

All-in-one heat pump water heating units BOI-200/260

Installation & Instruction Manual

Edition 2008

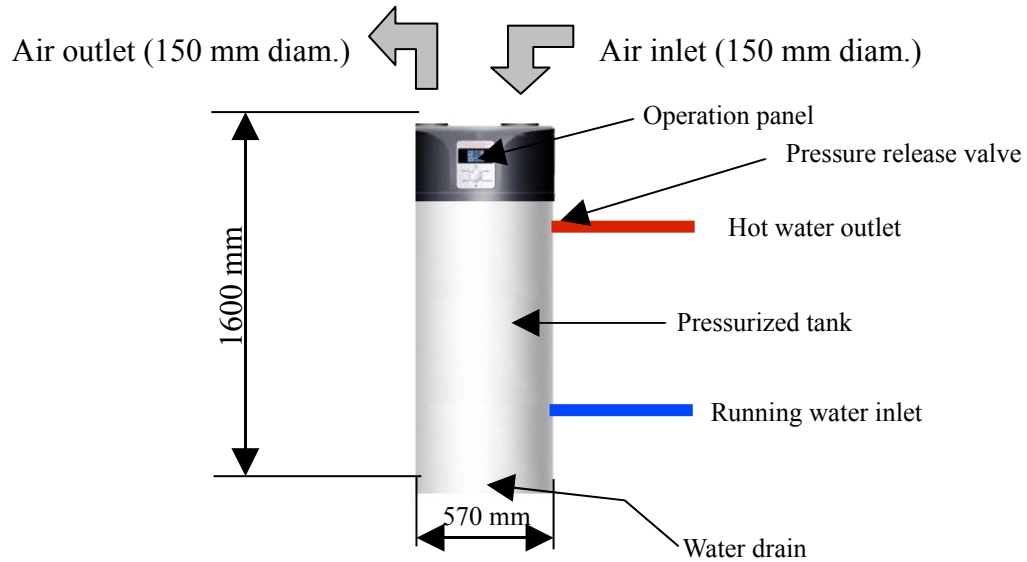


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1. Installation Manual

1.1 Installation scheme



- This monobloc heat pump water heater is a combination of water tank and heat pump unit. There are only water pipes and ducted pipes for air inlet and outlet connections needed for installation.
- To protect the water tank, please make sure the pressure-release valve is installed on the water outlet.

1.2 Installation notice

1.2.1 Water tank protection

The mono bloc heat pump has a sealed tank, pressure-release valve is required for installation.

Make sure the discharge pipe of the pressure-release valve is open and unblocked. Pressure has to be released frequently to remove water dirt (calcium carbonate) to prevent jam. Pressure protection of the safety valve is 0,7Mpa. When the tank pressure > 0,7Mpa, the valve will release the pressure. When the pressure < 0,6Mpa, the valve stops releasing the pressure. The discharge pipe connected to this valve must be put downwards and in non-frosting condition.

1.2.2 Electrical issues

The power cable for the mono bloc must be separated from other electrical appliances and must comply with rated power supply and voltage.

It must at least be conform to 2271EC53 3x1.5

Grounding for heat pump unit must be connected with effective exterior grounding and anti-electric shock device.

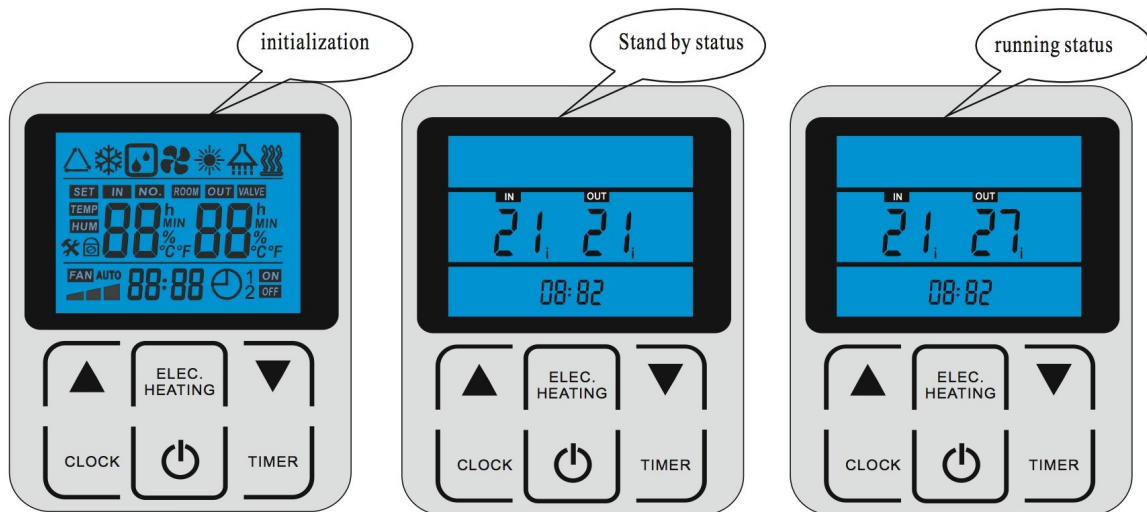
Heat pump installer has to be a certified technician.

Minimum fuse contact breaking distance is 3 mm for protection.

Fuse rating: 10A

2. User Manual

2.1 The control panel



2.1.1 Initialization

When the unit is connected to the power line, the controller will initialize with a full screen display and switch to standby status after 3 seconds.

2.1.2 ON/OFF button



Press this button to switch from standby mode to running mode. The display will show inlet and outlet water temperature, timer status, time and heating icon.

Press this button to switch from running mode to standby mode. The display will show inlet and outlet water temperature, timer status and time.

2.1.3 Arrow buttons ▲ and ▼

These two buttons are for parameter checking and setting, time and timer adjustment.

2.1.4 CLOCK button

This button is for setting the time and serves as cancellation button during timer setting.

2.1.5 TIMER button

This button is for entering timer ON and timer OFF setting.

2.1.6 ELEC. HEATING button

This button starts/stops electrical heating and is used to activate parameter setting together with the on/off button. Electrical heating (when present) will start automatically once a week for disinfection purpose.

2.2 Performance data

| Specifications | Model | BOI-200 | BOI-260 |
|---|-------------------|-----------------|-----------------|
| Rated heating capacity | kw | 3,8 | 3,8 |
| Nominal tank volume | L | 200 | 260 |
| Rated input power | W | 900 | 900 |
| Maximum input power | W | 1500 | 1500 |
| Tank material | | stainless steel | stainless steel |
| Housing material | | coated epoxy | coated epoxy |
| Rated current | A | 4,5 | 4,5 |
| Power supply | V | 240V-1f | 240V-1f |
| Rated water outlet temperature | °C | 55 | 55 |
| Max water outlet temp (heat pump only) | °C | 60 | 60 |
| Max water outlet temp (incl elec heating) | °C | 10°C-70°C | 10°C-70°C |
| Decontamination temperature | °C | 60°C - 90°C | 60°C - 90°C |
| Air volume | m ³ /u | 550 | 550 |
| Air pressure | Pa | 60 | 60 |
| Refrigerant gas | g | R407c/ 750 | R407c/ 750 |
| Input air temperature range | °C | -10°C - 45°C | -10°C - 45°C |
| COP according to En 255 | | 3,98 | 3,96 |
| Hot water production $\Delta T=40^{\circ}\text{C}$ | liter/hour | 90 | 90 |
| Heating time $\Delta T=40^{\circ}\text{C}$ | h | 2h13min | 2h54min |
| Total power consumption $\Delta T=40^{\circ}\text{C}$ | kWh | 2,35 | 3,05 |
| Air duct size | mm | 150 | 150 |
| Noise level | dB(A) | 49 | 49 |
| Water connections | | 3/4" | 3/4" |
| Power electrical heater | kWh | 1,5 | 1,5 |
| Packing dimensions | L/B/H | 635/635/1735 | 635/635/1985 |
| Unit dimensions | Ø/H | Ø560/1700 | Ø560/1950 |
| Net weight | kg | 73 | 84 |
| Gross weight | kg | 78 | 89 |

- Applicable working conditions:
 - Ambient temperature: 0 – 40 °C
 - Inlet water temperature: 1 – 40 °C
 - Relative humidity: less than 85%
- Measuring conditions for performance data:
 - Dry bulb 25 °C, wet bulb 19 °C, inlet water 15 °C, outlet water 55 °C

2.3 Operating the water heater

2.3.1 Checking the parameters

Regardless the mode the heat pump is running in, pressing the up or down arrow button will start displaying parameters 0. Pressing the arrows again allows scrolling through the list. Both the parameter number and its value are flashing. See table on next page.

2.3.2 Changing a parameter

NOTE: parameters can only be changed in **standby** mode.

From standby mode, select the parameter to be changed as described above. Its number and its value are flashing. Press ELECT. HEATING and ON/OFF buttons at the same time. Only the parameter value is now flashing and its value can be changed with the up or down arrows. When set, the controller will store the new value automatically after 5 seconds.

2.3.3 Setting the time

The clock is a 24 hour system. Time setting can be performed regardless the operating mode. Press the CLOCK button to activate the time setting mode, hours and minutes will both be flashing. Press CLOCK again, the hours will be flashing and can be set with the arrow keys. Press CLOCK one more time, now the minutes will be flashing and can be set with the arrow keys. Press CLOCK again to go back to the main display.

2.3.4 Setting the timer

Timer setting can be performed regardless the operating mode. Press TIMER button to activate the timer setting mode, hours and minutes will both be flashing and the display will show the ON icon. Press TIMER again, the hours will be flashing and can be set with the arrow keys. Press TIMER again, the minutes will start flashing and can be set with the arrow keys. Press TIMER again, hours and minutes will both be flashing and the display will show the OFF icon. Timer OFF can now be programmed in the same way. Timer settings are programmed in memory and again available after power failure.

Press the ON/OFF button for final confirmation.

2.3.5 Cancellation of the timer

When Timer ON/OFF is activated with the relative icons on the display, press CLOCK to cancel the setting.

2.3.6 Setting electrical heating

The electrical heater can be turned on or off regardless the operating mode. The electrical heater can work independently of the heat pump.

2.3.7 Keypad lock and unlock

Regardless the operating mode, pressing both arrow keys at the same time will lock or unlock the keypad.

2.3.8 Setting the fan speed

When the heat pump is running, repeatedly press CLOCK and TIMER at the same time until the required speed fan speed has been reached.

2.4 Parameter settings

| Parameter | Description | Range | Default | Remarks |
|-----------|--|-------------|----------------|--------------------------------------|
| 0 | Desired temperature of tank water | 10 – 70 °C | 55 °C | Adjustable |
| 1 | Water temperature difference for heat pump restarting | 2 – 15 °C | 3 °C | Adjustable |
| 2 | Temperature setting point to start electrical heating | 10 – 90 °C | 55 °C | Adjustable |
| 3 | Interval between heat pump and electrical heating start | 0 - 90 | 1 | Adjustable, multiply by 5 min. |
| 4 | Weekly disinfection temperature of electrical heater | 60 – 90 °C | 70 °C | Adjustable |
| 5 | Duration of weekly disinfection | 10 – 90 min | 30 min | Adjustable |
| 6 | Operating time before defrosting starts | 30 – 90 min | 45 min | Adjustable |
| 7 | Temperature to start defrosting | -30 – 0 °C | -7 °C | Adjustable |
| 8 | Temperature to stop defrosting | 2 – 30 °C | 13 °C | Adjustable |
| 9 | Maximum duration of defrosting | 1 – 12 min | 8 min | Adjustable |
| 10 | Control of electronic expansion valve | 0/1 | 1 | 0 – manual 1 - automatic |
| 11 (*) | Target for superheat | -20 – 20 °C | 4 °C | Adjustable |
| 12 | Manual control of step motor in electronic expansion valve | 10 - 50 | 35 | 10 – closing end 50 – opening end |
| A | Water temperature at the bottom part of the water tank | -9 – 99 °C | Measured value | Error code P1 when failure |
| B | Water temperature at the top part of the water tank | -9 – 99 °C | Measured value | Error code P2 when failure |
| C | Evaporator coil temperature | -9 – 99 °C | Measured value | Error code P3 when failure |
| D | Return gas temperature | -9 – 99 °C | Measured value | Error code P4 when failure |
| E | Discharge gas temperature | -9 – 99 °C | Measured value | Error code P5 when failure |
| F | Step motor position (number of steps) | 10 - 50 | Measured value | |

Remark:

(*) - This parameter controls the opening/closing of the expansion valve

Attention:

All parameters (except parameter 0) must be adjusted by *certified technicians* only

2.5 Error messages and indications

| Status | Code | Indication | Reason | Solution |
|--|-----------|----------------------------------|--|--|
| Standby | | OFF | / | / |
| Running | | ON | / | / |
| Sensor failure of water temp. at bottom part of tank | P1 | ☆● (1 flash & 1 pause) | Short circuit of related sensor or connection failure | Check connection or replace sensor |
| Sensor failure of water temp. at upper part of tank | P2 | ☆☆● (2 flash & 1 pause) | Short circuit of related sensor or connection failure | Check connection or replace sensor |
| Sensor failure of evaporator coil temp. | P3 | ☆☆☆● (3 flash & 1 pause) | Short circuit of related sensor or connection failure | Check connection or replace sensor |
| Sensor failure of return gas temp. | P4 | ☆☆☆☆● (4 flash & 1 pause) | Short circuit of related sensor or connection failure | Check connection or replace sensor |
| Sensor failure of discharge gas temp. | P5 | ☆☆☆☆● (5 flash & 1 pause) | Short circuit of related sensor or connection failure | Check connection or replace sensor |
| High pressure failure | E1 | ☆☆☆☆☆☆● (6 flash & 1 pause) | System working pressure is too high | Check water temp. and water level in the tank |
| Low pressure failure | E2 | ☆☆☆☆☆☆● (7 flash & 1 pause) | System working pressure too low or capillary tube jammed | Lack of refrigerant. Check for refrigerant leakage or replace capillary tube/expansion valve |
| Overheat protection | E3 | ☆☆☆☆☆☆☆☆● (8 flash & 1 pause) | Water temperature too high | Disconnect electric heater |
| Discharge gas temp. protection | E4 | ☆☆☆☆☆☆☆☆● (9 flash & 1 pause) | Discharge gas too hot | Check if sufficient refrigerant, check water temp. and water level in the tank |
| Defrosting | | Continuous flashes without stop | / | / |
| Communication failure between controller and display | E8 | No flashes | No communication between display and controller | Check connection of display and controller |

2.6 Electrical diagram

