OWNER'S & INSTALLATION MANUAL

Unit for Air to Water Heat Pump System
(M-Thermal)

Thank you very much for purchasing our product,
Before using your unit , please read this manual carefully and keep it for future reference.

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CHAPTER 1

INDOOR UNIT FOR AIR TO WATER HEAT PUMP SYSTEM(M-THERMAL)

IMPORTANT

These installation instructions are an integral part of the product and must be given to the installer and kept by the user.

The warnings and indications contained in the present handbook must be carefully read and understood as they provide important information relative to handling and operating safety. This handbook must therefore always be kept available for later consultation.

Installation must be carried out in compliance with valid regulations and the manufacturer's instructions by a qualified professional.

An installation error could result in physical injury to persons or animals as well as mechanical damage for which the manufacturer may under no circumstances be held responsible.

After having unpacked the heat pump, the content should be checked for possible damage.

Before connecting the heat pump, ensure that the data is compatible with the true installation conditions and does not exceed the maximum authorised limits for the product in question.

Before beginning any installation, handling or repair work on the heat pump, always isolate the electrical power supply to the unit.

In the case of a fault and/or operating error on the heat pump, the electrical power supply must be isolated and no attempt should be made to repair the fault.

Repair work may only be carried out by an authorised technical assistance service using original spare parts only. Non-respect of the aforementioned clauses may have a negative influence on the operating safety of the heat pump.

To guarantee the efficiency and correct operation of the heat pump, it is important to ensure it is regularly maintained in compliance with the instructions.

In the case where a heat pump is sold or transferred to another user, always ensure that all technical documentation is sent with the equipment to be used by the new user or installer.

This heat pump may only be used for the purpose for which it was designed: to heat a swimming pool; all other uses must be considered inappropriate, incorrect or even dangerous.

This heat pump may only be used for the purpose for which it was designed to space heating or cooling, under floor heating, sanitary water heating, all other used must be considered inappropriate, incorrect or even dangerous.

This unit should be installed in a water proof place, or the safety of the unit and the operator cannot be ensured.

If the indoor unit is not running for 24 hours, the pump in the indoor unit will turn on and run for 3 minutes to preventing pump from blocking.

Equipment complying with IEC 61000-3-12.

The appliance shall not be installed in the laundry.

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1. PRECAUTIONS

To prevent injury to the user or other people and property damage, the following instructions must be followed.

The safety precautions listed here are divided into two categories. In either case, important safety instructions are listed to which close attention must be paid.

WARNING

Failure to observe a warning may result in death or serious Injury.

CAUTION

Failure to observe a caution may result in injury or damage to the equipment.

WARNING

- **The water heating unit must be earthed effectively.**
- **A creepage breaker must be installed near the power supply**.
- **Do not tear off the labels on the units for the purpose of warning or reminding.**

WARNING

- Ask the professional installer for installation of the air source heat pump water heating units，improper installation may result in water leakage, electric shock, or fire.
- Ask the professional service person for the repair and maintenance.Improper repair and maintenance may result in water leakage, electric shock or fire.
- In order to avoid electric shock,fire or injury,if any abnormality is detected,such as smell of fire,turn off the power supply and call your service agent for instructions.
- Never use the wire and fuse with wrong rated current.Use of wrong wire or fuse may cause the unit to break down or a fire.
- 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.
- Never touch the air outlet or the horizontal blades while the swing flap is in operation.Fingers may become caught or the unit may break down.
- Never put any objects into the air inlet or outlet.
  Objects touching the fan of high speed can be dangerous.
- Do not dispose this product as unsorted municipal waste.Collection of such waste separately for special treatment is necessary.
- The appliance shall be installed in accordance national wiring regulations.
- The appliance should not be used by children without supervision.
- If the supply cord is damaged, it must be replaced by the manufacturer or its service agent or a similarly qualified person in order to avoid a hazard.
- An all-pole disconnection device which has at least 3mm separation distance in all pole and a residual current device(RCD)with the rating of above 10mA shall be incorporated in the fixed wiring according to the national rule.
- DISPOSAL：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 you 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 groundwater and get into the food chain, damaging your health and well-being.

CAUTION

- The earth pole of terminal must be earthed,and the rated current should be more than 10A. Make sure that power supply terminal and power supply plug are dry enough and have a good connection.
  Method: Turn on power supply run the unit for half a hour then turn it off and check whether the power supply plug is hot or nor.If it's hot (more than 50℃),please change it with a new and eligible one, or it may result in an electric shock or fire.
- Do not use the air-source water heater for other purposes.
- Before cleaning,be sure to stop the operation and turn the breaker off or pull out the power cord.
  Otherwise, an electric shock and injury may be caused.
- The hot water probable need to mix with cold water or too hot water (over 50℃) in the heating unit may result in injury.
- In order to avoid injury, do not remove the fan guard on the outdoor unit.
- Do not operate the air-source water heater with a wet hand.
  An electric shock may be caused.
- The installation height of power supply should be over 1.8m,if any water may spatter, add safe protection from water.
- It's normal if some water drops from the hole of pressure relief valve during operation. However, if the water is in a great amount, call your service agent for instructions.
- After a long term use, check the unit stand and fittings.
  If damaged, the unit may fall and result in injury.
- Arrange the drain hose to ensure smooth drainpipe.
  Improper drainpipe 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, and 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. INTRODUCTION

2.1 General information

Thank you for purchasing this indoor unit.
The indoor unit is the indoor part of the air to water heat pumps. These units are designed for wall mounted installation and used for both heating and cooling applications. The units can be combined with fan coil units, under floor heating applications, low temperature radiators, sanitary water heating applications and solar kit for sanitary hot water applications.

■ Heating/cooling units

The indoor unit range consists of one seriel: a heating/cooling seriel. The seriels is delivered with an integrated auxiliary heater for additional heating capacity during cold outdoor temperatures. The auxiliary heater also serves as a auxiliary in case of malfunctioning of the outdoor unit. The auxiliary heater models are available for a heating capacity of 4.5kW.

■ Sanitary hot water tank (option)

An optional sanitary hot water tank with integrated 1.5kW electrical heater can be connected to the indoor unit. The sanitary hot water tank is available in three sizes: 150, 200 and 300 liters. Refer to the sanitary hot water tank installation manual for further details.

■ Solar kit for sanitary hot water tank (option)

For information connecting the solar kit, refer to the installation of that kit.

2.2 Scope of this manual

This installation manual describes the procedures for unpacking, installing and connecting all indoor unit modes.

NOTE

Installation of the heat pump outdoor unit is described in the outdoor unit installation manual.

3. ACCESSORIES

Table. 3-1

Accessory name		Qty	Shape
Owner's & Installation Manual		1	This manual
Mounting bracket		1	
M4 screws		2	—
Water tank temperature sensor		1	—
Y-style filter		1	
Floor heating inlet temperature sensor, T1B		1	—
Drain pan kit		1	
M8 expansion screws		5	—
Manual ball valve	SMK-80/CSD80GN1	3	
	SMK-120/CSD80GN1 SMK-140/CSD80GN1	0	
Two-way valve	SMK-80/CSD80GN1	2	
	SMK-120/CSD80GN1 SMK-140/CSD80GN1	3	

4. TYPICAL APPLICATION EXAMPLES

CAUTION

When the M-thermal system is used in series with another heat source (eg:gas,boil),it shall be make sure that the return water temperature to the refrigerant to water heat exchanger does not exceed 50℃.We should not be hold liable for any damage resulting from not observing this rule .

The application examples given below are for illustration purposes only.

Example 1

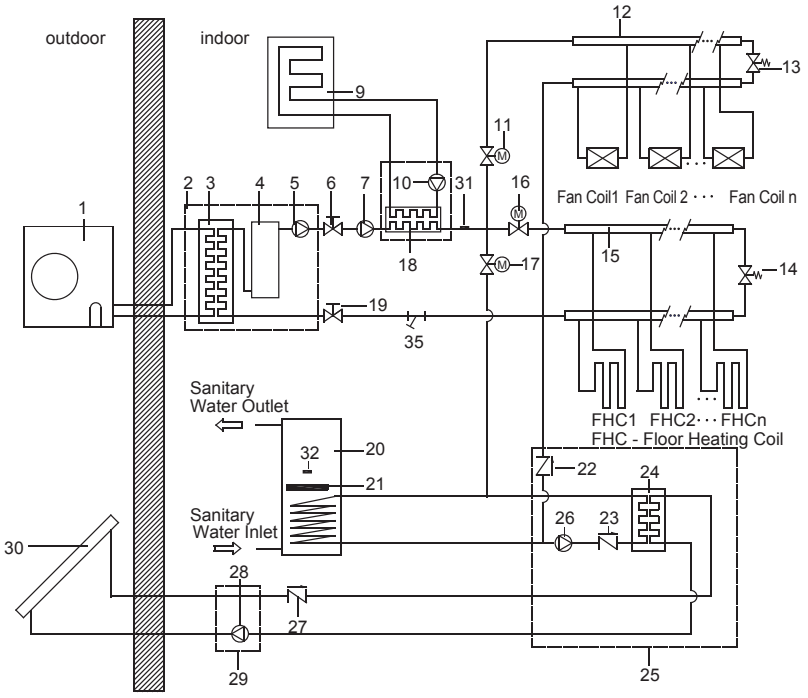


Fig.4-1

Example 2

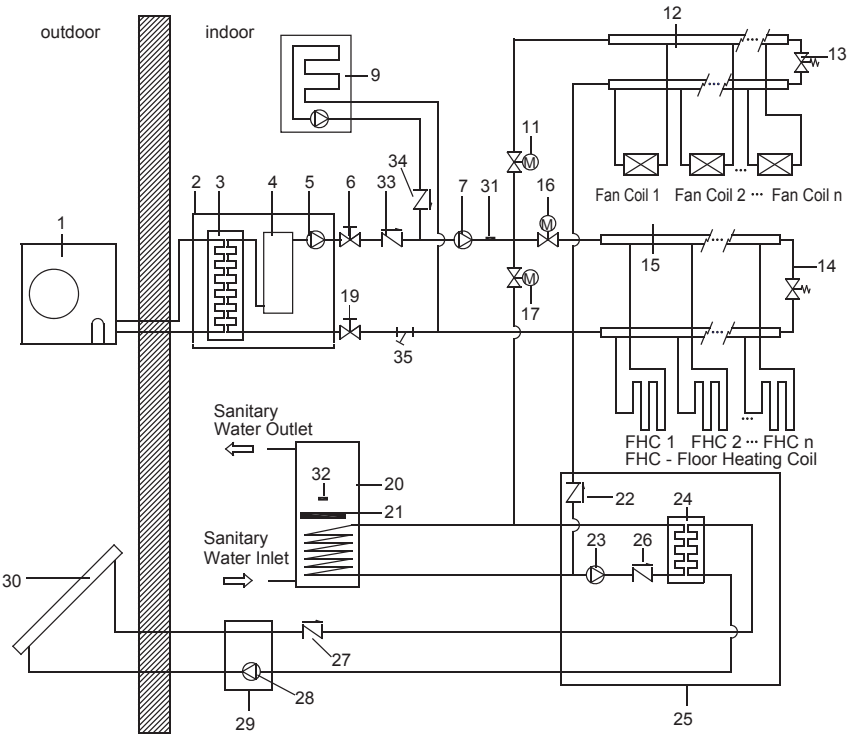


Fig.4-2

Table. 4-1

1	Outdoor unit
2	Indoor unit (Hydro kit)
3	Refrigerant to water heat exchanger
4	Auxiliary heater vessel
5	Pump 1
6	Shut-off valve (field supply)
7	Auxiliary pump (optional, field supply) Pump 2
8	Water to water heat exchanger kit (optional, field supply)
9	Boiler (optional, field supply)
10	Pump 4 (optional, field supply)
11	Motorised 2-way valve (accessory of indoor unit), SV2
12	Collector (field supply)
13	By-pass valve (field supply)
14	By-pass valve (field supply)
15	Collector (field supply)
16	Motorised 2-way valve (accessory of indoor unit) , SV3
17	Motorised 2-way valve (accessory of indoor unit) , SV1
18	Water to water heat exchanger (optional, field supply)
19	Shut-off valve (field supply)
20	Sanitary hot water tank
21	Electric heater
22	Non-return valve
23	Non-return valve
24	Water to water heat exchanger
25	Solar kit (optional)
26	Pump for solar kit, Pump 3
27	Non-return valve (to be included in solar pump station or to be installed in field piping)
28	Pump for solar pump station
29	Solar pump station (field supply)
30	Solar panels (field supply)
31	Temperature sensor for heating/cooling water (accessory of indoor unit. It is not need to be installed, if there is not any auxiliary heating source or floor heating coil), T1B
32	Temperature sensor for sanitary water (accessory of indoor unit), T5
33	Non-return valve (field supply)
34	Non-return valve (field supply)
35	Y-style filter

5. OVERVIEW OF THE INDOOR UNIT

5.1 Opening the indoor unit

■ **The front flap on the indoor unit cover gives access to the manometer and user interface.**

■ **The indoor unit cover can be removed by removing the 6 side screws and unhitching the cover.**

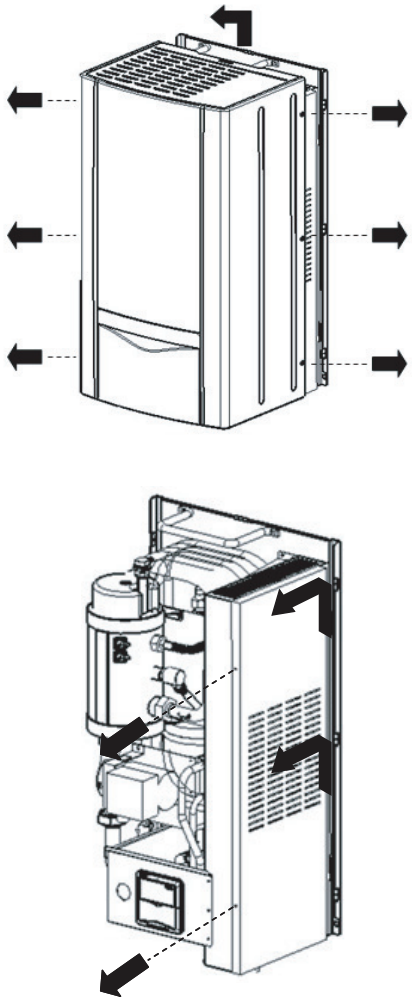


Fig.5-1

CAUTION

Make sure to fix the cover with the screws and nylon washers when installing the cover (screws are delivered as accessory) .

Parts inside the unit can be hot.

■ **To gain access to the control box components – e.g. to connect the field wiring – the control box service panel can be removed. Thereto, loosen the front screws and unhitch the control box service panel.**

CAUTION

Switch off all power supply – i.e. outdoor unit power supply ,indoor unit power supply, electric heater and auxiliary heater power supply before removing the control box service panel.

5.2 Main components

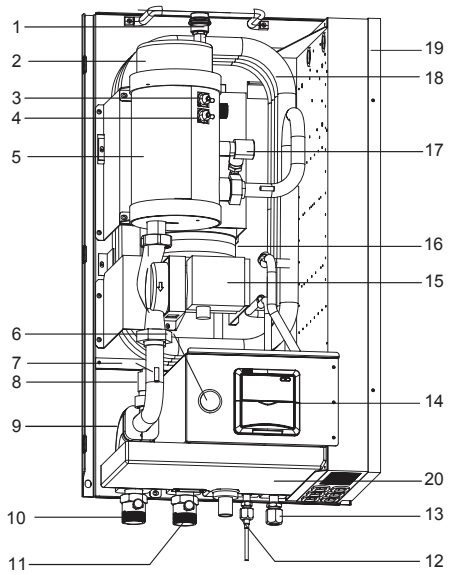


Fig.5-2

1 Air purge valve
Remaining air in the water circuit will be automatically removed via the air purge valve.

2 Auxiliary heater cover and auxiliary heater
The auxiliary heater consists of two electrical heating element that will provide additional heating capacity to the water circuit if the heating capacity of the outdoor unit is insufficient due to low outdoor temperature.

3 Manual reset thermal protector
The auxiliary heater is equipped with two thermal protectors. The thermal protectors are validated when the temperature becomes too high. The manual reset thermal protector cut off temperature is 75℃.

4 Automatically reset thermal protector
The automatically reset thermal protector cut off temperature is 68 ℃.

5 Auxiliary heater vessel
The auxiliary heater heats the water in the auxiliary heater vessel.

6 Manometer
The Manometer allows readout the water pressure in the water circuit.

7 Temperature sensors
Five temperature sensors determine the water and refrigerant temperature at various points in the water circuit.

8 Flow switch
The flow switch checks the flow in the water circuit and protects the heat exchanger against freeing and the pump against damage.

9 Insulation
The insulation layers are equipped in order to prevent the condensate in the water and refrigerant inlet and outlet.

10 Water outlet connection

11 Water inlet connection
Two shut-off valve (field supply) should be connected to the water inlet and outlet connections.

12 Refrigerant liquid connection

13 Refrigerant gas connection

14 User interface
The user interface allows the installer and user to set up, use and maintain the unit.

15 Pump
The pump circulates the water in the water circuit. If the pressure loss is too high, an additional pump is needed to be connected in the water outlet circuit.If the indoor unit is not running for 24 hours ,the pump will run for 3 minutes to prevent the block of the pump.

16 Expansion Vessel
The expansion vessel automatically stabilizes the pressure of water circuit.

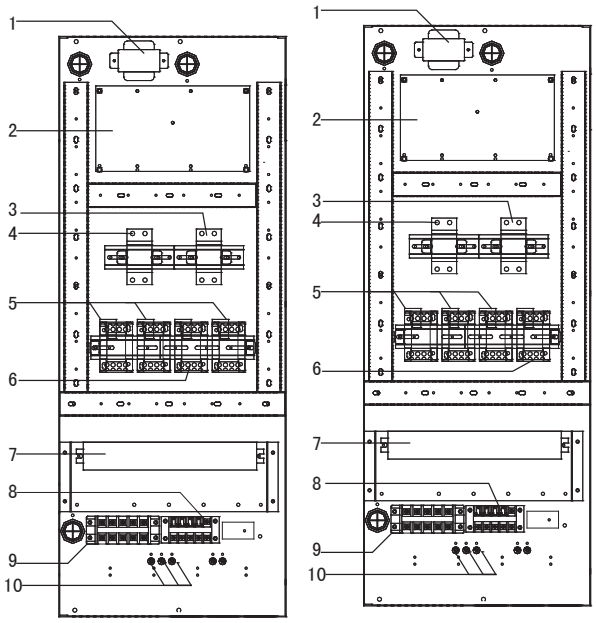
17 Pressure relief valve
The pressure relief valve prevents excessive water pressure in the water circuit by opening at 3 bar and discharging some water.

18 Refrigerant to water heat exchanger

19 Control box
The control box contains the main electronic and electrical parts of the indoor unit.

20 Drain pan kit
For heating/cooling unit it is necessary to install the drain pan kit. The drain pan kit is an necessary of indoor unit.

5.3 Control box main components



SMK-80/CSD80GN1

SMK-120/CSD80GN1
SMK-140/CSD80GN1

Fig.5-3

1 Transformer

2 PCB
The main PCB (Printed Circuit Board) controls the functioning of the unit

3 Auxiliary heater circuit breaker
The circuit breaker protects the auxiliary heater electrical circuit against overload or short circuit

4 Auxiliary heater and electric heater circuit breaker
The circuit breaker protects the auxiliary heater and the electric heater in the sanitary hot water tank electrical circuit against overload or short circuit

5 Auxiliary heater contactor

6 Electric heater contactor

7 Terminal blocks
The terminal blocks allow easy connection of field wiring

8 Terminal blocks for power supply of the electric heater for sanitary hot water tank and the out door unit.

9 Terminal blocks for power supply of the indoor unit

10 Grounding hole
Make the machine grounding safely and reliably

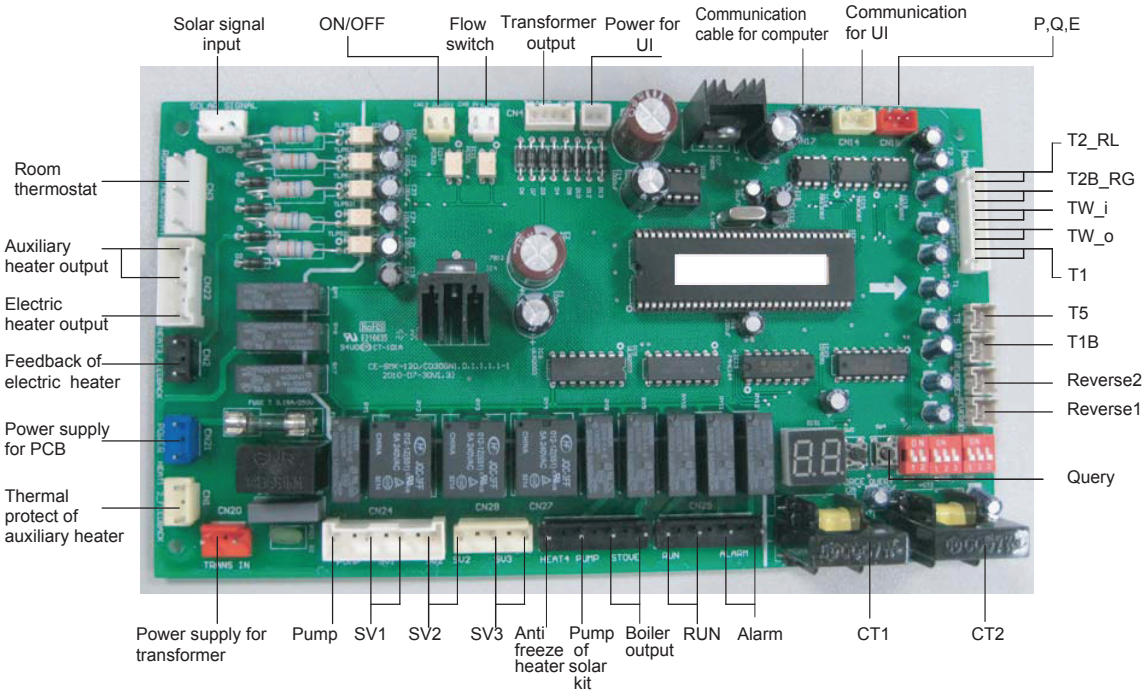


Fig.5-4

5.4 Functional diagram

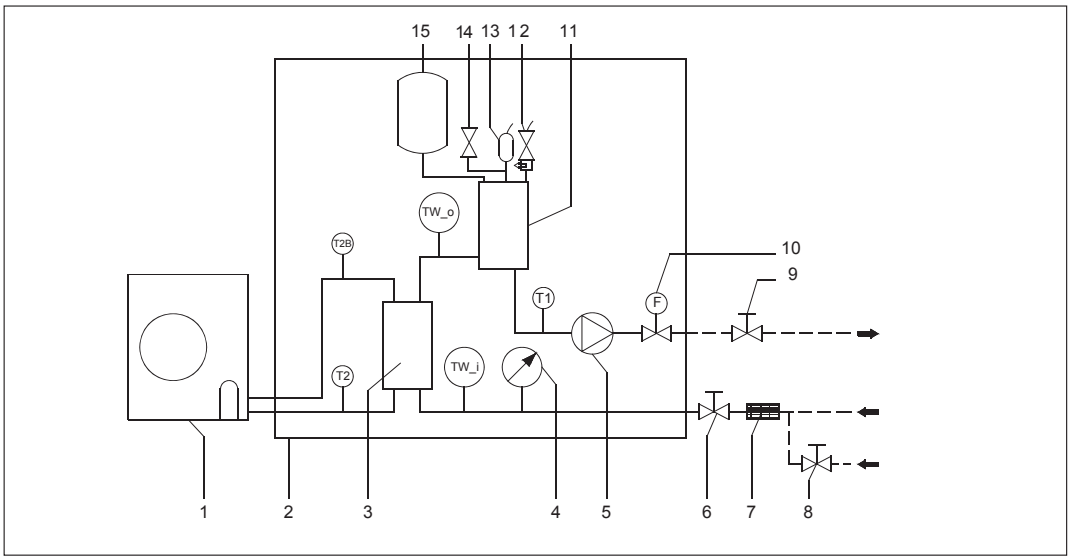


Fig.5-5

1 Outdoor unit
2 Indoor unit (Hydro kit)
3 Refrigerant to water heat exchanger
4 Manometer
5 Pump
6 Shut-off valve(field supply)
7 Filter (Accessory of Indoor unit)
8 Auto-water replenishing (field supply)
9 Shut-off valve (field supply)
10 Flow switch
11 Auxiliary heater vessel
12 Pressure relieve valve
13 Automatic air purge valve
14 Manual air purge valve
15 Expansion vessel
TW_o Water side temperature sensor
T1 Water side temperature sensor
T2B Refrigerant side temperature sensor
TW_i Water side temperature sensor

6. INSTALLATION OF THE INDOOR UNIT

CAUTION

The indoor unit should be installed in a water proof place, or the safety of the unit and the operator cannot be ensured.

6.1 Selecting an installation location

- **The indoor unit is to be wall mounted in an indoor location that meets the following requirements:**
- **The installation location is frost-free.**
- **The space around the unit is adequate for serving, see figure 6-3.**
- **The space around the unit allows for sufficient air circulation.**
- **There is a provision for condensate drain and pressure relief valve blow-off.**

CAUTION

When the unit running in the cooling mode, Condensate may drop from the water inlet and water outlet pipes. Please make sure the dropping condensate will not result in damage of your furniture and other devices.

- **The installation surface is a flat and vertical non-combustible wall, capable of supporting the operation weight of the unit.**
- **There is no danger of fire due to leakage of inflammable gas.**
- **All piping lengths and distance have been taken into consideration.**

Table. 6-1

Requirement	SMK-80/CSD80GN1	SMK-120/CSD80GN1 SMK-140/CSD80GN1
Maximum allowable refrigerant piping length between outdoor unit and indoor unit.	25m	50m
Maximum allowable height distance between outdoor unit and indoor unit when outdoor unit is top.	10m	15m
Maximum allowable height distance between outdoor unit and indoor unit when outdoor unit is bottom.	5m	10m
Maximum allowable distance between the 2-way valve SV1 and the indoor unit (only for installations with sanitary hot water tank).	3m	3m
Maximum allowable distance between the sanitary hot water tank and the indoor unit (only for installations with sanitary hot water tank). The thermistor cable supplied with the indoor unit is 15 m in length.	10m	10m
Maximum allowable be distance between the T1B and the indoor unit .The temperature sensor a cable of T1B supplied with the indoor unit is 10m in length.	8m	8m

- **The equipment is not intended for use in a potentially explosive atmosphere.**

NOTE

If the installation is equipped with a sanitary hot water tank (optional), please refer to the sanitary hot water installation manual.

6.2 Dimensions and service space

- **Unit of measurement: mm**
  Dimensions of the wall bracket:

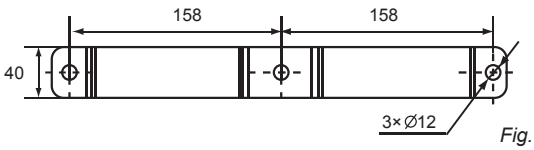
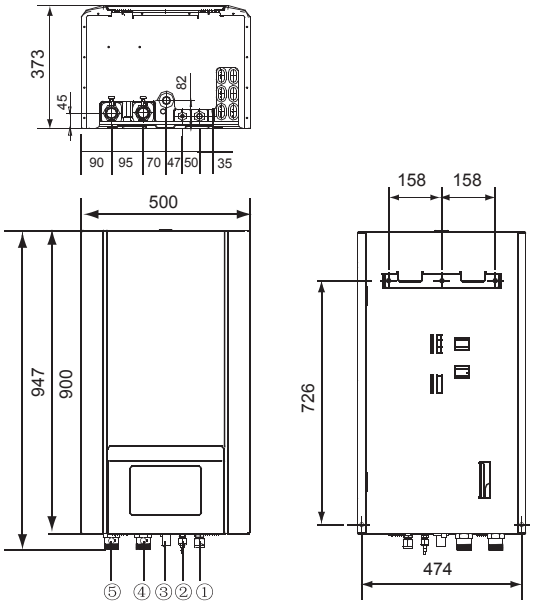


Fig.6-1

- **Dimensions of the unit, see figure 6-2.**



NO.	NAME
1	Refrigerant gas connection 5/8"-14UNF
2	Refrigerant liquid connection 3/8"-14UNF
3	Drainage Ø 25
4	Water Inlet R5/4
5	Water Outlet R5/4

Fig.6-2

- Required service space, see figure 6-3.

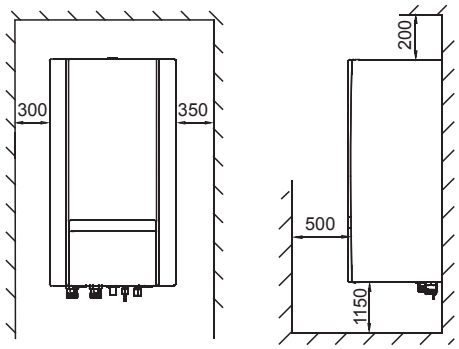


Fig.6-3

6.3 Inspecting, handling and unpacking the unit

- **The indoor unit is packed in a box.**
- **At delivery, the unit must be checked and any damage must be reported immediately to the carrier claims agent.**
- **Check if all indoor unit accessories are enclosed.**
- **Bring the unit as close as possible to the final installation position in its original package in order to prevent damage during transport.**
- **The indoor unit weights approximately 60kg and should be lifted by two persons using the two lifting bars provided.**

WARNING

Do not grasp the control box or piping to lift the unit! Two lifting bars are provided to lift the unit.

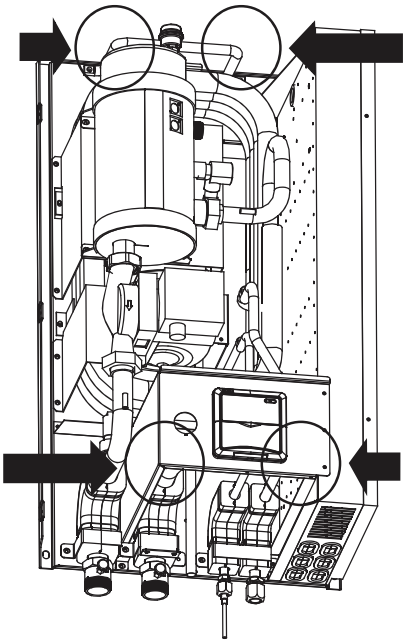


Fig.6-4

6.4 Mounting the indoor unit

WARNING

The weight of the indoor unit is approximately 63kg. Two persons are required to mount the unit.

- Fix the wall mounting bracket to the wall using appropriate plugs and screws.
- Make sure the wall mounting bracket is completely level. When the unit is not installed level, air might get trapped in the water circuit resulting in malfunctioning of the unit.
- Pay special attention to this when installing an indoor unit to prevent overflow of the drain pan
- Hang the indoor unit on the wall mounting bracket.
- Fix the indoor unit at the bottom inside using appropriate plugs and screws. To do so, the unit is equipped with 2 holes at the bottom outer edges of the frame.

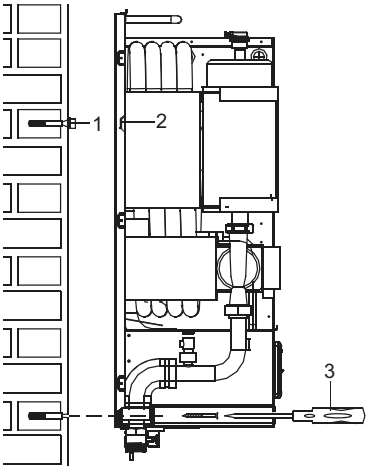


Fig.6-5

6.5 Refrigerant pipework

For all guidelines, instructions and specifications regarding refrigerant pipework between the indoor unit and outdoor unit, please refer to the outdoor unit installation and owner's manual.
The location of the gas pipe and liquid pipe on the indoor unit is shown under "Main components" in section 5.2.

Table. 6-2

Refrigerant piping specifications	Indoor unit	Outdoor unit
Gas pipe connection	15.9mm (5/8 inch)	15.9mm (5/8 inch)
Liquid pipe connection	9.52mm (3/8 inch)	9.52mm (3/8 inch)

WARNING

When connecting the refrigerant pipes, always use two wrenches/spanners for tightening or loosening nuts! Failure to do so can result in damaged piping connections and leaks.

6.6 Water pipework

- **Checking the water circuit**

The units are equipped with a water inlet and water outlet for connection to a water circuit. This circuit must be provided by a licensed technician and must comply with all relevant European and national regulations.

WARNING

The unit is only to be used in a closed water system. Application in an open water circuit can lead to excessive corrosion of the piping.

Before continuing the installation of the unit, check the following points:

- The maximum water pressure is 3 bar,but the best pressure range is between 1 to 2 bar. It will be perfect, if the water pressure is the same as pre-pressure of expansion vessel.
- To facilitate service and maintenance install one shut-off value at the water inlet and one shut-off value at the water outlet of the indoor unit as show in Fig5-5.
- Drain taps must be provided at all low points of the system to permit complete drainage of the circuit during maintenance.
- Make sure to provide a proper drain for the pressure relief valve to avoid any water coming into contact with electrical parts.

● Air vents must be provided at all high points of the system. The vents should be located at points which are easily accessible for servicing. An automatic air purge is provided inside the indoor unit. Check that this air purge is not tightened too much so that automatic release of air in the water circuit remains possible.

There might be air in the electric heater water tank. The air will cause the damage of the electric heater and cause the abnormal operation of the system. The air in the water tank can be purged by the manual discharging valve in the top of the water tank.
The power for the electric heater can not be supplied before discharging the air in the water tank. It will last 30 min until discharging the air completely.

● Take care that the components installed in the field piping can withstand the water pressure.

● The filter (accessory of indoor unit) must be connected into the water circuit as shown in Fig 5-5.

CAUTION

When the unit running in the cooling mode, Condensate may drop from the water inlet and water outlet pipes. Please make sure the dropping condensate will not result in damage of your furniture and other devices.

■ **Checking the water volume and expansion vessel pressure**

The unit is equipped with an expansion vessel of 6.5 liter which has a default pre-pressure of 1 bar.

To assure proper operation of the unit, the pre-pressure of the expansion vessel might need to be adjusted and the minimum and maximum water volume must be checked.

■ **Setting the pre-pressure of the expansion vessel**

When it is required to change the default pre-pressure of the expansion vessel (1bar), keep in mind the following guidelines:

● Use only dry nitrogen to set the expansion vessel pre-pressure.

● Inappropriate setting of the expansion vessel pre-pressure will lead to malfunction of the system. Therefore, the pre-pressure should be adjusted by a licensed installer.

■ **Calculating the water circuit pressure drop**

If the water circuit pressure drop excluding the indoor is too high, an auxiliary pump (pump 2 as described in Fig 4-1 and Fig 4-2) is necessary to be installed in the water circuit.

CAUTION

- An auxiliary pump should be installed while the water resistance is more than 30kpa.
- Failure to install an auxiliary pump in the water circuit when the pressure drop is too high may result in heating/cooling capacity reduction, the heat exchanger freeing and the pump damage.

WARNING

If the indoor unit is not running for 24 hours, the pump in the indoor unit and the auxiliary pump(if installed) will turn on and run for 3 minutes to preventing pump from blocking.

■ **Connecting the water circuit**

Water connections must be made in accordance with the outlook diagram delivered with the unit, respecting the water in- and outlet.

WARNING

Be careful not to deform the unit piping by using excessive force when connecting the piping. Deformation of the piping can cause the unit to malfunction.

If air, moisture or dust gets in the water circuit, problems may occur. Therefore, always take into account the following when connecting the water circuit:

● Use clean pipes only.

● Hold the pipe end downwards when removing burrs.

● Cover the pipe end when inserting it through a wall so that no dust and dirt enter.

● Use a good thread sealant for the sealing of the connections. The sealing must be able to withstand the pressures and temperatures of the system.

● When using non-brass metallic piping, make sure to insulate both materials from each other to prevent galvanic corrosion.

● Because brass is a soft material, use appropriate tooling for connecting the water circuit. Inappropriate tooling will cause damage to the pipes.

WARNING

● The unit is only to be used in a closed water system. Application in an open water circuit can lead to excessive corrosion of the water piping.

● Never use Zn-coated parts in the water circuit. Excessive corrosion of these parts may occur as copper piping is used in the unit's internal water circuit.

6.7 Charging water

■ **Connect the water supply to a drain and fill valve.**

■ **Make sure the automatic air purge valve is open (at least 2 turns).**

■ **Fill with water until the manometer indicates a pressure of approximately 1.0~2.0 bar. Remove air in the circuit as much as possible using the air purge valves. Air present in the water circuit might cause malfunctioning of the auxiliary heater.**

■ **Check that the auxiliary heater vessel is filled with water by screw off the vent valve two laps, it will be full of water until finish draining off the air.**

NOTE

● During filling, it might not be possible to remove all air in the system. Remaining air will be removed through the automatic air purge valve during first operating hours of the system. Additional filling with water afterwards might be required.

● The water pressure indicated on the manometer will vary depending on the water temperature (higher temperature at higher water temperature).However, at all times water pressure should remain above 0.3 bar to avoid air entering the circuit.

● The unit might dispose some excessive water through the pressure relief valve.

● Water quality must be according to EN directive 98/83 EC.

6.8 Piping insulation

The complete water circuit, inclusive all piping, must be insulated to prevent condensation during cooling operation and reduction of the cooling and heating capacity.

If the temperature is higher than 30℃ and the humidity is higher than 80%RH, then the thickness of the sealing materials should be at least 20 mm in order to avoid condensation on the surface of the sealing.

CAUTION

Failure to do good piping insulation may result in cooling/heating capacity reduction a,d condensate drop and destroy of the furniture and other devices.

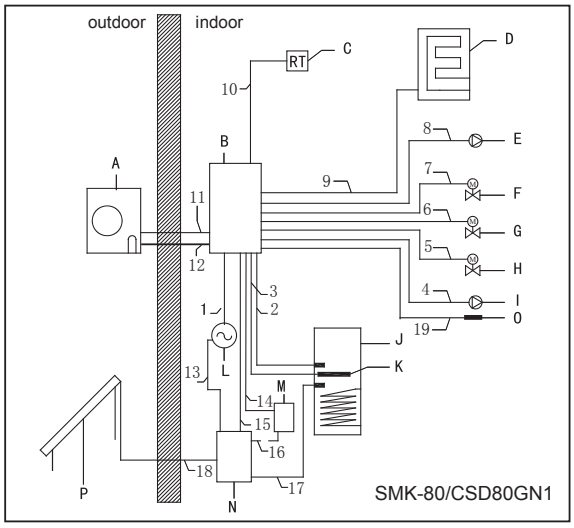
6.9 Field wiring

WARNING

- A main switch or other means for disconnection, having a contact separation in all pipes, must be incorporated in the fixed wiring in accordance with relevant local and national legislation.
- Switch off the power supply before making any connection.
- All field wiring and component must be installed by a licensed electrician and must comply with relevant European and national regulations.
- The field wiring must be carried out on accordance with the wiring diagram supplied with the unit and the instructions given below.
- Be sure to establish an earth. Do not earth the unit to a utility pipe, surge absorber, or telephone earth. Incomplete earth may cause electrical shock.
- Be sure to install an earth leakage protector (30mA). Failure to do so may cause electrical shock.

■ **Overview**

The illustration below gives an overview of the required field wiring between several parts of the installation. Refer also to "Typical application examples" section.



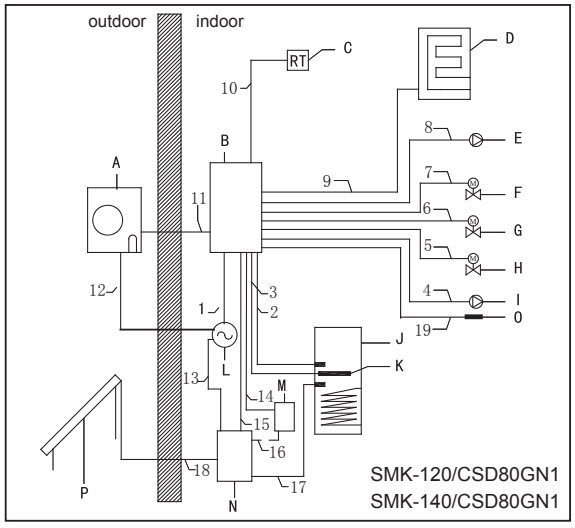


Fig.6-7

Table. 6-3

A	Outdoor unit
B	Indoor unit
C	Room thermostat (optional)
D	Boiler (optional)
E	Auxiliary pump, Pump 2
F	Motorised 2-way valve for Sanitary hot water tank loop, SV1
G	Motorised 2-way valve for Fan coil units loop, SV2
H	Motorised 2-way valve for Floor heating loop, SV3
I	Pump of Solar kit, Pump 3
J	Sanitary hot water tank (optional)
K	Electric heater (optional)
L	Single phase power supply or outdoor unit, indoor unit and electric heater
M	Solar kit
N	Solar pump station
O	Temperature sensor T1B
P	Solar panel

Table. 6-4

Item	Description		Require number of conductors	Section of the conductor
1	Power supply cable for indoor unit		3+GND	4 mm²
2	Temperature sensor cable		2	———
3	Power supply cable from indoor unit to Sanitary hot water tank		2+GND	2.5 mm²
4	Power supply cable for Pump of solar kit (Pump 3)		2+GND	1.0 mm²
5	Power supply cable for Motorised 2-way valve, SV3		3	1.0 mm²
6	Power supply cable for Motorised 2-way-valve, SV2		3	1.0 mm²
7	Power supply cable for Motorised 2-way valve, SV1		3	1.0 mm²
8	Power supply cable for auxiliary pump (Pump2)		2+GND	1.0 mm²
9	Communication cable between indoor unit and boiler		2	1.0 mm²
10	Room thermostat cable		4(L, N, C, H)	1.0 mm²
11	Communication cable between indoor unit and outdoor unit		3 (P, Q, E)	3×0.5 mm² (3 - Shield wire)
12	Power supply cable for outdoor unit	SMK-80/CSD80GN1	2+GND	2.5 mm²
		SMK-120/CSD80GN1 SMK-140/CSD80GN1	3+GND	
13	Power supply cable for solar pump station		2+GND	1.0 mm²
14	Power supply cable for the pump of solar kit		2+GND	1.0 mm²
15	Signal input from solar pump station to indoor unit		2	1.0 mm²
16	Power supply cable for the pump of solar kit		2+GND	1.0 mm²
17	Sanitary hot water tank temperature sensor cable		2	———
18	Sanitary hot water tank temperature sensor cable		2	———
19	Water circuit temperature senor T1B cable		2	———

■ The wiring diagram of the indoor unit is shown as page 20

PCB	Main Control Board
UI	User interface, or wire controller
T2_RL	Refrigerant liquid tube temperature sensor
T2B_RG	Refrigerant gas tube temperature sensor

Table. 6-5

T_W-in	Inlet water temperature sensor (Inlet water temperature sensor of heat exchanger)
T_W-out	Outlet water temperature sensor of heat exchanger
T1	Outlet water temperature sensor of indoor unit
T5	Sanitary hot water tank temperature sensor
T1B	Outlet water temperature sensor of indoor unit and boiler
K1M	AC contactor
K2M	AC contactor
K3M	AC contactor
K4M	AC contactor
CT1, CT2	Current detector
SV1	2-way valve for sanitary hot water tank circuit
SV2	2-way valve for fan coil circuit
SV3	2-way valve for underfloor heating circuit
Pro-hyd	Flow switch

■ **Field wiring guidelines**

● Most field wiring on the indoor unit side is to be made on the terminal block inside the control box. To gain access to the terminal block, remove the indoor unit cover and control box service panel, see section 5-1.

● Cable tie mountings are provided at the bottom of the control box. Fix all cables using cable ties (field supply).

● A dedicated power circuit is required for the auxiliary heater.

● Installations equipped with a sanitary hot water tank (optional), require a dedicated power circuit for the electric heater.

Please refer to the sanitary hot water installation manual.

■ **Connection of the indoor unit power supply and communication cable Power circuit and cable requirements**

● Power supply for the indoor units is to be provided through the indoor side. Data communication with the outdoor unit is provided through the cable which labeled as P, Q, E.

● For all guidelines and specifications regarding field wiring between the indoor unit and the outdoor unit, please refer to the outdoor unit installation manual.

■ **Procedure**

● Using the appropriate cable, connect the power circuit to the appropriate terminals as shown on the wiring diagram and the illustration below.
● Connect the earth conductor (yellow/green) to the earthing screw on the control box mounting plate.
● Fix the cable with cable ties to the cable tie mountings to ensure strain relief.
● When routing out cables, make sure that these do not obstruct mounting of the indoor unit cover.

■ **Connection of the auxiliary heater power supply**
Power circuit and cable requirements

CAUTION

Be sure to use a dedicated power circuit for the auxiliary heater.
Never use a power circuit shared by another appliance.

This power circuit must be protected with the required safety devices according to local and national regulations.

Select the power cable in accordance with relevant local and national regulations.

■ **Procedure**

● Using the appropriate cable, connect the power circuit to the appropriate terminals as shown on the wiring diagram.

● Connect the earth conductor (yellow/green) to the earth screw on the block terminal.
● Fix the cable with cable ties to the cable tie mountings to ensure strain relief.

■ **Connection of the thermostat cable**
Connection of the thermostat cable depends on the application.
See section7.2 “Room thermostat installation configuration” for more information and configuration options on pump configuration in combination with room thermostat.

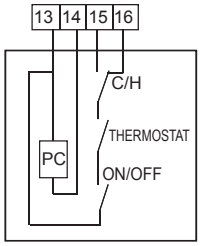
● Thermostat requirements
1.Power supply: 220-240V~ 50Hz or battery operated.
2.Contact voltage: 220-240V~ 50Hz.

● Procedure

1.Connection of the thermostat cable to the appropriate terminals shown on the wiring diagram.

2. Fix the cable with cable ties to the cable tie mountings to ensure strain relief.

3. Set the “Field setting ” about the selection of Room Thermostat.



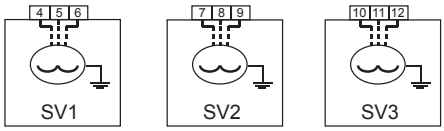
■ **Connection of the valve cable**

● Valve requirements
1.Power supply: 220-240V~ 50Hz. 2.Maximum running current: 100mA.

● Wiring the 2-way valve
1.Using the appropriate cable, connect the valve control cable to the terminal as shown on the wiring diagram.

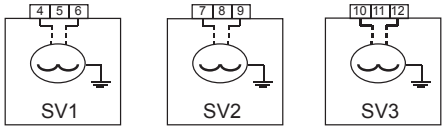
NOTE

Wiring is different for a NC (normal closed) valve and a NO (normal open) valve. Make sure to connect to the correct terminal numbers as detailed on the wiring diagram and illustrations below.



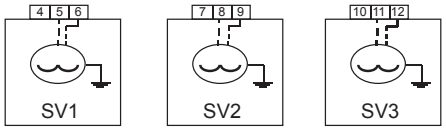
3-wire NO (normal open) and NC （normal close）
2-way motorized valve

Fig.6-8



2-wire NC(normal close) 2-way motorized valve

Fig.6-9



2-wire NO (normal open) 2-way motorized valve

Fig.6-10

NOTE

For the NC (normal closed) valve, it is necessary to reverse the terminal 4 and 5, 7 and 8, 10 and 11 to get the right opening and closing of the valve.

2.Fix the cable(s) with cable ties to the cable tie mountings to ensure strain relief.

■ **Electrical Connection of Water Pump**

Water pump specification:

Power supply: 220-240V~ 50Hz

Maximum running current: 2A

● Using the appropriate cable, connected the pump cable to the terminals as shown in Fig.6-11.

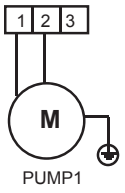


Fig.6-11

● Fix the cable with cable ties to the cable tie mountings to ensure strain relief.

■ **Connection of Solar Pump Station(See the Instruction Manual of Solar Pump Station)**

■ **Electrical Connection of Anti-frozen electric heater (Reserved)**

■ **Electrical Connection of External Heat Source**

● Using the appropriate cable, and connect the control terminal of heat source such as gas boiler etc., the control terminal of this unit is 25-26 terminals in the connector base.

NOTE

This control terminal of the indoor unit only outputs one switch signal; it needs to change wiring when matching with different external heat sources.

The signal wire connected the solar energy pump with hydraulic module need to be increased protection, such as fuse, for avoiding the abnormal operation lead to the device damage.

1. If the external heat source needs one switch signal to control the input situation, then directly connect the corresponding wire terminal of this machine with the corresponding terminals of the external heat source, as describing in Fig.6-12.

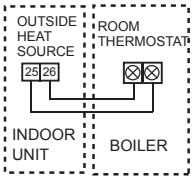


Fig.6-12

2. If the external heat source needs one control signal of the specified voltage (such as 220-240V~ 50Hz), then it need to supply the control terminal 25 and 26 with corresponding power as describing in Fig.6-13.

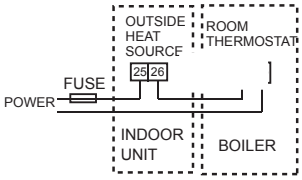


Fig.6-13

■ **External Wiring of Operation/ Fault**

● The terminal 27 and 28 will be conducted when the unit is running, and will be disconnected when the unit is turned off or stood by.

● The terminal 29 and 30 will be conducted when there is a running fault, and be disconnected when the unit is running correctly.

● The connection is described in *Fig.6-14* .

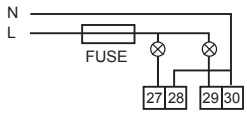


Fig.6-14

■ **Remote ON/OFF Terminal**

"A B" terminal is used for remote ON/OFF switch; it needs to connect external control switch, the control logic as follow:

UI	ON	ON	OFF	OFF
External switch	Close	Disconnect	Close	Disconnect
Machine state	Stop	Operate	Stop	Stop

The connecting as *Fig.6-15*.

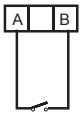


Fig.6-15

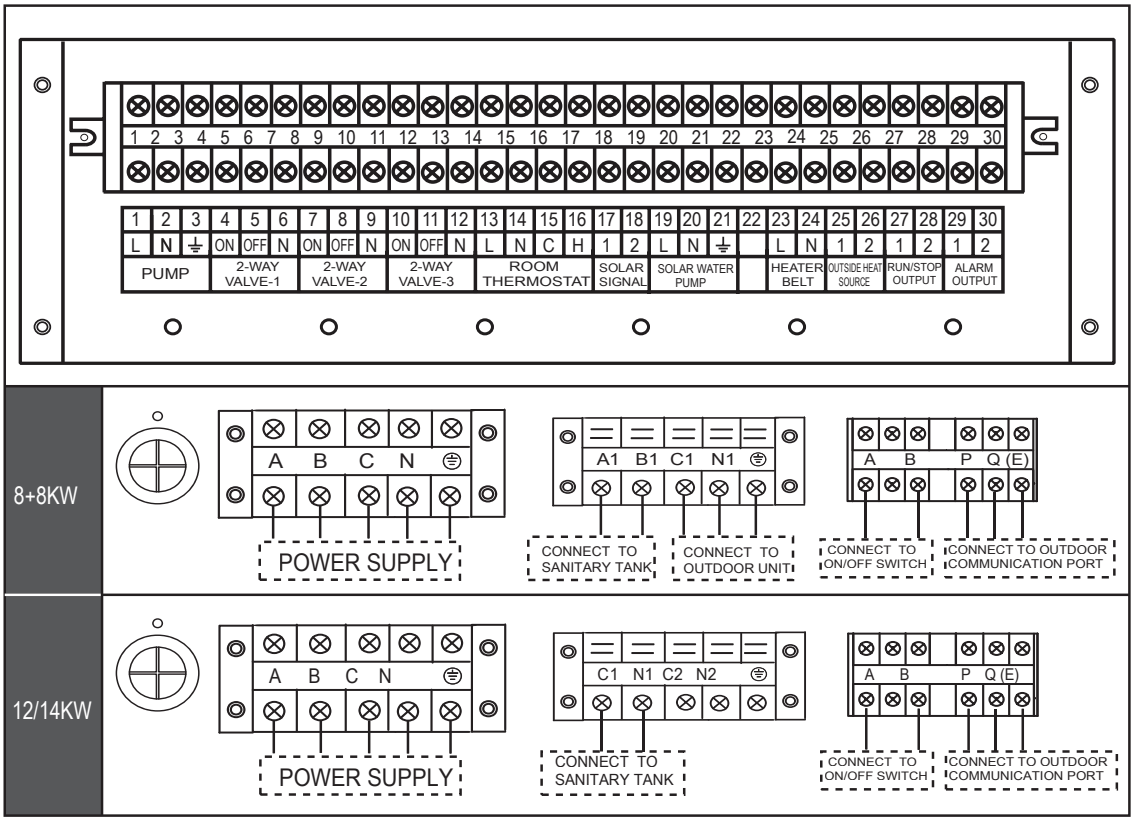


Fig.6-16

6.10 Installation of drain pan kit

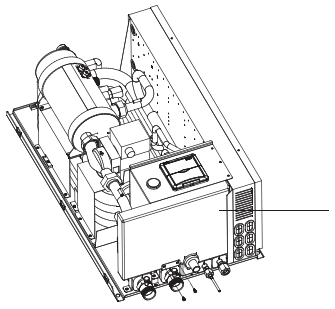


Fig.6-17

Take out the drain pan kit from the packing foam, then insert it and drill two screws on it as the figure.

7. START-UP AND CONFIGURATION

The indoor unit should be configured by the installer to match the installation environment (outdoor climate, installed options, etc) and user expertise.

CAUTION

It is important that all information in this chapter is read sequentially by the installer and that the system is configured as application.

7.1 Dip switch setting overview

Dip switch is located on the control box PCB and are for future use . Switch off the power supply before opening the control box service panel and making any changes to the switch settings.

7.2 Room thermostat installation configuration

When no thermostat is connected to the indoor unit, the value of field setting "0-7" should be set to be "0".

When a thermostat is connected to the indoor unit, the value of field setting "0-7" should be set to be "1".

NOTE

● When a room thermostat is connected to the indoor unit, the heating and cooling schedule timers are never available. Other schedule timers are not affected. For more information on the schedule timers, refer to the operation manual.

● When a room thermostat is connected to the indoor unit, and the button or button is pressed, the icon will flash to indicate that the room thermostat has priority and controls ON/OFF operation and change over operation.

7.3 Pump operation configuration

NOTE

To set the pump speed, refer to the section of "Setting the pump speed" in section 9.3.

The pump will operate whenever there is heating or cooling demand requested by the room thermostat or wire controller. If the flow rate is higher than the set point of flow switch, the pump will operate continuously. If the flow rate is lower than the set point of the flow switch, the pump will stop and Error code E8 will displayed. The pump will operate again 3 minutes later and the flow switch will check the flow rate again to determine the action of the pump. If the flow rate is lower than the set point of the flow switch for 3 times, the pump will stop and Error code E0 will displayed.

7.4 Sanitary hot water tank installation configuration

When no sanitary hot water tank is installed, the value of field setting "0-2" should be set to be "0".

When a sanitary hot water tank is installed, the value of field setting "0-2" should be set to be "1".

7.5 Initial start-up at low outdoor ambient temperatures

During initial start-up and when water temperature is low, it is important that the water is heated gradually. Failure to do so may result in cracking of concrete floors due to rapid temperature change. Please contact the responsible cast concrete building contractor for further details.
To do so, the lowest leaving water set temperature can be decreased to a value between 15℃ and 25℃ by adjusting the field setting "6-3"

NOTE

Heating between 15℃ and 25℃ is performed by the auxiliary heater only.

8. WATER CIRCUIT AIR PURGE FUNCTION

Before running of the unit, the air inside the water circuit should be purged. During purging:

Charge water from the water inlet side of the indoor unit.

Set the value of field setting "7-5" to be "1". Switch off the power supply and switch on the power supply again, press the button next continuous for at least 10 seconds, SV1, SV2, and SV3 will be opened, and 3 minutes later the pump inside the indoor unit will be turned on. Through continuous running the pump and open all the valves in the water circuit, the air inside the water circuit is easier to be purged.

9. PRE-OPERATION CHECKS

9.1 Checks before initial start-up

Warning: Switch off the power supply before making any connections.

■ After the installation of the unit, check the following before switching on the circuit breaker:

● Field wiring

Make sure that the field wiring between local supply panel and indoor unit, outdoor unit and indoor unit, indoor unit and valves (when applicable), indoor unit and room thermostat (when applicable), and indoor unit and sanitary hot water tank has been carried out according to the instructions described in the chapter "Field wiring", according to

the wiring diagrams and according to European and national regulations.

● Fuses or protection devices

Check that the fuses or the locally installed protection devices are of the size and type specified in the chapter “Technical specifications”. Make sure that neither a fuse nor a protection device has been bypassed.

● Electric heater circuit breaker

Do not forget to turn on the electric heater circuit breaker in the control box (applies only to units with optional sanitary hot water tank installed).

● Earth wiring

Make sure that the earth wires have been connected properly and that the earth terminals are tightened.

● Internal wiring

Visually check the control box on loose connections or damaged electrical components.

● Fixation

Check that the unit is properly fixed, to avoid abnormal noises and vibrations when starting up the unit.

● Damaged equipment

Check the inside of the unit on damaged components or squeezed pipes.

● Refrigerant leak

Check the inside of the unit on refrigerant leakage. If there is a refrigerant leak, call your local dealer.

● Power supply voltage

Check the power supply voltage on the local supply panel. The voltage must correspond to the voltage on the identification label of the unit.

● Air purge valve

Make sure the air purge valve is open (at least 2 turns).

● Pressure relief valve

Check if the auxiliary heater vessel is completely filled with water by operating the pressure relief valves. It should purge water instead of air.

CAUTION

Operating the system with the auxiliary heater vessel not completely filled with water will damage the auxiliary heater!

● Shut-off valves

Make sure that the shut-off valves are correctly installed and fully open.

CAUTION

Operating the system with closed valves will damage the pump !

9.2 Powering up the indoor unit

When power supply to the indoor unit is turned on, “0” is displayed on the user interface during its initialization, which might take up to 30 seconds. During this process the user interface cannot be operated.

9.3 Setting the pump speed

The pump speed can be selected on the pump.

The default setting is high speed. If the water flow in the system is too high (e.g., noise of running water in the installation) the speed can be set to low speed.

NOTE

The speed dial on the pump indicates 3 speed setting.

The available external static pressure (ESP, expressed in mmH_2O) in function of the water flow (l/min) is shown in the previous section.

■ **Pump hydraulic performance**

Flow-head curve

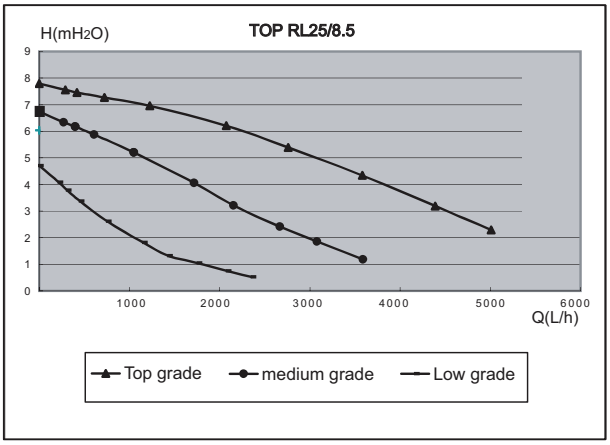


Fig.9-1

CAUTION

If the external pressure loss of the water circuit is too high,it is necessary to install an auxiliary pump(Pump 2) as describing in Fig.4-1 and Fig.4-2. Fail to install an auxiliary pump will result in cooling/heating capacity reduction.

10. FIELD SETTINGS

The indoor unit should be configured by the installer to match the installation environment (outdoor climate, installed options, etc.) and user demand. These field settings are accessible and programmable through the user interface on the indoor unit.

Each field setting is assigned a 4-digit number or code, for example, “3-1-15”, which is indicated on the user interface display. The first digit “3” indicates the “first code” or field setting group. The second digit indicates the second code. The last 2-digit number “15” indicate the value of code “3-1”.

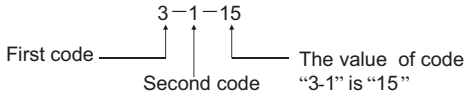


Fig.10-1

A list of all field settings and default values is given under “Field settings table” . In this same list, we provided for 2 columns to register the date and value of altered field settings at variance with the default value.
A detailed description of each field setting is given under the section of “Detailed description” .

10.1 Procedure

■ To change one or more field settings, proceed as follows.

Fig.10-2

1 Press the button to enter FIELD SET MODE .

The SETTING icon will be displayed. The current selected field setting code is indicated “8-8-88”, with the set value displayed as the last 2-digit number .

2 Press the Prev button to select the appropriate field setting first code.

3 Press the Next button to select the appropriate field setting second code.

4 Press the ▲ button and ▼ button to change the set value of the select field setting.

5 Save the new value by pressing the OK button.

6 Repeat step 2 through 4 to change other field settings as required.

7 When finished, press the button for the second time to exit FIELD SET MODE.

NOTE

Changes made to a specific field setting are only stored when the OK button is pressed. Navigating to a new field setting code or pressing the button will discard the change made.

NOTE

■ Before shipping, the set values have been set as shown under “Field setting table ”.

■ When exiting FIELD SET MODE, “8-8-88” may be displayed on the user interface LCD while the unit initializes itself.

10.2 Detailed description

■ Basic option

This part of field setting determines the basic option of the heat pump system, so that the control system can select the appropriate control mode.

● “0-0” Under floor heating terminal: defines whether the system installations with under floor heating “1” or not “0”.

● “0-1” Fan coil: defines whether the system installations with fan coil “1” or not “0”.

● “0-2” Sanitary hot water tank: defines whether the system installations with sanitary hot water tank “1” or not “0”.

● “0-3” Electric heater for sanitary hot water tank: defines whether an electric heater was assembled in the sanitary hot water tank “1” or not “0”.

● “0-4” Auxiliary heating source: defines whether there is a boiler as an auxiliary heating source for the system “1” or not “0”.

● “0-5” Solar kit: defines whether there is a solar kit to heating the sanitary hot water tank “1” or not “0”.

● “0-6” auxiliary heater: defines whether there are electric heaters assembled in the indoor unit “1” or not “0”.

● “0-7” Room thermostat: defines whether there is a room thermostat connected with the indoor unit “1” or not “0”.

● “0-8” Fan coil function:defines the function of the fan coil,"0"for cooling only,"1" for heating and cooling.

■ Priority

This part defines the priority of space heating, space cooling and sanitary hot water tank heating.

● “1-0” Space heating and sanitary heating priority: defines the priority of space heating and sanitary heating, “0” for sanitary heating priority, “1” for space heating priority, and “2” means space heating and sanitary heating have the same priority.

● “1-1” Space cooling and sanitary heating priority: defines the priority of space cooling and sanitary heating, “0” for sanitary heating priority, “1” for space cooling priority.

● “1-2” Heat pump maximum running period for sanitary water tank heating: specifies the maximum time period during which sanitary water tank heating can be activated, even when the target sanitary hot water temperature has not yet been reached..

● “1-3” Solar heating priority: defines the priority sanitary hot water tank heating by solar kit “1” or by heat pump & electric heater “0”.

■ Disinfection function

Applies only to installations with a sanitary hot water tank.

The disinfection function disinfects the sanitary hot water tank by periodically heating the sanitary water to a specific temperature.

The disinfection function field settings must be configured by the installer according to national and local regulations.

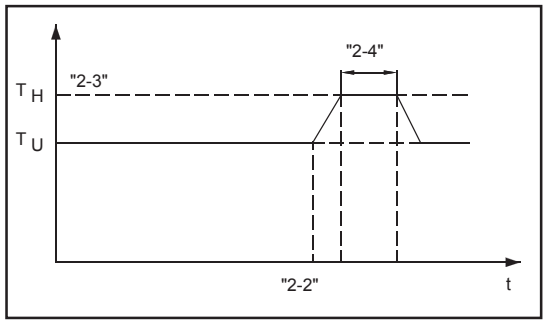
● “2-0” Operation interval: day(s) of the week at which the sanitary water should be heated.

● “2-1” Status: defines whether the disinfection function is turned on (1) or off (0).

● “2-2” Start time: defines the time of the day at which the sanitary water should be heated.

● “2-3” Set point: defines the hot water temperature to be reached to realize disinfection function.

● “2-4” Interval: time period defining how long the set point temperature should be maintained.



TU User set point temperature (as set on the user interface)

TH High set point temperature “2-03” for disinfection function

t Time

Fig.10-4

■ Auxiliary heating source operation

● “3-0” Temperature difference: defines the temperature difference between the set temperature and the outlet temperature of indoor unit, above which the auxiliary heating source such as boiler may be turned on.

● “3-1” Interval: defines the time period after which the auxiliary heating source such as boiler may be turned on.

● “3-2” Outdoor temperature: defines the outdoor temperature below which the auxiliary heating source such as boiler operation may be allowed.

● “3-3” Floor heating inlet temperature: defines the temperature below which the under floor heating may be allowed.

■ Electric heater & HP priority

Applies only to installations with a sanitary hot water tank.

● “4-0” Electric heater delay time: defines the time period behind which the electric heater of the sanitary hot water tank will be turned on.

● “4-1” Heat pump start temperature difference: defines the temperature difference between set temperature and water tank temperature, below which heat pump turning on will be allowed.

● “4-2” Set point correction for sanitary hot water tank temperature: specifies the temperature difference above the set temperature for the electric heater to heating the water tank.

■ Auxiliary heater operation

● “5-0” Auxiliary heater delay time: defines the time period behind which the auxiliary heater of the indoor unit will be turned on.

● “5-1” Auxiliary heater turn on temperature difference 1: defines the temperature difference between set temperature and water outlet temperature of indoor unit, below which one of the auxiliary heaters will be turned on.

● “5-2” Auxiliary heater turn on temperature difference 2: defines the emperature difference between set temperature and water tank temperature, below which both of the auxiliary heaters will be turned on.

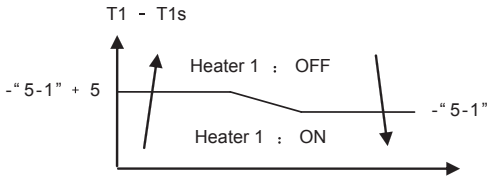


Fig.10-5

● “5-3” Auxiliary heater turn on outdoor temperature: specifies the outdoor temperature below which the auxiliary heater may turn on.

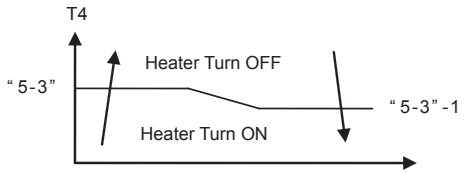


Fig.10-6

■ Cooling and heating set point range

The purpose of this field setting is to prevent the user from selecting a wrong (i.e., too hot or too cold) leaving water temperature. Thereto the heating temperature set point range and the cooling temperature set point range available to the user can be configured.

CAUTION

In case of a floor heating application, it is important to limit the maximum leaving water temperature at heating operation according to the specifications of the floor heating installation.

In case of a floor cooling application, it is important to limit the minimum leaving water temperature at cooling operation (field setting of parameter “6-1”) to 16～18℃ to prevent condensation on the floor.

● “6-0” Cooling set point upper limit: maximum leaving water temperature for cooling operation.

● “6-1” Cooling set point lower limit: minimum leaving water temperature for cooling operation.

● “6-2” Heating set point upper limit: maximum leaving water temperature for heating operation.

● “6-3” Heating set point lower limit: minimum leaving water temperature for heating operation.

● “6-4” Sanitary heating set point upper limit: maximum leaving water temperature for sanitary heating operation.

● “6-5” Sanitary heating set point lower limit: minimum leaving water temperature for sanitary heating operation.

■ Others

● “7-0” Celsius/Fahrenheit switching: “0” for Celsius, and “1” for Fahrenheit.

● “7-1” Silent mode running period: defines the running period of silent mode.

● “7-2” Run test function: “0” for run test function disable, and “1” for run test function disable.

● “7-3” Run test period: specifies the period of run test.

● “7-4” Under floor first time heating function: “0” for disable and “1” for enable.

● “7-5” Air purge function: “0” for disable and “1” for enable.

● “7-6” Temperature selection: “0” for water out from indoor unit and “1” for water tank.

■ **Field setting table**

Table. 10-1

First Code	2nd Code	Setting name	Default value	Range	Step	Unit	Remark
0	Basic selection						
	0	floor heating	0	0/1			0-No selection; 1-Selection
	1	fan coil or low temperature radiat	0	0/1			0-No selection; 1-Selection
	2	sanitary hot water tank	0	0/1			0-No selection; 1-Selection
	3	Electric heater for sanitary hot water tank	1	0/1			0-No selection; 1-Selection
	4	Auxilary Heating source such as gas boiler	0	0/1			0-No selection; 1-Selection
	5	Solar kit	0	0/1			0-No selection; 1-Selection
	6	Auxiliary heater of indoor unit	1	0/1			0-No selection; 1-Selection
	7	Room thermostat	0	0/1			0-No selection; 1-Selection
	8	Fan coil function	0	0/1			0-Cooling only, 1-heating and cooling
1	Priority						
	0	Space heating and Sanitary heating priority	0	0/1/2			0-Sanitary heating priority, 1- space heating priority, 2 - both
	1	Cooling and Sanitary heating priority	0	0/1			0-Sanitary heating priority, 1- Fan coil cooling priority
	2	HP Max. Running period for heating sanitary water tank	10	10~95	5	min	
	3	Solar heating priority	0	0/1			1-solar priority；0-HP priority
2	Disinfection function						
	0	Operation interval	5(Fri.)	0~7	-	-	0-Sun, 1-Mon,…,6-Sat, 7-all
	1	Status	1(ON)	0/1			0-OFF,1-ON
	2	Start time	23:00	0~23	1	hr	0-0:00, 1-1:00, … , 23-23:00
	3	Set point temperature	60	50~65	5	℃	
	4	Interval	10	5~60	5	min	
3	Aux. heating resources operation						
	0	Boiler turn on temperature difference	10	5~15	1	℃	It should satisfied all conditions before turning on boiler
	1	Boiler turn on time delay	30	0~95	5	min	
	2	Boiler turn on outdoor temperatui	0	-5~35	1	℃	
	3	Under floor heating inlet temperature upper limit	60	56~70		℃	
4	Electric heater & HP priority						
	0	Electric heater delay time	20	20~95	5	min	
	1	HP Start Temperature Difference	5	1~20	1	℃	
	2	Set point correction for Sanitary hot water tank	2	0~5	1	℃	
5	Auxiliary Heater Operation						
	0	Auxiliary Heater1/2 turn on time delay	20	5~60	5	min	
	1	Auxiliary Heater1 turn on temperature difference	5	2~15	1	℃	
	2	Auxiliary Heater2 turn on temperature difference	5	2~15	1	℃	
	3	Auxiliary heater turn on outdoor temperature	0	-5~35	1	℃	
6	Cooling and heating set point ranges						
	0	Cooling set point upper limit	22	18~22	1	℃	
	1	Cooling set point lower limit	7	5~18	1	℃	
	2	Heating set point upper limit	55	37~55	1	℃	
	3	Heating set point lower limit	25	15~37	1	℃	
	4	Sanitary heating set point upper limit	55	38~60	1	℃	
	5	Sanitary heating set point lower limit	35	35~38		℃	
7	Others						
	0	Celsius / Fahrenheit switching	0	0/1	1		0-Celsius, 1-Fahrenheit
	1	Silent mode	8	1~24		hr	
	2	Run Test	0	0/1	1		0-Disable; 1-Enable
	3	Run Test period	8	8~20		min	
	4	First time floor heating function	0	0/1			0-Disable; 1-Enable
	5	Air purge function	0	0/1			0-Disable; 1-Enable
	6	Temperature selection	0	0/1			0-water out from indoor unit; 1-water tank;

11. FINAL CHECK

Before switch on the unit, read following recommendations:

■ When the complete installation and all necessary settings have been carried out, close all front panels of the unit and refit the indoor unit cover.

■ The service panel of the control box may only be opened by a licensed electrician for maintenance purposes.

12. MAINTENANCE

In order to ensure optimal availability of the unit, a number of checks and inspections on the unit and the field wiring have to be carried out at regular intervals.

CAUTION

- Before carrying out any maintenance or repair activity, always switch off the circuit breaker on the supply panel, remove the fuse or open the protection devices of the unit.
- Make sure that before starting any maintenance or repair activity, also the power supply to the outdoor unit is switched off.

■ The described checks must be executed at least once a year:

- Water pressure

  Check if the water pressure is above 0.3 bar. If necessary add water.

- Water filter

  Clean the water filter.

- Water pressure relief valve

Check for correct operation of the pressure relief valve by turning the red knob along the valve counter-clockwise:

1.If you do not hear a clacking sound, contact your local dealer.

2.In case the water keeps running out of the unit, close both the water inlet and outlet shut-off valves first and then contact your local dealer.

- Pressure relief valve hose

  Check that the pressure relief valve hose is positioned appropriately to drain the water.

  If the drain pan kit is installed, make sure that the pressure relief valve hose end is positioned in the drain pan.

- Auxiliary heater vessel insulation cover

  Check that the auxiliary heater insulation cover is fastened tightly around the auxiliary heater vessel.

- Sanitary hot water tank pressure relief valve (field supply)

  Applies only to installations with a sanitary hot water tank.

  Check for correct operation of the pressure relief valve on the sanitary hot water tank.

- Sanitary hot water electric heater

Applies only to installations with a sanitary hot water tank.

It is advisable to remove lime buildup on the electric heater to extend its life span, especially in regions with hod water. To do so, drain the sanitary hot water tank, remove the electric heater from the sanitary hot water tank and immerse in a bucket (or similar) with lime-removing product for 24 hours.

- Indoor unit control box

1.Carry out a through visual inspection of the control box and look for obvious defects such as loose connections or defective wiring.

2.Check for correct operation of contactors by the use of an ohmmeter. All of these contactors must be in open position.

13. ERROR CODE

Table. 13-1

Error code	Explanation	
E0	Flow switch error(continuous for 3 times, and should be reset by switch off the power supply)	
E1	T2 error	
E2	UI communication error	
E3	Outdoor unit communication error	
E4	T2B error	
E5	T5 error	
E6	T1 error	
E7	T1B error	
E8	Flow switch（one time ）	
E9	TW_in error	
EA	TW_out error	
Eb	T4 error	
Ec	Heat pump error	
Ed	Phase protection	
EE	Eeprom error	
EF	Outdoor unit error	
P0	T2 high temperature protection	
P1	T2B low temperature protection	
P2	TW_out high temperature protection	
P3	TW_out low temperature protection	
P4	TW_in high temperature protection	
P5	T1 high temperature protection	
P6	T1B high temperature protection	
P7	Outdoor unit protection	
P8	Sanitary hot water tank electric heater protection	
P9	SMK-80/CSD80GN1	Auxiliary heater I protection
	SMK-120/CSD80GN1 SMK-140/CSD80GN1	Auxiliary heater protection
PA	Auxiliary heater II protection	
Pb	Anti -freezing protection	
Pc	Temperature controller error(result from the conflict between cool mode and heat mode)	
t0~t7	Run test	
dF	Defrost	
d0	Oil return function	
d1	Sterilize	
Tp	Air purge function	
Pp	Water pump run for 3 minutes	
Fc	Refrigerate	

14. SPECIFICATIONS

Table.14-1

Model		SMK-80/CSD80GN1	SMK-120/CSD80GN1	SMK-140/CSD80GN1
Nominal Capacity	Cooling	Refer to Technical Data		
	Heating	8 kW	12 kW	14 kW
Rated Input		7.7 kW	8.2 kW	
EIE. Heating Ⅰ Rated Input		4.0kW(400V)		
EIE. Heating Ⅰ Current		10 A		
PS	High	4.4 Mpa		
	Low	2.6 Mpa		
Dimensions H×W×D		900×500×375mm		
Weight	Net Weight	64kg	63kg	
	Gross Weight	77kg	75kg	
Connections	Water Inlet/outlet	1-1/4″MBSP		
	Water Drain	hose nipple		
	Refrigerant Liquid Side	Φ9.52 mm(3/8 inch)		
	Refrigerant Gas Side	Φ15.9 mm(5/8 inch)		
Expansion vessel	Volume	6.5 L		
	Maximum Working Pressure(Mwp)	3 bar		
Pump	Type	water cooled		
Sound Pressure Level		32 dBA		
Internal Water Volume		6 L		
Pressure Relief Valve Water Circuit		3 bar		
Operation Range-Water Side	Heating	+15～+55℃		
	Cooling	+7～+22℃		
Operation Range-Air Side	Heating	-20～+35℃		
	Cooling	+15～+43℃		
	Domestic Hot Water By Heat Pump	-20～+43℃		
Standard Unit	Power Supply	380-415V~ 50Hz		
	Nominal Running Current	See outdoor unit installation manual		
Backup Heater	EIE. Heating Ⅱ Rated Input	3.5kW(230V)	4.0kW(400V)	
	EIE. Heating Ⅱ Current	15.2A	10 A	

NOTE

- MBSP: Male British Standard Pipe
- Sound Pressure Level: At 1 m in front of the unit(free field condition)

SMK-80/CSD80GN1

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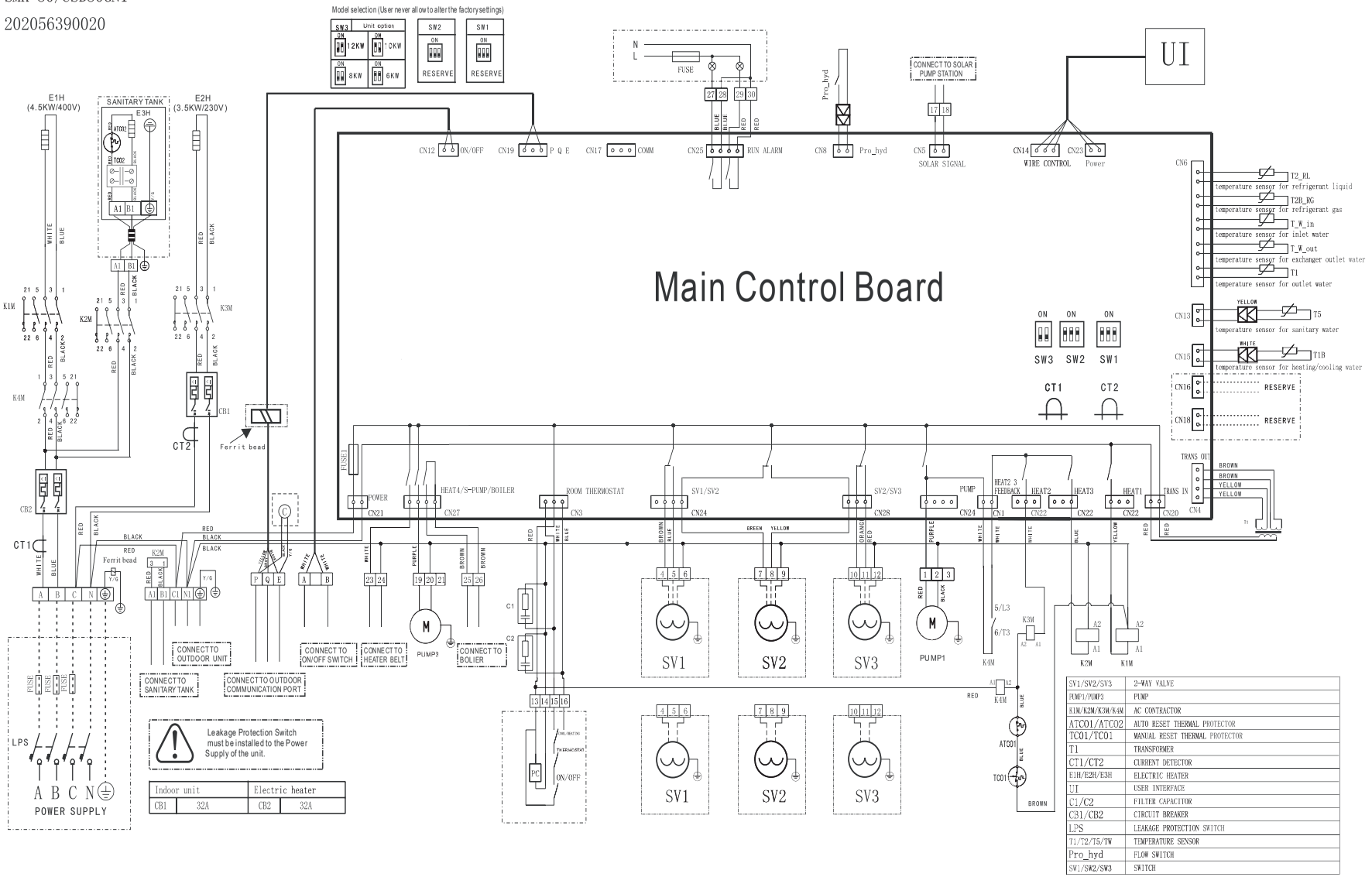

SV1/SV2/SV3	2-WAY VALVE
PUMP1/PUMP3	PUMP
K1M/K2M/K3M/K4M	AC CONTRACTOR
ATC01/ATC02	AUTO RESET THERMAL PROTECTOR
TC01/TC01	MANUAL RESET THERMAL PROTECTOR
T1	TRANSFORMER
CT1/CT2	CURRENT DETECTOR
E1H/E2H/E3H	ELECTRIC HEATER
UI	USER INTERFACE
C1/C2	FILTER CAPACITOR
CB1/CB2	CIRCUIT BREAKER
LPS	LEAKAGE PROTECTION SWITCH
T1/T2/T5/TW	TEMPERATURE SENSOR
Pro_hyd	FLOW SWITCH
SW1/SW2/SW3	SWITCH

SMK-120/CSD80GN1
SMK-140/CSD80GN1

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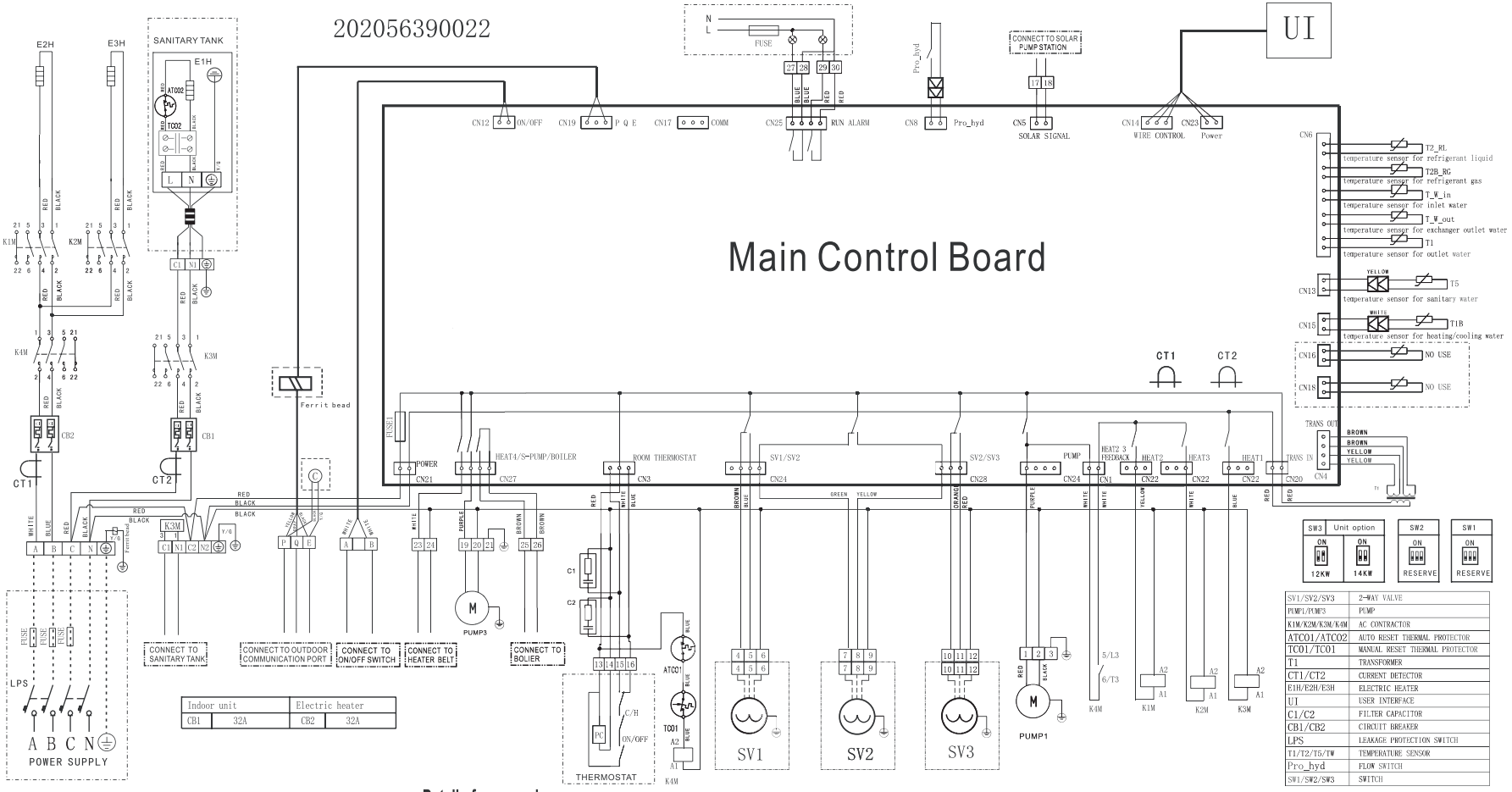

Indoor unit		Electric heater	
CB1	32A	CB2	32A

SV1/SV2/SV3	2-WAY VALVE
PUMP1/PUMP3	PUMP
K1M/K2M/K3M/K4M	AC CONTRACTOR
ATC01/ATC02	AUTO RESET THERMAL PROTECTOR
TC01/TC01	MANUAL RESET THERMAL PROTECTOR
T1	TRANSFORMER
CT1/CT2	CURRENT DETECTOR
E1H/E2H/E3H	ELECTRIC HEATER
UI	USER INTERFACE
C1/C2	FILTER CAPACITOR
CB1/CB2	CIRCUIT BREAKER
LPS	LEAKAGE PROTECTION SWITCH
T1/T2/T5/TW	TEMPERATURE SENSOR
Pro_hyd	FLOW SWITCH
SW1/SW2/SW3	SWITCH

Leakage Protection Switch must be installed to the Power Supply of the unit.

Detail of error codes

E0	Water flow error if continuous for 3 times, then it need to be reset by switch off the power supply	E8	Water flow error one time	P1	T2B high temperature protection	P8	Water tank electric heater protection
E1	T2 error	E9	Plate exchanger inlet water sensor error	P2	Refrigerant to water heat exchanger outlet high temperatu re protection	P9	Hydraulic module electrical heating protection
E2	Wire controller communication error	EA	Plate exchanger outlet water sensor error	P3	Refrigerant to water heat exchanger outlet low temperature protection	Pb	Anti -freezing protection
E3	Outdoor unit communication error	Eb	Outdoor unit sensor error	P4	Refrigerant to water heat exchanger inlet high temperature protection	Pc	Temperature controller error(result from the conflict between cool mode and heat mode)
E4	T2B error	Ed	Phase protection	P5	T1 high temperature protection	t0~t7	Run test
E5	T5 error	EE	Eeprom error	P6	T1B high temperature protection	dF	Defrost
E6	T1 error	P0	T2 high temperature protection	P7	Outdoor unit protection	d0	Oil return function
E7	T1B error						

CHAPTER 2

AIR TO WATER HEAT PUMP SYSTEM(M-THERMAL) WIRE CONTROLLER

Thank you very much for purchasing our product,
Before using your unit , please read this manual carefully and keep it for future reference.

Appearance

NOTE

There will be subject to change without prior notice for improvement of the product's appearance design.

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1. PRECAUTIONS

The following contents are stated on the product and the installation manual, including usage, precautions against personal harm and property loss, and the methods of using the product correctly and safely. After fully understanding the following contents (identifiers and icons), read the text body and observe the following rules.

CAUTION

Read the precautions carefully before installation.
Stated below are important safety issues that must be obeyed.
Meanings of all parts are as follows:

- Caution Means improper handling may lead to personal injury or property loss.
- Warning Means improper handling may lead to personal death or severe injury.

2. INTRODUCTION

The M-Thermal heat pump system is designed to provide you a comfortable climate for many years at low energy consumption.

To get the most comfort with the lowest energy consumption out of your system, it is very important to utilize the controller to operate the heat pump unit.

Defining possible schedule timer actions for each day can help you minimize the energy consumption. Ask your installer for support if required.

- **Make sure the M-Thermal heat pump system works at the lowest possible hot water temperature required to heat your house and the "Auxiliary heater turn on outdoor temperature" is configured correctly.**

  To optimize this, make sure the "Auxiliary heater turn on outdoor temperature" is configured to match the installation environment. Setting this temperature correctly will avoid the auxiliary heater to operate when the heat pump has sufficient capacity to heat up your house. Refer to the section of "Field settings".

- **Make sure the sanitary hot water is only heated up to the sanitary hot water temperature you required. [This recommendations only apply to installations with an optional sanitary hot water tank]**

  Start with a low sanitary hot water set point (e.g. 45℃) by using the wire controller, and only increase if you feel that the sanitary hot water supply temperature is not sufficient.

- **Make sure the sanitary hot water heating only start 1 to 2 hours before you expect sanitary hot water usage. [This recommendations only apply to installations with an optional sanitary hot water tank]**

  In case your only need a lot of sanitary hot water in the evening or in the morning, only allow sanitary water heating during early morning and early evening. Also keep hours with low electricity cost tariffs in mind.

To do this, program the sanitary water heating schedule timer.
Operating the heat pump comes down to operating the wire controller.

CAUTION

- Never let the wire controller get wet. This may cause an electric shock or fire.
- Never press the buttons of the wire controller with a hard, pointed object. This may damage the wire controller.
- Never inspect or service the wire controller yourself, ask a qualified service person to do this.

3. FEATURES AND FUNCTIONS

The wire controller is a state of the art controller that offers full control over your installation.

NOTE

Some functions described in this manual may not be available or should not be available. Ask your installer for more information.

3.1 Basic controller functions

The basic controller functions are:

- Turning the unit ON/OFF
- Operation mode change-over:
  - Space heating
  - Space cooling
  - Sanitary water heating
  - Space heating & Sanitary water heating
  - Space cooling & Sanitary water heating
- Selection of features:
  - Silent mode
  - Run test function
  - Air purge function
- Temperature set point adjustment

NOTE

The functions “space cooling” , “space heating” and “sanitary water heating” can only be selected when the corresponding equipment is installed.

3.2 Clock function

The clock functions are:

- 24 hour real time clock
- Day of the week indicator

3.3 Schedule timer function

The schedule timer function allows the user to schedule the operation of the installation according to a daily or a weekly program.

4. NAME AND FUNCTION OF BUTTONS

Fig. 4-1

4.1 Cooling/Heating ON/OFF button

The ON/OFF button starts or stops the heating or cooling function of the unit.

When the unit is connected with an external room thermostat, this button is not operable and the icon is shown .

Pressing the ON/OFF button consecutively too many times may cause malfunction of the system.

NOTE

Remark that pushing button has no influence on the sanitary water heating. Sanitary water heating is only switched on or off by means of the button.

4.2 Weekly schedule timer button

The main function of this multi-purpose button is to enable/disable the schedule time.

The button is also used to program the controller. The function of the button depends on the actual status of the controller or the on previous actions carried out by the operator.

4.3 Silent mode button

This button enables or disables silent mode.

Under silent mode, the compressor and the fan of the outdoor unit will run at lower frequency to reduce the noise of the outdoor unit.

When the unit operates in silent mode, the silent mode icon will be displayed in the screen.

The unit will exit silent mode when satisfies either of the following conditions: (1) Press silent mode button under silent mode; or (2) The timer begin to work when the unit operates in the silent mode, and the unit will exit silent mode when the timer period is longer than the setting value of “7-1” in “Field settings”.

4.4 Clock setting button

This button enables or disenables clock setting.

Under normal mode, press clock setting button to enter the clock setting interface.

Using Prev button and Next button to switch among weekday, hour, minute, the switch-over object will be flashed. Using button and button to adjust the parameter of the date, hour, and minute. After adjusting the parameter then press OK button to save the setting and exit clock setting. If press directly or not press the button OK for 10 seconds, it will exit without saving the setting value.

4.5 Sanitary water heating button

This button enables or disables heating of the sanitary water.

This button is not used when the sanitary hot water tank is not installed and “Not available” icon will be displayed on the screen if the button is pressed. The installation of sanitary water tank needs to configure the value “0-2” of “Field settings” to be 1.

If sanitary water heating is enablled, the icon will be shown in the screen.

When the heat pump is used to heat the sanitary water tank, the outlet temperature of the indoor unit is set to be 55℃ and can not be adjusted..

NOTE

Remark that pushing the button has no influence on the sanitary water heating. Sanitary water heating is only switched ON or OFF by means of the button.

4.6 Sanitary hot water temperature setting button

This button enables or disables sanitary water temperature setting, and should be work together with the ▲ button and ▼ button to adjust the temperature of sanitary water.

This button is not used when the sanitary hot water tank is not installed and "Not available" icon will be displayed on the screen if the button is pressed.

When adjusting water temperature, the icons and will be shown on the screen, the setting temperature value of water tank will be displayed as −888.8, the water temperature can be adjusted through ▲ button and ▼ buttons. Pressing the button ▲ or the button ▼ every time can adjust 1℃. After adjusting sanitary water temperature, the button OK is used to confirm the setting. If the button OK is not pressed after adjusting the sanitary water temperature, the change of the setting will not be accepted by the wire controller.

Sanitary water tank temperature setting range is from 35℃ to 60℃. If the setting temperature is below 35℃ then 35℃ is used to be the setting. If the setting temperature is above 60℃, then 60℃ is used to be the setting.

The default sanitary water temperature is 45℃.

4.7 Space cooling/Space heating button

This button allows manual switching between cooling or heating mode. The default mode is heating mode.

When the unit is connected with an external room thermostat, this button is not operable and the icon is shown.

If the unit is operating in cooling mode then the cooling icon will be shown, and if the unit is operating in heating mode then the heating icon will be shown. If the unit is not running then the mode icon will disappear within 5 seconds.

If fan coil is not installed or is not selected by "Field settings", the space heating/space cooling button can only used for space heating, and the space cooling is not valid. If the button switches to the space cooling mode, "Not available" icon will be shown to indicate that this function is not available.

The display icon for each mode of space cooling, space heating, sanitary water heating, space cooling & sanitary water heating,space heating & sanitary water heating is described in table 4-1.

Table 4-1

Mode	Screen display	Operation lamp ●	Remark
Space cooling	The space cooling icon is shown.	Operation lamp ● lights	Press the ON/OFF button ⏻ to operate or stop space cooling
Space heating	The space heating icon is shown.	Operation lamp ● lights	Press the ON/OFF button ⏻ to operate or stop space heating
Sanitary water heating	The sanitary heating icon shown.	Operation lamp ● is off	Press sanitary water heating button to switch ON/OFF for water heating. Under sanitary water heating mode, the space cooling/space heating button ⏻ is not valid.
Space cooling & sanitary water heating	The sanitary water heating icon and space cooling icon are shown	Operation lamp ● lights	Press sanitary water heating button to switch ON/OFF for water heating. Press the ON/OFF button ⏻ to operate or stop space cooling.
Space heating & sanitary water heating	The sanitary water heating icon and space heating icon are shown.	Operation lamp ● lights	Press sanitary water heating button to switch ON/OFF for water heating. Press the ON/OFF button ⏻ to operate or stop space heating.

4.8 Space cooling/Space heating temperature setting button

This button enables or disables space cooling/space heating temperature setting, and should be work together with the ▲ button and button ▼ to adjust the temperature of the outlet water temperature of indoor unit.

When adjusting water temperature under cooling mode, the icon and the icon are shown. When adjusting water temperature under heating mode, the icon and the icon are shown. The setting temperature will be displayed as 888.8 ℃. The temperature can be adjusted through ▲ and ▼ buttons. Pressing the button ▲ or the button ▼ every time can adjust 1℃. After adjusting the temperature, the button OK is used to confirm the setting. If the button OK is not pressed after adjusting the temperature, the change of the setting will not be accepted by the wire controller.

The water temperature setting range is from 7℃ to 22℃ for the space cooling mode. The setting temperature will be 7℃ if the setting temperature is below 7℃,and 22℃ if the setting temperature is above 22℃.

The water temperature setting range is from 25℃ to 55℃ for the space heating mode. The setting temperature will be 25℃ if the setting temperature is below 25℃, and 55℃ if the setting temperature is above 55℃.

NOTE

● If the heat pump is used for sanitary water heating, the outlet water temperature of indoor unit is 55℃ and cannot be adjusted.

● If fan coil is not installed or is not selected by "Field settings", the space heating/space cooling button can only used for space heating, and the space cooling is not valid. If the button switches to the space cooling mode, "Not available" icon will be shown to indicate that this function is not available.

4.9 Menu button

This button enables and disables menu setting function of the controller.

The value of the menu can be adjusted when the unit is power on and the change will be valid only after switch off the power supply and then switching on the power supply again.

Press button can enter the setting menu of the controller, such as priority setting for sanitary hot water heating mode and space cooling/space heating mode, disinfection function setting, silent mode setting. When the controller enters the menu setting, the menu icon will be shown.

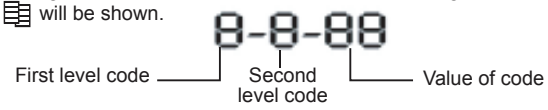

Fig 4-2

The menu utilize 3-section and 4 number code setting as shown in Fig 4-2. The first code is the first level of the menu; the second code is the secondary level of the menu, and the third and fourth code is corresponding values of the previous two codes. The first level menu is adjusted by Prev button. The secondary level menu is adjusted by Next button.

The content (value) of the menu is described by the last two numbers of the code. If the value of a menu needs to be adjusted, the default value or the previous confirmed value will be displayed first. Using button ▲ and button ▼ to adjust the value of the setting. When adjusting the parameter will be flashed, and press OK button to confirm and the value will not be flashed. If the setting change is not confirming by press OK button, all the codes will remain as the original setting values.

Exit the menu setting: (1) Press the menu button and exit the menu setting if the controller is in the menu setting mode. Or (2) no button press operation for 60 seconds, then it will exit automatically.

4.10 Check button

This button enables and disenables the checking function of the controller.

Press this button（press for the first time）can check the system running parameter and malfunction or error code quickly. When it is checking, press Prev and Next button to cyclic check all the parameters of the system. Press it again will exit the checking.

The exiting checking function condition: (1) press the check button again（press the second time）; or (2) no button press operation for checking in 30 seconds.

4.11 Page up button Prev

This button is used for page up function. In the menu setting function mode it is used to adjust the first menu code. In the check mode it is used to page up the parameters to be checked.

Press this button for 10 seconds, the system will enter the first time running for the floor heating, and the icon will be flashed slowly.

4.12 Page down button Next

This button is used for page down function. In the menu setting function mode it is used to adjust the second menu code. In the check mode it is used to page down the parameters to be checked.

4.13 Increasing button ▲

This button is used for increasing the current value.

When adjusting the setting temperature, press this button will increase the temperature value. If the button is pressed over 1 second then the temperature will rise with "1℃/℉" per 0.2 second.

When adjusting the time, press this button will increases the time value. If the button is pressed over 1 second then it will rise with "1h" or "1min" per 0.2 second.

When adjusting the week day value, press this button will increase 1 day.

When adjusting the setting parameters of the menu, press this button will roll forward the setting parameters.

4.14 Decreasing button ▼

This button is used for decreasing the current value.

When adjusting the setting temperature, press this button will decrease the temperature value. If the button is pressed over 1 second then it will decrease with "1℃/℉" per 0.2 second.

When adjusting the time, press this button will decreases the time value. If the button is pressed over 1 second then it will decrease with "1h" or "1min" per 0.2 second.

When adjusting the week day value, press this button will decrease 1 day.

When adjusting the setting parameter of the menu, press this button will roll backward the parameter setting.

4.15 Confirm button OK

After changing the value of each setting, press this button to confirm the change. If forget to press this confirm button, all changing setting will not be valid, and the unit operates with the original setting.

4.16 Lock button lock

Press this button for locking all other buttons. If each one of other buttons is pressed, "Not Available" icon will be shown to indicate invalid press. Press lock button again can unlock the buttons.

4.17 Reset button Reset

Press this button to reset the wire controller, and return to factory default settings.

The clock can not be recovered and the weekly schedule timer will be cleaned by pressing reset Reset button.

5. NAME AND FUNCTION OF ICONS

5.1 Spacing cooling mode icon

This icon indicates the current operation mode is space cooling.

5.2 Spacing heating mode icon

This icon indicates the current operation mode is space heating.

5.3 Sanitary water heating icon

This icon indicates the current operation mode is sanitary water heating.

5.4 Pump icon

This icon indicates that the circulation pump is running.

5.5 Compressor icon

This icon indicates that the compressor in the outdoor unit is active.

5.6 Silent mode icon

This icon indicates the current operation mode is silent mode.

5.7 Disinfection icon

This icon indicates that the disinfection mode is active.

5.8 Defrost icon

This icon indicates that the defrost mode is active.

5.9 Anti-freezing icon

This icon indicates that the anti-freezing mode is active.

5.10 Weekly schedule timer icon

1 2 3 4 SUN MON TUE WED THU FRI SAT

These icons indicate the operation and the date of the weekly schedule timer. These icons SUN MON TUE WED THU FRI SAT indicate the date that has set the schedule timer. These icons 1 2 3 4 indicate the operation of that day.

After setting the weekly schedule timer function, the corresponding date will be displayed. When the date that have set the schedule timer arrive, the lamp of that day will be flashed slowly to indicate that the day has the action of weekly timer setting.

If some day has set the weekly timing and the date arrived, then the lights up number of the lamp will be the same as the number of the weekly timer operation.

For example, in a week, Monday, Thursday and Sunday have been set weekly schedule timer operations through wire controller, and Thursday has set 3 weekly timer operations. The lamps of Monday, Thursday and Sunday will be lightened on the wire controller; and when it is Thursday, the lamp will be flashed slowly and the corresponding lamps of 3 timing operations will be lightened.

5.11 Sanitary water tank electric heater icon

This icon indicates that the electric heater of the sanitary water tank is active. The electric heater provides auxiliary heating for the sanitary hot water tank.

The electric heater is located in the sanitary hot water tank.

The icon is not used when the sanitary hot water tank is not installed.

5.12 First stage auxiliary heater icon

This icon indicates that the first stage auxiliary heater of the indoor unit is operating when there is a high demand for heating capacity. The auxiliary heater provides extra heating capacity in case of low ambient outdoor temperature (high heating load).

5.13 Second stage auxiliary heater icon

This icon indicates that the second stage auxiliary heater of the indoor unit is operating when there is a high demand for heating capacity. The auxiliary heater provides extra heating capacity in case of low ambient outdoor temperature (high heating load).

5.14 Setting temperature display

The display shows the current set temperature of the installation.

When adjusting the temperature setting (the outlet water temperature of cooling and heating mode, the setting temperature of the sanitary water tank), the corresponding temperature setting will be displayed.

Exit conditions: (1) After adjusting the temperature, press OK button for confirmation; or (2) no adjusting the temperature setting in 10 seconds then it will exit automatically.

5.15 Display temperature

The display also used to shows the water outlet temperature of indoor unit when there is no button press operation.

Usually the wire controller display the outlet water temperature of the indoor unit.

Under the check state, it will display the checking information (temperature or Error code).

5.16 External heat source icon

External heat source includes solar energy, gas boiler, etc. These icons indicate that external heat source(s) is (are) installed.

When a solar panel is installed, the icon EXTERNAL POWER is shown. When a gas boiler is installed, the icon EXTERNAL POWER is shown. When a solar panel and a gas boiler are installed, the icons are shown.

When using solar energy to heat the sanitary water tank icon EXTERNAL POWER will flash slowly; and when use gas boiler for space heating icon EXTERNAL POWER will flash slowly.

5.17 Room thermostat icon

This icon indicates that an external room thermostat with higher priority is controlling your installation. This external room thermostat can start and stop the space heating/cooling operation and change the operation mode (cooling/heating).

When an external room thermostat with a higher priority is connected, the schedule timer for space cooling and space heating will not function.

5.18 Clock display

The clock display shows the current time.

When reading or programming the schedule timer, the clock display shows the action time.

5.19 Menu code and value display

The first code and the second represent the first level and the second level menu from the field set list.

The last two numbers indicate the value of the first and the second code.

5.20 Operation lamp

The operation lamp lights in each one mode of the space cooling, space heating, space cooling & sanitary water heating, space heating & sanitary water heating operation, and the operation lamp will OFF if the unit does not operate in one of the mode among the space cooling, space heating, space cooling & sanitary water heating, space heating & sanitary water heating operation.

while the other operation modes can still be active.

If a malfunction of the unit occurs, the operation lamp ● will flash quickly, and the Error code will be display on the temperature display icon 888.8.

If the communication malfunction between the controller and the unit occurs, the operation lamp ● will flash quickly.

The lamp will switch OFF if the unit is switch off.

5.21 Floor heating inlet temperature icon

This icon indicates the checking parameter is the inlet temperature of floor heating.

If the floor heating first time heating operates, the icon will flash slowly.

5.22 Space cooling & sanitary water heating icon &

These two icons indicate the current operation mode are space cooling and sanitary water heating.

5.23 Space heating & sanitary water heating icon &

These two icons indicate the current operation mode are space heating and sanitary water heating.

5.24 Schedule timer OFF icon

This icon indicates all the operations of the schedule timer are inactive.

5.25 Lock icon

This icon indicates all the buttons of the controller are locked except button lock.

5.26 Not available icon

This icon is displayed whenever non-installed option is addressed or a function is not available.

6. SETTING UP THE CONTROLLER

After initial installation, the user can set the clock and day of the week.

The controller is equipped with a schedule timer that enables the user to schedule operations. Setting the clock and day of the week is required to be able to use the schedule timer.

6.1 Setting the clock

- **Hold down the clock button**
  The clock read-out and the day of week indicator start flashing.
- **Using Prev button or Next button to switch from week, hour and minute.**
- **Using ▲ button or ▼ button to change the parameter of the day of week, hour and minute.**
- **Press OK button to confirm the changes.**
  To leave this procedure without saving, press the button.
  If no button is pressed for 10 minutes the clock and day of the week will return to their previous setting.

NOTE

The clock needs to be set manually.

6.2 Setting the schedule timer

To set the schedule timer, refer to the chapter “Schedule timer”.

7. DESCRIPTION OF THE OPERATION MODE

7.1 Space heating operation

In this mode, heating will be active as required by the water temperature set point. The set point can be set manually.

7.2 Space cooling operation

In this mode, cooling will be activated as required by the water temperature set point. The set point can be set manually.

NOTE

Switching between space heating and space cooling operation can only be done by pressing the / button or by an external room thermostat.

7.3 Sanitary water heating operation

In this mode, the unit will deliver hot water to the sanitary hot water tank when the space heating or the space cooling operation has reached its temperature set point. When necessary, the electric heater of the tank provides auxiliary heating for the sanitary hot water tank.

The sanitary hot water temperature set point can be set manually.

NOTE

- In order to provide sanitary hot water throughout the day, it is advised to keep the sanitary water heating operation on continuously.
- Any sanitary water heating is impossible when the sanitary hot water tank is not installed.
- When the icon EXTERNAL POWER flashes, hot water is delivered to the sanitary hot water tank by the solar kit option and not by M-Thermal unit.

7.4 Space heating & sanitary water heating operation &

In this mode, the M-Thermal unit provides space heating operation or sanitary water heating operation according to the priority of these two modes. The priority of space heating and sanitary water heating is determined by the value of field settings “1-0”.

7.5 Space cooling & sanitary water heating operation &

In this mode, the M-Thermal unit provides space cooling operation or sanitary water heating operation according to the priority of these two modes. The priority of space cooling and sanitary water heating is determined by the value of field settings “1-1”.

7.6 Defrost

In space heating operation, sanitary water heating or space heating & sanitary water heating operation, freezing of the outdoor heat exchanger may occur due to low outdoor temperature. If this risk occurs, the system goes into defrost operation. It reverse the cycle and takes heat from the indoor system to prevent freezing of the outdoor system. The auxiliary heater installed in the auxiliary heater of the indoor unit will switch on during the defrost cycle to provide additional heat, and switch off after the defrost cycle. After a maximum of 10 minutes of defrost operation, the system returns to its previous operation.

7.7 Silent mode

Silent mode operation means that the unit works at reduced capacity so that the noise produced by the unit drops. This implies that the indoor heating and cooling capacity will also drop. Beware of this when a certain level heating is required indoors.

7.8 Disinfection function

When the icon appears, the disinfection function is activated. If the disinfection setting temperature is above 50℃, the electric heater in the sanitary will switch on to provide auxiliary heating.

7.9 Anti-freezing protection function

When the icon appears, the anti-freezing protection function is activated. The unit or the auxiliary heater is operating according to the control logic of anti-freezing protection function.

8 CONTROLLER OPERATIONS

8.1Manual operation

In manual operation, the user manually controls the settings of the installation. The last setting remains active until the use changes it or until the schedule timer forces another setting.

As the controller can be used for a wide variety of installations, it is possible to select a function which is not available on your installation. In that case the icon Not Available will appear.

8.2 Switching on and setting space cooling and heating

- **Use the button to select space cooling or space heating Icon or will appears.**
- **Use the button to go to the water temperature setting and the corresponding water set temperature will appears.**
- **Use the button or button to set the desired water temperature.**

Temperature range for space cooling: 7℃ to 22℃.

Temperature range for space heating: 25℃ to 55℃.

NOTE

If the unit operates in sanitary water heating mode, the water temperature of the indoor unit cannot be adjusted. The default water temperature is 55℃.

- **Use the button to confirm the temperature set.**
- **Switch on the unit by pushing the button.**

The operation lamp ● lights up.

NOTE

When the unit is connected to an external room thermostat, buttons and are not operable and icon is shown. In this case, the external room thermostat switches the unit on or off and determines the operation mode (space cooling or space heating).

8.3 Selection and setting of sanitary water heating

- **Use the button to activate sanitary water heating, icon appears on the display.**
- **Use the button go to the sanitary water tank temperature setting and the corresponding water set temperature will appears.**
- **Use the button or button to set the desired water temperature.**

Temperature range for sanitary water heating: 35℃ to 60℃.

- **Use the button to confirm the temperature set.**
- **Press the button to deactivate sanitary water heating, icon disappears from the display.**

NOTE

Remark that pushing the button has no influence on the sanitary water heating. Sanitary water heating is only switched on or off by means of the button.

8.4 Switching on and setting space heating & sanitary water heating &

According to the steps of section 8.2 to switch on and set space heating .

According to the steps of section 8.3 to select and set the sanitary water heating

Set the value of field setting “1-0” for the priority of space heating and sanitary water heating .

The unit will operate according to the priority of space heating and sanitary water heating .

8.5 Switching on and setting space cooling & sanitary water heating &

According to the steps of section 8.2 to switch on and set space cooling .

According to the steps of section 8.3 to select and set the sanitary water heating

Set the value of field setting “1-1” for the priority of space cooling and sanitary water heating.

The unit will operate according to the priority of space cooling and sanitary water heating

8.6 Selecting silent mode operation

Use the button to activate silent mode operation.

Icon appears on the display.

8.7 Displaying temperature and Error code

Push the check button to goto checking mode and the corresponding temperature or Error code appears on the position of .

Use the Prev and Next buttons to display temperature or Error code.

The display sequence is as following: return water temperature of indoor unit, outlet water temperature of refrigerant to water heat exchanger, outlet water temperature of indoor unit, water tank temperature, inlet water temperature of floor heating circuit, refrigerant inlet temperature, refrigerant outlet temperature, water tank setting temperature, outlet water setting temperature of indoor, environment temperature of indoor side, the latest three malfunction or error codes. If the temperature sensor of floor heating inlet circuit is not installed, as checking this temperature, “--” will be shown in the place of icon .

The check and display sequence are described in table 8-1.

Table 8-1

sequence	Content	Display method and position
1	Return water temperature of indoor unit	The return water temperature of indoor unit icon  appears and the temperature is displayed at the position of icon  .
2	Refrigerant to water Heat exchanger outlet water temperature	The heat exchanger outlet water temperature of indoor unit icor  appears and the temperature is displayed at the position of icon .
3	Outlet water temperature of indoor unit	The outlet water temperature of indoor unit icon  appears and the temperature is displayed at the position of icon  .
4	Water tank temperature	The water tank temperature icon  appears and the temperature is displayed at the position of icon  .
5	Floor heating circuit inlet temperature	The floor heating circuit inlet temperature icon  appears and the temperature is displayed at the position of icon  .
6	Refrigerant inlet temperature of indoor unit	The refrigerant inlet temperature icon  appears and the temperature is displayed at the position of icon  .
7	Refrigerant outlet temperature	The refrigerant outlet temperature icon  appears and the temperature is displayed at the position of icon  .
8	Setting water tank temperature	The icons  and  appear, and the temperature is display at the position of icon  .
9	Outlet water Setting temperature of indoor unit	The icons  and  appear, and the temperature is display at the position of icon  for the space cooling mode. The icons  and  appear, and the temperature is display at the position of icon  for the space heating mode
10	Inoor side temperature	UI senses the temperature at any time and displays at the position of icon  .
11	Malfunction or error code	Malfunction or error code is displayed at the position of icon 
12		Malfunction or error code is displayed at the position of icon 
13		Malfunction or error code is displayed at the position of 

Checking function can check the recent 3 malfunction or error codes, the first code is the nearest just happened code. If there is new error or malfunction, then the first error code will be shifted to the second place, the new one will take place of it.

If the operation lamp flash quickly that means there is alarm at present, the first code be checked is the current error code; if the operation lamp do not flash, then the first code be checked is the error code that happened before.

Push the check button again to leaves the checking mode, or if no button is pressed for 30 seconds the controller leaves the checking mode.

8.8 Schedule timer operation

In schedule timer operation, the installation is controlled by the schedule timer. The actions programmed in the schedule timer will be executed automatically.

The schedule timer always follows the last command until a new command is given. This means that the user can temporary overrule the last executed programmed command by manual operation. The schedule timer will regain control over the installation as soon as the next programmed command of the schedule timer comes.

NOTE

- Only use the W button to enable or disable the schedule timer. The schedule timer overrules the ⏻ button. The ⏻ button only overrules the schedule timer until the next programmed action.
- When power returns after a power supply failure, the auto restart function reapplies the user interface settings at the time of the power supply failure.

CAUTION

- The programmed schedule is time driven Therefore, it is essential to set the clock and the day of the week correctly.
- The actions programmed in the schedule timer will not be lost after a power failure so that reprogramming the schedule timer is not required.

8.9 What can the schedule timer do?

■ **Space cooling and space heating**

Switch on the desired mode at a scheduled time. In combination with a set point. Five actions per weekday can be programmed, totalling 35 actions.

NOTE

When the unit is connected to an external room thermostat, the schedule timer for space cooling and space heating is overrulamp by the external room thermostat.

■ **Silent mode**

Switch the mode on or off at a scheduled time. Five actions can be programmed per mode, these actions are repeated daily.

■ **Sanitary water heating**

Switch the mode on or off at a scheduled time. Five actions can be programmed per mode, these actions are repeated daily.

CAUTION

The programmed actions are not stored according to their timing but according to the time of programming. This means that the action that was programmed first gets number 1, even though it is executed after other programmed action numbers.

- When the schedule timer switches space heating or space cooling OFF, the controller will also be switched off. Note that this has no influence on sanitary water heating.

8.10 What can the schedule timer NOT do?

The schedule timer can not change the operation mode from space cooling to space heating or vice versa.

8.11 How to interpret the programmed actions

To be able to understand the behavior of your installation when the schedule timer is enablamp, it is important to keep in mind that the “last” programmed command overrulamp the “preceding” programmed command and will remain active until the “next” programmed command occurs.

Example: imagine the actual time is 17:30 and actions are programmed at 13:00, 16:00 and 19:00. The “last” programmed command (16:00) overrulamp the “previous” command (13:00) and will remain active until the “next” programmed command (19:00) occurs.

So in order to know the actual setting, one should consult the last programmed command. It is clear that the “last” programmed command may date from the day before.

9. SCHEDULE TIMER

Under normal state press W button for 5 seconds can open or close schedule timer function. When schedule timer function is inactive the icon W OFF is shown.

To leave schedule timer procedure without saving, press the W button.

If no button is pressed for 30 seconds the procedure will be finished and the schedule timer will return to previous setting.

Each cycle has 7 days and starts from Sunday to Saturday, we can set 5 operations in each day.

9.1 Weekly schedule timer

Press W button can enter weekly timer setting state, and enter the first step. During weekly timer setting state, press Prev button can go back to the previous step, press Next button can go on to the next step, and press ▲ button and ▼ button within each step can adjust the setting value and Press OK button can save the setting vale.

Step1: The icons of the total week SUN MON TUE WED THU FRI SAT are flash, and all the operations of each day of the week are set simultaneously. If the previous settings of each day of the week are the same, the operation icon is shown. If the previous settings of each day of the week are not the same, the operation icons are OFF. Using ▲ button and ▼ button to select week icon SUN MON TUE WED THU FRI SAT, all the icons of the days of the week with weekly timer function will be lighted, the selected week day icon will be flashed, and all the selected week days operation icons will be lightened. Shift to the week day icon which need to be set, then press Next button to enter to step (2), and then it will lighten up the icons of selected week day and operation.

Step2: Using ▲ button and ▼ button to select operation icon ①②③④⑤, then the selected operation will be flashed. Shifting to the operation icon which needs to be set, then press Next to enter step (3), or press Prev to go back to step (1).

Step3: Using ▲ button and ▼ button to set the hour 88:, then press Next button to enter step (4), or press Prev button to go back to step (2).

Step4: Using ▲ button and ▼ button to set the minute :88, then press Next button to enter step (5), or press Prev button to go back to step (3).

Step5: Using ▲ button and ▼ button to select the mode icon , then the selected operation mode will flash,and then press Next button to enter step (6), or press Prev button to go back to step (4).

Step6: While entering step (6), icon will flash. Using ▲ button or ▼ button to set whether the selected mode of step (5) is timer ON or timer OFF, once there has selection then the icon will not flash. If the timer OFF is selected, the icon will lighten, and the temperature display icon will become“ — — ” . If the timer ON is selected, the icon will disappear, and the temperature display icon will display default or saved temperature. If icon is selected, press ▼ button or ▲ button can switch to close all modes, the icon will lighten and the temperature display icon will be “ALL”,and all the modes will be lightened. After finished setting, press Next button will enter to step (7) if it is timer ON, or go back to step (1). Press Prev button will go back to step (5).

Step7: Using ▲ button or ▼ button to set temperature , and press OK button to save this setting, then go to step (2) and begin the next operation setting. If this is the last operation then will go to step (1) to proceed the next week’s setting. It can also press Next button to go back to step (1), and press Prev button to go back to step (6).

9.2 Weekly schedule timer duplicate （duplicate the previous day）

Under normal mode, press W button to enter the weekly timer setting interface.

Use ▲ button or ▼ button to select the day of the week icon SUN MON TUE WED THU FRI SAT, the selected week day icon will flash, shift to the day of the week icon which needs to be duplicated, and then press button to duplicate the day.

9.3 Weekly timer cancel

■ **Cancel one day**

Under normal mode, press W button to enter the weekly timer setting interface.

- Use ▲ button or ▼ button to select the week day icon SUN MON TUE WED THU FRI SAT , the selected week day icon will flash, shift to the week day icon which needs to be canceled, and then press button to cancel the day.

■ **Cancel one operation of one day**

Under normal mode, press W button to enter the weekly timer setting interface.

- Use ▲ button or ▼ button to select the week day icon Next SUN MON TUE WED THU FRI SAT , the selected week day icon will flash, shift to the week day icon which needs to be set, and then press button to goto step (2).
- Use ▲ button or ▼ button to select the operation of week day icon 1 2 3 4 , the selected operation will be flashed, shift to the operation which needs to be canceled, and then press button to cancel the operation.

9.3 Conflict between manual operation and weekly schedule timer

■ **When there is conflict between manual operation and schedule timer function**

- If the conflict between the manual operation and schedule timer happens right at the moment of manual operation, then the manual operation has the higher priority than schedule timer and the unit will operate according to the manual operation.
- If the conflict between the manual operation and schedule timer happens after a period of time of the manual operation, then the schedule timer has the higher priority than manual operation. The unit will operate .according to the manual operation for a period and than switch to operate according to schedule timer when the time of schedule timer comes.

10. FIELD SETTING TABLE

Table. 10-1

First Code	2nd Code	Setting name	Default value	Range	Step	Unit	Remark
0	Basic selection						
	0	floor heating	0	0/1			0-No selection; 1-Selection
	1	fan coil or low temperature radiat	0	0/1			0-No selection; 1-Selection
	2	sanitary hot water tank	0	0/1			0-No selection; 1-Selection
	3	Electric heater for sanitary hot water tank	1	0/1			0-No selection; 1-Selection
	4	Auxilary Heating source such as boiler	0	0/1			0-No selection; 1-Selection
	5	Solar kit	0	0/1			0-No selection; 1-Selection
	6	Auxiliary heater of indoor unit	1	0/1			0-No selection; 1-Selection
	7	Room thermostat	0	0/1			0-No selection; 1-Selection
	8	Fan coil function	0	0/1			0-Cooling only, 1-heating and cooling
1	Priority						
	0	Space heating and Sanitary heating priority	0	0/1/2			0-Sanitary heating priority, 1- space heating priority, 2 - both
	1	Cooling and Sanitary heating priority	0	0/1			0-Sanitary heating priority, 1- Fan coil cooling priority
	2	HP Max. Running period for heating sanitary water tank	10	10~95	5	min	
	3	Solar heating priority	0	0/1			1-solar priority; 0-HP priority
2	Disinfection function						
	0	Operation interval	5(Fri.)	0~7	-	-	0-Sun, 1-Mon,…,6-Sat, 7-all
	1	Status	1(ON)	0/1			0-OFF,1-ON
	2	Start time	23:00	0~23	1	hr	0-0:00, 1-1:00, … , 23-23:00
	3	Set point temperature	60	50~65	5	℃	
	4	Interval	10	5~60	5	min	
3	Aux. heating resources operation						
	0	Boiler turn on temperature difference	10	5~15	1	℃	It should satisfied all conditions before turning on boiler
	1	Boiler turn on time delay	30	0~95	5	min	
	2	Boiler turn on outdoor temperatui	0	-5~35	1	℃	
	3	Under floor heating inlet temperature upper limit	60	56~70	1	℃	
4	Electric heater & HP priority						
	0	Electric heater delay time	20	20~95	5	min	
	1	HP Start Temperature Difference	5	1~20	1	℃	
	2	Set point correction for Sanitary hot water tank	2	0~5	1	℃	
5	Auxiliary Heater Operation						
	0	Auxiliary Heater1/2 turn on time delay	20	5~60	5	min	
	1	Auxiliary Heater1 turn on temperature difference	5	2~15	1	℃	
	2	Auxiliary Heater2 turn on temperature difference	5	2~15	1	℃	
	3	Auxiliary heater turn on outdoor temperature	0	-5~35	1	℃	
6	Cooling and heating set point ranges						
	0	Cooling set point upper limit	22	18~22	1	℃	
	1	Cooling set point lower limit	7	5~18	1	℃	
	2	Heating set point upper limit	55	37~55	1	℃	
	3	Heating set point lower limit	25	15~37	1	℃	
	4	Sanitary heating set point upper limit	55	38~60	1	℃	
	5	Sanitary heating set point lower limit	35	35~38		℃	
7	Others						
	0	Celsius / Fahrenheit switching		0/1	1		0-Celsius, 1-Fahrenheit
	1	Silent mode	8	1~24		hr	
	2	Run Test		0/1	1		0-Disable; 1-Enable
	3	Run Test period	8	8~20		min	
	4	First time floor heating function		0/1			0-Disable; 1-Enable
	5	Air purge function		0/1			0-Disable; 1-Enable
	6	Temperature selection		0/1			0-water out from indoor unit; 1-water tank;

11. AUXILIARY FUNCTION OF THE CONTROLLER

11.1 Screen saving function

The action of the screen saving function is to close the backlight of the controller to save energy.

Enter condition: no button operation in 60 seconds.

Exit condition: there are any button operations.

11.2 Run test mode function

When the indoor unit receives the trail run signal of the wire controller, the pump PU.I and PU.O (if install) will operate, and then running each actions for 5minutes (the value of the time can be adjusted from field settings) in the following sequence: sanitary water heating, fan coil heating, floor heating, external heat source, fan coil cooling. After running these actions, the unit will exit trail running mode automatically and go to the off mode.

During the trial running, every protection is valid and the running state icon will be displayed.

If the value of field setting “7-2” is set to be 1, then press the check button over 5 seconds, the unit will enter the trail running mode. If the value of field setting “7-2” is set to be 0, the pushing of the button will not go to trail running mode.

During trial running mode, icons OPERATION appear. If the current action of trail running is sanitary water heating, sanitary water heating icon will flash slowly; if the current action is fan coil heating, the heating icon will flash slowly; if the current action is floor heating, the heating icon and floor heating circuit inlet temperature icon will flash slowly at the same time; if the current action is external heat sources heating, the external heat sources icon ROOM THERMOSTAT will flash slowly; and if the current action is the solar kit heating the solar kit icon will flash slowly.

11.3 Lock function

Press the lock button lock will lock the wire controller and the lock icon appears at the lower right corner of the controller. Under locking state, any button operation of wire controller is not workable.

The outlet temperature of the indoor unit, current time, error code and corresponding running icons will display during lock state.

Under lock state, the back light will lights up and the lock icon will flash if there is any button operations.

Press the lock button lock again under lock state will unlock the controller.

11.4 Electric heater of sanitary water tank manually on/off function

Press the sanitary water tank heating button over 5 seconds the electric heater of sanitary water tank will manually switch on and the icon will flash.

The manually switch on of sanitary water tank heater is valid only one time. This means if the water tank temperature reaches the setting point and then exits the heating operation, it needs to press the button over 5 seconds again to manually switch on the electric heater.

Exit sanitary water tank electrical heating manually switch on function: (1) the water tank temperature reaches the setting point; or (2) press button over 5 seconds again will manually switch off the electric heater heating operation.

If the sanitary water tank is not installed in the installation and the value of field setting “0-2” is set to be 0, the manually switch on/off of the electric heater is not valid. In this case, if the button is pressed, "Not available" will appear.

11.5 Auto restart

Before power off the water heater or wire controller, the wire controller will automatically record the message of the ON and OFF state, setting water temperature, weekly schedule timing, field settings etc. of the units.

When power returns after a power supply failure or after power on the power supply for the unit, the auto restart function reapplies the controller settings at the time of the power supply failure or power off.

If the E2 which was used to memorize auto restart messages has error, the machine will be shut down and the error code will display. The unit will not permit to switch on again before solving the error.

11.6 Floor heating first time heating function

If the value of “7-4” in the Field setting is set to be “1”, and continuous press Prev button over 10 seconds, the unit will enter the floor heating first time heating function. In this case, the unit will operate as the preset floor heating mode.

During the floor heating first time heating mode, the icon flashes slowly.

11.7 The air purge function for the water circuit

If the value of “7-5” in the Field setting is set to be “1”, and continuous press Next button over 10 seconds, the unit will enter air purge function for the water circuit. In this case, all of the 2-way motorized valve (SV1, SV2, SV3) will be opened, 3 minutes later the pump in the indoor unit will switch on and running till exit the mode. In this way, the air in the water circuit will be purged.

After entering the air purge function, continuous press Next button over 10 seconds will exit this function. If the unit encounters power supply failure during the air purge function mode, the unit will exit this mode automatically.

After entering the air purge function, the pump icon and the operation icon of cooling/heating/sanitary water heating OPERATION flash simultaneously.

11.8 Checking the temperature and error code

The controller can check 10 temperature and latest 3 malfunction or error code. Refer chapter 8.7 “Displaying temperature and Error code” for more information.

12 TROUBLE SHOOTING

12.1 Guidelines

■ **The guidelines below might help to solve your problem. If you cannot solve the problem, consult your installer.**

- No reading on the controller

Check if the mains power is still connected to your installation.

- One of the error codes appears

Consult your installer or your local dealer.

- The schedule timer does work but the programmed actions are executed at the wrong time (e.g. 1 hour too late or too early)

Check if the clock and day of the week are set correctly, correct if necessary.

12.2 Definitions of error codes

If the unit encounters an error, the lamp ● will flash quickly, and the current error code will appear at the position of icon 8-8-88 simultaneously. The previously 2 error codes can be checked by the checking button. The detail of error is described below.

Table. 12-1

Error code	Explanation	
E0	Flow switch error(continuous for 3 times, and should be reset by switch off the power supply)	
E1	T2 error	
E2	UI communication error	
E3	Outdoor unit communication error	
E4	T2B error	
E5	T5 error	
E6	T1 error	
E7	T1B error	
E8	Flow switch（one time ）	
E9	TW_in error	
EA	TW_out error	
Eb	T4 error	
Ec	Heat pump error	
Ed	Phase protection	
EE	Eeprom error	
EF	Outdoor unit error	
P0	T2 high temperature protection	
P1	T2B low temperature protection	
P2	TW_out high temperature protection	
P3	TW_out low temperature protection	
P4	TW_in high temperature protection	
P5	T1 high temperature protection	
P6	T1B high temperature protection	
P7	Outdoor unit protection	
P8	Sanitary hot water tank electric heater protection	
P9	SMK-80/CSD80GN1	Auxiliary heater I protection
	SMK-120/CSD80GN1 SMK-140/CSD80GN1	Auxiliary heater protection
PA	Auxiliary heater II protection	
Pb	Anti -freezing protection	
Pc	Temperature controller error(result from the conflict between cool mode and heat mode)	
t0~t7	Run test	
dF	Defrost	
d0	Oil return function	
d1	Sterilize	
Tp	Air purge function	
Pp	Water pump run for 3 minutes	
Fc	Refrigerate	