



MTC3-1991 User Manual

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Introduction

Thank you for buying our MTC3 thermostat. We hope you will enjoy the ease of use offered by the well-known user interface and design. This high-quality thermostat is designed to have a minimum of impact on the environment and will at the same time provide you with long-lasting heating comfort.

The thermostat will switch on your heating system at predetermined times each day of the week. The thermostat is preset with up to four events for each day of the week. Lowering the temperature when your home is unoccupied will reduce your energy costs without reducing comfort. The thermostat comes with preset heating schedules suitable for most homes.

MTC3 has a temperature setting range of 0-40°C, a night setback, frost protection and limit temperatures to ensure your comfort and protect your property from excessive temperatures.

The front cover can be flipped down.

Behind the front cover, on the left side of the front, there is an on/off switch, up = on / down = off. On the right side, there are three buttons. An upper button, a centre button and a lower button.

The centre button is used to access the menu and confirm changes and settings made in the menu.

The upper and lower buttons are used to navigate through the menu and change parameters and settings.

To access the menu, activate the thermostat by pushing any of the three buttons.

Then hold the centre button in for five seconds.

Note: If you hold the centre button for ten seconds, the thermostat will perform a factory reset, i.e. all settings will then be reset to their factory settings.

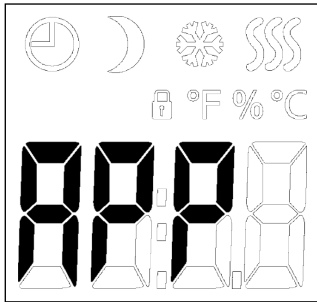
This thermostat can be used as a controller for electric room heating pursuant to EN50559.

Menu Overview

Menu	Setting Options	Factory Setting
APP	APP: A; F; C; AF; AE	A
SCA	SChI: SCLo - 40.0°C SCLo: 0.0°C - SChI	40°C 0°C
Li	LiHi: LiLo - 40°C LiLo: 0°C - LiHi	28°C 15°C
tP	FLo: Actual measured temperature ro: Actual measured temperature	Readout Readout
LCd	SCA: C; nu diS: SP; tP	C SP
AdJ	Measured temperature +/- 10°C	0.0°C
nSb	2.0°C - 8.0°C	5.0°C
dEF	5.0° - 10.0°C	8.0°C

Menu	Setting Options	Factory Setting	
PWM	oFF; on; AUt	Aut	
	oFF	diF: 0.3-10.0	0.4
	AUt	CYHi: 10-60 CYLo: 10-30	30 15
Pli	0-30 min	0 min	
Time	ModE: oFF; 5;2; 6;1; 7;0; 0;7 dAY: Non; tuE; UEd; thu; Fri; SAT; Sun hour: 0-23 min: 0-59	oFF None None None	
SW	None	Readout	
Done	Save settings and exit the menu	None	

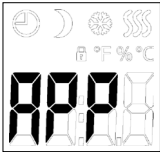
APP : Sensor Application 1/2



This option allows you to choose which sensor is used to control the heating system. If a factory reset is performed, the thermostat will autodetect an external sensor.

- **A:** With this setting, the internal room sensor inside the thermostat controls the heating system.
- **F:** With this setting, the floor sensor controls the heating system.
- **C:** With this setting, the thermostat operates as a regulator and no sensors are used. The setting is a percentage of the full load in increments of 1%. Note that Floor Protection is not active when using the thermostat as a regulator.
- **AF:** With this setting, the internal room sensor controls the heating system subject to maximum and minimum limits for floor temperature. The maximum temperature limit protects wooden floors from excessive heat. The minimum temperature limit prevents the floor from becoming uncomfortably cold when heating is not needed, e.g. in a bathroom. Note that this function will increase energy consumption. Floor Limit temperatures are set in the “Li : Floor Temperature Limit” menu.

APP: Sensor Application 2/2



- **AE:** With this setting, an optional external room sensor (connected to the floor sensor terminals) controls the heating system.

How to execute it:

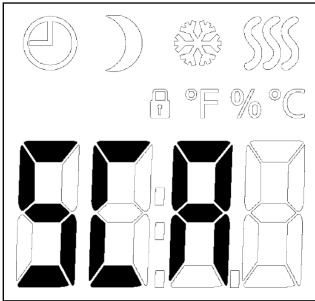
- Access the menu.
- Scroll through the menu to APP.
- Press the centre button to enter the SENSOR APPLICATION setting.
- Use the upper or lower button to select the application that suits your installation.
- Confirm your choice with the centre button.

Menu structure:

APP: A; F; C; AF; AE

Factory: A

SCA : Temperature Scale



How to execute it:

- Access the menu.
- Scroll through the menu to SCA.
- Press the centre button to enter the Scale settings.
- Use the upper or lower button to set the limit for the highest temperature the thermostat may use as a set-point temperature.
- Confirm your choice with the centre button.
- Use the upper or lower button to set the limit for the lowest temperature the thermostat may use as a set-point temperature.
- Confirm your choice with the centre button.

This option allows you to set the minimum and maximum temperatures to which the thermostat can be set.

Operating temperatures:

- SChI: Maximum Temperature Scale can be set to between the Minimum Temperature and 40°C.
- SCLo: Minimum Temperature Scale can be set to between 0°C and the Maximum Temperature.

(If “Sensor Application” is set to “Floor”, a maximum temperature of 27°C can protect wooden floors from drying out. For precise information, please ask your flooring supplier).

Menu structure:

SCA:

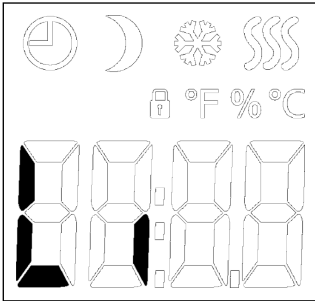
SChI: 0.0°C - 40.0°C

Factory: 40.0

SCLo: 0.0°C - SChI

Factory: 00.0

Li : Floor Temperature Limit



This option allows you to set the minimum and maximum limits for floor temperature.

Floor limit temperatures:

Floor limit temperatures allow you to set the highest (LiHi) and lowest (LiLo) permissible floor temperature during room temperature control with the sensor application **AF**. If floor temperature rises above the maximum temperature limit, the thermostat will deactivate the heating system to maintain the temperature below the set maximum. If floor temperature drops below the minimum temperature limit, the thermostat will activate the heating system to maintain the temperature above the set minimum. Note that this feature is only applicable in the sensor application **AF**.

Menu structure:

Li:

LiHi: LiLo - 40°C

LiLo: 0°C - LiHi

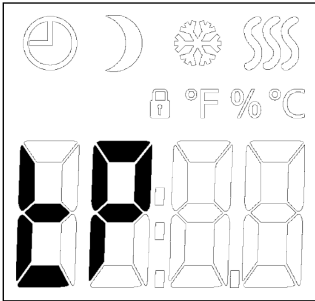
Factory: 28°C

Factory: 15°C

How to execute it:

- Access the menu.
- Scroll through the menu to Li.
- Press the centre button to enter the Limit setting.
- Use the upper or lower button to set the limit for the highest temperature the thermostat may reach.
- Confirm your choice with the centre button.
- Use the upper or lower button to set the limit for the lowest temperature the thermostat may reach.
- Confirm your choice with the centre button.

TP : Temperature Readout



Depends on which sensors are connected and which sensor application is chosen. Temperatures from the floor sensor and the internal room sensor can be monitored here.

Display settings are not applicable if the sensor application is set to C.

How to execute it:

- Access the menu.
- Scroll through the menu to TP.
- Press the centre button to enter the temperature readout.

Either the floor sensor temperature, the room sensor temperature or both are shown depending on the sensor application setting.

- Use the centre button to jump to the next sensor type and jump to the menu.

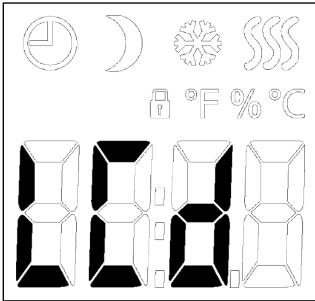
Menu structure:

TP:

FLo: Actual measured floor temperature

ro: Actual measured room temperature

LCD : Display Settings



This option allows you to select what data you want to be shown in the idle display.

SCA = Temperature scale setting:

C = Celsius

(nU = numerical 0-100%)

DiS = Displayed in idle display:

SP = Setpoint temperature

tP = Measured temperature

Display settings are not applicable if the sensor application is set to C.

How to execute it:

- Access the menu.
- Scroll through the menu to LCD.
- Press the centre button to enter the temperature scale setting.
- Use the upper or lower button to toggle between the different options.
- Confirm your choice with the centre button.
- Use the upper or lower button to toggle between the different options.
- Confirm your choice with the centre button.

Menu structure:

LCd

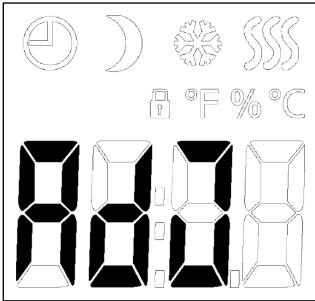
SCA: C; nu

diS: SP; tP

Factory: C

Factory: SP

ADJ : Adjust



This option allows you to calibrate the measured room temperature.

You should calibrate the sensor if the temperature reading differs from the actual temperature.

The measured temperature has to be entered.

Note that with sensor application **F**, the temperature is measured in the floor, this temperature would be higher than the ambient temperature.

Adjust is not applicable if the sensor application is set to **C**.

How to execute it:

You can calibrate the sensor with +/- 10°C in steps of 0.1°C as follows:

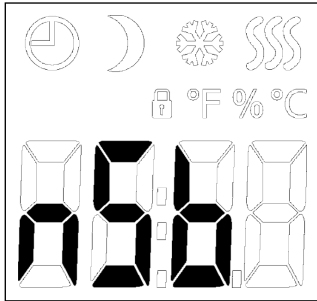
- Access the menu.
- Scroll through the menu to ADJ.
- Press the centre button.
- Use the upper or lower button to adjust the sensor to the value by which you want to increase/decrease the temperature.
- Confirm your choice with the centre button.

Menu structure:

AdJ:

Measured temperature +/- 10°C Factory: 0.0°C

NSB : Night Setback



How to execute it:

- Access the menu.
- Scroll through the menu to NSB.
- Press the centre button to enter the Night setback setting.
- Use the upper or lower button to adjust the value by which you want to decrease the temperature when NSB is activated.
- Confirm your choice with the centre button.

This option allows you to set the value by which the temperature should be reduced when NSB is activated. NSB is activated either by the event schedule or with a signal from an external timer connected to terminal S. When the NSB signal is active, a half-moon icon is shown in the display together with the lowered setpoint temperature.

The function is factory set to 5°C but can be set to values between 2-8° in increments of 0.5°C.

If the Application is set to **C** and "Night setback" is selected, the night setback is set in relative values. The setpoint specifies (in percent) the time that the unit is to remain active in a PWM cycle, which is usually 20 min. Setback degree is specified as a percentage of the setpoint. The setpoint multiplied by the setback degree gives the activation degree.

Example: If the setpoint is set to 60% and night setback is set to 25%, the activation degree will be $(0.60 \times 0.25 = 0.15) = 15\%$.

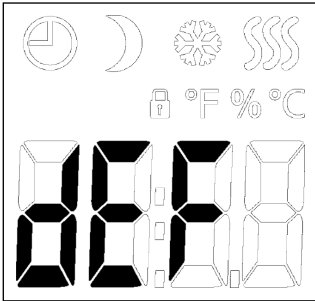
Menu structure:

nSb:

2.0 - 8.0

Factory: 5.0°C

DEF : Frost Protection



This option allows you to set the parameters for any possible frost protection function.

An external signal can activate the frost protection, the thermostat will then maintain a fixed floor/room temperature.

The function is factory-set to 8°C but can be set to values from 5-10° in increments of 0.5°C.

If the Application is set to **C** and "Frost protection" is selected, then frost protection is set in absolute values in percent.

How to execute it:

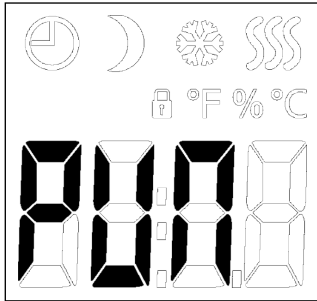
- Access the menu.
- Scroll through the menu to DEF.
- Press the centre button to enter the frost protection settings.
- Use the upper or lower button to set the temperature you want to be the setpoint temperature when DEF is activated.
- Confirm your choice with the centre button.

Menu structure:

dEF: 5.0° - 10.0°C

Factory: 8.0°C

PWM : Pulse Width Modulation



With this setting, you can change the duration of the heating periods.

Off: Simple “on/off” regulation, where the relay is closed when the measured temperature is below the setpoint, and opened when the measured temperature is above the setpoint. Hysteresis (diF) is used to avoid too frequent relay switching.

Auto: Like “PWM On”, but the PWM period is increased or decreased depending on the minimum and maximum temperature measured during a PWM period. This will increase the lifetime of the relay by reducing the number of relay switches, but still ensure the comfort of the user by keeping the temperature swings below an acceptable level.

Menu structure:

PWM: oFF; on; AUt

oFF: diF: 0.3-10.0

AU: CYHi: 10-60

CYLo: 10-30

Factory: 0.4

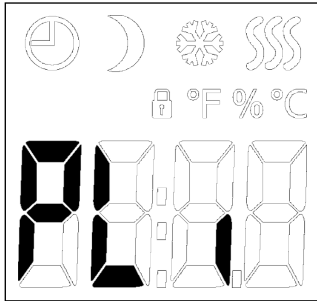
Factory: 30

Factory: 15

How to execute it:

- Access the menu.
- Scroll through the menu to PUn.
- Press the centre button to enter the PWM settings.
- Use the upper and lower button to toggle between the different Pulse width modulation modes.
- Confirm your choice with the centre button.
- Use the upper or lower button to set the hysteresis or duty cycle.
- Confirm your choice with the centre button.

PLI : Power Limit 1/2



This thermostat complies with EN 50559 (VDE 0705-559) for electrical floor heating. The regulation applies to electrical floor heating with a maximum floor weight of 4 kN/m². To ensure that hotspots due to unintentionally covering up part of the surface are avoided, the heating function can be time-limited as per EN/DIN.

Note that this function is not applicable to other heating applications such as wall and/or ceiling heating. If it can be foreseen in advance that unintentional covering up of part of a floor might occur, then it is important to assess the correct period of time for which the floor heating must be time-limited.

The heating can be limited by using a set number of minutes per hour. The thermostat will then divide the given number of minutes per hour up into 3 periods, depending on the thermostat's actual PWM cycle.

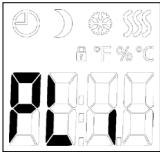
Example:

If obstacles could be present that cover up a part of the floor, then the heating might need to be limited by some number of minutes so as to avoid hotspots in the floor.

If you want the thermostat to heat a maximum of 90% of the time, then the thermostat should be limited by 10%.

Ten percent of one hour is 6 minutes. Enter 6 min. in the PLI menu in order to lower the heating by 10%.

PLI : Power Limit 2/2



Equation to calculate number of minutes that could be entered in the PLI menu - when an average heating effect is desired:

$$\left(1 - \left(\frac{\text{Average desired heating effect per } m^2}{\text{Floor heating element effect per } m^2} \right) \right) * 60 \text{ min.}$$

Note!

If the result of the equation is negative, then nothing should be entered.

The function is factory-set to 0 minutes but can be set to values between 0-30 minutes in increments of 1 minute.

How to execute it:

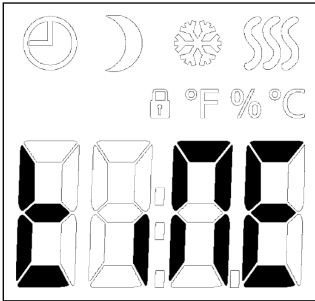
- Access the menu.
- Scroll through the menu to PLi.
- Press the centre button to enter the Power limit settings.
- Use the upper or lower button to set the number of minutes by which you want the heating to be deactivated per hour.
- Confirm your choice with the centre button.

Menu structure:

PLi: 0-30

Factory: 0

TIME : Time and Event Setting 1/2



The MTC3 has a timer function that keeps track of the current weekday and time of the day. It is possible to select different event schedules for the MTC3.

The events differ in the number of days that are using 4 events (with a setback period during both night and daytime) and 2 events (only using a setback period for the night).

The different event schedules of the MTC3 have the following definitions:

OFF: Events are disabled and the comfort temperature is maintained 24/7

5 : 2: Monday – Friday with 4 events,
Saturday & Sunday with 2 events

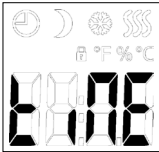
6 : 1: Monday – Saturday with 4 events,
Sunday with 2 events

7 : 0: Monday – Sunday with 4 events

0 : 7: Monday – Sunday with 2 events

Note if an external timer is used - the external timer has priority.

TIME : Time and Event Setting 2/2



How to execute it:

- Access the menu.
- Scroll through the menu to tiNE.
- Press the centre button to enter the time and event settings.
- Use the upper or lower button to toggle between the different Schedule modes.
- Confirm your choice with the centre button.
- Use the upper or lower button to set the current day.
- Confirm your choice with the centre button.
- Use the upper or lower button to set the current hour.
- Confirm your choice with the centre button.
- Use the upper or lower button to set the current minutes.
- Confirm your choice with the centre button.

Time schedule for the events:

4-event:	Time:	Temperature:
Morning	06:00-08:00	Setpoint
Daytime	08:00-16:00	Setpoint - NSB
Evening	16:00-23:00	Setpoint
Night	23:00-06:00	Setpoint - NSB

2-event:	Time:	Temperature:
Day	08:00-23:00	Setpoint
Night	23:00-08:00	Setpoint - NSB

Menu structure:

tiNE:

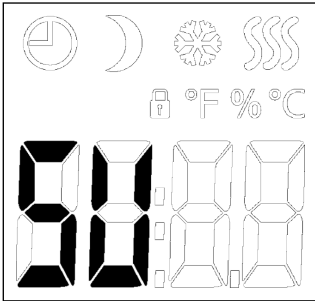
NodE: oFF; 5:2; 6:1; 7:0; 0:7

dAY: Non; tuE; UEd; thu; Fri; SAT; Sun

hour: 0-23

Nin: 0-59

SW : Software Version



This function provides a readout containing the software version number.

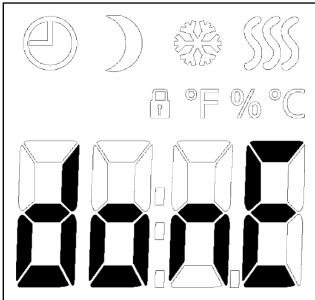
How to execute it:

- Access the menu.
- Scroll through the menu to SU.
- Press the centre button to enter the software readout.
- Press the centre button to exit the readout.

Menu structure:

SW: Readout

Done : Exiting the Menu



This is the exit from the menu.

Note there is a timeout function.

If no button is pressed for 30 seconds, the thermostat will return to the main screen.

Note the settings are saved when the menu is exited.

How to execute it:

When in the menu:

- Scroll through the menu to donE.
- Press the centre button to exit the menu.

Menu structure:

donE: Return to main screen

Troubleshooting and Additional Information

Error codes

E0: Internal fault.
Heating is shut off.

E1: Built-in sensor fault.

The sensor application is changed to C (regulator).

E2: External wired floor sensor or external wired room sensor fault.

(The sensor is either damaged, short-circuited or disconnected).

The sensor application is changed to C (regulator)

If AF is used - the sensor application is changed to A (internal room sensor).

E5: Internal overheating.

Internal overheating. If the E5 Error persists, please contact your installer.

Note that the backlight is lit if any fault is detected.

- If there is no reaction when any button is pushed, except from the backlight. - Check for the padlock icon, the child lock might be activated.

Child Lock

The child lock can be activated directly if the thermostat is idle or if the thermostat's backlight is activated but never from within the menu.

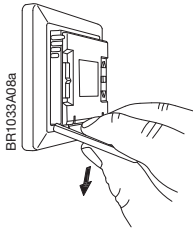
- Activate the child lock by holding the upper and lower buttons simultaneously, until the padlock icon is shown in the display.
- The padlock icon indicates that the child lock is activated.
- Deactivate the child lock by holding the upper and lower buttons simultaneously, until the padlock icon is no longer shown in the display.

Factory reset

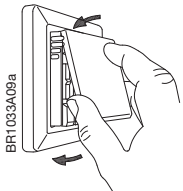
- Activate the thermostat by pushing any of the three buttons.
- Hold the centre button for ten seconds. (Keep holding the button even when the menu is entered).

Note that all user-made settings are deleted.

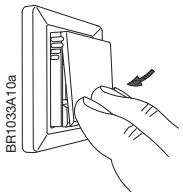
Changing the Front Cover



- Open the front cover
- Grasp the front cover with the index, middle and ring finger on the upper side of the front cover, as close as possible to the thermostat.
- Pull the front cover downwards.



- Align the top of the new front cover with the top of the thermostat.



- Press at the bottom of the new front cover, applying pressure where the taps are located.

Contact : Help and Support



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