Operating Instructions
Heat Pump Control OTE 3 / OTE 4

Heat Pump Control
Heating/Cooling/Hot Water

Contents

1 General

The following manual is intended to be a support for the operation of OCHSNER heat pumps which are equipped with the **OCHSNER Tronic Easy** © (OTE) heat pump control.

The precautionary pointers below will be used in this document.

WARNING
Pointers which, if not heeded, can mean danger to life and limb, and can also lead to material damage. These pointers must be heeded without fail.

ATTENTION
Pointer which, if not heeded, can lead to an appliance malfunction and to material damage (to system components, building, ...). These pointers must be heeded without fail.

NOTE
Tips which are intended to aid the job in hand, or mean additional information for the user.

1.1 Proper use

The control has been designed so that it can be deployed in many different systems. It is thus possible that not all the functions described here are used in your system and accessories (such as sensors, room remote controller etc.) are not included in the scope of delivery.

The control may only be used for the following purposes:

- Energy processing via heat pumps and/or additional energy generators (oil/gas/electricity).
- Hot water heating for hot water storage tanks.
- Heating or cooling operation for direct circuits and/or mixing circuits.

Any further uses are not recognised as proper. OCHSNER accepts no liability for possible damage (non-compliance with instructions).

1.2 CE-Labelling

The product you have purchased conforms to the technical regulations valid at the time of manufacture, and is CE-conform.

2 Safety instructions

Read this manual carefully before you begin to adjust the heat pump.

Converting or altering the appliance is not allowed. Work on the appliance (repairs, alterations) may only be carried out by the manufacturer or by a specialist authorised by the manufacturer.

All circuit breakers in the heating system are to be turned off before any work is carried out on the terminal strips or electrical connections (wiring). The heating system consists of the control, the auxiliary modules and the components that are connected to the control (heat generator, pumps, safety thermostats, etc.)

ATTENTION Danger to life and limb!
Contact with the terminal strips, wires connected to them, or non-connected wires by persons or by means of electrically conductive materials is prohibited, as the terminal strips could be live (danger of contact with live circuit).

The commissioning as well as the servicing of the appliances may only be carried out by personnel which are authorised by OCHSNER.

The installation of the appliances and their electrical wiring may only be carried out by a specialist according to local regulations and codes of practice.

Protective functions for the heat pump can be activated by the control. However, as the control is not certified as a safety appliance, the protection against failure or damage to the heat pump must be adapted to the local instructions (for instance, by additional external switching of the safety appliances used.

The installation of the appliances and their electrical wiring may only be carried out by a specialist according to local regulations and codes of practice.

OCHSNER accepts no liability for possible damage due to improper use.

3 Description

3.1 System OTE

The OTE © heat pump control contains appliances for the automatic control of heat pump heating systems with cooling function as well as hot water heating. The standard system always comprises at least 2 components: OTE and operating facility.

Fig. 1: OTE control in the heat pump

A control unit can regulate the following system circuits/heat generators.

- 1x direct circuit (HEATING and/or COOLING)
- 1x mixed circuit (HEATING and/or COOLING)
- 1x directly heated hot water tank (with auxiliary heater)
- 1x heat pump (HEATING and COOLING)
- 1x additional heat generator (electrical auxiliary heater or release contact for external heat generators).

All types of heat pumps can be controlled (HEATING/COOLING):

- Brine/Water heat pumps
- Water/Water heat pumps
- Direct extraction/Water heat pumps
- Air/Water heat pumps with integrated de-icing

All settings required in the system can be made via the Master Control Panel (Master Control Panel can either be the basic appliance or the room terminal with touch display).

Fig. 2: Basic control panel

3.2 Further control elements

Further control elements are the room control or the room terminal with touch display. Room controls can be installed in any desired room. The room terminal with touch display is usable as either a room control or as a Master Control Panel with additional functions.

Fig. 3: Room controls

Fig. 4: Room terminal with touch display (optional)

4 System operation

The heat pump operation takes place by means of the basic operating panel. This is easily accessible in a plastic housing mounted on the heat pump. The user has **2 buttons** and an **illuminated display** at his disposal.

The heat pump has no separate main switch. In emergencies, the system **must** be switched off by means of the specified circuit breakers. The circuit breakers **must** be so reachable as to ensure a switching off at any time.

4.1 Main display

Current temperatures and operational conditions are shown in the main display.

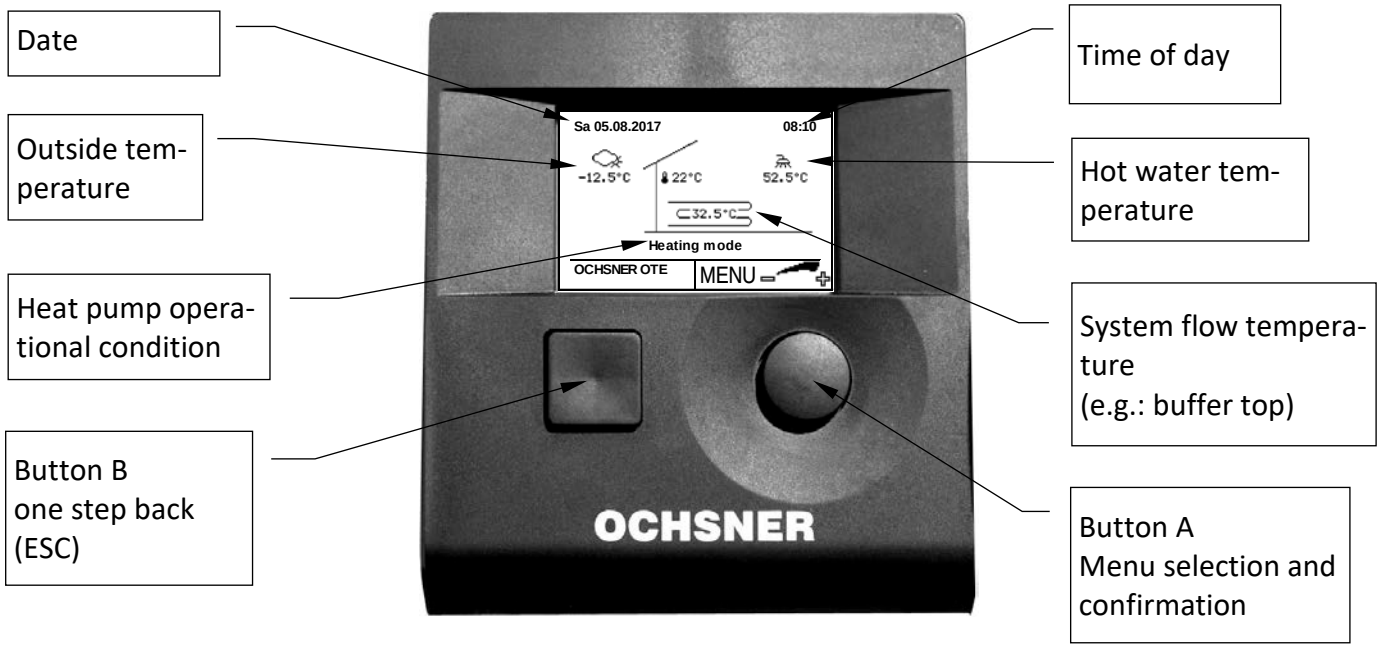


Fig. 5: Control unit MB64xx

Control using the control unit MB64xx in the heat pump's inside unit is described as follows. Separate operating instructions are available for the room control units and the room terminal.

4.2 Menus

By pressing button A, the main menu will be called up. The heating system is displayed in the main menu. Each heat user (*heating circuits, hot-water circuits*) and each heat generator (*heat pump, electric auxiliary heater, furnace, etc.*) has its own sub-menu.

Example main menu:

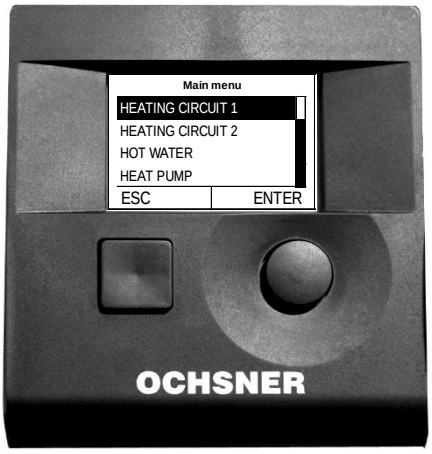


Fig. 6: Main menu

4.3 Password protection

The OTE is operated in differently accessible levels. This is to avoid inadvertent incorrect parameter settings.

The customer service and system partner levels are password protected.

Incorrect changes to settings in password protected levels can lead to damage to the system!

OCHSNER accepts no liability for this!

<u>ONLY</u> change settings on the level you are permitted!

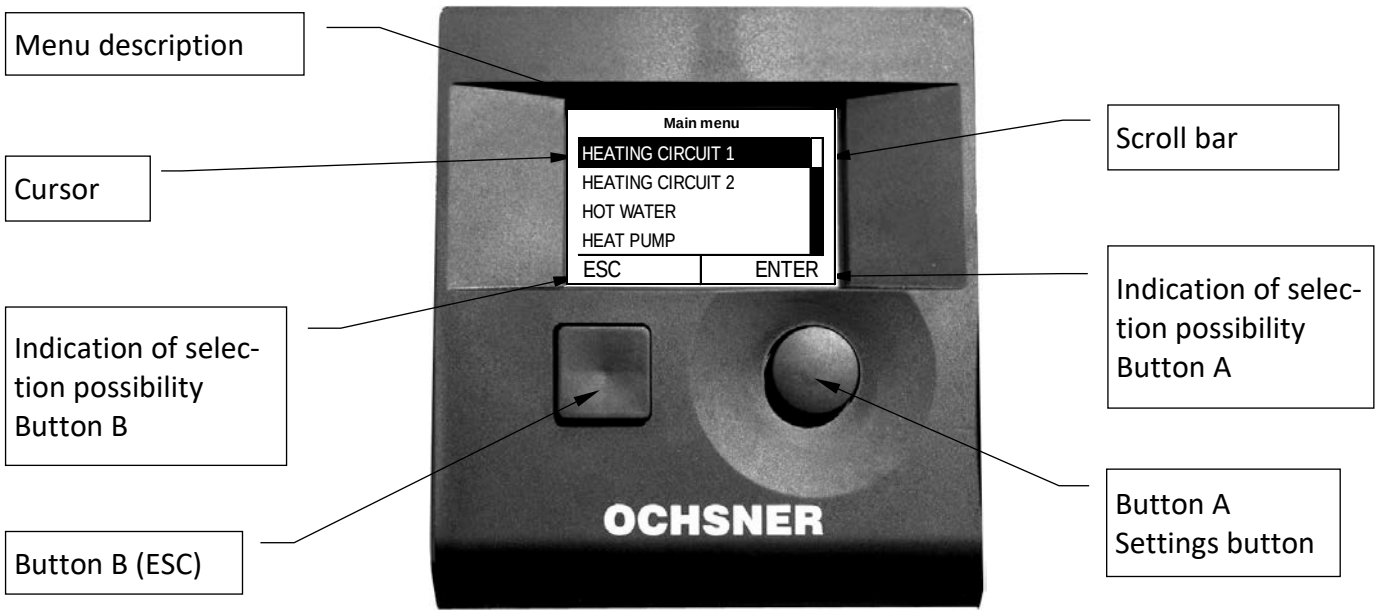


Fig. 7: Control unit MB64xx

5 Heating/Cooling (Heating circuits)

5.1 Room temperature too high, too low

With this function, the current room temperature set value can be adapted for individual requirements/circumstances quickly and simply.

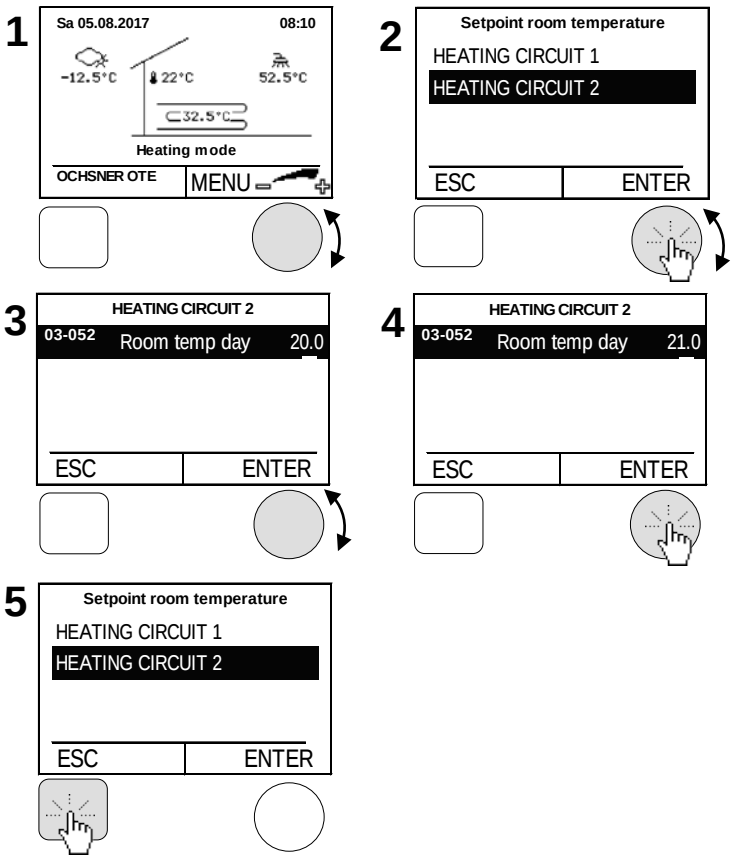
If, however, it is obvious that the room temperature, especially at higher or lower outside temperatures does not comply with your requirements, it is recommended to adjust the heating/cooling curve accordingly (see Section 5.8/5.10).

NOTE

Please observe: Any change in the room temperature set value will automatically shift the heating curve and change the heating limit (the same holds for cooling mode). Any change in the room temperature set value will also change the energy consumption of your heat pump system.

Settings procedure:

1. In the main display **turn** the button > the comfort menu appears
2. Select the desired heating circuit in the comfort menu by turning and **pressing** the button.
3. The room temperature set value can be adjusted by **turning** the adjusting button.
4. The setting is stored by **pressing** ENTER.
5. By **pressing** of the ESC – button you return to the main display.



5.2 Influence of room temperature

The set heating circuit flow temperature is always controlled according to the set heating/cooling curve (outside temperature dependent). If the system has a room control unit or a room terminal with touch display (which can measure the current room temperature in this heating circuit), the current room temperature can also be additionally used for calculating the set flow temperature. If you wish to use this function, please contact your OCHSNER system partner.

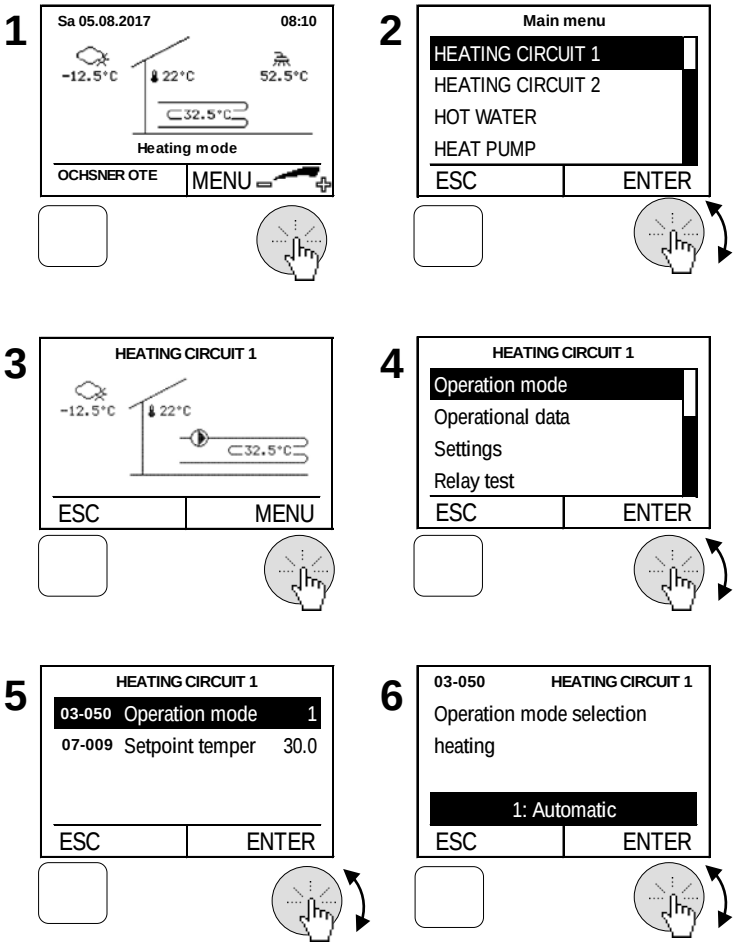
5.3 Operation selection heating circuit

The following modes of operation can be set:

Mode of operation	Description
0: Standby mode	Heating circuit OFF (frost protection function still active)
1: Automatic	Automatic control according to the time program set, automatic switch-over HEATING/COOLING **(recommended)**
4: Normal heating mode	Without timer program, the heater control always controls to room temperature set value.
5: Economy heating mode	Without timer program, the heater control always controls to set-back room temperature set value.
7: Manual heating mode	Heating to a permanent set flow value (07-009) Heating curve not active
8: Manual cooling mode	Heating to a permanent set flow value (07-009) Heating curve not active

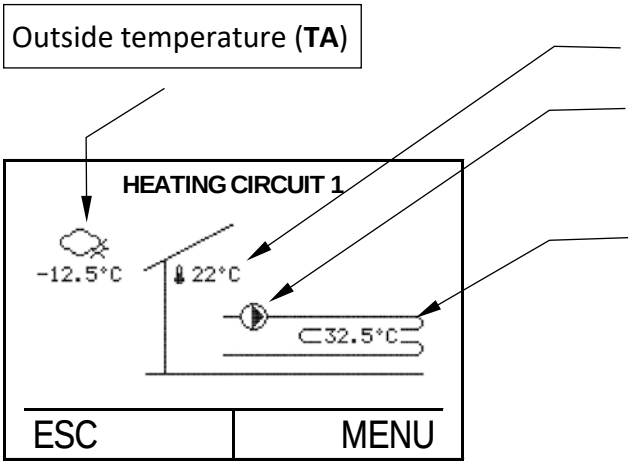
Settings procedure:

1. **Press** the adjustment button in the main display > the main menu appears
2. Select the Heating Circuit by **turning** the adjustment knob and confirm by **pressing** the knob.
3. In heating circuit temperature image, select the sub-menu by **pressing** the adjustment knob.
4. Confirm the ***operation mode*** by **pressing** the adjustment knob
5. Confirm the ***operation mode*** by **pressing** the adjustment knob
6. Set the operation mode by **turning** the adjustment knob and store this by **pressing**.



5.4 Temperature image

The temperature image gives an overview of the condition and temperatures of direct heating circuits and mixing circuits.



Outside temperature (**TA**)

Room temperature (**TI**) (only if there is a room unit)

Heating circuit pump (**HKP**) ON-OFF

Flow temperature
Depending on the type of system, the measured value will be taken from one of the following sensors:
- Buffer tank in system **(TPO)**
- no buffer (direct heating circuit (**TWV**))
- mixed heating circuit (**TMK**)

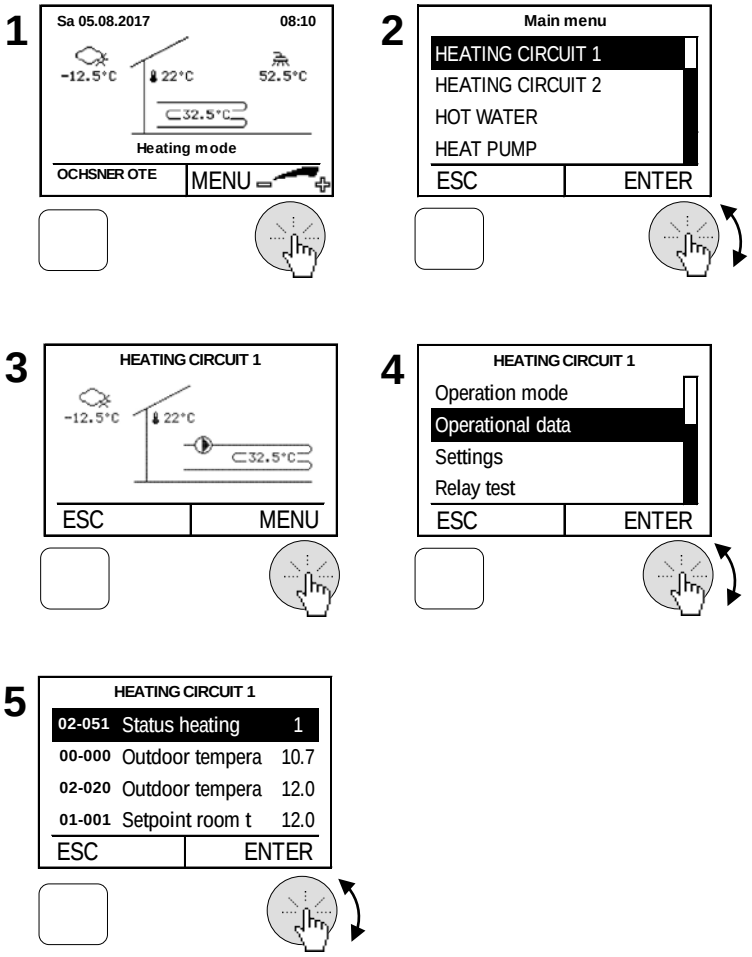
5.5 Operational data

Operational data	**Description**
02-051 Status heating circuit	
0 = switched off	(e.g. heating limit exceeded)
1 = normal heating mode	
3 = economy heating mode	Heating operation (reduced set value)
4 = frost protection mode	Control to "frost protection temperature" to avoid the heating circuit freezing up.
6 = hot water priority	(Heating circuit OFF during de-icing)
7 = holiday mode	
8 = party mode	
9 = normal cooling mode	
11 = economy cooling mode	Cooling operation (reduced set value)
13 = manual operation	
15 = party mode cooling	
16 = drying: heating phase	(floor screed heating programme active)
17 = drying: steady phase	(floor screed heating programme active)
18 = drying: cooling phase	(floor screed heating programme active)
19 = drying: final phase	(floor screed heating programme still active)
22 = cooling mode extern	(cooling to external set value input)
23 = heating mode extern	(heating to external set value input)
00-000 Outdoor temperature	Current outside temperature
02-020 Outdoor temperature average value	Mean outside temperature (relevant for heating/cooling limit)

01-001 Setpoint room temperature	Current room set value (dependent on operation selection/time program)
00-002 Actual heating circuit flow temperature	Current temperature in the heating circuit
01-002 Setpoint heating circuit flow temperature	Current flow temperature; is generated by control in order to reach the set room temperature

Example for heating circuit:

1. **Press** the adjustment knob in the main display > the main menu appears
2. Select the desired menu by **turning** the adjustment knob and confirm by **pressing** the knob.
3. The temperature image for the selected menu appears
4. The current values are displayed in the temperature image
   → see temperature images; select the menu by **pressing** the adjustment knob.
5. Select ***operational data*** or ***relay test*** in the heating circuit menu by **turning** the adjustment knob and confirm by **pressing** > call up data and return to main menu by repeated **pressing** of the ESC knob.



5.6 Relay test

The output status can be seen in the relay test.

Output status	Description
01-020 Heating circuit pump	0: Heating circuit pump OFF 1: Heating circuit pump ON
01-021 Mixing valve heating circuit	Mixer degree of operation: -100% Mixer closed 0% both outputs (15, 16) mixers shut off 100% Mixer open

5.7 Adjusting the heating curve

For weather dependent heating controls, the current set flow temperature is deduced by means of the current outside temperature. The heating curve is also used. The heating curve is adjusted using 3 parameters. Heating starts only when the mean outside temperature in the past 10 h (standard setting) is lower than the set heating limit (see Section 0)

Parameter	Description
03-001 Base point temperature heating curve	The desired flow temperature at 20°C outside temperature is set here.
03-012 Design outside temperature	The standardised lowest outside temperature in the climate region is set here.
03-013 Design supply temperature (VLT)	The desired flow temperature at standard outside temperature is set here.

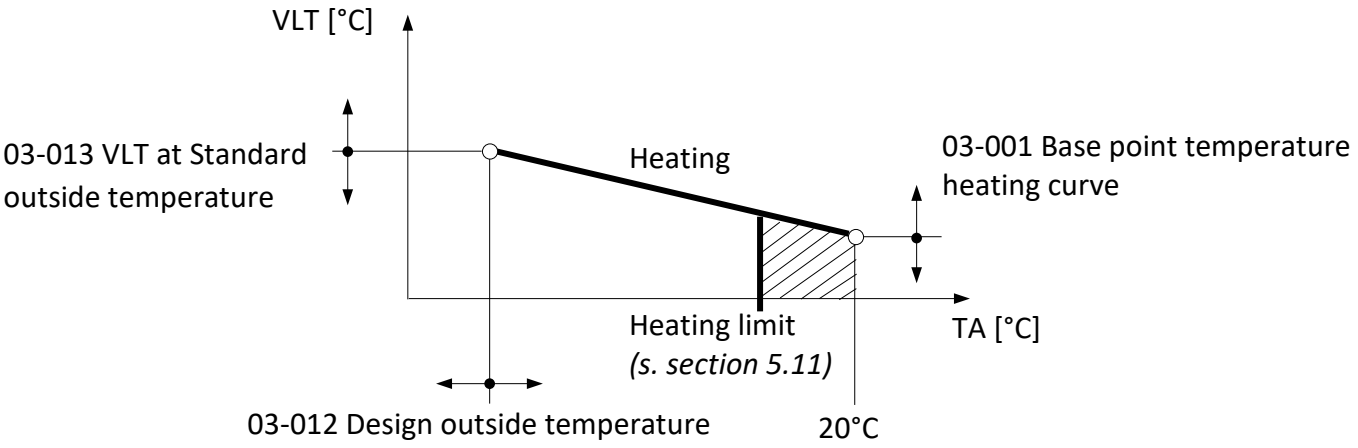


Fig. 8: Heating curve with setting parameters

If required, when the room temperature is too low or too high, the user can make small adjustments to the heating curve by means of the following table. The basic settings for the heating curve are to be carried out by a specialist engineer.
As changes to settings - due to the inertia of the heating system - only affect the room temperature time-delayed, it is recommended to only carry out one adjustment step per day.

Outside temperature by day	Room temperature	
	too cold	**too warm**
+ 5 °C to +15°C	Set base point temperature **(03-001) higher**	Set base point temperature **lower**
-15°C to + 5 °C	*Set VLT at standard temperature* **(03-013) higher**	*Set VLT at standard temperature* **lower**

Record the adjustments in the Table:

Date	Heating curve		Comments
	03-001	03-013	

Table 1: adjust heating curve

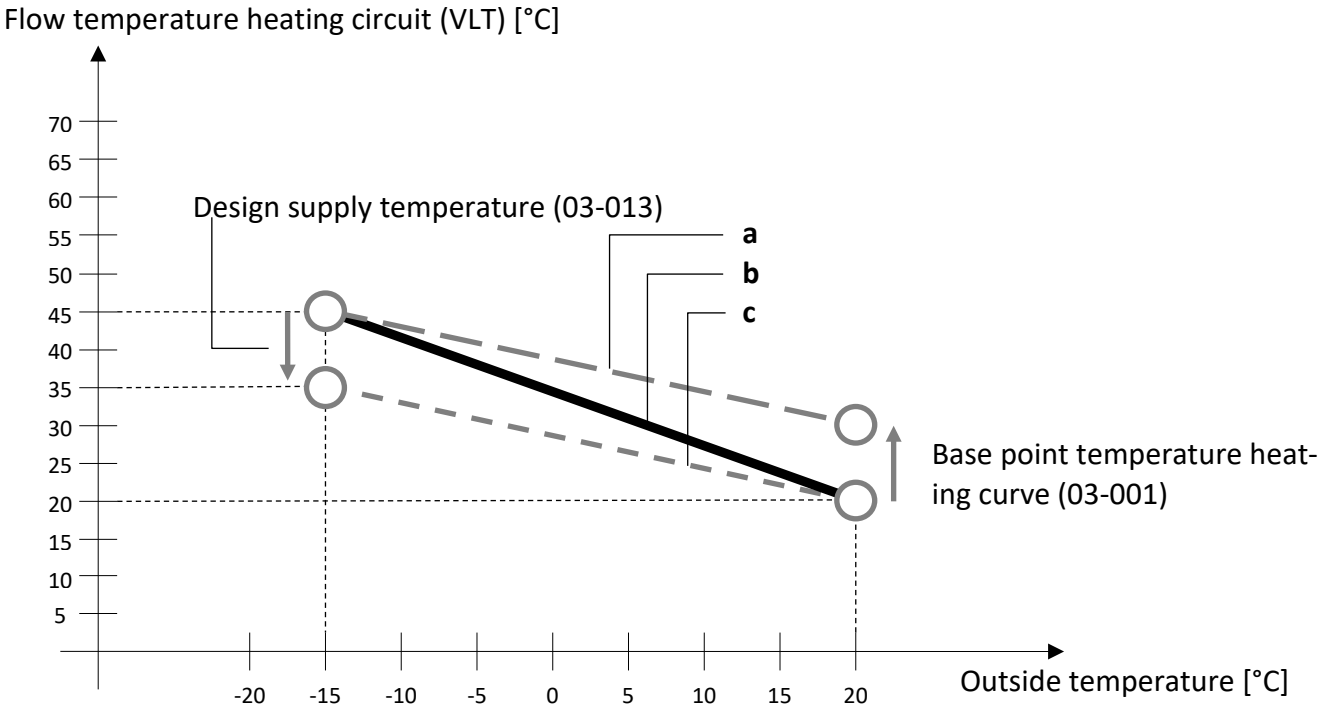


Fig. 9: Heating curve correction

a) Modified heating curve when the base point temperature (03-001) is set higher
b) Basic heating curve set by the heating engineer during commissioning
c) Modified heating curve when the base point temperature (03-013) is set lower

5.8 Set heating curve

Settings procedure:

1. **Press** the adjustment knob in the main display > the main menu appears

2. Select the Heating Circuit by **turning** the adjustment knob and confirm by **pressing** the knob. > the temperature image for the heating circuit appears.

3. In heating circuit temperature image, select the heating circuit menu by **pressing** the adjustment knob.

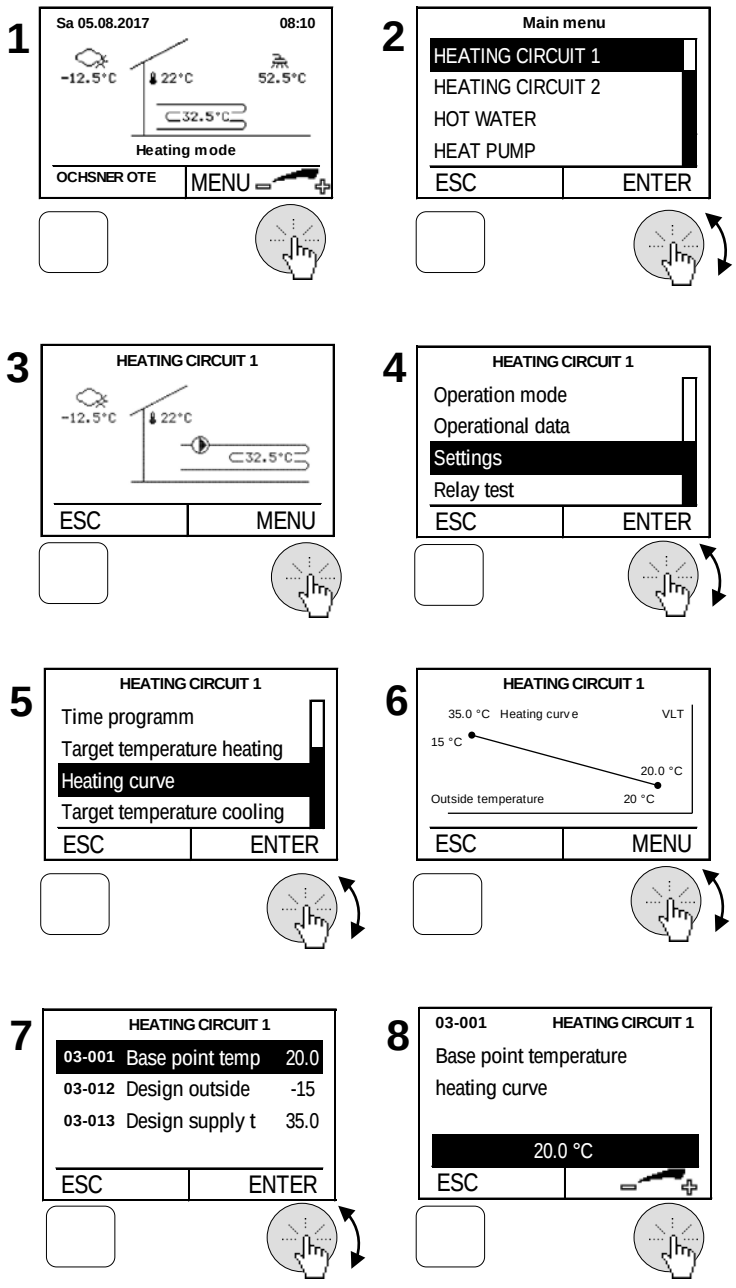
4. By **turning** the adjustment knob, select ***settings*** in the main menu and confirm this by **pressing** the knob.

5. By **turning** the adjustment knob, select ***heating curve*** and confirm this by **pressing** the knob.

6. In heating curve temperature image, select the heating curve menu by **pressing** the adjustment knob.

7. Select the ***Base point temperature heating curve*** by **pressing** the adjustment knob

8. Change/set the parameter by **turning** the settings knob and store by **pressing**, repeated **pressing** returns to main display.



All other heating curve parameters can be adjusted in similar fashion.

5.9 Cooling curve

For weather dependent controls, the current set flow temperature is deduced by means of the current outside temperature. The cooling curve is adjusted using 3 parameters.

Parameter	Description
03-043 Cooling setpoint temperature	The desired flow temperature at 20°C outside temperature is set here.
03-047 Design outside temperature cooling curve	The standardised outside temperature in the climate region is set here.
03-048 Design supply temperature cooling curve	The desired flow temperature at standard outside temperature is set here.

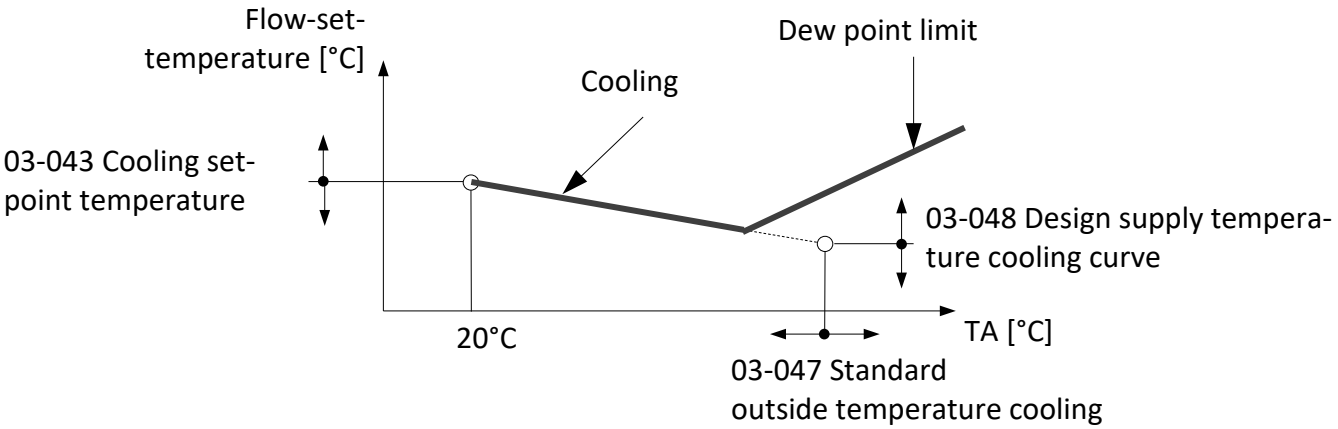


Fig. 10: Cooling curve with setting parameters

Dew point limit:

In the "cooling" mode, the minimum flow temperature is limited. The limit (dew point) is calculated by the control using the following values:

- Current room temperature:
- Current relative humidity in the room

If no room temperature can be measured, the current outside temperature is used. If no relative humidity can be measured, the dew point limit is calculated using a substitute value of 60% rel. (Room temperature and humidity can be measured by the room control units or by the room terminal with touch display).

Incorrect cooling curve settings can cause damage to the system (condense water build up). OCHSNER accepts no liability for this! Change the cooling curve settings only after consulting your contractual partner!

5.10 Setting the cooling curve

Settings procedure:

1. **Press** the adjustment knob in the main display > the main menu appears

2. Select the Cooling circuit by **turning** the adjustment knob and confirm by **pressing** the knob. > the temperature image for the heating circuit appears.

3. In heating circuit temperature image, select the heating circuit menu by **pressing** the adjustment knob.

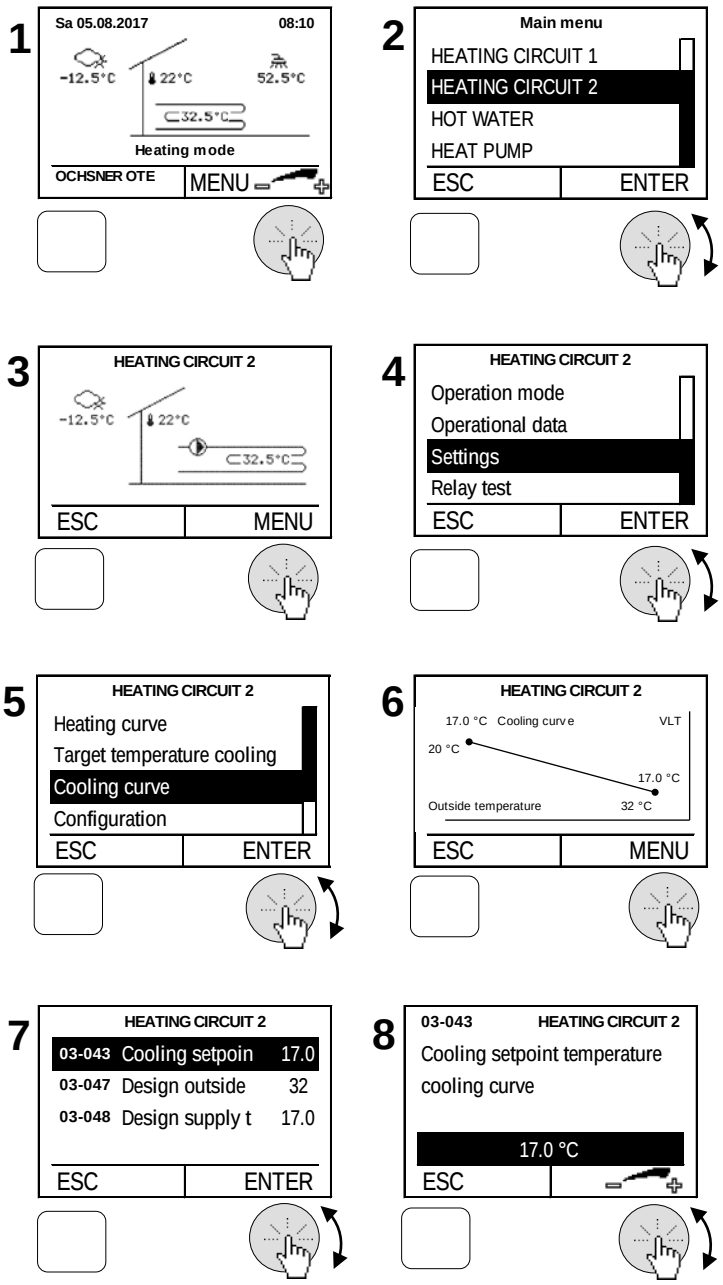
4. By **turning** the adjustment knob, select ***settings*** in the main menu and confirm this by **pressing** the knob.

5. By **turning** the adjustment knob, select ***cooling curve*** and confirm this by **pressing** the knob.

6. In cooling curve temperature image, select the cooling curve menu by **pressing** the adjustment knob.

7. Select the ***cooling setpoint temperature*** by **pressing** the adjustment knob

8. Change/adjust the parameter by **turning** the adjustment knob and store this by **pressing**. By repeated **pressing** of the ESC – knob you return to the main display.



All other cooling curve parameters can be adjusted in similar fashion.

5.11 Setting the heating limit

By setting the heating limit, the *mean* outside temperature at which the heating circuit's heating function is activated will be set. If the mean outside temperature is higher than the set value, the heating function will not be released.
Please observe: "A difference of at least 5K must be given between the heating and cooling limits!" Example setting: Heating limit =15°C and cooling limit =20°C
Settings procedure: see section 5.12

5.12 Set temperature for heating

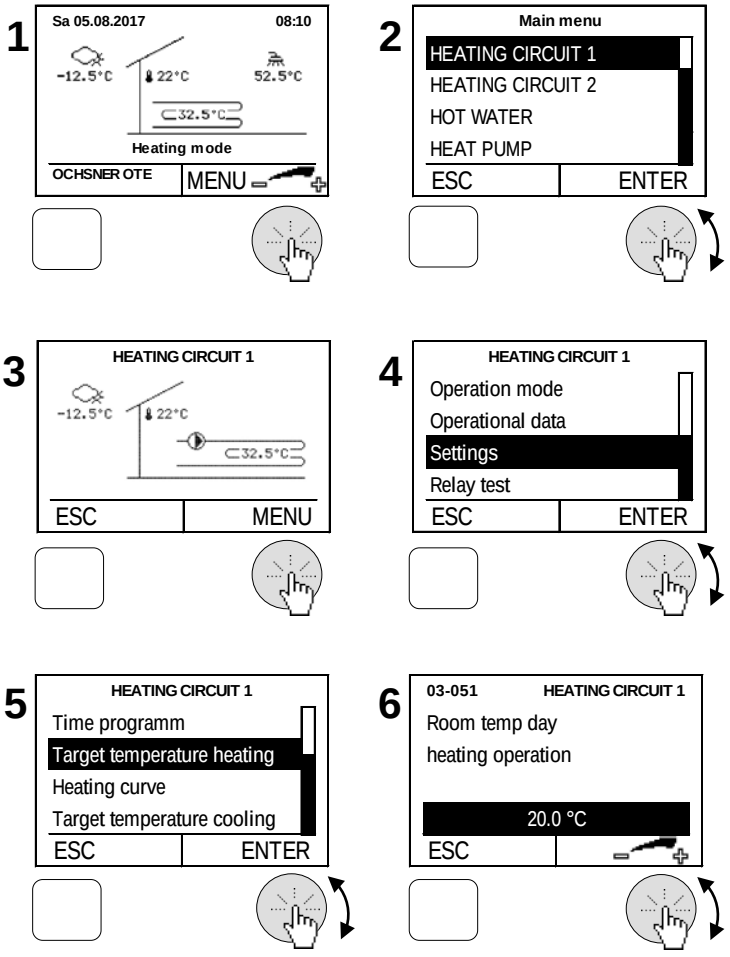
NOTE

Any change in the room temperature set value will automatically shift the heating curve and change the heating limit (the heating curve is related to a room temperature set value of 20°C).

Set values	Description
03-051 Room temperature day heating operation	The desired normal room temperature is set here. (see time program)
03-053 Room temperature night time heating operation	The desired set-back room temperature is set here. (see time program)
03-021 Heating limit outdoor temperature	The desired heating limit is set here.

Settings procedure:

1. **Press** the adjustment knob in the main display > the main menu appears
2. Select the Heating Circuit by **turning** the adjustment knob and confirm by **pressing** the knob. > the temperature image for the heating circuit appears.
3. In heating circuit temperature image, select the heating circuit menu by **pressing** the adjustment knob.
4. By **turning** the adjustment knob, select ***settings*** in the main menu and confirm this by **pressing** the knob.
5. By **turning** the adjustment knob, select ***target temperature heating*** and confirm this by **pressing** the knob.
6. Select the ***Room temp. day heating operation*** by **pressing** the adjustment knob
7. Change/adjust the room temperature by **turning** the adjustment knob and store this by **pressing**. > By repeated **pressing** of the ESC – knob you return to the main display.



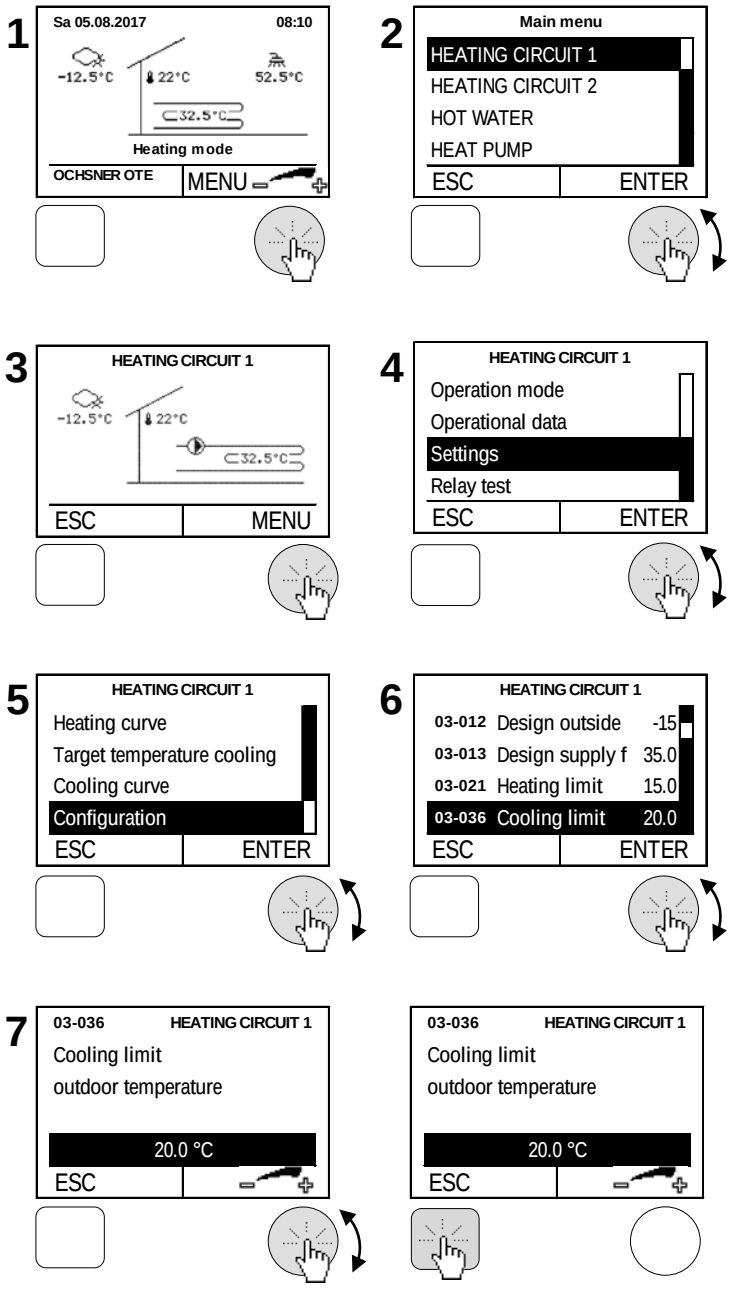
5.13 Setting the cooling limit

By setting the cooling limit, the *mean* outside temperature at which the heating circuit's cooling function is activated will be set. This is also valid when using the passive cooling function. If the mean outside temperature is lower than the set value, the cooling function will not be released.

Please observe: "A difference of at least 5K must be given between the heating and cooling limits!" Example setting: Heating limit =15°C and cooling limit =20°C

Settings procedure:

1. **Press** the adjustment knob in the main display > the main menu appears
2. Select the Heating Circuit by **turning** the adjustment knob and confirm by **pressing** the knob. > the temperature image for the heating circuit appears.
3. In heating circuit temperature image, select the heating circuit menu by **pressing** the adjustment knob.
4. By **turning** the adjustment knob, select ***settings*** in the main menu and confirm this by **pressing** the knob.
5. By **turning** the adjustment knob, select ***configuration*** and confirm this by **pressing** the knob.
6. Confirm the ***cooling limit*** by **pressing** the adjustment knob
7. Change/adjust the limiting cooling temperature by **turning** the adjustment knob and store this by **pressing**. > By repeated **pressing** of the ESC – knob you return to the main display.



5.14 Set temperature for cooling

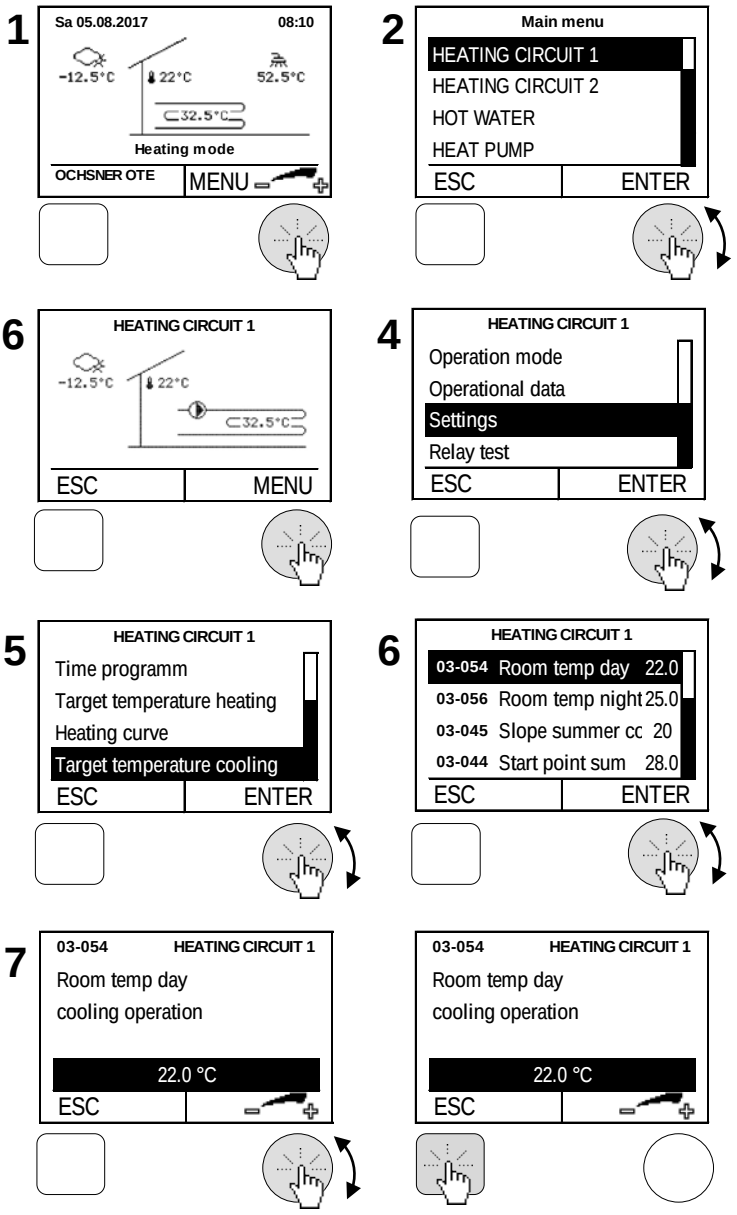
NOTES:

- Any change in the room temperature set value will automatically shift the cooling curve and change the cooling limit (the cooling curve is related to a room temperature set value of 22°C).
- Every heating circuit can also cool, provided it was parametered during commissioning.

Set values	Description
03-054 Room temp day cooling operation	The desired normal room temperature is set here. (see time program)
03-056 Room temp night cooling operation	The desired set-back room temperature is set here. (see time program)

Settings procedure:

1. **Press** the adjustment knob in the main display > the main menu appears
2. Select the Heating Circuit by **turning** the adjustment knob and confirm by **pressing** the knob. > the temperature image for the heating circuit appears.
3. In heating circuit temperature image, select the heating circuit menu by **pressing** the adjustment knob.
4. By **turning** the adjustment knob, select ***settings*** in the main menu and confirm this by **pressing** the knob.
5. By **turning** the adjustment knob, select ***target temperature cooling*** and confirm this by **pressing** the knob.
6. Select the ***Room temp. day cooling operation*** by **pressing** the adjustment knob
7. Change/adjust the room temperature by **turning** the adjustment knob and store this by **pressing**. > By repeated **pressing** of the ESC – knob you return to the main display.



5.15 Set temperature manual operation

For the "Manual operation heating" or "Manual operation cooling" selection, a fixed set temperature is used for the control. To activate the manual operation, see Section 5.3.

ATTENTION
The heating and cooling limits are not active in this mode!
Control is to the set temperature, independent of the current outside temperature.

Settings procedure:

1. **Press** the adjustment knob in the main display > the main menu appears

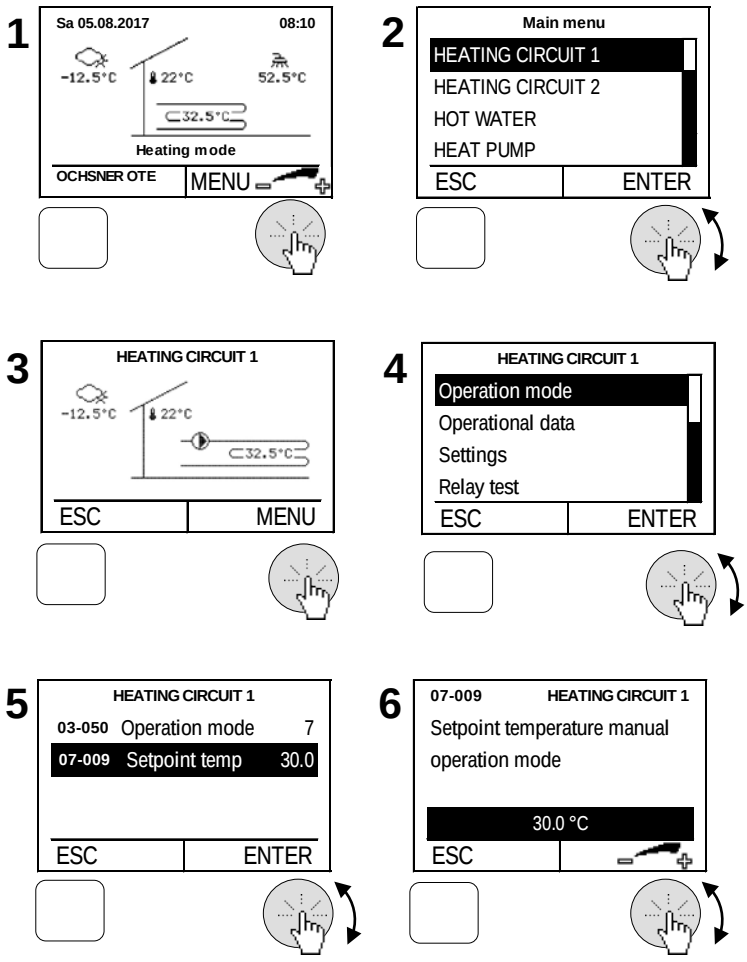
2. Select the Heating Circuit by **turning** the adjustment knob and confirm by **pressing** the knob. > the temperature image for the heating circuit appears.
All heating circuits are always displayed in the main menu.

3. In heating circuit temperature image, select the heating circuit menu by **pressing** the adjustment knob.

4. ***Operation mode selection 7*** in the heating circuit menu: Select ***Manual heating mode*** and confirm by **pressing** the adjustment knob

5. By **turning** the adjustment knob, select ***Setpoint temperature manual operation mode*** and confirm this by **pressing** the knob.

6. Change/adjust the parameter by **turning** the adjustment knob and store this by **pressing**. By repeated **pressing** of the ESC – knob you return to the main display.



6 Hot water circuit

Hot water heating has priority over heating/cooling. During hot water heating - depending on the type of system/control setting - the heating circuit pumps are switched off.

6.1 Operation selection

The following modes of operation can be set:

Operation selection	Description
0: No charging	No hot water charging → the frost protection temperature for hot water (10°C) is active.
1: Automatic	The hot water charging takes place via the time program for hot water/anti-legionella function
2: Normal daytime temperature	Hot water charging always takes place according to the standard temperature (no consideration of the time program).

Settings procedure:

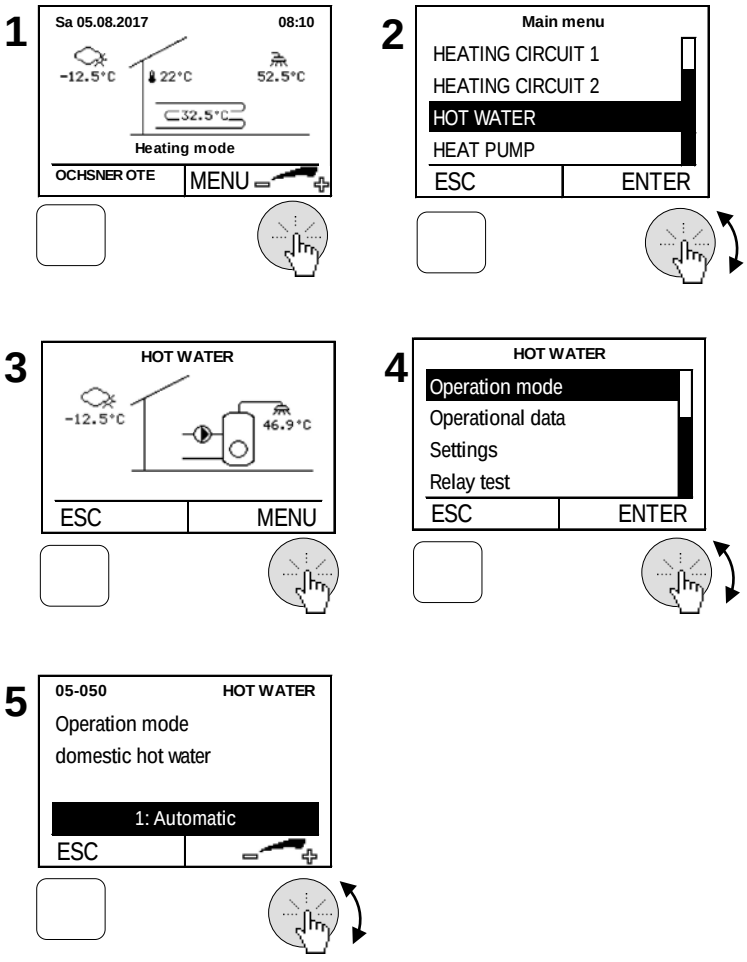
1. **Press** the adjustment knob in the main display > the main menu appears

2. Select the Hot Water Circuit by **turning** the adjustment knob and confirm by **pressing** the knob. > the temperature image for the hot water circuit appears.

3. In hot water circuit temperature image, select the hot water circuit menu by **pressing** the adjustment knob.

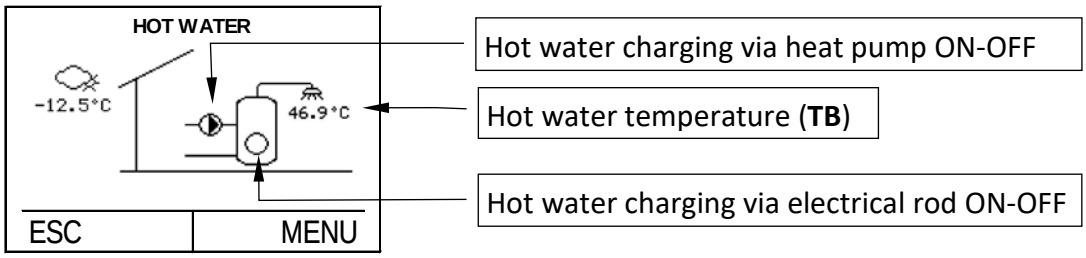
4. By **turning** the adjustment knob, select ***Operation mode*** in the hot water menu and confirm this by **pressing** the knob.

5. Change/adjust the operation selection by **turning** the adjustment knob and store this by **pressing**.



6.2 Temperature image

The hot water circuit temperature image gives an overview of the conditions and temperatures.



6.3 Operational data

The operational data can be seen in the hot water menu:

Operational data	Description
02-052 Status Hot Water	
0 = Switched off	The hot water circuit is switched off. → the set value has been reached
1 = Normal charge mode	Charge to "05-051 normal hot water temperature"
2 = Comfort charge mode	Charging to "05-004 Legionella protection temperature°
5 = Fault	Hot water circuit malfunctioning
8 = Economy charge mode	Charge to "05-086 energy saving hot water temperature"
10 = Electric recharging	Charging via hot water auxiliary heater
11 = Charge aborted	Hot water charging terminated New start after temperature further reduced.
00-004 Actual temperature hot water (TB)	The current hot water temperature is displayed.
01-004 Hot water setpoint temperature	Current hot water set value is generated by the control and is dependent on the operation selection/time program.

6.4 Relay test

The output status can be seen in the relay test.

Output status	Description
01-054 Hot water charge electro	0: Electro heating hot water OFF 1: Electro heating hot water ON
01-066 Switchover valve/ charge pump hot water	0: Hot water charging with heat pump OFF 1: Hot water charging with heat pump ON

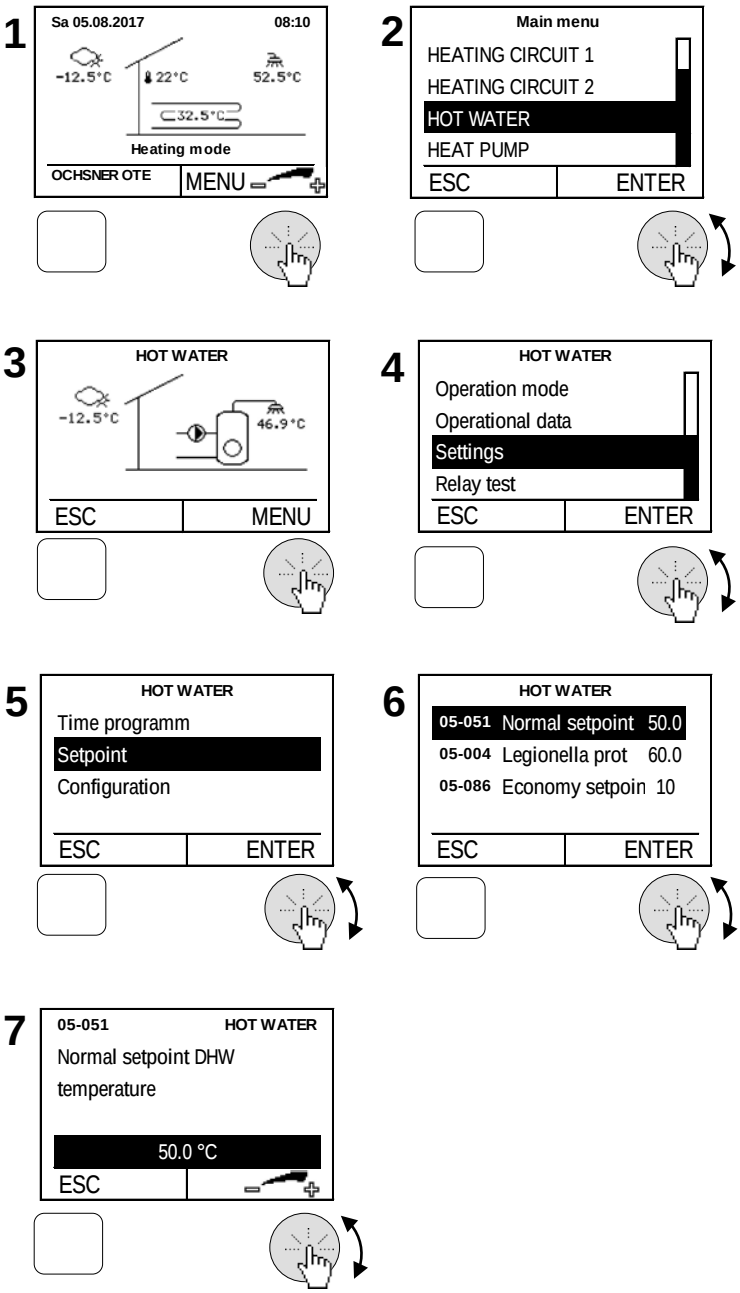
6.5 Set hot water temperature

3 set temperatures can be set for each hot water circuit.

Set values	Description
05-051 Normal setpoint DHW temperature	The desired hot water temperature is set here.
05-004 Legionella protection temperature	The legionella protection temperature is set here.
05-086 Economy setpoint DHW temperature	The hot water set-back temperature is set here.

Settings procedure:

1. **Press** the adjustment knob in the main display > the main menu appears
2. Select the Hot water circuit in the main menu
3. In hot water circuit temperature image, select the hot water circuit menu by **pressing** the adjustment knob.
4. By **turning** the adjustment knob, select ***settings*** in the main menu and confirm this by **pressing** the knob.
5. Select ***Setpoint*** and confirm by **pressing** the adjustment knob
6. Select ***Normal setpoint DHW temperature*** by pressing the settings knob and calibrate.
7. Change/adjust the parameter by **turning** the adjustment knob and store this by **pressing**. By repeated pressing of the ESC – knob you return to the main display.



7 Time program

7.1 Settings procedure

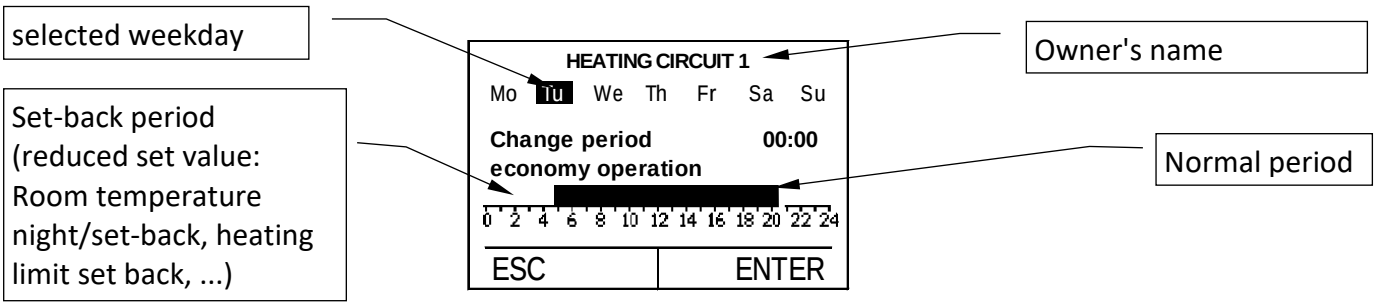
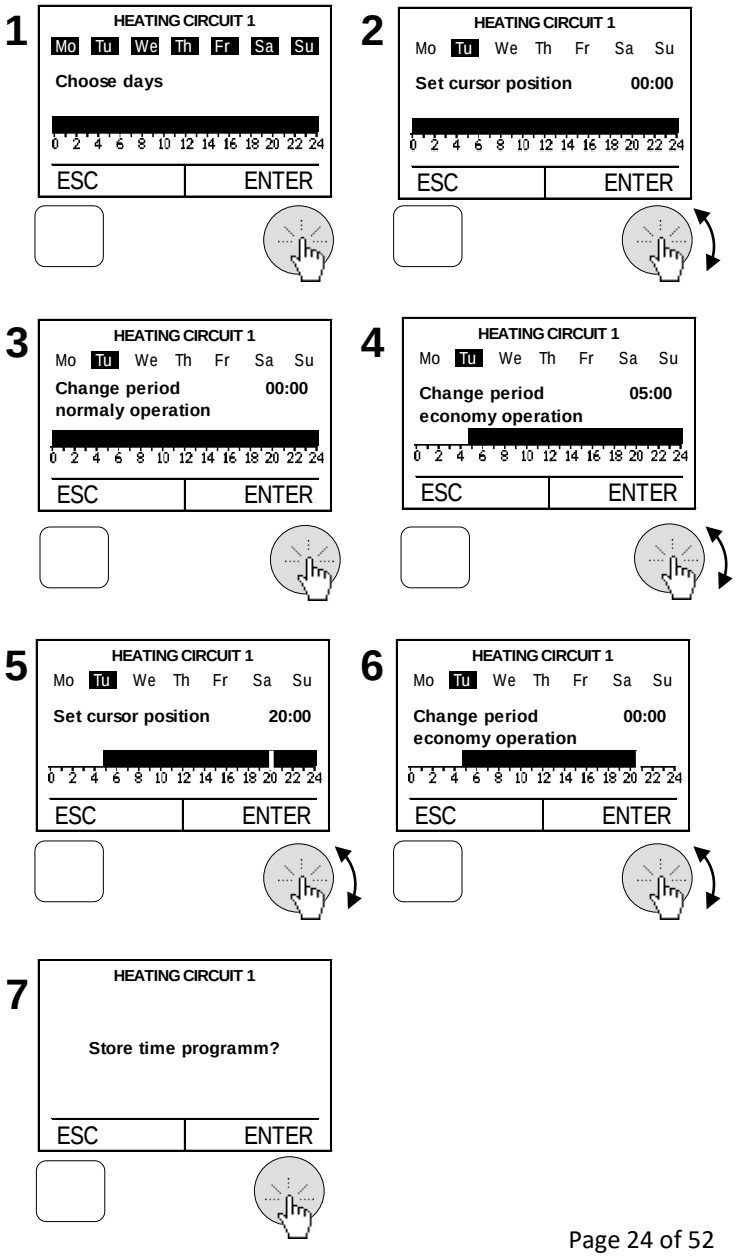


Fig. 11: Time program display

Changing the time program:

Example: Set-back period setting from 20:00 to 5:00.
The following Sections (7.2, 7.3) show where to find each time program in the menu.

1. Select the day by **turning** the settings knob Each day of the week can be separately selected, or all the days of the week at one time.
2. Position the cursor by **turning** the adjustment knob and confirm this by **pressing** the knob
3. Select the period to be changed (normal or set-back operation) by **pressing** the adjustment knob.
4. Change/adjust the period by **turning** the adjustment knob and store this by **pressing**.
5. Position the cursor once again by **turning** the knob and repeat steps 3 - 4.
6. Confirm the setting by **pressing** the adjustment knob Return by **pressing** the ESC knob. If required, select the next block.
7. Store the time program change/setting for all the days by **pressing** the adjustment knob.

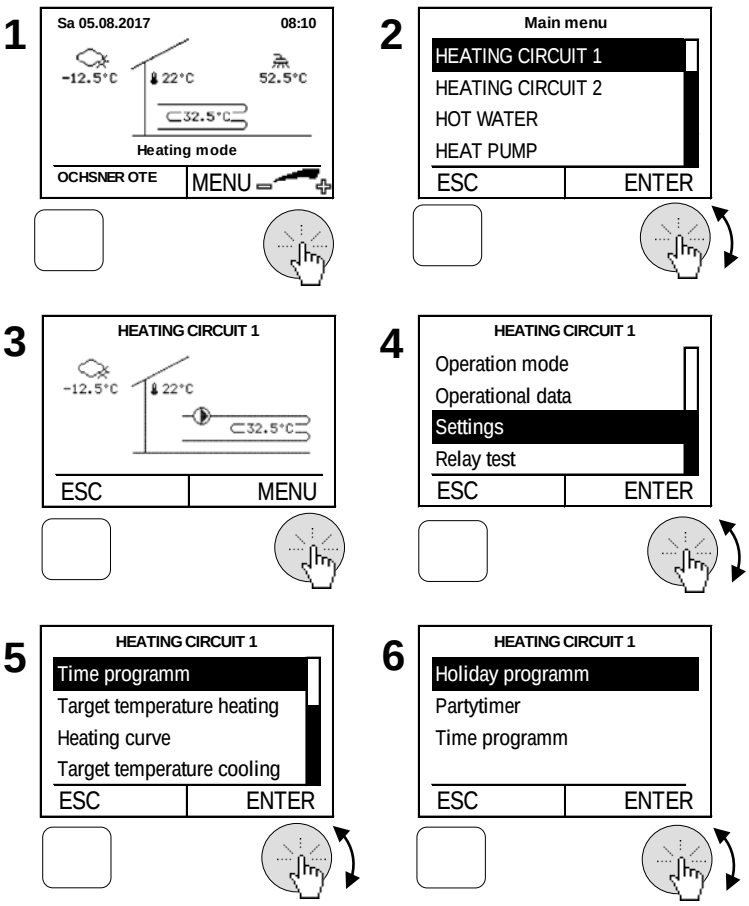


7.2 Time program for heating

Time program Heating	Description
Holiday program	With this function, up to 7 time periods in which the these heating circuits are switched off can be programmed. (During this period, the system is controlled to frost protection temperature to avoid the heating circuit freezing). You can enter the holiday programme's start and end points. The holiday programme starts and ends at 24:00 for each set day.
Party timer	By entering the time in minutes, the system can change to normal operation during the set-back period.
Time program	The time at which the heating system in normal or set-back temperature runs can be defined in the week time program. (Set temperature, see Section 5.12/5.14)

Settings procedure:

1. **Press** the adjustment knob in the main display > the main menu appears
2. Select the Heating Circuit by **turning** the adjustment knob and confirm by **pressing** the knob. > the temperature image for the heating circuit appears.
3. In heating circuit temperature image, select the heating circuit menu by **pressing** the adjustment knob.
4. By **turning** the adjustment knob, select ***Settings*** in the heating circuit menu and confirm this by **pressing** the knob.
5. By **turning** the adjustment knob, select ***time program*** and confirm this by **pressing** the knob.
6. By **turning** the adjustment knob, select the desired ***time program*** and confirm this by **pressing** the knob. > Adjust the time program according to the description (see Section 7.1)



7.3 Time program for hot water

Time program Hot water	Description
Hot water time program	The time of day at which the hot water charging at normal or energy saving temperature takes place is set here.
Hot water anti Legionella time program	The time at which the increased Legionella protection temperature is active is set here. (Depending on the type of system, the heating to Legionella protection temperature will (partly) done by the auxiliary heater - but only when the heat pump has switched off via the max. flow temperature limiter - i.e. a higher temperature cannot be reached.)

Settings procedure:

1. **Press** the adjustment knob in the main display > the main menu appears

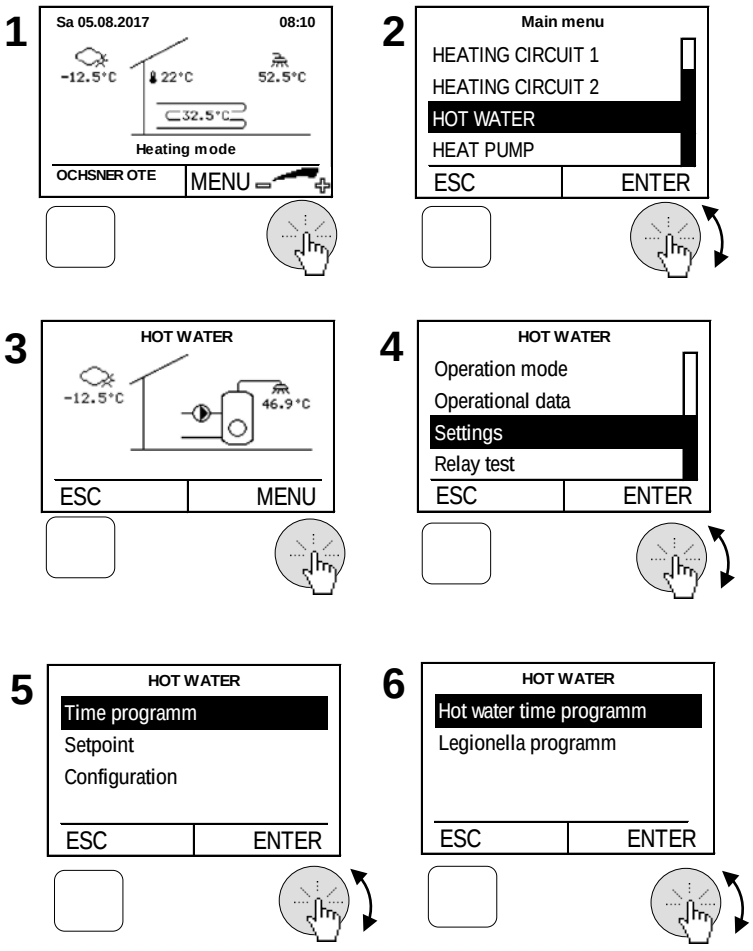
2. Select the Hot Water Circuit by **turning** the adjustment knob and confirm by **pressing** the knob. > the temperature image for the hot water circuit appears.

3. In hot water temperature image, select the hot water menu by **pressing** the adjustment knob.

4. By **turning** the adjustment knob, select ***Settings*** in the hot water menu and confirm this by **pressing** the knob.

5. By **turning** the adjustment knob, select ***time program*** and confirm this by **pressing** the knob.

7. By **turning** the adjustment knob, select the desired ***time program*** and confirm this by **pressing** the knob. > Adjust the time program according to the description (see Section 7.1)



8 Heat pump

The following modes of operation can be set:

Operation selection heat pump	**Description**
0: Off	The heat pump is switched off. **NOTE:** Only switch the heat pump off in emergencies! (If the heat pump operation selection = 0: is set, the next heat generator will be called on if heat is required. That could also be an electro auxiliary heater.)
1: Automatic	The heat pump operates in automatic mode. Dependent on the heat demand, the heat pump will be automatically switched on and off. *(recommended setting)*

Settings procedure:

1. **Press** the adjustment knob in the main display > the main menu appears

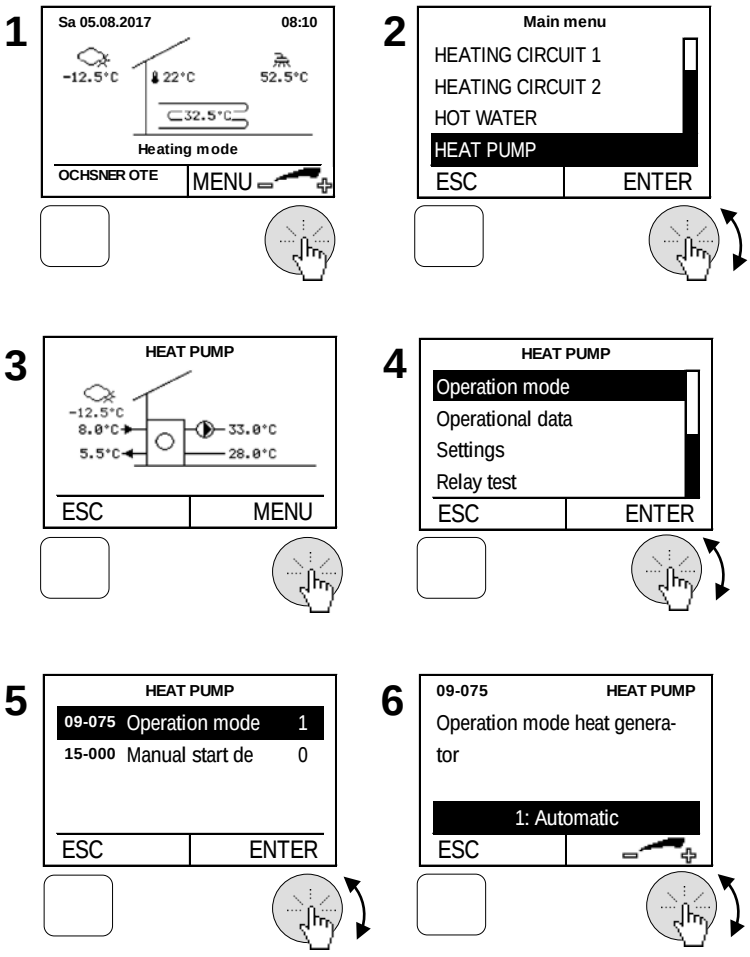
2. Select the heat pump by **turning** the adjustment knob and confirm by **pressing** the knob. > the temperature image for the heat pump appears.

3. In heat pump temperature image, select the heat pump menu by **pressing** the adjustment knob.

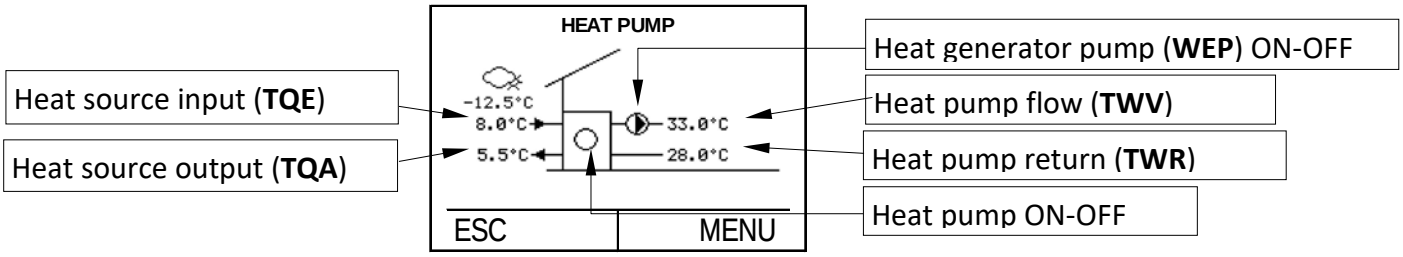
4. By **turning** the adjustment knob, select ***Operation mode selection*** in the heat pump menu and confirm this by **pressing** the knob.

5. Confirm the ***Operation mode heat pump*** by **pressing** the adjustment knob

6. Change/set the operation mode by **turning** the settings knob and store by **pressing**, repeated **pressing** of the ESC knob returns to main display.



8.1 Temperature image



8.2 Operational data

The operational data can be seen in the heat pump menu:

Operational data	Description
02-053 Status heat generator	
0 = Switched off	Heat pump switched off
1 = Heating mode	Heat pump in heating or hot water operation
2 = Lead time heating mode	
3 = Externally blocked	Utility switch off (EVU contact)
4 = Cooling mode	Heat pump in cooling operation
5 = Lead time cooling mode	
6 = Lead time de-icing mode	
7 = De-icing mode	
9 = Drain off	The heat pump is in draining mode after de-icing
10 = De-icing blocking time	De-icing criteria fulfilled, de-icing blocking period not yet over.
11 = De-icing pre heat	
12 = De-icing 1	
13 = De-icing 2	
14 = De-icing 3	
15 = Alarm	see Section 16.1 ALARM
16 = Malfunction	see Section 16.3 ERROR
17 = Blocked	see Section 16.6 BLOCKING
21 = TWVmax switch-off	Flow temperature too high or too low
22 = TWVset switch-off	Switching hysteresis in heat pump manual operation exceeded
23 = TQEmax switch-off	Heat source input temperature too high
24 = TQAmin switch-off	Heat source outlet temperature to low (frost protection)
26 = Bivalent switch-off	Blocking due to bivalence temperature
28 = Minimum off time	Demand for heat, but stand-still period active
29 = Minimum run time	No more heat demand, minimum running time active
36 = Passive cooling	Only possible for heat pumps with heat source water or brine. The carrier temperature for cooling is called on without switching on the compressor.
37 = Heating mode requested	Heat pump waits for report heating
38 = Cooling mode requested	Heat pump waits for report cooling
00-007 TWV temperature (flow	Heat pump flow temperature (sensor TWV)

temp.)	
00-008 TWR temperature (HP return temp.)	Heat pump return temperature (sensor TWR)
00-070 TQA heat source output temp.	Heat source outlet temperature (sensor TQA), for Air/Water heat pumps - evaporator temperature 2
00-071 TQE heat source input temp.	Heat source input temperature (sensor TQE), for Air/Water heat pumps - evaporator temperature 1
00-076 Actual compressor rotational speed (RPS)	The current compressor speed is shown here (not accessible with all heat pumps)
00-088 Flow temperature passive cooling (TPV)	Flow temperature for passive cooling
02-080 Operating cycles	Display of the absolute heat pump switching cycles
02-081 Operating hours	Display of the absolute heat pump operating hours
21-002 Flow rate heat sink	Current flow rate in the heat use system
21-090 Flow rate heat source	Current flow rate in the heat source system (only for heat source brine or water)
23-001 Heating energy	Display of the absolute used energy in kWh
23-004 De-icing energy	Display of the absolute used energy in kWh
23-005 Cooling energy	Display of the absolute used energy in kWh
23-066 Hot water energy	Display of the absolute used energy in kWh
23-010 Heating energy	Display of the absolute used energy in MWh
23-011 De-icing energy	Display of the absolute used energy in MWh
23-012 Cooling energy	Display of the absolute used energy in MWh
23-013 Hot water energy	Display of the absolute used energy in MWh

8.3 Relay test

The output status can be seen in the relay test.

Output status	**Description**
01-022 Heat generator pump	0 … 100%
01-076 Setpoint rotational speed compressor	0 … 100%
01-077 Heat source pump/fan	0 … 100%

8.4 De-icing start manual

For heat pumps with air as the heat source (Air/Water heat pump), a de-icing fixture is integrated which de-ices the evaporator at low outside temperatures. This function can be started manually if the evaporator is very iced up.

ONLY start this function after a de-icing malfunction or when instructed by authorised personnel. Frequent starting can lead to damage to the heat pump function.

Settings procedure:

1. **Press** the adjustment knob in the main display > the main menu appears

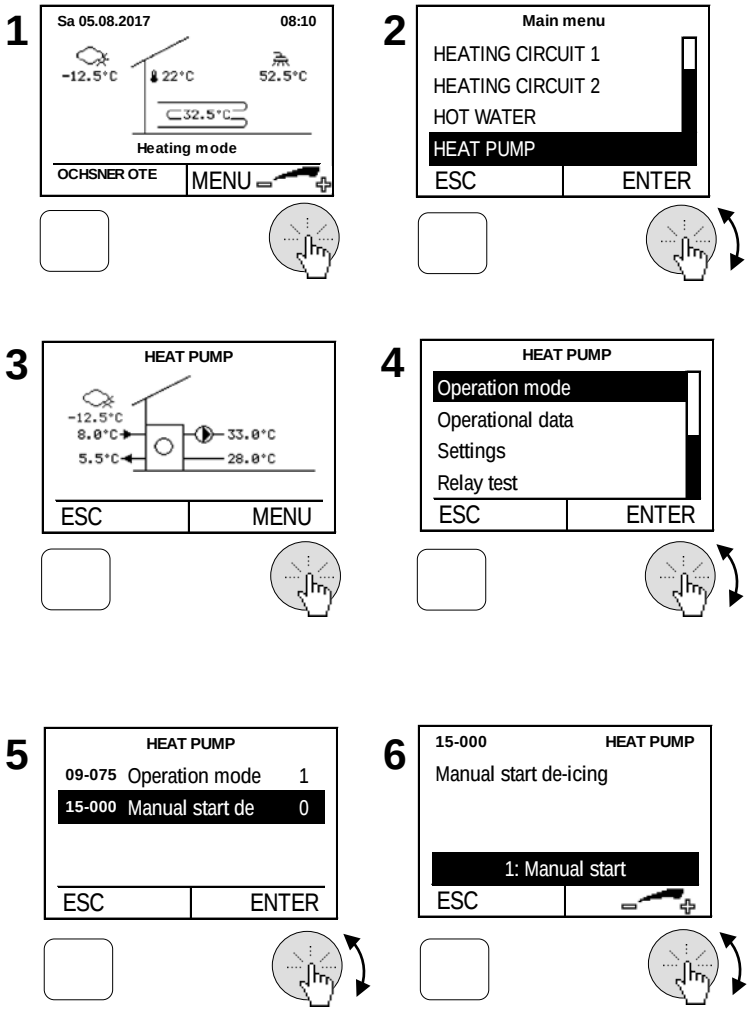
2. Select the heat pump by **turning** the adjustment knob and confirm by **pressing** the knob. > the temperature image for the heat pump appears.

3. In heat pump temperature image, select the heat pump menu by **pressing** the adjustment knob.

4. By **turning** the adjustment knob, select ***Operation mode selection*** in the heat pump menu and confirm this by **pressing** the knob.

5. By **turning** the adjustment knob, select ***Manual start de-icing*** and confirm this by **pressing** the knob.

6. Set the de-icing mode by **turning** the settings knob and store by **pressing**, > repeated **pressing** of the ESC knob returns to main display.



9 Auxiliary heater

An auxiliary heater (electro, oil or gas furnace) can be integrated into the heat pump system. The auxiliary heater operation mode is set as follows:

Operation selection	**Description**
0: Off	Auxiliary heater OFF (Auxiliary heater is then not available for charging support (apart from frost protection/de-icing support))
1: Automatic	The auxiliary heater operates in automatic mode. Dependent on the heat demand, the heat pump will be automatically switched on and off. *(recommended setting, switch in occurs only when the heat pump cannot manage alone)*
4: Manual mode heating	Auxiliary heater heats to a fixed flow set temperature (09-020). **Attention:** This setting can lead to increased heating costs and should as a rule only be used for short periods for commissioning/testing purposes.

Settings procedure:

1. **Press** the adjustment knob in the main display > the main menu appears

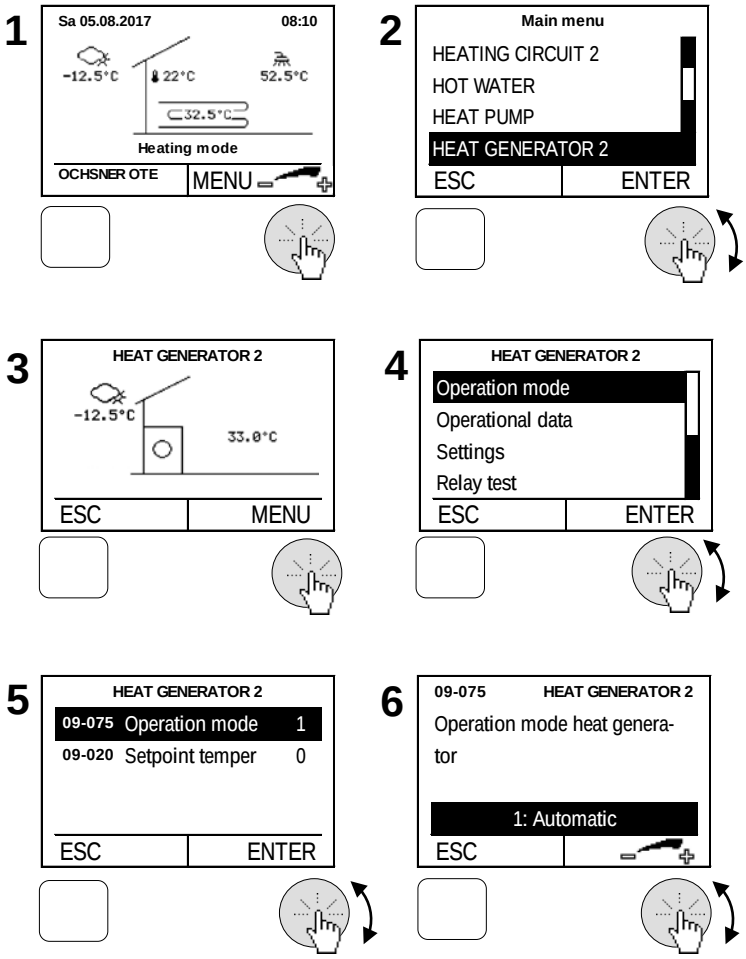
2. Select the auxiliary heater by **turning** the adjustment knob and confirm by **pressing** the knob. > the temperature image for the auxiliary heater appears.

3. In auxiliary heater temperature image, select the auxiliary heater menu by **pressing** the adjustment knob.

4. By **turning** the adjustment knob, select ***Operation mode selection*** in the auxiliary heater menu and confirm this by **pressing** the knob.

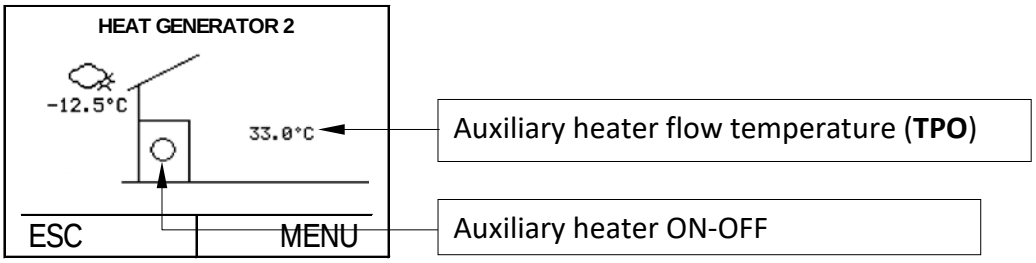
5. Confirm the ***operation mode heat generator*** by **pressing** the adjustment knob

6. Set the operation mode by **turning** the settings knob and store by **pressing**, > repeated **pressing** of the ESC knob returns to main display.



9.1 Temperature image

The auxiliary heater temperature image gives an overview of the conditions and temperatures.



9.2 Operational data

Operational data	**Description**
02-053 Status heat generator	
1 = Heating mode	Auxiliary heater switched on
2 = Lead time heating mode	Switch off via utility
3 = Externally blocked	
21 = TWVmax switch-off	Flow temperature too high TWV
22 = TWVset switch-off	Switching hysteresis in manual operation exceeded
26 = Bivalent switch-off	Auxiliary heater in demand, is blocked however
28 = Minimum off time	Demand for heat, but stand-still period active
29 = Minimum run time	No more heat demand, minimum running time active
00-007 TWV temperature (flow temp.)	Temperature at the nearest auxiliary heater sensor (buffer top (TPO) or in flow (TWV)
02-080 Operating cycles	Display of the absolute auxiliary heater switching cycles
02-081 Operating hours	Display of the absolute auxiliary heater operating hours
23-001 Heating energy kWh	
23-010 Heating energy MWh	

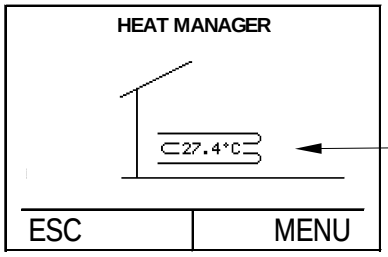
9.3 Relay test

The output status can be seen in the relay test.

Output status	**Description**
01-040 Auxiliary heating	0 … 100%

10 Heat distribution / heat manager

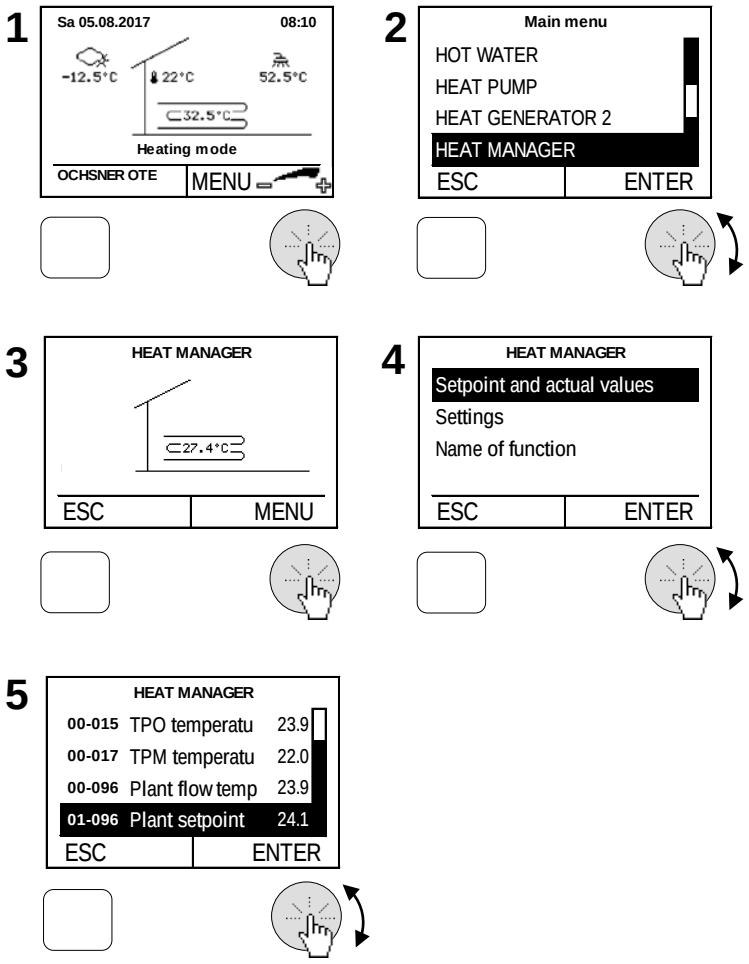
The temperature image of the heat distributor gives information on the current system flow temperature.



System flow temperature
(**TPO**) with buffer/ header tank
(**TWV**) without buffer tank and 1xheating circuit

System temperature call up:

1. **Press** the adjustment knob in the main display > the main menu appears
2. Select the desired menu by **turning** the adjustment knob and confirm by **pressing** the knob. The temperature image for the selected menu appears
3. The current values are displayed in the temperature image
   → see temperature images; select the menu by **pressing** the adjustment knob.
4. By **turning** the adjustment knob, select ***Setpoint and actual values*** in the sub-menu and confirm this by **pressing** the knob.
5. Call up data and by repeated **pressing** of the ESC – knob you return to the main display.



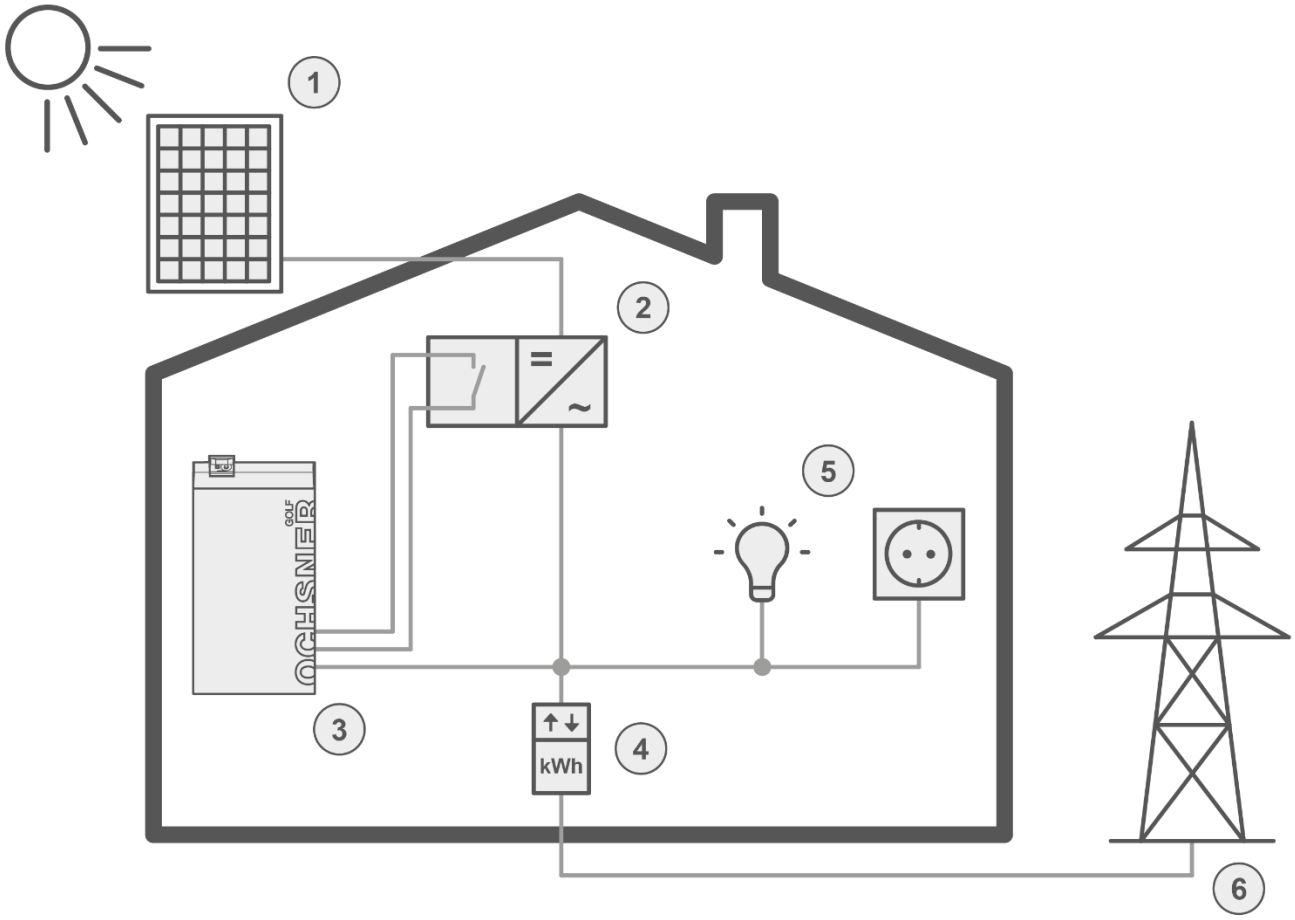
11 Cascade manager

The cascade manager is necessary when several heat pumps are used in a heating system (cascading). If required, please contact the OCHSNER customer service or your nearest OCHSNER system partner

12 Photovoltaic-Energy own consumption

You can ideally use available energy from your photovoltaic system (if installed) with your OCHSNER heat pump. For this you need a switching contact of the photovoltaic system, which gives the heat pump control OTE the signal "energy available”.

The heat pump can then use the available energy to heat up the buffer tank, the hot water tank or the whole building in order to use this as an energy/heat store (the same holds for cooling operation - charging possible at low temperatures). The thermal energy storage has at present a far greater potential than electrical storage (accumulators). You can thus optimise the energy consumption simply and thus significantly increase the efficiency of the complete system.



1) Photovoltaic modules
2) Inverter (with switching contact)
3) Heat pump (with OTE control)
4) Meter (current draw or feed)
5) Electrical consumers
6) Public grid

The following possibilities can be individually combined, in order to store photo voltaic energy in the form of thermal energy.

- Hot water heating to an increased set value
- Excess heating circuit overheating (increased flow temperature in heating operation resp. decreased flow temperature in cooling operation)
- Increased heating set value (fixed buffer set value)
- Decreased cooling set value (fixed buffer set value)
- Automatic recognition of summer operation (the buffer is not heated during summer, only the hot water charging to set value resp. cooling to a decreased set value (if this is set correspondingly in your system) takes place).

If you wish to use this function, please contact your OCHSNER customer service or your nearest OCHSNER system partner.

13 Smart-Grid-Function (to BWP)

The Smart Grid Function is a defined standard (SG-Ready) from the Bundesverband Wärmepumpe (BWP, Federal Heat Pump Association), which allows the heat pump to be correspondingly controlled in an intelligent electric grid - a Smart Grid (SG). With this function, subsidised tariffs for heat pumps can be used in the electricity grids of the future. Such tariffs are derived from surplus electricity which occur naturally when generated by renewable sources such as wind and solar energy. Smart Grids serve as peak balancers, Smart Grid capable heat pumps will then be switched with priority when surplus electricity is available cheaply. They then store the surplus energy in the form of hot water (or in cooling operation in the form of cold water).

If you have a corresponding Smart Grid tariff, or wish to conclude one, please contact your nearest OCHSNER system partner.

14 Building Management

There is the possibility to transfer the heating/cooling set value from a building management system to the heat pump control. This set value can be transferred by means of a 0-10V DC signal and a switching contact for heating/cooling. The control can furthermore send certain operational conditions to the building management system (e.g.: Heat pump running, heat pump in cooling operation. If you wish to use this function, please contact your nearest OCHSNER system partner.

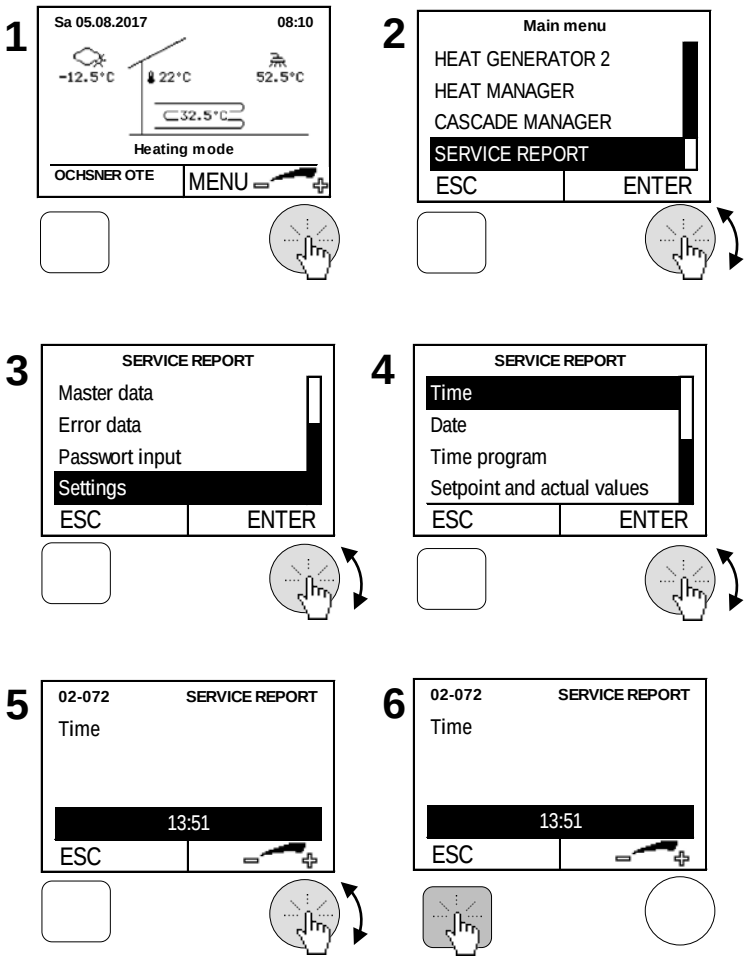
15 Service-Report

15.1 Setting date and time

Settings procedure:

1. **Press** the adjustment knob in the main display > the main menu appears
2. Select the Service Report by **turning** the adjustment knob and confirm by **pressing** the knob.
3. By **turning** the adjustment knob, select ***Settings*** in the Service Report menu and confirm this by **pressing** the knob.
4. Select ***Time*** by **pressing** the adjustment knob
5. Set the time of day by **turning** the adjustment knob and store this by **pressing**.
6. > By repeated **pressing** of the ESC – knob you return to the main display.

☝ The date can be set in the same way.



The automatic Summer-Winter time switch-over takes place on the last Sunday in October and on the last Sunday in March. By installing a room terminal with touch display, the time of day can be automatically set on the OTE control. The date and time setting described here is then of no effect.

15.2 Set master data

The system user can set master data (texts) in the control. The following master data are settable:

- System owner's name
- Installer's name
- Planner's name

Settings procedure:

1. **Press** the adjustment knob in the main display > the main menu appears

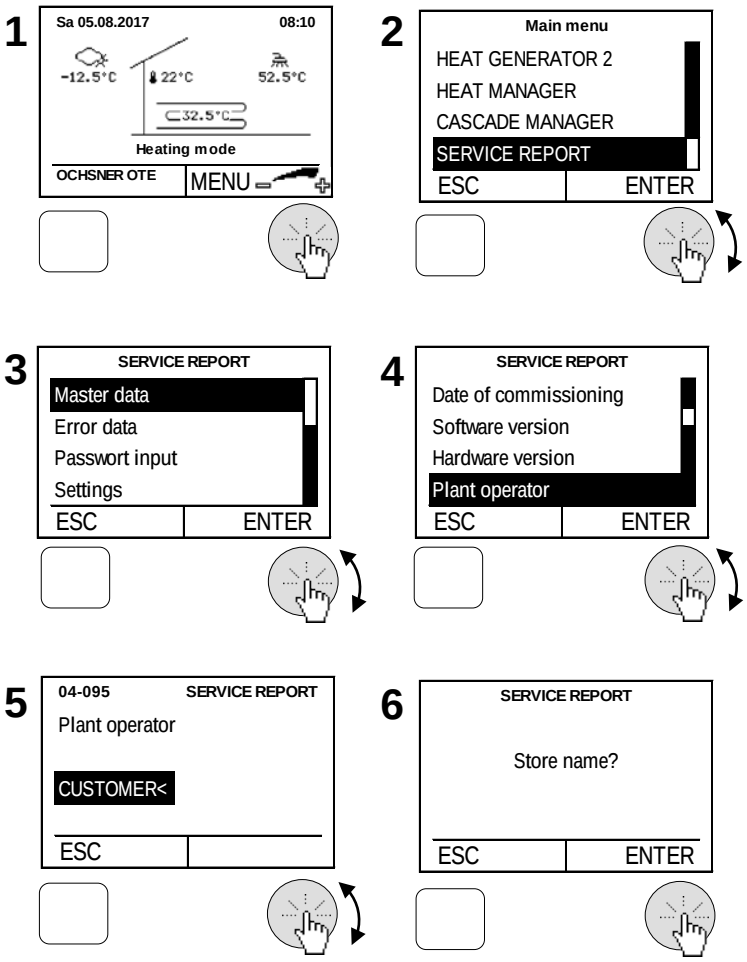
2. Select the Service Report by **turning** the adjustment knob and confirm by **pressing** the knob.

3. By **turning** the adjustment knob, select ***Master Data*** in the Service Report menu and confirm this by **pressing** the knob.

4. By **turning** the adjustment knob, select ***Plant operator*** and confirm this by **pressing** the knob.

5. **Delete text:** Turn the adjustment knob anticlockwise until the delete sign "<" appears beside the text. Delete the text by **pressing** the knob. ESC - button to return

6. Store by **pressing** the settings knob > repeated **pressing** of the ESC knob returns to main display.



15.3 Floor screed heating programme

1. Starting the floor screed heating programme
   The heating circuit pump is switched on at the start. The flow temperature is read after 5 minutes. The measured value is stored as the start and end temperature set value.

2. Heating up phase
   The flow set value increases in the heat up phase with a settable ramp up. The set value is increased every hour, as long as the current value has reached the set value within this hour. If the set value has not been reached, this will be increased by the value set when the current value has reached the set value.

3. Equilibrium phase
   Once the set maximum temperature has been reached, the set value remains in the equilibrium phase for the time set.

4. Cooling off phase
   After the equilibrium phase the flow temperature sinks with the set downwards ramp until the set value of the original start value has been reached.

5. Termination of the floor screed heat up programme
   The heat up programme can be terminated manually at any time. It will be automatically terminated once the stored start and end set temperatures have been reached or after the set time program (04-068). At the latest, however, after 30 days (adjustable).

What to do if the power fails:

Heating up phase: If there is a power failure during the heat up phase, the programme always restarts, the original start value is retained.

Equilibrium phase: If there is a power failure during the equilibrium phase, the maximum temperature is kept and the outage-time added to the equilibrium phase.

Cooling off phase: If there is a power failure during the cooling off phase, the current flow temperature is measured and from there onwards reduced on the set ramp down. Only one heating circuit per control can be started to heat up the floor screed. The floor screed heat up takes place via a ramp-up/ramp-down function with increasing and decreasing flow temperature.

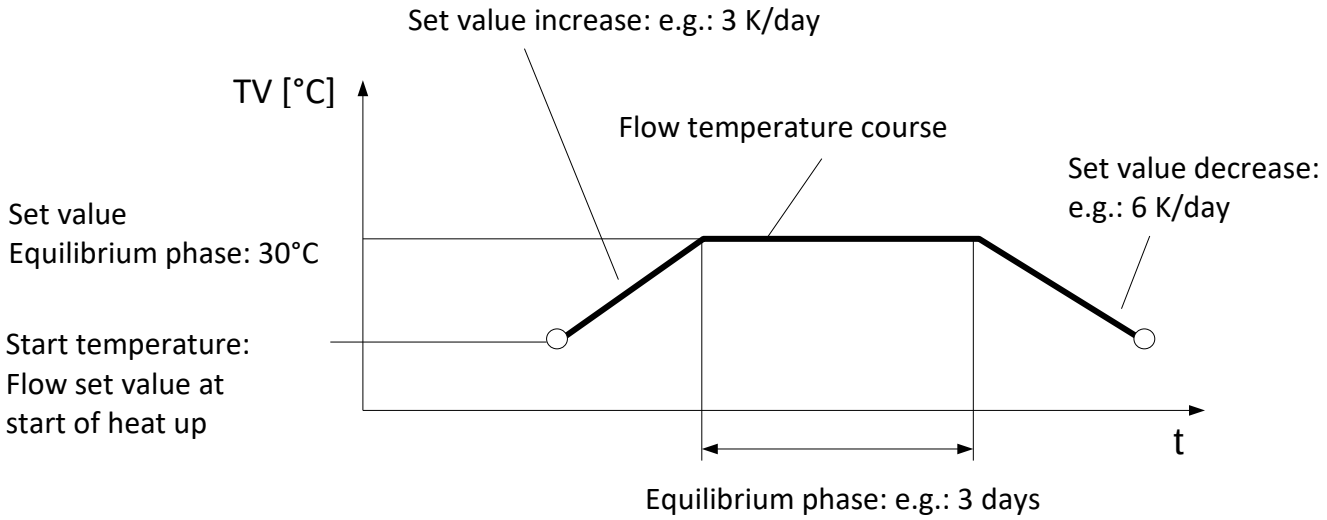


Fig. 12: Flow temperature course for floor screed heat up

The settings for set value increase or equilibrium phase must be adjusted by a professional partner after consultation with the floor screed professional! Incorrect settings can lead to damage to the floor screed. OCHSNER accepts no liability for this!

NOTE

Heating up the floor screed with heat pumps is **NOT** permitted for earth-coupled systems (heat pumps type GMSW or GMDW). Due to the heating up, above average amounts of energy could be extracted from the ground, which could lead to sustained damage to the whole heat pump heating system. **OCHSNER accepts no liability for this!**

15.4 Start the programme

Settings procedure:

1. **Press** the adjustment knob in the main display > the main menu appears

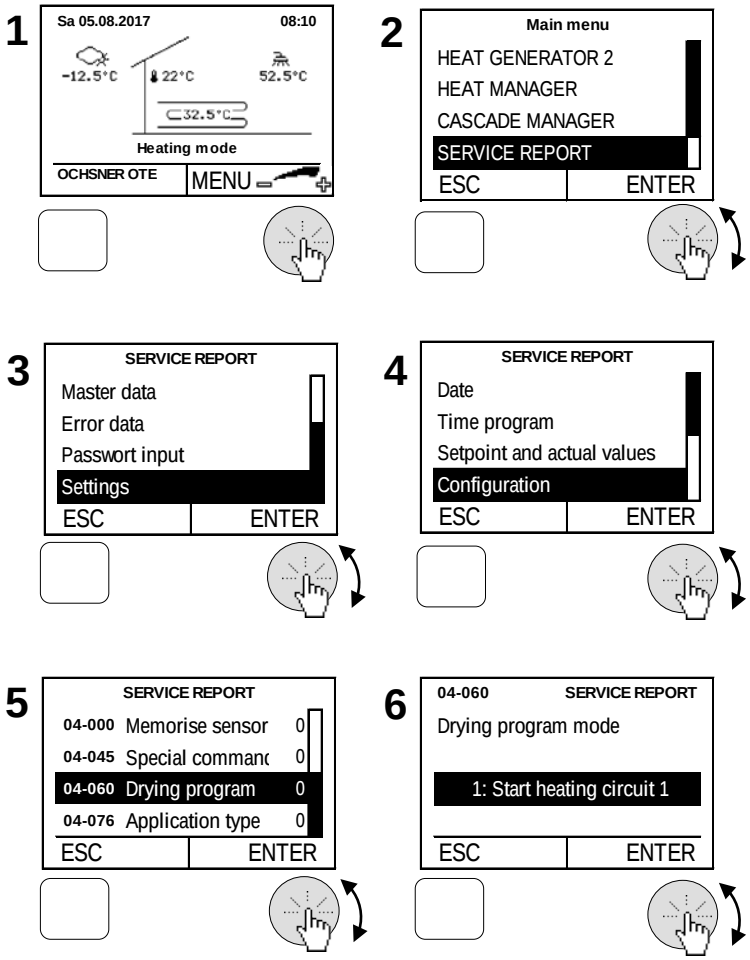
2. Select the Service Report by **turning** the adjustment knob and confirm by **pressing** the knob.

3. By **turning** the adjustment knob, select ***Settings*** in the Service Report menu and confirm this by **pressing** the knob.

4. By **turning** the adjustment knob, **select *Configuration*** and confirm this by **pressing** the knob.

5. By **turning** the adjustment knob, select ***Drying program mode*** and confirm this by **pressing** the knob.

6. Select each heating circuit by **turning** the settings knob and store by **pressing**, > repeated **pressing** of the ESC knob returns to main display.



👍 Only ONE heating circuit can be started at any time in drying mode.

During the heating up phase, the following operational status will be displayed:

16: Heat up phase drying program
17: Equilibrium phase drying program
18: Cooling off phase drying program
19: Drying program terminated

16 Error reports

Error reports will only be displayed on the master control unit. Via the ESC knob, "**INFO**" and an error text appear (see Fig. 13).

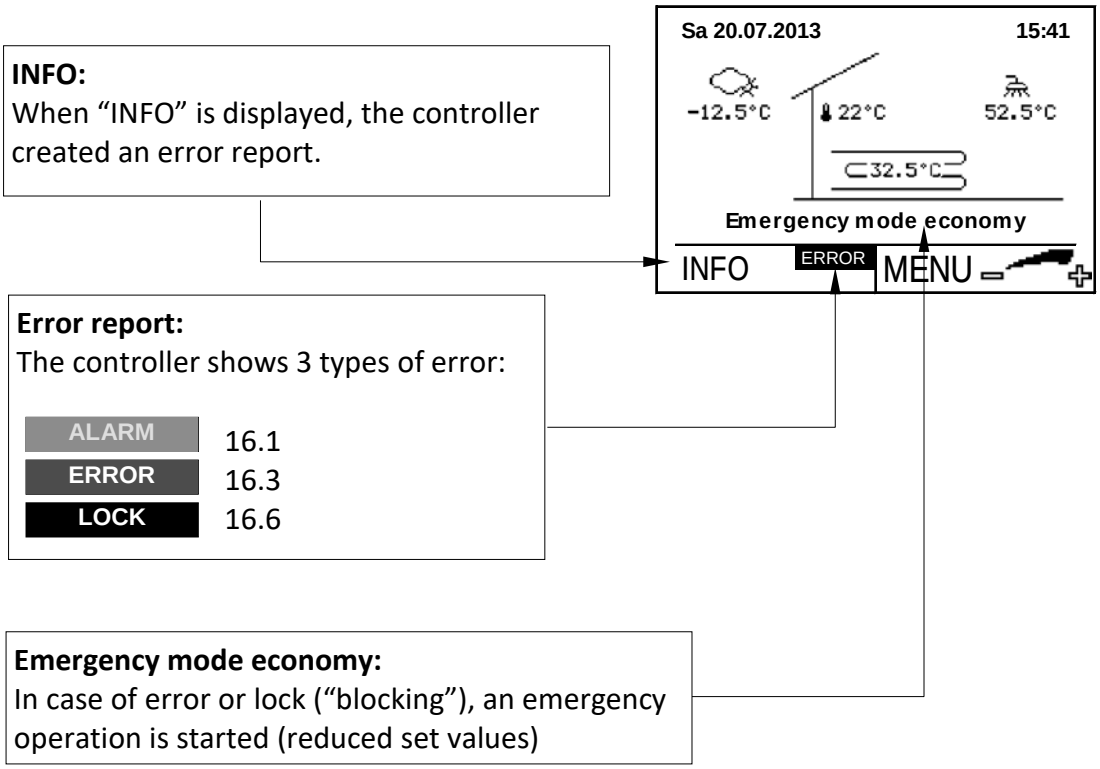


Fig. 13: Overview of error reports

16.1 ALARM

The report ALARM appears when a sensor is defect. (Exception: Breakage of safety-related sensors
→ Report "ERROR" / "LOCK"

A substitute value is made. The heat pump continues in emergency mode.

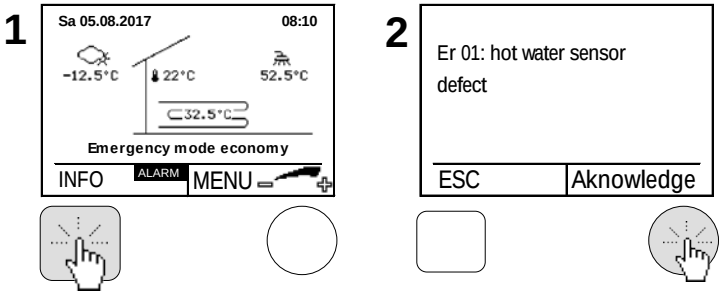
16.2 Procedure by ALARM

Contact your contractual partner and arrange for the sensor to be replaced.

Example hot water sensor defect:

1. **Press** the ESC knob in the main display > the alarm menu appears.

2. The error number as well as the defective sensor is displayed in the alarm menu.



16.3 ERROR

The ERROR report appears when the heat pump is switched off via a **safety device / safety function.** In ERROR cases, the system changes to "emergency operation - reduced". The system is controlled at reduced temperatures (heating and warm water) and the additional heat generators (electro auxiliary, furnace) take over the heating (if installed).

Emergency mode economy: The set value for heating will be reduced by 7°C; the set value for hot water to 35°C.

NOTE

The heat pump restarts automatically when the safety device releases the heat pump (error no longer in system).
Following malfunction repair measures are possible:

- **2** Automatic acknowledgement
- **3** Manual acknowledgement

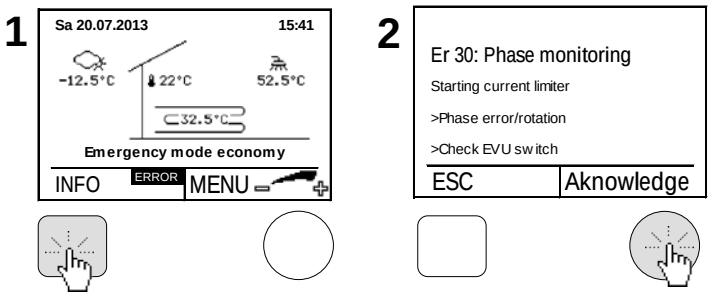
The manual acknowledgement only leads to a heat pump restart when the error is **no longer** present at the safety device.

16.4 Procedure by ERROR

Contact your contractual partner and try to acknowledge the error. If the error is no longer present after acknowledgement, the heat pump restarts and the additional heat generators turn off.

Example of error acknowledgement:

1. **Press** the ESC knob in the main display > the error menu appears.
2. The error number as well as the error are displayed in the error menu. The error can be acknowledged by **pressing** the settings knob > repeated **pressing** of the ESC knob returns to main display.



Remedying the ERROR reports may only be carried out by OCHSNER authorised installers! Before beginning work on the heat pump, it must be switched off on all poles from the power supply and protected against switching back on! Incorrect changes to settings by third parties will delete all warranty and guarantee claims.

16.5 Error table

Code	Malfunc-tion store code	Error description	Possible cause/ remedy
115		Er 01: Hot water sensor defect	Replace sensor
116		Er 10: Outside sensor de-fect	Replace sensor
117		Er 14: Mixer sensor defect	Replace sensor
124		Er 20: TWR sensor defect	Replace sensor
120		Er 22: Switch-off sensor TPM or TWR defect	Replace sensor
136		Er 23: TPV sensor defect	Replace sensor
118		Er 24: Buffer sensor defect	Replace sensor
114		Er 29: TWV sensor defect	Replace sensor
11	11	Er 30: Phase monitor	Check power supply
134		Er 32: THG sensor defect	Replace sensor
138		Er 33: High pressure sensor defect	Check sensor
137		Er 34: Low pressure sensor defect	Check sensor
5	5	Er 36: High pressure	Insufficient heat distribution, circulation pump defect, valve closed / air in the system, Check the hydraulics
18	18	Er 37: Low pressure	Heat source insufficient, not enough re-frigerant, expansion valve Check the refrigerant circuit (OCHSNER)
16	16	Er 38: Hot gas	Expansion valve, insufficient refrigerant, set value too high Check the refrigerant circuit (OCHSNER)
10	10	Er 39: Motor protection compressor	Motor protection relay, Phase er-ror/overload, heat source temperature too high Check the compressor in refrigerant cir-cuit (OCHSNER)
8	8	Er 42: Frost protection in heat use system	Insufficient heat distribution, circulation pump defect, valve closed / air in the system, check the buffer pump or the hydraulics

Code	Malfunc-tion store code	Error description	Possible cause/ remedy
		Er 46: TSG sensor defect	Replace sensor
9	9	Er 47: De-icing malfunction	Insufficient de-icing energy Evaporator/Sensor Check the refrigerant circuit (OCHSNER)
129	129	Er 48: TQE sen-sor/evaporator 1 defect	Replace sensor
130	130	Er 49: TQA sen-sor/evaporator 2 defect	Replace sensor
12	12	Er 50: Expansion valve	Check the function of the EEV (OCHSNER)
1	1	Er 56: Flow rate heat source	Insufficient heat source energy, heat source pump/filter insufficient flow rate at heat source
2	2	Er 57: Frost protection of heat source	Insufficient heat source energy, heat source temperature too low, check heat source, check heat source pump/filter, clean water filter, ground water pump defect
3	3	Er 58: Motor protection heat source	Check motor protection, check wiring to motor, motor protection relay, phase defect/overload, thermo-contact
143	143	Er 59: Sensor breakage TWV + TWR	Check sensor
144	144	Er 60: Sensor breakage TQA + TQE	Check sensor
42	42	Er 71: Bus malfunction, room remote unit	Check eBus wiring
30	30	Er 80: Address WEZ 1	Check addressing
31	31	Er 81: Address WEZ 2	Check addressing
32	32	Er 82: Address WEZ 3	Check addressing
33	33	Er 83: Address WEZ 4	Check addressing
34	34	Er 84: Address WEZ 5	Check addressing
35	35	Er 85: Address WEZ 6	Check addressing
36	36	Er 86: Address WEZ 7	Check addressing
37	37	Er 87: Address WEZ 8	Check addressing

Code	Malfunc-tion store code	Error description	Possible cause/ remedy
20	20	Er 91: Flow rate in heat use system	Water pressure too low, circulation pump defect, valve closed/air in sys-tem, check hydraulics
21	21	Er 90: Overheating	Check the refrigerant circuit (OCHSNER)
98	98	Er 98: Electrical heating rod is only heat generator!	Check the heat pump operation selec-tion (see Section8)
104	104	Er104: Buzzer malfunction heat pump	OCHSNER customer service
108	108	Er108: Communication malfunction outside unit	Only for Air Basic - check wiring
109	109	Er109: Compressor over-heating	Only for Air Basic - automatic acknowl-edgement
100	100	Er 200: Condensation tem-perature too low	Check the refrigerant circuit (OCHSNER)
102	102	Er 202: Evaporation tem-perature too low	Check the refrigerant circuit (OCHSNER)
103	103	Er 203: Evaporation tem-perature too high	Check the refrigerant circuit (OCHSNER)
240	240	Er 240: OTE does not rec-ognise Modbus circuit board	OCHSNER customer service
241	241	Er 241: Modbus communi-cation error	Only for Air Eagle - loss of voltage? Check the wiring of the ModBus con-nection from inside to outside unit Otherwise, OCHSNER customer service
242	242	Er 242: Communication malfunction CAN Bus	Only for Air Eagle - check the CAN Bus and ModBus wiring (possible conse-quential failure of Er241) Otherwise, OCHSNER customer service

16.6 BLOCKING

In "BLOCKING" cases, the system changes to "emergency mode economy". The heat pump is switched off. The system is controlled at reduced temperatures (heating and warm water) and the additional heat generators (electro auxiliary, furnace) take over the heating (if installed). An automatic restart is only possible when blocking function is no longer active.

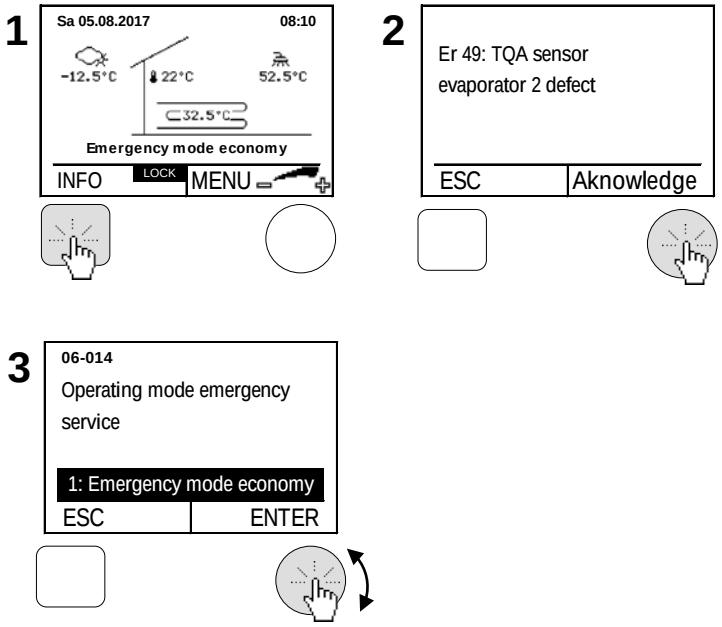
16.7 Procedure by BLOCKING

Contact your contractual partner and start (when desired) the "Emergency operation normal".

1. **Press** the ESC knob in the main display > the blocking menu appears.

2. The type of error which has led to the heat pump blocking will be displayed in the blocking menu. The emergency operation menu is selected by **pressing** the adjustment knob.

3. Set the operation mode by **turning** the settings knob and store by **pressing**, > repeated **pressing** of the ESC knob returns to main display.



1: Emergency operation reduced: The set value for heating will be reduced by 7°C; the set value for hot water to 35°C.
2: Emergency operation normal: The set values are not reduced → no reduction of temperatures.
Attention: These types of operation can lead to increased heating costs as the heat load is cover only by the additional heat generators (if installed).

17 Heat meter

The OTE control offers the possibility of recording the amount of heat the heat pump gives off. The recording takes place using the classic heat meter method. The temperature differential of the heat pump is continuously measured and the amount of heat calculated with the flow rate.

Prerequisite for reproducible heat amounts is the calibration of the EC-pumps, the hydraulic balance in the system as well as the correct installation of the flow sensors.
This is to be carried out by the system partner/system installer in the course of commissioning.

The **annual performance factor (APF)** for electrically driven heat pumps is the result of the division of the amount of heat given off (displayed on the OTE) by the amount of electricity used (readable from the heat pump tariff meter)

$$\mathbf{APF} = \frac{Q_{th(Heizperiode)}}{W_{el(Heizperiode)}}$$

The end customer is to be informed by the system installer that for the calculation of the APF to VDI 4650, normative values (comp. norm fuel consumption in cars) will be used. Using these normative values, today's comfort demands will not be met!

The **measured APF** is essentially dependent on user behaviour and other factors and is less than the **COP**[1] and the **APF as calculated to VDI 4650**[2]

[1] COP = **C**oefficient **o**f **P**erformance: Heat pump's Performance factor, instantaneous value, COP ≠ APF
[2] VDI 4650: Policy which defines the calculation procedure for annual performance factors

Call up procedure:

1) **Press** the adjustment knob in the main display > the main menu appears

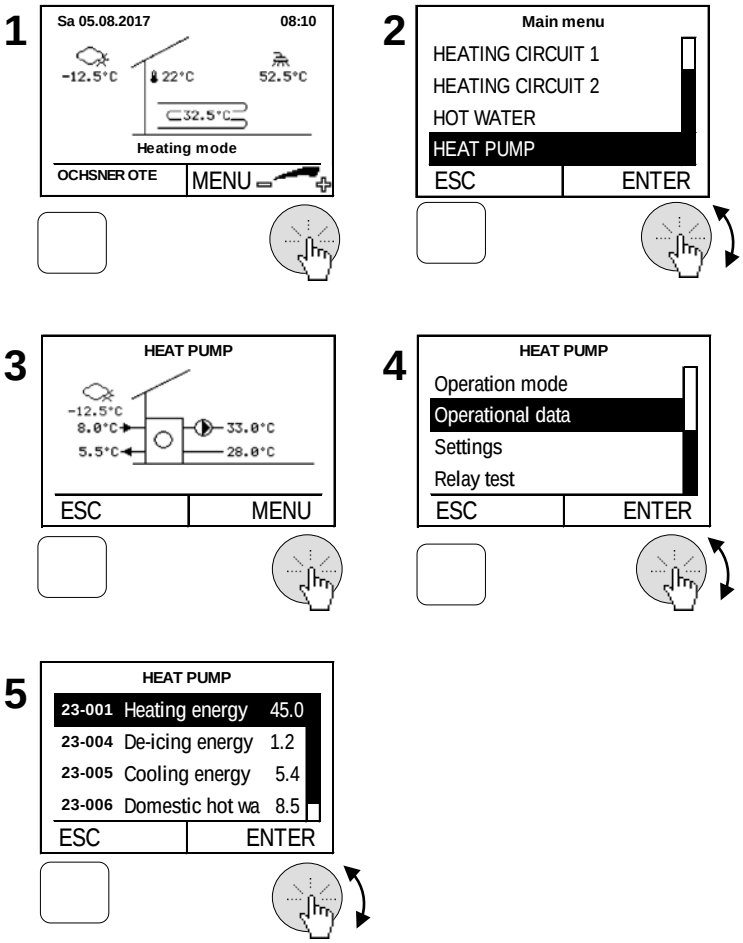
2) Select the heat pump by **turning** the adjustment knob and confirm by **pressing** the knob. > the temperature image for the auxiliary heater appears.

3) In heat pump temperature image, select the heat pump menu by **pressing** the adjustment knob.

4) By **turning** the adjustment knob, select ***Operation selection*** in the heat pump menu and confirm this by **pressing** the knob.

5) The amount of heat can be called up:

a) Heating energy
b) De-icing energy
c) Cooling energy
d) Hot water energy



18 Annex

18.1 Technical Data Control

Description	Data OTE3 (SE6024WPC)	Data OTE4 (SE6034WPC)
Operational voltage	~ 230 V (AC) ± 10%, 50 Hz	
Current draw stand-by	< 11W	5W
Maximum current draw	max. 16 W	max. 15W
Measurement circuit voltage	24V	
Ambient temperature in operation	0°C to 50°C	
Ambient temperature storage	-20°C to 60°C	
Humidity in operation	max. 85% relative humidity, not condensing	
Sensor wiring, length, cross section	max. 100m, min. 0,75mm²	
eBus: • Bus wiring, length, cross section • Loading	 2-wire Bus, twisted, max. 50m, min. 1mm² 24V; max. 80mA (constant current)	
Switching rating outputs (relays)	~230 VAC 6(2) A, 50 Hz	
Set value input	0 to10 VDC, non-floating, current max. 10mA	
Power reserve timer	Ca. 300 days	Ca. 200 days
Dimensions of the control (HxWxD)	320 mm x 150 mm x 61 mm	

18.2 Temperature sensor

All control temperature sensors have the same characteristic NTC 5000Ω at 25°C (see Table).

Temp [°C]	Resistance [Ω]	Temp [°C]	Resistance [Ω]	Temp [°C]	Resistance [Ω]	Temp [°C]	Resistance [Ω]
-20	48322.7	8	10949.6	30	4029.2	58	1339.6
-18	43071.6	10	9942.9	32	3702.3	60	1246.2
-16	38447.9	12	9039.2	34	3405.3	62	1160.2
-14	34370.5	14	8227.2	36	3135.1	64	1081.0
-12	30769.4	15	7852.3	38	2889.1	65	1043.7
-10	27584.4	16	7496.6	40	2664.8	66	1008.0
-8	24763.2	17	7159.0	42	2460.2	67	973.6
-7	23474.8	18	6838.4	43	2364.7	68	940.5
-6	22260.9	19	6534.0	44	2273.4	69	908.8
-4	20038.1	20	6244.9	46	2102.6	70	878.3
-2	18061.0	21	5970.1	48	1946.3	71	848.9
0	16300.0	22	5709.0	50	1803.2	72	820.7
2	14729.4	24	5224.6	52	1672.1	74	767.5
4	13326.8	26	4786.3	54	1551.7	76	718.2
6	12072.6	28	4389.2	56	1441.2	78	672.6

Notes:

We reserve the right to change technical data without notice!

This instruction describes appliances which are not always in the scope of supply in series. Therefore deviations to your heat pump are quite possible.

System installer

Company: .....

Address: .....

.....

Tel.: .....

Service engineer:

.....

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