

SERVICE MANUAL

ComfortStar[®]

Revision 190212V1.9

Indoor unit

NEO36SC-T

NEO60SC-T

Outdoor unit

CCU36-410-T

CCU60-410-T

CCU60-410-3-T

CONTENTS

- 1.General Information
- 2.Indoor Unit
- 3.Outdoor Unit
- 4.Installation
- 5.Control

Part 1 General Information.....1
Part 2 Indoor Units.....6
Part 3 Outdoor Units.....34
Part 4 Installation.....60
Part 5 Control.....71

※The specifications, designs, and information in this book are subject to change without notice for product improvement.

Part 1

General Information

1. Model Names of Indoor/Outdoor Units	2
2. External Appearance	3
2.1 Indoor Units	3
2.2 Outdoor Units	3
3. Features	4

1. Model Names of Indoor/Outdoor Units

1.1 Indoor Units

R410A(capacity multiplied by 1000Btu/h)

Cooling only				
Indoor units type	Indoor units model	Capacity(Btu/h)	Capacity(KW)	Power supply
ceiling&floor	NEO36SC-T	36000	10.5	220-230V 60Hz 1ph
	NEO60SC-T	60000	16	220-230V 60Hz 1ph

1.2 Outdoor Units

Model of outdoor unit and corresponding indoor unit

Cooling only					
Outdoor units type	Outdoor units model	Capacity(Btu/h)	Power supply	Compressor model	Compressor brand
outdoor unit	CCU36-410-T	36000	220-230V 60Hz 1ph	ATH356UN-C9EN	HaiLI
	CCU60-410-T	60000	220-230V 60Hz 1ph	C-SBP160H16A	Panasonic
	CCU60-410-3-T	60000	220-230V 60Hz 3ph	ZP54KUE-TF5-52E	Copeland

2. External Appearance

2.1 Indoor Units

Ceiling & floor type



2.2 Outdoor Units



3. Features

This news series has below outstanding improvements and features.

1. Elegant appearance
2. Much better performance and efficiency
3. Compact body with more competitive loading capacity.
4. Reliable and well-know compressors.
5. 24V control start-up, safety.
6. We adapt throttle piston installed in indoor unit, easy to maintain.
7. Easy to install the unit.
8. Match ceiling and floor indoor unit

Part 2

Indoor Units

Ceiling & Floor Type

1. Features	6
2.Specifications.....	7
3.Dimensions.....	8
4.Service Space.....	9
5.Wiring Diagrams	10
6.Electric Characteristics.....	10
7.Sound Levels.....	11
8.Accessories.....	12
9.The Specification of Power	13

1. Features

1.1. New design, more modern and elegant appearance.



1.2. Convenient installation.

- The ceiling type can be easily installed into a corner of the ceiling even if the ceiling is very narrow
- It is especially useful when installation of an air conditioner in the center of the ceiling is impossible due to a structure such as one lighting.

1.3. vertical direction auto swing and wide angle air flow.

- Air flow directional control minimizes the air resistance and produces wilder air flow to vertical direction.
- The range of horizontal air discharge is widened which secures wider air flow distribution to provide more comfortable air circulation no matter where the unit is set up

1.4. Three level fan speed, more humanism design, meets different air-supply requirement.

1.5. Water proof by utilizing the absorbing plastic film on water collector.

1.6. Easy operation.

1.7. Remote control and optional wired control method.

2. Specifications

SPECIFICATIONS (LIGHT COMMERCIAL A/C)

UNIVERSAL OUTDOOR UNIT

Model name	Universal Outdoor Unit		CCU36-410-T	CCU60-410-T	CCU60-410-3-T
Power supply	V/Ph/Hz		220-240V~/60Hz	208-230V/1Ph/60Hz	220V/3Ph/60Hz
Max. input consumption	W		4915	8000	7350
Max. current	A		24.5	40.0	24.0
Starting current	A		68.0	125.0	137.0
Max Operating Pressure(MPa)	Discharge	MPa	4.5	4.2	4.2
	Suction	MPa	1.2	1.5	1.5
Compressor	Brand		HaiLI	Panasonic	Copeland
	Model		ATH356UN-C9EN	C-SBP160H16A	ZP54KUE-TF5-52E
	Type		Rotary	Scroll	Scroll
	Capacity	W	10550	13608	15900
	Input	W	3480	5143	4950
	Rated current(RLA)	A	16.7	23.0	15.1
	Locked rotor Amp(LRA)	A	68	121	137
	Thermal protector		internal	internal	internal
	Capacitor	mF	80	80	/
Refrigerant oil	ml	800	1500	1500	
Outdoor coil	Number of row		1	1	1
	Fin spacing	mm	1.5	1.5	1.5
	Fin material		Louver or Corrugated Fin	Louver or Corrugated Fin	Louver or Corrugated Fin
	Tube outside diameter	mm	φ7	φ7	φ7
	Tube material		Innergroover tube type	Innergroover tube type	Innergroover tube type
	Coil length x height x width	mm	570×570×714	2141×798×12.7	2141×798×12.7
	Number of circuit		5	4	4
Outdoor fan motor	Brand		BROAD-OCEAN	BROAD-OCEAN	BROAD-OCEAN
	Model		Y7S623B036	Y7S623C5130	Y7S623C5130
	Input	W	172	400	400
	Output	W	86	265	265
	Running current	A	0.65	1.82	1.82
	Capacitor	mF	6	12	12
	Speed	rpm	1076	1100	1100
Outdoor air flow	m ³ /h		5100	6900	6900
Outdoor noise level	dB(A)		59	62	62
Outdoor dimension	Unit (WxHxD)	mm	600*600*760	740*740*843	740*740*843
	Packing (WxHxD)	mm	630*630*792	769*769*865	769*769*865
Outdoor weight	Net	kg	62	77	72
	Gross	kg	70	82	77.5
Refrigerant	Type		R410A	R410A	R410A
	Charge	g	1800	2250	2500
Throttle type			Piston orifice in indoor unit	VALVECORE	VALVECORE
Refrigerant pipe	Liquid side	mm	9.52	9.52	9.52
	Gas side	mm	19.05	19.05	19.05
	Max. refrigerant pipe length	m	30	50	50
	Max. difference in level	m	20	30	30
Ambient temperature range	Cooling	°C	-5~43	-5~43	-5~43
	Heating	°C	/	/	/

Notes:

1. Nominal cooling capacities are based on the following conditions:

Indoor temp: 27°CDB, 19°CWB; Outdoor temp: 35°CDB;

2. Nominal heating capacities are based on the following conditions:

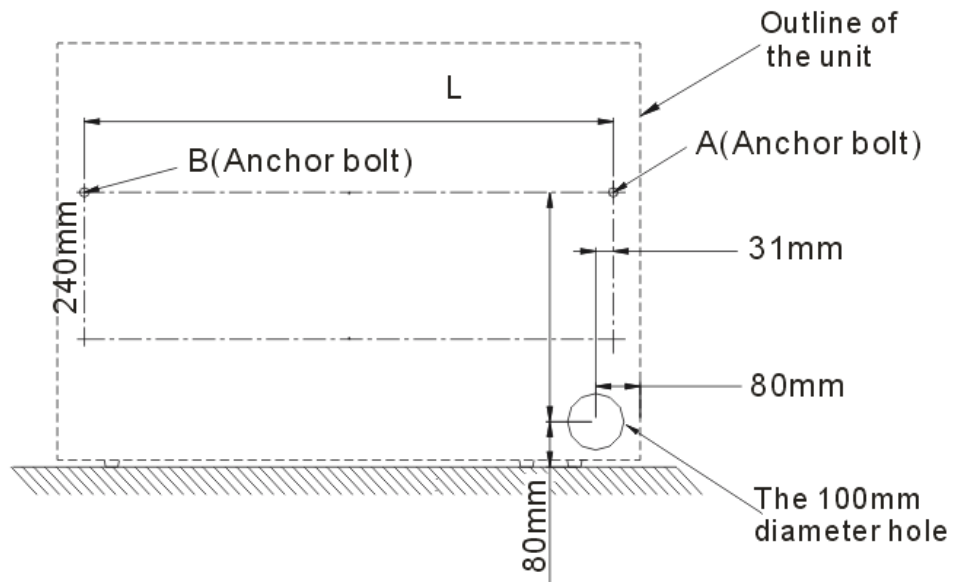
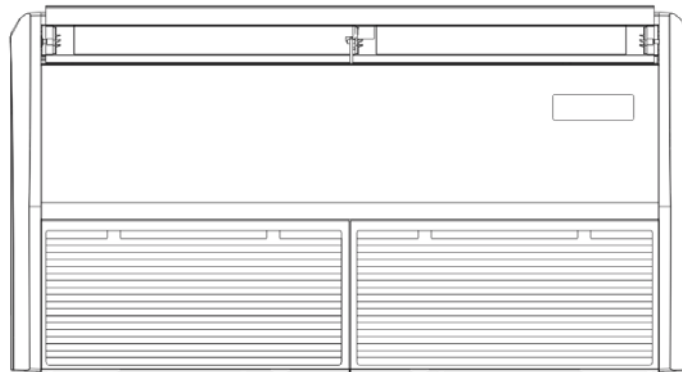
Indoor temp: 20°CDB; Outdoor temp: 7°CDB, 6°CWB;

3. Actual noise level may differ, depending on the room structure, etc, since these noise values are from an anechoic room.

Remark: The above design and specification are subject to change without prior notice for product improvement.

3. Dimensions

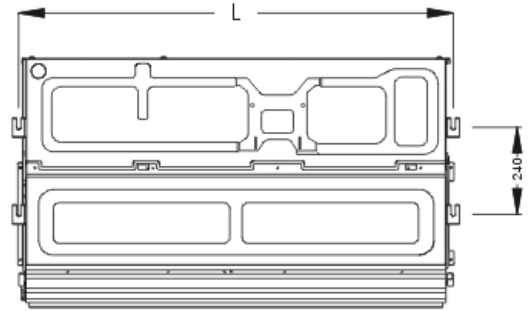
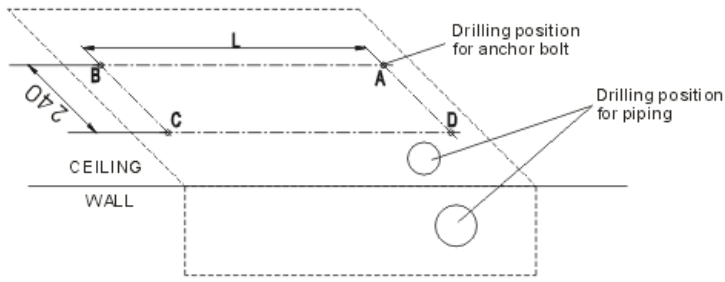
a. Floor console installation



NOTE:

Cooling Capacity Dimension	18000 Btu/hr	24000 Btu/hr	36000 Btu/hr	48000 Btu/hr
L	980mm	980mm	1200mm	1560mm

b. Ceiling installation



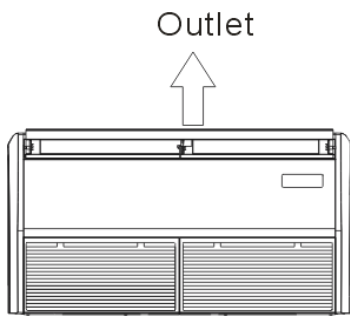
NOTE:

Cooling Capacity Dimension	18000 Btu/hr	24000 Btu/hr	36000 Btu/hr	48000 Btu/hr
L	980mm	980mm	1200mm	1560mm

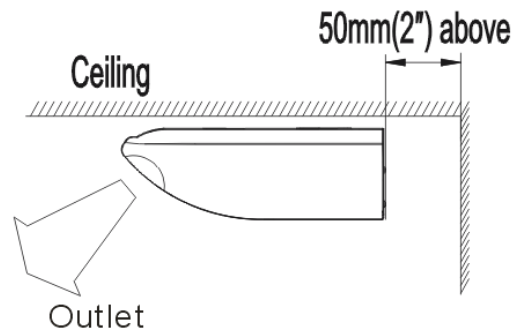
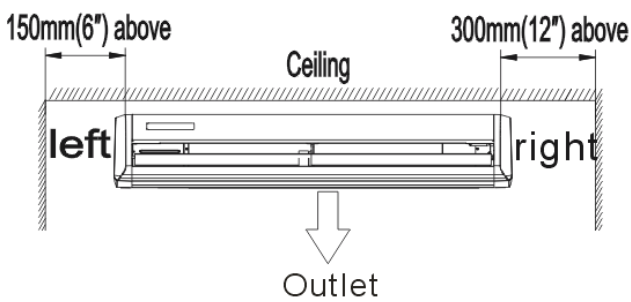
Note: The dimension of 48000Btu/h and 60000Btu/h are the same

4. Service Space

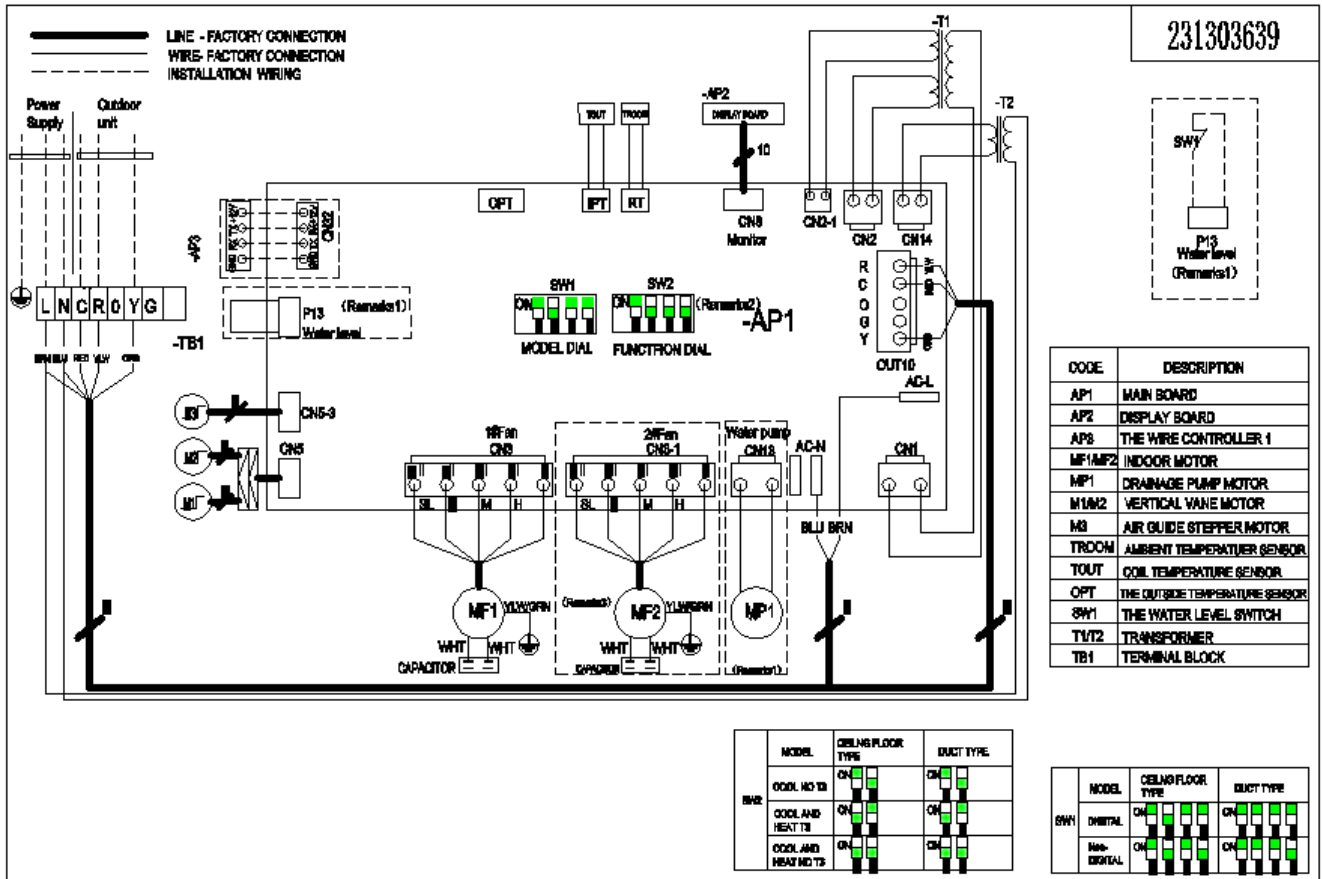
● **Floor console**



● **Under ceiling**



5. Wiring Diagram



6. Electric Characteristics

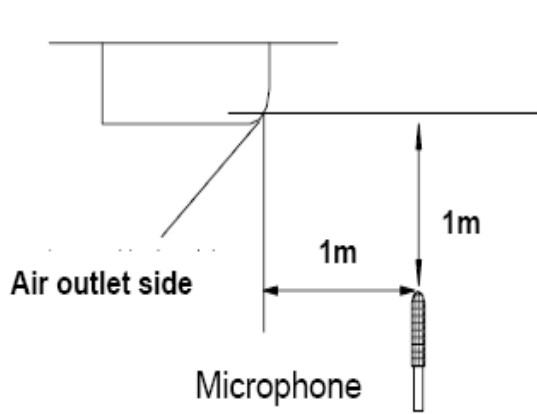
Model	Indoor Units				Power Supply	
	Hz	Voltage	Min.	Max.	MCA	MFA
NEO36SC-T	60	220-230V	198V	242V	2.25	15
NEO60SC-T	60	220-230V	198V	242V	2.25	15

Remark:

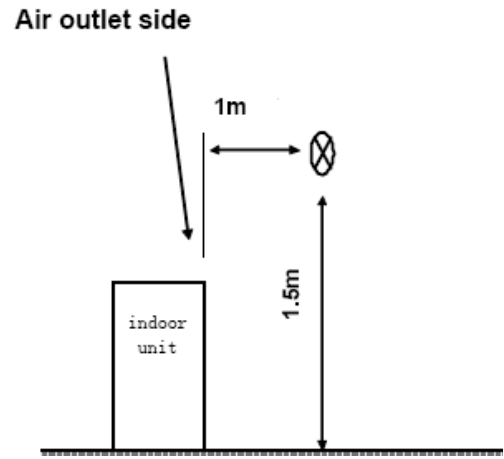
MCA: Min. Current Amps. (A)

MFA: Max. Fuse Amps. (A)

7.Sound Levels












Ceiling



Floor

Model	Noise level dB(A)		
	H	M	L
NEO36SC-T	52	49	46
NEO60SC-T	53	51	48

8.Accessories

	Name	Shape	Quantity
Installation fittings	1.Hook		2
	2.Hanging arm		2
Remote controller & Its holder	3 Remote controller		1
	4. Remote controller holder		1
	5. Mounting screw (ST2.9×10-C-H)		2
	6. Alkaline dry batteries (AM4)		2
Others	7. Owner's manual		1
	8. Installation manual		1
	9. Remote controller manual		1

9.The Specification of Power

For 220-230V~ 60Hz ,1Ph Outdoor unit type:

Type (Cooling only)			24000 Btu/h	36000 Btu/h
Power	Indoor unit	Phase	1- Phase	1- Phase
		Frequency and Voltage	220-230V~, 60Hz	220-230V~, 60Hz
	Outdoor unit	Phase	1- Phase	1- Phase
		Frequency and Voltage	220-230V~, 60Hz	220-230V~, 60Hz
Indoor Circuit Breaker/ Fuse (A)			25/15	25/15
Outdoor Circuit Breaker/ Fuse (A)			50/35	50/35
Indoor Unit Power Wiring (mm ²)			3x2.5	3x2.5
Outdoor Unit Power Wiring(mm ²)			3X3.3	3X3.3
Indoor/Outdoor Connecting Wiring (mm ²)		Weak Electric Signal	2x1.0	2x1.0

3Ph Outdoor unit type:

Type (Cooling only)			48000 Btu/h	60000 Btu/h
Power	Indoor unit	Phase	1- Phase	1- Phase
		Frequency and Voltage	220-230V~, 60Hz	220-230V~, 60Hz
	Outdoor unit	Phase	3- Phase	3- Phase
		Frequency and Voltage	220V~, 60Hz	220V~, 60Hz
Indoor Circuit Breaker/ Fuse (A)			25/15	25/15
Outdoor Circuit Breaker/ Fuse (A)			50/38	50/38
Indoor Unit Power Wiring (mm ²)			3x2.5	3x2.5
Outdoor Unit Power Wiring(mm ²)			5X4.0	5X4.0
Indoor/Outdoor Connecting Wiring (mm ²)		Weak Electric Signal	2x1.0	2x1.0

For 380-420V~ 60Hz 3Ph Outdoor unit type:

Type (Cooling only)			48000 Btu/h	60000 Btu/h
Power	Indoor unit	Phase	1- Phase	1- Phase
		Frequency and Voltage	220-230V~, 60Hz	220-230V~, 60Hz
	Outdoor unit	Phase	3- Phase	3- Phase
		Frequency and Voltage	380-420V~, 60Hz	380-420V~, 60Hz
Indoor Circuit Breaker/ Fuse (A)			25/15	25/15
Outdoor Circuit Breaker/ Fuse (A)			35/25	35/25
Indoor Unit Power Wiring (mm ²)			3x2.5	3x2.5
Outdoor Unit Power Wiring(mm ²)			5X2.5	5X2.5
Indoor/Outdoor Connecting Wiring (mm ²)		Weak Electric Signal	2x1.0	2x1.0

Part 3

Outdoor Units

1. Specifications.....	15
2. Dimensions.....	16
3. Service Space.....	17
4. Piping Diagrams.....	17
5. Wiring Diagrams	18
6. Electric Characteristics.....	20
7. Operation Limits	21
8. Troubleshooting.....	22

1. Specifications

SPECIFICATIONS(LIGHT COMMERCIALA/C)

UNIVERSAL OUTDOOR UNIT

Model name	Universal Outdoor Unit		CCU36-410-T	CCU60-410-T	CCU60-410-3-T
Power supply	V/Ph/Hz		220-240V~/60Hz	208-230V/1Ph/60Hz	220V/3Ph/60Hz
Max. input consumption	W		4915	8000	7350
Max. current	A		24.5	40.0	24.0
Starting current	A		68.0	125.0	137.0
Max Operating Pressure(MPa)	Discharge	MPa	4.5	4.2	4.2
	Suction	MPa	1.2	1.5	1.5
Compressor	Brand		HaiLI	Panasonic	Copeland
	Model		ATH356UN-C9EN	C-SBP160H16A	ZP54KUE-TF5-52E
	Type		Rotary	Scroll	Scroll
	Capacity	W	10550	13608	15900
	Input	W	3480	5143	4950
	Rated current(RLA)	A	16.7	23.0	15.1
	Locked rotor Amp(LRA)	A	68	121	137
	Thermal protector		internal	internal	internal
	Capacitor	mF	80	80	/
Refrigerant oil	ml	800	1500	1500	
Outdoor coil	Number of row		1	1	1
	Fin spacing	mm	1.5	1.5	1.5
	Fin material		Louver or Corrugated Fin	Louver or Corrugated Fin	Louver or Corrugated Fin
	Tube outside diameter	mm	φ7	φ7	φ7
	Tube material		Innergroover tube type	Innergroover tube type	Innergroover tube type
	Coil length x height x width	mm	570×570×714	2141×798×12.7	2141×798×12.7
	Number of circuit		5	4	4
Outdoor fan motor	Brand		BROAD-OCEAN	BROAD-OCEAN	BROAD-OCEAN
	Model		Y7S623B036	Y7S623C5130	Y7S623C5130
	Input	W	172	400	400
	Output	W	86	265	265
	Running current	A	0.65	1.82	1.82
	Capacitor	mF	6	12	12
	Speed	rpm	1076	1100	1100
Outdoor air flow	m ³ /h	5100	6900	6900	
Outdoor noise level	dB(A)	59	62	62	
Outdoor dimension	Unit (WxHxD)	mm	600*600*760	740*740*843	740*740*843
	Packing (WxHxD)	mm	630*630*792	769*769*865	769*769*865
Outdoor weight	Net	kg	62	77	72
	Gross	kg	70	82	77.5
Refrigerant	Type		R410A	R410A	R410A
	Charge	g	1800	2250	2500
Throttle type			Piston orifice in indoor unit	VALVECORE	VALVECORE
Refrigerant pipe	Liquid side	mm	9.52	9.52	9.52
	Gas side	mm	19.05	19.05	19.05
	Max. refrigerant pipe length	m	30	50	50
	Max. difference in level	m	20	30	30
Ambient temperature range	Cooling	℃	-5~43	-5~43	-5~43
	Heating	℃	/	/	/

Notes:

1. Nominal cooling capacities are based on the following conditions:

Indoor temp: 27°CDB, 19°CWB; Outdoor temp: 35°CDB;

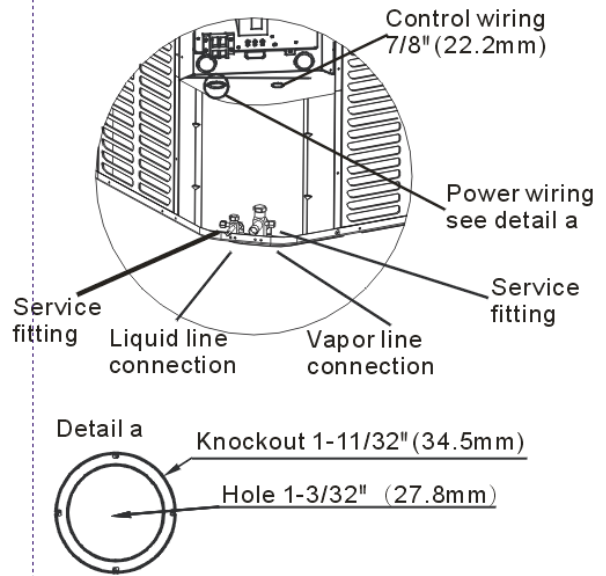
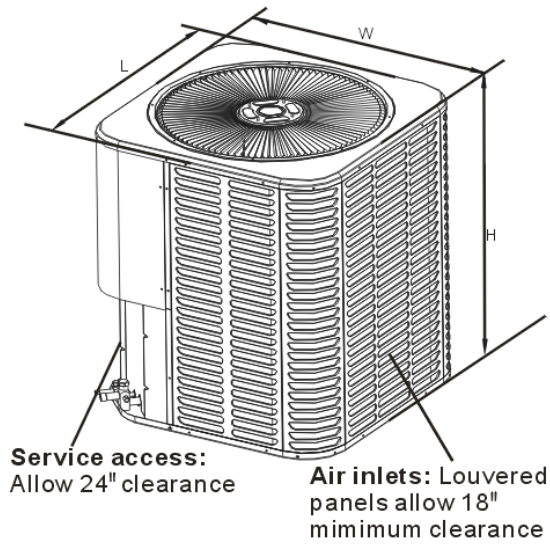
2. Nominal heating capacities are based on the following conditions:

Indoor temp: 20°CDB; Outdoor temp: 7°CDB, 6°CWB;

3. Actual noise level may differ, depending on the room structure, etc, since these noise values are from an anechoic room.

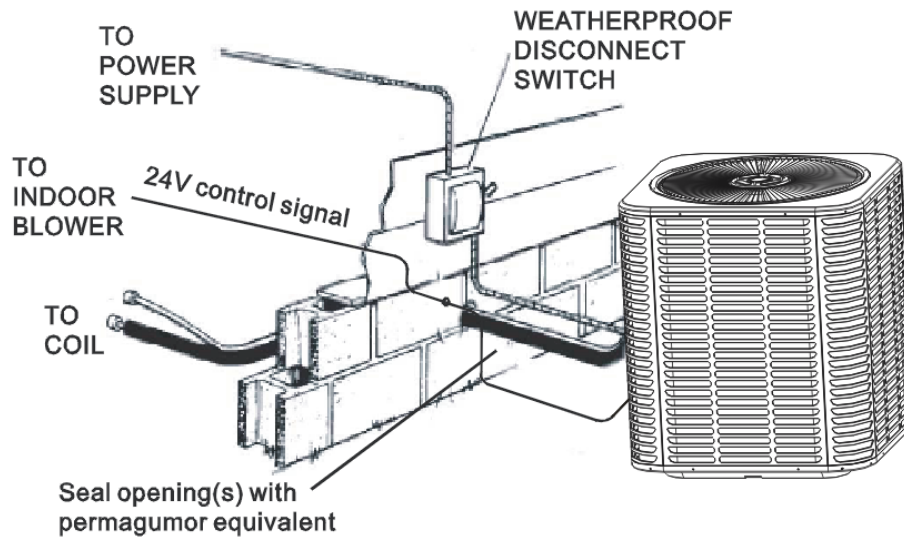
Remark: The above design and specification are subject to change without prior notice for product improvement.

2. Dimensions



Unit Model (Btu/h)	Dimensions (Inches)			Refrigerant Connection Service Valve Size	
	"H" in [mm]	"W" in [mm]	"L" in [mm]	Liquid in	Vapor in
24000	24-15/16[633]	21-7/8[554]	21-7/8[554]	3/8	5/8
36000	29-7/8[759]	23-5/8[600]	23-5/8[600]	3/8	3/4
48000	29-7/8[759]	29-1/8[740]	29-1/8 [740]	3/8	3/4
60000	33-3/16[843]	29-1/8 [740]	29-1/8 [740]	3/8	3/4

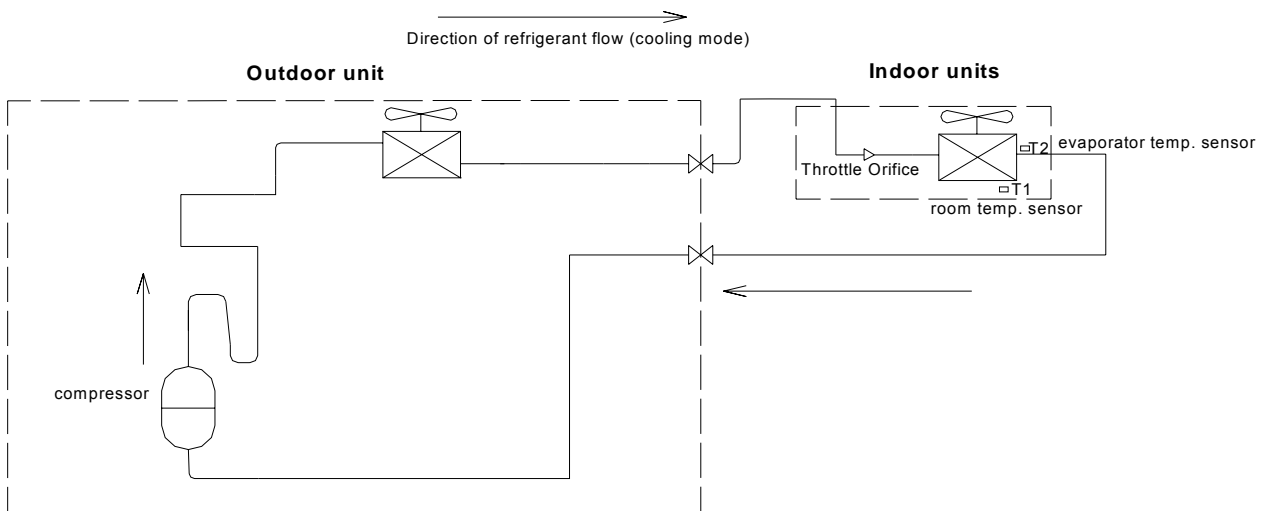
3. Service Space



NOTE: All outdoor wiring must be weather proof

4. Piping Diagrams

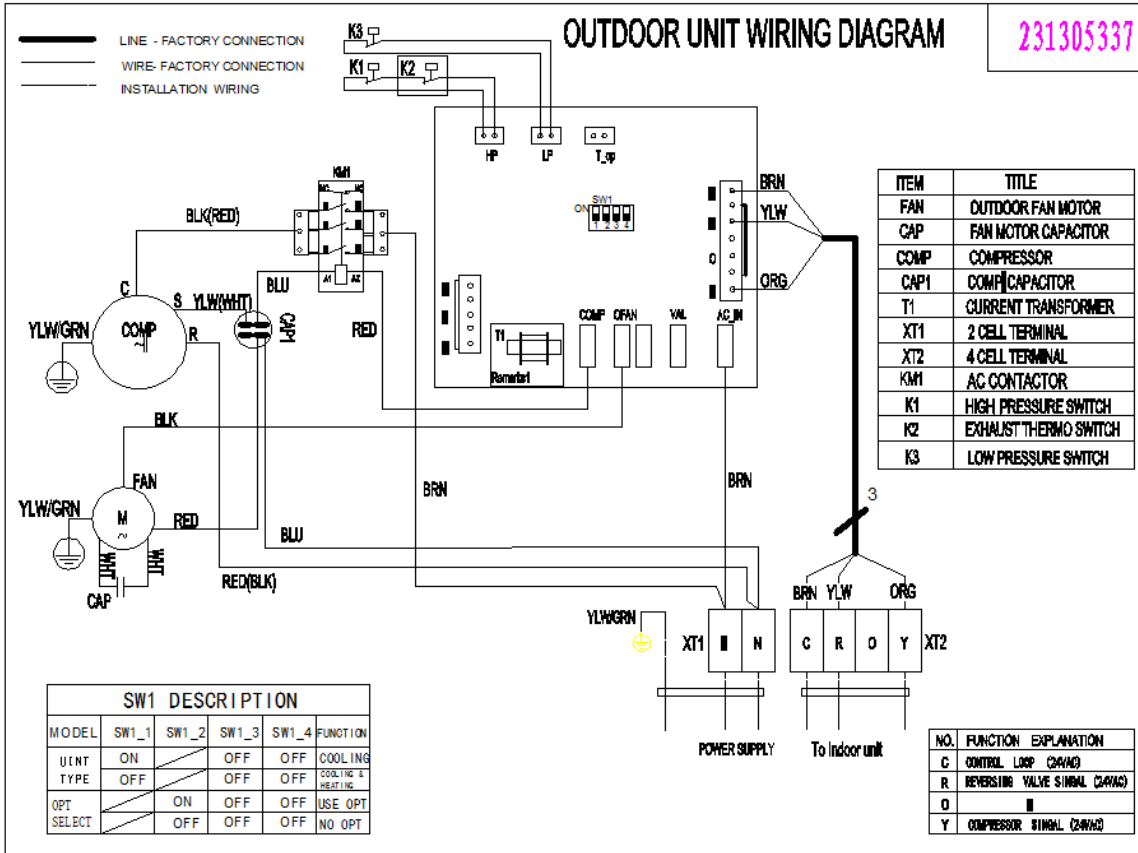
- CCU36-410-T
- CCU60-410-T
- CCU60-410-3-T



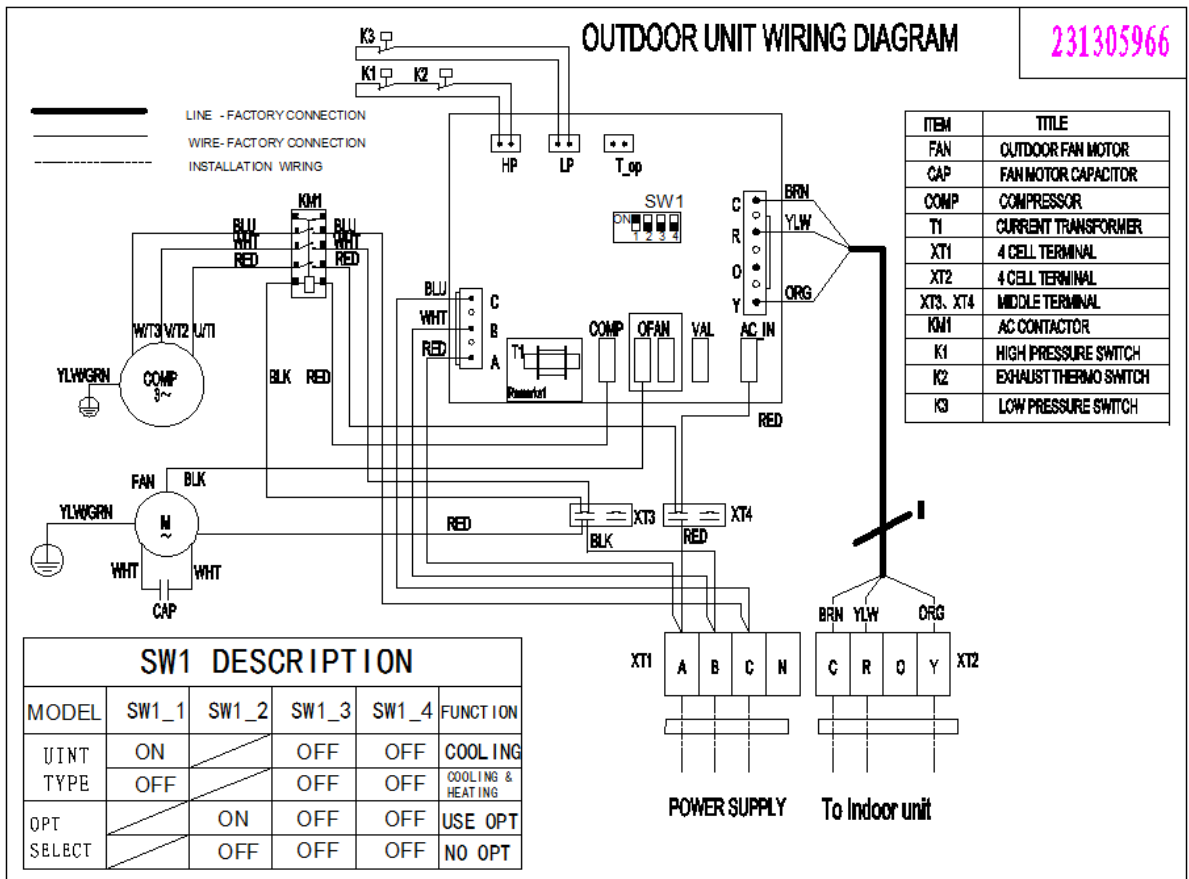
5. Wiring Diagrams

CCU36-410-T

CCU60-410-T



CCU60-410-3-T



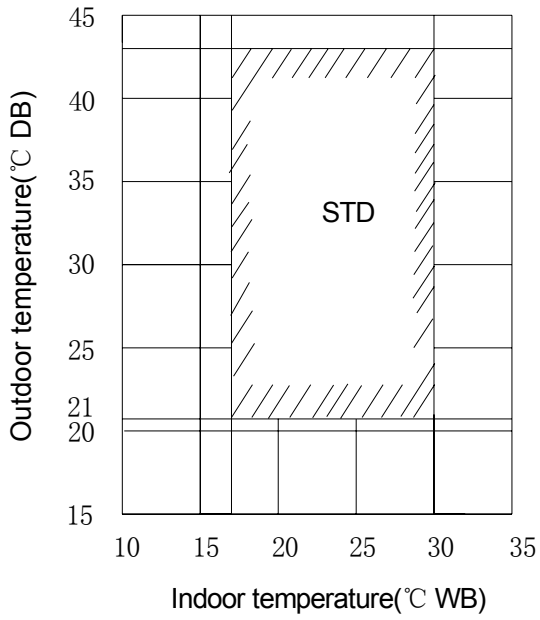
6. Electric Characteristics

Model	Power Supply				
	Hz	Phase	Voltage	Min.	Max.
CCU36-410-T	60	1	220-230V~	198	242
CCU60-410-T	60	1	220-230V~	198	242
CCU60-410-3-T	60	3	220-230V~	198	242

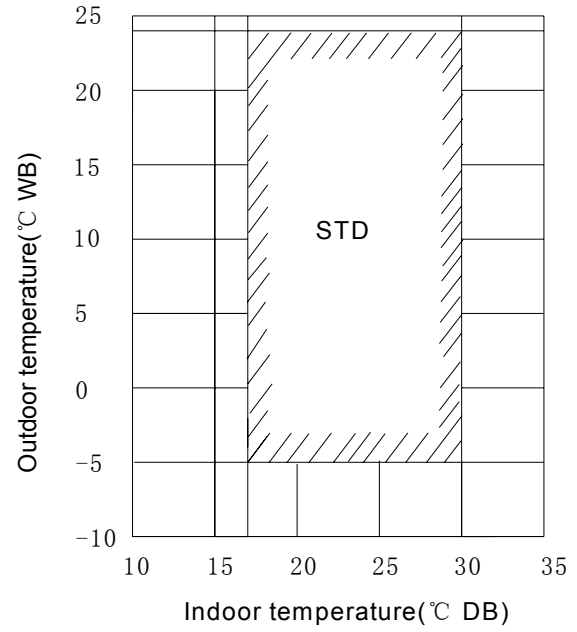
7.Operation Limits

Operation mode	Outdoor temperature(°C)	Room temperature(°C)
Cooling operation	21~43	17~30
Heating operation	-5~24	17~30

Cooling



Heating



8.Troubleshooting

8.1. Self-diagnosis

Indoor unit's LED indication

(1) For the ceiling and floor indoor unit

Displayed code	Fault type	STATUS
E1	Indoor environment temperature sensor.	System-down then indoor unit shown fault and display fault code.
E2	Indoor coil temperature sensor	System-down then indoor unit shown fault and display fault code.
E3	Outdoor coil temperature sensor	System-down then indoor unit shown fault and display fault code.
Ed	EEPROM fault (internal unit)	System-down then indoor unit shown fault and display fault code.
EL	Water pump malfunction (Water-level protection)	System-down then indoor unit shown fault and display fault code.

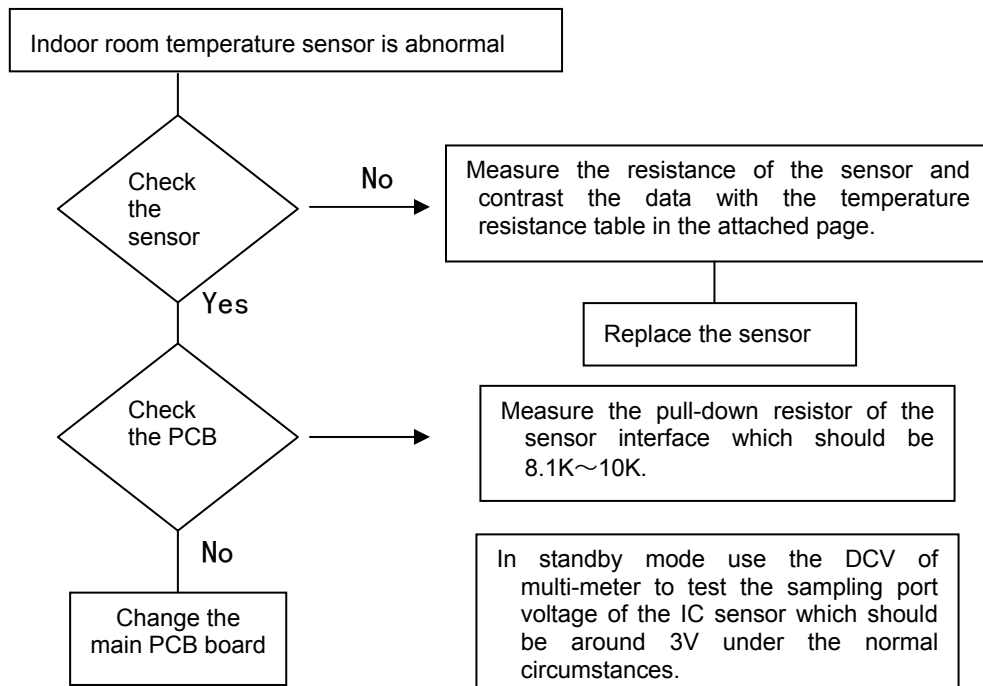
(2) LEDs' for the indication of outdoor trouble

Displayed code	Fault type	STATUS
L9	A system outdoor coil temperature sensor	System-down then indoor/outdoor unit shown fault and display fault code.
LA	B system outdoor coil temperature sensor	System-down then indoor/outdoor unit shown fault and display fault code.
L8	Outdoor environment temperature sensor.	System-down then indoor/outdoor unit shown fault and display fault code.
H1	High pressure and exhaust gas temperature protection	System-down then indoor/outdoor unit shown fault and display fault code.
H2	Low pressure protection	System-down then indoor/outdoor unit shown fault and display fault code.
HE	Power phase sequence protection	System can't be turned on again and the indoor/outdoor unit shown fault and display fault code.
H8	Over-current protection of invariable frequency compressor 1	System-down then indoor/outdoor unit shown fault and display fault code.
H9	Over-current protection of invariable frequency compressor 2	System-down then indoor/outdoor unit shown fault and display fault code.
E0	Communication failure between indoor and outdoor units	Outdoor unit can't be turned on again and the indoor/outdoor unit shown fault and display fault code.

8.2. Solving steps for typical malfunction

(1) For the indoor unit

E1. Indoor room temperature sensor is abnormal



E2: Indoor coil temperature sensor:

Trouble shooting mode is the same as “E1”

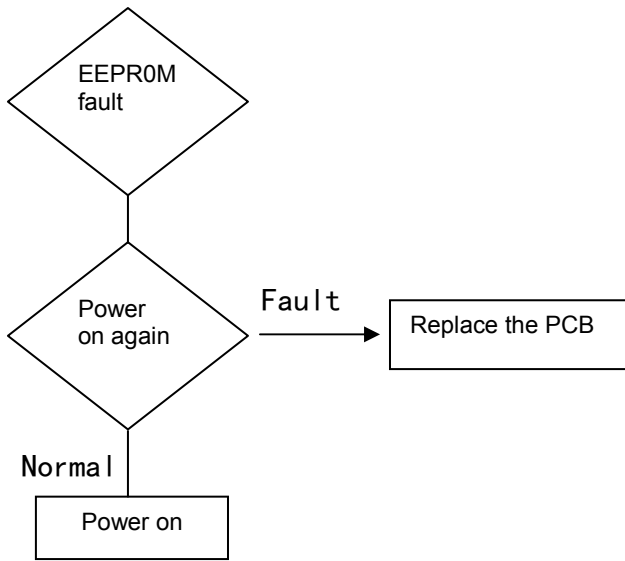
E3: Outdoor coil temperature sensor:

First check the dial switch whether it's correct on “T3” switch or not. Then check the issue according “E1” trouble shooting mode.

Water-level alarm malfunction:

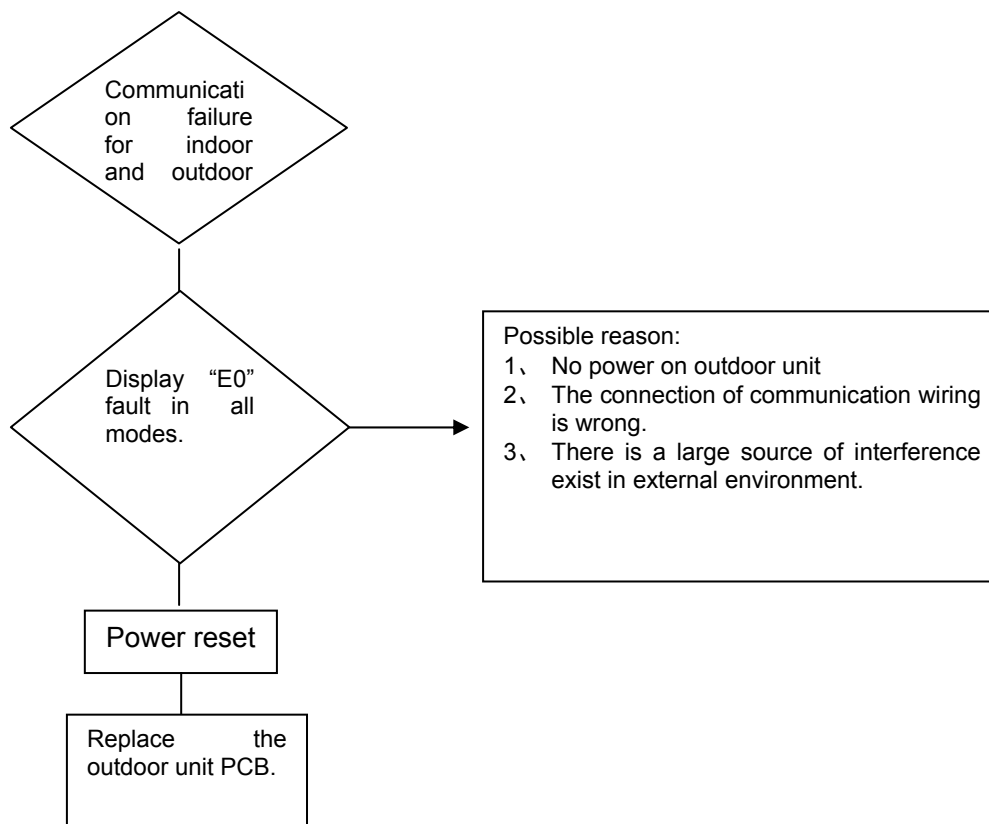
- Check whether the water-level of indoor unit defrosting pan is full or not.
- Check the slope of drainage pipe to confirm that whether the water can discharge smoothly.
- Check whether the water level switch float is jammed or not.
- Check whether the connect line of water switch is off (The floating ball is in the normal position). Short circuit the water switch interface on main PCB to confirm whether the PCB can running normally otherwise the PCB has been damaged.
- Change the PCB.

Ed: EEPROM fault

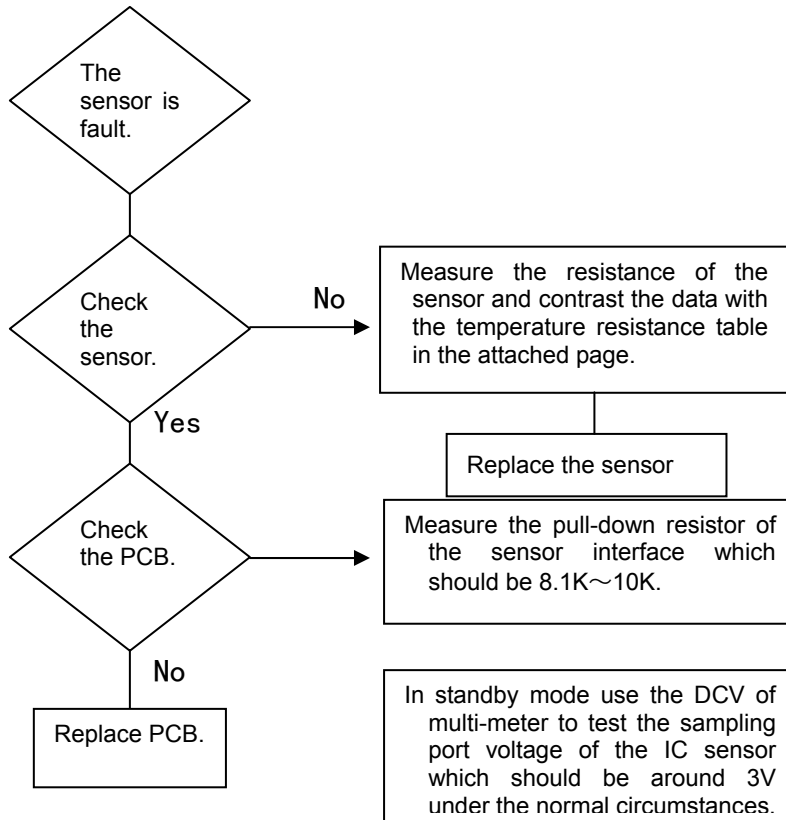


(2) For the outdoor unit

E0: Communication failure between indoor and outdoor units



L8: Outdoor environment temperature sensor open circuit or short circuit fault



L9: A system outdoor coil temperature sensor open circuit or short circuit fault

Trouble shooting mode is the same as "L8"

LA: B system outdoor coil temperature sensor open circuit or short circuit fault

Trouble shooting mode is the same as "L8"

H1: System high pressure protection

- 1、 Measure whether the system pressure is normal or not.
- 2、 Disconnect the pressure switch and Measure whether the connect line of pressure switch is short circuit.
- 3、 Replace the PCB if pressure switch and system pressure is normal.

H2: System low pressure protection

Trouble shooting mode is the same as "P04".

HE: Power phase sequence protection

- 1、 Check whether the voltage of outdoor unit A, B, C 3 phase is normal or not.(Whether Lack of phase)
- 2、 Check whether the phase connection is right.

Appendix Indoor Temp. and Pipe Temp. Sensor Resistance Value Table (°C--K)

°C	K Ohm	°C	K Ohm	°C	K Ohm	°C	K Ohm
-20	115.266	20	12.6431	60	2.35774	100	0.62973
-19	108.146	21	12.0561	61	2.27249	101	0.61148
-18	101.517	22	11.5000	62	2.19073	102	0.59386
-17	96.3423	23	10.9731	63	2.11241	103	0.57683
-16	89.5865	24	10.4736	64	2.03732	104	0.56038
-15	84.2190	25	10.0000	65	1.96532	105	0.54448
-14	79.3110	26	9.55074	66	1.89627	106	0.52912
-13	74.5360	27	9.12445	67	1.83003	107	0.51426
-12	70.1698	28	8.71983	68	1.76647	108	0.49989
-11	66.0898	29	8.33566	69	1.70547	109	0.48600
-10	62.2756	30	7.97078	70	1.64691	110	0.47256
-9	58.7079	31	7.62411	71	1.59068	111	0.45957
-8	56.3694	32	7.29464	72	1.53668	112	0.44699
-7	52.2438	33	6.98142	73	1.48481	113	0.43482
-6	49.3161	34	6.68355	74	1.43498	114	0.42304
-5	46.5725	35	6.40021	75	1.38703	115	0.41164
-4	44.0000	36	6.13059	76	1.34105	116	0.40060
-3	41.5878	37	5.87359	77	1.29078	117	0.38991
-2	39.8239	38	5.62961	78	1.25423	118	0.37956
-1	37.1988	39	5.39689	79	1.21330	119	0.36954
0	35.2024	40	5.17519	80	1.17393	120	0.35982
1	33.3269	41	4.96392	81	1.13604	121	0.35042
2	31.5635	42	4.76253	82	1.09958	122	0.3413
3	29.9058	43	4.57050	83	1.06448	123	0.33246
4	28.3459	44	4.38736	84	1.03069	124	0.32390
5	26.8778	45	4.21263	85	0.99815	125	0.31559
6	25.4954	46	4.04589	86	0.96681	126	0.30754
7	24.1932	47	3.88673	87	0.93662	127	0.29974
8	22.5662	48	3.73476	88	0.90753	128	0.29216
9	21.8094	49	3.58962	89	0.87950	129	0.28482
10	20.7184	50	3.45097	90	0.85248	130	0.27770
11	19.6891	51	3.31847	91	0.82643	131	0.27078
12	18.7177	52	3.19183	92	0.80132	132	0.26408
13	17.8005	53	3.07075	93	0.77709	133	0.25757
14	16.9341	54	2.95896	94	0.75373	134	0.25125
15	16.1156	55	2.84421	95	0.73119	135	0.24512
16	15.3418	56	2.73823	96	0.70944	136	0.23916
17	14.6181	57	2.63682	97	0.68844	137	0.23338
18	13.9180	58	2.53973	98	0.66818	138	0.22776
19	13.2631	59	2.44677	99	0.64862	139	0.22231

Part 4

Installation

1. Precaution on Installation	28
2. Vacuum Dry and Leakage Checking	29
3. Additional Refrigerant Charge	31
4. Water Drainage	32
5. Insulation Work	35
6. Wiring	36
7. Test Operation	37

1. Precaution on Installation

1). Measure the necessary length of the connecting pipe, and make it by the following way.

a. Connect the indoor unit at first, then the outdoor unit.

Bend the tubing in proper way. Do not harm them.

Specially Notice the pipe length/height/dimension of each capacity.

Maximum pipe length

Model	Max. Length	Max. Elevation
24,000Btu/h	25m	10m
36,000Btu/h	30m	20m
48,000Btu/h~60,000Btu/h	50m	30m

Piping sizes

Model	Liquid(mm)	Gas(mm)
24,000Btu/h	9.5	15.88
36,000(48,000)(60,000)Btu/h	9.5	19

CAUTIONS

- Daub the surfaces of the flare pipe and the joint nuts with frozen oil, and wrench it for 3~4 rounds
- With hands before fasten the flare nuts.
- Be sure to use two wrenches simultaneously when you connect or disconnect the pipes.

Pipe gauge	Tightening torque	Flare dimension A		Flare shape
		Min (mm)	Max	
Φ6.4	15~16N.m (153~163 kgf.cm)	8.3	8.7	
Φ9.5	25~26N.m (255~265kgf.cm)	12.0	12.4	
Φ12.7	35~36N.m (357~367kgf.cm)	15.4	15.8	
Φ15.9	45~47N.m (459~480 kgf.cm)	18.6	19.1	
Φ19.1	65~67N.m (663~684kgf.cm)	22.9	23.3	

b. The stop valve of the outdoor unit should be closed absolutely (as original state). Every time you connect it, first loosen the nuts at the part of stop valve, then connect the flare pipe immediately (in 5 minutes). If the nuts have been loosened for a long time, dusts and other impurities may enter the pipe system and may cause malfunction later. So please expel the air out of the pipe with refrigerant before connection.

c. Expel the air after connecting the refrigerant pipe with the indoor unit and the outdoor unit. Then fasten the nuts at the repair-points.

2) Locate The Pipe

a. Drill a hole in the wall (suitable just for the size of the wall conduit), then set on the fittings such as the wall conduit and its cover.

b. Bind the connecting pipe and the cables together tightly with binding tapes. Do not let air in, which will cause water leakage by condensation.

c. Pass the bound connecting pipe through the wall conduit from outside. Be careful of the pipe allocation to do no damage to the tubing.

3) Connect the pipes.

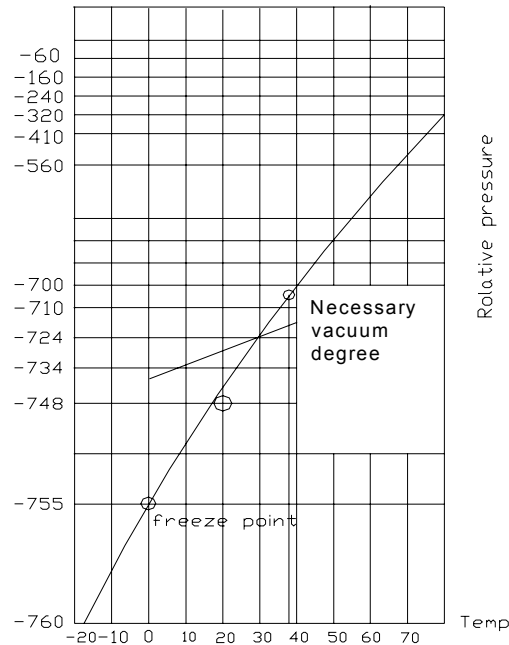
4) Then, open the stem of stop valves of the outdoor unit to make the refrigerant pipe connecting the indoor unit with the outdoor unit in fluent flow.

5) Be sure of no leakage by checking it with leak detector or soap water.

6) Cover the joint of the connecting pipe to the indoor unit with the soundproof / insulating sheath (fittings), and bind it well with the tapes to prevent leakage.

2. Vacuum Dry and Leakage Checking

- 1) Vacuum Dry: use vacuum pump to change the moisture (liquid) into steam (gas) in the pipe and discharge it out of the pipe to make the pipe dry. Under one atmospheric pressure, the boiling point of water(steam temperature) is 100°C. Use vacuum pump to make the pressure in the pipe near vacuum state, the boiling point of water falls relatively. When it falls under outdoor temperature, the moisture in the pipe will be vaporized.

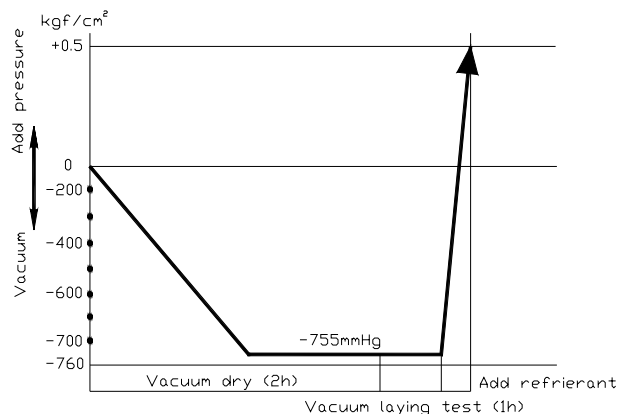


2) Vacuum dry procedure

There are two methods of vacuum dry due to different construction environment: common vacuum dry, special vacuum dry.

①. Common vacuum dry procedure

- Vacuum dry (for the first time)---connect the all-purpose detector to the inlet of liquid pipe and gas pipe, and run the vacuum pump more than two hours (the vacuum pump should be below -755mmHg)
- If the pump can't achieve below -755mmHg after pumping 2 hours, moisture or leakage point will still exist in the pipe. At this time, it should be pumped 1 hour more.
- If the pump can't achieve -755mmHg after pumping 3 hours, please check if there are some leakage points.
- Vacuum placement test: place 1 hour when it achieves -755mmHg, pass if the vacuum watch shows no rising. If it rises, it shows there's moisture or leakage point.
- Vacuuming from liquid pipe and gas pipe at the same time.
- Sketch map of common vacuum dry procedure.



②. Special vacuum dry procedure

- This vacuum dry method is used in the following conditions:
- There's moisture when flushing the refrigerant pipe.
- Rainwater may enter into the pipe.
- Vacuum dry for the first time 2h pumping

③. Vacuum destroy for the second time Fill nitrogen to 0.5Kgf/cm²

Because nitrogen is for drying gas, it has vacuum drying effect during vacuum destroy. But if the moisture is too much, this method can't dry thoroughly. So, please pay more attention to prevent water entering and forming condensation water.

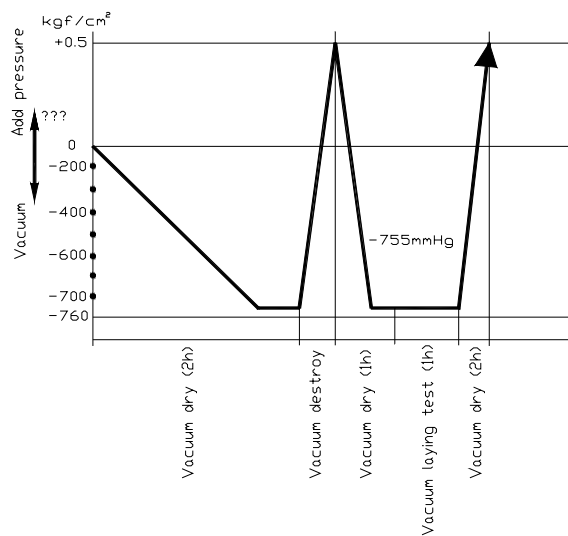
④. Vacuum dry for the second time.....1h pumping

Determinant: Pass if achieving below -755mmHg. If -755mmHg can't be achieved in 2h, repeat procedure

③ and ④.

⑤. Vacuum placing test 1h

⑥. Sketch map of special vacuum dry procedure



3. Additional Refrigerant Charge

Caution

- a) Refrigerant cannot be charged until field wiring has been completed.
- b) Refrigerant may only be charged after performing the leak test and the vacuum pumping.
- c) When charging a system, care shall be taken that its maximum permissible charge is never exceeded, in view of the danger of liquid hammer.
- d) Charging with an unsuitable substance may cause explosions and accidents, so always ensure that the appropriate refrigerant is charged.
- e) Refrigerant containers shall be opened slowly.
- f) Always use protective gloves and protect your eyes when charging refrigerant.

The outdoor unit is factory charged with refrigerant. Calculate the added refrigerant according to the diameter and the length of the liquid side pipe of the outdoor unit/indoor unit.

For 12kBtu/h (outdoor unit throttle)

R(g) D(mm)	φ6.4
L(m)	—
Less than 5m (One-way)	—
Added Refrigerant When Over 5m(One-way)	15g/m×(L-5)

For 24, 36, 48, 60kBtu/h (indoor unit throttle)

R(g) D(mm)	φ6.4	Φ9.5	Φ12.7
L(m)	—	—	—
Less than 5m (One-way)	—	—	—
Added Refrigerant When Over 5m(One-way)	30g/m×(L-5)	65g/m×(L-5)	115g/m×(L-5)

Remark:

R (g): Additional refrigerant to be charged
 L (m): The length of the refrigerant pipe (one-way)
 D (mm): Liquid side piping diameter

4. Water Drainage

4.1 Gradient and Supporting

- 1). Keep the drainpipe sloping downwards at a gradient of at least 1/50. Keep the drainpipe as short as possible and eliminate the air bubble.
- 2). The horizontal drainpipe should be short. When the pipe is too long, a prop stand must be installed to keep the gradient of 1/50 and prevent bending. Refer to the following table for the specification of the prop stand.

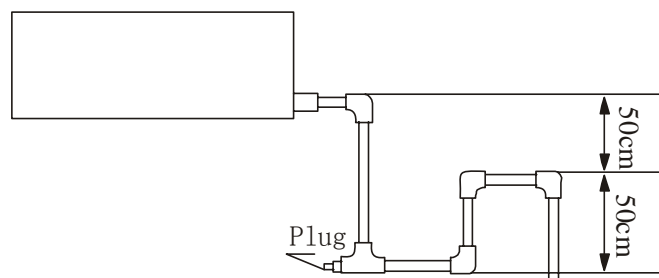
	Diameter	Distance between the prop stands
Hard PVC pipe	25~40mm	1~1.5m

3). Precautions

- ① The diameter of drainpipe should meet the drainage requirement at least.
- ② the drainpipe should be heat-insulated to prevent atomization.
- ③ Drainpipe should be installed before installing indoor unit. After powering on, there is some water in water-receiver plate. Please check if the drain pump can operate correctly.
- ④ All connection should be firm.
- ⑤ Wipe color on PVC pipe to note connection.
- ⑥ Climbing, horizontal and bending conditions are prohibited.
- ⑦ The dimension of drainpipe can't less than the connecting dimension of indoor drainpipe.
- ⑧ Heat-insulation should be done well to prevent condensation.
- ⑨ Indoor units with different drainage type can't share one convergent drainpipe.

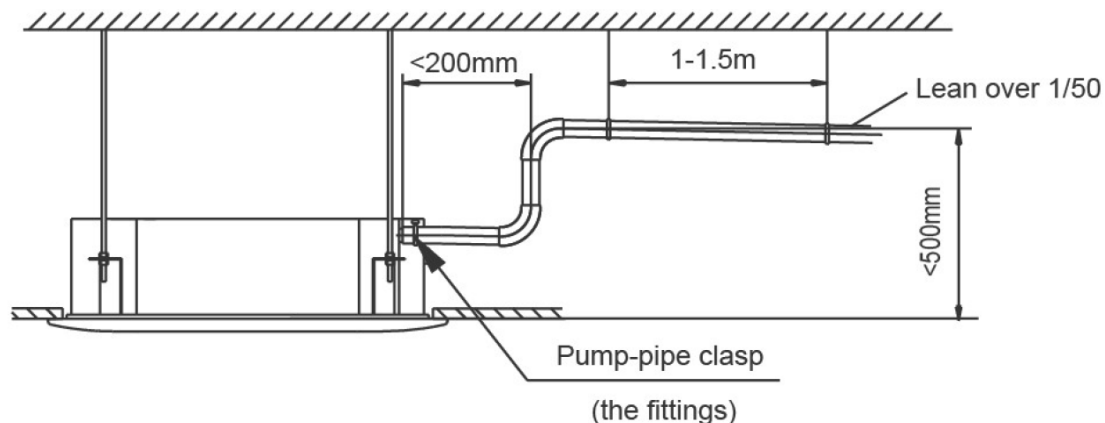
4.2 Drainpipe Trap

- 1). If the pressure at the connection of the drainpipe is negative, it needs to design drainpipe trap.
- 2). Every indoor unit needs one drainpipe trap.
- 3). A plug should be designed to do cleaning.

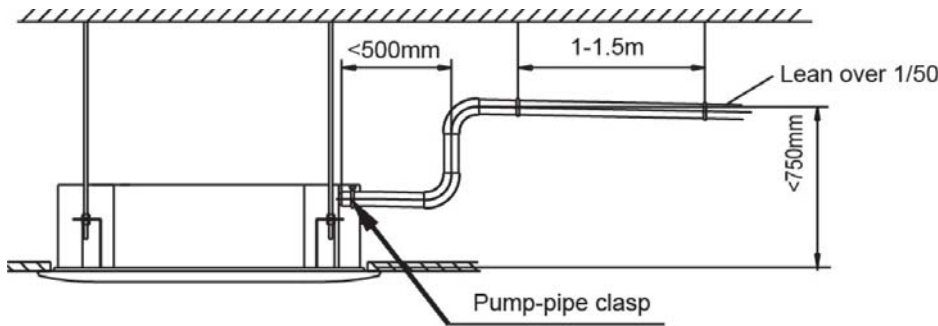


4.3 Upwards drainage (drain pump)

For Four-way cassette(compact)



For Four-way cassette



4.4 Convergent drainage

- 1). The number of indoor units should be as small as possible to prevent the traverse main pipe overlong.
- 2). Indoor unit with drain pump and indoor unit without drain pump should be in different drainage system.



- 3). Selecting the diameter

Number of connecting indoor units → Calculate drainage volume → Select the diameter

Calculate allowed volume = Total cooling capacity of indoor units (HP) × 2 (l/ hr)

	Allowed volume(lean 1/50) (l/ hr)	I.D. (mm)	Thick
Hard PVC	$\infty \leq 14$	∅ 25	3.0
Hard PVC	$14 < \infty \leq 88$	∅ 30	3.5
Hard PVC	$88 < \infty \leq 334$	∅ 40	4.0
Hard PVC	$175 < \infty \leq 334$	∅ 50	4.5
Hard PVC	$334 < \infty$	∅ 80	6.0

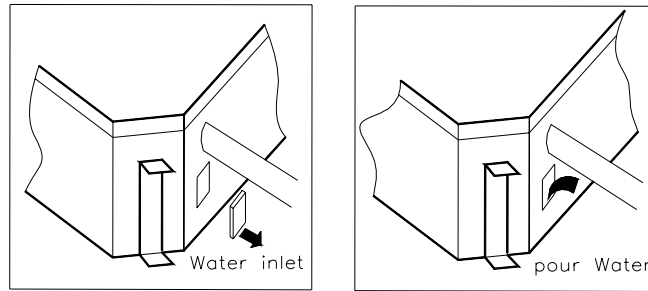
4.5 Drainage test

- 1). Drainage without drain pump

After finishing drainpipe installation, pour some water into the water receiver plate to check if the water flows smoothly.

- 2). Drainage with drain pump

- ① Poke the Water Level Switch, remove the cover, use water pipe to pour 2000ml water into the water receipt plate through the water inlet.



② Turn on the power to Cooling operation. Check the pump's operation and switch on the Water Level Switch. Check the pump's sound and look into the transparent hard pipe in the outlet at the same time to check if the water can discharge normally.

③ Stop the air conditioner running ,turn off the power , and put back the power.

- Stop the air conditioner. After 3 minutes, check if it has abnormality. If the collocation of drainpipes is illogical, the water will flow back overfull, which will cause the alarm lamp flashes, even overflow from the water receipt plate.
- Keep on pouring water until it gives an alarm signal for high water level, check if the pump drains water at once. If the water level can't fall below the alarmed water level after 3 minutes, the air conditioner will stop. Turn off the power and drain the remained water, and then turn on the air conditioner.

Note: the drain stuff in the main water receipt plate is for maintenance. Stuff up the drain stuff to prevent water leakage.

5. Insulation Work

5.1 Insulation material and thickness

1). Insulation material

Insulation material should adopt the material which is able to endure the pipe's temperature: no less than 70°C in the high-pressure side, no less than 120°C in the low-pressure side(For the cooling type machine, no requirements at the low-pressure side.)

Example: Heat pump type----Heat-resistant Polyethylene foam (withstand above 120°C)

Cooling only type---- Polyethylene foam (withstand above 100°C)

2). Thickness choice for insulation material

Insulation material thickness is as follows:

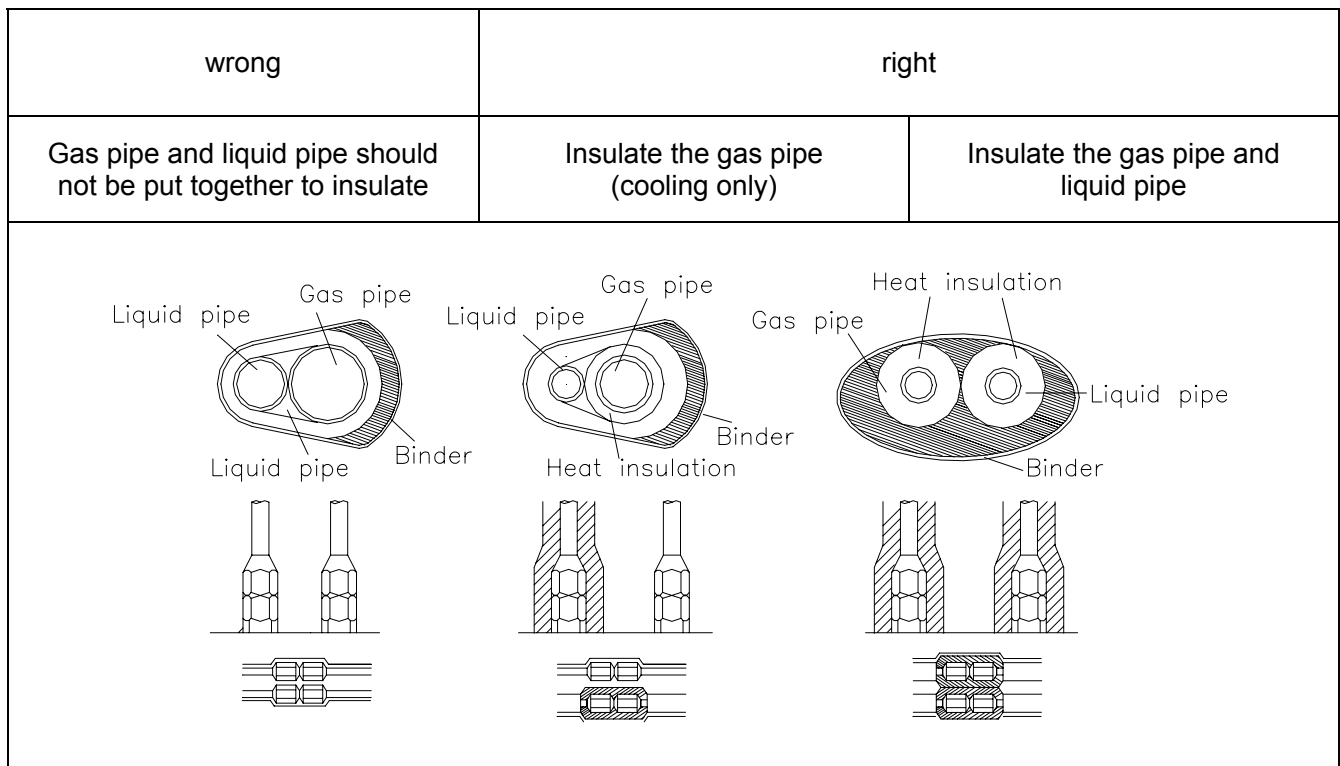
	Pipe diameter (mm)	Adiabatic material thickness
Refrigerant pipe	Φ6.4—Φ25.4	10mm
	Φ28.6—Φ38.1	15mm
Drainage pipe	Inner diameterΦ20—Φ32	6mm

5.2 Refrigerant pipe insulation

1). Work Procedure

- ① Before laying the pipes, the non-jointing parts and non-connection parts should be heat insulated.
- ② When the gas proof test is eligible, the jointing area, expanding area and the flange area should be heat insulated

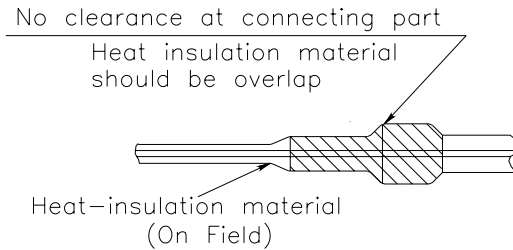
2). Insulation for non-jointing parts and non-connection parts



For construction convenience, before laying pipes, use insulation material to insulate the pipes to be deal with, at the same time, at two ends of the pipe, remain some length not to be insulated, in order to be welded and check the leakage after laying the pipes.

3). Insulate for the jointing area, expanding area and the flange area

- ① Insulate for the jointing area, expanding area and the flange area should be done after checking leakage of the pipes
- ② Make sure there's no clearance in the joining part of the accessorial insulation material and local preparative insulation material.



5.3 Drainage pipe insulation

1) The connection part should be insulated, or else water will be condensing at the non-insulation part.

5.4 Note

- 1) The jointing area, expanding area and the flange area should be heat insulated after passing the pressure test
- 2) The gas and liquid pipe should be heat insulated individually, the connecting part should be heat insulated individually.
- 3) Use the attached heat-insulation material to insulate the pipe connections (pipes' tie-in ,expand nut) of the indoor unit.

6. Wiring

Please refer to the Wiring Diagram.

7. Test Operation

(1) The test operation must be carried out after the entire installation has been completed.

(2) Please confirm the following points before the test operation.

- The indoor unit and outdoor unit are installed properly.
- Tubing and wiring are correctly completed.
- The refrigerant pipe system is leakage-checked.
- The drainage is unimpeded.
- The ground wiring is connected correctly.
- The length of the tubing and the added stow capacity of the refrigerant have been recorded.
- The power voltage fits the rated voltage of the air conditioner.
- There is no obstacle at the outlet and inlet of the outdoor and indoor units.
- The gas-side and liquid-side stop valves are both opened.
- The air conditioner is pre-heated by turning on the power.

(3) According to the user's requirement, install the remote controller when the remote controller's signal can reach the indoor unit smoothly.

(4) Test operation

Set the air conditioner under the mode of "COOLING" with the remote controller, and check the following points.

Indoor unit

- Whether the switch on the remote controller works well.
- Whether the buttons on the remote controller works well.
- Whether the air flow louver moves normally.
- Whether the room temperature is adjusted well.
- Whether the indicator lights normally.
- Whether the temporary buttons works well.
- Whether the drainage is normal.
- Whether there is vibration or abnormal noise during operation.

Outdoor unit

- Whether there is vibration or abnormal noise during operation.
- Whether the generated wind, noise, or condensed of by the air conditioner have influenced your neighborhood.
- Whether any of the refrigerant is leaked.

Part 5

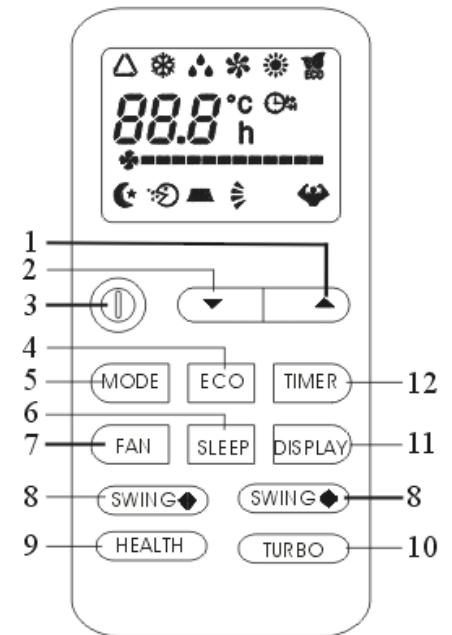
Control

1. Wireless Remote Controller	39
2. Explosive view	40

1. Wireless Remote Controller

1.1 Remote Function

No.	Button	Function
1	▲ (TEMP UP)	Increase the temperature or time by 1 unit
2	▼ (TEMP DN)	Decrease the temperature or time by 1 unit
3	ON/OFF	To switch the conditioner on and off.
4	ECO	In cooling mode,press this button ,the temperature will increase 2°C on the base of setting temperature In heating mode, press this button, the temperature will decrease 2°C on the base of setting temperature
5	MODE	To select the mode of operation
6	SLEEP	To activate the function “SLEEP”
7	FAN	To select the fan speed of auto/low/mid/high
8	SWING	To activate or deactivate of the movement of the “DEFLECTORS” .
9	HEALTHY	To switch - on /off HEALTHY funtion.It is a button which controls the ionizer or plasma generator only for inverter type.
10	TURBO	In cooling mode, press this button, the unit will give the maximum cooling temperature with 16°C In heating mode, press this button, the unit will give the maximum heating temperature with 31°C
11	DISPLAY	To switch on/off the LED display (if present)
12	TIMER	To set automatic switching-on/off



- ⚠ The outlooking and some function of remote control may vary according to the model.
- ⚠ The shape and position of buttons and indicators may vary according to the model, but their function is the same.
- ⚠ The unit confirms the correct reception of each press button with a beep.

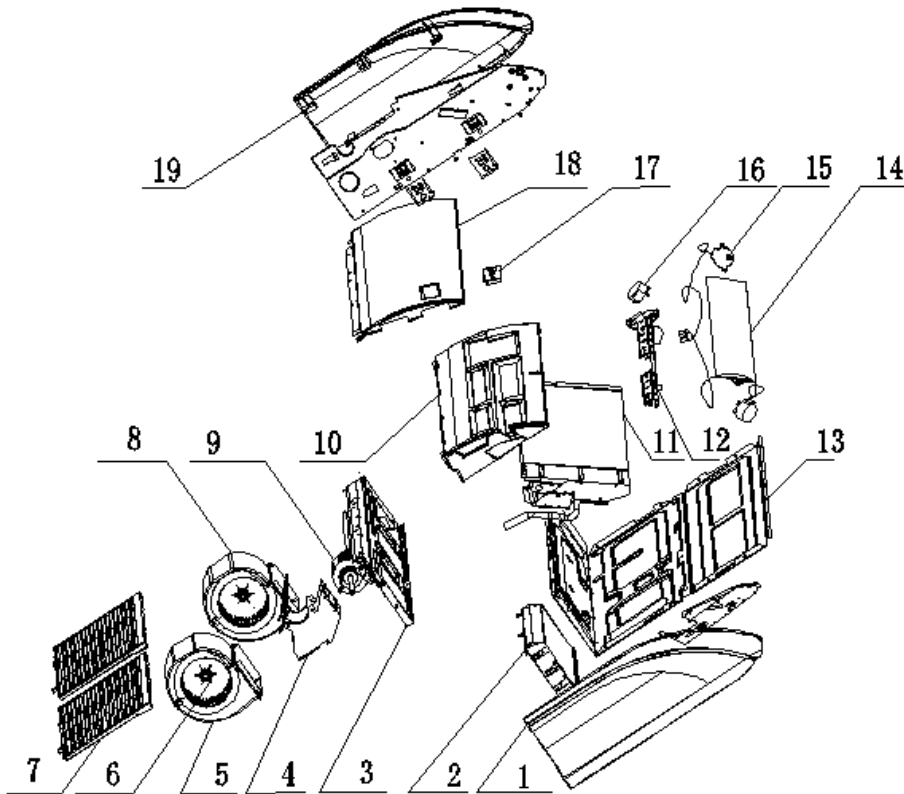
1.2 General Function for wireless remote controller: Specification

Rated voltage	3.0V(2pieces of LR03 7 # batteries)
Min voltage for sending signal of CPU	2.4V
Effective receiving distance	8m~11m
Operation condition	-5~60°C

2. Explosive view

Indoor unit

NEO36SC-T



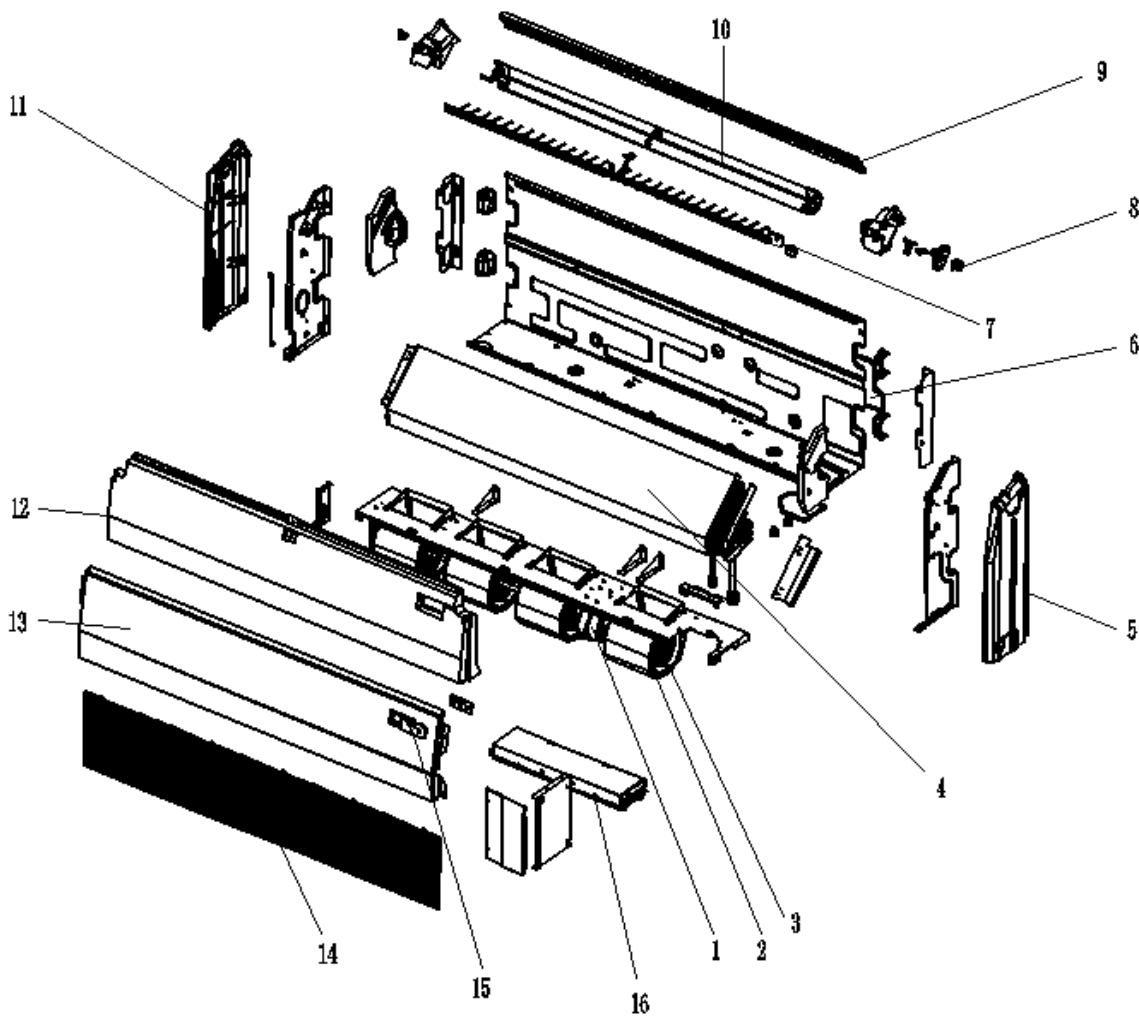
Spare parts list

No	Part Name	Q'ty	Remark
2	Electronic box	1	
3	Middle plate	1	
4	Supporter for fan motor	1	
5	Down foam shell	2	
6	Indoor fan	2	
7	Filter	2	
8	Up foam shell	2	
9	Indoor fan motor	1	
10	Drain tray assembly	1	
11	Evaporator subassembly	1	
12	Vertical Vane	1	
13	Base plate	1	
14	Supporter of horizontal vane	1	
15	Vane motor	1	
16	Bearing Mount	1	
17	Screw cover	1	
18	Front panel	1	

Explosive view

19	Right plate assembly	1	Not shown in Explosion view
20	Remote	1	
21	Main PCB	1	
22	Transformer	1	
23	Room sensor	1	
24	Pipe sensor	1	
25	Indoor fan capacitor	1	
26	Display PCB	1	

NEO60SC-T



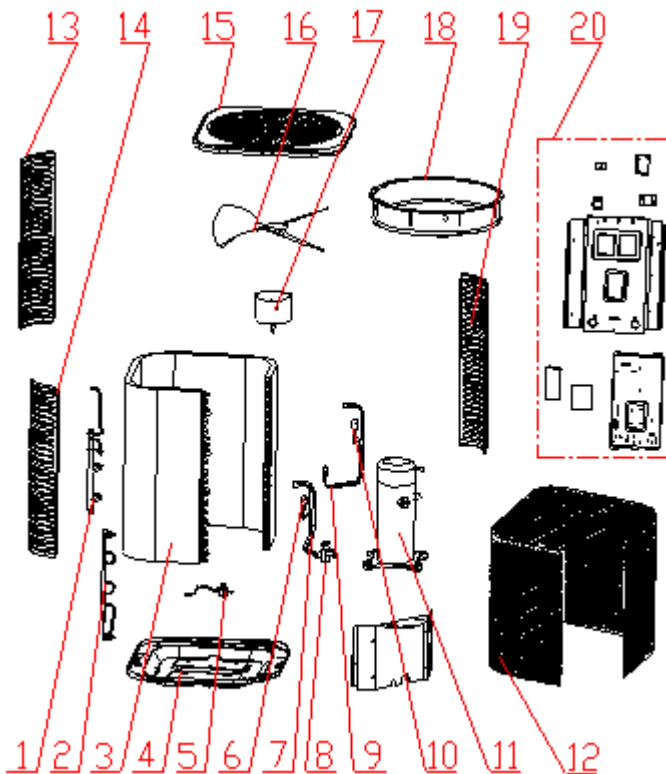
Spare parts list			
No	Part Name	Q'ty	Remark
1	Indoor fan capacitor	2	
2	Up foam shell	4	
	Down foam shell	4	
3	Indoor fan	4	
4	Indoor fan motor	2	
4	Evaporator subassembly	1	
5	Right plate assembly	1	
6	Base plate	1	
7	Vertical vane	2	

Explosive view

8	Vane motor	1	
9	Outlet panel	1	
10	Horizontal vane	1	
11	Left plate assembly	1	
12	Drain tray assembly	1	
13	Front panel	1	
14	Filter	1	
15	Display PCB	1	
16	Electronic box	1	
17	MainPCB	1	Not shown in Explosion view
18	Transformer	1	
19	Room sensor	1	
20	Pipe sensor	1	
21	Terminal	1	
22	Remote	1	

Outdoor unit

CCU36-410-T
CCU60-410-T
CCU60-410-3-T



Spare parts list			
No.	Part Name	Q'ty	Remark
1	Input pipe of condenser	1	
2	Output pipe of condenser	1	

3	Condenser	1	
4	Base	1	
5	Two-way Valve	1	
6	Low pressure switch	1	
7	Suction pipe	1	
8	Three-way Valve	1	
9	Discharge pipe	1	
10	Discharge temp sensor	1	
11	Compressor	1	
12	Filter	1	
13	Top plate	1	
14	Down plate	1	
15	Top Cover	1	
16	Propeller Fan	1	
17	Outdoor Motor	1	
18	Wind circle	1	
19	Support plate	1	
20-1	High pressure switch	1	
20-2	Compressor capacitor	1	
20-3	Fan capacitor	1	
20-4	Outdoor PCB	1	
20-5	Outdoor terminal	1	
20-6	A.C contactor	1	
20-7	Cable Clamp	1	

Notice: The explosive view is for your reference only.