

Service Manual

Models: GWH09QB-K3DNA1G GWH12QC-K3DNB4G
GWH09QB-K3DNA2G GWH12QC-K3DNB6G
GWH09QB-K3DNA5G (Refrigerant R410A)
GWH09QB-K3DNB2G
GWH09QB-K3DNB4G
GWH09QB-K3DNB6G
GWH12QC-K3DNA1G
GWH12QC-K3DNA2G
GWH12QC-K3DNA5G
GWH12QC-K3DNB2G

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2. Specifications

2.1 Specification Sheet

Parameter		Unit	Value
Model			1.GWH09QB-K3DNA1G 2.GWH09QB-K3DNA5G 3.GWH09QB-K3DNB2G 4.GWH09QB-K3DNB4G 5.GWH09QB-K3DNB6G
Product Code			1.CB419005501 2.CB425003501 3.CB432002201 4.CB434002301 5.CB435000401
Power Supply	Rated Voltage	V~	220-240
	Rated Frequency	Hz	50
	Phases		1
Power Supply Mode			Outdoor
Cooling Capacity(Min~Max)		W	2600(450~3230)
Heating Capacity(Min~Max)		W	2800(450~4100)
Cooling Power Input(Min~Max)		W	805(200~1420)
Heating Power Input(Min~Max)		W	755(200~1550)
Cooling Current Input		A	3.7
Heating Current Input		A	3.4
Rated Input		W	1550
Rated Current		A	6.9
Air Flow Volume(SH/H/M//L/SL)		m ³ /h	560/490/430/330/-
Dehumidifying Volume		L/h	0.8
EER		W/W	3.23
COP		W/W	3.71
SEER		W/W	6.1
HSPF		W/W	/
Application Area		m ²	12-18
Indoor Unit	Indoor Unit Model		1.GWH09QB-K3DNA1G/I 2.GWH09QB-K3DNA5G/I 3.GWH09QB-K3DNB2G/I 4.GWH09QB-K3DNB4G/I 5.GWH09QB-K3DNB6G/I
	Indoor Unit Product Code		1.CB419N05501 2.CB425N03500 3.CB432N02200 4.CB434N02300 5.CB435N00400
	Fan Type		Cross-flow
	Fan Diameter Length(DXL)	mm	Φ98X580
	Cooling Speed(SH/H/M//L/SL)	r/min	1300/1200/1050/800/-
	Heating Speed(SH/H/M//L/SL)	r/min	1300/1200/1050/900/-
	Fan Motor Power Output	W	20
	Fan Motor RLA	A	0.215
	Fan Motor Capacitor	μF	1
	Evaporator Form		Aluminum Fin-copper Tube
	Evaporator Pipe Diameter	mm	Φ5
	Evaporator Row-fin Gap	mm	2-1.4
	Evaporator Coil Length (LXDXW)	mm	584X22.8X266.7
	Swing Motor Model		MP24AA
	Swing Motor Power Output	W	1.5
	Fuse Current	A	3.15
	Sound Pressure Level(SH/H/M//L/SL)	dB (A)	39/36/32/26/-
	Sound Power Level(SH/H/M//L/SL)	dB (A)	55/52/44/38/-
	Dimension (WXHXD)	mm	790X275X200
	Dimension of Carton Box (LXWXH)	mm	863X268X352
Dimension of Package(LXWXH)	mm	866X271X367	
Net Weight	kg	9	
Gross Weight	kg	11	

Outdoor Unit	Outdoor Unit Model		GWH09QB-K3DNA1G/O	
	Outdoor Unit Product Code		CB419W05501	
	Compressor Manufacturer		ZHUHAI LANDA COMPRESSOR CO.,LTD.	
	Compressor Model		QXA-A086zC190	
	Compressor Oil		RB68EP	
	Compressor Type		Rotary	
	Compressor LRA.	A		40
	Compressor RLA	A		3.1
	Compressor Power Input	W		850
	Compressor Overload Protector			1NT11L-6233
	Throttling Method			Electron expansion valve
	Set Temperature Range	°C		16~30
	Cooling Operation Ambient Temperature Range	°C		-15~43
	Heating Operation Ambient Temperature Range	°C		-20~24
	Condenser Form			Aluminum Fin-copper Tube
	Condenser Pipe Diameter	mm		Φ7
	Condenser Rows-fin Gap	mm		1-1.4
	Condenser Coil Length (LXDXW)	mm		710X19.05X508
	Fan Motor Speed	rpm		900
	Fan Motor Power Output	W		30
	Fan Motor RLA	A		0.36
	Fan Motor Capacitor	μF		/
	Outdoor Unit Air Flow Volume	m ³ /h		1600
	Fan Type			Axial-flow
	Fan Diameter	mm		Φ400
	Defrosting Method			Automatic Defrosting
	Climate Type			T1
	Isolation			I
	Moisture Protection			IP24
	Permissible Excessive Operating Pressure for the Discharge Side	MPa		4.3
	Permissible Excessive Operating Pressure for the Suction Side	MPa		2.5
	Sound Pressure Level (H/M/L)	dB (A)		52/-/-
Sound Power Level (H/M/L)	dB (A)		61/-/-	
Dimension(WXHXD)	mm		776X540X320	
Dimension of Carton Box (LXWXH)	mm		848X360X580	
Dimension of Package(LXWXH)	mm		851X363X595	
Net Weight	kg		28	
Gross Weight	kg		31	
Refrigerant			R410A	
Refrigerant Charge	kg		0.7	
Connection Pipe	Connection Pipe Length	m	5	
	Connection Pipe Gas Additional Charge	g/m	20	
	Outer Diameter Liquid Pipe	mm	Φ6	
	Outer Diameter Gas Pipe	mm	Φ9.52	
	Max Distance Height	m	10	
	Max Distance Length	m	15	
	Note: The connection pipe applies metric diameter.			

The above data is subject to change without notice. Please refer to the nameplate of the unit.

Parameter		Unit	Value	
Model			1.GWH09QB-K3DNA1G 2.GWH09QB-K3DNA2G 3.GWH09QB-K3DNB4G 4.GWH09QB-K3DNB6G	
Product Code			1.CB419005500 2.CB426001200 3.CB434002302 4.CB435000403	
Power Supply	Rated Voltage	V~	220-240	
	Rated Frequency	Hz	50	
	Phases		1	
Power Supply Mode			Outdoor	
Cooling Capacity(Min~Max)		W	2600(450~3230)	
Heating Capacity(Min~Max)		W	2800(450~4100)	
Cooling Power Input(Min~Max)		W	805(200~1420)	
Heating Power Input(Min~Max)		W	755(200~1550)	
Cooling Current Input		A	3.7	
Heating Current Input		A	3.4	
Rated Input		W	1550	
Rated Current		A	6.9	
Air Flow Volume(SH/H/M//L/SL)		m ³ /h	560/490/430/330/-	
Dehumidifying Volume		L/h	0.8	
EER		W/W	3.23	
COP		W/W	3.71	
SEER		W/W	6.1	
HSPF		W/W	/	
Application Area		m ²	12-18	
Indoor Unit	Indoor Unit Model		1.GWH09QB-K3DNA1G/I 2.GWH09QB-K3DNA2G/I 3.GWH09QB-K3DNB4G/I 4.GWH09QB-K3DNB6G/I	
	Indoor Unit Product Code		1.CB419N05500 2.CB426N01200 3.CB434N02302 4.CB435N00403	
	Fan Type		Cross-flow	
	Fan Diameter Length(DXL)		mm	Φ98X580
	Cooling Speed(SH/H/M//L/SL)		r/min	1300/1200/1050/800/-
	Heating Speed(SH/H/M//L/SL)		r/min	1300/1200/1050/900/-
	Fan Motor Power Output		W	20
	Fan Motor RLA		A	0.215
	Fan Motor Capacitor		μF	1
	Evaporator Form			Aluminum Fin-copper Tube
	Evaporator Pipe Diameter		mm	Φ5
	Evaporator Row-fin Gap		mm	2-1.4
	Evaporator Coil Length (LXDXW)		mm	584X22.8X266.7
	Swing Motor Model			MP24AA
	Swing Motor Power Output		W	1.5
	Fuse Current		A	3.15
	Sound Pressure Level(SH/H/M//L/SL)		dB (A)	39/36/32/26/-
	Sound Power Level(SH/H/M//L/SL)		dB (A)	55/52/44/38/-
	Dimension (WXHXD)		mm	790X275X200
	Dimension of Carton Box (LXWXH)		mm	863X268X352
Dimension of Package(LXWXH)		mm	866X271X367	
Net Weight		kg	9	
Gross Weight		kg	11	

Outdoor Unit	Outdoor Unit Model		GWH09QB-K3DNA1G/O	
	Outdoor Unit Product Code		CB419W05500	
	Compressor Manufacturer		ZHUHAI LANDA COMPRESSOR CO.,LTD.	
	Compressor Model		QXA-A086zC190	
	Compressor Oil		RB68EP	
	Compressor Type		Rotary	
	Compressor LRA.	A		40
	Compressor RLA	A		3.1
	Compressor Power Input	W		850
	Compressor Overload Protector			1NT11L-6233
	Throttling Method			Electron expansion valve
	Set Temperature Range	°C		16~30
	Cooling Operation Ambient Temperature Range	°C		-15~43
	Heating Operation Ambient Temperature Range	°C		-15~24
	Condenser Form			Aluminum Fin-copper Tube
	Condenser Pipe Diameter	mm		Φ7
	Condenser Rows-fin Gap	mm		1-1.4
	Condenser Coil Length (LXDXW)	mm		710X19.05X508
	Fan Motor Speed	rpm		900
	Fan Motor Power Output	W		30
	Fan Motor RLA	A		0.36
	Fan Motor Capacitor	μF		/
	Outdoor Unit Air Flow Volume	m ³ /h		1600
	Fan Type			Axial-flow
	Fan Diameter	mm		Φ400
	Defrosting Method			Automatic Defrosting
	Climate Type			T1
	Isolation			I
	Moisture Protection			IP24
	Permissible Excessive Operating Pressure for the Discharge Side	MPa		4.3
	Permissible Excessive Operating Pressure for the Suction Side	MPa		2.5
	Sound Pressure Level (H/M/L)	dB (A)		52/-/-
	Sound Power Level (H/M/L)	dB (A)		61/-/-
Dimension(WXHXD)	mm		776X540X320	
Dimension of Carton Box (LXWXH)	mm		848X360X580	
Dimension of Package(LXWXH)	mm		851X363X595	
Net Weight	kg		28	
Gross Weight	kg		31	
Refrigerant			R410A	
Refrigerant Charge	kg		0.7	
Connection Pipe	Connection Pipe Length	m	5	
	Connection Pipe Gas Additional Charge	g/m	20	
	Outer Diameter Liquid Pipe	mm	Φ6	
	Outer Diameter Gas Pipe	mm	Φ9.52	
	Max Distance Height	m	10	
	Max Distance Length	m	15	
Note: The connection pipe applies metric diameter.				

The above data is subject to change without notice. Please refer to the nameplate of the unit.

Parameter		Unit	Value	
Model			1.GWH12QC-K3DNA1G 2.GWH12QC-K3DNA5G 3.GWH12QC-K3DNB2G 4.GWH12QC-K3DNB4G 5.GWH12QC-K3DNB6G	GWH12QC-K3DNA2G
Product Code			1.CB419005401 2.CB425003601 3.CB432002101 4.CB434002101 5.CB435000101	CB426001301
Power Supply	Rated Voltage	V~	220-240	220-240
	Rated Frequency	Hz	50	50
	Phases		1	1
Power Supply Mode			Outdoor	Outdoor
Cooling Capacity(Min~Max)		W	3500(600~3960)	3500(600~3960)
Heating Capacity(Min~Max)		W	3670(600~5130)	3670(600~5130)
Cooling Power Input(Min~Max)		W	1084(200~1550)	1084(200~1550)
Heating Power Input(Min~Max)		W	989(220~1650)	989(220~1650)
Cooling Current Input		A	5.2	5.2
Heating Current Input		A	5.0	5.0
Rated Input		W	1650	1650
Rated Current		A	7.3	7.3
Air Flow Volume(SH/H/M//L/SL)		m ³ /h	660/540/460/330/-	660/540/460/330/-
Dehumidifying Volume		L/h	1.4	1.4
EER		W/W	3.23	3.23
COP		W/W	3.71	3.71
SEER		W/W	6.1	6.1
HSPF		W/W	/	/
Application Area		m ²	16-24	16-24
Indoor Unit	Indoor Unit Model		1.GWH12QC-K3DNA1G/I 2.GWH12QC-K3DNA5G/I 3.GWH12QC-K3DNB2G/I 4.GWH12QC-K3DNB4G/I 5.GWH12QC-K3DNB6G/I	GWH12QC-K3DNA2G/I
	Indoor Unit Product Code		1.CB419N05401 2.CB425N03600 3.CB432N02101 4.CB434N02100 5.CB435N00100	CB426N01300
	Fan Type		Cross-flow	Cross-flow
	Fan Diameter Length(DXL)	mm	Φ98X633.5	Φ98X633.5
	Cooling Speed(SH/H/M//L/SL)	r/min	1350/1200/1050/850/-	1350/1200/1050/850/-
	Heating Speed(SH/H/M//L/SL)	r/min	1300/1150/1000/900/-	1300/1150/1000/900/-
	Fan Motor Power Output	W	20	20
	Fan Motor RLA	A	0.31	0.31
	Fan Motor Capacitor	μF	1.5	1.5
	Evaporator Form		Aluminum Fin-copper Tube	Aluminum Fin-copper Tube
	Evaporator Pipe Diameter	mm	Φ5	Φ5
	Evaporator Row-fin Gap	mm	2-1.4	2-1.4
	Evaporator Coil Length (LXDXW)	mm	635X22.8X306.3	635X22.8X306.3
	Swing Motor Model		MP24BA	MP24BA
	Swing Motor Power Output	W	1.5	1.5
	Fuse Current	A	3.15	3.15
	Sound Pressure Level(SH/H/M//L/SL)	dB (A)	42/39/33/26/-	42/39/33/26/-
	Sound Power Level(SH/H/M//L/SL)	dB (A)	57/53/45/42/-	57/53/45/42/-
	Dimension (WXHXD)	mm	845X289X209	845X289X209
	Dimension of Carton Box (LXWXH)	mm	918X278X364	918X278X364
Dimension of Package(LXWXH)	mm	921X281X379	921X281X379	
Net Weight	kg	10	10	
Gross Weight	kg	12	12.5	

Outdoor Unit	Outdoor Unit Model		GWH12QC-K3DNA1G/O	
	Outdoor Unit Product Code		CB419W05401	
	Compressor Manufacturer		ZHUHAI LANDA COMPRESSOR CO.,LTD.	
	Compressor Model		QXA-A086zC190	
	Compressor Oil		RB68EP	
	Compressor Type		Rotary	
	Compressor LRA.	A		40
	Compressor RLA	A		3.1
	Compressor Power Input	W		850
	Compressor Overload Protector			1NT11L-6233
	Throttling Method			Electron expansion valve
	Set Temperature Range	°C		16~30
	Cooling Operation Ambient Temperature Range	°C		-15~43
	Heating Operation Ambient Temperature Range	°C		-20~24
	Condenser Form			Aluminum Fin-copper Tube
	Condenser Pipe Diameter	mm		Φ7
	Condenser Rows-fin Gap	mm		2-1.4
	Condenser Coil Length (LXDXW)	mm		710X38.1X506
	Fan Motor Speed	rpm		900
	Fan Motor Power Output	W		30
	Fan Motor RLA	A		0.36
	Fan Motor Capacitor	μF		/
	Outdoor Unit Air Flow Volume	m ³ /h		1600
	Fan Type			Axial-flow
	Fan Diameter	mm		Φ400
	Defrosting Method			Automatic Defrosting
	Climate Type			T1
	Isolation			I
	Moisture Protection			IP24
	Permissible Excessive Operating Pressure for the Discharge Side	MPa		4.3
	Permissible Excessive Operating Pressure for the Suction Side	MPa		2.5
	Sound Pressure Level (H/M/L)	dB (A)		53/-/-
	Sound Power Level (H/M/L)	dB (A)		62/-/-
Dimension(WXHXD)	mm		776X540X320	
Dimension of Carton Box (LXWXH)	mm		848X360X580	
Dimension of Package(LXWXH)	mm		851X363X595	
Net Weight	kg		29	
Gross Weight	kg		32	
Refrigerant			R410A	
Refrigerant Charge	kg		0.85	
Connection Pipe	Connection Pipe Length	m	5	
	Connection Pipe Gas Additional Charge	g/m	20	
	Outer Diameter Liquid Pipe	mm	Φ6	
	Outer Diameter Gas Pipe	mm	Φ9.52	
	Max Distance Height	m	10	
	Max Distance Length	m	20	
Note: The connection pipe applies metric diameter.				

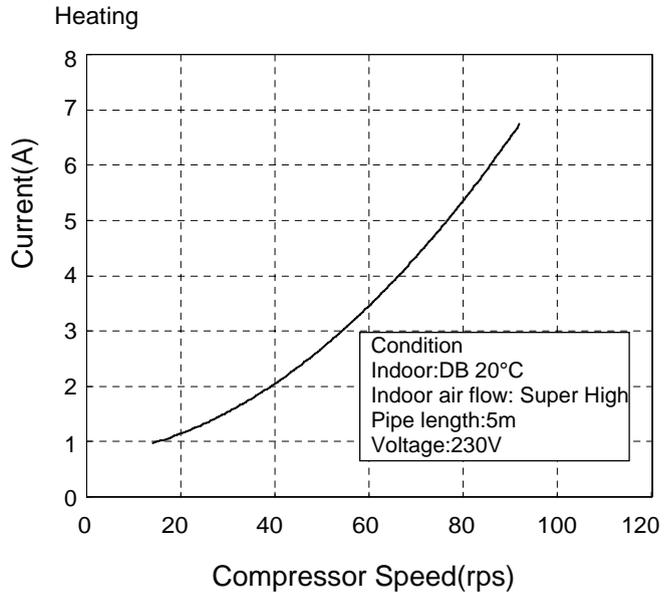
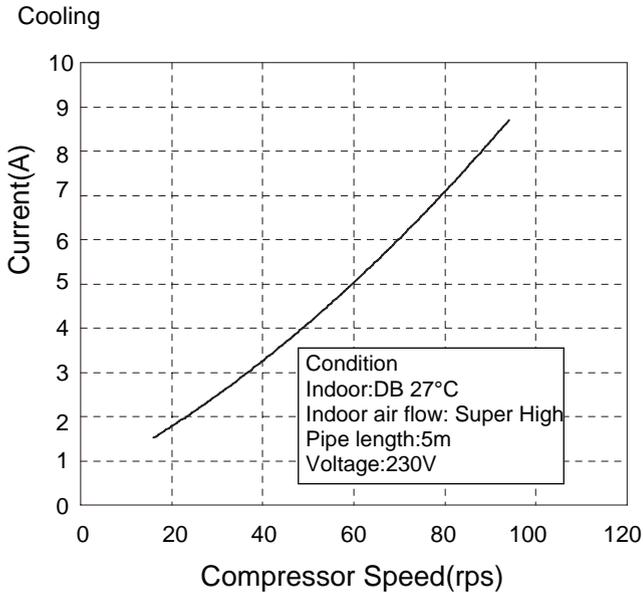
The above data is subject to change without notice. Please refer to the nameplate of the unit.

Parameter		Unit	Value
Model			1.GWH12QC-K3DNA1G 2.GWH12QC-K3DNA5G 2.GWH12QC-K3DNB2G 4.GWH12QC-K3DNB4G 3.GWH12QC-K3DNB6G
Product Code			1.CB419005400 2.CB425003602 2.CB432002100 4.CB434002102 3.CB435000100
Power Supply	Rated Voltage	V~	220-240
	Rated Frequency	Hz	50
	Phases		1
Power Supply Mode			Outdoor
Cooling Capacity(Min~Max)		W	3500(600~3960)
Heating Capacity(Min~Max)		W	3670(600~5130)
Cooling Power Input(Min~Max)		W	1084(200~1550)
Heating Power Input(Min~Max)		W	989(220~1650)
Cooling Current Input		A	5.2
Heating Current Input		A	5.0
Rated Input		W	1650
Rated Current		A	7.3
Air Flow Volume(SH/H/M//L/SL)		m ³ /h	660/540/460/330/-
Dehumidifying Volume		L/h	1.4
EER		W/W	3.23
COP		W/W	3.71
SEER		W/W	6.1
HSPF		W/W	/
Application Area		m ²	16-24
Indoor Unit	Indoor Unit Model		1.GWH12QC-K3DNA1G/I 2.GWH12QC-K3DNA5G/I 3.GWH12QC-K3DNB2G/I 4.GWH12QC-K3DNB4G/I 5.GWH12QC-K3DNB6G/I
	Indoor Unit Product Code		1.CB419N05400 2.CB425N03602 3.CB432N02100 4.CB434N02102 5.CB435N00100
	Fan Type		Cross-flow
	Fan Diameter Length(DXL)	mm	Φ98X633.5
	Cooling Speed(SH/H/M//L/SL)	r/min	1350/1200/1050/850/-
	Heating Speed(SH/H/M//L/SL)	r/min	1300/1150/1000/900/-
	Fan Motor Power Output	W	20
	Fan Motor RLA	A	0.31
	Fan Motor Capacitor	μF	1.5
	Evaporator Form		Aluminum Fin-copper Tube
	Evaporator Pipe Diameter	mm	Φ5
	Evaporator Row-fin Gap	mm	2-1.4
	Evaporator Coil Length (LXD _X W)	mm	635X22.8X306.3
	Swing Motor Model		MP24BA
	Swing Motor Power Output	W	1.5
	Fuse Current	A	3.15
	Sound Pressure Level(SH/H/M//L/SL)	dB (A)	42/39/33/26/-
	Sound Power Level(SH/H/M//L/SL)	dB (A)	57/53/45/42/-
	Dimension (WXHXD)	mm	845X289X209
	Dimension of Carton Box (LXWXH)	mm	918X278X364
Dimension of Package(LXWXH)	mm	921X281X379	
Net Weight	kg	10	
Gross Weight	kg	12	

Outdoor Unit	Outdoor Unit Model		GWH12QC-K3DNA1G/O
	Outdoor Unit Product Code		CB419W05400
	Compressor Manufacturer		ZHUHAI LANDA COMPRESSOR CO.,LTD.
	Compressor Model		QXA-A086zC190
	Compressor Oil		RB68EP
	Compressor Type		Rotary
	Compressor LRA.	A	40
	Compressor RLA	A	3.1
	Compressor Power Input	W	850
	Compressor Overload Protector		1NT11L-6233
	Throttling Method		Electron expansion valve
	Set Temperature Range	°C	16~30
	Cooling Operation Ambient Temperature Range	°C	-15~43
	Heating Operation Ambient Temperature Range	°C	-15~24
	Condenser Form		Aluminum Fin-copper Tube
	Condenser Pipe Diameter	mm	Φ7
	Condenser Rows-fin Gap	mm	2-1.4
	Condenser Coil Length (LXDXW)	mm	710X38.1X506
	Fan Motor Speed	rpm	900
	Fan Motor Power Output	W	30
	Fan Motor RLA	A	0.36
	Fan Motor Capacitor	μF	/
	Outdoor Unit Air Flow Volume	m ³ /h	1600
	Fan Type		Axial-flow
	Fan Diameter	mm	Φ400
	Defrosting Method		Automatic Defrosting
	Climate Type		T1
	Isolation		I
	Moisture Protection		IP24
	Permissible Excessive Operating Pressure for the Discharge Side	MPa	4.3
	Permissible Excessive Operating Pressure for the Suction Side	MPa	2.5
	Sound Pressure Level (H/M/L)	dB (A)	53/-/-
Sound Power Level (H/M/L)	dB (A)	62/-/-	
Dimension(WXHXD)	mm	776X540X320	
Dimension of Carton Box (LXWXH)	mm	848X360X580	
Dimension of Package(LXWXH)	mm	851X363X595	
Net Weight	kg	29	
Gross Weight	kg	32	
Refrigerant		R410A	
Refrigerant Charge	kg	0.85	
Connection Pipe	Connection Pipe Length	m	5
	Connection Pipe Gas Additional Charge	g/m	20
	Outer Diameter Liquid Pipe	mm	Φ6
	Outer Diameter Gas Pipe	mm	Φ9.52
	Max Distance Height	m	10
	Max Distance Length	m	20
Note: The connection pipe applies metric diameter.			

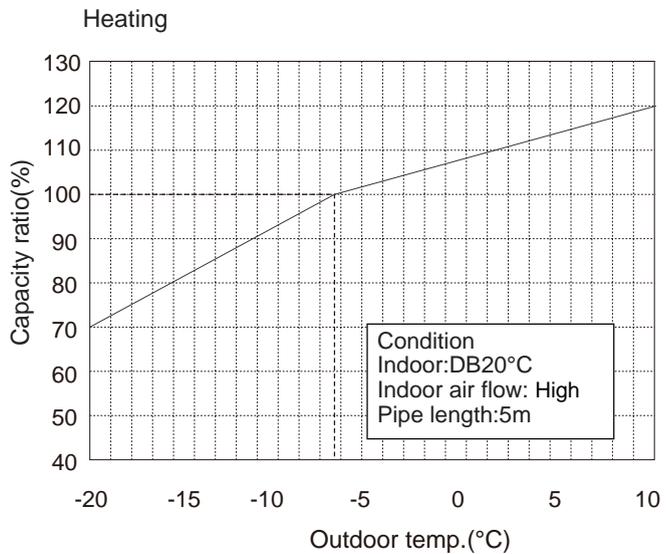
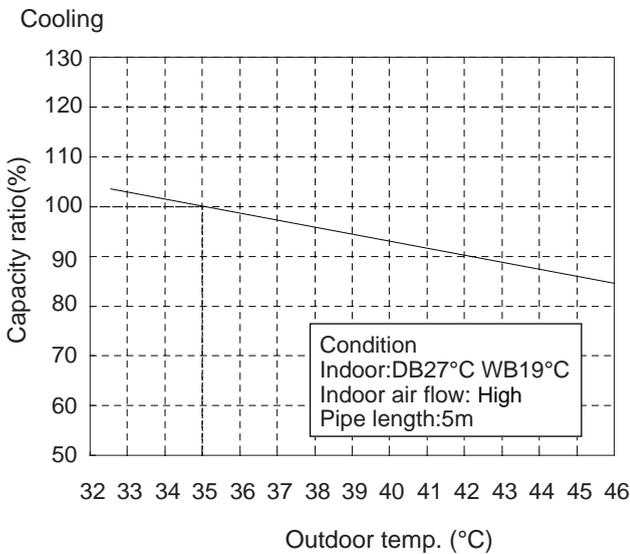
The above data is subject to change without notice. Please refer to the nameplate of the unit.

2.2 Operation Characteristic Curve

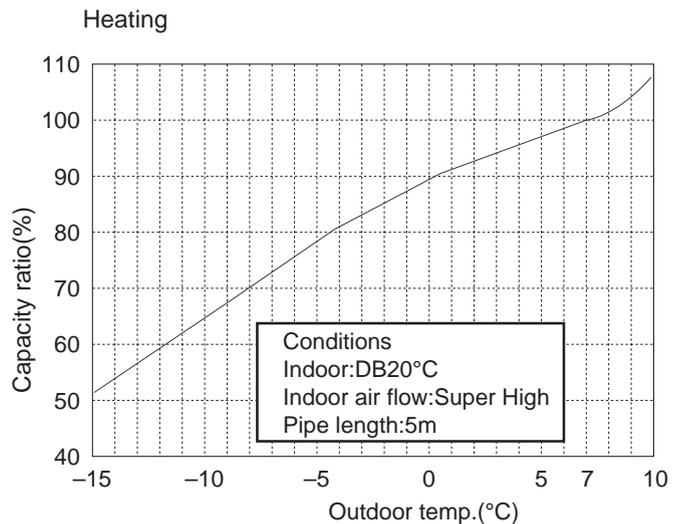
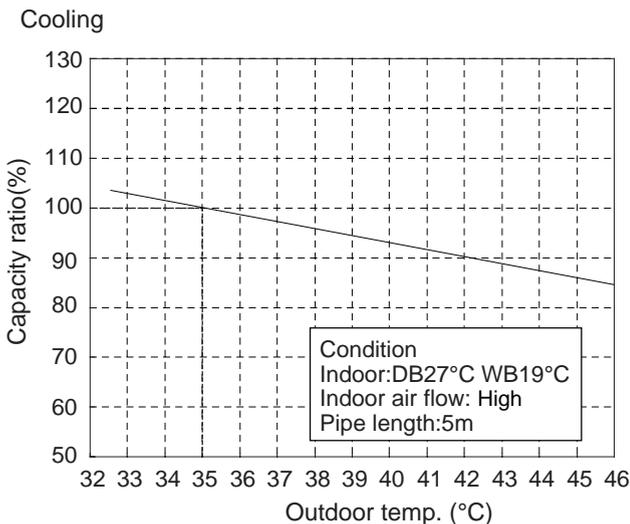


2.3 Capacity Variation Ratio According to Temperature

Heating operation ambient temperature range is -20°C~24°C

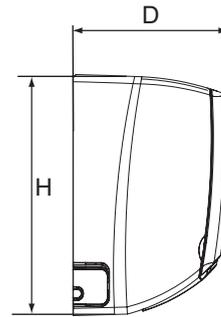
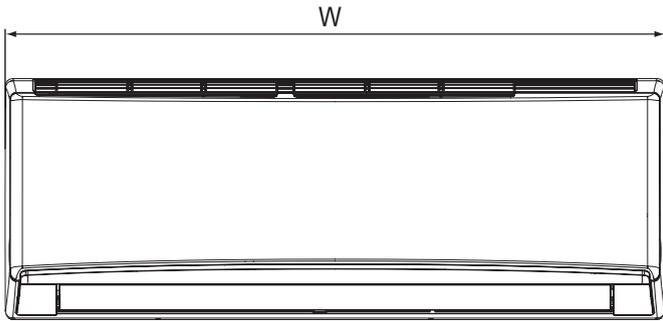


Heating operation ambient temperature range is -15°C~24°C

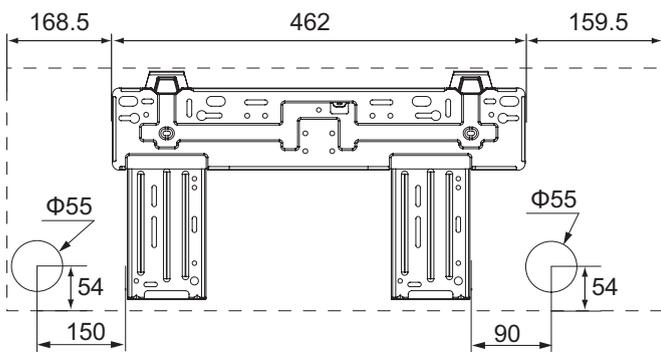


3. Outline Dimension Diagram

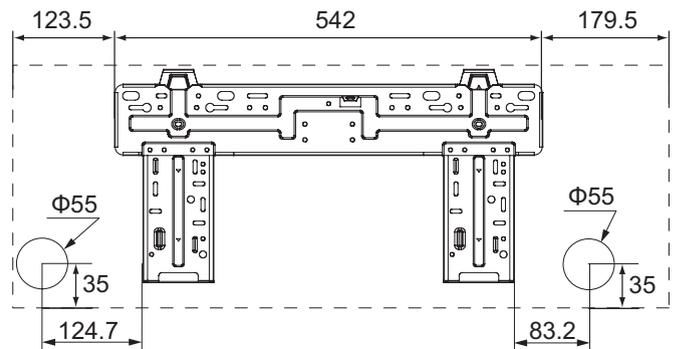
3.1 Indoor Unit



09K



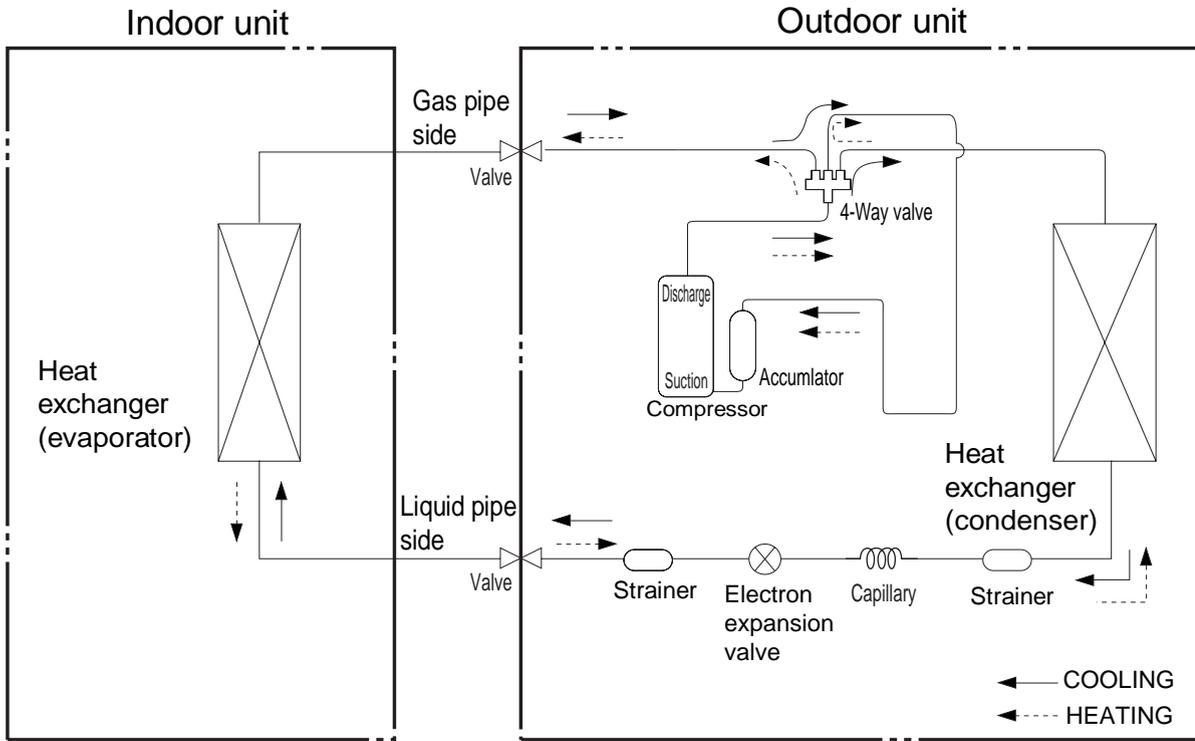
12K



Model	W	H	D
09K	790	275	200
12K	845	289	209

Unit:mm

4. Refrigerant System Diagram



Connection pipe specification:
 Liquid pipe: 1/4" (6mm)
 Gas pipe: 3/8" (9.52mm)

5. Electrical Part

5.1 Wiring Diagram

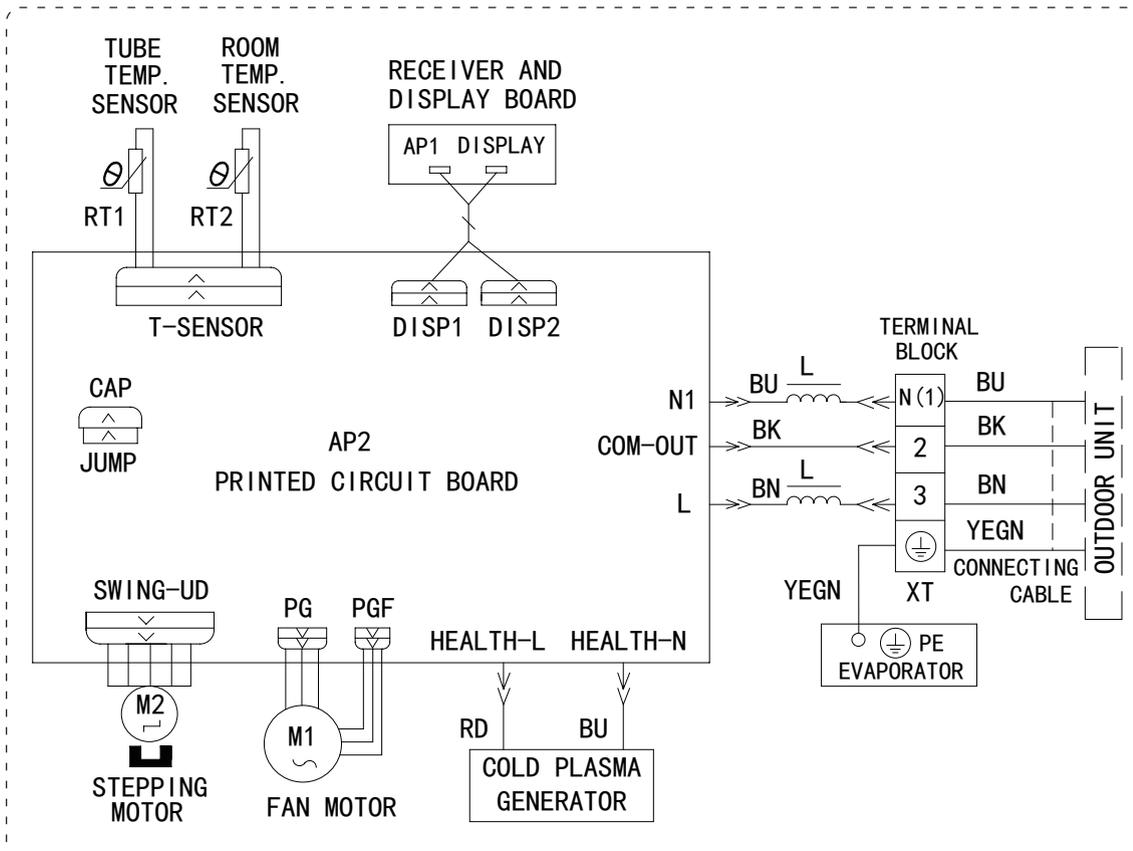
• Instruction

Symbol	Symbol Color	Symbol	Symbol Color	Symbol	Name
WH	White	GN	Green	CAP	Jumper cap
YE	Yellow	BN	Brown	COMP	Compressor
RD	Red	BU	Blue		Grounding wire
YEGN	Yellow/Green	BK	Black	/	/
VT	Violet	OG	Orange	/	/

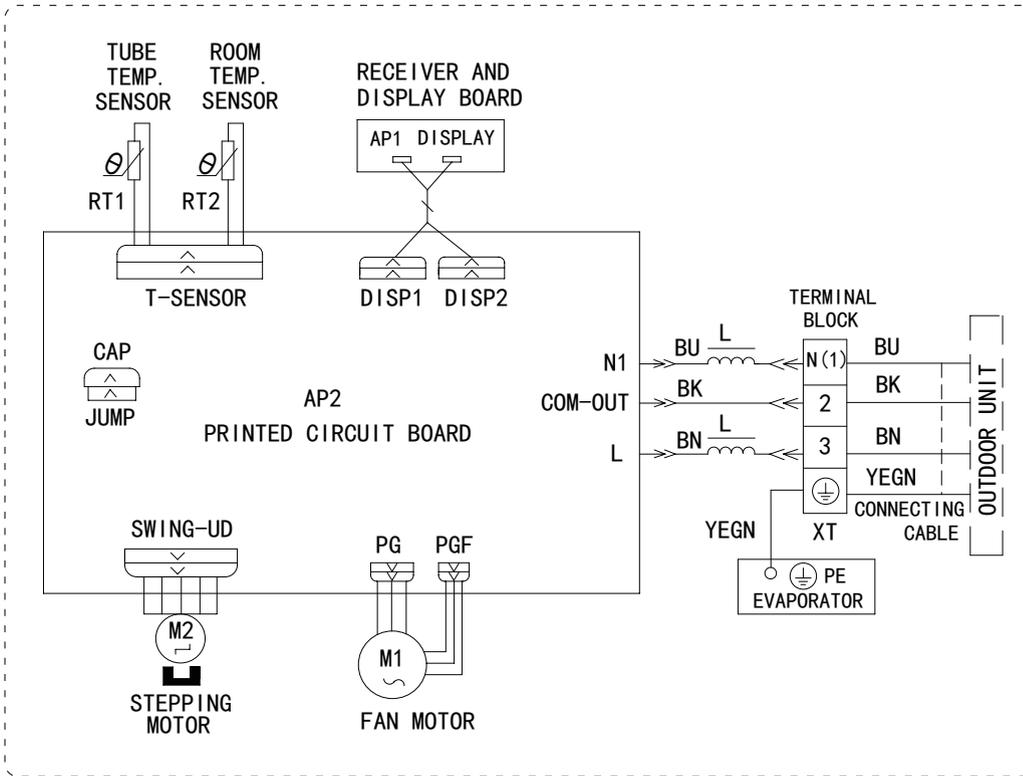
Note: Jumper cap is used to determine fan speed and the swing angle of horizontal lover for this model.

• Indoor Unit

GWH09QB-K3DNA1G/I(CB419N05501) GWH09QB-K3DNA2G/I(CB426N01200) GWH09QB-K3DNB2G/I(CB432N02200)
 GWH09QB-K3DNB4G/I(CB434N02300) GWH09QB-K3DNB6G/I(CB435N00400) GWH12QC-K3DNA1G/I(CB419N05401)
 GWH12QC-K3DNA2G/I(CB426N01300) GWH12QC-K3DNA5G/I(CB425N03602) GWH12QC-K3DNB2G/I(CB432N02101)
 GWH12QC-K3DNB4G/I(CB434N02100) GWH12QC-K3DNB6G/I(CB435N00100)

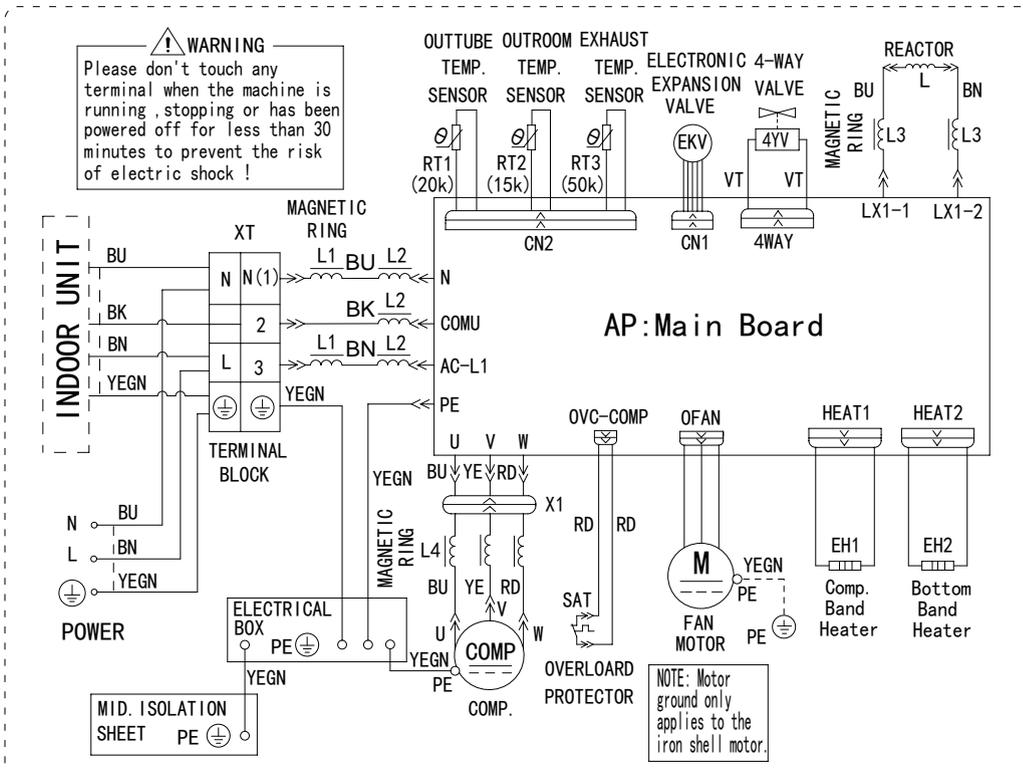


GWH09QB-K3DNA1G/I(CB419N05500) GWH09QB-K3DNB4G/I(CB434N02302) GWH09QB-K3DNA5G/I(CB425N03500)
 GWH09QB-K3DNB6G/I(CB435N00403) GWH12QC-K3DNB4G/I(CB434N02102) GWH12QC-K3DNA1G/I(CB419N05400)
 GWH12QC-K3DNB2G/I(CB432N02100) GWH12QC-K3DNA5G/I(CB425N03600)

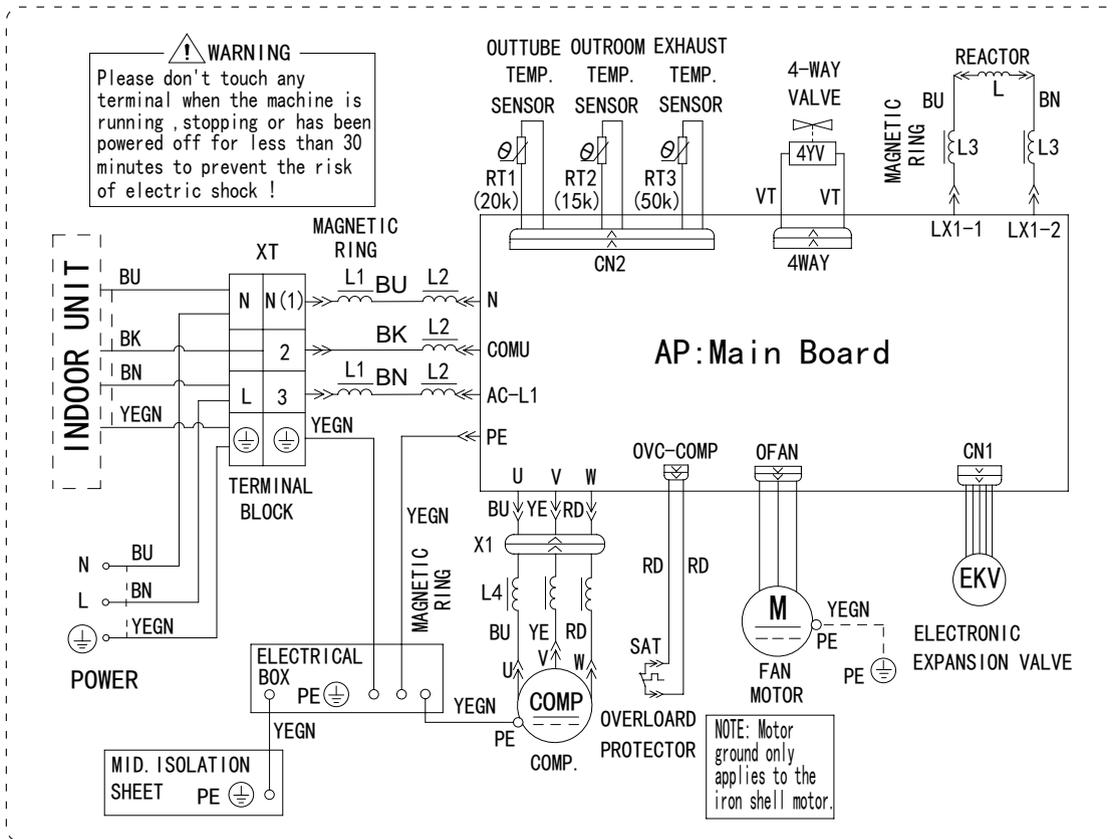


• Outdoor Unit

GWH09QB-K3DNA1G/O(CB419W05501) GWH12QC-K3DNA1G/O(CB419W05401)



GWH09QB-K3DNA1G/O(CB419W05500) GWH12QC-K3DNA1G/O(CB419W05400)



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

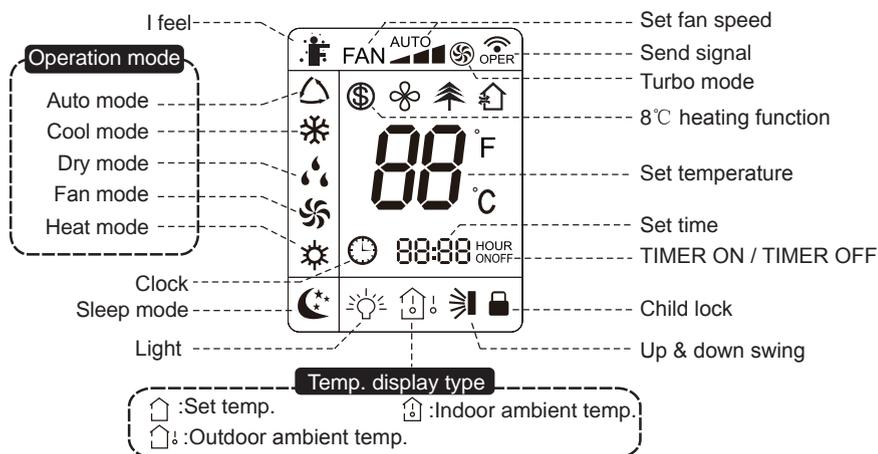
6. Function and Control

6.1 Remote Controller Introduction



- 1 ON/OFF button
- 2 MODE button
- 3 FAN button
- 4 SWING button
- 5 TURBO button
- 6 ▲/ ▼button
- 7 SLEEP button
- 8 TEMP button
- 9 I FEEL button
- 10 LIGHT button
- 11 CLOCK button
- 12 TIMER ON / TIMER OFF button

Introduction for icons on display screen



Introduction for buttons on remote controller

Note:

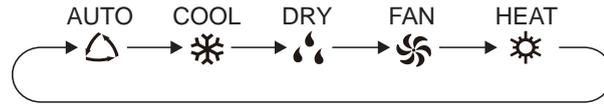
- After putting through the power, the air conditioner will give out a sound. Operation indicator "⏻" is ON (red indicator). After that, you can operate the air conditioner by using remote controller.
- Under on status, pressing the button on the remote controller, the signal icon "📶" on the display of remote controller will blink once and the air conditioner will give out a "de" sound, which means the signal has been sent to the air conditioner.
- Under off status, set temperature and clock icon will be displayed on the display of remote controller (If timer on, timer off and light functions are set, the corresponding icons will be displayed on the display of remote controller at the same time); Under on status, the display will show the corresponding set function icons.

1. ON/OFF button

Press this button can turn on or turn off the air conditioner. After turning on the air conditioner, operation indicator "  "on indoor unit's display is ON (green indicator. The colour is different for different models), and indoor unit will give out a sound.

2. MODE button

Press this button to select your required operation mode.



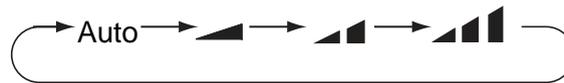
- When selecting auto mode, air conditioner will operate automatically according to ex-factory setting. Set temperature can't be adjusted and will not be displayed as well. Press "FAN" button can adjust fan speed. Press "SWING" button can adjust fan blowing angle.
- After selecting cool mode, air conditioner will operate under cool mode. Cool indicator "  "on indoor unit is ON. Press "▲" or " ▼ " button to adjust set temperature. Press "FAN" button to adjust fan speed. Press "SWING" button to adjust fan blowing angle.
- When selecting dry mode, the air conditioner operates at low speed under dry mode. Dry indicator "  " on indoor unit is ON. Under dry mode, fan speed can't be adjusted. Press "SWING" button to adjust fan blowing angle.
- When selecting fan mode, the air conditioner will only blow fan, no cooling and no heating. All indicators are OFF. Press "FAN" button to adjust fan speed. Press "SWING" button to adjust fan blowing angle.
- When selecting heating mode, the air conditioner operates under heat mode. Heat indicator "  " on indoor unit is ON. Press "▲" or " ▼ " button to adjust set temperature. Press "FAN" button to adjust fan speed. Press "SWING" button to adjust fan blowing angle. (Cooling only unit won't receive heating mode signal. If setting heat mode with remote controller, press ON/OFF button can't start up the unit).

Note:

- For preventing cold air, after starting up heating mode, indoor unit will delay 1~5 minutes to blow air (actual delay time is depend on indoor ambient temperature).
- Set temperature range from remote controller: 16~30°C; Fan speed: auto, low speed, medium speed, high speed.

3. FAN button

Pressing this button can set fan speed circularly as: auto (AUTO), low(), medium(), high().

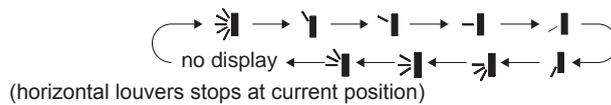


Caution:

- Under AUTO speed, air conditioner will select proper fan speed automatically according to ex-factory setting.
- Fan speed under dry mode is low speed.

4. SWING button

Press this button can select up&down swing angle. Fan blow angle can be selected circularly as below:



- When selecting "  ", air conditioner is blowing fan automatically. Horizontal louver will automatically swing up & down at maximum angle.
- When selecting "  ", "  ", "  ", "  ", air conditioner is blowing fan at fixed position. Horizontal louver will stop at the fixed position.
- When selecting "  ", "  ", "  ", air conditioner is blowing fan at fixed angle. Horizontal louver will send air at the fixed angle.
- Hold "  " button above 2s to set your required swing angle. When reaching your required angle, release the button.

Note:

- "  ", "  ", "  " may not be available. When air conditioner receives this signal, the air conditioner will blow fan automatically.

5. TURBO button

Under COOL or HEAT mode, press this button to turn to quick COOL or quick HEAT mode. "  " icon is displayed on remote controller. Press this button again to exit turbo function and "  " icon will disappear.

6. ▲/▼ button

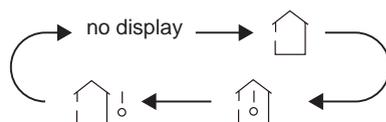
- Press "▲" or "▼" button once increase or decrease set temperature 1°C. Holding "▲" or "▼" button, 2s later, set temperature on remote controller will change quickly. On releasing button after setting is finished, temperature indicator on indoor unit will change accordingly. (Temperature can't be adjusted under auto mode)
- When setting TIMER ON, TIMER OFF or CLOCK, press "▲" or "▲" button to adjust time. (Refer to CLOCK, TIMER ON, TIMER OFF buttons) When setting TIMER ON, TIMER OFF or CLOCK, press "▲" or "▲" button to adjust time. (Refer to CLOCK, TIMER ON, TIMER OFF buttons)

7. SLEEP button

Under COOL, HEAT or DRY mode, press this button to start up sleep function. "☾" icon is displayed on remote controller. Press this button again to cancel sleep function and "☾" icon will disappear.

8. TEMP button

By pressing this button, you can see indoor set temperature, indoor ambient temperature or outdoor ambient temperature on indoor unit's display. The setting on remote controller is selected circularly as below:



- When selecting "no display" or "house icon with thermometer" with remote controller, temperature indicator on indoor unit displays set temperature.
- When selecting "house icon with thermometer and degree symbol" with remote controller, temperature indicator on indoor unit displays indoor ambient temperature.
- When selecting "house icon with thermometer and exclamation mark" with remote controller, temperature indicator on indoor unit displays outdoor ambient temperature.

Note:

- Outdoor temperature display is not available for some models. At that time, indoor unit receives "house icon with thermometer and exclamation mark" signal, while it displays indoor set temperature.
- It's defaulted to display set temperature when turning on the unit. There is no display in the remote controller.
- Only for the models whose indoor unit has dual-8 display.
- When selecting displaying of indoor or outdoor ambient temperature, indoor temperature indicator displays corresponding temperature and automatically turn to display set temperature after three or five seconds.

9. I FEEL button

Press this button to start I FEEL function and "I FEEL" icon will be displayed on the remote controller. After this function is set, the remote controller will send the detected ambient temperature to the controller and the unit will automatically adjust the indoor temperature according to the detected temperature. Press this button again to close I FEEL function and "I FEEL" icon will disappear.

- Please put the remote controller near user when this function is set. Do not put the remote controller near the object of high temperature or low temperature in order to avoid detecting inaccurate ambient temperature.

10. LIGHT button

Press this button to turn off display light on indoor unit. "display light off" icon on remote controller disappears. Press this button again to turn on display light. "display light on" icon is displayed.

11. CLOCK button

Press this button to set clock time. "clock" icon on remote controller will blink. Press "▲" or "▼" button within 5s to set clock time. Each pressing of "▲" or "▼" button, clock time will increase or decrease 1 minute. If hold "▲" or "▼" button, 2s later, time will change quickly. Release this button when reaching your required time. Press "CLOCK" button to confirm the time. "clock" icon stops blinking.

Note:

- Clock time adopts 24-hour mode.
- The interval between two operation can't exceeds 5s. Otherwise, remote controller will quit setting status. Operation for TIMER ON/TIMER OFF is the same.

12. TIMER ON / TIMER OFF button

• TIMER ON button

"TIMER ON" button can set the time for timer on. After pressing this button, "timer on" icon disappears and the word "ON" on remote controller blinks. Press "▲" or "▼" button to adjust TIMER ON setting. After each pressing "▲" or "▼" button, TIMER ON setting will increase or decrease 1min. Hold "▲" or "▼" button, 2s later, the time will change quickly until reaching your required time. Press "TIMER ON" to confirm it. The word "ON" will stop blinking. "timer on" icon resumes displaying. Cancel TIMER ON: Under the condition that TIMER ON is started up, press "TIMER ON" button to cancel it.

• TIMER OFF button

"TIMER OFF" button can set the time for timer off. After pressing this button, "timer off" icon disappears and the word "OFF" on remote controller blinks. Press "▲" or "▼" button to adjust TIMER OFF setting. After each pressing "▲" or "▼" button, TIMER OFF setting will increase or decrease 1min. Hold "▲" or "▼" button, 2s later, the time will change quickly until reaching your required time. Press "TIMER OFF" word "OFF" will stop blinking. "timer off" icon resumes displaying. Cancel TIMER OFF. Under the condition that TIMER OFF is started up, press "TIMER OFF" button to cancel it.

Note:

- Under on and off status, you can set TIMER OFF or TIMER ON simultaneously.
- Before setting TIMER ON or TIMER OFF, please adjust the clock time.
- After starting up TIMER ON or TIMER OFF, set the constant circulating valid. After that, air conditioner will be turned on or turned off according to setting time. ON/OFF button has no effect on setting. If you don't need this function, please use remote controller to cancel it.

6.2 Brief Description of Modes and Functions

● Indoor Unit

1. Basic function of system

(1) Cooling mode

(1) Under this mode, fan and swing operates at setting status. Temperature setting range is 16~30°C.

(2) During malfunction of outdoor unit or the unit is stopped because of protection, indoor unit keeps original operation status.

(2) Drying mode

(1) Under this mode, fan operates at low speed and swing operates at setting status. Temperature setting range is 16~30°C.

(2) During malfunction of outdoor unit or the unit is stopped because of protection, indoor unit keeps original operation status.

(3) Protection status is same as that under cooling mode.

(4) Sleep function is not available for drying mode.

(3) Heating mode

(1) Under this mode, Temperature setting range is 16~30°C.

(2) Working condition and process for heating mode:

When turn on the unit under heating mode, indoor unit enters into cold air prevention status. When the unit is stopped or at OFF status, and indoor unit has been started up just now, the unit enters into residual heat-blowing status.

(4) Working method for AUTO mode:

1. Working condition and process for AUTO mode:

a. Under AUTO mode, standard heating $T_{\text{preset}}=20^{\circ}\text{C}$ and standard cooling $T_{\text{preset}}=25^{\circ}\text{C}$. The unit will switch mode automatically according to ambient temperature.

2. Protection function

a. During cooling operation, protection function is same as that under cooling mode.

b. During heating operation, protection function is same as that under heating mode.

3. Display: Set temperature is the set value under each condition. Ambient temperature is ($T_{\text{amb.}}-T_{\text{compensation}}$) for heat pump unit and $T_{\text{amb.}}$ for cooling only unit.

4. If there's I feel function, $T_{\text{compensation}}$ is 0. Others are same as above.

(5) Fan mode

Under this mode, indoor fan operates at set fan speed. Compressor, outdoor fan, 4-way valve and electric heating tube stop operation. Indoor fan can select to operate at high, medium, low or auto fan speed. Temperature setting range is 16~30°C.

2. Other control

(1) Buzzer

Upon energization or availablely operating the unit or remote controller, the buzzer will give out a beep.

(2) Auto button

If press this auto button when turning off the unit, the complete unit will operate at auto mode. Indoor fan operates at auto fan speed and swing function is turned on. Press this auto button at ON status to turn off the unit.

(3) Auto fan

Heating mode: During auto heating mode or normal heating mode, auto fan speed will adjust the fan speed automatically according to ambient temperature and set temperature.

(4) Sleep

After setting sleep function for a period of time, system will adjust set temperature automatically.

(5) Timer function:

General timer and clock timer functions are compatible by equipping remote controller with different functions.

(6) Memory function

memorize compensation temperature, off-peak energization value.

Memory content: mode, up&down swing, light, set temperature, set fan speed, general timer (clock timer can't be memorized).

After power recovery, the unit will be turned on automatically according to memory content.

(7) Health function

During operation of indoor fan, set health function by remote controller. Turn off the unit will also turn off health function.

Turn on the unit by pressing auto button, and the health is defaulted ON.

(8) I feel control mode

After controller received I feel control signal and ambient temperature sent by remote controller, controller will work according to the ambient temperature sent by remote controller.

(9) Entry condition for compulsory defrosting function

When turn on the unit under heating mode and set temperature is 16°C (or 16.5°C by remote controller), press "+, -, +, -, +, -" button successively within 5s and then indoor unit will enter into compulsory defrosting setting status:

- (1) If there's only indoor unit's controller, it enters into indoor normal defrosting mode.
- (2) If there's indoor unit's controller and outdoor unit's controller, indoor unit will send compulsory defrosting mode signal to outdoor unit and then outdoor unit will operate under normal defrosting mode. After indoor unit received the signal that outdoor unit has entered into defrosting status, indoor unit will cancel to send compulsory mode to outdoor unit. If outdoor unit hasn't received feedback signal from outdoor unit after 3min, indoor unit will also cancel to send compulsory defrosting signal.

(10) Refrigerant recovery function:

Enter into Freon recovery mode actively: Within 5min after energization, turn on the unit at 16°C under cooling mode, and press light button for 3 times within 3s to enter into Freon recovery mode. Fo is displayed and Freon recovery mode will be sent to outdoor unit.

(11) Ambient temperature display control mode

1. When user set the remote controller to display set temperature (corresponding remote control code: 01), current set temperature will be displayed.
2. Only when remote control signal is switched to indoor ambient temperature display status (corresponding remote control code: 10) from other display status (corresponding remote control code: 00, 01, 11), controller will display indoor ambient temperature for 3s and then turn back to display set temperature.

Under this mode, indoor fan operates at set fan speed. Compressor, outdoor fan, 4-way valve and electric heating tube stop operation. Indoor fan can select to operate at high, medium, low or auto fan speed. Temperature setting range is 16~30°C.

(12) Off-peak energization function:

Adjust compressor's minimum stop time. The original minimum stop time is 180s and then we change to:

The time interval between two start-ups of compressor can't be less than $180 + T_s (0 \leq T \leq 15)$. T is the variable of controller. That's to say the minimum stop time of compressor is 180s~195s. Read-in T into memory chip when refurbish the memory chip each time. After power recovery, compressor can only be started up after 180+T s at least.

(13) SE control mode

The unit operates at SE status.

(14) X-fan mode

When X-fan function is turned on, after turn off the unit, indoor fan will still operate at low speed for 2min and then the complete unit will be turned off. When x-fan function is turned off, after turn off the unit, the complete unit will be turned off directly.

(15) 8° heating function

Under heating mode, you can set 8° heating function by remote controller. The system will operate at 8° set temperature.

(16) Turbo function

Turbo function can be set under cooling and heating modes. Press Fan Speed button to cancel turbo setting. Turbo function is not available under auto, drying and fan modes.

● Outdoor Unit

1. Cooling mode:

Working condition and process of cooling mode:

- ① When Tindoor ambient temperature $\geq T_{\text{preset}}$, unit enters into cooling mode. Indoor fan, outdoor fan and compressor start operation. Indoor fan operates according to set fan speed.
 - ② When Tindoor ambient temperature $\leq T_{\text{preset}} - 2^{\circ}\text{C}$, compressor stops operation and outdoor fan will stop 30s later. Indoor fan operates according to set fan speed.
 - ③ When $T_{\text{preset}} - 2^{\circ}\text{C} < \text{Tindoor ambient temperature} < T_{\text{preset}}$, unit operates according to the previous status.
- Under cooling mode, 4-way valve is not energized. Temperature setting range is 16~30°C. If compressor stops because of malfunction in cooling mode, indoor fan and swing motor will work according to the original status.

2. Drying mode

(1) Working condition and process of drying mode

- ① When Tindoor ambient temperature $> T_{\text{preset}}$, unit will be in drying mode. Outdoor fan and compressor start operation while indoor fan will operate at low fan speed.
 - ② When $T_{\text{preset}} - 2^{\circ}\text{C} \leq \text{Tindoor ambient temperature} \leq T_{\text{preset}}$, unit operates according to the previous status.
 - ③ When Tindoor ambient temperature $< T_{\text{preset}} - 2^{\circ}\text{C}$, compressor stops operation and outdoor fan will stop 30s later.
- (2) Under drying mode, 4-way valve is not energized. Temperature setting range is 16~30°C.
- (3) Protection function: same as in cooling mode.

3. Fan mode

- (1) Under this mode, indoor fan can select different fan speed (except Turbo) or auto fan speed. Compressor, outdoor fan and 4-way valve all stop operation.
- (2) In fan mode, temperature setting range is 16~30°C.

4. Heating mode

Working condition and process of heating mode:

- ① When $T_{\text{preset}} - (\text{Tindoor ambient temperature} - T_{\text{compensation}}) \geq 1^{\circ}\text{C}$, unit enters into heating mode. Compressor, outdoor fan and 4-way valve start operation.
- ② When $-2^{\circ}\text{C} < T_{\text{preset}} - (\text{Tindoor ambient temperature} - T_{\text{compensation}}) < 1^{\circ}\text{C}$, unit operates according to the previous status.
- ③ When $T_{\text{preset}} - (\text{Tindoor ambient temperature} - T_{\text{compensation}}) \leq -2^{\circ}\text{C}$, compressor stops operation and outdoor fan will stop 30s later. Indoor fan will be in residual-heat blowing status.
- ④ When unit is turned off under heating mode or changed to other modes from heating mode, 4-way valve will be power-off 2min after compressor stops working (compressor is in operation status under heating mode).
- ⑤ When Tindoor ambient temperature $> 30^{\circ}\text{C}$, compressor stops operation immediately. Outdoor fan will stop 30s later.
- ⑥ Under the condition that compressor is turned on, when unit is changed to heating mode from cooling or drying mode, 4-way valve will be energized in 2~3min's delay.

Note: Tcompensation is determined by IDU and ODU. If IDU controls the compensation temperature, then Tcompensation is determined according to the value sent by IDU to ODU; If IDU does not control the compensation temperature, then Tcompensation will default to 3°C by the ODU.

5. Freon recovery mode

After the Freon recovery signal from IDU is received, cooling at rated frequency will be forcibly turned on to recover Freon. Indoor unit will display Fo. If any signal from remote controller is received, unit will exit from Freon recovery mode and indoor unit stops displaying Fo.

6. Compulsory defrosting

If unit is turned on under heating mode and set temperature is 16°C (by remote controller), press "+, -, +, -, +, -" within 5s, unit will enter into compulsory defrosting mode and send the signal to ODU. When the compulsory defrosting signal from ODU is received, IDU will exit from the compulsory defrosting mode and stop sending the signal to ODU.

After ODU receives the compulsory defrosting code, it will start compulsory defrosting. Defrosting frequency and opening angle will be the same as in normal defrosting mode. When compulsory defrosting is finished, the complete unit resumes original status.

7. Auto mode

Auto mode is determined by controller of IDU. See IDU logic for details.

8. 8°C heating

Set temperature is 8°C . Display board of IDU displays 8°C . Under this mode, “Cold air prevention” function is shielded.

If compressor is operating under this mode, fan speed will adjust according to auto fan speed; if compressor stops operation under this mode, indoor fan will be in residual-heat blowing status.

When power on, communication light will be blinking in a normal way (after receiving a group of correct signals, blinking stops for 0.2s~0.3s). If there's no communication, communication light will be always on. If other ODU has malfunction, communication light will be on for 1s and off for 1s in a circular way.

Part II : Installation and Maintenance

7. Notes for Installation and Maintenance

Safety Precautions: Important!

Please read the safety precautions carefully before installation and maintenance.

The following contents are very important for installation and maintenance.

Please follow the instructions below.

- The installation or maintenance must accord with the instructions.
- Comply with all national electrical codes and local electrical codes.
- Pay attention to the warnings and cautions in this manual.
- All installation and maintenance shall be performed by distributor or qualified person.
- All electric work must be performed by a licensed technician according to local regulations and the instructions given in this manual.
- Be caution during installation and maintenance. Prohibit incorrect operation to prevent electric shock, casualty and other accidents.



Warnings

Electrical Safety Precautions:

1. Cut off the power supply of air conditioner before checking and maintenance.
2. The air condition must apply specialized circuit and prohibit share the same circuit with other appliances.
3. The air conditioner should be installed in suitable location and ensure the power plug is touchable.
4. Make sure each wiring terminal is connected firmly during installation and maintenance.
5. Have the unit adequately grounded. The grounding wire can't be used for other purposes.
6. Must apply protective accessories such as protective boards, cable-cross loop and wire clip.
7. The live wire, neutral wire and grounding wire of power supply must be corresponding to the live wire, neutral wire and grounding wire of the air conditioner.
8. The power cord and power connection wires can't be pressed by hard objects.
9. If power cord or connection wire is broken, it must be replaced by a qualified person.

10. If the power cord or connection wire is not long enough, please get the specialized power cord or connection wire from the manufacture or distributor. Prohibit prolong the wire by yourself.

11. For the air conditioner without plug, an air switch must be installed in the circuit. The air switch should be all-pole parting and the contact parting distance should be more than 3mm.

12. Make sure all wires and pipes are connected properly and the valves are opened before energizing.

13. Check if there is electric leakage on the unit body. If yes, please eliminate the electric leakage.

14. Replace the fuse with a new one of the same specification if it is burnt down; don't replace it with a cooper wire or conducting wire.

15. If the unit is to be installed in a humid place, the circuit breaker must be installed.

Installation Safety Precautions:

1. Select the installation location according to the requirement of this manual.(See the requirements in installation part)
2. Handle unit transportation with care; the unit should not be carried by only one person if it is more than 20kg.
3. When installing the indoor unit and outdoor unit, a sufficient fixing bolt must be installed; make sure the installation support is firm.
4. Ware safety belt if the height of working is above 2m.
5. Use equipped components or appointed components during installation.
6. Make sure no foreign objects are left in the unit after finishing installation.

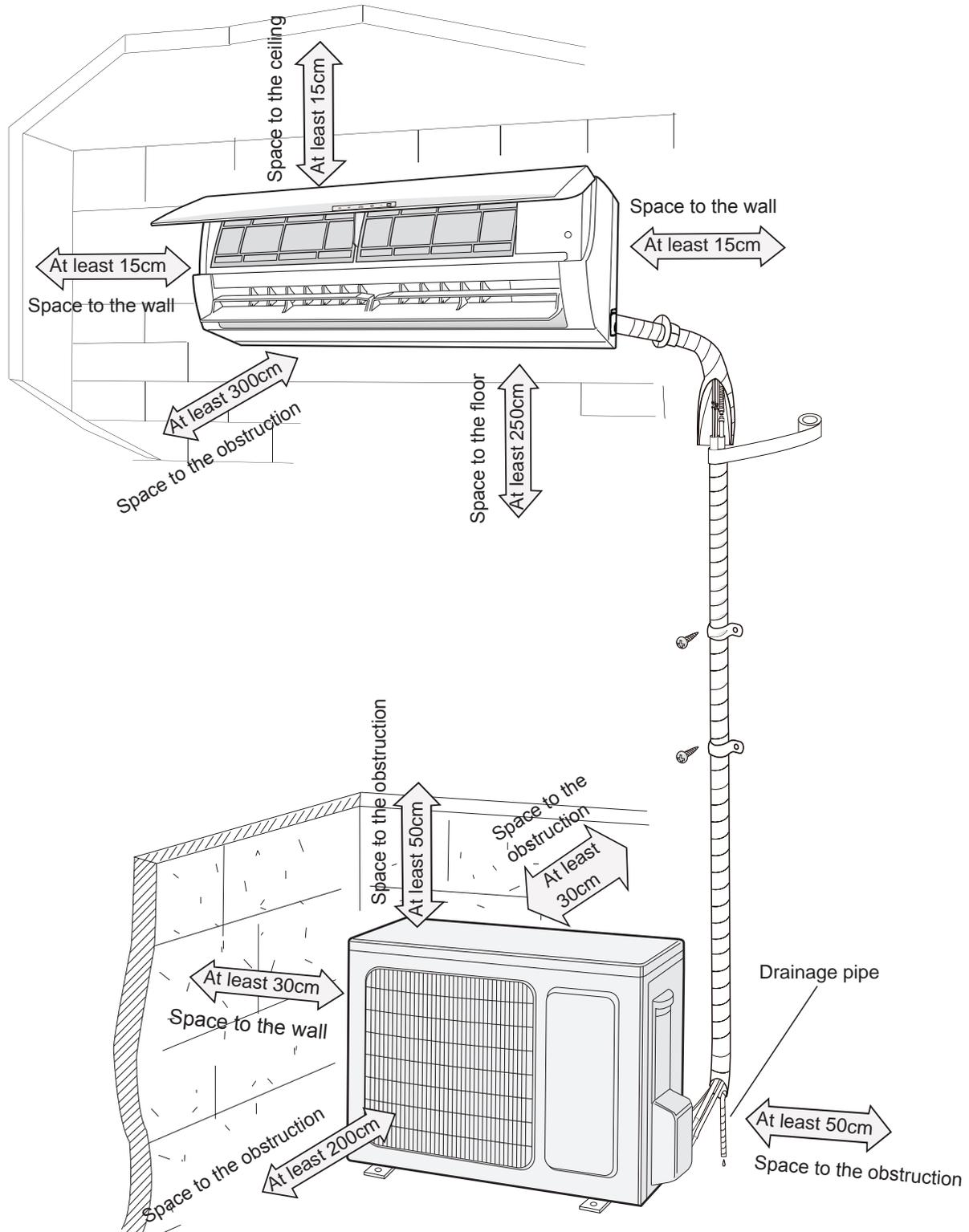
Refrigerant Safety Precautions:

1. Avoid contact between refrigerant and fire as it generates poisonous gas; Prohibit prolong the connection pipe by welding.
2. Apply specified refrigerant only. Never have it mixed with any other refrigerant. Never have air remain in the refrigerant line as it may lead to rupture or other hazards.
3. Make sure no refrigerant gas is leaking out when installation is completed.
4. If there is refrigerant leakage, please take sufficient measure to minimize the density of refrigerant.
5. Never touch the refrigerant piping or compressor without wearing glove to avoid scald or frostbite.

Improper installation may lead to fire hazard, explosion, electric shock or injury.

8. Installation

8.1 Installation Dimension Diagram



8.2 Installation Parts-checking

No.	Name	No.	Name
1	Indoor unit	8	Sealing gum
2	Outdoor unit	9	Wrapping tape
3	Connection pipe	10	Support of outdoor unit
4	Drainage pipe	11	Fixing screw
5	Wall-mounting frame	12	Drainage plug(cooling and heating unit)
6	Connecting cable(power cord)	13	Owner's manual, remote controller
7	Wall pipe		

⚠ Note:

- 1.Please contact the local agent for installation.
- 2.Don't use unqualified power cord.

8.3 Selection of Installation Location

1. Basic Requirement:

Installing the unit in the following places may cause malfunction. If it is unavoidable, please consult the local dealer:

- (1) The place with strong heat sources, vapors, flammable or explosive gas, or volatile objects spread in the air.
- (2) The place with high-frequency devices (such as welding machine, medical equipment).
- (3) The place near coast area.
- (4) The place with oil or fumes in the air.
- (5) The place with sulfured gas.
- (6) Other places with special circumstances.
- (7) The appliance shall not be installed in the laundry.

2. Indoor Unit:

- (1) There should be no obstruction near air inlet and air outlet.
- (2) Select a location where the condensation water can be dispersed easily and won't affect other people.
- (3) Select a location which is convenient to connect the outdoor unit and near the power socket.
- (4) Select a location which is out of reach for children.
- (5) The location should be able to withstand the weight of indoor unit and won't increase noise and vibration.
- (6) The appliance must be installed 2.5m above floor.
- (7) Don't install the indoor unit right above the electric appliance.
- (8) Please try your best to keep way from fluorescent lamp.

3. Outdoor Unit:

- (1) Select a location where the noise and outflow air emitted by the outdoor unit will not affect neighborhood.
- (2) The location should be well ventilated and dry, in which the outdoor unit won't be exposed directly to sunlight or strong wind.
- (3) The location should be able to withstand the weight of outdoor unit.
- (4) Make sure that the installation follows the requirement of installation dimension diagram.
- (5) Select a location which is out of reach for children and far away from animals or plants.If it is unavoidable, please add fence for safety purpose.

8.4 Electric Connection Requirement

1. Safety Precaution

- (1) Must follow the electric safety regulations when installing the unit.
- (2) According to the local safety regulations, use qualified power supply circuit and air switch.
- (3) Make sure the power supply matches with the requirement of air conditioner. Unstable power supply or incorrect wiring may result in electric shock, fire hazard or malfunction. Please install proper power supply cables before using the air conditioner.

Air-conditioner	Air switch capacity
09/12K	16A

- (4) Properly connect the live wire, neutral wire and grounding wire of power socket.
- (5) Be sure to cut off the power supply before proceeding any work related to electricity and safety.
- (6) Do not put through the power before finishing installation.
- (7) For appliances with type Y attachment, the instructions shall contain the substance of the following. If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.
- (8) The temperature of refrigerant circuit will be high, please keep the interconnection cable away from the copper tube.
- (9) The appliance shall be installed in accordance with national wiring regulations.

2. Grounding Requirement:

- (1) The air conditioner is first class electric appliance. It must be properly grounded with specialized grounding device by a professional. Please make sure it is always grounded effectively, otherwise it may cause electric shock.
- (2) The yellow-green wire in air conditioner is grounding wire, which can't be used for other purposes.
- (3) The grounding resistance should comply with national electric safety regulations.
- (4) The appliance must be positioned so that the plug is accessible.
- (5) An all-pole disconnection switch having a contact separation of at least 3mm in all poles should be connected in fixed wiring.
- (6) Including an air switch with suitable capacity, please note the following table. Air switch should be included magnet buckle and heating buckle function, it can protect the circuit-short and overload. (Caution: please do not use the fuse only for protect the circuit)

8.5 Installation of Indoor Unit

1. Choosing Installation location

Recommend the installation location to the client and then confirm it with the client.

2. Install Wall-mounting Frame

- (1) Hang the wall-mounting frame on the wall; adjust it in horizontal position with the level meter and then point out the screw fixing holes on the wall.
- (2) Drill the screw fixing holes on the wall with impact drill (the specification of drill head should be the same as the plastic expansion particle) and then fill the plastic expansion particles

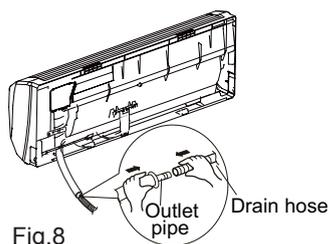


Fig.8

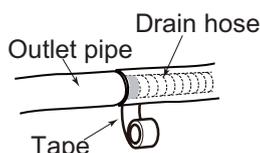


Fig.9

⚠ Note:

- (1) Add insulating pipe in the indoor drain hose in order to prevent condensation.
- (2) The plastic expansion particles are not provided. (As show in Fig.10)

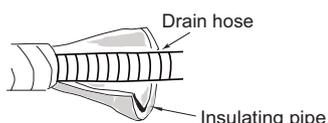


Fig.10

7. Connect Wire of Indoor Unit

- (1) Open the panel, remove the screw on the wiring cover and then take down the cover.(As show in Fig.11)

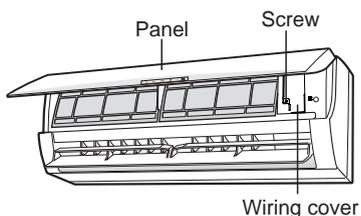


Fig.11

- (2) Make the power connection wire go through the cable-cross hole at the back of indoor unit and then pull it out from the front side.(As show in Fig.12)

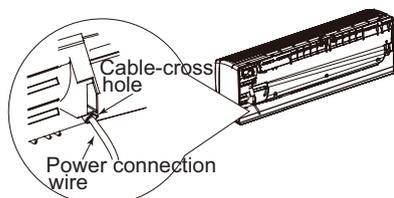


Fig.12

- (3) Remove the wire clip; connect the power connection wire to the wiring terminal according to the color; tighten the screw and then fix the power connection wire with wire clip.(As show in Fig.13)

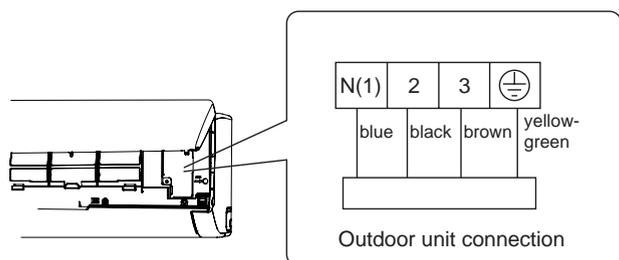


Fig.13

- (4) Put wiring cover back and then tighten the screw.
- (5) Close the panel.

⚠ Note:

- (1) All wires of indoor unit and outdoor unit should be connected by a professional.
- (2) If the length of power connection wire is insufficient, please contact the supplier for a new one. Avoid extending the wire by yourself.
- (3) For the air conditioner with plug, the plug should be reachable after finishing installation.
- (4) For the air conditioner without plug, an air switch must be installed in the line. The air switch should be all-pole parting and the contact parting distance should be more than 3mm.

8. Bind up Pipe

- (1) Bind up the connection pipe, power cord and drain hose with the band.(As show in Fig.14)
- (2) Reserve a certain length of drain hose and power cord for installation when binding them. When binding to a certain degree, separate the indoor power and then separate the drain hose.(As show in Fig.15)
- (3) Bind them evenly.
- (4) The liquid pipe and gas pipe should be bound separately at the end.

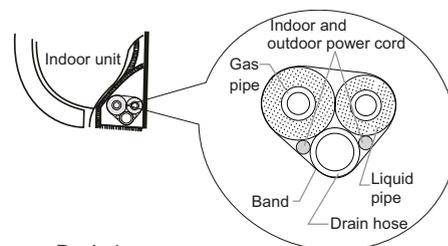


Fig.14

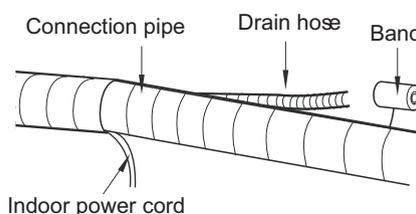


Fig.15

⚠ Note:

- (1) The power cord and control wire can't be crossed or winding.
- (2) The drain hose should be bound at the bottom.

9. Hang the Indoor Unit

- (1) Put the bound pipes in the wall pipe and then make them pass through the wall hole.
- (2) Hang the indoor unit on the wall-mounting frame.
- (3) Stuff the gap between pipes and wall hole with sealing gum.
- (4) Fix the wall pipe.(As show in Fig.16)
- (5) Check if the indoor unit is installed firmly and closed to the wall.(As show in Fig.17)

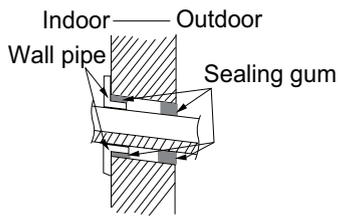


Fig.16

⚠ Note:

Do not bend the drain hose too excessively in order to prevent blocking.

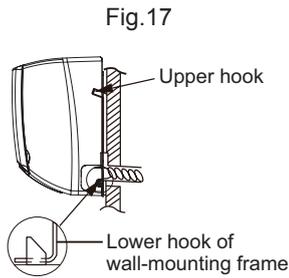


Fig.17

8.6 Installation of Outdoor Unit

1. Fix the Support of Outdoor Unit(Select it according to the actual installation situation)

- (1) Select installation location according to the house structure.
- (2) Fix the support of outdoor unit on the selected location with expansion screws.

⚠ Note:

- (1) Take sufficient protective measures when installing the outdoor unit.
- (2) Make sure the support can withstand at least four times the unit weight.
- (3) The outdoor unit should be installed at least 3cm above the floor in order to install drain joint.(As show in Fig.18)
- (4) For the unit with cooling capacity of 2300W~5000W, 6 expansion screws are needed; for the unit with cooling capacity of 6000W~8000W, 8 expansion screws are needed; for the unit with cooling capacity of 10000W~16000W, 10 expansion screws are needed.

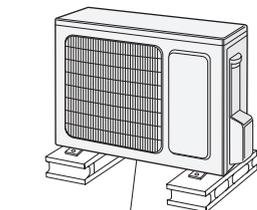


Fig.18

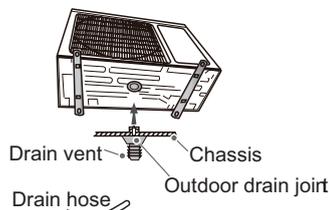


Fig.19

2. Install Drain Joint(Only for cooling and heating unit)

- (1) Connect the outdoor drain joint into the hole on the chassis.
 - (2) Connect the drain hose into the drain vent.
- (As show in Fig.19)

3. Fix Outdoor Unit

- (1) Place the outdoor unit on the support.
 - (2) Fix the foot holes of outdoor unit with bolts.
- (As show in Fig.20)

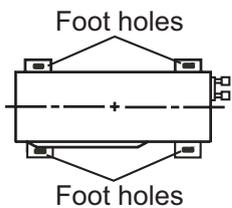


Fig.20

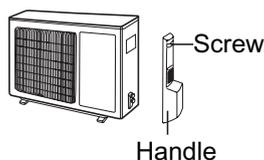


Fig.21

4. Connect Indoor and Outdoor Pipes

- (1) Remove the screw on the right handle of outdoor unit and then remove the handle.(As show in Fig.21)
- (2) Remove the screw cap of valve and aim the pipe joint at the bellmouth of pipe.(As show in Fig.22)

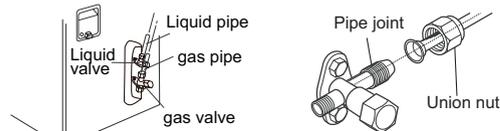


Fig.22

- (3) Pretightening the union nut with hand.
- (4) Tighten the union nut with torque wrench .

Refer to the following table for wrench moment of force:

Hex nut diameter(mm)	Tightening torque(N·m)
Φ6	15~20
Φ9.52	30~40
Φ12	45~55
Φ16	60~65
Φ19	70~75

5. Connect Outdoor Electric Wire

- (1) Remove the wire clip; connect the power connection wire and power cord to the wiring terminal according to the color; fix them with screws.(As show in Fig.23)

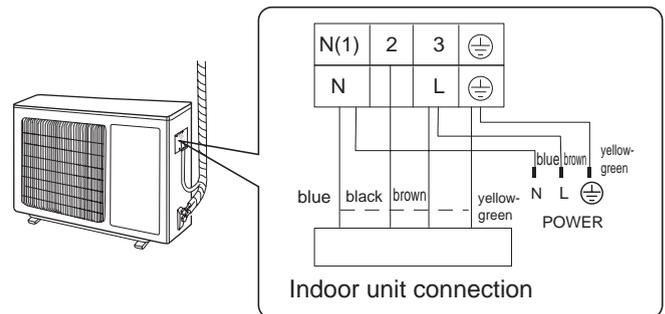


Fig.23

- (2) Fix the power connection wire and power cord with wire clip.

⚠ Note:

- (1) After tightening the screw, pull the power cord slightly to check if it is firm.
- (2) Never cut the power connection wire to prolong or shorten the distance.

6. Neaten the Pipes

- (1) The pipes should be placed along the wall, bent reasonably and hidden possibly. Min. semidiameter of bending the pipe is 10cm.
- (2) If the outdoor unit is higher than the wall hole, you must set a U-shaped curve in the pipe before pipe goes into the room, in order to prevent rain from getting into the room.(As show in Fig.24)

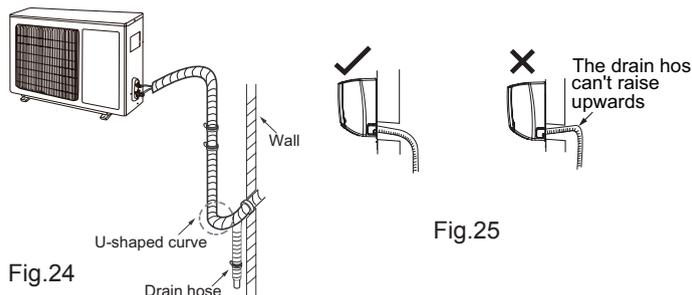


Fig.24

Fig.25

⚠ Note:

- (1) The through-wall height of drain hose shouldn't be higher than the outlet pipe hole of indoor unit.(As show in Fig.25)
- (2) Slant the drain hose slightly downwards. The drain hose can't be curved, raised and fluctuant, etc.(As show in Fig.26)
- (3) The water outlet can't be placed in water in order to drain smoothly.(As show in Fig.27)

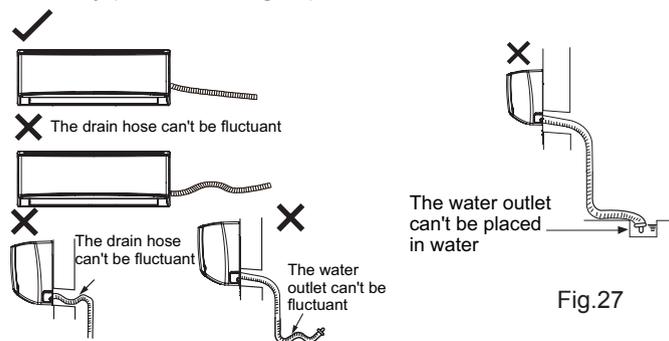


Fig.26

Fig.27

8.7 Vacuum Pumping and Leak Detection

1. Use Vacuum Pump

- (1) Remove the valve caps on the liquid valve and gas valve and the nut of refrigerant charging vent.
- (2) Connect the charging hose of piezometer to the refrigerant charging vent of gas valve and then connect the other charging hose to the vacuum pump.
- (3) Open the piezometer completely and operate for 10-15min to check if the pressure of piezometer remains in -0.1MPa.
- (4) Close the vacuum pump and maintain this status for 1-2min to check if the pressure of piezometer remains in -0.1MPa. If the pressure decreases, there may be leakage.
- (5) Remove the piezometer, open the valve core of liquid valve and gas valve completely with inner hexagon spanner.
- (6) Tighten the screw caps of valves and refrigerant charging vent.(As show in Fig.28)

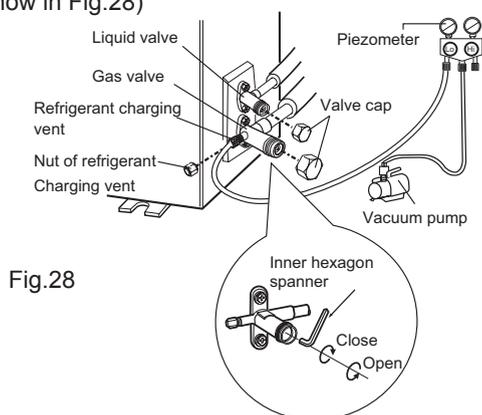


Fig.28

2. Leakage detection

- (1) With leakage detector: Check if there is leakage with leakage detector.
- (2) With soap water: If leakage detector is not available, please use soap water for leakage detection. Apply soap water at the suspected position and keep the soap water for more than 3min. If there are air bubbles coming out of this position, there's a leakage.

8.8 Check after Installation and Test Operation

1. Check after Installation

Check according to the following requirement after finishing installation.

NO.	Items to be checked	Possible malfunction
1	Has the unit been installed firmly?	The unit may drop, shake or emit noise.
2	Have you done the refrigerant leakage test?	It may cause insufficient cooling (heating) capacity.
3	Is heat insulation of pipeline sufficient?	It may cause condensation and water dripping.
4	Is water drained well?	It may cause condensation and water dripping.
5	Is the voltage of power supply according to the voltage marked on the nameplate?	It may cause malfunction or damage the parts.
6	Is electric wiring and pipeline installed correctly?	It may cause malfunction or damage the parts.
7	Is the unit grounded securely?	It may cause electric leakage.
8	Does the power cord follow the specification?	It may cause malfunction or damage the parts.
9	Is there any obstruction in air inlet and air outlet?	It may cause insufficient cooling (heating).
10	The dust and sundries caused during installation are removed?	It may cause malfunction or damaging the parts.
11	The gas valve and liquid valve of connection pipe are open completely?	It may cause insufficient cooling (heating) capacity.

2. Test operation

- (1) Preparation of test operation
 - The client approves the air conditioner installation.
 - Specify the important notes for air conditioner to the client.
- (2) Method of test operation
 - Put through the power, press ON/OFF button on the remote controller to start operation.
 - Press MODE button to select AUTO, COOL, DRY, FAN and HEAT to check whether the operation is normal or not.
 - If the ambient temperature is lower than 16°C , the air conditioner can't start cooling.

9. Maintenance

9.1 Error Code List

NO.	Malfunction Name	Display Method of Indoor Unit			Display Method of Outdoor Unit			A/C status	Possible Causes	
		Dual-8 Code Display	Indicator Display (during blinking, ON 0.5s and OFF 0.5s)			Indicator has 3 kinds of display status and during blinking, ON 0.5s and OFF 0.5s				
			Operation Indicator	Cool Indicator	Heating Indicator	Yellow Indicator	Red Indicator			Green Indicator
1	High pressure protection of system	E1							During cooling and drying operation, except indoor fan operates, all loads stop operation. During heating operation, the complete unit stops.	Possible reasons: 1. Refrigerant was superabundant; 2. Poor heat exchange (including filth blockage of heat exchanger and bad radiating environment); Ambient temperature is too high.
2	Antifreezing protection	E2				OFF 3S and blink 3 times			During cooling and drying operation, compressor and outdoor fan stop while indoor fan operates.	1. Poor air-return in indoor unit; 2. Fan speed is abnormal; 3. Evaporator is dirty.
3	System block or refrigerant leakage	E3					OFF 3S and blink 9 times		The Dual-8 Code Display will show E3 until the low pressure switch stop operation.	1.Low-pressure protection 2.Low-pressure protection of system 3.Low-pressure protection of compressor
4	High discharge temperature protection of compressor	E4				OFF 3S and blink 7 times			During cooling and drying operation, compressor and outdoor fan stop while indoor fan operates. During heating operation, all loads stop.	Please refer to the malfunction analysis (discharge protection, overload).
5	Overcurrent protection	E5				OFF 3S and blink 5 times			During cooling and drying operation, compressor and outdoor fan stop while indoor fan operates. During heating operation, all loads stop.	1. Supply voltage is unstable; 2. Supply voltage is too low and load is too high; 3. Evaporator is dirty.
6	Communication Malfunction	E6						OFF	During cooling operation, compressor stops while indoor fan motor operates. During heating operation, the complete unit stops.	Refer to the corresponding malfunction analysis.
7	High temperature resistant protection	E8				OFF 3S and blink 6 times			During cooling operation: compressor will stop while indoor fan will operate. During heating operation, the complete unit stops.	Refer to the malfunction analysis (overload, high temperature resistant).
8	EEPROM malfunction	EE				OFF 3S and blink 11 times			During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop	Replace outdoor control panel AP1
9	Limit/decrease frequency due to high temperature of module	EU							All loads operate normally, while operation frequency for compressor is decreased	Discharging after the complete unit is de-energized for 20mins, check whether the thermal grease on IPM Module of outdoor control panel AP1 is sufficient and whether the radiator is inserted tightly. If its no use, please replace control panel AP1.
10	Malfunction protection of jumper cap	C5							Wireless remote receiver and button are effective, but can not dispose the related command	1. No jumper cap insert on mainboard. 2. Incorrect insert of jumper cap. 3. Jumper cap damaged. 4. Abnormal detecting circuit of mainboard.

NO.	Malfunction Name	Display Method of Indoor Unit			Display Method of Outdoor Unit			A/C status	Possible Causes	
		Dual-8 Code Display	Indicator Display (during blinking, ON 0.5s and OFF 0.5s)			Indicator has 3 kinds of display status and during blinking, ON 0.5s and OFF 0.5s				
			Operation Indicator	Cool Indicator	Heating Indicator	Yellow Indicator	Red Indicator			Green Indicator
11	Gathering refrigerant	F0							When the outdoor unit receive signal of Gathering refrigerant ,the system will be forced to run under cooling mode for gathering refrigerant	Nominal cooling mode
12	Indoor ambient temperature sensor is open/short circuited	F1							During cooling and drying operation, indoor unit operates while other loads will stop; during heating operation, the complete unit will stop operation.	<ol style="list-style-type: none"> Loosening or bad contact of indoor ambient temp. sensor and mainboard terminal. Components in mainboard fell down leads short circuit. Indoor ambient temp. sensor damaged.(check with sensor resistance value chart) Mainboard damaged.
13	Indoor evaporator temperature sensor is open/short circuited	F2							AC stops operation once reaches the setting temperature. Cooling, drying: internal fan motor stops operation while other loads stop operation; heating: AC stop operation	<ol style="list-style-type: none"> Loosening or bad contact of Indoor evaporator temp. sensor and mainboard terminal. Components on the mainboard fall down leads short circuit. Indoor evaporator temp. sensor damaged.(check temp. sensor value chart for testing) Mainboard damaged.
14	Outdoor ambient temperature sensor is open/short circuited	F3					OFF 3S and blink 6 times		During cooling and drying operating, compressor stops while indoor fan operates; During heating operation, the complete unit will stop operation	Outdoor temperature sensor hasnt been connected well or is damaged. Please check it by referring to the resistance table for temperature sensor)
15	Outdoor condenser temperature sensor is open/short circuited	F4					OFF 3S and blink 5 times		During cooling and drying operation, compressor stops while indoor fan will operate; During heating operation, the complete unit will stop operation.	Outdoor temperature sensor hasnt been connected well or is damaged. Please check it by referring to the resistance table for temperature sensor)
16	Outdoor discharge temperature sensor is open/short circuited	F5					OFF 3S and blink 7 times		During cooling and drying operation, compressor will sop after operating for about 3 mins, while indoor fan will operate; During heating operation, the complete unit will stop after operating for about 3 mins.	<ol style="list-style-type: none"> Outdoor temperature sensor hasnt been connected well or is damaged. Please check it by referring to the resistance table for temperature sensor) The head of temperature sensor hasnt been inserted into the copper tube
17	Limit/ decrease frequency due to overload	F6					OFF 3S and blink 3 times		All loads operate normally, while operation frequency for compressor is decreased	Refer to the malfunction analysis (overload, high temperature resistant)
18	Decrease frequency due to overcurrent	F8					OFF 3S and blink once		All loads operate normally, while operation frequency for compressor is decreased	The input supply voltage is too low; System pressure is too high and overload

NO.	Malfunction Name	Display Method of Indoor Unit			Display Method of Outdoor Unit			A/C status	Possible Causes	
		Dual-8 Code Display	Indicator Display (during blinking, ON 0.5s and OFF 0.5s)			Indicator has 3 kinds of display status and during blinking, ON 0.5s and OFF 0.5s				
			Operation Indicator	Cool Indicator	Heating Indicator	Yellow Indicator	Red Indicator			Green Indicator
19	Decrease frequency due to high air discharge	F9					OFF 3S and blink twice	All loads operate normally, while operation frequency for compressor is decreased	Overload or temperature is too high; Refrigerant is insufficient; Malfunction of electric expansion valve (EKV)	
20	Limit/ decrease frequency due to antifreezing	FH					OFF 3S and blink 4 times	All loads operate normally, while operation frequency for compressor is decreased	Poor air-return in indoor unit or fan speed is too low	
21	Voltage for DC bus-bar is too high	PH					OFF 3S and blink 13 times	During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	1. Measure the voltage of position L and N on wiring board (XT), if the voltage is higher than 265VAC, turn on the unit after the supply voltage is increased to the normal range. 2.If the AC input is normal, measure the voltage of electrolytic capacitor C on control panel (AP1), if its normal, theres malfunction for the circuit, please replace the control panel (AP1)	
22	Voltage of DC bus-bar is too low	PL					OFF 3S and blink 12 times	During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop	1. Measure the voltage of position L and N on wiring board (XT), if the voltage is higher than 150VAC, turn on the unit after the supply voltage is increased to the normal range. 2.If the AC input is normal, measure the voltage of electrolytic capacitor C on control panel (AP1), if its normal, theres malfunction for the circuit, please replace the control panel (AP1)	
23	Compressor Min frequency in test state	P0							Showing during min. cooling or min. heating test	
24	Compressor rated frequency in test state	P1							Showing during nominal cooling or nominal heating test	
25	Compressor maximum frequency in test state	P2							Showing during max. cooling or max. heating test	

NO.	Malfunction Name	Display Method of Indoor Unit			Display Method of Outdoor Unit			A/C status	Possible Causes	
		Dual-8 Code Display	Indicator Display (during blinking, ON 0.5s and OFF 0.5s)			Indicator has 3 kinds of display status and during blinking, ON 0.5s and OFF 0.5s				
			Operation Indicator	Cool Indicator	Heating Indicator	Yellow Indicator	Red Indicator			Green Indicator
26	Compressor intermediate frequency in test state	P3							Showing during middle cooling or middle heating test	
27	Overcurrent protection of phase current for compressor	P5						During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the malfunction analysis (IPM protection, loss of synchronism protection and overcurrent protection of phase current for compressor).	
28	Charging malfunction of capacitor	PU						During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop	Refer to the part three—charging malfunction analysis of capacitor	
29	Malfunction of module temperature sensor circuit	P7						During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop	Replace outdoor control panel AP1	
30	Module high temperature protection	P8						During cooling operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop	After the complete unit is de-energized for 20mins, check whether the thermal grease on IPM Module of outdoor control panel AP1 is sufficient and whether the radiator is inserted tightly. If its no use, please replace control panel AP1.	
31	Overload protection for compressor	H3				OFF 3S and blink 8 times		During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	1. Wiring terminal OVC-COMP is loosened. In normal state, the resistance for this terminal should be less than 1ohm. 2. Refer to the malfunction analysis (discharge protection, overload)	
32	IPM protection	H5				OFF 3S and blink 4 times		During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the malfunction analysis (IPM protection, loss of synchronism protection and overcurrent protection of phase current for compressor).	
33	Module temperature is too high	H5				OFF 3S and blink 10 times				

NO.	Malfunction Name	Display Method of Indoor Unit			Display Method of Outdoor Unit			A/C status	Possible Causes	
		Dual-8 Code Display	Indicator Display (during blinking, ON 0.5s and OFF 0.5s)			Indicator has 3 kinds of display status and during blinking, ON 0.5s and OFF 0.5s				
			Operation Indicator	Cool Indicator	Heating Indicator	Yellow Indicator	Red Indicator	Green Indicator		
34	Internal motor (fan motor) do not operate	H6							Internal fan motor, external fan motor, compressor and electric heater stop operation, guide louver stops at present location.	1. Bad contact of DC motor feedback terminal. 2. Bad contact of DC motor control end. 3. Fan motor is stalling. 4. Motor malfunction. 5. Malfunction of mainboard rev detecting circuit.
35	Desynchronizing of compressor	H7							During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the malfunction analysis (IPM protection, loss of synchronism protection and overcurrent protection of phase current for compressor).
36	PFC protection	HC				OFF 3S and blink 14 times			During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the malfunction analysis
37	Outdoor DC fan motor malfunction	L3					OFF 3S and blink 14 times		Outdoor DC fan motor malfunction lead to compressor stop operation,	DC fan motor malfunction or system blocked or the connector loosed
38	power protection	L9				OFF 3S and blink 9 times			compressor stop operation and Outdoor fan motor will stop 30s latter , 3 minutes latter fan motor and compressor will restart	To protect the electrical components when detect high power
39	Indoor unit and outdoor unit doesnt match	LP				OFF 3S and blink 16 times			compressor and Outdoor fan motor cant work	Indoor unit and outdoor unit doesnt match
40	Failure start-up	LC							During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the malfunction analysis
41	Normal communication							continuously		
42	Defrosting				OFF 3S and blink once (during blinking, ON 10s and OFF 0.5s)	OFF 3S and blink twice			Defrosting will occur in heating mode. Compressor will operate while indoor fan will stop operation.	Its the normal state

NO.	Malfunction Name	Display Method of Indoor Unit			Display Method of Outdoor Unit			A/C status	Possible Causes	
		Dual-8 Code Display	Indicator Display (during blinking, ON 0.5s and OFF 0.5s)			Indicator has 3 kinds of display status and during blinking, ON 0.5s and OFF 0.5s				
			Operation Indicator	Cool Indicator	Heating Indicator	Yellow Indicator	Red Indicator			Green Indicator
43	Malfunction of phase current detection circuit for compressor	U1							During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop	Replace outdoor control panel AP1
44	Malfunction of voltage dropping for DC bus-bar	U3							During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop	Supply voltage is unstable
45	Malfunction of complete units current detection	U5							During cooling and drying operation, the compressor will stop while indoor fan will operate; During heating operating, the complete unit will stop operation.	Theres circuit malfunction on outdoor units control panel AP1, please replace the outdoor units control panel AP1.
46	The four-way valve is abnormal	U7							If this malfunction occurs during heating operation, the complete unit will stop operation.	1. Supply voltage is lower than AC175V; 2. Wiring terminal 4V is loosened or broken; 3. 4V is damaged, please replace 4V.
47	Frequency limiting (power)						OFF 3S and blink 13 times			
48	Compressor is open-circuited					OFF 3S and blink once				
49	The temperature for turning on the unit is reached						OFF 3S and blink 8 times			
50	Frequency limiting (module temperature)						OFF 3S and blink 11 times			
51	Malfunction of zero-cross detection circuit	U8							The complete unit stops	1. Power supply is abnormal; 2. Detection circuit of indoor control mainboard is abnormal.

Analysis or processing of some of the malfunction display:**1. Compressor discharge protection**

Possible causes: shortage of refrigerant; blockage of air filter; poor ventilation or air flow short pass for condenser; the system has noncondensing gas (such as air, water etc.); blockage of capillary assy (including filter); leakage inside four-way valve causes incorrect operation; malfunction of compressor; malfunction of protection relay; malfunction of discharge sensor; outdoor temperature too high.

Processing method: refer to the malfunction analysis in the above section.

2. Low voltage overcurrent protection

Possible cause: Sudden drop of supply voltage.

3. Communication malfunction

Processing method: Check if communication signal cable is connected reliably.

4. Sensor open or short circuit

Processing method: Check whether sensor is normal, connected with the corresponding position on the controller and if damage of lead wire is found.

5. Compressor over load protection

Possible causes: insufficient or too much refrigerant; blockage of capillary and increase of suction temp.; improper running of compressor, burning in or stuck of bearing, damage of discharge valve; malfunction of protector.

Processing method: adjust refrigerant amount; replace the capillary; replace the compressor; use universal meter to check if the contactor of compressor is fine when it is not overheated, if not replace the protector.

6. System malfunction

i.e. overload protection. When tube temperature (Check the temperature of outdoor heat exchanger when cooling and check the temperature of indoor heat exchanger when heating) is too high, protection will be activated.

Possible causes: Outdoor temperature is too high when cooling; insufficient outdoor air circulation; refrigerant flow malfunction. please refer to the malfunction analysis in the previous section for handling method.

7. IPM module protection

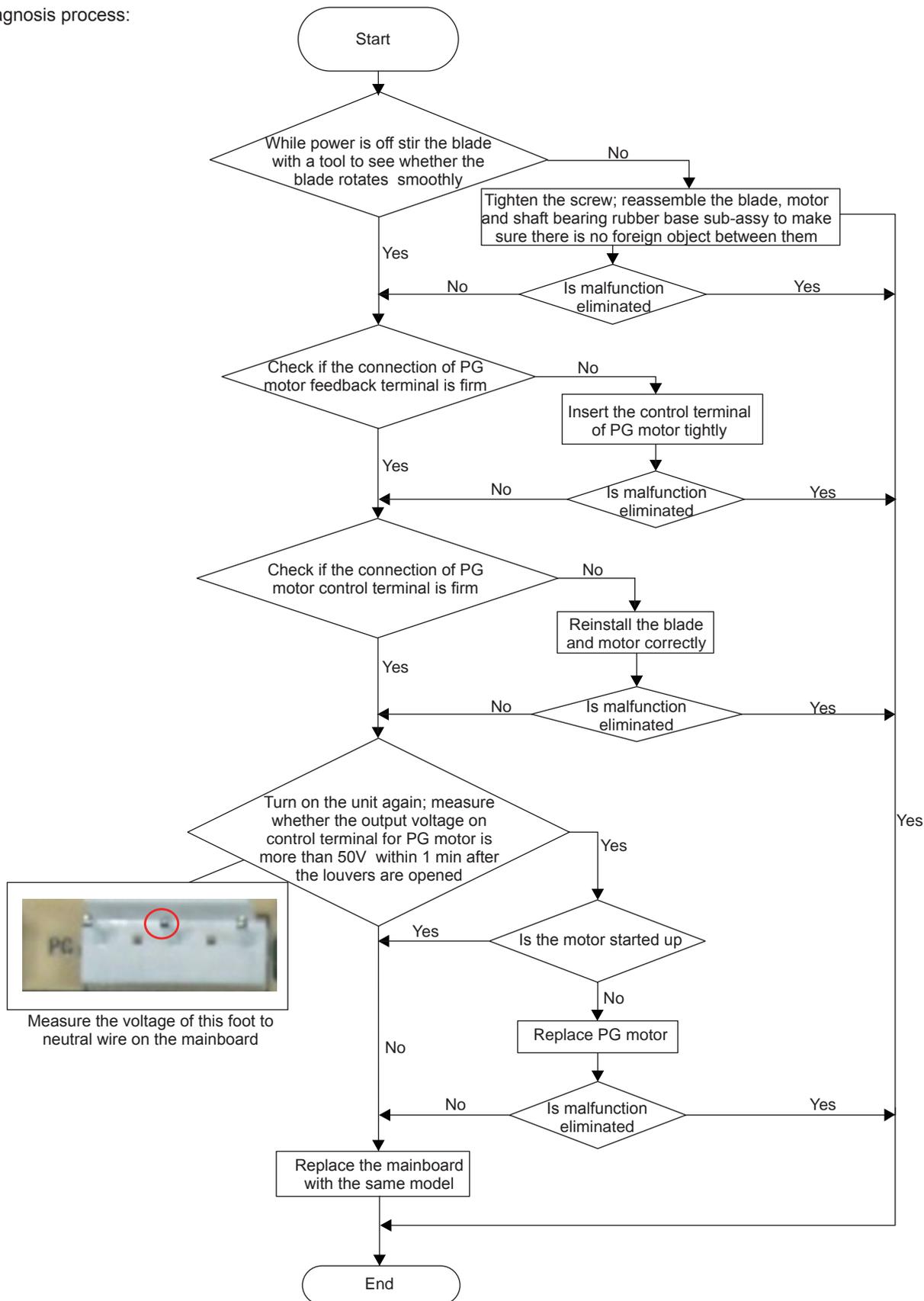
Processing method: Once the module malfunction happens, if it persists for a long time and can not be self-canceled, cut off the power and turn off the unit, and then re-energize the unit again after about 10 min. After repeating the procedure for several times, if the malfunction still exists, replace the module.

(2) Malfunction of Blocked Protection of IDU Fan Motor H6

Main detection points:

- Smoothly the control terminal of PG motor connected tightly?
- Smoothly the feedback interface of PG motor connected tightly?
- The fan motor can't operate?
- The motor is broken?
- Detection circuit of the mainboard is defined abnormal?

Malfunction diagnosis process:

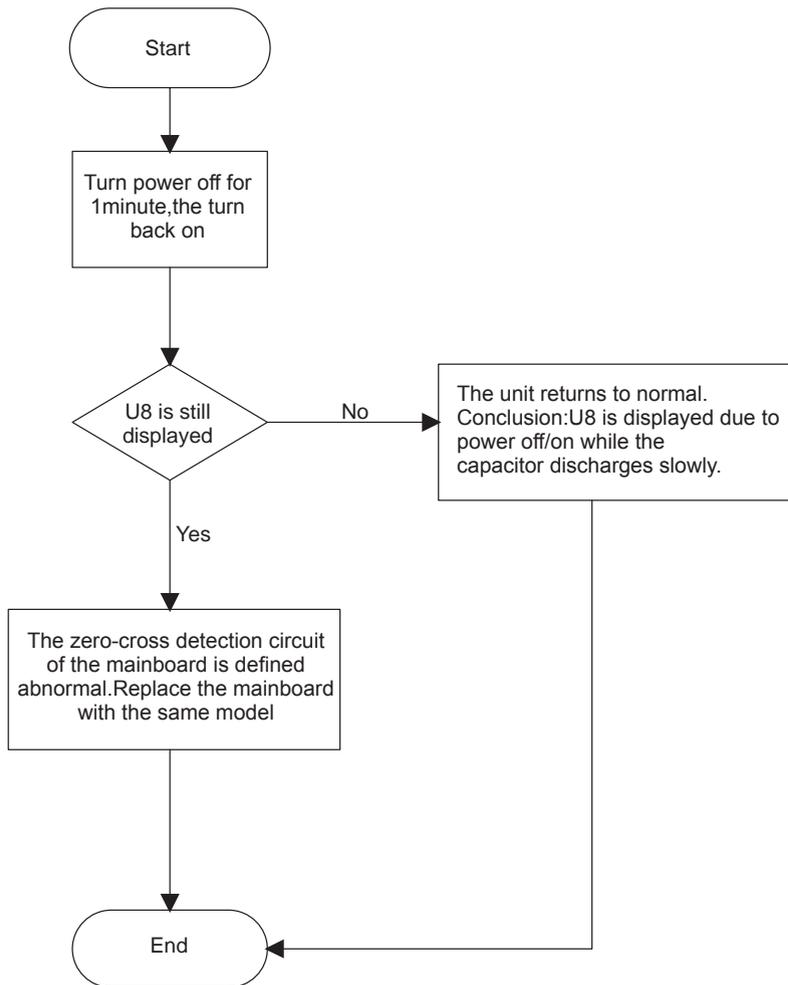


(4) Malfunction of Zero-crossing Inspection Circuit Malfunction of the IDU Fan Motor U8

Main detection points:

- Instant energization after de-energization while the capacitor discharges slowly?
- The zero-cross detection circuit of the mainboard is defined abnormal?

Malfunction diagnosis process:

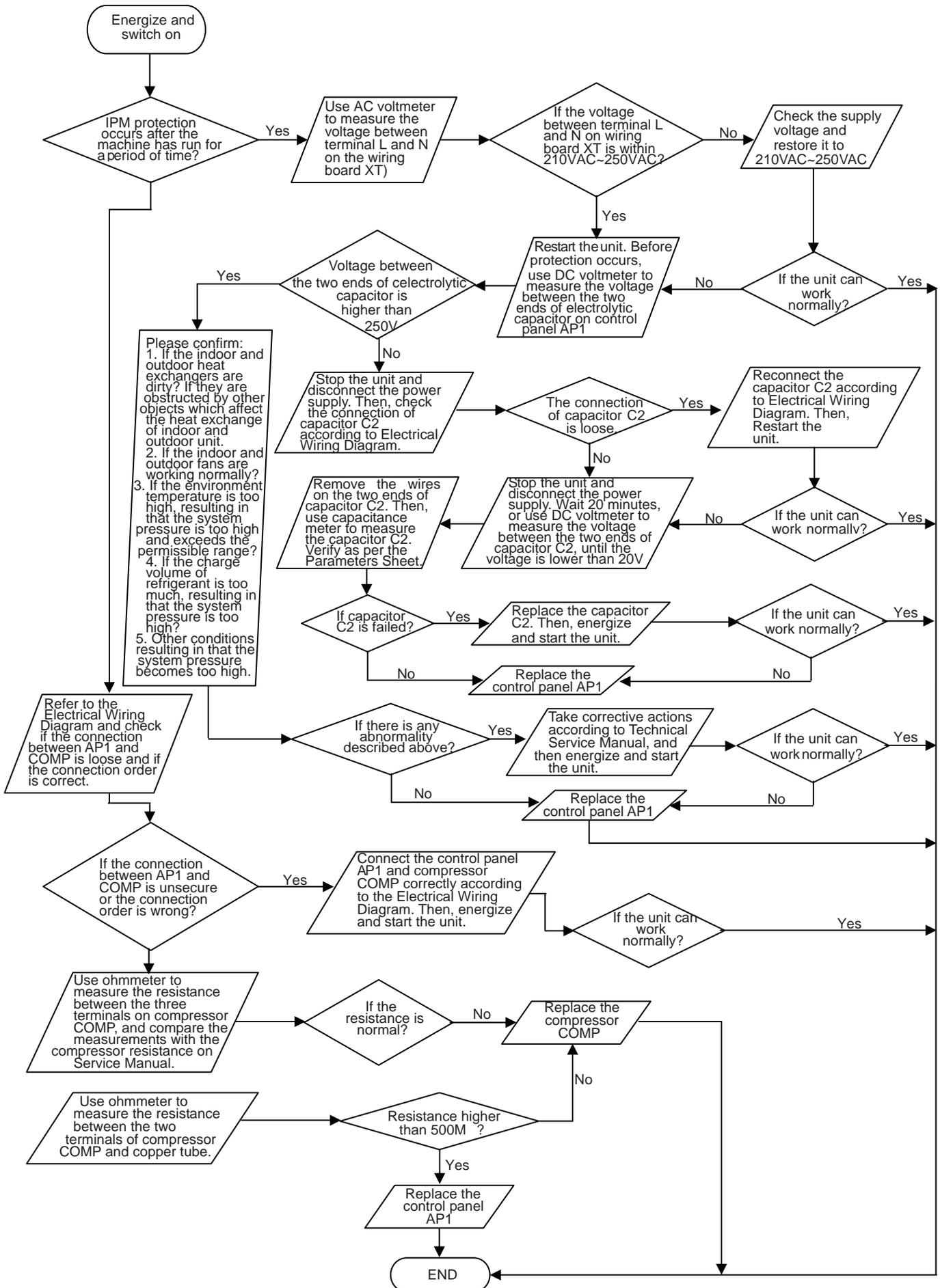


(2) IPM Protection, Out-of-step Fault, Compressor Phase Overcurrent (AP1 below refers to the outdoor control panel)

Main check points:

- Is the connection between control panel AP1 and compressor COMP secure? Loose? Is the connection in correct order?
- Is the voltage input of the machine within normal range? (Use AC voltmeter to measure the voltage between terminal L and N on the wiring board XT)
- Is the compressor coil resistance normal? Is the insulation of compressor coil against the copper tube in good condition?
- Is the working load of the machine too high? Is the radiation good?
- Is the charge volume of refrigerant correct?

Fault diagnosis process:

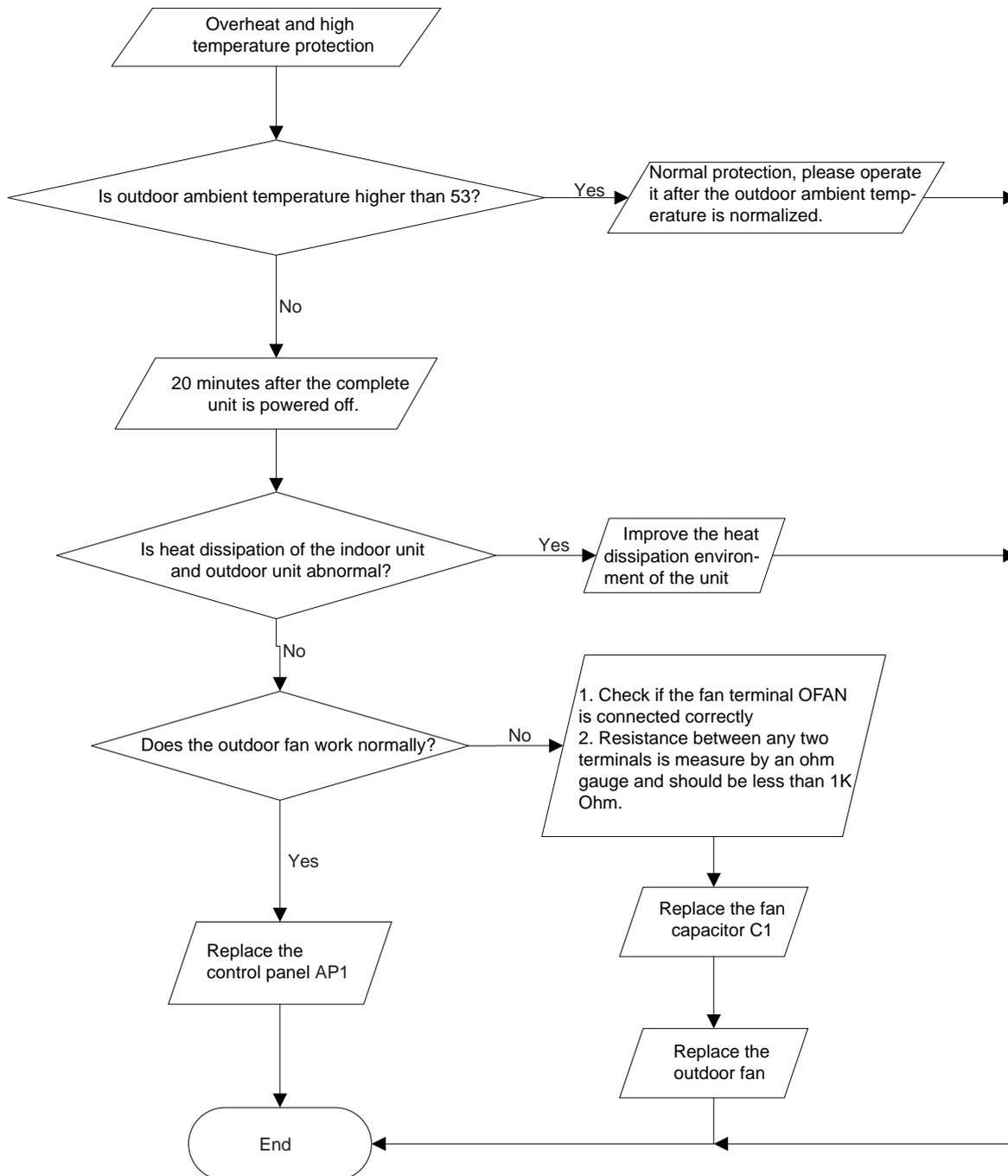


(3) High temperature and overload protection diagnosis (AP1 hereinafter refers to the control board of the outdoor unit)

Mainly detect:

- Is outdoor ambient temperature in normal range?
- Are the outdoor and indoor fans operating normally?
- Is the heat dissipation environment inside and outside the unit good?

Fault diagnosis process:

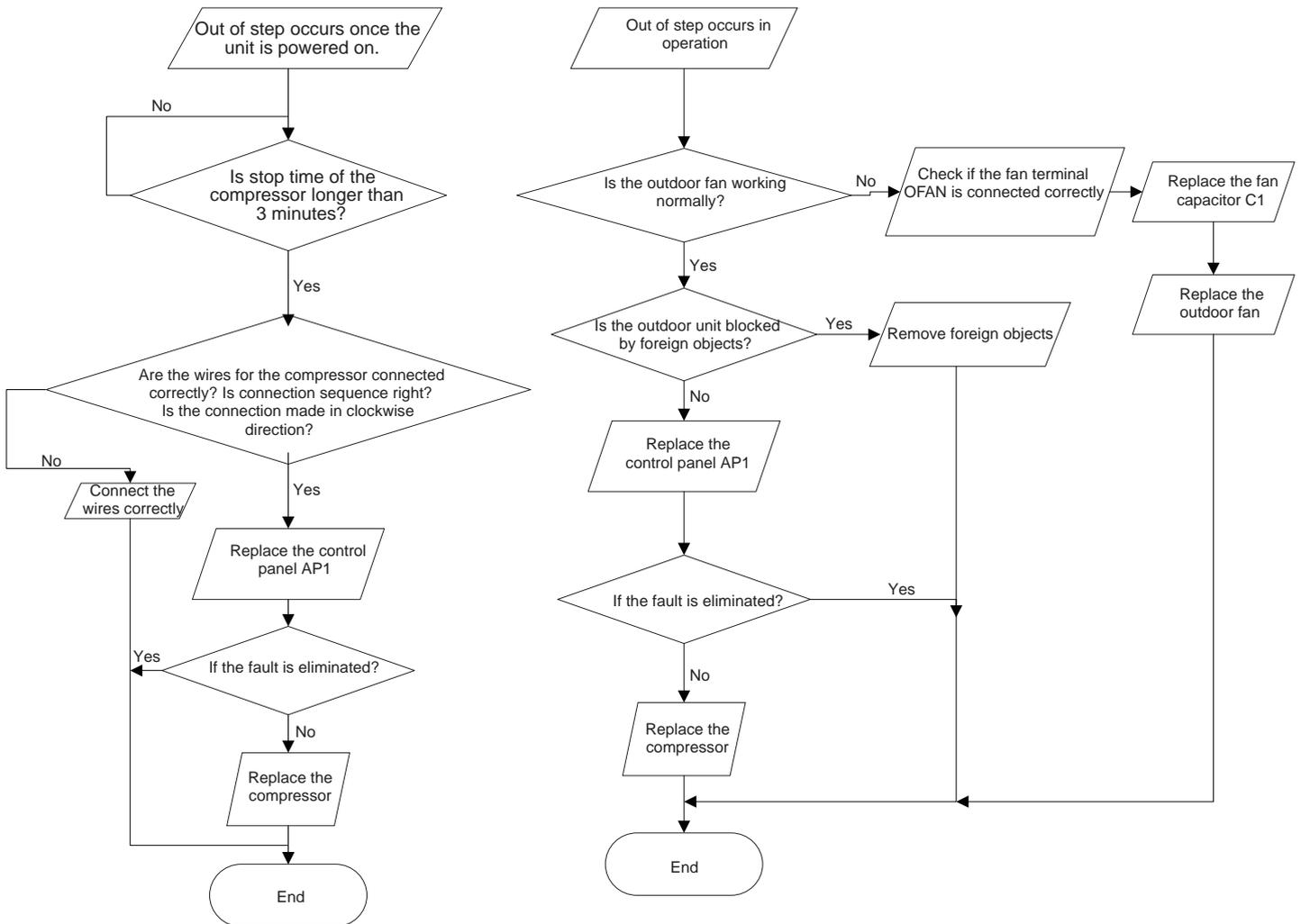


(5) Out of step diagnosis for the compressor (AP1 hereinafter refers to the control board of the outdoor unit)

Mainly detect:

- Is the system pressure too high?
- Is the input voltage too low?

Fault diagnosis process:

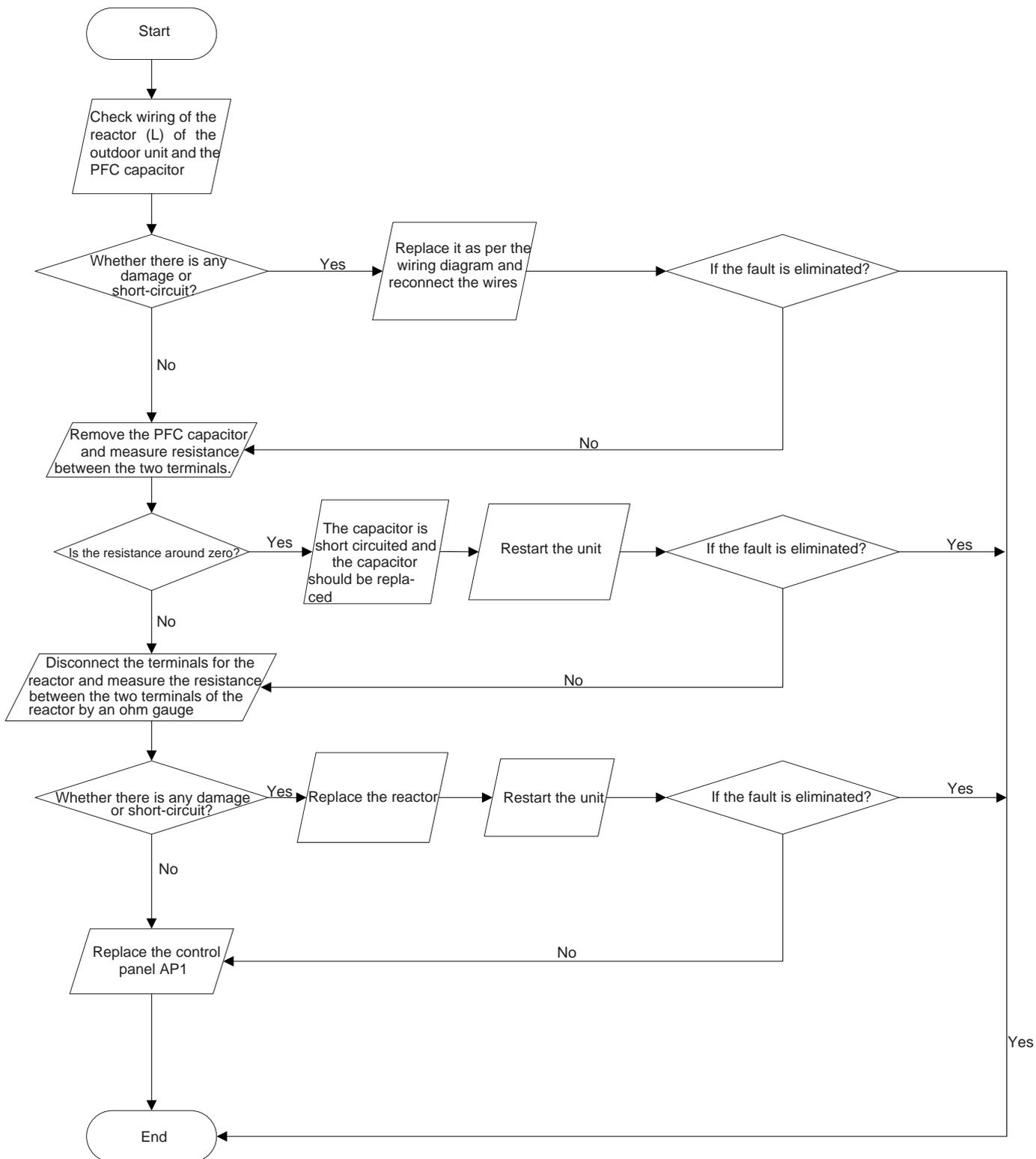


(7) Power factor correct or (PFC) fault (a fault of outdoor unit) (AP1 hereinafter refers to the control board of the outdoor unit)

Mainly detect:

- Check if the reactor (L) of the outdoor unit and the PFC capacitor are broken

Fault diagnosis process:

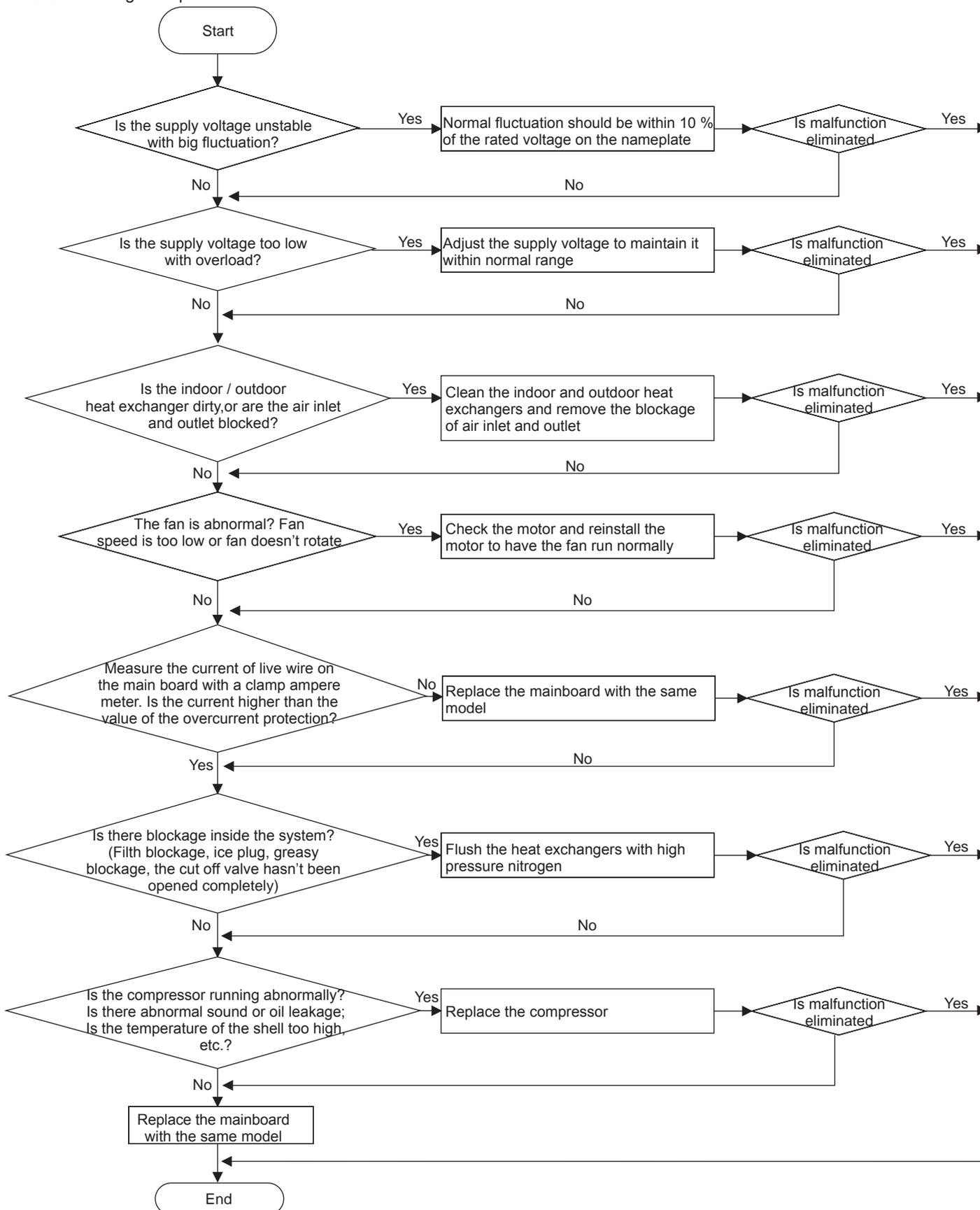


(9) Malfunction of Overcurrent Protection

Main detection points:

- Is the supply voltage unstable with big fluctuation?
- Is the supply voltage too low with overload?
- Hardware trouble?

Malfunction diagnosis process:



9.3 Troubleshooting for Normal Malfunction

1. Air Conditioner Can't be Started Up

Possible Causes	Discriminating Method (Air conditioner Status)	Troubleshooting
No power supply, or poor connection for power plug	After energization, operation indicator isn't bright and the buzzer can't give out sound	Confirm whether it's due to power failure. If yes, wait for power recovery. If not, check power supply circuit and make sure the power plug is connected well.
Wrong wire connection between indoor unit and outdoor unit, or poor connection for wiring terminals	Under normal power supply circumstances, operation indicator isn't bright after energization	Check the circuit according to circuit diagram and connect wires correctly. Make sure all wiring terminals are connected firmly
Electric leakage for air conditioner	After energization, room circuit breaker trips off at once	Make sure the air conditioner is grounded reliably Make sure wires of air conditioner is connected correctly Check the wiring inside air conditioner. Check whether the insulation layer of power cord is damaged; if yes, place the power cord.
Model selection for air switch is improper	After energization, air switch trips off	Select proper air switch
Malfunction of remote controller	After energization, operation indicator is bright, while no display on remote controller or buttons have no action.	Replace batteries for remote controller Repair or replace remote controller

2. Poor Cooling (Heating) for Air Conditioner

Possible Causes	Discriminating Method (Air conditioner Status)	Troubleshooting
Set temperature is improper	Observe the set temperature on remote controller	Adjust the set temperature
Rotation speed of the IDU fan motor is set too low	Small wind blow	Set the fan speed at high or medium
Filter of indoor unit is blocked	Check the filter to see it's blocked	Clean the filter
Installation position for indoor unit and outdoor unit is improper	Check whether the installation position is proper according to installation requirement for air conditioner	Adjust the installation position, and install the rainproof and sunproof for outdoor unit
Refrigerant is leaking	Discharged air temperature during cooling is higher than normal discharged wind temperature; Discharged air temperature during heating is lower than normal discharged wind temperature; Unit's pressure is much lower than regulated range	Find out the leakage causes and deal with it. Add refrigerant.
Malfunction of 4-way valve	Blow cold wind during heating	Replace the 4-way valve
Malfunction of capillary	Discharged air temperature during cooling is higher than normal discharged wind temperature; Discharged air temperature during heating is lower than normal discharged wind temperature; Unit's pressure is much lower than regulated range. If refrigerant isn't leaking, part of capillary is blocked	Replace the capillary
Flow volume of valve is insufficient	The pressure of valves is much lower than that stated in the specification	Open the valve completely
Malfunction of horizontal louver	Horizontal louver can't swing	Refer to point 3 of maintenance method for details
Malfunction of the IDU fan motor	The IDU fan motor can't operate	Refer to troubleshooting for H6 for maintenance method in details
Malfunction of the ODU fan motor	The ODU fan motor can't operate	Refer to point 4 of maintenance method for details
Malfunction of compressor	Compressor can't operate	Refer to point 5 of maintenance method for details

3. Horizontal Louver Can't Swing

Possible Causes	Discriminating Method (Air conditioner Status)	Troubleshooting
Wrong wire connection, or poor connection	Check the wiring status according to circuit diagram	Connect wires according to wiring diagram to make sure all wiring terminals are connected firmly
Stepping motor is damaged	Stepping motor can't operate	Repair or replace stepping motor
Main board is damaged	Others are all normal, while horizontal louver can't operate	Replace the main board with the same model

4. ODU Fan Motor Can't Operate

Possible causes	Discriminating method (air conditioner status)	Troubleshooting
Wrong wire connection, or poor connection	Check the wiring status according to circuit diagram	Connect wires according to wiring diagram to make sure all wiring terminals are connected firmly
Capacity of the ODU fan motor is damaged	Measure the capacity of fan capacitor with an universal meter and find that the capacity is out of the deviation range indicated on the nameplate of fan capacitor.	Replace the capacity of fan
Power voltage is a little low or high	Use universal meter to measure the power supply voltage. The voltage is a little high or low	Suggest to equip with voltage regulator
Motor of outdoor unit is damaged	When unit is on, cooling/heating performance is bad and ODU compressor generates a lot of noise and heat.	Change compressor oil and refrigerant. If no better, replace the compressor with a new one

5. Compressor Can't Operate

Possible causes	Discriminating method (air conditioner status)	Troubleshooting
Wrong wire connection, or poor connection	Check the wiring status according to circuit diagram	Connect wires according to wiring diagram to make sure all wiring terminals are connected firmly
Capacity of compressor is damaged	Measure the capacity of fan capacitor with an universal meter and find that the capacity is out of the deviation range indicated on the nameplate of fan capacitor.	Replace the compressor capacitor
Power voltage is a little low or high	Use universal meter to measure the power supply voltage. The voltage is a little high or low	Suggest to equip with voltage regulator
Coil of compressor is burnt out	Use universal meter to measure the resistance between compressor terminals and it's 0	Repair or replace compressor
Cylinder of compressor is blocked	Compressor can't operate	Repair or replace compressor

6. Air Conditioner is Leaking

Possible causes	Discriminating method (air conditioner status)	Troubleshooting
Drain pipe is blocked	Water leaking from indoor unit	Eliminate the foreign objects inside the drain pipe
Drain pipe is broken	Water leaking from drain pipe	Replace drain pipe
Wrapping is not tight	Water leaking from the pipe connection place of indoor unit	Wrap it again and bundle it tightly

7. Abnormal Sound and Vibration

Possible causes	Discriminating method (air conditioner status)	Troubleshooting
When turn on or turn off the unit, the panel and other parts will expand and there's abnormal sound	There's the sound of "PAPA"	Normal phenomenon. Abnormal sound will disappear after a few minutes.
When turn on or turn off the unit, there's abnormal sound due to flow of refrigerant inside air conditioner	Water-running sound can be heard	Normal phenomenon. Abnormal sound will disappear after a few minutes.
Foreign objects inside the indoor unit or there're parts touching together inside the indoor unit	There's abnormal sound fro indoor unit	Remove foreign objects. Adjust all parts' position of indoor unit, tighten screws and stick damping plaster between connected parts
Foreign objects inside the outdoor unit or there're parts touching together inside the outdoor unit	There's abnormal sound fro outdoor unit	Remove foreign objects. Adjust all parts' position of outdoor unit, tighten screws and stick damping plaster between connected parts
Short circuit inside the magnetic coil	During heating, the way valve has abnormal electromagnetic sound	Replace magnetic coil
Abnormal shake of compressor	Outdoor unit gives out abnormal sound	Adjust the support foot mat of compressor, tighten the bolts
Abnormal sound inside the compressor	Abnormal sound inside the compressor	If add too much refrigerant during maintenance, please reduce refrigerant properly. Replace compressor for other circumstances.

NO.	Description	Part Code		Qty
		GWH09QB-K3DNA1G/I (Cold Plasma)	GWH09QB-K3DNA1G/I	
		Product Code	Product Code	
		CB419N05501	CB419N05500	
1	Front Panel Assy	20022496	20022496	1
2	Display Board	30565231	30565231	1
3	Front Case Assy	20022495	20022495	1
4	Helicoid Tongue	26112508	26112508	1
5	Left Axile Bush	10512037	10512037	1
6	Rear Case assy	20162010	20162010	1
7	Drainage Hose	0523001408	0523001408	1
8	Ring of Bearing	26152022	26152022	1
9	Evaporator Support	24212180	24212180	1
10	Cold Plasma Generator	1114001602	/	1
11	Evaporator Assy	01002000044	01002000044	1
12	Wall Mounting Frame	01252043	01252043	1
13	Cross Flow Fan	10352059	10352059	1
14	Fan Motor	150120874	150120874	1
15	Connecting pipe clamp	2611216401	2611216401	1
16	Rubber Plug (Water Tray)	76712012	76712012	1
17	Stepping Motor	1521212901	1521212901	1
18	Crank	73012005	73012005	1
19	Electric Box Assy	10000201389	10000201390	1
20	Axile Bush	10542036	10542036	1
21	Terminal Board	42011233	42011233	1
22	Jumper	4202300101	4202300101	1
23	Main Board	30138000427	30130205	1
24	Electric Box Cover Sub-Assy	01402065	01402065	1
25	Shield Cover of Electric Box Cover	01592150	01592150	1
26	Electric Box Cover	20112207	20112207	1
27	Power Cord	/	/	/
28	Connecting Cable	4002052317	4002052317	0
29	Remote Controller	30510474	30510474	1
30	Capacitor CBB61	33010747	33010747	1

Above data is subject to change without notice.

NO.	Description	Part Code		Qty
		GWH12QC-K3DNA1G/I (Cold Plasma)	GWH12QC-K3DNA1G/I	
		Product Code	Product Code	
		CB419N05401	CB419N05400	
1	Front Panel Assy	20022493	20022493	1
2	Display Board	30565231	30565231	1
3	Front Case Assy	20022489	20022489	1
4	Helicoid Tongue	26112507	26112507	1
5	Left Axile Bush	10512037	10512037	1
6	Rear Case assy	22202375	22202375	1
7	Drainage Hose	05230014	05230014	1
8	Ring of Bearing	26152022	26152022	1
9	Evaporator Support	24212179	24212179	1
10	Cold Plasma Generator	1114001602	/	1
11	Evaporator Assy	0100297601	0100297601	1
12	Wall Mounting Frame	01252484	01252484	1
13	Cross Flow Fan	10352056	10352056	1
14	Fan Motor	15012146	15012146	1
15	Connecting pipe clamp	2611216401	2611216401	1
16	Rubber Plug (Water Tray)	76712012	76712012	1
17	SteppingMotor	1521210701	1521210701	1
18	Crank	73012005	73012005	1
19	Electric Box Assy	10000201387	10000201388	1
20	Axile Bush	10542036	10542036	1
21	Terminal Board	42011233	42011233	1
22	Jumper	4202300105	4202300105	1
23	Main Board	30138000430	30130207	1
24	Electric Box Cover Sub-Assy	01402065	01402065	1
25	Shield Cover of Electric Box Cover	01592150	01592150	1
26	Electric Box Cover	20112207	20112207	1
27	Power Cord	/	/	/
28	Connecting Cable	4002052317	4002052317	0
29	Remote Controller	30510474	30510474	1
30	Capacitor CBB611A	3301074712	3301074712	1

Above data is subject to change without notice.

NO.	Description	Part Code		Qty
		GWH12QC-K3DNB4G/I (Cold Plasma)	GWH12QC-K3DNB6G/I (Cold Plasma)	
		Product Code		
		CB434N02100	CB435N00100	
1	Front Panel Assy	20000300027	20000300049	1
2	Display Board	30565260	30565281	1
3	Front Case Assy	00000200045	00000200045	1
4	Helicoid Tongue	26112436	26112507	1
5	Left Axile Bush	10512037	10512037	1
6	Rear Case assy	00000100093	22202375	1
7	Drainage Hose	05230014	05230014	1
8	Ring of Bearing	26152022	26152022	1
9	Evaporator Support	24212179	24212179	1
10	Cold Plasma Generator	1114001602	1114001602	1
11	Evaporator Assy	01100100245	0100297601	1
12	Wall Mounting Frame	01252484	01252484	1
13	Cross Flow Fan	10352056	10352056	1
14	Fan Motor	1501214603	15012146	1
15	Connecting pipe clamp	2611216401	2611216401	1
16	Rubber Plug (Water Tray)	76712012	76712012	1
17	Stepping Motor	1521210701	1521210701	1
18	Crank	73012005	73012005	1
19	Electric Box Assy	10000202559	10000202284	1
20	Axile Bush	10542036	10542036	1
21	Terminal Board	42011233	42011233	1
22	Jumper	4202300114	4202300114	1
23	Main Board	30138000430	30138000430	1
24	Electric Box Cover Sub-Assy	01402065	01402065	1
25	Shield Cover of Electric Box Cover	01592150	01592150	1
26	Electric Box Cover	20112207	20112207	1
27	Power Cord	/	/	/
28	Connecting Cable	4002052317	4002052317	0
29	Remote Controller	30510474	30510474	1
30	Capacitor CBB61S	3301074712	3301074712	1

Above data is subject to change without notice.

NO.	Description	Part Code		Qty
		GWH12QC-K3DNB2G/I	GWH12QC-K3DNB2G/I (Cold Plasma)	
		Product Code		
		CB432N02100	CB432N02101	
1	Front Panel Assy	20000300018	20000300018	1
2	Display Board	30565260	30565260	1
3	Front Case Assy	00000200045	00000200045	1
4	Helicoid Tongue	26112507	26112436	1
5	Left Axile Bush	10512037	10512037	1
6	Rear Case assy	22202375	00000100093	1
7	Drainage Hose	05230014	05230014	1
8	Ring of Bearing	26152022	26152022	1
9	Evaporator Support	24212179	24212179	1
10	Cold Plasma Generator	/	1114001602	1
11	Evaporator Assy	0100297601	0100297601	1
12	Wall Mounting Frame	01252484	01252484	1
13	Cross Flow Fan	10352056	10352056	1
14	Fan Motor	15012146	1501214603	1
15	Connecting pipe clamp	2611216401	2611216401	1
16	Rubber Plug (Water Tray)	76712012	76712012	1
17	Stepping Motor	1521210701	1521210701	1
18	Crank	73012005	73012005	1
19	Electric Box Assy	10000202164	10000202559	1
20	Axile Bush	10542036	10542036	1
21	Terminal Board	42011233	42011233	1
22	Jumper	4202300114	4202300114	1
23	Main Board	30130207	30138000430	1
24	Electric Box Cover Sub-Assy	01402065	01402065	1
25	Shield Cover of Electric Box Cover	01592150	01592150	1
26	Electric Box Cover	20112207	20112207	1
27	Power Cord	/	/	/
28	Connecting Cable	4002052317	4002052317	0
29	Remote Controller	30510474	30510474	1
30	Capacitor CBB611A	3301074712	3301074712	1

Above data is subject to change without notice.

NO.	Description	Part Code		Qty
		GWH09QB-K3DNB2G/I (Cold Plasma)	GWH09QB-K3DNB4G/I (Cold Plasma)	
		Product Code		
		CB432N02200	CB434N02300	
1	Front Panel Assy	20000300019	20000300026	1
2	Display Board	30565260	30565260	1
3	Front Case Assy	00000200040	00000200040	1
4	Helicoid Tongue	26112508	26112508	1
5	Left Axile Bush	10512037	10512037	1
6	Rear Case assy	20162010	20162010	1
7	Drainage Hose	0523001408	0523001408	1
8	Ring of Bearing	26152022	26152022	1
9	Evaporator Support	24212180	24212180	1
10	Cold Plasma Generator	1114001602	1114001602	1
11	Evaporator Assy	01002000044	01002000044	1
12	Wall Mounting Frame	01252043	01252043	1
13	Cross Flow Fan	10352059	10352059	1
14	Fan Motor	150120874	150120874	1
15	Connecting pipe clamp	2611216401	2611216401	1
16	Rubber Plug (Water Tray)	76712012	76712012	1
17	Stepping Motor	1521212901	1521212901	1
18	Crank	73012005	73012005	1
19	Electric Box Assy	10000202565	10000202565	1
20	Axile Bush	10542036	10542036	1
21	Terminal Board	42011233	42011233	1
22	Jumper	4202300104	4202300104	1
23	Main Board	30138000427	30138000427	1
24	Electric Box Cover Sub-Assy	01402065	01402065	1
25	Shield Cover of Electric Box Cover	01592150	01592150	1
26	Electric Box Cover	20112207	20112207	1
27	Power Cord	/	/	/
28	Connecting Cable	4002052317	4002052317	0
29	Remote Controller	30510474	30510474	1
30	Capacitor CBB61S	33010747	33010747	1

Above data is subject to change without notice.

NO.	Description	Part Code		Qty
		GWH09QB-K3DNA2G/I (Cold Plasma)	GWH09QB-K3DNA5G/I	
		Product Code		
		CB426N01200	CB425N03500	
1	Front Panel Assy	20022719	00000300036	1
2	Display Board	30565265	30565260	1
3	Front Case Assy	2002273001	2002249501	1
4	Helicoid Tongue	26112508	26112508	1
5	Left Axile Bush	10512037	10512037	1
6	Rear Case assy	20162010	20162010	1
7	Drainage Hose	0523001408	0523001408	1
8	Ring of Bearing	26152022	26152022	1
9	Evaporator Support	24212180	24212180	1
10	Cold Plasma Generator	11140016	/	1
11	Evaporator Assy	01002000044	0100200004402	1
12	Wall Mounting Frame	01252043	01252043	1
13	Cross Flow Fan	10352059	10352059	1
14	Fan Motor	150120874	150120874	1
15	Connecting pipe clamp	2611216401	2611216401	1
16	Rubber Plug (Water Tray)	76712012	76712012	1
17	Stepping Motor	1521212901	1521212901	1
18	Crank	73012005	73012005	1
19	Electric Box Assy	10000202687	10000202756	1
20	Axile Bush	10542036	10542036	1
21	Terminal Board	42011233	42011233	1
22	Jumper	4202300104	4202300101	1
23	Main Board	30138000427	30130205	1
24	Electric Box Cover Sub-Assy	01402065	01402065	1
25	Shield Cover of Electric Box Cover	01592150	01592150	1
26	Electric Box Cover	20112207	20112207	1
27	Power Cord	/	/	/
28	Connecting Cable	4002052317	4002052317	0
29	Remote Controller	30510474	30510474	1
30	Capacitor CBB61S	33010747	33010747	1

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NO.	Description	Part Code		Qty
		GWH09QB-K3DNB4G/I	GWH09QB-K3DNB6G/I	
		Product Code		
		CB434N02302	CB435N00403	
1	Front Panel Assy	20000300026	20000300050	1
2	Display Board	30565260	30565281	1
3	Front Case Assy	00000200040	00000200040	1
4	Helicoid Tongue	26112508	26112508	1
5	Left Axile Bush	10512037	10512037	1
6	Rear Case assy	20162010	20162010	1
7	Drainage Hose	0523001408	0523001408	1
8	Ring of Bearing	26152022	26152022	1
9	Evaporator Support	24212180	24212180	1
10	Cold Plasma Generator	/	/	1
11	Evaporator Assy	01002000044	01002000044	1
12	Wall Mounting Frame	01252043	01252043	1
13	Cross Flow Fan	10352059	10352059	1
14	Fan Motor	150120874	150120874	1
15	Connecting pipe clamp	2611216401	2611216401	1
16	Rubber Plug (Water Tray)	76712012	76712012	1
17	Stepping Motor	1521212901	1521212901	1
18	Crank	73012005	73012005	1
19	Electric Box Assy	10000202782	10000202833	1
20	Axile Bush	10542036	10542036	1
21	Terminal Board	42011233	42011233	1
22	Jumper	4202300104	4202300104	1
23	Main Board	30130205	30130205	1
24	Electric Box Cover Sub-Assy	01402065	01402065	1
25	Shield Cover of Electric Box Cover	01592150	01592150	1
26	Electric Box Cover	20112207	20112207	1
27	Power Cord	/	/	/
28	Connecting Cable	4002052317	4002052317	0
29	Remote Controller	30510474	30510474	1
30	Capacitor CBB61S	33010747	33010747	1

Above data is subject to change without notice.

NO.	Description	Part Code		Qty
		GWH12QC-K3DNA2G/I (Cold Plasma)	GWH12QC-K3DNB4G/I	
		Product Code		
		CB426N01300	CB434N02102	
1	Front Panel Assy	2002270401	20000300027	1
2	Display Board	30565265	30565260	1
3	Front Case Assy	2002273101	00000200045	1
4	Helicoid Tongue	26112436	26112436	1
5	Left Axile Bush	10512037	10512037	1
6	Rear Case assy	00000100093	00000100093	1
7	Drainage Hose	05230014	05230014	1
8	Ring of Bearing	26152022	26152022	1
9	Evaporator Support	24212179	24212179	1
10	Cold Plasma Generator	1114001602	/	1
11	Evaporator Assy	01100100245	01100100245	1
12	Wall Mounting Frame	01252484	01252484	1
13	Cross Flow Fan	10352056	10352056	1
14	Fan Motor	1501214603	1501214603	1
15	Connecting pipe clamp	2611216401	2611216401	1
16	Rubber Plug (Water Tray)	76712012	76712012	1
17	Stepping Motor	1521210701	1521210701	1
18	Crank	73012005	73012005	1
19	Electric Box Assy	10000202688	10000202164	1
20	Axile Bush	10542036	10542036	1
21	Terminal Board	42011233	42011233	1
22	Jumper	4202300114	4202300114	1
23	Main Board	30138000430	30130207	1
24	Electric Box Cover Sub-Assy	01402065	01402065	1
25	Shield Cover of Electric Box Cover	01592150	01592150	1
26	Electric Box Cover	20112207	20112207	1
27	Power Cord	/	/	/
28	Connecting Cable	4002052317	4002052317	0
29	Remote Controller	30510474	30510474	1
30	Capacitor CBB611A	3301074712	3301074712	1

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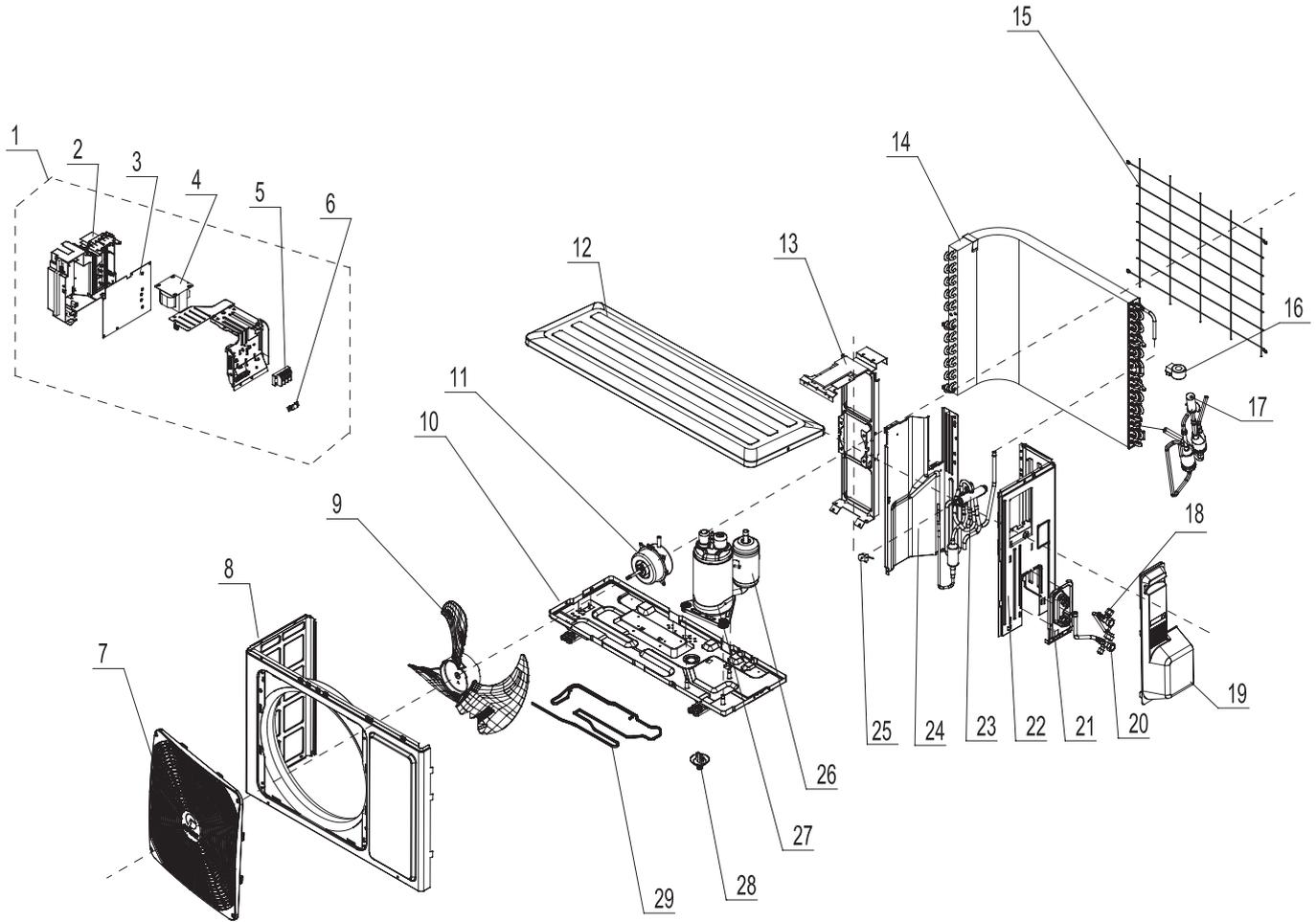
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		GWH12QC-K3DNA5G/I	GWH12QC-K3DNA5G/I (Cold Plasma)	
		Product Code		
		CB425N03600	CB425N03602	
1	Front Panel Assy	00000300022	00000300022	1
2	Display Board	30565260	30565260	1
3	Front Case Assy	00000200022	00000200022	1
4	Helicoid Tongue	26112436	26112436	1
5	Left Axile Bush	10512037	10512037	1
6	Rear Case assy	00000100093	00000100093	1
7	Drainage Hose	05230014	05230014	1
8	Ring of Bearing	26152022	26152022	1
9	Evaporator Support	24212179	24212179	1
10	Cold Plasma Generator	/	1114001602	1
11	Evaporator Assy	01100100245	01100100245	1
12	Wall Mounting Frame	01252484	01252484	1
13	Cross Flow Fan	10352056	10352056	1
14	Fan Motor	1501214603	1501214603	1
15	Connecting pipe clamp	2611216401	2611216401	1
16	Rubber Plug (Water Tray)	76712012	76712012	1
17	Stepping Motor	1521210701	1521210701	1
18	Crank	73012005	73012005	1
19	Electric Box Assy	10000202716	10000202788	1
20	Axile Bush	10542036	10542036	1
21	Terminal Board	42011233	42011233	1
22	Jumper	4202300105	4202300105	1
23	Main Board	30130207	30138000430	1
24	Electric Box Cover Sub-Assy	01402065	01402065	1
25	Shield Cover of Electric Box Cover	01592150	01592150	1
26	Electric Box Cover	20112207	20112207	1
27	Power Cord	/	/	/
28	Connecting Cable	4002052317	4002052317	0
29	Remote Controller	30510474	30510474	1
30	Capacitor CBB61S	3301074712	3301074712	1

Above data is subject to change without notice.

NO.	Description	Part Code	Qty
		GWH09QB-K3DNB6G/I (Cold Plasma)	
		Product Code CB435N00400	
1	Front Panel Assy	20000300050	1
2	Display Board	30565281	1
3	Front Case Assy	00000200040	1
4	Helicoid Tongue	26112508	1
5	Left Axile Bush	10512037	1
6	Rear Case assy	20162010	1
7	Drainage Hose	0523001408	1
8	Ring of Bearing	26152022	1
9	Evaporator Support	24212180	1
10	Cold Plasma Generator	1114001602	1
11	Evaporator Assy	01002000044	1
12	Wall Mounting Frame	01252043	1
13	Cross Flow Fan	10352059	1
14	Fan Motor	150120874	1
15	Connecting pipe clamp	2611216401	1
16	Rubber Plug (Water Tray)	76712012	1
17	Stepping Motor	1521212901	1
18	Crank	73012005	1
19	Electric Box Assy	10000202398	1
20	Axile Bush	10542036	1
21	Terminal Board	42011233	1
22	Jumper	4202300104	1
23	Main Board	30138000427	1
24	Electric Box Cover Sub-Assy	01402065	1
25	Shield Cover of Electric Box Cover	01592150	1
26	Electric Box Cover	20112207	1
27	Power Cord	/	/
28	Connecting Cable	4002052317	0
29	Remote Controller	30510474	1
30	Capacitor CBB61S	33010747	1

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10.2 Outdoor Unit



NO.	Description	Part Code		Qty
		GWH09QB-K3DNA1G/O		
		Product Code		
		CB419W05501	CB419W05500	
1	Electric Box Assy	10000100118	10000100132	1
2	Electric Box Sub-Assy	10000500049	10000500053	1
3	Main Board	30138000453	30138000455	1
4	Reactor	43130184	43130184	1
5	Terminal Board	42010313	42010313	1
6	Wire Clamp	71010003	71010003	1
7	Front Grill	22413027	22413027	1
8	Front Panel Assy	0153304802	0153304802	1
9	Axial Flow Fan	10333004	10333004	1
10	Chassis Sub-assy	0280330401P	02803037P	1
11	Fan Motor	1501308506	1501308506	1
12	Top Cover Sub-Assy	01253073	01253073	1
13	Motor Support	01703104	01703104	1
14	Condenser Assy	01100200141	01100200141	1
15	Rear Grill	01473009	01473009	1
16	Electric Expand Valve Fitting	4300876701	4300876701	1
17	Electronic Expansion Valve	07135228	07135228	1
18	Valve	07100003	07100003	1
19	Big Handle	262334332	262334332	1
20	Cut off Valve Assy	07133474	07133474	1
21	Valve Support	0171314201P	0171314201P	1
22	Right Side Plate Sub-Assy	0130317801	0130317801	1
23	4-Way Valve Assy	03015200074	03015200074	1
24	Clapboard Sub-Assy	0123338502	0123338502	1
25	Magnet Coil	4300040050	4300040050	1
26	Compressor and Fittings	0010322402	0010322402	1
27	Electrical Heater	7661281401	/	1
28	Drainage Connector	06123401	06123401	1
29	Electrical Heater (Chassis)	7651000414	/	1

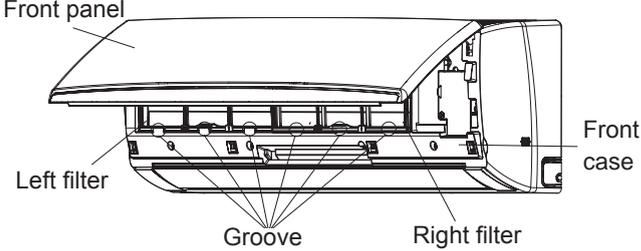
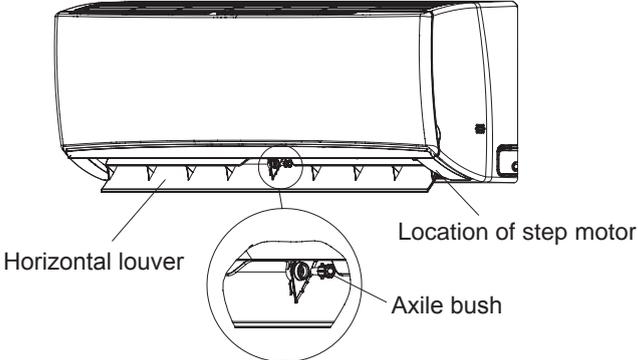
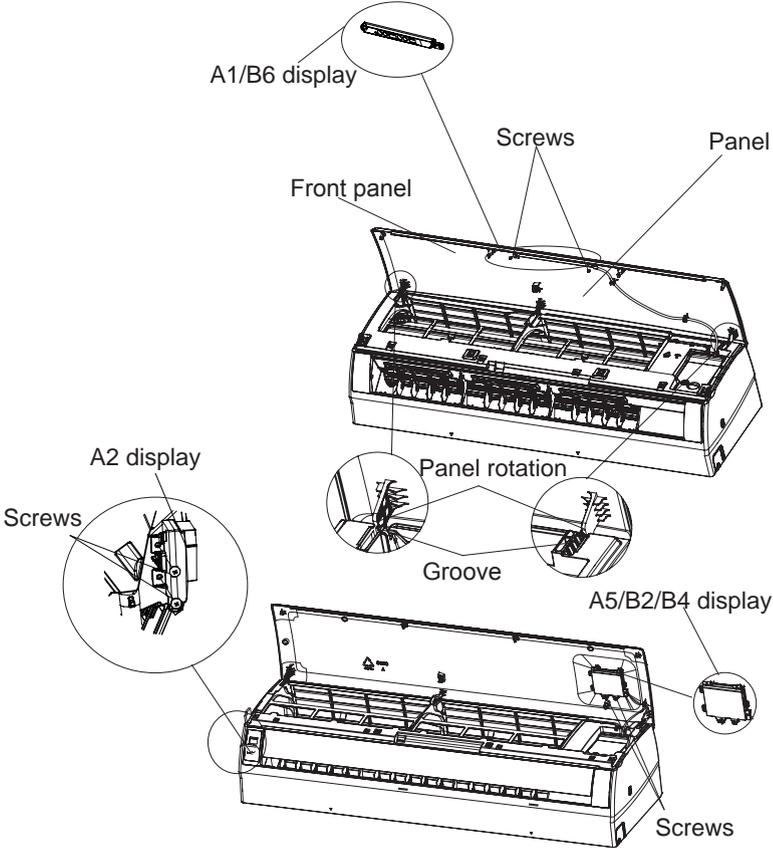
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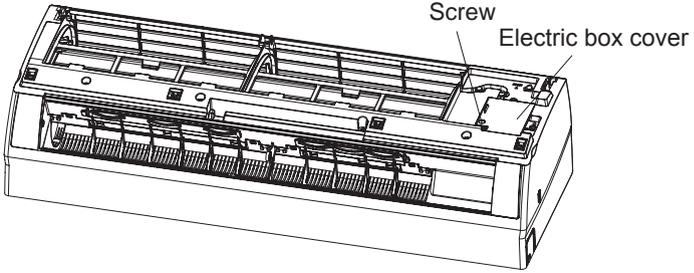
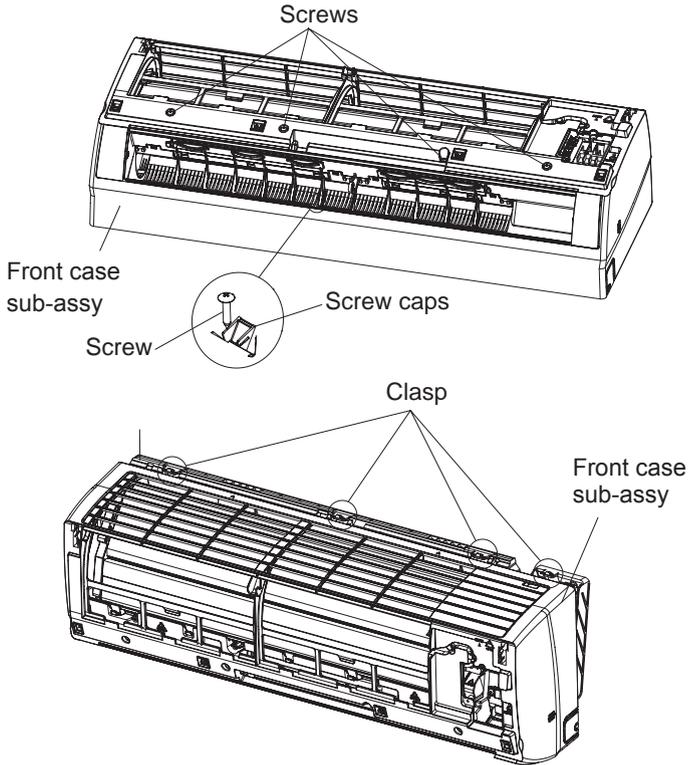
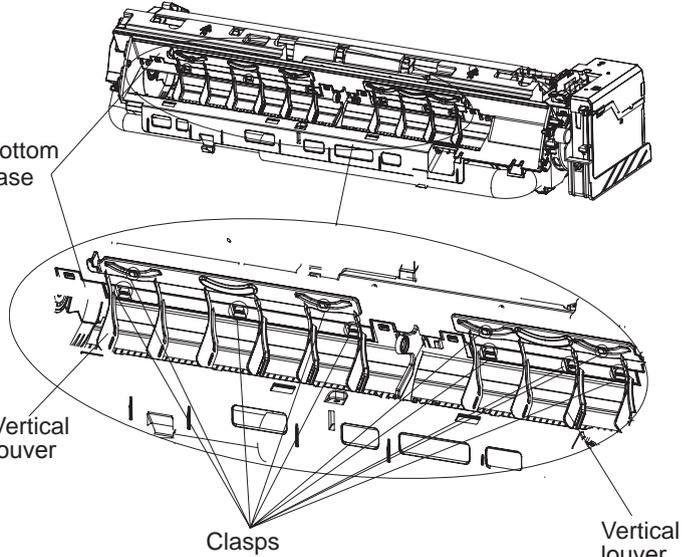
NO.	Description	Part Code		Qty
		GWH12QC-K3DNA1G/O		
	Product Code	CB419W05401	CB419W05400	
1	Electric Box Assy	10000100120	10000100134	1
2	Electric Box Sub-Assy	10000500051	10000500055	1
3	Main Board	30138000456	30138000454	1
4	Reactor	43130184	43130184	1
5	Terminal Board	42010313	42010313	1
6	Wire Clamp	71010003	71010003	1
7	Front Grill	22413027	22413027	1
8	Front Panel Assy	0153304802	0153304802	1
9	Axial Flow Fan	10333004	10333004	1
10	Chassis Sub-assy	02803304P	02803151P	1
11	Fan Motor	1501308506	1501308506	1
12	Top Cover Sub-Assy	01253073	01253073	1
13	Motor Support	0170310401	0170310401	1
14	Condenser Assy	01100200142	01100200142	1
15	Rear Grill	01473009	01473009	1
16	Electric Expand Valve Fitting	4300876701	4300876701	1
17	Electronic Expansion Valve	07135228	07135228	1
18	Valve	07100003	07100003	1
19	Big Handle	262334332	262334332	1
20	Cut off Valve Assy	07133474	07133474	1
21	Valve Support	0171314201P	0171314201P	1
22	Right Side Plate Sub-Assy	0130317801	0130317801	1
23	4-Way Valve Assy	03015200075	03015200075	1
24	Clapboard Sub-Assy	0123338502	0123338502	1
25	Magnet Coil	4300040050	4300040050	1
26	Compressor and Fittings	0010322402	0010322402	1
27	Electrical Heater	7661281401	/	1
28	Drainage Connector	06123401	06123401	1
29	Electrical Heater (Chassis)	7651000414	/	1

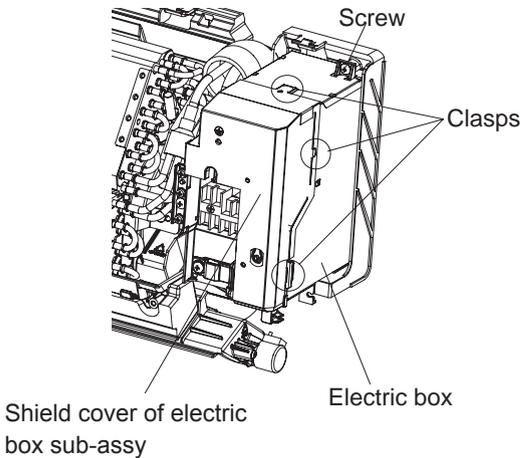
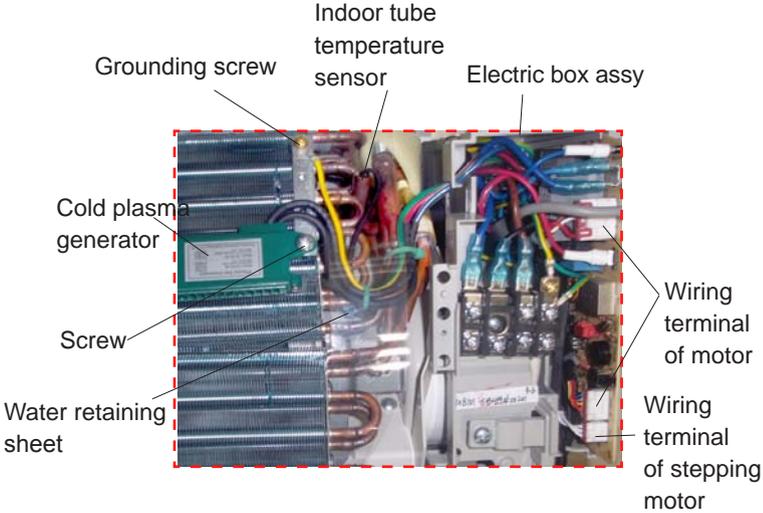
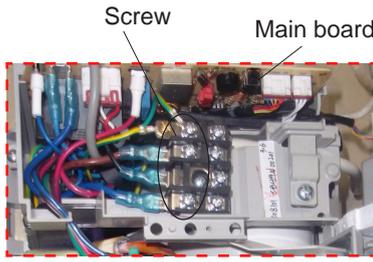
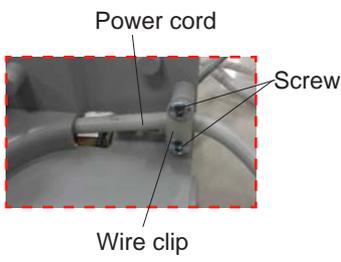
11. Removal Procedure

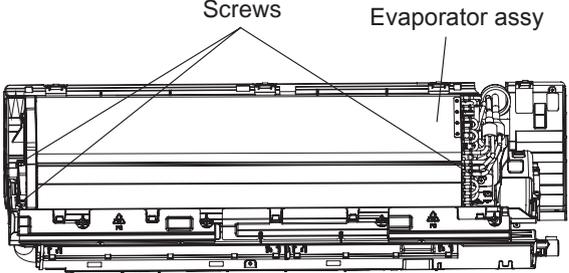
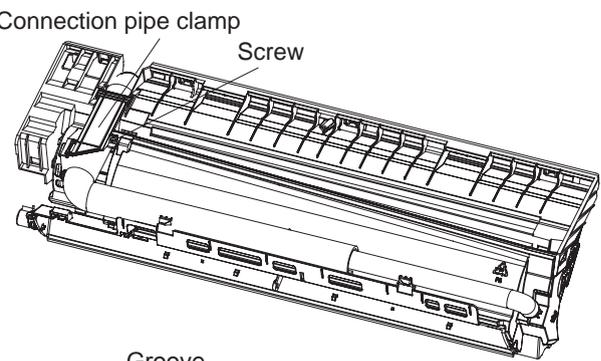
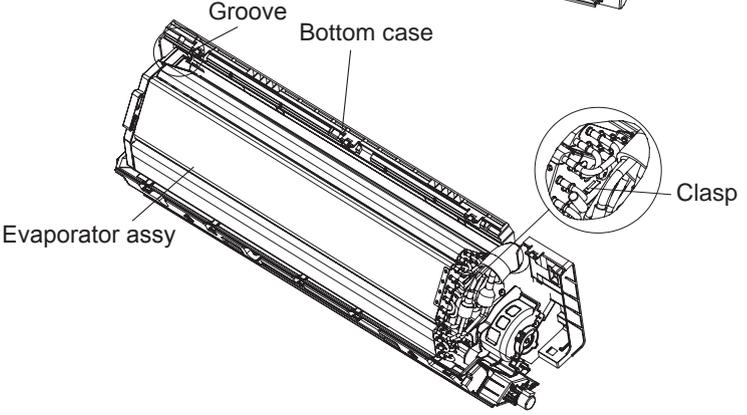
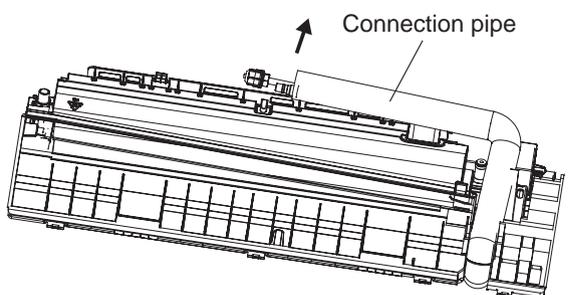
! Caution: discharge the refrigerant completely before removal.

11.1 Removal Procedure of Indoor Unit

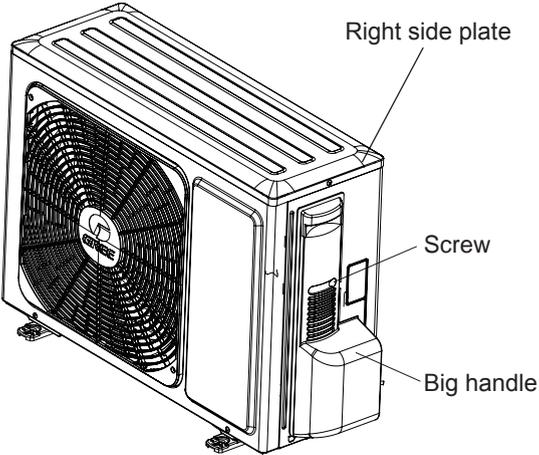
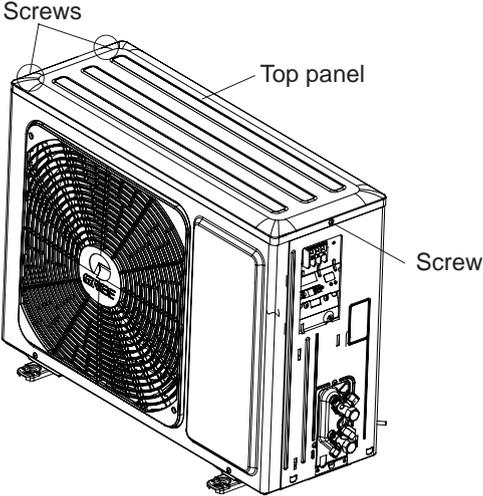
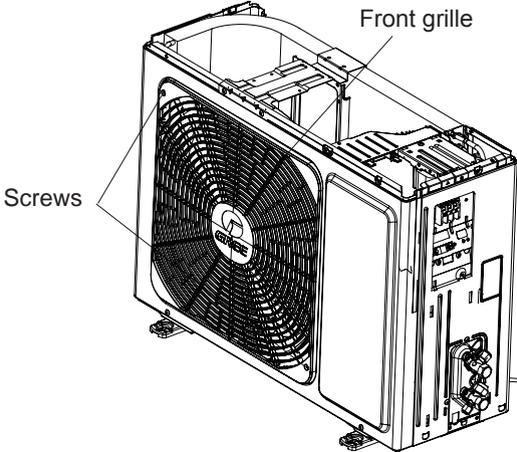
Step	Procedure	
1. Remove filter assembly	<p>Open the front panel. Push the left filter and right filter until they are separate from the groove on the front panel. Remove the left filter and right filter respectively.</p>	
2. Remove horizontal louver	<p>Push out the axle bush on horizontal louver. Bend the horizontal louver with hand and then separate the horizontal louver from the crankshaft of step motor to remove it.</p>	
3. Remove panel	<p>a</p> <p>① A1/B6 display: Screw off the 2 screws that are locking the display board. Separate the display board from the front panel.</p> <p>② A2 display: Screw off the 2 screws that are locking the display board. This display can be disassembled only after removing the front case (refer to step 5 of disassembly).</p> <p>③ A5/B2/B4 display: Screw off the 2 screws that are locking the display board.</p> <p>b</p> <p>Separate the panel rotation shaft from the groove fixing the front panel and then removes the front panel.</p>	

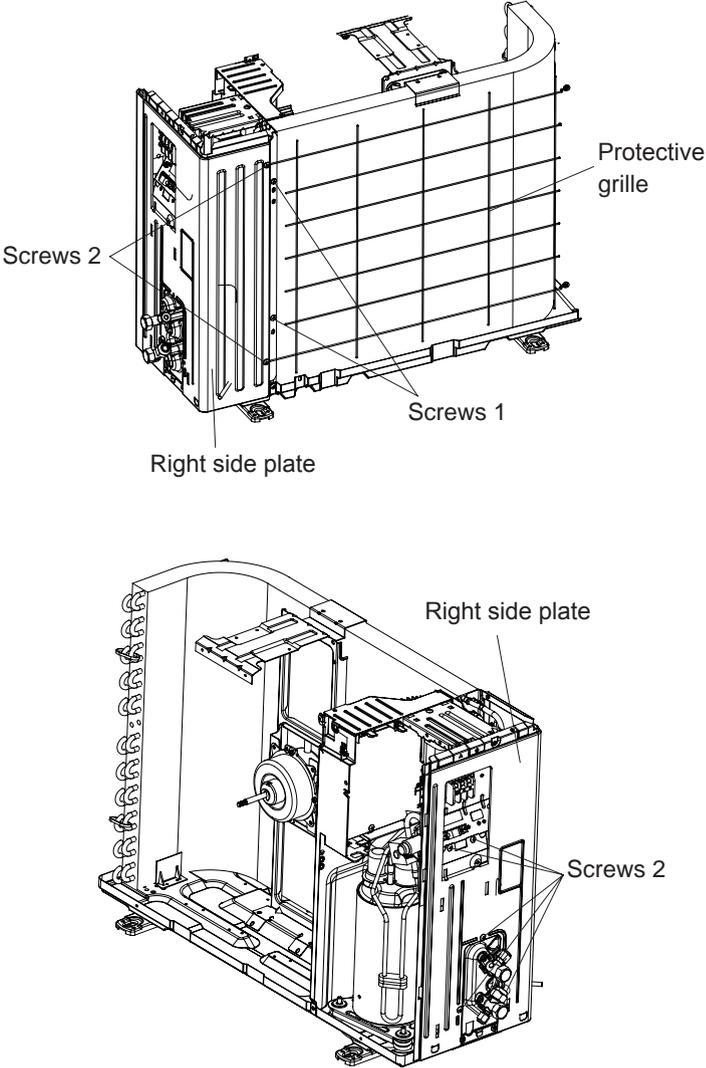
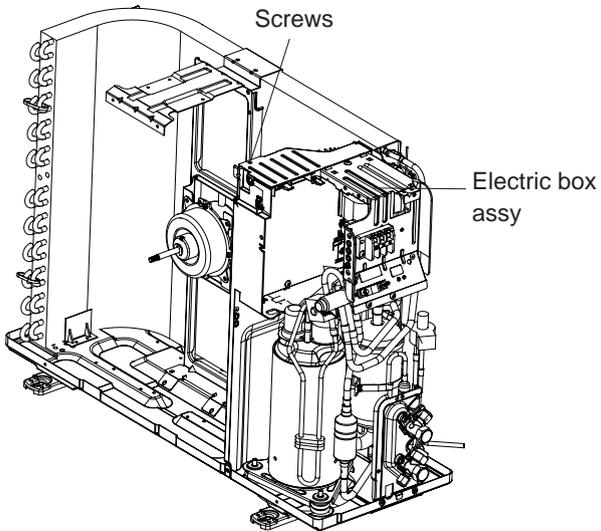
Step	Procedure
4. Remove electric box cover	<p>Remove the screws on the electric box cover to remove the electric box cover.</p> 
5. Remove front case sub-assy	<p>a Remove the screws fixing front case.</p> <p>Note: 1. Open the screw caps before removing the screws around the air outlet. 2. The quantity of screws fixing the front case sub-assy is different for different models.</p> <p>b Loosen the connection clasps between front case sub-assy and bottom case. Lift up the front case sub-assy and take it out.</p> 
6. Remove vertical louver	<p>Loosen the connection clasps between vertical louver and bottom case to remove vertical louver.</p> 

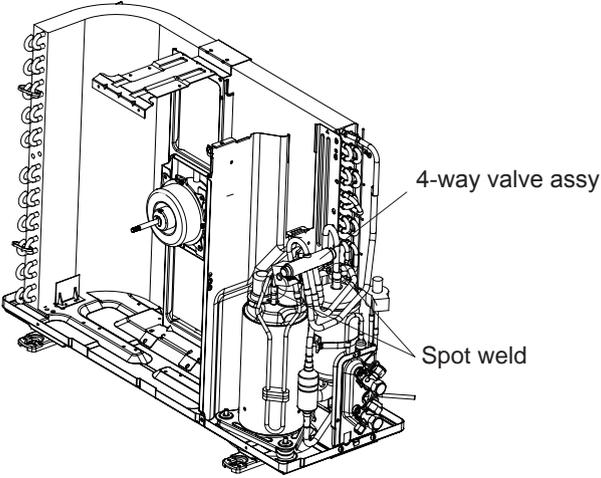
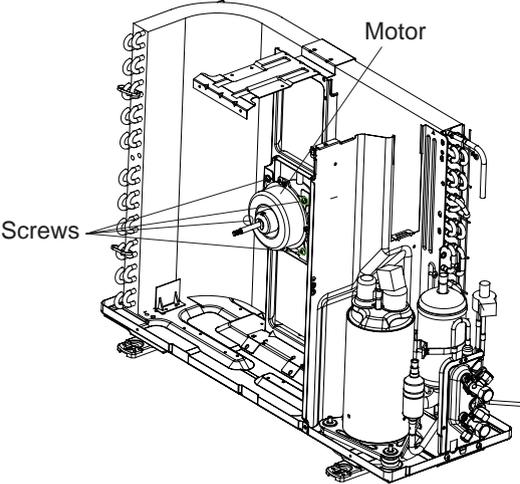
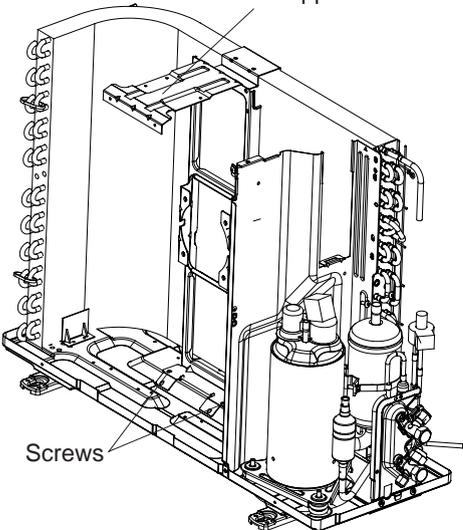
Step	Procedure
7. Remove electric box assy	
a	<p>Loosen the connection clasps between shield cover of electric box sub-assy and electric box, and then remove the shield cover of electric box sub-assy. Remove the screw fixing electric box assy .</p> 
b	<p>① Take off the water retaining sheet. Remove the cold plasma generator by screwing off the locking screw on the generator. ② Take off the indoor tube temperature sensor. ③ Screw off 1 grounding screw. ④ Remove the wiring terminals of motor and stepping motor. ⑤ Remove the electric box assy.</p> 
c	<p>Twist off the screws that are locking each lead wire and rotate the electric box assy. Twist off the screws that are locking the wire clip. Loosen the power cord and remove its wiring terminal. Lift up the main board and take it off.</p>  

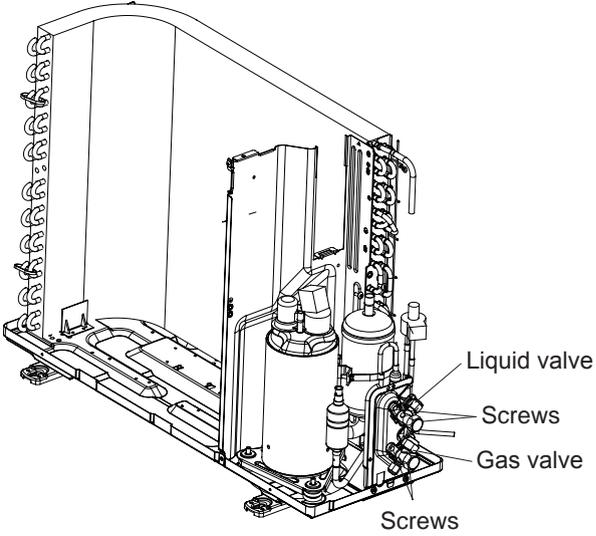
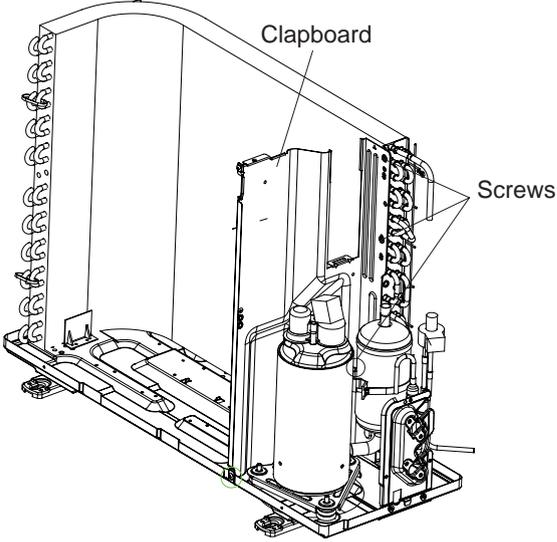
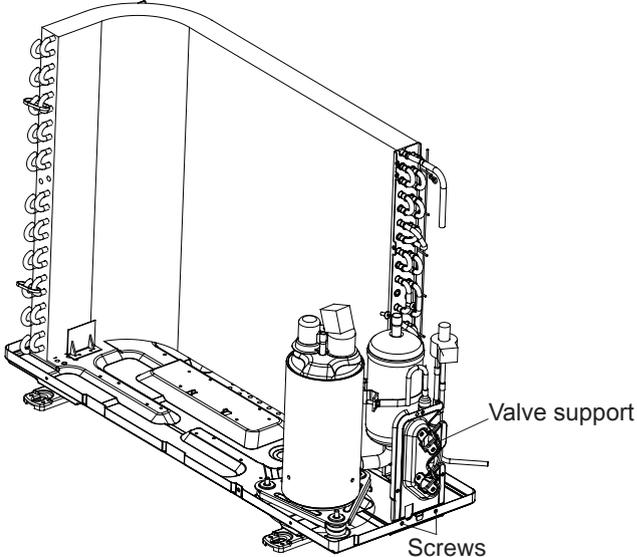
Step	Procedure	
	<p>Instruction: Some wiring terminal of this product is with lock catch and other devices. The pulling method is as below:</p> <p>1.Remove the soft sheath for some terminals at first, hold the circlip and then pull out the terminals.</p> <p>2.Pull out the holder for some terminals at first (holder is not available for some wiring terminal), hold the connector and then pull the terminal.</p>	 <p>Labels: circlip, soft sheath, holder, connector</p>
8. Remove evaporator assy		
a	Remove 3 screws fixing evaporator assy.	 <p>Labels: Screws, Evaporator assy</p>
b	At the back of the unit, remove the screw fixing connection pipe clamp and then remove the connection pipe clamp.	 <p>Labels: Connection pipe clamp, Screw</p>
c	First remove the left side of the evaporator from the groove of bottom case and then remove the right side from the clasp on the bottom case.	 <p>Labels: Groove, Bottom case, Evaporator assy, Clasp</p>
d	Adjust the position of connection pipe on evaporator slightly and then lift the evaporator upwards to remove it.	 <p>Labels: Connection pipe</p>

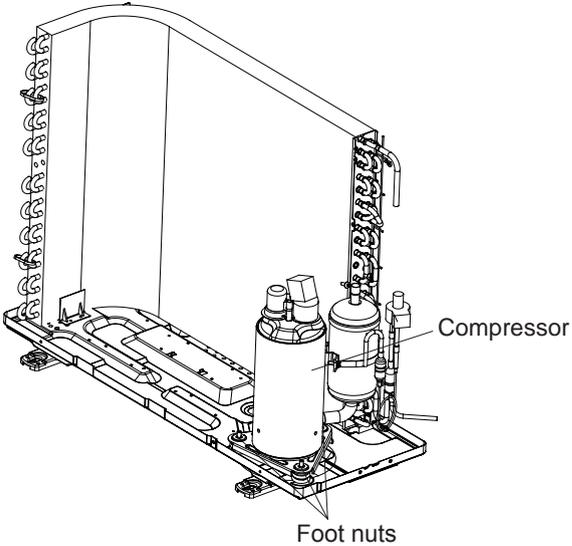
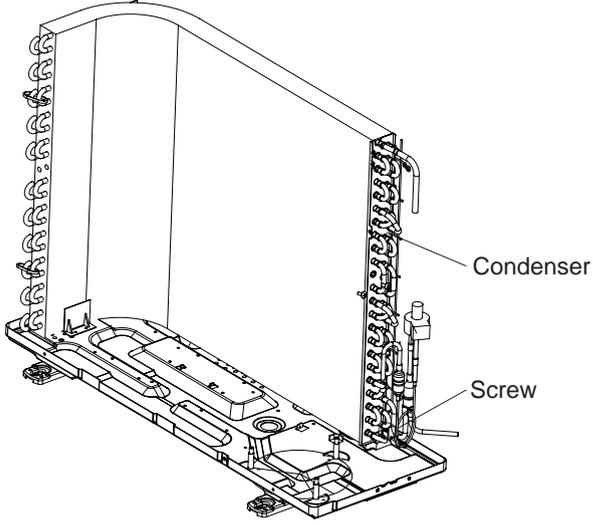
11.2 Removal Procedure of Outdoor Unit

Step	Procedure
1. Remove big handle	<p>Remove the screw fixing big handle; slide out the big handle upwards to make the clasp of big handle separate from the groove of right side plate, and then remove the big handle.</p>  <p>The diagram shows the outdoor unit from a three-quarter perspective. A line points to the 'Right side plate' on the top right. Another line points to a 'Screw' on the side panel. A third line points to the 'Big handle' protruding from the bottom right side.</p>
2. Remove top panel	<p>Remove the screws fixing top panel and then remove the top panel.</p>  <p>The diagram shows the outdoor unit with the top panel partially removed. Lines point to 'Screws' on the top edge of the unit and a 'Screw' on the side panel. The 'Top panel' is labeled as the part being removed.</p>
3. Remove front grille	<p>Remove connection screws between the front grille and the front panel. Then remove the front grille.</p>  <p>The diagram shows the outdoor unit with the front grille removed. Lines point to the 'Front grille' and 'Screws' that were used to secure it to the front panel.</p>

Step	Procedure
<p data-bbox="126 231 626 264">6. Remove protective grille and right side plate</p> <p data-bbox="233 388 686 482">Remove the screws 1 fixing protective grille and then remove the protective grille.</p> <p data-bbox="233 912 686 978">Remove the screws 2 fixing right side plate and then remove the right side plate.</p>	 <p data-bbox="784 541 886 570">Screws 2</p> <p data-bbox="1377 438 1490 497">Protective grille</p> <p data-bbox="1187 694 1289 722">Screws 1</p> <p data-bbox="932 749 1101 777">Right side plate</p> <p data-bbox="1203 891 1377 919">Right side plate</p> <p data-bbox="1349 1153 1451 1181">Screws 2</p>
<p data-bbox="126 1432 431 1465">7. Remove electric box assy</p>	<p data-bbox="233 1546 686 1640">Remove the screws fixing electric box assy ; pull out each wiring terminal; lift the electric box assy upwards to remove it.</p> <p data-bbox="233 1677 686 1793">Note: When pulling out the wiring terminal, pay attention to loose the clasp and don't pull it so hard.</p>  <p data-bbox="1133 1465 1219 1493">Screws</p> <p data-bbox="1349 1624 1482 1683">Electric box assy</p>

Step	Procedure
8. Remove 4-way valve assy	<p>Unsolder the spot weld of 4-way valve assy, compressor and condenser, and then remove the 4-way valve assy .</p> <p>Note: When unsoldering the spot weld, wrap the 4-way valve with wet cloth completely to avoid damaging the valve due to high temperature.</p> 
9. Remove motor	<p>Remove the screws fixing motor and then remove the motor.</p> 
10. Remove motor support	<p>Remove the screws fixing motor support and then remove the motor support.</p> 

Step	Procedure
<p>11. Remove gas valve and liquid valve</p>	<p>Remove two screws fixing the gas valve, then remove the gas valve.</p> <p>Remove two screws fixing the liquid valve, then remove the liquid valve.</p> 
<p>12. Remove clapboard</p>	<p>Remove the screws fixing clapboard and then remove the clapboard.</p> 
<p>13. Remove the valve support</p>	<p>Screw off the screws that are locking the valve support. Then remove it.</p> 

Step	Procedure
16. Remove compressor	<p>Remove 3 foot nuts on compressor, and then remove the compressor.</p> <p>Note: Protect the ports of discharge pipe and suction pipe to avoid foreign objects to enter it.</p> 
17. Remove condenser	<p>Remove one screw fixing the condenser, then remove the condenser.</p> 

Appendix:

Appendix 1: Reference Sheet of Celsius and Fahrenheit

Conversion formula for Fahrenheit degree and Celsius degree: $T_f = T_c \times 1.8 + 32$

Set temperature

Fahrenheit display temperature (°F)	Fahrenheit (°F)	Celsius (°C)	Fahrenheit display temperature (°F)	Fahrenheit (°F)	Celsius (°C)	Fahrenheit display temperature (°F)	Fahrenheit (°F)	Celsius (°C)
61	60.8	16	69/70	69.8	21	78/79	78.8	26
62/63	62.6	17	71/72	71.6	22	80/81	80.6	27
64/65	64.4	18	73/74	73.4	23	82/83	82.4	28
66/67	66.2	19	75/76	75.2	24	84/85	84.2	29
68	68	20	77	77	25	86	86	30

Ambient temperature

Fahrenheit display temperature (°F)	Fahrenheit (°F)	Celsius (°C)	Fahrenheit display temperature (°F)	Fahrenheit (°F)	Celsius (°C)	Fahrenheit display temperature (°F)	Fahrenheit (°F)	Celsius (°C)
32/33	32	0	55/56	55.4	13	79/80	78.8	26
34/35	33.8	1	57/58	57.2	14	81	80.6	27
36	35.6	2	59/60	59	15	82/83	82.4	28
37/38	37.4	3	61/62	60.8	16	84/85	84.2	29
39/40	39.2	4	63	62.6	17	86/87	86	30
41/42	41	5	64/65	64.4	18	88/89	87.8	31
43/44	42.8	6	66/67	66.2	19	90	89.6	32
45	44.6	7	68/69	68	20	91/92	91.4	33
46/47	46.4	8	70/71	69.8	21	93/94	93.2	34
48/49	48.2	9	72	71.6	22	95/96	95	35
50/51	50	10	73/74	73.4	23	97/98	96.8	36
52/53	51.8	11	75/76	75.2	24	99	98.6	37
54	53.6	12	77/78	77	25			

Appendix 2: Configuration of Connection Pipe

1. Standard length of connection pipe

- 5m, 7.5m, 8m.

2. Min. length of connection pipe is 3m.

3. Max. length of connection pipe and max. high difference.

4. The additional refrigerant oil and refrigerant charging required after prolonging connection pipe

- After the length of connection pipe is prolonged for 10m at the basis of standard length, you should add 5ml of refrigerant oil for each additional 5m of connection pipe.

- The calculation method of additional refrigerant charging amount (on the basis of liquid pipe):

Cooling capacity	Max length of connection pipe	Max height difference
5000 Btu/h(1465 W)	15 m	5 m
7000 Btu/h(2051 W)	15 m	5 m
9000 Btu/h(2637 W)	15 m	10 m
12000 Btu/h(3516 W)	20 m	10 m
18000 Btu/h(5274 W)	25 m	10 m
24000 Btu/h(7032 W)	25 m	10 m
28000 Btu/h(8204 W)	30 m	10 m
36000 Btu/h(10548 W)	30 m	20 m
42000 Btu/h(12306 W)	30 m	20 m
48000 Btu/h(14064 W)	30 m	20 m

- When the length of connection pipe is above 5m, add refrigerant according to the prolonged length of liquid pipe. The additional refrigerant charging amount per meter is different according to the diameter of liquid pipe. See the following sheet.

- Additional refrigerant charging amount = prolonged length of liquid pipe X additional refrigerant charging amount per meter

Additional refrigerant charging amount for R22, R407C, R410A and R134a			
Diameter of connection pipe		Outdoor unit throttle	
Liquid pipe(mm)	Gas pipe(mm)	Cooling only(g/m)	Cooling and heating(g/m)
Φ6	Φ9.5 or Φ12	15	20
Φ6 or Φ9.5	Φ16 or Φ19	15	20
Φ12	Φ19 or Φ22.2	30	120
Φ16	Φ25.4 or Φ31.8	60	120
Φ19	/	250	250
Φ22.2	/	350	350

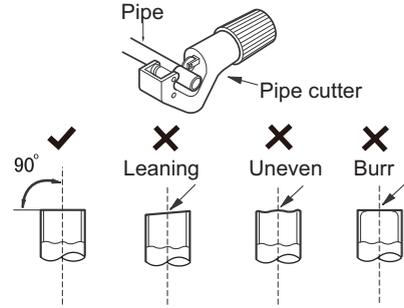
Appendix 3: Pipe Expanding Method

⚠ Note:

Improper pipe expanding is the main cause of refrigerant leakage. Please expand the pipe according to the following steps:

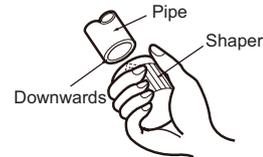
A: Cut the pip

- Confirm the pipe length according to the distance of indoor unit and outdoor unit.
- Cut the required pipe with pipe cutter.



B: Remove the burrs

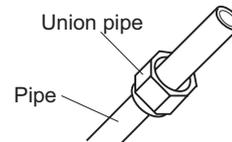
- Remove the burrs with shaper and prevent the burrs from getting into the pipe.



C: Put on suitable insulating pipe

D: Put on the union nut

- Remove the union nut on the indoor connection pipe and outdoor valve; install the union nut on the pipe.



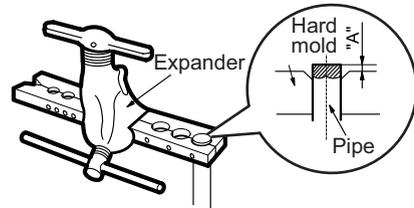
E: Expand the port

- Expand the port with expander.

⚠ Note:

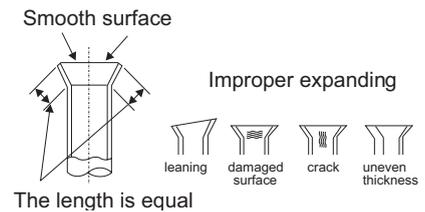
- "A" is different according to the diameter, please refer to the sheet below:

Outer diameter(mm)	A(mm)	
	Max	Min
Φ6 - 6.35 (1/4")	1.3	0.7
Φ9.52 (3/8")	1.6	1.0
Φ12 - 12.70 (1/2")	1.8	1.0
Φ16 - 15.88 (5/8")	2.4	2.2



F: Inspection

- Check the quality of expanding port. If there is any blemish, expand the port again according to the steps above.



Appendix 4: List of Resistance for Temperature Sensor

Resistance Table of Ambient Temperature Sensor for Indoor and Outdoor (15K)

Temp(°C)	Resistance(kΩ)	Temp(°C)	Resistance(kΩ)	Temp(°C)	Resistance(kΩ)	Temp(°C)	Resistance(kΩ)
-19	138.1	20	18.75	59	3.848	98	1.071
-18	128.6	21	17.93	60	3.711	99	1.039
-17	121.6	22	17.14	61	3.579	100	1.009
-16	115	23	16.39	62	3.454	101	0.98
-15	108.7	24	15.68	63	3.333	102	0.952
-14	102.9	25	15	64	3.217	103	0.925
-13	97.4	26	14.36	65	3.105	104	0.898
-12	92.22	27	13.74	66	2.998	105	0.873
-11	87.35	28	13.16	67	2.896	106	0.848
-10	82.75	29	12.6	68	2.797	107	0.825
-9	78.43	30	12.07	69	2.702	108	0.802
-8	74.35	31	11.57	70	2.611	109	0.779
-7	70.5	32	11.09	71	2.523	110	0.758
-6	66.88	33	10.63	72	2.439	111	0.737
-5	63.46	34	10.2	73	2.358	112	0.717
-4	60.23	35	9.779	74	2.28	113	0.697
-3	57.18	36	9.382	75	2.206	114	0.678
-2	54.31	37	9.003	76	2.133	115	0.66
-1	51.59	38	8.642	77	2.064	116	0.642
0	49.02	39	8.297	78	1.997	117	0.625
1	46.6	40	7.967	79	1.933	118	0.608
2	44.31	41	7.653	80	1.871	119	0.592
3	42.14	42	7.352	81	1.811	120	0.577
4	40.09	43	7.065	82	1.754	121	0.561
5	38.15	44	6.791	83	1.699	122	0.547
6	36.32	45	6.529	84	1.645	123	0.532
7	34.58	46	6.278	85	1.594	124	0.519
8	32.94	47	6.038	86	1.544	125	0.505
9	31.38	48	5.809	87	1.497	126	0.492
10	29.9	49	5.589	88	1.451	127	0.48
11	28.51	50	5.379	89	1.408	128	0.467
12	27.18	51	5.197	90	1.363	129	0.456
13	25.92	52	4.986	91	1.322	130	0.444
14	24.73	53	4.802	92	1.282	131	0.433
15	23.6	54	4.625	93	1.244	132	0.422
16	22.53	55	4.456	94	1.207	133	0.412
17	21.51	56	4.294	95	1.171	134	0.401
18	20.54	57	4.139	96	1.136	135	0.391
19	19.63	58	3.99	97	1.103	136	0.382

Resistance Table of Tube Temperature Sensors for Indoor and Outdoor (20K)

Temp(°C)	Resistance(kΩ)	Temp(°C)	Resistance(kΩ)	Temp(°C)	Resistance(kΩ)	Temp(°C)	Resistance(kΩ)
-19	181.4	20	25.01	59	5.13	98	1.427
-18	171.4	21	23.9	60	4.948	99	1.386
-17	162.1	22	22.85	61	4.773	100	1.346
-16	153.3	23	21.85	62	4.605	101	1.307
-15	145	24	20.9	63	4.443	102	1.269
-14	137.2	25	20	64	4.289	103	1.233
-13	129.9	26	19.14	65	4.14	104	1.198
-12	123	27	18.13	66	3.998	105	1.164
-11	116.5	28	17.55	67	3.861	106	1.131
-10	110.3	29	16.8	68	3.729	107	1.099
-9	104.6	30	16.1	69	3.603	108	1.069
-8	99.13	31	15.43	70	3.481	109	1.039
-7	94	32	14.79	71	3.364	110	1.01
-6	89.17	33	14.18	72	3.252	111	0.983
-5	84.61	34	13.59	73	3.144	112	0.956
-4	80.31	35	13.04	74	3.04	113	0.93
-3	76.24	36	12.51	75	2.94	114	0.904
-2	72.41	37	12	76	2.844	115	0.88
-1	68.79	38	11.52	77	2.752	116	0.856
0	65.37	39	11.06	78	2.663	117	0.833
1	62.13	40	10.62	79	2.577	118	0.811
2	59.08	41	10.2	80	2.495	119	0.77
3	56.19	42	9.803	81	2.415	120	0.769
4	53.46	43	9.42	82	2.339	121	0.746
5	50.87	44	9.054	83	2.265	122	0.729
6	48.42	45	8.705	84	2.194	123	0.71
7	46.11	46	8.37	85	2.125	124	0.692
8	43.92	47	8.051	86	2.059	125	0.674
9	41.84	48	7.745	87	1.996	126	0.658
10	39.87	49	7.453	88	1.934	127	0.64
11	38.01	50	7.173	89	1.875	128	0.623
12	36.24	51	6.905	90	1.818	129	0.607
13	34.57	52	6.648	91	1.736	130	0.592
14	32.98	53	6.403	92	1.71	131	0.577
15	31.47	54	6.167	93	1.658	132	0.563
16	30.04	55	5.942	94	1.609	133	0.549
17	28.68	56	5.726	95	1.561	134	0.535
18	27.39	57	5.519	96	1.515	135	0.521
19	26.17	58	5.32	97	1.47	136	0.509

Resistance Table of Discharge Temperature Sensor for Outdoor (50K)

Temp(°C)	Resistance(kΩ)	Temp(°C)	Resistance(kΩ)	Temp(°C)	Resistance(kΩ)	Temp(°C)	Resistance(kΩ)
-29	853.5	10	98	49	18.34	88	4.75
-28	799.8	11	93.42	50	17.65	89	4.61
-27	750	12	89.07	51	16.99	90	4.47
-26	703.8	13	84.95	52	16.36	91	4.33
-25	660.8	14	81.05	53	15.75	92	4.20
-24	620.8	15	77.35	54	15.17	93	4.08
-23	580.6	16	73.83	55	14.62	94	3.96
-22	548.9	17	70.5	56	14.09	95	3.84
-21	516.6	18	67.34	57	13.58	96	3.73
-20	486.5	19	64.33	58	13.09	97	3.62
-19	458.3	20	61.48	59	12.62	98	3.51
-18	432	21	58.77	60	12.17	99	3.41
-17	407.4	22	56.19	61	11.74	100	3.32
-16	384.5	23	53.74	62	11.32	101	3.22
-15	362.9	24	51.41	63	10.93	102	3.13
-14	342.8	25	49.19	64	10.54	103	3.04
-13	323.9	26	47.08	65	10.18	104	2.96
-12	306.2	27	45.07	66	9.83	105	2.87
-11	289.6	28	43.16	67	9.49	106	2.79
-10	274	29	41.34	68	9.17	107	2.72
-9	259.3	30	39.61	69	8.85	108	2.64
-8	245.6	31	37.96	70	8.56	109	2.57
-7	232.6	32	36.38	71	8.27	110	2.50
-6	220.5	33	34.88	72	7.99	111	2.43
-5	209	34	33.45	73	7.73	112	2.37
-4	198.3	35	32.09	74	7.47	113	2.30
-3	199.1	36	30.79	75	7.22	114	2.24
-2	178.5	37	29.54	76	7.00	115	2.18
-1	169.5	38	28.36	77	6.76	116	2.12
0	161	39	27.23	78	6.54	117	2.07
1	153	40	26.15	79	6.33	118	2.02
2	145.4	41	25.11	80	6.13	119	1.96
3	138.3	42	24.13	81	5.93	120	1.91
4	131.5	43	23.19	82	5.75	121	1.86
5	125.1	44	22.29	83	5.57	122	1.82
6	119.1	45	21.43	84	5.39	123	1.77
7	113.4	46	20.6	85	5.22	124	1.73
8	108	47	19.81	86	5.06	125	1.68
9	102.8	48	19.06	87	4.90	126	1.64

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