CP4M

**Mains Operated
Programmable Thermostat**

Installation and Operation Guide

EPH CONTROLS

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Mains Operated Programmable Thermostat

Installation Instructions

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 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 setpoint 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 Default Settings

Contacts:	Volt free contacts
Program:	5/2D
Backlight:	Auto
Keypad:	Unlocked
Clock type:	24 Hr Clock
Daylight saving:	On
In built frost protection:	5˚C - Not adjustable
Switching differential:	0.4˚C

Specifications

Power supply:	200 - 240 Vac, 50-60 HZ
Power consumption:	630 mW
Temp. control range:	5 … 35˚C
Ambient temperature:	0 … 50˚C
Admissible ambient humidity:	5 - 95% RH

Dimensions:	140 x 99 x 30mm
Temperature sensor:	NTC 100K Ohm @ 25°C
Temperature indication:	°C
Frost protection:	OFF
Contact rating:	250Vac 7A
Program memory backup:	3 months
Battery:	LIR2032
Backlight:	Blue
IP Rating:	IP20
Backplate:	British System Standard
Pollution degree:	Pollution Degree 2
Rated impluse voltage:	2,500V as per EN 60730
Automatic action:	Type 1.C
Software:	Class A
Ball pressure test temperature	70°C

Wiring diagram

COM OFF ... **ON**

| | N | L | 1 | 2 | 3 | 4 |

200-240Vac

50Hz-60Hz ... CONTACT RATING: 250Vac~/7A

O ... T
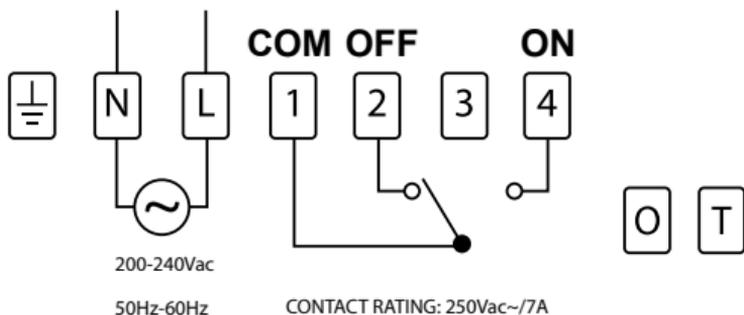
If mains voltage output is required, terminal L & 1 must be electrically linked. The cable link is provided with this thermostat.

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 the section.

This thermostat can be mounted in the following ways:

1) **To a recessed conduit box**
2) **Directly mounted on wall**

Mounting & Installation (Continued)

1) The mounting height should be 1.5 metres above the floor level.

2) The thermostat should be wall mounted in the room where the heating is to be controlled.

   The place of installation should be chosen so that the sensor can measure the room temperature as accurately as possible.

   Choose the mounting location to prevent direct exposure to sunlight or other heating / cooling sources when mounted.

3) Fix the mounting plate directly to the wall with the screws provided.

4) Attach the thermostat to the mounting plate.
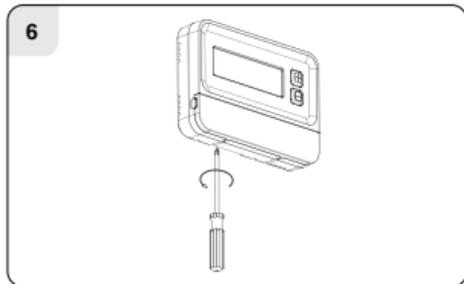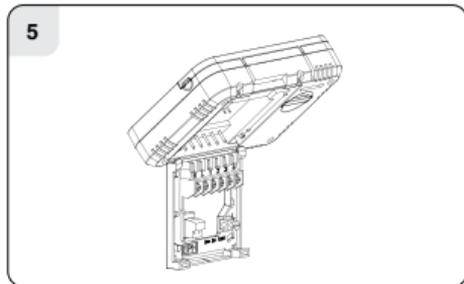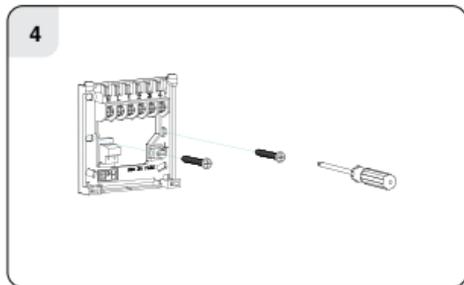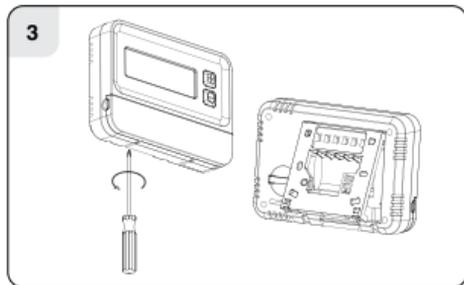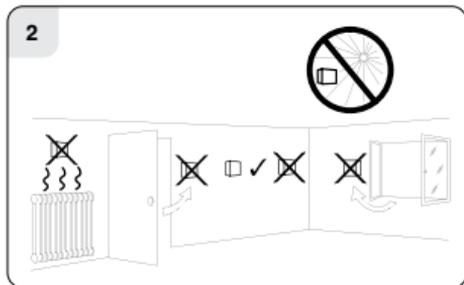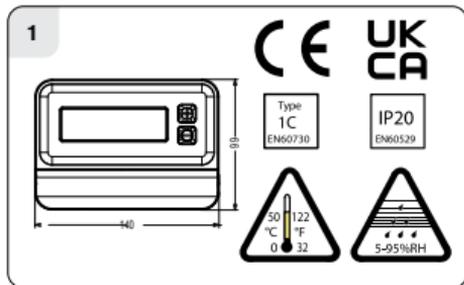
Mains Operated Programmable Thermostat

Operating Instructions

LCD Symbol Description

Current program

Day of the week

Day / Month

Current Time
(Boost to time)

OS OT MON TUE WED THU FRI SAT SUN

1 4 · 2 5 · 3 6

88:88 88:88 88.8°

HOLIDAY BOOST TO FROM OFF MAN AUTO

Temperature

Heating on symbol

Keypad lock symbol

Operating mode

Button Description

Set point increase

Set point decrease

Reset button

OK confirm button

Boost mode

Copy function
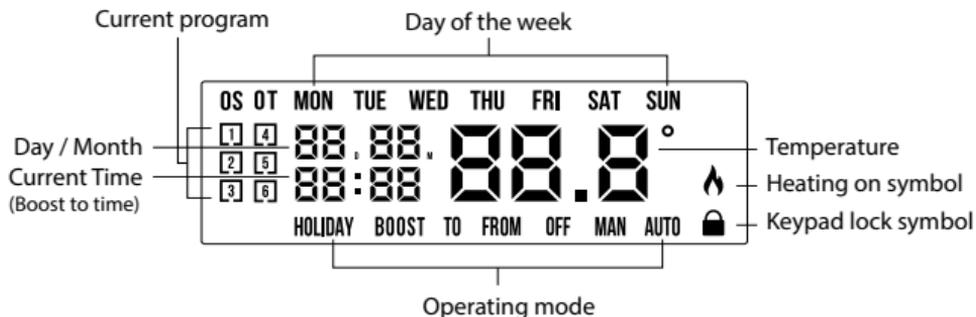
Holiday mode
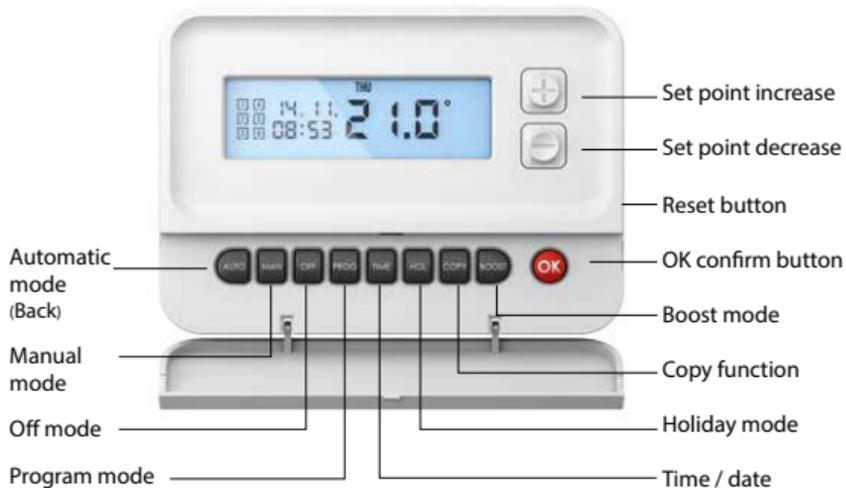
Time / date

Automatic mode (Back)

Manual mode

Off mode

Program mode

(AUTO)	Automatic mode	(TIME)	Set Time/Date	(⊕)	Set point increase
(MAN)	Manual mode	(HOL)	Holiday mode	(⊖)	Set point decrease
(OFF)	Off mode	(COPY)	Copy function	(OK)	Confirm button
(PROG)	Program mode	(BOOST)	Boost mode	▪ RESET	Reset button

Resetting the thermostat

Press the ▪️ ʀᴇꜱᴇᴛ button on the side of the thermostat.

'rst no' will appear on the screen.

Press the ⊕ button.

'rst yes' will appear on the screen.

Press the (OK) button to reset the thermostat.

Keypad lock and unlock (🔒) OFF

To lock the keypad, press and hold the ⊕ and ⊖ buttons for 10 seconds.

🔒 will appear on the screen. The keypad is now locked.

To unlock the keypad, press and hold the ⊕ and ⊖ buttons for 10 seconds.

🔒 will disappear from the screen. The keypad is now unlocked.

Setting the date, time and programming mode

Press the ⌈TIME⌉ button once, the year will begin flashing.

Press the ⊕ or ⊖ buttons to adjust the year.   Press ⓄⓀ.

Press the ⊕ or ⊖ buttons to adjust the month.   Press ⓄⓀ.

Press the ⊕ or ⊖ buttons to adjust the day.   Press ⓄⓀ.

Press the ⊕ or ⊖ buttons to adjust the hour.   Press ⓄⓀ.

Press the ⊕ or ⊖ buttons to adjust the minute.   Press ⓄⓀ.

Press the ⊕ or ⊖ buttons to adjust from 5/2d to 7d or 24h mode.

Press the ⊕ or ⊖ buttons to turn DST (Day Light Saving time) On or Off.

Press the ⌈AUTO⌉ button or wait 5 seconds and the thermostat will return to normal operation.

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℃	10℃	10℃	10℃	21℃	10℃
Sat-Sun	08:00	10:00	12:00	14:00	17:30	23:00
	21℃	10℃	10℃	10℃	21℃	10℃

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

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

Programming Modes

The CP4M Main Operated Programmable 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 temperatures.

7 Day mode   Programming all 7 days individually with different times and temperatures.

24 Hour mode   Programming all 7 days as one block with the same time and temperatures.

If 7d 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 the [PROG] button once.

Programming for Monday to Friday is now selected.

Press the ⊕ or ⊖ buttons to adjust the P1 time.   Press (OK).
Press the ⊕ or ⊖ buttons to adjust the P1 temp.   Press (OK).
Repeat this process to adjust P2 to P6 times and temperatures. Press (OK).

Programming for Saturday to Sunday is now selected.

Press the ⊕ or ⊖ buttons to adjust the P1 time.   Press (OK).
Press the ⊕ or ⊖ buttons to adjust the P1 temp.   Press (OK).
Repeat this process to adjust P2 to P6 times and temperatures.
Press the (AUTO) button to return to automatic mode.

While in PROG Mode pressing the [PROG] button will jump from P1-P2 etc without changing the temperature.

While in PROG Mode pressing the [TIME] button will jump to the next day (block of days).

Copy Function

Copy function may only be used if the thermostat is in the 7d mode.

Set the times and temperatures for the day that you wish to copy from in PROG Mode.

When still on the day press the [COPY] button.

The day of the week that you have selected will be shown with **'COPY'** below it.

The next day will begin to flash on the top of the screen.

Press the ⊕ button to copy the times and temperatures to that day.

Press the ⊖ button to skip a day.

You can copy to multiple days using the ⊕ button.

Press the (OK) button when copying has been completed.

Temporary Override

When in AUTO mode, press the ⊕ or ⊖ buttons to adjust the temperature setpoint. **'OvEr'** will appear on the screen.

Press ⓞⓚ or after 5 seconds the thermostat will operate in this temperature, until the next switching time.

To cancel temporary override, press the |ᵒᶠᶠ| buttton and then press the (ᴬᵁᵀᴼ) button to return to the automatic mode.

Permanent Override

Press the |ᴹᴬᴺ| button to enter the manual mode (Permanent Override), **'MAN'** will appear on the screen.

Press the ⊕ or ⊖ buttons to adjust the temperature setpoint.

Press ⓞⓚ or after 5 seconds the thermostat will operate in this permanent override.

To cancel permanent override, press the |ᵒᶠᶠ| buttton and then press the (ᴬᵁᵀᴼ) button to return to the automatic mode.

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 the $\boxed{\text{BOOST}}$ button 1, 2 or 3 times, the time that the boost will be activated to will flash on the screen.

If you do not press any other button the boost will activate to the temperature displayed on the screen after 5 seconds.

If you press the $\boxed{\text{OK}}$ button the temperature will now flash. You can edit the temperature if you press the $\boxed{\oplus}$ or $\boxed{\ominus}$ buttons.

Press the $\boxed{\text{OK}}$ button or wait for 5 seconds for the boost to activate.

'**BOOST TO**' will now be displayed on the screen with the time that it is activated to displayed above this text.

Press the $\boxed{\text{BOOST}}$ button again to deactivate the boost.

Holiday Function

This will switch your heating system off between the start and end times you select .

Press the ⬛ᴴᴼᴸ button, '**HOLIDAY FROM**' will appear on screen.

Press the ⊕ or ⊖ buttons to adjust the year. Press (OK).

Press the ⊕ or ⊖ buttons to adjust the month. Press (OK).

Press the ⊕ or ⊖ buttons to adjust the day. Press (OK).

Press the ⊕ or ⊖ buttons to adjust the hour. Press (OK).

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

Press the ⊕ or ⊖ buttons to adjust the day. Press (OK).

Press the ⊕ or ⊖ buttons to adjust the month. Press (OK).

Press the ⊕ or ⊖ buttons to adjust the year. Press (OK).
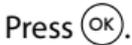
Press the ⊕ or ⊖ buttons to adjust the hour. Press (OK).

The thermostat will now return to the mode it was in before the Holiday settings were entered. To cancel Holiday mode, press the ⬛ᴴᴼᴸ button.

Backlight mode selection 🔆 AUTO

There are two settings for selection. The factory default setting is **AUTO**.

OFF   The backlight is permanently **OFF**.

AUTO   On pressing any button the backlight stays on for 5 seconds.

ON   The backlight is permanently **ON**.

To adjust the backlight setting, lower the cover on the front of the unit.

Press the (OK) button for 5 seconds.

Press either the ⊕ or ⊖ buttons to select the **OFF**, **AUTO or ON** mode.

Press the (OK) button.

Installer menu

To access the installer menu, you must hold [PROG] and (OK) for 5 seconds.

When in the installer menu, press ⊕ , ⊖ and (OK) to navigate and select.
Use (AUTO), [MAN] or [OFF] to go back a step.

P0 1: **Mode (Normal / Optimum Start / TPI)**

P0 2: **Hi Lo (limiting the thermostat)**

P0 3: **Hysteresis (differential)**

P0 4: **Calibration**

P0 5: **Frost Protection**

PIN

Exit

Installer menu (with OpenTherm® connected)

P0 6: **Setting DHW temperature**

P0 7: **OpenTherm® Information**

P0 8: **DHOP**

P0 9: **Set OpenTherm® Parameters**

Exit

PO 1 Operating Mode (Normal / Optimum Start / TPI)

Nor (Normal Mode)

When the thermostat is in Normal mode, the thermostat will try to reach the target temperature after the program changes.

Example: 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 06:30am and the room temperature will start to increase then.

OS (Optimum Start Mode)   **BOILER PLUS** ✓

When the thermostat is in Optimum Start mode, the thermostat will try to reach the target temperature by the start time 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. This will allow the thermostat 10, 15, 20, 25 or 30 minutes to increase the room temperature by 1°C.

Ti can be set when OS is selected in the installer menu. 🕑 20°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 if the temperature is increasing too quickly.

Optimum Start Control Graph with Ti = 20

Optimum Start Control Graph with Ti = 15

**Optimum Start Control Graph with Ti = 10**

Example when Ti = 20

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

Example when Ti = 10 ▶

Program 1 on the thermostat is 21℃ for 06:30am and the room temperature is 18℃. The thermostat will start the heating at 06:00am to reach 21℃ for 06:30am @ Ti=10.
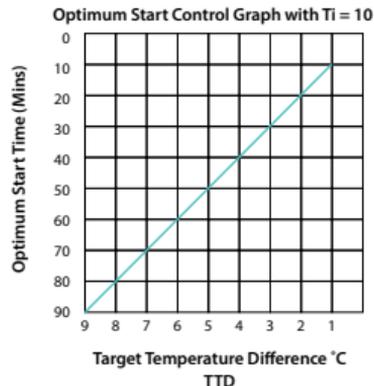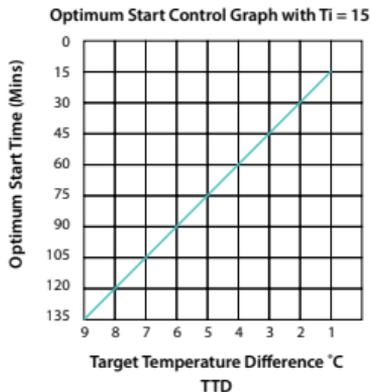
TPI (Time Proportional & Integral Mode)

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 setpoint by too much. It will also turn on if the temperature is falling so it doesn't undershoot the setpoint which will leave the user with a more comfortable level of heat.

There are 2 settings that will affect the thermostats operation:

1. CYC - No. 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 setpoint temperature. You can select 2/3/6 or 12.

2. Pb - Proportional Bandwidth: 🕐 2˚C

This value refers to the temperature below the setpoint 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.
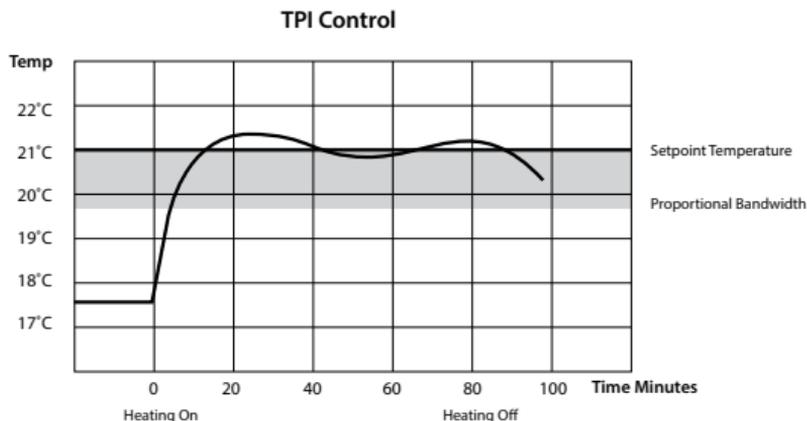
TPI Control

Example: 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 06:30am and the room temperature will start to increase then but will switch itself off before it reaches temperature and allow the room temperature to increase naturally – this cycle may begin again if the thermostat isn't reaching temperature.

PO 2 Setting high & low limits 🕓 Hi 35˚C and Lo 5˚C

This menu allows the installer to change the min. and max. temperature range that the thermostat can be set at. Defaults are 35°C for Hi and 5°C for Lo.

PO 3 Hysteresis HOn and HOFF

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

HOn is the fall in temperature – Default – 0.4°C. This will allow a fall of 0.4°C from the setpoint before the thermostat turns on again.

HOFF is the rise in temperature – Default – 0.0°C. This will allow the temperature to rise 0°C above its setpoint.

PO 4 Calibration

This menu allows the installer to re-calibrate the thermostat. The current temperature will be displayed on the screen and can be adjusted by pressing the ⊕ or ⊖ buttons .

PO 5 Frost Protection 🔒 5˚C

This menu allows the installer to activate or de-activate frost protection.

When frost protection is activated the thermostat will switch on the boiler when the temperature drops below 5˚C.

PIN Function

This menu allows the user to put a PIN lock on the thermostat. The PIN lock will reduce the functionality of the thermostat.

The user will have two options to choose from:

01: All buttons will be disabled.

02: The only modes available are the AUTO & OFF.

Set up the PIN

Press and hold $\boxed{\text{PROG}}$ and $\textcircled{\text{OK}}$, '**P01**' will appear on the screen.

Press $\boxed{\oplus}$ until '**PIn**' appears on the screen. Press $\textcircled{\text{OK}}$, '**OFF**' will appear. Press $\boxed{\oplus}$ to change from **OFF** to **ON**. Press $\textcircled{\text{OK}}$.

'ᴄᴏᴏᴏ' will flash on the screen.

Press $\boxed{\oplus}$ and $\boxed{\ominus}$ to set the value from 0 to 9 for the first digit.

Press $\textcircled{\text{OK}}$ to move to the next PIN digit. When the last digit of the PIN is set, Press $\textcircled{\text{OK}}$.

'**VErIFy'** is displayed with 'ᴄᴏᴏᴏ'.

Press $\boxed{\oplus}$ and $\boxed{\ominus}$ to set the value from 0 to 9 for the first digit.

Press $\textcircled{\text{OK}}$ to move to the next PIN digit. When the last digit of the PIN is set. Press $\textcircled{\text{OK}}$. The PIN is now verified.

'**OP t 01'** will be appear.

Press $\boxed{\oplus}$ and $\boxed{\ominus}$ to choose between options 01 and 02. Press $\textcircled{\text{OK}}$.

The PIN lock is now activated.

If the verification PIN is entered incorrectly the user is brought back to the menu.

PIN Function (Continued)

When the PIN lock is active the Lock symbol 🔒 will flash every second on the screen.

When the thermostat is PIN locked, Pressing the $\boxed{\text{AUTO}}$ will take the user to the PIN unlock screen.

To Unlock the PIN

Press and hold $\boxed{\text{PROG}}$ and $\textcircled{\text{OK}}$, '**UNLOCK**' will appear on the screen. '$\mathit{0000}$' will flash on the screen.

Press $\boxed{\oplus}$ and $\boxed{\ominus}$ to set the value from 0 to 9 for the first digit.

Press $\textcircled{\text{OK}}$ to move to the next PIN digit.

When the last digit of the PIN is set.
Press $\textcircled{\text{OK}}$.

The PIN is now unlocked.

If a PIN has been unlocked on the thermostat, it will automatically reactivate if there is no button pressed for 2 minutes.

To Deactivate the PIN

When the PIN is unlocked (see above instructions)

Press and hold $\boxed{\text{PROG}}$ and $\textcircled{\text{OK}}$, '**P01**' will appear on the screen.

Press $\boxed{\oplus}$ until '**P06 PIn**' appears on the screen.

Press $\textcircled{\text{OK}}$, '**ON**' will appear on the screen.

Press $\boxed{\oplus}$ or $\boxed{\ominus}$ to select '**OFF**'. Press $\textcircled{\text{OK}}$.

'**0000**' will flash on the screen. Enter the PIN. Press $\textcircled{\text{OK}}$.

The PIN is now disabled.

Press $\boxed{\text{AUTO}}$ to return to normal operation or it will automatically exit after 20 seconds.

Exit

This menu allows the installer to return to the main interface.

It is also possible to exit the installer menu by pressing $\boxed{\text{AUTO}}$, $\boxed{\text{MAN}}$ or $\boxed{\text{OFF}}$ whilst in the installer menu.

PO 6 Setting DHW temperature

This menu allows the installer to change the DHW temperature of the boiler. The temperature can be set in 0.5°C increments by pressing the ⊕ or ⊖ buttons.

Press the (OK) button to select the desired temperature.

This menu is only available when the thermostat is connected to OpenTherm® and DHOP is ON (P08 OT installer menu).

PO 7 OpenTherm® Information

This menu allows the installer to view information received from the OpenTherm® boiler. It may take a few seconds to load information relating to each parameter. The information that can be shown from the boiler is outlined in the table below.

Displayed on screen	Description	Remark
tSEt	Target water temp	
tFLO	Outlet water temp	
trEt	Return water temp	
tdH	DHW temperature	This is only visible if DHOP is On (P08 OT Installer menu)
tFLU	Flue gas temperature	Dependent on boiler
tESt	Outdoor temperature	Dependent on boiler
nOdU	Modulation percentage	
FLOr	Water flow	This is only visible if DHOP is On (P08 OT Installer menu)
PrES	Water pressure	Dependent on boiler

PO 8 DHOP

This menu allows the installer to activate or deactivate DHW target temperature control from the thermostat. This menu is only available when the thermostat is connected to OpenTherm®

PO 9 Set OpenTherm® Parameters

This menu allows the installer to configure the OpenTherm® parameters.

To access the menu please enter the password "08" with the ⊕ or ⊖ buttons.

Press (OK) to confirm.

The parameters that can be set are outlined in the table below.

Param	Description	Range	Default
HHCH t-1	Maximum set point heating	45 - 85°C	85°C
LLCH t-2	Minimum set point heating	10 - HHCH°C	45°C
CLI t-3	This allows user to select different climatic curves for weather compensation. This only applies to Boilers with an outside sensor connected.	0.2 - 3.0	1.2
InFL t-4	Influence of room sensor on modulation of the boiler. Recommended value is 10.	0 - 20	10
HHbO t-5	This is the target setpoint for your CH flow temperature. Note: this value must be within the range of HHCH and LLCH.	HHCH Max >=ID57 >=LLCH Min	85°C
Exit	Press OK button to turn back to main interface.		
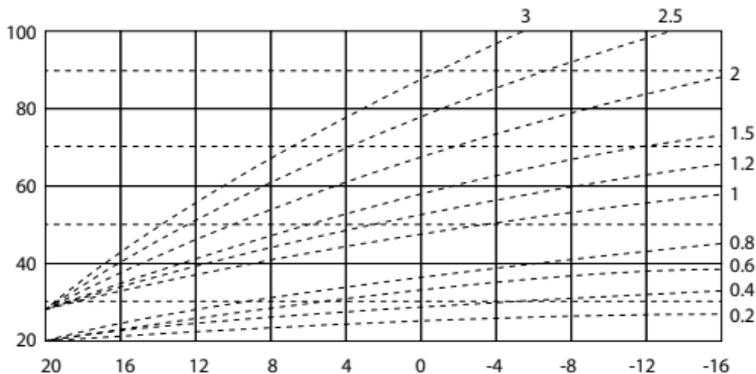
Climatic Curve

Exit

This menu allows the installer to return to the main interface.

It is also possible to exit the installer menu by pressing AUTO, MAN or OFF whilst in the installer menu.

Service Interval 🖬 OFF

The service interval gives the installer the ability to put an annual countdown timer on the timeswitch. When the Service Interval is activated '**SErv**' will appear on the screen which will alert the user that their annual boiler service is due.

For details on how to enable or disable the Service Interval, please contact customer service.

Notes

Notes

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