MULTIPIPE

22-02402
Digital 24 V Thermostat

Product Compliance

This product complies with the essential requirements of the following EC Directives:

• Electro-Magnetic Compatibility Directive 2014/30/EU
• Low Voltage Directive 2014/35/EU
• 2011/65/EU

SAFETY INFORMATION

These instructions are applicable to the model stated on the front cover of this manual only, and must not be used with any other make or model.

These instructions are intended to apply in the United Kingdom only, and should be followed along with any other statutory obligations.

This accessory must be fitted by a Competent person, and installation must comply with the guidance provided in the current editions of BS7671 (IEE Wiring Regulations) and Part 'P' of the Building Regulations. Failure to comply with the requirements of these publications could lead to prosecution.

Always isolate the AC Mains supply before opening or removing the unit from the wall or wall box.

Please leave these instructions with the end user where they should be kept in a safe place for future reference.

INTRODUCTION

A thermostat is a device that is used to switch the heating system in your home on and off as needed. It works by sensing the air temperature and switching on the heating when the air temperature falls below the thermostat setting, and switching it off once the set temperature has been reached.

The 22-02402 Digital 24V Thermostat is a stylish and accurate digital room thermostat that is fitted with a large easy to read Liquid Crystal Display (LCD). It benefits from simple one-touch operation, and this thermostat has been specifically designed to be used with underfloor heating systems.

A back light and frost function add to the features of this thermostat.

FEATURES

• Valve Protection Function (VPF)
• Large, easy to read LCD with orange display
• Stylish casing
• User friendly
• Frost protection
• Reset button

Installation

Please read the important safety information at the start of this manual before you begin to install the device.

The ideal position to locate the digital thermostat is about 1.5m above floor level. It should be mounted in a location where the thermostat is easily accessible, reasonably lit and free from extremes of temperature.

The electrical connections to the thermostat are made to the internal terminal strip. Connection details are shown below - no Earth connection is required for the correct and safe operation of the thermostat as the device is double insulated.

Terminal Connections

Terminal	Description	Terminal Block
←	Switched Output	
L	Mains Live	
N	Mains Neutral	
⏱	Temperature setback (230V AC input)	

24V Switching

Terminal	Description	Terminal Block
←	Switched Output	
L1	Mains Live	
L2	Mains Neutral	
⏱	Temperature setback (24V AC input)	

After installing the thermostat in a suitable location, wiring connections can be made as shown above. The following criteria apply to the installation:

• The incoming AC mains supply should be 230V AC and fused at 2 amps.
• Optimum cable size for installation is 1.5 mm2; wiring colours should be in accordance with the current requirements of the IEE Wiring Regulations.
• All wiring connections should be securely made, and be firmly terminated within each of the terminal screw clamps.

Do not restore the mains supply to the system until all associated items are fully installed.

NOTE: All electrical installation work should be carried out by a suitably qualified Electrician or other competent person. If you are not sure how to install this programmable thermostat consult either with a qualified electrician, heating engineer or your boiler / heating system supplier for advice on how to continue. Do not remove or refit the themostat wiring without the mains supply to the system being isolated.

Switch and Jumper Settings

Changes to the switch or jumper settings should only be made by the Engineer carrying out the installation or other qualified person.

The installer should select the switch or jumper positions required if changes need to be made to the factory default settings.

Switch	Position	Function
System	Heat Cool	HEAT – Heating system (default) COOL – Cooling system

Jumper	Position	Function
J1 – Setback Function	On Off	ON - Enable (default) OFF - Disable
J2 - Output Control Type	On Off	ON – PWM output (default) OFF – On/Off output
J3 - Valve Protection (VP)	On Off	ON - Enable (default) OFF - Disable

N.B: If the System switch is set to 'Cool', PWM mode is automatically disabled. In this case the thermostat will only operate in On-Off mode, even if the Output Control DIP switch is set for PWM mode.

After Installation

After completing installation and powering up the thermostat for the first time the it will behave in the following way:

All the indicators on the display and the backlight will be turned on for two seconds.
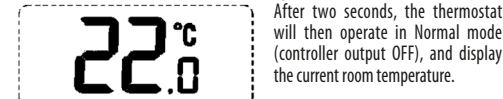
After two seconds, the thermostat will then operate in Normal mode (controller output OFF), and display the current room temperature.

If the Reset Button is pressed, the thermostat will behave in the same way as described above, except that any previously saved user settings will be deleted and overwritten with the default settings.

Function	Default Value
Operation Mode	Normal
Room Temperature	22ºC, updated within a few seconds
All Set Point Temperatures	20ºC
ºC Indicator	On
Setback Indicator	Off
Heat Indicator	Off
Output Relay	Off

N.B: Please be aware that after a Reset, the thermostat output relay may turn ON if the room temperature is lower than the Set Point temperature.

USER INTERFACE AND CONTROLS

The status and operation of the thermostat can be clearly seen on the large orange backlit Liquid Crystal Display (LCD) - this display allows the user to see at a glance the current status of the heating system.

There are few user controls for thethermostat, making the controller very easy to operate. These controls are shown below, along with a description of each of their functions.

User Control Function Summary

Key / Operation	Symbol	Functions
MINUS (-) key		Decreases the selected setting
PLUS (+) key		Increases the selected setting
RESET button		Resets the controller to default (original factory) settings

Operation

As previously described, the thermostat is configured and adjusted by the use of an intuitive user interface with a minimal number of user controls, and the backlit LCD gives a highly visible, easily readable indication of the thermostat status.

LCD Indicator Function Summary

Indicator	Symbol	Function
FROST (left hand side on display)		Indicates frost protection mode is active
CRESCENT		Indicates setback temperature mode is active
TEMPERATURE		Indicates either current room temperature or set point temperature
Right hand side on display		Indicates cooling mode is active.
HEATING		Indicates heat control mode is active

Checking the Set Temperature

Pressing either the PLUS or MINUS key once will display the current Set Point temperature:

After three seconds without a key press, the thermostat will return to NORMAL mode and will display the current room temperature.

Adjusting the Set Point Temperature

Adjusting the Set Point temperature is done with the thermostat in NORMAL mode. Press either the PLUS or MINUS key twice to enter setting mode. After doing this, the displayed Set Point temperature will flash:

Press the PLUS or MINUS key to increase or decrease the Set Point temperature within the range of 10 °C to 35 °C, in 0.5 °C steps. The Set Point temperature will stop flashing while being adjusted, but will flash again once the key is released. Pressing and holding the PLUS or MINUS key for two seconds will increase or decrease the setting quickly.

The thermostat will return to NORMAL mode after 5 seconds if no key is pressed.

Frost Protection Mode

The thermostat has a Frost Protection mode, but this is only active when the thermostat is operating in HEATING mode. The Frost Protection mode temperature is preset at 5 ºC; this temperature is factory set and cannot be adjusted.

To enable Frost Protection press the PLUS and MINUS keys together for 3 seconds, then release them. The display will then display the Frost Protection Set Point and Frost icon:

To disable Frost Protection and return the thermostat to NORMAL mode, press the PLUS and MINUS keys together for 3 seconds.

Temperature Offset

To adjust the temperature offset press both the + and – buttons in together until SEt appears in the display window you can then make your required changes with the + or – buttons in steps of 0.5°C ranging from -3.5ºC to +3.5ºC. Changes will then be saved. When all changes are complete, the thermostat will revert back to the current room temperature if no further buttons are pressed for 5 seconds.

OTHER FUNCTIONS AND CONTROLS

Backlight
The backlight of the thermostat is switched on automatically whenever any of the keys are pressed. The backlight will remain illuminated for approximately 5 seconds after the last key press. If the room temperature is higher than 35 °C, the backlight will blink on and off.
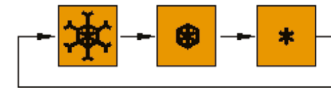
The backlight will not illuminate if there is no mains supply to the controller.

Control Status

The thermostat indicates on the LCD the control status by using a selection of display icons.
The display will show animated flame icon when in HEATING mode.
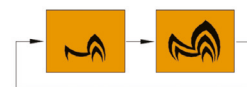
The display will show an animated snowflake icon when in COOLING mode.

Reset Button

The Reset Button is provided as a way to restore the heating controller to its default factory settings. Pressing this button will delete any previously entered settings.

Setback Temperature
The thermostat has a provision to set a setback temperature; this is automatically fixed at 4 °C below the current set point temperature for Heating, and 4 °C above the current set point temperature for Cooling.

The Setback feature will only operate if a connection is made to the Setback terminal . The terminal is sampled every second, and if the terminal state is HIGH (above 175V AC), the Crescent indicator will be shown on the display, and the Setback temperature will be applied.

Temperatures outside the Operating Range

Temperatures below 10 °C are displayed without the leading '0'. Temperatures exceeding the measurable range will be indicated by 'HI' for temperatures above the upper limit, and 'LO' for temperatures below the lower limit, as shown in the images below:

Valve Protection Function

The Valve Protection (VP) function is provided as a way to avoid the control valve from sticking or seizing when not being used for long periods (e.g. during the summer).

This function is enabled by setting the Valve Protection jumper to the enable position. When enabled, the VP function will turn on the thermostat output to operate the control valve for a period of 5 minutes every week: the VP function will still operate even if the room temperature is higher than 35 °C.

Pulse width modulation

Radiant panel heating systems tend to have a problem with overshooting, i.e. rooms continue to be heated even after the desired temperature has been reached and the valve has been closed. The thermostat solves this problem electronically and especially effectively using what is known as pulse width modulation. By continuously comparing set temperature with actual temperature, the lengths of opening times for the valves actuators are regulated in such a way the temperature is almost completely prevented from exceeding or falling below the set temperature. In this way, the required temperature setting is regulated in a precise and convenient way.

Note: When the thermostat is used with radiator or convector heating systems, pulse width modulation can be switched off if necessary (see basic settings section)

ENERGY TIP

One way to set and use your room thermostat is to find the lowest temperature setting that you are comfortable with, and then leave it set at this temperature. You can do this by setting the room thermostat to a low temperature, (for example 17 °C) and then increasing the setting by one degree each day until you are comfortable with the room temperature - you won't have to adjust the thermostat further, as adjustment above this setting will waste energy: a 1 °C increase in temperature is equal to 3% of your heating costs.

Maintenance

The thermostat digital room thermostat requires no special maintenance. Periodically, the outer casing can be wiped clean using a dry cloth (please DO NOT use solvents, polishes, detergents or abrasive cleaners, as these can damage the thermostat).

There are no user serviceable parts within the unit; any servicing or repairs should only be carried out by company selling the product or their appointed agents.

Should the thermostat room thermostat fail to function correctly, check:

• Mains supply to the thermostat is switched on.
• Heating system is switched on.
• If the thermostat is still not functioning correctly, press the Reset Button.

Product Specification

Model:	22-02402 Digital 24 V thermostat
Type:	Non-programmable digital room thermostat designed for underfloor heating applications.

Operation
Control Method:
1. PWM control (default)
2. On – Off control

Temperature Measurement
Temperature display range:	5.0 ºC – 45.0 ºC
Temperature display resolution:	0.5 ºC
Temperature setting range:	10.0 ºC – 35.0 ºC
Temperature setting resolution:	0.5 ºC
Frost protection setting:	5.0 ºC

Memory Backup
Type: Internal memory (EEPROM)

Switching
Switching Voltage: 230V AC / 50Hz
Switching Current: Switching current 0.2A resistive
IP30 Class 2

Environment
Operating Temperature: 0ºC to + 40ºC
Storage Temperature: - 20ºC to + 60ºC