

Fig 1

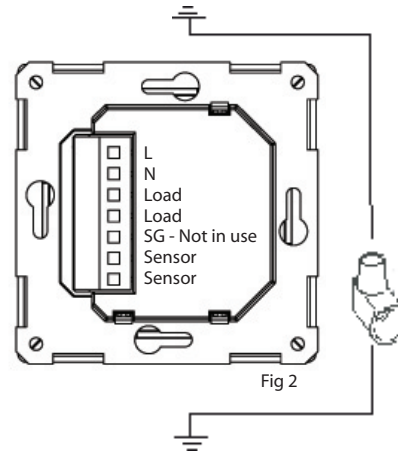


Fig 2

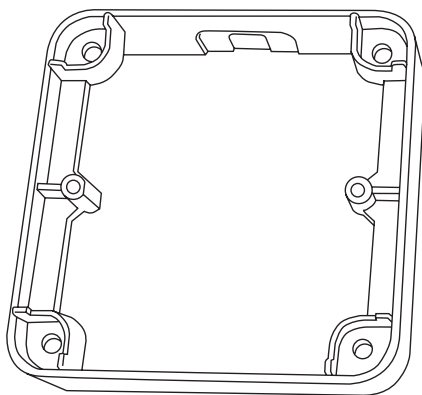


Fig 3

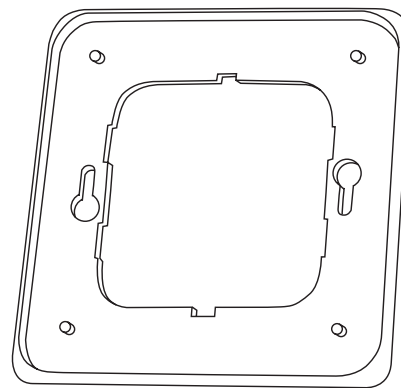


Fig 4

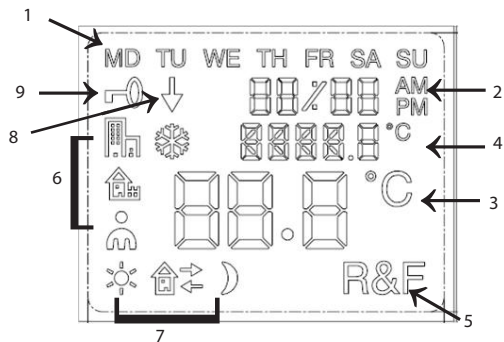






Fig 5

Golvgivare/Floor sensor (NTC)

Temp (C°)	Value (kOhm)
10°C	19,9 kOhm
15°C	15,7 kOhm
20°C	12,5 kOhm
25°C	10,0 kOhm
30°C	8,0 kOhm

Abbreviations in the installation instructions

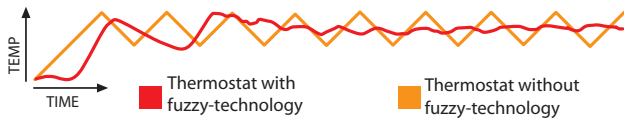
CONF	Contrast	d 15P	Display		Programme for office environment
LOCK	Lock	12HR	12 hours display		User settings
SET	Settings	24HR	24 hours display		Frost protection programme
"LED L"	Low light intensity in control lamp	"R"	Room	4E	4 events
"LED H"	High light intensity in control lamp	"F"	Floor	UF IL	Activating time in %
CLK	Time	"R&F"	Room and floor	S	Daylight Saving Time (DST)
dRFE	Date	RNF	Setting function	"OH"	Overheat protection
ON	On	PROG	Programming	"AF"	Adaptive function
OFF	Off		Programme for home environment		
MD	Monday	TU	Tuesday	WE	Wednesday
TH	Thursday	FR	Friday	SA	Saturday
SU	Sunday				

Description

EB-Therm 350 is a microprocessor-controlled thermostat with LCD-display. The front is fitted with an LED with dual function (Fig 1a) and three control buttons (Fig 1b).

Fuzzy-technology

Temperature control is done with help of an algorithm, which uses fuzzy technology. The technology involves the thermostat testing and collecting data from start-up, and based on this compute when to switch on and off. This technology reduces the temperature variations and thus provides a more constant temperature and lower energy consumption. The floor temperature varies less than +/- 0.3 degrees. See figure below.



Installation

Flushing mounting - EB-Therm is fitted in a standard appliance box 65 mm. The thermostat shall be placed in a location protected from sunlight and draught. The floor sensor must be fitted in a flexible conduit laid in the floor, where the conduit endings are sealed so that the floor sensor can be easily replaced. All tubes leading into the appliance box must be sealed so that the air temperature sensor cannot be affected by draught.

1. Make sure the box is level with the wall.
2. Press the latch, at the right, (Fig 1c) and take off the front and frame.
3. Connect power, voltage 230 VAC, load and floor sensor cable. Any extension of the floor sensor cable must be by means of high voltage current. Protective conductor for incoming feed and heating cable is connected with a connection clip in the box (Fig 2).
4. Insert the thermostat into the mounting box and screw tight with supplied screws.
5. Fit the frame and front.
6. If the thermostat will be installed in double frame, innercorner must be removed.

Fitting with extension frame

Attach the extension frame E 85 816 68 (Fig 3) to the wall with screws. Then fit the thermostat according to the instructions above.



Fitting with Backplate

If the supplied frame does not cover the hole, Ebeco Backplate is used (Fig 4).

Settings

Display description

The thermostat's LCD-display has a blue background light, which is activated when a button is pressed and shines for 30 seconds after the last push of a button. The LCD-display (Fig 5) shows the following items:

1 Day of the week	MD TU WETH FR SA SU	Shows current day of the week (Mo-Su)
2 Time & date	88:88 AM PM	Shows time in 12- or 24 hours format. Date is shown as MM:DD and years are shown as 20YY.
3 Temperature	88.8 °C	Shows set point in C.
4 Menu	8888.8 °C	Shows actual temperature /selected menu.
5 Functions	R&F	Shows the thermostat's selected function.
6 Preset programmes		Shows whether any programme is running (office, home environment, own settings, frost protection).
7 Own settings		Shows whether any event functions are selected (wake up, out, back or night).
8 Programme is running	↓	Shows that a programme is running.
9 Lock	→0	Shows that the thermostat is locked.

The first time the thermostat is switched on it is set to normal mode.

The display shows:

1. Day of the week
2. Time
3. Set point (set temperature) 22 °C
4. Thermostat setting (F if floor sensor exists, otherwise R)
5. Adaptive function on

Menu

The menu is accessed by pressing ● when the thermostat is set to normal. Then press ▲ or ▼ to move around the submenus and ● to select a setting. To exit a menu without selecting a submenu, either press ▲ or ▼ until the display shows END. Then press ● or wait 30 seconds and it will return by itself.

Power on/off

This function puts the thermostat into hibernate mode, as long as it is in this mode it is not controlling the heating. The clock functions as normal and the times and temperatures that have been programmed remain in the memory.

To access standby mode, press and hold ● for 4 seconds. By pressing and holding ● for 4 seconds, you return to normal settings.

Lock

→0 indicates that the thermostat is locked. To lock the thermostat:

1. Press ●. The display shows CONF.
2. Press ▼ repeatedly until the display shows LOCK. Confirm with ●.
3. Unlock the thermostat by pressing ▲ and ▼ simultaneously. Hold them down until →0 disappears.

LED

The thermostat is fitted with an LED with dual function (Fig 1a).

1. Green light – the thermostat is on and the underfloor heating is switched off.
2. Red light – the thermostat is on and the underfloor heating is activated.
3. Flashing green and red light – error indication. The thermostat shows error messages until it is switched off. Continue reading under troubleshooting.
4. No light – the thermostat is switched off or is not getting any current.

The LED's light intensity has two settings, low and high. The standard setting is low. To set the desired level.

1. Press ●. The display shows **CONF**.
2. Press ▼ repeatedly until the display shows **SEF**. Press ●.
3. Press ▼ repeatedly until the menu shows "LED". Press ●.
4. Press ▲ or ▼ to select setting, the menu shows "LED L" or "LED H". Confirm with ●.

Time, date and temperature

The thermostat shows time and date. The calendar switches over automatically in leap years and automatically adapts to DST. To be able to use the programme for temperature reduction, time and date must be set. The thermostat automatically computes which day of the week it is.

Set time

1. Press ●. The display shows **CONF**.
2. Press ▼ repeatedly until the display shows **SEF**. Press ●.
3. The menu in the display shows **CLK**. Press ●. Hours now flash.
4. Press ▲ or ▼ repeatedly to set the hours. Confirm with ●.
5. Repeat the previous step to set the minutes.
6. Repeat the previous step to set month and year.

Set date

1. Press ●. The display shows **CONF**.
2. Press ▼ repeatedly until the display shows **SEF**. Press ●.
3. Press ▼ repeatedly until the display shows **DATE**. Press ●.
4. Press ▲ or ▼ repeatedly to set the date. Confirm with ●.

Deactivate DST

1. Press ●. The display shows **CONF**.
2. Press ▼ repeatedly until the display shows **SEF**. Press ●.
3. Press ▼ repeatedly until the display shows **S**. Press ●.
4. The display shows the current setting. Press ▼ to change. Confirm with ●.

Temperature

For every push on ▲ or ▼ the desired temperature increases or decreases by 0.5°C.

How the thermostat shows the time is set as follows

1. Press ●. The display shows **CONF**.
2. Press ▼ repeatedly until the display shows **SEF**. Press ●.
3. Press ▼ repeatedly until the display shows **d 15P**. Press ●.
4. The display shows the current setting. Press ▼ to change. Confirm with ●.

Thermostat settings

EB-Therm can work with three separate functions:

"R&F" - Room - and floor-thermostat – A built-in sensor regulates the room temperature.

The external floor sensor functions as a floor temperature limiter.

The limitation can be set between 5°C and 45°C. The factory setting is 35°C, which gives a surface temperature of approx. 27°C.

To adjust overheat protection temperature:

1. Press ●. The display shows **CONF**.
2. Press ▼ repeatedly until the display shows **SEF**. Press ●.
3. Press ▼ repeatedly until the display shows **OH**. Press ●.
4. Actual temperature is now flashing. Press ▲ or ▼ to change. Confirm with ●.

In rooms with large windows which are exposed for sunlight, we recommend this setting.

"F" - Floor thermostat - The external floor sensor regulates the floor temperature. Preset value is 22°C. If the floor sensor is engaged the first time the thermostat is switched on, the thermostat selects this function automatically.



"R" - Room thermostat - A built-in sensor regulates the room temperature. The function cannot be selected when the floor sensor is connected. If the floor sensor is not connected at the first switch-on, the thermostat automatically selects this function.

To select any of these settings:

1. Press ●. The display shows **CONF**.
 2. Press ▼ repeatedly until the display shows **SEF**. Press ●.
 3. Press ▼ repeatedly until the display shows **R&F**. Press ●.
 4. One of the icons **R**, **F** or **R&F** flash, depending on which is the current setting.
 5. Press ▲ or ▼ to change selected setting. Confirm with ●.
- NOTE! **R** can not be selected if the floor sensor is connected.

Preset programme

The thermostat has two preset programmes for temperature reduction which are adapted for home- or office environments.





Programme for home environment . The temperature is automatically reduced by 5°C during	
Mo – Fr 08:30 – 15:00	
Mo – Su 23:00 – 05:00	
Programme for office environment . The temperature is automatically reduced 5°C the whole time except for:	
Mo – Fr 06:00 – 18:00	





To select any of these programmes:

1. Press ●. The display shows **CONF**.
 2. Press ▼ repeatedly until the display shows **PROG**. Press ●.
- One of the icons for preset programmes will flash, depending on the current setting. (If no icon flashes, no preset programme is selected).
3. Press ▲ or ▼ to select between , , ,  or no programme. Confirm with ●.

If a preset programme is selected the programme starts up. ↓ is shown together with actual icon and indicates that a programme is running.

User settings

EB-Therm 350 has programmes for own settings. You can set four events Monday to Sunday. The four events Mo-Su are WAKEUP , OUT , BACK  and NIGHT .

1. Press ●. The display shows **CONF**.
2. Press ▼ repeatedly until the display shows **SEF**. Press ●.
3. Press ▼ repeatedly until the display shows **4E**. Press ●.
4. The MASTER set, ^{MD TU WETH FR SA SU}, all 7 days are now displayed. Press ●.
5. , actual time and temperature is shown in the display.
6. The hours digits are flashing. Press ▲ or ▼ to set the hours. Confirm with ●.
7. Press ▲ or ▼ to set the minutes. Confirm with ●.
8. Press ▲ or ▼ to set the temperature. Confirm with ●.
9.  is shown, repeat steps 6-8 to set the time and temperature for this event.
10.  is shown, repeat steps 6-8 to set the time and temperature for this event.
11.  is shown, repeat steps 6-8 to set the time and temperature for this event.

If any of the days of the week are divergent, do as follows:

1. Press ●. The display shows **CONF**.
2. Press ▼ repeatedly until the display shows **SEF**. Press ●.
3. Press ▼ repeatedly until the display shows **4E**. Press ●.
4. Now actual MASTER set is shown, ^{MD TU WETH FR SA SU}. Press ▲ or ▼ repeatedly until the divergent day is shown. Confirm with ●.
5. Program the 4 events of the day, according to step 6-11 above.

Is there any more divergent days, repeat steps above.

Display of actual value (current temperature)

When the key set is locked, press ●. The light comes on and the current temperature is displayed for 30 seconds as small digits above the set value (the temperature required).

If the thermostat is set as a floor thermostat (**F**), it displays the current temperature in the floor.

If the thermostat is set as a room thermostat (**R**), it displays the current temperature in the room.

If the thermostat is set as a room and floor thermostat, (**R&F**) it displays the current temperature in the room.

Frost protection programme ❄

This programme is designed for long absence. When this program is selected, the thermostat will regulate by this set value. All other set values and settings will remain in memory and the thermostat will go back to them when this program will be deactivated. The temperature can be between 5°C and 15°C. Factory set temperature is 10°C.

1. Press ●. The display shows **CONF**.
2. Press ▼ repeatedly until the display shows **SEF**. Press ●.
3. Press ▼ repeatedly until the display shows **F.P.** Press ●.
4. Now the selected temperature is flashing.
5. Press ▲ or ▼ to select the set value. Confirm with ●.

To activate this programme:

1. Press ●. The display shows **CONF**.
 2. Press ▼ repeatedly until the display shows **PROG**. Press ●.
- One of the icons for preset programmes will flash, depending on the current setting. (If no icon flashes, no preset programme is selected).

3. Press ▼ to select ❄. Confirm with ●.

If a preset programme is selected the programme starts up. ↓ is shown together with ❄ and indicates that the programme is running.

Display contrast

1. Press ●. The display shows **CONF**.
2. Press ●. The display shows 1,2, 3.....8 depending on actual setting.
3. Press ▲ or ▼, to change the contrast. Confirm with ●.

Adaptive function

The thermostat is equipped with a so-called adaptive function, which means that if you have programmed the thermostat to keep a certain temperature at a certain time, the thermostat will calculate itself when to start heating so that the floor surface will keep the set temperature at the preset time. Factory set is ON.

To deactivate the adaptive function:

1. Press ●. The display shows **CONF**.
2. Press ▼ repeatedly until the display shows **SEF**. Press ●.
3. Press ▼ repeatedly until the display shows "AF". Press ●.
4. The display shows the actual settings. Press ▼ to change. Confirm with ●.

Operation time

The thermostat can show the operation time in percent for the last 24 hours, 7 days, 30 days or 365 days. To see the percentage operation time:

1. Press ●. The display shows **CONF**.
 2. Press ▼ repeatedly until the display shows **UT**. Press ●.
- The display shows operation time in percent for the last 24 hours.
3. Press ▲. The display shows **7d** and operation time in percent for the last 7 days.
 4. Repeat the steps above to show the operation time for the last 30 days or 365 days, respectively.

Ventilation mode

If the measured temperature is reduced by more than 3°C during one minute, the thermostat is automatically put in ventilation mode. The thermostat stops heating for 15 minutes. When 15 minutes have passed, the thermostat returns to normal mode.

The ventilation mode is always active, regardless of which programme is running.

Troubleshooting

When an error occurs, the thermostat will switch off the heating. The LED flashes alternately in red and green. The LCD-display shows a flashing error code, the display shows according to below:

Error 1: Short circuit room sensor.

Error 2: Interruption room sensor.

Error 3: Short circuit floor sensor.

Error 4: Interruption floor sensor.

The supply cord of this control can be replaced only by the manufacturer or his accredited service agent.

Technical specifications

Voltage	230 VAC-50 Hz
Air temperature range	5-37°C
Floor temperature range	5-37°C
Temperatur limiter	5-45°C
Breaking capacity	3600W / 16A / 230 VAC
Main switch	1-pole
Connection cable	max 2,5 mm ²
Load	cos φ = 0,3
Hysteresis	+/- 0,3°C
Protection class	IP21
Run reserve	36 hours
Colour	Polar white as standard, aluminium and bronze as option
Background lighting	Shines 30 seconds after the last button is pushed
Max length sensor cable	45 m, 2 x 1,5mm ²
The LED's indication:	
Green	230 VAC supply connected
Red	Floor heating cable operating
Flashing green and red light	Error indication

Adapted for Eljo Trend, Elko RS, Strömfors and Merten frame-systems.

EMC-certified and can handle an overvoltage of 2 500 VAC.

Safety standard: CE

Fulfils the RoHS and WEEE-directive

EB-Therm 350 with accessories

Art. No.	Article	Dimensions (mm)
E 85 816 66	EB-Therm 350	81x81x40
E 85 816 68	Extension frame	81x81x18
E 85 816 71	Sensor cable 3 m (included in the pack)	
E 85 816 97	Back plate, polar white	86x86x6
E 85 816 98	Back plate, aluminium	86x86x6
E 85 816 99	Back plate, bronze	86x86x6
E 85 816 78	Front Cover, aluminium	
E 85 816 79	Front Cover, bronze	

Model no. 66 210 84

Type IB

Degree of pollution 2

Rated impulse voltage = 4000V

Size of terminal 2,5 mm²

Start / Stop set back programme

This will not erase settings, will only start and stop set back programme.

Start programme:

1. Press ●. Display shows **CONF**.
 2. Press ▼ repeatedly until display shows **PROG**. Press ●.
- If a programme is active one icon is flashing **🏠**, **👤**, **❄**.
3. Press ▲ or ▼ repeatedly to choose icon, chosen icon must flash. Confirm with ●.

Stop programme:

1. Press ●. Display shows **CONF**.
 2. Press ▼ repeatedly until display shows **PROG**. Press ●.
- If a programme is active one icon is flashing **🏠**, **👤**, **❄**.
3. Press ▲ or ▼ repeatedly until no icon flash. Confirm with ●.