

**INSTALLATION INSTRUCTIONS
OPTIONS 909.2 & 909.3**

Detailed Instruction ‘OpenTherm Thermostat’ (1:4 version)

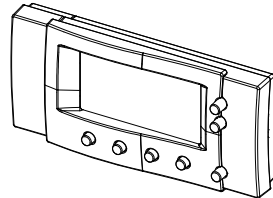
“Wireless thermostat 1:4 version” is a multiple air heaters remote controller, able to control up to 4 air heaters. If the application involve 5 air heaters, two wireless thermostats are required.

Functional features

- Five pre-set timer programs (adjustable)
- Wireless thermostat for up to 4 air heaters
- Three languages support: Dutch, English, French
- Four hotkeys
- Three levels of daily room temperature
- Automatic or manual functioning
- RF Air Heater remote control
- Function failure diagnostic and display
- Automatic identification protocol
- 2 wire thermostat for one air heater

System components

1) Wireless thermostat Air Heater Control 1:4 (wireless thermostat) version with integrated RF module is provided with two AA LR6 alkaline 1,5V STILO batteries



RF module for the air heater (RF Bridge). Uses wireless OpenTherm connection of the air heater.

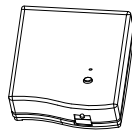
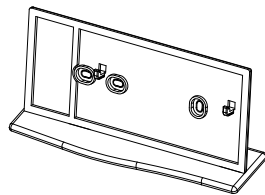
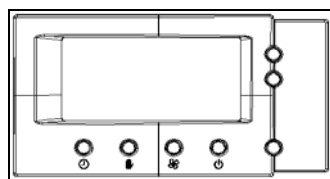


Table support
It allows, instead of wall installation, the positioning of the wireless thermostat on flat surfaces.

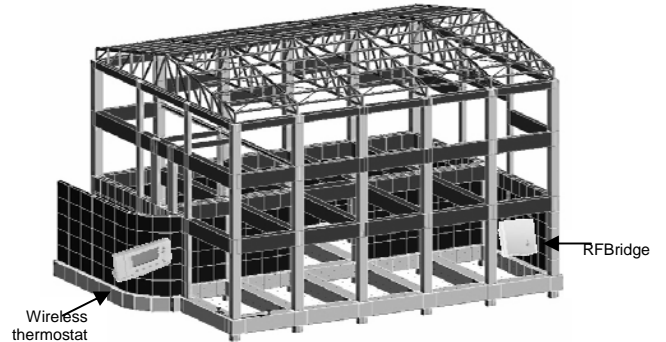


2) Two-wire thermostat control.
The two-wire thermostat for air heater uses twisted wires or shielded cable.



Installation

GENERAL RECOMMENDATIONS



Take into account following guidelines especially when installing the wireless thermostat in harsh environment, like plant, industrial plant and similar places.

To assure system reliability, please review and apply the information given below.

- Within a typical small plant the wireless thermostat and RF bride should communicate reliably within a 30 m range (up to 50 m in case no major obstacles are placed onto the Line of Sight path of the two devices).
- It is important to take into consideration that walls and ceilings, metal columns, metal doors and gates will reduce the RF signal.
- The strength of the RF signal reaching the relay box (or the RF OpenTherm Bridge) depends on the number of walls, number of corners, number of doors (especially if metallic), gates and ceilings separating it from the room thermostat (MMI), as well as the plant construction - the above picture illustrates an example of typical Industrial Plant construction.
- Walls and ceilings reinforced with steel or plasterboard walls lined with metal foil reduce the RF signal significantly. Also metal grid used for metallic cage, fences, normally used into warehouses can significantly affect RF performances of device.

In case there are some physical obstacles between the wireless thermostat and the RF bridge (e.g.: walls, concrete surfaces, metal surfaces, shielded surfaces (i.e. metallic doors, gate, etc), metal machinery and even metal grid (i.e. wall made of concrete and internal metal grid to reinforce the structure), the RF communication distance could be affected and LOS communication distance cannot be guaranteed any longer.

If installation location is affected by above mentioned obstacles it is highly recommended to reconsider the installation of a wireless thermostat.


Other simple recommendations:

- Wireless thermostat should be installed in **an open space** for best performance as it is a radio frequency device.
- Leave at least 30cm distance from any metal objects including wall boxes, metallic doors, cages, gates and at least 1 meter from any other electrical equipment eg. radio, TV, PC, electrical machinery in general (also alarm systems), etc.
- Do not mount onto metal wall boxes.
- It is recommended that the RF Bridge is fully installed.
- For the best temperature control performance the wireless thermostat should not be placed near heat or cool sources (e.g. cooker, lamp, radiator, doorways, windows).

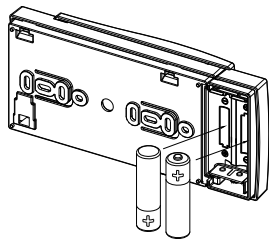
WIRELESS THERMOSTAT

The Wireless thermostat, with integrated RF, is provided with two AA LR6 alkaline 1,5V STILO batteries. It has an electronic integrated device which constantly monitors the batteries' power level.

The batteries supplied with the wireless thermostat have one year lifetime.

When batteries replacement is necessary, on the LCD display, of the Wireless thermostat, the symbol "lower batteries" is shown 

To insert or replace batteries, it is necessary to access to the battery' holder placed on the back of the wireless thermostat. Always replace both batteries. Use new batteries of correct type and voltage. Insert the batteries into the batteries holder respecting the polarity (see picture).



WARNING

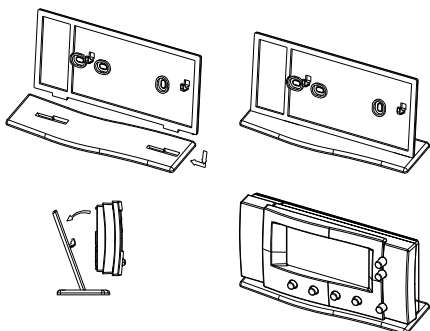


Do not throw out the exhausted batteries together with the normal garbage but throw them out in the proper container for exhausted batteries.

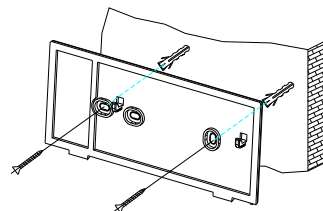
During batteries replacement, functioning mode and programmed data remain stored in the wireless thermostat memory.

According to the batteries replacement time, it may be necessary to reset day, hour and minutes (see Switch ON – Day, hours and minutes setting paragraph).

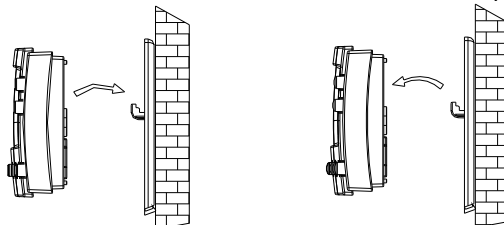
To use the table support, it is necessary to assemble the two plastic parts (base and back panel) and subsequently to accommodate the wireless thermostat as shown in picture below.



The wireless thermostat 1:4, if not used in combination with the table support, is normally fixed on the wall, to the back panel. Use the screws set in equipment to fix the back panel to the wall.



Once the back panel has been fixed to the wall, fix or remove the Wireless thermostat, as shown in picture below

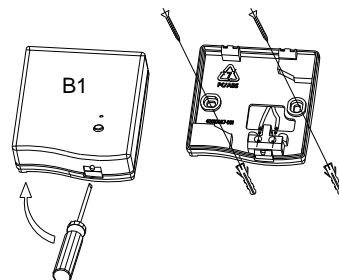


The wireless thermostat has to be fixed to the wall at 1,5m.high from bottom, far from entry doors, windows or heating sources that can affect room temperature measurement.

Remark : 50m free field.

RF BRIDGE

The RF Bridge module is electrically connected to the Air Heater board to the OpenTherm® line, by connecting two not polarized wires. A proper screw terminal is provided for this operation.



To gain access to the screw terminal, remove the front side of the RF Bridge module and, with a screwdriver, work on the indicated point as shown below.

The RF Bridge has to be installed outside, next or inside the Air Heater, avoiding to shield it completely with metal parts.

After cutting off power supply to the Air Heater, fix the back panel of the RF bridge to the wall, using the screw set in equipment. Take care to let pass the wire in the hole above the connection block. Then connect the two wires to the connections blocks (A, B) of the RF bridge and the air heater. Then connect the line voltage.

WARNING



The RF Bridge module must be connected only at the Air Heater board's to the OpenTherm® line and not at the Room Thermostat line.

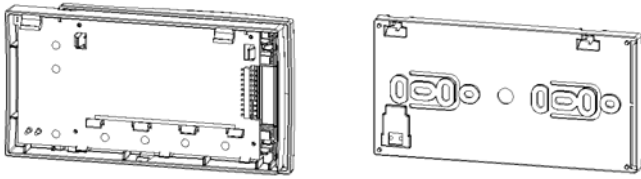
Use a bipolar cable (2x1sqmm max) taking care that it follows a different path from that one of the main supply cables. The length of the cable must be less than 20m. Finally close the RF Bridge module.

TWO WIRE THERMOSTAT

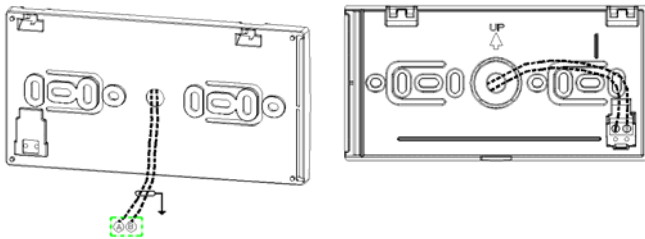
The two-wire thermostat is fed by two wires via OpenTherm communication. Max length = 50m.

Make use of twisted wires or shielded cable (max. 2*1mm²) (p.e. Liycy or Beldon 8451).

After loosening the cover, a connection block with two terminals appears (see pic. below).



Connect the wires from terminals A & B of the appliance with the terminals on the cover (no polarization) (as illustrated)



The two-wire thermostat can be fixed on the wall (see above).

LED diagnostic

The RF Bridge has an incorporated bicolor LED, for operation/visual indication, and a key to synchronize the RF bridge with the wireless thermostat.

Following the detailed signaling description:

Status	Visual indication*	Description
1	Short GREEN flash every 10", active for 0,1"	NORMAL OPERATION
2	Short GREEN flash every 3", active for 0,1"	OVERRIDE MODE
3	Short RED flash every second, active for 0,1"	RF BRIDGE NOT BOUND
4	Long RED flash every second, active for 0,5"	RF BRIDGE IN BINDING MODE
5	Short RED flash following by 3 short GREEN flashes every 3" (RED active for 0,25"; GREEN active for 0,1")	BINDING PROCEDURE FAILED
6	Short RED flash every 3", active for 0,1"	LOSS OF RF COMMUNICATION FOR ALL UNITS BOUND TO RF BRIDGE
7	3 Short RED flashes every 3", active for 0,1"	LOSS OF OpenTherm® COMMUNICATION (Air Heater/RF Bridge)
8	2 Short RED flashes every 3", active for 0,1"	LOSS OF OpenTherm® COMMUNICATION (RF Bridge/Wireless thermostat)

*In some cases the diagnostic is refreshed few minutes later than the real activation of the operation status.

Functional system check

After the installation described above, be sure that the Air Heater has correctly power on and that the RF Bridge LED shows the functional status 1 (NORMAL OPERATION).

In case of different visual LED indication, it is necessary to go through the binding procedure as explained in the "Binding Procedure" paragraph.



In case of generic communications errors on wireless thermostat appear, place the wireless thermostat in a place which allows a more reliable RF communication. If the problem persists, go on with the "Binding procedure".


Remark: When the power or the wireless thermostat (batteries) have been disconnected, it can take up to 10mins until the connection between the RF thermostat and the controller is restored


a. Place the wireless thermostat near the RF Bridge


b. Press for more then 15 sec. the key present on the RF Bridge, till the LED shows the functional status 3 (RF BRIDGE NOT BOUND). This operation reset all data related to a previous binding procedure of the RF Bridge.

c. Push for 5 sec. the key present on the RF Bridge, till the LED shows the functional status 4 (RF BRIDGE IN BINDING MODE).

d. With the wireless thermostat placed in initial display mode push the  button for 15 sec. When service menu appears, push key  (>>) and scroll into the menu till BIND command is shown.

e. Push the  (Bind) key to activate the command BIND.



On the display of the wireless thermostat will appear the "aerial" symbol , while the LED of the RF Bridge shows the functional status 1 (NORMAL OPERATION).

To return to the initial display mode, push the key  for 15 sec. Starting from now, the system is bounded, so the wireless thermostat, can be re-placed again in the original installation place.

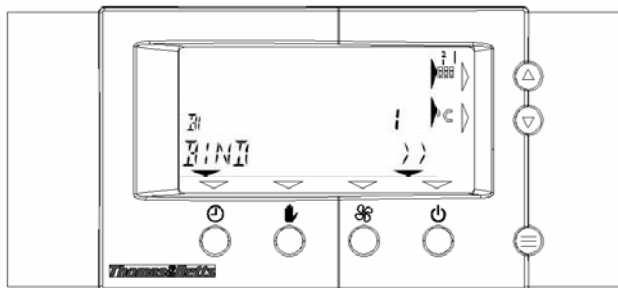
Binding menu: how to expand the system up to 4 AHs

Do not keep more than one bridge "on" (=learning phase) during "binding procedure". Before to start to bind the wireless thermostat to a bridge, please turn off the remaining bridges you do not want to "catch" (the binding message coming from the wireless thermostat is sent to all listening RF Bridges and every RF bridge always answers this message, even if not in "learning phase").

On the LCD a triangle, displayed above or sideways to one or more keys, shows that these keys are active.

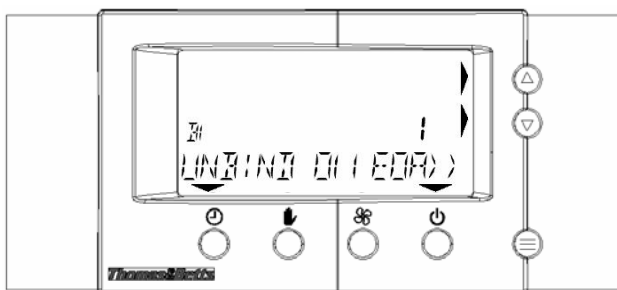
Bind menu is designed to bind up to 4 bridges (4 air heaters). By keys  it is possible to select index ("1" to "4") (B1 to B4) which will be assigned to bridge during a binding operation. Pushing the  (BIND) key the binding procedure starts (of course the related bridge must be in binding mode – please see pint c. of the previous paragraph - and must be near to the thermostat, while other RF bridges must be switched off).

This means to follow the binding operation/instruction for one bridge at time, being sure that the other ones are not supplied).



After successful binding operation, "UNBIND" text and blinking address of the RF bridge - e.g. "011E0A" - will be shown on the display (see below). To bind another bridge,

user need to change the index to "2" by pressing and push the (BIND) key. This operation can be repeated up to index "4". This operation must be done with a RF Bridge at time (keeping switched off the other ones).

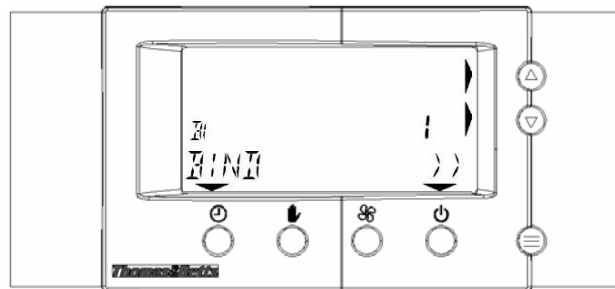


To UNBIND already binded RF bridges (e.g. in case the user wants to remove some of them, etc.) just select index of bridge that needs to be removed and push the (UNBIND).

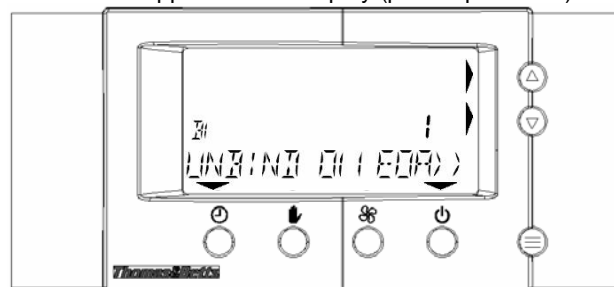
Remark : bridge also needs to be unbind (press for more than 15 sec on the button).

Following steps provide a detailed guidance concerning binding procedure:

1. Take the wireless thermostat and RF bridge you want to bind. Place the wireless thermostat close to the RF bridge module. Make sure that other RF bridges are switched off. This means to follow the binding operation/instruction for one bridge at time, being sure that the other ones not being supplied.
2. Press for more then 15 sec. the key present on the RF Bridge, till the LED shows the functionality status 3 (RF BRIDGE NOT BOUND) This operation reset all data related to a previous binding procedure of the RF Bridge.
3. Push for 5 sec. the key present on the RF Bridge, till the LED shows the functional status 4 (RF BRIDGE IN BINDING MODE).
4. Select BIND menu. With the wireless thermostat placed in function mode, push the key for 15 sec to enter the menu page of the installer function parameters setting mode service. Push on key (>>) you enter in page 3 of installer function parameters setting mode SERVICE menu (please see next picture).



5. By keys select index (from "1" to "4") which will be assigned to RF bridge during a binding operation.
6. Push the (BIND) key to activate the command BIND.
7. Once a successful binding operation has been done, the "aerial" symbol , "UNBIND" text and blinking address of the RF bridge (e.g. "011E0A") will appear on the display (please pic below).

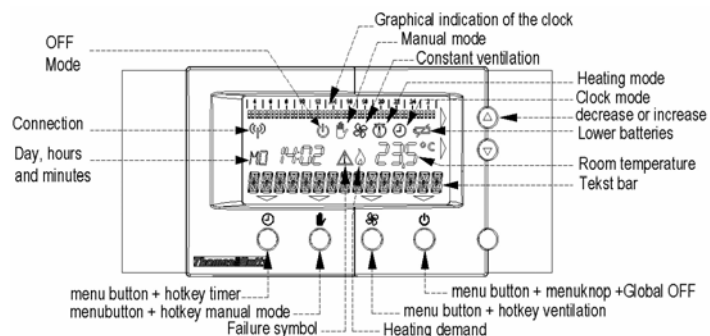


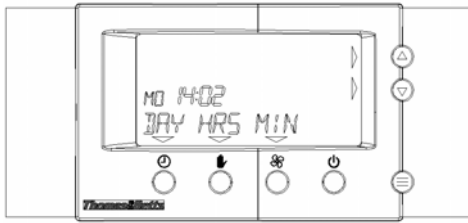
8. The LED on the RF Bridge shows the functional status 1 (flash short GREEN every 10", active for 0,1" = NORMAL OPERATION).
9. Place a label B1, B2, B3 or B4 on the bridge.
10. To bind another RF Bridge repeat this procedure. Just select another RF bridge index in BIND menu. (if BIND menu is already selected skip point 4.)

Return to function mode is automatic after *parameters selection timing*, or manual by acting on the key for 15 sec.

Alphanumeric LCD display

The thermostat uses an alphanumeric LCD display here shown as follows:





Use **DAY**, **HRS** and **MIN** to select current day, hour and minutes (flashing of the pre-set parameter shows the selection). Keys **↑** increase or decrease the value of the pre-set parameter.

Press once more **⏏** to leave this menu. On the LCD a triangle, displayed above or sideways to one or more keys, shows that these keys are active.

Language setting

The thermostat supports Multilanguage test messages, English is the default language. In order to set the favorite language, make sure that thermostat is placed in initial display mode, press **⏏** for 15 sec., when service menu appears, press **➡** and scroll into the menu till **LNG** command is shown. Press **DAY** (**LNG**) to activate the command **LNG**, then use **↑** to select the desired language and confirm the choice by pressing **OK**.

To come back to the initial display mode, press **⏏** for 15 sec.

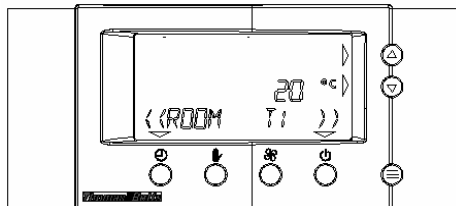
Clock setting

When the clock wasn't set with the first power on: Place the thermostat in the initial display mode, press **⏏** and then press **➡**. Next press **CLK**. This menu (see pic. above) gives you the opportunity to change the date and time. Use **DAY**, **HRS** and **MIN** to select current day, hour and minutes (flashing of the pre-set parameter shows the selection). Keys **↑** increase or decrease the value of the pre-set parameter.

Press once more **⏏** to leave this menu.

Pre-set room temperature modification

It's possible to change the pre-set room temperature values. With the thermostat placed in initial display mode press **⏏**, then **➡** next press **SET**. In this way you enter the temperature change menu. Select the parameter to be changed on key **←** (**<<**) or **➡** (**>>**), the keys **↑** increases or decreases the selected parameter value.

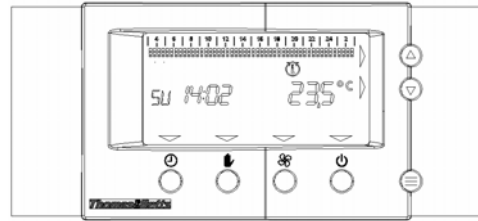


The 3 temperature levels, are default programmed as follows (values can be modified between 5°C & 35°C):
 ROOM T1 (Night temp) = 5°C
 ROOM T2 (Day temp1) = 18°C
 ROOM T3 (Day temp2) = 21°C

Exit this menu by pressing **⏏**. Refer to specification, supplied by the Air Heater manufacturer, for meaning and the modification of other user parameters.

Automatic functioning

After switching on, the thermostat is selected in initial display mode:



In this condition the thermostat allows the Air Heater functioning, in order to supply heating. On the LCD display, following parameters are continuously displayed: room temperature, day of the week and current hour and minutes. Central heating programming clock is selected in automatic functioning mode and it uses the pre-set program number 1.

Pre-set programs are the following:

Program n. 1

DAY	ROOM T1	ROOM T2	ROOM T3
From Monday to Friday	03:00÷08:0016:30÷03:00	08:00÷16:30	-
Saturday	03:00÷03:00	-	-
Sunday	03:00÷03:00	-	-

Program n. 2

DAY	ROOM T1	ROOM T2	ROOM T3
From Monday to Friday	03:00÷07:0017:00÷03:00	07:00÷17:00	-
Saturday	03:00÷03:00	-	-
Sunday	03:00÷03:00	-	-

Program n. 3

DAY	ROOM T1	ROOM T2	ROOM T3
From Monday to Friday	03:00÷08:0017:00÷03:00	08:00÷17:00	-
Saturday	03:00÷08:0012:00÷03:00	08:00÷12:00	-
Sunday	03:00÷03:00	-	-




Program n. 4

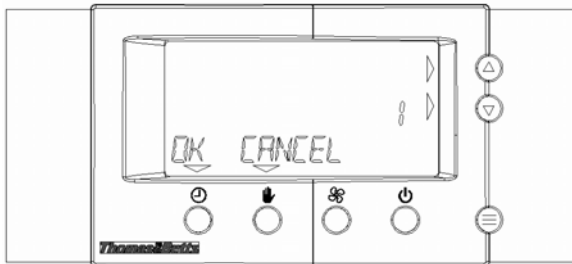
DAY	ROOM T1	ROOM T2	ROOM T3
From Monday to Friday	03:00÷08:0017:00÷03:00	-	08:00÷17:00
Saturday	03:00÷03:00	-	-
Sunday	03:00÷03:00	-	-




Program n. 5

DAY	ROOM T1	ROOM T2	ROOM T3
From Monday to Friday	03:00÷16:0023:00÷03:00	16:00÷23:00	-
Saturday	03:00÷09:0023:00÷03:00	09:00÷23:00	-
Sunday	03:00÷03:00	-	-

Pre-set program selection



It is possible to select one of the central heating programs among the five pre-set. To select it, with the thermostat placed in initial display mode, press , then press  (PRG), next press  (PRE):



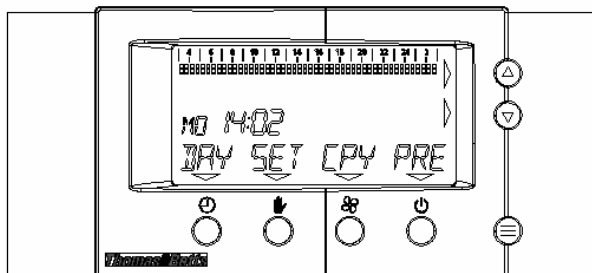
By acting on  it is possible to select the required pre-set program (from 1 to 5) and, as a consequence, after pressing  (OK) the selection is confirmed. Press  to return to the initial display mode.


Pre-set program modification


It is possible to modify a pre-set program or to develop one or more customized programs.


With the thermostat placed in initial display mode, press , then press  (PRG).



This way you enter the modification menu of the central heating programming clock pre-set program.



By pressing the key  (DAY) you select the day when program has to be changed (the weekly day is shown by the


LCD display placed sideways the hour), while with key  (SET) is selected the temperature level to be programmed (T1, T2 or T3) for a certain time.

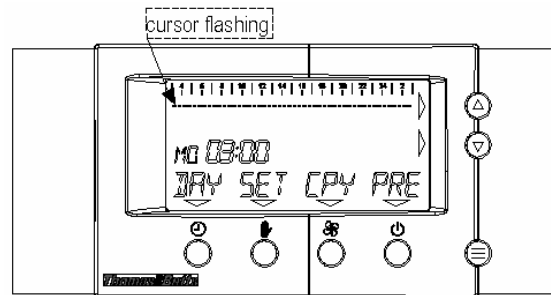
Once selected the temperature level, acting on key  it's possible to set this value in the interval time that you require; the programming is represented on the programming clock bar present on the LCD display, the flashing symbol, related to the selected temperature level, moves its position from left to right. The flash position shows at what time programming occurs (programming clock bar), this information is also shown by the clock placed on the LCD display. Minimum programming interval is 30 minutes.


To let pre-set programming unchanged, before acting on  keys , select the temperature level marked with "NONE".


Example how to make a personalised program:


Assume we require a program with following values: Monday to Friday 7am – 5pm it has to be 21°C, from 5pm – 6pm it has to be 18°C and the rest of the time it can't be less than 7°C.


Press  (DAY) to MO (Monday) 03:00
You will see a cursor flashing in the top left corner of the screen.





Press  (set) and choose T1.


Press  until Monday 7am (this means from 3am till 7am we programmed temperature T1).

Press  (set) and choose T3.

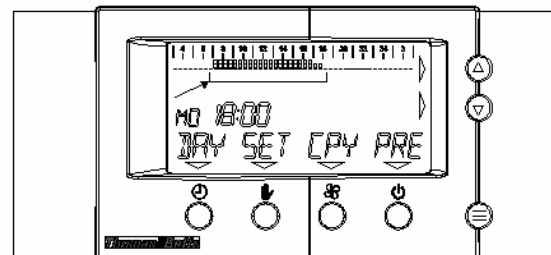
We change the time with the upper  till 5pm (this means from 7am till 5pm we programmed temperature T3).

Press  (set) and choose T2.

Change the time to 6pm with the upper .



Press  (set) and choose T1 again. Change the time to 02.30am (Monday).



Now you will see the following screen.




Look at the bar on top of the screen.

From 7am to 5pm we have two squares (T3) from 5pm to 6pm we have one square (T2) and for the rest there is a dotted line (T1).


Now press  (COPY) +  (DAY) to copy Monday to Tuesday.

Press  (COPY) +  (DAY) to copy Tuesday to Wednesday.

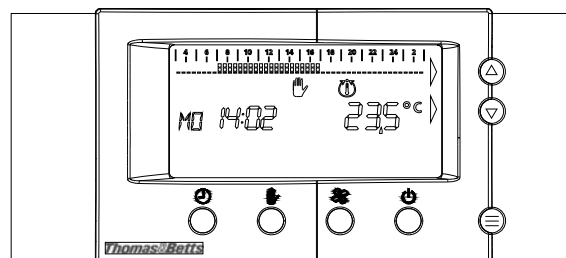
Press  to exit this menu.

Manual functioning

When the thermostat is working in automatic clock mode is always possible to change the required room temperature

value acting on keys .

This action is shown by the LCD display as follows:



The manual functioning remains until the first central heating programming clock change.


Four Hotkeys

The thermostat is equipped with **four hotkeys**


When you are standing in the initial display mode you only have one button to push (you don't have to enter the menu).



- **Overwork Timer** 


Practical you force the room thermostat function for a certain time to a certain temperature.

By pressing  you select the timer mode.

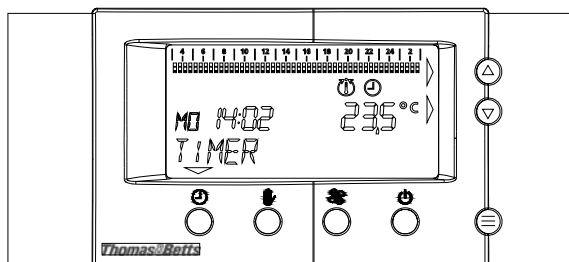
Clock changes are made by pressing  (time).

Temperature changes are made by pressing  (setp).


The preferred settings are defined by using  .

Leave this menu by pressing .

The following screen appears.





The timer function runs automatically until the defined time has passed.


You can end the timer function by pressing  twice.

- **Manual Mode** 

With this hotkey you select the continuous manual function of the room thermostat.



Press  and choose your desired temperature by using . This temperature is maintained as long as the manual mode is selected.

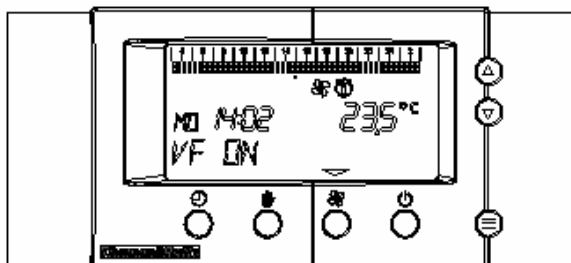
There is no timeline visual.

Leave this menu by pressing .


- **Ventilation Mode** 

This mode allows you to start or stop the ventilator regardless whether there is a heating demand or not.

Press  ones to start the ventilator, press  again to stop the ventilator.




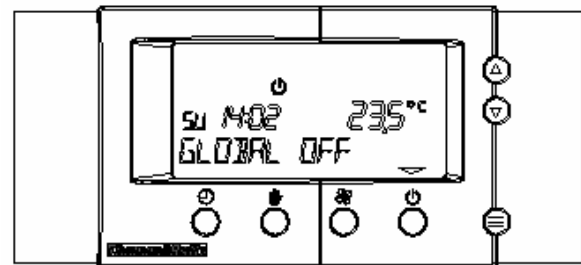
- **Global off** 

Select  to turn the heater completely off.


When this mode is selected the heater completes his current cycle.

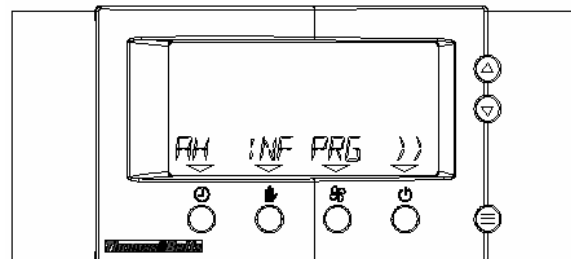
This is like an OFF switch (nothing will work)


By pressing  again the heater is turned back on.



Menu possibilities


By pressing  while standing in the initial display mode we become following screen.

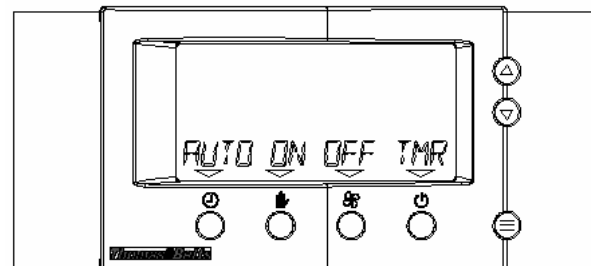



By pressing  (>>) we can scroll through the two different menu's.

- AH / INF / PRG
- SET / CLK



- **Air heating (AH)**


Press  (AH) you get following screen.





In this mode you can choose to run the air heater in automatic mode  (AUTO). The air heater runs then by the clock program.

You can see the programming clock bar on the top of the screen.



Choose  (ON) a temperature needs to be chosen increase or decrease with . The air heater will be working by the continuous manual function of the room thermostat.

Press  (OFF) and the air heater will go into 'off mode' (anti-frost function stays active). It is possible to turn on the ventilator manually.



Press  (TMR) to select the timer function (see hotkeys).


Press  to leave this menu.

- **Info (INF)**

Press shortly , select  (INF).

In this mode you can check several parameters.

To check the different parameters scroll right  (>>) or left  (<<).

Leave this menu by pressing .

- **Program (PRG)**

see pre-set program modification (p6/8).

- **Temp. Setting (SET)**

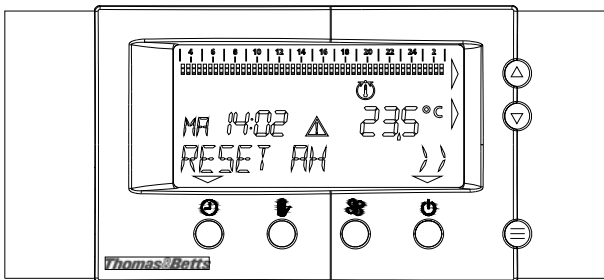
see pre-set room temperature modification (p5/8).

- **Clock Setting (CLK)**

See clock settings (p5/8)

Function failure diagnostic and display

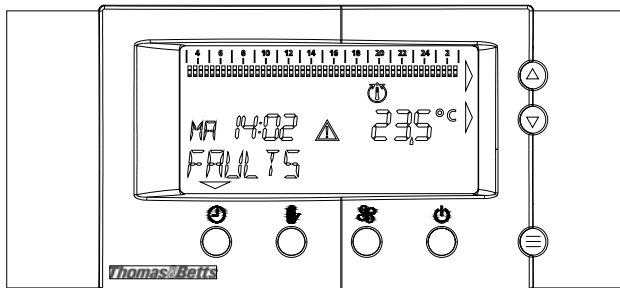
In case a failure occurs, on the display the symbol alarm blinks and is showing the writing RESET AH



Pressing (>>) gives you more information about the fault. Go back to the initial display and press to reset the air heater.

- fault code 1 = Gas/ Flame
- fault code 2 = over temp
- fault code 3 = Air Pressure

When the communication is lost on a wireless thermostat (cable loose) you get following error.



Press faultcode4 = communication error

BMBC LED diagnose

The BMBC board has an incorporated GREEN led for operation/visual indication. Follow the detailed signaling description.

Status	Visual indications	Description
1	LED ON (not blinking)	Normal operation– no error condition is present
2	Fast flash of the LED every 0.5"	- High limit thermostat opened - No flame detected at the end of the ignition cycle - Air pressure switch contact not closed after air pressure switch switching check timer is elapsed - Spurious flame
3	Slow flash of the LED every 2.5"	- Air pressure switch contact not closed during air pressure switch switching check timer counting

Subject to modifications