MUNDOCLIMA® Aerotherm

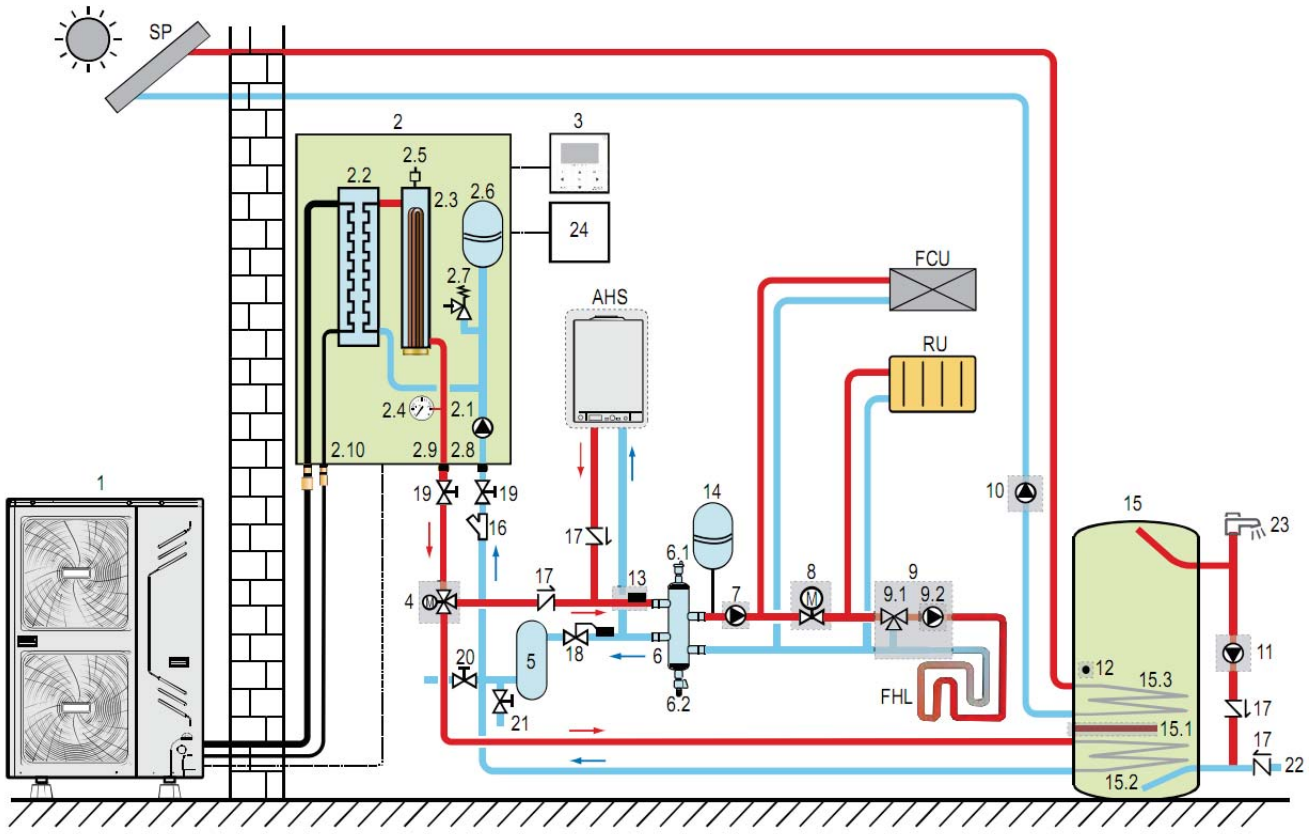
INDOOR UNIT AEROTHERM V17

Owner's & Installation manual

www.mundoclima.com

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

22/07/2017
SO30170 to SO30172
English



1 Outdoor unit
2 Indoor unit
2.1 PUMP_I (built-in circulating pump)
2.2 Plate heat exchanger (air to water heat exchanger)
2.3 IBH (built-in backup heater)
2.4 Manometer (built-in)
2.5 Air vent valve (built-in)
2.6 Expansion vessel (built-in)
2.7 Safety valve (built-in pressure relief)
2.8 Water inlet
2.9 Water outlet
2.10 Refrigerant connections
3 User interface
4 SV1: Motorized 3-way valve (field supply)
5 Buffer tank (field supply)
6 Balance tank (field supply)
6.1 Air vent valve
6.2 Drain valve
7 P_o: Circulating pump (field supply)
8 SV2: Motorized 2-way valve (field supply)
9 Mixing station (field supply)
9.1 Mixing valve
9.2 P_c: Mixing pump
10 P_s: Solar pump (field supply)
11 P_d: DHW pipe pump (field supply)
12 T5: Domestic water tank temp. sensor (accessory)
13 T1B: Final outlet water temperature sensor (optional)
14 Expansion vessel (field supply)
15 Domestic hot water tank (field supply)
15.1 TBH: Domestic hot water tank booster heater
15.2 Coil heat exchanger for heat pump
15.3 Coil heat exchanger for solar
16 Filter (accessory)
17 Non return valve (field supply)
18 Aquastat valve (field supply)
19 Shut-off valve (field supply)
20 Fill valve (field supply)
21 Drain valve (field supply)
22 Tap water inlet pipe (field supply)
23 Hot water tap (field supply)
24 Room thermostat (field supply)
25 Collector (field supply)
SP Solar plate (field supply)
AHS Auxiliary heat source (field supply)
FCU Fan coil unit (field supply)
RU Radiator unit (field supply)
FHL Floor heating loop (field supply)

NOTE

If domestic hot water tank is connected into the system, 12 (T5, accessory) must be installed into the domestic hot water tank and connected to indoor unit.

If AHS is connected into the system, 13 (T1B, optional accessory) must be installed at the final water outlet pipe and connected to indoor unit.

Components 4, 7, 8, 9.2, 10, 11, AHS are needed to be connected to indoor unit and be controlled by indoor unit.

CONTENTS PAGE

1 INTRODUCTION 3
2 ACCESSORIES 4
3 SAFETY CONSIDERATIONS 4
4 TYPICAL APPLICATION EXAMPLES.....6
5 INSTALLATION OF THE INDOOR UNIT 16
6 START-UP AND CONFIGURATION.....30
7 TEST RUN AND FINAL CHECK.....43
8 MAINTENANCE AND SERVICE.....43
9 TROUBLE SHOOTING.....43
10 PARAMETERS CHECK IN THE UNIT.....45
11 TECHNICAL SPECIFICATIONS.....47
ANNEX 1: INDOOR UNIT WIRING DIAGRAM 48
ANNEX 2: TABLE FOR SERVICEMAN 50

READ THESE INSTRUCTIONS CAREFULLY BEFORE INSTALLATION. KEEP THIS MANUAL IN A HANDY PLACE FOR FUTURE REFERENCE.

IMPROPER INSTALLATION OR ATTACHMENT OF EQUIPMENT OR ACCESSORIES COULD RESULT IN ELECTRIC SHOCK, SHORT-CIRCUIT, LEAKS, FIRE OR OTHER DAMAGE TO THE EQUIPMENT. BE SURE ONLY TO USE ACCESSORIES MADE BY THE SUPPLIER WHICH ARE SPECIFICALLY DESIGNED FOR USE WITH THE EQUIPMENT AND HAVE THEM INSTALLED BY A PROFESSIONAL.

ALL ACTIVITIES DESCRIBED IN THIS MANUAL SHALL BE CARRIED OUT BY A LICENSED TECHNICIAN.

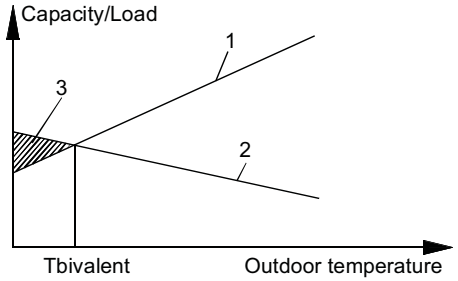
BE SURE TO WEAR ADEQUATE PERSONEL PROTECTION EQUIPMENT (PROTECTION GLOVES, SAFETY GLASSES,) WHEN PERFORMING INSTALLATION, MAINTENANCE OR SERVICE TO THE UNIT.

IF UNSURE OF INSTALLATION PROCEDURES OR USE, ALWAYS CONTACT YOUR DEALER FOR ADVICE AND INFORMATION.

1 INTRODUCTION

1.1 General information

- These units are used for both heating and cooling applications. The units can be combined with fan coil units, floor heating applications, low temperature high efficiency radiators, domestic hot water tank (option) and solar kit (field supply).
- A wired remote controller is standard supplied with the unit to control your installation.
- The unit is delivered with an integrated backup heater for additional heating capacity during cold outdoor temperatures. The backup heater also serves as a backup in case of malfunctioning of the unit and for freeze protection of the outside water piping during winter time. The capacity of backup heater for different unit listed below.



1. Heat pump capacity
2. Required heating capacity (site dependent)
3. Additional heating capacity provided by the backup heater

Power supply	1-phase							3-phase		
Indoor unit model	4 to 8kW			10 to 16kW				12 to 16kW		
Capacity of outdoor unit [kW]	4	6	8	10	12	14	16	12	14	16
Capacity of backup heater	3.0kW							4.5kW		

- **Domestic hot water tank (option)**
  An optional domestic hot water tank with integrated 3 kW electrical booster heater can be connected to the unit.

  There is a heat change in the tank, if the heat exchange outside is enamelled, the heat exchange surface is required to be bigger than 1.7m^2 for matching the 10kW ~16kW unit and the heat exchanger surface is required to be bigger than 1.4m^2 for matching the 5kW~7kW unit.
- **Room thermostat (field supply)**
  An optional room thermostat can be connected to the unit.
- **Solar kit for domestic hot water tank (field supply)**
  An optional solar kit can be connected to the unit.
- **Remote alarm kit (field supply)**
  A remote alarm kit can be connect to the unit.
- **Operation range**

Operationg range of indoor unit	
Outlet water (Heating mode)	+25 ~ +60℃
Outlet water (Cooling mode)	+5 ~ +25℃
Domestic hot water	+40 ~ +60℃
Ambient temperature	-20 ~ +46℃
Water pressure	0.3~3bar(g)

■ **No heat pump operation, backup heater or boiler only.**

(*) The models have a frozen prevention function using the heat pump and back up heater to keep the water system safe from freezing in all conditions. In case accidental or intentional power shutdown is likely to happen, we recommend to use glycol(-Refer to 9.3 Water pipework caution: "-Use of glycol).

1.2 Scope of this manual

This installation & owner's manual describes the procedures for installation.

2 ACCESSORIES

2.1 Accessories supplied with the unit

	Name	Shape	Quantity
Installation fittings	1. Indoor unit installation & owner's manual (This book)		1
	2. Y-shape filter		1
	3. Mounting bracket		1
	4.User interface kit (digital remote controller)		1
	5. M8 expansion screws		5
	6.T5 temperature sensor for domestic hot water tank		1 (10 m)
	7.Copper nut	—	1
	8. Controller installation & owner's manual		1

3 SAFETY CONSIDERATIONS

The precautions listed here are divided into the following two types. Both cover very important topics, so be sure to follow them carefully.

Meanings of **DANGER**, **WARNING**, **CAUTION** and **NOTE** symbols.

DANGER
Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING
Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION
Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

NOTE
Indicates situations that may result in equipment or property-damage accidents only.

DANGER

- Before touching electric terminal parts, turn off power switch.
- When service panels are removed, live parts can be easily touched by accident.
  Never leave the unit unattended during installation or servicing when the service panel is removed.
- Do not touch water pipes during and immediately after operation as the pipes may be hot. Your hand may suffer burns. To avoid injury, give the piping time to return to normal temperature or be sure to wear proper gloves.
- Do not touch any switch with wet fingers. Touching a switch with wet fingers can cause electrical shock.
- Before touching electrical parts, turn off all applicable power supply.

WARNING

- Tear apart and throw away plastic packaging bags so that children will not play with them.
  Children playing with plastic bags face danger of death by suffocation.
- Safely dispose of packing materials. Packing materials, such as nails and other metal or wooden parts, may cause stabs or other injuries.
- Ask your dealer or qualified personnel to carry out installation work. Do not install the machine by yourself.
  Improper installation may result in water leakage, electric shocks or fire.
- Perform installation work in accordance with this installation manual.Improper installation may lead to water leakage, electric shocks or fire.
- Be sure to use only the specified accessories and parts for installation work.
  Failure to use the specified parts may result in water leakage, electric shocks, fire, or the unit falling.
- Install the unit on a foundation that can withstand its weight.
- Insufficient strength may result in the fall of equipment and causing injury.
- Carry out the specified installation work in consideration of strong winds, hurricanes, or earthquakes.
  Improper installation work may result in accidents due to fall of equipment.

- Make certain that all electrical work is carried out by qualified personnel according to the local laws and regulations and this Installation & owner's manual, using a separate circuit.
  Insufficient capacity of the power supply circuit or improper electrical construction may lead to electric shocks or fire.
- Be sure to install a ground fault circuit interrupter according to local laws and regulations.
  Failure to install a ground fault circuit interrupter may cause electric shocks and fire.
- Make sure that all wiring is secure, using the specified wires and ensuring that external forces do not act on the terminal connections or wires.
  Incomplete connection or fixing may cause a fire.
- When wiring the power supply, form the wires so that the frontside panel can be securely fastened.
  If the frontside panel is not in place, overheat of the terminals, electric shocks or a fire may be caused.
- After completing the installation work, check to make sure that there is no leakage of refrigerant gas.
- Never directly touch any accidental leaking refrigerant. This could result in severe wounds caused by frostbite.
- Do not touch the refrigerant pipes during and immediately after operation as the refrigerant pipes may be hot or cold, depending on the condition of the refrigerant flowing through the refrigerant piping, compressor and other refrigerant cycle parts. Your hands may suffer burns or frostbite if you touch the refrigerant pipes. To avoid injury, give the pipes time to return to normal temperature or, if you must touch them, be sure to wear proper gloves.
- Do not touch the internal parts (pump, backup heater, etc.) during and immediately after operation.
  Your hands may suffer burns if you touch the internal parts. To avoid injury, give the internal parts time to return to normal temperature or, if you must touch them, be sure to wear proper gloves.
- This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.

CAUTION

- For use of units in applications with temperature alarm settings it is advised to foresee a delay of 10 minutes for signalling the alarm in case the alarm temperature is exceeded. The unit may stop for several minutes during normal operation for "defrosting of the unit" or when in "thermostat-stop" operation.
- Ground the unit.
  Grounding resistance should be according to local laws and regulations
  Do not connect the ground wire to gas or water pipes, lightning conductor or telephone ground wire.
  Incomplete grounding may cause electric shocks.

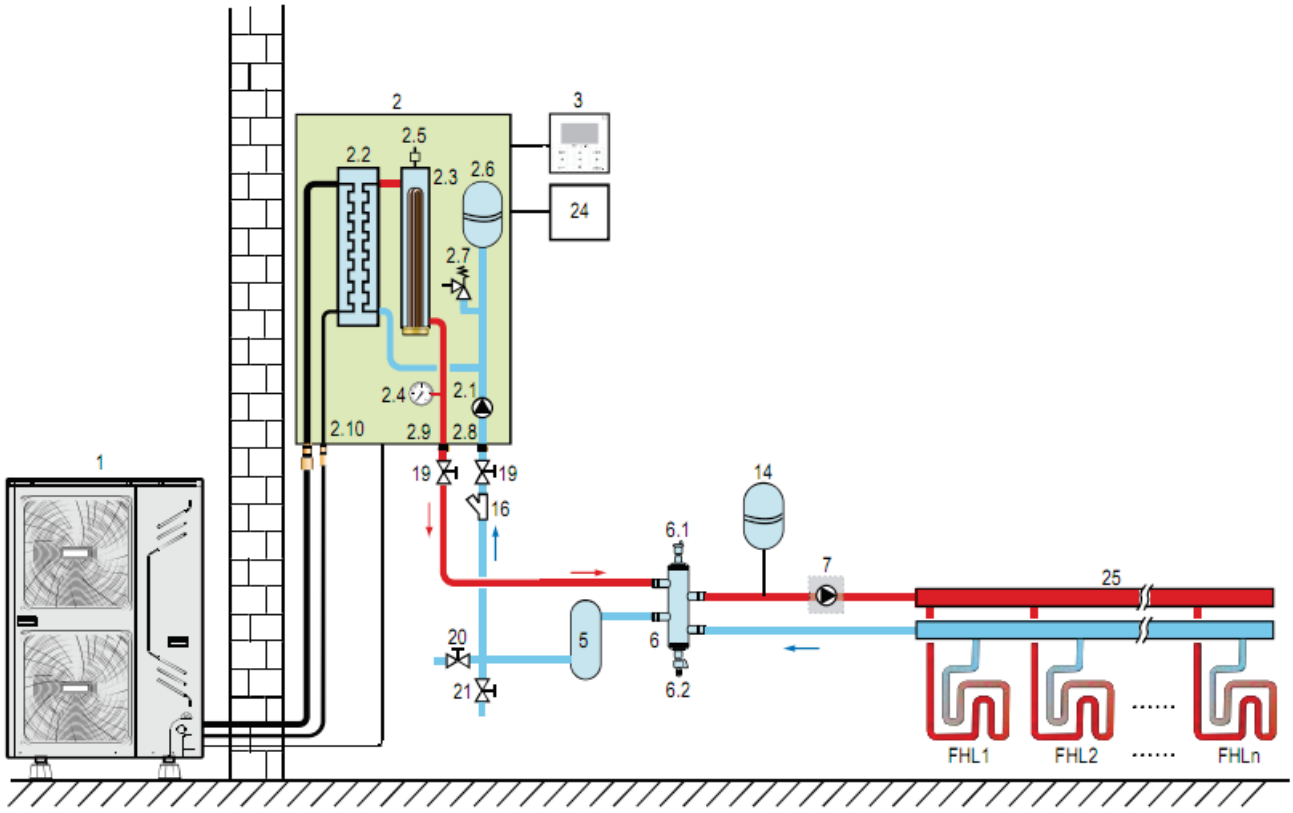
  a) Gas pipe.
  Ignition or explosion may occur if the gas leaks.
  b) Water pipe.
  Hard vinyl tubes are not effective grounds.
  c) Lightning conductor or telephone ground wire.
  Electric potential may rise abnormally if struck by a lightning bolt.
- Install the power wire at least 3 feet (1 meter) away from televisions or radios to prevent image interference or noise.
  (Depending on the radio waves, a distance of 3 feet (1 meter) may not be sufficient to eliminate the noise.)
- Do not rinse the unit. This may cause electric shocks or fire.
  the appliance shall be installed in accordance with national wiring regulations; If the supply cord is damaged, it must be replaced by qualified persons in order to avoid a hazard.
- Do not install the unit in places such as the following:
  a) Where there is mist of mineral oil, oil spray or vapour.
  Plastic parts may deteriorate, and cause them to fall out or water to leak.
  b) Where corrosive gas, such as sulphurous acid gas, is produced.
  Corrosion of copper pipes or soldered parts may cause the refrigerant to leak.
  c) Where there is machinery which emits electromagnetic waves.
  Electromagnetic waves may disturb the control system, and cause malfunction of the equipment.
  d) Where flammable gases may leak, where carbon fibre or ignitable dust is suspended in the air or where volatile flammables, such as thinner or gasoline, are handled.
  Such gases may cause a fire.
  e) Where the air contains high levels of salt such as that near the ocean.
  f) Where voltage fluctuates a lot, such as that in factories.
  g) In vehicles or vessels.
  h) Where acidic or alkaline vapour is present.

4 TYPICAL APPLICATION EXAMPLES

The application examples given below are for illustration purposes only.

4.1 Application 1

Space heating only application with a room thermostat connected to the unit.



1 Outdoor unit
2 Indoor unit
2.1 PUMP_I (built-in circulating pump)
2.2 Plate heat exchanger (air to water heat exchanger)
2.3 IBH (built-in backup heater)
2.4 Manometer (built-in)
2.5 Air vent valve (built-in)
2.6 Expansion vessel (built-in)
2.7 Safety valve (built-in pressure relief)
2.8 Water inlet
2.9 Water outlet
2.10 Refrigerant connections
3 User interface
5 Buffer tank (field supply)
6 Balance tank (field supply)
6.1 Air vent valve
6.2 Drain valve
7 P_o: Outside circulating pump (field supply)
14 Expansion vessel (field supply)
16 Filter (accessory)
19 Shut-off valve (field supply)
20 Fill valve (field supply)
21 Drain valve (field supply)
24 Room thermostat (field supply)
25 Collector (field supply)
FHL1…n Floor heating loop (field supply)

NOTE

The volume of the buffer tank(5) should be larger than 30L. The drain valve(21) should be installed at the lowest position of the water circulating system.

Unit operation and space heating

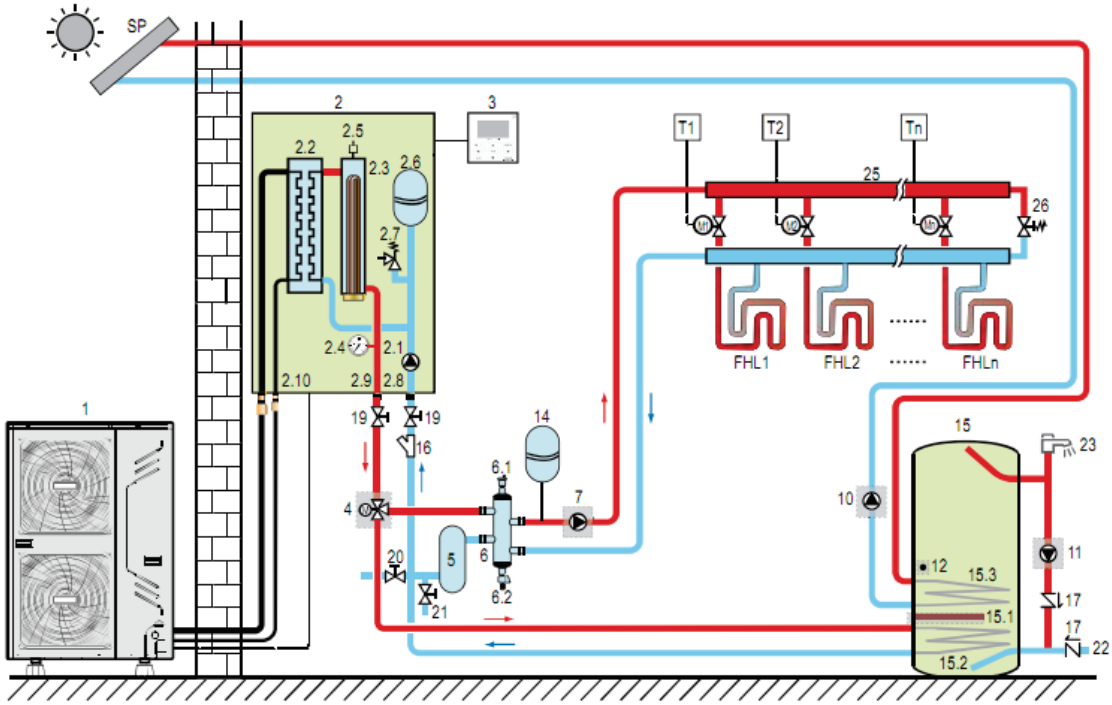
When a room thermostat is connected to the unit and when there is a heating request from the room thermostat, the unit will start operating to achieve the target water flow temperature as set on the user interface. When the room temperature is above the thermostat set point in heating mode, the unit will stop operating, the circulated pump(2.1) and (7) will stop running also, the room thermostat uesd as a switch here.

NOTE

Make sure to connect the thermostat wires to the correct terminals method B should be selected (see pag. 29) and to configure the ROOM THERMOSTAT in the "FOR SERVICEMAN /ROOM THERMOSTAT" (see pag. 37).

4.2 Application 2

Space heating only application without room thermostat connected to the unit. The temperature in each room is controlled by a valve on each water circuit. Domestic hot water is provided through the domestic hot water tank which is connected to the unit.



1 Outdoor unit
2 Indoor unit
2.1 PUMP_I (built-in circulating pump)
2.2 Plate heat exchanger (air to water heat exchanger)
2.3 IBH (built-in backup heater)
2.4 Manometer (built-in)
2.5 Air vent valve (built-in)
2.6 Expansion vessel (built-in)
2.7 Safety valve (built-in pressure relief)
2.8 Water inlet
2.9 Water outlet
2.10 Refrigerant connections
3 User interface
4 SV1: Motorized 3-way valve (field supply)
5 Buffer tank (field supply)
6 Balance tank (field supply)
6.1 Air vent valve
6.2 Drain valve
7 P_o: Outside circulating pump (field supply)
10 P_s: Solar pump (field supply)
11 P_d: DHW pipe pump (field supply)
12 T5: Domestic water tank temperature sensor (accessory)
14 Expansion vessel (field supply)
15 Domestic hot water tank (field supply)
15.1 TBH: Domestic hot water tank booster heater
15.2 Coil heat exchanger for heat pump
15.3 Coil heat exchanger for solar
16 Filter (accessory)
17 Non return valve (field supply)
19 Shut-off valve (field supply)
20 Fill valve (field supply)
21 Drain valve (field supply)
22 Tap water inlet pipe (field supply)
23 Hot water tap (field supply)
25 Collector (field supply)
26 Bypass valve (field supply)
SP Solar plate (field supply)
FHL1…n Floor heating loop (field supply)
M1…n Motorized valve (field supply)
T1…n Room thermostat (field supply)

NOTE

The volume of the buffer tank(5) should be larger than 30L. The drain valve(21) should be installed at the lowest position of the water circulating system.

■ **Circulated pump operation**

With no room thermostat connected to the indoor unit (2), the circulating pump (2.1) and (7) will operate as long as the unit is on for space heating. The circulating pump (2.1) will operate as long as the unit is on for heating domestic hot water (DHW).

■ **Space heating**

1) The unit (1) and (2) will operate to achieve the target water flow temperature as set on the user interface.
2) When circulation in each space heating loop (FHL1..n) is controlled by remotely controlled valves (M1..n), it is important to provide a by-pass valve (26) to avoid the flow switch safety device from being activated. The by-pass valve should be selected as such that at all time the minimum water flow as mentioned under **"TECHNICAL SPECIFICATIONS"** is guaranteed.

■ **Domestic water heating**

1) When domestic water heating mode is enabled (either manually by the user, or automatically through a schedule) the target domestic hot water temperature will be achieved by a combination of the heat exchanger coil and the electrical booster heater (when the booster heater in the tank is configured YES).
2) When the domestic hot water temperature is below the user configured set point, the 3-way valve(4) will be activated to heat the domestic water by means of the heat pump. In case of large domestic hot water demand or a high domestic hot water temperature setting, the booster heater (15.1) can provide additional heating.

■ **DHW pipe pump operation**

1) The DHW pipe pump(11) is used to circulate the domestic hot water through the hot tap water pipes for keeping the water in the hot tap water pipes in order to make the hot water coming quickly when user open the tap.
2) The DHW pipe pump(11) will operate for a period of time when the time reaches the set timers which have be set by user interface. More details refer to the manual of user interface.

CAUTION

Make sure to fit the 3-way valve correctly. For more details, refer to "**Connection for other components/For 3-way valve SV1** " .

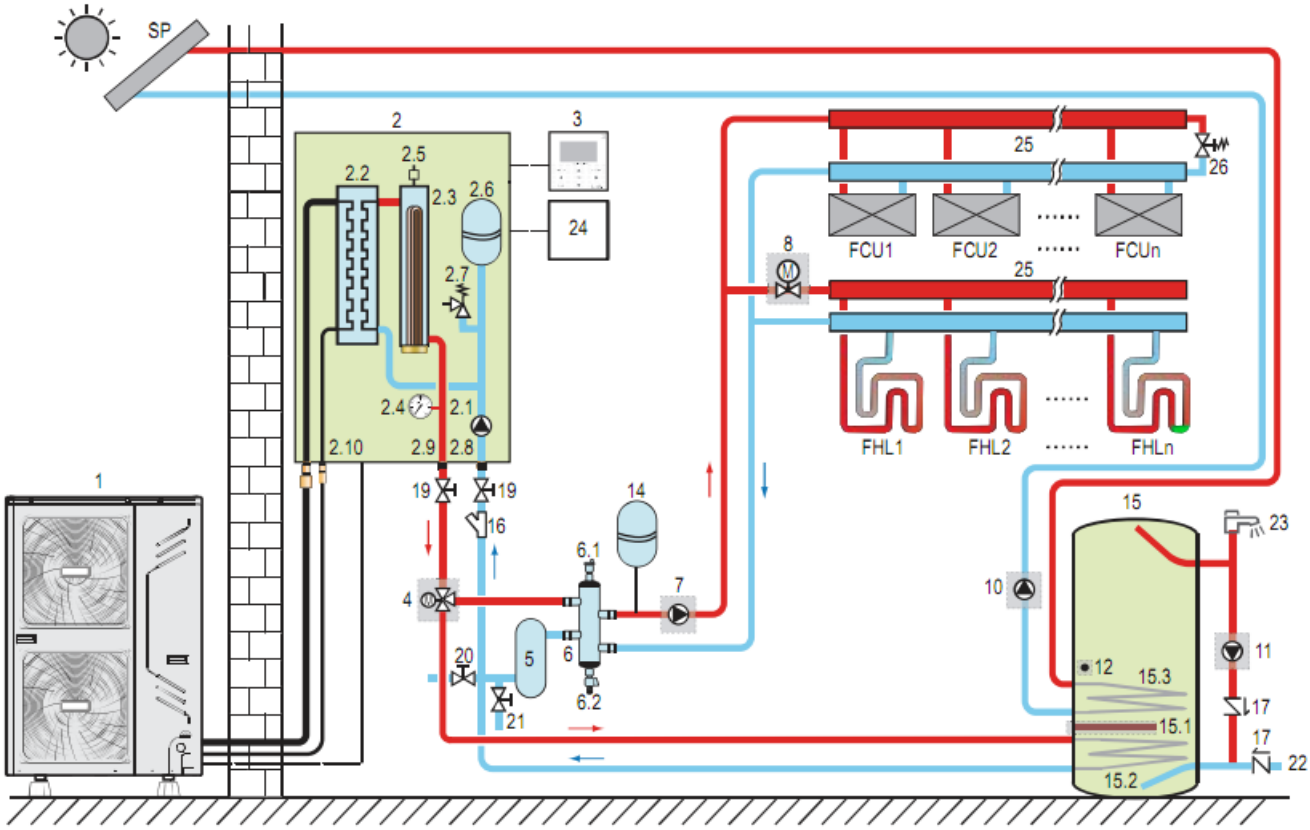
NOTE

The unit can be configured so that at low outdoor temperatures the domestic water is exclusively heated by the booster heater. This assures that the full capacity of the heat pump is available for space heating.

Details on domestic hot water tank configuration for low outdoor temperature (T4DHWMIN) can be found under "**Field settings/how to set the DHW MODE**".

4.3 Application 3

Space cooling and heating application with a room thermostat suitable for heating/cooling changeover connected to the unit. Heating is provided through floor heating loops and fan coil units. Cooling is provided through the fan coil units only. Domestic hot water is provided through the domestic hot water tank which is connected to the unit.



1 Outdoor unit
2 Indoor unit
2.1 PUMP_I (built-in circulating pump)
2.2 Plate heat exchanger (air to water heat exchanger)
2.3 IBH (built-in backup heater)
2.4 Manometer (built-in)
2.5 Air vent valve (built-in)
2.6 Expansion vessel (built-in)
2.7 Safety valve (built-in pressure relief)
2.8 Water inlet
2.9 Water outlet
2.10 Refrigerant connections
3 User interface
4 SV1: Motorized 3-way valve (field supply)
5 Buffer tank (field supply)
6 Balance tank (field supply)
6.1 Air vent valve
6.2 Drain valve
7 P_o: Outside circulating pump (field supply)
8 SV2: Motorized 2-way valve (field supply)
10 P_s: Solar pump (field supply)
11 P_d: DHW pipe pump (field supply)
12 T5: Domestic water tank temperature sensor (accessory)
14 Expansion vessel (field supply)
15 Domestic hot water tank (field supply)
15.1 TBH: Domestic hot water tank booster heater
15.2 Coil heat exchanger for heat pump
15.3 Coil heat exchanger for solar
16 Filter (accessory)
17 Non return valve (field supply)
19 Shut-off valve (field supply)
20 Fill valve (field supply)
21 Drain valve (field supply)
22 Tap water inlet pipe (field supply)
23 Hot water tap (field supply)
24 Room thermostat (field supply)
25 Collector (field supply)
26 Bypass valve (field supply)
SP Solar plate (field supply)
FHL1…n Floor heating loop (field supply)
FCU1…n Fan coil unit (field supply)

NOTE

The volume of the buffer tank(5) should be larger than 30L. The drain valve(21) should be installed at the lowest position of the water circulating system.

■Pump operation and space heating and cooling

According to the season, the unit will switch to “heating mode” or “cooling mode” according to the temperature detected by the room thermostat. wiring of room thermostat should follow **method A** (see pag. 29)

When space heating/cooling is requested by the room thermostat (24), the pump will start operating and the unit (1) and (2) will switch to "heating mode"/"cooling mode". The unit (1) and (2) will start operating to achieve the target leaving cold/hot water temperature.

In case of cooling mode, the motorized 2-way valve (8) will close as to prevent cold water running through the floor heating loops (FHL).

CAUTION

- Make sure to connect the thermostat wires to the correct terminals (see "For room thermostat" on **“connection for other components”**) and to configure the ROOM THERMOSTAT in the user interface correctly (see **“Field settings/ROOM THERMOSTAT”**).
- Wiring of the 2-way valve (8) 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.

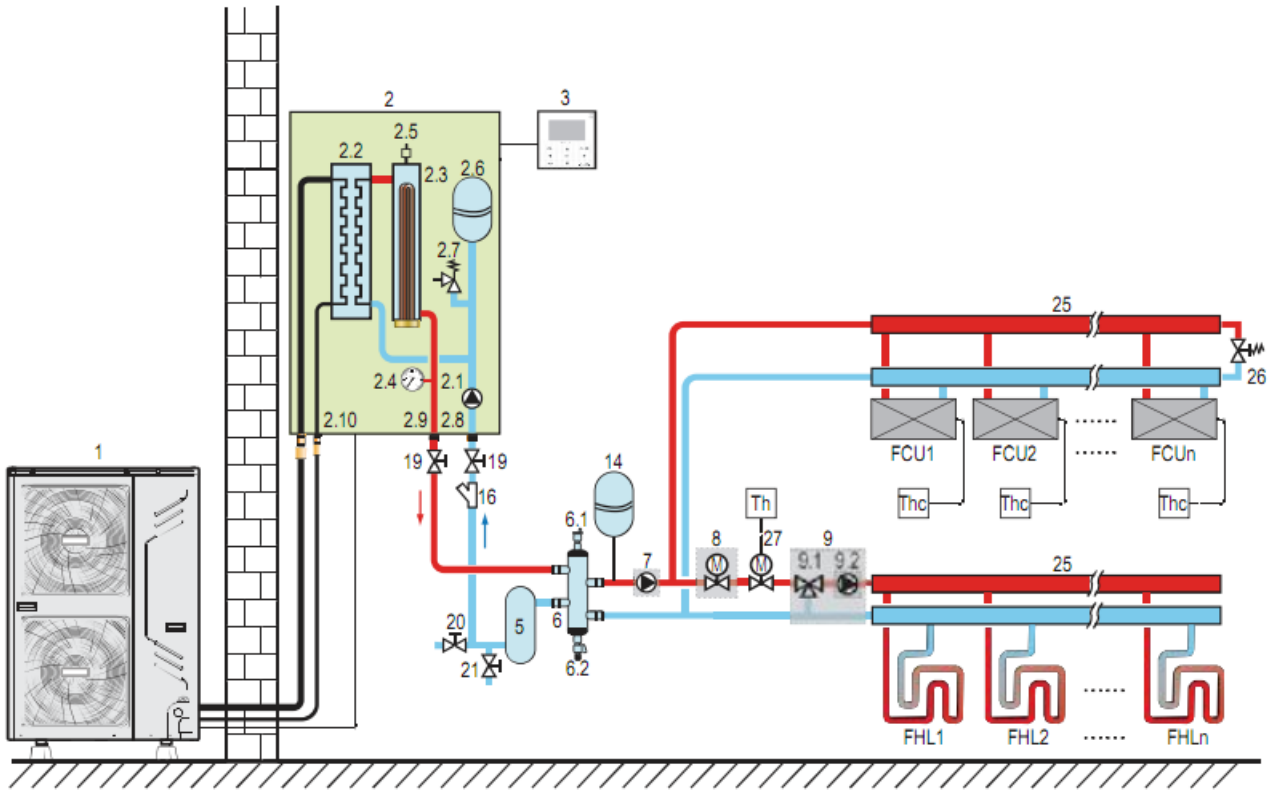
The ON/OFF setting of the heating/cooling operation can’t be done on the user interface.

■ Domestic water heating

Domestic water heating and DHW pipe pump operatiing are as described in **"Application 2”.**

4.4 Application 4

Space cooling and heating application without a room thermostat connected to the indoor unit , but with a heating only room thermostat controlling the floor heating and a heating/cooling thermostat controlling the fan coil units. Heating is provided through floor heating loops and fan coil units. Cooling is provided through the fan coil units only.



1 Outdoor unit
2 Indoor unit
2.1 PUMP_I (built-in circulating pump)
2.2 Plate heat exchanger (air to water heat exchanger)
2.3 IBH (built-in backup heater)
2.4 Manometer (built-in)
2.5 Air vent valve (built-in)
2.6 Expansion vessel (built-in)
2.7 Safety valve (built-in pressure relief)
2.8 Water inlet
2.9 Water outlet
2.10 Refrigerant connections
3 User interface
5 Buffer tank (field supply)
6 Balance tank (field supply)
6.1 Air vent valve
6.2 Drain valve
7 P_o: Outside circulating pump (field supply)
8 SV2: Motorized 2-way valve (field supply)
9 Mixing station (field supply)
9.1 Mixing valve
9.2 P_c: Mixing pump
14 Expansion vessel (field supply)
16 Filter (accessory)
17 Non return valve (field supply)
19 Shut-off valve (field supply)
20 Fill valve (field supply)
21 Drain valve (field supply)
25 Collector (field supply)
26 Bypass volve (field supply)
27 Motorized 2-way valve for activation of thermostat (field supply)
SP Solar plate (field supply)
Th Heating only room thermostat for floor heating loop (field supply)
Thc Heating/Cooling room thermostat for fan coil unit (field supply)
FHL1…n Floor heating loop (field supply)
FCU1…n Fan coil unit (field supply)

NOTE

The volume of the buffer tank(5) should be larger than 30L. The drain valve(21) should be installed at the lowest position of the water circulating system.

■ **Pump operation**

With no room thermostat connected to the indoor unit (2) , the circulated pump (2.1) and (7) will operate as long as the unit is on for space heating. The pump (2.1) will operate as long as the unit is on for heating domestic hot water.

NOTE

Details on pump configuration can be found undr **"6.6 setting the pump speed"** (see pag. 32).

■ **Space heating and cooling**

According to the season, the customer will select cooling or heating through the user interface.
The unit (1) will operate in cooling mode or heating mode to achieve the target water flow temperature.
In heating mode, the 2-way valve (8) is open. Hot water is provided to both the fan coil units and the floor heating loops.
In cooling mode, the motorised 2-way valve (8) is closed to prevent cold water running through the floor heating loops (FHL).

CAUTION

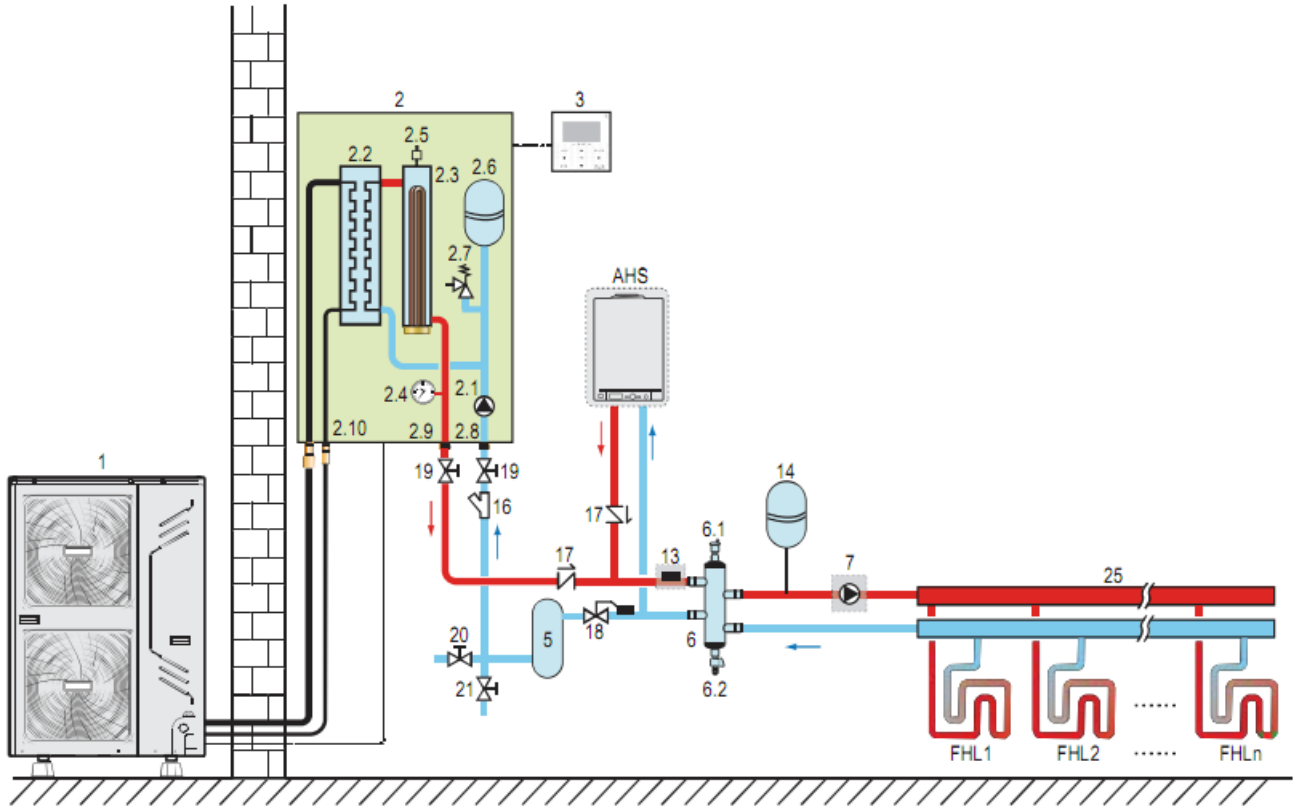
When several loops in the system by remotely controlled valves, it might be required to install a by-pass valve (26) to avoid the flow switch safety device from being activated. See also **"Application 2".**

Wiring of the 2-way valve (8) is different for a NC (normal closed) valve and a NO (normal open) valve the NO valve is unavailable to this unit! Make sure to connect to the correct terminal numbers as detailed on the wiring diagram.

The ON/OFF setting of the heating/cooling operation is done by the user interface.

4.5 Application 5

Space heating with an auxiliary boiler (alternating operation).
Space heating application by either the unit or by an auxiliary boiler connected in the system.
■ The unit controlled contact (also called "permission signal for the auxiliary boiler") is determined by the outdoor temperature (thermistor located at the outdoor unit). See **"FOR SERVICEMAN/OTHER HEATING SOURCE/AHS"** (See pag. 38).
■ Bivalent operation is possible for both space heating operation and domestic water heating operation.
■ If the auxiliary boiler only provides heating for space heating, the boiler must be integrated in the piping work and in the field wiring according to the illustration for **application A**.
■ If the auxiliary boiler is also providing heating for domestic hot water, the boiler can be integrated in the piping work and in the field wiring according to the illustration for **application B**.
■ **Application C** can be used If the temperature of water from unit is not high enough. An additional 3-way valve should be installed, if the temperature of water from unit is high enough. The boiler will then be bypassed. When the temperature is not high enough, the 3-way valve will open and the water from unit will flow through the boiler and be heated again.

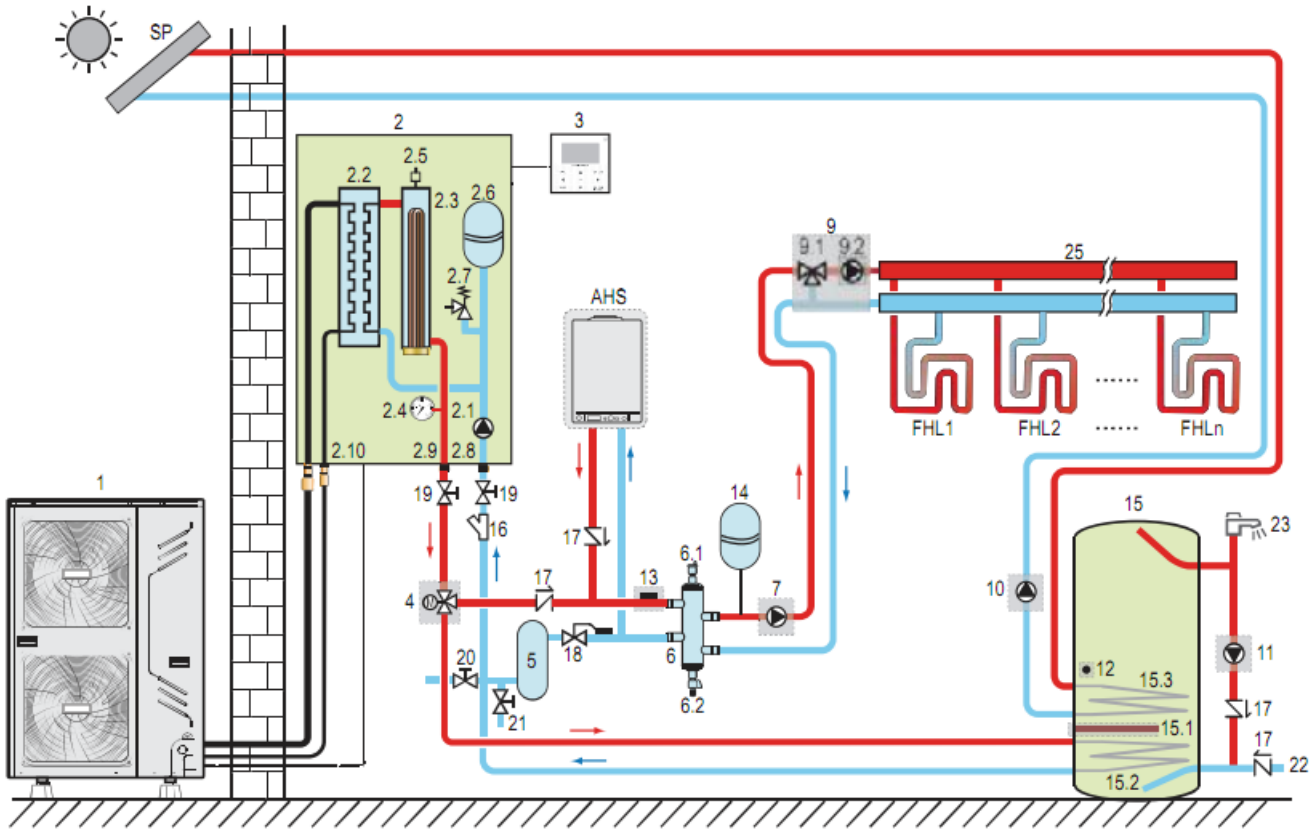


AHS Boiler (field supply)

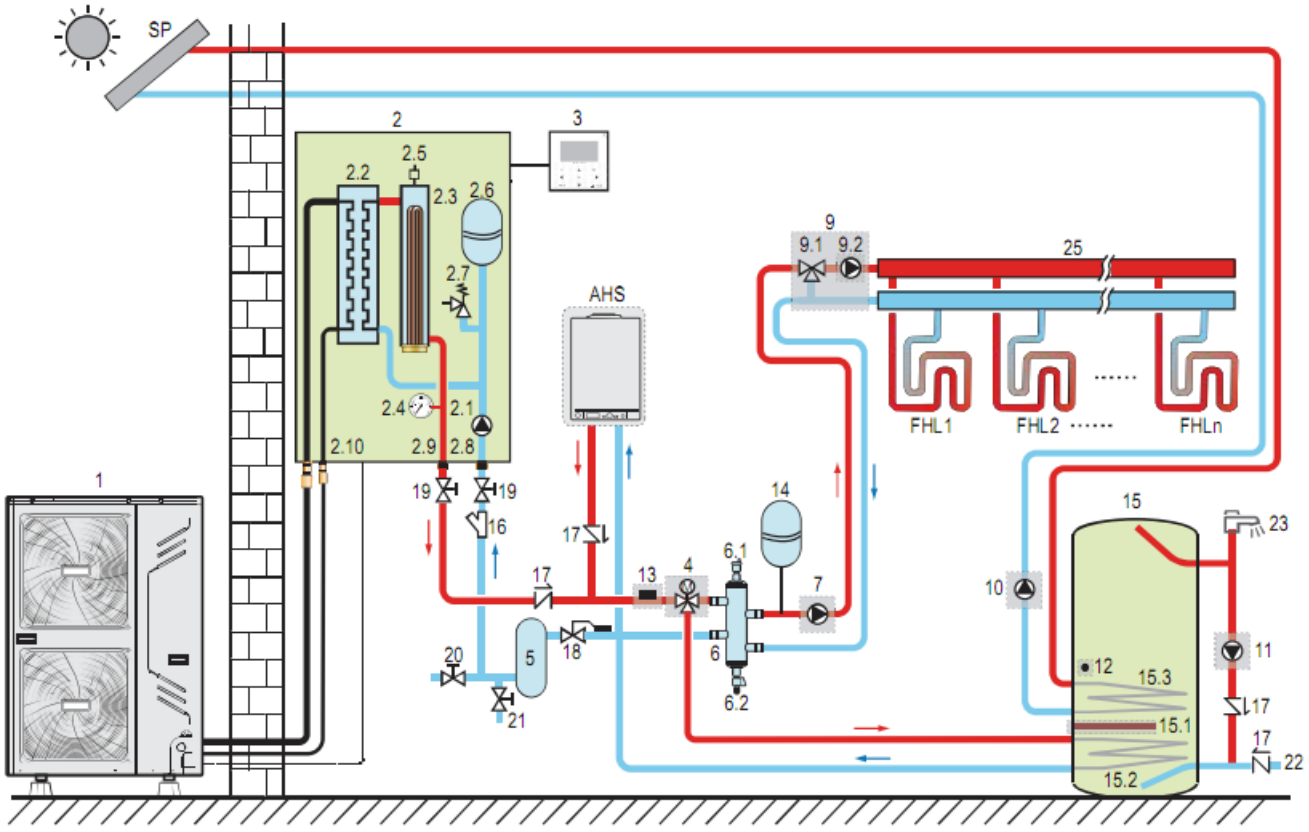
CAUTION

Be sure that the boiler and the integration of the boiler in the system is in accordance with relevant local laws and regulations.

Application A

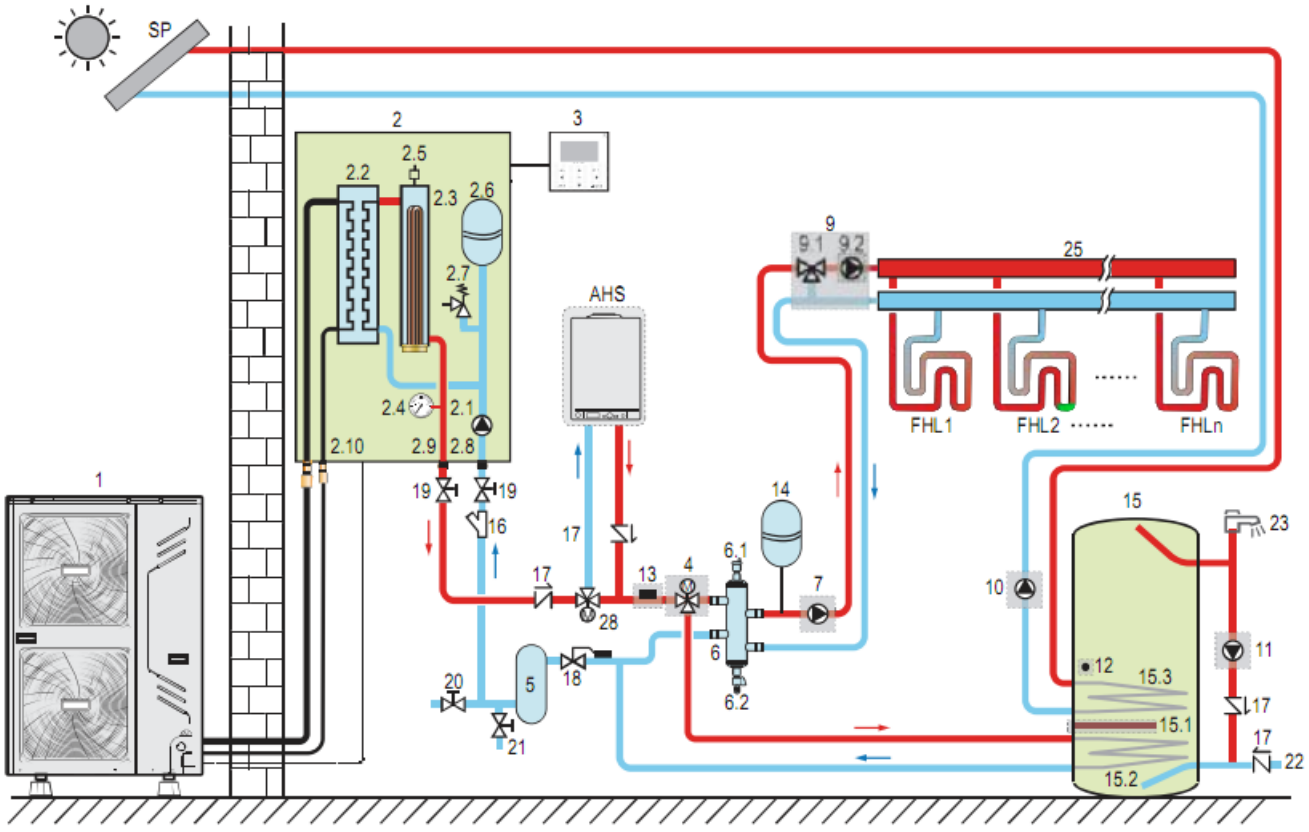


Application B



Application C

if application C is selected, the control cable connect to boiler should also connect to the 3-way valve (28)



1 Outdoor unit
2 Indoor unit
2.1 PUMP_I (built-in circulating pump)
2.2 Plate heat exchanger (air to water heat exchanger)
2.3 IBH (built-in backup heater)
2.4 Manometer (built-in)
2.5 Air vent valve (built-in)
2.6 Expansion vessel (built-in)
2.7 Safety valve (built-in pressure relief)
2.8 Water inlet
2.9 Water outlet
2.10 Refrigerant connections
3 User interface
4 SV1: Motorized 3-way valve (field supply)
5 Buffer tank (field supply)
6 Balance tank (field supply)
6.1 Air vent valve
6.2 Drain valve
7 P_o: Outside circulating pump (field supply)
9 Mixing station (field supply)
9.1 Mixing valve
9.2 P_c: Mixing pump
10 P_s: Solar pump (field supply)
11 P_d: DHW pipe pump (field supply)
12 T5: Domestic water tank temperature sensor (accessory)
13 T1B: Confluent outlet water temperature sensor (optional)
14 Expansion vessel (field supply)
15 Domestic hot water tank (field supply)
15.1 TBH: Domestic hot water tank booster heater
15.2 Coil heat exchanger for heat pump
15.3 Coil heat exchanger for solar
16 Filter (accessory)
17 Non return valve (field supply)
18 Aquastat valve (field supply)
19 Shut-off valve (field supply)
20 Fill valve (field supply)
21 Drain valve (field supply)
22 Tap water inlet pipe (field supply)
23 Hot water tap (field supply)
25 Collector (field supply)
28 Motorized 3-way valve (field supply)
SP Solar plate (field supply)
FHL1…n Floor heating loop (field supply)
AHS Auxiliary heating source such as boiler (field supply)

NOTE

The volume of the buffer tank (5) should be larger than 30L. The drain valve (21) should be installed at the lowest position of the water circulating system.

Operation

When heating required, either the unit or the boiler starts operating, depending on the outdoor temperature (see pag. 38).

- As the outdoor temperature is measured via the outdoor unit air temperature sensor, make sure to install the outdoor unit in the shade, so that it is not influenced by the sun.
- Frequent switching may cause corrosion of the boiler in an early stage. Contact the manufacturer of the boiler.
- During heating operation of the unit, the unit will operate so as to achieve the target water flow temperature as set on the user interface. When weather dependent operation is active, the water temperature is determined automatically depending on the outdoor temperature.
- During heating operation of the boiler, the boiler will operate so as to achieve the target water flow temperature as set on the user interface.
- Never set the target water flow temperature set point on the user interface above (60°C).

NOTE

Make sure to configure the **"FOR SERVICEMAN/OTHER HEATING SOURCE/AHS"**

CAUTION

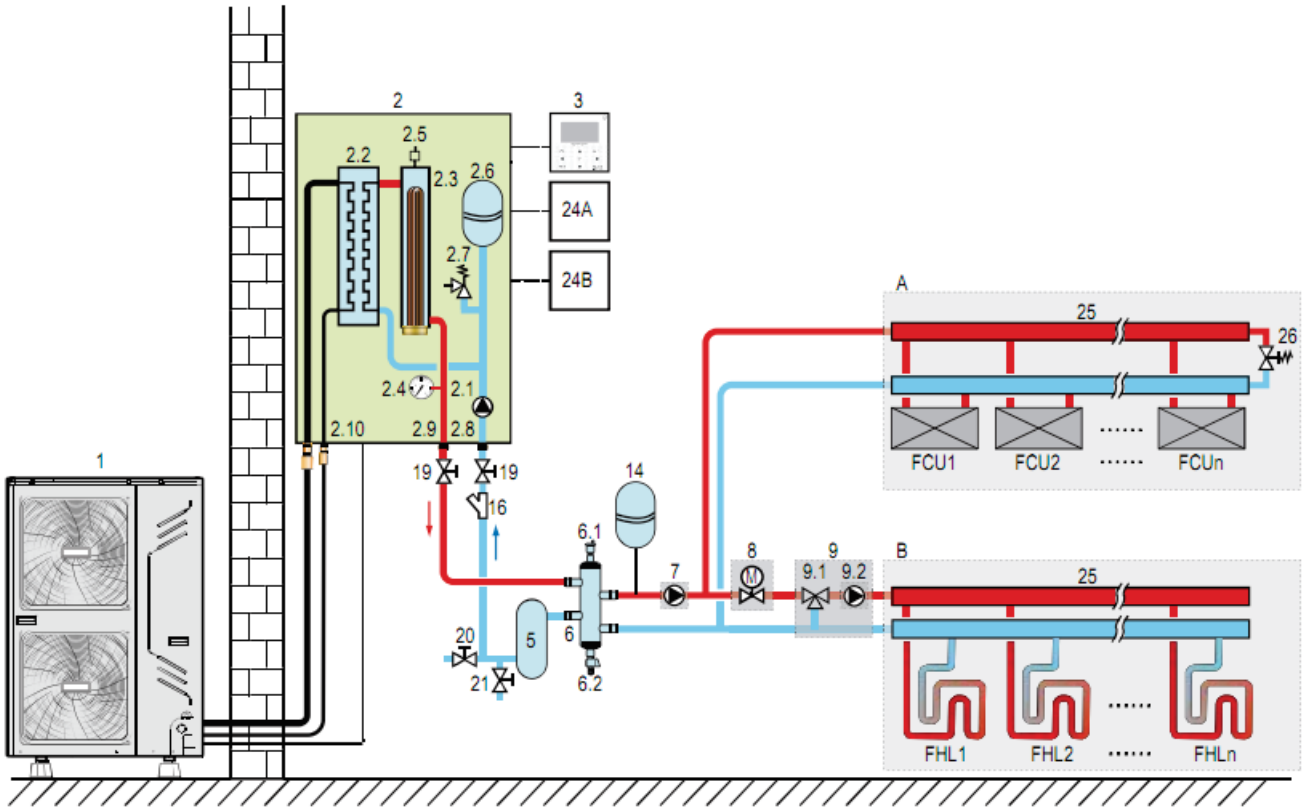
- Make sure that return water to the heat exchanger never exceeds 60°C. never put the target water flow temperature set point on the user interface above 60°C.
- Make sure that the non-return valves (field supply) are correctly installed in the system.
- The supplier shall not be held liable for any damage resulting from failure to observe this rule.

4.6 Application 6

■ Space heating with a two room thermostat application through floor heating loops and fan coil units. The floor heating loops and fan coil units require different operating water temperatures.
■ The floor heating loops require a lower water temperature in heating mode compared to fan coil units. To achieve these two set points, a mixing station is used to adapt the water temperature according to requirements of the floor heating loops. The fan coil units are directly connected to the unit water circuit and the floor heating loops are after the mixing station. Control of this mixing station is not done by the unit.
■ The operation and configuration of the field water circuit is the responsibility of the installer.
■ We only offer a dual set point control function. This function allows two set points to be generated. Depending on the required water temperature (floor heating loops and/or fan coil units are required) the first set point or second set point can be activated. See **"FOR SERVICEMAN /ROOM THERMOSTAT**.

NOTE

The wiring of room thermostat 24A (for fan coil units) and 24B(for floor heating loops) should follow 'method C' (See pag. 29) When start signal is detected in "H" port, the MAIN side will turn on, the operation mode and target temperature can be set in the user interface. When stop signal is detected, the MAIN side will turn off. When start signal is detected in "C port, the ROOM side will turn on, the operation mode and target temperature decided by the climate related curves (if curves not selected, curve 4 will be the default one). When stop signal is detected, the ROOM side will turn off. When stop signal detected in both "H" and "C" port, the unit will turn off.



1	Outdoor unit	3	User interface	16	Filter (accessory)
2	Indoor unit	5	Buffer tank (field supply)	19	Shut-off valve (field supply)
2.1	PUMP_I (built-in circulating pump)	6	Balance tank (field supply)	20	Fill valve (field supply)
2.2	Plate heat exchanger (air to water heat exchanger)	6.1	Air vent valve	21	Drain valve (field supply)
		6.2	Drain valve	24A	Room thermostat for zone A (field supply)
2.3	IBH (built-in backup heater)	7	P_o: Outside circulating pump (field supply)	24B	Room thermostat for zone B (field supply)
2.4	Manometer (built-in)			25	Collector (field supply)
2.5	Air vent valve (built-in)	8	SV2: Motorized 2-way valve (field supply)	26	Bypass valve (field supply)
2.6	Expansion vessel (built-in)			A	Zone A
2.7	Safety valve (built-in pressure relief)	9	Mixing pump (field supply)	B	Zone B
2.8	Water inlet	9.1	Mixing valve	FHL1…n	Floor heating loop (field supply)
2.9	Water outlet	9.2	P_c: Mixing pump	FCU1…n	Fan coil unit (field supply)
2.10	Refrigerant connections	14	Expansion vessel (field supply)		

NOTE

The volume of the buffer tank(5) should be larger than 30L. The drain valve(21) should be installed at the lowest position of the water circulating system.

The advantage of the dual set point control is that the heat pump will/can operate at the lowest required water flow temperature when only floor heating is required. Higher water flow temperatures are only required in case fan coil units are operating. This results in a better performance of the heat pump.

Pump operation and space heating

The pump (2.1) and (7) will operate when there is a request for heating from A and/or B. The outdoor unit will start operating to achieve the target water flow temperature. The target leaving water temperature depends on which room thermostat is requesting heating.

When the room temperature of both zones is above the thermostat set point, the outdoor unit and pump will stop operating.

NOTE

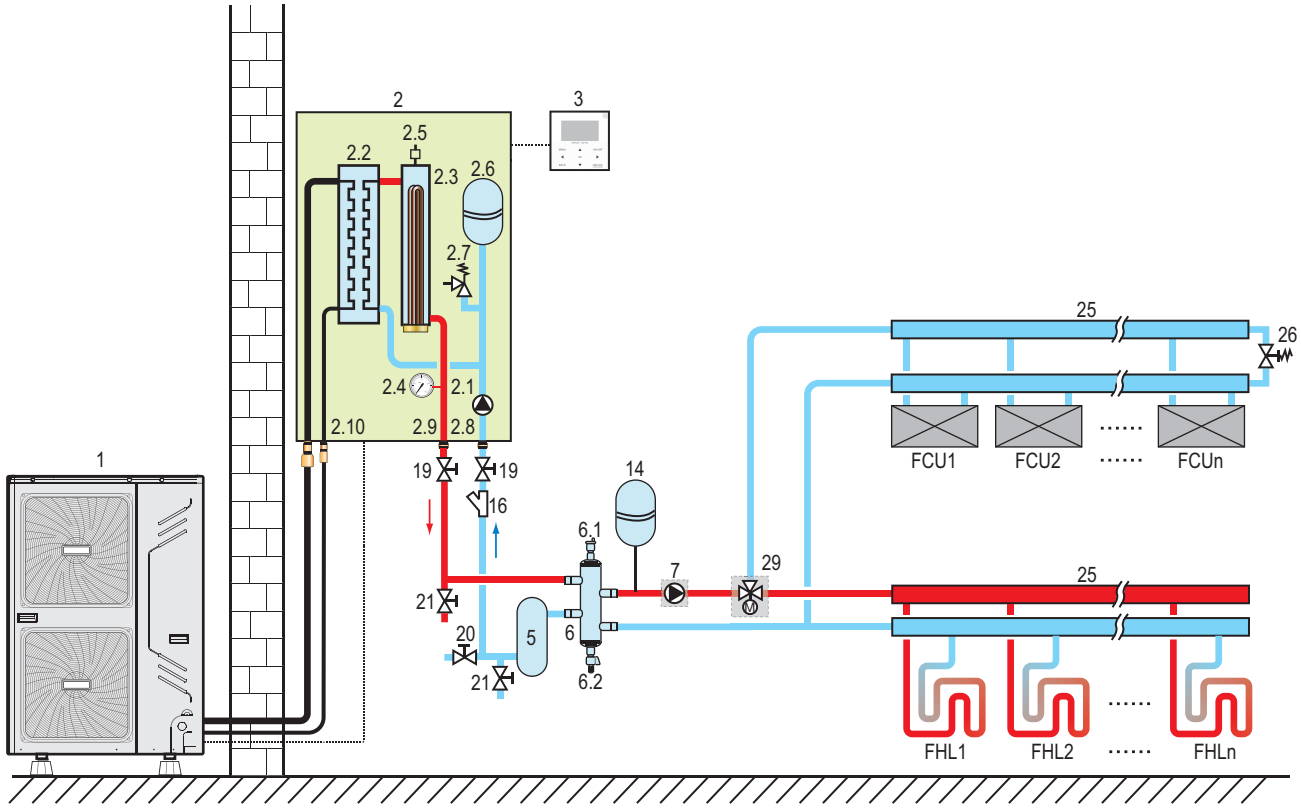
Make sure to configure the room thermostat installation on the user interface correctly. Refer to "**FOR SERVICEMAN/ROOM THERMOSTAT**".

NOTE

- It is the installers' responsibility to ensure that no unwanted situations can occur (e.g. extremely high temperature water going towards floor heating loops, etc.)
- The supplier does not offer any type of mixing station. Dual set point control only provides the possibility to use two set points.
- When only zone A requests heating, zone B will be fed with water at a temperature equal to the first set point. This can lead to unwanted heating in zone B.
- When only zone B requests heating, the mixing station will be fed with water at a temperature equal to the second set point. Depending on the control of the mixing station, the floor heating loop can still receive water at a temperature equal to the set point of the mixing station.
- Be aware that the actual water temperature through the floor heating loops depends on the control and setting of the mixing station.

4.7 Application 7

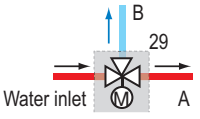
Space cooling and heating application without a room thermostat connected to the unit, but the temperature sensor attached in the user interface is used to control the ON/OFF of the unit. Heating is provided through floor heating loops. Cooling is provided through the fan coil units. A 3-way valve is used to change the direction of water flow when the operation mode changed.



1 Outdoor unit
2 Indoor unit
2.1 PUMP_I (built-in circulating pump)
2.2 Plate heat exchanger (air to water heat exchanger)
2.3 IBH (built-in backup heater)
2.4 Manometer (built-in)
2.5 Air vent valve (built-in)
2.6 Expansion vessel (built-in)
2.7 Safety valve (built-in pressure relief)
2.8 Water inlet
2.9 Water outlet
2.10 Refrigerant connections
3 User interface (accessory)
5 Buffer tank (field supply)
6 Balance tank (field supply)
6.1 Air vent valve
6.2 Drain valve
7 P_o Outside circulating pump (field supply)
14 Expansion vessel (field supply)
16 Filter (accessory)
19 Shut-off valve (field supply)
20 Fill valve (field supply)
21 Drain valve (field supply)
25 Collector (field supply)
26 Bypass valve (field supply)
29 Motorized 3-way valve (field supply)
FHL1…n Floor heating loop (field supply)
FCU1…n Fan coil unit (field supply)

NOTE

The volume of the buffer tank(5) should be larger than 30L. The drain valve(21) should be installed at the lowest position of the water circulating system.
The wiring of the 3-way valve (29) should follow the wiring of 2-way valve SV2 (refer to **"Connection for other components/ For 2-way valve SV2"**).



NOTE

In normal condition, port A should be opened, while signal sent to the 3-way valve (29), port A will be closed and port B will be opened. When in cool mode, ON signal will sent from unit to the 3-way valve (29), the cold water will flow through port inlet to port B, and port B should connect to the fan coil units. While in heating mode, the hot water will flow through port inlet to port A, and port A should connect to the floor heating loops. In this way, all the water from the unit will flow through the floor heating loops and thus ensure better performance of the floor heating.

As the temperature sensor is used to detect the room temperature, the user interface(3) should be placed in the room where floor heating loops and fan coil units is installed. Correct configuration should be applied in the user interface (refer to **"Field settings/ TEMP. TYPE SETTING"**). The target room temperature can be set on the main page of user interface, the target outlet water temperature will be calculated from climate related curves, the unit will turn off when the room temperature reaches the target temperature.

5. 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.

5.1 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 5-3.**
- **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. 5-1

Requirement	Lenght
Maximum allowable piping length between the 3-way valve SV1 and the indoor unit (only for installations with domestic hot water tank)	3m
Maximum allowable piping length between the domestic hot water tank and the indoor unit (only for installations with domestic hot water tank). The temperature sensor cable supplied with the indoor unit is 10 m in length.	8m
Maximum allowable piping length between the T1B and the indoor unit. The temperature sensor a cable of T1B supplied with the indoor unit is 10m in length.	8m

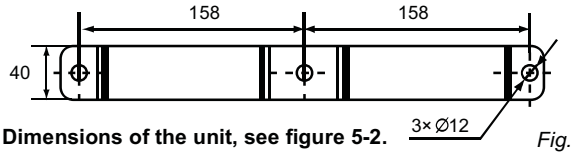
- **The equipment is not intended for use in a potentially explosive atmosphere.**

NOTE

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

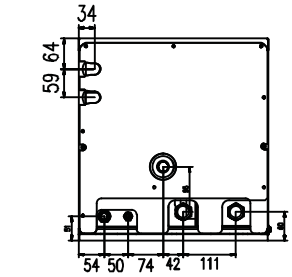
5.2 Dimensions and service space

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



- **Dimensions of the unit, see figure 5-2.**

Fig.5-1



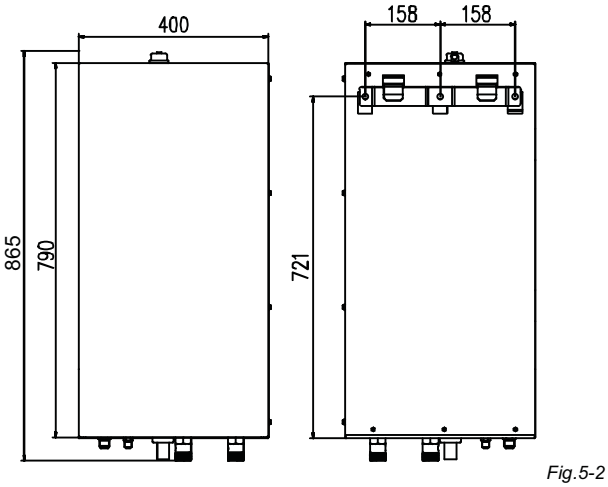


Fig.5-2

NO.	NAME
1	Refrigerant gas connection 5/8"-14UNF
2	Refrigerant liquid connection 3/8"-14UNF
3	Drainage Ø 25
4	Water Inlet DN25 (1")
5	Water Outlet DN25 (1")

- Required service space, see figure 5-3.

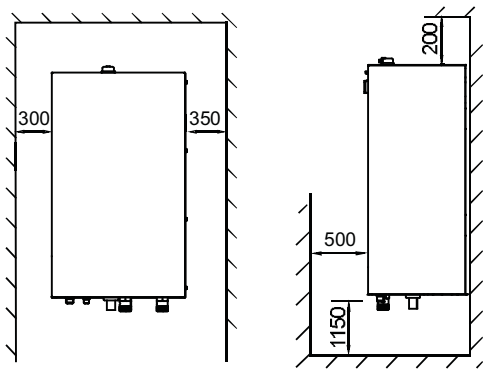


Fig.5-3

5.3 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.

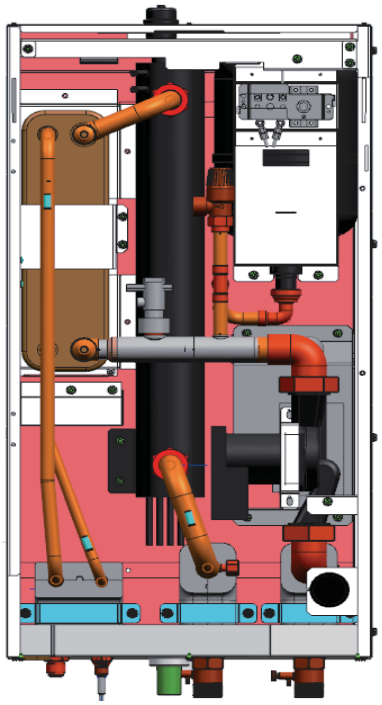


Fig.5-4

5.4 Mounting the indoor unit

WARNING

The weight of the indoor unit is approximately 60kg.
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.

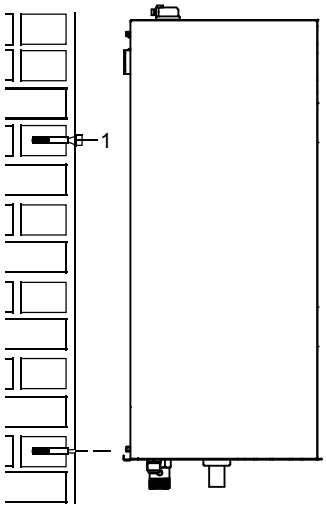


Fig.5-5

5.5 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. 5-2

Refrigerant piping specifications	Indoor unit	Outdoor unit
Gas pipe connection	φ15.9mm (5/8")	φ15.9mm (5/8")
Liquid pipe connection	φ9.52mm (3/8")	φ9.52mm (3/8")

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.

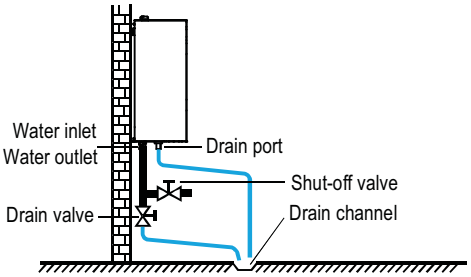
5.6 Water pipework

All piping lengths and distances have been taken into consideration. Refer to table. 5-1.

NOTE

- If the installation is equipped with a domestic hot water tank (optional), please refer to the domestic hot water tank Installation & owner's manual.
- If no glycol is in the system,in case of a power supply failure or pump operating failure, drain the system (as suggested in the figure below).

NOTE If no glycol is in the system,in case of a power supply failure or pump operating failure, drain the system (as suggested in the figure below).



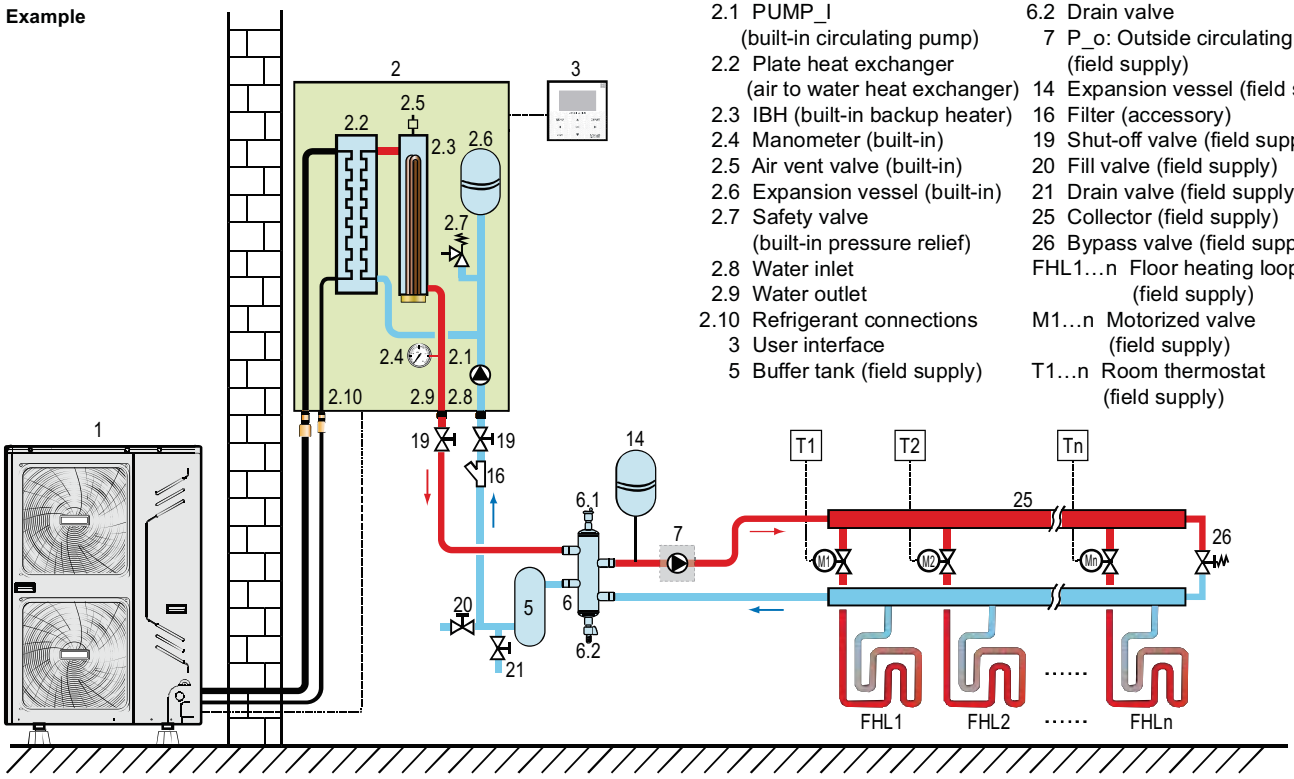
When water is at standstill inside the system, freezing is very likely to happen and damaging the system in the process.

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 local laws and regulations.

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.

Example



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

- The maximum water pressure = 3 bar.
- The maximum water temperature is 70°C according to safety device setting.
- Always use materials which are compatible with the water used in the system and with the materials used in the unit.
- Take care that the components installed in the field piping can withstand the water pressure and temperature.
- Drain taps must be provided at all low points of the system to permit complete drainage of the circuit during maintenance.
- 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 unit. Check that this air purge valve is not tightened too much so that automatic release of air in the water circuit remains possible.

Checking the water volume and expansion vessel pre-pressure

The unit is equipped with an expansion vessel of 5 litre which has a default pre-pressure of 1.5 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.

1. Check that the total water volume in the installation, excluding the internal water volume of the unit, is 20L minimum. Refer to **"11 Technical specifications"** to know the internal water volume of the unit.

NOTE

- In most applications this minimum water volume will have a satisfying result.
- In critical processes or in rooms with a high heat load though, extra water volume might be required.
- When circulation in each space heating loop is controlled by remotely controlled valves, it is important that this minimum water volume is kept even if all the valves are closed.

1 Outdoor unit
2 Indoor unit
2.1 PUMP_I (built-in circulating pump)
2.2 Plate heat exchanger (air to water heat exchanger)
2.3 IBH (built-in backup heater)
2.4 Manometer (built-in)
2.5 Air vent valve (built-in)
2.6 Expansion vessel (built-in)
2.7 Safety valve (built-in pressure relief)
2.8 Water inlet
2.9 Water outlet
2.10 Refrigerant connections
3 User interface
5 Buffer tank (field supply)
6 Balance tank (field supply)
6.1 Air vent valve
6.2 Drain valve
7 P_o: Outside circulating pump (field supply)
14 Expansion vessel (field supply)
16 Filter (accessory)
19 Shut-off valve (field supply)
20 Fill valve (field supply)
21 Drain valve (field supply)
25 Collector (field supply)
26 Bypass valve (field supply)
FHL1…n Floor heating loop (field supply)
M1…n Motorized valve (field supply)
T1…n Room thermostat (field supply)

2. Using the table below, determine if the expansion vessel pre- pressure requires adjustment.
3. Using the table and instructions below, determine if the total water volume in the installation is below the maximum allowed water volume.

Installation height difference[(a)]	Water volume ≤160 l	>160 l
≤7 m	No pre-pressure adjustment required.	Actions required: • pre-pressure must be decreased, calculate according to "Calculating the pre-pressure of the expansion vessel" • check if the water volume is lower than maximum allowed water volume (use graph below)
>7 m	Actions required: • pre-pressure must be increased, calculate according to "Calculating the pre-pressure of the expansion vessel" • check if the water volume is lower than maximum allowed water volume (use graph below)	Expansion vessel of the unit too small for the installation.

(a) Installation height difference: height difference (m) between the highest point of the water circuit and the unit. If the unit is located at the highest point of the installation, the installation height is considered 0 m.

Calculating the pre-pressure of the expansion vessel

The pre-pressure (Pg) to be set depends on the maximum installation height difference (H) and is calculated as below:
Pg(bar)=(H(m)/10+0.3) bar

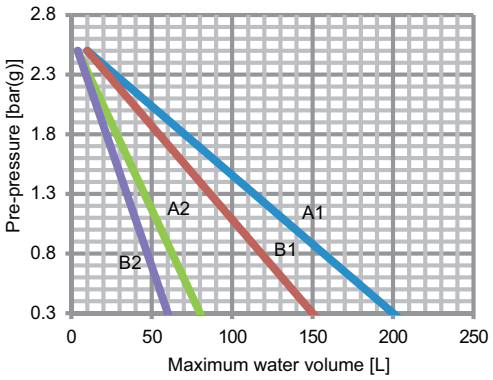
Checking the maximum allowed water volume

To determine the maximum allowed water volume in the entire circuit, proceed as follows:

1. Determine for the calculated pre-pressure (Pg) the corresponding maximum water volume using the graph below.

2. Check that the total water volume in the entire water circuit is lower than this value.

If this is not the case, the expansion vessel inside the unit is too small for the installation.



A1 System without glycol for 1-phase 10~16 kw and 3-phase 12~16 kw unit
A2 System without glycol for 4 to 8 kW unit
B1 System with 25% propylene glycol for 1-phase 10~16 kw and 3-phase 12~16 kw unit
B2 System with 25% propylene glycol for 4 to 8 kW unit
(Refer to “Caution: “Use of glycol”)

Example 1
The unit is installed 5 m below the highest point in the water circuit.
The total water volume in the water circuit is 100 l.
In this example, no action or adjustment is required.

Example 2
The unit is installed at the highest point in the water circuit. The total water volume in the water circuit is 180 l.
Result:
- Since 180 l is higher than 160 l, the pre-pressure must be decreased (see table above).
- The required pre-pressure is:
  Pg(bar) = (H(m)/10+0.3) bar = (0/10+0.3) bar = 0.3 bar
- The corresponding maximum water volume can be read from the graph: approximately 210 l.
- Since the total water volume (180 l) is below the maximum water volume (210 l), the expansion vessel suffices for the installation.

Setting the pre-pressure of the expansion vessel

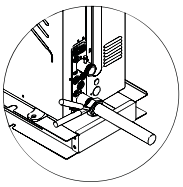
When it is required to change the default pre-pressure of the expansion vessel (1 bar), keep in mind the following guidelines:
- Use only dry nitrogen to set the expansion vessel pre-pressure.
- Inappropriate setting of the expansion vessel pre-pressure will lead to malfunction of the system. Therefore, the pre-pressure should only be adjusted by a licensed installer.

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.

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.



NOTE

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.
- When using a 3-way valve in the water circuit.Preferably choose a ball type 3-way valve to guarantee full separation between domestic hot water and floor heating water circuit.
- When using a 3-way valve or a 2-way valve in the water circuit. The recommended maximum changeover time of the valve should be less than 60 seconds.

Protecting the water circuit against freezing

Frost can cause damage to the hydraulic system. As this unit is installed outdoors and thus the hydraulic system is exposed to freezing temperatures, care must be taken to prevent freezing of the system.

All hydraulic parts are insulated to reduce heat loss. Insulation must be foreseen on the field piping.

The unit is already equipped with several features to prevent freezing.

- The software contains special functions using heat pump to protect the complete system against freezing.
  When the temperature of the water flow in the system drop to a certain value, the software will take action to heat the water, either by the heat pump or the electric heating tap, or backup heater.
  The freeze protection function will turn off only when the temperature increase to a certain value.

However in case of power failure, above mentioned features can not protect the unit from freezing.
If power failure can happen at times the unit is unattended, the supplier recommends adding glycol to the water system. Refer to Caution: “Use of glycol”.
Depending on the expected lowest outdoor temperature, make sure the water system is filled with a weight concentration of glycol as mentioned in the table below.

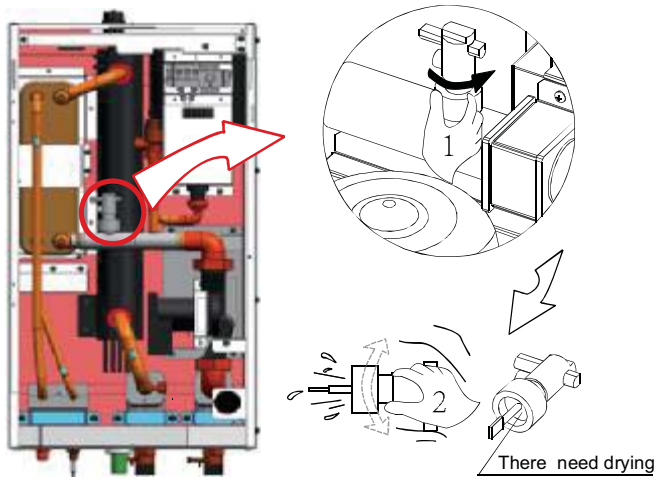
When glycol added to the system, the performance of the unit will be affected, the correction factor of the unit capacity、flow rate and pressure drop of the system listed in the table below:

Freezing point( )						
	0	-5	-10	-15	-20	-25
Percentage of ethylene glycol in weight						
	0	12%	20%	28%	35%	40%
cPf	1	0.98	0.97	0.965	0.96	0.955
cQ	1	1.02	1.04	1.075	1.11	1.14
cdp	1	1.07	1.11	1.18	1.22	1.24

cPf: correction factor for unit heating capacity
cQ: correction factor for flow rate
cdp: correction factor for system pressure drop

If no glycol added to the system water must be drain out when power supply failure.

Besides, water may enter into the flow switch, which can’t be drain out and may freezing when the temperature is low enough, so you should remove the flow switch and dry it, then you can install it into the unit.



NOTE

- Counterclockwise rotation, remove the flow switch.
- Drying the flow switch completly.

WARNING

(a) ETHYLENE GLYCOL IS TOXIC
The concentrations mentioned in the table above will not prevent the medium from freezing, but prevent the hydraulics from bursting.

CAUTION

Use of glycol

- Use of glycol for installations with a domestic hot water tank:
  - Only propylene glycol having a toxicity rating or class of 1, as listed in "Clinical Toxicology of Commercial Products, 5th edition" may be used.
  The maximum allowed water volume is then reduced according to the figure “Maximum allowed water volume” Refer to the Installation.
- In case of over-pressure when using glycol, be sure to connect the safety valve to a drain pan in order to recover the glycol.

Corrosion of the system due to presence of glycol

Uninhibited glycol will turn acidic under the influence of oxygen. This process is accelerated by presence of copper and at higher temperatures. The acidic uninhibited glycol attacks metal surfaces and forms galvanic corrosion cells that cause severe damage to the system.

It is therefore of extreme importance:

- That the water treatment is correctly executed by a qualified water specialist;
- That a glycol with corrosion inhibitors is selected to counteract acids formed by the oxidation of glycols;
- That in case of an installation with a domestic hot water tank, only the use of propylene glycol is allowed. In other installations the use of ethylene glycol is permitted as well;
- That no automotive glycol is used because their corrosion inhibitors have a limited lifetime and contain silicates which can foul or plug the system;
- That galvanized pipingis not used in glycol systems since its presence may lead to the precipitation of certain components in the glycol’s corrosion inhibitor;
- That it has to be made sure the glycol is compatible with the used materials in the system.

NOTE

- Be aware of the hygroscopic property of glycol: it absorbs moisture from its environment.
- Leaving the cap off the glycol container causes the concentration of water to increase. The glycol concentration is then lower than assumed. And in consequence, freezing can happen after all.
- Preventive actions must be taken to ensure minimal exposure of the glycol to air.

Also refer to "Pre-operation checks/Checks before initial start-up"

5.7 Filling water

1. Connect the water supply to the fill port and open the valve.
2. Make sure the automatic air purge valve is open (at least 2 turns).
3. Fill with water until the manometer indicates a pressure of approximately 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 backup heater.

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 valves 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 pressure 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 "Safe Drinking water Act "

5.8 Piping insulation

The complete water circuit including all piping, must be insulated to prevent condensation during cooling operation and reduction of the heating and cooling capacity as well as prevention of freezing of the outside water piping during winter time. The thickness of the sealing materials must be at least 13 mm with λ= 0.039 W/mK in order to prevent freezing on the outside water piping.
If the temperature is higher than 30°C and the humidity is higher than RH 80%, then the thickness of the sealing materials should be at least 20 mm in order to avoid condensation on the surface of the sealing.

5.9 Field wiring

WARNING

- A main switch or other means for disconnection, having a contact separation in all poles, must be incorporated in the fixed wiring in accordance with relevant local laws and regulations.
- Switch off the power supply before making any connections.
- Use only copper wires.
- Never squeeze bundled cables and make sure that it does not come in contact with the piping and sharp edges. Make sure no external pressure is applied to the terminal connections.
- All field wiring and components must be installed by a licensed electrician and must comply with relevant local laws and regulations.
- The field wiring must be carried out in accordance with the wiring diagram supplied with the unit and the instructions given below.

- Be sure to use a dedicated power supply. Never use a power supply shared by another appliance.
- Be sure to establish a ground. Do not ground the unit to a utility pipe, surge absorber, or telephone ground. Incomplete ground may cause electrical shock.
- Be sure to install a ground fault circuit interrupter (30 mA). Failure to do so may cause electrical shock.
- Be sure to install the required fuses or circuit breakers.

5.9.1 Precautions on electrical wiring work

- Fix cables so that cables do not make contact with the pipes (especially on high pressure side).
- Secure the electrical wiring with cable ties as shown in figure so that it does not come in contact with the piping, particularly on the high-pressure side.
- Make sure no external pressure is applied to the terminal connectors.
- When installing the ground fault circuit interrupter make sure that it is compatible with the inverter (resistant to high frequency electrical noise) to avoid unnecessary opening of the ground fault circuit interrupter.

NOTE

The ground fault circuit interrupter must be a high- speed type breaker of 30 mA (<0.1 s).

- As this unit is equipped with an inverter, installing a phase advancing capacitor not only will deteriorate power factor improvement effect, but also may cause capacitor abnormal heating accident due to high-frequency waves. Therefore, never install a phase advancing capacitor.

5.9.2 Overview

The illustration below gives an overview of the required field wiring between several parts of the installation. Refer also to "4 Typical application examples".

5.9.2.1 Opening the indoor unit

■ **The indoor unit cover can be removed by removing the 3 bottom screws and unhitching the cover.**

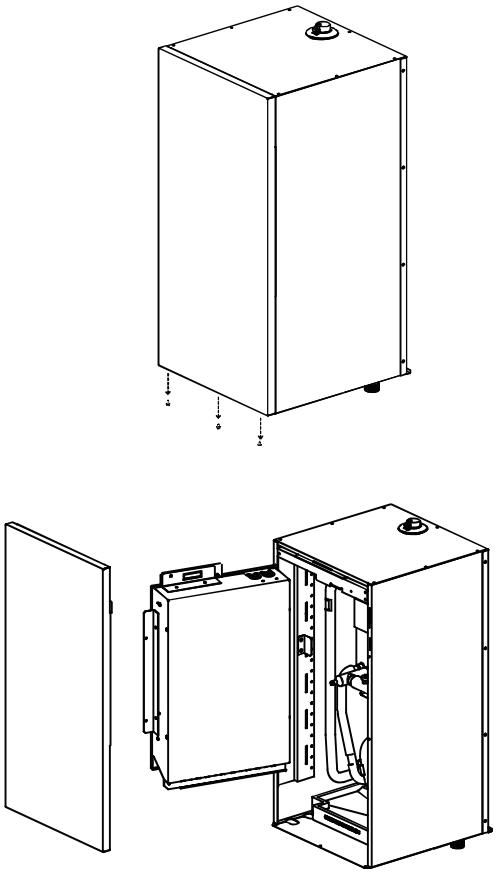


Fig.5-6

CAUTION

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

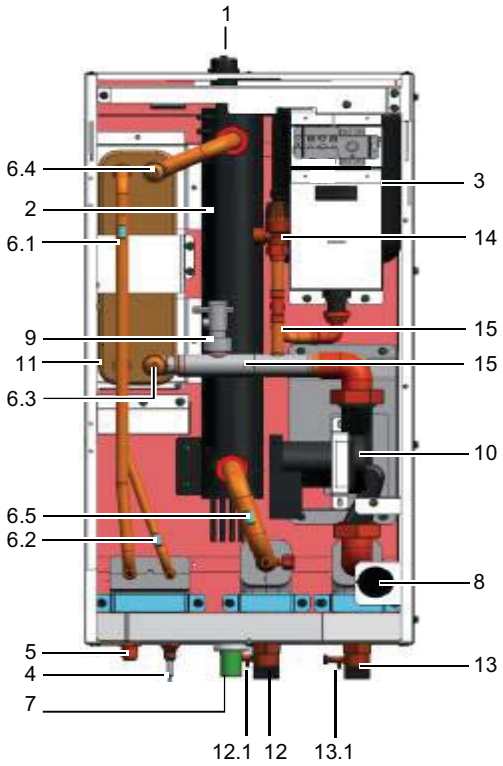
Parts inside the unit can be hot.

■ **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

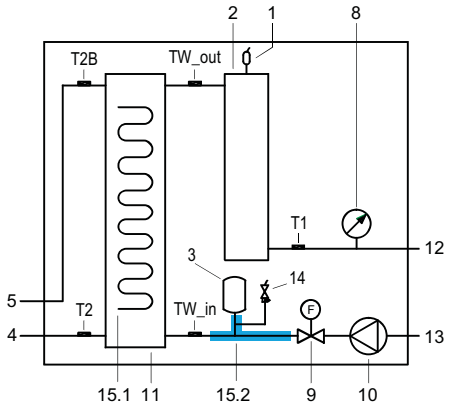
Switch off all power supply – i.e. outdoor unit power supply ,indoor unit power supply, electric heater and auxiliary heater power supply before removing the control box service panel.

5.9.2.2 Indoor unit components



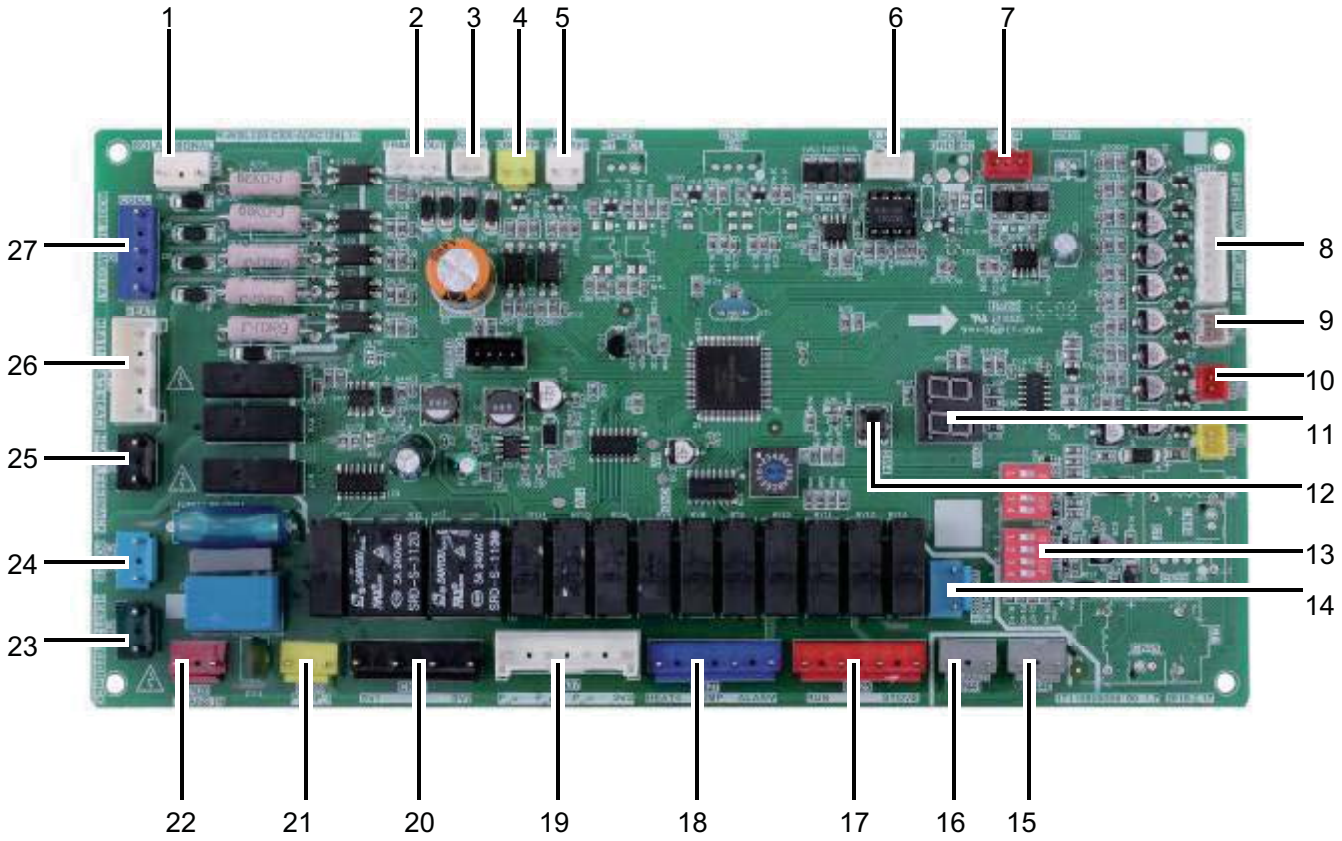
1. Air vent valve
   Remaining air in the water circuit will be automatically removed via the air vent valve.
2. Backup heater
   The backup heater consists of an electrical heating element that will provide additional heating capacity to the water circuit if the heating capacity of the unit is insufficient due to low outdoor temperatures, it also protects the external water piping from freezing during cold periods.
3. Expansion vessel (5.L)
4. Refrigerant liquid connection
5. Refrigerant gas connection
6. temperature sensors
   Four temperature sensors determine the water and refrigerant temperature at various points in the unit.
   6.1-T2B; 6.2-T2; 6.3-TW_in; 6.4-TW_out; 6.5-T1
7. Drain port
8. Manometer
   The manometer allows readout of the water pressure in the water circuit.
9. Flow switch
   The flow switch checks the flow in the water circuit and protects the heat exchanger against freezing and the pump against damage.
10. Pump
    The pump circulates the water in the water circuit.
11. Heat exchanger
12. Water outlet connection
12.1 Air vent valve
13. Water inlet connection
13.1 Drain valve
14. Safty valve
    The pressure relief valve prevents excessive water pressure in the water circuit by opening at 43.5 psi (3 bar) and discharging some water.
15. Electrical heating tape (15.1-15.2)

Functional diagram of indoor unit components

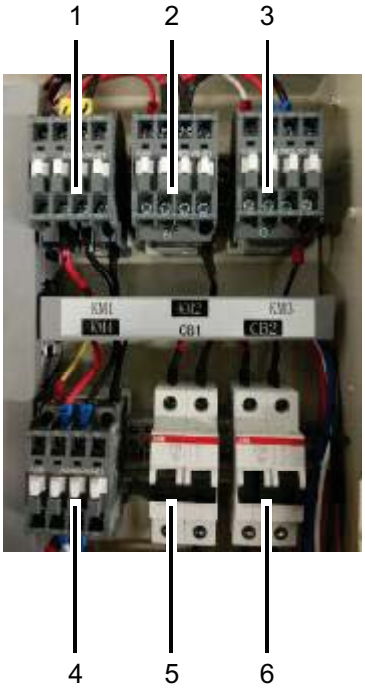


1 Air vent valve
2 Backup heater vessel with backup heater
3 Expansion vessel
4 Refrigerant liquid connection
5 Refrigerant gas connection
8 Manometer
9 Flow switch
10 Circulated Pump
11 Heat exchanger
12 Water outlet connection
13 Water inlet connection
14 Safety valve
15.1 Electrical heating tape
15.2 Electrical heating tape
temperature sensors: Tw_in, Tw_out, T1, T2, T2B

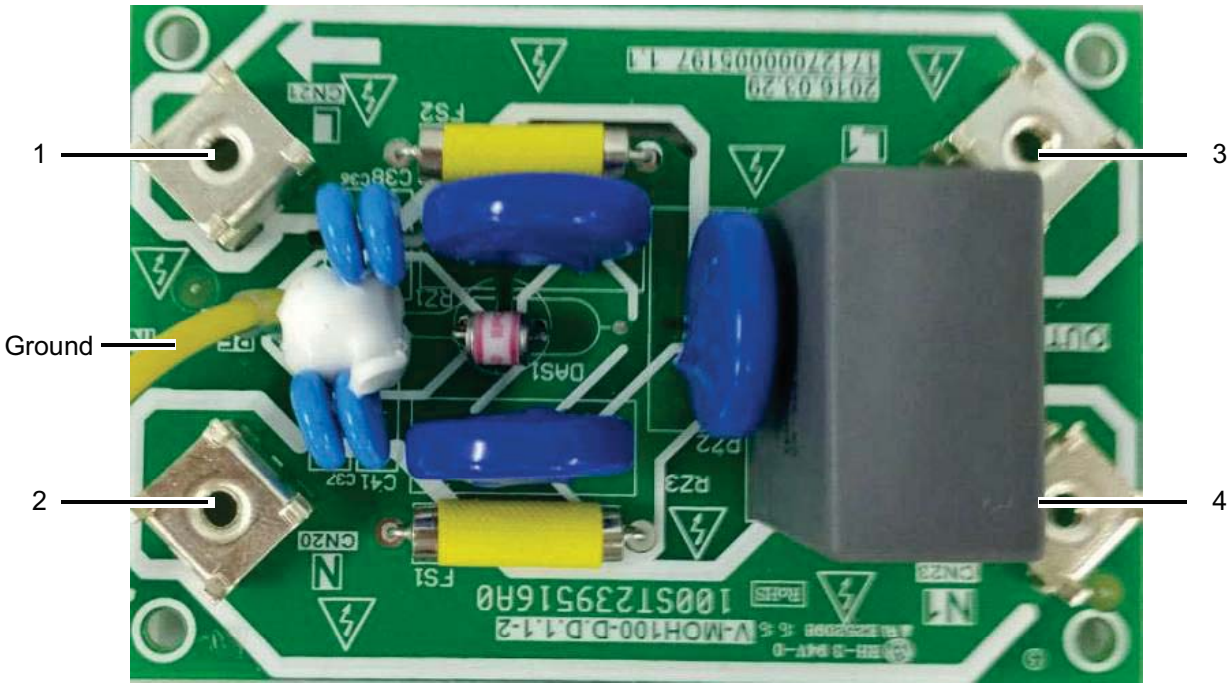
5.9.2.3 Switch box main components



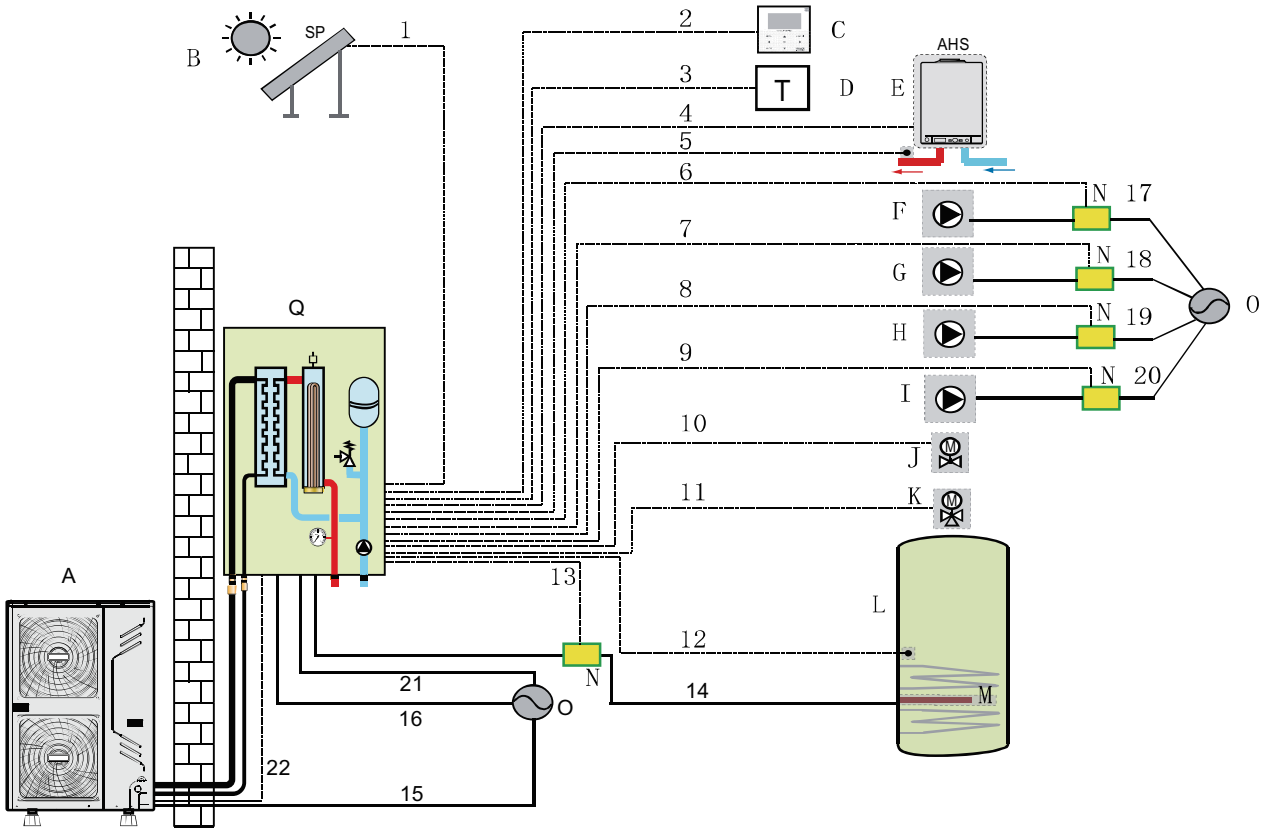
1 Input port for solar energy(CN5)
2 Output port for transformer(CN4)
3 Power supply port for user interface(CN36)
4 Port for remote switch(CN12)
5 Port for flow switch（CN8）
6 Communicate port between outdoor unit and door PCB(CN14)
7 Communicate port between door PCB and user interface(CN19)
8 Port for temperature sensors(Twout, Twin, T1, T2,T2B)(CN6)
9 Port for temperature sensor(CN13)(T5,Sanitary water temp.)
10 Port for temperature sensor(T1B, the final outlet temp.)(CN15)
11 Digital displays(DIS1)
12 Check button(SW4)
13 DIP switch(S1,S2)
14 Output port for deforst(CN34)
15 Port for anti-freeze eletric heating tape (internal)(CN40)
16 Port for anti-freeze eletric heating tape (internal)(CN41)
17 Output port for external heating source / operation output port(CN25)
18 Port for anti-freeze eletric heating tape(external) /port for solar energy pump/output port for remote alarm(CN27)
19 Port for external circulted pump/pipe pump/mix pump/2-way valve SV2(CN37)
20 Port for SV1(3-way valve) and SV3(CN24)
21 Port for internal pump(CN28)
22 Input port for transformer(CN20)
23 Feedback port for temperature switch(CN1)
24 Port for power supply(CN21)
25 Feedback port for external temp. switch(shorted in default)(CN2)
26 Control port backup heater/booster heater(CN22)
27 Control port for room thermostat(CN3)



1 IBH contactor KM1
2 IBH contactor KM2
3 IBH contactor KM3
4 TBH contactor KM4
5 IBH circuit breaker CB1
6 TBH circuit breaker CB2



1 Power supply L
2 Power supply N
3 Power supply for main control board L
4 Power supply for main control board N
5 Ground



A Outdoor unit
B Solar energy kit (field supply)
C User interface
D Room thermostat (field supply)
E Boiler (field supply)
F P_s: Solar pump (field supply)
G P_c: Mixing pump (field supply)
H P_o: Outside circulate pump (field supply)
I P_d: DHW pump (field supply)
J SV2: 2-way valve (field supply)
K SV1: 3-way valve for domestic hot water tank (field supply)
L Domestic hot water tank
M Booster heater
N Contactor
O Power supply
Q Indoor unit

Item	Description	AC/DC	Required number of conductors	Maximum running current
1	Solar energy kit signal cable	AC	2	200mA
2	User interface cable	AC	5	200mA
3	Room thermostat cable	AC	2 or 3	200mA(a)
4	Boiler control cable	/	2	200mA
5	Thermistor cable	DC	2	200mA
6	Solar pump control pump	/	2	200mA
7	Mixing pump control cable	/	2	200mA
8	Outside circulation pump control cable	AC	2	200mA(a)
9	DHW pump control cable	AC	2	200mA(a)
10	2-way valve control cable	AC	2	200mA(a)
11	3-way valve control cable	AC	2 or 3	200mA(a)
12	Thermistor cable	DC	2	(b)
13	Booster heater control cable	AC	2	200mA(a)
14	Power supply cable for booster heater	AC	2	200mA(a)
15	Power supply cable for outdoor unit	AC	2+GND（1-phase） 3+GND（3-phase）	31A（1-phase） 15A（3-phase）
16	Power supply cable for backup heater	AC	2+GND（1-phase） 3+GND（3-phase）	14A（1-phase） 6A（3-phase）
17	Power supply cable for solar pump	AC	2	200mA(a)
18	Power supply cable for mixing pump	AC	2	200mA(a)
19	Power supply cable for outside circulation pump	AC	2	200mA(a)
20	Power supply cable for DHW pump	AC	2	200mA(a)
21	Power supply cable for indoor unit	AC	2+GND（1-phase） 3+GND（3-phase）	32A（1-phase） 25A（3-phase）
22	Communication wire	DC	3	200mA(a)

(a) Minimum cable section AWG18 (0.75 mm^2)

(b) The temperature sensor cable are delivered with the unit

Equipment must be grounded.

All high-voltage external loads, if it is metal or a grounded port, must be grounded.

All external loads current is needed less than 1.5A, if the loads current is greater than 1.5A,Single external load current is needed less than 0.2A, if the single load current is greater than 0.2A, the load must be controlled through AC contactor.

Field wiring guidelines

- Most field wiring on the unit is to be made on the terminal block inside the switch box. To gain access to the terminal block, remove the switch box service panel (door 2).

WARNING

Switch off all power supply – i.e. unit power supply and backup heater and domestic hot water tank power supply (if applicable) – before removing the switch box service panel.

- Fix all cables using cable ties.
- A dedicated power circuit is required for the backup heater.
- Installations equipped with a domestic hot water tank (optional), require a dedicated power circuit for the **booster heater**.
  Please refer to the domestic hot water tank Installation & owner's manual.
  Secure the wiring in the order shown below.
- Lay the electrical wiring so that the front cover does not rise up when doing wiring work and attach the front cover securely (see figure).
- Follow the electric wiring diagram for electrical wiring works (the electric wiring diagrams are located on the rear side of door 1.
- Form the wires and fix the cover firmly so that the cover may be fit in properly.

Precautions on wiring of power supply

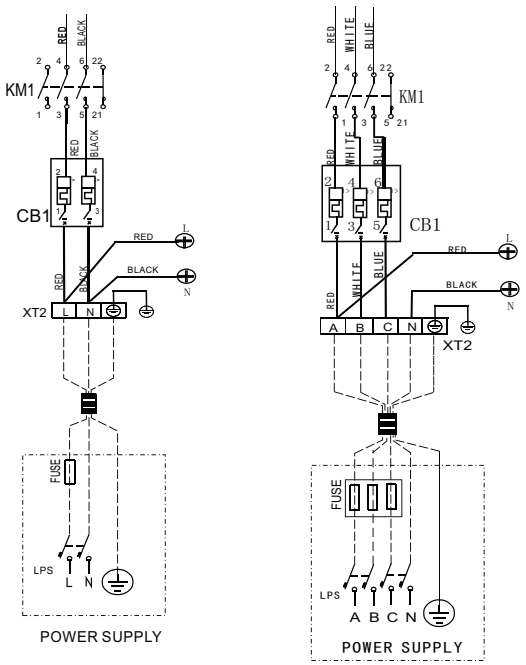
- Use a round crimp-style terminal for connection to the power supply terminal board. In case it cannot be used due to unavoidable reasons, be sure to observe the following instruction.

- Do not connect wires of different gauge to the same power supply terminal. (Looseness in the connection may cause overheating.)
- When connecting wires of the same gauge, connect them according to the below figure.

- Use the correct screwdriver to tighten the terminal screws. Small screwdrivers can damage the screw head and prevent appropriate tightening.
- Over-tightening the terminal screws can damage the screws.
- Attach a ground fault circuit interrupter and fuse to the power supply line.
- In wiring, make certain that prescribed wires are used, carry out complete connections, and fix the wires so that outside forces are not applied to the terminals.

Specifications of standard wiring components

Equipment main Power Supply Wiring (XT2)



	1-phase	3-phase
Maximum overcurrent protector (MOP)	32	25
Wiring size	Wiring size must comply with the applicable local laws and regulations	

(a) Stated values are maximum values (see electrical data for exact values).

NOTE

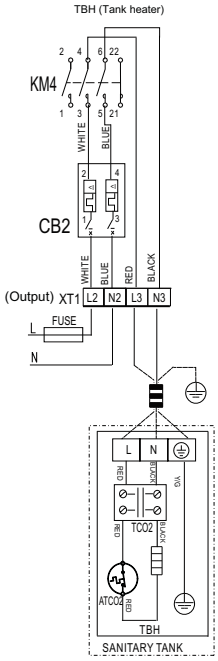
The ground fault circuit interrupter must be a high-speed type breaker of 30 mA (<0.1 s).
External cable must meet 60245IEC57 standards.

Connection of the backup heater power supply (XT1)

Power circuit and cable requirements

- Be sure to use a dedicated power circuit for the backup heater. Never use a power circuit shared by another appliance.
- Use one and same dedicated power supply for the unit, backup heater and booster heater (domestic hot water tank).

This power circuit must be protected with the required safety devices according to local laws and regulations.
Select the power cable in accordance with relevant local laws and regulations. For the maximum running current of the backup heater, refer to the table below.



	Backup heater capacity	
	3kw 1-phase	4.5kw 3-phase
Backup heater nominal voltage	230V	400V
Minimum circuit amps (MCA)	14.3	14.3
Maximum overcurrent protector (MOP)	32A	32A

NOTE

The ground fault circuit interrupter must be a high-speed type breaker of 30 mA (<0.1 s).
External cable must meet 60245IEC57 standards.

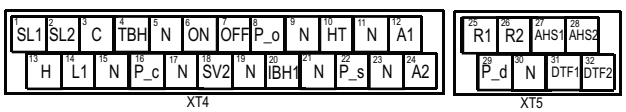
Connection for other components (XT4 / XT5)

Electrical parts of the hydraulic compartment: The **XT4/XT5** contains terminals for solar energy, remote alarm, 2-way valve, 3-way valve, pump, booster heater and external heating source.
The parts wiring is illustrated below:

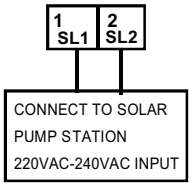
Equipment must be grounded.
All high-voltage external load, if it is metal or a grounded port, must be grounded.

All external load current is needed less than 0.2A, if the single load current is greater than 0.2A, the load must be controlled through AC contactor.

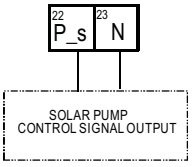
"STV1" "STV2", "A1" "A2", "R1" "R1" and "DTF1" "DTF2" wiring terminal ports provide only the switch signal.
TBH electric heating power is less than 3000W.



For solar kit:

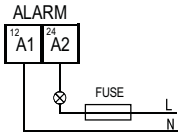


Voltage	220VAC-240VAC
Maximum running current	0.2A
Wiring size	0.75mm²



Voltage	220VAC-240VAC
Maximum running current	0.2A
Wiring size	0.75mm²

For remote alarm:

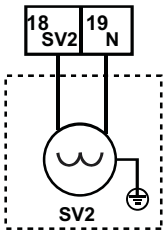


Voltage	Passive signal port
Maximum running current	0.2A
Wiring size	0.75mm²

Procedure

1. Connect the cable to the appropriate terminals as shown on the diagram.
2. Fix the cable with cable ties to the cable tie mountings to ensure stress relief.

For 2-way valve SV2:



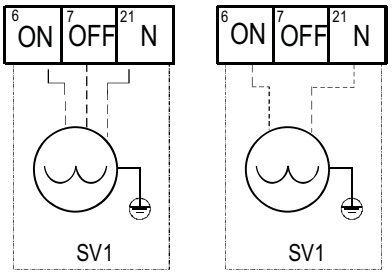
Voltage	220VAC-240VAC
Maximum running current	0.2A
Wiring size	0.75mm²

NOTE: Only a normal closing (NC) valve is available for this unit.

Procedure

1. Connect the valve cable to the appropriate terminals as shown in the picture
2. Fix the cable with cable ties to the cable tie mountings to ensure stress relief

For 3-way valve SV1



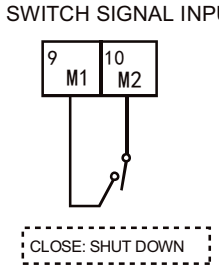
Voltage	220VAC-240VAC
Maximum running current	0.2A
Wiring size	0.75mm²

NOTE: Wiring of the 3-way valve is different for NC (normal close) and NO (normal open). Before wiring, read the Installation & Owner's manual for the 3-way valve carefully and install the valve as should in the picture. Make sure to connect it to the correct terminal numbers.

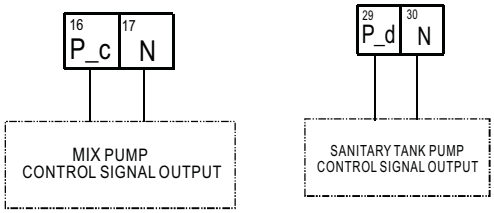
Procedure

1. Connect the cable to the appropriate terminals as shown in the picture
2. Fix the cable with cable ties to the cable tie mountings to ensure stress relief.

For remote shutdown:



For tank loop pump P_d and mix pump P_c:



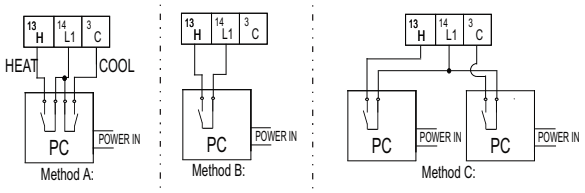
Voltage	220VAC-240VAC
Maximum running current	0.2A
Wiring size	0.75mm^2

Procedure

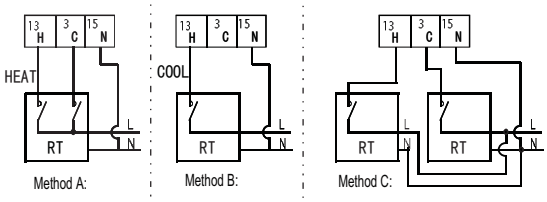
1. Connect the cable to the appropriate terminals as shown in the picture.
2. Fix the cable with cable ties to the cable tie mountings to ensure stress relief

For room thermostat:

External ON/OFF thermostat:



External thermostat:



Voltage	220VAC-240VAC
Maximum running current	0.2A
Wiring size	0.75mm^2

There are three methods for connecting the thermostat cable (as described in the picture above) and it depends on the application.
If method “A” is selected, the space operation mode can be selected on the room thermostat. If method “B” is selected, the room thermostat is used as a switch. When the room temperature reaches the target temperature, the units will turn off, while the space operation mode can only be selected on the user interface.

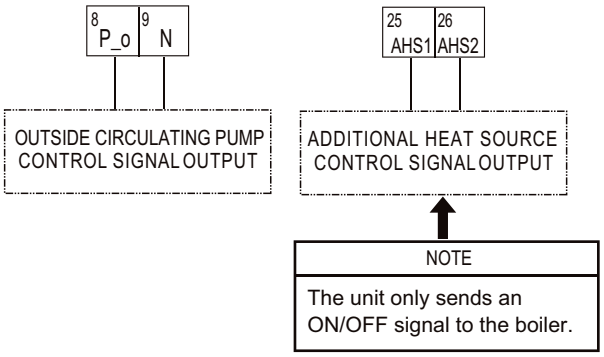
If method “C” is selected, application 6 (refer to 4.6 Application 6) should be applied. Any room thermostat sent ON signal to the unit will the unit turn on. Both room thermostat sent OFF signals to the unit will the unit turn off. The operation mode can be set in the user interface.
When the room thermostat is installed the ON/OFF of the unit is decided by the temperature detected by the thermostat, the user interface can only set the target temperature.

NOTE:
1.The wiring of the thermostat should correspond to the settings of the user interface.
2. Power supply of machine and room thermostat must be connected to the same Neutral Line and (A) Phase Line.

Procedure

1. Connect the cable to the appropriate terminals as shown on the picture
2. Fix the cable with cable ties to the cable tie mountings to ensure stress relief

For boiler and pipe pump P_o:



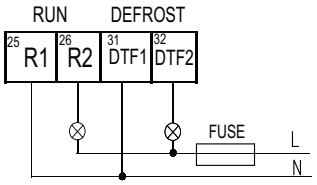
Voltage	220VAC
Maximum running current	0.2A
Wiring size	0.75mm^2

■ **External Wiring of Operation/ Fault**

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

● The terminal 25 \26 and 31\30 will be disconnected when there is a running fault, and be connected when the unit is running correctly.

● The connection is described.

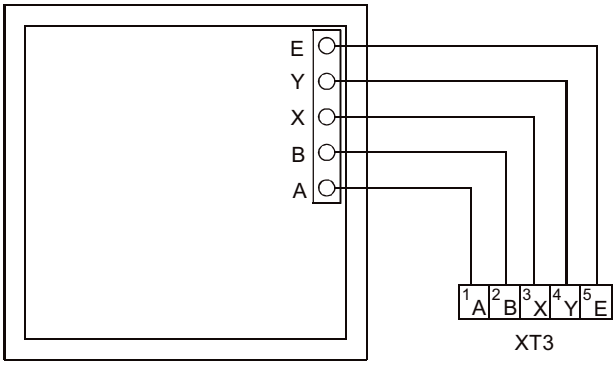


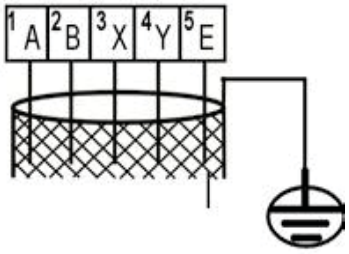
Procedure

1. Connect the cable to the appropriate terminals as shown on the picture
2. Fix the cable with cable ties to the cable tie mountings to ensure stress relief.

For user interface (controller) (XT3):

COMMUNICATION





"PLEASE USE SHIELDED WIRE AND EARTH THE WIRE."

Wire type	5 wire shielded cable
Wire section	AWG18-AWG16(0.75~1.25mm^2)
Maximum wire length	150m

As described above, during wiring, port A in the unit terminal XT3 corresponds to port A in the user interface. Port B corresponds to port B. Port X corresponds to port X. Port Y corresponds to port Y, and port E corresponds to port E..

Procedure

1. Remove the rear part of the user interface.
2. Connect the cable to the appropriate terminals as shown in the picture
3. Reattach the rear part of the user interface

6 START-UP AND CONFIGURATION

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

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

6.1 Climate related curves

The climate related curves can be selected in the user interface (refer to the operation manual, **6.2.2 Weather Temperature set,** if ECO mode is enabled, please refer to the operation manual **6.2.3 ECO Mode**).
Once the curve is selected, the target outlet water temperature is determined by the outdoor temperature. In each mode, you can select one curve from eight curves in the user interface. And it designed for three applications. Floor heating Low temperature / Floor heating High temperature and Radiator. For some new building with good insulation, you can adopt floor heating Low temperature curves. And set corresponding curves in controller. If your building insulation is not so well, you can choose floor heating high temperature curves. If you need relace a boiler for radiator, Please choose radiator curves.
The relationship between outdoor temperature(T4/℃) and target outlet water temperature(T1s/℃) is described in the table and picture in the next page.

The selection of the low/high temperature curve can be done in the user interface. Incool mode reter to 10.7 Field setting/COOL control/ How to set the COOL mode. In heat mode refer to 10.7 Field setting/ HEAT control/How to set the HEAT mode.

Temperature curves for heating mode:

T1s Curve number	Outdoor Temp. T4										
	-20	-15	-10	-5	0	5	10	15	20	25	35
LOW 1	30	30	30	28	27	25	23	22	20	20	20
LOW 2	34	34	34	32	29	27	25	22	20	20	20
LOW 3	38	38	38	35	32	29	26	23	20	20	20
LOW 4	41	41	41	38	34	31	27	24	20	20	20
LOW 5	45	45	45	41	37	33	28	24	20	20	20
LOW 6	49	46	44	42	39	37	35	32	30	30	30
LOW 7	51	49	46	43	41	38	35	33	30	30	30
LOW 8	54	51	48	45	42	39	36	33	30	30	30
HIGH 1	55	53	50	47	43	40	37	33	30	30	30
HIGH 2	55	55	52	48	45	41	37	34	30	30	30
HIGH 3	55	55	54	50	46	42	38	34	30	30	30
HIGH 4	46	46	46	43	39	36	32	29	25	25	25
HIGH 5	50	50	50	46	42	38	33	29	25	25	25
HIGH 6	53	53	53	48	44	39	34	30	25	25	25
HIGH 7	57	57	57	52	46	41	36	30	25	25	25
HIGH 8	60	60	60	54	48	42	37	31	25	25	25

Temperature curves for heating ECO mode:

T1s Curve number	Outdoor Temp. T4										
	-20	-15	-10	-5	0	5	10	15	20	25	35
ECO-LOW 1	25	25	25	23	22	20	20	20	20	20	20
ECO-LOW 2	29	29	29	26	24	22	20	20	20	20	20
ECO-LOW 3	32	32	32	29	26	24	21	20	20	20	20
ECO-LOW 4	36	36	36	32	29	25	22	20	20	20	20
ECO-LOW 5	39	39	39	35	31	27	23	20	20	20	20
ECO-LOW 6	45	42	39	37	34	32	30	30	30	30	30
ECO-LOW 7	48	44	41	38	36	33	30	30	30	30	30
ECO-LOW 8	50	46	43	40	37	34	31	30	30	30	30
ECO-HIGH 1	50	48	45	42	38	35	32	30	30	30	30
ECO-HIGH 2	50	50	47	43	40	36	32	30	30	30	30
ECO-HIGH 3	50	50	49	45	41	37	33	30	30	30	30
ECO-HIGH 4	41	41	41	38	34	31	27	25	25	25	25
ECO-HIGH 5	45	45	45	40	36	32	28	25	25	25	25
ECO-HIGH 6	48	48	48	43	39	34	29	25	25	25	25
ECO-HIGH 7	52	52	52	46	41	36	31	26	25	25	25
ECO-HIGH 8	55	55	55	49	43	37	32	27	25	25	25

Temperature curves for cooling mode:

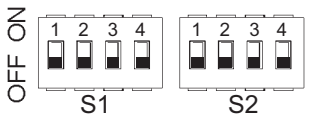
T1s Curve number	Outdoor Temp. T4			
	-5 ~ 14	15 ~ 21	22 ~ 29	30 ~ 46
LOW 1	18	13	10	7
LOW 2	19	14	11	8
LOW 3	20	15	12	9
LOW 4	21	16	13	10
LOW 5	22	17	14	11
LOW 6	23	18	15	12
LOW 7	24	19	16	13
LOW 8	25	21	18	14
HIGH 1	20	18	18	18
HIGH 2	21	19	18	18
HIGH 3	22	20	18	18
HIGH 4	23	21	18	18
HIGH 5	24	22	20	18
HIGH 6	25	23	21	19
HIGH 7	25	24	22	20
HIGH 8	25	25	23	21

6.2 DIP switch settings overview

DIP switch S1 and S2 are located on the switch box PCB (see**"Indoor unit components/Switch box main components"**) and allows configuration of additional heating source temperature sensor installation, the second inner backup heater installition, etc.

WARNING

Switch off the power supply before opening the switch box service panel and making any changes to the DIP switch settings.



DIP switch	Description	ON	OFF
S1-1	Selection of refrigerant pipe length	⩾60% of Max. Piping Length(*)	＜60% of Max. Piping Length(*)
S1-2	Backup heater outlet temperature T1 temperature sensor installation	Not installed	Installed
S1-3	The first inner backup heater IBH1 installation	Not installed	Installed
S1-4	The second inner backup heater IBH2 installation	Not installed	Installed
S2-1	Additional heating source outlet temperature T1B sensor installation	Installed	Not installed
S2-2	/	/	/
S2-3	/	/	/
S2-4	/	/	/

(*) Max. piping length: refer to the manual of outdoor unit.

6.3 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 water flow set temperature can be decreased to a value between 25°C and 35°C by adjusting the FOR SERVICEMAN. Refer to "FOR SERVICEMAN/SPECIAL FUNCTION/ PREHEATING FOR FLOOR".

6.4 Pre-operation checks

Checks before initial start-up

DANGER

Switch off the power supply before making any connections.

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

1. Field wiring
   Make sure that the field wiring between local supply panel and unit and valves (when applicable), unit and room thermostat (when applicable), unit and domestic hot water tank, and unit and backup heater box have been carried out according to the instructions described in the chapter "**Field wiring**", according to the wiring diagrams and according to local laws and regulations.
2. Fuses, circuit breakers, 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.
3. Backup heater circuit breaker
   Do not forget to turn on the backup heater circuit breaker in the switchbox (it depends on the backup heater type). Refer to the wiring diagram.
4. Booster heater circuit breaker
   Do not forget to turn on the booster heater circuit breaker (applies only to units with optional domestic hot water tank installed).
5. Ground wiring
   Make sure that the ground wires have been connected properly and that the ground terminals are tightened.
6. Internal wiring
   Visually check the switch box on loose connections or damaged electrical components.
7. Fixation
   Check that the unit is properly fixed, to avoid abnormal noises and vibrations when starting up the unit.
8. Damaged equipment
   Check the inside of the unit on damaged components or squeezed pipes.
9. Refrigerant leak
   Check the inside of the unit on refrigerant leakage. If there is a refrigerant leak, call your local dealer.
10. 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.
11. Air purge valve
    Make sure the air purge valve is open (at least 2 turns).
12. Shut-off valves
    Make sure that the shut-off valves are fully open

Operating the system with closed valves will damage the circulated pump!

6.5 Powering up the unit

When power supply to the unit is turned on, "1%~99%" is displayed on the user interface during its initialisation. During this process the user interface cannot be operated.

6.6 Setting the pump speed

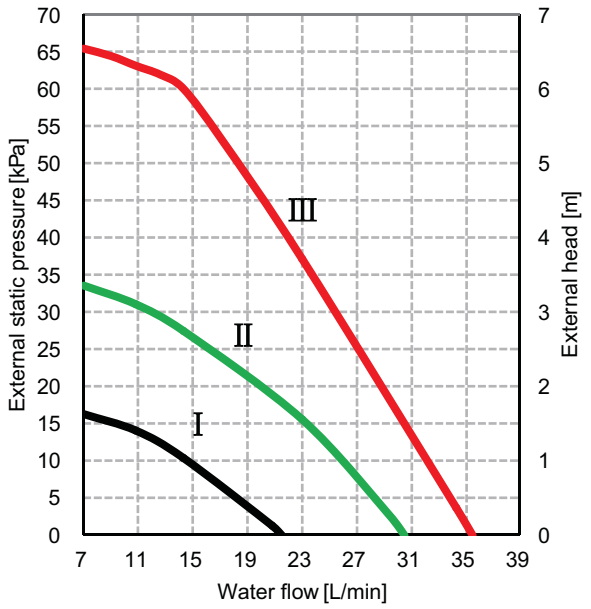
The pump speed can be selected by adjust the red nob on the pump, the place that notch point to indicate the speed of the pump.

The default setting is the highest speed (III). If the water flow in the system is too high the speed can be set to low speed (I).

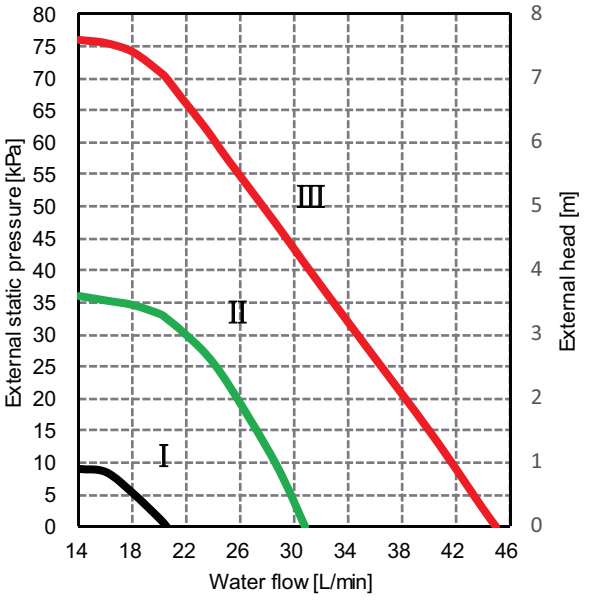
The available external static pressure in function of the water flow is shown in the graph below.

Constant speed Ⅰ Ⅱ Ⅲ

Models 4 to 8kW



Models 10 to 16kW



Pump LED diagnose and remedy

The pump have an LED operating status display, this makes it easy for the technician to search for the cause of a fault in the heating system.
1. If the LED display lights up continuously green, it means the pump is running normally.
2. If the LED display is flashing green, it means the pump is running venting routine. The pump runs during 10min in venting function, afterwards the installer has to adjust the targeted performance.
3. If the LED is flashing green/red, it means the pump has stopped operating due to an external reason. The pump will restart by itself after the abnormal situation disappeared. The probably reason to cause the problem is that the pump undervoltage or overvoltage (U<160V or U>280V), you should check the voltage supply. Another reason is the module overheating, and then you should check the water and ambient temperature.
4. If the LED is flashing red, it means the pump has stopped operating, some serious fault has happened(e.g. pump blocked), the pump cannot restart itself due to a permanent failure and the pump should be changed.
5. If the LED is not light up, it means no power supply to the pump, maybe the pump is not connected to power supply, you should check the cable connection. If the pump is still running, it means the LED is damaged. Or the electronics are damaged and the pump should be changed.

Failure diagnosis at the moment of first installation

- In case nothing is displayed on the user interface, check for any of the following abnormalities before you can diagnose possible malfunction codes.
  - Disconnection or wiring error (between power supply and unit and between unit and user interface).
  - The fuse on the PCB may have run out.
- If the user interface shows "E8"or"E0" as an error code, there is a possibility that air exist in the system, or the water volume in the system is less than the minmum volume.
- If the error code "E2" is displayed on the user interface, check for the wiring between user interface and unit.

More error code and failure cause can be found in “Error codes”.

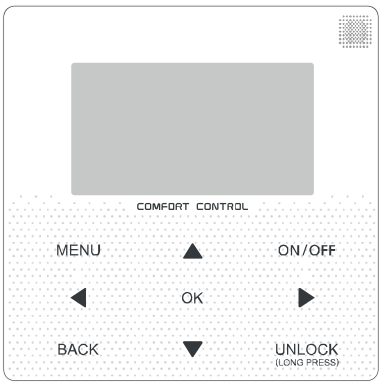
6.7 Field settings

The unit shall be configured by the installer to match the installation environment (outdoor climate, installed options, etc.) and user demand. Thereto, a number of so called field settings are available. These field settings are accessible and programmable through the “FOR SERVICEMAN” in user interface.

Procedure

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

Temperature values displayed on the digital controller (user interface) are in °C



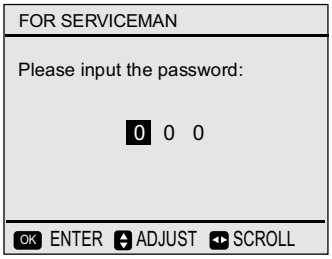
Keys	Function
MENU	• Go to the menu structure (on the home page)
◄► ▼ ▲	• Navigate the cursor on the display • Navigate in the menu structure • Adjust settings
ON/OFF	• Turn on or off the space heating/cooling operation mode or DHW mode • Turn on or off the function in the menu structure
BACK	• Come back to the up level
UNLOCK	• Long press for unlock /lock the controller • Unlock /lock some function such as “DHW temperature adjusting “
OK	• Go to the next step when you are programming a schedule in the menu structure confirms a selection enter a submenu in the menu structure

6.7.1 FOR SERVICEMAN

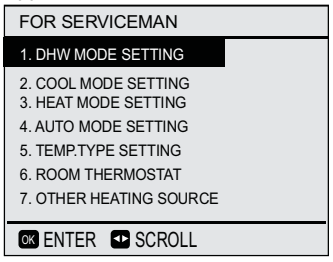
“FOR SERVICEMAN” is set up for installer when using to set the parameter.
1. Setting the composition of equipment.
2. Setting the parameter.

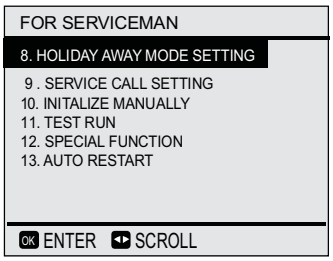
How to go to FOR SERVICEMAN

Go to MENU> FOR SERVICEMAN. Press OK



The password is 666. Use ◄ ► to navigate and use ▼ ▲ to adjust the numerical value. Press OK, then the following page will appear:





Use ▼ ▲ to scroll and use “ok” to enter submenu for setting the parameters.

Note: Annex 2: Table FOR SERVICEMAN" (See page 50).

6.7.2 DHW MODE SETTING

About DHW mode

DHW domestic hot water

DHW MODE SETTING typically consists of the following :
1. DHW MODE: enable or disable the DHW mode
2. TANK HEATER： set whether the booster heater available or not
3. DISINFECT： set the parameters for disinfection
4. DHW PRIORITY： set the priority between domestic hot water heating and space operation
5. DHW PUMP： set the parameters for DHW pump operation

The above functions applies only to installations with a domestic hot water tank.

How to set the DHW mode

To determine whether the DHW mode is effective.
Go to MENU> FOR SERVICEMAN> DHW MODE SETTING .Press OK. The following page will appear.

1 DHW MODE SETTING	
1.1. DHW MODE	☑YES ☐NON
1.2. TANK HEATER	☑YES ☐NON
1.3. DISINFECT	☑YES ☐NON
1.4. DHW PRIORITY	☑YES ☐NON
1.5. DHW PUMP	☐YES ☑NON
OK ENTER ◀▶ SCROLL	

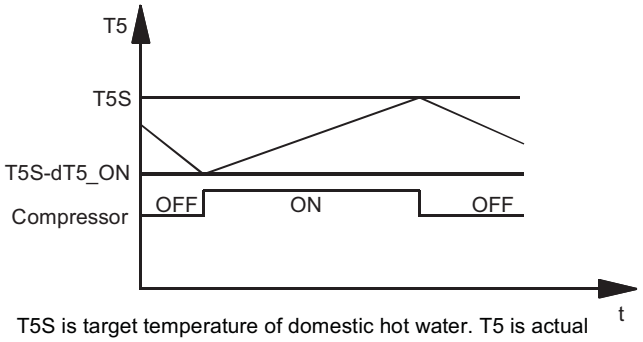
Using◄、► to scroll and use OK to enter，when the curson is on☐YES, press OK to set the DHW MODE effective.When the cursor is on☐NON,press OK to set the DHW MODE ineffective.

1. Go to MENU> FOR SERVICEMAN>DHW MODE SETTING>1.1 DHW MODE

1.1 DHW MODE	
dT5_ON	5°C
dT1S5	10°C
T4DHWMAX	43°C
T4DHWMIN	-10°C
t INTERVAL DHW	5 MIN
◀▶ ▲▼SCROLL	

Use ◄ ► ▼ ▲ to scroll and adjust parameters,use BACK to exit.

dT5_ON is the temperature difference for starting the heat pump, the picture below illustrate the function of dT5_ON.

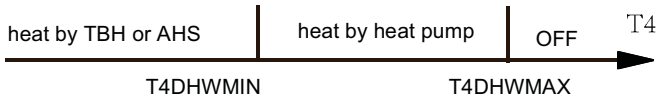


T5S is target temperature of domestic hot water. T5 is actual temperature of domestic hot water. When T5 drops to a certain temperature (T5≤T5S-dT5_ON), the heat pump will be available.

dT1S5 is the correct value for the target outlet water temperature (T1S=T5+dT1S5)

T4DHWMAX is the maximum ambient temperature that the heat pump can operate for domestic water heating, the unit will not operate if the ambient temperature is above it in DHW mode.

T4DHWMIN is the minimum ambient temperature that the heat pump can operate for domestic water heating, the heat pump will turn off if the ambient temperature drop below it in water heating mode. The relationship between operation of the unit and ambient temperature can be illustrated in the picture below:



t_INTERVAL_DHW is the start time interval of compressor in DHW mode. When the compressor stops running, the next time that the compressor turn on should be " t_INTERVAL_DHW " minute later at least.

Go to FOR SERVICEMAN>DHW MODE SETTING>1.2 TANK HEATER

1.2 TANK HEATER	
dT5 TBH OFF	5°C
T4_TBH_ON	20°C
t_TBH_DELAY	90 MIN
◀▶ ▲▼SCROLL	

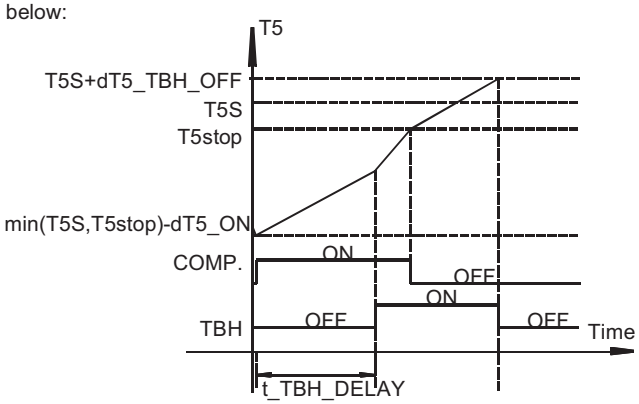
Use ◄ ► ▼ ▲ to scroll and adjust parameters. Use BACK to exit.

dT5_TBH_OFF is the temperature difference between T5 and T5S that turn the booster heater off, the booster heater will turn off if T5≥T5S+dT_TBH_OFF.

T4_TBH_ON is the temperature only when the ambient temperature lower than it the booster heater will be available.

t_TBH_DELAY is the time that the compressor has run before starting the booster heater (if T5 min(T5S,T5stop)).

The operation of the unit during DHW mode described in the picture below:



In the picture, T5stop is a parameter relate to ambient temperature, which can't be changed in the user interface, when T5≥T5stop, the heat pump will turn off.

Note: the booster heater and backup heater can't operate simultaneously, if the booster heater has been on, the backup heater will be off.
If the booster heater is unavailable (1.2 TANK HEATER NON is selected), the dT5_ON can't be adjusted and fixed at 2.

3. Go to MENU> FOR SERVICEMAN>DHW MODE SETTING>1.3 DISINFECT

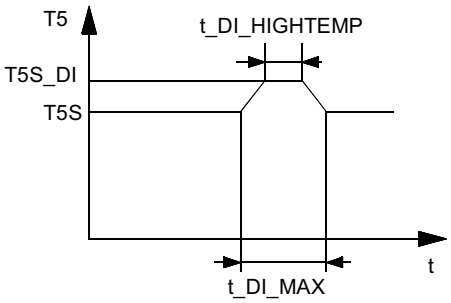
1.3 DISINFECT	
T5S_DI	5°C
t_DI_HIGHTEMP.	30 MIN
t_DI_MAX	120 MIN
◀▶ ▲▼SCROLL	

Use ◄ ► ▼ ▲ to scroll and adjust parameters. Use BACK to exit.

T5S_DI is the target temperature of water in the domestic hot water tank in the DISINFECT function.

t_DI_HIGHTEMP is the time that the hot water will last.

t_DI_MAX is the time that disinfection will last. The change of domestic water temperature is described in the picture below:

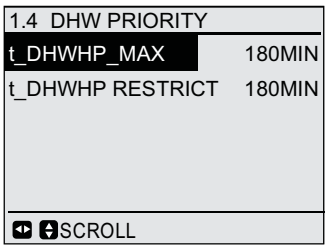


Be aware that the domestic hot water temperature at the hot water tap will be equal to the value selected in FOR SERVICEMAN "T5S_DI" after a disinfection operation.

WARNING

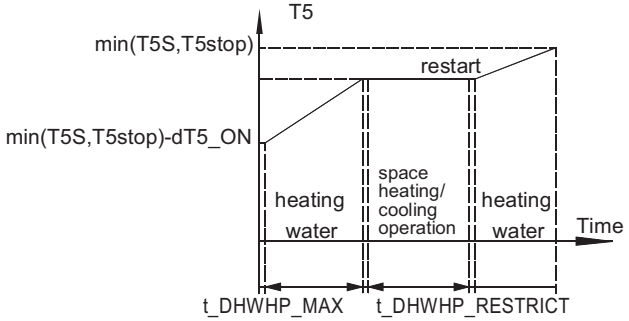
If this high domestic hot water temperature can be a potential risk for human injuries, a mixing valve (field supply) shall be installed at the hot water outlet connection of the domestic hot water tank. This mixing valve shall secure that the hot water temperature at the hot water tap never rise above a set maximum value. This maximum allowable hot water temperature shall be selected according to local laws and regulations.

4. Go to SERVICEMAN>DHW MODE SETTING>1.4DHW PRIORITY:

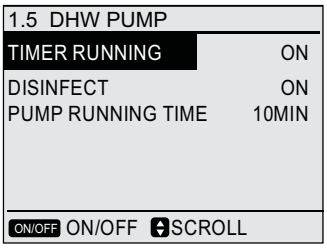


The function of the DHW PRIORITY is used to set the operation priority between domestic water heating and space (heating/ cooling)operation. You can use◄、►、▼、▲ to scroll and adjust parameters.Using BACK to exit.
T_DHWHP_MAX is the maximum continuous working period of heat pump in DHW PRIORITY mode.
T_DHWHP_RESTRICT is the operation time for space heating/ cooling operation.

If DHW PRIORITY is enabled, the operation of the unit can be described in the picture below



If NON is selected in the DHW PRIORITY mode, when it is available and the space heating/cooling is OFF, the heat pump will heat the water as required. If space heating/cooling is ON, the water will be heated as required when the booster heater is unavailable. Only when the space heating/cooling is OFF will the heat pump operate to heat domestic water.



Go to FOR SERVICEMAN>DHW MODE SETTING>1.5DHW PUMP You can use ◄ ► ▼ ▲ to scroll and adjust parameters. Using BACK to exit.

When the **TIMER RUNNING** is **ON**, the DHW pump will run as timed and keep running for an certain time (as defined in **PUMP RUNNING TIME**).

When **DISINFECT** is **ON**, the DHW pump will operate when the unit is in disinfect mode and T5≥T5S_DI-2, the time that the pump keep running is t+5min.

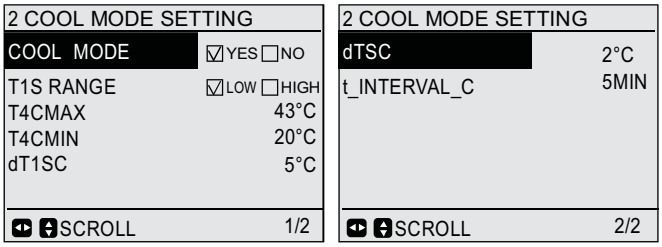
6.7.3 COOL MODE SETTING

About COOL MODE SETTING

COOL MODE SETTING typically consists of the following:
1. COOL MODE: Setting the COOL mode effctive or not
2. T1S RANGE: Selecting the range of target outlet water temperature
3. T4CMAX: Setting the maximum operation ambient temperature
4. T4CMIN: Setting the minimum operation ambient temperature
5. dT1SC: Setting the temperature difference for starting the heat pump
6. t_INTERVAL_C: Setting the compressor start time interval

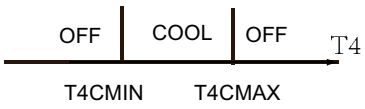
How to set the COOL mode

To determine whether the COOL mode is effective, go to MENU> FOR SERVICEMAN> COOL MODE SETTING. Press OK. The following page will be appear

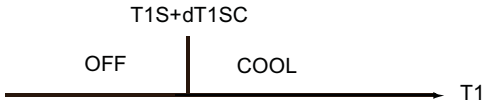


When the cursor is on COOL MODE, Using ◄、► to select YES or NON, then press OK to enable or disable the cool mode, When the cursor is on T1S RANGE, Using ◄、►to select the range of target outlet water temperature. When LOW is selected, the minimum target temperature is 5°C if climate related curve function (correspond to "weather temperature set" in the user interface)is enabled , the curve selected is low temperature curve. When HIGH is selected, the minimum target temperature is 18°C, if climate related curve function correspond to "weather temperature set" in the user interface is enabled , the curve selected is high temperature curve.

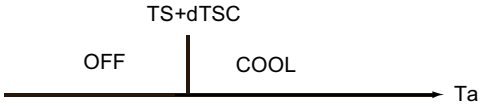
When the cursor is on T4CMAX T4CMIN dT1SC dTSC or t_INTERVAL_C, Using ◄ ► ▼ ▲ to scroll and adjust the parameter.
T4CMAX is the maximum operation ambient temperature in COOL mode. The unit can't work if the ambient temperature above it.
T4CMIN is the minimum operation ambient temperature in COOL mode. the unit will turn off if the ambient temperature drop below it.
The relationship between the operation of the unit and ambient temperature can be illustrated in the picture below:



dT1SC is the temperature difference between T1(actual outlet water temperature) and T1S(target outlet water temperature) for starting the unit in cool mode, only when the T1 high enough will the unit turn on, and the unit will turn off if T1 drop to a certain value. It can be illustrated in the picture below:.



In the picture ΔT is a parameter relate to ambient temperature, it can't be changed in the user interface dTSC is the temperature difference between Ta(actual room temperature) and TS(target room temperature) for starting the unit when ROOM TEMP. is enabled in TEMP.TYPE SETTING refer to10.7 Field setting/ TEMP.TYPE SETTING . Only when the Ta high enough will the unit turn on, and the unit will turn off if Ta drop to a certain value. It can be illustrated in the picture below(only when room thermostat is available will this function be available).



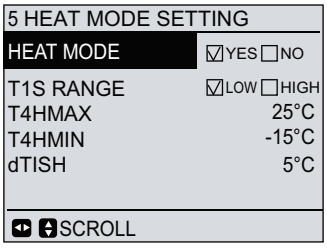
6.7.4 HEAT MODE SETTING

About HEAT MODE SETTING

HEAT MODE SETTING mode typically consists of the following:
1. HEAT MODE: Enable or disable the HEAT mode
2. T1S RANGE: Selecting the range of setting outlet water temperature
3. T4HMAX: Setting the maximum operation ambient temperature
4. T4HMIN: Setting the minimum operation ambient temperature
5. dTISH: Setting the temperature difference for starting the unit
6. t_INTERVAL_H: Setting the compressor start time interval

How to set the Heat mode

To determine whether the HEAT mode is effective, go to MENU> FOR SERVICEMAN> HEAT MODE SETTING. Press OK. The following page will appear

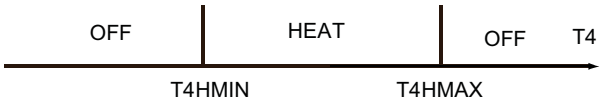


When the cursor is on HEAT MODE, Using ◄ ► to scroll to YES or NON and press OK to enable or disable the heat mode, When the cursor is on T1S RANGE, Using ◄ ►to scroll to LOW or HIGH and press OK to select the range of target outlet water temperature. When LOW is selected, the maximum target temperature is 55 if climate related curve function correspond to "weather temperature set" in the user interface is enabled , the curve selected is low temperature curve. When HIGH is selected, the maximum target temperature is 60 if climate related curve function correspond to "weather temperature set" in the user interface is enabled , the curve selected is high temperature curve.

When the cursor is on **T4HMAX T4HMIN dT1SH dTSH or t_INTERVAL_H**, Using ◄ ► ▼ ▲ to scroll and adjust the parameter.

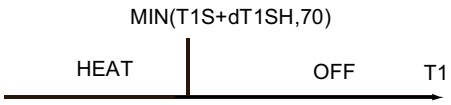
T4HMAX is the maximum operation ambient temperature for heat mode. The unit can't work if the ambient temperature above it.

T4HMIN is the minimum operation ambient temperature for heat mode. the unit will turn off if the ambient temperature below it. The relationship between the operation of the unit and ambient temperature can be illustrated in the picture below:

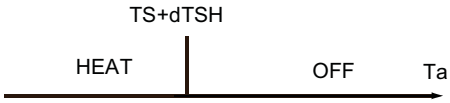


dT1SH is the temperature difference between T1 and T1S for starting the unit in heat mode.
When the target outlet water temperature T1S<47, the unit will on or off as described below(ΔT is a parameter relate to T1S, which can't be changed on the user interface):

When the target outlet water temperature T1S≥47, the unit will on or off as described below



dTSH is the temperature difference between Ta(Ta is the room temperature) and TS for starting the unit when ROOM TEMP. is enabled in TEMP.TYPE SETTING refer to10.7 Field setting/ TEMP.TYPE SETTING . Only when Ta drop to a certain value will the unit turn on, and the unit will turn off if Ta high enough. It can be illustrated in the picture below(only when room thermostat is available will this function be available).



t_INTERVAL_H is the compressor start time interval in heat mode. When the compressor stops running, the next time that the compressor turn on should be " t_INTERVAL_H" minute later at least.

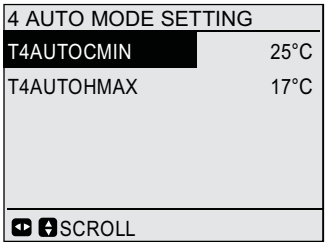
6.7.5 AUTO MODE SETTING

About AUTO SETTING

Controlling AUTO mode typically consists of the following
1. T4AUTOCMIN setting the minimum operating ambient temperature for cooling
2.T4AUTOHMAX: setting the maximum operating ambient temperature for heating

How to set the AUTO mode

To determine whether the AUTO mode is effective, go to MENU> FOR SERVICEMAN> AUTO MODE SETTING. Press OK. The following page will appear.



Using ◄ ► ▼ ▲ to scroll and adjust the parameter.

T4AUTOCMIN is the minimum operating ambient temperature for cooling in auto mode. The unit will turn off if ambient temperature lower than it when in space cooling operation.
T4AUTOHMAX is the maximum operating ambient temperature for heating in auto mode. The unit will turn off if ambient temperature higher than it when in space heating operation.
The relationship between operation of the heat pump and ambient temperature described in the picture below

In the picture, AHS is additional heating source, IBH is backup heater in the unit.

6.7.6 TEMP. TYPE SETTING

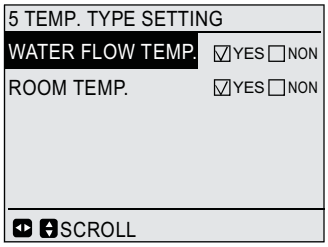
About TEMP. TYPE SETTING

The TEMP. TYPE SETTING is used for selecting whether the water flow temperature or room temperature to control the heat pump's ON/OFF.

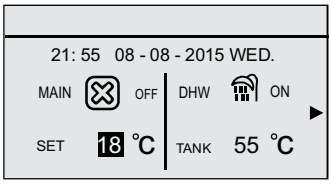
When ROOM TEMP. is enabled, the target outlet water temperature will be calculated from climate related curves.

How to enter the TEMP. TYPE SETTING

To enter the TEMP.TYPE SETTING, go to MENU> FOR SERVICEMAN> TEMP. TYPE SETTING. Press OK. The following page will appear:

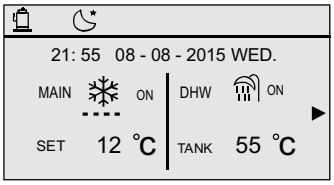


If you set WATER FLOW TEMP. to YES, and set ROOM TEMP. to NON, then the water flow temperature will display on the home page, and the water flow temperature will work as the target temperature.

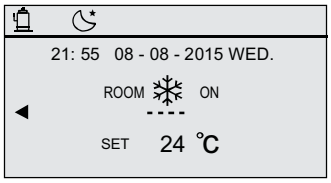


If you set WATER FLOW TEMP. to YES, and set ROOM TEMP. to YES, then the water temperature will be displayed on the home page, them both water temperature and room temperature will be detected, either the water temperature or the room temperature reaches the target temperature will the unit turn off.

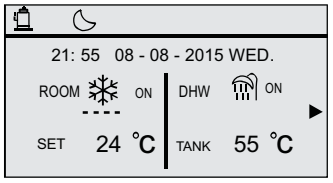
In this condition the first target outlet water temperature can be set in the main page, the second one can be calculated from the climate related curves, in heat mode, the higher one will be the real target outlet temperature, while in cool mode, the lower one will be selected.



If ► pressed, the main page will display the room temperature:



If you set WATER FLOW TEMP. to NON, and set ROOM TEMP. to YES, then the room temperature will display on the home page, and the room temperature will work as the target temperature.
The target outlet water temperature can be calculated from the climate related curves.



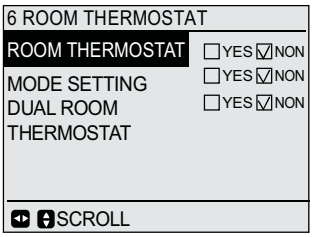
6.7.7 ROOM THERMOSTAT

About ROOM THERMOSTAT

The ROOM THERMOSTAT is used to set whether the room thermostat is available.

How to set the ROOM THERMOSTAT

To set the ROOM THERMOSTAT, go to MENU> FOR SERVICEMAN> ROOM THERMOSTAT. Press OK. The following page will appear:



If room thermostat is available, please select YES and press OK.
In MODE SETTING, if YES is selected, the mode setting and on/off of the unit can't be done by the user interface, the timer function is unavailable; the running mode, on/off of the unit decided by the room thermostat, while the temperature setting can be done by the user interface. If NON is selected, the user interface can be used to set operation mode and target temperature, while the on/off of the unit is determined by room thermostat, the timer function is unavailable.
In DUAL ROOM THERMOSTAT, if YES is selected, the ROOM THERMOSTAT MODE SETTING will turn to NON automatically, and the WATER FLOW TEMP. and ROOM TEMP. forcibly set to YES. The timer function in the user interface is unavailable; the setting of operation mode and target temperature can be done on the user interface.
The "DUAL ROOM THERMOSTA" function can be used only when application 6 (refer to Application 6) is applied. If zone A requires heating/cooling (ON signal from room thermostat 5A), the unit will turn on, the operation mode and target temperature of outlet water should be set in the user interface. If zone B requires heating/cooling (ON signal from room thermostat 5B), the unit will turn on, the operation mode can be set in the user interface, the target temperature of outlet water will be decided by ambient temperature (target outlet water temperature is calculated from climate related curves, if no curves selected, the default curve will be curve 4). If no heating/cooling demanded for both zone A and zone B (OFF signal from thermostat 5A and 5heat by heat pump only B), the unit will turn off.

Note: The setting in the user interface should correspond to the wiring of thermostat. If YES is selected in ROOM THERMOSTAT and the MODE SETTING is NON, the wiring of thermostat should follow method A. If the MODE SETTING is YES, then the wiring should follow method B If "DUAL ROOM THERMOSTAT" is selected, the wiring of room thermostat should follow "method C" . (refer to "Connection for other components/For room thermostat")

6.7.8 OTHER HEATING SOURCE

About OTHER HEATING SOURCE

The OTHER HEATING SOURCE is used to set whether the backup heater additional heating source like boiler solar energy kit is available.

How to set the OTHER HEATING SOURCE

To set the OTHER HEATING SOURCE, go to MENU> FOR SERVICEMAN> OTHER HEATING SOURCE, Press OK. The following page will appear:

7 OTHER HEATING SOURCE	
7.1.BACKUP HEATER	☑YES ☐NON
7.2.AHS	☐YES ☑NON
7.3.SOLAR ENERGY	☐YES ☑NON
◄► ▲▼SCROLL	

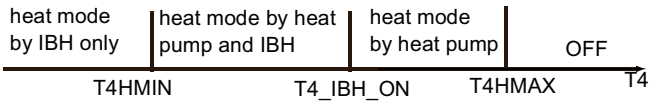
If backup heater is avalable, please select YES at BACKUP HEATER, then you press OK, the following page will appear:

7.1 BACKUP HEATER	
HEAT MODE	☑YES ☐NON
DHW MODE	☐YES ☑NON
T4_IBH_ON	-5°C
dT1_IBH_ON	5°C
t_IBH_DELAY	30MIN
t_IBH12_DELAY	5MIN
◄► ▲▼SCROLL	

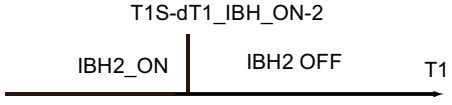
When the cursor is on HEAT MODE or DHW MODE, Using ◄ ► to selet YES or NON, if YES is selected, the backup heater will be available in corresponding mode, otherwise it will be unavailable.

When the cursor is on T4_IBH_ON dT1_IBH_ON t_IBH_DELAY or t_IBH12_DELAY, Using ◄ ► ▼ ▲ to scroll and adjust the parameter.

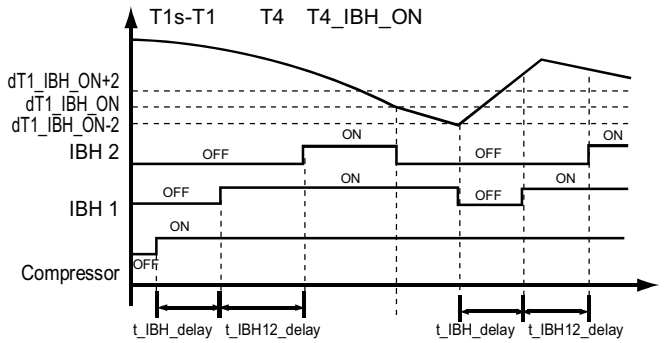
T4_IBH_ON is the ambient temperature for starting backup heater, the ambient temperature above which the backup heater will be unavailable, the relationship between operation of the backup heater and the ambient temperature can be described in the picture below.



dT1_IBH_ON is the temperature difference between T1S and T1 for starting the backup heater. only when T1<T1S-dT1_IBH_ON can the backup heater turn on. When the second backup heater is installed, if the temperature difference between T1S and T1 large than dT1_IBH_ON+2, the second backup heater will turn on. the relationship between operation of the backup heater and the temperature difference can be described in the picture below.



t_IBH_DELAY is the time that the compressor has run before the first backup heater turn on(if T1<T1S)..
t_IBH12_DELAY is the time that the first backup heater has run before the second backup heater turn on.



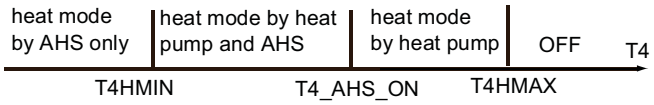
If additional heating source is avilable, please select YES at the corresponding position, then you press OK, the following page will appear:

7.2 ADDTIONAL HEATING SOURCE	
HEAT MODE	☑YES ☐NON
DHW MODE	☐YES ☑NON
T4_AHS_ON	-5°C
dT1_AHS_ON	5°C
dT1_AHS_OFF	0°C
t_AHS_DELAY	30MIN
◄► ▲▼SCROLL	

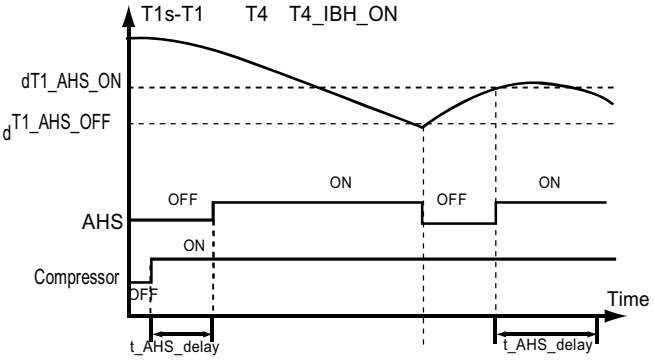
When the cursor is on HEAT MODE or DHW MODE, Using ◄ ► to selet YES or NON, if YES is selected, the additional heating source will be available in corresponding mode, otherwise it will be unavailable.
NOTE: If YES selected in DHW MODE the installation of additional heating source should follow “Application 5/Application B”

When the cursor is on T4_AHS_ON dT1_AHS_ON dT1_AHS_OFF or t_AHS_DELAY, Using ◄ ► ▼ ▲ to scroll and adjust the parameter.

T4_AHS_ON is the ambient temperature for starting the additional heating source, when the ambient temperature above which the additional heating source will be unavailable. The relationship between the operation of additional heating source and ambient temperature can be described in the picture below:



dT1_AHS_ON is the temperature difference between T1S and T1 for turning the additional heating source on(only when T1<T1S-dT1_AHS_ON)
dT1_AHS_OFF is the temperature difference between T1S and T1 for turning the additional heating source off (when T1≥T1S+dT1_AHS_OFF the additional heating source will turn off)
t_AHS_DELAY is the time that the compressor has heat by heat pump only run before starting the additional heating source, it should short than the additional heating source’s start time interval.
The operation of the heat pump and the additional heating source described in the picture below:



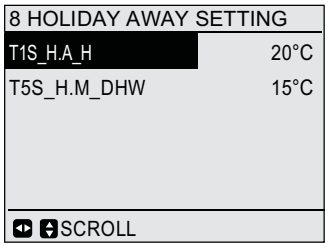
6.7.9 HOLIDAY AWAY SETTING

About HOLIDAY AWAY SETTING

The HOLIDAY AWAY SETTING is used to set the outlet water temperature when you are in holiday for prevention of freezing.

How to enter the HOLIDAY AWAY SETTING

To enter the HOLIDAY AWAY SETTING, go to MENU> FOR SERVICEMAN> HOLIDAY AWAY SETTING. Press OK. The following page will appear:



When the cursor is on T1S_H.A._H or T5S_H.M_DHW, Using◄ ► ▼ ▲ to scroll and adjust the parameter,
T1S_H.A._H is the target outlet water temperature for space heating when in holiday away mode.
T1S_H.M_DHW is the target outlet water temperature for water heating when in holiday away mode.

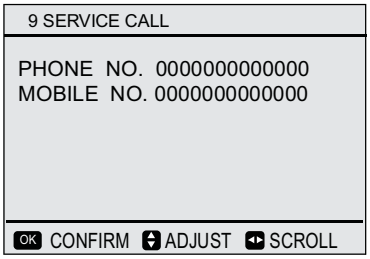
6.7.10 SERVICE CALL

About SERVICE CALL

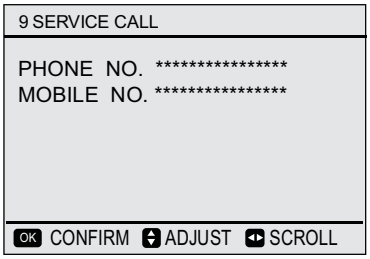
The installers can set his phone number in SERVICE CALL.
If unit can't work, you can call this number for help.

How to set the SERVICE CALL

To set the SERVICE CALL, go to MENU> FOR SERVICEMAN> SERVICE CALL. Press OK. The following page will appear:



Using ▼ ▲ to scroll and set the phone number, the maxmuim length of the phone number is 13, if the length of phone number short than 12, please input ■, as described in the picture below:



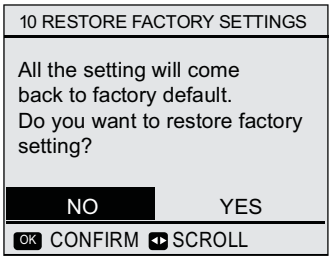
6.7.11 RESTORE FACTORY SETTINGS

About RESTORE FACTORY SETTINGS

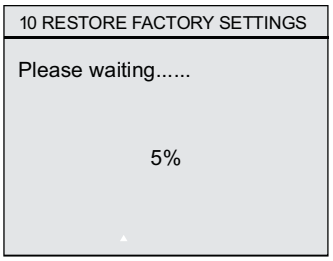
The RESTORE FACTORY SETTING is used to restore all the parameters set in the user interface to the factory setting.

How to set the RESTORE FACTORY SETTINGS

To restore factory settings, go to MENU> FOR SERVICEMAN> RESTORE FACTORY SETTINGS. Press OK. The following page will appear:



Using ◄ ► to scroll the cursor to YES and press OK, the following page will disapper:



After a few seconds, all the parameters set in the user interface will restore to factory settings

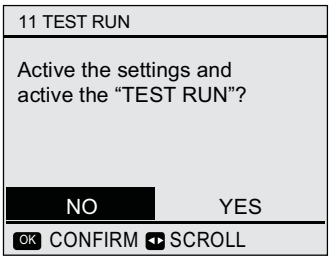
6.7.12 TEST RUN

About TEST RUN

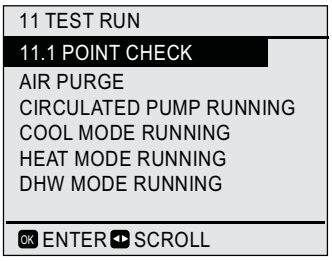
The TEST RUN is used to check correct operation of the values, air purge, circulted pump running,cooling, heating and domestic water heating

How to enter the TEST RUN

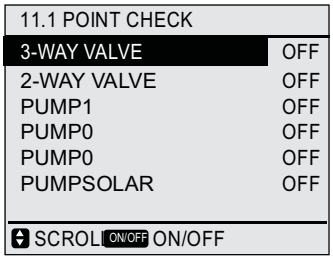
To enter the test run, go to MENU> FOR SERVICEMAN> TEST RUN. Press OK. The following page will appear:

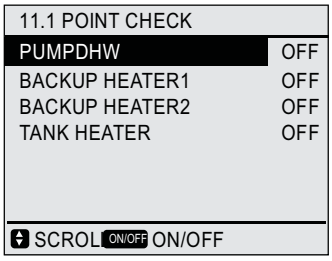


If YES is selected, the following page will appear:

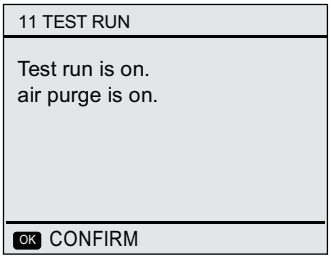


Using ▼ ▲ to scroll to the mode you want to run and press OK, then the unit will run as you selected.
If 11.1 POINT CHECK is selected, the following page will disappear



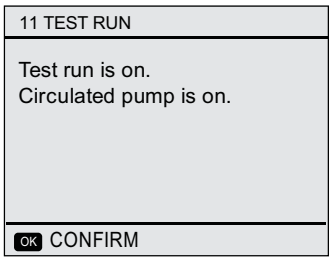


Using ▼ ▲ to scroll to the components you want to check and press ON/OFF, for example, when 3-WAY VALVE is selected and ON/OFF pressed, if the 3-way valve is open/close, then the operation of 3-way valve is normal, so does other components.
If you select AIR PURGE and OK is pressed, the page will displayed as following:



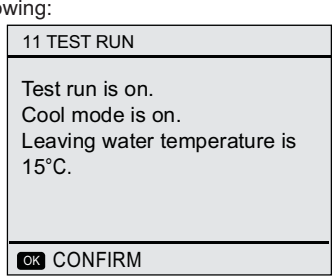
When in air purge mode, the 3-way valve will open, the 2-way valve will close, 60s later the pump in the unit (PUMPI) will operate for 10min, during which the flow switch will not work. after the pump stoped, the 3-way valve will close and the 2-way valve will open, 60s later both the PUMPI and PUMPO will operate until the next command recived.

When the CIRCULATED PUMP RUNNING is selected, the page will displayed as following:



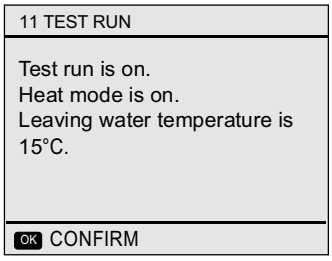
When circulated pump running is turned on, all the running components will stop, 60min later,the 3-way valve will open, the 2-way valve will close, 60s later PUMPI will operate , 30s later, if the flow switch checked normal flow,the PUMPI will operate for 3min, after the pump stoped, the 3-way valve will close and the 2-way valve will open, 60s later the both PUMPI and PUMPO will operate, 2min later, the flow switch will check the water flow , if the flow switch close for 15s, the PUMPI and PUMPO will operate until the next command recived.

When the COOL MODE RUNNING is selected, the page will displayed as following:



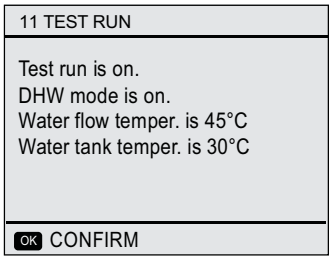
During COOL MODE test running, the default target outlet water temperature is 7°C, the unit will operate until the water temperature drop to a certain value or the next command recived.

When the HEAT MODE RUNNING is selected, the page will displayed as following:



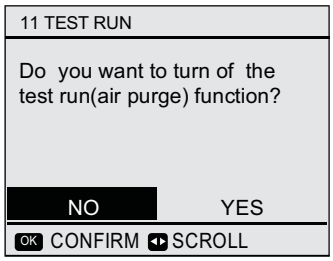
During HEAT MODE test running, the default target outlet water temperature is 35°C, the first backup heater will turn on after the compressor runned for 10min, 60s later the second backup heater will turn on. After the two backup heater runned for 3min, both backup heater will turn off,the heat pump will operate until the water temperature increase to a certain value or the next command recived.

When the DHW MODE RUNNING is selected, the page will displayed as following:



During DHW MODE test running, the default target temperature of the domestic water is 55°C, the booster heater will turn on after the compressor runned for 10min, the booster heater will turn off 3min later, the heat pump will operate until the water temperature increase to a certain value or the next command recived.

During test run, all the buttons except OK is invalid. If you want to turn off the test run,please press OK, for example ,when the unit is in air purge mode, after you press OK,the page will displayed as following:



Using ◄ ► to scroll the cursor to YES and press OK, the test run will turn off.

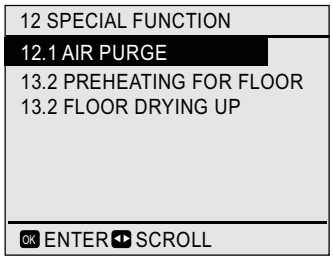
6.7.13 SPECIAL FUNCTION

About SPECIAL FUNCTION

The SPECIAL FUNCTION contains AIR PURGE, PREHEATING FOR FLOOR, FLOOR DRYING UP. It's used in some special conditions, for example: the initial start of the unit, initial running of floor heating.

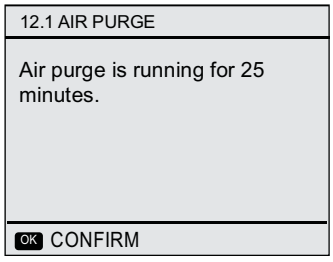
How to enter the SPECIAL FUNCTION

Go to MENU> FOR SERVICEMAN> SPECIAL FUNCTION.



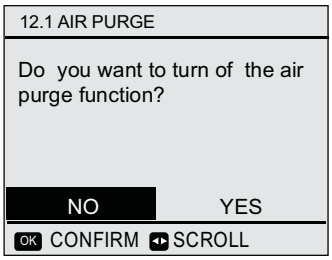
Use ▼ ▲ to scroll and use OK to enter.
During first operation of the unit, air may remained in the system which can case malfunction during operation, so it is necessary to run air purge function to release the air(make sure the air purge valve opened).

Go to FOR SERVICEMAN > 12 SPECIAL FUNCTION>12.1AIR PURGE



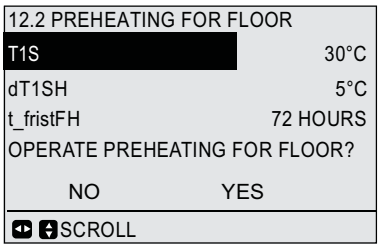
During air purge, the 3-way valve will open, the 2-way valve will close, 60seconds later the pump in the unit (PUMPI) will operate for 10min, during which the flow switch will not work. after the pump stoped, the 3-way valve will close and the 2-way valve will open, 60s later the both the PUMPI and PUMPO will operate until the stopping command recived

The number displayed on the page is the time that the air purge has running. During air purge, all the buttons except OK is invalid. If you want to turn off the air purge, please press OK, then the following page will appear:

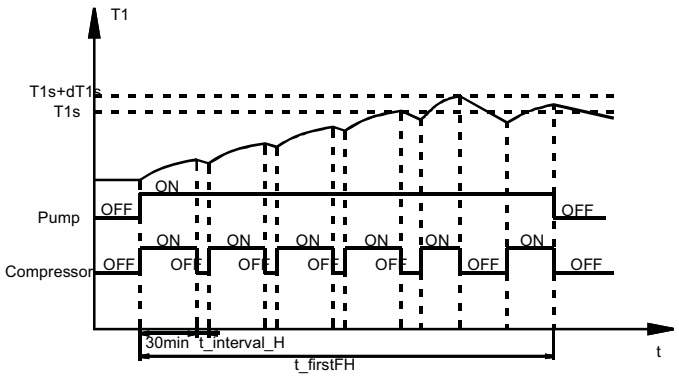


Use◄ ► to scroll and use OK to confirm.

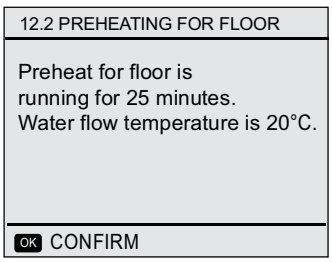
If PREHEATING FOR FLOOR is selected,after press OK ,the page will displayed as following:



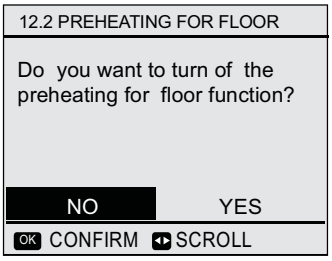
When the cursor is on T1S, dT1SH or t_fristFH, Using ◄、►、▼、▲ to scroll and adjust the parameter.
T1S is the target outlet water temperature in preheating for floor mode, the T1S set here should equal to the target outlet water temperature set in the main page.
dT1SH is the temperature difference for stopping the unit.(When T1≥T1S+dT1S the heat pump will turn off)
t_fristFH is the time last for preheating floor.
The operation of the unit during preheating for floor described in the picture below:



When the cursor is on OPERATE PREHEATING FOR FLOOR, Using ◄ ►to scroll to YES and press OK, the page will be displayed as following:

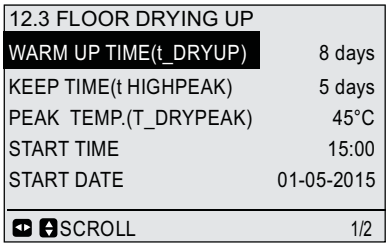


During preheating for floor, all the buttons except OK is invalid. If you want to turn off the preheating for floor, please press OK, then the page will displayed as following:



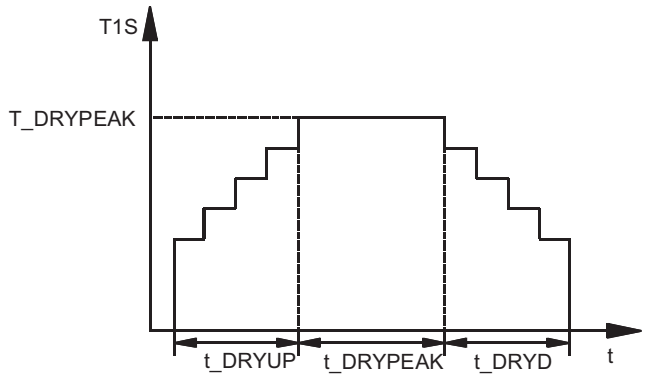
Using ◄ ►to scroll the cursor to YES and press OK, the preheating for floor will turn off.

Before floor heating, if large amount of water remain in the floor, the floor may be deformed or even rupture during floor heating operation, in order to protect the floor, floor drying is necessary, during which the temperature of the floor should be increased gradually.
If FLOOR DRYING UP is selected, after press OK ,the page will displayed as following:

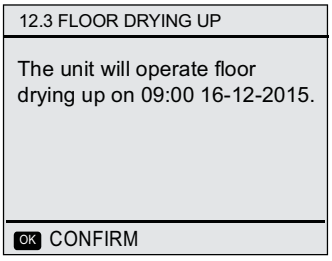


When the cursor is on **WARM UP TIME(t_DRYUP), KEEP TIME (t_HIGHPEAK), TEMP. DOWN TIME(t_DRYD), PEAK TEMP. (T_DRYPEAK), START TIME or START DATA**, Using ◄ ► ▼ ▲ to scroll and adjust the parameter.
t_DRYUP is the day for warming up;
t_HIGHPEAK is the day that high temperature last;
t_DRYD is the day for droping temperature
T DRYPEAK is the target peak temperature of water flow during floor drying up.

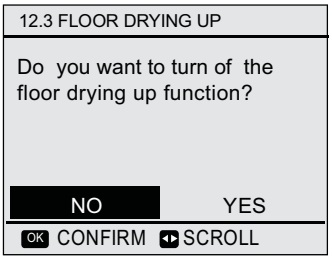
The target outlet water temperature during floor drying up described in the picture below:



When the cursor is on OPERATE FLOOR DRYING UP?, Using ◄ ► to scroll to YES and press OK, the page will be displayed as following:



During floor drying up, all the buttons except OK is invalid. When the heat pump malfunction, the floor drying mode will turn off when the backup heater and additional heating source is unavailable. If you want to turn off the floor drying up, please press OK, then the page will displayed as following:



Using ◄ ► to scroll the cursor to YES and press OK, the floor drying up will turn off.

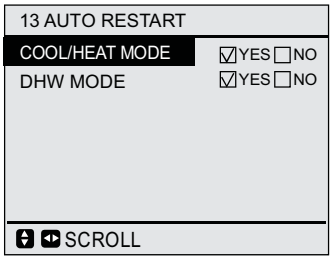
6.7.14 AUTO RESTART

About AUTO RESTART

The AUTO RESTART function is used to select whether the unit reapplies the user interface settings at the time of the power supply returns after power supply failure.

How to set the AUTO RESTART

Go to MENU> FOR SERVICEMAN>
AUTO RESTART.



Use ▼ ▲ ◄ ► to scroll and use OK to select YES or NON to enable or disable the auto restart function. If the auto restart function is enabled, 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. If this function is disabled, when power returns after a power supply failure, the unit won't auto restart.

6.7.15 Nouns illutration

The nouns related to this unit illustrated in the table bellow

Parameter	Illustration
T1	Outlet water temperature
T1B	Outlet water temperature of additional heating source
T1S	Target outlet water temperature
T2	Temperature of refrigerant at outlet /inlet of plate heat exchanger
T2B	Temperature of refrigerant at inlet /outlet of plate heat exchanger
T3	Temperature of tube at outlet/inlet of condenser
T4	Ambient temperature
T5	Temperature of domestic hot water
Th	Suction temperature
Tp	Discharge temperature
Tw_in	Inlet water temperature of plate heat exchanger
Tw_out	Outlet water temperature of plate heat exchanger
AHS	Additional heating source
IBH1	Thefirst backup heater
IBH 2	The second backup heater
TBH	Backup heater in the domestic hot water tank
Pe	Evaporate/condense pressure

7 TEST RUN AND FINAL CHECK

The installer is obliged to verify correct operation of unit after installation.

7.1 Final check

Before switching 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 unit cover.
- The service panel of the switch box may only be opened by a licensed electrician for maintenance purposes.

NOTE

That during the first running period of the unit, required power input may be higher than stated on the nameplate of the unit. This phenomenon originates from the compressor that needs elapse of a 50 hours run in period before reaching smooth operation and stable power consumption.

7.2 Test run operation (manual)

If required, the installer can perform a manual test run operation at any time to check correct operation of air purge, heating, cooling and domestic water heating ,refer to “**Field settings/test run**”.

8 MAINTENANCE AND SERVICE

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.
This maintenance has to be carried out by your local technician
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.
This maintenance has to be carried out by your local Midea technician.

DANGER

ELECTRIC SHOCK
- Before carrying out any maintenance or repair activity, always switch off the circuit breaker on the supply panel, remove the fuses (or switch off the circuit breakers) or open 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.
- Do not touch live parts for 10 minutes after the power supply is turned off because of high voltage risk.
- The heater of the compressor may operate even in stop mode.
- Please note that some sections of the electric component box are hot.
- Make sure you do not touch a conductive section.
- Do not rinse the unit. This may cause electric shocks or fire.
- When service panels are removed, live parts can be easily touched by accident.
  Never leave the unit unattended during installation or servicing when service panel is removed.

The described checks must be executed at least once a year by qualified personnel.
1. Water pressure
   Check if the water pressure is above 1 bar. If necessary add water.
2. Water filter
   Clean the water filter.
3. Water pressure relief valve
   Check for correct operation of the pressure relief valve by turning the black knob on the valve counter-clockwise:
   - If you do not hear a clacking sound, contact your local dealer.
   - 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.
4. Pressure relief valve hose
   Check that the pressure relief valve hose is positioned appropriately to drain the water.
5. Backup heater vessel insulation cover
   Check that the backup heater insulation cover is fastened tightly around the backup heater vessel.
6. Domestic hot water tank pressure relief valve (field supply)
   Applies only to installations with a domestic hot water tank.
   Check for correct operation of the pressure relief valve on the domestic hot water tank.
7. Domestic hot water tank booster heater
   Applies only to installations with a domestic hot water tank.
   It is advisable to remove lime buildup on the booster heater to extend its life span, especially in regions with hard water. To do so, drain the domestic hot water tank, remove the booster heater from the domestic hot water tank and immerse in a bucket (or similar) with lime-removing product for 24 hours.
8. Unit switch box
   - Carry out a thorough visual inspection of the switch box and look for obvious defects such as loose connections or defective wiring.
   - Check for correct operation of contactors by use of an ohm meter. All contacts of these contactors must be in open position.
9. In case of use of glycol
   (Refer to Water pipework Caution: "Use of glycol")
   Document the glycol concentration and the pH-value in the system at least once a year.
   - A pH-value below 8.0 indicates that a significant portion of the inhibitor has been depleted and that more inhibitor needs to be added.
   - When the pH-value is below 7.0 then oxidation of the glycol occurred, the system should be drained and flushed thoroughly before severe damage occurs.

   Make sure that the disposal of the glycol solution is done in accordance with relevant local laws and regulations.

9 TROUBLE SHOOTING

This section provides useful information for diagnosing and correcting certain troubles which may occur in the unit.
This troubleshooting and related corrective actions may only be carried out by your local technician.

9.1 General guidelines

Before starting the troubleshooting procedure, carry out a thorough visual inspection of the unit and look for obvious defects such as loose connections or defective wiring.

CAUTION

When carrying out an inspection on the switch box of the unit, always make sure that the main switch of the unit is switched off.

When a safety device was activated, stop the unit and find out why the safety device was activated before resetting it. Under no circumstances safety devices may be bridged or changed to a value other than the factory setting. If the cause of the problem cannot be found, call your local dealer.

If the pressure relief valve is not working correctly and is to be replaced, always reconnect the flexible hose attached to the pressure relief valve, to avoid water dripping out of the unit!

NOTE

For problems related to the optional solar kit for domestic water heating, refer to the troubleshooting in the Installation & owner's manual of that kit.

9.2 General symptoms

Symptom 1: The unit is turned on but the unit is not heating or cooling as expected

POSSIBLE CAUSES	CORRECTIVE ACTION
The temperature setting is not correct.	Check the controller set point. T4HMAX, T4HMIN in heat mode.T4CMAX,T4CMIN in cool mode. T4DHWMAX, T4DHWMIN in DHW mode.
The water flow is too low.	• Check that all shut off valves of the water circuit are completely open. • Check if the water filter needs cleaning. • Make sure there is no air in the system (purge air). • Check on the manometer that there is sufficient water pressure. The water pressure must be>1 bar (water is cold). • Make sure that the expansion vessel is not broken. • Check that the resistance in the water circuit is not too high for the pump
The water volume in the installation is too low.	Make sure that the water volume in the installation is above the minimum required value (refer to "**Water pipework/Checking the water volume and expansion vessel pre-pressure**").

Symptom 2: The unit is turned on but the compressor is not starting (space heating or domestic water heating)

POSSIBLE CAUSES	CORRECTIVE ACTION
The unit must start up out of its operation range (the water temperature is too low).	In case of low water temperature, the system utilizes the backup heater to reach the minimum water temperature first (12°C). • Check that the backup heater power supply is correct. • Check that the backup heater thermal fuse is closed. • Check that the backup heater thermal protector is not activated. • Check that the backup heater contactors are not broken.

Symptom 3: Pump is making noise (cavitation)

POSSIBLE CAUSES	CORRECTIVE ACTION
There is air in the system.	Purge air.
Water pressure at pump inlet is too low.	• Check on the manometer that there is sufficient water pressure. The water pressure must be > 1 bar (water is cold). • Check that the manometer is not broken. • Check that the expansion vessel is not broken. • Check that the setting of the pre- pressure of the expansion vessel is correct (refer to **"Water pipework/Checking the water volume and expansion vessel pre-pressure"**).

Symptom 4: The water pressure relief valve opens

POSSIBLE CAUSES	CORRECTIVE ACTION
The expansion vessel is broken.	Replace the expansion vessel.
The filling water pressure in the installation is higher than 0.3MPa.	Make sure that the filling water pressure in the installation is about 0.15~0.20MPa (refer to **"Water pipework/Checking the water volume and expansion vessel pre-pressure"**).

Symptom 5: The water pressure relief valve leaks

POSSIBLE CAUSES	CORRECTIVE ACTION
Dirt is blocking the water pressure relief valve outlet.	Check for correct operation of the pressure relief valve by turning the red knob on the valve counter clockwise: • If you do not hear a clacking sound, contact your local dealer. • 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.

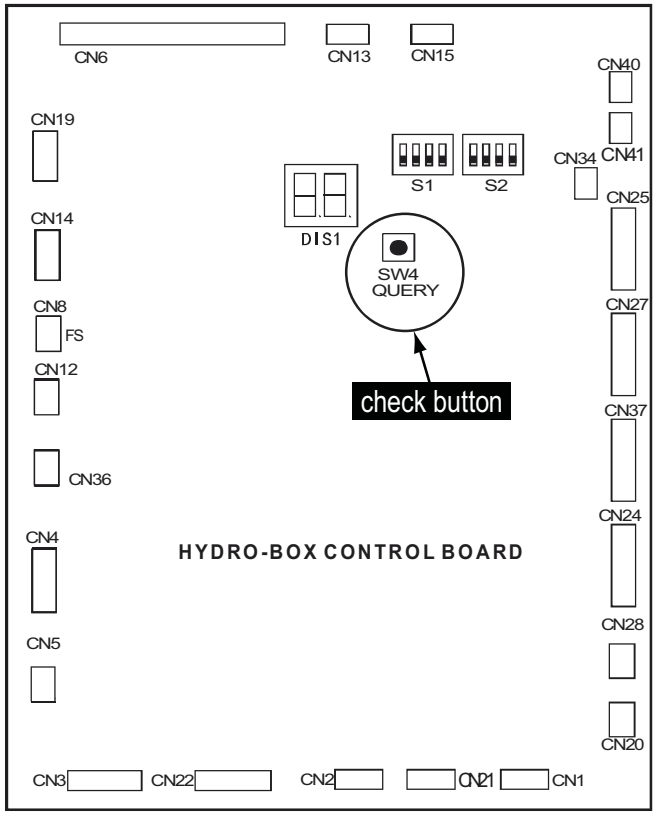
Symptom 6: Space heating capacity shortage at low outdoor temperatures

POSSIBLE CAUSES	CORRECTIVE ACTION
Backup heater operation is not activated.	Check that the **"OTHER HEATING SOURCE/ BACKUP HEATER"** is enabled, see **"Field settings"** Check whether or not the thermal protector of the backup heater has been activated (refer to **"Switch box main components", "Backup heater thermal protector"** for location of the reset button). Check if booster heater is running, the backup heater and booster heater can't operate simultaneously.
Too much heat pump capacity is used for heating domestic hot water (applies only to installations with a domestic hot water tank).	Check that the 't_DHWHP_MAX' and "t_DHWHP_RESTRICT" are configured appropriately: • Make sure that the 'DHW PRIORITY' in the user interface is disabled. • Raise the "T4_TBH_ON" in the user interface/FOR SERVICEMAN to activate the booster heater for domestic water heating。

10 PARAMETERS CHECK IN THE UNIT

To check the parameters of hydraulic box, open door 2 and you'll see the PCB like following, the digital display will show the temperature of outlet water in normal condition('0' will display if the unit is off or error code will display if error occurs). Long press the check button and the digital display will show the operating mode, and then press the check button in sequence, the digital display will show the value, the implication of the value illustrated in the table

hydraulic box SW4



Number	Implication
0	Temperature of outlet water when unit is on, when the unit is off, '0' will display
1	Operation mode(0——OFF 2——COOL 3——HEAT 5——Water heating)
2	Capacity requirement before correction
3	Capacity requirement after correction
4	Outlet water temperature of backup heater
5	Outlet water temperature of additional heating source
6	Target outlet water temperature calculated from climate related curves
7	Room temperature
8	Temperature of domestic hot water
9	Temperature of refrigerant at outlet /inlet of plate heat exchanger when in heat mode/cool mode
10	Temperature of refrigerant at inlet /outlet of plate heat exchanger when in heat mode/cool mode
11	Temperature of water at outlet of plate heat exchanger
12	Temperature of water at inlet of plate heat exchanger
13	Ambient temperature
14	Current of backup heater 1
15	Current of backup heater 2
16	Error/protection code for the last time,'—'will display if no error/protection occur
17	Error/protection code for the second last time,'—'will display if no error/protection occur
18	Error/protection code for the third last time,'—'will display if no error/protection occur
19	Version of software(hydraulic module)

10.1 Error codes

When a safety device is activated, an error code will be displayed on the user interface.

A list of all errors and corrective actions can be found in the table below.

Reset the safety by turning the unit OFF and back ON.

In case this procedure for resetting the safety is not successful, contact your local dealer.

Error code	Failure cause	Corrective action
E0	Water flow fault （Three times E8）	Refer to E8
E1	Power fault (only for three phase unit)	Connect the power supply cables in normal phase. Change any two of the three power supply cables (L1, L2 , L3) to correct phase
E2	Communication fault between controller(use interface) and indoor unit	Check the wiring between user interface and unit,or contact your local dealer
E3	Indoor unit(hydro-box) water outlet temperature sensor(T1) fault	Contact your local dealer.
E4	Water(domestic hot water) tank temperature sensor(T5) fault	Contact your local dealer.
E5	Outdoor unit exchange temperature sensor (T3) fault	Contact your local dealer
E6	Outdoor unit ambient temperature sensor(T4) fault	Contact your local dealer
E8	Water flow fault	• Check that all shut off valves of the water circuit are completely open. • Check if the water filter needs cleaning. • Check that the unit is operating within its operating range (refer to **"TECHNICAL SPECIFICATIONS"**). • Also refer to **"Charging water"** • Make sure there is no air in the system (purge air). • Check on the manometer that there is sufficient water pressure. The water pressure must be >1 bar (water is cold). • Check that the pump speed setting is on he highest speed. • Make sure that the expansion vessel is not broken. • Check that the resistance in the water circuit is not too high for the pump (refer to **"Setting the pump speed"**). • If this error occurs at defrost operation (during space heating or domestic water heating), make sure that the backup heater power supply is wired correctly and that fuses are not blown. • Check that the pump fuse and PCB fuse are not blown.

Error code	Failure cause	Corrective action
E9	Compressor suction line temperature sensor(Th) fault	Contact your local dealer
EA	Compressor discharge line temperature sensor(Tp) fault	Contact your local dealer
Ed	Indoor unit(hydro-box) plate exchanger water inlet temperature sensor (Tw_in) fault	Contact your local dealer
EE	Indoor unit(hydro-box) PCB EEPROM fault	Contact your local dealer
EP	Water tank heater current leakage fault	Contact your local dealer
H0	Communication fault between indoor unit(hydro-box) and outdoor unit	Contact your local dealer
H1	Communication fault between outdoor unit and IR341	Contact your local dealer
H2	Indoor unit(hydro-box) plate exchanger Freon outlet(heat) temperature sensor (T2) fault	Contact your local dealer
H3	Indoor unit(hydro-box) plate exchanger Freon outlet(heat) temperature sensor (T2B) fault	Contact your local dealer
H4	Three times P6 Protects	Contact your local dealer
H5	Room temperature sensor (Ta) fault	Contact your local dealer
H6	DC fan motor fault	Contact your local dealer
H7	DC compressor voltage protect fault	Contact your local dealer
H8	Pressure sensor fault	Contact your local dealer
H9	Additional heat source water outlet temperature sensor(T1B) fault	Contact your local dealer
HE	Heat mode fan is running in A region for minutes (continuously low speed for long time)	Contact your local dealer
HF	Outdoor unit EEPROM fault	Contact your local dealer

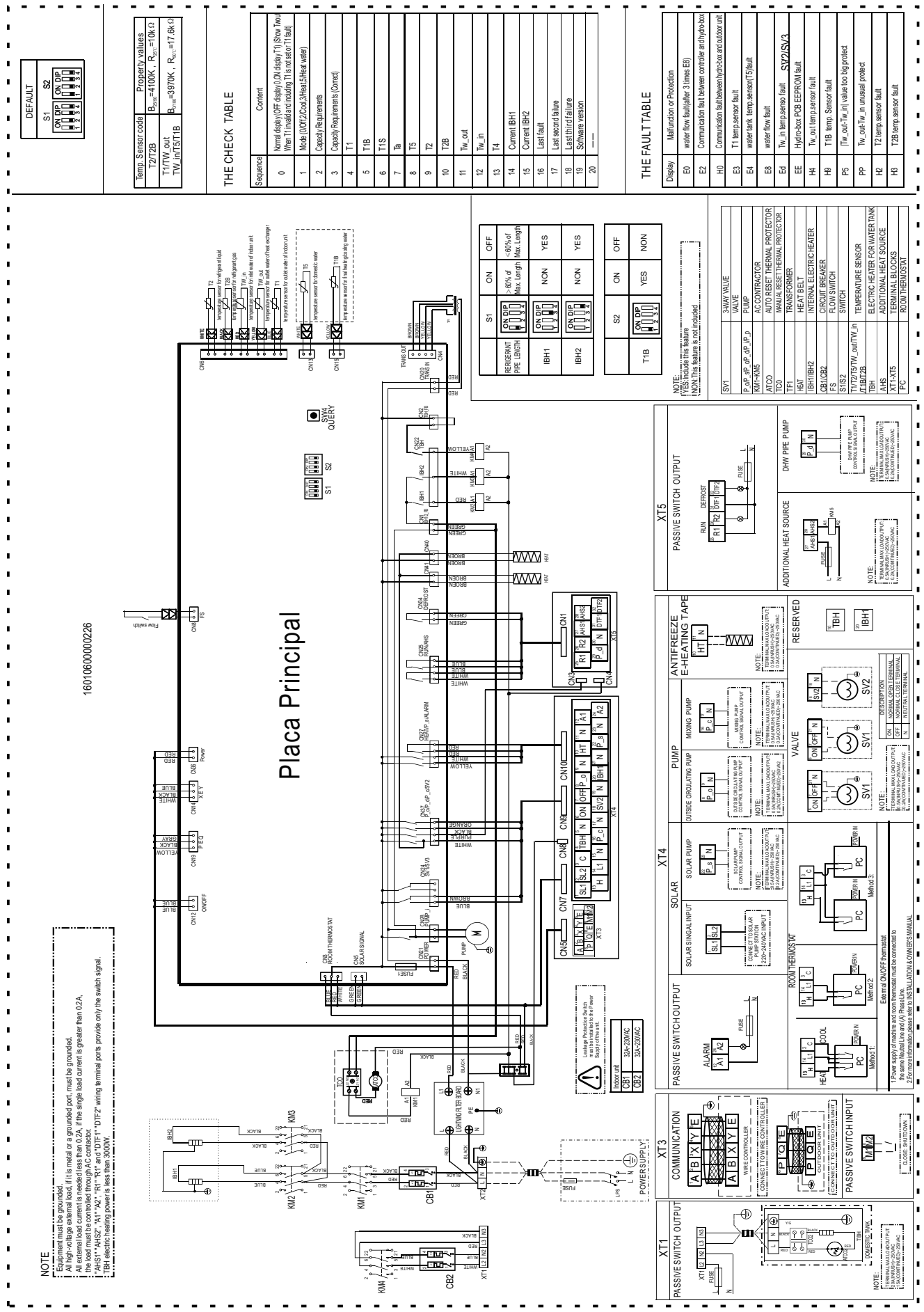
Error code	Failure cause	Corrective action
HC	Indoor unit(hydro-box) heater without current fault	Contact your local dealer
HH	10 times H6 in 120 minutes	Contact your local dealer
HL	PFC module fault	Contact your local dealer
C7	Transducer module temperature too high protect	Contact your local dealer
C9	Operate frequency unusual protect	Contact your local dealer
P1	Heat pump system high pressure protect	Check that the unit is operating within its operating range, contact your local dealer
P3	DC compressor current protect	Check that the unit is operating within its operating range, contact your local dealer
P4	Compressor discharge temperature too high protect	Clean the outdoor coil. If the coil is clean, contact your local dealer
P5	Tw_out –Tw_in value too big protect	Checking if the flow rate in the system is too small
P6	Transducer module protect	Contact your local dealer
P9	DC fan motor protect	Contact your local dealer
Pd	Outdoor unit exchanger temperature (T3) too high protect	Clean the outdoor coil. If the coil is clean, contact your local dealer.
PL	Transducer module radiator temperature too high protect	Clean the fines. If the fin is clean, contact your local dealer
PP	Tw_out- Tw_in unusual protect	Contact your local dealer
P0	Heat pump system low pressure protect	Contact your local dealer
HA	Indoor unit(hydro-box) plate exchanger water outlet temperature sensor (Tw_out) fault	Contact your local dealer.
F1	DC generatrix low voltage protection	Contact your local dealer
HP	3 times low pressure protect in 1 hour in cooling mode	Contact your local dealer.

11 TECHNICAL SPECIFICATIONS

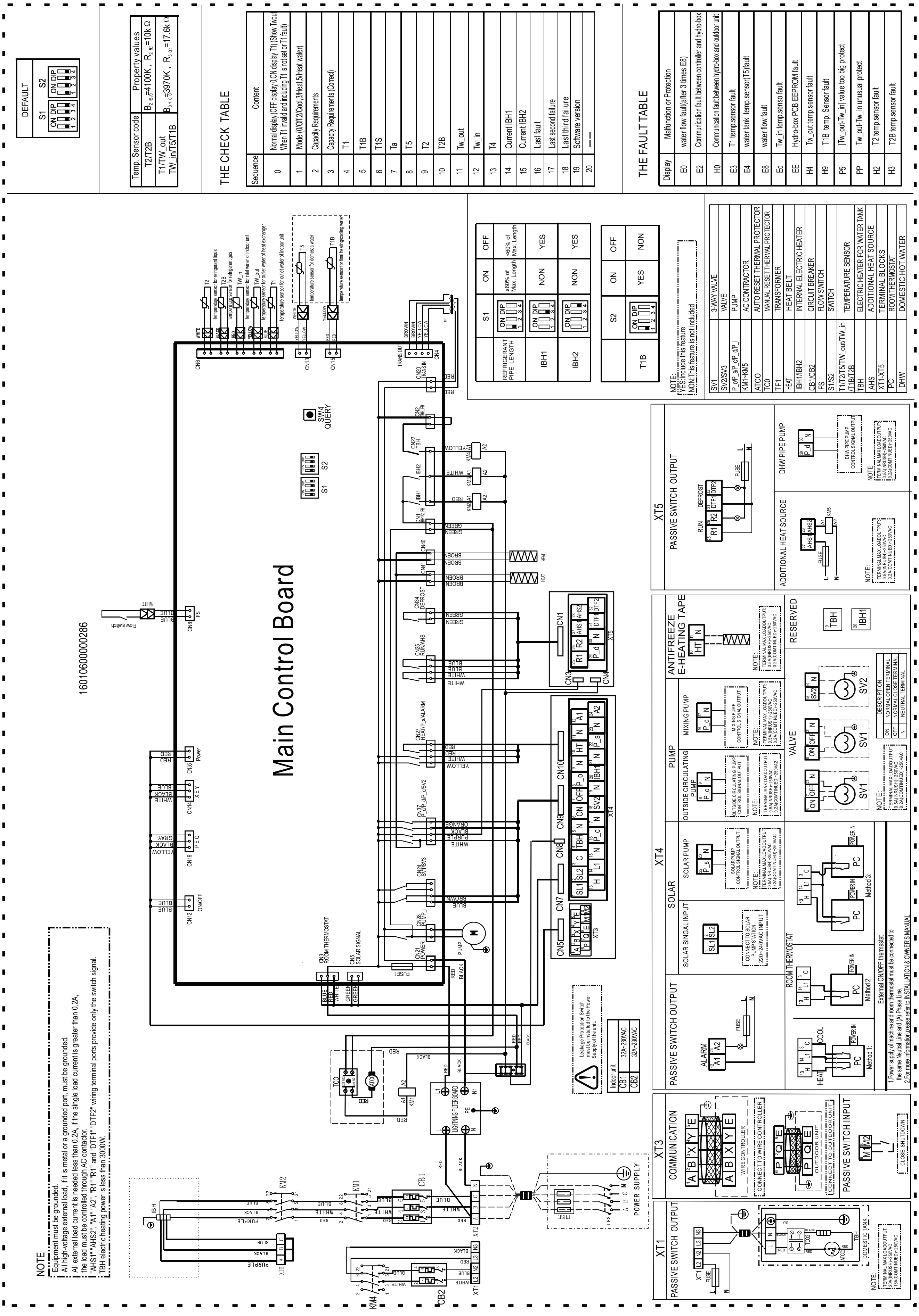
Model	4 to 8kW	10 to 16kW (1 Phase)	12 to 16kW (3 Phases)
Power supply	220-240V~ 50Hz		380-415V3N~50Hz
Rated power input	3.1kW	3.1kW	4.6kW
Rated current	13.5A	13.5A	6.7A
Norminal capacity	Refer to the technical data		
Dimensions (W×H×D)[mm]	400*865*427		
Packing (W×H×D)[mm]	495×1040×495		
Heat exchanger	Plate heat exchanger		
Electric heater	1.5kW×2	1.5kW×2	1.5kW×3
Internal water volume	5.0L	5.5L	5.5L
Safety pressure of water circuit	3bar(g)	3bar(g)	3bar(g)
Filter mesh	80	80	80
Min. water flow (flow switch)	11L/min	16L/min	16L/min
Pump			
Type	DC inverter centrifugal water cooling pump		
Max. head	6m	7.5m	7.5m
Power input	3~45W	4~75W	4~75W
No. of speed	3	3	3
Expanssion vessel			
Volume	5L	5L	5L
Max. operating pressure	8bar(g)	8bar(g)	8bar(g)
Pre-charge pressure	1.5bar(g)	1.5bar(g)	1.5bar(g)
Weight			
Net weight	51kg	54kg	53kg
Gross weight	57kg	60kg	59kg
Connections			
Refrigerant gas/liquid side	φ15.9 / φ9.52		
Water inlet/outlet	R1"		
Drain connection	φ25		
Operation range			
Outlet water (Heating mode)	+25 ~ +60℃		
Outlet water (Cooling mode)	+5 ~ +25℃		
Domestic hot water	+40 ~ +60℃		
Ambient temperature	-20 ~ +46℃		
Water pressure	0.3~3bar		

ANNEX 1: INDOOR UNIT WIRING DIAGRAM

1 phase



3 phases


DEFAULT
S1
S2
Temp. Sensor code
Property values
T2/T2B
T1/TW_out
TW_in/T5/T1B
THE CHECK TABLE
Sequence
Content
0 Normal display (OFF display 0,ON display T1) (Show Twout When T1 invalid and including T1 is not set or T1 fault)
1 Mode (0/Off,2/Cool,3/Heat,5/Heat water)
2 Capacity Requirements
3 Capacity Requirements (Correct)
4 T1
5 T1B
6 T1S
7 Ta
8 T5
9 T2
10 T2B
11 Tw_out
12 Tw_in
13 T4
14 Current IBH1
15 Current IBH2
16 Last fault
17 Last second failure
18 Last third failure
19 Software version
20 ---
THE FAULT TABLE
Display
Malfunction or Protection
E0 water flow fault(after 3 times E8)
E2 Communication fault between controller and hydro-box
H0 Communication fault between hydro-box and outdoor unit
E3 T1 temp.sensor fault
E4 water tank temp.sensor(T5)fault
E8 water flow fault
Ed Tw_in temp.senso fault
EE Hydro-box PCB EEPROM fault
H4 Tw_out temp.sensor fault
H9 T1B temp. Sensor fault
P5 |Tw_out-Tw_in| value too big protect
PP Tw_out-Tw_in unusual protect
H2 T2 temp.sensor fault
H3 T2B temp.sensor fault
Main Control Board
16010600000286
NOTE
Equipment must be grounded.
All high-voltage external load, if it is metal or a grounded port, must be grounded.
All external load current is needed less than 0.2A, if the single load current is greater than 0.2A, the load must be controlled through AC contactor.
"AHS1" "AHS2", "A1" "A2", "R1" "R2" and "DTF1" "DTF2" wiring terminal ports provide only the switch signal.
TBH electric heating power is less than 3000W.
REFRIGERANT PIPE LENGTH
IBH1
IBH2
T1B
NOTE:
YES:Include this feature
NON:This feature is not included
SV1 3-WAY VALVE
SV2/SV3 VALVE
P_o/P_s/P_c/P_d/P_i PUMP
KM1~KM5 AC CONTRACTOR
ATCO AUTO RESET THERMAL PROTECTOR
TC0 MANUAL RESET THERMAL PROTECTOR
TF1 TRANSFORMER
HEAT HEAT BELT
IBH1/IBH2 INTERNAL ELECTRIC HEATER
CB1/CB2 CIRCUIT BREAKER
FS FLOW SWITCH
S1/S2 SWITCH
T1/T2/T5/TW_out/TW_in/T1B/T2B TEMPERATURE SENSOR
TBH ELECTRIC HEATER FOR WATER TANK
AHS ADDITIONAL HEAT SOURCE
XT1-XT5 TERMINAL BLOCKS
PC ROOM THERMOSTAT
DHW DOMESTIC HOT WATER
XT1
XT3
XT4
XT5
PASSIVE SWITCH OUTPUT
COMMUNICATION
PASSIVE SWITCH INPUT
SOLAR
PUMP
ANTIFREEZE E-HEATING TAPE
RESERVED
VALVE
ADDITIONAL HEAT SOURCE
DHW PIPE PUMP
ROOM THERMOSTAT
POWER SUPPLY

ANNEX 2: TABLE FOR SERVICEMAN

Nº	Code	Description	Value	Default value	Range	Step	Unit
1. DHW MODE SETTING							
1.1	DHW MODE	The selection of whether DHW mode is avalaible		YES	YES/NON	-	-
1.1.1	dT5_ON	Temperature difference between T5 (actual temp. of DHW) and T5S (target temp. of DHW) for turn the unit ON (T5 ≤ T5S - dT5_ON)		5	2 ~ 10	1	ºC
1.1.2	dT1S5	The correct value for T1S (target outlet water temp.) (T1S = T5 + dT1S5)		10	5 ~ 20	1	ºC
1.1.3	T4DHWMAX	The maximum operating ambient temp.		43	35 ~ 43	1	ºC
1.1.4	T4DHWMIN	The minimum operating ambient temp.		-10	-20 ~ 5	1	ºC
1.1.5	t_INTERVAL DHW	The compressor start time interval		5	5 ~ 30	1	min
1.2	TANK HEATER	The selection of whether TANK HEATER is avalaible		YES	YES/NON	-	-
1.2.1	dT5_TBH_OFF	Temp. difference between T5 and T5S that turn the tank heater OFF (T5 ≥ T5S + dT5_TBH_OFF)		5	2 ~ 10	1	ºC
1.2.2	T4_TBH_ON	The temp. only when the ambient temperature lower than it the tank heater will operate		5	-5 ~ 20	1	ºC
1.2.3	t_TBH_DELAY	The time that the compressor has run before starting the tank heater		90	60 ~ 240	5	min
1.3	DISINFECT	The selection of whether DISINFECT mode is avalaible		YES	YES/NON	-	-
1.3.1	T5S_DI	The setting temp. of water in the domestic water tank		65	60 ~ 70	1	ºC
1.3.2	t_DI_HIGHTEMP.	The time high temp. of water to be lasted		15	5 ~ 45	5	min
1.3.3	t_DI_MAX	The time that desinfection to be lasted		210	90 ~ 300	5	min
1.4	DHW PRIORITY	The selection of whether DHW priority is avalaible		YES	YES/NON	-	-
1.4.1	t_DHWHP_MAX	The maximum operation time of heat pump		180	60 ~ 600	5	min
1.4.2	t_DHWHP_RESTRICT	The operation time for space heating/cooling operation		180	60 ~ 600	5	min
1.5	DHW PUMP	The selection for whether the DHW pump is installed or not		NON	YES/NON	-	-
1.5.1	TIMER RUNNING	The selection for whether the DHW pump will run as timed		YES	YES/NON	-	-
1.5.2	DISINFECT	The selection for whether the DHW pump will run as disinfect mode is on		YES	YES/NON	-	-
1.5.3	PUMP RUNNING TIME	The pump running time		5	5 ~ 120	1	min
2. COOL MODE SETTING							
2.1	COOL MODE	The selection of whether space cool mode is avalaible		YES	YES/NON	-	-
2.2	T1S RANGE	The range of target outlet water temp.		LOW	LOW/HIGH	-	-
2.3	T4CMAX	The maximum operating ambient temp.		43	35 ~ 46	1	ºC
2.4	T4CMIN	The minimum operating ambient temp.		10	-5 ~ 25	1	ºC
2.5	dT1SC	The temp. difference between T1 (actual outlet water temp.) and T1S (target outlet water temp.) for starting the unit (T1 ≥ T1S + dT1SC)		5	2 ~ 10	1	ºC
2.6	dTSC	The temp. difference between Ta (actual room temp.) and TS (target room temp.) for starting the unit when room thermostat is installed (T1 ≥ T1S + dTSC)		2	1 ~ 10	1	ºC
2.7	t_INTERVAL_C	The compressor start time interval		5	5 ~ 30	1	min
3. HEAT MODE SETTING							
3.1	HEAT MODE	The selection of whether space heat mode is avalaible		YES	YES/NON	-	-
3.2	T1S RANGE	The range of target outlet water temp.		LOW	LOW/HIGH	-	-
3.3	T4HMAX	The maximum operating ambient temp.		25	10 ~ 30	1	ºC
3.4	T4HMIN	The minimum operating ambient temp.		-15	-5 ~ 20	1	ºC
3.5	dT1SH	The temp. difference between T1 (actual outlet water temp.) and T1S (target outlet water temp.) for starting the unit (T1 ≤ T1S - dT1SH)		5	2 ~ 10	1	ºC
3.6	dTSH	The temp. difference between Ta (actual room temp.) and TS (target room temp.) for starting the unit when room thermostat is installed (Ta ≤ TS - dTSH)		2	1 ~ 10	1	ºC
3.7	t_INTERVAL_h	The compressor start time interval		5	5 ~ 60	1	min

Nº	Code	Description	Value	Default value	Range	Step	Unit
4. AUTO MODE SETTING							
4.1	T4AUTOCMIN	The minimum operation ambient temperature for cooling		25	20 ~ 29	1	ºC
4.2	T4AUTOHMAX	The maximum operation ambient temperature for heating		17	10 ~ 17	1	ºC
5. TEMP. TYPE SETTING							
5.1	WATER FLOW TEMP.	The selection of whether the water temp. will be displayed on the home page		YES	YES/NON	-	-
5.2	ROOM TEMP.	The selection of whether the room temp. will be displayed on the home page		NON	YES/NON	-	-
6. ROOM THERMOSTAT							
6.1	ROOM THERMOSTAT	The selection of whether the room thermostat is avalaible		NON	YES/NON	-	-
6.2	MODE SETTING	The selection for whether the mode setting is avalaible by thermostat		NON	YES/NON	-	-
6.3	DUAL ROOM THERMOSTAT	The selection for whether the dual room thermostat is avalaible		NON	YES/NON	-	-
7. OTHER HEATING SOURCE							
7.1	BACKUP HEATER	The selection for whether the inner hydrobox heater is avalaible		YES	YES/NON	-	-
7.1.1	HEAT MODE	The selection for whether the backup heater will be used in space heating mode		YES	YES/NON	-	-
7.1.2	DHW MODE	The selection for whether the backup heater will be used in DHW mode		NON	YES/NON	-	-
7.1.3	T4_IBH_ON	The ambient temp. for starting the backup heater		-5	-15 ~ 10	1	ºC
7.1.4	dT1_IBH_ON	The temp. difference between T1S (target outlet water temp.) and T1 (actual outlet water temp.) for starting the backup heater (T1 ≤ T1S - dT1_IBH_ON)		5	2 ~ 10	1	ºC
7.1.5	t_IBH_DELAY	The time that the compressor has run before the first backup heater turn ON		30	15 ~ 120	5	min
7.1.6	t_IBH12_DELAY	The time that the compressor has run before the second backup heater turn ON		5	5 ~ 30	5	min
7.2	AHS	The selection for whether the additional heating sourse is avalaible		NON	YES/NON	-	-
7.2.1	HEAT MODE	The selección for whether the additional heating source will be used in space heating mode		YES	YES/NON	-	-
7.2.2	DHW MODE	The selección for whether the additional heating source will be used in DHW mode		NON	YES/NON	-	-
7.2.3	T4_AHS_ON	The ambient temp. for starting the AHS		-5	-15 ~ 10	1	ºC
7.2.4	dT1_AHS_ON	The temp. difference between T1S (target outlet water temp.) and T1 (actual outlet water temp.) for turning the AHS ON (T1 ≤ T1S - dT1_AHS_ON)		5	2 ~ 10	1	ºC
7.2.5	dT1_AHS_OFF	The temp. difference between T1S (target outlet water temp.) and T1 (actual outlet water temp.) for turning the AHS OFF (T1 ≥ T1S + dT1_AHS_OFF)		0	-5 ~ 0	1	ºC
7.2.6	t_AHS_DELAY	The time that the compressor has runed before starting the AHS		30	15 ~ 120	5	min
7.3	SOLAR ENERGY	The selection for whether the solar energy kit is avalaible		NON	YES/NON	-	-
8. HOLIDAY AWAY MODE SETTING							
8.1	T1S_H.A_H	The target outlet water temp. for space heating		25	20 ~ 25	1	ºC
8.2	T5S_H.M_DHW	The target outlet water temp. for DHW		25	15 ~ 25	1	ºC

Nº	Code	Description	Value	Default value	Range	Step	Unit
9. SERVICE CALL SETTING							
9.1	PHONE NO.	Phone number for service call		-	-	-	-
9.2	MOBILE NO.	Mobile number for service call		-	-	-	-
10. RESTORE SETTINGS							
10.1	RESTORE FACTORE SETTINGS	Restore factory settings		NON	YES/NON	-	-
11. TEST RUN							
11.1	POINT CHECK	Check function		-	-	-	-
11.2	AIR PURGE	Test the air purge function		-	-	-	-
11.3	CIRCULATED PUMP RUNNING	Test the circulated pump		-	-	-	-
11.4	COOL MODE RUNNING	Test the cool mode		-	-	-	-
11.5	HEAT MODE RUNNING	Test the heat mode		-	-	-	-
11.6	DHW MODE RUNNING	Test the DHW mode		-	-	-	-
12. SPECIAL FUNCTION							
12.1	AIR PURGE	Purge the air within the water circuit		-	-	-	-
12.2	PREHEATING FOR FLOOR	Preheating the floor		-	-	-	-
12.2.1	FLOW SET TEMPERATURE (T1S)	The target temp. of outlet water during preheating for floor		30	25 ~ 35	1	ºC
12.2.2	RETURN TEMPERATURE (dT1SH)	The temp. difference between T1 (actual outlet water temp.) and T1S (target outlet water temp.) for turn the unit OFF (T1 ≥ T1S + dT1SH)		5	2 ~ 10	1	ºC
12.2.3	PREHEATING TIME (t_fristFH)	The time last for preheating for floor		72	48 ~ 96	1	h
12.2.4	OPERATE PREHEATING FOR FLOOR	The selection of start preheating for floor		NON	YES/NON	-	-
12.3	FLOOR DRYING UP	Drying up the floor		-	-	-	-
12.3.1	WARM UP TIME (t_DRYUP)	The day for warming up		8	4 ~ 15	1	day
12.3.2	KEEP TIME (t_HIGHPEAK)	The day for high temp. last		5	3 ~ 7	1	day
12.3.3	TEMP. DOWN TIME (t_DRY D)	The day for droping temp.		5	4 ~ 15	1	day
12.3.4	PEAK TEMP. (t_DRYPEAK)	The target peak temp. of outlet water during floor drying up		45	30 ~ 55	1	day
12.3.5	START TIME	The time of floor drying up start		-	-	-	-
12.3.6	START DATE	The date of floor drying up start		-	-	-	-
12.3.7	OPERATE FLOOR DRYING UP	The selection of start drying up floor		NON	YES/NON	-	-
13. AUTO RESTART							
13.1	COOL/HEAT MODE	The selection of enable or disable auto restart function during cool/heat mode		YES	YES/NON	-	-
13.2	DHW MODE	The selection of enable or disable auto restart function during DHW mode		YES	YES/NON	-	-

MUNDOCLIMA®
Aerotherm

www.mundoclima.com

ASK FOR MORE INFORMATION
Phone: (+34) 93 446 27 81
eMail: info@mundoclima.com

TECHNICAL ASSISTANCE
Phone: (+34) 93 652 53 57