SALUS
C O N T R O L S

GB THERMOSTAT THERMO 091 – USER'S MANUAL

Your new thermostat will serve your family for years and significantly save the energy cost. The large multi-data liquid crystal display allows you to operate the feature-rich design with a touch of a button. Before operating the thermostat, we hope you can read this manual thoroughly.

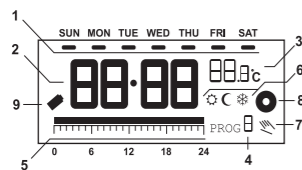## BE FAMILIAR WITH YOUR THERMOSTAT
Appearance
There is a sliding door on the right half of the thermostat. If you open the door, you can see some buttons. This door is removable for the replacement of batteries. After opening the door, you can flip the door up or down to see the dip switch and battery compartment.

Specification

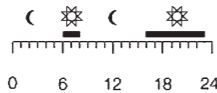| Temperature measurement range:	0---34.5°C (0.5°C step)
Temperature control range:	5---30°C (0.5°C step)
Temperature accuracy:	+/-1°C
Clock accuracy:	+/-70 seconds/month
Program:	6 preset, 3 user-define
Switching span:	1°C or 2°C
Control mode:	Heating or Cooling system
Minimum air-con. cycle time:	5 minutes
Switching:	230VAC 50Hz 5A resistive
Battery:	2 x LR6 alkaline battery
Dimensions:	154 x 80 x 30 mm (W x H x D)
Operation temperature:	0 --- 45°C
Storage temperature:	-20 --- 60°C
Operating humidity:	5 --- 90% non-condensing

LCD

1 Day of the week Indicator
2 Time
3 Temperature
4 Program Number
5 Program Profile Indicator
6 Temperature Mode Indicator
7 Manual Override Indicator
8 Output-On Indicator – will be displayed and rotates if the ouput is on. It will disappear if the output is off
9 Low Battery Indicator – will be displayed if the voltage of the batteries drop to a certain level. Please change the batteries as soon as possible.

Temperature mode
You can see ☼ and ☾ on both the buttons and the LCD. ☼ means comfort temperature and ☾ means economy temperature. These two temperatures are user changeable. Furthermore, there is a fixed defrost temperature (7°C) indicated by ❄ on the LCD. Throughout the operation of the thermostat we will refer to them as comfort, economy or defrost temperature instead of numeric values.

Program
Euro-thermostat is a programmable thermostat. It can automatically adjust the room temperature to a comfortable level when you are at home, and lower it to save energy when you go out or sleep. What you have to do is to program the thermostat so that it knows when to raise the temperature. There are altogether nine programs contained in the memory of the thermostat. Six of them are preset in the factory and the remaining three are user changeable.
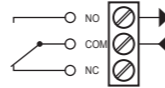
Manual override
If you want to change the temperature temporarily and do not want to alter the programs you have set, you can simply touch a button to override the current program.

INSTALLATION INSTRUCTIONS
Caution: Switch off the electric source before installing the thermostat. We recommend that the installation be performed by trained personnel.
Select a suitable location for the thermostat. The location of the thermostat can greatly affect its performance. If it is located where air circulation cannot reach, or exposed to direct sun light, it will not adjust the room temperature properly. To ensure proper operation, the thermostat should be installed at an inside wall with freely circulating air. Find a place where your family is usually occupied. Avoid close proximity to heat generating appliances (e.g. TV, heater, refrigerator) or exposed to direct sunlight. Do not install near a door where the thermostat will suffer from vibration.

Wiring
Wiring terminals are at the back of the thermostat.
You can find three terminals labeled COM, NO and NC.
It is a typical single-pole, double throw (SPDT) contact.
In most situations COM and NO are used.
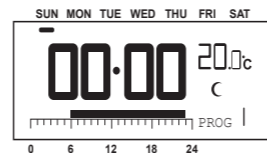
Mounting the thermostat
Using the template provided, drill two ø6mm holes in the wall. Insert the wall anchors and tighten the left screw with 3mm clearance. Fix the thermostat by putting it over the screwhead and slide it rightward (note the keyhole-like opening at the back of the thermostat). Tighten the remain screw to lock it in place.
Note: If the wall is made of wood, there is no need to use the wall anchors. Drill two ø2.7mm holes instead of ø6mm.

USING YOUR NEW THERMOSTAT
The following procedures show how to operate the thermostat. It is recommended that you follow the instructions and try to operate once before connecting it to the heating or cooling system.

1, Start
The thermostat is operated by two LR6 alkaline batteries. Please remove the front cover and install two new batteries.
When the batteries are installed, the thermostat should be operating and you can see the LCD active. If the thermostat does not work properly, please check the batteries for wrong polarities and press the reset button by using a ball-point pen.
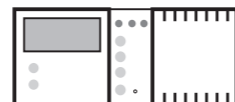The LCD after start or reset:

Note:
i, Temperature may not be 20°C as the diagram shown and the Output-On indicator may activate after a few seconds, depending on different situations.
ii, Do not use a pencil to push the reset button. The graphite residue of a pencil can cause a short circuit and damage the thermostat.
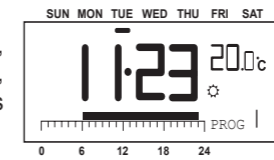
2, Set day/time
To set day, press **d**. Similarly, press **h** to set hour and **m** to set minute.
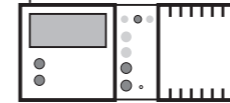Buttons used:

Example:
When start or after reset, the time is 00:00, Sunday. To set the clock to current time (e.g., 11:23, Tuesday), press **d** 2 times, **h** 11 times and **m** 23 times.

Note: When you press and hold the keys for 2 seconds, the day/time will change rapidly. Release when the desired setting comes.
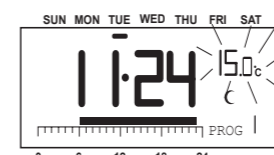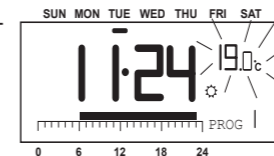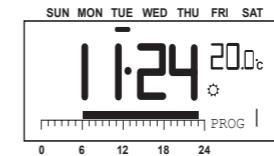
3, View/Change temperature
Press **Temp**, and the thermostat enter View/Change temperature mode. The LCD will show the setting of the current temperature mode (☼, ☾ or ❄) which will be flashing. Press ☼ or ☾ to review or change the temperature. Press OK to directly return to normal operation mode. Buttons used:

Example:
i, In normal mode…

ii, Press **Temp.** The setting of comfort temperature is flashing:

iii, To change, press ☼. For example, to change to 21.5°C, press ☼ 5 times :

iv, To review economy temperature, press ☾:

v, You can press ☾ key again to set the economy temperature, or press **OK** to return to normal operation mode.

Note:
i, The temperature setting range is 5° to 30°C.
ii, To lower the setting, enter View/Change temperature mode and press ☼ or ☾ until it reaches 30°C and then the setting will return to 5°C. Continue to pressing until the desired setting comes.
iii, The setting will change rapidly by pressing and holding the keys.
iv, Please note the temperature mode indicator. A ☼ means the comfort temperature is being viewed or changed. A ☾ indicates economy temperature. If is shown, it is defrost temperature. Defrost temperature is always at 7°C and is not changeable.
v, It is not always necessary to use the **OK** key to return to normal operation mode. After 15 seconds of no key pressed it will automatically return to normal mode.

4, Manual Override
Press ☼ to select comfort temperature. Press ☾ to select economy temperature. The current temperature mode will be overrode until the next set point of the program comes. Press **OK** to clear override. Buttons used :

Example:
i, In normal operation mode, press ☾ to change the current comfort setting to economy setting:

The temperature is now set to economy mode. This mode will be held until 23:00. (It is because the program for the day is PROG 1. At 23:00 the temperature will change from comfort to economy, which matches the override setting.)
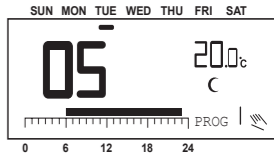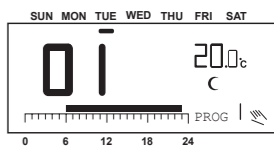
Time hold
Timer hold is an alternative to manual override. Press and hold ☼ (or ☾) key for 2 seconds, the hold time will appear. Press the key again to set the hold time. Press **OK** to return to normal operation mode. The maximum can be set is 24 hours. In the hold period the temperature will not be affected by the program. When timer hold is active, pressing the corresponding temperature mode key (e.g., ☼ if comfort mode is being held) will show the remaining hold time. The remaining hold time can also be changed by using the same key. If another temperature mode key is pressed (e.g., if comfort mode is being held), the timer hold will be cleared.

Example:

i, To change the current setting from comfort to economy for 5 hours, press and hold ☾ for 2 seconds. The hold time will appear.

ii, The hold time is 1 hour. Press ☾ 4 times to change the hold time to 5:

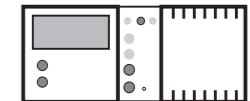iii, Press **OK** or just leave no key pressed for 15 seconds, the thermostat will return to normal mode

Note:
i, A 'hand' appears when the current temperature mode is being override.
ii, The setting will change rapidly by pressing and holding the keys.
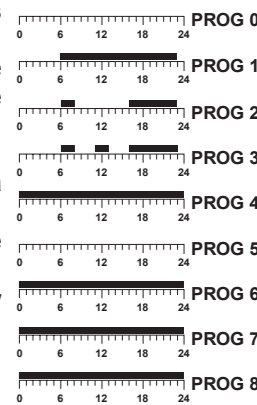
5, View/Change Programs
Press **Prog**, the program of the current day is ready to be changed.
Press **Prog** again to advance to the next day and the program of that day will be shown.
Press **Prog#** to change the program.
Program 6, 7 and 8 are user-define programs. You can use ☼ or ☾ to change the distribution of comfort or economy temperature and **h** to review the setting.
Press **OK** to return to normal operation mode.
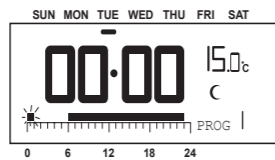Buttons used:

There are altogether nine programs available, as the diagram shown:
Program 0 is a special program. It will set the whole day to defrost temperature (7°C). (If cooling mode is selected, it will turn off the system. See Part 8, Controlling a cooling system.)
Program 1,2, and 3 are some typical schedules of a day. You can select them if you find them suitable.
Program 4 sets the whole day to comfort temperature while program 5 sets it to economy.
Program 6, 7 and 8 are user-define programs. They can be modified to suit your need.

PROG 0
PROG 1
PROG 2
PROG 3
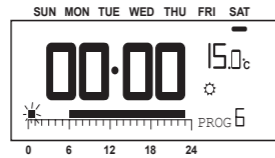PROG 4
PROG 5
PROG 6
PROG 7
PROG 8

Example:

i, Assume you want to assign program 6 to Saturday and want to set the whole day to economy temperature except from 13:00 to 18:00. Press **Prog.** The thermostat enters program mode and the program of the current day (e.g., Tuesday) is ready to be programmed.
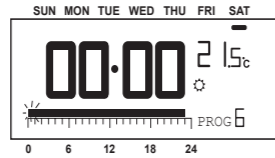
The display shows that the program set for Tuesday is program 1, with the temperature at 00:00 at economy temperature (15°C).
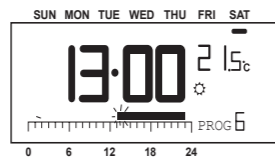
ii, Press **Prog** 4 times. The day indicator will point to Saturday:

iii, Press **Prog#** 5 times to change the program from program 1 to program 6:

iv, Now you can set the time shown to economy temperature by pressing ☾, or press ☼ to set it to comfort temperature. Or you can use **h** key to pass through the time without changing the setting.
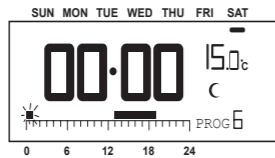
Since we want to set 13:00 to 18:00 to comfort temperature and the remains to economy temperature, press ☾ 13 times. 00:00 to 12:00 will be programmed to economy temperature:

v, Press **h** or ☼ 6 times to move the flashing point to 19;00:

vi, Finally, press ☾ 5 times to set the remains of the day to economy temperature:

vii, By pressing **OK** or leaving no key pressed for 15 seconds, the thermostat will return to normal operation mode.

Note:

i, Program 0, 1, 2, 3, 4, 5 are preset programs. ☼ and ☾ cannot be used to edit them. But the **h** key is still active.

ii, The nine programs are common to all seven days. This includes the three user-defined programs. This means that if you change one of the user-defined programs of a day, the same program of the other days will also be changed.

iii, The setting will change rapidly by pressing and holding the keys.

6, Reset button

There is a small hole at the right of the **OK** key. This is the reset button. Pressing it can reset the thermostat into initial status:
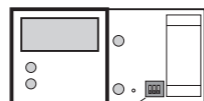
Time – 00:00:00; Day – Sunday; Temperature – Comfort: 19°C, Economy: 15°C; Programs – All seven days set to PROG 1; User-define programs – Set to comfort; Manual override – All cleared; Output – Off

Note: Do not use a pencil to push the reset button because the graphite residue can cause a short circuit and damage the thermostat.

Under an environment with high (+/- 8KV) electrostatic discharge, the product may not be operated as in normal conditions. The user maybe required to reset the unit.

7, Dip switches

If you remove the front cover, you can find three small switches (dip switches). These three switches are used to control the span, output-on delay and heat/cool system (This thermostat is capable of controlling a cooling system. For details please refer to Part 8: Controlling a cooling system.)

Dip switches

7.1, SPAN

Span is the temperature difference between the turn on temperature and turn off temperature. 1°C or 2°C of span can be selected and the effect is summarized in the following table:

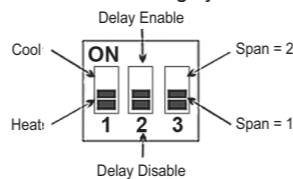| Span		Heating System	Cooling System
1°C	On when.....	$Tr \leq Ts-0.5$	$Tr \geq Ts+0.5$
	Off when.....	$Tr \geq Ts+0.5$	$Tr \leq Ts-0.5$
2°C	On when.....	$Tr \leq Ts-1.0$	$Tr \geq Ts+1.0$
	Off when.....	$Tr \geq Ts+1.0$	$Tr \leq Ts-1.0$

Ts: Set temperature
Tr: Room temperature

For example, if you set the temperature to 20°C and span = 1, the heater will operate when the room temperature drops to 19.5°C and turns off when the temperature rises to 20.5°C

7.2, Output-on 5 minutes delay

With this switch enabled, the external system will switch on only if it has been off for more than 5 minutes. If cooling system is selected, this function will be activated automatically.

7.3, Heat/Cool system select

To select whether a heating or a cooling system to be controlled. Note that normally for a heating system the comfort temperature is higher than the economy temperature, while it is reverse for a cooling system.

Delay Enable
Cool — ON — Span = 2
Heat — 1 2 3 — Span = 1
Delay Disable

8, Controlling a cooling system

By setting the dip switch, the thermostat can be used to control a cooling system. The operation is similar to that of heating system. However, there are some differences between them, as the following list:

1, In general the comfort temperature of a cooling system is lower than the economy temperature.

2, The switching is reversed: The thermostat switches on the system when the room temperature is higher than the set temperature.

3, There is no more defrost temperature. The snow (❄) and 7°C will not be displayed. If you select program 0 the thermostat will switch off the cooling system.

4, The 5 minute minimum cycle time is enabled automatically, regardless of the setting of the dip switch.

Inside the packaging you should find
1 Euro-thermostat   2 #6 x 1" screws
2 wall anchors   1 drilling template
1 user manual