RDTP-24

EPH CONTROLS

24V Recessed Room Thermostat

Installation and Operation Guide

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24V Programmable Room Thermostat

Installation Instructions

Factory Default Settings

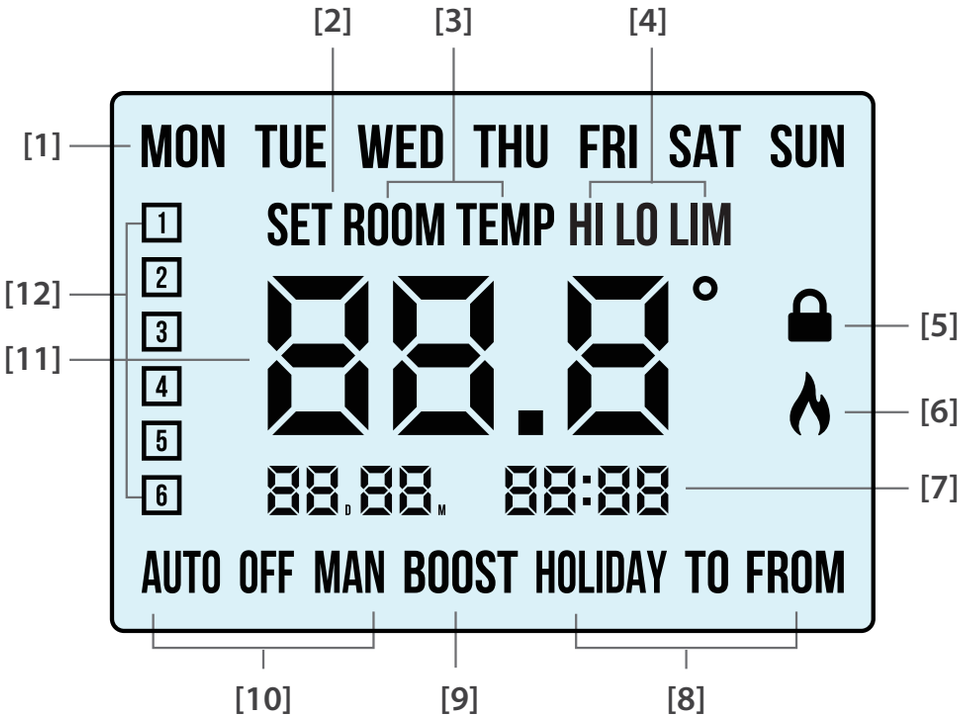
High and Low Temp. limitation:	Off
Keypad lock:	Off
Operating mode:	Normal
Temperature indicator:	˚C
Frost protection:	On (5˚C)
HYS On:	0.4˚C
HYS OFF:	0.0˚C

Specifications

Switch output:	SPDT Volt Free
Power supply / Input:	24Vac
Power consumption:	Operating <1W
	Standby 0.1 mW
Temperature range:	5 … 35˚C
Ambient temperature:	0 … 45˚C
Ambient admissible humidity:	5 - 95%RH
Contact rating:	5(1)A 24Vac
Dimensions:	95 x 95 x 40mm
Internal Temperature sensor:	NTC 100K
External Temperature sensor:	NTC 10K
Program memory backup:	3 months
Battery:	LIR2032
Backlight:	White
IP rating:	IP20
Pollution degree:	2
Hysteresis (Switching differential):	Adjustable from 0 to 1°C
	0.1°C increments
Automatic action:	1C

LCD Display

[1] Displays current day of the week.
[2] Displays when setting target temperature.
[3] Displays current room temperature.
[4] Displays when setting HIGH and LOW temperature limit.
[5] Displays when keypad is locked.
[6] Displays when the thermostat is calling for heat.
[7] Displays current time and date.
[8] Displays when setting holiday mode.
[9] Displays when thermostat is in boost mode.
[10] Displays current operating mode.
[11] Displays current / target temperature.
[12] Displays current time program.



Buttons

Menu button

Time Button

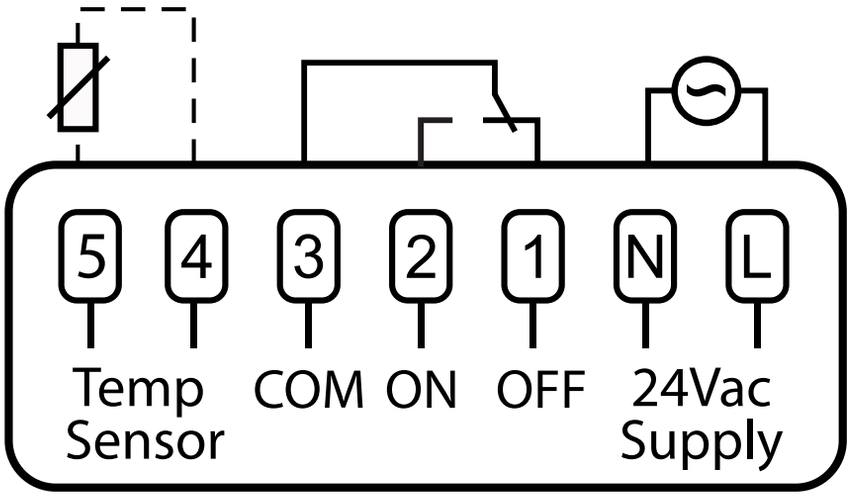
+1h Button

Down Button

Up Button

OK Button

Wiring



Terminal Connections

L	24Vac Live In
N	24Vac Neutral In
Terminal 1	OFF - N/C Normally closed connection
Terminal 2	ON - N/O Normally open connection
Terminal 3	COM - Common connection
Terminal 4 & 5	*External Temperature Sensor / Probe

*Available as an accessory if required

Note:

If an external NTC 10K sensor is connected, the thermostat will automatically detect and read the temperature from the probe's location.

Mounting & Installation

Caution!

- Installation and connection should only be carried out by a qualified person.
- Only qualified electricians or authorised service staff are permitted to open the thermostat.
- If the thermostat is used in a way not specified by the manufacturer, its safety may be impaired.
- Prior to setting the thermostat, it is necessary to complete all required settings described in this section.
- Before commencing installation, the thermostat must be first disconnected from the mains.

This thermostat can be mounted to a recessed conduit box.

1) Remove the thermostat from its packaging.

2) Choose a mounting location so that the thermostat can measure the room temperature as accurately as possible.
   - Mount the thermostat 1.5 metres above the floor level.
   - Prevent direct exposure to sunlight or other heating / cooling sources.

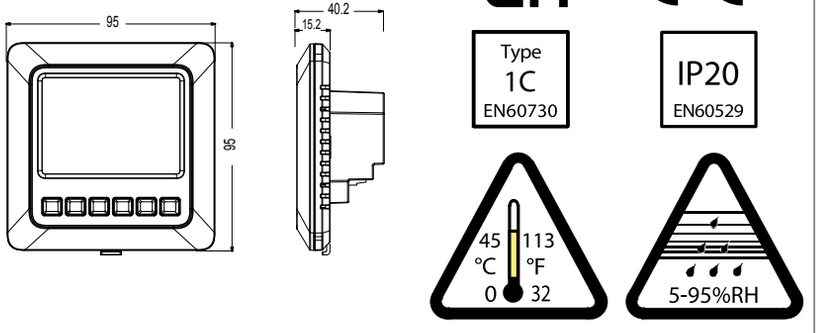
3) Use the fastening clip on the base of the thermostat to release the front housing from the rear wiring box as per diagram on page 10.

4) Wire the thermostat according to the wiring diagram on page 7.

5) Screw the rear wiring box to the recessed back box.

6) Attach the front housing to the rear wiring box until it clips securely into place.

1



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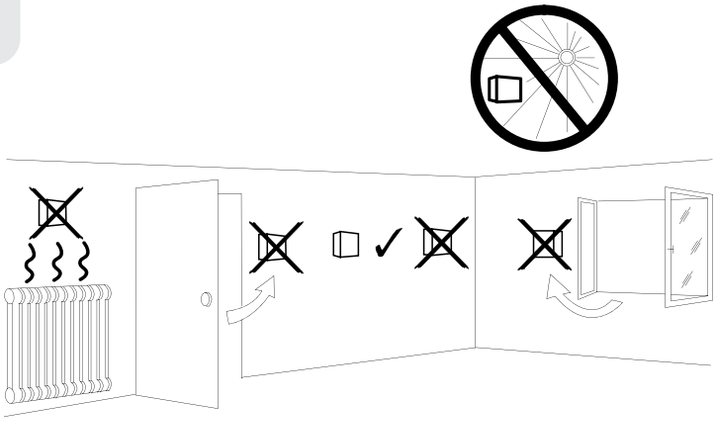

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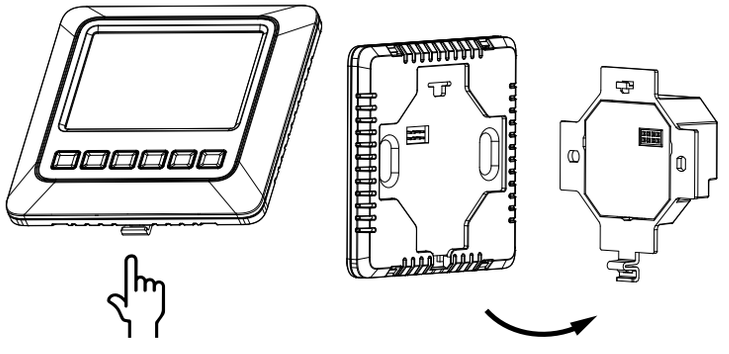

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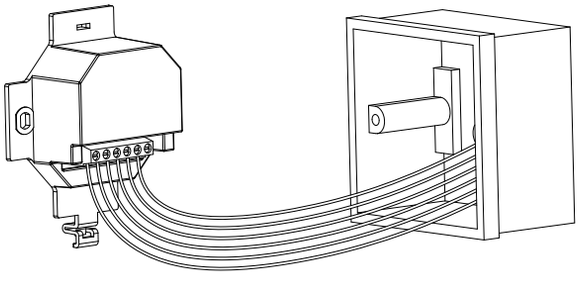

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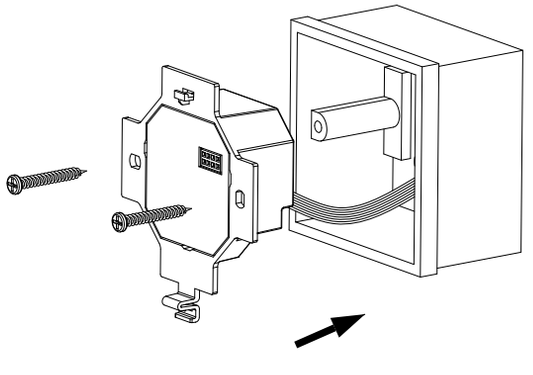

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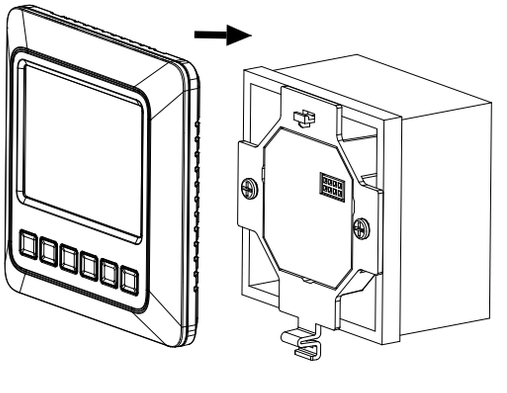


24V Programmable Room Thermostat

Operating Instructions

Adjusting the Target Temperature

Press [^] to increase the target temperature from 5 - 35˚C.

Press [OK] or wait 5 seconds. The target temperature is now saved.

Press [v] to decrease the target temperature from 5 - 35˚C.

Press [OK] or wait 5 seconds. The target temperature is now saved.

Locking the Keypad

To lock the thermostat, press and hold [v] and [^] for 10 seconds.

🔒 will appear on the screen. The buttons are now disabled.

To unlock the thermostat, press and hold [v] and [^] for 10 seconds.

🔒 will disappear from the screen. The buttons are now enabled.

Backlight AUTO

There are three settings for selection.

‘AUtO’ The backlight is on for 10 seconds when any button is pressed.

‘On’ The backlight is permanently on.

‘OFF’ The backlight is permanently off.

To adjust the backlight setting, press and hold OK for 10 seconds. **‘AUtO’** appears on the screen.

Use ∨ and ∧ to change the mode between AUTO, ON and OFF.

Press OK to confirm selection and to return to normal operation.

Mode Selection AUTO

There are three modes available for selection.

OFF means the thermostat is permanently off.

MAN or manual means that the thermostat is permanently on.

AUTO means that the thermostat will operate according to the times and temperatures that have been pre-programmed.

Press ☰ to change between '**AUTO**', '**OFF**' & '**MAN**'.

The current mode will be underlined on the screen.

Press ☰ again to scroll through the three modes.

Press OK or wait 5 seconds to confirm.

When in the Manual mode the thermostat will display the current room temperature and the word '**MAN**'.

When in the OFF mode the thermostat will display the current room temperature and the word '**OFF**'.

When in the AUTO mode the thermostat will display the current room temperature, the number of the current program and the word '**AUTO**'.

Setting the Date, Time and Programming Mode

Press [◷] once, the year will begin flashing.

Press [∨] and [∧] to adjust the year. Press [OK].

Repeat this for the month, day, hour and minute. Press [OK].

Press [∨] and [∧] to adjust from 5/2d to 7d or 24h mode. Press [OK].

Press [∨] and [∧] to turn DST (Day Light Saving time) On or Off.

Wait 20 sec or press [☰], the thermostat will return to normal operation.

Holiday Mode

Holiday mode will switch the thermostat off but will have frost protection enabled for the duration of the holiday period.

Press and hold [◷] for 5 seconds.

'**HOLIDAY FROM**' will appear on the screen.

Press [∨], [∧] and [OK] to set time for holiday mode to begin.

'**HOLIDAY TO**' will appear on the screen.

Press [∨], [∧] and [OK] to set time for holiday mode to end.

The thermostat will switch off for the holiday period.

Press [OK] to cancel the holiday function.

How your Programmable Thermostat works

When the thermostat is in the AUTO mode, it will operate according to the times and temperatures that have been programmed. The user can select from 6 different programs per day, each with a time and a temperature.

There is no OFF time, only a higher and a lower target temperature.

If the user wants the thermostat to be OFF at a certain time, set the temperature for this time to be low. The thermostat will turn ON if the room temperature is lower than the target temperature for the current period.

Example: If P1 is set to be 21˚C at 6am, and if P2 is set to be 10˚C at 8am, the thermostat will look for the temperature to be 21˚C between 6am and 8am.

Factory Program Setting

5/2d

5/2 Day						
	P1	P2	P3	P4	P5	P6
Mon-Fri	06:30	08:00	12:00	14:00	17:30	22:00
	21°C	10°C	10°C	10°C	21°C	10°C
Sat-Sun	08:00	10:00	12:00	14:00	17:30	23:00
	21°C	10°C	10°C	10°C	21°C	10°C

7 Day						
	P1	P2	P3	P4	P5	P6
Mon-Fri	06:30	08:00	12:00	14:00	17:30	22:00
	21°C	10°C	10°C	10°C	21°C	10°C
Sat-Sun	08:00	10:00	12:00	14:00	17:30	23:00
	21°C	10°C	10°C	10°C	21°C	10°C

24 Hour						
	P1	P2	P3	P4	P5	P6
Everyday	06:30	08:00	12:00	14:00	17:30	22:00
	21°C	10°C	10°C	10°C	21°C	10°C

Programming Modes

The RDTP-24 Room Thermostat has the following programming modes available:

5/2 Day mode	Programing Monday to Friday as one block and Saturday and Sunday as a 2nd block. Each block can have 6 different times and target temperatures.
7 Day mode	Programming all 7 days individually with different times and target temperatures.
24 Hour mode	Programming all 7 days as one block with the same times and target temperatures.

If 7 D mode is selected, you can program each day of the week with 6 individual times and temperatures.

If 24H mode is selected, you can only program each day of the week with the same 6 times and temperatures.

Adjust the Program Setting in 5/2 Day Mode

Press [⏲] twice.

Programming for Monday to Friday is now selected.

Press [∨] and [∧] to adjust the P1 time. Press [OK].

Press [∨] and [∧] to adjust the P1 temperature. Press [OK].

Repeat this process to adjust P2 to P6 times & temperatures. Press [OK].

Programming for Saturday to Sunday is now selected.

Press [∨] and [∧] to adjust the P1 time. Press [OK].

Press [∨] and [∧] to adjust the P1 temperature. Press [OK].

Repeat this process to adjust P2 to P6 times & temperatures. Press [OK].

Press [☰] to return to automatic mode.

While in programming mode, pressing [⏲] will jump to the next day (block of days).

Temporary Override

When in AUTO mode, press [∨] or [∧] to adjust the target temperature.

Press [OK] or wait 5 seconds, the thermostat will operate to this new target temperature until the next switching time.

Permanent Override

Press [☰] to select '**MAN**' or manual mode (Permanent Override).

Press [OK].

Press [∨] or [∧] to adjust the target temperature.

Press [OK] or wait 5 seconds, the thermostat will operate to this target temperature.

To cancel permanent override, press [☰] until the '**AUTO**' or '**OFF**' mode are selected.

Boost Function

The thermostat can be boosted to a specific temperature for 1, 2 or 3 hours while the thermostat is operating in all modes except for holiday mode.

Press [+1h] 1, 2 or 3 times, the end time of the boost program will appear flashing on the screen.

If you press [OK] the temperature will now flash. You can adjust the target temperature by pressing the [∨] or [∧].

Press [OK] or wait for 5 seconds for the boost to activate.

'**BOOST TO**' will now be displayed on the screen with the end time for the boost program.

Press [+1h] again to deactivate the boost, the thermostat will revert to its previous operating mode.

Menu Function

This menu allows the user to adjust additional functions.

To access the menu, press and hold ☰ & OK together for 5 seconds.

P01 Operating Mode (Normal / Optimum Start / TPI)

There are three settings for selection, Normal, Delay Start or TPI mode. The default setting is Normal.

Press and hold ☰ & OK together for 5 seconds.

'**P01**' will appear on the screen.

Press OK to select.

Use ∨ and ∧ to select between:

nOr (Normal mode)

OS (Optimum start mode)

tPi (Time proportional integral mode)

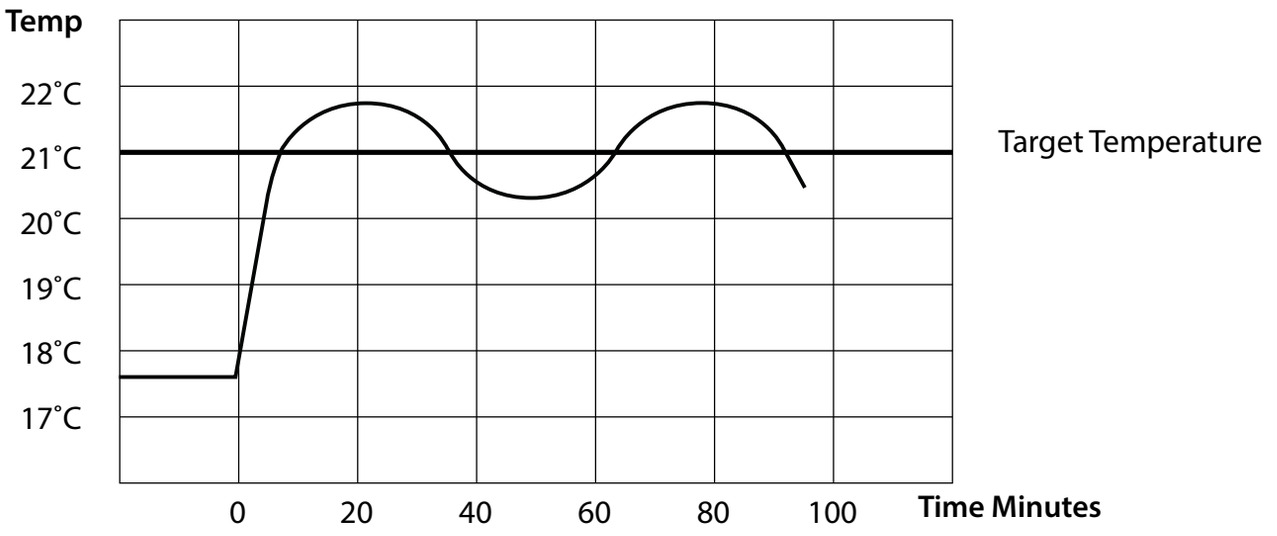
Press OK to confirm the mode.

Normal Mode (Nor)

When the temperature falls below the target temperature, 🔥 will appear and the thermostat will activate the demand for heat.

When the temperature rises above the target temperature, 🔥 will disappear, and the thermostat will cancel the demand for heat.

Graph (23.1): Normal Mode (On / Off Control)



P01 Operating Mode continued

Optimum Start Control (OS)

When the thermostat is in Optimum Start mode, it will try to reach the target temperature by the start of the next switching time. This is done by setting the Ti (time interval) on the thermostat in this menu to 10, 15, 20, 25 or 30 minutes. This will allow the thermostat 10 to 30 minutes to increase the room temperature by 1°C.

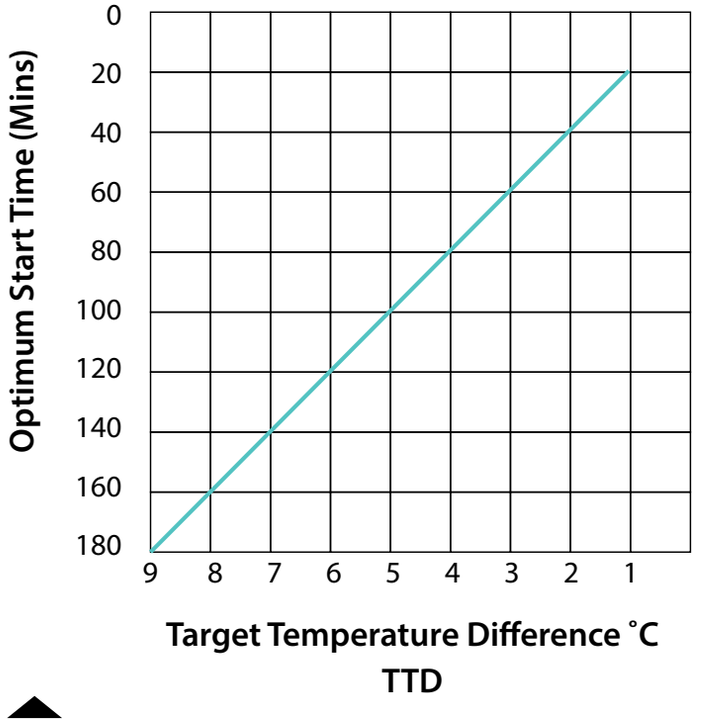
To achieve the target temperature when the program starts, the thermostat will read:

1. The Room Temperature (RT)
2. The Setpoint Temperature (ST)
3. The Target Temperature Difference (TTD) is the difference between the setpoint temperature and the room temperature .

The time (in minutes) that it will take to overcome (TTD) is called Optimum Start Time (OST) and its maximum value is 3 hours = 180 mins. This is subtracted from the start time.

As the temperature increases the thermostat will recalculate the OST.

Optimum Start Control Graph with Ti = 20



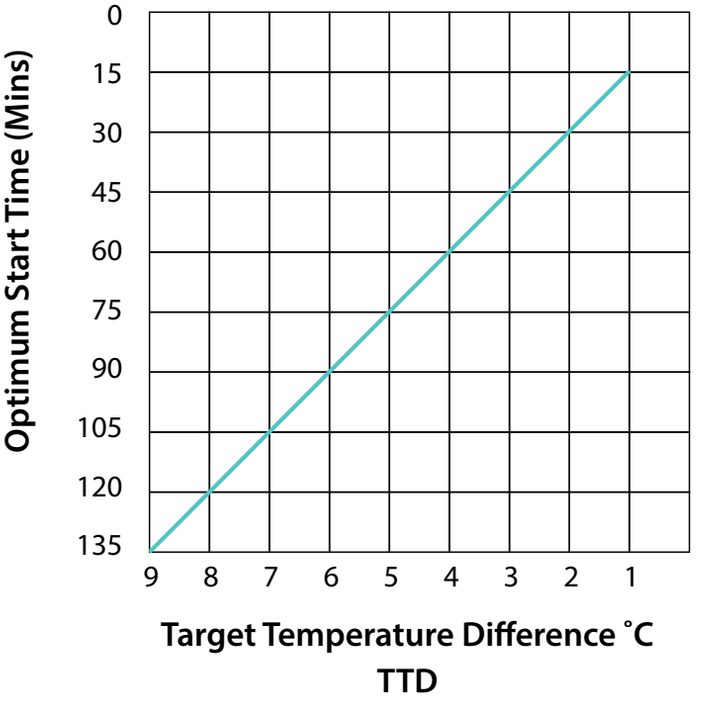
Example when Ti = 20

Program 1 on the thermostat is 21°C for 06:30am and the room temperature is 18°C. The thermostat will start the heating at 05:30am to reach 21°C for 06:30am @ Ti=20.

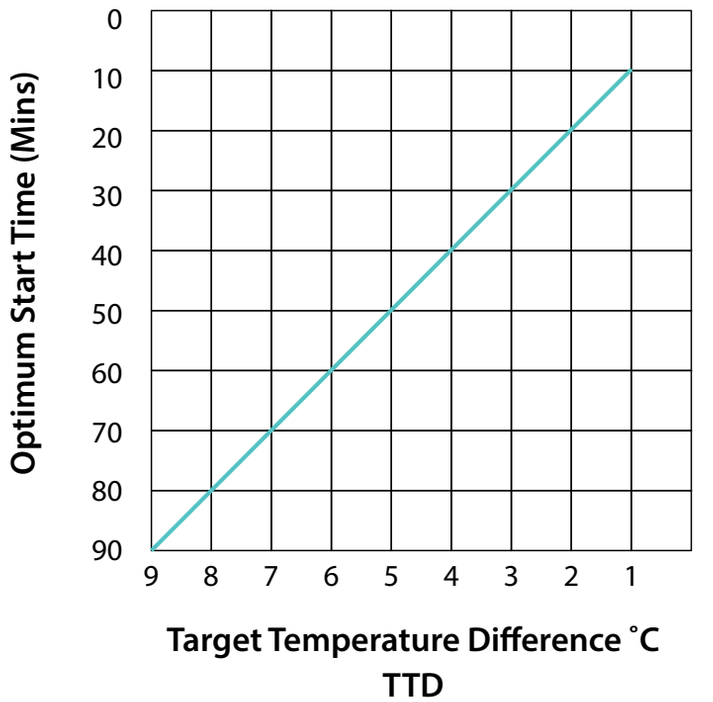
Example when Ti = 10

Program 1 on the thermostat is 21°C for 06:30am and the room temperature is 18°C. The thermostat will start the heating at 06:00am to reach 21°C for 06:30am @ Ti=10.

Optimum Start Control Graph with Ti = 15



Optimum Start Control Graph with Ti = 10



P01 Operating Mode continued

Time Proportional Integral Mode (TPI)

When the thermostat is in TPI mode and the temperature is rising in the zone and falls into the Proportional Bandwidth section, TPI will start to affect the thermostats operation. The thermostat will turn on and off as it gains heat so that it doesn't overshoot the target by too much. It will also turn on if the temperature is falling so it doesn't undershoot the target which will leave the user with a more comfortable level of heat.

There are 2 settings that will affect the thermostats operation.

1. The number of heating cycles per hour.
2. The Proportional Bandwidth.

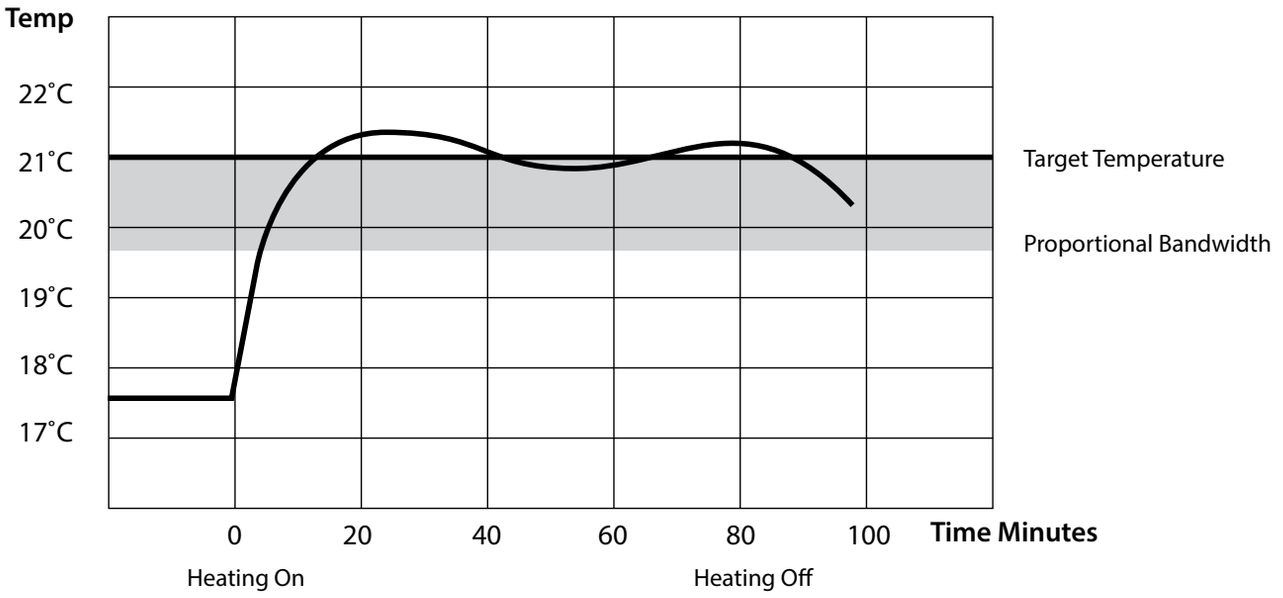
CyC – Number of Heating Cycles per hour **6 Cycles**

This value will decide how often the thermostat will cycle the heating on and off when trying to achieve the target temperature. You can select 2/3/6 or 12.

Pb -Proportional Bandwidth 2°C

This value refers to the temperature below the target at which the thermostat will start to operate in TPI control. You can set this temperature from 1.5°C to 3.0°C in 0.1°C increments.

Graph (27.1): TPI Control



P01 Operating Mode continued

Time Proportional Integral Mode (TPI) Continued

Once TPI mode is selected, '**CYC**' and '**06**' will appear on the screen.

Use ⌄ and ⌃ to select from 2, 3, 6 or 12.

Press OK to confirm.

'**P Band**' and '**2.0**' will appear on the screen.

Use ⌄ and ⌃ to select from 1.5 to 3.0.

Press OK to confirm.

Press ☰ to return to normal operation.

P02 Setting High & Low Limits Hi 35°C Lo 5°C

This menu allows the installer to change the minimum and maximum temperatures that the thermostat can be set at.

To access this setting, press and hold ☰ & OK together for 5 seconds.

'**P01**' will appear on the screen.

Press ^ until '**P02**' appears on the screen.

Press OK to select.

Use v and ^ to select '**ON**'.

Press OK to select. '**HI LIM**' will appear on the screen, the temperature will begin to flash.

Use v and ^ to select the high limit for the thermostat.

Press OK to confirm. '**LO LIM**' will appear on the screen, the temperature will begin to flash.

Use v and ^ to select the low limit for the thermostat.

Press OK to confirm. The settings will be saved.

Press ☰ to return to the previous screen. When this setting is enabled, '**LIM**' will appear permanently on the screen.

P03 Hysteresis HOn & HOff HOn 0.4°C HOFF 0.0°C

This menu allows the installer to change the switching differential of the thermostat when the temperature is rising and falling.

If '**HYS ON**' is set at 0.4˚C and the setpoint is 20˚C, then the thermostat will switch on when the temperature drops below 19.6˚C.

If '**HYS OFF**' is set at 0.2˚C and the setpoint is 20˚C, then the thermostat will switch off when the temperature reaches 20.2˚C.

To access this setting, press and hold ☰ & OK together for 5 seconds.

'**P01**' will appear on the screen.

Press ^ until '**P03**' appears on the screen. Press OK.

'**HOn**' will appear on the screen and the differential temperature will begin to flash.

Use v & ^ to select the '**HOn**' temperature, press OK to confirm.

'**HOFF**' will appear on the screen and the differential temperature will begin to flash.

Use v & ^ to select the '**HOFF**' temperature, press OK to confirm.

The settings will be saved.

Press ☰ to return to the previous screen.

P04 Calibrate

This menu allows the installer to calibrate the temperature of the thermostat.

To access this setting, press and hold ☰ & OK together for 5 seconds.

'**P01**' will appear on the screen.

Press ^ until '**P04**' appears on the screen.

Press OK to select.

'**CAL**' and the actual temperature will appear on the screen.

Press v and ^ to calibrate the temperature.

Press OK to confirm the temperature.

The current temperature will be saved and the user will be returned to the previous screen.

P05 Frost Protection On 5°C

This menu allows the installer to enable or disable frost protection on the thermostat.

When '**ON**' the thermostat will automatically call for heat when the temperature drops to 5˚C.

To access this setting, press and hold ☰ & OK together for 5 seconds.

'**P01**' will appear on the screen.

Press ^ until '**P05**' appears on the screen.

Press OK to select.

'**Fr**' will appear on the screen and '**ON**' will begin to flash.

Use v and ^ to turn frost protection '**ON**' or '**OFF**'.

Press OK to confirm.

The setting will be saved and the user will be returned to the previous screen.

P06 AFS - Air / Floor Sensor (01 Internal air sensor)

This function allows the user to select between 3 different temperature sensor options.

01 Internal air sensor – This option allows the user to record the room temperature using the internal sensor. This is the default option.

02 External air sensor – This option allows the user to record the temperature of an adjacent room. **(NTC10K temperature sensor required).**

03 Internal air sensor with an external hight limit sensor. – This option allows the user to record the room temperature with the internal sensor while having the external sensor record the floor temperature to prevent overheating.

(NTC10K temperature sensor required).

P06 AFS - Air / Floor Sensor continued

Press and hold ⏻ and OK buttons together for 5 seconds.

'P01' will appear on the screen.

Press ^ until **'P07'** appears on the screen.

Press OK to select.

'01' will flash on the screen.

Use ^ and v to choose between options 01, 02 or 03.

Press OK to confirm.

Press ⏻ to return to normal operation.

Note: NTC10K temperature sensor can be bought separately as an accessory.

P07 FHL - Floor High Limit 26°C

This function allows the user to select the high limit temperature of the external sensor. Selectable temperature range 5...45°C.

Temperature Sensor 03 must be selected, See Page 26 P07 AFS.

Press and hold the ⏻ and OK together for 5 seconds.

'P01' will appear on the screen.

Press ^ until **'P08'** appears on the screen.

Press OK to select.

The high limit temperature will flash on the screen.

Use ^ and v to choose the desired high limit temperature.

Press OK confirm the temperature.

Press ⏻ to return to normal operation.

P08 Resetting the Thermostat

To reset the thermostat to factory settings,

Press and hold ☰ and OK together for 5 seconds.

'**P01**' will appear on the screen.

Press ^ until '**P06**' appears on the screen.

Press OK to select.

'**FACt**' will appear on the screen and '**nO**' will begin to flash.

Press ^ .

'**YES**' will flash on the screen.

Press OK to confirm.

The thermostat will restart and revert to its factory defined settings.

P09 Exiting the Menu

To exit from the installer menu at anytime press ☰ .

Alternatively navigate to P07 and press OK .

Notes

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