gross)			kg	215/265
	System Operation Control			—	Wired Control with LED Display + Wireless Controller
	Condensate Drainage(O.D)			mm	25.4
	Air Filter			—	Standard Washable Synthetic

Models				Indoor Unit	FGR/C-M(I)
					40
				Outdoor Unit	FGR/C-M(O)
					40
Outdoor Unit	Power Supply			V/Ph/Hz	380/3/50
	Compressor	Compressor Type			Scroll
		Nominal Current		A	20.2
		L.R.A			140
		Vibration Isolator			Rubber
		Protection Device			Auto Reset Thermal Overload
	Fan	Fan Type/Drive			Inner Groove Copper Tube
		Fan Speed		rpm	730
		Blade Material			Plastic
		Diameter		mm	750
	Coil	Tube Material			Inner Groove Copper Tube
		Fin	Material		Aluminum
			No.of Rows/FPI		2/14
	Coil Area			Sqm	2.71
	Sound Pressure Level			dB(A)	69
	Dimension (Outline/Package)	Height		mm	1772/1950
		Width			1290/1370
		Depth			880/980
	Weight(Net/Gross)			kg	300/330
	Pipe sizes	Suction		mm	Φ35
		Liquid			Φ16

Models			Indoor Unit	FG/C-M(I)
				40
			Outdoor Unit	FG/C-M(O)
				40
Nominal Capacity At Rated ESP		Cooling	Btu/h	129675
			kW	38
		Heating	Btu/h	/
			kW	/
Power Supply			V/Ph/Hz	380/3/50
Power Consumption		Cooling	kW	16
		Heating		/
Running Current		Cooling	A	30.5
		Heating		/
Refrigerant Type				R22
Refrigerant Charge			kg	11
Indoor Unit	Power Supply		V/Ph/Hz	380/3/50
	Fan	Type		Centrifugal / Belt Drive
		Air flow	CFM	4120
			m^3/h	7000
		Input Power	kW	2.2
		Running Current	A	4.2
		Rated ESP	in.wg	0.60
			Pa	150
		Fan Motor Protection	—	Overload protection
		Sound Pressure Level (H/M/L/SL)	dB(A)	58
	Coil	Tube	Material	—	Inner Groove Copper Tube
			Diameter	mm	9.52
		Fin	Material	—	Aluminum
			No.of Rows/FPI	—	3/16
	Coil Area			Sqm	0.86
	Dimensions (Outline/Package)		Height	mm	650/835
			Width		1700/1890
			Depth		1100/1460
	Weight(Net/Gross)			kg	215/265
	System Operation Control			—	Wired Control with LED Display + Wireless Controller
	Condensate Drainage(O.D)			mm	25.4
	Air Filter			—	Standard Washable Synthetic

Models				Indoor Unit	FG/C-M(I)
					40
				Outdoor Unit	FG/C-M(O)
					40
Outdoor Unit	Power Supply			V/Ph/Hz	380/3/50
	Compressor	Compressor Type			Scroll
		Nominal Current		A	20.2
		L.R.A			140
		Vibration Isolator			Rubber
		Protection Device			Auto Reset Thermal Overload
	Fan	Fan Type/Drive			Inner Groove Copper Tube
		Fan Speed		rpm	730
		Blade Material			Plastic
		Diameter		mm	750
	Coil	Tube Material			Inner Groove Copper Tube
		Fin	Material		Aluminum
			No.of Rows/FPI		2/14
	Coil Area			Sqm	2.71
	Sound Pressure Level			dB(A)	69
	Dimension (Outline/Package)	Height		mm	1772/1950
		Width			1290/1370
		Depth			880/980
	Weight(Net/Gross)			kg	300/330
	Pipe sizes	Suction		mm	Φ35
		Liquid			Φ16

Note：

① Nominal capacities are based on the follow conditions.

	Indoor	Outdoor
Cooling	DB：27℃(80.6℉) WB：19℃(66.2℉)	DB：35℃(95℉) WB：/℃(/℉)
Heating	DB：20℃(68℉) WB：/℃(/℉)	DB：7℃(44.6℉) WB：6℃(42.8℉)
Piping Length	7.5m	

4.2 Operation Range

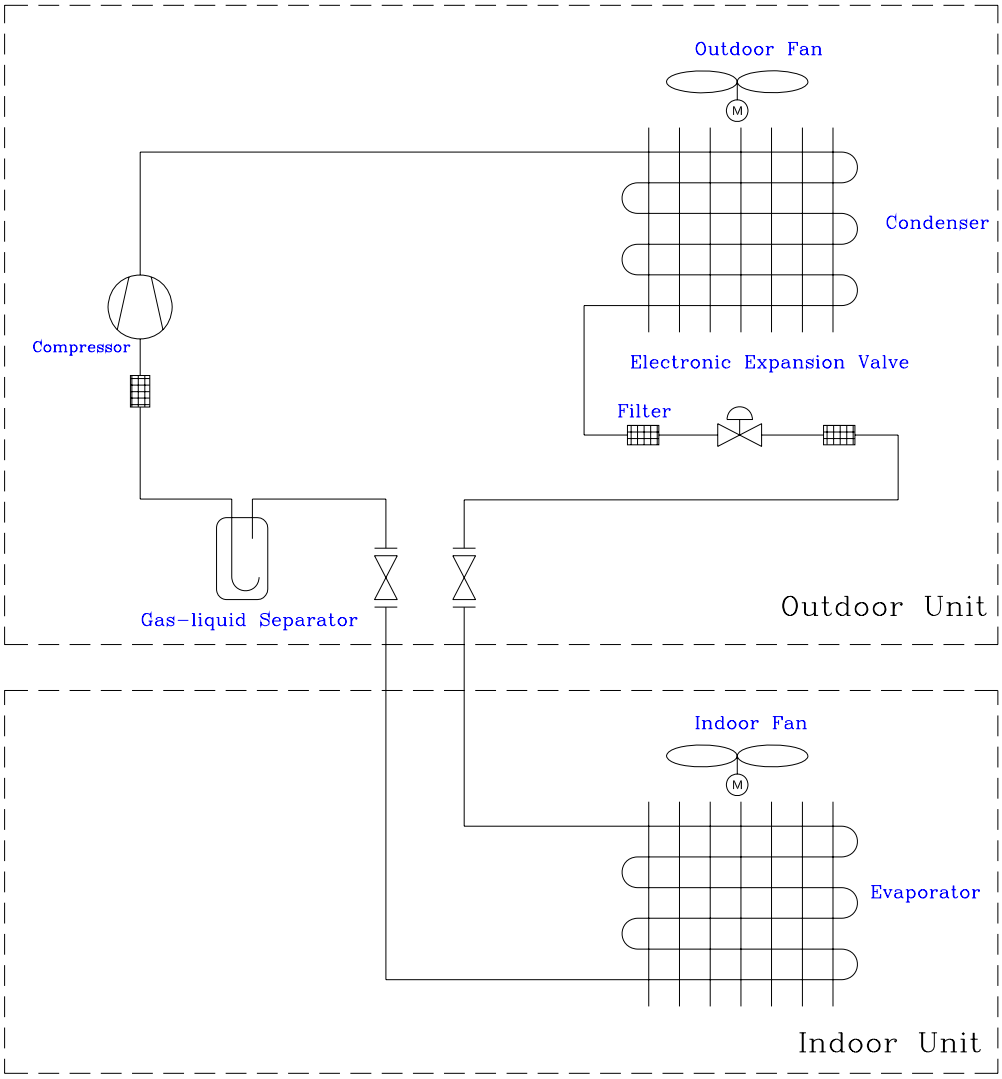
	Indoor unit dry / wet bulb Temp.（℃）	Outdoor unit dry / wet bulb Temp（℃）
Max. Cooling	32/23	43/26

Min. Cooling	21/15	21/15
Max. Heating	27/-	24/18
Min. Heating	20/-	-5/-6

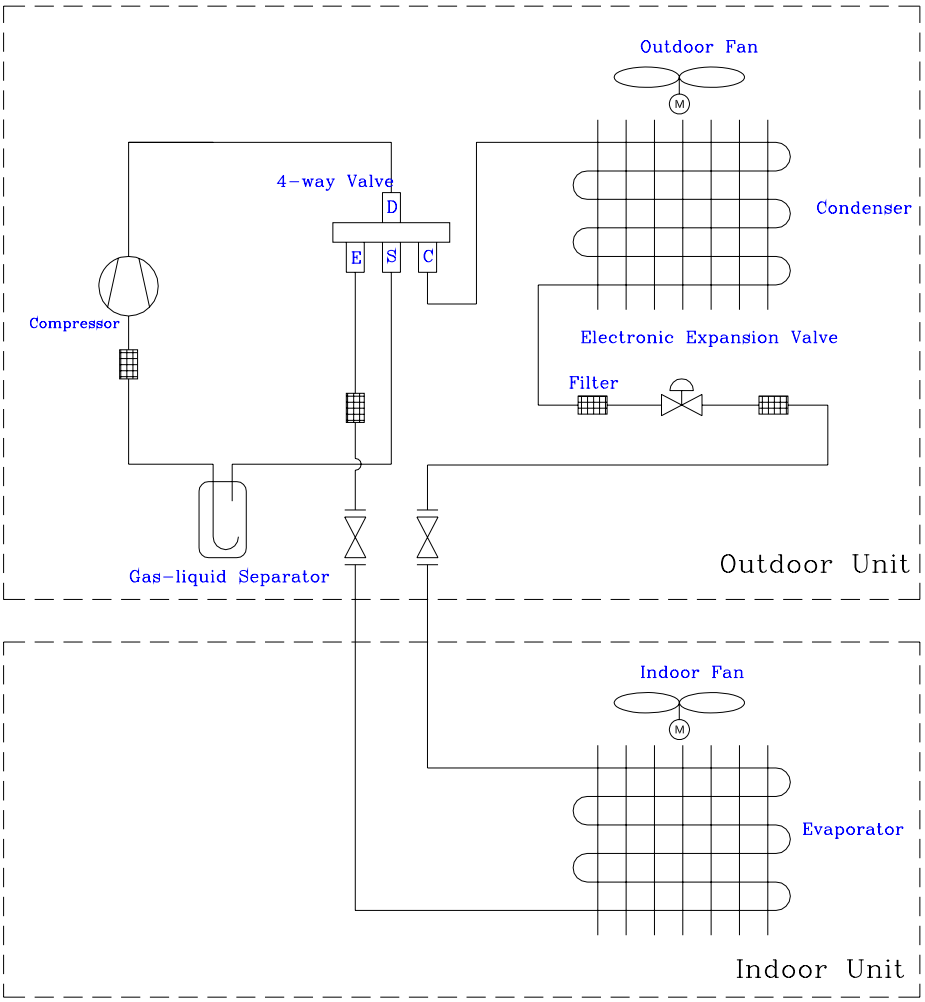
5 PIPING DIAGRAM

Name	compressor	4-way valve	Stop Valve	Check Valve	Capillary	Filter	Electronic Expansion Valve
Sign							
Name	Temperature Sensor	Pressure Switch	Heat Exchanger with Axial Flow Fan	Heat Exchange with Cross Flow Blower	Heat Exchanger with Centrifugal Fan	Thermal Expansion Valve	Vapour Liquid Separator
Sign							

5.1 Cooling Only


Outdoor Fan
M
Condenser
Compressor
Electronic Expansion Valve
Filter
Gas-liquid Separator
Outdoor Unit
Indoor Fan
M
Evaporator
Indoor Unit

5.2 Heat Pump



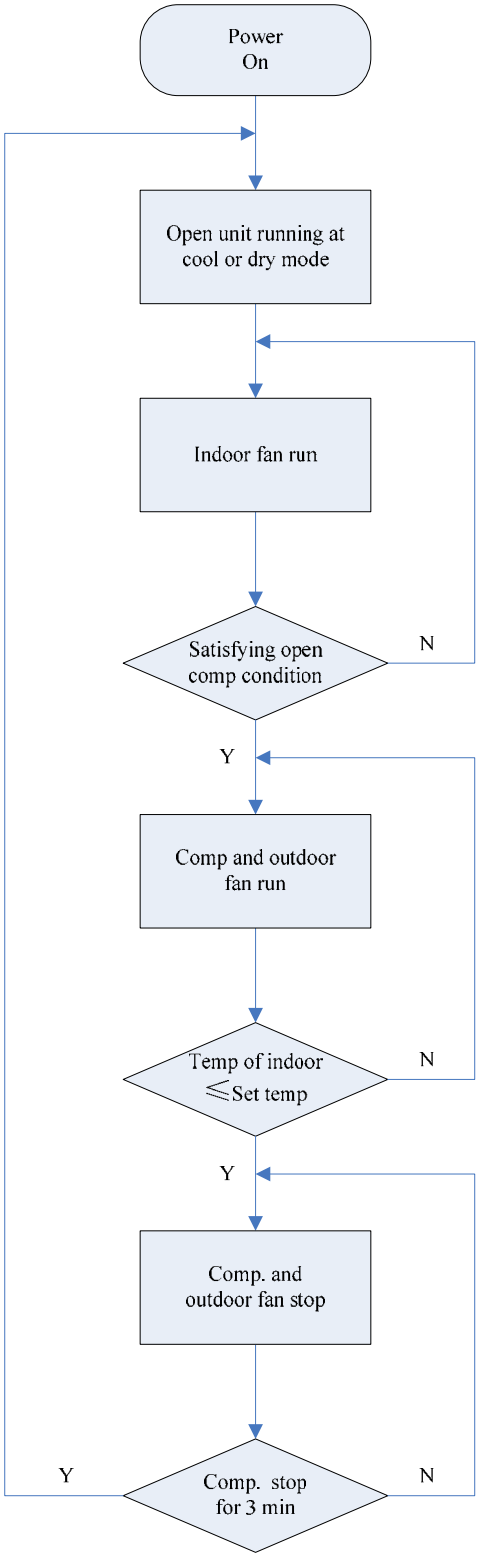
Note: FG（R）40/C-M has oil separator. The electric expansion valve is connected with the throttle capillary.

CONTROL

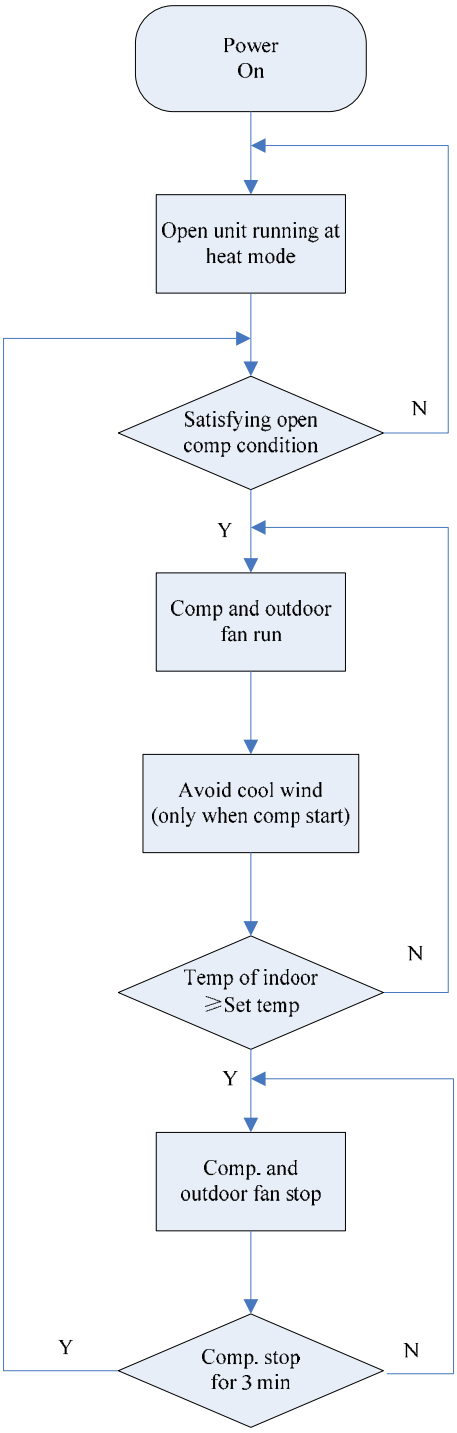
CONTROL

1 OPERATION FLOWCHART

1.1 Cooling/Dry Operation

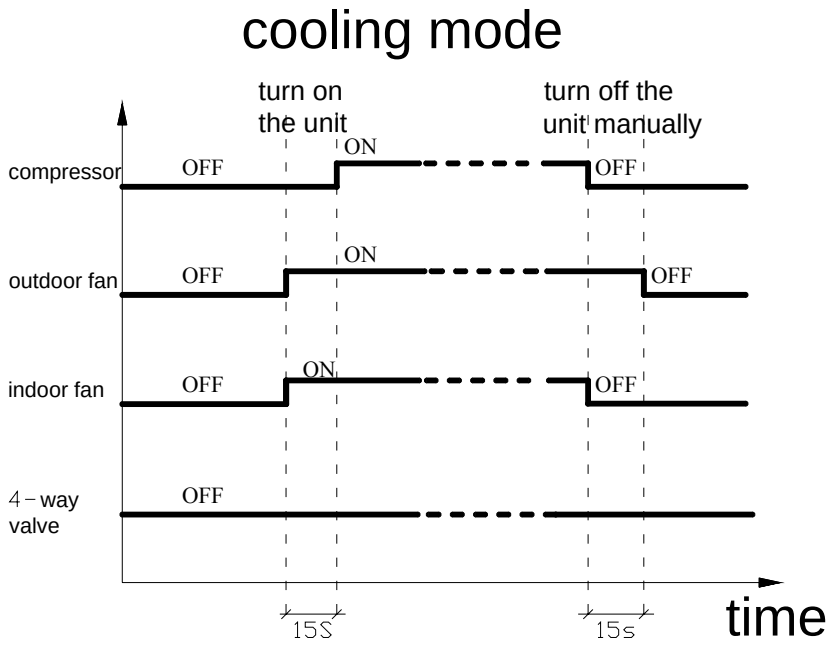


1.2 Heating Operation



2 MAIN LOGIC

2.1 Cooling

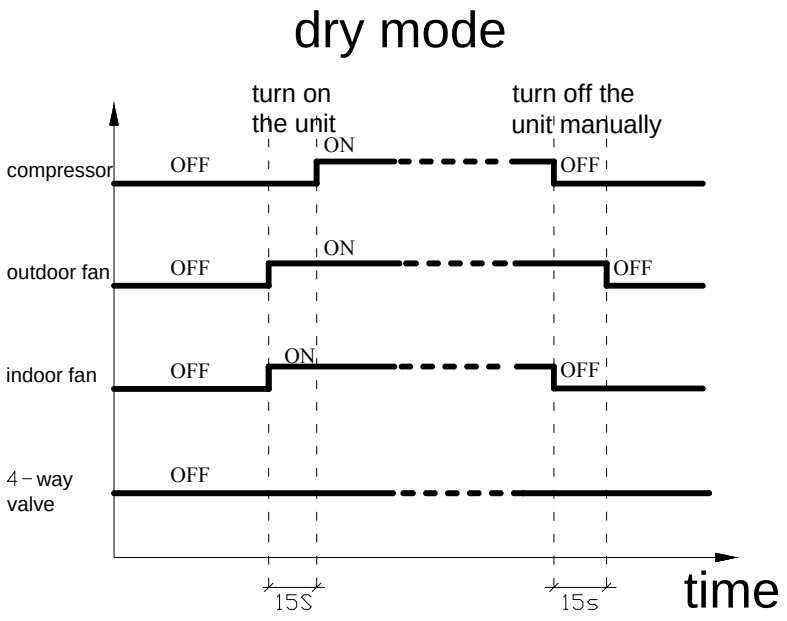


When $T_{ambient} \geq T_{setting} + 1℃$, the unit starts cooling. In that case, the compressor, the outdoor fan and the indoor fan will run. The outdoor fan will run for 15s before the compressor runs.

When $T_{ambient} \leq T_{setting} - 1℃$, the unit stops cooling. In that case, the compressor, the outdoor fan will stop running while the indoor fan will run. The outdoor fan will stop after the compressor stops for 15s.

When $T_{ambient} = T_{setting}$, the compressor and the outdoor fan will remain the previous running state and the indoor fan will run.

2.2 Dry Mode



When $T_{ambient} \geq T_{setting} + 2℃$, the unit starts cooling. In that case, the compressor, the outdoor fan and the indoor fan will run. The outdoor fan will run for 15s before the compressor runs.

When $T_{setting} - 2℃ < T_{ambient} < T_{setting} + 2℃$, the compressor and the outdoor fan will repeat running for 6min and stopping for 4min, while the indoor fan will run.

When $T_{ambient} \leq T_{setting} — 2℃$, the compressor, the outdoor fan will stop running. The outdoor fan will stop after the compressor stops for 15s.

2.2.2 Dual System

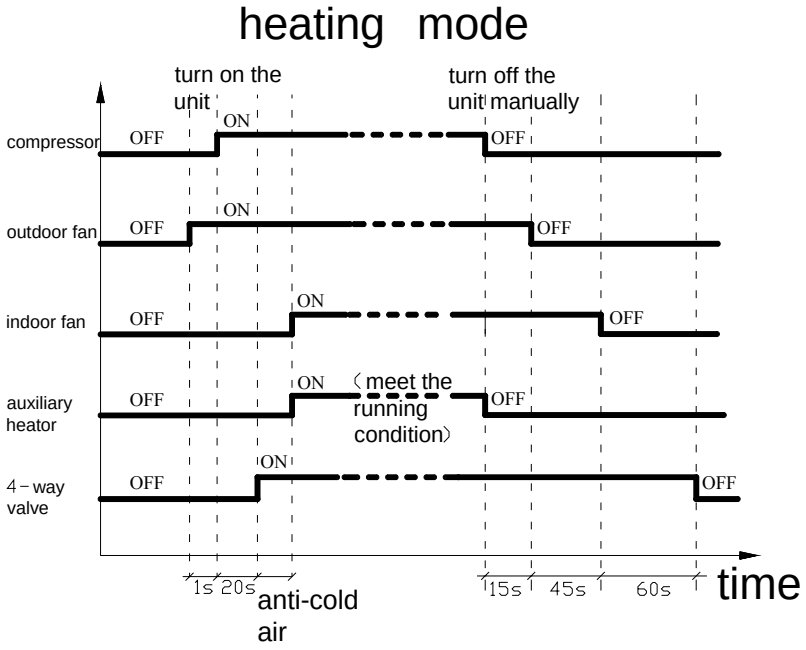
When $T_{ambient} \geq T_{setting} + 2℃$, the unit starts cooling. The indoor fan will run at low speed. The outdoor fan A will run for 15s before the compressor runs. After the compressor A runs for 15s, the outdoor fan B will run. The compressor B will run 15s later.

During running, the unit will run according to the following situation for 6-min interval:

When $T_{setting} - 2℃ < T_{ambient} < T_{setting} + 2℃$, the compressor A and the outdoor fan A will repeat running for 6min and stopping for 4min, while the compressor will remain the previous running state.

When $T_{ambient} \leq T_{setting} - 2℃$, the compressor A will stop. The outdoor fan A will stop 15s later. It will detect the temperature 6min later. When $T_{ambient} \leq T_{setting} - 2℃$, the compressor B will stop. The outdoor fan B will stop 15s later.

2.3 Heating Mode

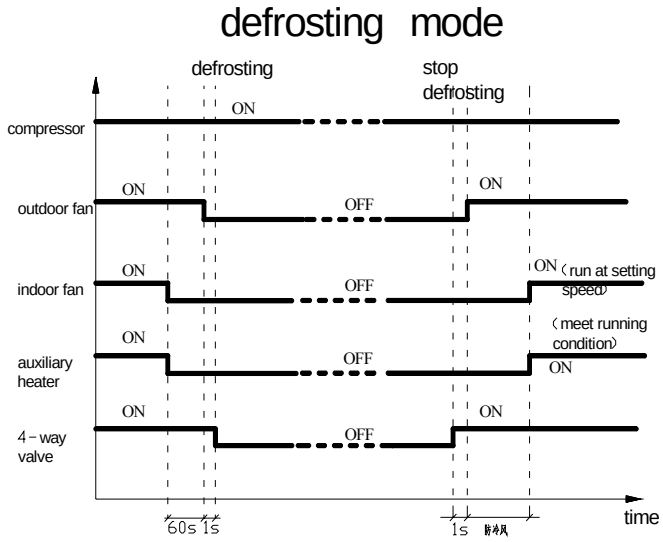


When $T_{ambient} - T_{supplement} \leq T_{setting} - 1℃$, the unit stars heating. The selector valve, the outdoor fan and the compressor will be energized and start running, while the indoor fan will run according to anti-cold air. The outdoor fan will run for 1s before the compressor runs. The 4-way valve will work 20s later.

When $T_{ambient} - T_{supplement} = T_{setting}$, the compressor, the selector valve and the outdoor fan will remain the previous running state and the indoor fan will run.

When $T_{ambient} - T_{supplement} \geq T_{setting} + 1℃$, the compressor and the outdoor fan stop running. The selector valve is still energized, and the indoor fan will run according to blowing residual heat. (In that case, the indoor fan must keep running in case of heat accumulation inside the air duct.) The compressor will stop running 15s earlier than the outdoor fan.

2.4 Defrosting



Defrosting Condition

When the heating time accumulates to 44min and $T_{condenser} \leq -5℃$ lasts for 1min, the unit will start defrosting. In that case, the selector valve, the outdoor fan and auxiliary e-heater will stop running, while the compressor will run forcibly and the indoor fan will run according to anti-cold air. (The indoor fan will not run during defrosting. After defrosting, with $T_{evaporator} \geq 35℃$ or time ≥45s, the indoor fan will start running.)

Defrosting Terminating Condition

The defrosting will terminate after it lasts for 10min or $T_{condenser} \geq +10℃$ lasts for 1s. In that case, the selector valve and the outdoor fan will run at the same time.

After defrosting, the 4-way valve is switched. The outdoor fan will run 1s later.

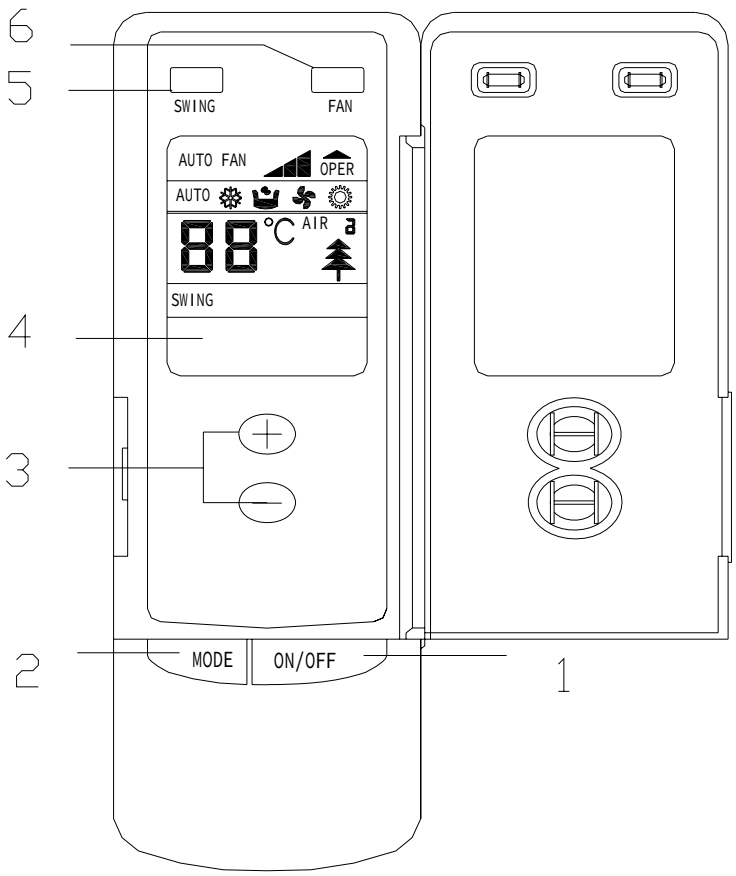
2.5 Fan Mode

Only the indoor fan is running.

3 WIRELESS REMOTE CONTROLLER

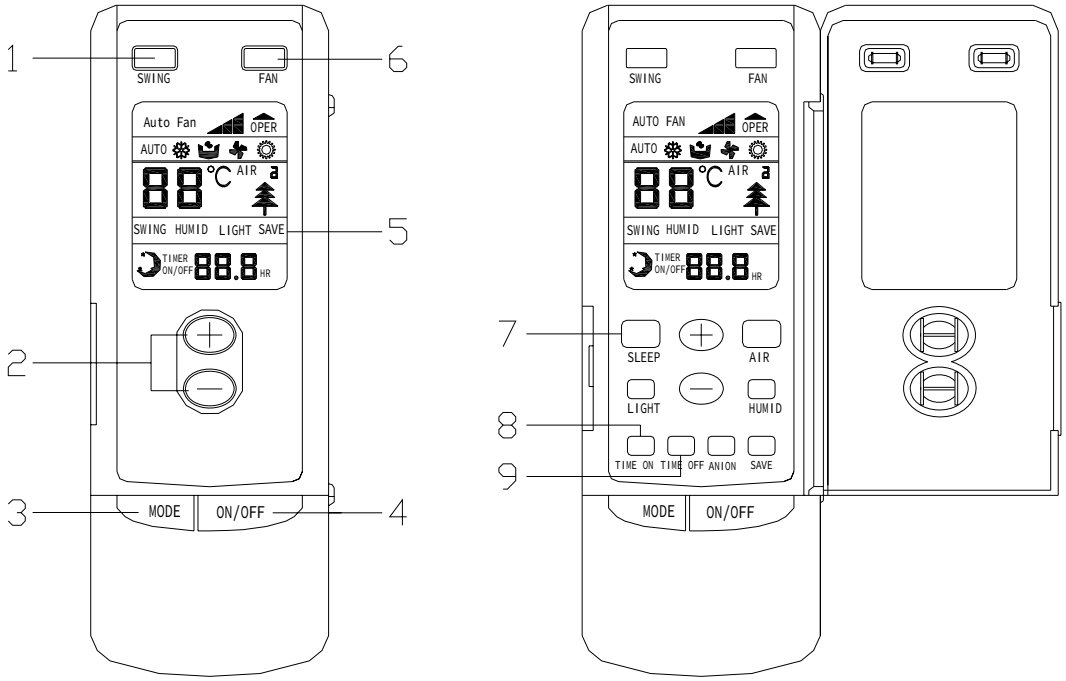
3.1 Operation View

1) Controller-Duct Type



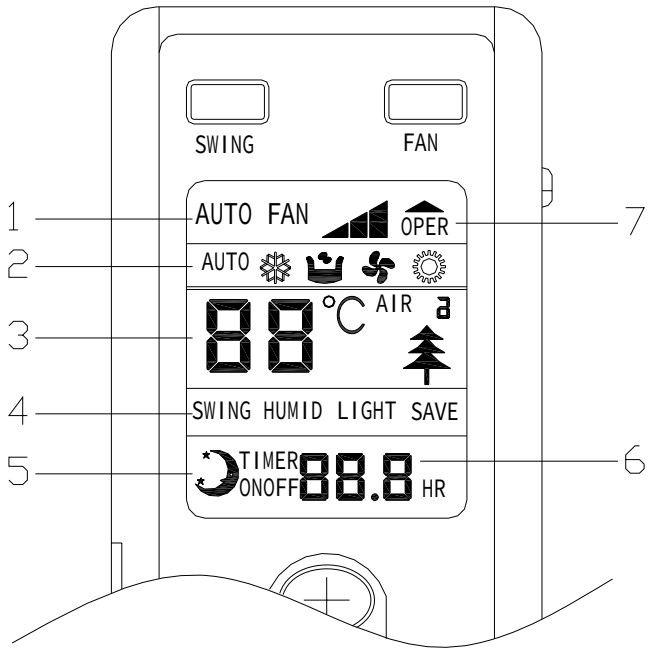
NO.	Name	Function description
1	ON/OFF button	Press the button to set start or close unit
2	Mode button	Press the button to select the mode, cooling, heating, fan or auto mode.
3	Increase/Decrease button	Press this button to increase/decrease the setup temp
4	LCD Screen	Display the status of remote information
5	Swing button	Press this button set swing function
6	Fan speed button	Press this button to set fan speed

2) Controller-Cassette Type and Ceiling Type



NO.	Name	Function description
1	Swing button	Press this button to set swing function
2	Increase/Decrease button	Press this button to increase/decrease the setup temp
3	Mode button	Press the button to select the mode, cooling, heating, fan or auto mode.
4	ON/OFF button	Press the button to set start or close unit
5	LCD Screen	Display the status of remote information
6	Fan speed button	Press this button to set fan speed
7	Sleep button	Press the button to set sleep function
8	Time on	Press the button to set time on function
9	Time off	Press the button to set time off function

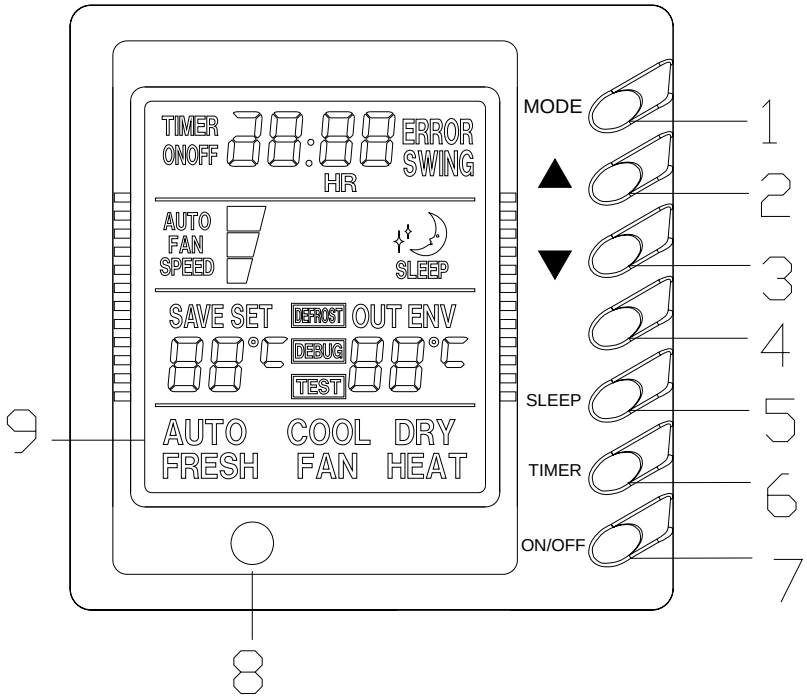
3.2 Display View



No.	Display	Function description
1	Fan Speed	AUTOFAN：auto fan speed, ：low fan speed, ：middle fan speed ：high fan speed，
2	Run Mode	AUTO：Auto running；：Cool running； ：Dry Running； ：Fan Running； ：Heat running (Heat and Cool unit only)
3	Setup temp	Temperature value of setting
4	Swing function	Swing is on
5	Sleep mode	Sleep mode is on
6	Time value	Timing value of setting
7	OPER	The controller is on

4 WIRED REMOTE CONTROLLER

4.1 Operation View

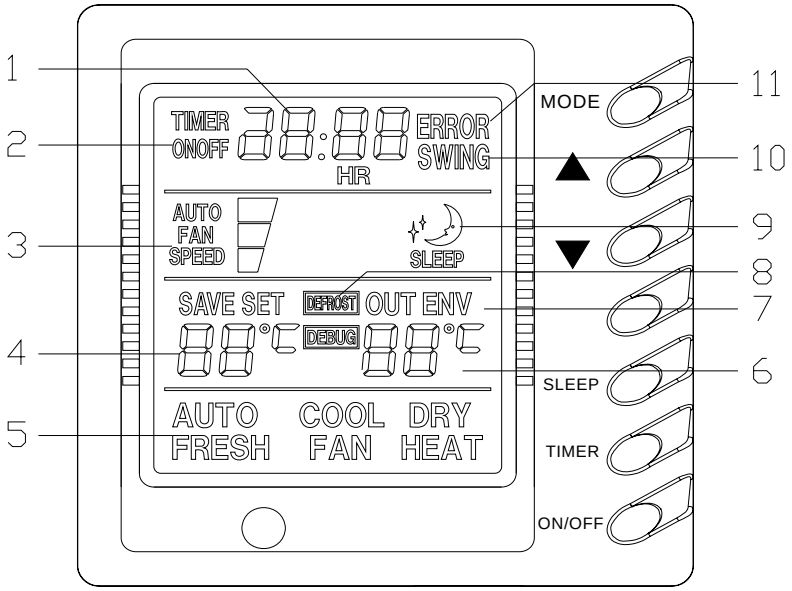


NO.	Name	Function description
1	MODE button	Press the button to select the mode, Cooling, heating, fan or auto mode.
2	Increasing button	Press this button to increase the setup temp.
3	Decreasing button	Press this button to decrease the setup temp.
4	Fan speed button	The button is invalid
5	Sleep button	Press the button to set sleep/swing function
6	Timer button	Press the button to set timer function
7	On/off button	Press the button to set start or close unit
8	Remote window	Get remote information
9	LCD display	Display unit information

Note:

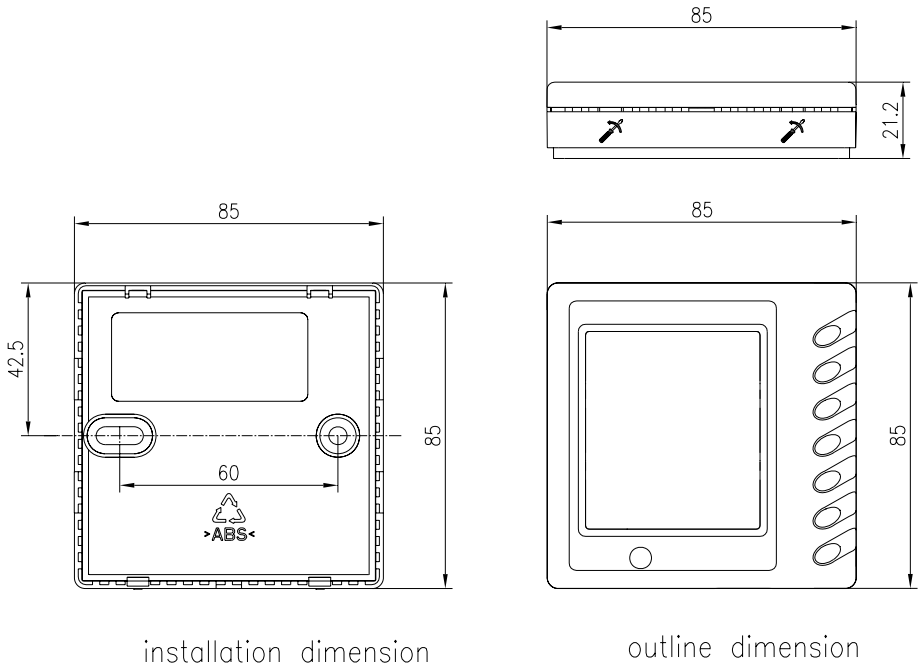
1) **MEMORY function setup:** At unit turned off, press "MODE" button for 10 seconds, could switch whether turn on or off the unit state after powered off.
2) **Lock function:** Press "▲"and"▼" at the same time for 5 seconds, the set temp. will display "EE" and shield, all buttons will sound; and repress the"▲"and "▼"at the same time for 5 seconds, the lock function will be released.(for details, please read corresponding parts of manual).

4.2 Display View



NO.	Name	Function description
1	Timer value	Display time value
2	Timer on/off	TIMER ON : display timer on, TIMER OFF : display timer off,
3	Fan speed display	When fan is on, displays circularly; when fan is off, nothing displays.
4	Set temp display	Display set temp value, its range is 16~30 ℃
5	Run mode display	AUTO: auto mode, COOL: cool mode, DRY: dry mode, FAN: fan mode, HEAT: heat mode(only cool and heat unit)
6	Indoor temp display	Display surrounding temp indoor
7	Outdoor temp display	The display is invalid
8	Frost display	When unit frosts ,it display
9	Sleep display	Display sleep at Sleep mode
10	Swing display	The display is invalid (no swing function)
11	Error display	When unit error, error code display

4.3 Dimension



4.4 Installation

- First select an installation position. According to the size of the communication line of the wire controller, leave a recess or a embedded wire hole to bury the communication line.
- If the communication line between the wire controller (85×85×20) and the indoor unit is surface-mounted, use 1# PVC pipe and make matching recess in the wall (refer to Figure 6); If concealed installation is adopted, 1# PVC pipe can be used (Refer to Figure 7).
- No matter if surface mounting or concealed mounting is selected, it is required to drill 2 holes (in the same level) which distance shall be the same as the distance (60mm) of installation holes in the bottom plate of the wire controller. Then insert a wood plug into each hole. Fix the bottom plate of the wire controller to the wall by using the two holes. Plug the communication line onto the control panel. Lastly install the panel of the wire controller.

Caution:

During the installation of the bottom plate of the wire controller, pay attention to the direction of the bottom plate. The plate's side with two notches must be at the lower position, and otherwise the panel of the wire controller cannot be correctly installed.

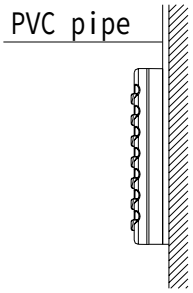


Fig6：Surface Mounting of Cable

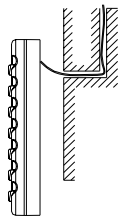


Fig7：Concealed mounting of Cable

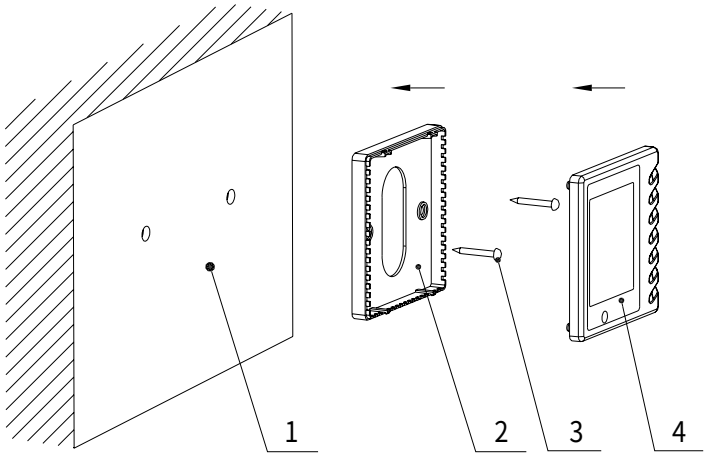


Fig 8 Schematic Diagram of Installation

No.	Name
1	Wall Surface
2	Bottom Plate of Wire Controller
3	Screw M4X10
4	Panel of Wire Controller

Caution:

- The communication distance between the main board and the wire controller can be as far as 20m (The standard distance is 8m).
- The wire controller shall not be installed in a place where there is water drop or large amount of water vapor.

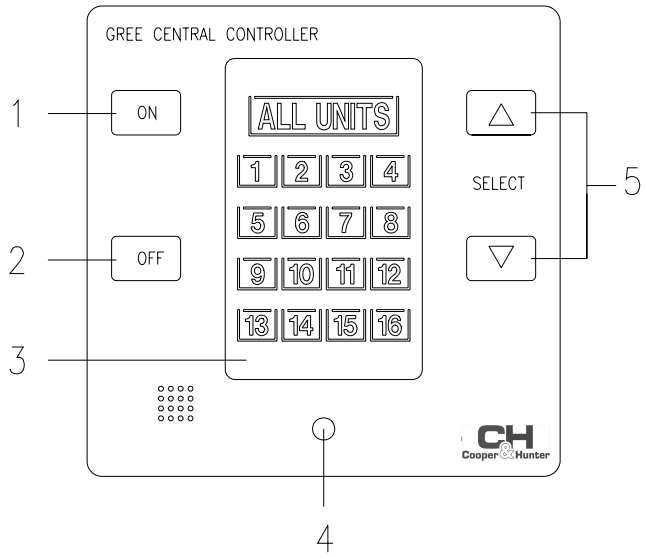
5 CENTRALIZED CONTROLLER

5.1 Centralized Controller-not with week timer

5.1.1 Function

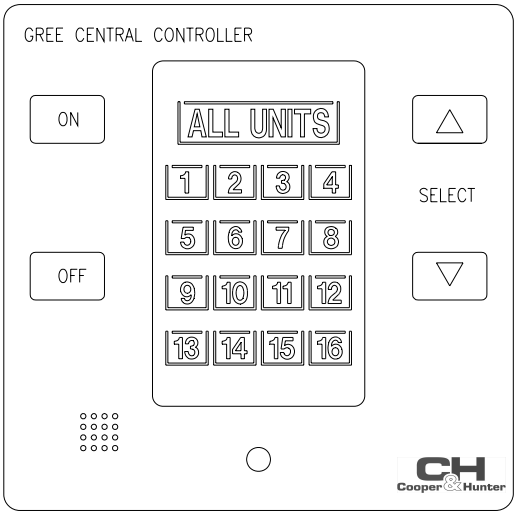
Centralized Controller-not with week timer only control on-off function of every unit. Up to 16 sets of units can be controlled simultaneously by the centralized controller-not with week timer.

5.1.2 Operation View



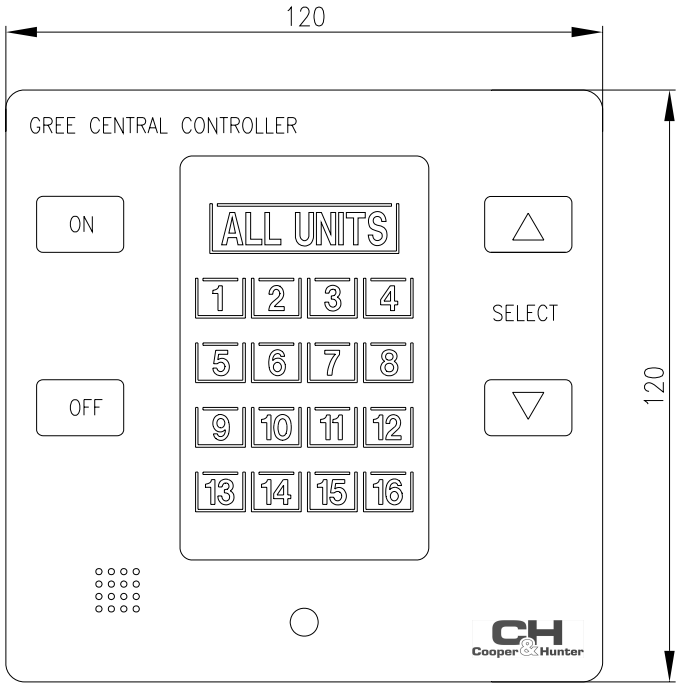
NO.	Name	Function description
1	ON button	Press the button to set start unit
2	OFF button	Press the button to set close unit
3	LCD display	Display unit information
4	LED	LED indication
5	Increasing / Decreasing button	Press buttons select the unit

5.1.3 Display View



Display unit address value in the net.

5.1.4 Dimensions

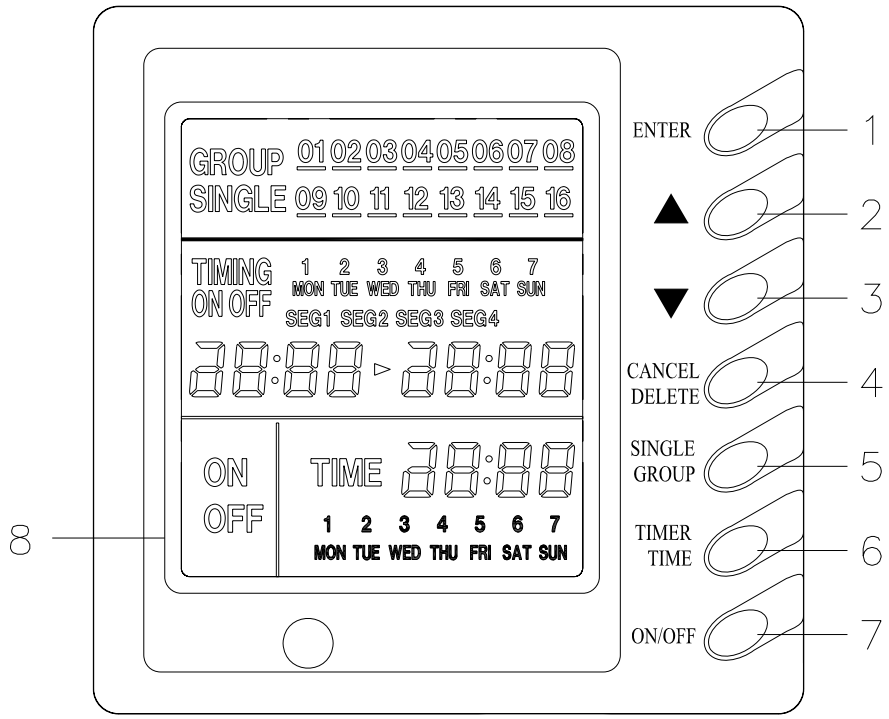


5.2 Centralized Controller-week timer

5.2.1 Function

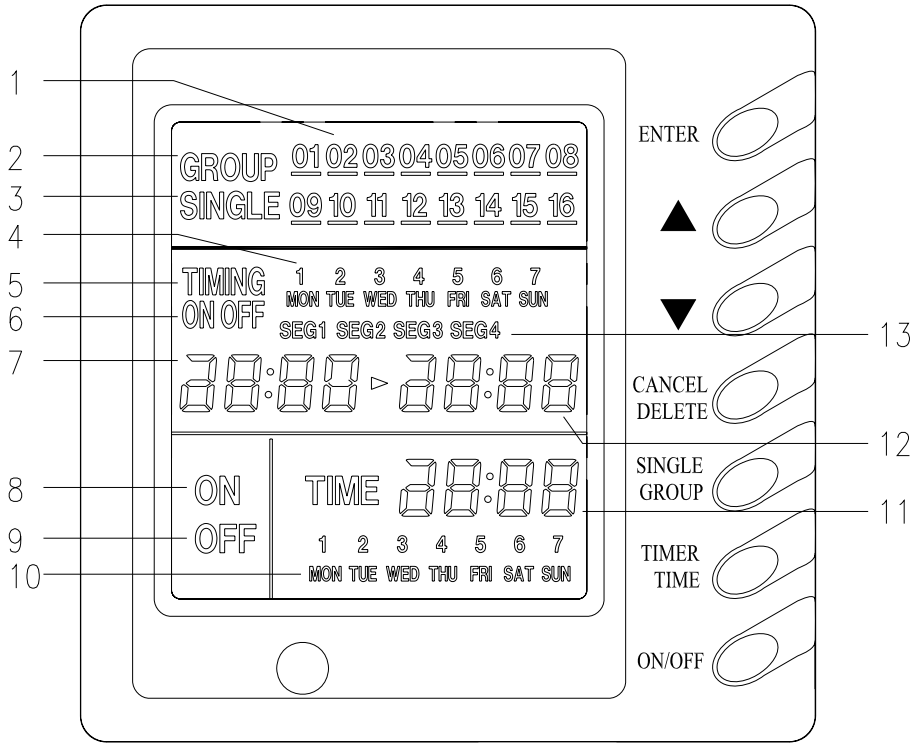
Centralized Control and Week Timer Functions: The centralized controller and the weekly timer are integrated in the same wire controller. The system has both the centralized control and the week timing functions. Up to 16 sets of units can be controlled simultaneously by the centralized controller (weekly timer). The weekly timer has the function of invalidating the lower unit. The weekly timing function is able to realized four timing ON/OFF periods for any unit every day, so as to achieve fully automatic operation. No timing control can be set for holidays. On and off of every duct type unit can be done through the Timer On/Off of this WEEKLY TIMER，it can not set other functions except on-off function of units.

5.2.2 Operation View



NO.	Name	Function description
1	ENTER button	Press the button to let setting validate.
2	Increasing button	Press "▲" and selected the unit or a certain day in one week or specific value. Press "▲" can set week part of time.
3	Decreasing button	Press "▼" and selected the unit or a certain day in one week or specific value. Press "▼" can set week part of time.
4	CANCEL/DELETE button	short-press "**cancel/delete**" to back to default page or last process, long-press "**cancel/delete**" to cancel timer of a certain time period in a certain day
5	SINGLLE/GROUP button	short-press "**single/group**" to enter single control setting. "**SINGLE**" displayed. long-press "**single/group**" to enter group control setting. "**GROUP**" displayed
6	TIMER/TIME button	Short-press "**timer/time**" to enter timer setting. Long-press "**timer/time**" under default page can begin time setting.
7	On/off button	Press the button to set start or close unit
8	LCD display	Display unit information

5.2.3 Display View

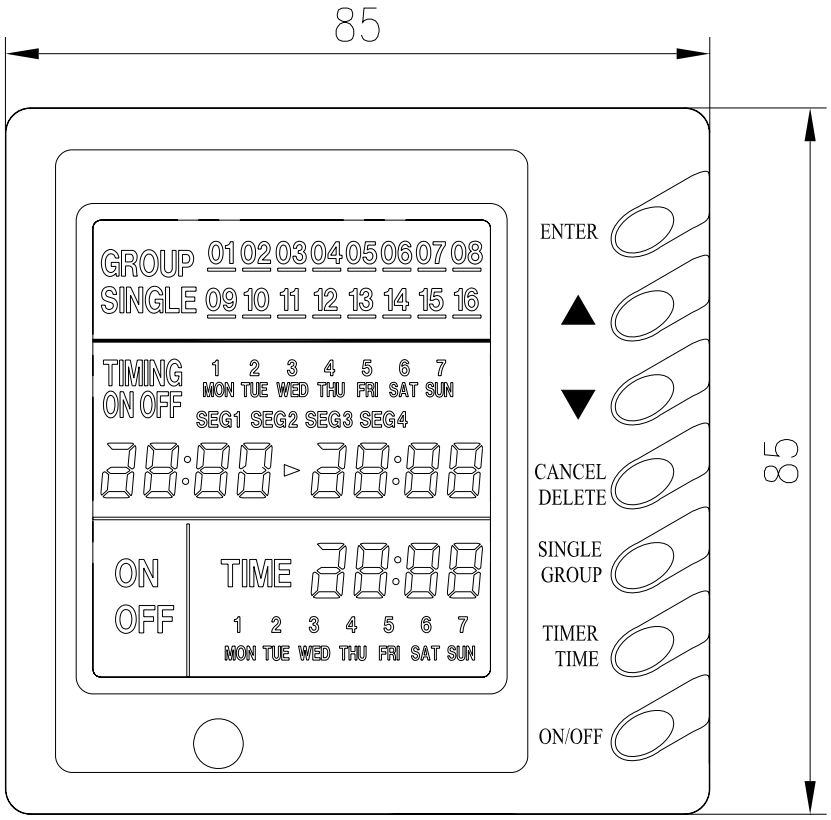


NO.	Name	Function description
1	unit's no. displays	Display unit's numbers
2	Group control displays	when group controls, it will display
3	Single control displays	when single unit controls, it will display
4	Timer time in week displays	Display time in week
5	Timer displays	Display time
6	timer state displays	"on": when set unit on, "on" will display; "off": when set unit off, "off" will display;
7	timer on time displays	Display starts time
8	on control displays	When set unit or group on, it will display,
9	off control displays	When set unit or group off, it will display,
10	present time in week display	Display present time of week.
11	present time in dual 8 displays	Display time of hour and minute now
12	timer off time displays	Display over time
13	timer period displays	Set to different time segment

Note:

Please read corresponding manual of weekly timer controller to be familiar with it.

5.2.4 Dimensions



5.3 Field Setting

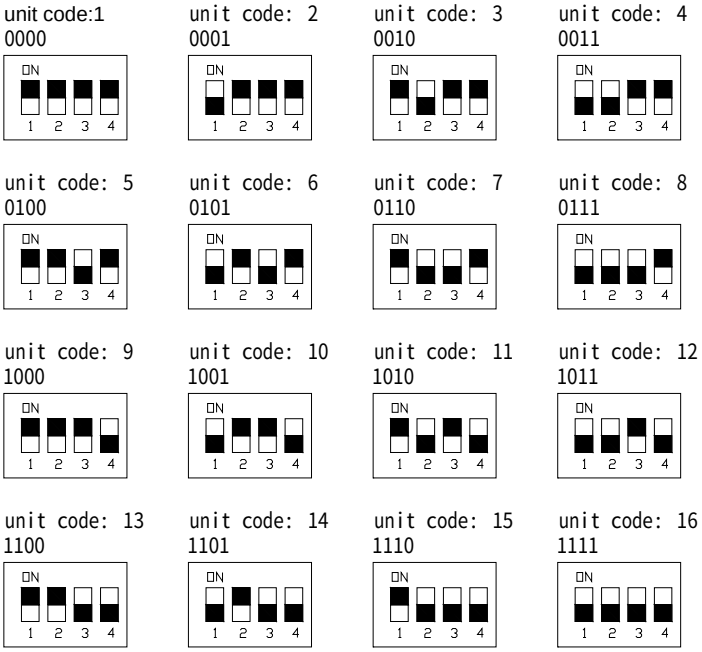
All unit codes are displayed on the central controller. The unit code is decided by the dial-up switch of the wire controller of each duct unit. The dial-up value is represented by the 4-1 switch from right to left. “ON” represents “0” while “OFF” represents “1”.

Example 1: The dial-up value is “0111”. Switch 1, 2, 3 should be on the opposite side of “ON” while switch 4 at “ON” position.

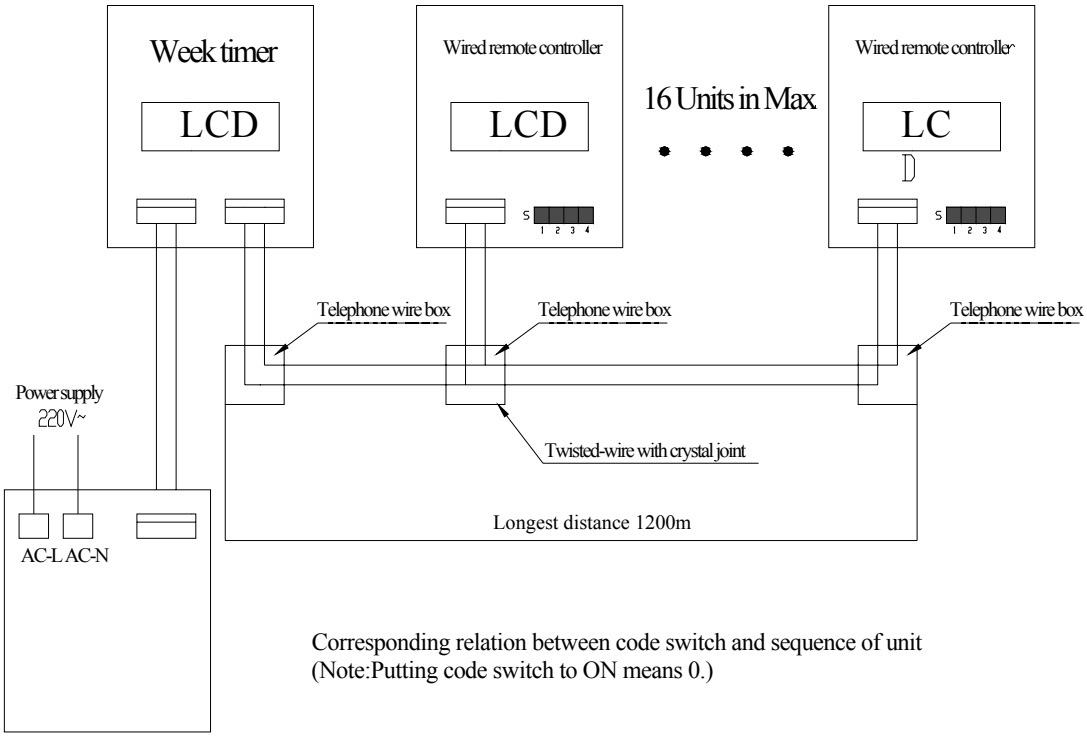
Example 2: The dial-up value is “1010”. Switch 2, 4 should be on the opposite side of “ON” while switch 1, 3 at “ON” position.

Code	No.	Code	No.	Code	No.	Code	No.
0000	1	0100	5	1000	9	1100	13
0001	2	0101	6	1001	10	1101	14
0010	3	0110	7	1010	11	1110	15
0011	4	0111	8	1011	12	1111	16

Refer to the following diagram：



5.4 Control Wiring Design



Corresponding relation between code switch and sequence of unit
(Note:Putting code switch to ON means 0.)

P	S	P	S	P	S	P	S
0000	1	0010	5	0001	9	0011	13
1000	2	1010	6	1001	10	1011	14
0100	3	0110	7	0101	11	0111	15
1100	4	1110	8	1101	12	1111	16

INSTALLATION

INSTALLATION

1 INDOOR UNIT INSTALLATION

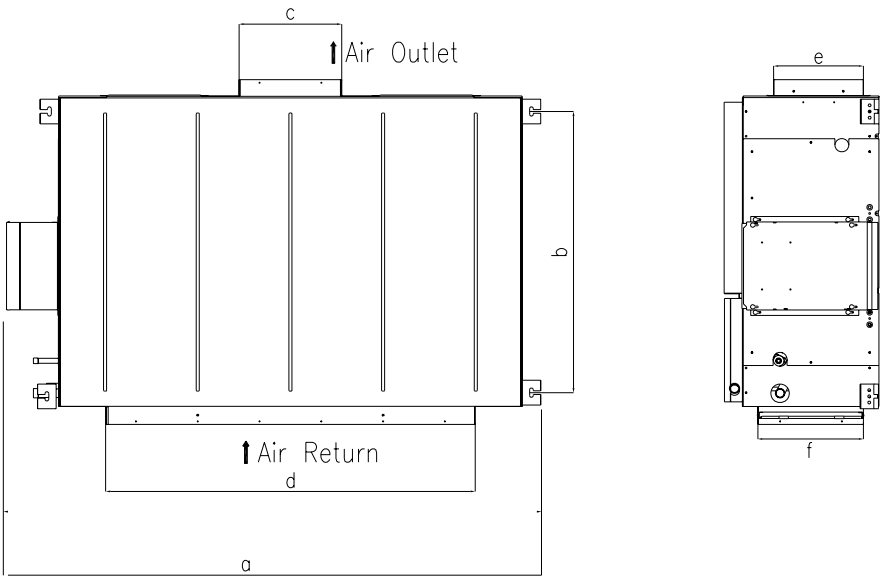
1.1 Before Installation

1. The preparation of all pipes (connecting pipes and drainage pipes) and cables (connecting lines of wired controller, indoor unit and outdoor unit) must be ready before the installation, so as to achieve smooth installation.
2. Drill an opening on the ceiling. Maybe it is required to support the ceiling to ensure the evenness of it and avoid the vibration of it. Consult with the user or a construction company for details.
3. In case the strength of ceiling is not enough, use angle iron sections to set up a beam support. Place the unit at the beam and fix it.

1.2 Installation Site

1. Ensure the top hanging piece has strong strength to withstand the weight of the unit.
2. The drainage pipe has convenient flow of water.
3. There is no obstacle blocking the air intake and exhaust outlet, so as to ensure sound air circulation.
4. The installation spaces required by the drawing must be ensured, so as to provide enough space for the service and maintenance.
5. The installation site must be far away from heat source, leakage of inflammable gas or smoke.
6. The indoor unit is of ceiling mount (indoor unit is hidden inside the ceiling).

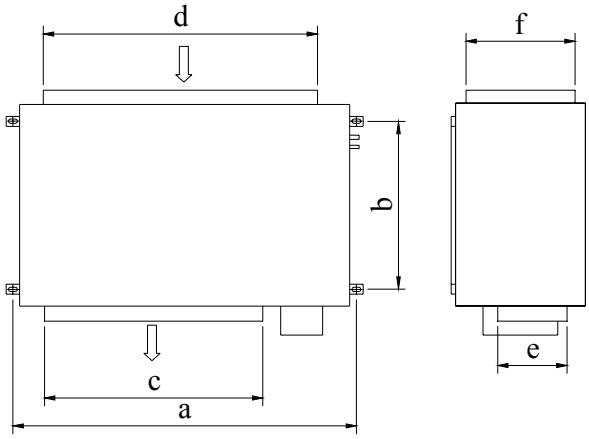
1.3 Dimension Data



Unit：mm

Model	a	b	c	d	e	f
FG20/C-M FGR20/C-M	1560	910	332	1194	292	342

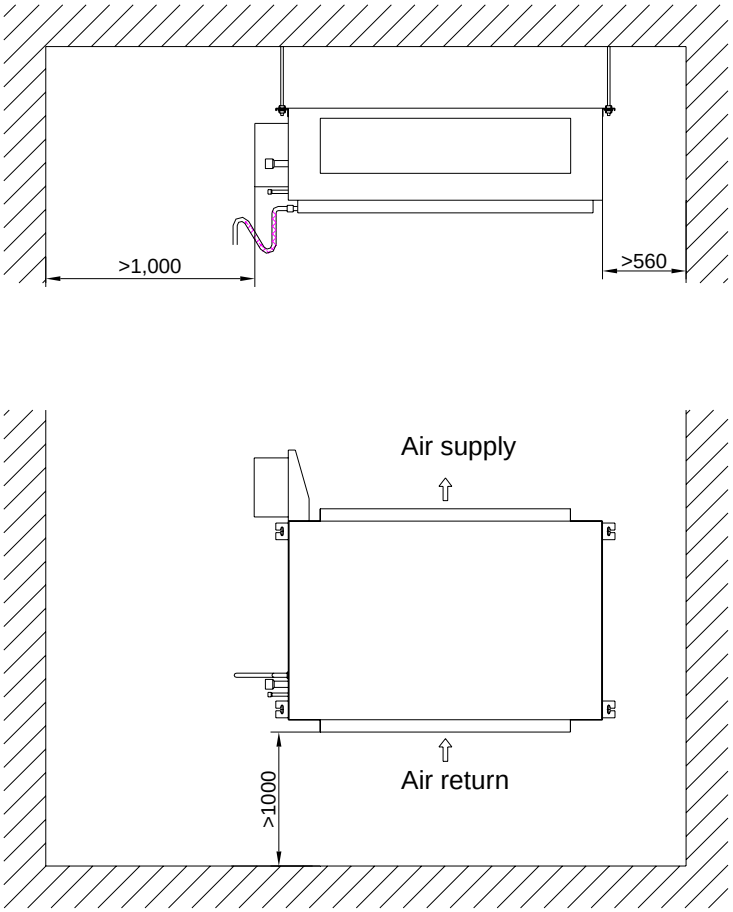
FG25/C-M FGR25/C-M	1560	910	332	1194	292	342
FG30/C-M FGR30/C-M	1560	910	1194	1194	292	342

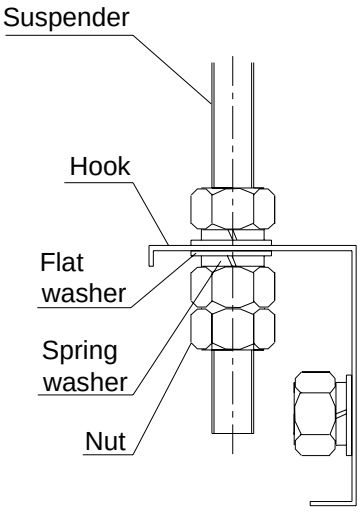


单位：mm

Model	a	b	c	d	e	f
FG40/C-M FGR40/C-M	1780	1040	868	1450	347	555

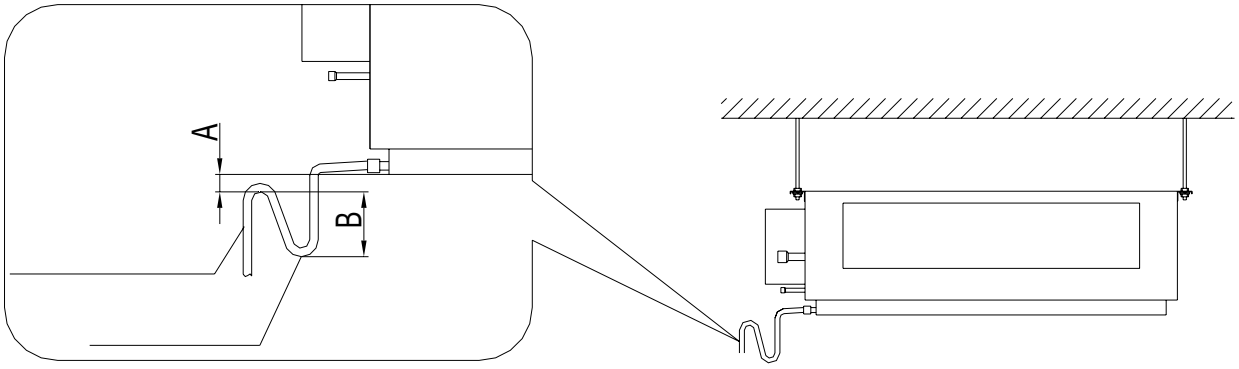
1.4 Installation Clearance Data





installation of suspender

1.5 Drain Piping Work



For easy drainage of the condensation water, it should be installed with a downward gradient. To avoid the condensation, the connection pipe joint should be insulated with thermal insulation material. A water seal should be employed as shown above and the height of the water seal could be determined by the pressure of the drain hose.

Drain hose is in negative pressure state: A = B≥P/10+20 (mm)

Drain hose is in positive pressure state: A≥30mm，B≥P/10+20 (mm)

2 OUTDOOR UNIT INSTALLATION

2.1 Before Installation

1. After receipt of the unit, please check the unit for damage during transport. If there is external or internal damage, please notify the company by written form.
2. After receipt of the unit, check and inspect the unit and accessories according to package list for models, damage of unit body and specification and quantity of accessories.
3. Confirm conveying route and method of the unit to avoid damage to the unit and possible injuries. For protection and safety of the unit, it is recommended to convey the unit together with the packing container, even in special conditions.
4. Check the installation foundation for firmness. If the unit is installed on the metal place, ensure electric insulation and conformability to relative criteria.
5. Ensure installation site away from the storage area with inflammable and explosive materials to avoid explosion or fire.

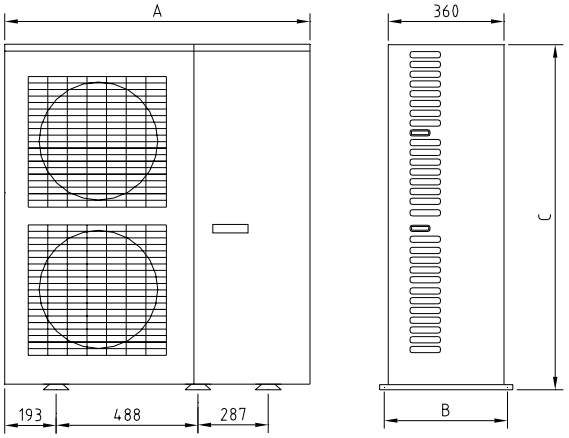
2.2 Installation Site

- ✧ Outdoor unit should be installed in a steady and stable place.
- ✧ To reduce the length of the refrigerant pipe and bend number, make sure the indoor unit and outdoor unit be close to each other.
- ✧ Ensure the operation noise do not disturb neighbors and passerby.
- ✧ Do not install the unit where it will be exposed to direct sunlight or other radiation heat source, or the awning or a rainproof cloth should be utilized.
- ✧ The inlet and outlet port should not be blocked.
- ✧ Make sure the well air circulation.
- ✧ Selection a location that is far away from combustible or explosive material, dust, fog or

moist.

Don’t connect any air leading duct to the outdoor unit, at neither the air inlet nor the air outlet. The outdoor unit will drop condensate while running at heat mode. If the temp is minus, it will form ice. Don’t let the rain proof interfere the ventilation of outdoor unit.

2.3 Dimension Data



Model	A	B	C
FG(R)20/C-M(O)	1150	360	1350
FG(R)25/C-M(O)	1150	360	1600

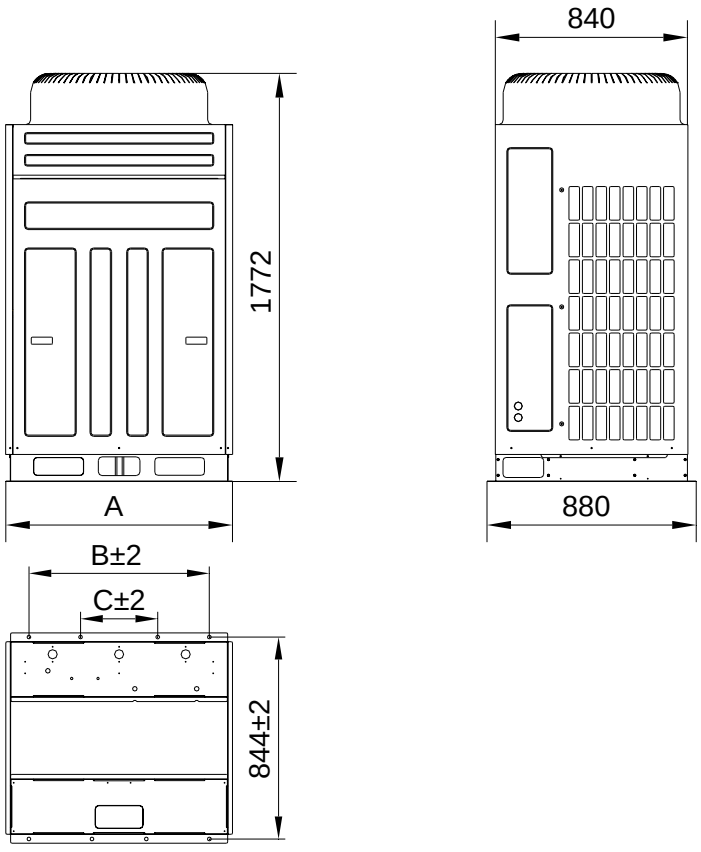
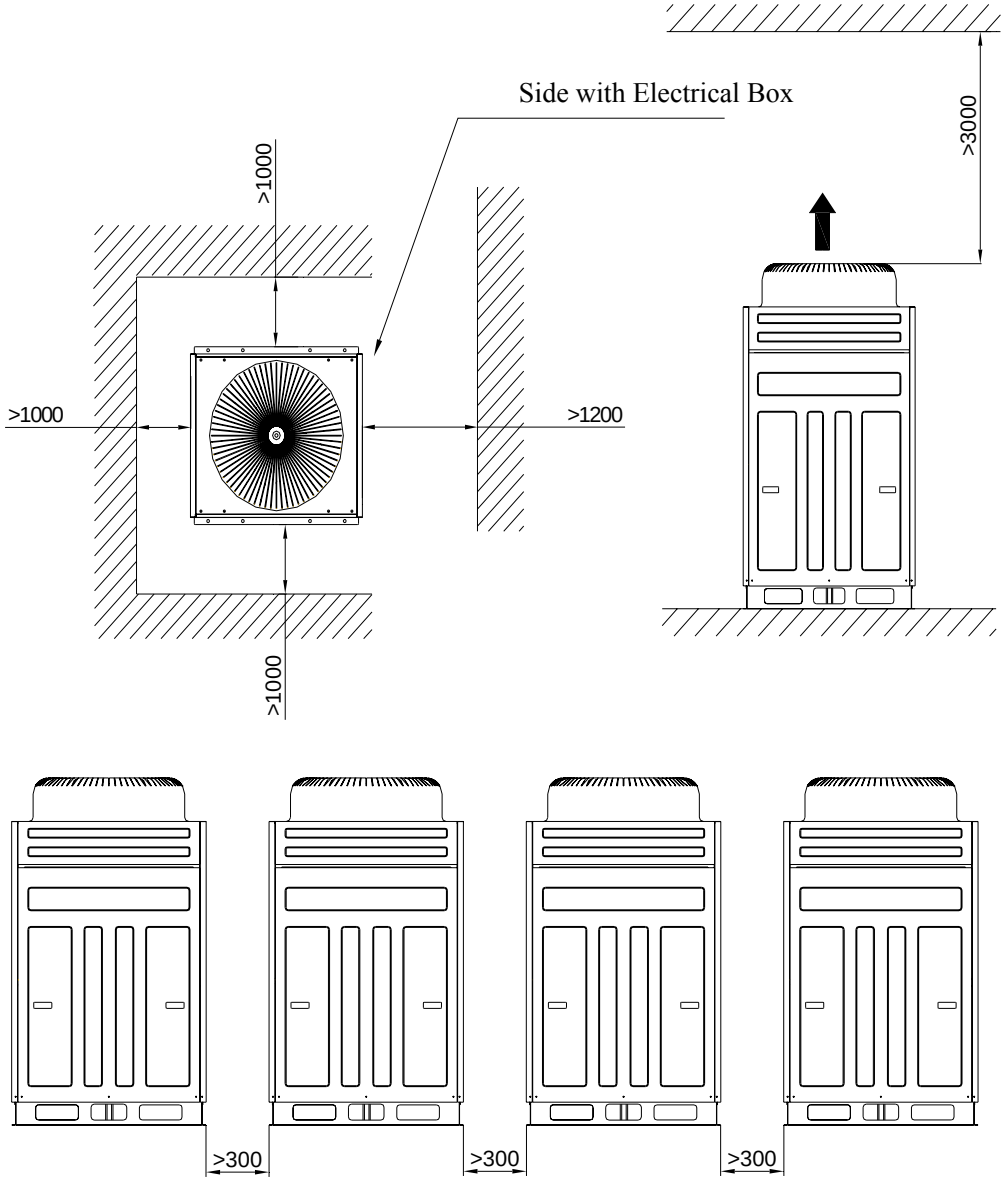


Fig 27 Schematic of the Outdoor unit

Table.3 Outlines and dimension of the unit **Unit: mm**

Model	A	B	C
FG(R)30/ C-M (O)	990	787	337
FG(R)40/C-M(O)	1290	1160	850

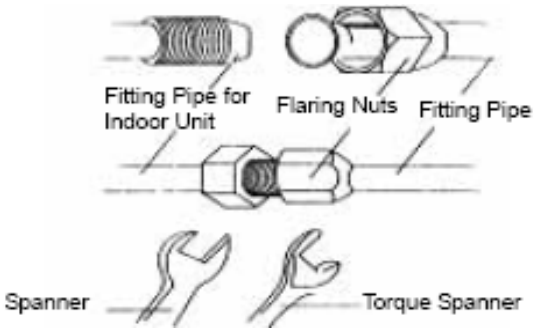
2.4 Installation Clearance Data

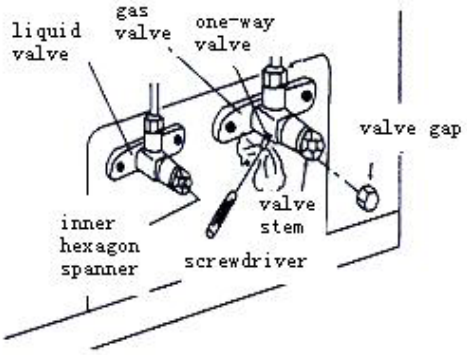


3 REFRIGERATION PIPING WORK

3.1 Refrigeration Piping Work Procedures

1. Align the flared end of the copper pipe with the center of the thread joint. Manually tighten the flared end nut.
2. Use torque spanner to tighten the flared end nut until the spanner clatters.





3.2 Cautions for Connecting Pipes

Note: Do not loosen the cap of the pipes when connecting the pipes between the indoor unit and the outdoor unit. Connect the pipes as soon as possible after loosening the cap of the pipes to avoid the entering of water and dusk. A metal pipe should be utilized if a pipe should be installed through a wall.

- ✧ The connection of the pipes should confirm to the following principles:
- ✧ Make sure to lessen the length of connecting pipe, the height difference between the indoor and outdoor unit, and the number of bends, and enlarge the diameter of bends.

The permitted maximum value of each case:

Height difference between the indoor and outdoor unit	＜30M
90^0 Number of bends	＜12
Length of connecting pipes	＜50M

- ✧ The pipe meld type could be employed for the connection of the pipes between the indoor and outdoor units.
- ✧ The pipe joint should be tightly connected when a pipe joint is employed between two pipes. It is better to use only one connecting pipe if the distance is not far.
- ✧ The pipes should not be shriveled when the pipes are connecting. The bend diameter should be longer than 200 millimeter. The connecting pipes should not be extended or curved frequently and the curving process should not be larger than 3 times in the same bending position.

3.3 Specification of Connection Pipe

Model	External Diameter		Maximum Length of Connection Pipe (m)	Maximum Difference in Height between Outdoor and Indoor Unit (m)	Max. number of angle fittings (90^o)	Additional Charge of Refrigerant (g/m)
	Gas Pipe (mm)	Liquid Pipe (mm)				

FG20/C-M	φ28	φ16	50	30	12	180g/m
FGR20/C-M						
FG25/C-M						
FGR25/C-M						
FG30/C-M						
FGR30/C-M						
FG40/C-M	φ35	φ16				
FGR40/C-M						

4 ELECTRIC WIRING WORK

4.1 Wiring Principle

- ✧ All of the supplied components, material, and electric operation should be accorded with the local principles.
- ✧ The power supply should adopt the rated voltage and special circuit for the ducted air-conditioning unit.
- ✧ About the electric working, please refer to the “circuit diagram” adhering to the unit.
- ✧ All the connection of the circuit should be carried out by the qualified electrician.
- ✧ A circuit breaker that can cut all the power supply of the system should be installed. Wiring diagram of the ducted air-conditioning unit is shown in Fig. 32.
- ✧ The units should be well earthing to the ground by professionals.
- ✧ Install a central switch which can cut all the power switch and air switch of the system.
- ✧ The air switch should have hot and magnetic auto-turn-off function to protect the system from overloading or short power.
- ✧ Please accord to electrical diagram on the unit when connecting the wires.

1) Open indoor electric box and outdoor electric box respectively and put the wires cross the electric boxes. Please choose the specification of the power cables according to the power capacity and the installation conditions of the unit. Fix the wires with wire clamp and assemble the electric cover after confirmation.
2) If ON/OFF function of the sub room unit is needed, the short wiring between L3 and A should be taken off and wired according to the dashed frame. If all of the sub rooms are turned off, the unit will be switched off, or you can turn off the unit from the control panel directly. In the meantime, you can set the parameters on the control panel.
3) The wiring schematic of the outdoor unit, please refer to Fig 32, while the power cord standard and air-switch type, please refer to recommending table 4.

4.2 Electric Wiring Design

Specification of Power Supply Wire and Air Switch

Wiring schematic for outside the unit

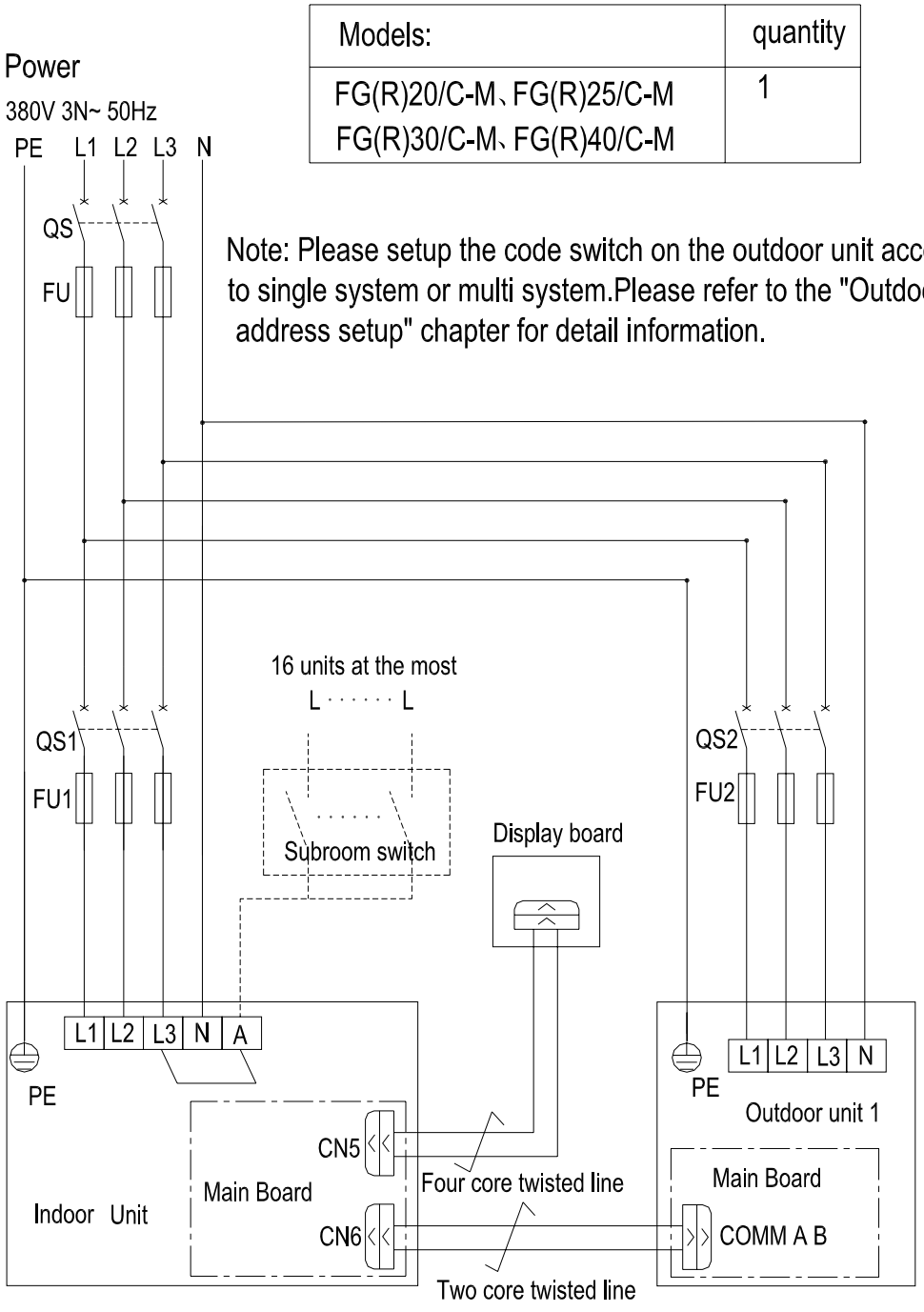


Fig.32 wiring schematic of outdoor unit and indoor unit

* The power cord must be copper inside, while the working temp. can not be over its standard one.

* If the total length of the power cord is over 15m, please increase the size by certain degree.

* Please confirm the other wire according to the actual need.

4.3 Specification of Power Supply Wire and Air Switch

Model	Power Supply	Air Switch (A)	Earthing section(mm^2)	Permit Min section (mm^2)
FGR20/C-M(I)	380V 3Ph~ 50Hz	16	2.5	2.5
FGR25/C-M(I)	380V 3Ph~ 50Hz	16	2.5	2.5
FGR30/C-M(I)	380V 3Ph~ 50Hz	20	2.5	2.5
FGR40/C-M(I)	380V 3Ph~ 50Hz	25	4.0	4.0
FG20/C-M (I)	380V 3Ph~ 50Hz	10	1.0	1.0
FG25/C-M (I)	380V 3Ph~ 50Hz	10	1.0	1.0
FG30/C-M (I)	380V 3Ph~ 50Hz	10	1.0	1.0
FG40/C-M (I)	380V 3Ph~ 50Hz	10	1.5	1.5
FG(R)20/C-M (O)	380V 3Ph~ 50Hz	25	4.0	4.0
FG(R)25/C-M (O)	380V 3Ph~ 50Hz	25	4.0	4.0
FG(R)30/C-M (O)	380V 3Ph~ 50Hz	32	6.0	6.0
FG(R)40/C-M (O)	380V 3Ph~ 50Hz	40	10.0	10.0

MAINTENANCE

MAINTENANCE

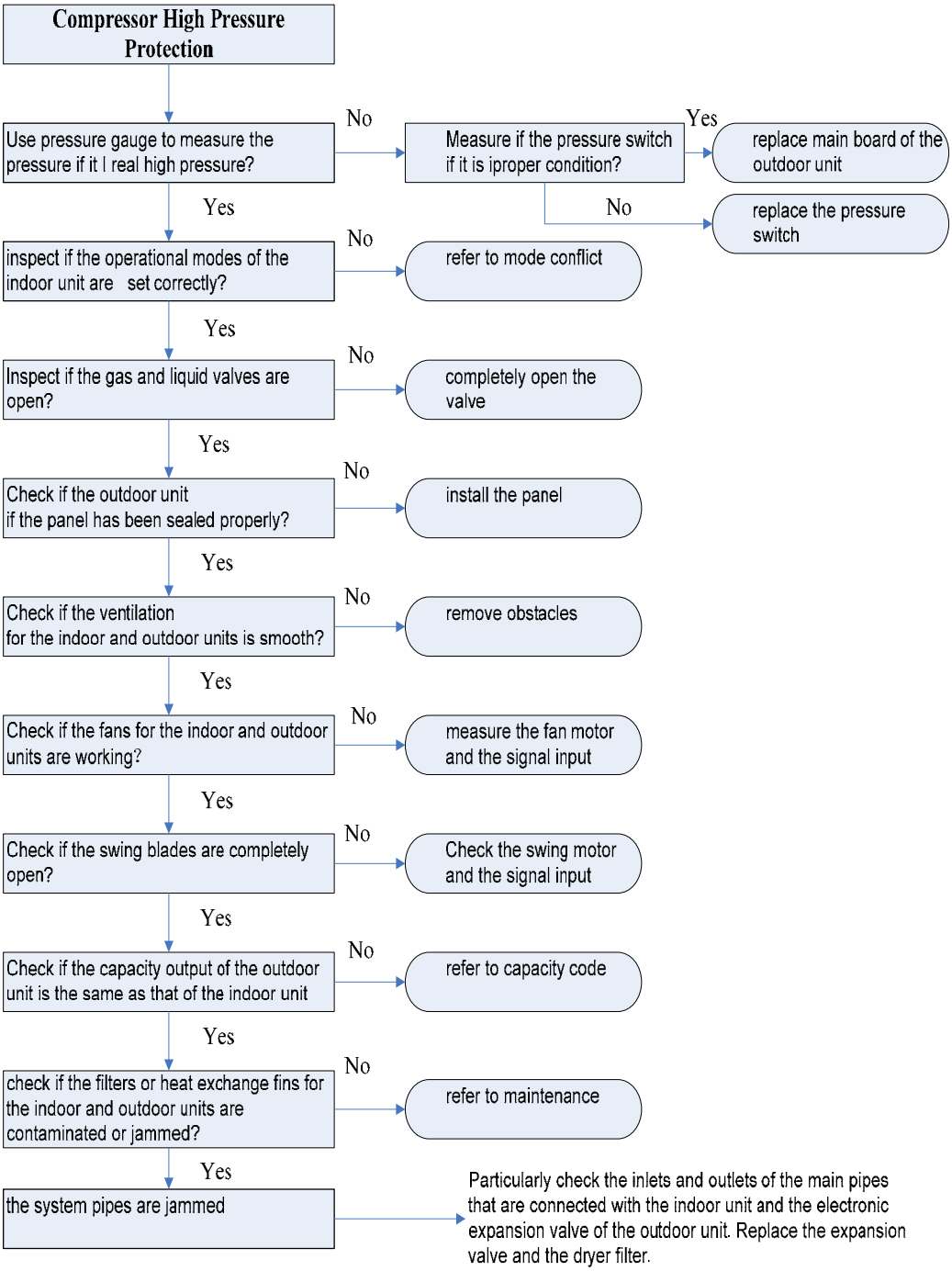
1 TROUBLE TABLE

Trouble Code	Trouble Name	Origin of Trouble Signal	Control Description
E1	Compressor High Pressure Protection	High Pressure Switch	When high pressure protection has been detected in continuously 3 seconds, shut off all loadings and shields all buttons and remote control signals. LED blinks and displays E1. The unit cannot recover automatically. Turn off the unit by press ON/OFF, clear “E1”and turn off the LED.
E3	Compressor low pressure protection	Low pressure switch	After 3min running of compressor, detect signal from low pressure switch. If detect that low pressure switch is cut off in continuously 30s, the complete unit will stop and display “E3”while LED blinks. 3min later, if the error has cleared, the complete unit resume running; If the low pressure switch protection has been detected for 3 times during 30min, the LED will blinks and displays “E3”. The unit cannot recover automatically which requires pressing ON/OFF, and then clear error code and turn off LED.
E4	Compressor discharge temp. protection	Compressor discharge temp. sensor.	After the running of compressor, if detect that discharge temp. is higher that 130℃ in continuously 30s, it is believed that there is high temp. protection of discharge pipes of compressor. Turn off compressor, external fan and inner fan. LED blinks and displays corresponding error code “E4”. After 3min stop of compressor, if detect that the discharge temp. is lower than 90℃ for continuously 5s, the compressor will resume running. Since the first error detected, if detect that there is 3 times of high temp. protection for compressor discharge pipes in 30min, turn off compressor, external fan and inner fan. LED blinks and displays corresponding error code “E4”. The unit cannot recover automatically which requires pressing ON/OFF, and then clearing error code and turning off LED.
E5	Overloading Protection of Compressor	Overcurrent Protector	If detect that overloading switch is cut off for continuously 3 seconds, it is believed that compressor is in the condition of overloading protection. Turn off compressor and external fan and the LED blinks and displays the corresponding error code E5.After 3 min stop of compressor, if the error has disappeared, the compressor will restart. From the first error detected, if overloading protection of

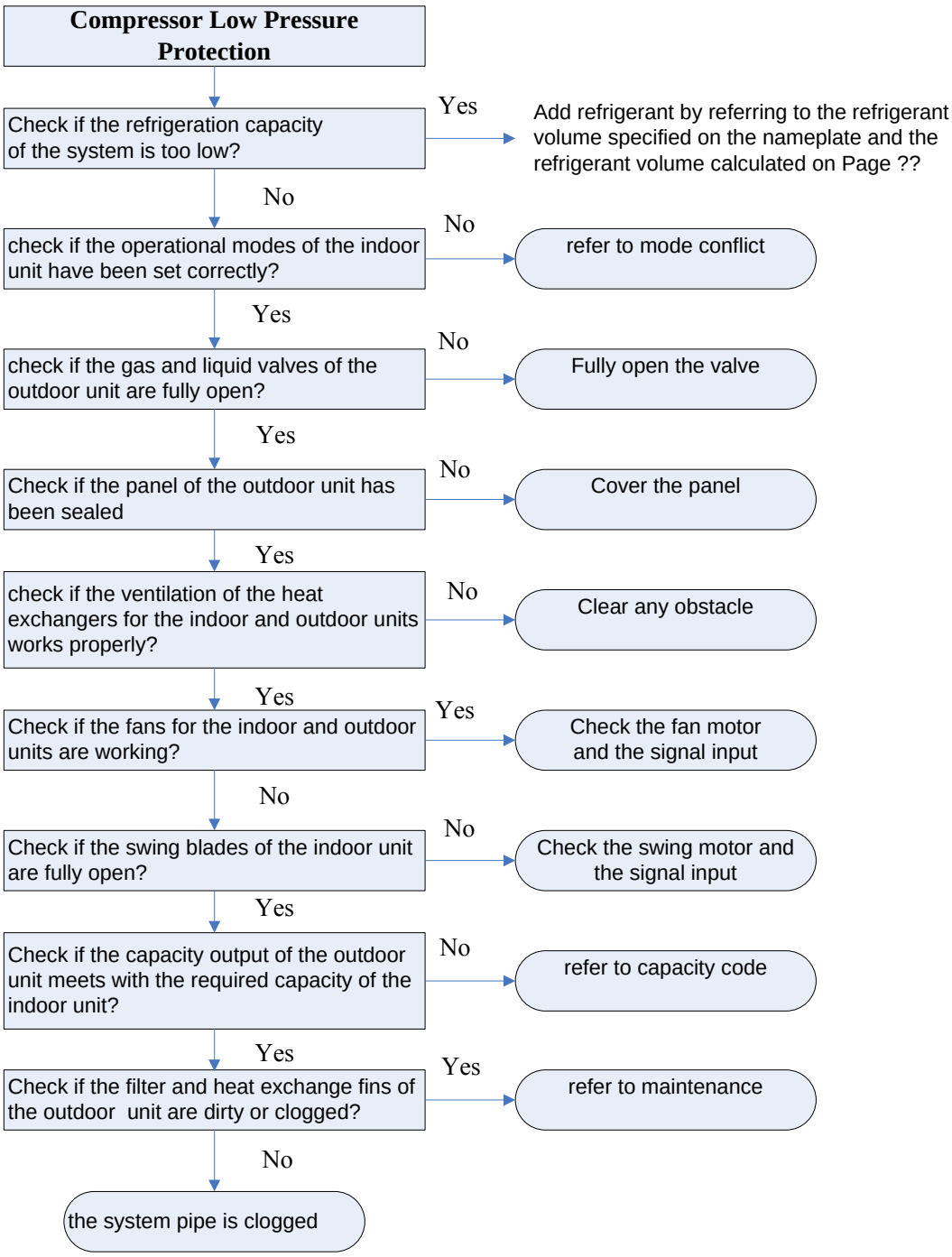
			compressor has been detected in 3 times in 30 min, turn off all loads (except for 4-way valve) and shield all buttons and remote control signal except for ON/OFF button. Then LED will blink and display the corresponding error code E5 and the complete unit cannot be automatically recovered After turning off the unit by press ON/OFF button, if the error disappears, clear the error code and turn off the LED.
E6	Communication error	Terminal interface	After energization, if the mainboard of the indoor unit does not receive signal, it is the communication error. In that case, the compressor and the outdoor fan will stop. If the indoor unit does not receive the signal of the outdoor unit, the auxiliary e-heater and the indoor fan will stop. If the wired controller does not receive the signal of the outdoor unit, E6 will be displayed. The machine will not work.
E8	Indoor fan protection	Motor switch or thermal relay	After startup of the indoor fan, if it is detected that the overload signal of the indoor fan lasts for 3s, all the load will be cut off. E8 will be displayed and the buzzer will beep.
F0	Indoor ambient temp. sensor error	Indoor ambient temp. sensor	If detect that AD value exceeds 250(short circuit with corresponding temp. 160 ℃) or less than 5 (open circuit with corresponding temp about -45℃), it is believed that there is error of temp. sensor.
F1	Temp. sensor error of indoor evaporator	Temp. sensor of indoor evaporator	If detect that AD value exceeds 250(short circuit with corresponding temp. 160 ℃) or less than 5 (open circuit with corresponding temp about-45℃), it is believed that there is error of temp. sensor.
F2	Tube sensor error for outdoor condenser	Tube sensor for outdoor condenser	If detect that AD value exceeds 250(short circuit with corresponding temp. 160 ℃) or less than 5 (open circuit with corresponding temp about -45℃), it is believed that there is error of temp. sensor.
F3	Outdoor ambient temp. sensor error	Outdoor ambient temp. sensor	If detect that AD value exceeds 250(short circuit with corresponding temp. 160 ℃) or less than 5 (open circuit with corresponding temp about -45℃), it is believed that there is error of temp. sensor.
F4	Discharge temp. sensor error	Discharge temp. sensor	If detect that AD value exceeds 250(short circuit with corresponding temp. 160 ℃) or less than 5 (open circuit with corresponding temp -45℃), it is believed that there is error of temp. sensor.

2 FLOW CHART OF TROUBLESHOOTING

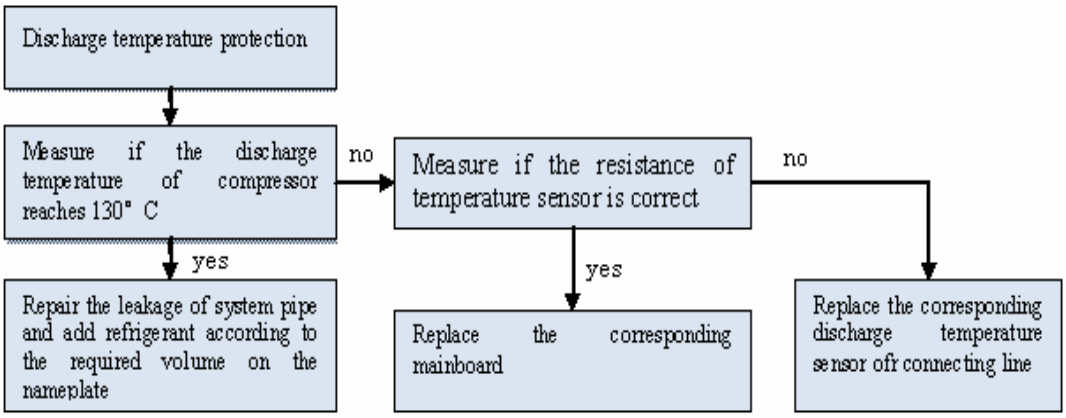
2.1 E1 Compressor High Pressure Protection



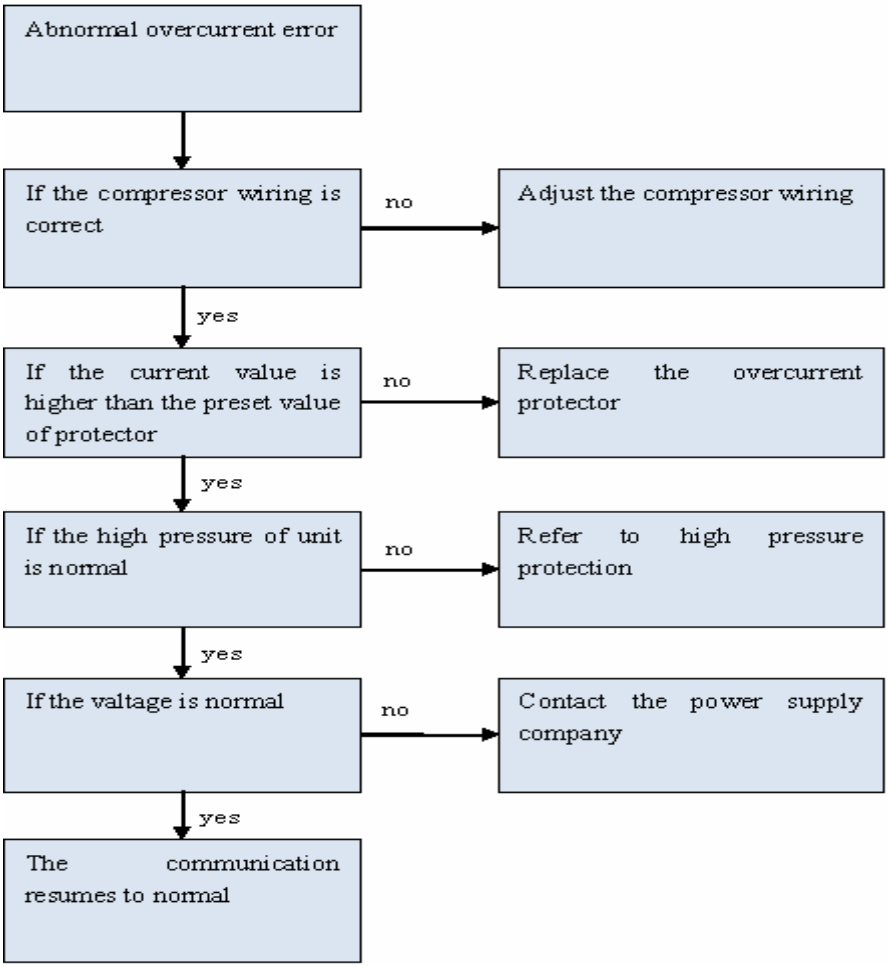
2.2 E3 Compressor Low Pressure Protection



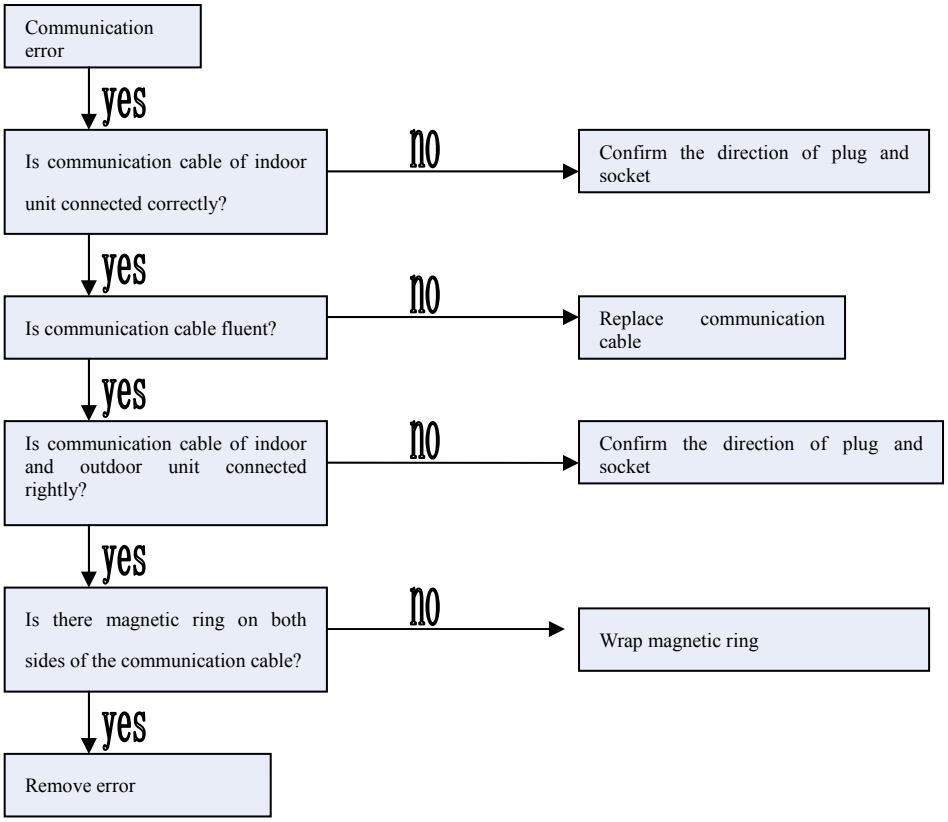
2.3 E4 Compressor Discharge Temp. Protection



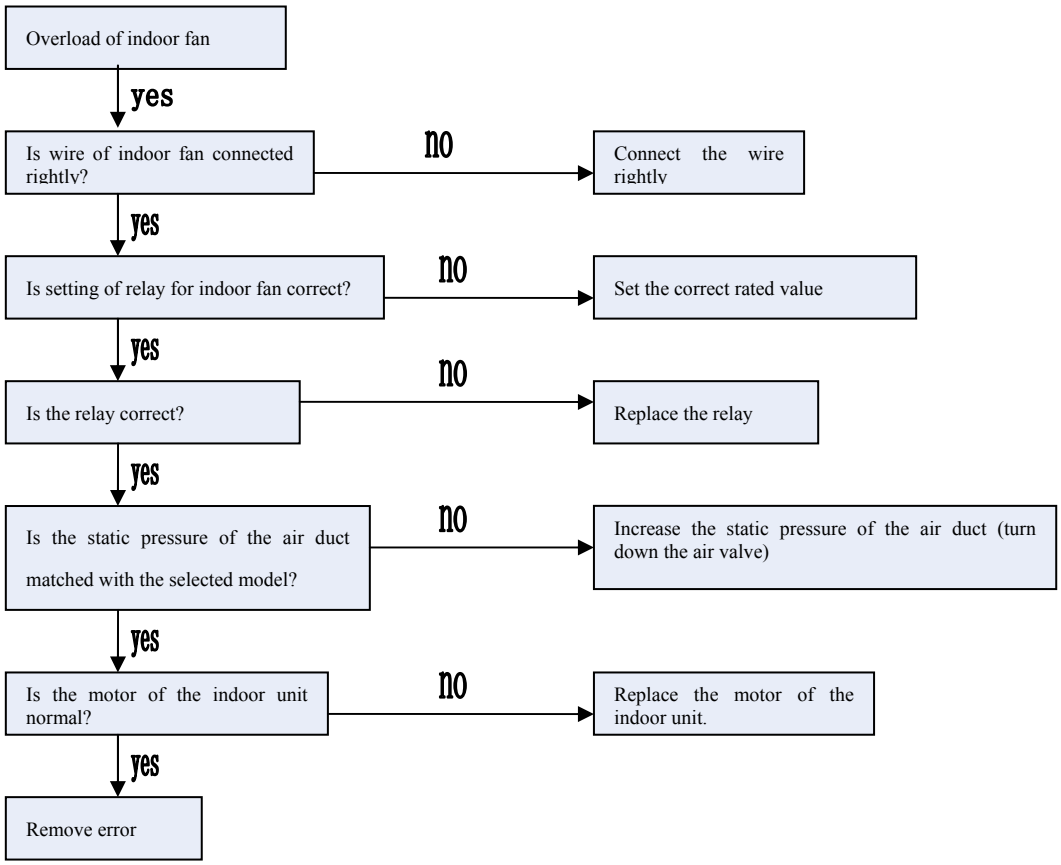
2.4 E5 Overcurrent Protection (Compressor Overloading Protection)



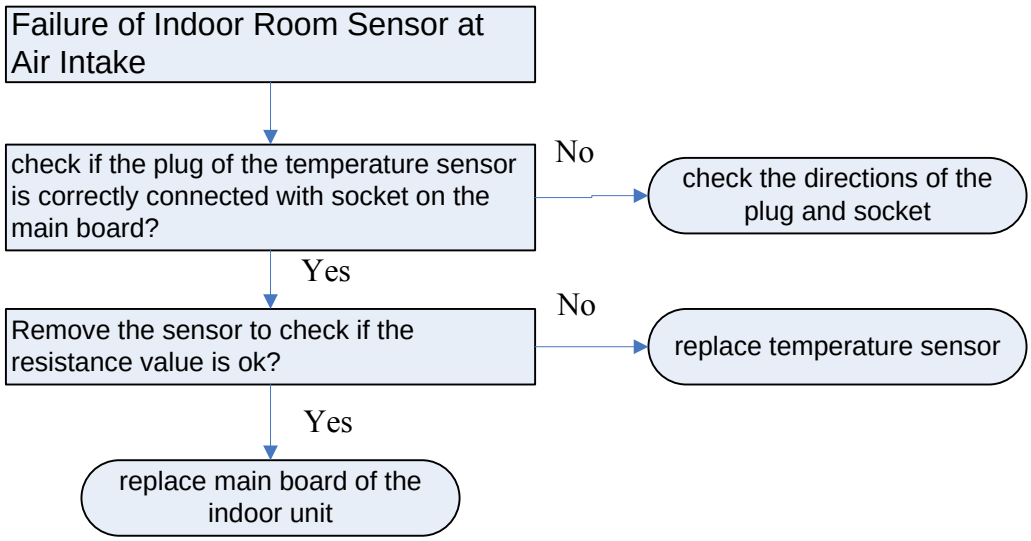
2.5 E6 Communication Error



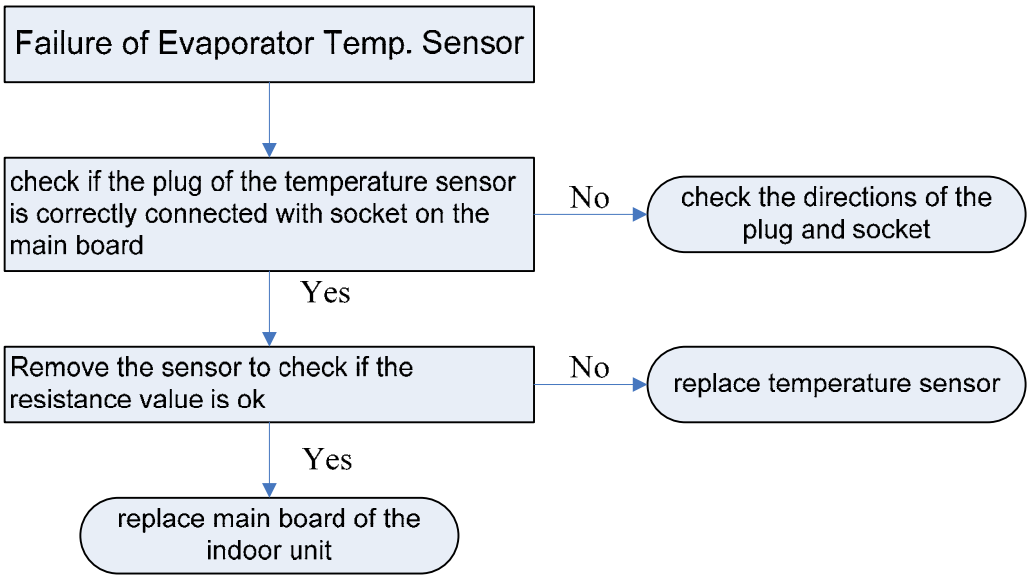
2.6 E8 Overload of Indoor Fan



2.7 F0 Failure of Indoor Room Sensor at Air Intake

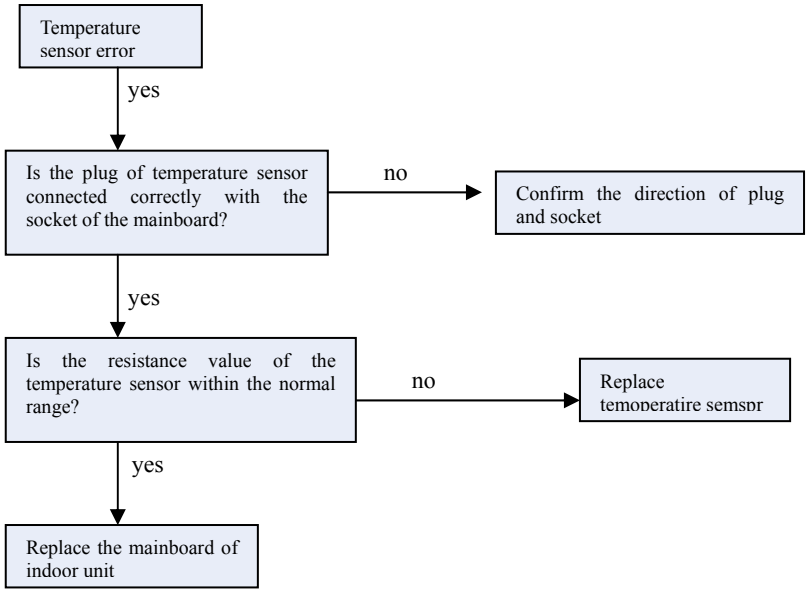


2.8 F1 Failure of Evaporator Temp. Sensor



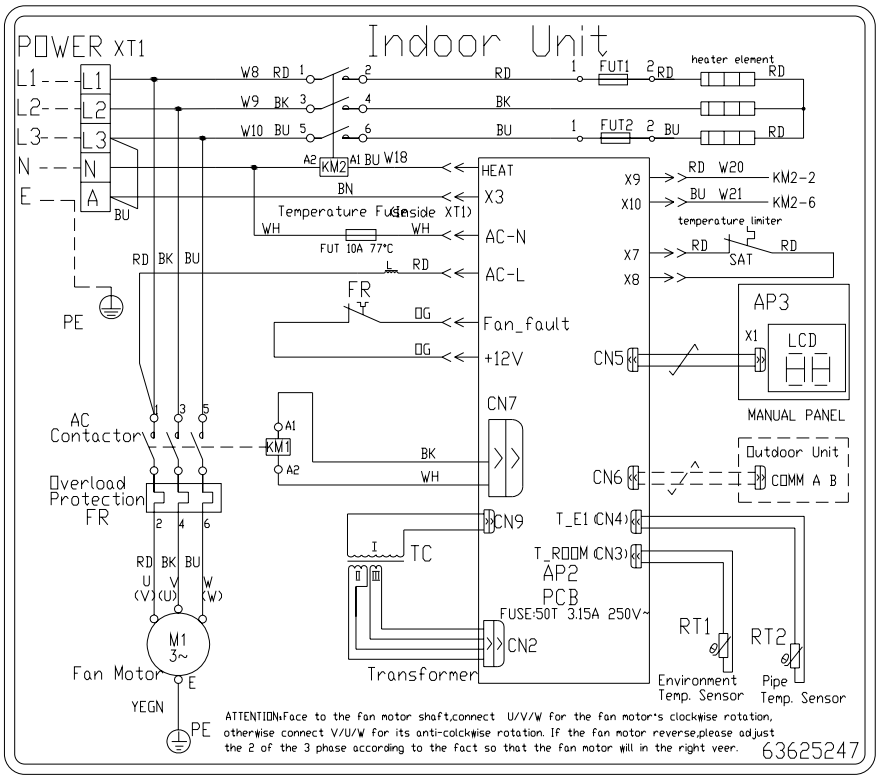
2.9 F2 Temperature Sensor Error of Condenser

F3 Outdoor Temperature Sensor Error
F4 Discharge Temperature Sensor Error

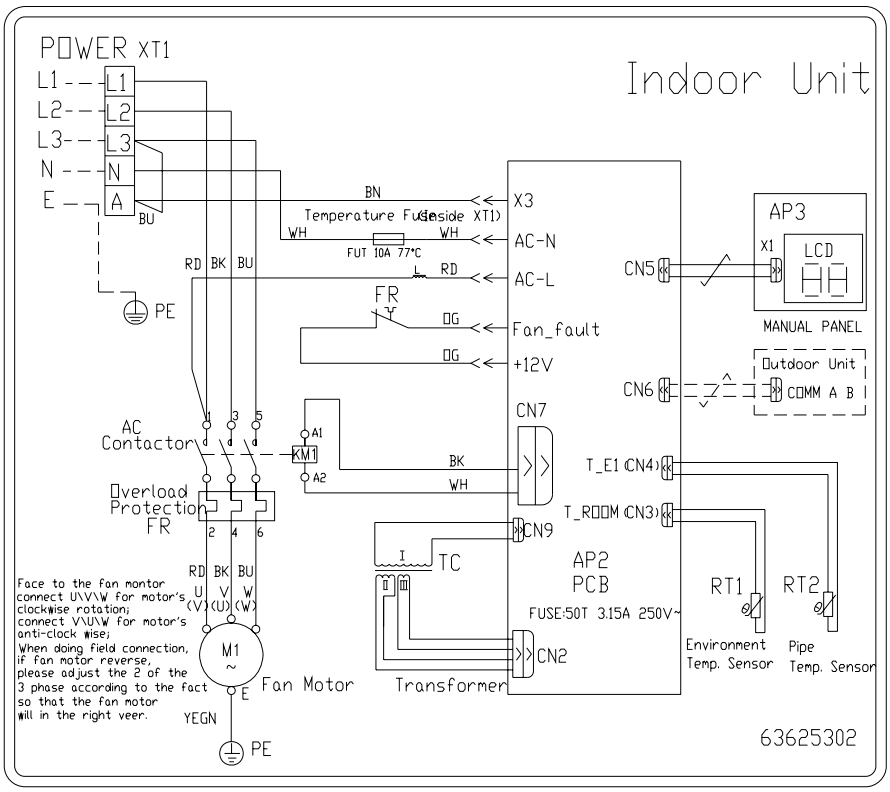


3 WIRING DIADRAM

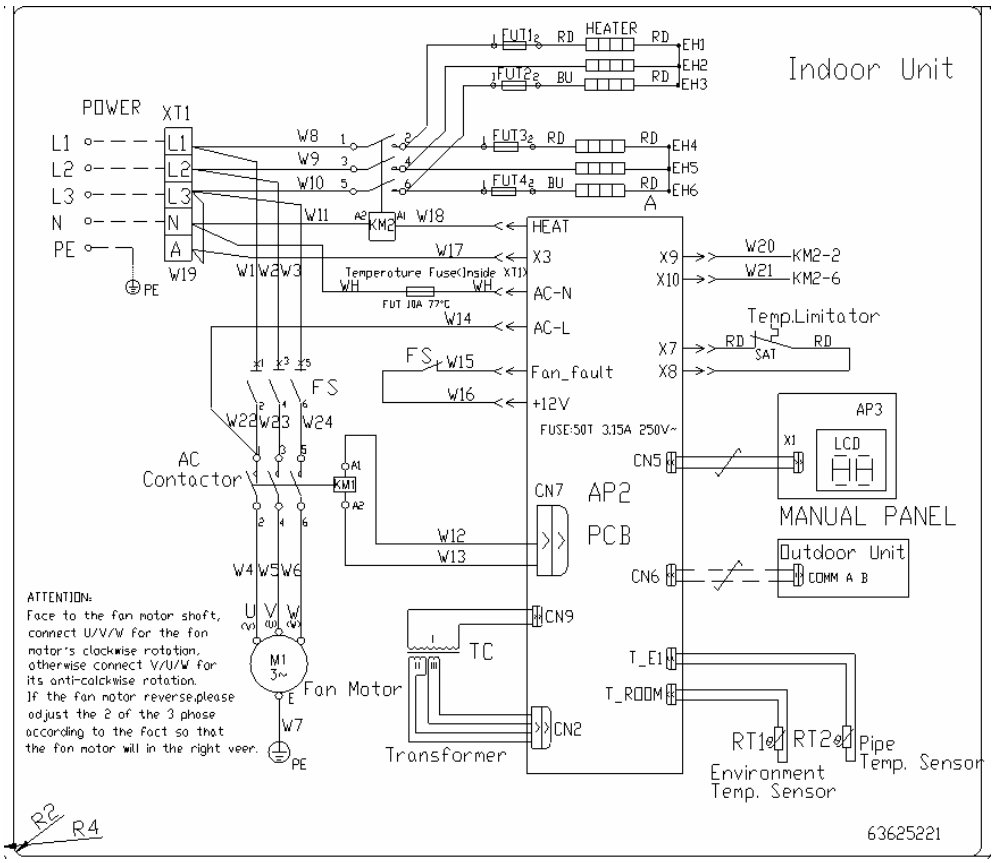
FGR20/C-M(I), FGR25/C-M(I), FGR30/C-M(I) (with e-heater)



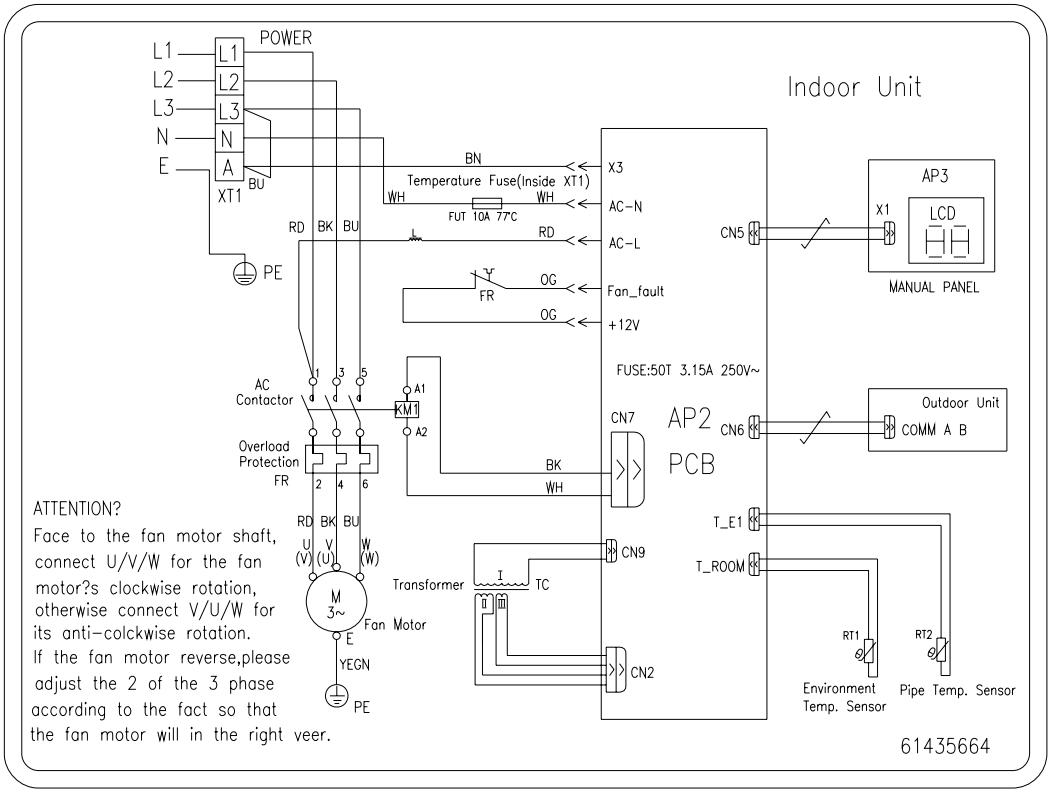
FGR30/C-M (I)



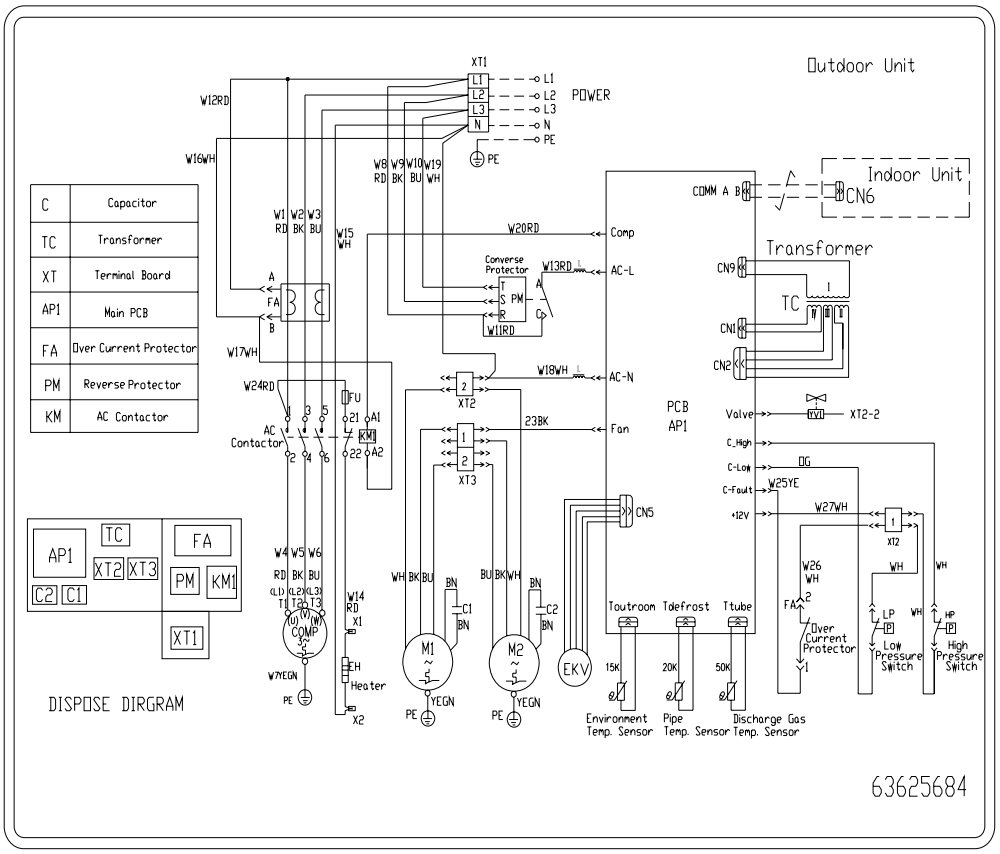
FGR40/C-M (I)



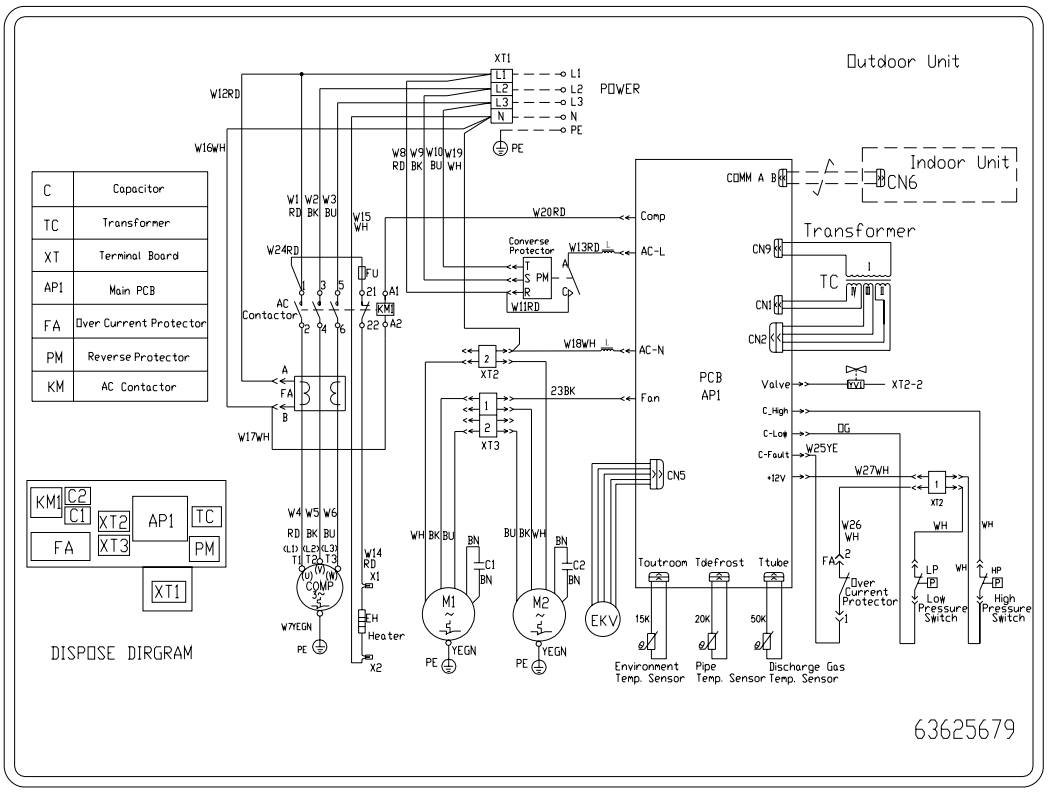
FG20/C-M(I), FG25/C-M(I), FG30/C-M(I), FG40/C-M(I)



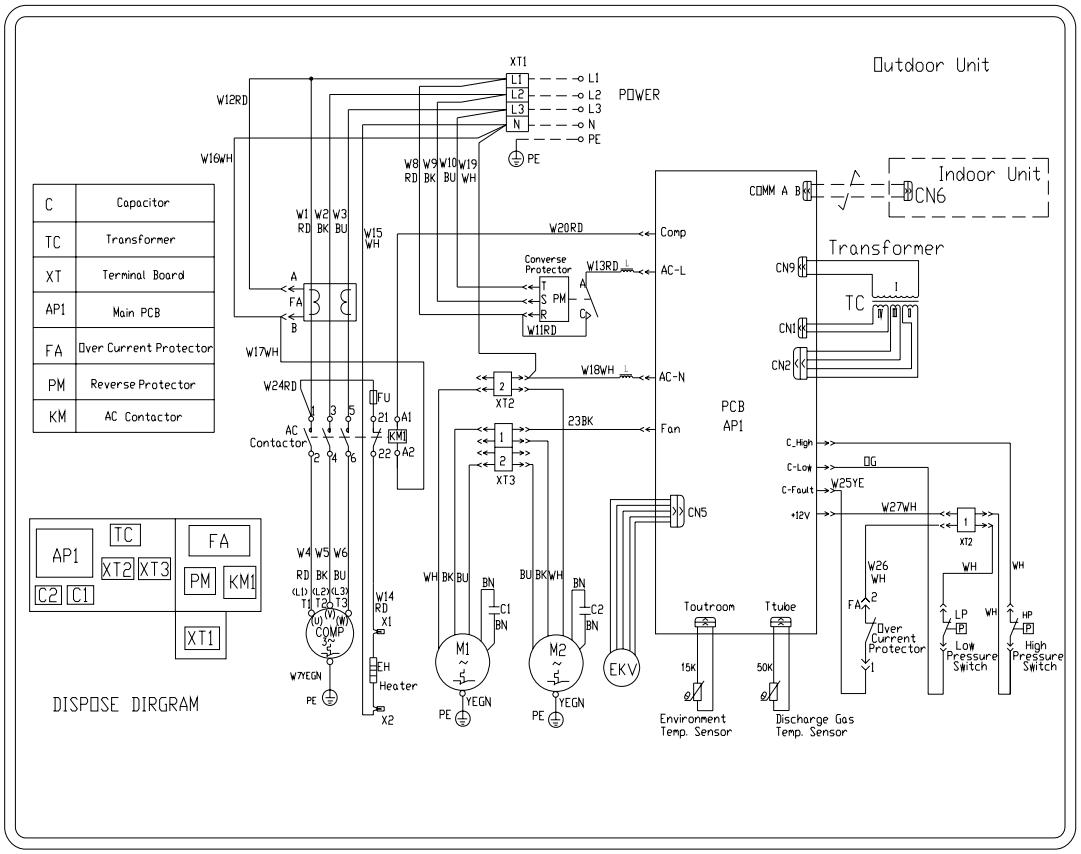
FGR20/C-M (O)



FGR25/C-M (O)

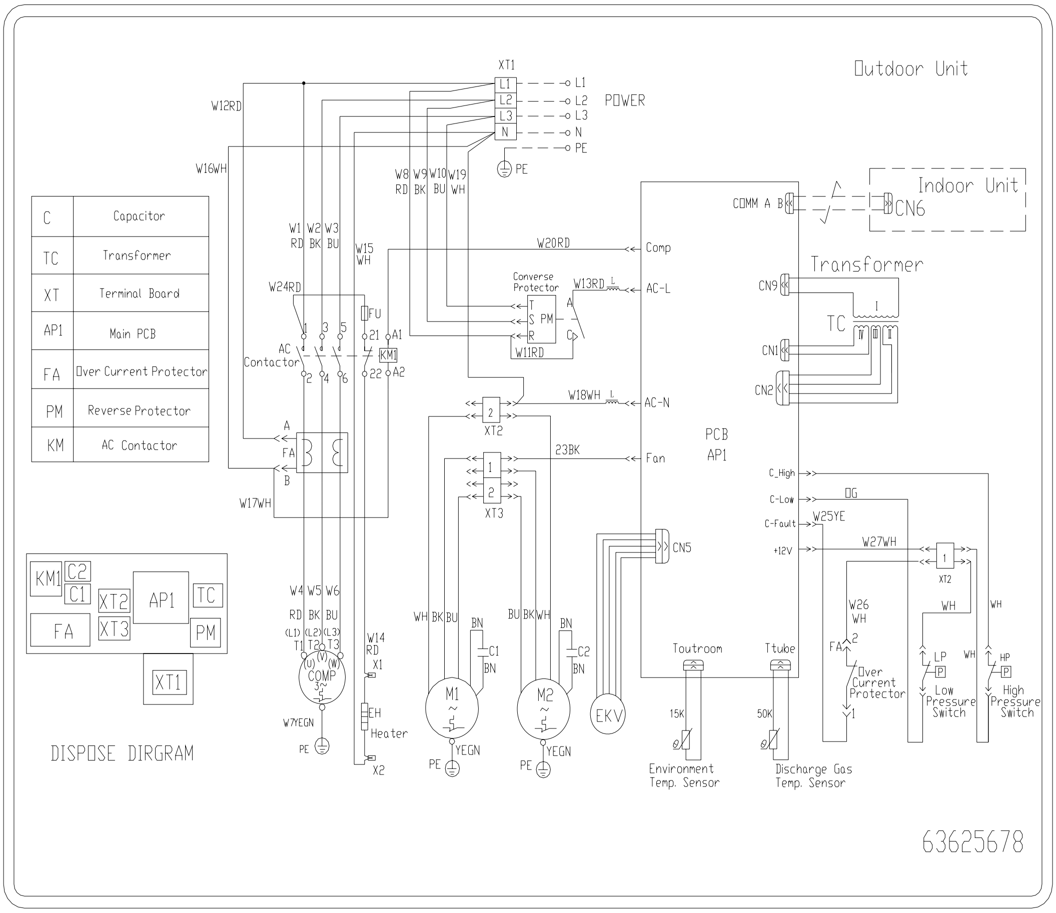


FG20/C-M (O)

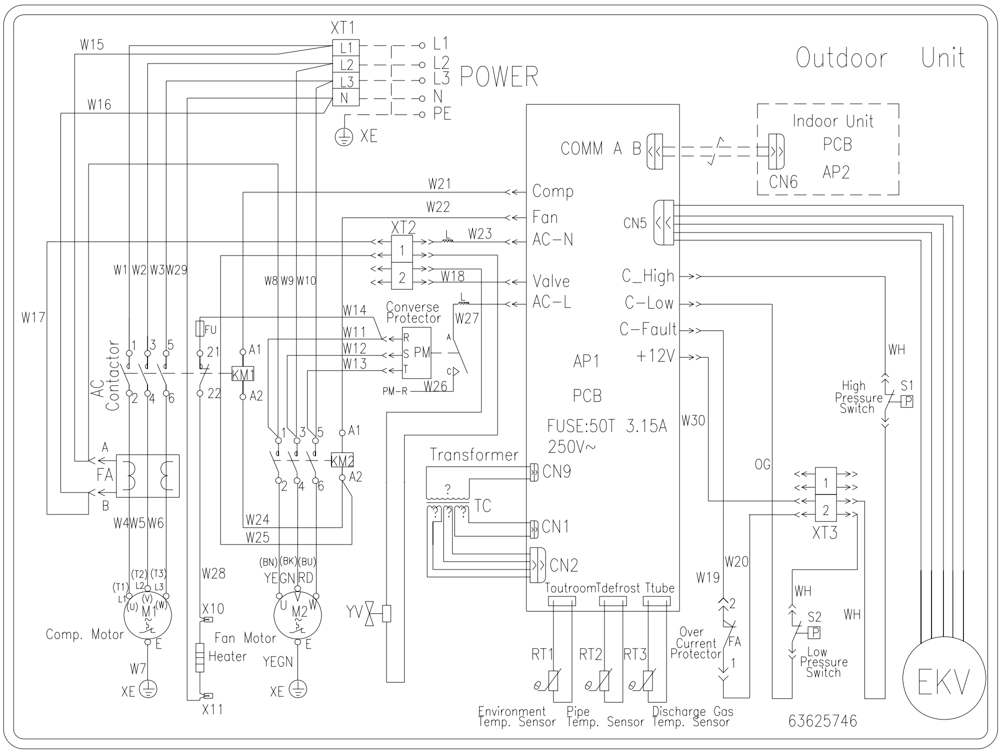


F

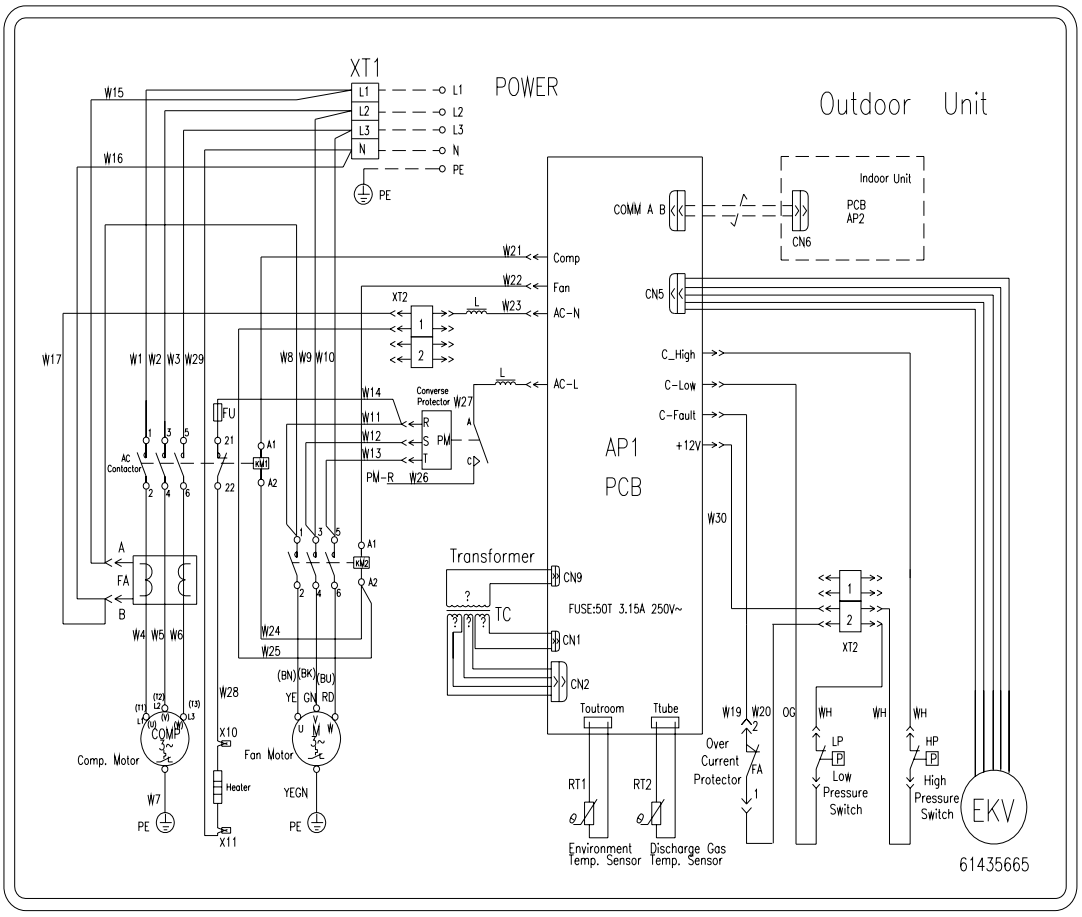
G25/C-M (O)


Outdoor Unit
XT1
L1
L2
L3
N
PE
POWER
Indoor Unit
CN6
COMM A B
C Capacitor
TC Transformer
XT Terminal Board
AP1 Main PCB
FA Over Current Protector
PM Reverse Protector
KM AC Contactor
W12RD
W16WH
W17WH
W24RD
W20RD
W13RD
W11RD
W18WH
23BK
W25YE
W27WH
W26 WH
Comp
AC-L
AC-N
Fan
PCB
AP1
Transformer
TC
CN9
CN1
CN2
CN5
C_High
C-Low
C-Fault
+12V
Converse Protector
AC Contactor
KM1
FU
XT2
XT3
COMP
M1
M2
C1
C2
EKV
EH
Heater
Toutroom
Ttube
Environment Temp. Sensor
Discharge Gas Temp. Sensor
Over Current Protector
LP
Low Pressure Switch
HP
High Pressure Switch
DISPOSE DIRGRAM
63625678

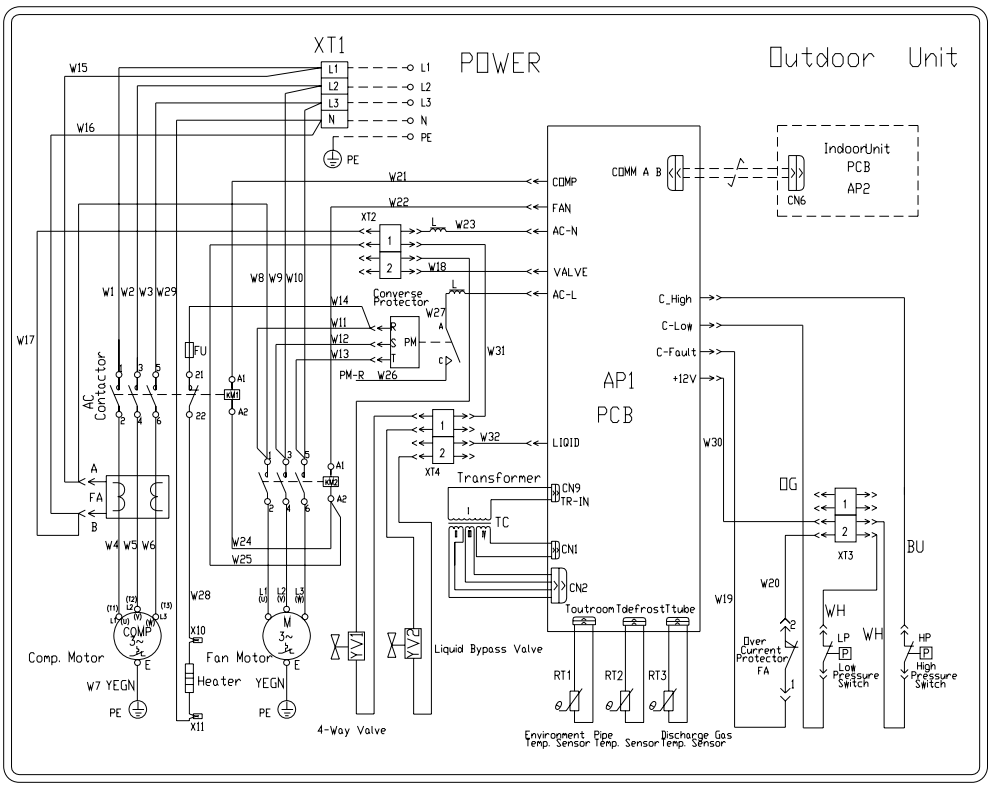
FGR30/C-M (O)


Outdoor Unit
XT1
L1
L2
L3
N
PE
POWER
XE
Indoor Unit
PCB
AP2
CN6
COMM A B
Comp
Fan
AC-N
Valve
AC-L
CN5
C_High
C-Low
C-Fault
+12V
AP1
PCB
FUSE:50T 3.15A
250V~
Transformer
TC
CN9
CN1
CN2
Toutroom Tdefrost Ttube
RT1 RT2 RT3
Environment Temp. Sensor
Pipe Temp. Sensor
Discharge Gas Temp. Sensor
Over Current Protector
High Pressure Switch
Low Pressure Switch
S1
S2
XT2
XT3
Converse Protector
AC Contactor
KM1
KM2
FU
Comp. Motor
Fan Motor
Heater
YV
EKV
63625746

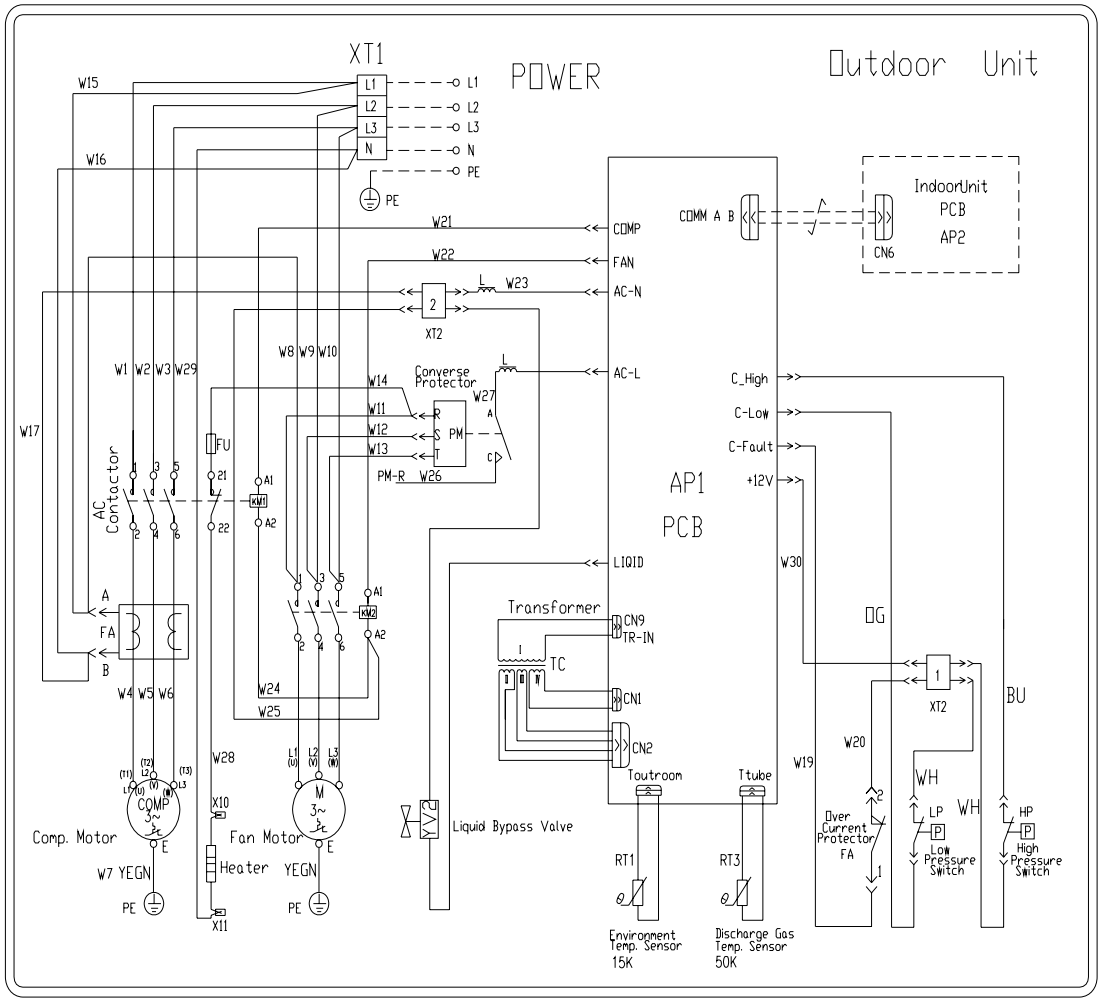
FG30/C-M (O)



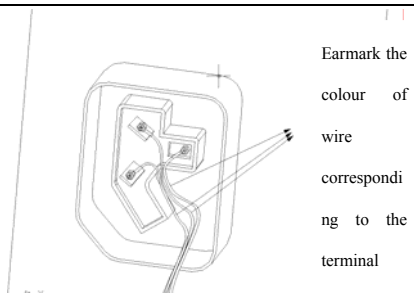
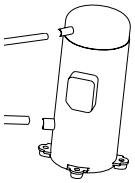
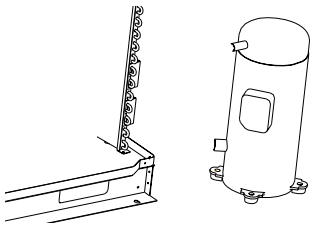
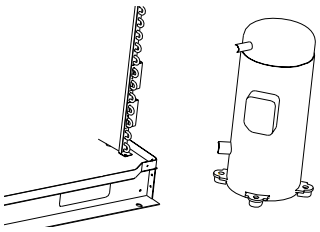
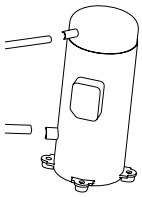
FGR40/C-M (O)

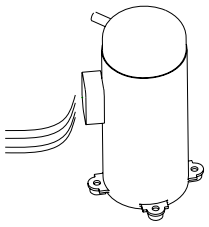
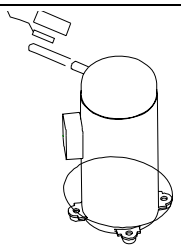


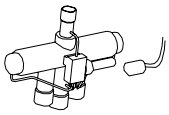
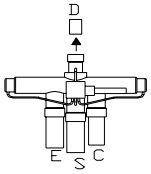
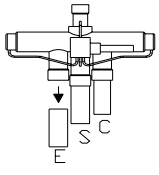
FG40/C-M (O)

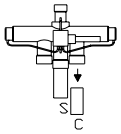
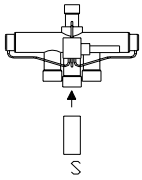
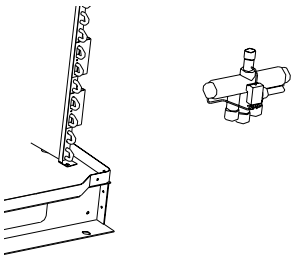

XT1
POWER
Outdoor Unit
L1
L2
L3
N
PE
W15
W16
W17
COMP
FAN
AC-N
AC-L
XT2
W21
W22
W23
COMM A B
IndoorUnit
PCB
AP2
CN6
W1 W2 W3 W29
W8 W9 W10
W14
Converse Protector
W27
W11
W12
W13
PM
PM-R W26
AC Contactor
FU
KM1
KM2
A1
A2
21
22
FA
W4 W5 W6
W24
W25
W28
X10
X11
Comp. Motor
Fan Motor
Heater
W7 YEGN
YEGN
Liquid Bypass Valve
AP1
PCB
LIQID
Transformer
CN9
TR-IN
TC
CN1
CN2
Toutroom
Ttube
RT1
RT3
Envirogment Temp. Sensor 15K
Discharge Gas Temp. Sensor 50K
C_High
C-Low
C-Fault
+12V
W30
W19
W20
XT2
BU
WH
LP
HP
Over Current Protector FA
Low Pressure Switch
High Pressure Switch

4 DISASSEMBLY AND ASSEMBLY PROCEDURE OF MAIN PARTS

Disassembly and Assembly of Compressor		
Remark: Make sure that there isn't any refrigerant in pipe system and the power supply is cut off before removal of the compressor..		
Step	Illustration	Handling Instruction
1．Disconnect the power cord		①Unscrew the retaining screw of power cord with screwdriver. ②Unplug the power cord. Note:Earmark the colour of wire corresponding to the terminal when Removing the wire , and the mixture can be avoided when recovering the wire connection.
2. Cut off the connection between compressor and pipes		Don't leave the welding slag inside pipes
3.Remove the compressor from the chassis		①Unscrew retaining nuts of the footing of compressor ②Remove the compressor from the chassis Hold it tightly to avoid accident.
4.Fix the new compressor on chassis		①Place the new compressor on chassis ②Fix retaining nuts of comprssor footing.
5. Connect the compressor with system pipes		Don't block it by welding.

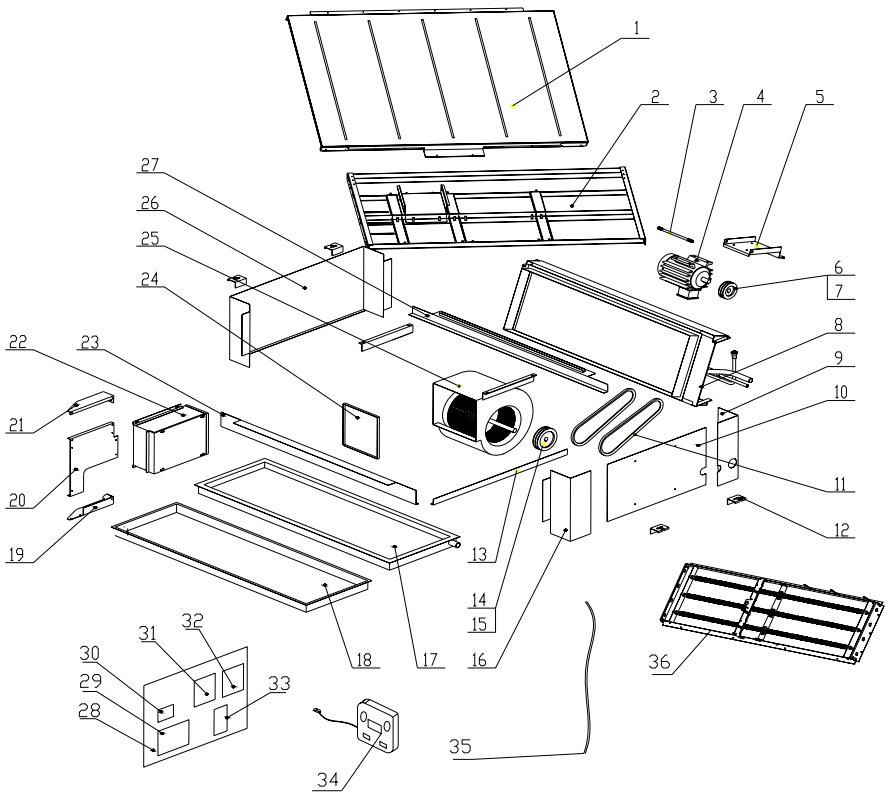
6.Connect the power cord of compressor		Note:Earmark the colour of wire corresponding to the terminal when connecting the wire , and the mixture can be avoided
7.Recover the electric heating tape of compressor and discharge temperature sensor,etc.		Enwind the bottom of compressor with electric heating tape and fix it.
8.Check if the compressor rotates in reverse and if lubricant have leaked		Check if the wiring is correct with reference to circuit diagram and check if there is any leakage after welding.

Disassembly and Assembly of 4-way valve		
Remark: Make sure that there isn't any refrigerant in pipe system and the power supply is cut off before removal of 4-way valve.		
Step	Illustration	Handling Instruction
Remove electric coils of 4- way valve		Place electric coils far away from the 4-way valve to prevent the connecting line of 4-way valve from burning when succeeding welding.
Disconnect the pipe (site D in illustration) of 4-way valve and discharge pipe		Don't leave welding slag inside pipes.
Disconnect the pipe (site E in illustration) of 4-way valve and connecting pipe		Don't leave welding slag inside pipes.

Disconnect the pipe (site C in illustration) of 4-valve and connecting pipe		Don't leave welding slag inside pipes.
Disconnect the pipe (site S in illustration) of 4-way valve and connecting pipe		Don't leave welding slag inside pipes.
Remove the 4-way valve		Remove 4-way valve after it is cooled.
Install new 4-way valve in reversed order and wrap it with wet cloth before welding.		

5 EXPLODED VIEWS AND PART LIST

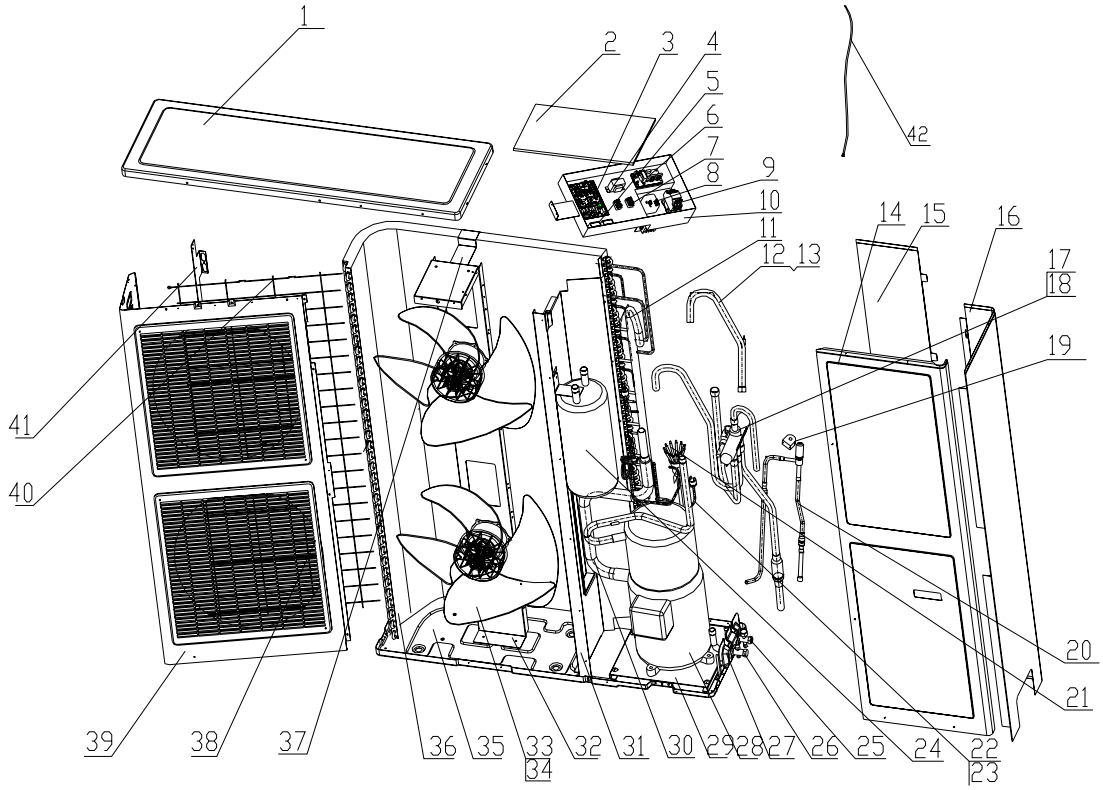
FGR20/C-M（I）



No.	Name	Qty	Product Code
1	Top Cover Sub-Assy	1	`01265352
2	SupportSteelBar	1	`01805367
3	rotate axletree	1	`10549057
4	Fan Motor for indoor unit	1	`15018303
5	Motor Fixed Board	1	` 01845309
6	Belt Pulley	1	` 10548148
7	Taper Sleeve	1	` 10548208
8	Condenser assy and evaporator assy	1	`01025359
9	Right Side Plate Sub-Assy 1	1	` 01315319
10	overhauling side	1	` 01545322
11	Belt SPA	2	` 76318320
12	Hook	4	` 02205302
13	Side beam sub-assy	1	` 01779104
14	Belt Pulley	1	`10548155
15	Taper Sleeve	1	10548218

16	Right Side Plate 2	1	` 01315350
17	FrontPanel_OutsideMachine	1	`01279092
18	MetalBase	1	`01209097
19	Electric Box fixity 3	1	` 01749058
20	Electric Box fixity 2	1	` 01749057
21	Electric Box fixity 1	1	` 01749056
22	Electric Box	1	` 01394921
23	back girder	1	`01875330
24	place with a draught of Connection board	2	01375225
25	Fan Motor Sub-assy	1	15705225
26	Left Side Plate Sub-Assy	1	01315383
27	front girder	1	`01779106
28	Electric Fixed Plate	1	`01339099
29	Main Board	1	` 30224206
30	Terminal Board	1	` 42011257
31	AC Contactor	1	` 44010232
32	Thermorelay	1	` 44020347
33	Wired controller	1	30294217
34	Transformer	1	` 43110239
35	Twin Pair Signal Cable	1	` 40110140
36	Electric Heater Assy	1	` 32105207

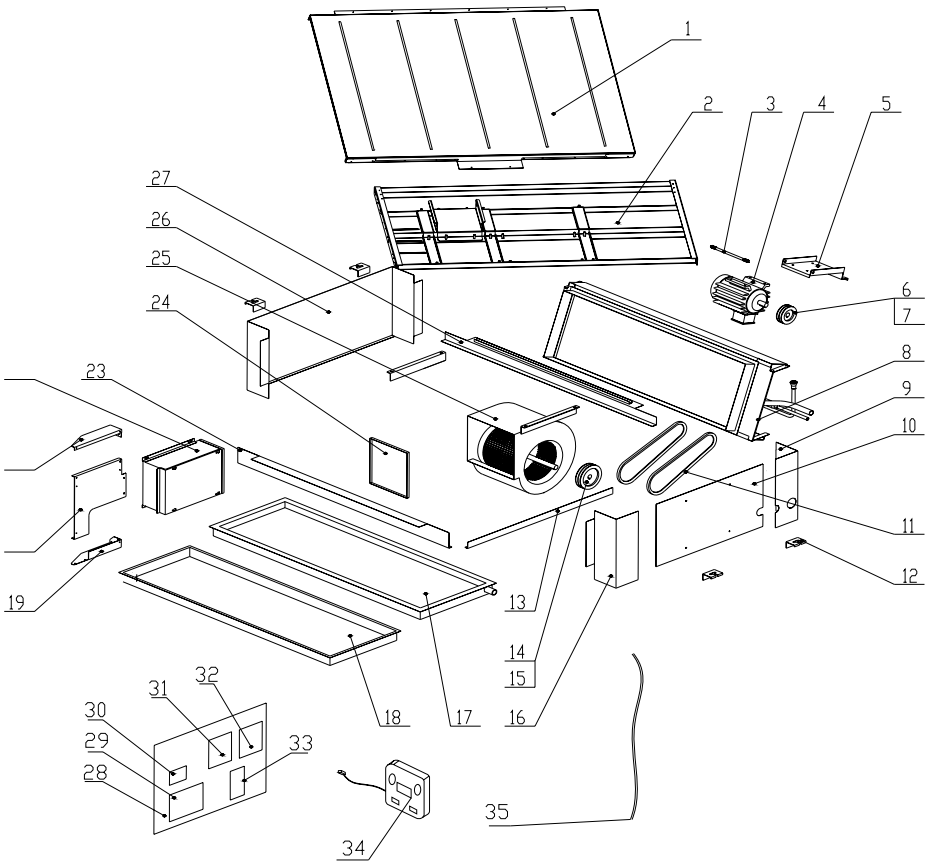
FGR20/C-M（O）



No.	Name	Product Code	Qty
1	Top cover	` 01258730	1
2	Electric Box Cover	` 01264157	1
3	Main Board	` 30224205	1
4	Transformer	` 43110240	1
5	capacitance	` 33010013	1
6	Phase Reverse Protector	` 46020052	1
7	Terminal board	` 42011043	1
8	AC Contactor	` 44010213	1
9	Over Current Protector	` 46020122	1
10	Electric Box Assy	` 01395694	1
11	Collecting Gas Pipe Sub-Assy	` 04675422	1
12	Inhalation Tube Sub-Assy	` 04675424	1
13	LOW Pressure switch	` 4602001510	1
14	Front side plate	` 01314205P	1
15	Rear side Plate Sub-assy	` 01315387P	1
16	Rear side Plate Sub-assy	` 01315384P	1
17	4-way valve sub-assy	` 04145332	1
18	4-way vavle	` 43000407	1
19	4-way valve fitting	` 4300040043	1

20	Electric Expansion valve sub-assy	` 0733525501	1
21	collecting liquid pipe sub-assy	`04415227	1
22	discharge tube sub-assy	` 04635423	1
23	pressure protect switch	` 4602001510	1
24	Gas-liquid separator	` 07424139	1
25	cut-off valve	` 07304101	1
26	cut-off valve	` 07105252	1
27	valve support sub-assy	` 01805386	1
28	compressor	` 00205245	1
29	retaining plate sub-assy	` 01845233P	1
30	Inhalation Tube Sub-Assy	` 04675423	1
31	clapboard sub-assy	` 01245243	1
32	motor support sub-assy	` 01804174	1
33	Axial flow fan	` 10338701	2
34	fan motor	` 15705701	2
35	base plate sub-assy	` 01195235P	1
36	condenser assy	` 01125366	1
37	motor support	` 01895233	1
38	front grill	` 26904119	2
39	front plate	` 01514101P	1
40	reticulation plate	` 01575204	1
41	condenser support plate	` 01804010	1
42	wiring	`4011014008	1

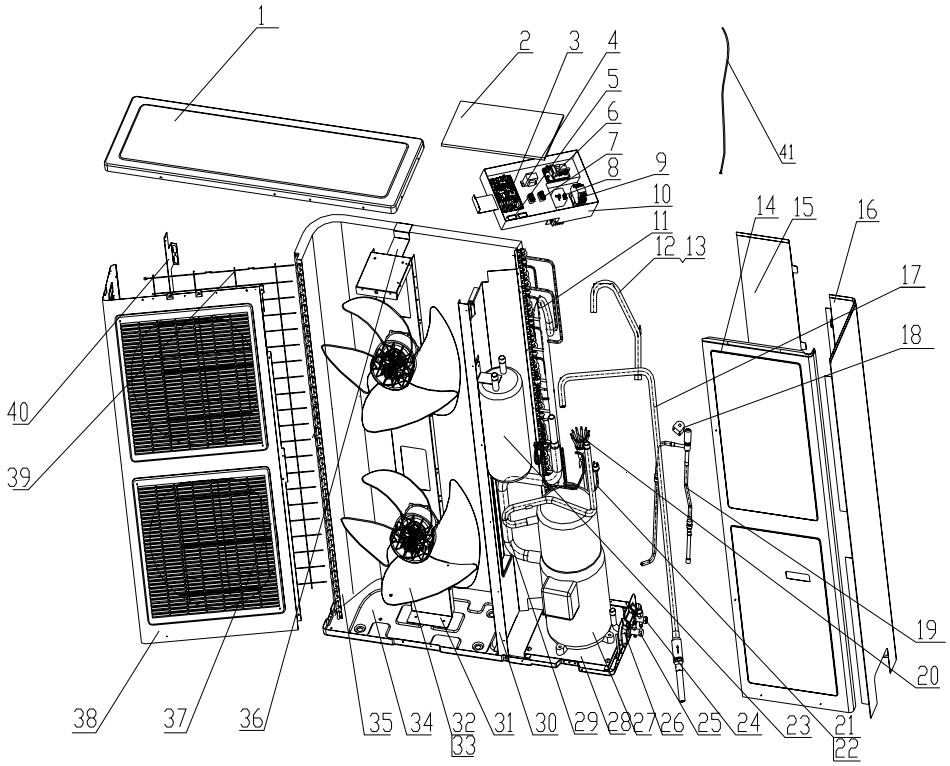
FG20/C-M（I）



No.	Name	Product Code	Qty
1	Top Cover Sub-Assy	1	`01265352
2	SupportSteelBar	1	`01805367
3	rotate axletree	1	`10549057
4	Fan Motor for indoor unit	1	`15018303
5	Motor Fixed Board	1	` 01845309
6	Belt Pulley	1	` 10548148
7	Taper Sleeve	1	` 10548208
8	Condenser assy and evaporator assy	1	`01025359
9	Right Side Plate Sub-Assy 1	1	` 01315319
10	overhauling side	1	` 01545322
11	Belt SPA	2	` 76318320
12	Hook	4	` 02205302
13	Side beam sub-assy	1	` 01779104
14	Belt Pulley	1	`10548155
15	Taper Sleeve	1	10548218
16	Right Side Plate 2	1	` 01315350

17	FrontPanel_OutsideMachine	1	`01279092
18	MetalBase	1	`01209097
19	Electric Box fixity 3	1	` 01749058
20	Electric Box fixity 2	1	` 01749057
21	Electric Box fixity 1	1	` 01749056
22	Electric Box	1	` 01394921
23	back girder	1	`01875330
24	Place with a draught of Connection board	2	01375225
25	Fan Motor Sub-assy	1	15705225
26	Left Side Plate Sub-Assy	1	01315383
27	front girder	1	`01779106
28	Electric Fixed Plate	1	`01339099
29	Main Board	1	` 30224206
30	Terminal Board	1	` 42011257
31	AC Contactor	1	` 44010232
32	Thermorelay	1	` 44020347
33	Wired controller	1	30294217
34	Transformer	1	` 43110239
35	Twin Pair Signal Cable	1	` 40110140

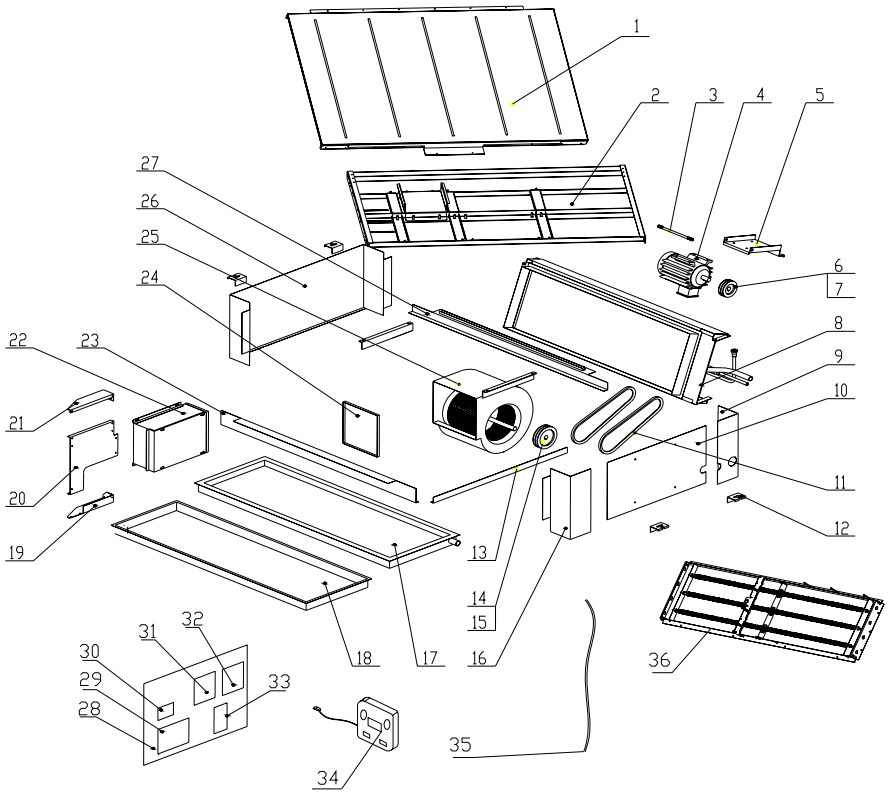
FG20/C-M（O）



No.	Name	Product Code	Qty
1	Top cover	` 01258730	1
2	Electric Box Cover	` 01264157	1
3	Main Board	` 30224208	1
4	Transformer	` 43110240	1
5	capacitance	` 33010013	1
6	Phase Reverse Protector	` 20123702	1
7	Terminal board	` 42011043	1
8	AC Contactor	` 44010213	1
9	Over Current Protector	` 46020122	1
10	Electric Box Assy	` 01395834	1
11	Collecting Gas Pipe Sub-Assy	` 04675422	1
12	Inhalation Tube Sub-Assy	` 04675424	1
13	LOW Pressure switch	`4602001510	1
14	Front side plate	` 01314205P	1
15	Rear side Plate Sub-assy	` 01315387P	1
16	Rear side Plate Sub-assy	` 01315384P	1
17	Electric Expansion valve sub-assy	` 0733525501	1
18	4-way valve Fitting	` 4300040043	1
19	Electric Expansion valve sub-assy	`0733525501	1
20	collecting liquid pipe sub-assy	`04415227	1

21	discharge tube sub-assy	` 04635423	1
22	pressure protect switch	` 4602001510	1
23	Gas-liquid separator	` 07424139	1
24	cut-off valve	` 07304101	1
25	cut-off valve	` 07105252	1
26	valve support sub-assy	` 01805386P	1
27	compressor	` 00205245	1
28	retaining plate sub-assy	` 01844120	1
29	Inhalation Tube Sub-Assy	` 04675423	1
30	clapboard sub-assy	` 01245243	1
31	motor support sub-assy	` 01804174	1
32	Axial flow fan	` 10338701	2
33	fan motor	` 15705701	2
34	base plate sub-assy	` 01195235P	1
35	condenser assy	` 01125366	1
36	motor support	` 01895233	1
37	front grill	` 26904119	2
38	front plate	` 01514101P	1
39	reticulation plate	` 01575204	1
40	condenser support plate	` 01804010	1
41	wiring	`4011014008	1

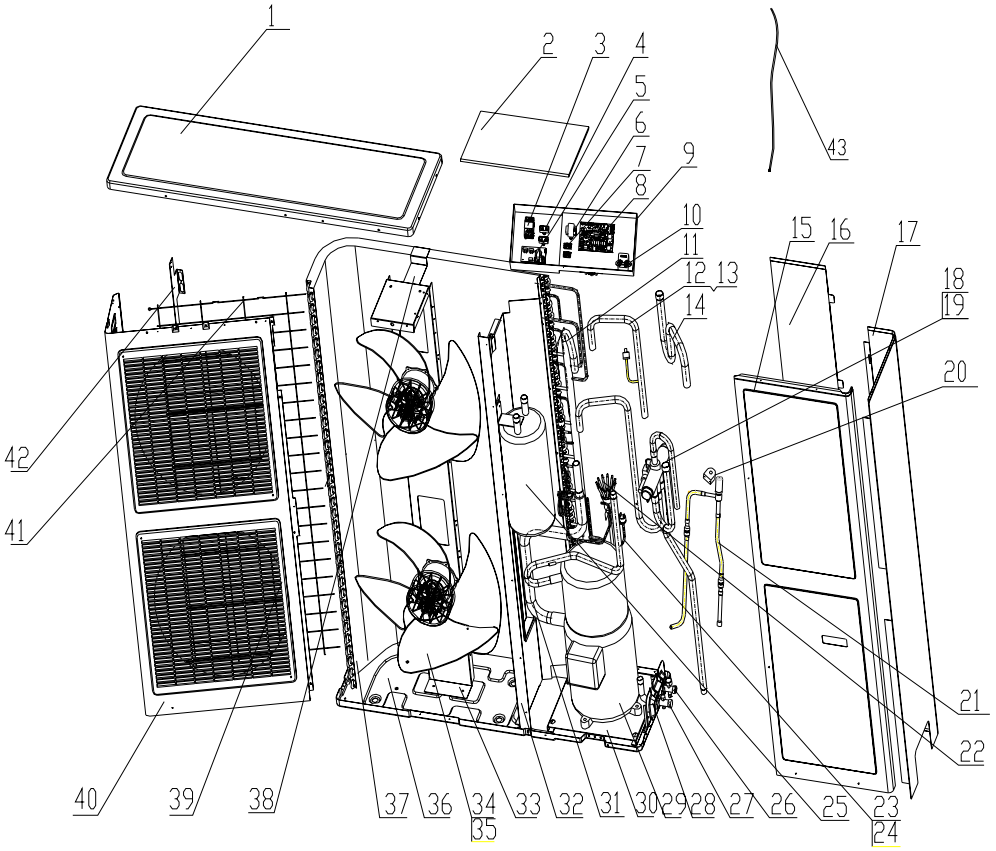
FGR25/C-M（I）



No.	Name	Qty	Product Code
1	Top Cover Sub-Assy	1	`01265352
2	SupportSteelBar	1	`01805367
3	rotate axletree	1	`10549057
4	Fan Motor for indoor unit	1	`15014805
5	Motor Fixed Board	1	` 01845223
6	Belt Pulley	1	` 10548150
7	Taper Sleeve	1	`10548213
8	Condenser assy and evaporator assy	1	`001025347
9	Right Side Plate Sub-Assy 1	1	` 01315319
10	overhauling side	1	` 01545322
11	Belt SPA	2	` 76318341
12	Hook	4	` 02205302
13	Side beam sub-assy	1	` 01779104
14	Belt Pulley	1	`10548156
15	Taper Sleeve	1	10548156
16	Right Side Plate 2	1	` 01315350
17	FrontPanel_OutsideMachine	1	`01284142
18	MetalBase	1	`01194136

19	Electric Box fixity 3	1	` 01749058
20	Electric Box fixity 2	1	` 01749057
21	Electric Box fixity 1	1	` 01749056
22	Electric Box	1	` 01394921
23	back girder	1	`01875330
24	Place with a draught of Connection board	2	01375225
25	Fan Motor Sub-assy	1	15705225
26	Left Side Plate Sub-Assy	1	01315383
27	front girder	1	`01779106
28	Electric Fixed Plate	1	`01339099
29	Main Board	1	` 30224206
30	Terminal Board	1	` 42011257
31	AC Contactor	1	` 44010232
32	Thermorelay	1	` 44020347
33	Wired controller	1	30294217
34	Transformer	1	` 43110239
35	Twin Pair Signal Cable	1	` 40110140
36	Electric Heater Assy	1	` 32105207

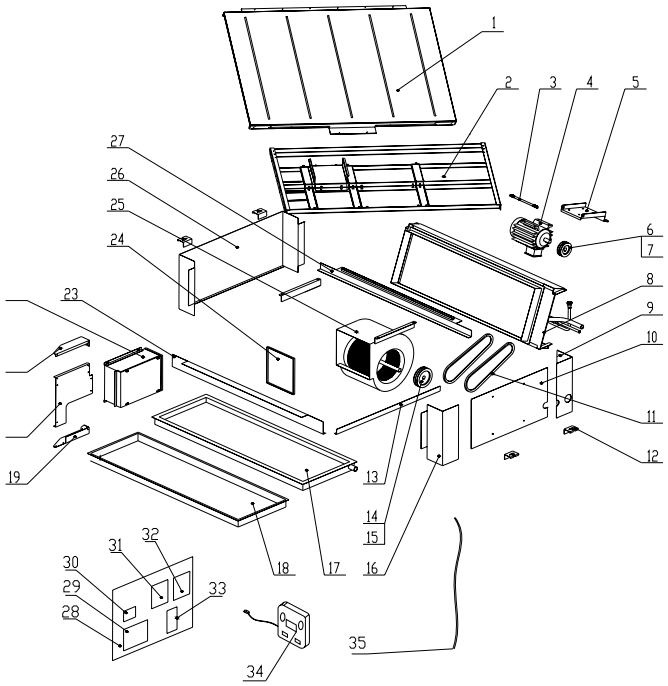
FGR25/C-M（O）



No.	Name	Product Code	Qty
1	top cover	` 01258730	1
2	electric box cover	` 01424002	1
3	AC contactor	` 44010214	1
4	capacitance	` 33010013	1
5	over current protector	` 46020114	1
6	transformer	`43110240	1
7	terminal board	` 42011043	1
8	main board	` 30224205	1
9	electric box assy	` 01395796	1
10	phase reverse protector	` 46020052	1
11	collecting gas pipe sub-assy	` 04675415	1
12	inhalation tube sub-assy	` 04675388	1
13	low pressure switch	`460200157	1
14	connection pipe sub-assy	` 05025619	1
15	rear side plate sub-assy	` 01315359P	1
16	front side plate	` 01308730	1
17	rear side plate sub-assy	` 01315358P	1
18	4-way valve sub-assy	` 04145327	1
19	4-way valve	` 430004061	1
20	4-way valve fittings	` 4300040043	1
21	electric expansion valve sub-assy	` 07335255	1
22	collecting liquid pipe sub-assy	` 04325592	1
23	discharge tube sub-assy	` 04635414	1
24	pressure protect switch	` 4602001522	1
25	gas-liquid separator	` 07424141	1
26	cut-off valve	` 07304101	1
27	cut-off valve	` 07105252	1
28	valve support sub-assy	` 01805386P	1
29	compressor	` 00205247	1
30	retaining plate sub-assy	` 01845224P	1
31	inhalation tube sub-assy	` 04675387	1
32	clapboard sub-assy	` 01245238	1
33	motor support sub-assy	` 01805368	1
34	axial flow fan	` 10338701	1
35	fan motor	` 15705701	2
36	base palte sub-assy	` 01195235P	1
37	condenser assy	` 01125358	1
38	motor support	` 01895233	1
39	front grill	` 26904119	2
40	front plate	` 01438707	1

41	reticulation plate	` 01575203	1
42	candenser suppart plate	` 01895310	1
43	wiring	`4011014008	1

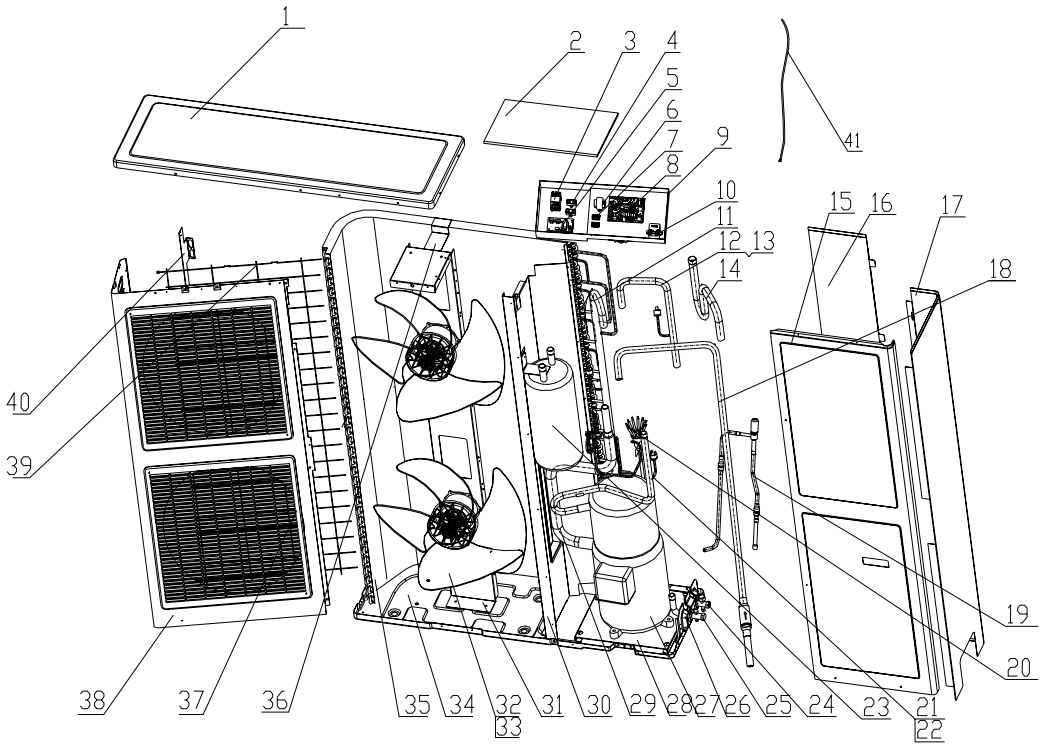
FG25/C-M（I）



No.	Name	Qty	Product Code
1	Top Cover Sub-Assy	1	`01265352
2	SupportSteelBar	1	`01805367
3	rotate axletree	1	`10549057
4	Fan Motor for indoor unit	1	`15014805
5	Motor Fixed Board	1	` 01845223
6	Belt Pulley	1	` 10548150
7	Taper Sleeve	1	`10548213
8	Condenser assy and evaporator assy	1	`001025347
9	Right Side Plate Sub-Assy 1	1	` 01315319
10	overhauling side	1	` 01545322
11	Belt SPA	2	` 76318341
12	Hook	4	` 02205302
13	Side beam sub-assy	1	` 01779104
14	Belt Pulley	1	`10548156
15	Taper Sleeve	1	10548156

16	Right Side Plate 2	1	` 01315350
17	FrontPanel_OutsideMachine	1	`01284142
18	MetalBase	1	`01194136
19	Electric Box fixity 3	1	` 01749058
20	Electric Box fixity 2	1	` 01749057
21	Electric Box fixity 1	1	` 01749056
22	Electric Box	1	` 01394921
23	back girder	1	`01875330
24	place with a draught of Connection board	2	01375225
25	Fan Motor Sub-assy	1	15705225
26	Left Side Plate Sub-Assy	1	01315383
27	front girder	1	`01779106
28	Electric Fixed Plate	1	`01339099
29	Main Board	1	` 30224206
30	Terminal Board	1	` 42011257
31	AC Contactor	1	` 44010232
32	Thermorelay	1	` 44020347
33	Wired controller	1	30294217
34	Transformer	1	` 43110239
35	Twin Pair Signal Cable	1	` 40110140

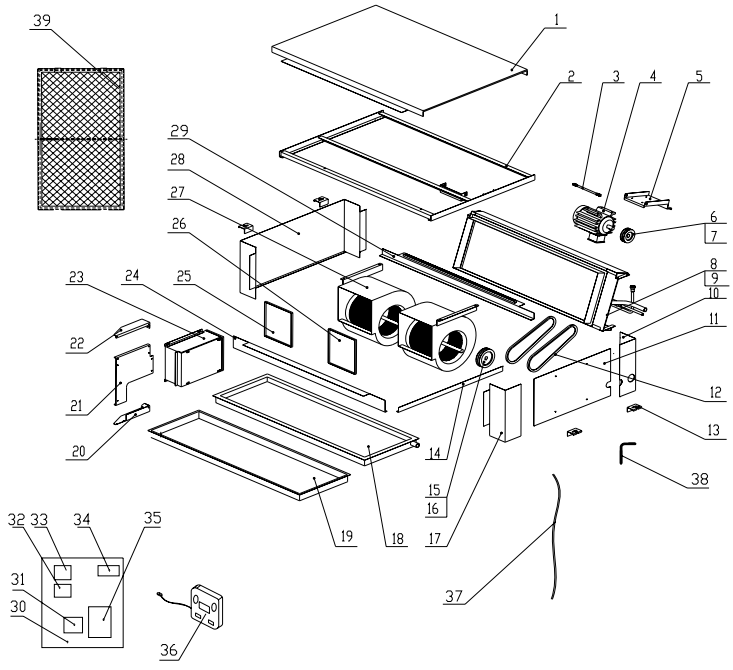
FG25/C-M（O）



NO.	Name	Product Code	Qty
1	top cover	` 01258730	1
2	electric box cover	` 01424002	1
3	AC contactor	` 44010214	1
4	capacitance	` 33010013	1
5	over current protector	` 46020114	1
6	transformer	` 43110240	1
7	terminal board	` 42011043	1
8	main board	` 30224208	1
9	electric box assy	` 01395684	1
10	phase reverse protector	` 46020052	1
11	collecting gas pipe sub-assy	` 04675415	1
12	inhalation tube sub-assy	`04675388	1
13	low pressure switch	`460200157	1
14	connection pipe	`05025673	1
15	rear side plate sub-assy	` 01315359P	1
16	front side plate	` 01308730	1
17	rear side plate sub-assy	` 01315358P	1
18	connection pipe sub-assy	` 05025619	1
19	electric expansion valve sub-assy	` 07335255	1
20	collecting liquid pipe sub-assy	` 04325592	1

21	discharge tube sub-assy	` 04635414	1
22	pressure protect switch	`4602001522	1
23	gas-liquid separator	` 07424141	1
24	cut-off valve	` 07304101	1
25	cut-off valve	` 07305224	1
26	valve support sub-assy	` 01805386	1
27	compressor	` 00205247	1
28	retaining plate sub-assy	` 01845224P	1
29	inhalation tube sub-assy	` 04675387	1
30	clapboard sub-assy	` 01245238	1
31	motor support sub-assy	` 01805368	1
32	axial flow fan	` 10338701	2
33	fan motor	` 15705701	2
34	base palte sub-assy	` 01195235P	1
35	condenser assy	` 01125358	1
36	motor support	` 01895233	1
37	front grill	` 26904119	2
38	front plate	` 01438707	1
39	reticulation plate	` 01575203	1
40	candenser suppart plate	` 01895238	1
41	wiring	`4011014008	1

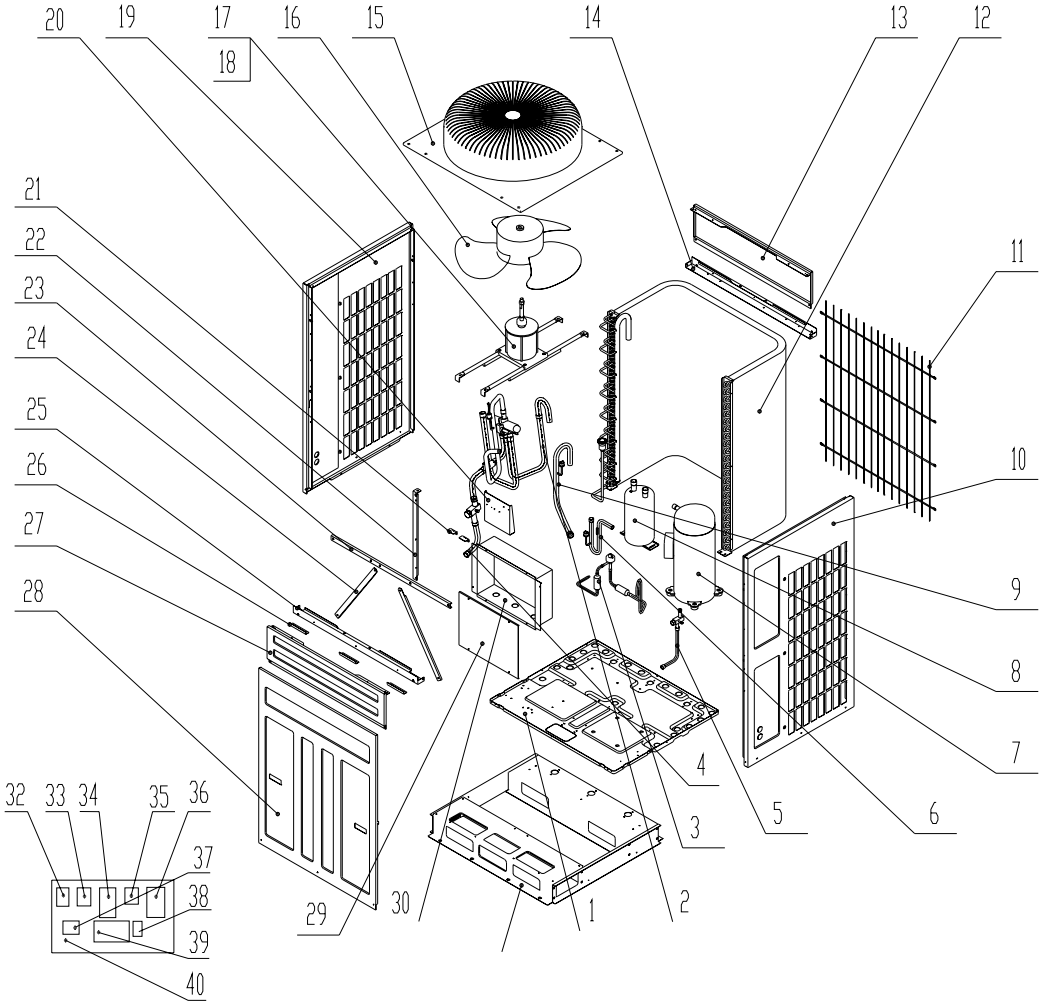
FG（R）30/C-M（I）



No.	Name	Qty	Product Code	
1	Top Cover Sub-Assy	1	` 01259106	
2	SupportSteelBar Assy	1	` 01729165	
3	rotate axletree	1	` 10549057	
4	Fan Motor for indoor unit	1	15009058	
5	Motor Fixed Board Sub-assy	1	， 01845309	
6	Belt Pulley 2-SPA80	1	` 10548152	
7	Taper Sleeve 1210-24	1	` 10548211	
8	Condenser assy and evaporator assy	1	` 01025320	
9	Electric Heater Assy	1	` 32105207	
10	Right Side Plate Sub-Assy 1	1	` 01315319	（only available in CF010N0641）
11	overhauling side	1	` 01539148	
12	Belt SPA(1082mm)	2	` 76318317	
13	Hook	4	， 02205302	
14	Side beam sub-assy	1	` 01875302	
15	Belt Pulley 2-SPA140	1	10548156	
16	Taper Sleeve 2012-25	1	10548218	
17	Right Side Plate 2	1	` 01309105	
18	FrontPanel_OutsideMachine	1	` 01285310P	
19	MetalBase	1	` 01285312	
20	Electric Box fixity 3	1	` 01749058	
21	Electric Box fixity 2	1	` 01749057	
22	Electric Box fixity 1	1	` 01749056	
23	Electric Box	1	` 01395344	
24	back girder	1	` 01779108	
25	place with a draught of Connection board 1	1	` 01389077	
26	place with a draught of Connection board 2	1	` 01389079	
27	Fan Motor Sub-assy	1	15009059	
28	Left Side Plate Sub-Assy	1	` 01315313	
29	front girder	1	` 01779106	
30	Electric Fixed Plate	1	` 01339099	
31	Transformer	1	` 43110239	
32	Thermorelay	1	` 44020367	
33	AC Contactor	1	` 44010229	

34	Terminal Board	1	` 42011257	
35	Main Board	1	` 30224206	
36	Wired controller	1	` 30294217	
37	Twin Pair Signal Cable	1	` 40010232	
38	measure staff	1	` 02169050	
39	Filter Sub-Assy	1	` 11129070	

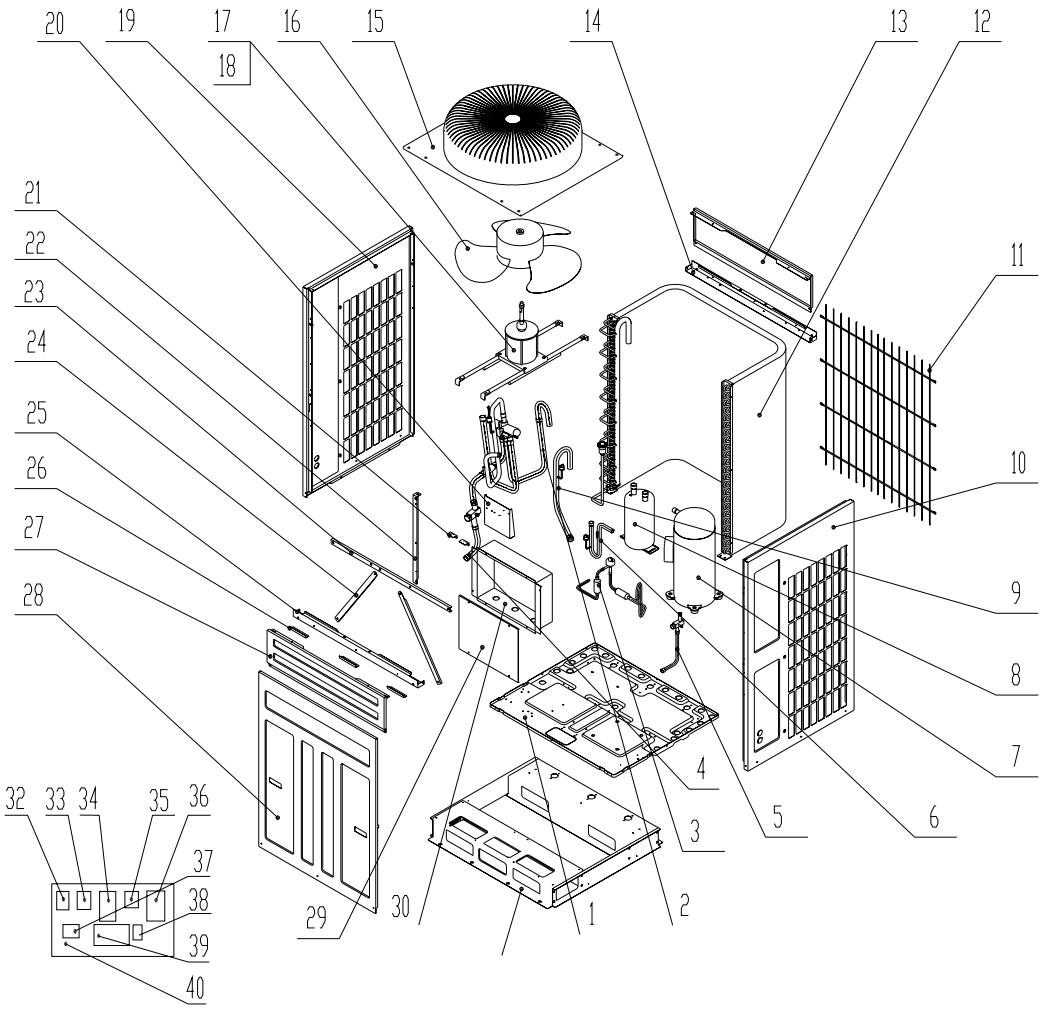
FGR30/C-M（O）



No.	Name	Qty	Product Code
1	Base Plate Sub-Assy	1	` 01195230P
2	4-way Valve with coil	1	` 04145295
3	Electric Expansion Valve Sub-Assy	1	` 07335238
4	Cut-off Valve	1	` 07130127
5	Liquid valve sub-assy	1	` 07109068
6	Discharge Tube	1	` 04615486

7	Compressor and Fittings	1	` 00100298
8	Gas-liquid Separator	1	` 072290571
9	Inhalation Tube Sub-Assy	1	` 04675356
10	Right side plate	1	` 01318759
11	Rear Grille	1	` 01238740
12	Condenser Assy	1	` 01125313
13	Back Cover Board	1	` 01258737
14	Back Support Plate	1	` 02225205P
15	Streamlined Dome	1	` 22265801
16	Fan Blade	1	` 10355801
17	Motor	1	` 15405244
18	Motor	1	` 15015802
19	Left side plate sub-assy	1	` 01314301P
20	Support 1	1	` 01804632
21	Support 3	1	` 01804634
22	Support plate 1(Electric Box)	1	` 01894602
23	Support plate sub-assy 1	1	` 01894607
24	Support plate 3	1	` 017987834
25	Supporting Strip	1	` 01894605
26	Supporting Strip	1	` 01798808
27	Front plate 1	1	` 01538736
28	Front plate 2	1	` 01538734
29	Electric Box Cover	1	` 01419059
30	Electric Box	1	` 01395728
31	Base Frame Sub-Assy	1	` 01284609
32	AC Contactor	1	` 44010214
33	AC Contactor	1	` 44010229
34	Phase Reverse Protector	1	` 46020052
35	Transformer	1	` 43110240
36	Main Board	1	` 30224205
37	Terminal Board	1	` 42011043
38	Terminal Board	1	` 42011103
39	Over Current Protector	1	` 46020113
40	Electric Panel Assy	1	` 01409075

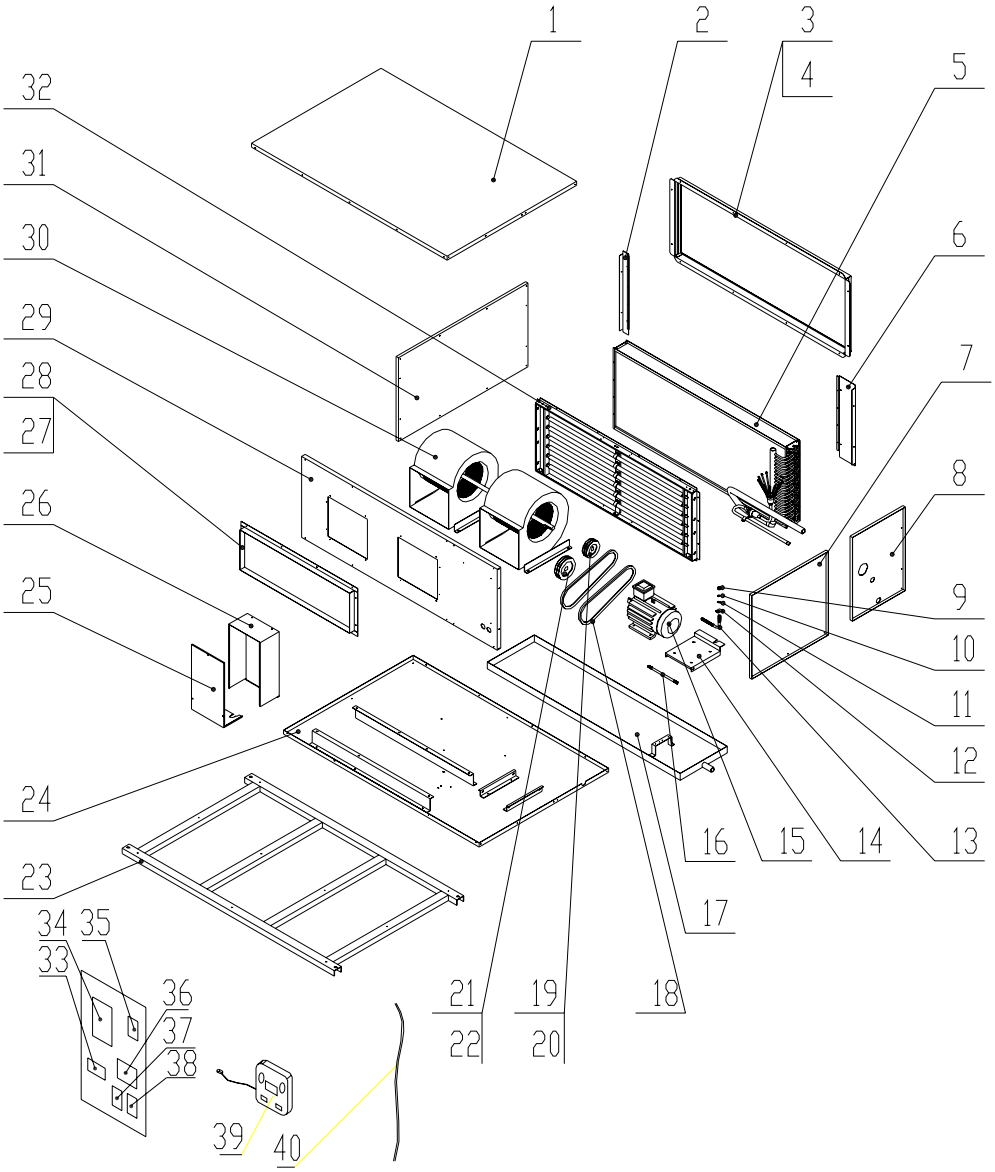
FG30/C-M（O）



No.	Name	Qty	Product Code
1	Base Plate Sub-Assy	1	` 01195230P
2	4-way Valve with coil	0	` 04145295
3	Electric Expansion Valve Sub-Assy	1	` 07335238
4	Cut-off Valve	1	` 07130127
5	Liquid valve sub-assy	1	` 07109068
6	Discharge Tube	1	` 04615486
7	Compressor and Fittings	1	` 00100298
8	Gas-liquid Separator	1	` 072290571
9	Inhalation Tube Sub-Assy	1	` 04675356
10	Right side plate	1	` 01318759
11	Rear Grille	1	` 01238740
12	Condenser Assy	1	` 01125313
13	Back Cover Board	1	` 01258737
14	Back Support Plate	1	` 02225205P
15	Streamlined Dome	1	` 22265801

16	Fan Blade	1	` 10355801
17	Motor	1	` 15405244
18	Motor	1	` 15015802
19	Left side plate sub-assy	1	` 01314301P
20	Support 1	1	` 01804632
21	Support 3	1	` 01804634
22	Support plate 1(Electric Box)	1	` 01894602
23	Support plate sub-assy 1	1	` 01894607
24	Support plate 3	1	` 017987834
25	Supporting Strip	1	` 01894605
26	Supporting Strip	1	` 01798808
27	Front plate 1	1	` 01538736
28	Front plate 2	1	` 01538734
29	Electric Box Cover	1	` 01419059
30	Electric Box	1	` 01395728
31	Base Frame Sub-Assy	1	` 01284609
32	AC Contactor	1	` 44010214
33	AC Contactor	1	` 44010229
34	Phase Reverse Protector	1	` 46020052
35	Transformer	1	` 43110240
36	Main Board	1	` 30224205
37	Terminal Board	1	` 42011043
38	Terminal Board	1	` 42011103
39	Over Current Protector	1	` 46020113
40	Electric Panel Assy	1	` 01409075

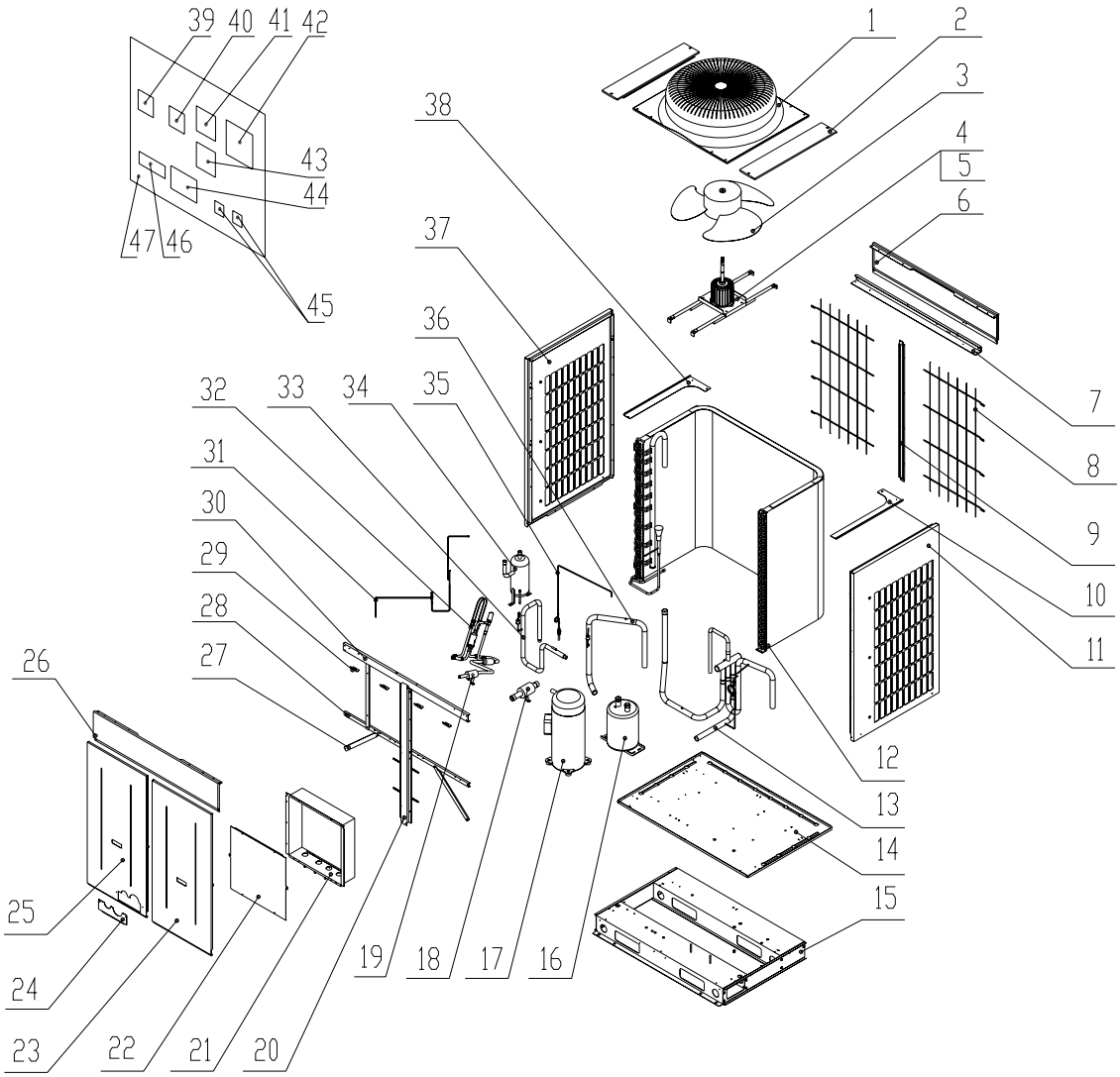
FG（R）40/C-M（I）



No.	Name	Qty	Product Code
1	Top Cover Sub-Assy	1	` 01265209
2	Retaining Plate Sub-Assy	1	` 01845205
3	Return Air Frame Sub-Assy	1	` 01375208P
4	Return Air Frame Sub-Assy	1	` 01875208P
5	Evaporator Assy	1	` 01025335
6	Retaining Plate Sub-Assy	1	` 01845207
7	Side Panel	1	` 01545212
8	Side Panel	1	` 01545210
9	Nut	1	` 70310114
10	Blot	1	` 70410312

11	Washer	1	` 70410309
12	Hook	1	` 02139056
13	Sheet Metal Piece	1	` 02169050
14	Retaining Plate	1	` 01845319
15	Fan Motor	1	` 15014805
16	rotate axletree	1	` 10549057
17	Water Collecting Tray Sub-Assy	1	` 01285219
18	Belt SPA	1	` 76318309
19	Belt Pulley	1	` 10548149
20	Taper Sleeve	1	` 10548213
21	Belt Pulley	1	` 10548155
22	Taper Sleeve	1	` 10548218
23	Sheet Metal Piece	1	` 01805212P
24	Base Plate Sub-Assy	1	` 01285222P
25	Electric Box Cover	1	` 01425304P
26	Electric Box Sub-Assy	1	` 01395346
27	Air Outlet Frame	1	` 01375210P
28	Air Outlet Side Board	1	` 01375209P
29	Frame Plate	1	` 01545213
30	Motor	1	` 15705214
31	Side Panel	1	` 01545212
32	Electric Heater Assy		/
33	Terminal Board	1	` 42011257
34	Main Board	1	`30224206
35	Transformer	1	` 43110239
36	Switch	1	` 46028101
37	AC contactor	1	` 44010213
38	AC contactor	1	` 44010229
39	Wired controller	1	` 30294217
40	Twin Pair Signal Cable	1	` 40010232

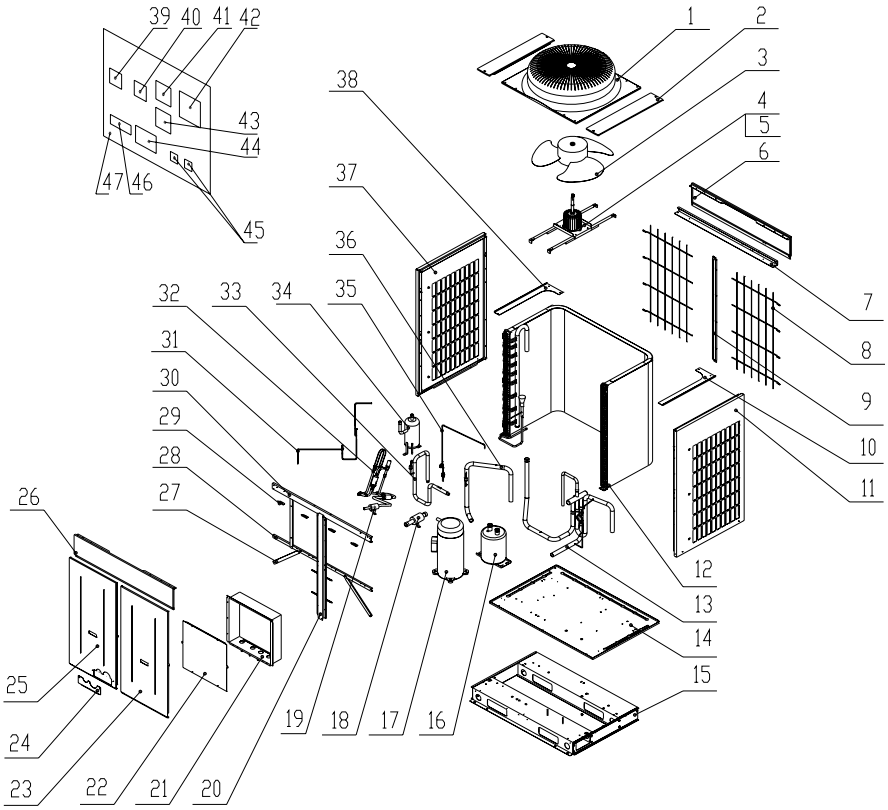
FGR40/C-M（O）



No.	Name	Qty	Product Code
1	Streamlined Dome	1	` 22265801
2	Top Cover Plate	1	`01264110P
3	Fan Blade	1	`10355801
4	Motor Assy	1	` 15404601
5	Motor SW650A	1	` 15704601
6	Rear Panel	1	`01544104P
7	Rear Lining Board Sub-Assy	1	`01264113P
8	Rear isolation sheet	1	`22414101
9	Rear Strengthen Girder	1	01854102P
10	right Cover Plate	1	`01264116P
11	Right Side Plate	1	` 01315344P
12	Condenser Assy	1	` 01125724
13	4-way Valve Sub-Assy	1	` 04145262
14	Base Plate Sub-Assy	1	`01195210P

15	Base Frame Sub-Assy	1	`01285242
16	Gas-liquid Separator	1	` 07421111
17	Compressor	1	` 00203007
18	Ball Valve	1	` 07180005
19	Liquid Valve Sub-Assy	1	`07108627
20	Front vertical prop sub-assy	1	`01854103P
21	Electric Box Assy	1	` 01395795
22	Eletric box cover 1	1	`01424108P
23	Front panel 1	1	`01544101P
24	Cover Plate	1	`01264133P
25	panel	2	`01544102P
26	Front Panel	1	`01544103P
27	Reinforced bar	3	`02224103P
28	Support plate	1	`01894101P
29	Support plate（panel）	1	`01894104P
30	Front Lining Board Sub-Assy	1	`01264111P
31	Liquid by-pass sub-assy	1	` 04615396
32	Electric Expansion Valve Sub-Assy	1	` 07335239
33	Discharge Tube Sub-Assy	1	` 04635362
34	Oil Separator	1	`07423202
35	oil Return Tube Sub-Assy	1	`04325340
36	Inhalation Tube Sub-Assy	1	` 04675369
37	Left Side Plate Sub-Assy	1	` 01314136P
38	left Cover Plate	1	` 01264115P
39	AC Contactor	1	` 44010229
40	AC Contactor	1	` 44010240
41	Phase Reverse Protector	1	` 46020052
42	Main Board WZ4235A	1	` 30224205
43	Transformer	1	` 4311024001
44	Over current protector HD-36-22	1	` 46020121
45	Terminal Board 2-8	2	` 42011103
46	Terminal Board	1	` 42011051
47	Original PCB Mounting Plate Sub-Assy	1	` 01325243

FG40/C-M（O）



No.	Name	Qty	Product Code
1	Streamlined Dome	1	` 22265801
2	Top Cover Plate	1	`01264110P
3	Fan Blade	1	`10355801
4	Motor Assy	1	` 15404601
5	Motor SW650A	1	` 15704601
6	Rear Panel	1	`01544104P
7	Rear Lining Board Sub-Assy	1	`01264113P
8	Rear isolation sheet	1	`22414101
9	Rear Strengthen Girder	1	01854102P
10	right Cover Plate	1	`01264116P
11	Right Side Plate	1	` 01315344P
12	Condenser Assy	1	` 01125724
13	4-way Valve Sub-Assy	0	` 04145262
14	Base Plate Sub-Assy	1	`01195210P
15	Base Frame Sub-Assy	1	`01285242
16	Gas-liquid Separator	1	` 07421111
17	Compressor	1	` 00203007
18	Ball Valve	1	` 07180005
19	Liquid Valve Sub-Assy	1	`07108627
20	Front vertical prop sub-assy	1	`01854103P
21	Electric Box Assy	1	` 01395795

22	Eletric box cover 1	1	`01424108P
23	Front panel 1	1	`01544101P
24	Cover Plate	1	`01264133P
25	panel	2	`01544102P
26	Front Panel	1	`01544103P
27	Reinforced bar	3	`02224103P
28	Support plate	1	`01894101P
29	Support plate（panel）	1	`01894104P
30	Front Lining Board Sub-Assy	1	`01264111P
31	Liquid by-pass sub-assy	1	` 04615396
32	Electric Expansion Valve Sub-Assy	1	` 07335239
33	Discharge Tube Sub-Assy	1	` 04635362
34	Oil Separator	1	`07423202
35	oil Return Tube Sub-Assy	1	`04325340
36	Inhalation Tube Sub-Assy	1	` 04675369
37	Left Side Plate Sub-Assy	1	` 01314136P
38	left Cover Plate	1	` 01264115P
39	AC Contactor	1	` 44010229
40	AC Contactor	1	` 44010240
41	Phase Reverse Protector	1	` 46020052
42	Main Board WZ4235A	1	` 30224205
43	Transformer	1	` 4311024001
44	Over current protector HD-36-22	1	` 46020121
45	Terminal Board 2-8	2	` 42011103
46	Terminal Board	1	` 42011051
47	Original PCB Mounting Plate Sub-Assy	1	` 01325243