MUNDOCLIMA®

ON/OFF HEAT PUMP

Service manual

MUC-HF2

CL20647 a CL20648
English

CONTENT

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

Part 1
General Information

1. Model Lists

Universal Outdoor unit Model	Compressor type	Compressor Brand	Matched indoor units
Heat Pump			
MUC-48 HF2 (UE20647)	SCROLL	SANYO	MUC-48 HF2 (UI20647)
MUC-60 HF2 (UE20648)	SCROLL	SANYO	MUC-48 HF2 (UI20648)

2. External Appearance

2.1 Indoor Unit

Duct

2.2 Outdoor Units

Double fan outdoor unit

3. Features

4.1 High quality coils:

The coil is constructed of advanced inner grooved copper tube and aluminum fins.

4.2 Anti-rust, 500 hours salt spray test.

4.3 Low operation sound level: Well-known stable and quiet running fan motor.

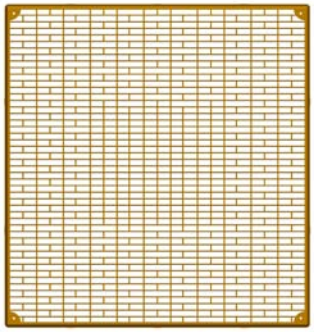
4.4 Well-known compressor.

4.5 Compact design: Smaller dimension and larger stuffing capacity.

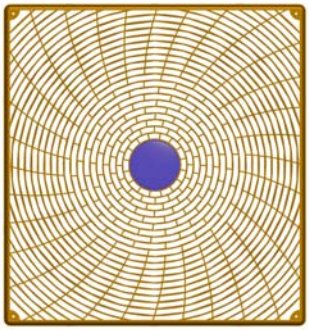
4.6 Universal outdoor unit design.

4.7 Optional air outlet grille: plastic type and wire type.

Wire type



Plastic type



Plastic type

4.8 Optional low temperature cooling module.

4.9 R410A environment friendly refrigerant.

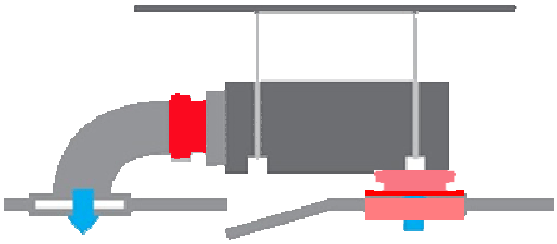
Duct Type

1. Features

1.1 Installation accessories: (Optional)

- Front Board, Canvas Air Passage, Filter, Panel, for easy installation

Front Board



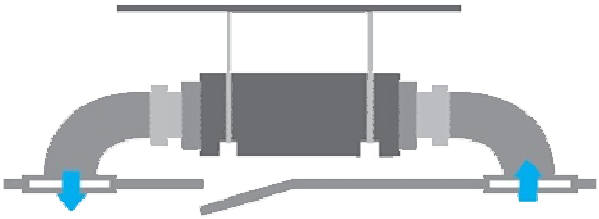
Canvas Air Passage

Filter

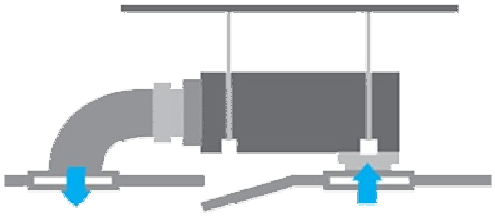
Panel

1.2 Easy Installation: Two air inlet styles (Bottom side or Rear side)

- Air inlet from rear is standard for all capacity; air inlet from bottom is optional.
- The size of air inlet frame from rear and bottom is same, it's very easy to move the cover from bottom to rear side, or from rear to the bottom, in order to matching the installation condition.



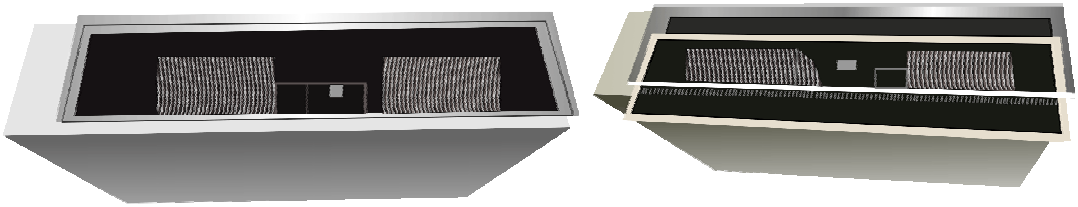
Air intake from rear (Standard)



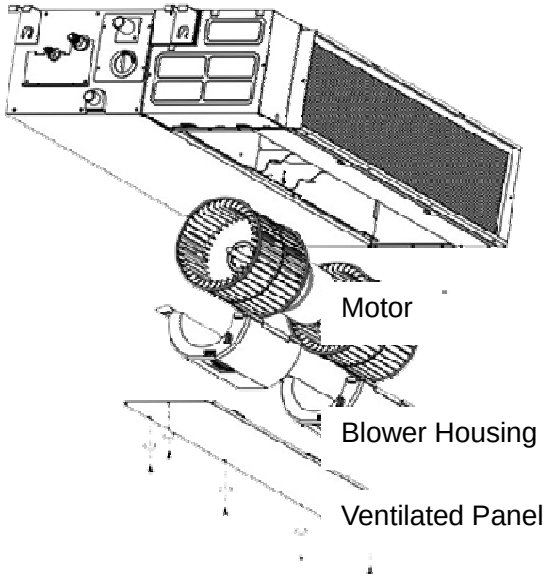
Air intake from bottom (Optional)

1.3 Easy maintenance

- Clean the filter (Optional, standard product without filter)
  It is easy to draw out the filter from the indoor unit for cleaning, even the filter is installed in rear side or bottom side.

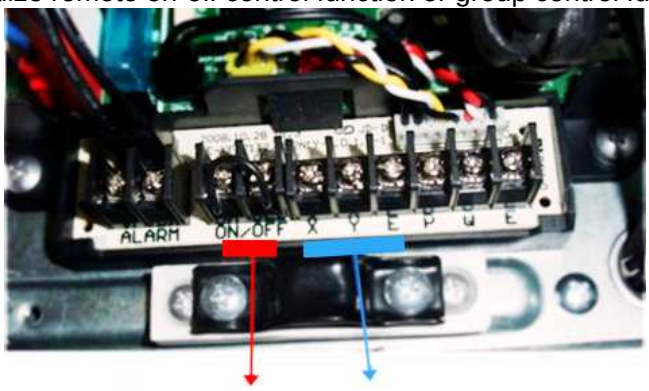


- Replace the motor or centrifugal fan
  Remove the ventilated panel firstly. Remove a half of blower housing and take out the motor with centrifugal fan. Directly remove two bolts, and then replace the motor or centrifugal fan easily.



1.4 Reserved remote on-off and central control ports

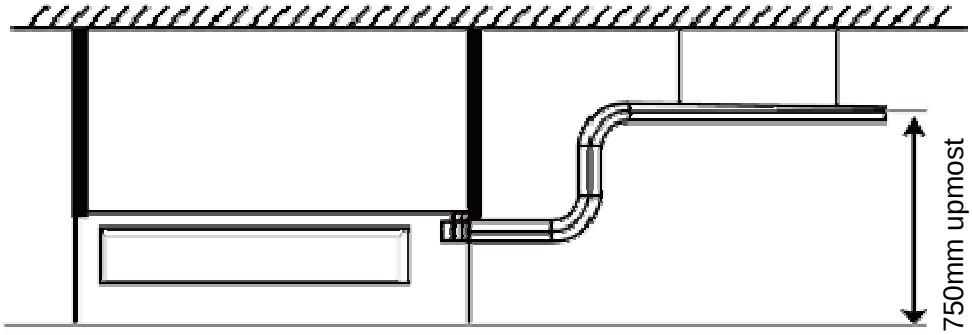
- Reserved remote on-off ports and central control ports, can connect the cable of an on-off controller or a central controller to realize remote on-off control function or group control function.

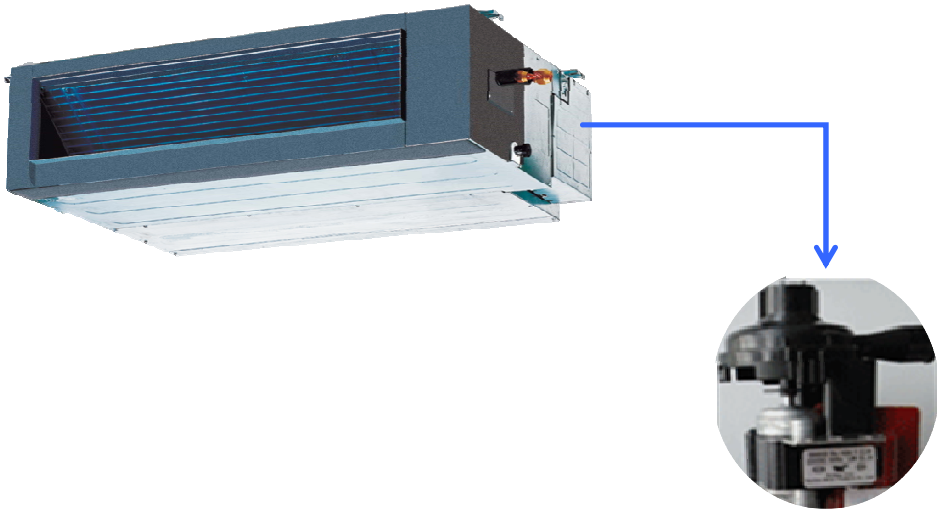


Remote on-off ports Central control ports

1.5 Built-in drain pump (Optional):

- Built-in drain pump can lift the water to 750mm upmost. It's convenient to install drainage piping under most space condition.



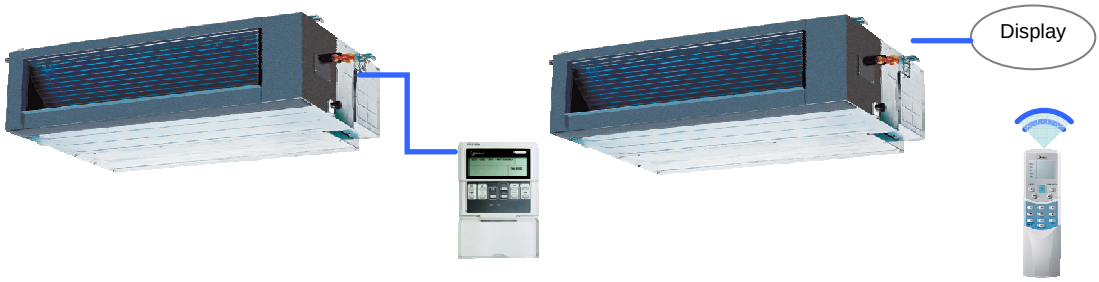


1.6 Built-in display board

- The standard indoor unit can be controlled by wired controller.
- There is a display board with a receiver in the E-box. Move out the display, and fix it in other place, even in the distance of 10m. The unit will realized remoter control.
- The wired controller and the display board can display the error code or production code when the chips detect some failure.

Wired Controller (Standard)

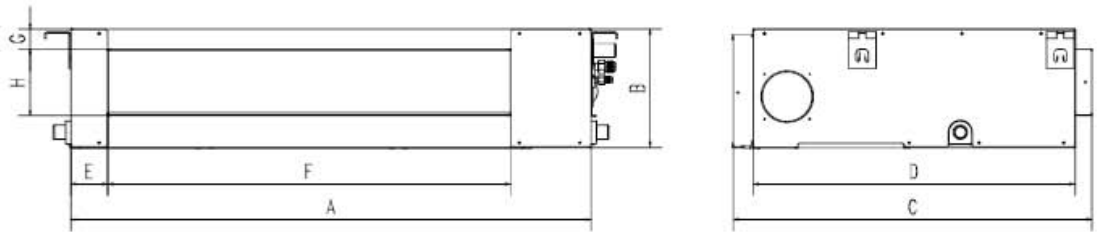
Remote Controller (Optional)



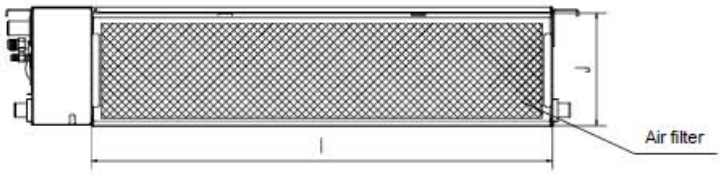
2. Dimensions

Outline dimension and air outlet opening size

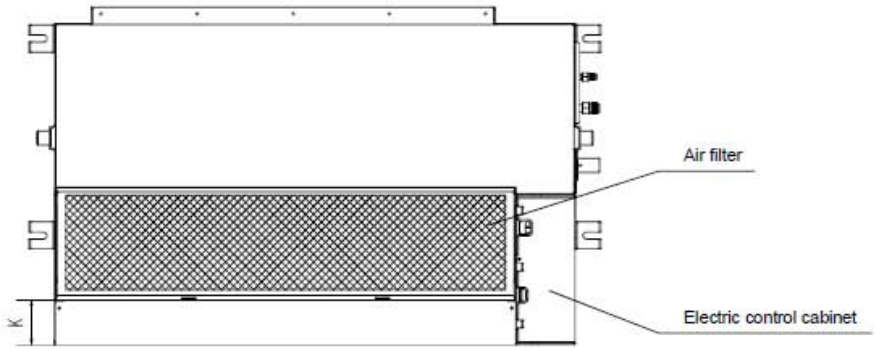
Unit: mm



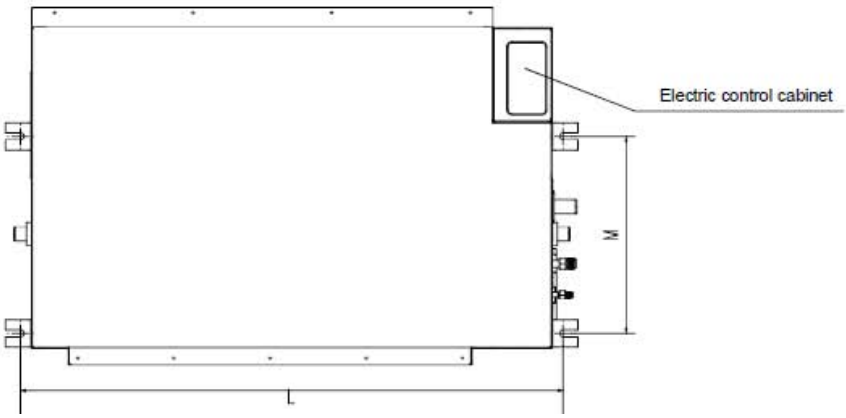
Air return opening size



Position size of descensional ventilation opening



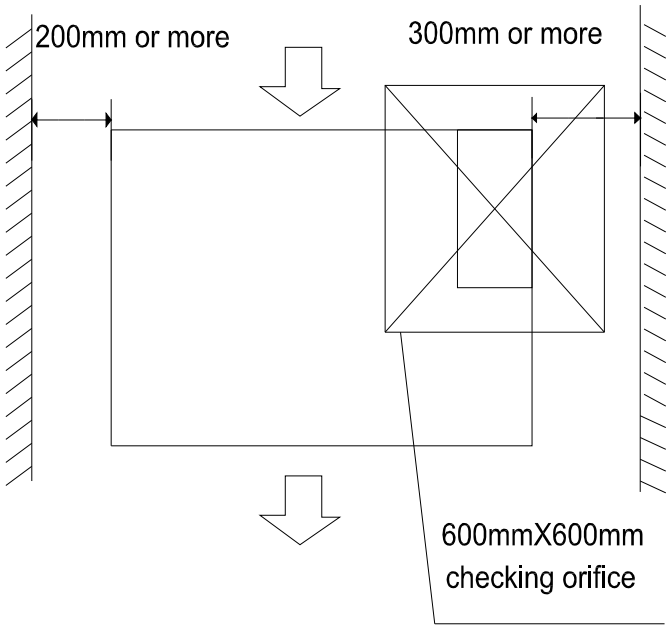
Size of mounted lug



Capacity (KBtu)	Outline dimension(mm)				Air outlet o pening size				Air return opening size			Size of outline dimension mounted plug	
	A	B	C	D	E	F	G	H	I	J	K	L	M
48~60	1200	300	865	800	80	968	40	204	1094	288	45	1240	500

3. Service Space

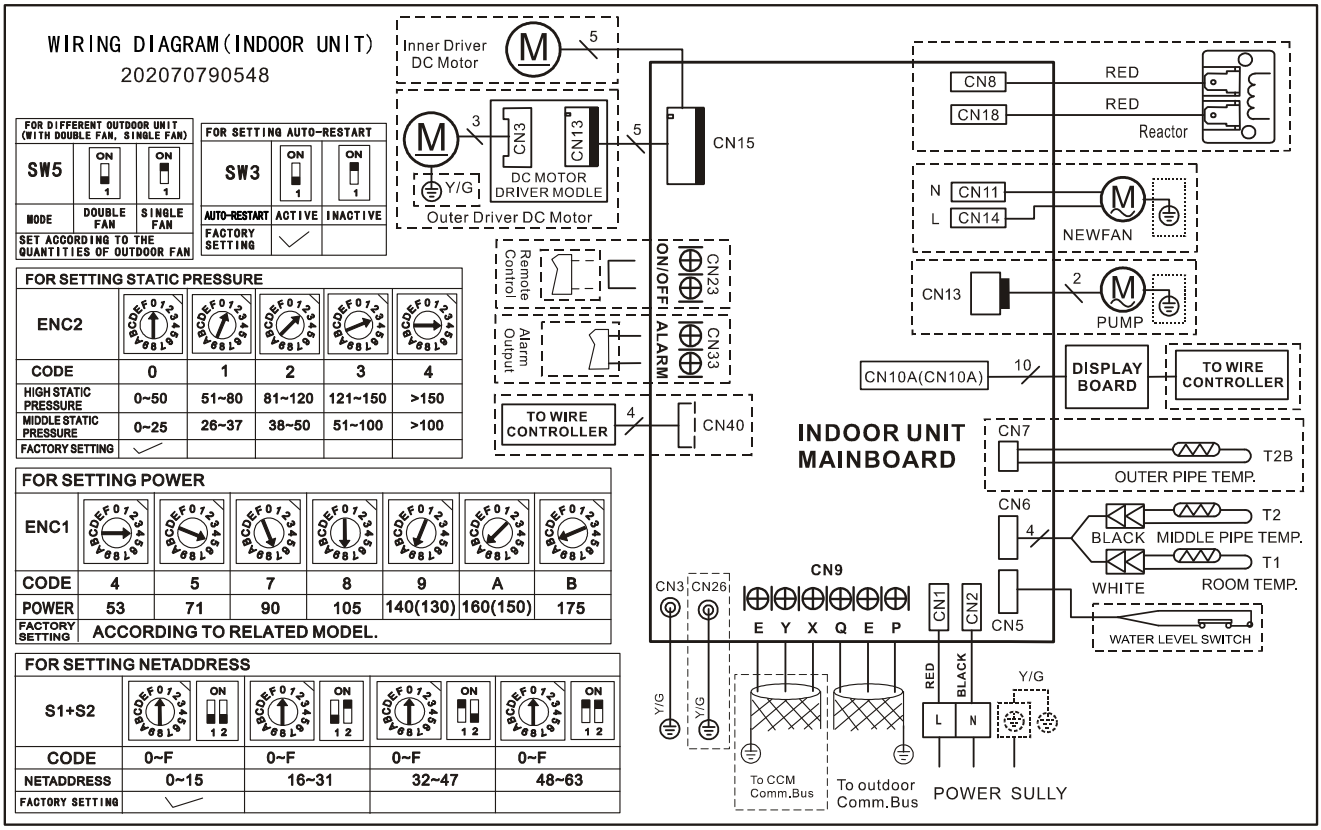
Ensure enough space required for installation and maintenance.



There is enough space for installation and maintenance. The ceiling is horizontal, and its structure can endure the weight of the indoor unit. The outlet and the inlet are not impeded, and the influence of external air is the least. The air flow can reach throughout the room. The connecting pipe and drainpipe could be extracted out easily. There is no direct radiation from heater.

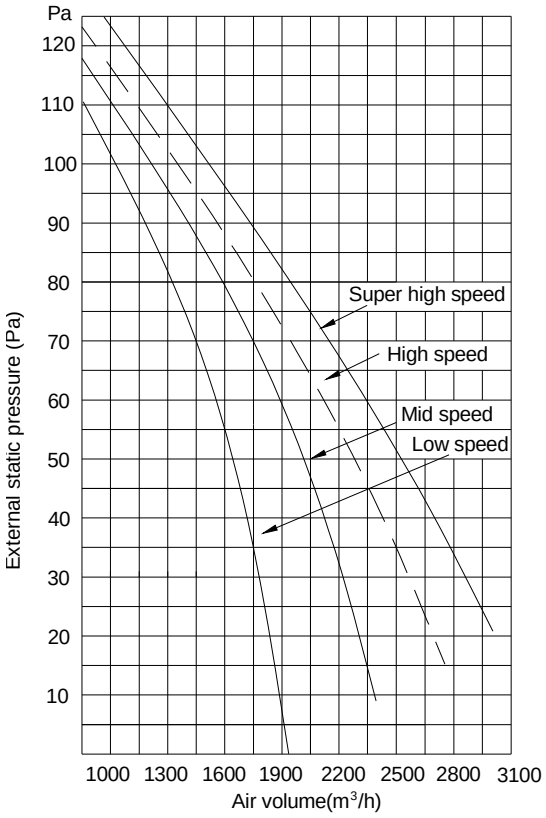
4. Wiring Diagrams

MUC-48HF2
MUC-60HF2

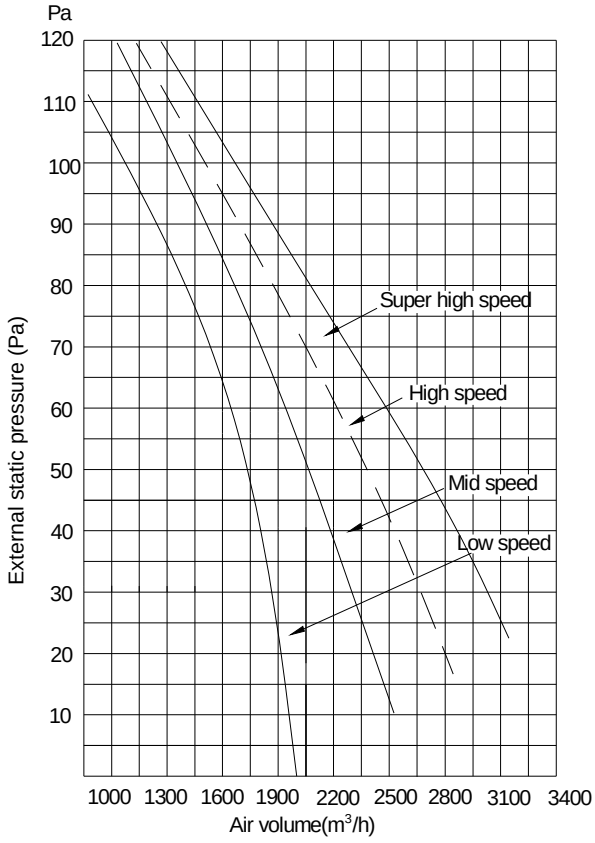


5. Static Pressure

45,000-48,000Btu/h



51,000-60,000Btu/h

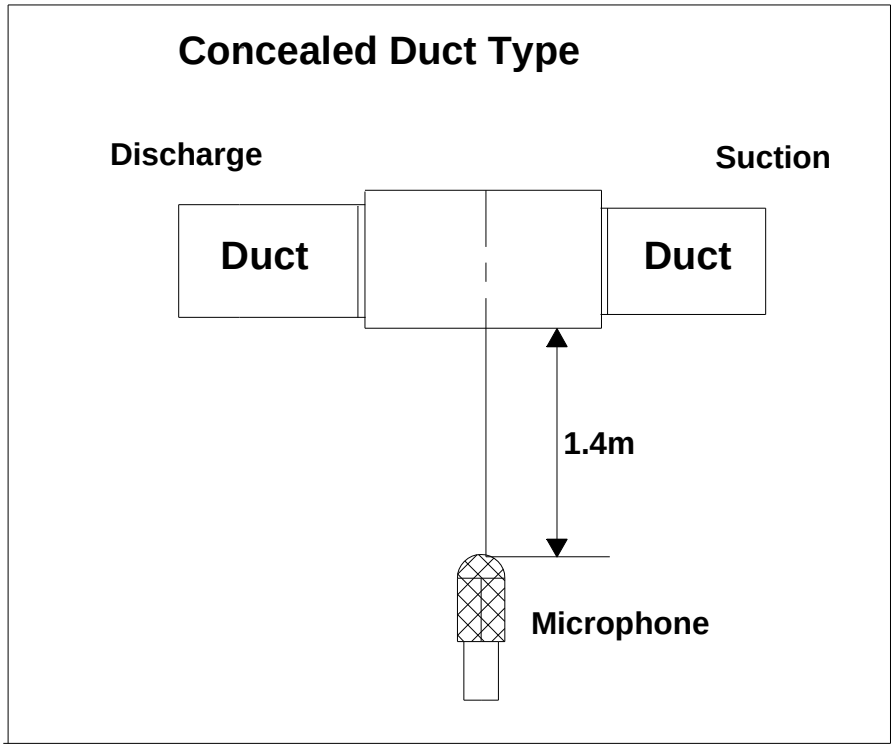


6. Electric Characteristics

Model	Indoor Unit				Power Supply
	Hz	Voltage	Min	Max	MFA
MUC-48HF2	50	220-240V	198V	254V	16
MUC-60HF2	50	220-240V	198V	254V	16

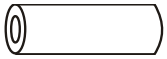
Note:
MFA: Max. Fuse Amps. (A)

7. Sound Levels



Model	Noise level dB(A)		
	H	M	L
MUC-48HF2	49	45	40
MUC-60HF2	49	45	40

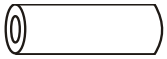
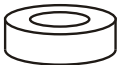
8. Accessories

	Name	Shape	Quantity
Tubing & Fittings	Soundproof/insulation sheath		2
	Binding tape		1
	Seal sponge		1
Drainpipe Fittings	Drain joint		1
	Seal ring		1
Wire controller	Wire controller	——————	1
others	Owner's manual	——————	1
	Installation manual	——————	1

9. The Specification of Power

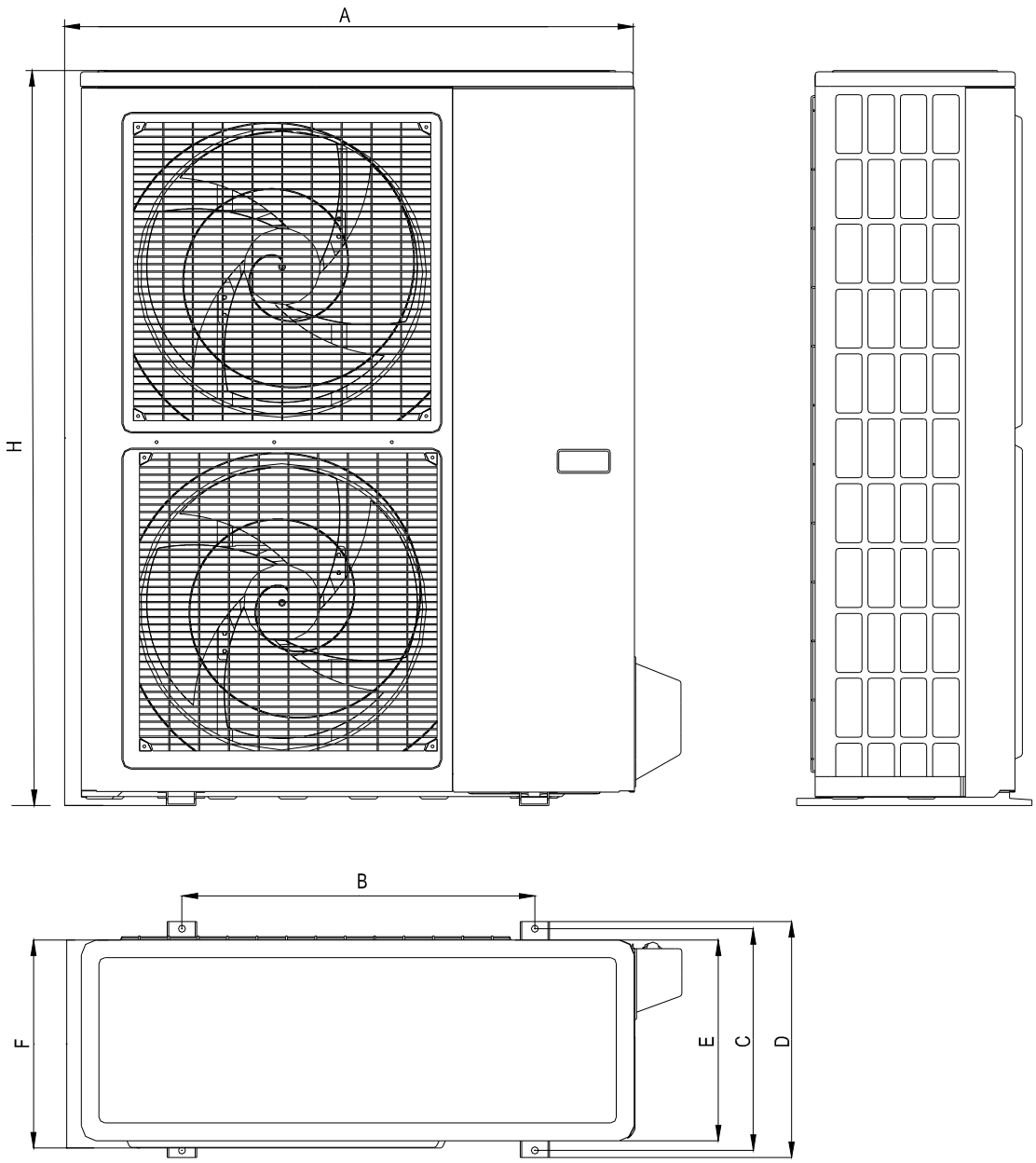
Model		MUC-48HF2 MUC-60HF2
INDOOR UNIT POWER	Phase	1-phase
	Frequency and Voltage	220-240V, 50Hz
	POWER WIRING (mm^2)	3×1.0
	Circuit Breaker/ Fuse (A)	20/16
OUTDOOR UNIT POWER	Phase	3-phase
	Frequency and Voltage	380-415V, 50Hz
	POWER WIRING (mm^2)	5×2.5
	Circuit Breaker/ Fuse (A)	25/20
Indoor/Outdoor Connecting Wiring (Weak Electric Signal) (mm^2)		3×0.2
Indoor/Outdoor Connecting Wiring (Strong Electric Signal) (mm^2)		———

8. Accessories

	Name	Shape	Quantity
Tubing & Fittings	Soundproof/insulation sheath		2
	Binding tape		1
	Seal sponge		1
Drainpipe Fittings	Drain joint		1
	Seal ring		1
Wire controller	Wire controller	———	1
others	Owner's manual	———	1
	Installation manual	———	1

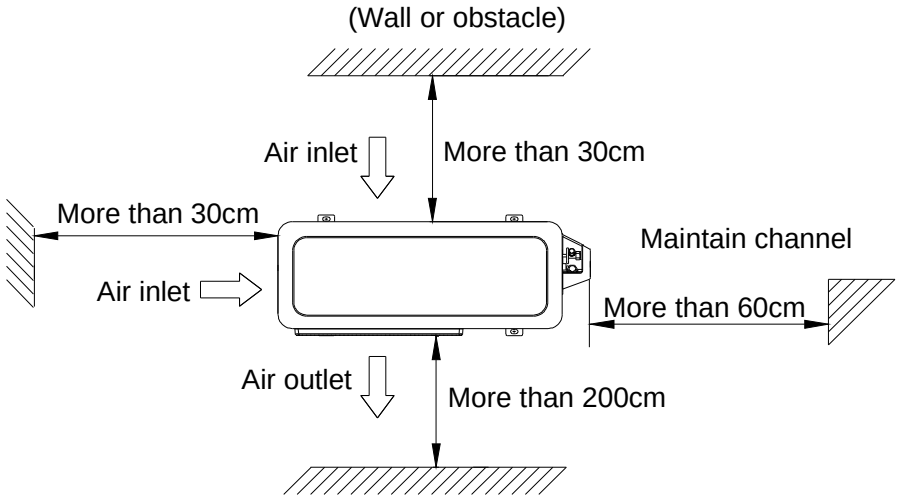
Part 3
Outdoor Units

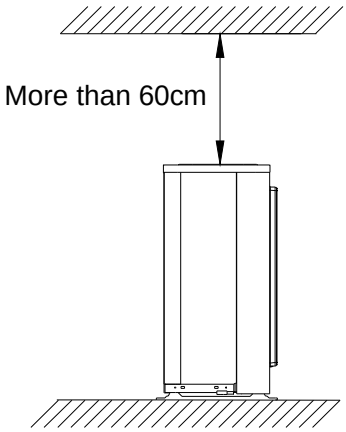
1. Dimensions



Model	Unit：mm						
	A	B	C	D	E	F	H
MUC-48HF2	938	634	404	448	370	392	1369
MUC-60HF2							

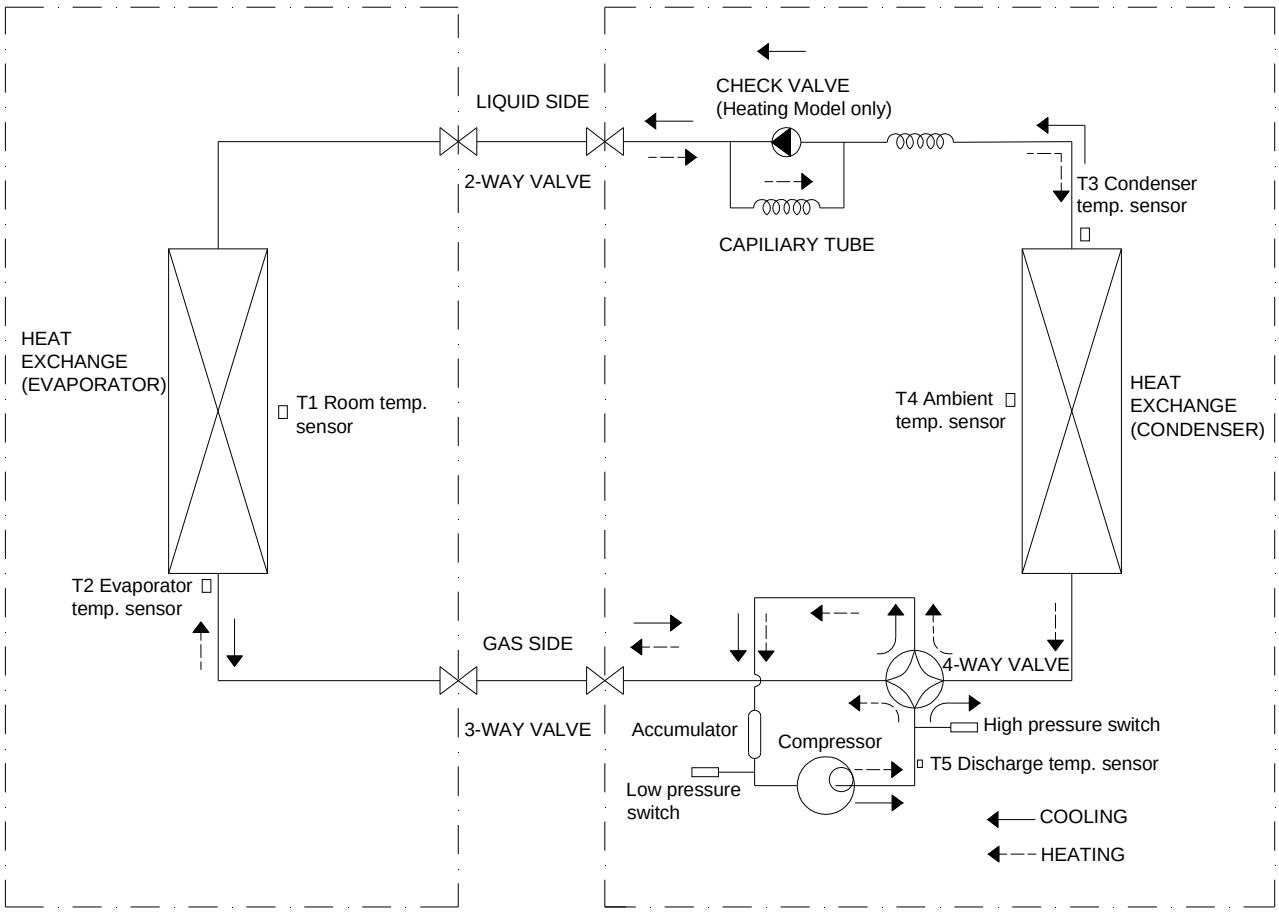
2. Service Space





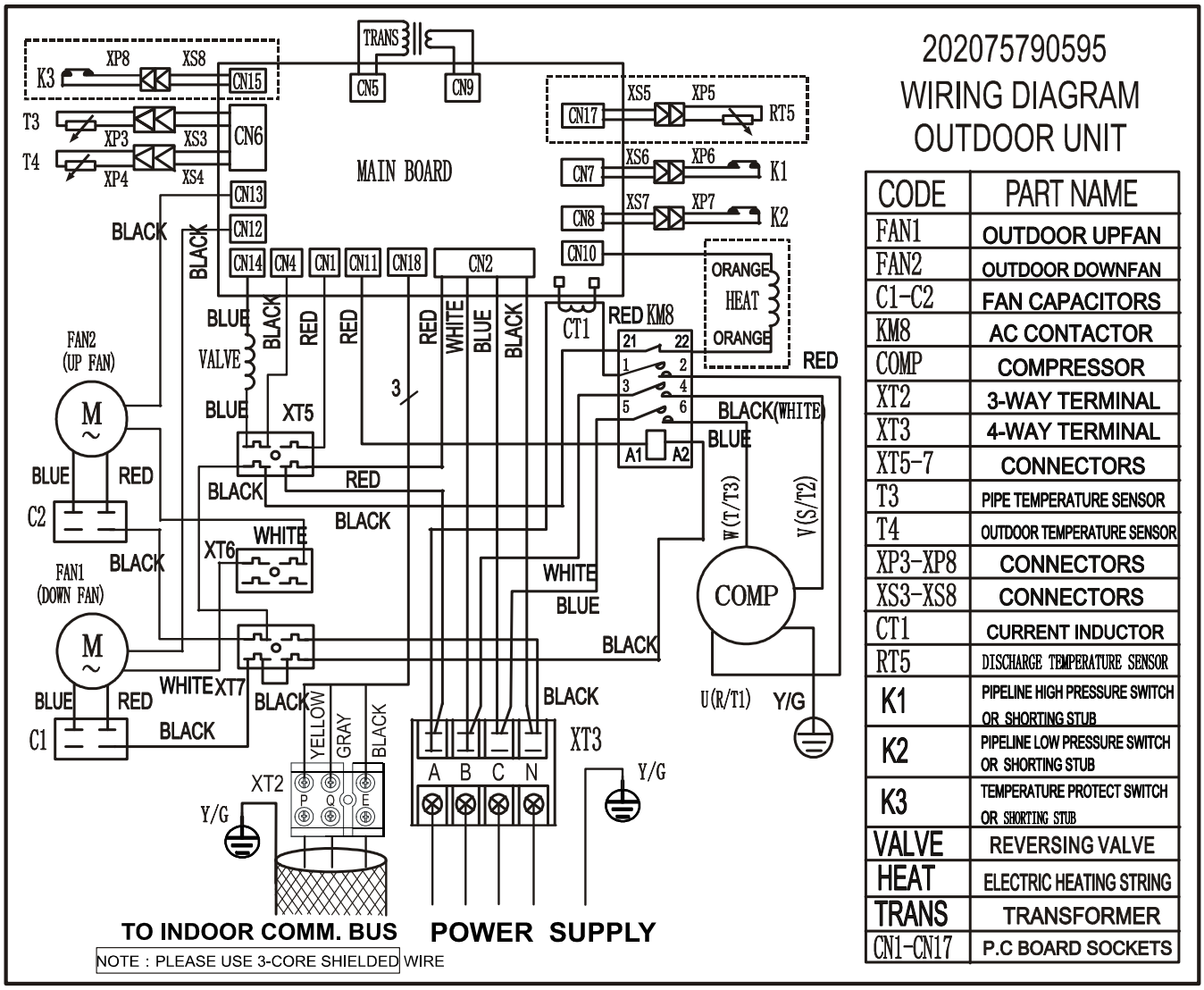
3. Piping Diagrams

MUC-48HF2
MUC-60HF2



4. Wiring Diagrams

MUC-48HF2
MUC-60HF2



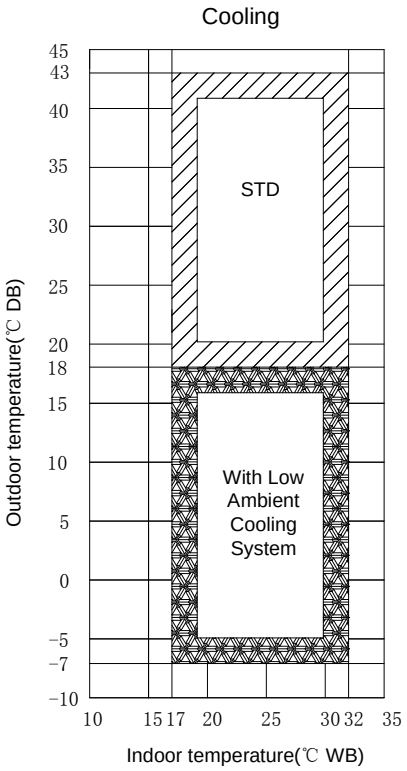
CODE	PART NAME
FAN1	OUTDOOR UPFAN
FAN2	OUTDOOR DOWNFAN
C1-C2	FAN CAPACITORS
KM8	AC CONTACTOR
COMP	COMPRESSOR
XT2	3-WAY TERMINAL
XT3	4-WAY TERMINAL
XT5-7	CONNECTORS
T3	PIPE TEMPERATURE SENSOR
T4	OUTDOOR TEMPERATURE SENSOR
XP3-XP8	CONNECTORS
XS3-XS8	CONNECTORS
CT1	CURRENT INDUCTOR
RT5	DISCHARGE TEMPERATURE SENSOR
K1	PIPELINE HIGH PRESSURE SWITCH OR SHORTING STUB
K2	PIPELINE LOW PRESSURE SWITCH OR SHORTING STUB
K3	TEMPERATURE PROTECT SWITCH OR SHORTING STUB
VALVE	REVERSING VALVE
HEAT	ELECTRIC HEATING STRING
TRANS	TRANSFORMER
CN1-CN17	P.C BOARD SOCKETS

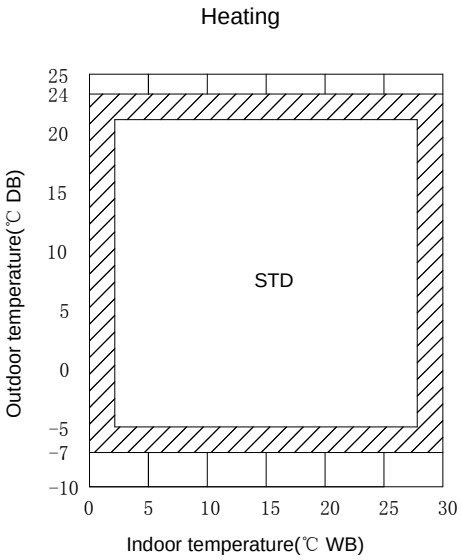
5. Electric Characteristics

Model	Outdoor Unit			
	Hz	Voltage	Min.	Max.
MUC-48HF2	50	380~415V	342V	435V
MUC-60HF2	50	380~415V	342V	435V

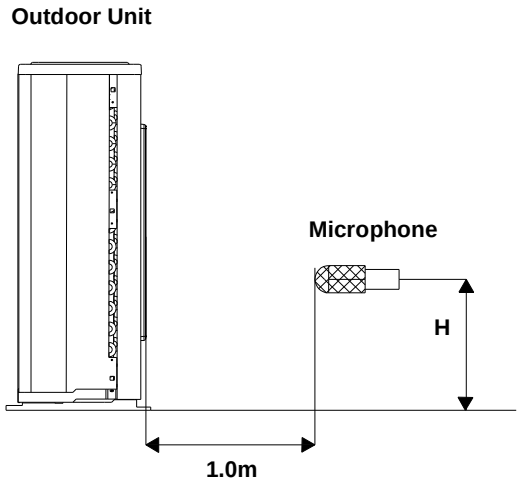
6. Operation Limits

Temperature / Mode	Cooling operation	Heating operation
Room temperature	17℃～32℃	0℃～30℃
Outdoor temperature	18℃～43℃ （-7℃～43℃：For the models with low temperature cooling system）	-7℃～24℃





7. Sound Levels



Note: H= 0.5 × height of outdoor unit

Model	Noise level dB(A)
MUC-48HF2	62
MUC-60HF2	63

Part 4
Electrical Control System

1. Electrical Control Function

1.1 Definition

T1: Indoor room temperature

T2: Coil temperature of evaporator

T3: Coil temperature of condenser

T4: Outdoor ambient temperature

T5: Compressor discharge temperature

1.2 Main Protection

1.2.1 Time delay at restart for compressor.

1.2.2 Sensor protection at open circuit and breaking disconnection.

1.2.3 Phase check function

If the phase sequence is detected wrong or lack of 1 or 2 phase, the unit won't start and there is error code displayed on outdoor PCB.

1.2.4 Over-current protection

When compressor is running, if the current is over twice of the rated for 3 seconds, the compressor will stop and an error code will be displayed on the outdoor PCB. If the current becomes normal, the indoor sends signal to the outdoor, the outdoor will display normally.

1.2.5 Fan Speed is out of control

When Indoor fan speed keeps too low (less than 300RPM) for 50s, the unit will stop and the LED will display the failure.

1.3 Operation Modes and Functions

1.3.1 Fan mode

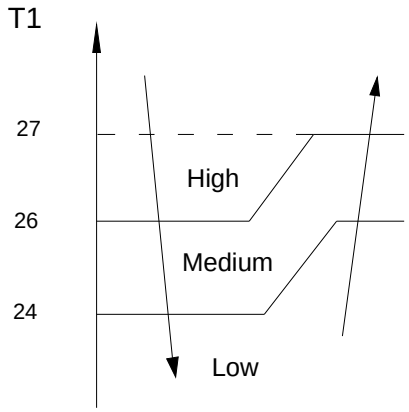
(1) Outdoor fan and compressor stop.

(2) Temperature setting function is disabled, and no setting temperature is displayed.

(3) Indoor fan can be set to high/(med)/low/auto.

(4) The louver operates same as in cooling mode.

(5) Auto fan:

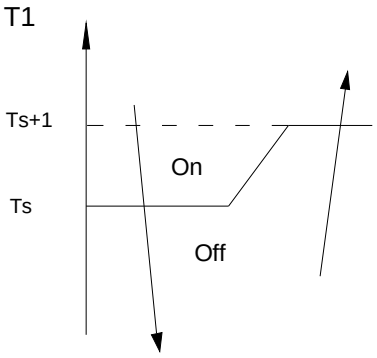


1.3.2 Cooling Mode

1.3.2.1 Compressor running rules

Once the compressor starts up, it will follow the below rules:

When indoor room temp.T1 is lower than Ts, the compressor and outdoor fan will shut off. When T1 is higher than Ts+1, the compressor and outdoor fan will start up.

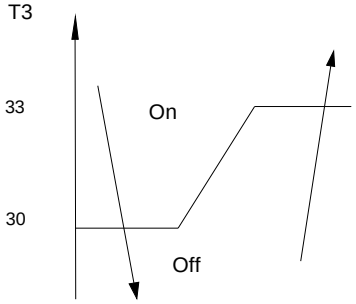


1.3.2.2 Outdoor fan running rules

For double-fan outdoor units:

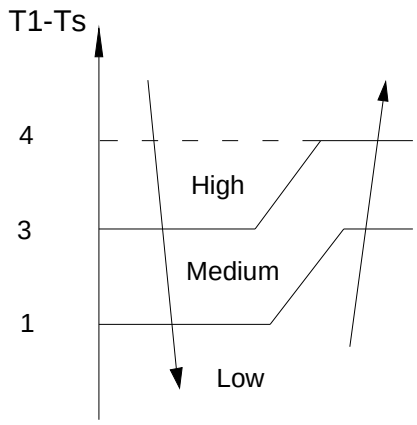
Fan(above): The outdoor fan runs all the time.

Fan(below):



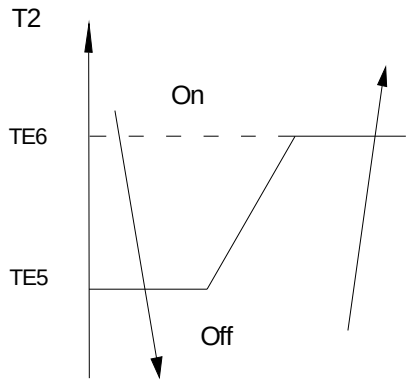
1.3.2.3 Indoor fan running rules

In cooling mode, indoor fan runs all the time and the speed can be selected as high, medium, low and auto. The auto fan:



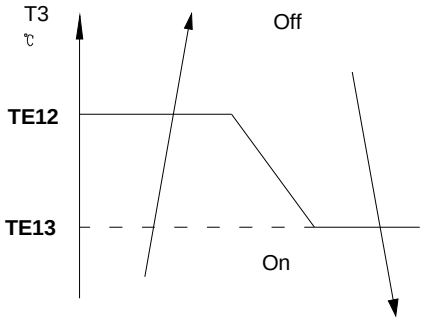
1.3.2.4 Low evaporator coil temperature T2 protection

For Duct:



When the evaporator coil temp.T2 keeps lower than TE5 for Time0, the compressor and outdoor fan will shut off. When T2 is higher than TE6, the compressor and outdoor fan will restart up.

1.3.2.5 Condenser high temperature T3 protection



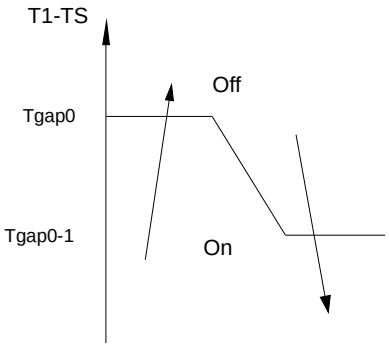
When T3>TE12 for Time1, the compressor will shut off. When T3≤TE13,the compressor will restart.

1.3.3 Heating Mode

1.3.3.1 Compressor running rules:

For Duct & super-slim cassette type: Once the compressor starts up, it keeps running 7 minutes,

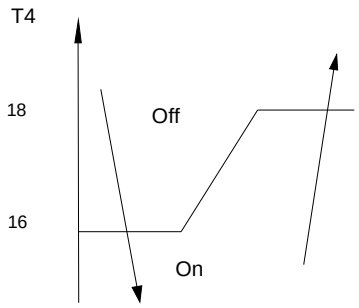
When indoor room temp.T1 is higher than Tgap0, the compressor and outdoor fan will shut off. When T1 is lower than Tgap0-1, the compressor and outdoor fan will start up.



1.3.3.2 Outdoor fan running rules:

Fan(below): The outdoor fan runs all the time.

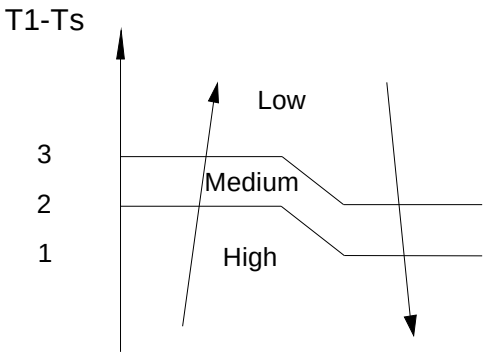
Fan(above):



1.3.3.3 Indoor fan running rules:

When the compressor is on, the indoor fan can be set to high/med/low/auto. And the anti-cold wind function has the priority.

Auto fan action:



1.3.3.4 Defrosting mode：

- **Condition of defrosting:**

AC will enter defrosting mode if any of the following items is satisfied.

A: T3< TE19 and the compressor keeps running over 45 minutes. Meanwhile T3＜TE17 for 3minutes.

B: After the last defrosting, the time that the outdoor fan is off but the compressor is on in high T2 protection cumulates up to 90 minutes.

- **Condition of ending defrosting:**

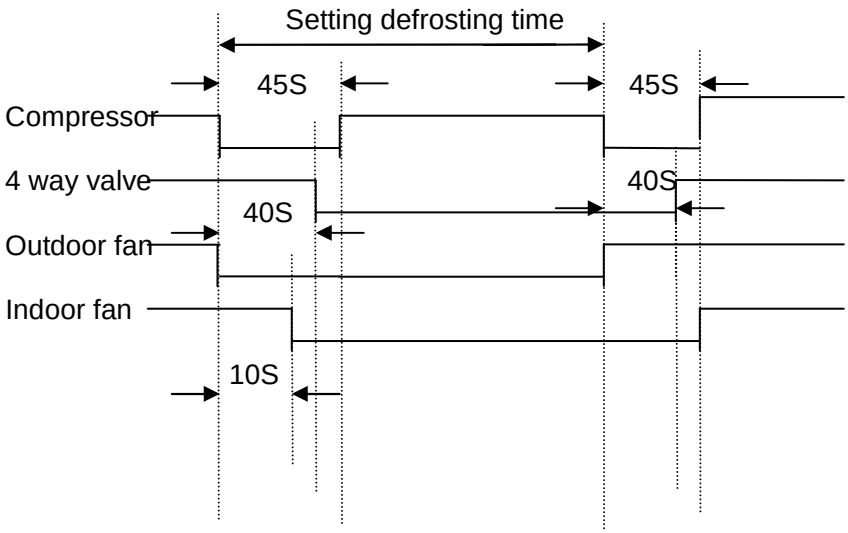
If any one of the following items is satisfied, the defrosting will terminate and the machine will turn to normal heating mode.

A: T3 rises to be higher than TE18.

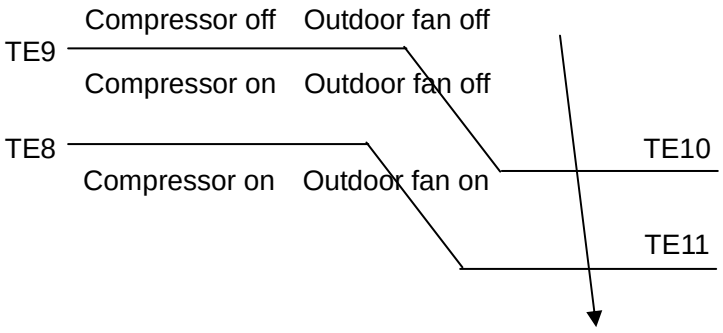
B: The machine has run for 10 minutes in defrosting.

C: Turn to other modes or off.

- **Defrosting action：**



1.3.3.5 High evaporator coil temp.T2 protection:



1.3.4 Auto-mode

This mode can be chosen with remote controller and the setting temperature can be changed between 17~30℃.

In auto mode, the machine will choose cooling, heating or fan-only mode according to ΔT (ΔT =T1-Ts).

ΔT=T1-Ts	Running mode
ΔT＞2℃	Cooling
-1≤ΔT≤2℃	Fan-only
ΔT<-1℃	Heating

Indoor fan will run at auto fan of the relevant mode.

The louver operates same as in relevant mode.

If the machine switches mode between heating and cooling, the compressor will keep stopping for 15 minutes and then choose mode according to T1-Ts.

If the setting temperature is modified, the machine will choose running function again.

1.3.5 Drying mode

1.3.5.1 The indoor fan will keep running at low speed.

1.3.5.2 All protections are active and the same as that in cooling mode.

1.3.5.3 The louver operates the same as in cooling mode.

1.3.6 Timer function

1.3.6.1 Timing range is 24 hours.

1.3.6.2 Timer on. The machine will turn on automatically when reaching the setting time.

1.3.6.3 Timer off. The machine will turn off automatically when reaching the setting time.

1.3.6.4 Timer on/off. The machine will turn on automatically when reaching the setting “on” time, and then turn off automatically when reaching the setting “off” time.

1.3.6.5 Timer off/on. The machine will turn off automatically when reaching the setting “off” time, and then turn on automatically when reaching the setting “on” time.

1.3.6.6 The timer function will not change the AC current operation mode. Suppose AC is off now, it will not start up firstly after setting the “timer off” function. And when reaching the setting time, the timer LED will be off and the AC running mode has not been changed.

1.3.6.7 The setting time is relative time.

1.3.7 Economy function

1.3.7.1 It is valid in cooling, heating and auto mode.

1.3.7.2. Turning off, changing mode or setting fan speed will cancel economy function.

1.3.7.3 Operation process in sleep mode is as follow:

After pressing ECONOMIC or SLEEP button on the controller, the machine will go into economy mode.

When cooling, the setting temperature rises 1℃(be lower than 30℃) every hour, 2 hours later the setting temperature stops rising.

For heat pump models, when they are in heating, the setting temperature reduces 1℃(be higher than 17℃) every hour, 2 hours later the setting temperature stops reducing.

1.3.7.4 In this mode, the fan speed is forced into AUTO mode.

1.3.8 Auto-Restart function

The indoor unit is equipped with auto-restart function, which is carried out through an auto-restart module. In case of a sudden power failure, the module memorizes the setting conditions before the power failure. The unit will resume the previous operation setting (not including Swing function) automatically after 3 minutes when power returns.

1.3.9 Drain pump control

1.3.9.1 Water level check

The water lever will be checked every 5 seconds, if the feedback signal is abnormal, it will be considered as drain water full by the control system.

1.3.9.2 Drain pump control

If there is no water full error, the drain pump will be on when the unit is in cooling mode (including auto-cooling and forced cooling) and dry mode. It will be off when the unit is in heating mode, fan only mode or off state (if the pump is on before the unit is off, it will delay 3 minutes to be off).

If there is a water full error, the drain pump will be on when the error occurs. Afterwards:

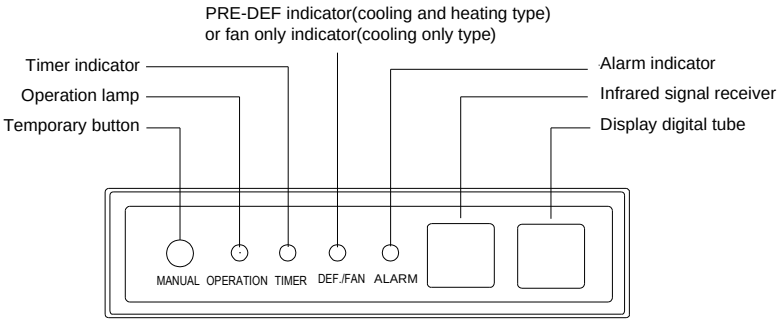
If the error disappears in 3 minutes, the drain pump will work as normal state. (if it is necessary to turn off the pump, it will be off in 1 minute delay.)

If the error is still there in 3 minutes, the drain pump will be off as well as the AC unit. The error can be cleared only when the power of the unit is cut off.

2. Troubleshooting

2.1 Display board

2.1.1 Icon explanation on indoor display board



2.2. Self-diagnosis

Indoor unit's LED indication

NO.	Malfunction	Running lamp	Timer lamp	Defrosting lamp	Alarm lamp	Display (digital tube)
1	Communication malfunction between indoor and outdoor units	☆	X	☆	X	E1
2	Open or short circuit of T1 temperature sensor	X	☆	X	X	E2
3	Open or short circuit of T2 temperature sensor	☆	X	X	X	E3
4	Outdoor unit malfunction	☆	☆	☆	☆	E6
5	Indoor EEPROM malfunction	☆	☆	X	X	E7
6	Full-water malfunction	X	X	X	☆	E8
7	Indoor fan speed is out of control	X	☆	X	☆	Eb
7	Protection of low pressure	☆	☆	☆	X	Ed
O (on) X(off) ☆(flash at 5Hz)						

LEDs' for the indication of outdoor trouble

Type	Contents	LED2(Green)	LED3(Yellow)	LED4(Red)
Normal	Normal running	O	X	X
Normal	Normal standby	X	O	X
Trouble	Phase sequence error	X	☆	X
Trouble	Lack of phase	X	X	☆
Trouble	Open-circuit and short-circuit trouble of T3	X	X	O
Trouble	Open-circuit and short-circuit trouble of T4	☆	X	X
Trouble	Temperature protection of compressor discharge	O	X	O
Trouble	Protection of high pressure	☆	☆	X
Trouble	Protection of low pressure	☆	X	☆
Trouble	Overload of current	X	☆	O
Trouble	High temperature protection of condenser	☆	☆	O
Trouble	Fan selection error	☆	☆	☆
O(light) X(off) ☆(flash at 1Hz)				

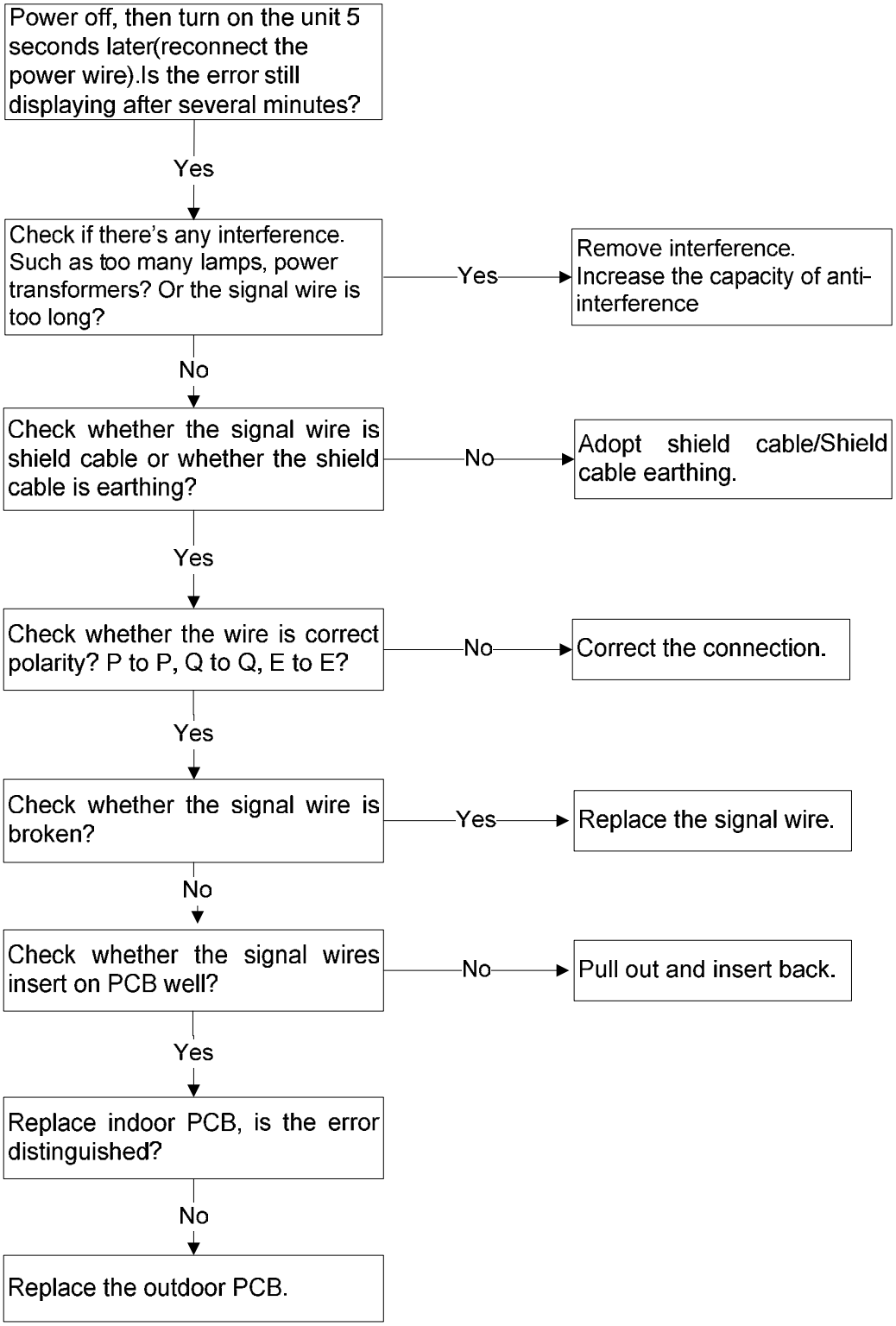
Note:

1. T3: Outdoor condenser temperature sensor
2. T4: Outdoor ambient temperature sensor

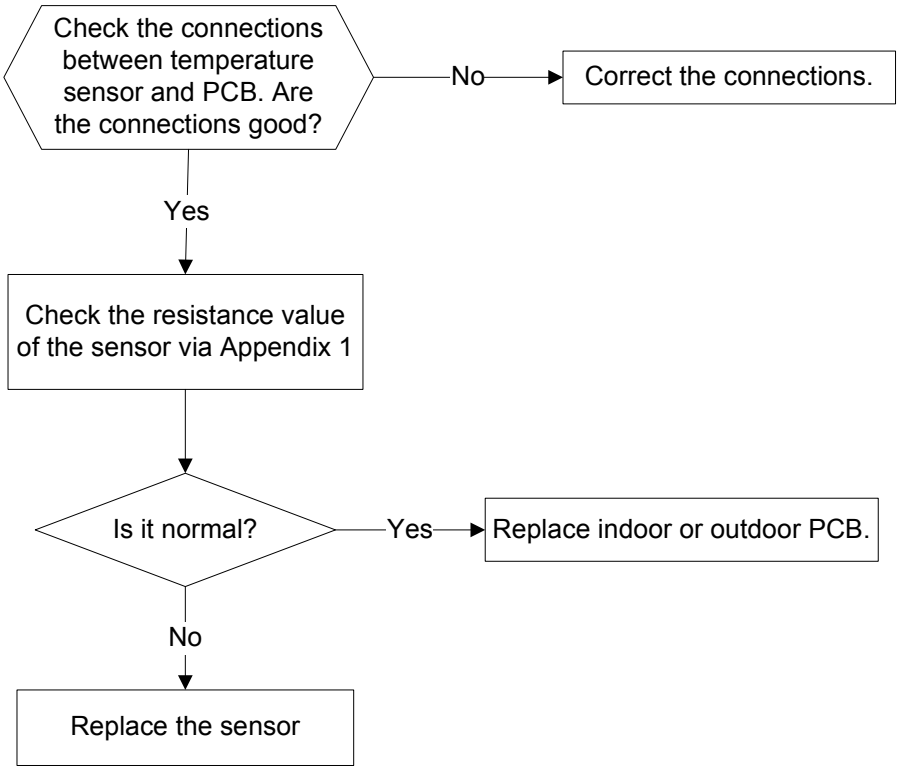
2.3. Solving steps for typical malfunction

(1) For indoor unit

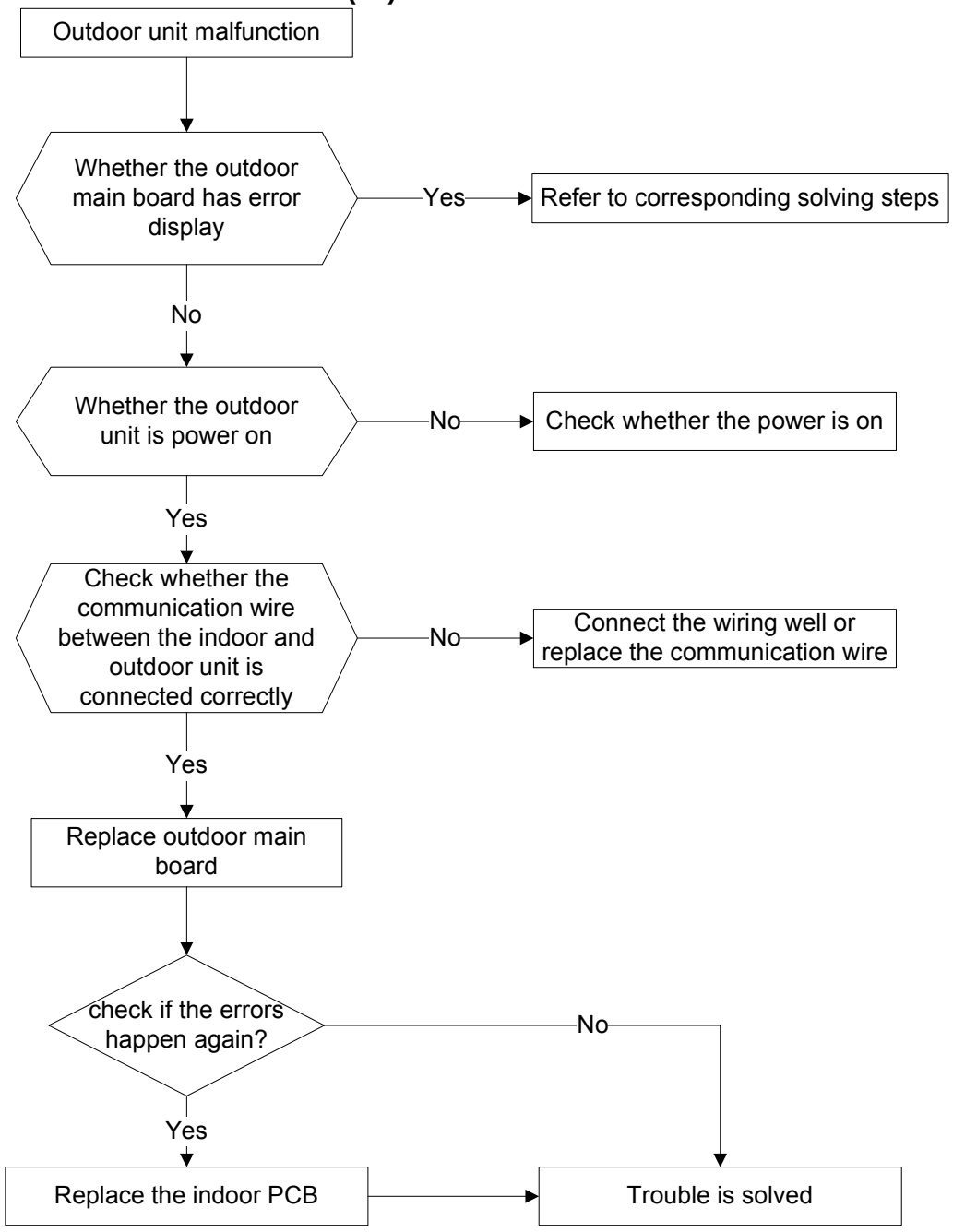
a. Communication malfunction between indoor and outdoor units (E1)



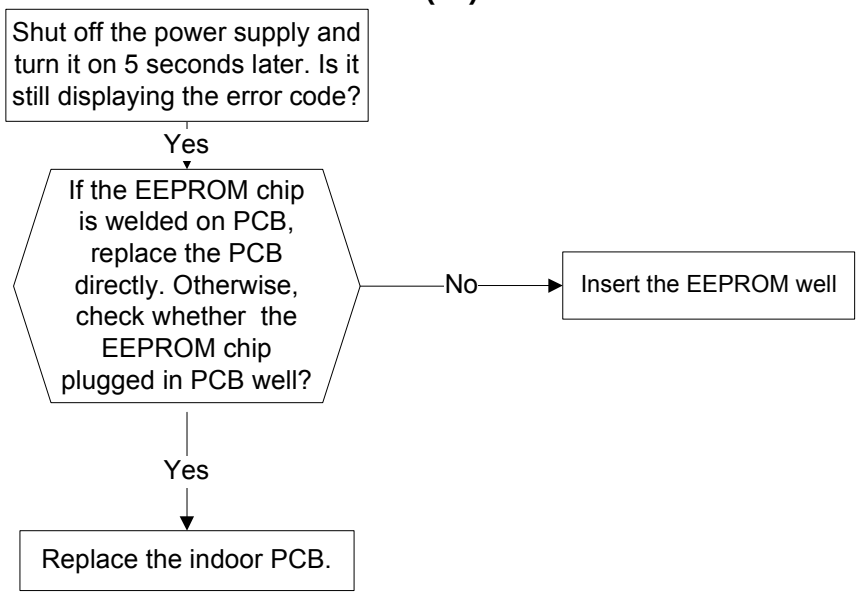
b. Open or short circuit of temperature sensor（E2，E3, E4）



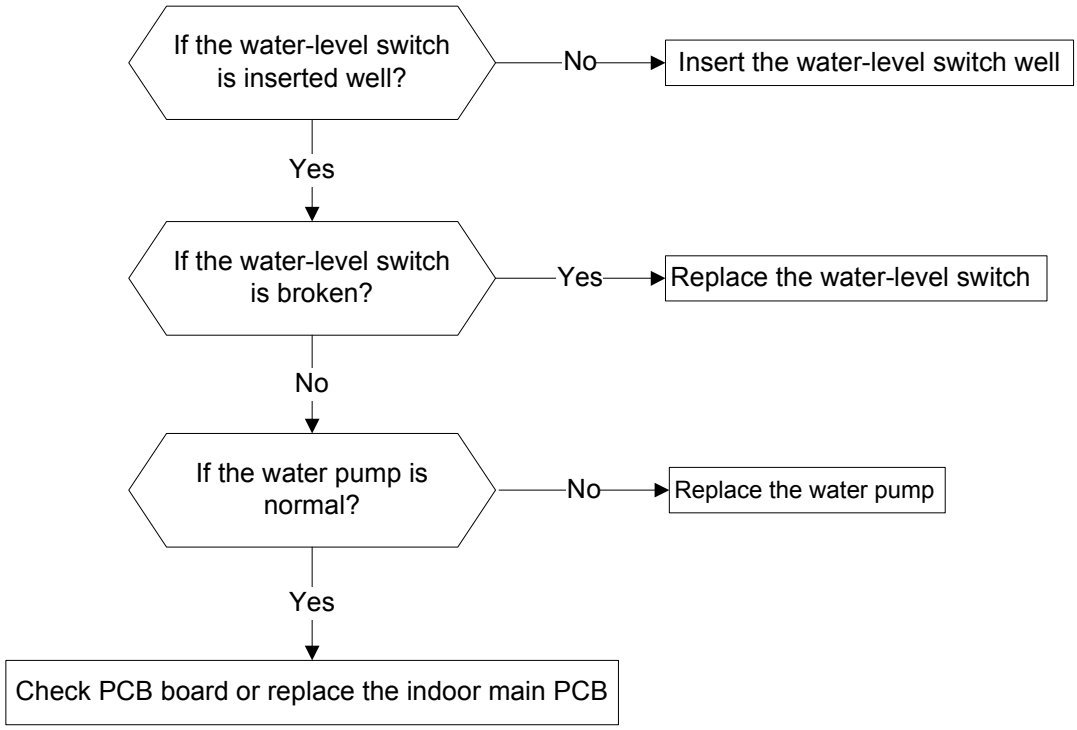
c. Outdoor unit malfunction (E6)



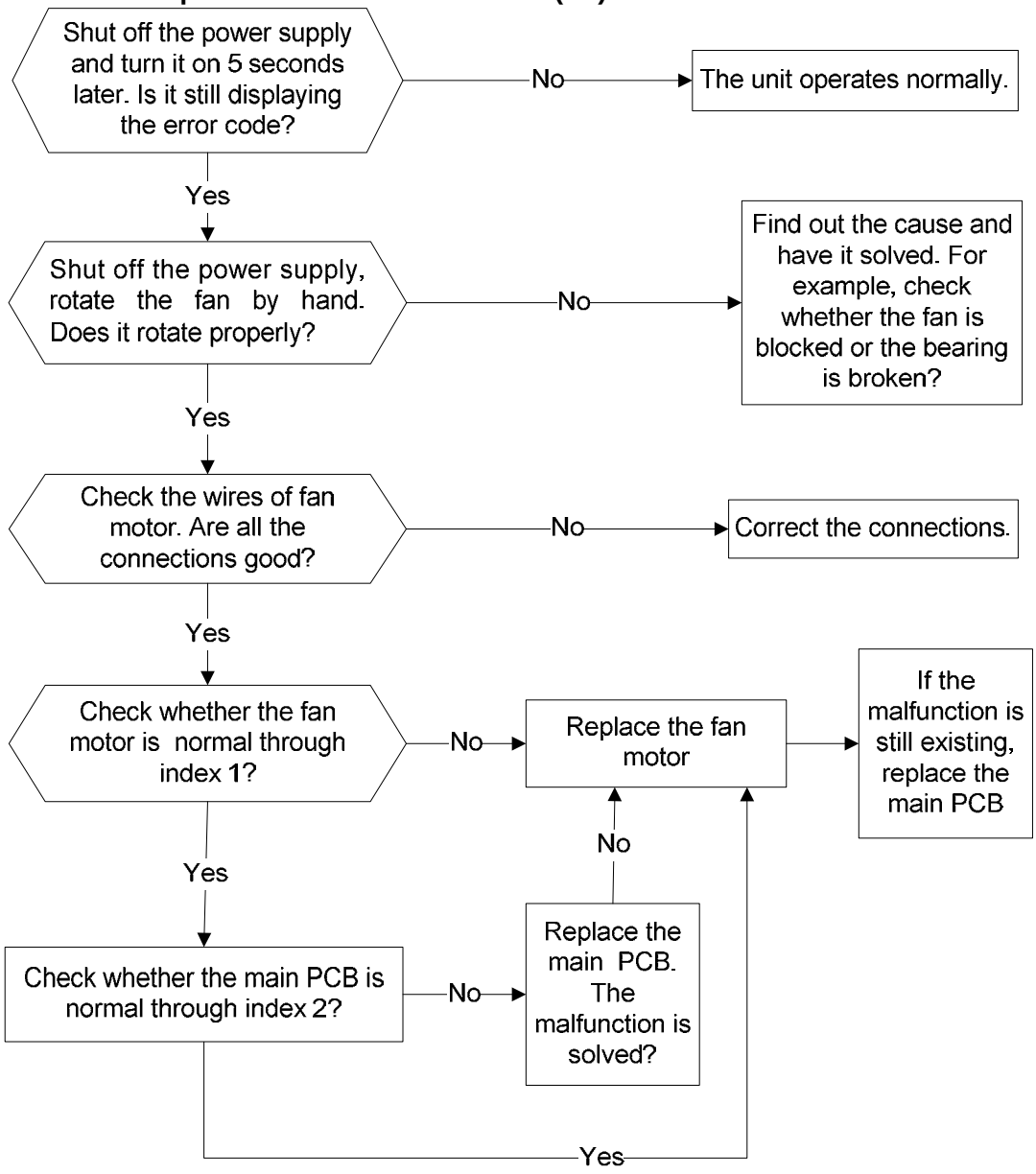
d. Indoor EEPROM malfunction (E7)



e. Full-water malfunction (E8)



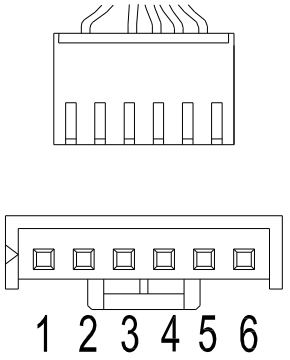
f. Indoor fan speed has been out of control (Eb)



Index 1:

1.Indoor DC fan motor(control chip is inside fan motor)

Measure the resistance value of each winding by using the tester. If any resistance value is zero, the fan motor must have problems and need to be replaced.

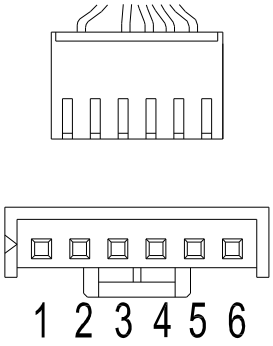


NO.	Color
1	Red
2	---
3	Black
4	White
5	Yellow
6	Blue

Index2:

1. DC fan motor(control chip is inside fan motor)

Power on and when the unit is in standby, measure the voltage of pin1-pin3, pin4-pin3 in fan motor connector. If the value of the voltage is not in the range showing in below table, the PCB must have problems and need to be replaced.



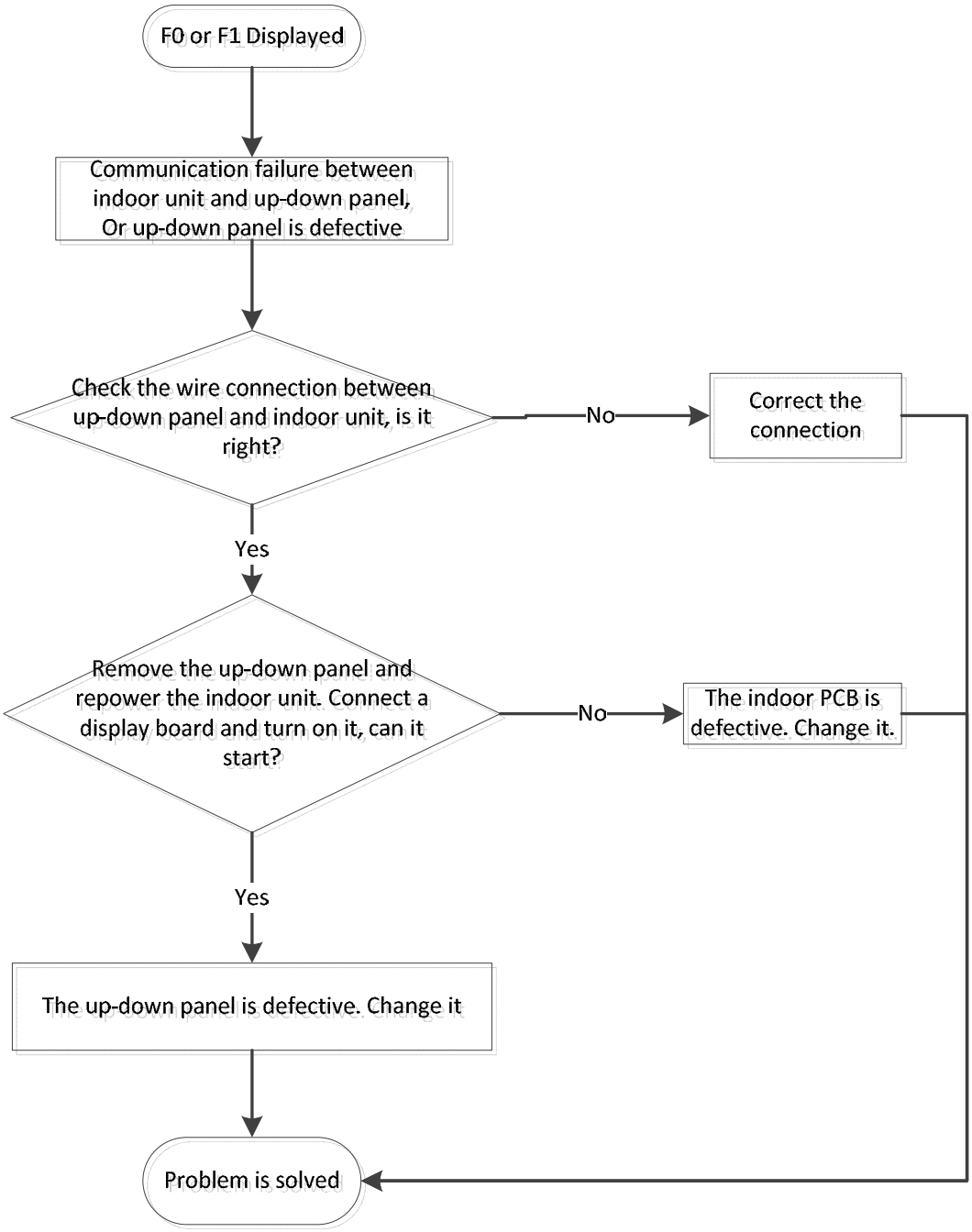
DC motor voltage input and output

NO.	Color	Signal	Voltage
1	Red	Vs/Vm	140~380V
2	---	---	---
3	Black	GND	0V
4	White	Vcc	13.5~16.5V
5	Yellow	Vsp	0~6.5V
6	Blue	FG	15V

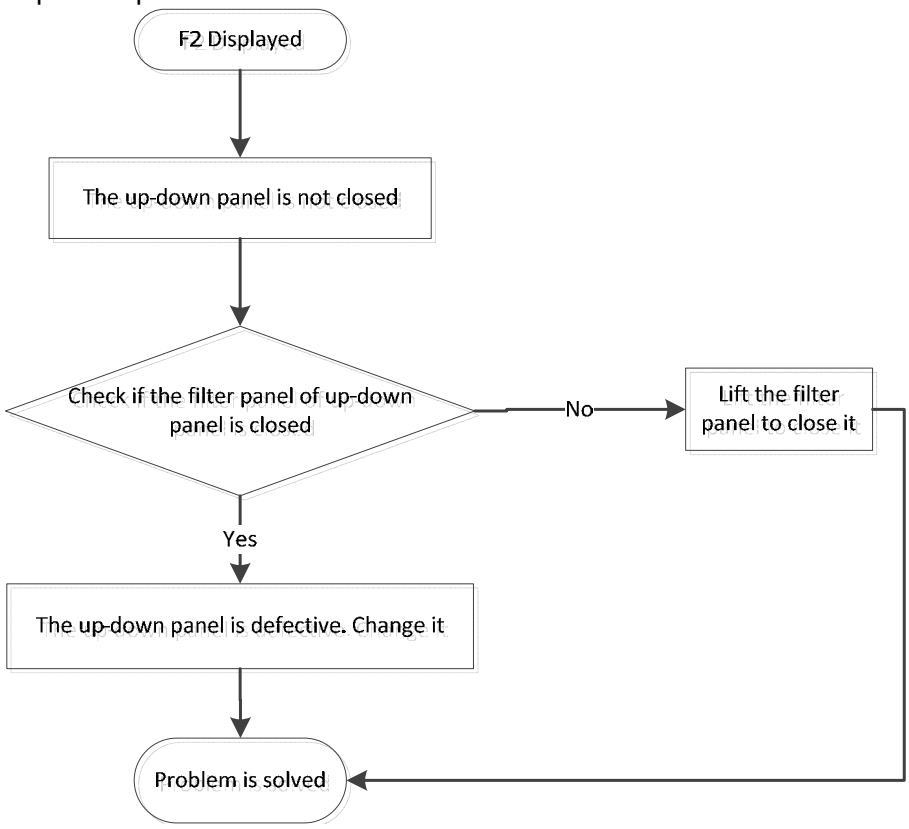
For the super-slim cassette with up-down panel

a. Communication error between indoor unit and up-down panel

b. Up-down panel is defective

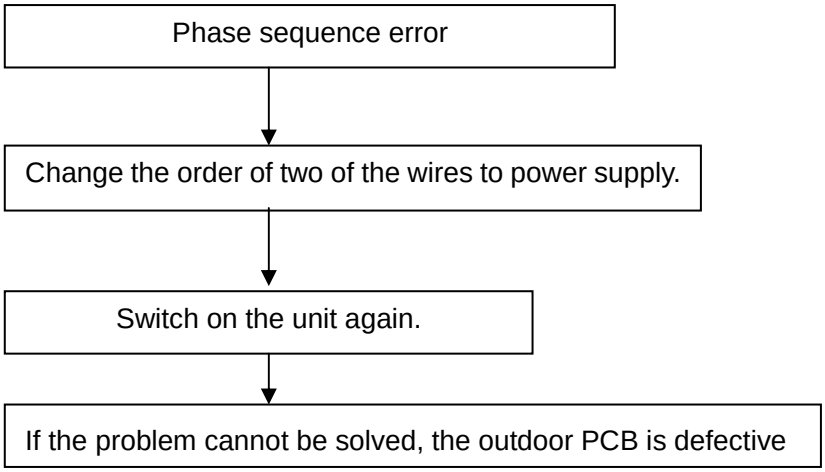


c Up-down panel is not closed

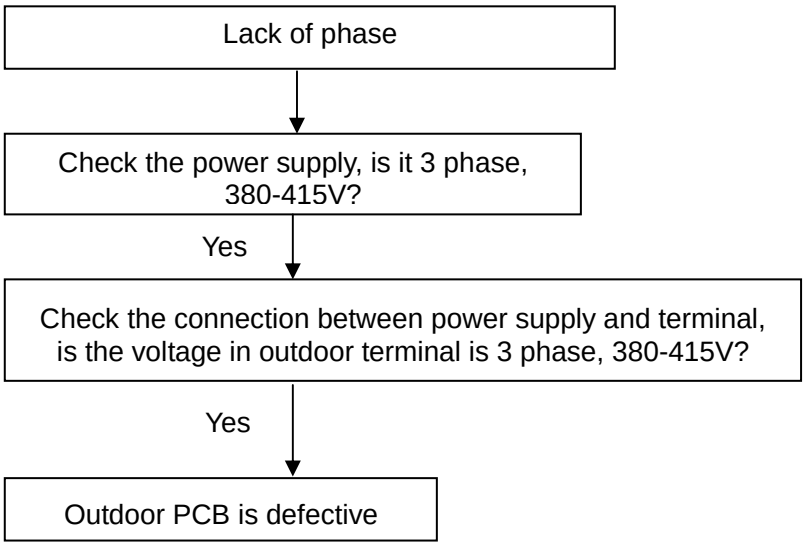


(2) For the outdoor unit

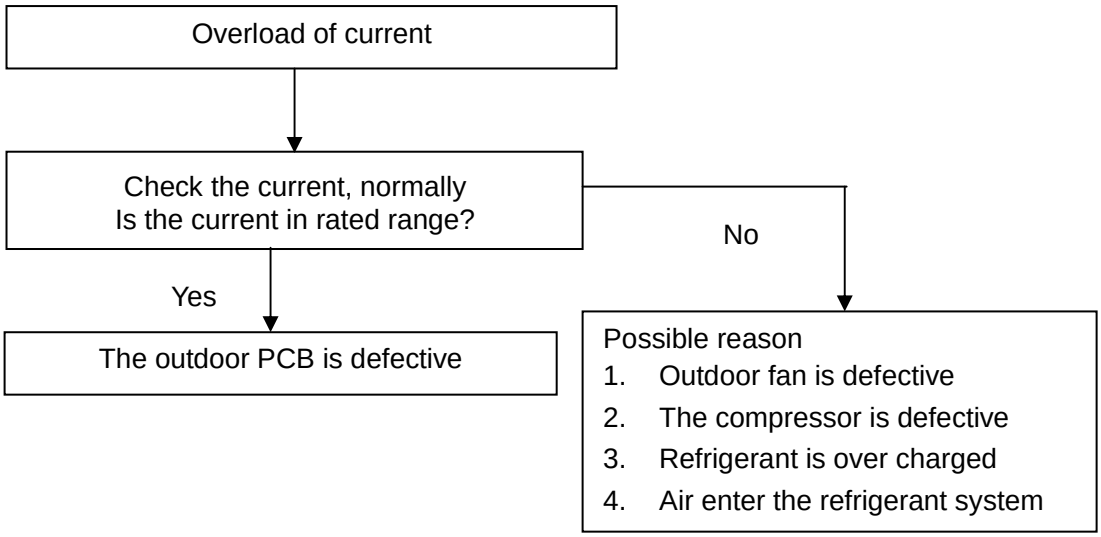
a. Phase sequence error:



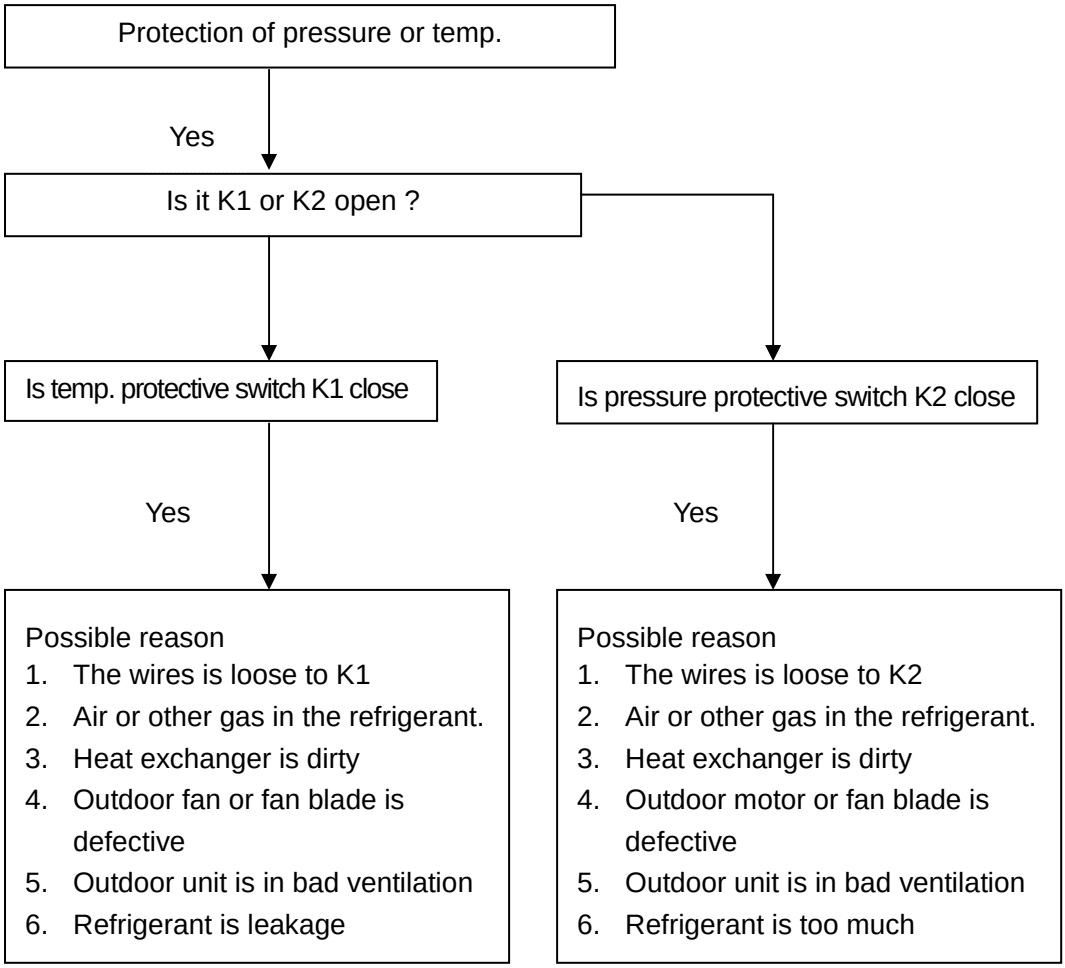
b. Lack of phase



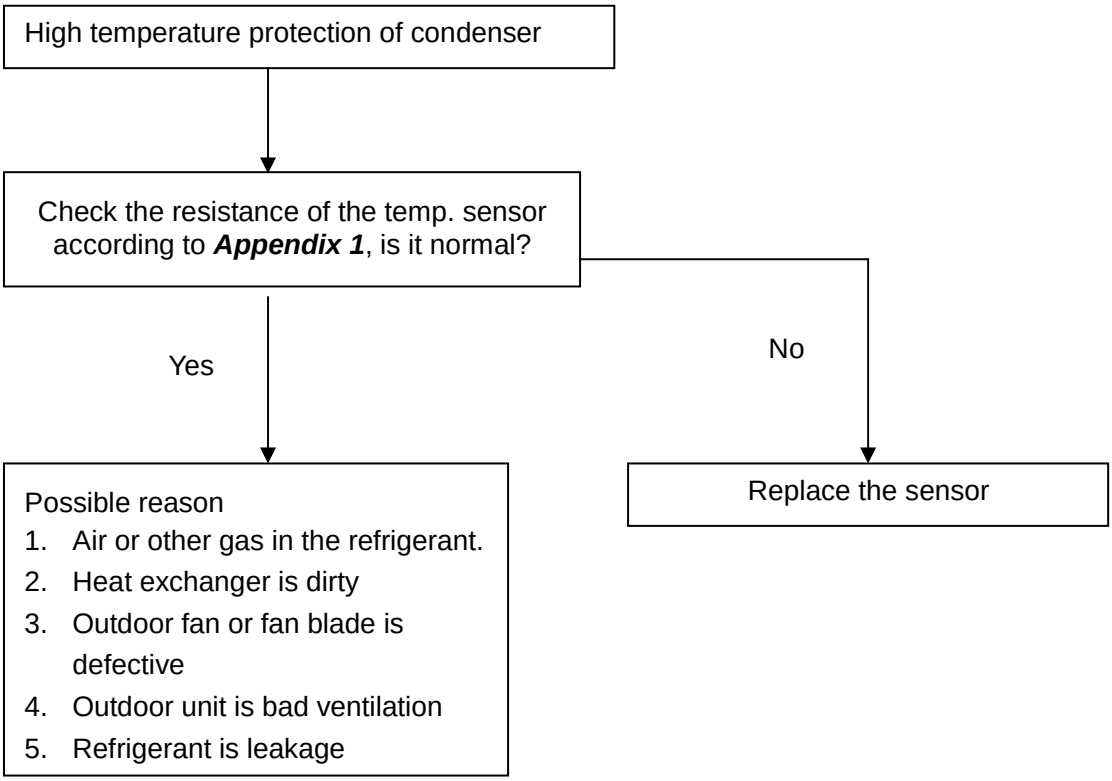
c. Overload of current



d. Protection of pressure or temp.



e. High temperature protection of condenser



Appendix 1 Temperature Sensor Resistance Value Table (℃--K)

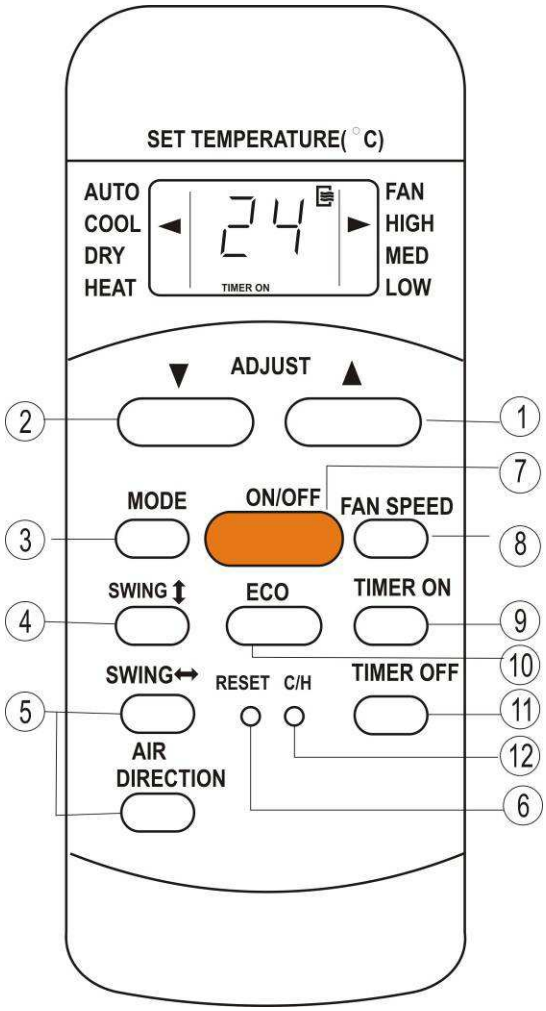
℃	K Ohm	℃	K Ohm	℃	K Ohm	℃	K Ohm
-20	115.266	20	12.6431	60	2.35774	100	0.62973
-19	108.146	21	12.0561	61	2.27249	101	0.61148
-18	101.517	22	11.5000	62	2.19073	102	0.59386
-17	96.3423	23	10.9731	63	2.11241	103	0.57683
-16	89.5865	24	10.4736	64	2.03732	104	0.56038
-15	84.2190	25	10.000	65	1.96532	105	0.54448
-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

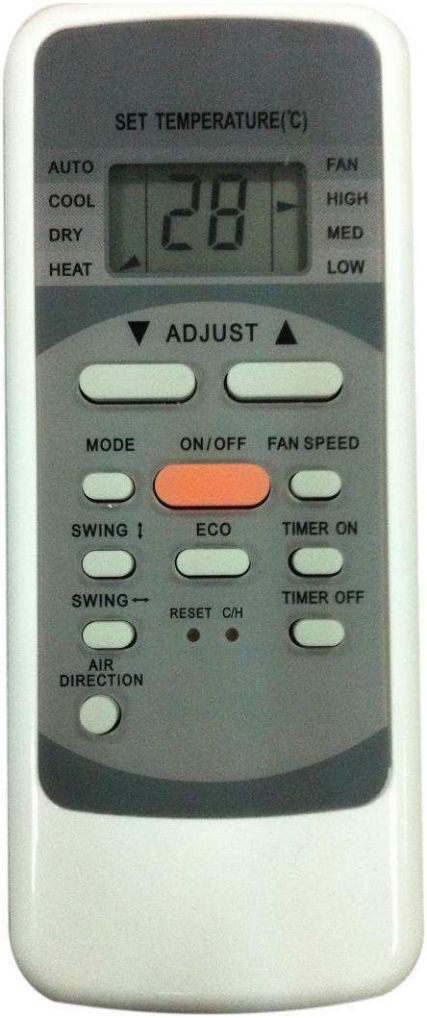
3. Controller

3.1 Wireless Remote Controller

3.1.1 RG51Q1/BGE

The R51Q1/BGE wireless remote controller is standard for Four-way cassette type and the Ceiling& floor type.





General Function for wireless remote controller:

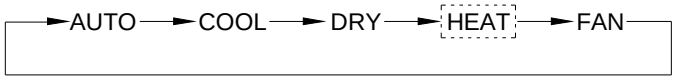
Model	RG51Q1/BGE
Rated voltage	3.0V(2pieces of LR03 7 # batteries)
Min voltage for sending signal of CPU	2.4V
Effective receiving distance	8m~11m
Operation condition	-5~60℃

Buttons and functions

1. Adjust ▼ : Decrease the set temp. Keeping pressing will decrease the temp with 1℃ per 0.5s.

2. Adjust ▲ : Increase the set temp. Keeping pressing will increase the temp with 1℃ per 0.5s.

3. MODE: Once pressing, running mode will be selected in the following sequence:



NOTE: No heating mode for cool only type unit.

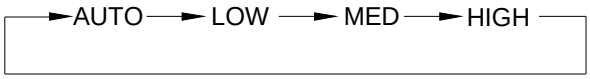
4. VERT SWING: Used to stop or start horizontal louver movement or set the desired up/down air flow direction. The louver changes 6 degree in angle for each press. If keep pushing more than 2 seconds, the louver will swing up and down automatically.

5. HORIZ SWING: Used to stop or start vertical louver movement.

6. AIR DIRECTION: Used to set the desired up/down air flow direction. The louver changes 6 degree in angle for each press.

7. ON/OFF: For turning on or turning off the air conditioner.

8. FAN SPEED: Fan speed will be selected in following sequence once pressing this button:



9. TIME ON: For time ON setting. Once pressing this button, the time will increase by 0.5 hour. When the set time exceeds 10 hours, pressing the button will increase the time by 1 hour. Adjusting the figure to 0.00 will cancel time ON setting.

10. ECO: Activate or turn off economic operation mode. It is suggested to turn on this function when sleeping. (Only available when remote controller is used with corresponding unit.)

11. TIME OFF: For time OFF setting. Once pressing this button, the time will increase by 0.5 hour. When the set time exceeds 10 hours, pressing the button will increase the time by 1 hour.

Adjust the figure to 0.00 will cancel time ON setting.

12. C/H (inner located): Press this button with a needle of 1mm to shift the mode between Cooling only and Cooling & Heating according to the feature of the machine.

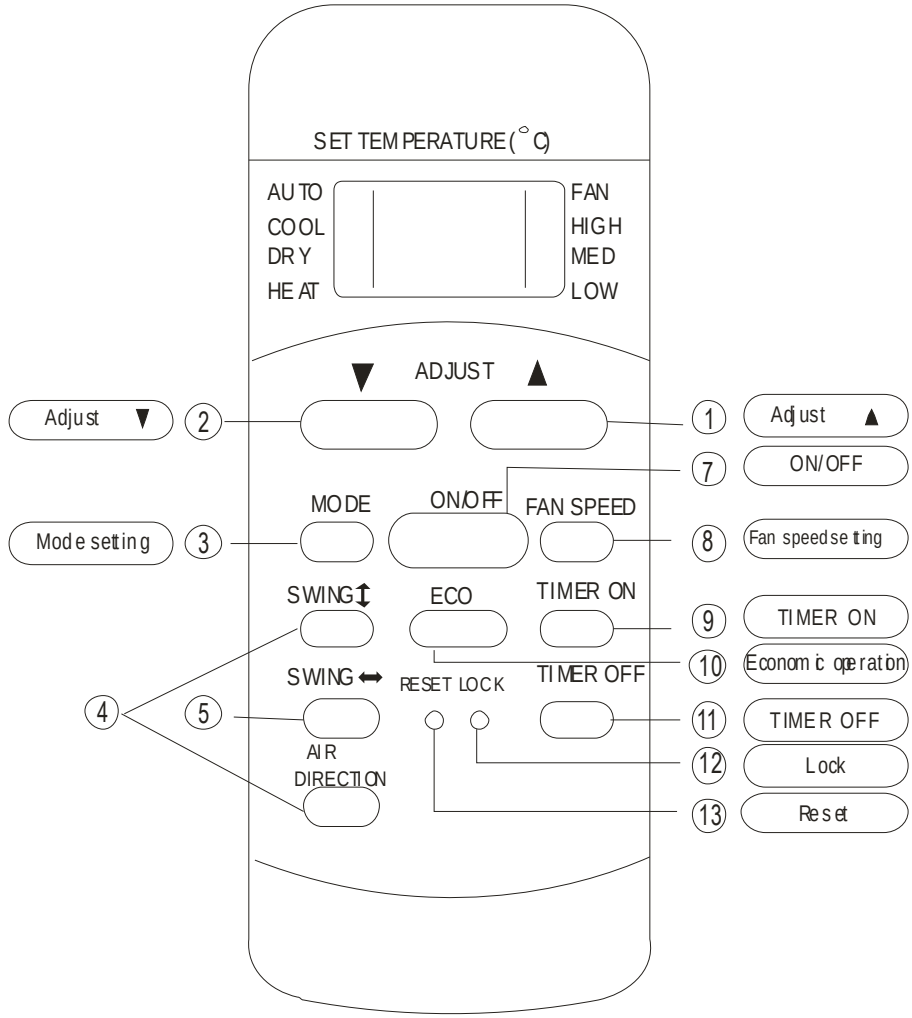
13.RESET (inner located): Press this button with a needle of 1mm to cancel the current setting and reset remote controller.

3.1.2 RG51C/E

Remote Controller Specifications

Model	RG51C/E
Rated Voltage	3.0V
Lowest Voltage of CPU Emitting Signal	2.0V
Reaching Distance	8m (when using 3.0 voltage, it can get 11m)
Environment Temperature Range	-5℃～60℃

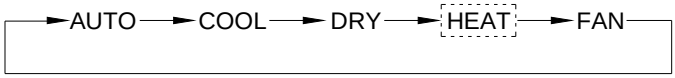
Introduction of Function Buttons on the Remote Controller



1. Adjust ▼ : Decrease the set temp. Keeping pressing will decrease the temp with 1℃ per 0.5s.

2. Adjust ▲ : Increase the set temp. Keeping pressing will increase the temp with 1℃ per 0.5s.

3. MODE: Once pressing, running mode will be selected in the following sequence:



NOTE: No heating mode for cool only type unit.

4. VERT SWING: Used to stop or start horizontal louver movement. The louver will swing up and down automatically if push this button.

AIR DIRECTION: Used to set the desired up/down air flow direction. The louver changes 6 degree in angle for each press.

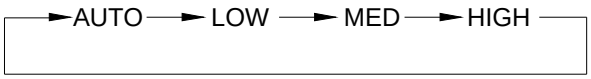
5. HORIZ SWING: Used to stop or start vertical louver movement.

6. FAN SPEED+ MODE: Press the Mode and Fan speed button simultaneously for 2 seconds. The remote

controls into faceplate setting state and the LCD shows F2.Press the TEMPUP(▲) to control the faceplate up and press the TEMP DOWN(▼) to control the faceplate down. Press any button to exit the faceplate setting state, then the LCD back to the normal display.

7. ON/OFF: For turning on or turning off the air conditioner.

8. FAN SPEED: Fan speed will be selected in following sequence once pressing this button:



9. TIME ON: For time ON setting. Once pressing this button, the time will increase by 0.5 hour. When the set time exceeds 10 hours, pressing the button will increase the time by 1 hour. Adjusting the figure to 0.00 will cancel time ON setting.

10. ECO: Select this function during the sleeping time. It can maintain the most comfortable temperature and save energy. This function is available on COOL, HEAT or AUTO mode only .

NOTE: While the unit is running under Energy-saving mode, it would be cancelled if press MODE, FAN SPEED or ON/OFF button.

11. TIME OFF: For time OFF setting. Once pressing this button, the time will increase by 0.5 hour. When the set time exceeds 10 hours, pressing the button will increase the time by 1 hour.

Adjust the figure to 0.00 will cancel time ON setting.

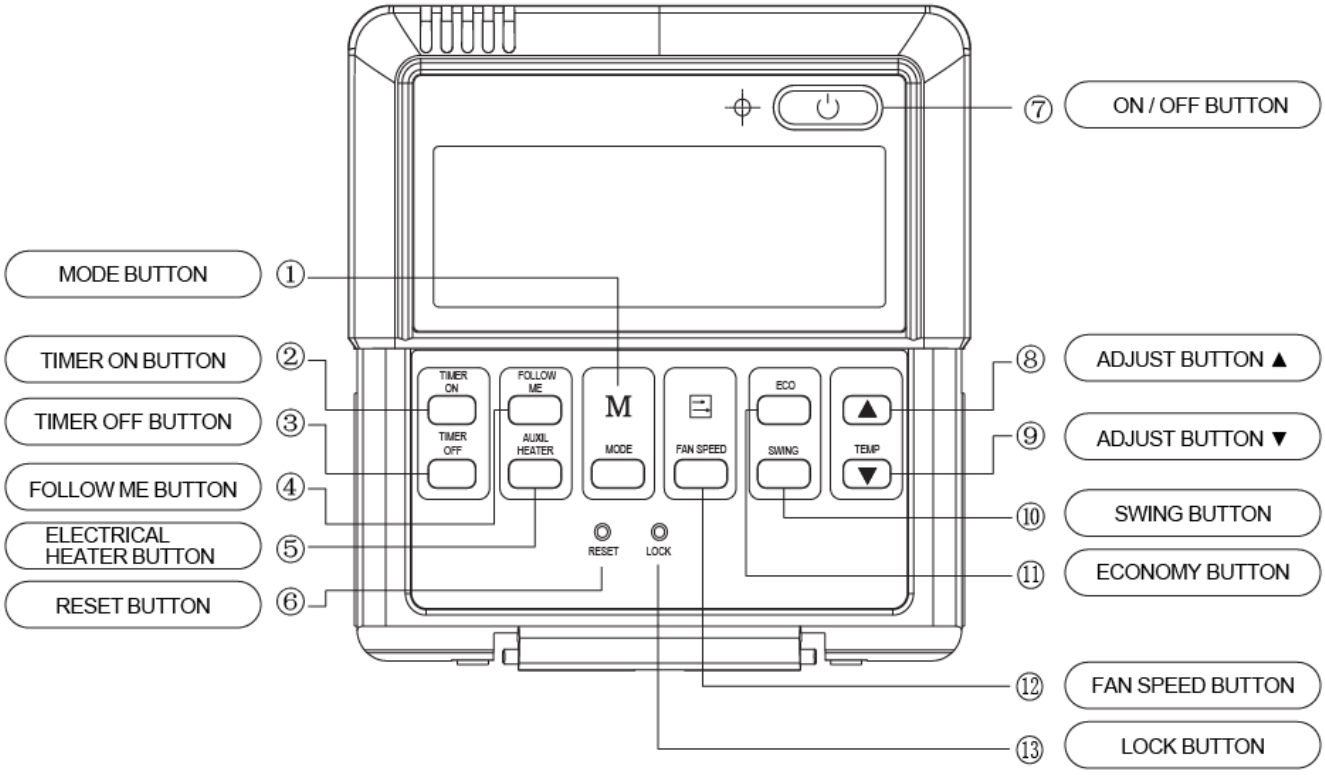
12. LOCK (inner located): Push this button to lock in all the current settings, and the remote controller will not accept any operation except that of the LOCK. Use the LOCK mode when you want to prevent settings from being changed accidentally. Press the LOCK button again to cancel the LOCK function. A lock symbol will appear on the remote controller display when the lock function is activated.

13.RESET (inner located): Once the recessed RESET button is pressed, all of the current settings will be cancelled and the controller will return to the initial settings..

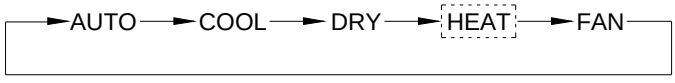
3.2 Wired Remote Controller

3.2.1 KJR-12B

Name and functions of buttons on the wire controller



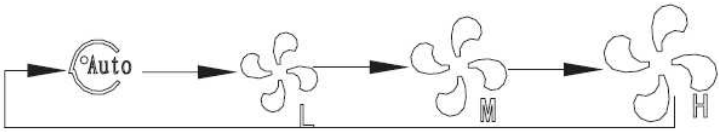
1. Mode button: When press this button, the operation mode change as the following sequence:



Remark: For the cooling only model, the heating mode is skipped.

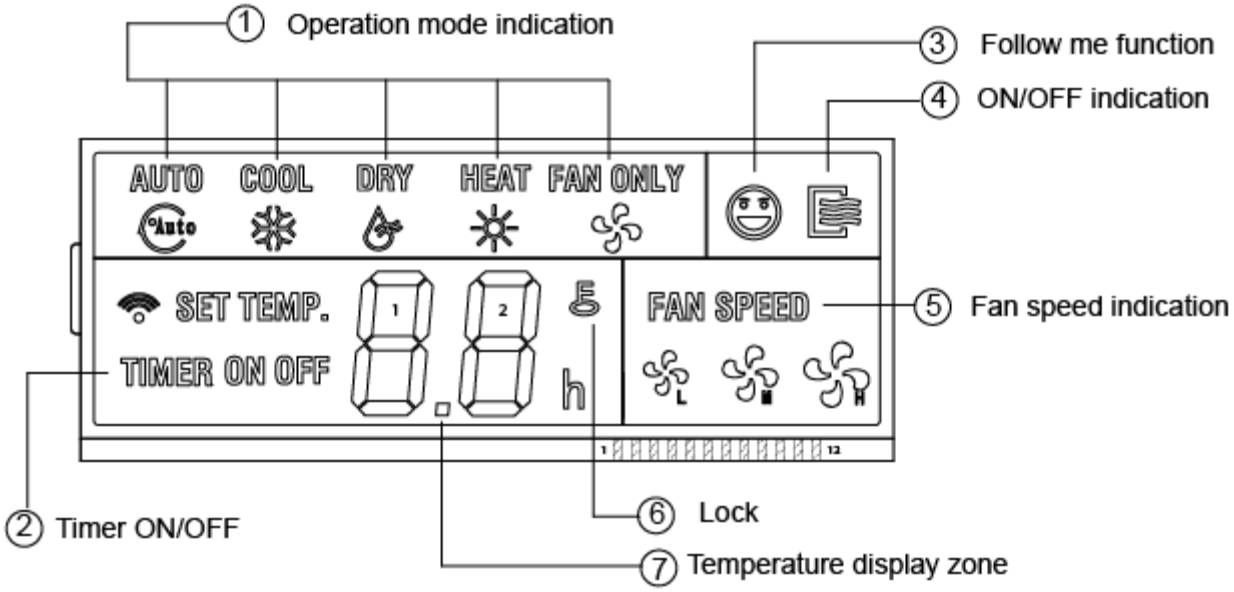
2. Timer on button: Press this button, timer on function is active. Then every press, the time increase 0.5h, after 10h, 1h increasement after each press. If cancel this Function, just set it to "0.0"
3. Timer off button: Press this button, timer off function is active. Then every press, the time increase 0.5h, after 10h, 1h increasement after each press. If cancel this function, just set it to "0.0" .
4. Follow me button: When under cool, heat and auto mode, press this button, follow me function is active. Press again, this function is ineffective.
5. Electrical heater button: If press this button in heat mode, electrical heater function become ineffective.
6. Reset button (hidden): Use a 1mm stick to press in the little hole , then the current setting is canceled . The wire controllers enter into original state.
7. ON/OFF button: When in off state, press this button, the indicator is on, the wire controller enter into on state, and send setting information to indoor PCB. When in on state, press this button, the indicator is off, and send instruction. If timer on or timer off has been set, it cancel this setting then send instruction to stop the machine.

8. Adjust button: Set indoor temperature up. If press and hold on, it will increase at 1degree per 0.5 second.
9. Adjust button: Set indoor temperature down. if press and hold on, it will decrease at 1degree per 0.5 Second.
10. Swing button: First press, start swing function; second press, stop swing. (Match to some model with swing function).
11. Economy operation button: press this button, the indoor unit operates in economy mode, press again, exit this mode (it may be ineffective for some models)
12. Fan speed button: press this button consecutively; the fan speed will circle as follow:



13. Lock button (hidden): When you push the LOCK button, all current settings are locked in and the wire controller does not accept any operation except that of the LOCK button. Use the lock mode when you want to prevent setting from being changed accidentally or play fully. Push the LOCK button again when you want to cancel the LOCK mode.

Name and function of LCD on the wire controller

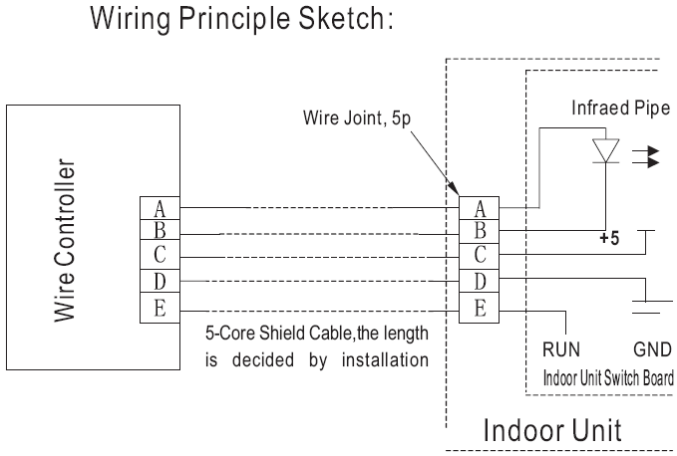


1. Operation mode indication: When press" MODE" button, the following mode can be selected in circle. Auto Cool Dry Heat Fan only Auto.
   Auto→ Cool→ Dry →Heat→ Fan only →Auto
   For cooling only model, heat mode is skipped.
2. Timer: When adjust setting on time or only on time is set, the "ON" is lighted. When adjust setting off time or only off time is set, the" OFF" is lighted. If on and off timer are both set, the "ON" and "OFF" are both lighted.
3. Follow me function: There is a temperature sensor inside the wire controller, after setting temperature, it will compare the two temperatures, and the space of wire controller will be the same as setting temperature. It is available under cooling, heating, auto mode.
4 ON/OFF indication: When it is on, the icon display, otherwise it is extinguished.
5. Fan speed indication: There are four fan modes: low, middle, high, auto. For some models, no middle fan then the middle fan is seen as high speed.
6. Lock: When the "LOCK" button is pressed, the icon appears and other buttons is unable, press again, the icon disappears.
7. Temperature display zone: Generally it displays setting temperature; it can be adjusted by press temperature button▲and▼ .But in fan mode, no display here.

Remark:

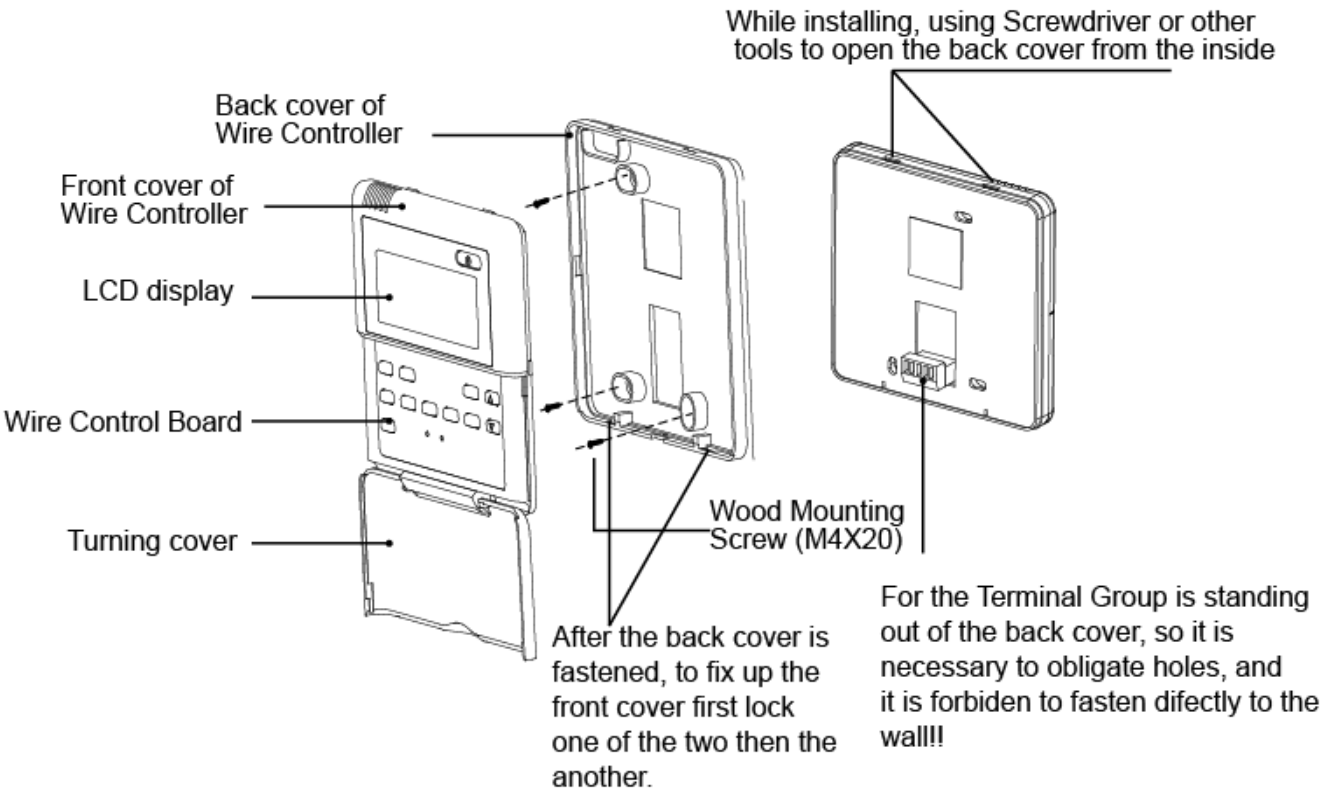
The wired controller will reset to factory setting with auto mode, auto fan and 24℃ setting temperature when the air conditioner restarts after power failure.
And this may cause inconsistent displays on the wired controller and on the air conditioner. You need to readjust the running status through the wired controller.

Installation



Installation Notice:

When the air conditioner needs the constant frequency wire controller, be sure adding a wire joint with 5 terminal named A, B, C, D, E in indoor unit, and fixing an infrared emitter whose anode and cathode connecting with A and B near the receiver in the indoor unit switch board, then connecting the terminal +5v, GND, Run in the switch board to C,D,E respectively.



NOTE
●The connecting wire should be a little longer as to take away the switch board easily for maintenance.
●The connecting wire should be a little longer as to take away the controller easily for maintenance.

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