Description additional functions for Mark air heaters

1 Manual operation of the main fan (Summer ventilation)

– Lift the thermostat's lid.

– Depress and hold the **[OK]** key for approx. five seconds during normal operation to permanently switch ON the fan.
– The symbol <fan> is now shown in the display.
– Repeat above to return to AUTOMATIC operation.

2 Manual reset of burner controller lockout

This function is only active when the burner controller of the air heater is in lockout and the relevant fault code is shown in the thermostat's display.

– Lift the thermostat's lid.
– Depress the **[OK]** key momentarily.
– The burner controller is then automatically reset and the fault report disappears from the display.

3 Display of the OEM fault code of the air heater

In the display's text line a possible fault – the so-called OEM code – is shown. Consult the air heater documentation to find the meaning of this code.

Note

The thermostat itself generates fault code <11> when the communication with the air heater is interrupted or when it breaks down. Check the connecting cable between thermostat and heater. If the fault persists it may be due to electro magnetic interference (EMC).
Contact your installer.

Advice

When there is to much electro magnetic interference causing interruptions a protected twisted pair cable should be used. Connect the screen of the cable to "earth" at the burner controller only. This cable can be bought at an electrical wholesaler. See chapter Electrical safety in the thermostat's manual.

4 Notes on multilanguage instruction booklet

This standard manual is available for general applications. Especially for the control of boiler heating applications. Therefore not all the standard functions and settings are applicable when the thermostat is used in combination with air heaters. All references, settings and notes relating to the function 'domestic hot water' are irrelevant and may, therefore, be neglected.

5 How to recognise a thermostat with 'Mark software'

After a complete reset of the thermostat, the display momentarily shows the name <Mark> and version number <EO 29> (or higher). This is done by depressing the **[RES]** button momentarily.

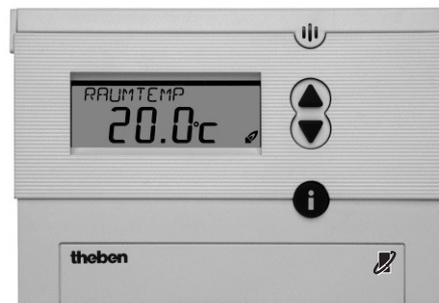## 6 Heat demand symbol in the display

When there is a heat demand from the thermostat and the subsequent action of the air heater, the display shows the symbol <radiator>.

theben

RAMSES 850 OT

310 123

RAUMTEMP
20.0c

RAM 701   RAM 722   RAM 713 EIB   RAM 741   TR 610 top   RAM 366 top   Cheops EIB

Table of Contents

1. Designated Use

The **RAMSES 850 OT** regulates the room and household water tempe-
rature depending on room or weather compensation and time. The room
thermostat must only be operated with heat generators having the sym-
bol OpenTherm 〽 or in connection with an OT-box 815/ 816/ 817 or
821. The system consists of **RAMSES 850 OT** and a OT-Box. It switches
an electrical load with a maximal current consumption of 8 (1)A (e. g. a
circulation pump, a burner or a motor mixing valve) on and off depen-
ding on time and room temperature. Use the system only in dry rooms
with impurities that are usual for flats or houses.

Designated use also includes adherence to the operating and mounting
instructions. Any other use is considered contrary to the designated use.
The manufacturer cannot be held liable for damages resulting from such
use.

2. Safety Instructions

⚠ The connection and installation of electrical devices must
only be carried out by a qualified technician.

The national regulations and respective safety instructions
are to be observed. Interferences and changes to the device will lead
to cancellation of the warranty.

ENGLISH

3. Description and Mounting of the Device

3.1. Device Overview

Hinged cover

Display of the day of week
(1 = Monday, 2 = Tuesday, etc.)

Multifunctional display, e.g.
"Room temperature 20,0°C"

Display PARTY - or
ECO program active

Display of the switch phases

RESET button

Icon bar for display of the
programming level
(rotary switch position MENU)

Enable household water

Modification buttons **+/−**

Rotary switch for program selection

Button **OK** (confirmation of settings/
selection or programming)

Button **ESC** (cancellation of
programming entries)

Info button for checking
the settings

3.2. Mounting and Electrical Connection

Mounting

- First, fix the back plate of the **RAMSES 850** top using the enclosed mounting material. Use the back plate as drilling pattern.
- Do not place the room thermostat to an exterior wall. The ideal place is an interior wall at about 1.5 m height.
- Avoid installation near radiators, windows, televisions or heat dissipating devices.

The room thermostat measures the temperature of the room in which it is placed and regulates it according to the programmed specifications. Therefore, avoid an unintentional interference with the measurement of temperature; errors could occur in the temperature control.

Electrical Connection

⚠ The heating boiler with OpenTherm connection provides the thermostat with power. For that purpose the boiler is equipped with a safety transformer.

The two-wire connection (OpenTherm) is not polarized, i.e. the wires can be connected as desired to the terminals of the heating boiler.
Do not lay the thermostat cable in the same cable channel as the 230 V mains cable.
Do not lay it parallel to a power cable.
Before connecting the thermostat, disconnect the heating boiler from mains by unplugging the mains cable.

Attention

⚠ The thermostat must not be connected directly to a 24V connection or to the terminal for an ON/OFF-thermostat. This could cause irreparable damage to the thermostat.
Make sure that the thermostat is connected to the right terminals before you connect the heating boiler again to the power supply. Interferences and changes to the thermostat will lead to the loss of warranty claims.

Note

Only connect this thermostat to a boiler with the OpenTherm Logo ⚡ .

Connection of External Temperature Sensors

You can connect an external temperature sensor to the terminal with the designation "DIGI". The room thermostat automatically recognizes the sensor and regulates the temperature measured by the remote sensor.

4. Installation and Operation

4.1. Carrying out a Reset

After first applying power by means of the OpenTherm connection, you must carry out a reset. Open the hinged cover and press on the reset button with a pointed object.

Reset ———

4.2. Selecting the Language

1. After the first reset or the reset to factory setting, the display shows the language selection.

   (Resetting the device to factory setting, see chap. 7, page 33)

2. Select your language with the ▲ or ▼ buttons. The available languages are displayed one after the other. Confirm with the **OK** button.

   | DEUTSCH |
   | NL |
   | ENGLISCH |
   | FRANCAIS |
   | ITALIANO |
   | DANSK |
   | ESPANOL |

3. The display will then automatically switch to the time setting.

Note: The language can also be changed in the "settings" menu (see chap. 6.5.5., page 32)

4.3. Setting the Time / Date

After selecting your language, the display automatically switches to the time and date setting. With the **ESC** button you can always return to the previous programming step and change the setting already entered.

1. The display shows the time.

   | HOUR |
   | 0.00 |

2. Use the buttons ▲ and ▼ to set the current time

   Set the hour and confirm with the **OK** button.

   | HOUR |
   | 15.00 |

   Set the minutes and confirm with the **OK** button.

   | MINUTE |
   | 15.34 |
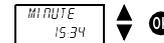
3. The display shows the date. Set the year, month and day one after the other. Confirm each setting with the **OK** button. The display changes automatically.

   | YEAR |
   | 2002 |

   | MONTH |
   | 04 |

   | DAY |
   | 09.04 |
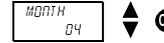
4. The display changes now automatically to the set automatic mode (e.g. display of the target temperature).

Note: Time and date as well as setting of the automatic changeover from summer to winter time can also be changed in the "HOUR/DATE" menu (see chap. 6.2., page 27).

4.4. Selecting the Temperature Profile

The programs P1 and P2 are fixed heating and household water programs are factory set and cannot be changed.

4.4.1. Program P1 (fixed program)

Comfort temperature Mo-Fr from 6 a.m. - 10 p.m. as well as Sa-Su from 7 a.m. - 11 p.m. Outside of these times the unit switches to a lower temperature. Household water enabled Mo-Fr from 6 a.m. - 11 p.m. as well as Sa-Su from 6 a.m. - 24 p.m. In between household hot water is not produced.

4.4.2. Program P2 (fixed program)

Comfort temperature Mo-Fr from 6 a.m. - 8 a.m. and from 4 p.m. - 8 p.m. as well as Sa-Su from 7 a.m. - 11 p.m. Outside of these times the unit switches to a lower temperature. Household water enabled from 6 a.m. - 11 p.m. right through as well as Sa-Su from 7 a.m. - 24 p.m. In between household water is not produced.

4.4.3. Program P3 (freely programmable)

The program P3 is an individually programmable temperature profile. Program P3 is not programmed when delivered (for programming see chap. 6).

If the program P3 has no setting for the programming of household water, the hot water program of P1 is used for the timer control of household water. In order to program the heating and household profile, there are 32 program locations available. The program locations are not separated into heating and household water, but used for both.

4.4.4. Permanent Comfort ☀ ▮

The room temperature is permanently regulated to the programmed comfort temperature. There is no reduction.

4.4.4. Permanent Reduction ☾ ▮

The room temperature is permanently regulated to the programmed lower temperature.

4.4.6. Antifreezing ❄ ▮

The room thermostat only turns on when the room temperature falls below the programmed antifreeze temperature.

When the selector switch is positioned on "Permanent Comfort", "Permanent Reduction" or "Antifreezing", you have to choose for household water the times set in the program P3. If the program P3 has no setting, the fixed times of program P1 are used.

4.5. Party / ECO Program

With the "Party / ECO" function you can cancel the temperature pro-file of the set program for the next few hours (up to 23 hours and 50 minutes).

4.5.1. Setting the Party / ECO Program

1. Press both buttons ▲ and ▼ or about 2 seconds.

2. The display changes and shows the text SAVE/ECO. Press the ▲ or ▼ button within 3 minutes to switch to temperature level HEATING/PARTY.

3. After 3 seconds the display changes and shows the text COMFORT Press the ▲ or ▼ button within 3 seconds and set the desired period in increments of ten minutes.

4. After 3 seconds, the display changes again and shows the desired target temperature with the addition PARTY (for comfort temperature) or ECO (for lower temperature). The Party or ECO program is active for the set period.

4.5.2. Early Cancellation of the Party / ECO Program

To cancel the "Party/ ECO" program, press both buttons ▲and ▼ for about 2 seconds until the display changes. Wait another 3 seconds until the display changes back again. The Party/ECO pro-gram is cancelled and the addition PARTY or ECO disappears from the display.

4.6. Info Button – Checking Current Room Temperature and Settings

With the Info button you can display the current room temperature as well as all important settings of each program.

1. Press the Info button. The display shows the current room temperature for about 3 seconds. In order to continue, press the Infobutton again.

2. In this way you can check the following information one after the other:

   - Outside temperature (only for weather-compensated control)

   - Target room temperature (only for room-compensated control)

   - Current room temperature - max. forward flow temperature

   - Current forward flow temperature

   - Target forward flow temperature

   - Pump on / off

   - Date / time

   - Desired temperature profile (switch times of the set program can only be seen with opened hinged cover)

   - Display mode

5. Control Systems / Types

The **RAMSES 850 OT** can be used as room-temperature-compensated or weather-compensated control system. The controller type changes automatically. If an outdoor sensor is connected to the heating system, this is detected and the controller switches to weather-compensated control.

The weather-compensated control can not be carried out in connection with the OT BOX 815/816/817, but with the OT Box 821.

When using the room-temperature-compensated control type, the target room temperature can be set directly on **RAMSES 850 OT**. When using the weather-compensated control type, the temperature is determined by a predefined heating curve. In this case you can set the starting point and the end point of the curve. When using the temperature level SAVE, the curve is shifted by an adjustable value in parallel to the old curve. For a temporary change of temperature you can move the curve with the buttons ▲ or ▼.
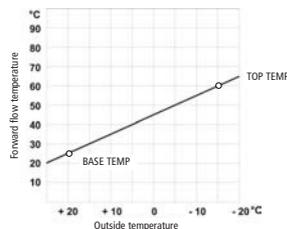
5.1. Settings for room-temperature-compensated control

5.1.1. Setting the Target Temperature

For the temperature profiles of the individual programs you can choose among three temperature values: comfort, lower and antifreeze temperature.

	Setting range	Factory setting
Comfort temperature	15 – 30 ℃	21 ℃
Lower temperature	10 – 29,8 ℃	15 ℃
Antifreeze temperature	6 – 15 ℃	10 ℃
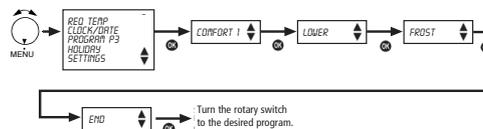
1. Open the hinged cover and turn the rotary switch to MENU.

2. Use the buttons ▲ or ▼ to select the entry REQ TEMP. Confirm with the **OK** button.

3. The display shows first the comfort temperature. Use the buttons ▲ or ▼ to change successively the comfort temperature, the lower temperature and the antifreeze temperature. Confirm each entry with the **OK** button. The display moves on automatically.

5.1.2. Temporarily Changing the Target Temperature

With this function you can temporarily change the target temperature given by the program. The changed target temperature is not permanently saved. It only remains set until the only until the next temperature change of the program (e.g. from comfort to lower temperature).

Note: If one of the programs "Permanent Comfort", "Permanent Reduction" or "Antifreezing" is set, the temperature change remains valid until the program changes.

1. Press the buttons ▲ or ▼. The display shows the set target temperature.
2. Change the target temperature with the buttons ▲ or ▼.
3. After approx. 3 seconds, the display automatically switches back to its original state, and the room thermostat regulates to the changed target temperature.

5.2. Setting for Weather-Compensated Control

5.2.1. Setting the Heating Curve

When using the weather-compensated control type, you have to set the starting point and the end point of the heating curve. To define the lower temperature, you can enter a parallel displacement of the heating curve.

	Setting range	Factory setting
Starting point	10 – 75 °C	25 °C
End point	25 – 85 °C	75 °C
P-movement reduction	-50 – 0 °C	-25 °C
Frost line	-5 – 10 °C	3 °C

1. Open the hinged cover and turn the rotary switch to MENU.
2. Use the buttons ▲ or ▼ to select the entry REQ TEMP. Confirm with the **OK** button.
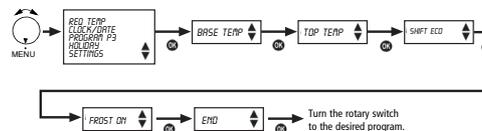
Defining the parameters for your heating system

What kind of heating system do you use?

Type of heating		Forward/backward flow temperature
Heating with radiators	High temperature	90 / 70
Heating with radiators	Middle temperature	70 / 50
Floor heating	Lowest temperature	40 / 30

Defining the parameters for your heating system

Type of heating	HC-Starting point	HC-end point End point	P-movement reduction	Frost limit
90 / 70 system	30 ˚C	85 ˚C	-15 ˚C	-3 ˚C
70 / 50 system	25 ˚C	75 ˚C	-15 ˚C	-3 ˚C
40 / 30 system	25 ˚C	45 ˚C	-15 ˚C	-3 ˚C

5.2.2. Temporarily Changing the Heating Curve

Using this function you can temporarily change the heating curve predefined by the program. You can set a parallel displacement of +/- 5. The set value causes a displacement of the heating curve of the setting *5 K. The modified heating curve is not permanently saved. It only remains set until the next temperature change.

If one of the programs "Permanent Heating", "Permanent Saving" or "Antifreezing" is set, the displaced curve remains valid until the program changes.

1. Press the buttons ▲ or ▼. The display shows the set displacement.

2. Use the buttons ▲ or ▼ to change the displacement.

3. After approx. 3 seconds, the display automatically switches back to its original state, and the room thermostat regulates to the modified target temperature.

5.2.3. Disconnecting the Heating

When using the weather-compensated control type, you can program the controller so that the heating switches off at a set outside temperature.
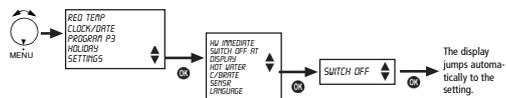
The set times of program P3 also apply to household water in case of weather-compensated control. If the program P3 has no setting, the fixed times of program P1 are used.

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6. Programming

Note: The programs P1 and P2 are fixed programs ex works and cannot be changed.

6.1. Setting the Target Temperatures

See section 5.

6.2. Setting the Time / Date

Setting time and date: hour, minute, year, month, day. Description see page 21.

Note: Time for changeover to winter time is taken from summer time, e.g. back from 3 a.m. to 2 a.m.

Start of summer time: month

Weekend within month

Hour for changeover: e.g. from 2 a.m. to 3 a.m.

Start of winter time: month

Weekend within month

back to CLOCK/DATE

6.3. Program P3 (Heating and Hot Water)

The programming of the heating and hot water program P3 is to be set via the PROGRAM menu. The settings of the temperature profiles are to be carried out in the same way for heating and hot water.

Setting heating and hot water program

```
         ┌──────────────┐              ┌──────────────┐        ┌──────────────┐
         │ REQ TEMP   ▲ │              │ HOT WATER    │        │ ▲  NEW        │
  MENU ─▶│ SETTINGS   ▼ │              │ HEATING      │ ─ ─ ─▶ │ ▼  CHECK      │
         │ HOLIDAY      │              └──────────────┘        │    CLEAR      │
         │ PROGRAM      │                                      │    END        │
         │ CLOCK/DATE OK│                                      └──────────────┘
         └──────────────┘
```
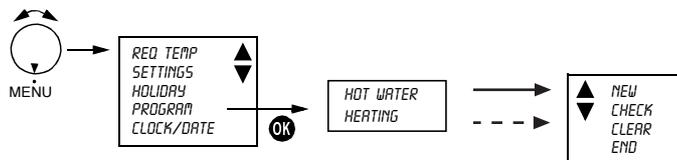
Setting new temperature profile P3

```
- - - - ▶  [NEW]  ──▶  [FREE]  ──3 sec.──▶  [MO-FR  ▲]  ──▶  [HOUR    ▲]  ──▶  [MINUTE   ▲]  ──▶  [LOWER   ▲]
           OK      [21]             [SA/SU     ]  OK  [16:00  ▼]  OK  [16:30  ▼]  OK  [COMFORT ▼]
                                    [DAILY      ]                                        OK
                          ┊         [SINGLE DAY]                                        │
                          ┊             OK  │                                          [END]
            Display of the free          │                                             │
            memory areas                 ▼                                          3 sec.
                                    [MONDAY    ▲]                                      │
                                OK  [TUESDAY    ]                              back to [NEW]
                                    [WEDNESDAY  ]
                                    [THURSDAY   ]
                                    [FRIDAY     ]
                                    [SATURDAY   ]
                                    [SUNDAY    ▼]
```
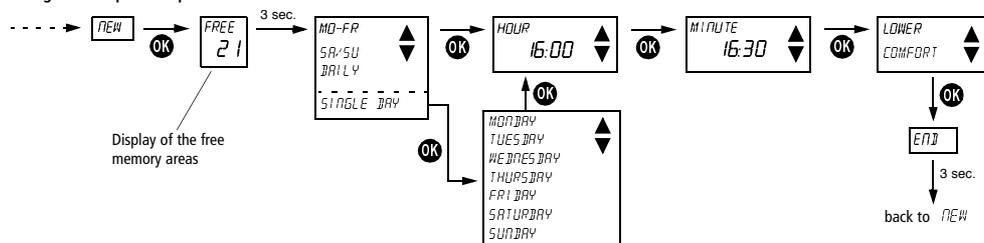
Checking temperature profile P3

no program stored in memory ──▶ [EMPTY] ──▶ back to PROGRAM see chap. 6.3.
                                    OK

```
- - - - ▶  [CHECK]  ──▶  [PROG display]
            OK           21.0 ℃
                         6:00
```

By pressing the **OK** or ▲ button, all switch times of the day are displayed one after the other.
Once the last switch time is reached, the switch times of the next day are displayed, etc.

──▶ [END] ──3 sec.──▶ back to PROGRAM see chap. 6.3.

Clearing the temperature profile

```
- - - - ▶  [CLEAR]  ──▶  [SINGLE]  ⇄  [ALL]  ⇄  [END]  ▲──▶  back to SINGLE
            OK            ▲   ▼        ▲   ▼
```
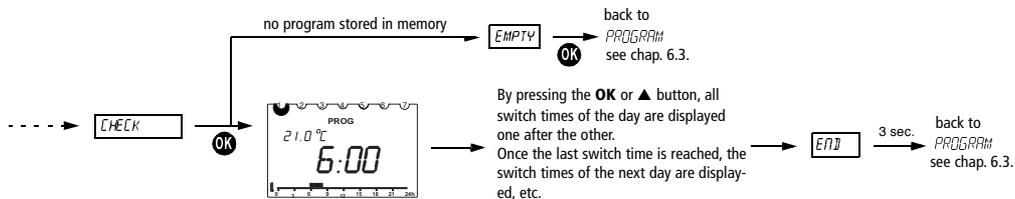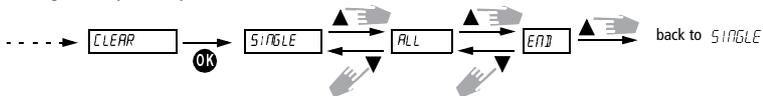
Displaying individual switch times and clearing them

1. Displaying the switch times

No program stored in memory

EMPTY 🆗 back to
PROGRAM
see chap. 6.3.

Display of the switch time

SINGLE 🆗

PROG
21.0 °C
6:00

▲

The switch times are displayed one after the other. Display next switch time with ▲

END 3 sec. back to
PROGRAM
see chap. 6.3.
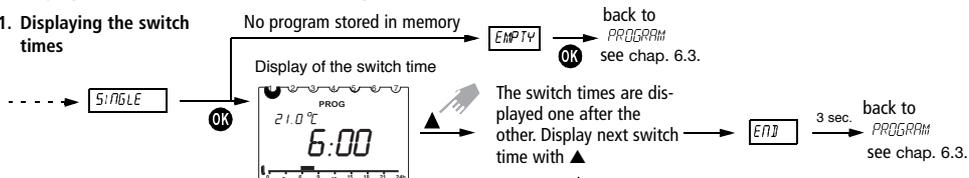
2. Clearing the desired switch times

In order to clear the displayed switch time, press the **OK** button. 🆗

PROG
CLEAR
6:00

🆗 The switch time is cleared and the next switch time is displayed.

Clearing all switch times

No program stored in memory

EMPTY 🆗 back to
PROGRAM
see chap. 6.3.

In order to cancel the clearing process, press the **ESC** button.

ALL 🆗 CONFIRM 🆗 back to
PROGRAM
see chap. 6.3.

30
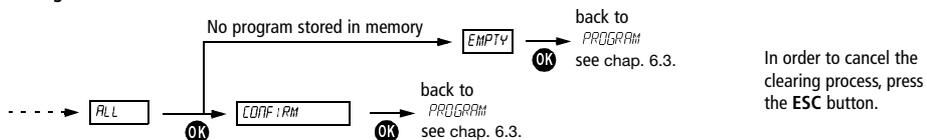
6.4. Setting the Holiday Program

By setting a holiday program, the temperature profile of the set automatic program can be cancelled for any period of time.

Note: With the **ESC** button, you can cancel the programming at any time.

1. Open the hinged cover and turn the rotary switch to MENU.

2. Use the buttons ▲ or ▼ to select the entry *HOLIDAY*. Confirm with the **OK** button.
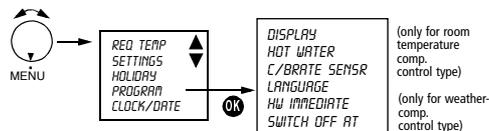
   Note: If a holiday program is already saved, you can choose if you want to check or clear it. In order to save a new holiday program, the already saved holiday program must be cleared.

3. If no holiday program has been saved yet, set the start and end date now with the buttons ▲ and ▼. Set the year, month, day and hour one after the other. Confirm each setting with the **OK** button. The display changes automatically.
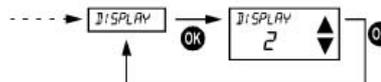
   Note: The end time must not be the same as or earlier than the start time. Otherwise an error message is displayed: *ERROR*. The holiday program must then be programmed again.

6.5. Service Settings

6.5.1. Overview

REQ TEMP
SETTINGS
HOLIDAY
PROGRAM
CLOCK/DATE

DISPLAY
HOT WATER
C/BRATE SENSR
LANGUAGE
HW IMMEDIATE
SWITCH OFF AT

(only for room temperature comp. control type)

(only for weather-comp. control type)

6.5.2. Selecting the Display Type
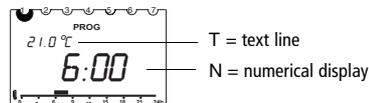

Select the display with the buttons ▲ or ▼. Confirm with the **OK** button. Cancel with **ESC.**

Note: The factory setting is highlighted grey in the table.

T = text line
N = numerical display

	Display type 1	Display type 2
Time	Text line	Numerical display
Actual temp.	Numerical display	Text line

On delivery, the display type 1 is set.

6.5.3. Selecting Hot Water

```
- - - -→ ┌──────┐      ┌──────────────┐
         │ HOT  │ ⊙K   │ HW TIME ONLY │ ⊙K
         │WATER │      │ HW TIME/TEMP │
         └──────┘      └──────────────┘
```
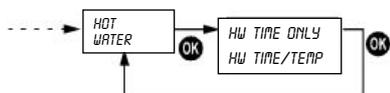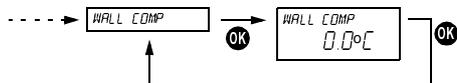
With the setting HW TIME ONLY, you can only have hot water.
With TEMP, the setting of the boiler is taken over. With the setting
HW TIME/TEMP, you can additionally define the HW target tempe-
rature.

6.5.4. Setting the Wall Compensation

If an unsuitable wall has to be used to mount the thermostat (installa-
tion at the exterior wall, chimney, etc.), there may be deviations in
temperature between the temperature measured by the thermostat
and the actual room temperature. This difference in temperature can
be compensated with the wall compensation by setting an offset value
(the wall compensation can be set within a range of +/–6 °C).

Example: The difference between the measured and the controlled
temperature is 2 °C, i.e. the room temperature is regulated 2 °C too
high: Offset value -2 °C.

```
- - - -→ ┌───────────┐      ┌───────────┐
         │ WALL COMP │ ⊙K   │ WALL COMP │ ⊙K
         └───────────┘      │   0.0°C   │
                            └───────────┘
```

Offset value adjustable from -3 °C ... +3 °C. Setting with the
buttons ▲ or ▼. Confirm the value with **OK** (cancel with **ESC**).

6.5.5. Selecting the Language

```
- - - -→ ┌──────────┐      ┌──────────┐ ▲        back to
         │ LANGUAGE │ ⊙K   │ FRANCAIS │          SERVICE
         └──────────┘      │ ENGLISH  │ ▼ ⊙K     see
                           │ DEUTSCH  │          chap. 6.5
                           │ NL       │
                           │ ESPANOL  │
                           │ ITALIANO │
                           └──────────┘
```

Select the language with the buttons ▲ or ▼.
Confirm with the **OK** button. Cancel with **ESC**.

6.5.6. Enable Household Water by Selecting "hot water immediately"

With this function, household water can be heated and enabled
once, regardless of the times set in the program.

```
. - -→ ┌──────────────┐      ┌─────┐      ┌──────────┐
       │ HW IMMEDIATE │ - -  │ OFF │      │ SETTINGS │
       └──────────────┘  ⊙K  │ ON  │      └──────────┘
                             └─────┘
```

Setting with the buttons ▲ or ▼. Confirm the
value with **OK** (cancel with **ESC)**.

ENGLISH

6.5.7. Heating Switch Off Depending on Outdoor Temperature (only Weather-Compensated Control)

In the menu "settings" the display shows the text "heating off at".

Now, you can enter the temperature for the heating switch off depending on outdoor temperature. You can set values between 10 ˚C and 25 ˚C. This function can be deactivated by setting the value 99 ˚C.

7. Delivery / Software Reset

With the buttons "ESC" and "OK", you can reset the factory delivery settings of **RAMSES 850 OT**. By pressing the buttons "ESC" and "OK" simultaneously for a longer time (about 2 sec.), a selection menu appears. Two types of software reset are available.

Following values are reset:

Software reset step 1:

Target temperature (comfort):	20 °C
Target temperature (reduction):	15 °C
Target temperature (antifreezing):	10 °C
Heating curve starting point	25 °C
Heating curve end point	75 °C
Reduction saving mode	-25 K
Holiday program	deleted
Heating program P3	deleted
Household water program P3	deleted
Hot water immediately	reset
Display	1

In step 1, time and language settings are not affected.

Software reset step 2:

Time	12:00
Language	German
Date	reset

8. Maintenance and Repair

RAMSES 850 OT is maintenance-free.

Only clean the device with a dry or slightly damp, soft and lint-free cloth. The interior of the device must remain free from water.

9. Disposal

At the end of its life, the room thermostat must be dismounted professionally and disposed of according to the national regulations with regard to the environment.

In case of doubts, please contact the manufacturer's representative in your country. Contact details can be found at the back of this manual.

10. Technical data

Control type:	Modulating controller, operates with the OpenTherm protocol
Accuracy:	±1 sec. per day by 20 ˚C
Control accuracy:	±0,2 K
Temperature meas. range:	0 ˚C to 50 ˚C, resolution 0.1 ˚C
Temperature setting range:	6 ˚C to 30 ˚C in increments of 0.2 ˚C
Memory spaces:	32 temperature changes, programmable for Mo-Fr, Sa-Su, each day or for individual days
Class of protection:	II according to EN 60730-1
Type of enclosure:	IP 20 according to EN 60529-1
Power reserve:	4 hours

ENGLISH