Midea R410A
Direct Heating Commercial Heat Pump
50Hz
Technical Manual

Applicable Model:

RSJ-420/SZN1-H

RSJ-800/SZN1-H

Midea reserves the right to discontinue, or change specification or designs at any time without notices and without incurring obligations.

Content

Part. 1 General information

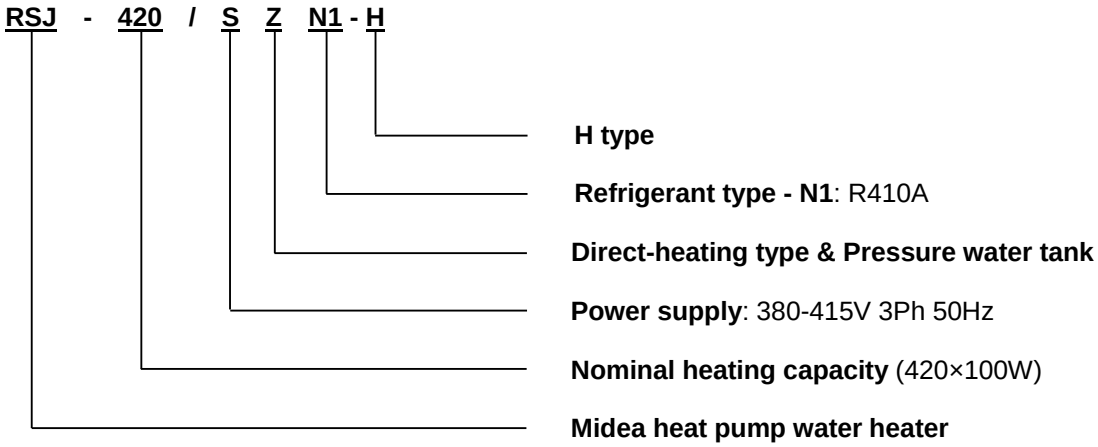
1. Model Names of Units

	Model	Power supply
Direct-heating Type	RSJ-420/SZN1-H	380-415V~, 3Ph, 50Hz
	RSJ-800/SZN1-H	380-415V~, 3Ph, 50Hz

2. External Appearance

RSJ-420/PZN1-H	RSJ-800/PZN1-H
	

3. Nomenclature



Part. 2 Performance

1. Features

- ✧ High capacity of hot water producing,
- ✧ High efficient, COP is up to 4.04 (39kW) and 4.00 (80kW).
- ✧ Unit applies refrigerant heating technology to increase the total energy absorb.
- ✧ Refrigerant E-heater design can ensure that hot water can be produced stably during defrosting period.
- ✧ Multi protection: High and low pressure protection, over-load current protection, anti-freezing function, etc.
- ✧ Multi-temperature sensors always monitor the unit operating status.
- ✧ Max. 4 units can be connected in parallel (39kW); Max. 2 units can be connected in parallel (80kW).
- ✧ User-friendly wired controller as standard, real-time clock function, power-off memory function.

2. Specifications

Model			RSJ-420/SZN1-H
Power supply		\	380-415V~, 3Ph, 50Hz
Water heating	Capacity	kW	39.0
	Input	kW	9.65
	COP	W/W	4.04
Running ambient temperature		\	-15 ºC～46 ºC
Outlet water temperature		\	Default 56ºC, 40 ºC～60 ºC
Rated input		kW	14.5
Rated current		A	24.0
Noise level		dB(A)	66
Refrigerant type		\	R410A
Quantity		\	4.5kg
Refrigerant control		\	EXV
Fan	Type	\	Axial fan
	Motor model	\	YDK550-6E
	Motor brand	\	Yongan/Dayang/Welling/Matchwell
	Quantity	\	1
	Motor input	W	810/680
	Capacitor		25μF/450V
	Speed (Hi/lo)	r/min	850/750
Coil	Type	\	Copper tube and aluminum fin
	Tube size	mm	Φ7
	No. of rows	\	2
	Fin spacing	mm	1.5
	Tube pitch(a)×row pitch(b)	mm	21×13.37
	Length× height	mm	2,827×798
	Number of circuits	\	19
Compressor	Model	\	ZP120KCE-TFD-522
	Type	\	Scroll
	Brand	\	Copeland
	Quantity	\	1
	Capacity	kW	29.2
	Input	W	9,200
	Rated current (RLA)	A	20
	Locked rotor Amp.(LRA)	A	118
	Thermal protector	\	Internal
	Refrigerant oil	ml	3,253
Controller		\	KJR-51/BMKE-A (Wired controller)
Air flow		m^3/h	≥12,000

Continues

Model			RSJ-420/SZN1-H
Water pipe	Inlet pipe	mm	DN32
	Outlet pipe	mm	DN32
Hot water yield		m^3/h	0.85
Dimension (W×H×D)		mm	1,015×1,775×1,026
Packing (W×H×D)		mm	1,070×1,900×1,030
Net/Gross weight		kg	323/343

Notes:

The heating capacity is tested under a standard ambient with temperature of outdoor 20 ºC(DB)/15 ºC(WB), inlet water temperature of the unit is 15 ºC, outlet water temperature is 55 ºC.

Model			RSJ-800/SZN1-H
Power supply		\	380-415V~, 3Ph, 50Hz
Water heating	Capacity	kW	80.0
	Input	kW	20.00
	COP	W/W	4.00
Running ambient temperature		\	-15 ºC～46 ºC
Outlet water temperature		\	Default 56ºC, 40 ºC～60 ºC
Rated input		kW	26.0
Rated current		A	34.0
Noise level		dB(A)	68
Refrigerant type		\	R410A
Quantity		\	4.4kg×2
Refrigerant control		\	EXV
Fan	Type	\	Axial fan
	Motor model	\	YDK550-6E
	Motor brand	\	Yongan/Dayang/Welling/Matchwell
	Quantity	\	2
	Motor input	W	810/680
	Capacitor		25μF/450V
	Speed (Hi/lo)	r/min	850/750
Coil	Type	\	Copper tube and aluminum fin
	Tube size	mm	Φ7
	No. of rows	\	2
	Fin spacing	mm	1.5
	Tube pitch(a)×row pitch(b)	mm	21×13.37
	Length× height	mm	(2,827×798)+(2,827×798)
	Number of circuits	\	20+20

Continues

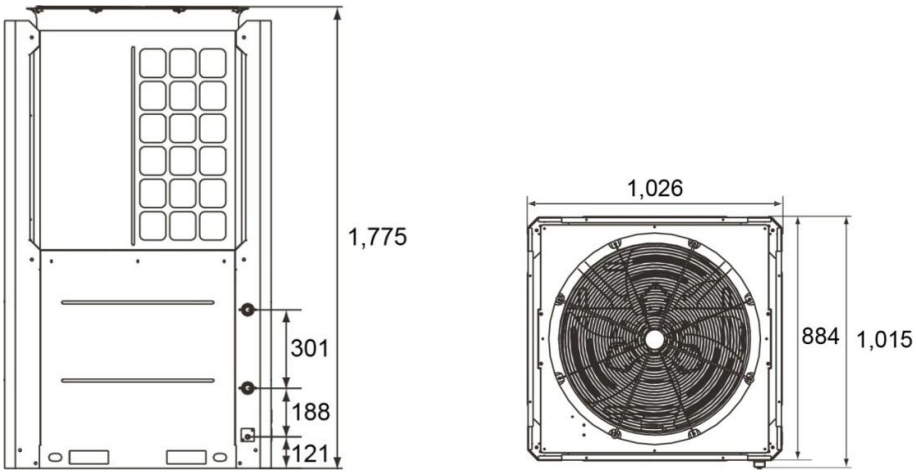
Model			RSJ-800/SZN1-H
Compressor	Model	\	SH120A4ALC
	Type	\	Scroll
	Brand	\	Danfoss
	Quantity	\	2
	Capacity	kW	29.95
	Input	W	9,462
	Rated current (RLA)	A	20.7
	Locked rotor Amp.(LRA)	A	142
	Thermal protector	\	Internal
	Refrigerant oil	ml	3,300
Controller		\	KJR-51/BMKE-A (Wired controller)
Air flow		m^3/h	≥25,000
Water pipe	Inlet pipe	mm	DN50
	Outlet pipe	mm	DN50
Hot water yield		m^3/h	1.72
Dimension (W×H×D)		mm	1,015×1,775×1,026
Packing (W×H×D)		mm	1,070×1,900×1,030
Net/Gross weight		kg	599/627

Notes:

The heating capacity is tested under a standard ambient with temperature of outdoor 20 ºC(DB)/15 ºC(WB), inlet water temperature of the unit is 15 ºC, outlet water temperature is 55 ºC.

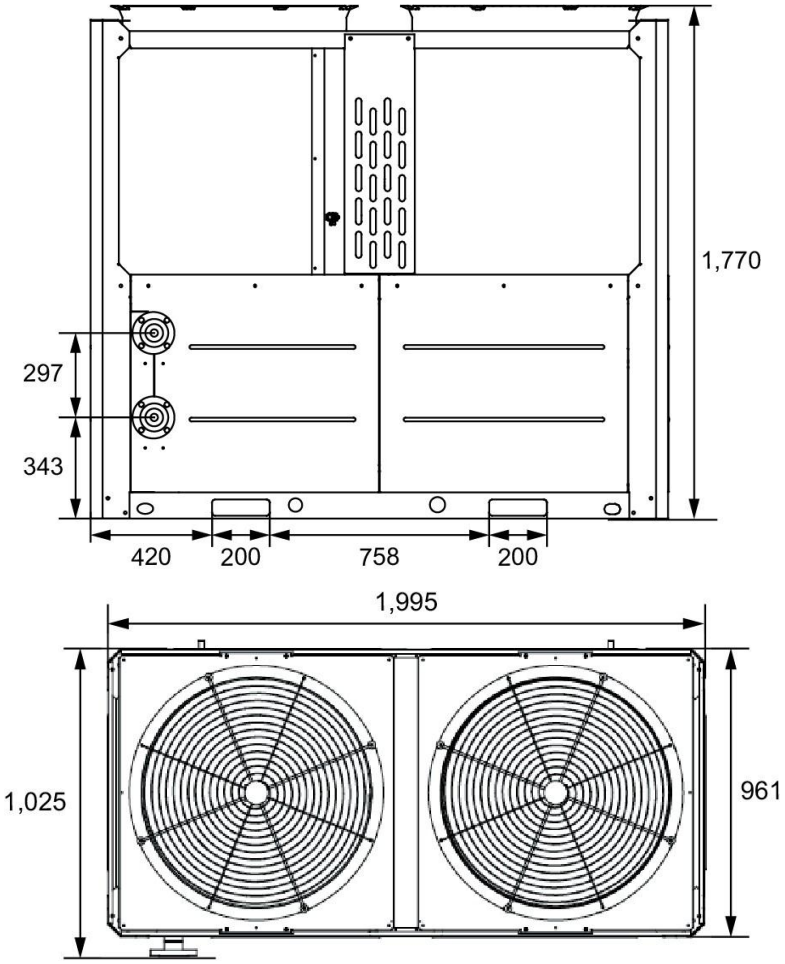
3. Dimensions (Unit: mm)

RSJ-420/SZN1-H



Top view

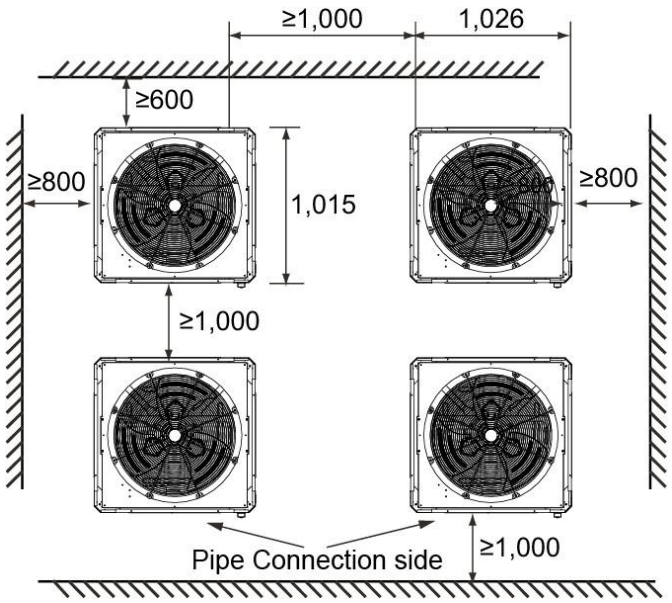
RSJ-800/SZN1-H

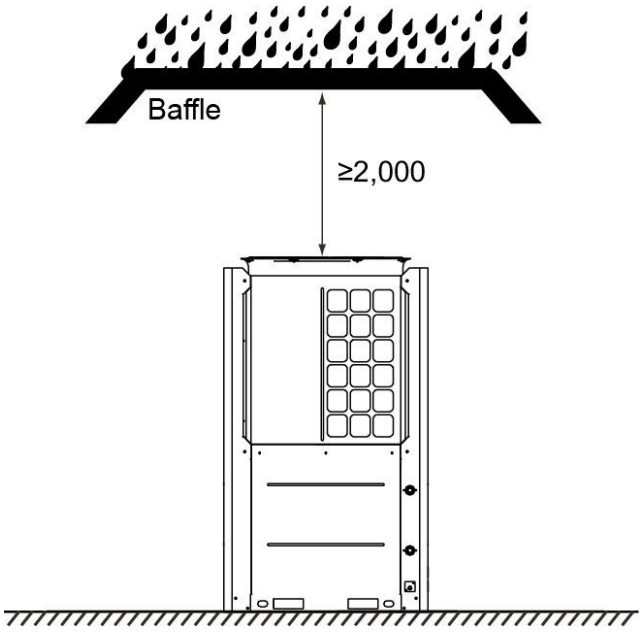


Top view

4. Service Space (Unit: mm)

RSJ-420/SZN1-H





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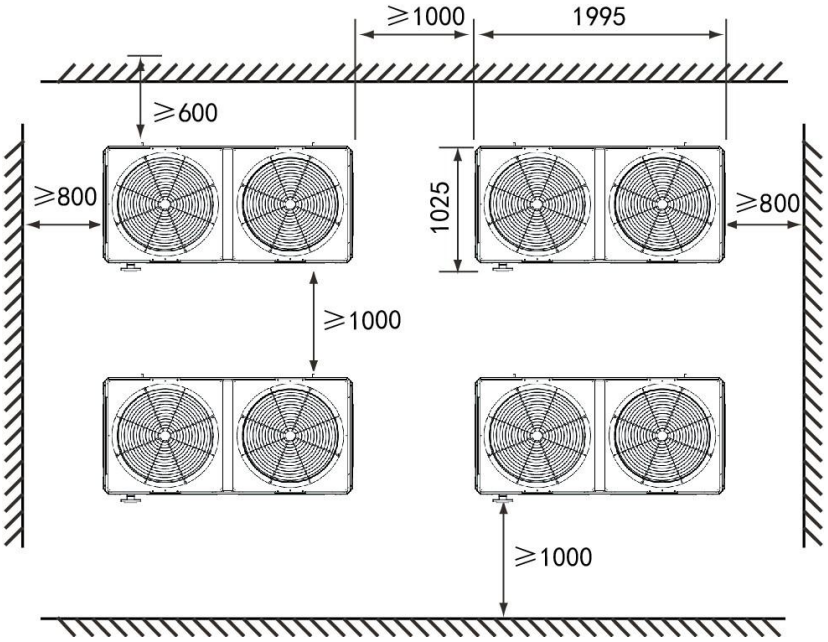
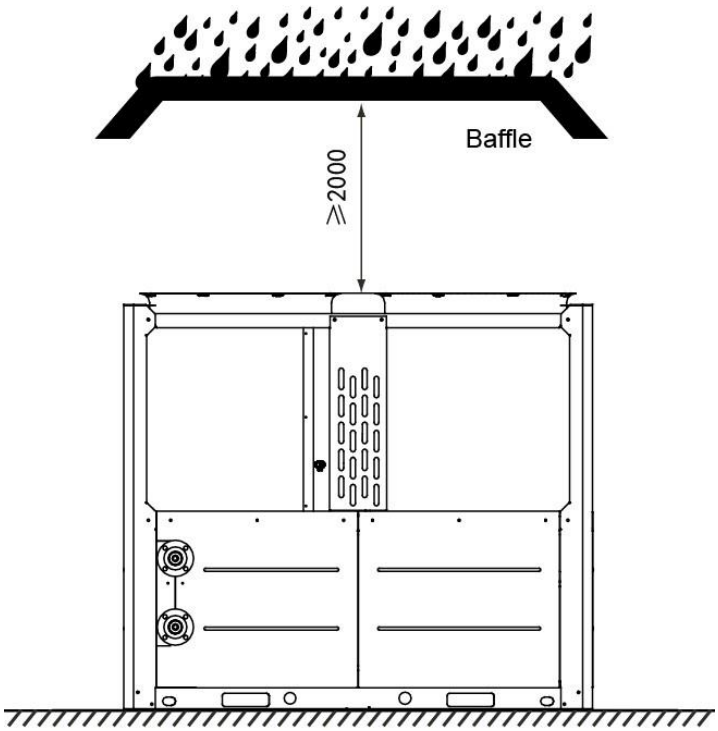
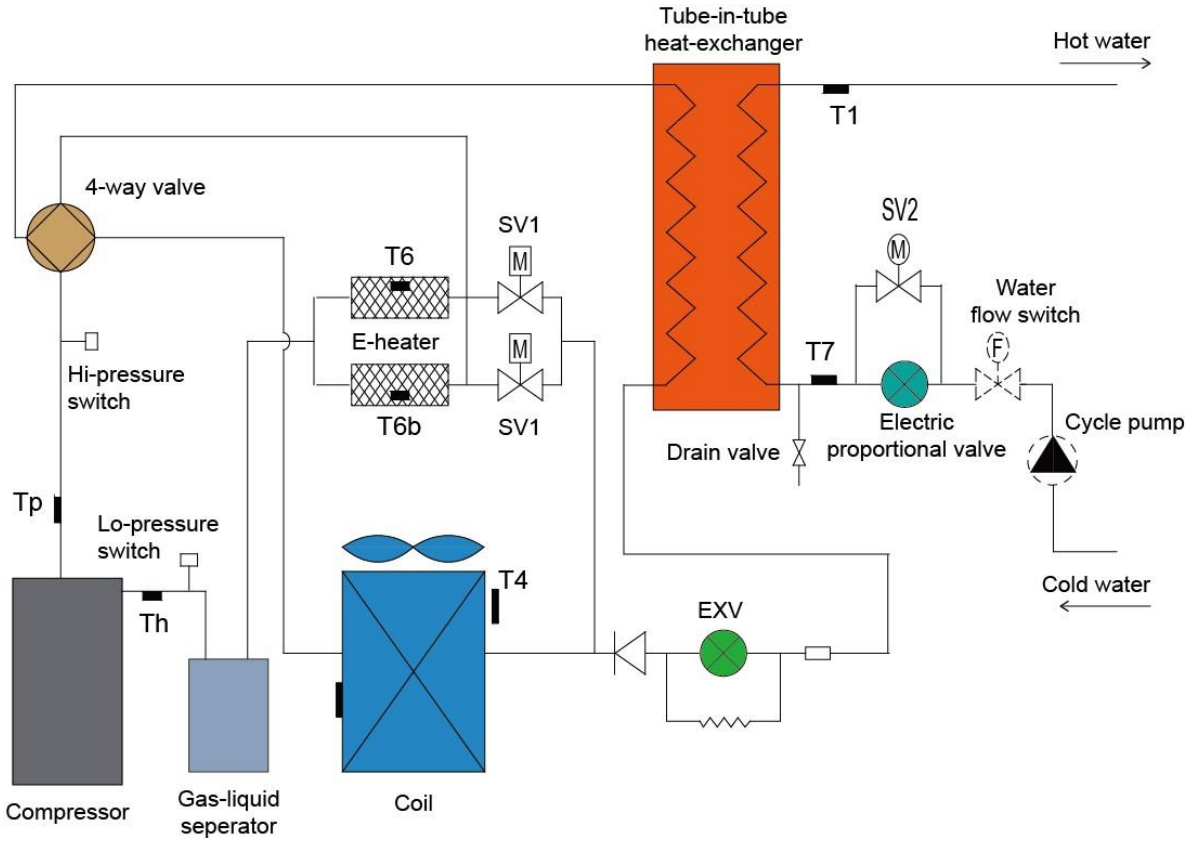




5. Refrigerant circuit

RSJ-420/SZN1-H



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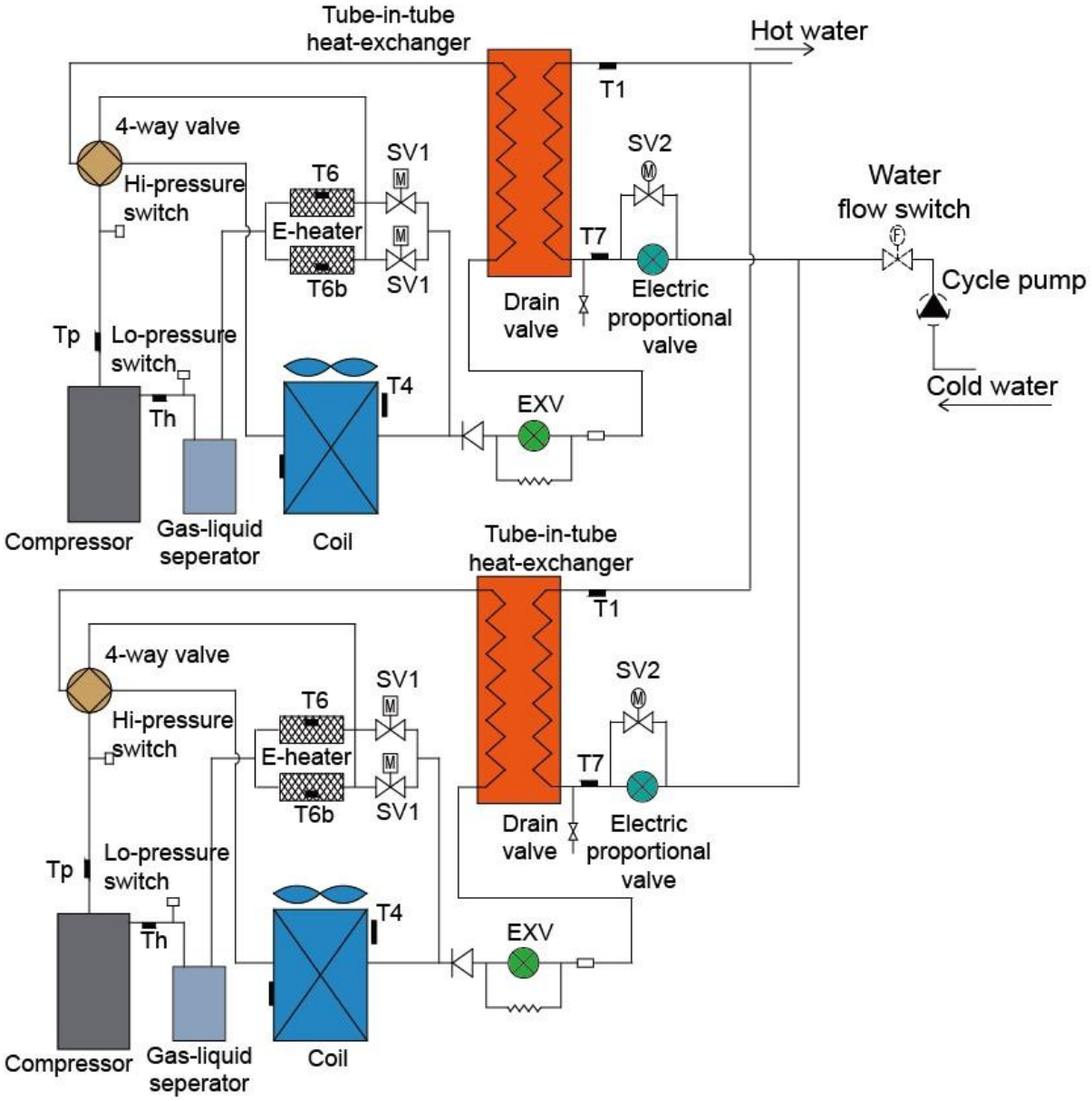
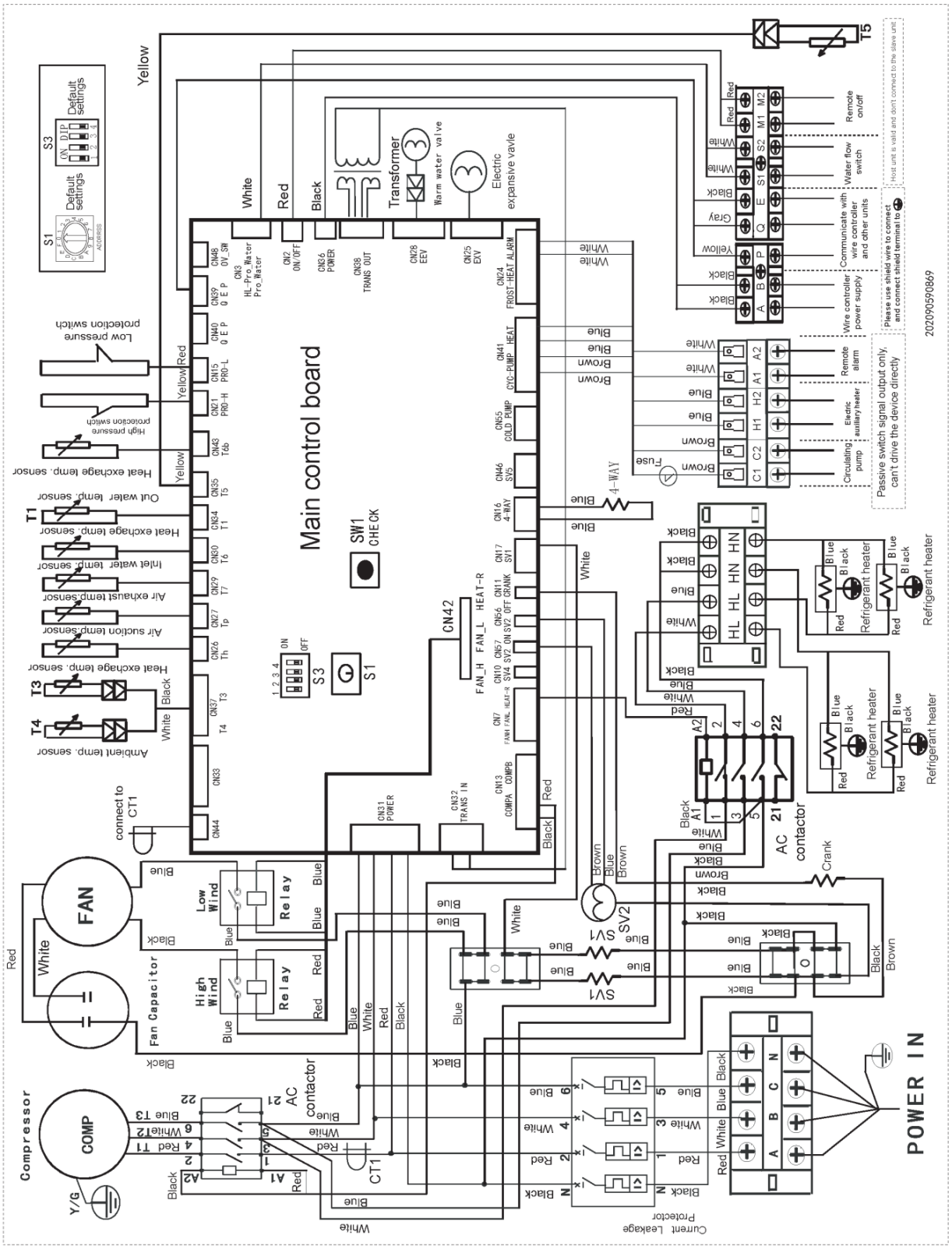
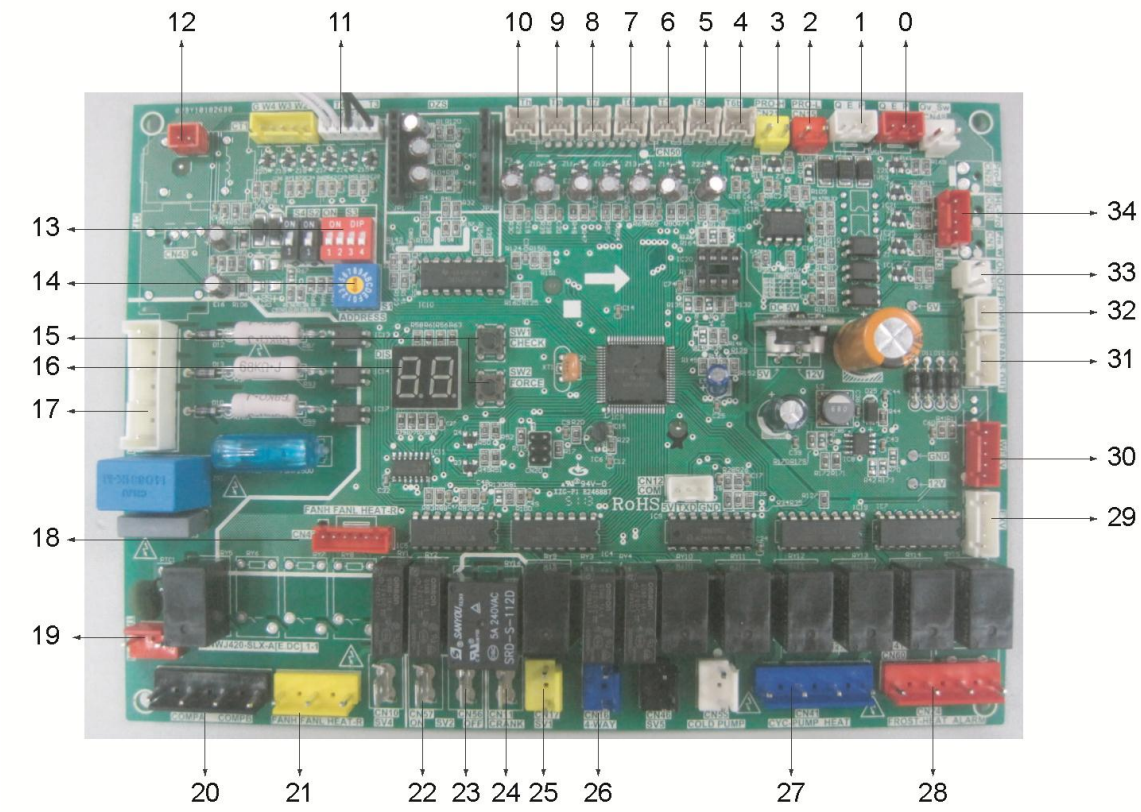


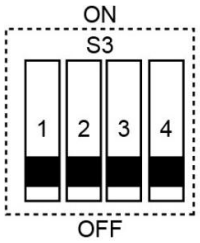
6. Wiring Diagrams

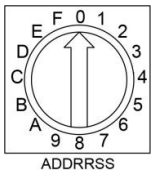
RSJ-420/SZN1-H





Item	Detail
0	Communication port for other unit
1	Communication port for wired controller
2	System low pressure protection connector
3	System high pressure protection connector
4	E-heater Temp. Sensor of refrigerant connector
5	Water tank (pook) Temp. sensor connector, only the host is valid, the slave is invalid
6	Water outlet Temp. sensor connector
7	E-heater pipe Temp. sensor connector of refrigerant
8	Water inlet Temp. sensor connector
9	Discharge Temp. sensor connector
10	Suction sensor connector

<table>
<tr><td>11</td><td>T3: Evaporator Temp. sensor connector
T4: Outdoor ambient Temp. sensor connector</td></tr>
<tr><td>12</td><td>Detection port for compressor current</td></tr>
<tr><td>13</td><td>S3-1: Remote ON/OFF functional status (OFF: inactive (default); ON: active)
S3-2: Defrost periodical choice (OFF: default time by program; ON: 28 minutes)
S3-3,4: Auxiliary heater choice (OFF: indicates 0, ON indicates 1, the factory default is 00)
 

<table>
<tr><td>00</td><td>01</td><td>10</td><td>11</td></tr>
<tr><td colspan="2">No E-heating</td><td>Water tank E-heating</td><td>Pipeline E-heating</td></tr>
</table></td></tr>
<tr><td>14</td><td>Address dial code
 

0~3 separately stands for address 0~3, means 0~3 set units. When dial the dial switch to 4 or more, then it will invalid.
Each module of water heat pump has the electric control function. Set the host unit through the address dial code on electric control board. Stipulate the unit with address dial code 0# as the host unit. Only after setting the host unit , the function of direct communication with wired controller and other function can be activated.</td></tr>
<tr><td>15</td><td>Left side: CHECK, spot check button, for checking the operating state of unit.
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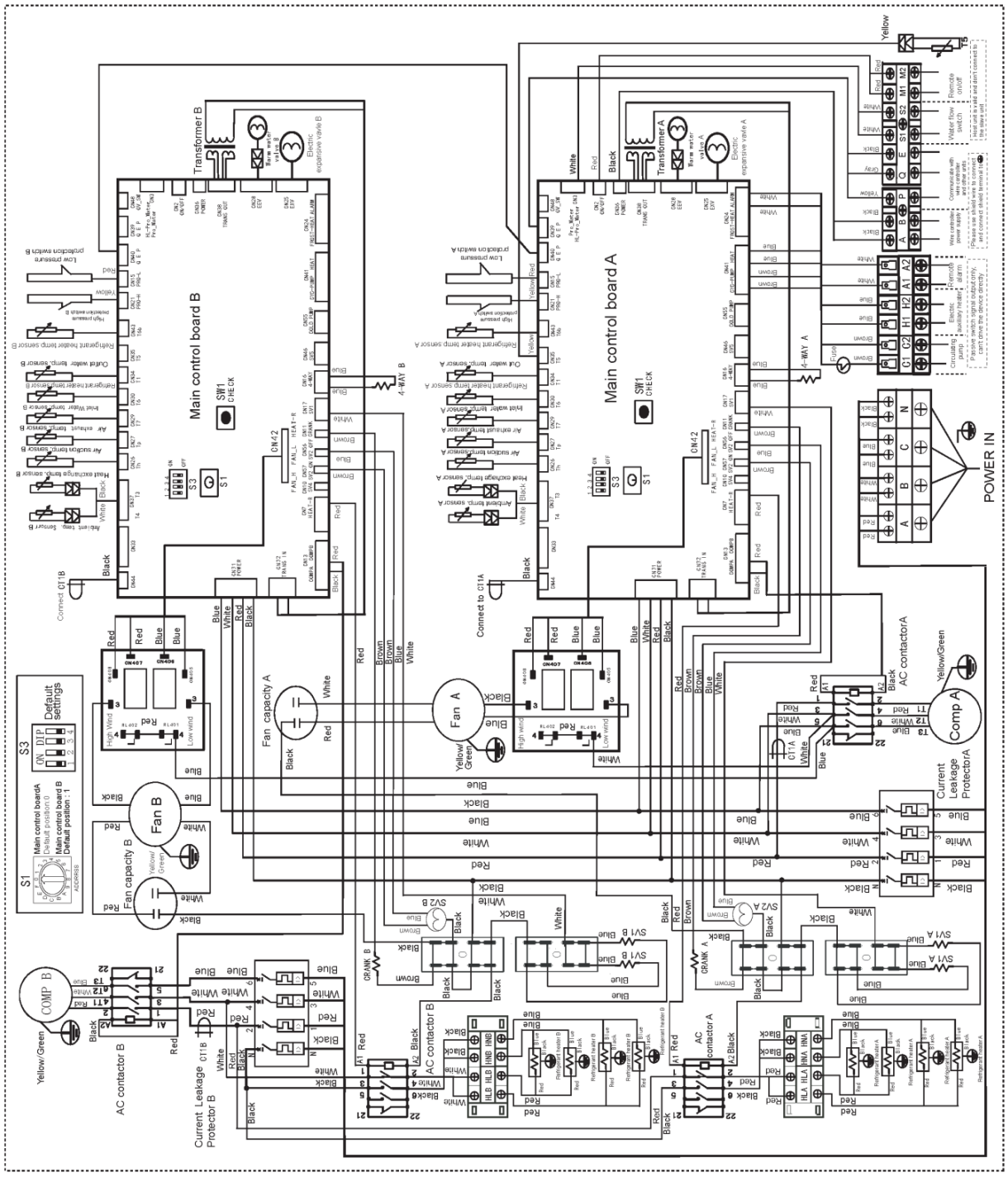
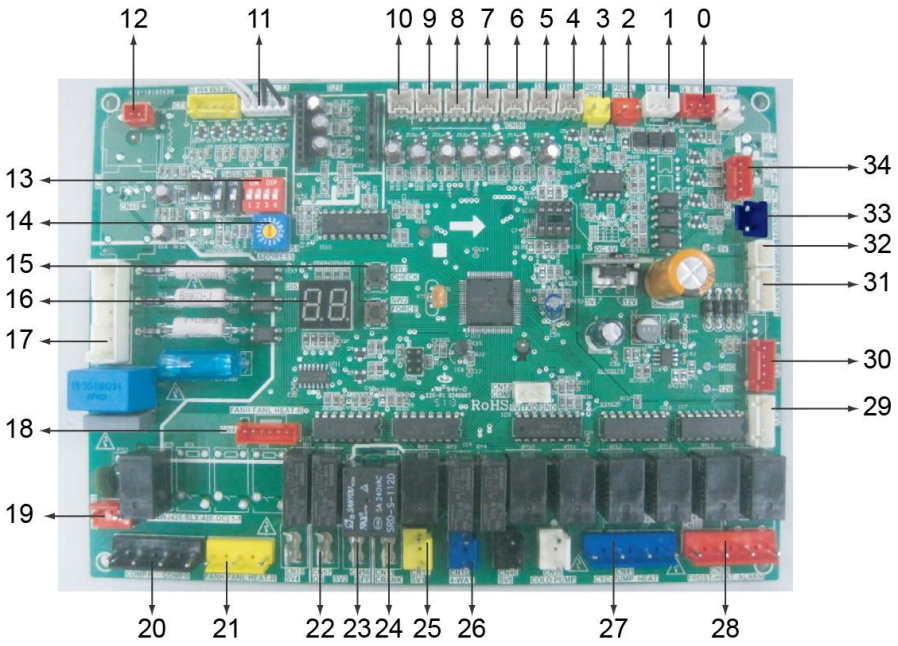
<tr><td>16</td><td>Digital screen.</td></tr>
<tr><td>17</td><td>3-phase, 4-wire system power input. Lack of phase or wrong phase only is detected on the initial stage of power on without detection during operation.</td></tr>
<tr><td>18</td><td>High and low fan speed.</td></tr>
<tr><td>19</td><td>Tranformer input, 220V AC current.</td></tr>
<tr><td>20</td><td>Control port for compressor.</td></tr>
<tr><td>21</td><td>Refrigerant E-heater control port.</td></tr>
<tr><td>22</td><td>Electric ball valve on.</td></tr>
<tr><td>23</td><td>Electric ball valve off.</td></tr>
<tr><td>24</td><td>Control port for crankcase E-heating belt.</td></tr>
</table>

25	One-way solenoid control port.
26	4-way valve control power.
27	Left side: Circulating water pump control; right side: E-heater control. Only supply ON/OFF signal, not supply power signal.
28	Right side: Remote alarm signal output. Only supply non-source ON/OFF signal, not supply power signal.
29	EXV connector.
30	Electric proportional valve connector.
31	Transformer output connector.
32	Power connector for wired controller.
33	Remote control port.
34	Water flow switch connector.

RSJ-800/SZN1-H





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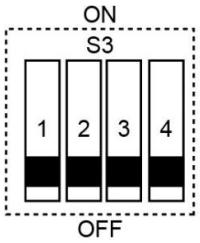

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 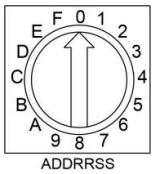

0~1 separately stands for address 0~1, means 0~1 set units. When dial the dial switch to 2 or more, then it will invalid.
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30	Electric proportional valve connector.
31	Transformer output connector.
32	Power connector for wired controller.
33	Remote control port.
34	Water flow switch connector.

Notes: RSJ-800/SZN1-H has two same PCB boards. Here only explains one PCB board.

7. Electric Characteristics

Model		RSJ-420/SZN1-H	RSJ-800/SZN1-H
Outdoor unit	Hz	50	50
	Voltage	380~415V, 3Ph	380~415V, 3Ph
	Min.	342V	342V
	Max.	456V	456V
Power supply	MCA	21	26
	TOCA	30	60
	MFA	30	60
Compressor	MSC	118	142
	RLA	16.6	20.7
OFM	kW	0.8	0.8
	FLA	3.7	3.7

Note:

MCA: Min. Current Amps. (A)

MFA: Max. Fuse Amps. (A)

TOCA: Total Over-current Amps. (A)

MSC: Max. Starting Amps. (A)

RLA: Rated Locked Amps. (A)

OFM: Outdoor Fan Motor

kW: Fan Motor Rated Output (kW)

FLA: Full Load Amps. (A)

8. Capacity Table

RSJ-420/SZN1-H

Mode	OT(℃) DB	Inlet water Temp. (℃)	Outlet water Temp. (℃)	Capacity(kW)	COP
RSJ-420/SZN1-H	43	29	40	55.72	6.36
			45	55.40	6.00
			50	54.75	5.64
			55	54.58	5.28
			60	52.46	5.03
	40	29	40	56.99	6.50
			45	55.14	5.89
			50	55.00	5.58
			55	54.42	5.31
			60	52.67	5.19
	35	29	40	51.15	5.71
			45	51.13	5.36
			50	50.98	5.05
			55	48.02	4.75
			60	47.19	4.31
	30	15	40	46.63	5.65
			45	46.31	5.32
			50	45.86	4.99
			55	47.61	4.68
			60	45.03	4.45
	25	15	40	42.04	5.09
			45	42.62	4.86
			50	42.72	4.60
			55	44.28	4.34
			60	42.49	3.93
	20	15	40	41.15	4.85
			45	41.65	4.60
			50	41.59	4.30
			55	39.76	4.01
			60	38.96	3.37
	15	9	40	35.70	4.62
			45	36.61	4.38
			50	37.22	4.14
			55	37.54	3.90
			60	37.10	3.48
	7	9	40	32.23	4.65
			45	30.83	4.29
			50	29.43	3.96
			55	27.68	3.67
	2	9	40	25.76	3.28
			45	23.20	2.99
			50	20.64	2.72
			55	19.59	2.48
	0	9	40	19.21	2.88
			45	21.18	2.83
			50	20.65	2.72
	-7	9	40	18.43	2.88
			45	19.21	2.80
			50	19.60	2.67
	-15	9	40	18.15	2.28
			45	17.65	2.13
			50	14.50	1.86

RSJ-800/SZN1-H

Note: OT – Outdoor Temperature (DB);

Mode	OT(℃) DB	Inlet water Temp. (℃)	Outlet water Temp. (℃)	Capacity(kW)	COP
RSJ-800/SZN1-H	43	29	40	102.34	5.74
			45	102.02	5.42
			50	101.36	5.09
			55	100.39	4.76
			60	99.08	4.44
	40	29	40	102.27	5.78
			45	100.43	5.25
			50	100.28	4.97
			55	100.05	4.73
			60	97.95	4.35
	35	29	40	94.77	5.39
			45	94.75	5.06
			50	94.60	4.76
			55	94.04	4.49
			60	92.81	4.21
	30	15	40	88.94	5.30
			45	88.62	5.00
			50	88.17	4.68
			55	87.70	4.39
			60	87.34	4.16
	25	15	40	83.06	4.86
			45	83.64	4.64
			50	83.74	4.39
			55	83.70	4.15
			60	83.51	3.92
	20	15	40	80.63	4.89
			45	81.13	4.64
			50	81.07	4.33
			55	81.05	4.04
			60	80.94	3.79
	15	9	40	73.19	4.55
			45	74.11	4.32
			50	74.72	4.07
			55	75.04	3.84
			60	75.09	3.62
	7	9	40	65.25	4.04
			45	63.85	3.72
			50	62.45	3.44
			55	61.05	3.19
	2	9	40	55.09	3.44
			45	52.53	3.14
			50	49.97	2.86
			55	47.41	2.60
	0	9	40	46.87	2.98
			45	48.84	2.93
			50	49.78	2.82
	-7	9	40	39.46	2.56
			45	40.23	2.50
			50	40.03	2.38
	-15	9	40	30.46	2.19
			45	29.97	2.04
			50	26.99	1.78

9. Accessories

Name	Qty.	Purpose
Installation & operation manual	1	
Water tank temperature sensor	1	For water tank temperature inspection.
Wired controller	1	Control the unit and display unit status.
Wire harness matched with wired controller	1	Connect the master unit with wired controller.
Y-shaped filter	1	Only for RSJ-420/SZN1-H

Part. 3 Installation

1. Safety information

To prevent injury to the user or other people and property damage, the following instructions must be followed. Incorrect operation due to ignoring of instructions may cause harm or damage.

- ✧ The unit must be earthed effectively. The earthing pole of socket must be grounded well, make sure that power supply socket and plug are dry enough and connected tightly.
- ✧ How to check the power supply socket and plug are qualified? Turn on power supply and keep the unit running for a half hour, then turn off power supply and plug out, check whether the socket and plug is hot or not.
- ✧ Do not remove, cover or deface any permanent instructions, labels, or the data labels from either the outside of the unit or inside of unit panels.
- ✧ Ask qualified person to perform the installation of this unit in accordance with local national regulations and this manual. Improper installation may result in water leakage, electric shock or fire.
- ✧ Ask qualified person for relocating, repairing and maintaining the unit. Improper installation may result in water leakage, electric shock or fire.
- ✧ Electric connection work should obey the instructions of local power company, local electric utility and this manual.
- ✧ Never use the wire and fuse with wrong rated current, otherwise unit may break down and cause fire furthermore.
- ✧ Do not insert fingers, rods or other objects into the air inlet or outlet. When the fan is rotating at high speed, it will cause injury.
- ✧ Never use a flammable spray such as hair spray, lacquer paint near the unit. It may cause a fire.
- ✧ This appliance is not intended for use by person (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.
- ✧ If the supply cord is damaged, it must be replaced by the manufacturer or its service agent or

similarly qualified person.

- ✧ Do not dispose this product as unsorted municipal waste. Collection of such waste separately for special treatment is necessary. Do not dispose of electrical appliances as unsorted municipal waste, use separate collection facilities. Contact your local government for information regarding the collection systems available. If electrical appliances are disposed of in landfills or dumps, hazardous substances can leak into the ground water and get into the food chain, damaging people's health and well-being.
- ✧ Before cleaning, be sure to stop the operation and turn the breaker off or pull out the power plug. Otherwise, an electric shock and injury may be caused.
- ✧ Water temperature over 50°C can cause severe burns instantly or death from scalds. Children, disabled and elderly are at highest risk of being scalded. Feel water before bathing or showering valves are recommended.
- ✧ Do not operate the unit with a wet hand. An electric shock may be caused.
- ✧ The installation height of power supply should be over 1.8m, if there is any water spattered, separate the power supply from water.
- ✧ A one-way valve must be installed on the water inlet side, which is available from accessories.
- ✧ Arrange the drain pipe to ensure smooth draining. Improper drainage work may cause wetting of the building, furniture, etc.
- ✧ Do not touch the inner parts of the controller. Do not remove the front panel. Some parts inside are dangerous to touch, otherwise a machine malfunction may be caused.
- ✧ Do not turn off the power supply. System will stop or restart heating automatically. A continuous power supply for water heating is necessary, except service and maintenance.

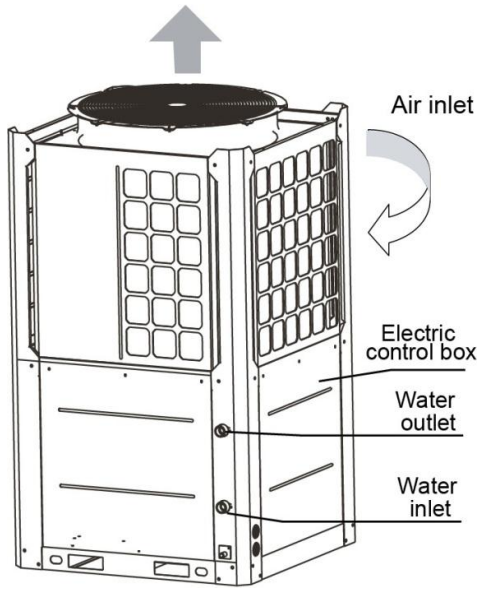
2. Unit Installation

Except for accessories supplied by factory, the water flow switch should be supplied by site. The cut-off value of switch should be more than V (V=0.1m^3/h × Amount of units). The water flow switch is used to detect the circulating water flow volume.

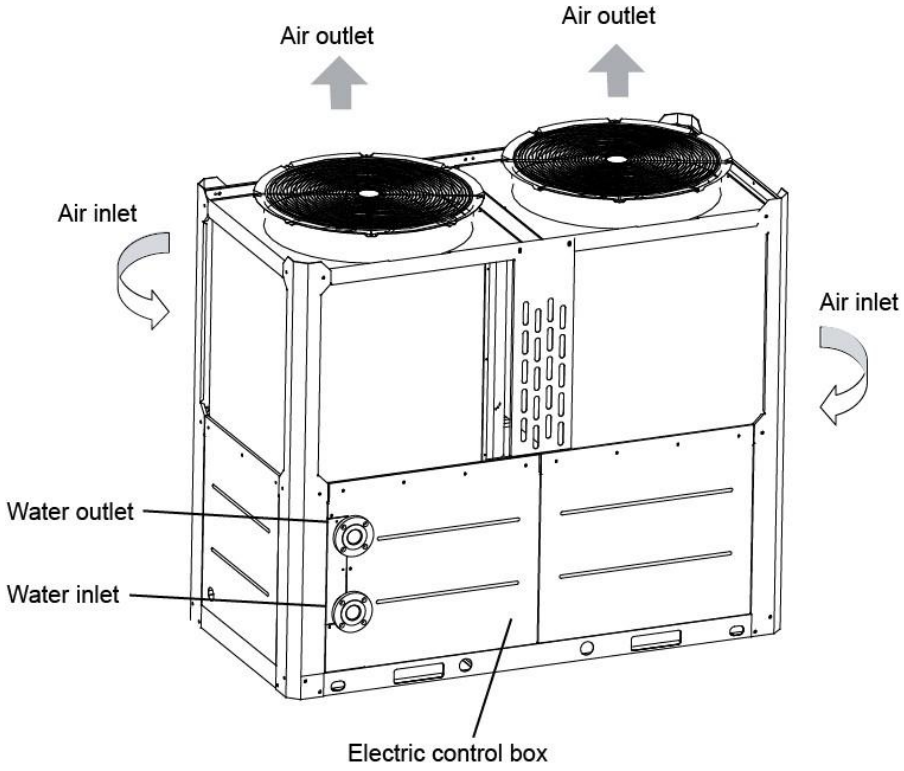
A single unit must be installed a set of water flow switch and wired controller, several units parallel connected can choose one or more sets of above accessories as required.

2.1 Unit outlook

RSJ-420/SZN1-H



RSJ-800/SZN1-H



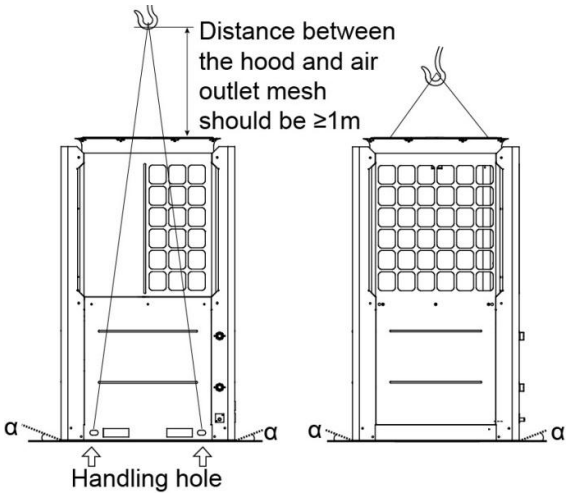
2.2 Carrying of unit

✧ Handling rope should at least can bear 3 times of the unit weight, and must go through the handling holes shown in following pictures, and make sure there is enough strength to add a

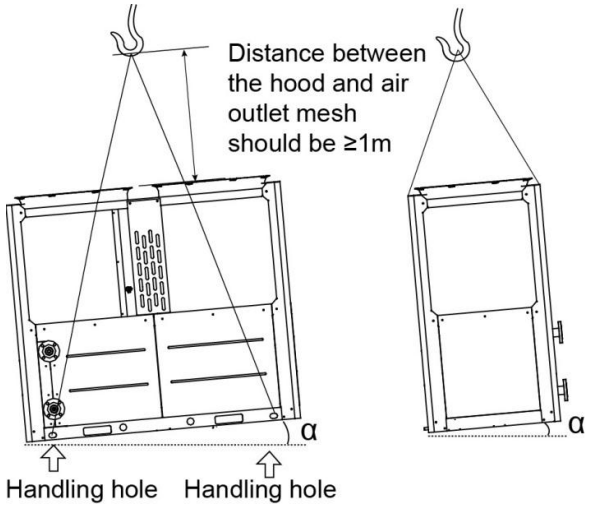
pad between the rop and unit in order to protect the unit.

- ✧ Distance between the hood and air outlet mesh shoule be more than 1 meter, and ensure that the hood has enough strength as well as reliability in handling process.
- ✧ Unit gradient (α) should be less than 3º. Handle with care, do not collide and drag drastically. DO NOT stand in handling operating radius.
- ✧ The distance between the air outlet mesh of unit and lift hook should be more than 1 meter.

RSJ-420/SZN1-H



RSJ-800/SZN1-H



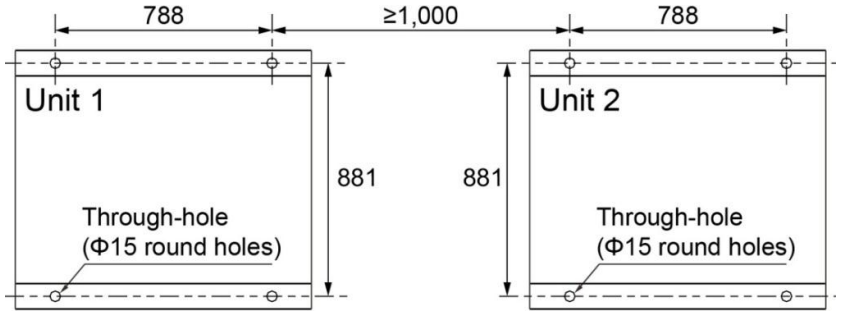
2.3 Unit installation caution

- ✧ The unit can be installed on the ground or on the suitable roof, but enough ventilation volume should be ensured in both cases.
- ✧ The unit should not be installed where noise and vibration are required to a certain extent.

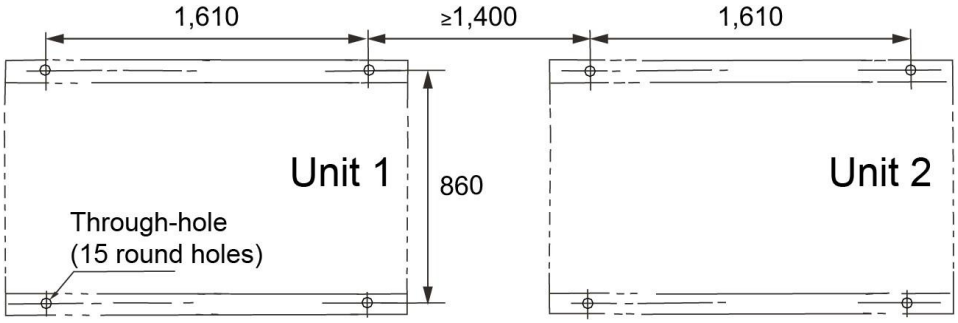
- ✧ The installed unit should be sheltered from direct sunlight as much as possible, and be far away from boiler flues and ambient air which may erode condenser coils and copper tube parts of the unit, such as the places that full of dust and oil fume.
- ✧ Safety measures of isolation should be taken, such as rail guards. These measures will avoid artificial damages and accidental damages.
- ✧ The height of the installation foundation for the unit should not be less than 100mm, and floor drains are required in installation sites, to ensure smooth drainage and remove any seeper.
- ✧ In case of installation on the ground, the steel base of the unit should be located on the concrete foundation, and the concrete plinth should extend below frozen soil layer. The foundation of the unit should not be connected to the foundation of the building, to avoid affecting the people due to transfer of noise and vibration. The base of the unit is provided with installation holes, which can be used to connect the unit and the foundation firmly.
- ✧ In case of installation on the roof, the roof must possess enough strength to sustain weight of the unit and maintenance personnel. The unit can be supported on concrete foundations or channel steel frames similar to those used in the unit installation on the ground. The load-bearing channel steel must be in alignment with the installation holes of the unit damper, and the channel steel should posses enough width for installing the damper.
- ✧ Consult the building contractor, the archietectural designer or other specialists about the cased with special installation requirements.
- ✧ The unit can be installed on the ground or ont the suitable roof, but it should follows the relative standards or laws to all lightnin-proof measures for the whole water heating system.

2.4 distance of unit ground screws (Unit: mm)

RSJ-420/SZN1-H



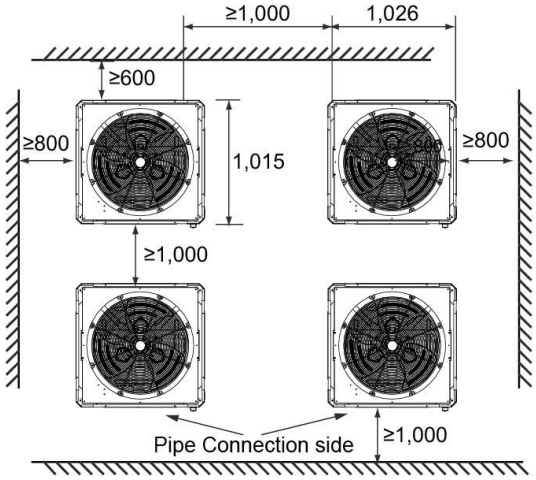
RSJ-800/SZN1-H



2.5 Unit installation space

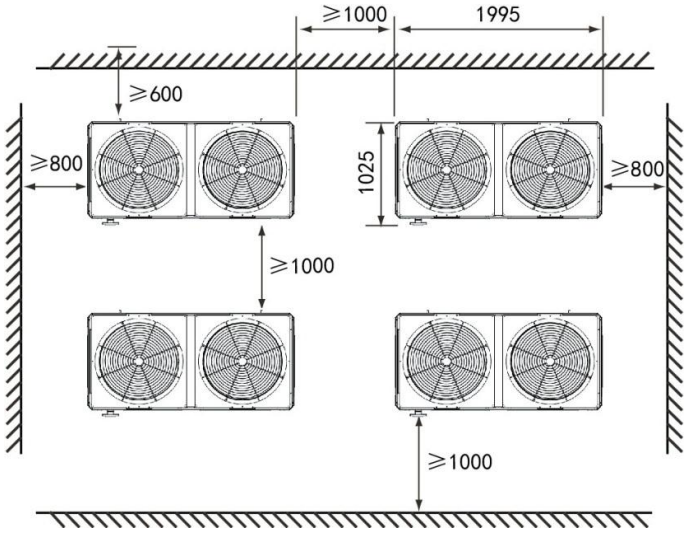
✧ Ensure enough space for installation and maintenance.

RSJ-420/SZN1-H



(Unit: mm)

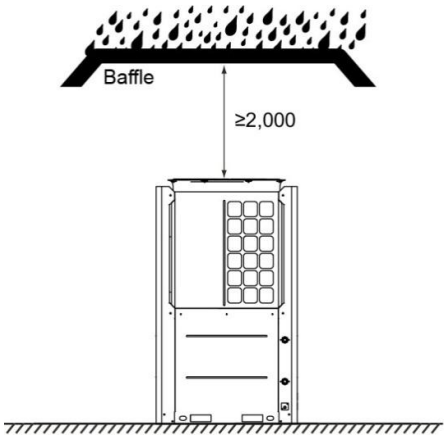
RSJ-800/SZN1-H



(Unit: mm)

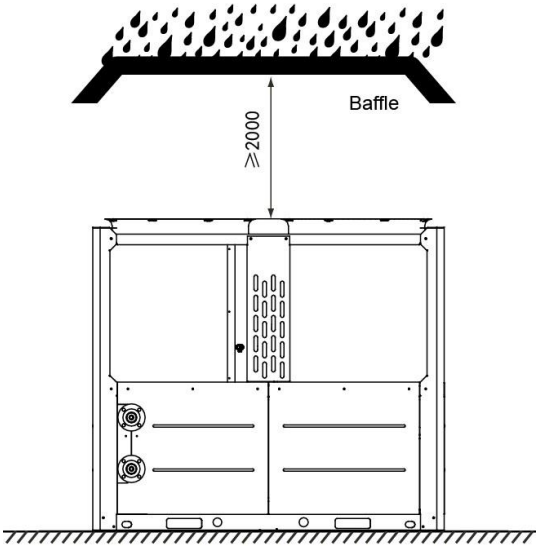
- ✧ Ensure there is enough air flow to supply the heat exchanger, Take influence of down draft caused by tall building around the unit to air discharge into condenser when installing.
- ✧ If install the unit at a place where ventilation is drastic, such as exposed roofs, short wall or louvers can be applied in case of turbulence disturbs air inlet. If short walls are applied, it should be shorter than the unit. Distance between short walls or louvers to unit should either satisfy requirements of unit installation minimum intervals.
- ✧ If the unit runs in winter, and the location has accumulated snow, the unit should stand higher than snow in order to let airflow ge through heat exchanger fluently.
- ✧ The unit circulating air volume is at least 12,000m^3/h. If the unit is installed in the basement, ensure air around the unit and outdoor air can circulate without obstruction.

RSJ-420/SZN1-H



(Unit: mm)

RSJ-800/SZN1-H



(Unit: mm)

2.6 Water pipeline system

- Water pipe joint specifications of single unit.

	Water inlet pipe joint	Water outlet pipe joint
RSJ-420/SZN1-H	DN32	DN32
RSJ-800/SZN1-H	DN50	DN50

- Water pipeline system design and construction must meet the national water and heating pipeline design requirements and relative standards.
- All the pipes are recommended to use PPR pipe, and the PPR pipe specificatons refers to up table.
- It must prevent dust and other sundries enter into the pipeline system during the pipeline installation and connection.
- The water flow switch which is used to detect the circulating water flow volume should be prepaired in site. The cut-off value of water flow switch is not less than ($0.1m^3/h$×amount of units).
- Only after unit is fixed, the water pipes can be installed.
- Use thermal insulation material to wrap the inlet water pipe, outlet water pipe and circulative water pipes.
- The pipe diameter of main water pipes:

RSJ-420/SZN1-H

Amount of units connected in parallel	Water inlet pipe joint	Water outlet pipe joint
1	DN32	DN32
2	DN50	DN50
3	DN65	DN65
4	DN80	DN80

RSJ-800/SZN1-H

Amount of units connected in parallel	Water inlet pipe joint	Water outlet pipe joint
1	DN50	DN50
2	DN80	DN80

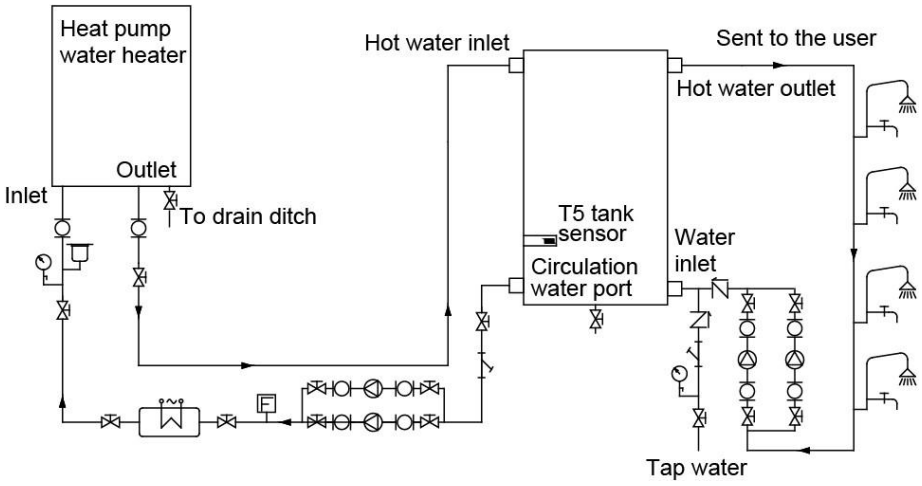
✧ Connection diagrammatic drawing of water pipe system

Icon specifications:

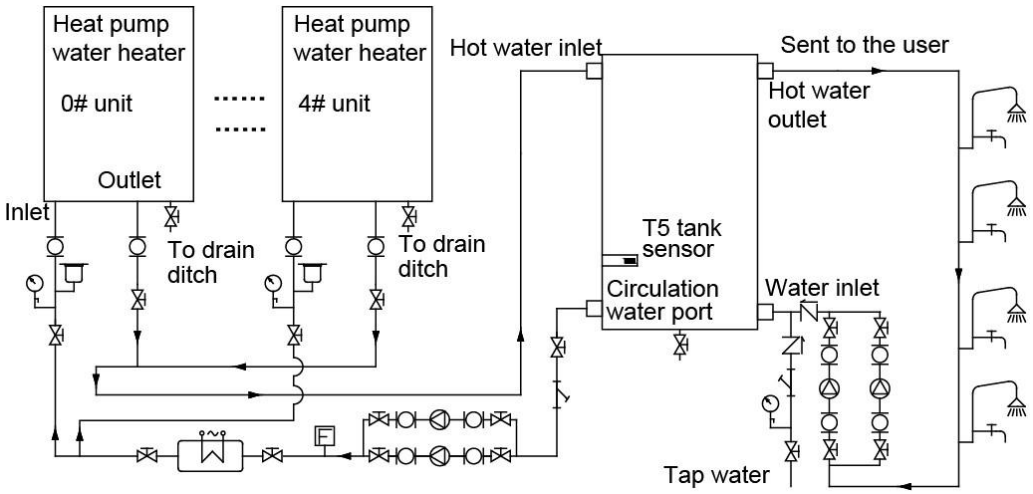
	Stop valve		Motor operated valve
	Flexible rubber joint (soft-connect)		Water pump
	Water using end		Water supply controller
	Solenoid valve		Pressure reducing valve
	Reflux valve		Auto air-exhaust valve
	Pressure gage		E-heater
	Y-shape filter		Water flow switch

RSJ-420/SZN1-H

Single unit drawing:

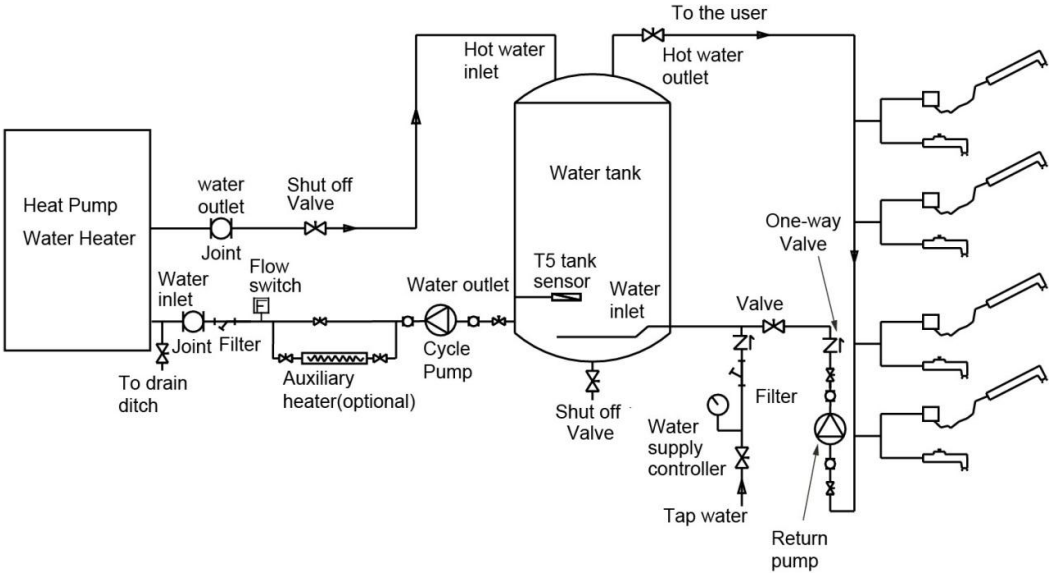


Double units drawing:

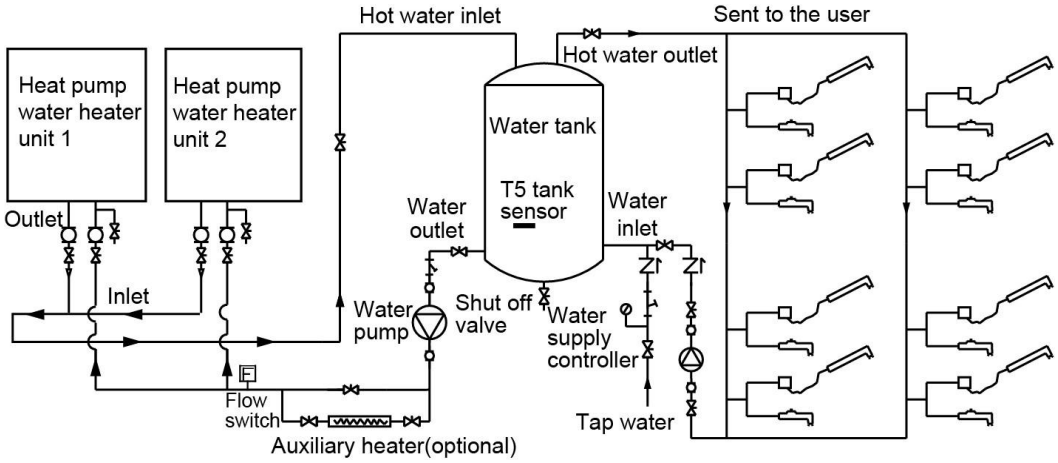


RSJ-800/SZN1-H

Single unit drawing:

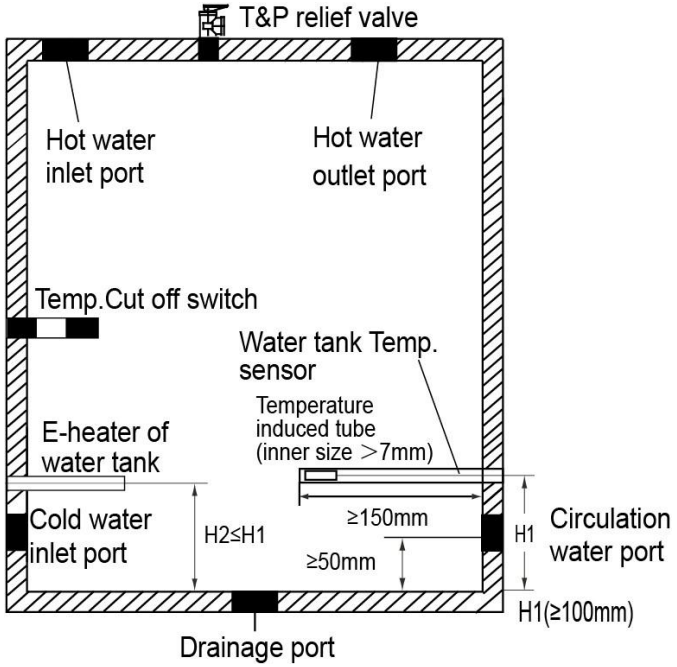


Double units drawing:



2.7 Water tank installation

- ✧ The water tank temperature sensor (T5) can not be placed in the water or on the water pipe directly. The water tank must be set a temperature pipe where the temperature sensor (T5) is installed.
- ✧ The water tank must have some safty devices to protect it such as temperature cut off switch, pressure and temperature relief vale, etc.
- ✧ Make sure E-heater is covered with water all the time.



✧ Water cycle pump selection:

RSJ-420/SZN1-H

Circulative heating rated water flow	7 m^3/h
Water resistance of circulative rated water flow	160 kPa

RSJ-800/SZN1-H

Circulative heating rated water flow	14 m^3/h
Water resistance of circulative rated water flow	160 kPa

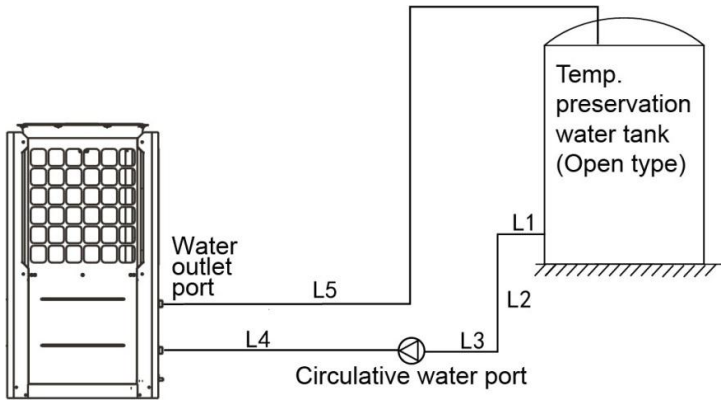
The hot water circulative pump must use hot water pump; the temperature resistance of the circulative water pump cannot lower than 80°C.

Rated head of circulative pump:

ΣOn-way resistance + ΣLocal resistance + Unit resistance

Rated flow of circulative pump:

Rated flow of a single circulation heating unit × Circulating unit quantity



2.8 E-heater capacity selection

✧ As the requirement, the auxiliary electric heater can be selected. The host unit provides the passive control signals of the auxiliary heater.

✧ The installation location of the auxiliary heater must strictly comply with the installation schematatic diagram.

✧ Rated heating capacity of total unit × 10%~30%.

✧ E-heater can apply the pipe-type or water tank E-heater. After installation, it must through dialing codes to choose the relative E-heating mode, otherwise it will damage the unit or

E-heater.

- ✧ The selection of auxiliary heater is only for reconmendation, and the selection of auxiliary heater can be selected according to the actual conditions.
- ✧ Make sure E-heater is covered with water all the time.

2.9 Electric connection of the unit

- ✧ Only use the electric components specified by product manufacture.
- ✧ Electronic installation must comply with the native regulations. Independent power supply should be applied. Power supply should satisfy electrical specifications that the unit requires.
- ✧ The unit must be ground wiring reliably.
- ✧ Set leakage protective devices according to the requirements of national technical standard about electric equipment.
- ✧ Power supply wire and signal wire should be arranged properly without interruption to each other, do not contact with connecting pipes and valves as well.
- ✧ When strong electricity and weak electricity are in parallel, please put the cable into each other's circuit and leave a proper space.
- ✧ No power supply wire is provided, please refer to the requirements in national standards or factory.
- ✧ In following table, power supply wire and connection length is the situation when voltage drop range is within 2%, if wire continuous length exceeds the ones listed in the table, please choose wires with a right diameters according to relative regulation.
- ✧ When finishing wiring, power on when there is no mistakes after a careful inspections.

RSJ-420/SZN1-H

Power supply	380-415V, 3Ph, 50Hz	
Min. wire size (metal pipe & synthetic resin pipe wire)	Wire size (<30m)	10# (UL1015)
	Ground wire	10# (UL1015)
Manual switch	Capacity	63 A
	Fuse	50 A
Leakage protector	30mA 0.1sec below	

RSJ-800/SZN1-H

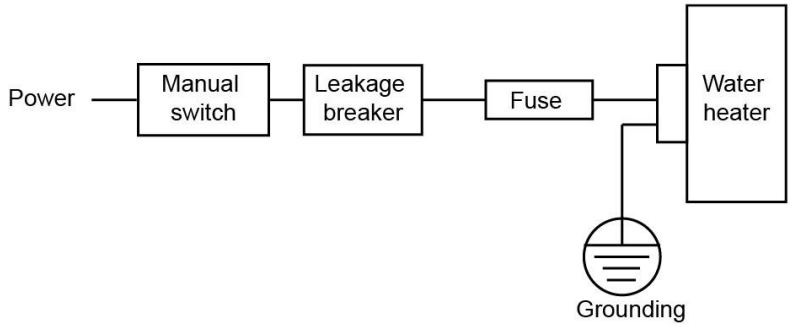
Power supply	380-415V, 3Ph, 50Hz	
Min. wire size (metal pipe & synthetic resin pipe wire)	Wire size (<30m)	25mm^2
	Ground wire	25mm^2
Manual switch	Capacity	125A
	Fuse	100A
Leakage protector	30mA 0.1sec below	

✧ Specifications of controlling wire

Item	Size (UL1015)	Remarks
E-heater controlling wire	18#	2-core
Circulating water pump controlling wire	18#	2-core
Remote alarm control wire	18#	2-core
Communication cable (shield)	22#	3-core
Wired controller power supply wire	22#	2-core
Targe flow switch	22#	2-core

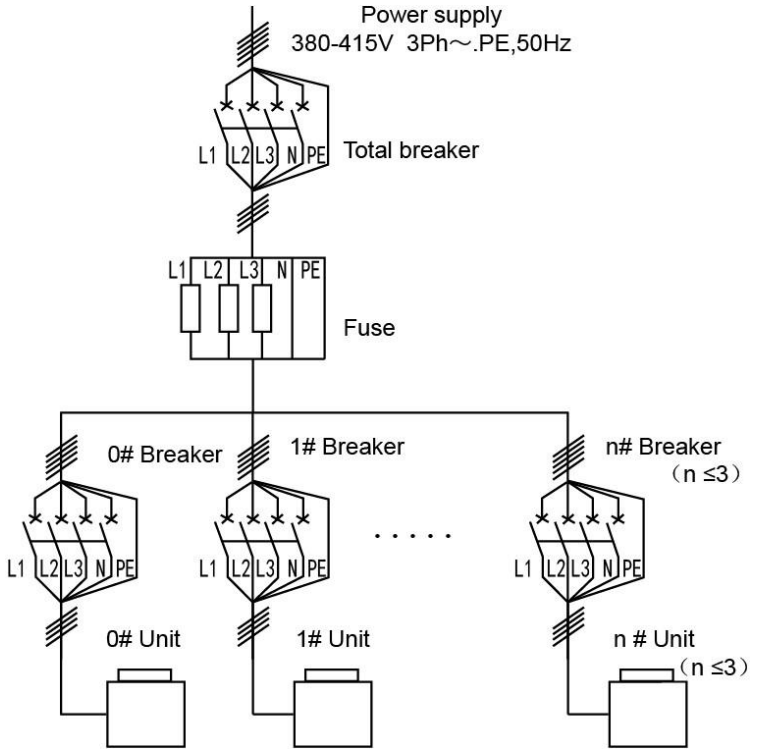
✧ Wiring diagram of water heater power

Single unit:

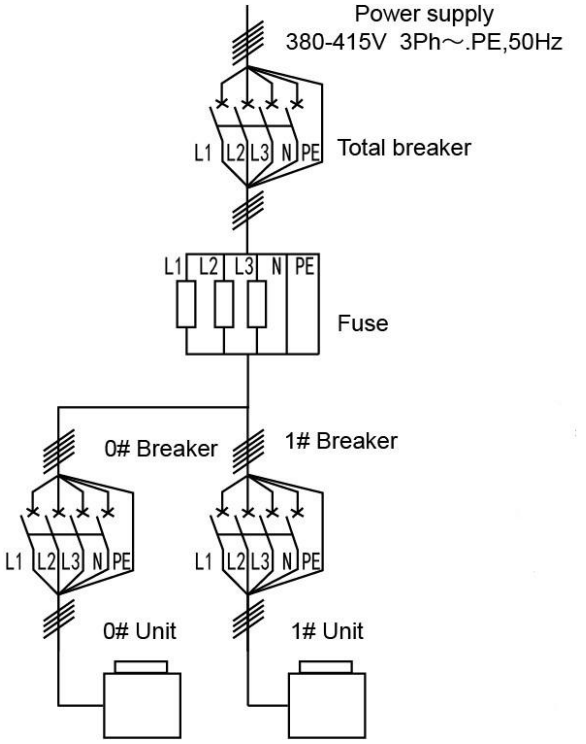


Multi-units:

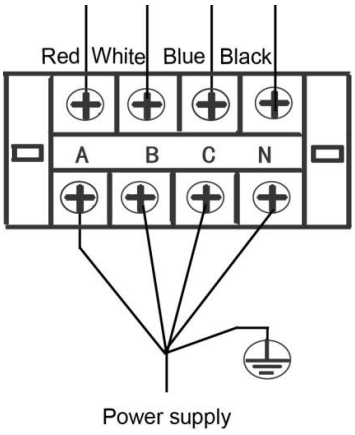
RSJ-420/SZN1-H

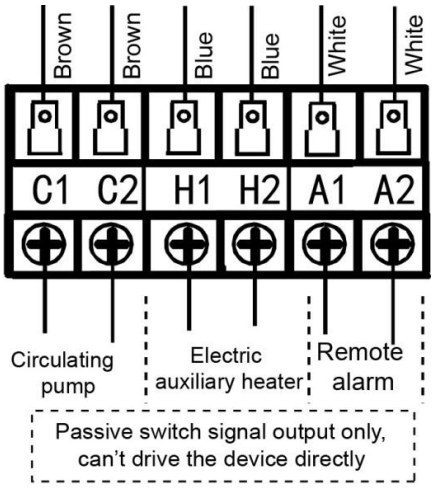


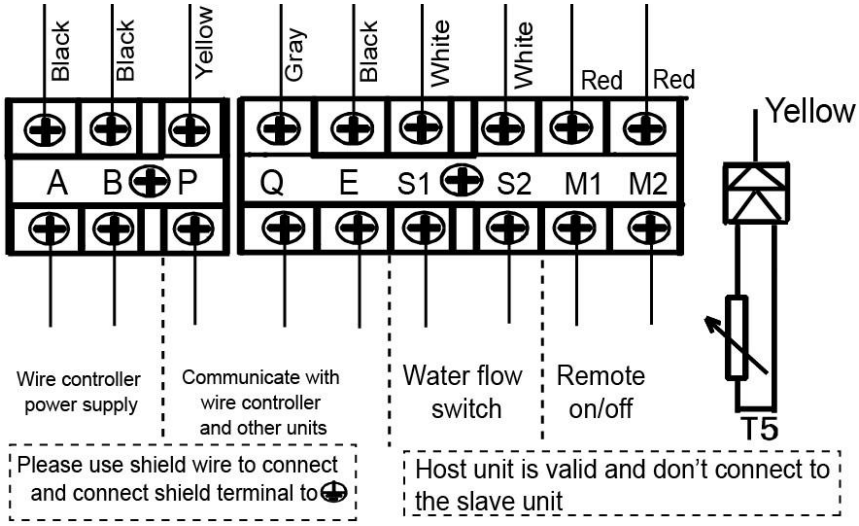
RSJ-800/SZN1-H



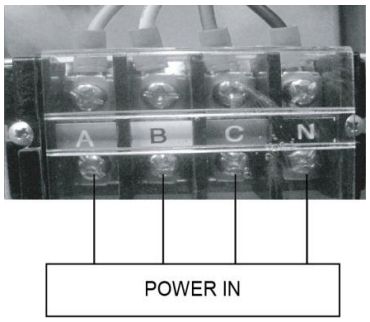
✧ Electric wiring figure

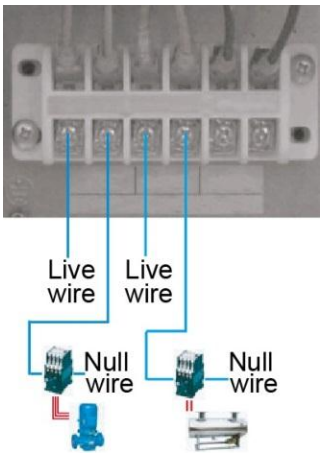


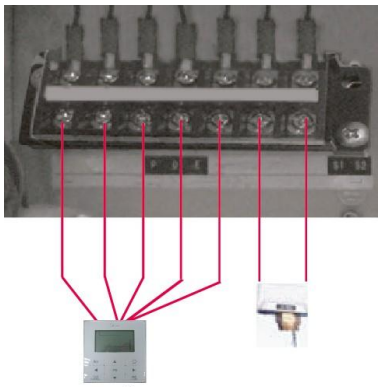




✧ Electric control schematic diagram of the unit (Only for reference)







KJR-51/BMKE-A

When power supply wire of the wired controller is less than 20m, wiring can be applied as the location shown as imaginary lines, when it it exeeds 20m, the power adapter is necessery.

Pay attention to the power phase sequence, if wrong connection of the phase sequence, the compressor will not operate, and digital screen of the water heater electrical control board will display error code. Change the phase sequence, and powering again until the digital screen does not display error and compressor starts normally.

The water flow switch, water pump, ON/OFF singal and E-heater are only connected with the host unit, which are not 220V control signal. So do not directly drive loading.

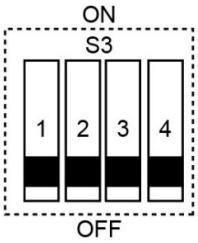
When the host unit has any one error of E1, E2 or E8, all the water heaters stop operation.

When the main unit has E4 error, the host unit and wired controller alarm the error, the slave units do not display error, then all the unit can not normally heat water, and go into backup mode.

When the host unit has other errors (except E1, E2, E8), then only stop the host unit, other units will not be affected. When the slave unit has error, only stop the operation of the error unit, other units will not be affected.

When the main or slave unit has protecton, only stop that unit, other units will not be affected.

✧ Dial code specification



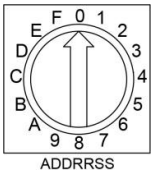
00	01	10	11
No E-heating		Water tank E-heating	Pipeline E-heating

S3-1: Remote ON/OFF functional status (OFF: inactive (default); ON: active).

S3-2: Defrost periodical choice (OFF: default time by program; ON: 28 minutes).

S3-3,4: Auxiliary heater choice (OFF: indicates 0, ON indicates 1, the factory default is 00).

Address dial code



0~3 separately stands for address 0~3, means 0~3 set units. When dial the dial switch to 4 or more for the unit RSJ-420/SZN1-H, and when dial the dial switch to 2 or more for the unit RSJ-800/SZN1-H, then it will invalid.

Each module of water heat pump has the electric control function. Set the host unit through the address dial code on electric control board. Stipulate the unit with address dial code 0# as the host unit. Only after setting the host unit , the function of direct communication with wired controller and other function can be activated.

3. Trial run

When use the wired controller to operate the water heater, please check as the following list:

No.	Item	Remark
1	Whether the unit is installed firmly.	
2	Whether the air inlet and outlet of the unit has obstacle.	
3	Whether the dial codes of each unit has dial to the correct position.	
4	Whether check the leakage of the water system.	
5	Whether the water system is clean.	

6	Whether the filter is clean.	
7	Whether the water drain is smoothly.	
8	Whether complete the heat insulation of the water pipe.	
9	Whether vacuum the pipeline of water side.	
10	Whether all the valves in the water side pipeline are under correct status.	
11	Whether the water flow switch work well.	
12	Whether the grounding correctly.	
13	Whether the power voltage meets the requirements of the unit.	
14	Whether the leakage protector can work effectively.	

When use the wired controller to operate the water heater, please check as the following listed:

No.	Item	Remark
1	Whether all the buttons of wired controller are normal.	
2	Whether the input voltage of the unit meet the requirements of the unit.	
3	Whether the electronic lock has been unlocked.	
4	Whether the water outlet temperature is normal.	
5	Whether there is any abnormal vibration and noise during operation.	

Notes:

The unit also has one function; it can easily to make the unit enter other modes.

Enter ‘Debugging replenishing’ method: Long press ‘CHECK’ button for 3~20s within 1 minute after power on, then the digital screen will display ‘0’ and be flashed with 2Hz frequency, means enter to the function selection state. Short check, the digital screen will successively display each corresponding number:

No. 4: Capacity testing mode I;

No. 5: Drain water mode;

No. 6: Force cycle pump operating;

No. 8: Force defrosting;

No.10: Capacity testing mode II.

After 5s, the digital pipe will flash with 1Hz frequency; means has already entered the debugging replenishing function.

4. Fault analysis and solutions

Not distribute to malfunction	
Phenomena	Cause
White aerosol or globule is given out. Or make sound of 'hiss' every now and then.	When the unit is defrosting, the sound of the 4-way valve being shifted. Air supply motor stop automatically to defrost.
	At the beginning and the end of the defrost process, sound is given out in motor valve occur.
	During the process or just after have stopped, sound likes water flow occurs, which will be amplified at the first 2~3 minutes, this is caused by process of refrigerant current or water discharge at dehumidifying operation.
	Slight 'hiss' is caused by heat exchanger as temperature changes. The sound gives out, because of heat expands and cold contracts of heat exchanger.
	During the beginning or just after have stopped, sound likes clock occur, which is caused by electric expanding valve operation.
Water outlet temperature fluctuation.	Because of different water inlet pressure, under special working condition that may show up water outlet temperature fluctuation, which is a normal phenomenon, and will not affect the actual use; appropriately adjust the water pressure can improve this phenomenon.
Water outlet temperature cannot reach the setting temperature.	Under low temperature condition, for the purpose of protecting the unit, the water outlet temperature may not reach the higher setting temperature, which is a normal phenomenon.
The terminal circulating water temperature lower than the setting temperature	For purpose of protecting the unit, the terminal circulating water temperature cannot reach 60ºC, which is a phenomenon, and will not affect the actual use.
Re-start after the unit stop, after 3 minutes then can be operated.	Compressor delay protection. It is a normal phenomenon.
The fan operates low speed or only operates one fan.	When the ambient temperature is high, for protecting the unit then the fan will shift to low speed or only operate one fan.
Heat exchanger defrosting.	If operated in winter, for the heat exchanger surface temperature is lower than the ambient one, and the heat exchanger surface temperature is lower than 0ºC, the surface will be frosted, which will affect the heat exchanging effect, so the unit should be periodically defrosting.
The fan cannot operate.	During defrosting, the fan will not be operated.

Need to check again	
Phenomena	Cause
Stop operation or drive up automatically	Detect the timer whether be given wrong operation.
	Detect anti-freezing mode is opened.
No operation	Whether the power is cut.
	Whether the manual power supply switch is off.
	Whether the fuse is broken.
	Whether the protection device works. (Operation lamp is lightened.)
	Whether it is the time set. (Operation lamp is lightened.)

Compressor is unable to drive	
Possible reason	Detect and settle measure
1. Power errors.	Connected with wrong phase sequence.
2. Wire connection is loosening.	Check and fasten again.
3. Relay or fuse errors.	Check and repair.
4. Compressor errors.	Change the compressor.

Fan has loud noise	
Possible reason	Detect and settle measure
1. Fixing screw of the fan is loosening.	Re-fasten the fixing screw of the fan.
2. Fan blade touched the cover shell or screen	Check and adjust.
3. The fan operated unsteadily.	Change the fan.

Abnormal noise given out from compressor	
Possible reason	Detect and settle measure
1. Liquid refrigerant flows into compressor and produces liquid strikes.	Check the EXV, and whether the temperature sensor loosen and repair.

2. Damages of the compressor inner components.	Change the compressor.

Water pump not operated or abnormal operated	
Possible reason	Detect and settle measure
1. Power errors.	Check and repair.
2. Relay error.	Change the relay.
3. There is gas in the water pipe.	Drain off the gas.

Compressor ON and OFF frequently	
Possible reason	Detect and settle measure
1. Bad circulation of water system.	Blocked the water system or has air in the water system. Check the water pump, valves, pipeline, and clean the water filter or drain off the air.
2. Low load.	Adjust the load or add stored energy device.

Compressor operated with no heating	
Possible reason	Detect and settle measure
1. Refrigerant leakage.	Check, repair and replenish the refrigerant.
2. Compressor error.	Change the compressor.

No obvious heating effect of the unit	
Possible reason	Detect and settle measure
1. Bad thermal insulation of water system.	Enlarge the thermal insulation of the system.
2. Bad heat exchanging of evaporator.	Check the air inlet and outlet whether are normal and clean the evaporator.
3. Lack of refrigerant.	Check whether has refrigerant leakage.
4. The water side heat exchanger has blocked.	Clean or change the heat exchanger.

In case the unit runs under abnormal condition, failure protection code will display on both digital tube on PCB board and wired controller. The indicator on the wired controller will flash with 5Hz. The display codes are shown in the following table:

No.	Error code	Reason
1	E1	Power phase sequence error.
2	E2	Communication error of host unit and wired controller, main unit and slave unit.
3	E3	Error of water outlet temperature sensor (T1).
4	E4	Error of water temperature sensor in the water tank (only host unit displays) (T5).
5	E5	Error of air heat-exchanger temperature sensor (T3).
6	E6	Error of outdoor ambient temperature sensor (T4)
7	E7	Error of E-heater pipe temperature sensor (T6, reserved).
8	E8	Error of circulating water flow detector (Only host unit displays).
9	E9	Error of suction temperature sensor (Th).
10	Ed	Error of water inlet temperature sensor (T7).
11	EA	Error of discharge temperature sensor (Tp).
12	EE	Error of EEprom
13	P0	System low pressure protection
14	P1	System high pressure protection
15	P2	Compressor current of system is overload (Protection)
16	P4	Protection for discharge Hi-temperature (Tp≥115ºC)
17	P7	Host unit is not matched with wired controller, host unit will display P7, and wired controller will display E2.
18	P8	Water outlet Hi-temperature protection. (≥68ºC, and keep 2 minutes)
19	C1	Compressor current is less than 2A during operation.
20	db	Anti-freezing function
21	d8	ON/OFF signal is ON close status.
22	Hb	Address conflict error.

- ✧ Continuous come out any error for 4 times within 2 hours, then the unit will stop running. At the same time, it will be counted as once. After 1 hour, the unit will be automatically running again.
- ✧ If the stop frequency reaches 5 times, the protection code will be displayed and the unit should be repowered on again.
- ✧ When the unit satisfies the unit stopping conditions, the counting of stop frequency will be

cleaned. By the way, also it will be cleaned when the unit has not any protection in 10 hours. Otherwise, if switch off the unit by wired controller, the counting of stop frequency will not be cleaned.

✧ The latest 3 protections or error code through spot check. Through the spot check button on PCB board to observe the operating status of unit. Convenient for maintaining by engineering technicians. Press check button once, it will first display check sequence number (No. and dot), then on second later display the parameter.

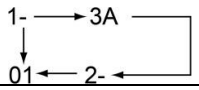
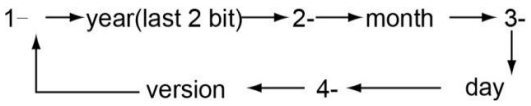
➢ Normal display contents:

1. Under standby and no error and protection situation, the main unit will display T5, the slave unit will display the address of this unit.

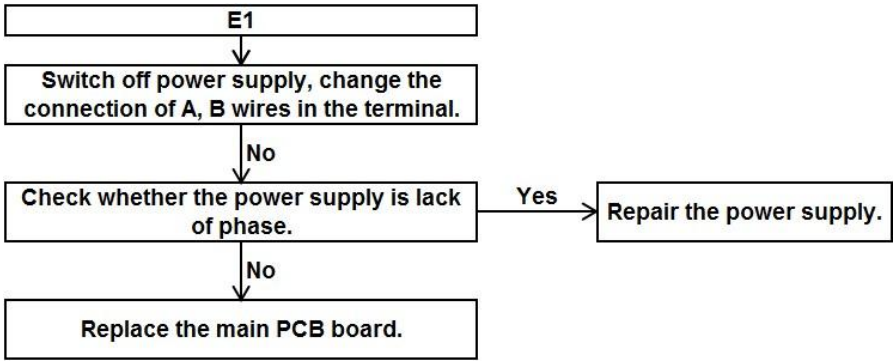
2. Under the main unit with T5 situation, display T5 temperature; if without T5 or T5 error, the unit will display error; the slave unit will display the T1 temperature.

➢ Detail spot check display contents as following:

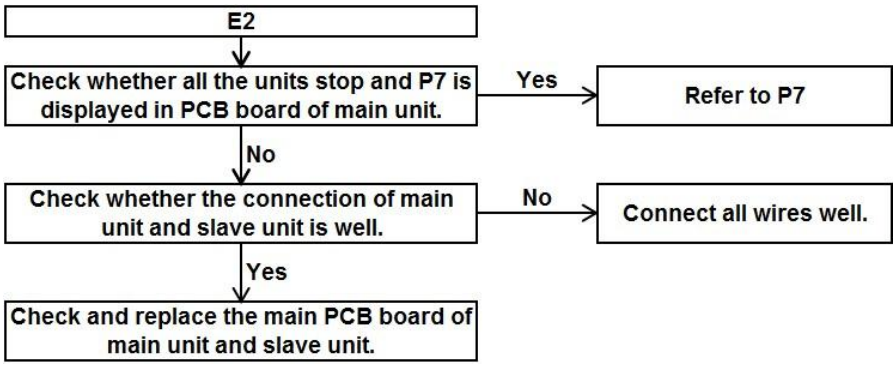
No.	Display	Specification
1	Water outlet temperature	T1 temperature value
2	Coil temperature	T3 temperature value
3	Ambient temperature	T4 temperature value
4	Water tank temperature	T5 temperature value
5	Refrigerant heating pipe temperature	T6 temperature value
6	Refrigerant heating pipe temperature	T6b temperature value
7	Water inlet temperature	T7 temperature value
8	Discharge temperature	Tp temperature value
9	Suction temperature	Th temperature value
10	Water outlet setting temperature	Ts temperature value
11	Operating temperature of circulating heating water	Tr temperature value
12	Compressor A current	IA current valve
13	Compressor B current	IB current valve (this unit display --)
14	EXV opening	EXV opening
15	Warm water valve opening	Warm water valve opening

16	Water level height	Host unit: 0~4; 0<S4, S4≤1<S3, S3≤2<S2, S2≤3<S1, 4≥S1. Slave: --.
17	Operating mode	Standby, stop: 0; Directly heat type: 1; Circulation type: 2; Defrosting: dF; Anti-freezing: db; Remote ON/OFF signal closure: d8.
18	Fan speed	F0: No fan; F1: Low; F2: Medium; F3: High.
19	Model code	Direct and circulate heating for closed tank with 50Hz model: 3A01. 
20	Protection frequency	XY: X for stop frequency because of 4 protections within 2 hours. Y for protection frequency within 2 hours.
21	Protection, error	Display the last third protection, error code.
22	Protection, error	Display the last second protection, error code.
23	Protection error	Display the last protection, error code.
24	The number of slave units	Host unit display XY, slaves displays --; X for amount of total units, Y for amount of operating units
25	Program version	
26	nd	End

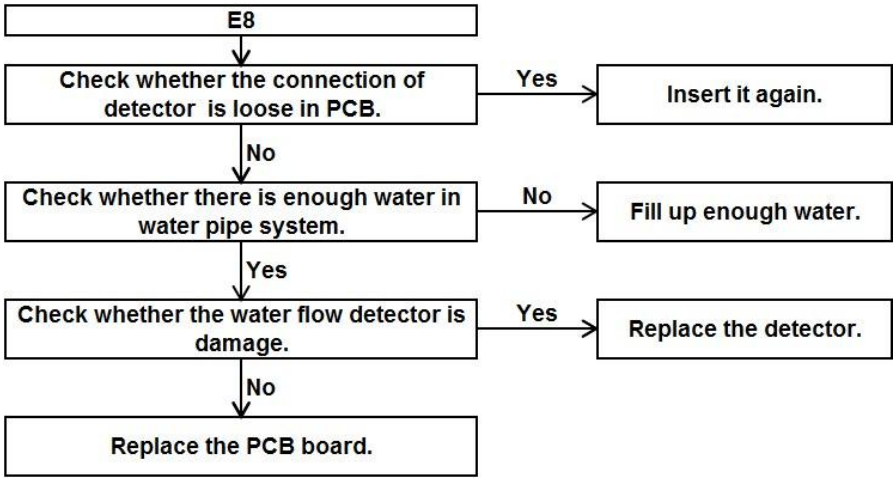
E1: Power phase sequence error



E2: Communication error of host unit and wired controller, main unit and slave unit.



E8: Error of circulating water flow detector (Only host unit displays).



E3: Error of water outlet temperature sensor (T1).

E4: Error of water temperature sensor in the water tank (only host unit displays) (T5).

E5: Error of air heat-exchanger temperature sensor (T3).

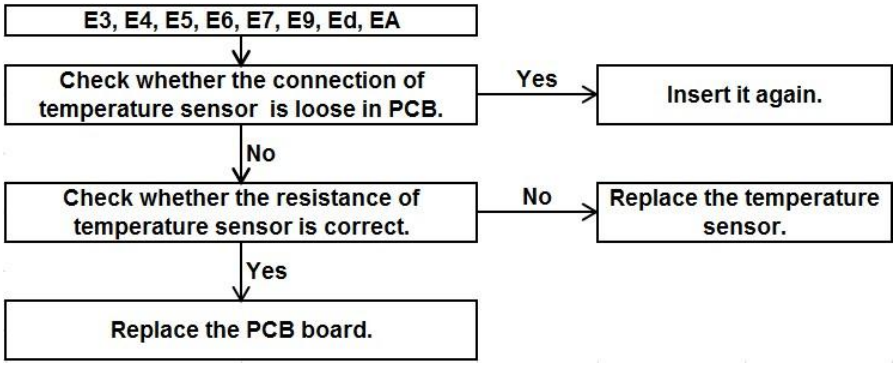
E6: Error of outdoor ambient temperature sensor (T4)

E7: Error of E-heater pipe temperature sensor (T6, reserved).

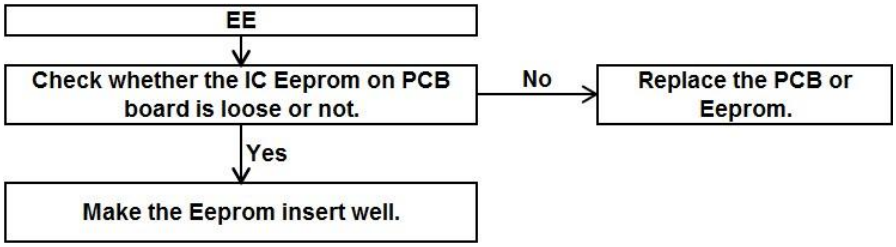
E9: Error of suction temperature sensor (Th).

Ed: Error of water inlet temperature sensor (T7).

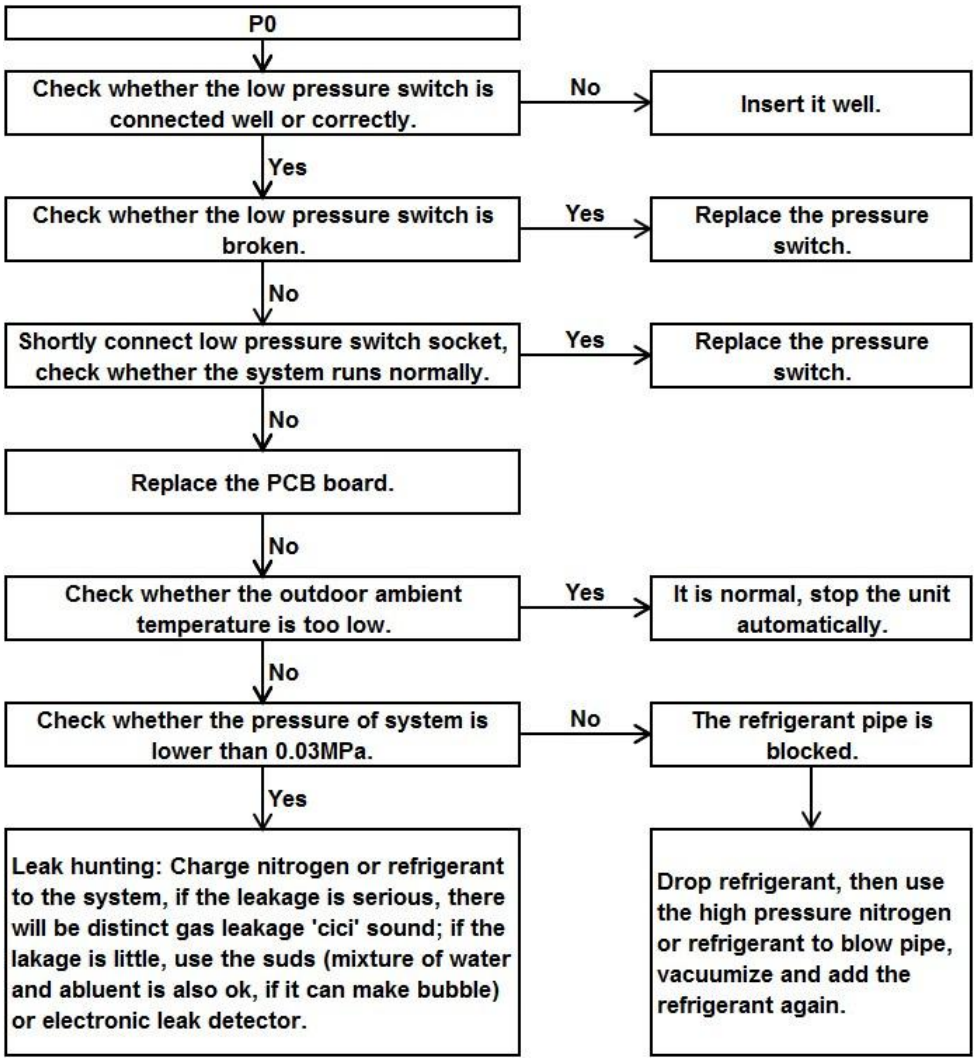
EA: Error of discharge temperature sensor (Tp).



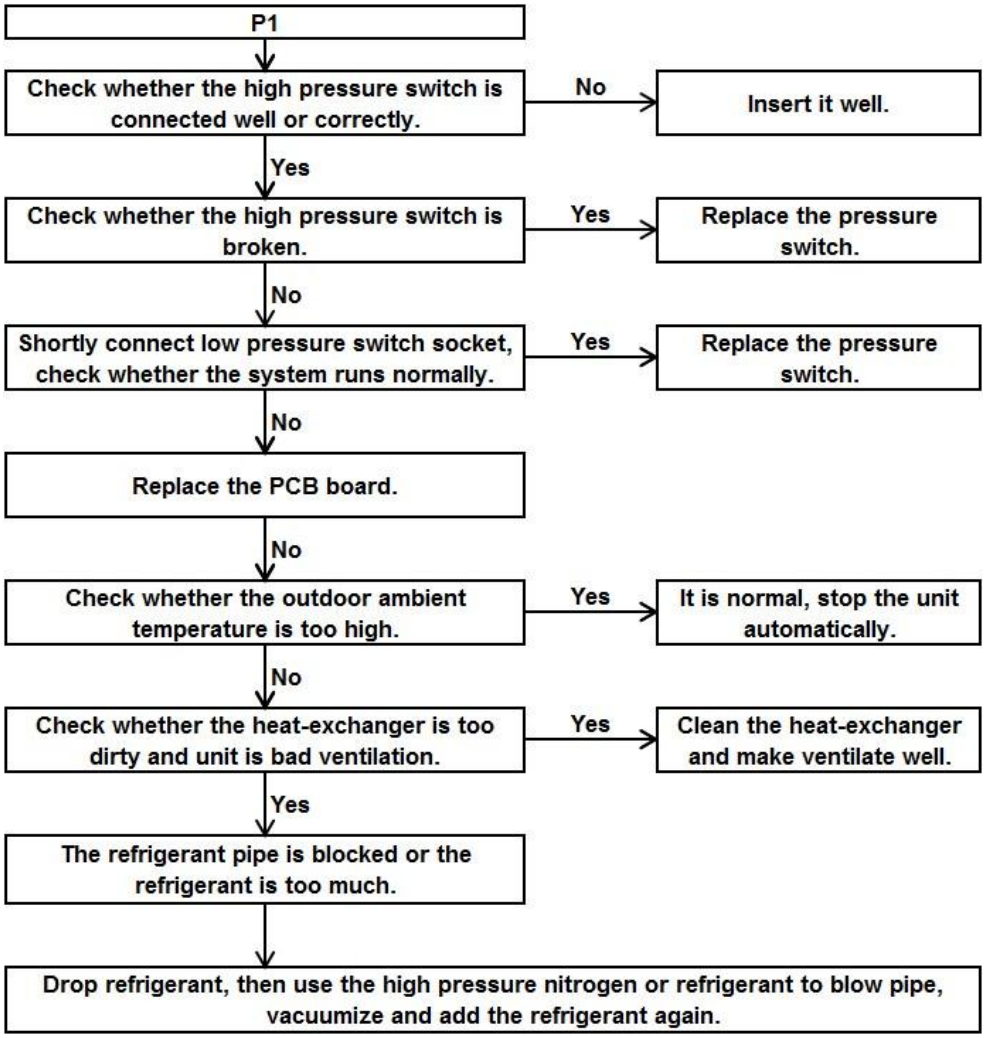
EE: Error of EEprom



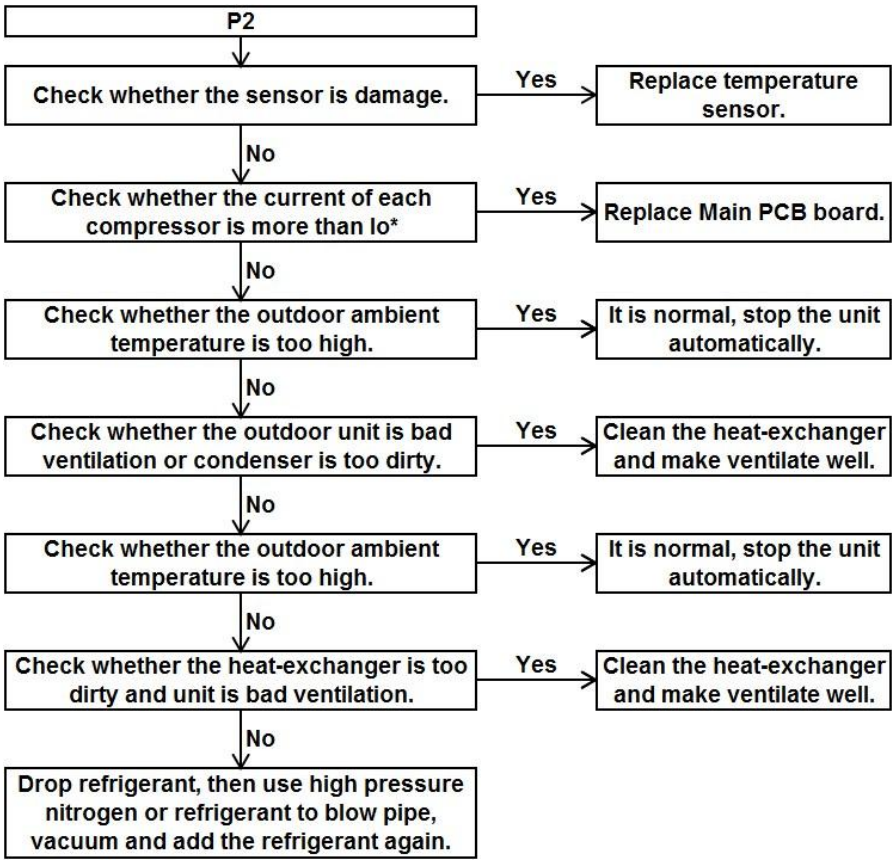
P0: System low pressure protection



P1: System high pressure protection

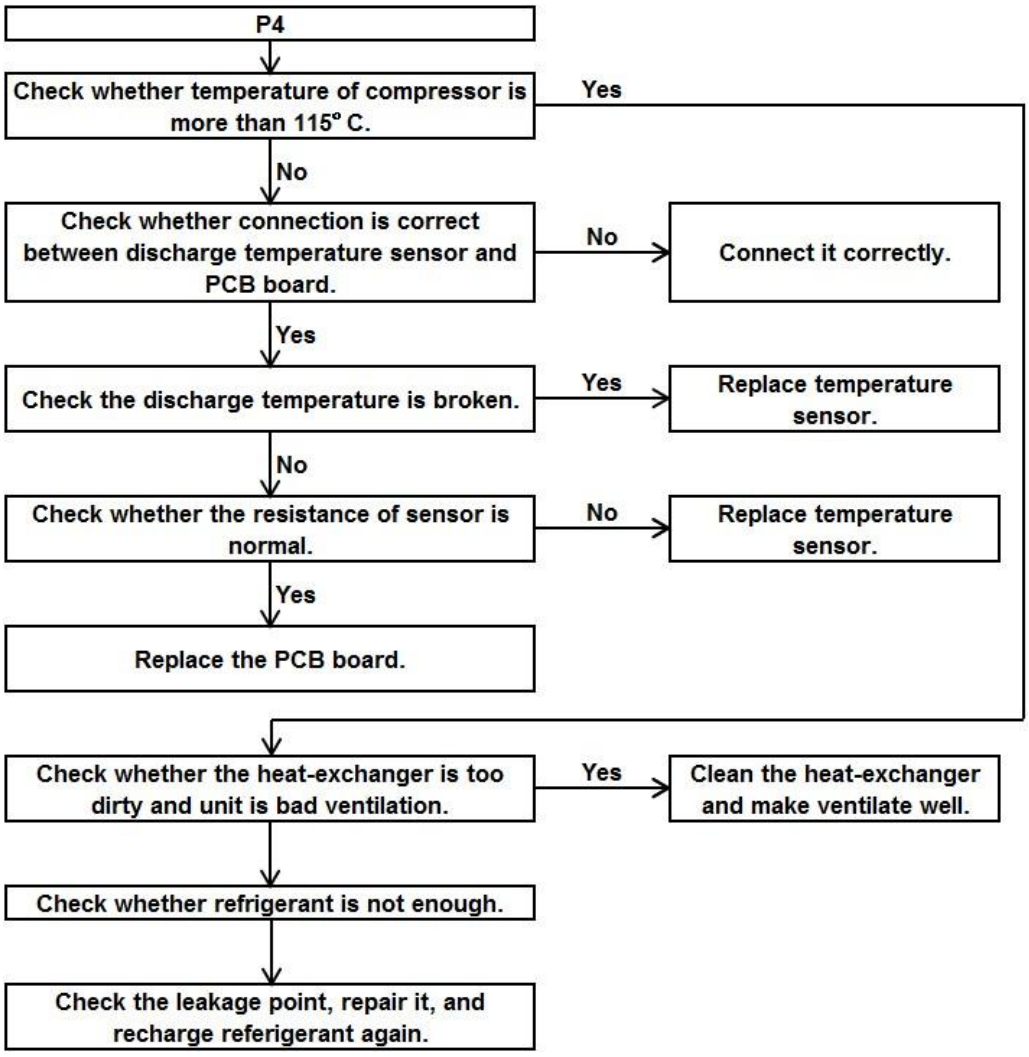


P2: Compressor current of system is overload

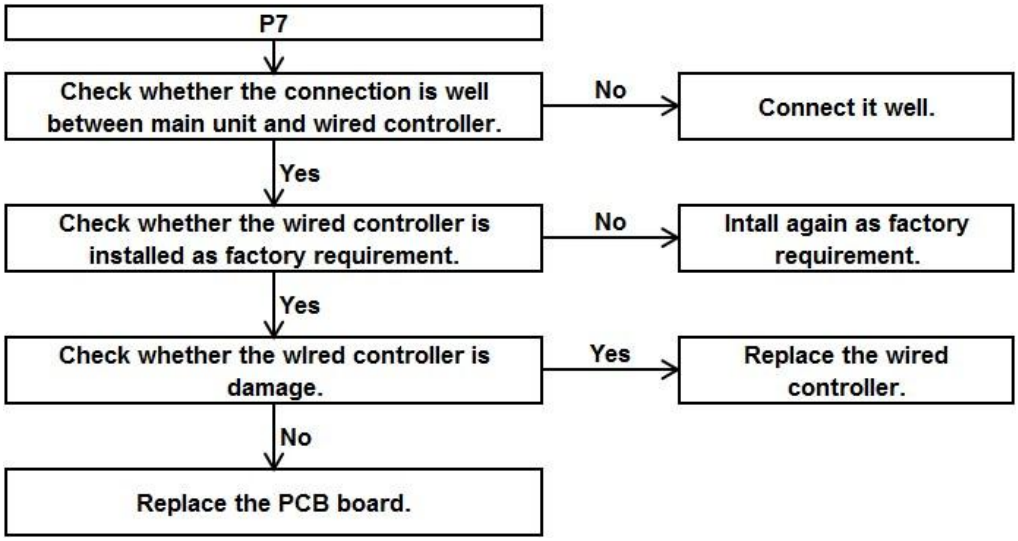


Notes: the value of Io is 30A.

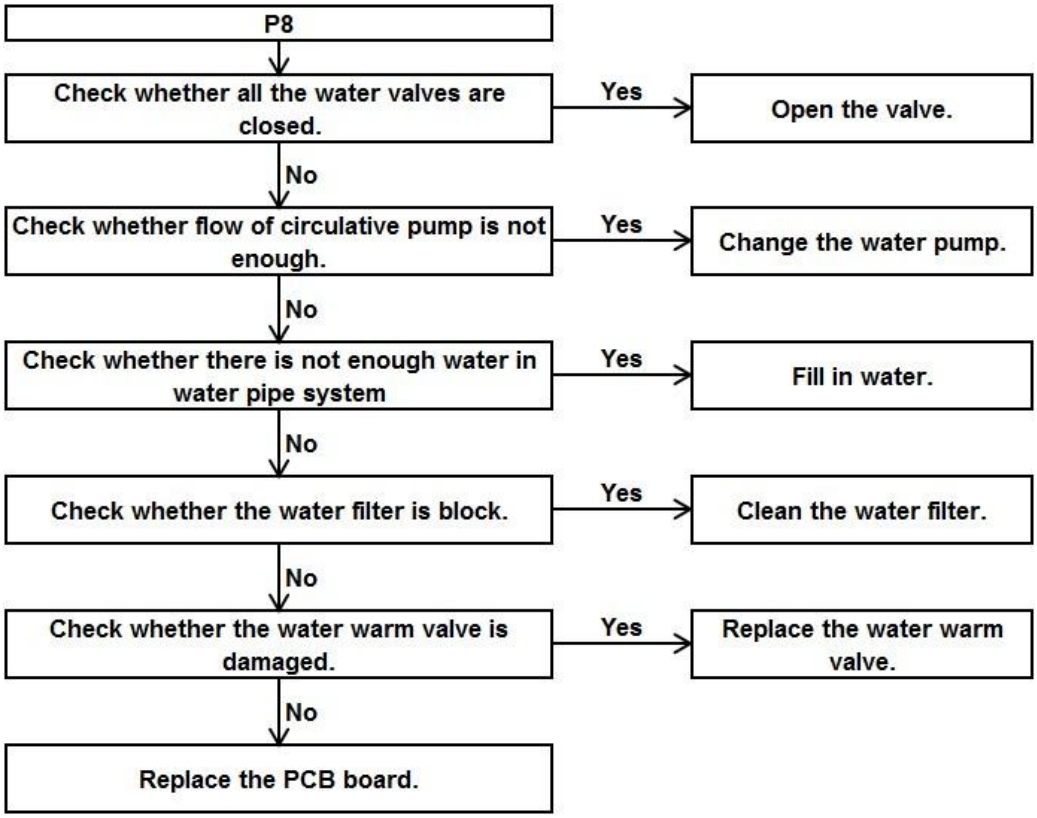
P4: Protection for discharge Hi-temperature (Tp≥115ºC)



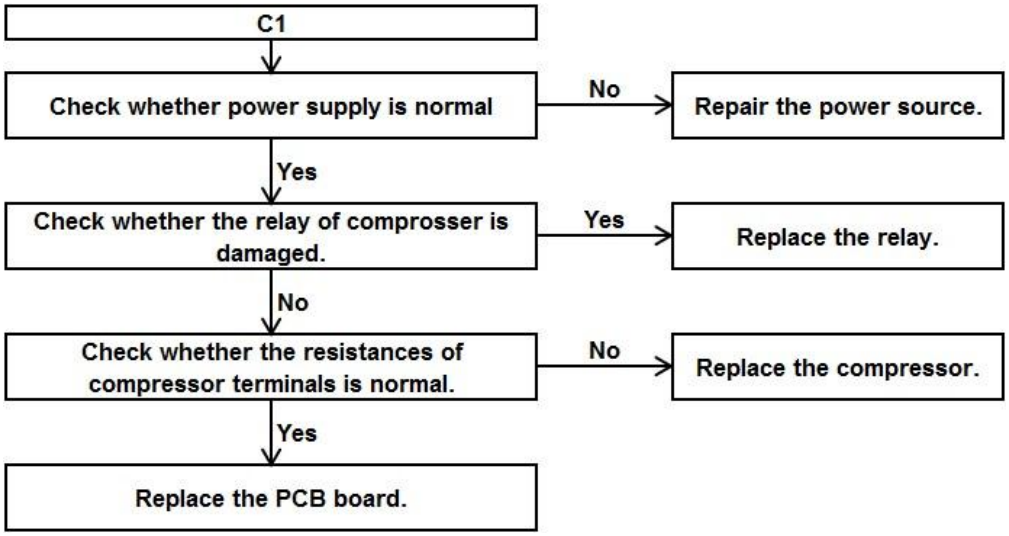
P7: Host unit is not matched with wired controller, host unit will display P7, and wired controller will display E2. (Power supply of wired controller is 10VAC, if the power supply is not stable, the code of protection or error will also be displayed.)



P8: Water outlet Hi-temperature protection. (≥68ºC, and keep 2 minutes)



C1: Compressor current is less than 2A during operation



5. Maintenance

- ✧ All the safety protection devices in the unit will be set before leaving the factory, the user can not adjust or remove them, in case to damage the unit.
- ✧ First switch on the unit or switch off the power for a long-term stop (More than 1 day) and then re-power on, it should prior to connect to the supply from the compressor operation.
- ✧ Please do not place other obstacles on the unit, it should keep dry and clean and well ventilated around the unit. When the heat exchanger has dust, it should be immediately cleaned, in case to affect the unit capacity or cause the unit stops for the protection.
- ✧ Periodically clean the filter in the water system, for avoiding blocking and damage the unit or cause unit protection, and it should ofter check the water replenishing system devices whether are normal.
- ✧ When the ambient temperature is below zero, it is forbidden to cut off the power, otherwise, the anti-freezing function will ineffective.
- ✧ For long-time not use the unit, drain off the water in the unit and pipeline system, and open the water plug on the water tank to drain off the water, incase the unit been frozen.
- ✧ Please do not frequentyly on and off the unit, please do not manual cut-off the manual adjust valve during the unit is operating.

- ✧ Often check the working situation of each part in the unit, and check the inner pipe connectors of the unit and whether the high and low pressure detecition ports of the refrigerant has oil dirty, to make sure the unit has no refrigerant leakage.
- ✧ Switch check for the electricity leakage protector.
- ✧ The leakage flow protector of electric control box operates a period (Generally a month), should be in the closed power on state to press the test button, check the leakage flow protector is normal or not (each time press the button, the leakage flow protector should be broken off once), if it is not normal and check the cause of the accident when be found, allowing once power on, and then, if no operation, it should find out the reason of the fault, and if necessary, do the movement characteristic test; if it is confirmed by the check for the leakage flow protector itself fails, it should be timely replacement or repaired.
- ✧ After running for a long time, the heat transfer surface of water side heat exchanger will deposit calcium carbonate or other minerals, when these substances on the heat transfer surface scale is large, then can affect the heat transfer performance and lead to increased power consumption, high air exhaust pressure (or suction pressure is too low). It can use the organic acids such as formic acid, citric acid, acetic acid detergent for cleaning. Do not use detergents containing fluoride chlorate, due to the material of the water side heat exchanger is stainless steel or copper, which is easily to be corrosive and cause refrigerant leakage.
- ✧ Clean the water side heat exchanger should be conducted by professionals.
- ✧ After using cleaning agent, use the clean water to clean the water pipe and heat exchanger, in case of the waterproof system will be corrosive or has cleaning scale after adsorption.
- ✧ Under using the clean agents, it should accord to the dirt deposition to adjust the detergent concentration, cleaning time and temperature.
- ✧ It needs to neutralize the waste liquid after cleaning; the waste liquid processing should contact the relative company.
- ✧ The cleanser have corrosion effect for the eyes, skin, nasalmucosa etc., so the protection device must be used in the cleaning process (such as protective glasses, protective gloves, protective mask, protective shoes, etc.) in order to prevent the inhalation or contact with the cleaner.

PH value	Total hardness	Electrical conductivity	Sulphate ion
6.5-8.0	<50ppm	<200μs/cm (25°C)	<50ppm
Silicon	Iron content	Sulfide ion	Chloride ion
<30ppm	<0.3ppm	None	<50ppm
Ammonia ion	Sodium ion	Calcium ion	\
None	None	<50ppm	\

Part. 4 Controller

1. Wired Controller (Standard)

1.1 Wired controller specifications

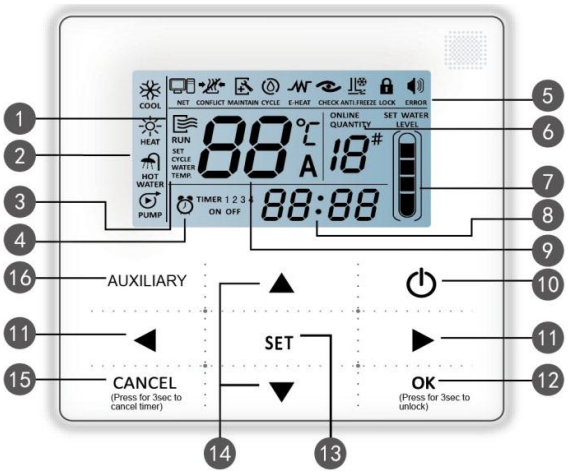
Model	KJR-51/BMKE-A
Input Voltage	10.0V
Operating environment temperature	-10ºC~+43ºC
Operating RH	RH 40%~RH 90%

Performance Features

1. Touch key operation.
2. LCD displays operation parameters.
3. Multiple timers.
4. Real-time clock (battery life: 5~8 years).

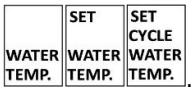
1.2 Introduction of function buttons on the wired controller

The wired controller, KJR-51/BMKE-A, is universal controller, and some functions as reserved are not available for this unit.



1. Operation icon (RUN): Indicate unit ON and OFF status; the icon displays when the unit is on and does not display when the unit is off.

2. Mode area: Indicate the main unit operating mode;

3. Setting temperature: 3 statuses can be displayed - 

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4. Timing ON/OFF indication (

): Indicate the timing information.

5. Function icon:

- 

: Display when water heater system connects to Modbus network;
- 

: Displays when other heat source is provided to the system.
- 

: Displays when water heater maintenance is needed. Press and hold '**AUXILIARY**' key for 3 seconds to cancel the icon and timing will restart until next maintenance.
- 

: Displays when cycle heating function is on.
- 

: Displays when electric auxiliary heating function is on.
- 

: Displays when check function is on.
- 

: Displays when ambient temperature is below 2^{o}C which means the main unit need anti-freezing action.
- 

: Displays when no key operation for 2 minutes and all keys are locked. Press and hold '**OK**' key for 3 seconds to unlock.
- 

: Displays when error or protection occurs and means the unit need maintenance by professionals.

6. Online quantity indication: Under normal status display the quantity of units connected to the wired controller; under check status display the device serial number.

7. Water level indication: Under normal status displays water level; under water level setting status displays setting value.

8. Clock: Under normal status displays clock; under timing setting displays the setting timing.

9. Water temperature: Under normal status display water temperature; under water

temperature setting status displays the setting value; under cycle heating water temperature setting status displays the setting value; under check status displays check parameter.

10. ON/OFF key (⏻): Turn on and turn off functions.

11. Right and left key (◄ and ►): Press these keys to check setting water temperature, setting cycle heating water temperature and setting water level under main page; press right key to shift to the next step setting under timing setting status. Press these keys to turn over the unit parameter information under check status.

12. OK key: Press this key to confirm settings. Press and hold this key for 3 seconds to unlock under locking status.

13. Setting key: Setting water temperature, timing and mode, etc. Press and hold this key for 3 seconds to enter check status.

14. Add and Reduce key (▲ and ▼): Move up or move down values of temperature, timing, water level, etc. Turn over #0~#15 units under check status.

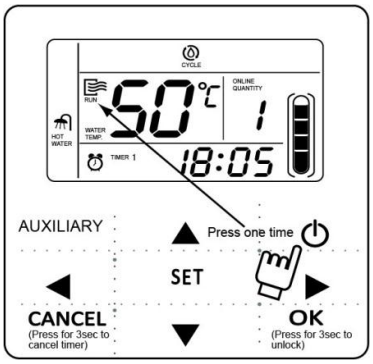
15. Cancel key: Press this key to cancel parameter setting under setting status; press and hold this key for 3 seconds to cancel timing when timing is valid.

16. Auxiliary key: Power on the cycle heating function, electric auxiliary heating function or water pump function.

1.3 Operation instruction

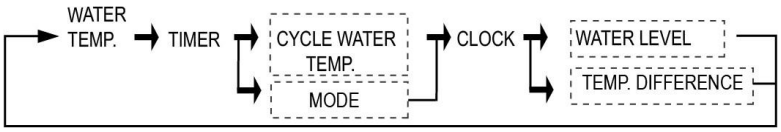
1.3.1 Turn on and turn off the main unit

- Press the ON/OFF key (⏻) to control on and off status of the main unit.
- Under off status, press the ON/OFF key (⏻) to run the main unit, at that time the LCD of wired controller will display the operation icon (RUN). The main unit will running as the current setting of the wired controller.
- Under on status, press the ON/OFF key (⏻) to turn off the main unit and the operation icon (RUN) on the LCD will disappear.



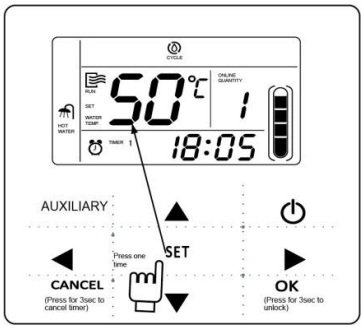
1.3.2 Setting operating modes and parameters

- Press **SET** key to enter the operation mode and parameters setting. The setting contents will change as the following order each time the key is pressed.



The setting options in the dotted line frame are not general setting. The wired controller automatically judges the needed setting according to the model of main unit.

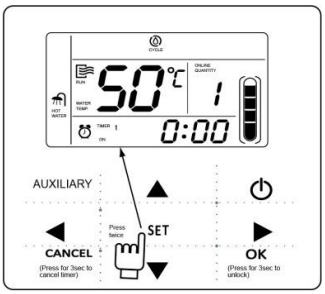
- Setting water temperature
  - ✓ Press the ▲ or ▼ button to adjust the water temperature after the controller is powered on. Or press **SET** key once when '**SET WATER TEMP**' is displayed on the LCD and then press the ▲ or ▼ button to adjust water temperature.
  - ✓ To check water temperature setting, press ◄ or ► key under the main page (the page displayed after the controller is powered on).



- Timing setting

  - ✓ 3 timing periods can be set on the wired controller; Timer 1, Timer 2, Timer 3. These 3 timers can control the main unit to be turned on and off 3 times at most during a day.

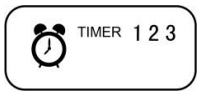
  - ✓ Press **SET** key under man page twice to enter timing setting. Then the LCD will display as the following:



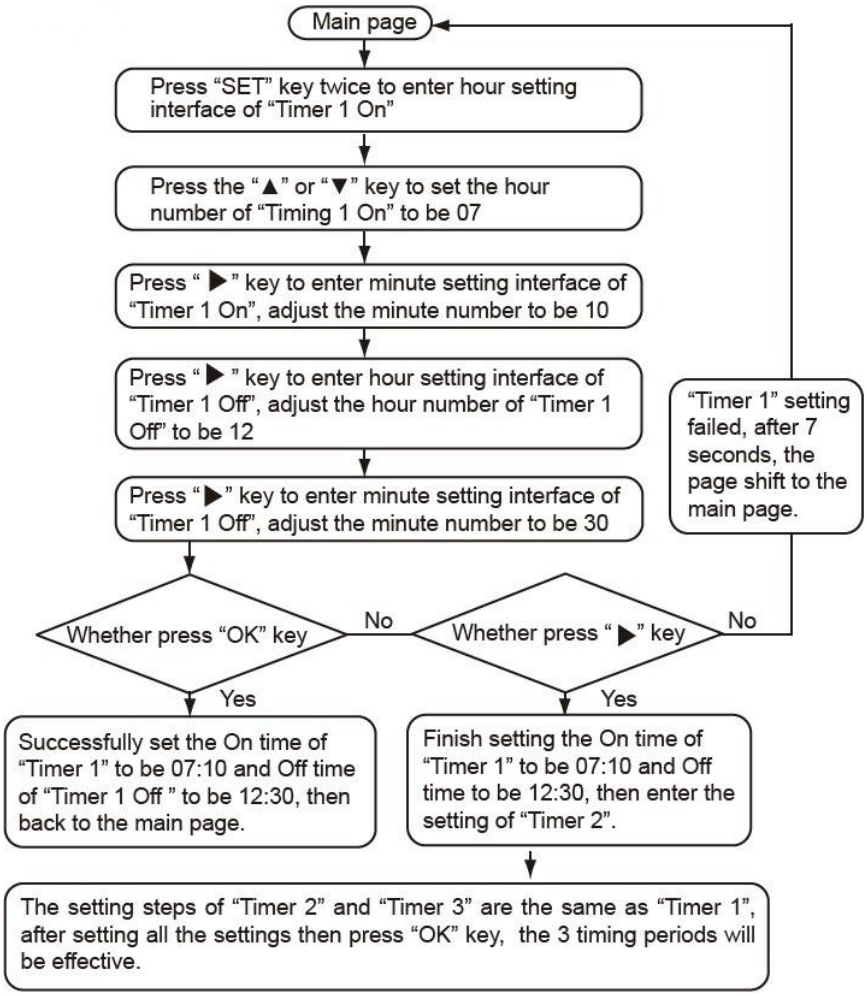
  - ✓ At this time the hour of the clock will flash, which means the current setting is the hour of Timer 1 on, press the ▲ or ▼ to adjust, press ► key when finished, and then the minute of the clock will flash, which means the current setting is the minute of Timer 1 on, press the ▲ or ▼ to adjust, press ► key when finished, the LCD will display as the following:

  - ✓ At this time the hour of the clock will flash, which means the current setting is the hour of Timer 1 off, press the ▲ or ▼ to adjust, press ► key when finished, and then the minute of the clock will flash, which means the current setting is the minute of Time 1 off, press the ▲ or ▼ to adjust, press ► key when finished, the LCD will display as the following:

✓ At this time the hour of the clock will flash, it means the current setting is the hour of the Timer 2 on. And the follow setting method will be the same as the Timer 1. Similarly, the setting of Timing 3 is the same as this method. After setting is finished, press **OK** key or wait for 7 seconds to confirm the setting, and the LCD will display the effective timing information, as the following display:



✓ Example of timing setting:

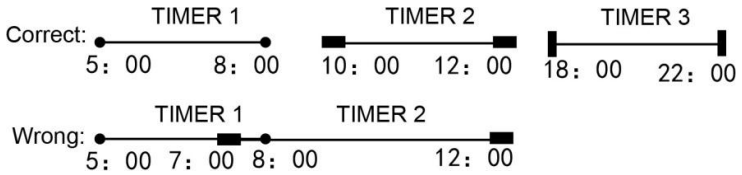


During any period of timing setting to press **OK** key, the timing periods which have been set will be effective (only if the on and off of one timing period have been set, the setting is effective).

Check timing information: to check the timing which has been set, press ◄ or ► key under main page, the on and off time of Timer 1, Timer 2 and Timer 3 will be displayed in turns.

Cancel timing: press and hold **CANCEL** key for 3 seconds, then all the effective timing periods will be cancelled.

✓ To avoid timing error, each period of timing should not be crossed, e.g.:

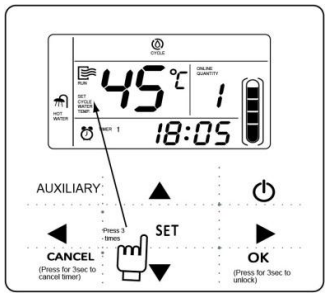


➢ Set the cycle heating water temperature (Reserved)

✓ Continuous press **SET** key 3 times to enter cycle heating water temperature setting. The LCD will display '**SET CYCLE WATER TEMP.**' and temperature value will flash.

✓ Press the ▲ or ▼ key to adjust the temperature value, press **OK** key or wait for 7 seconds to confirm. During setting process pressing **CANCEL** key to exit without saving.

✓ Check cycle water temperature value setting: press ◄ or ► key under main page to check the value.

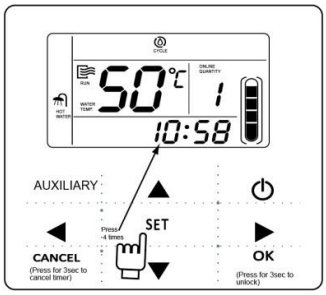


➢ Set clock

Press the **SET** key 4 times to enter clock setting. The hour of the clock will flash, which means the current setting is the hour of the clock, press the ▲ or ▼ key to adjust, press

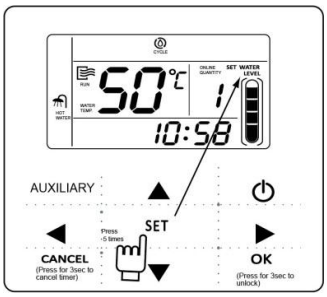
► key when finished, and then the minute of the clock will flash, it means the current setting is the minute of the clock, press the ▲ or ▼ key to adjust, press **OK** key when finished or wait for 7 seconds to confirm. During the setting process press the **CANCEL** key to exit without saving.

Setting the clock should be correct, otherwise cannot get the correct timing on and timing off.



- Set water level (Reserved)

Press the SET key 5 times to enter the water level setting. Press the ▲ or ▼ key to adjust the water level. Press OK key when finished or wait for 7 seconds to confirm. During the setting process, press the CANCEL key to exit without saving. The setting value is 50%, 75% or 100%. Press the ◄ or ► key to check the water level which has been set under main page.

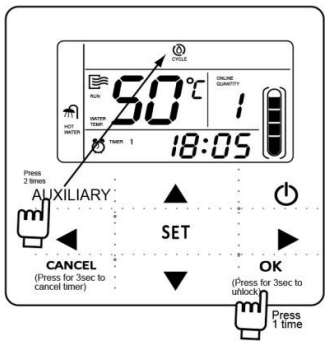


1.3.3 Auxiliary operation

- Cycle heating (Reserved）

Cycle heating function makes the direct heating water heater to run the cycle heating function.

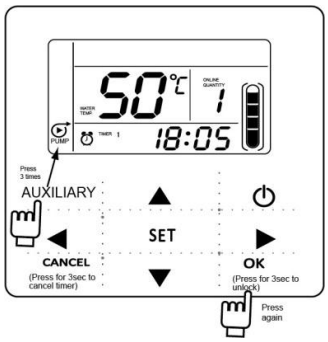
Operation method: press **AUXILIARY** key twice to enter this function. The CYCLE icon will flash, press **OK** key to confirm. The '**CYCLE**' icon will be on if the cycle heating running requirement is fulfilled and will be off if not fulfilled.



- Water pump (reserved for future use.)

  This function is used to run the main water pump in the device installing and debugging.

  Operation method: Press **AUXILIARY** key 3 times to enter this function. The PUMP icon will flash and then press **OK** key to confirm. The '**PUMP**' icon will be on if the pump running requirement is fulfilled and will be off not fulfilled.



- Cancel auxiliary

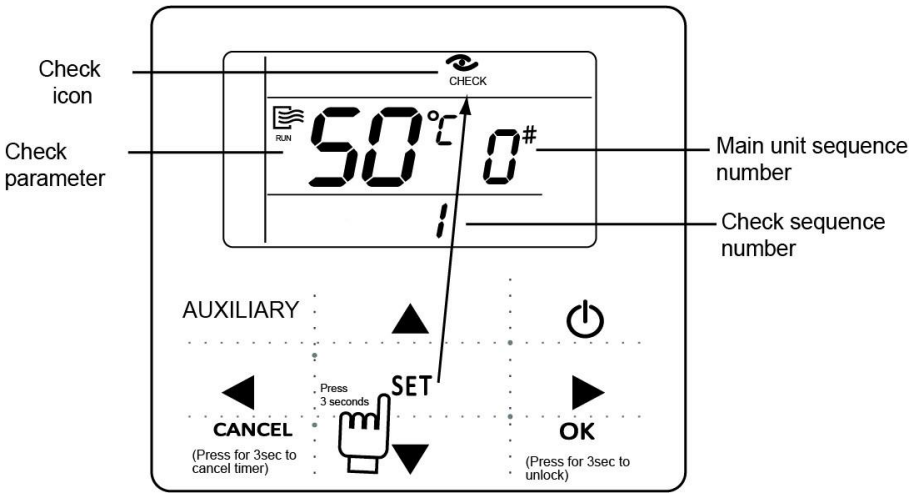
  To stop the auxiliary function, press the **AUXILIARY** key again, and then press CANCEL key when the corresponding icon is flashing. Then the auxiliary function will be cancelled.

1.3.4 Check

- Check function allows the user to check all the operating parameters, error and

protection information of the main unit.

- Enter method: press and hold **SET** key for 3 seconds to enter check interface, as the figure display:



- Press the ▲ or ▼ key to adjust the main unit serial number and check 16 unit's status information from #0~#15. Press ◄ or ► to adjust the check sequence number of one unit and check all the status information of this unit.

- Check content:

Water outlet temperature T1→2, Outdoor pipe temperature T3→3, Outdoor ambient temperature T4→4, Air exhausting temperature→
Compressor A current→6, Compressor B current→7, EXV opening→8, EXV opening
Last one error or protection→10, last second error or protection→
Last third error or protection→12, Outdoor unit model→13, Wired controller setting value→1, Water outlet temperature T1……

1.3.5 Error handling

- When the unit has error or protection, the icon will flash. Press and hold **SET** key for 3 seconds to enter check status and then press the ▲ or ▼ key to check the unit of #0~#15. If the '**ERROR**' icon is on, it means the corresponding unit has error or protection at that time. The last 3 error or protection codes of the unit can be checked. The error icon will disappear if the error or protection is cleared.
- For the error code, refers to trouble shooting part.

1.4 Installation of wired controller

1.4.1 Caution

- Stated below are important safety issues that must be obeyed.
- Confirm there is no abnormal phenomena during test operation after complete, then hand the manual to the user.
- Reinstallation must be performed by professional.
- Do not install the unit in a place vulnerable to leakage of flammable gases. Once flammable gases are leaked and left around the wired controller, fire any occur.
- The wiring should adapt to the wired controller current. Otherwise, electric leakage or heating may occur and result in fire.
- The specified cables shall be applied in the wiring. No external force may be applied to the terminal. Otherwise, wire cut and heating may occur and result in fire.
- Circuit of wired controller is low voltage circuit. Never connect it with a standard 220V or 380V circuit or put it into a same wiring tube with the circuit.
- The shield cable must be connected stable to the ground, or transmission may fail.
- Do not attempt to extend the shield cable by cutting, if it is necessary, use terminal connection block to connect.
- Do not place the wired controller near the lamps, to avoid the signal of the controller to be disturbed.

- Do not install the unit in a place with much oil, steam, sulfide gas. Otherwise, the product may deform and fail.

1.4.2 Preparation before installation:

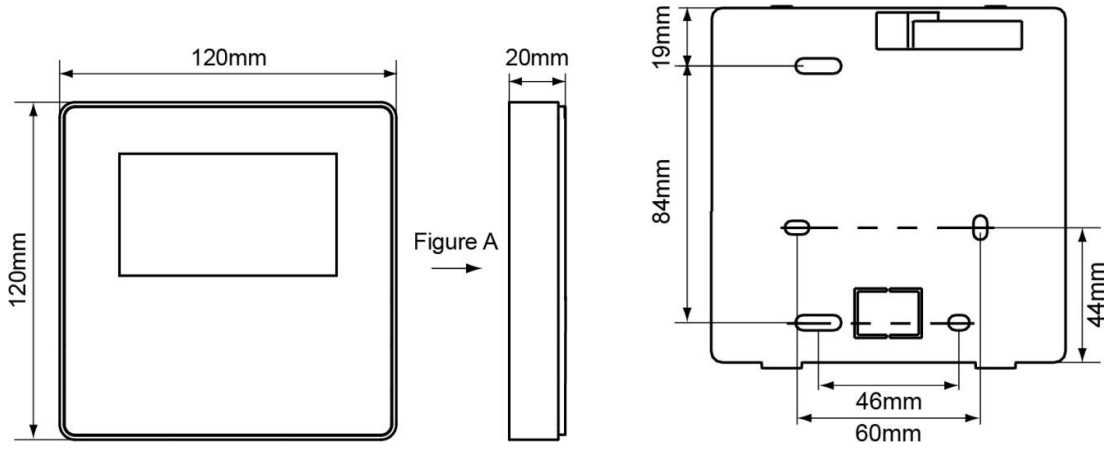
Check whether the following assemblies are complete:

Name	Qty.	Remarks
Wired controller	1	
Cross round head wood mounting screw	3	M4×20, for mounting on the wall.
Cross round head mounting screw	2	M4×25, for mounting on the electric switch box.
Installation manual	1	
Owner's manual	1	
Plastic expansion pipe	3	For mounting on the wall.
Plastic screw bar	2	For fixing on the 86 electrician box.

Prepare the following assemblies on the site:

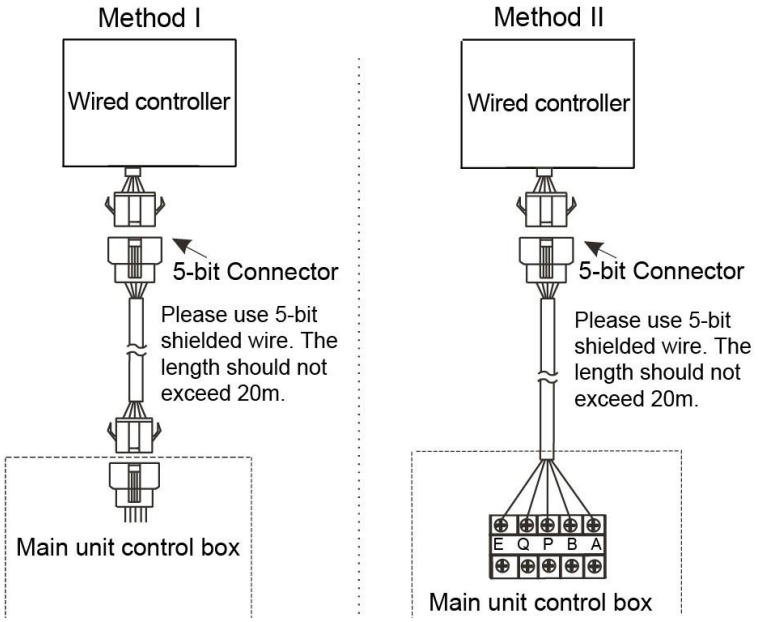
Name	Qty.	Remarks
Wiring tube (insulating sleeve and tightening screw)	1	Embeded into wall.
Electrician box	1	Embeded into wall.

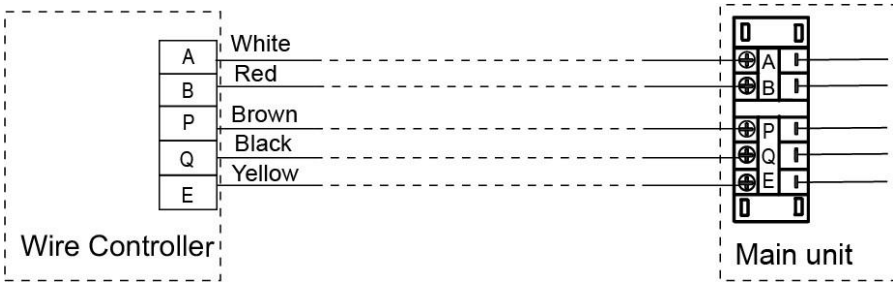
1.4.3 Dimensions



1.4.4 Wire connection

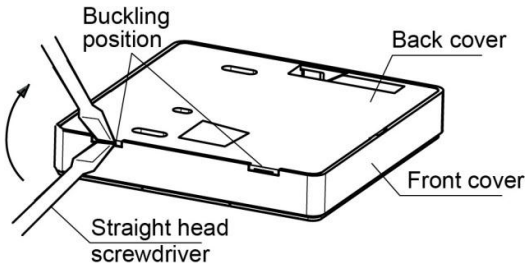
There are two methods to connection between wired controller and main unit.



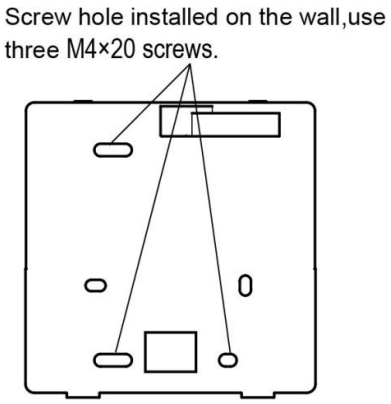


1.4.5 Back cover installation

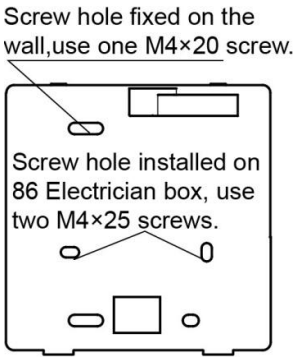
- Use straight head screwdriver to insert into the buckling position in the bottom of wired controller, and spin the screwdriver to take down the back cover. Pay attention to spinning direction, otherwise will damage the back cover.



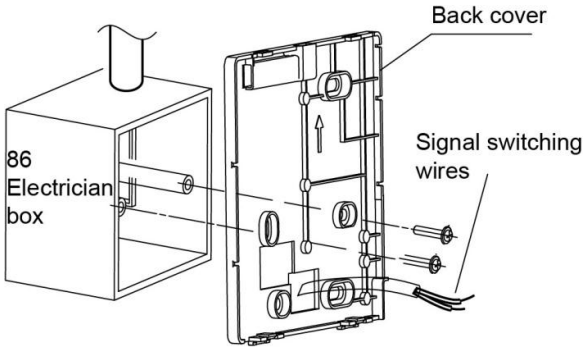
- Use three M4×20 screws to directly install the back cover on the wall.



- Use two M4×25 screws to install the back cover on the 86 electrician box, and use one M4×20 screw for fixing on the wall.



- Adjust the length of two plastic screw bars in the accessory to be standard length from the electrical box screw bar to the wall. Make sure when install the screw bar to the electrical box screw bar, make it as flat as the wall.



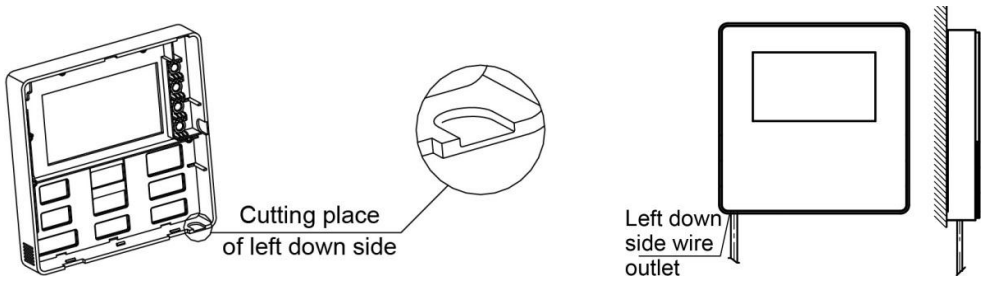
- Use cross head screws to fix the wired controller bottom cover in the electric control box through the screw bar. Make sure the wired controller bottom cover is on the same level after installation, and then install the wired controller back to the bottom cover.

- Over fasten the screw will lead to deformation of back cover.

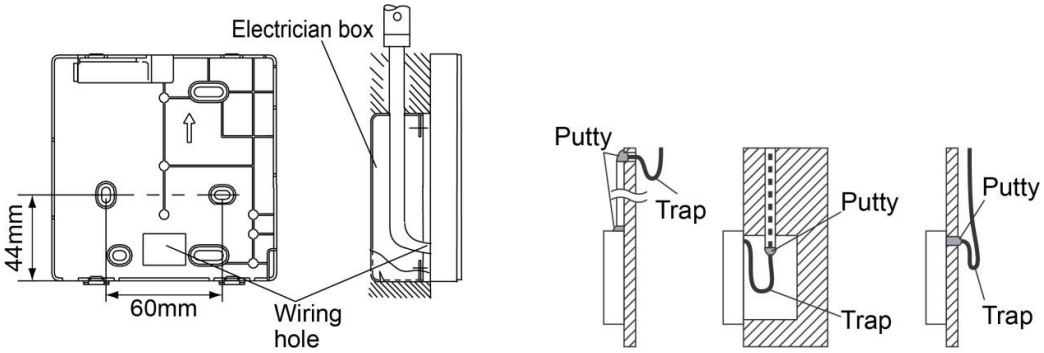
1.4.6 Wire outlet

Avoid the water enter into the wired controller, use trap and putty to seal the connectors of wires during wiring installation.

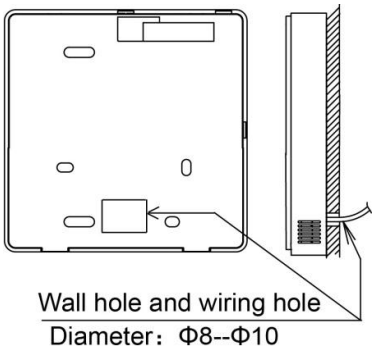
Method 1:



Method 2:

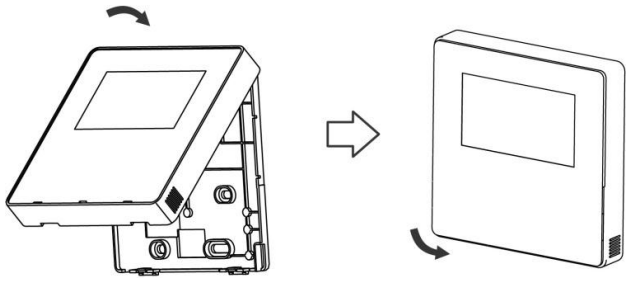


Method 3:



1.4.7 Front cover installation

- After adjusting the front cover and then buckle the front cover. It should avoid to clamping the communication switching wire during installation.



- Correct install the back cover and firmly buckle the front cover and back cover, otherwise will make the front cover drop off.