Doc Ref: M401 Issue 6.0 Apr 2026

POWRMATIC®

MC200

User, Installation & Servicing Manual

Issue 6.0 Apr 2026





POWRMATIC®

Certificate of Guarantee

This is to certify that this controller is guaranteed for one year from the date of original installation.

To make a claim

In the first instance you must contact your appliance supplier, or installer and provide:-

1. The appliance type and serial number.
2. The original commissioning documentation plus as much detail as possible on the fault.
3. Your supplier, or installer, will then contact Powrmatic to make a guarantee claim on your behalf.

Conditions of Guarantee

1. The controller must have been installed by a competent recognised installer, and in accordance with the manufacturer's instructions, I.E.E. regulations and local regulations.
2. The controller has been used in accordance with the manufacturers instructions.
3. No unauthorised repairs of modifications have been made. Powrmatic 'General Conditions of Sales' have been observed.
4. Except for the obligation of Powrmatic Ltd to perform warranty repairs during the guarantee period Powrmatic will not be liable in respect of any claim for direct or indirect consequential losses, including loss of profits or increased cost arising from loss of use of the heater, or any event arising there from.

Powrmatic Ltd, Hort Bridge, Ilminster, Somerset, TA19 9PS
Tel: 01460 53535 **Fax: 01460 52341**
Web: www.powrmatic.co.uk **e-mail: warranty@powrmatic.co.uk**

Important: This certificate must be kept with the appliance

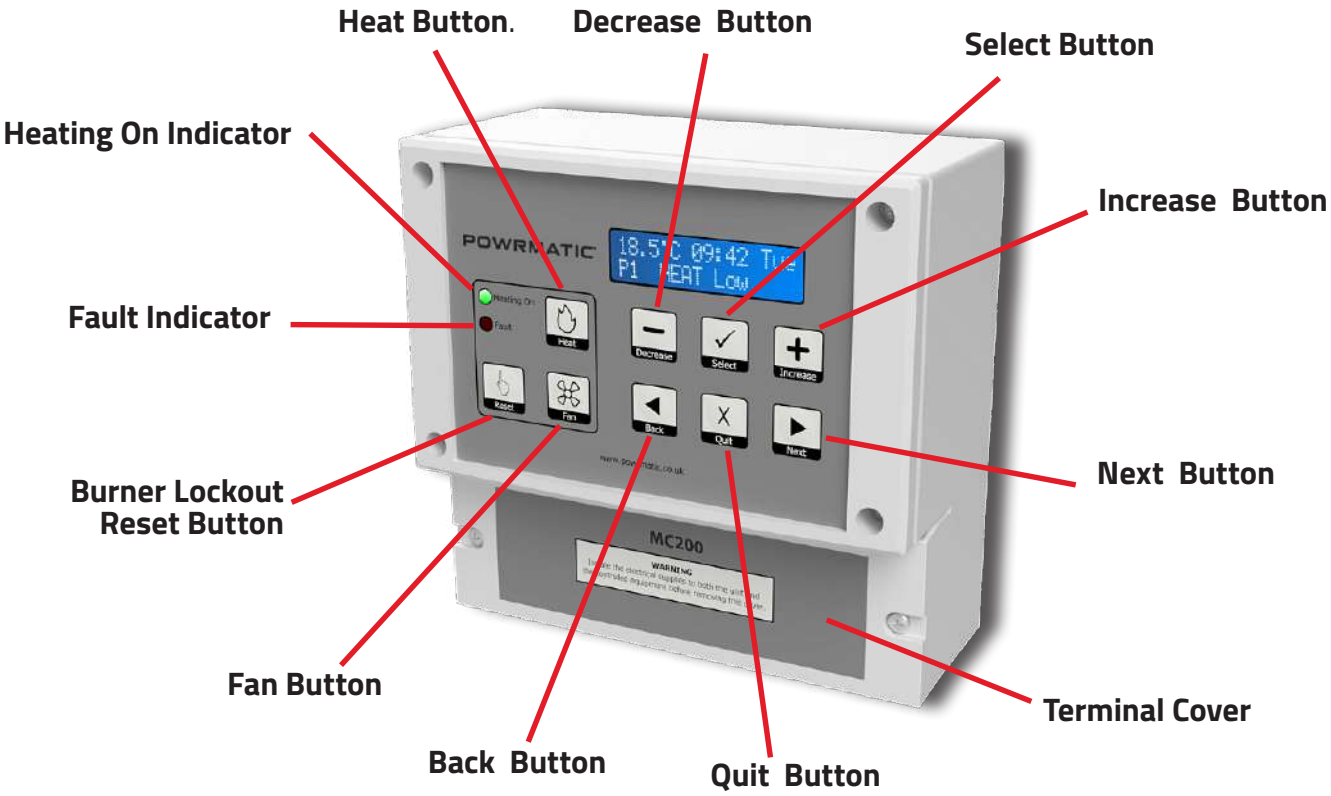
Failure to provide a copy of the commissioning sheet invalidates the heater warranty

Users, Installation and Servicing Instructions

CONTENTS

Title	Section	Contents	Page
User Instructions			4
Pre Installation			
	1.1	Introduction	9
	1.2	Technical data	11
		Dimensions	11
Installation			
	2.1	Fitting the unit	12
	2.2	Electrical Cable Installation	13
	2.3	Interconnecting Wiring Diagrams	15
	2.3.1	*ErP 2021 Heaters*	
		LX/VX Heaters with Modulation control	*15*
		LX/VX Heaters with optional High/Low control	*15*
		LX/VX Heaters with optional On/Off control	*15*
		LEC Heaters with Modulation control	*16*
		CXG Heaters with Modulation control	*16*
		CXO Heaters with High/Low control	*16*
		ErP 2018 Heaters	
		CPx Heaters 1 phase with High/Low control	*17*
		CPx Heaters 3 phase with High/Low control	*17*
		OUH Heaters with High/Low control	*17*
	2.3.2	*ErP 2018 Radiant Tube Heaters*	
		SRP Linear and U Tube with High/Low control	*18*
		SRP DL with High/Low control	*18*
		SRP HB Herringbone with High/Low control	*18*
	2.3.3	*ErP 2018 Heaters*	
		LNVx/VPx Heaters with High/Low control	*19*
		LNVx/VPx with optional Modulation control	*19*
	2.3.4	*Non-ErP Heaters (prior to 2018)*	
		NVx/VPC Heaters with On/Off control	*20*
		NVx/VPC Heaters with optional High/Low control	*20*
		NVx/VPC with optional Modulation control	*20*
		CPx Heaters 1 phase with High/Low control	*21*
		CPx Heaters 3 phase with High/Low control	*21*
		OUH Heaters with High/Low control	*21*
		NVS Heaters with On/Off control	*22*
		NVS Heaters with optional High/Low control	*22*
	2.4	External Inputs	23
		BMS Input	*23*
		Remote OFF Input	*23*
		Remote Sensor	*24*
		Additional Remote Sensor averaging	*24*
	2.5	Commissioning and Output Sequences	26
Additional Documents			
	3.1	Fault Displays and Fault Finding	30
	3.2	Short Parts List and Options	31

User Instructions



Heat Button - (Note: this facility may be limited or disabled by the User).

If heating is ON (via programme)

Pressing the Heat button for **less than 2 seconds** overrides the programme to **OFF**. Any extension time that has been set is canceled.

Pressing the heat button for **more than 3 seconds** determines that heat will remain on for an extension time after the programmed off time. The extension timer will increase in 30 minute steps, up to the maximum allowed period, and then revert to 0 minutes.

Release the button when the required extension period is showing.

If heating is OFF (via override)

Pressing the Heat button removes override and reverts to the current programme. If heating is OFF (via programme)

Pressing the Heat button for less than 2 seconds brings on heating for 30 minutes.

Pressing the heat button for more than 3 seconds will increase the on time in 30 minute steps, up to the maximum allowed period, and then revert to 0 minutes.

Release the button when the required heating period is showing.

Fan Button - (Note: this facility may be limited or disabled by the User).

In **WINTER** and **OFF** mode and RADIANT burner type, the Fan button has no control over the heater fan.

In **SUMMER** mode, the Fan button switches on the fan for air circulation, and another press switches it off. If the fan is left on, it will be automatically switched off at midnight.

If the fan is running because the heating is on and the fan is in **AUTO** or **CONST** mode, the Fan button cannot switch it off.

If the fan is in an **ON** mode, it always runs, in **WINTER**, **SUMMER** and **OFF**. The Fan button cannot switch it off.

Reset Button - Press to reset the burner controls from lockout, (when this facility is available on the heater).

Select Button - Press to accept changes.

Decrease Button - Press to decrease values.



Increase Button - Press to increase values.



Quit Button - Press to exit without saving changed values.



Back Button - Press to enter User Menu, go back to previous screen.



Next Button - Press to enter User Menu, go forward to next screen.



Indicators

Heating On LED - Is illuminated when the MC200 is indicating a mode function (It does not confirm that the heating is actually working).

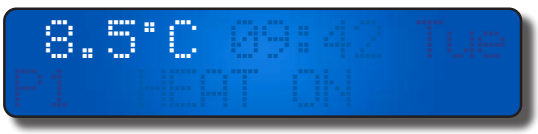
- Solid **Amber** - when the heater has a **Modulating mode**. **Amber** will also flash in **ErP mode** when any heat relay is switched on turning **Amber** when steady.
- Solid **Red** - when the heater is either in **Hi-Low mode** or a **Radiant mode**. **Red** will also flash in **Radiant mode** when fan in a 'delay on' or 'delay off' also in **ErP mode** when any heat relay is switched off .
- Solid **Green** - when the heater is an **On/Off mode**.

Fault LED - flashes when the burner control is at lockout, solid light when a service call is due (if this has been set) or when there is a sensor fault. The bottom line of the display will alternate between normal display and type of fault.

B) Display

The first display normally shows:

- the current air temperature as measured by the internal sensor, an external sensor or the average temperature if two sensors are fitted.



- the time of day using 24-hr notation. The colon flashes once per second to confirm that the clock is running.



- the day of the week. Programmes are associated with individual days of the week or day-groups such as weekday or weekend.



- Programme number - Px n *(where x represents the active programme number.)*



- the current setting of the heater: ON or OFF, as determined by the internal programmes (the display will say ON even if the MC200 is not currently calling for heat because the thermostat is satisfied)



or for High/Low an indication of the heat demand. HEAT HI or HEAT LO,



or for Modulating burners a simple bar-graph display for modulating control heaters where 1 bar is low fire and 10 bars is high fire.



- "Frost Guard" is displayed when Frost/setback is set to ON and the space temperature is lower than the Frost/setback temperature setting.

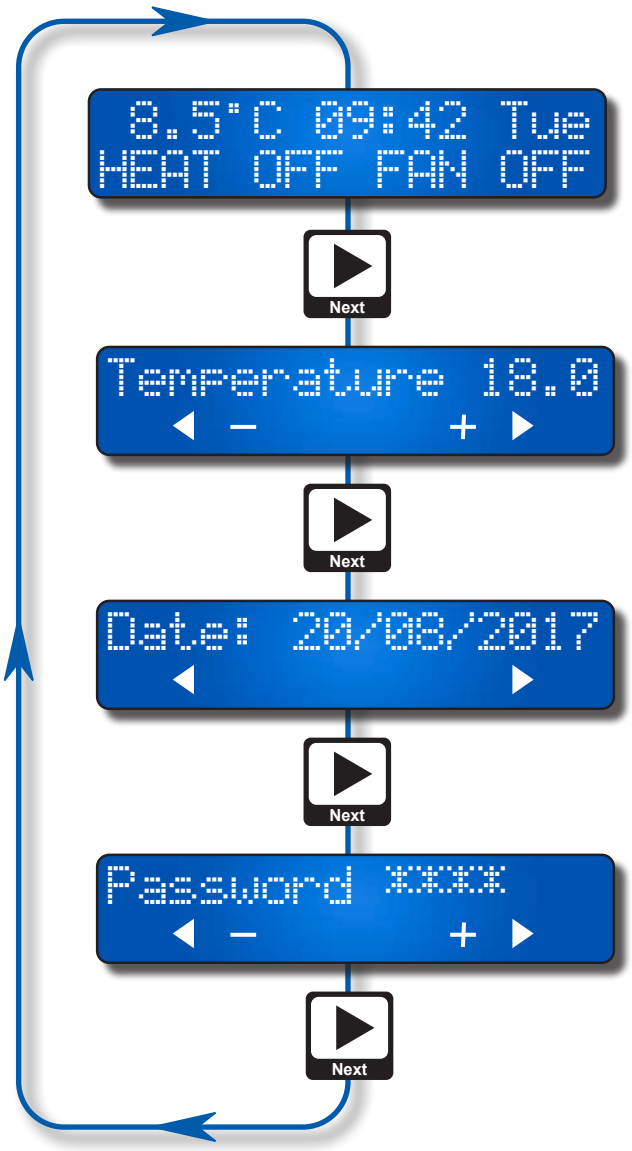


C) Direct Control

Note: If configured during the commissioning stage the User has the following direct control of the heater without using the settings menu.

- If the Fault LED is on because the heater is at lockout, the user can reset the heater by pressing the Reset button.
- The user can switch the heating ON or OFF by pressing the Heat button.
- The user can start or cancel extension time by pressing the Heat button longer than 3 seconds.
- The user can run the fan without heating, by pressing the Fan button.

- Pressing of the next button will scroll through the screen displays available to the user



The top line will show which setting or which part of the programmes you are viewing.

The second line of the display shows which keypad buttons are active (◄ **-** ✓ **X** **+** ►).

After changing any setting, press the ✓ button to save the new setting.

To return to the normal display, press the **X** button or do not touch any buttons for 15 or more seconds.

Keys ◄, ►, **-** and **+** will auto-repeat if held down longer than approximately half a second.

The **+** button will automatically wrap round from the maximum value to the minimum value and the **-** button will wrap the other way.

D) User Settings

Temperature



This shows the temperature set by the currently active programme, and it is the target temperature for thermostatic control. The user can increase or decrease the value to adjust comfort. This will not alter the set temperature associated with the programme, but it will temporarily alter the target temperature for thermostatic control.

The effect of altering the temperature lasts until the current programme expires or until another programme changes the set temperature requirement.

Note: the range of adjustment permitted may be limited during commissioning. Temperature adjustment can be disabled by a setting within the user menu.

- Press the **+** or **-** button to increase or decrease the day temperature set point.
- Press the ✓ button to save changes, press the **X** button to exit without saving, press the ► button to move to the next setting.

Clock Set



Sets the current date and the time of day. The correct date allows the MC200 to know the day of the week, allows for automatic BST-GMT changeovers, carries out the holiday shutdown function and permits override password entry.

- Press the ✓ button to alter date and/or time.
- Press the ◄ or ► button to select digit to change (digit chosen will flash).
- Press the **+** or **-** button to change the digit.
- Press the ◄ or ► button to select next digit to change or until 'Set clock?' appears on screen
- Press the ✓ button to save changes, press the **X** button to exit without saving, press the ► button to move to the next setting.

Programme Settings



The MC200 has 14 programmes, each of which can be assigned to any day of the week. Each programme can be given an ON time, an OFF time and a set temperature. The user may organize the programmes in any way that suits. The simplest would be one programme ON in the morning, OFF at the end of the afternoon, active Monday to Friday.
If two or more programmes are active at the same time, for instance one is ON all day and another is ON between 11:00 and 13:00, then the set temperature of the second programme will apply between 11:00 and 13:00, and the set temperature of the first programme will apply during the rest of the working day.

Programme times increment in 5 minute steps.

Extension time (if set) applies when all programmes have reached the end of their set period for that day.

Optimum start applies at the beginning of the first programme to switch on and optimum stop applies at the end of the last programme to switch off.

- Press the ✓ button to set/alter programme.
- Press the ✓ button to alter programme P1 or the **+** or **-** button to select specific programme number then press the ✓ button to accept.
- Press the **+** or **-** button to alter/set the HEAT ON time.
- Press the ▶ button to move to the HEAT OFF time
- Press the **+** or **-** button to alter/set the HEAT OFF time.
- Press the ▶ button to move to the temperature
- Press the **+** or **-** button to change the temperature.
- Press the ▶ button to move to the Programmed days
- Press the **+** or **-** button to alter between: Mon-Fri; SatSun; 7 days; Off or individual days.
- Press the ▶ button to and 'Save Prog x?' will appear.
- Press the ✓ button to save changes, press the **X** button to exit without saving, press the ▶ button to move to the next setting.

Holiday Date



A future date can be set so that the heating will not operate on that date, and remains "OFF" for a consecutive number of days from that date. The date includes the year number, ensuring that the holiday shutdown date is not automatically repeated the following year.

During the holiday period the heater will only operate if the temperature falls below the frost temperature and if frost temperature operation is selected "ON" in the engineer menu. The night temperature setting is ignored during holidays. During the holiday period, manual operation of the fan or heater is permitted. Any manual operation still on at midnight will be automatically cancelled.

- Press the ✓ button to add a holiday period.
- Press the **+** or **-** button to set the start date.
- Press the ▶ button to select the month to change.
- Press the **+** or **-** button to set the month.
- Press the ▶ button to select the year to change.
- Press the **+** or **-** button to set the year.
- Press the ▶ button to select the number of days.
- Press the **+** or **-** button to enter the number of days.
- Press the ▶ button to and 'Holiday save?' will appear.
- Press the ✓ button to save changes, press the **X** button to exit without saving, press the ▶ button to move to the next setting.

Run Mode



The MC200 has three Run modes: **WINTER, SUMMER** and **OFF**.
Winter - the heating operates when any programme is in a "HEAT ON" period. The heating also operates to maintain the Night Temperature if this has been set. The heating also operates when the temperature drops below the frost temperature.

NOTE: Summer/Winter mode has no connection with the clock change from GMT to BST.

Summer - the fan operates to circulate air when switched on manually. With certain types of heater or certain types of installation, Fan-only operation may not be appropriate and the fan control circuit should not be used.
In SUMMER the heating never operates unless the temperature drops below the frost temperature.
During commissioning the frost temperature operation will be set to be ON or OFF. If the frost setting is OFF, the heater will not operate under frost conditions in any User mode.

OFF - the heater never operates unless the temperature drops below the frost temperature (see above)

- Press the **+** or **-** button to change between WINTER, SUMMER & OFF.
- Press the ✓ button to save changes, press the **X** button to exit without saving, press the ▶ button to move to the next setting.

User Instructions

User Button Permission



This menu option facilitates the user to enable or disable the following controls separately if it is required to restrict unauthorised access to user controls.

NOTE: User permissions are only effective when User access to the menu is protected by a password.

- **Reset** - Allows operation of the reset button
- **Change temperature** - Allows temporary adjustment of the current set temperature
- **Heat Override** - Allows switching ON/OFF and extension of Heat ON time
- **Fan override** - Allows switching ON/OFF of the fan

- Press the ✓ button to alter the permissions.
- Press the **+** or **-** button to toggle between YES & NO..
- Press the ▶ button to select next digit to change or until 'Save??' appears on screen
- Press the ✓ button to save changes, press the **X** button to exit without saving, press the ▶ button to move to the next setting.

Set Password



The user may enter a 4-digit password here. Once set, the password must be given before selected user controls may be accessed or changed. “Set password” cannot be entered unless the password has been given.

As delivered, the MC200 has no User password restrictions.

- Press the **+** or **-** button to set the first digit.
- Press the ▶ button to select the next digit.
- Press the **+** or **-** button to set the second digit.
- Press the ▶ button to select the next digit.
- Press the **+** or **-** button to set the third digit.
- Press the ▶ button to select the next digit.
- Press the **+** or **-** button to set the last digit.
- Press the ✓ button to save changes - 'SET OK' will appear briefly, press the **X** button to exit without saving, press the ▶ button to move to the next setting.

Extension Time



A user can extend the heating to operate beyond the switch-off time of the last programme of the day, in 30minute increments, by pressing the Heat button. This menu option allows a maximum extension period to be set, in units of 30minutes.

If set to 0 minutes, extension is not permitted.

Factory default setting: 1 hour. Maximum setting 3 hours.

- Press the **+** or **-** button to set the appropriate extended time.
- Press the ✓ button to save changes - 'Setting saved' will appear briefly, press the **X** button to exit without saving, press the ▶ button to move to the next setting.

Cost Log



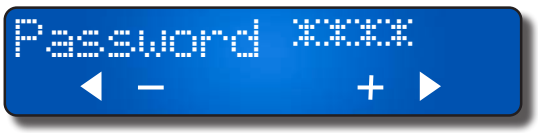
This option shows the total hours run and the total cost of running since the log was last cleared. The display will show the date when it was last cleared. For this option to function it is necessary to enter the fuel cost and heater rating (see Engineer Menu for the latter). The cost log should be cleared whenever the heater type is changed.

For Hi/Lo heaters, there are two heater power entries and the MC200 will calculate the run cost according to the level of heat requested.

In the case of modulating control heaters, the cost is an estimate based on half the full heater power.

- Press the ✓ button to enter the sub-menu. Display shows Start Date.
- Press the ▶ button to select next screen 'Total Hours'.
- Press the ▶ button to select next screen 'Total Cost'.
- Press the ▶ button to select next screen 'Clear Log?'.
- Press the ✓ button to clear log. This will reset the start date to the current date.
- Press the ▶ button to select next screen 'costs per kWh'
- Press the **+** or **-** button to change the cost per kWh.
- Press the ✓ button to save changes, press the **X** button to exit without saving, press the ▶ button to move to the next setting.

Password



Once a password has been set, the password must be entered at this menu option to allow access to selected user controls.

Once entered the password gives access to the User menu functions for 60 minutes.

To re-apply the restrictions before the end of the 60 minute period, select the 'Enter password' option and press the ✓ button without entering any digits. The display will show **'Password CLOSED'.**

- Press the **+** or **-** button to set the first digit.
- Press the ► button to select the next digit.
- Press the **+** or **-** button to set the second digit.
- Press the ► button to select the next digit.
- Press the **+** or **-** button to set the third digit.
- Press the ► button to select the next digit.
- Press the **+** or **-** button to set the last digit.
- Press the ✓ button to save changes - VALID will appear briefly, press the **X** button to exit without saving, press the ► button to move to the next setting.
If **'FAIL'** appears on the screen, the incorrect password has been entered. Repeat entry sequence.

E) Additional notifications
Service Date

When the MC200 is installed the Commissioning Engineer may have entered a date for when the heating equipment requires servicing.

When this date is reached the MC200 fault indicator will be illuminated and the display will alternate between the normal display and "Service due, call engineer".



The Service Engineer can clear this display by entering a new service date when the heating equipment has been serviced.

1.1 Introduction

The MC200/V3 is a high specification heating controller designed specifically to meet the demands of modern fuel efficient heating equipment and the latest energy saving and environmental guidelines and uses a simple menu based structure for entering User settings.

Optimum start technology is available that will continually monitor the heating systems previous performance to determine the optimum time to turn the heating on to raise the space temperature to the required level for when occupancy begins. Optimum stop can also be selected which can save energy at the end of the heating period.

The MC200/V3 is protected by 2 levels of password. The User password may be set to restrict access to certain User controls. The second password is for use by commissioning and servicing engineers and allows access to parameters normally used only in the initial setting of the controller, a fault log and system reset facility.

The user keypad allows easy selection of the heating and fan only modes, the override functions and fault reset. These may also be locked in various combinations to allow different levels of user accessibility.

The MC200/V3 can give a readout of the hours the burner has operated, to help accessing servicing intervals and after being programmed with the correct data, can also give an indication of the running costs of the heating appliance. In addition a forward service date can be programmed. When the due date is reached a notification will be shown which alternates with the normal display. This notification can only be removed by a Service Engineer.

The MC200/V3 can be used to directly control both Hi/Lo and Modulating burners, the latter by an internally generated 0-10V signal.

1.1.2 Clock

- The unit date range is from 01/01/2001 to 31/12/2099
- Leap years are recognised
- BST begins on the last Sunday in March and ends on the last Sunday in October. The time changes at 01:00 GMT.
- The clock may gain or lose up to 10 minutes in a year.

1.1.3 Programme

- 14 timers are provided in the software, and each can be assigned to any single day of the week, or to day groupings such as weekdays or weekends. This allows greatest flexibility in operating the heating whenever required.
- It is possible to schedule timers so that one starts before another has finished. The heating will be on while any timer is requiring Heat On, and the heating will turn off only when all timers have reached Heat Off. The

requested temperature will be set by the most recent timer to switch On. When an overlapping timer switches Off, the requested temperature will be set by the remaining timer(s).

Important: No timer can be programmed to run past midnight, because it is assigned to a day of the week. If timed heating is required across midnight, it must be provided by two timers, one ending at 23:55 and the other starting at 00:05. At midnight, all manual over-rides and extensions are cleared.

1.1.4 Optimum Start

A control system which starts plant operation at the latest possible time such that internal conditions will be up to required limits at the start of the occupancy period.

- The MC200/V3 achieves Optimum start by keeping a moving record of how many minutes it takes to increase the temperature per degree in each 3° band of temperature from 5°C to 20°C. The current overnight temperature is referenced and the MC200/V3 can estimate how many minutes are required to bring the temperature to the required level.

When Optimum Start is enabled the switch-on time for the heater is then advanced accordingly to achieve the required temperature by the Heat On time i.e. the warmer the night time temperature the closer the switch on time will be to the Heat On time.

NOTE: Max 2Hrs before start time. If optimum start is selected, no program time should be selected to start before 2:00am.

1.1.5 Optimum Stop

A control system which stops plant operation at the earliest possible time such that internal conditions will not deteriorate beyond preset limits by the end of the occupancy period.

- The MC200/V3 keeps a note of how many minutes are taken for the temperature to drop the number of degrees entered against this parameter when the heating period ends. When Optimum Stop is enabled, the MC200/V3 switches off the heating that number of minutes early.

1.1.6 Temperature Sensors

The MC200 has an in-built temperature sensor by default. This can be removed and replaced with a remote sensor if the controller is outside the area to be heated.

Important: Optional sensors are available from Powrmatic Ltd. Alternative types must not be used.

The remote sensor may be either a room (warm air), black bulb (for radiant) or duct type.

The MC200 internal sensor can also be used in conjunction with an additional remote sensor which will give an average of the two temperature readings. Options are:

- Default internal sensor only
- Remote sensor only
- Internal sensor plus remote sensor
- Remote sensor plus remote sensor

The remote sensor should be sited no further than 100m from the main unit. Siting of the sensor is important in that it must be fitted where the temperature will be generally representative of the area to be heated, installed 1.7m above floor level and away from draughty areas or areas subjected to direct heat from sunlight, radiators etc.

The second 'sensor' input can also accept a volt free switch input i.e. a volt free switch is connected across Terminals Com & In2 to facilitate a remote on (BMS) or remote off.

Heating will be overridden by the switch operation during programmed heating times. Heating control returns to normal when the switch reverts, or when the programmed control period ends.

The switched control does not occur while heating is turned on due to manual override in non-programmed times, and does not occur during the manually-selected extension time at the end of a programmed control period.

If heating has been manually overridden to be off during a programmed heating period, the switched control cannot bring on the heating.

The 'Heat on' option means that heat will be turned fully on by the switch. For high-low burners, the high and low relays will be on, and for modulating burners, the control output will be 10v.

Cost logging operates as usual. During these switch control periods the burn time is recorded at the maximum rate.

If the sensor goes open-circuit (or either of the sensors where two are fitted), the Fault LED will flash.

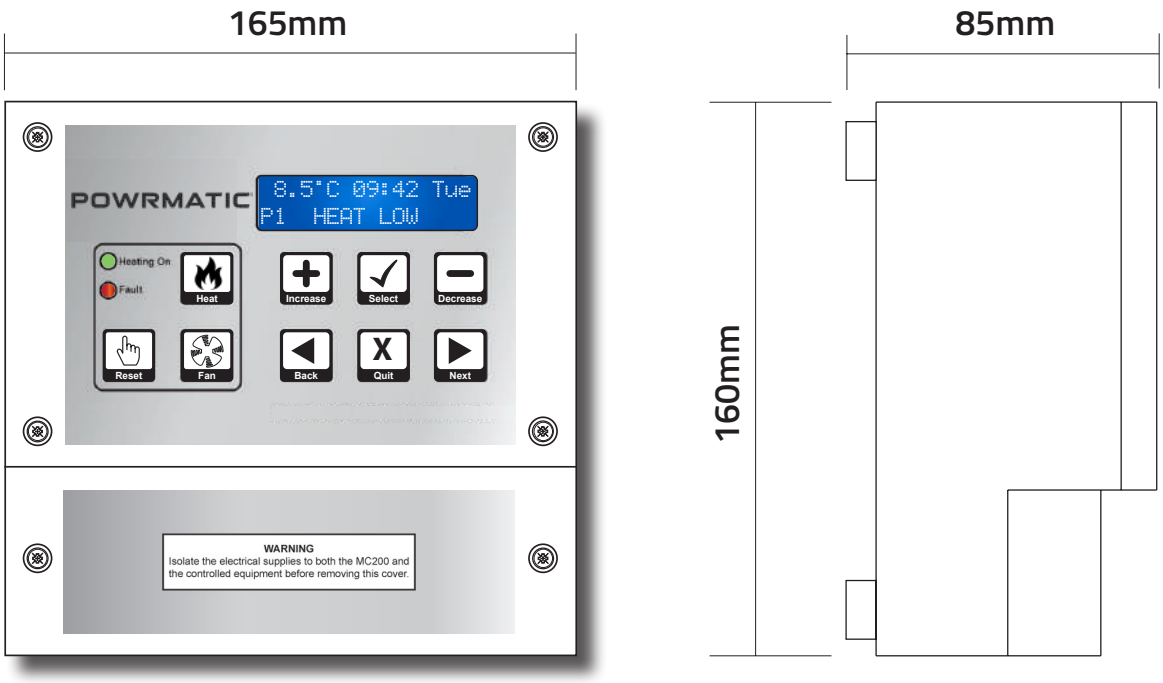
The LCD display will show "sensor fault".

Important: The earlier MC100 sensor cannot be used with the MC200/V3 and visa versa.

1.2 Technical Data

Electricity supply	230V 50Hz Fused at 6A.
Internal Fuses	F1 20mm 6.3A 230V.(HRC).
Display	2 line 5mm Backlit L.C.D.
Day set point range	10 - 60°C.
Night set point range	1 - 15°C.
Temperature accuracy	0.5 °C.
Overall switching differential	Adjustable 0.5 - 10.0°C for Hi/Lo burner types.
Sensing Element	Internal or remotely mounted up to 100m from control.
Switching contacts ratings	12A. 230V.ac. (resistive). All Volt Free
Modulating Control	0-10V dc
Heating ON Indicator	Yellow when the burner is a Modulating type, Green L.E.D. when the heater is a single-stage burner, Red when the heater is either in Hi-Low burn or a Radiant mode. Red will also flash in radiant mode when fan in a delay on or delay off.
Fault (Lockout) Indicator	Orange L.E.D.
Protection Rating	IP20
Software versions	H.08

Dimensions



2.1 Fitting the Unit

2.1.1 Fitting Space Requirement

The controller will be delivered to site in a cardboard box. The box may have a fixing template on the rear to aid drilling the fixing holes. If not, the base of the controller housing has the fixing dimensions imprinted into the plastic.

All of the packaging can be recycled. Please make use of local recycling facilities.

Important: The MC200/V3 and sensor MUST NOT be sited in areas of high electromagnetic fields, i.e. distribution boards, transformers or heavy duty supply cables.

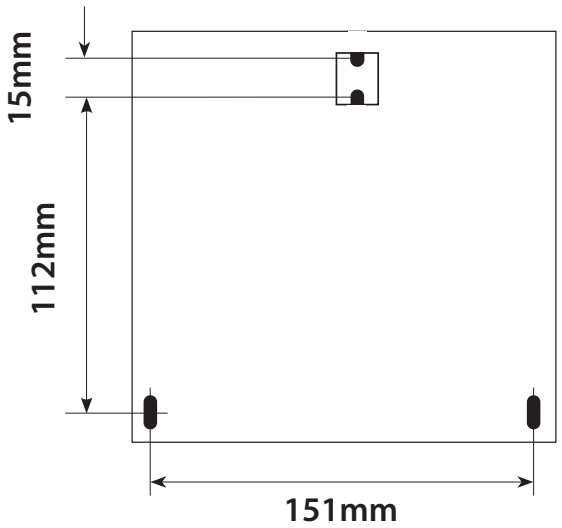
2.1.2 Location

Siting of the MC200/V3 is important in that it must be fitted where the temperature will be representative of the area being heated.

It should be installed 1.7m above floor level (unless a remote sensor is being used) and away from draughty areas or areas subjected to direct heat from sunlight, radiators etc. It must also be easily accessible for programming and operation.

2.1.3 Fixing

The MC200/V3 will accept cable entry from the bottom and the back.



Remove the two screws from the terminal cover and remove.

Check that the unit fits in the intended mounting position.

Using the template on the packaging box (invert if necessary) or using the dimensions on the back of the housing, mark the location of the three fixing holes.

Fit the top (or bottom if inverted) screw leaving approximately 5mm protruding. Locate the MC200 on the top (or bottom if inverted) fixing screw, line up the bottom (or top if inverted) fixing holes and secure using two screws.

The warning label supplied loose must be applied centrally to the terminal cover.

If required the unit may be inverted by the following procedure so that cable entry is from the top.

NOTE: that in this orientation the internal sensor cannot be used and a remote sensor must be used instead albeit it can be alongside the MC200/V3.

Remove the four screws that secure the top (keypad and display) section.

Rotate the section through 180°, the ribbon cable is long enough to allow this, and refit the top section to the case.

Alternatively a sub base is available, as an optional extra, to allow cable entry from the top or side.

2.1.4 Remote Sensor Fixing (optional)

Warning: Only sensors supplied by the manufacturer can be used remotely. NEVER use a domestic style room thermostat!





The remote sensor should be installed 1.7m above floor level and away from draughty areas or areas subjected to direct heat from sunlight, radiators etc. and should be sited no further than 100m from the main unit

Additionally, Radiant Black Bulb sensors should also be in sight of at least one of the radiant tubes.

Duct sensors should be placed in a position to receive a representation of the duct temperature.

Remove cover and offer the sensor up to the intended mounting position and mark two fixing holes.

Fix sensor base plate to the wall, complete wiring connections (2 core screened cable) and refit cover.

2.2.1 Electrical Connections

Warning: Wiring external to the MC200 must be installed in accordance with I.E.E... Regulations together with any local regulations which may apply.

Wiring terminals are located beneath the electrical lower front cover. Wiring should be completed in conduit, for which knockouts are provided in the bottom of the casing.

Mains supply and control circuit wiring should be completed in cables not less than 0.5mm².

Warning: The mains electrical supply to the MC200 should be taken from the appliance through a local isolator fitted adjacent to the MC200.

Warning: Should more than one appliance be controlled from one MC200 an interfacing relay box MUST BE USED with the MC200 driving the relay coils.

Alternatively a MC300 Multi control system may be used.

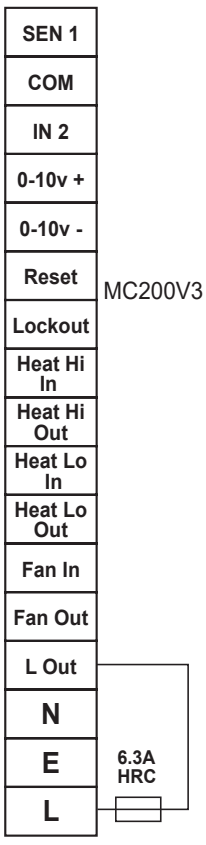
Note: Sensor cable must be screened two core and a minimum of 0.6mm² if solid and 7 x 0.2mm² if multi-strand. The screen must be grounded only at the MC200.

For remote sensing, connect sensor cables to terminals SEN1 and COM after removing and discarding the fitted sensor bead, for averaging sensing/auxiliary switching, connect cables to terminals IN1 and COM.

Warning: Wiring for the temperature sensor MUST BE RUN SEPARATELY and apart from ALL other wiring. Failure to regard this instruction may cause the MC200 to malfunction and may render it faulty. Under no circumstances must voltage be applied to the sensor connections.

Note: Burner Reset terminal is internally connected to NEUTRAL when the reset button is pressed.

Terminal	Type		Function
SEN1	Input	[1]	Connection for prime external sensor (not polarity sensitive)
COM	Input	[1]	Common connection for sensors and/or auxiliary switch
IN2	Input	[1]	Connection for 2nd sensor (averaging) and or auxiliary switch
0-10V +	Output		0-10Vdc output for modulation control MODULATION BURNERS ONLY
0-10V -	Output		0Vdc (gnd) output for modulation control MODULATION BURNERS ONLY
RESET	Output		NEUTRAL reset output (internally connected)
LOCKOUT	Input	[2]	Receives mains voltage lockout signal from burner
Heat Hi IN	Input	[3]	Hi Heat input (common relay contact)
Heat Hi OUT	Output	[3]	Hi Heat output (normally open relay contact)
Heat Lo IN	Input	[3]	Low heat/Heat input (common relay contact)
Heat Lo OUT	Output	[3]	Low heat/Heat output (normally open relay contact)
Fan IN	Input	[3]	Fan input (common relay contact)
Fan OUT	Output	[3]	Fan output (normally open relay contact)
L OUT	Output	[2]	6.3A fused 230V output terminal for heat/fan circuits where required
N	Input		NEUTRAL
E	Earth		EARTH
L	Input	[2]	LIVE



Notes:

[1] No Voltage - Voltage must not be applied to the sensor terminals. If a switch is fitted across COM and IN2, it must be volt free.

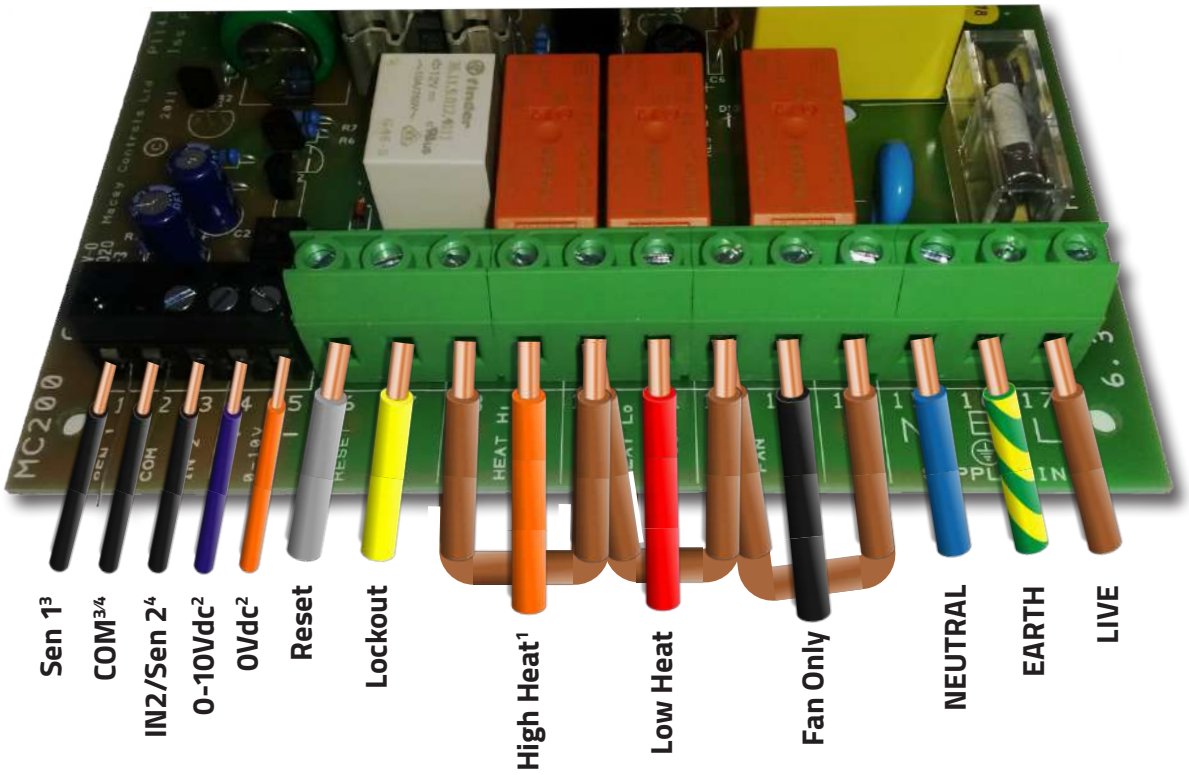
[2] 230V 50Hz Mains Voltage

[3] Volt Free - If a voltage is required (230V, 24V, 110V etc) the appropriate voltage must be applied to the corresponding input terminal.

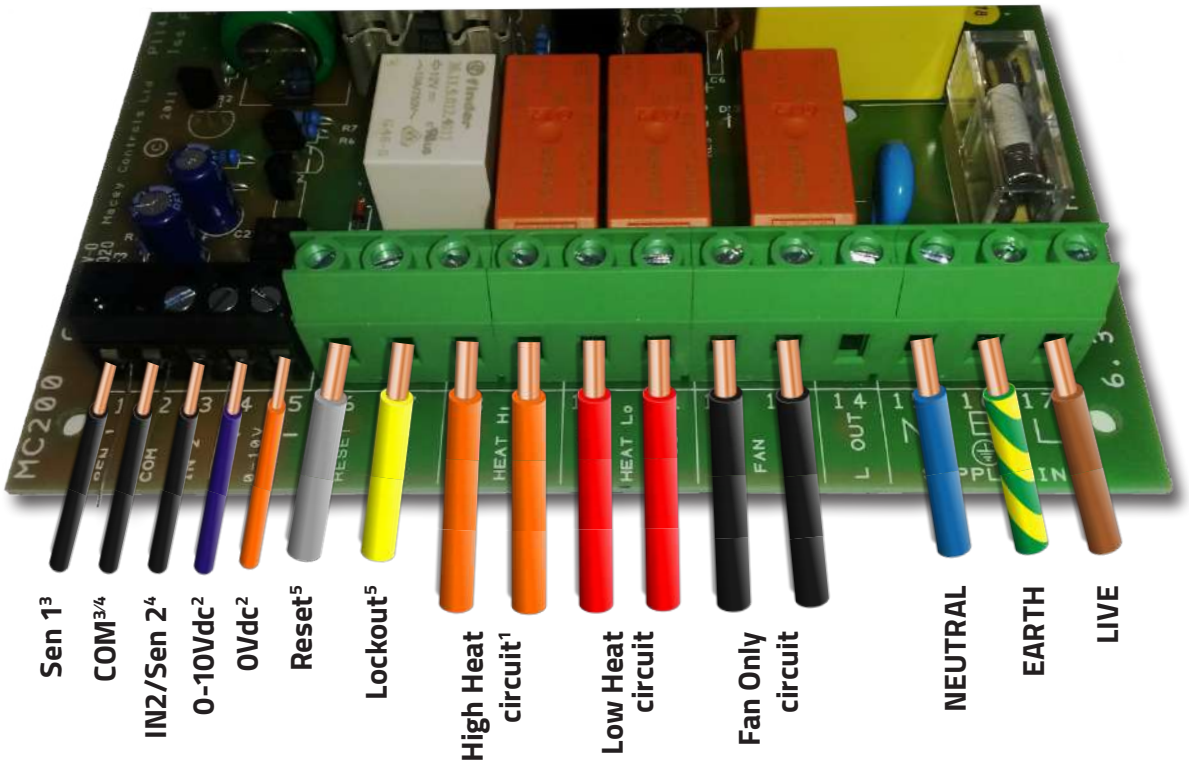
2.2 Electrical Cable Installation

2.2.2 External Wiring

2.2.2.1 Wiring details for current Powrmatic heaters utilising fused live output terminal 14 and detailing 'link' wires.



2.2.2.2 Wiring details for older Powrmatic heaters utilising volt free heat and fan terminals

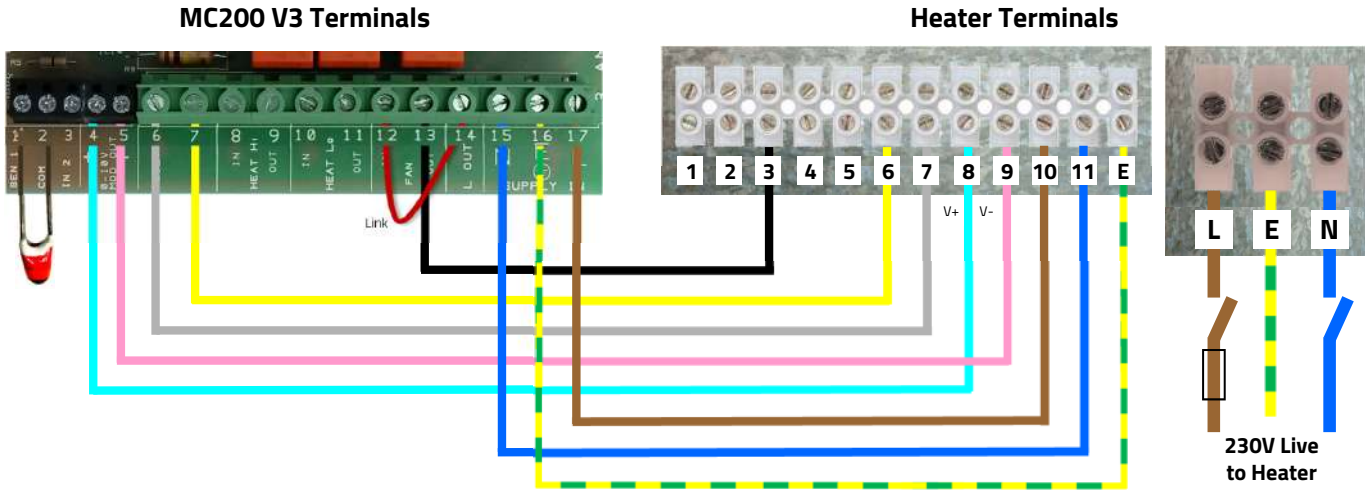


Notes:
1 Wiring for High/Low burners only
2 Wiring for modulation burners only
3 Wiring for external remote sensor only (internal sensor as std)
4 Wiring for remote ON or OFF switch/additional sensor only
5 Wiring for Burner Lockout heaters only

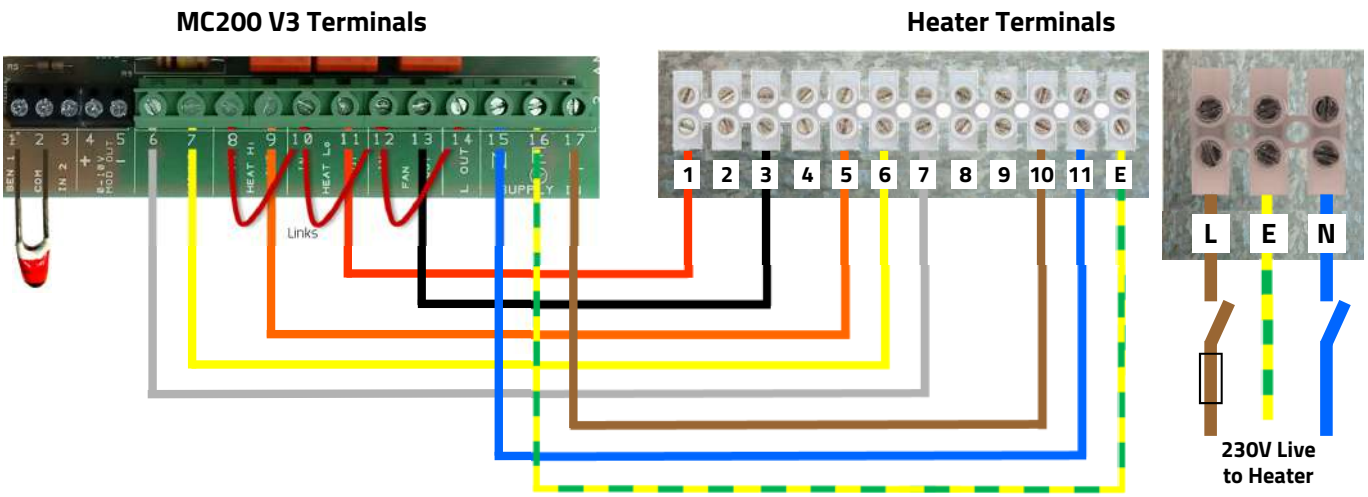
2.3 Interconnecting Wiring Diagrams

2.3.1 Heaters manufactured to current ErP 2021

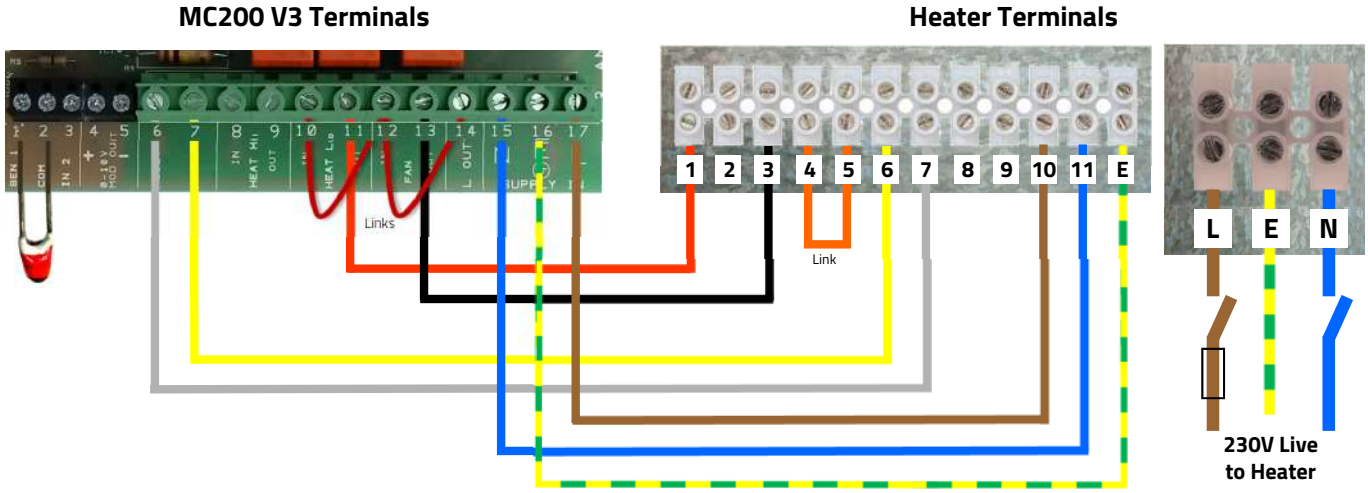
MC200 Controlling ErP 2021 LX or VX Heaters with Modulating Control (standard)



MC200 Controlling ErP 2021 LX or VX Heaters with optional High/Low Control

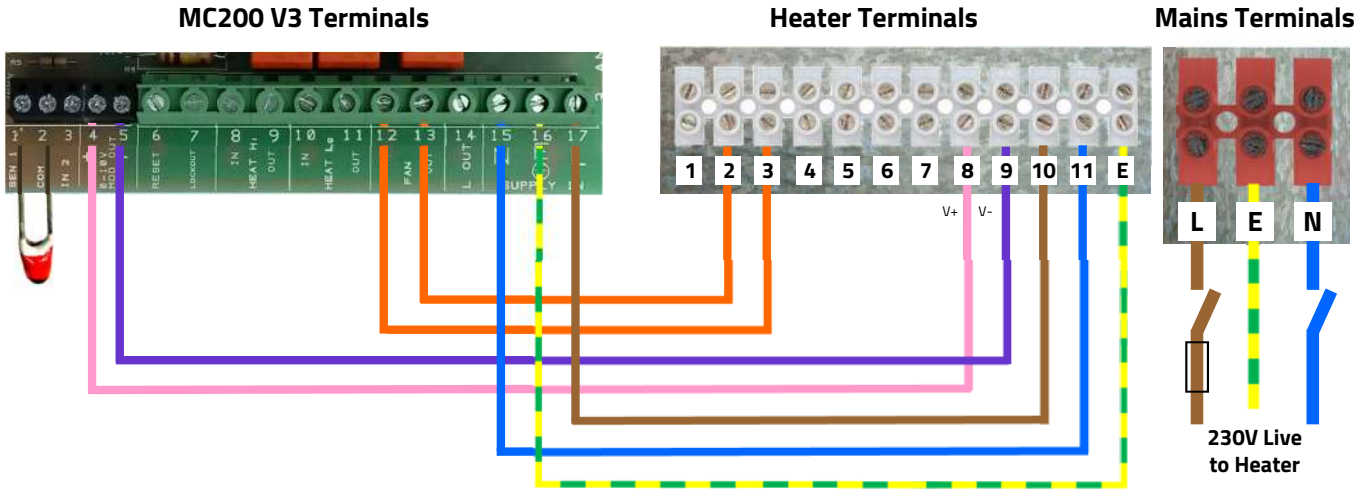


MC200 Controlling ErP 2021 LX or VX Heaters with optional On/Off Control

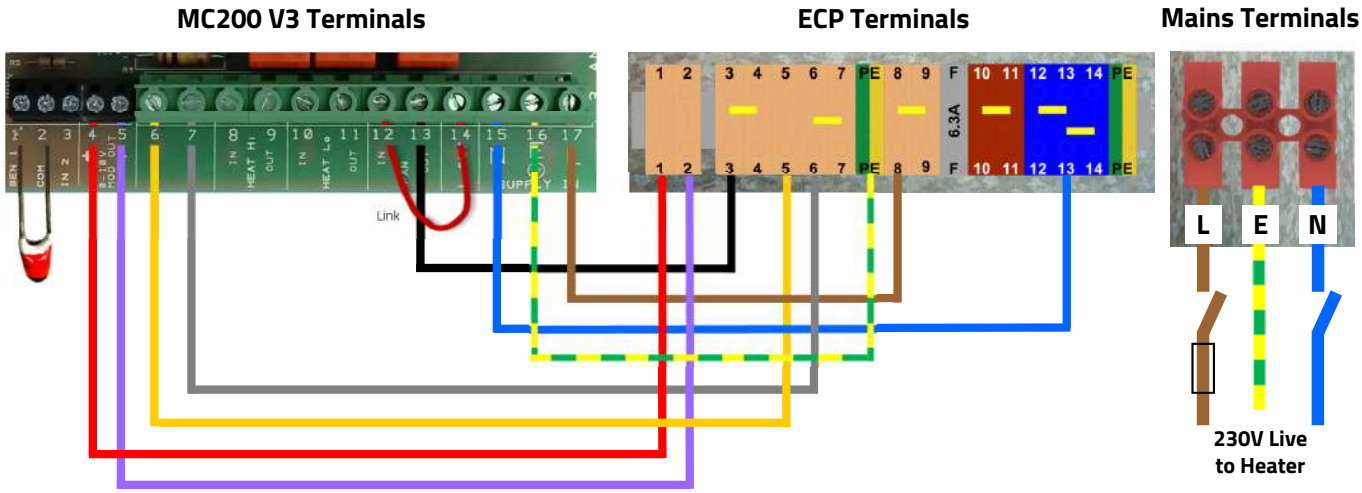


2.3 Interconnecting Wiring Diagrams

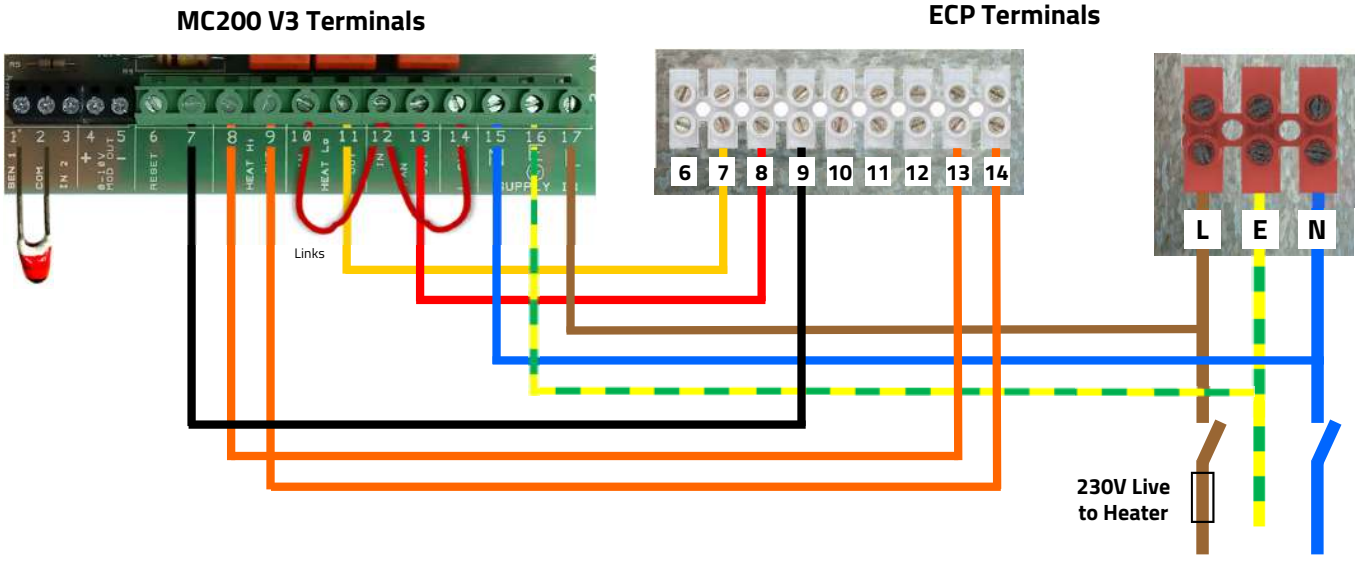
MC200 Controlling ErP 2021 LEC Heaters with Modulating Control (standard)



MC200 Controlling ErP 2021 CXG Heaters with Modulating Control

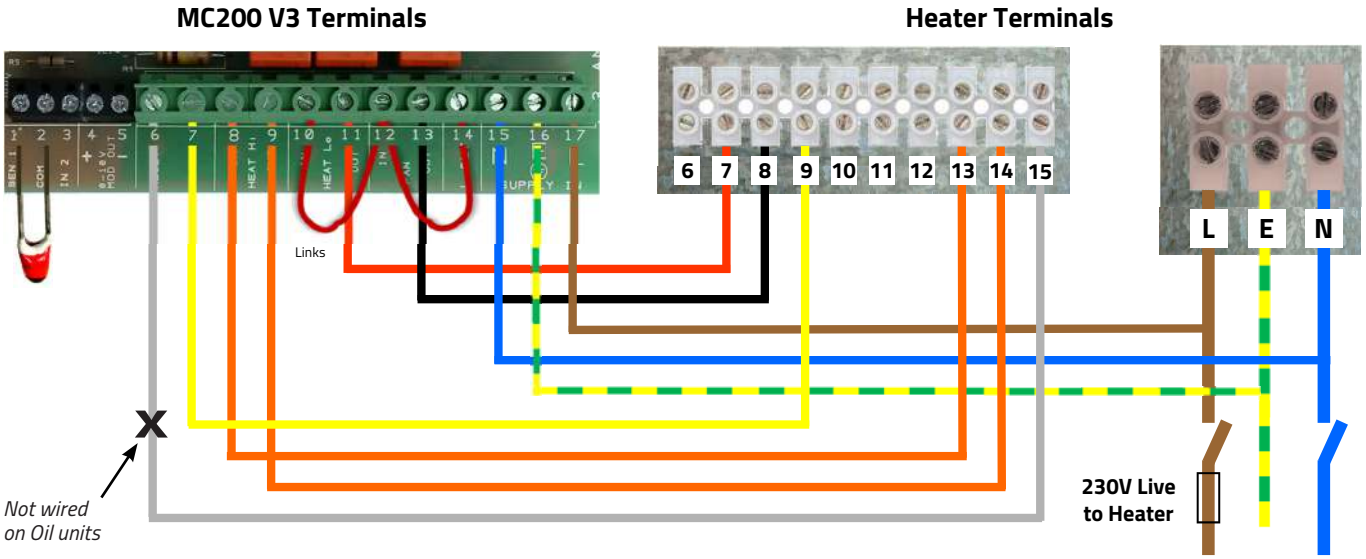


MC200 Controlling ErP 2021 CXO Heaters with Pulse Modulation Control

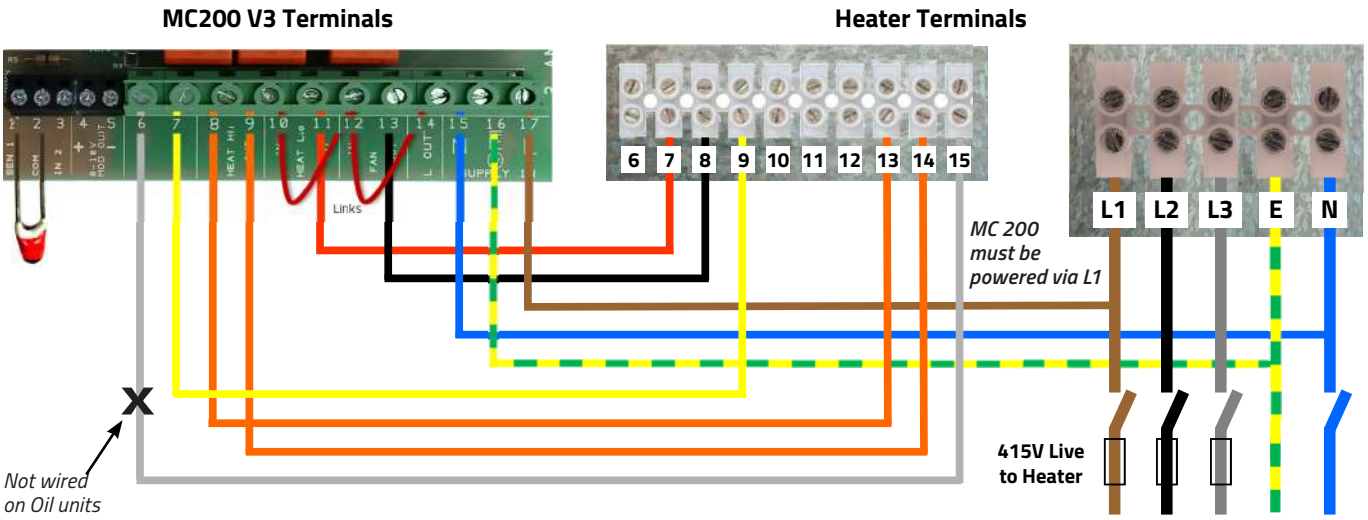


2.3 Interconnecting Wiring Diagrams

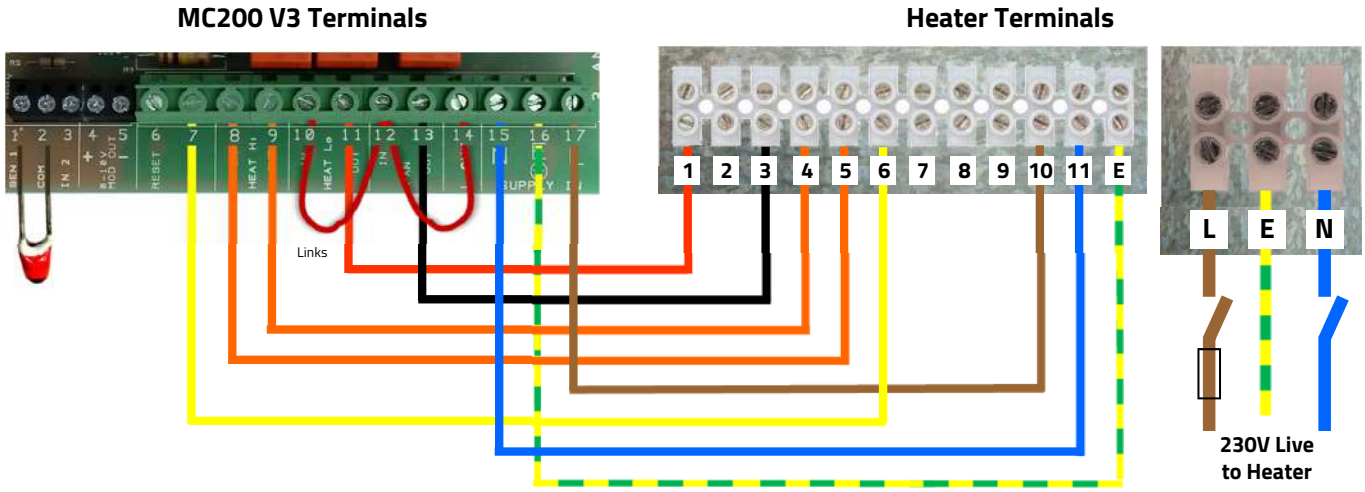
MC200 Controlling 1Pha ErP 2018 CPx Cabinet Heaters with High/Low Control



MC200 Controlling 3Pha ErP 2018 CPx Cabinet Heaters with High/Low Control



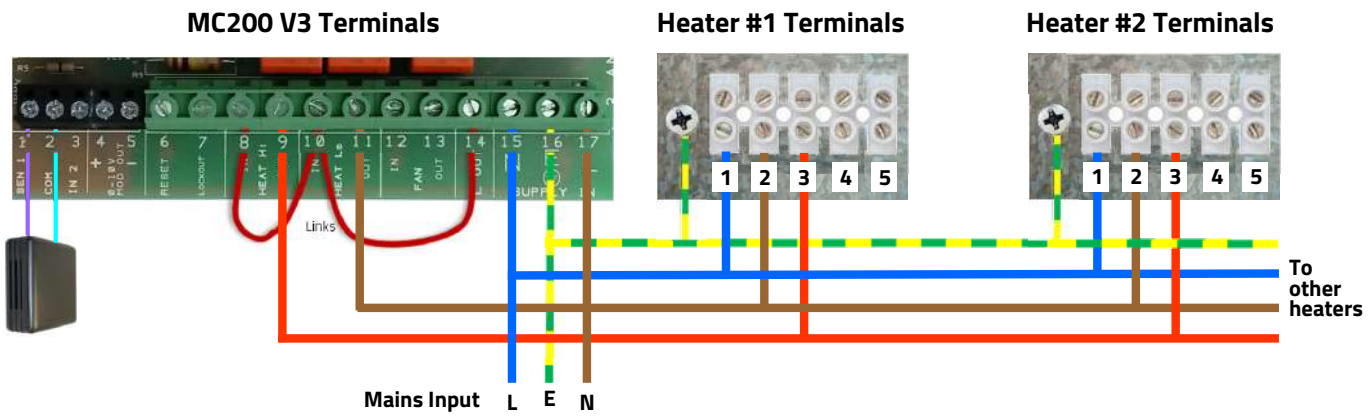
MC200 Controlling ErP 2018 OUH Heaters with High/Low Control



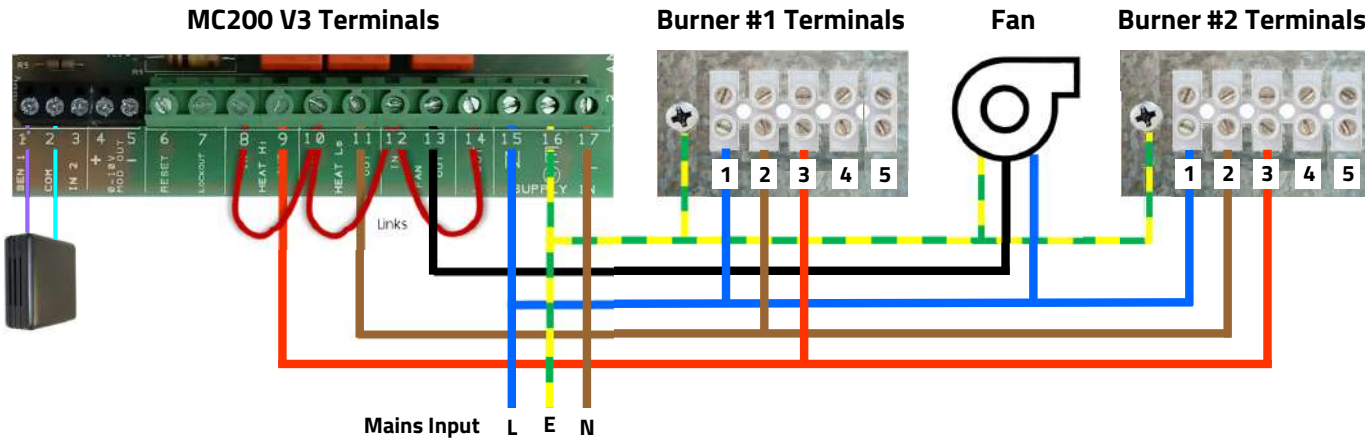
2.3 Interconnecting Wiring Diagrams

2.3.2 Radiant Heaters manufactured to current ErP 2018

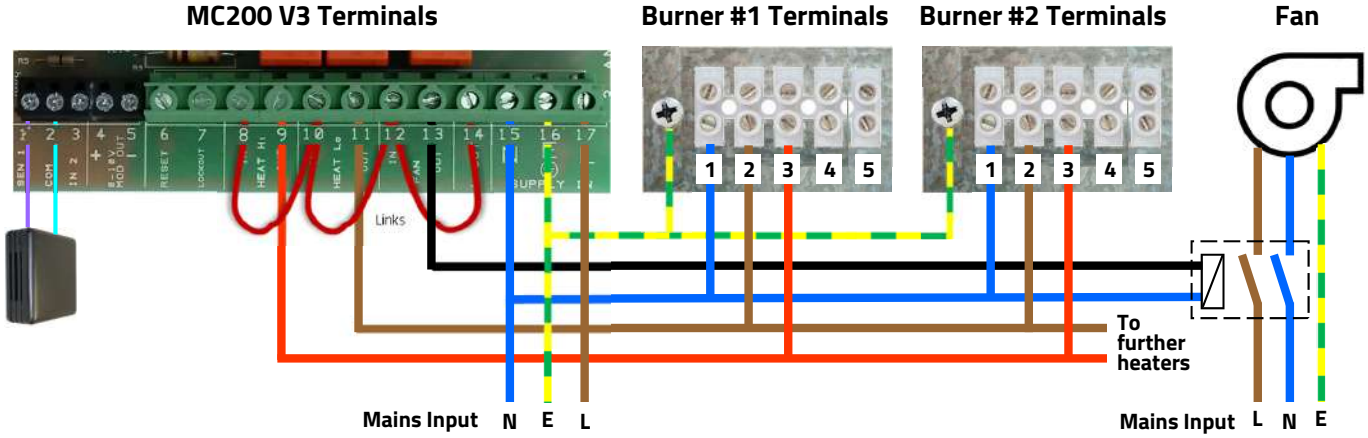
MC200 Controlling SrP Linear and U Tube Heaters with High/Low Control



MC200 Controlling SrP DL Heaters with High/Low Control



MC200 Controlling SrP HB Heaters with High/Low Control

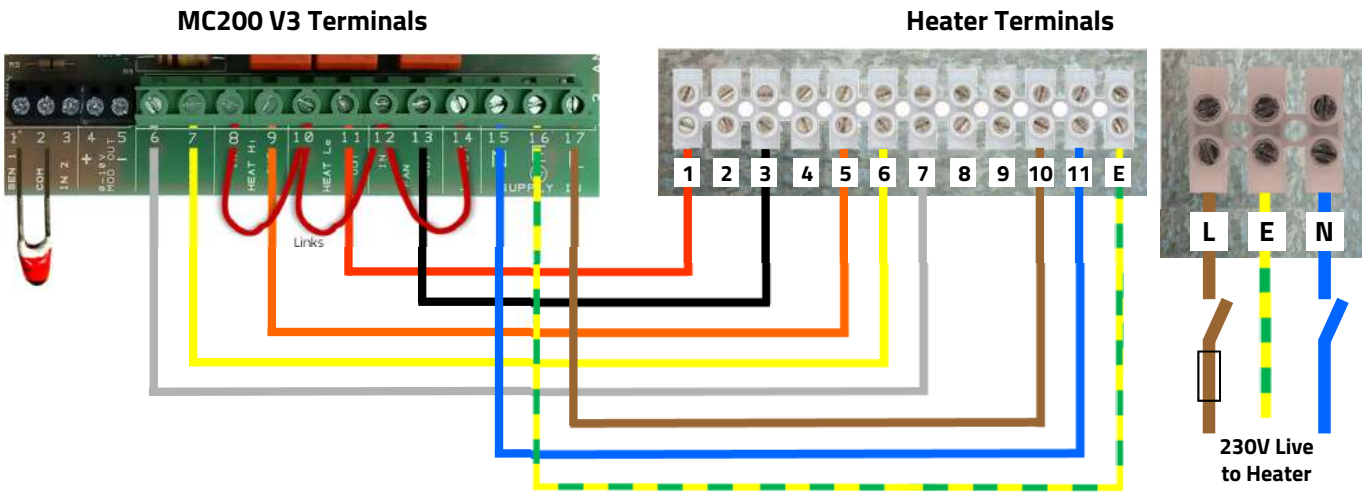


For SrP HB Radiant Heaters - refer to Supplement ref M314

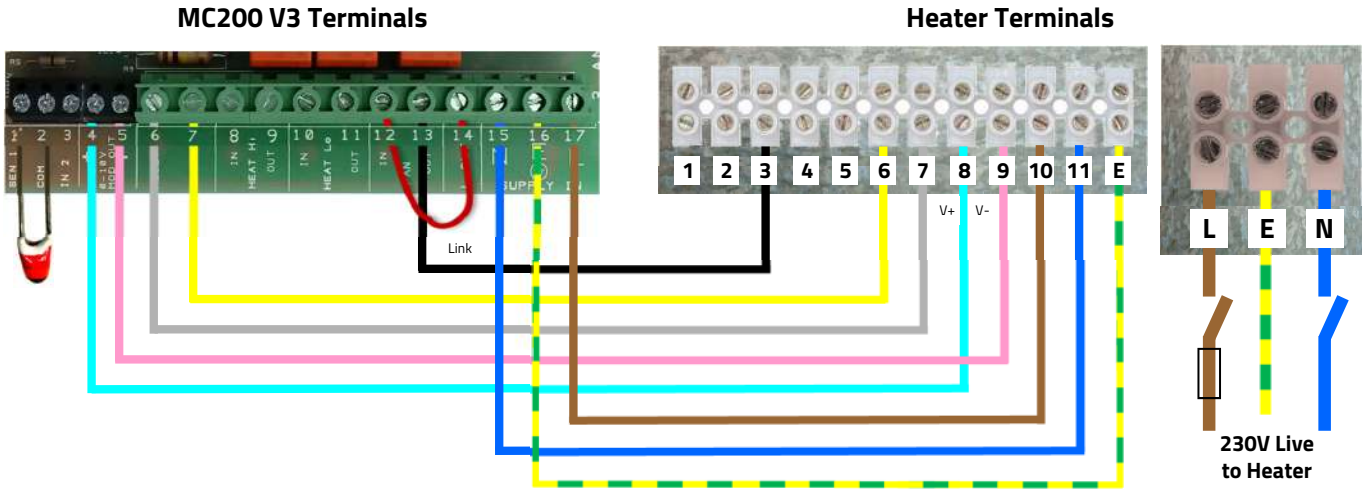
2.3 Interconnecting Wiring Diagrams

2.3.3 ErP 2018 Products (manufactured BETWEEN January 2018 and 2021)

MC200 Controlling ErP 2018 LNVx or VPx Heaters with High/Low Control



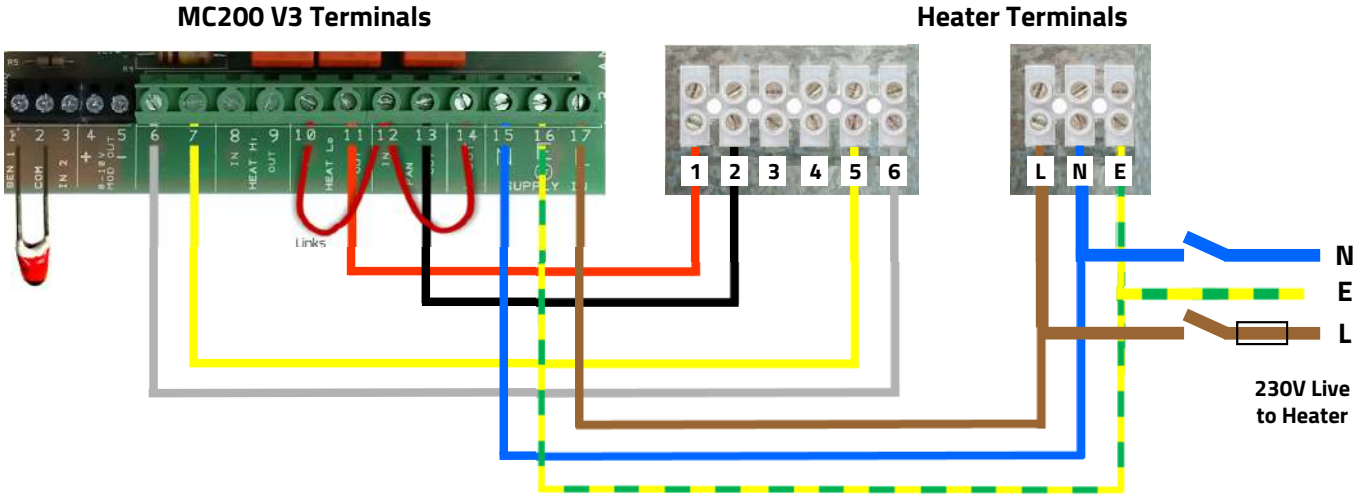
MC200 Controlling ErP 2018 LNVx or VPx Heaters with optional Modulating Control



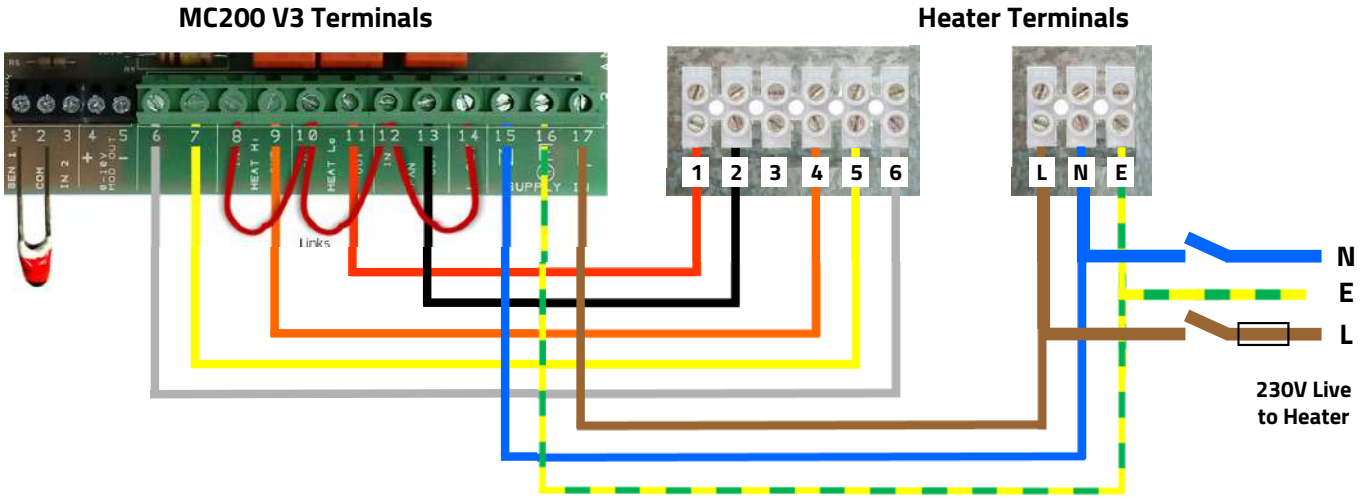
2.3 Interconnecting Wiring Diagrams

2.3.4 Non-ErP Products (manufactured PRIOR TO January 2018)

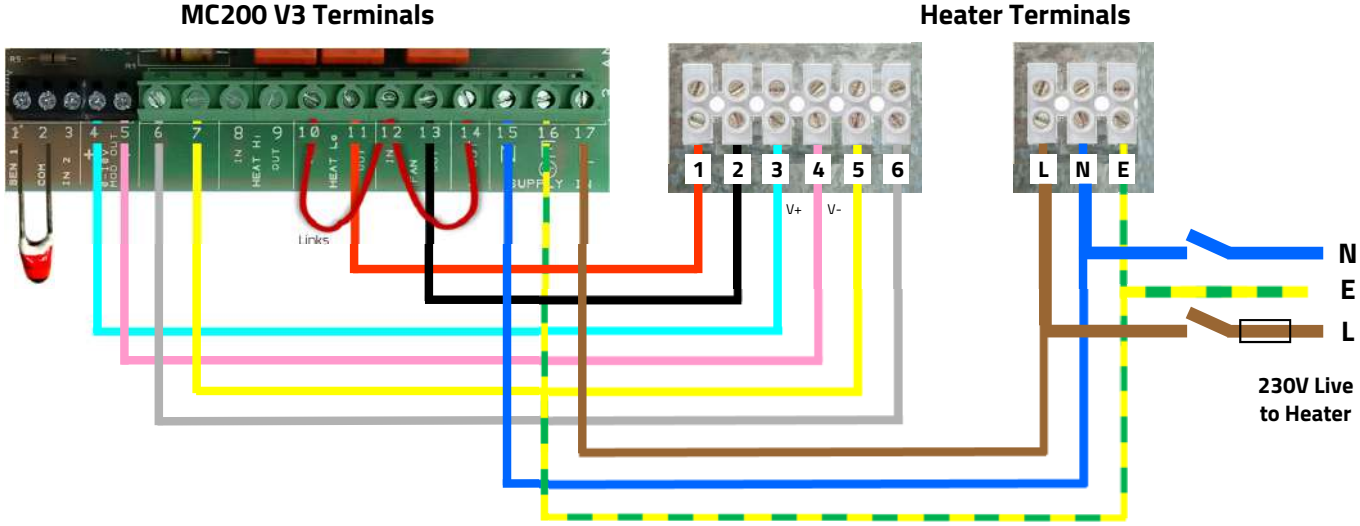
MC200 Controlling NVx or VPC Heaters with On/Off Control (standard)



MC200 Controlling NVx or VPC Heaters with optional High/Low Control

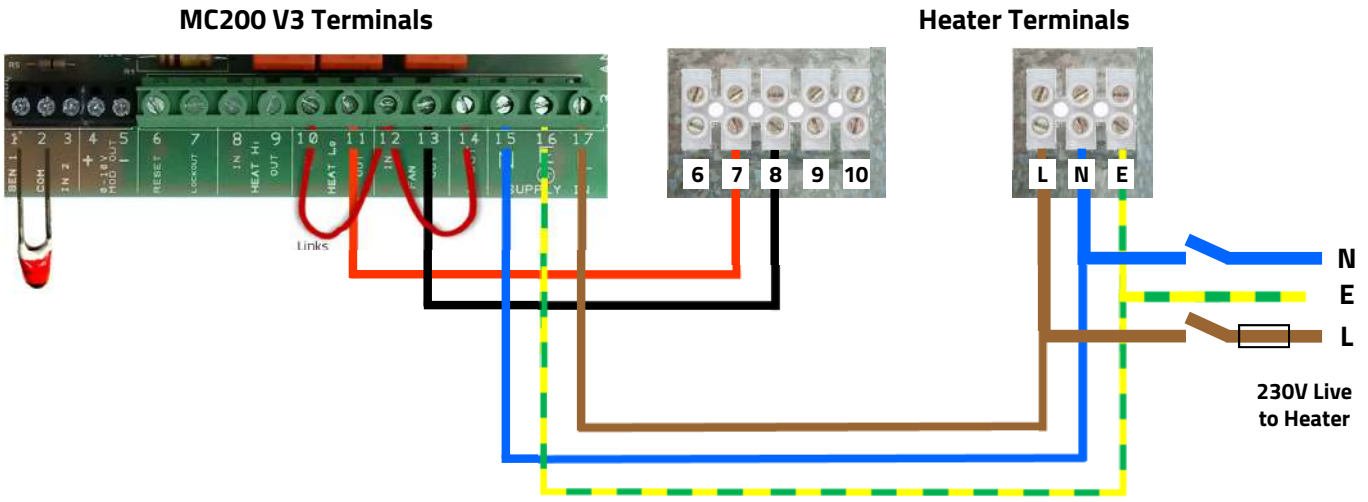


MC200 Controlling NVx or VPC Heaters with optional Modulation Control

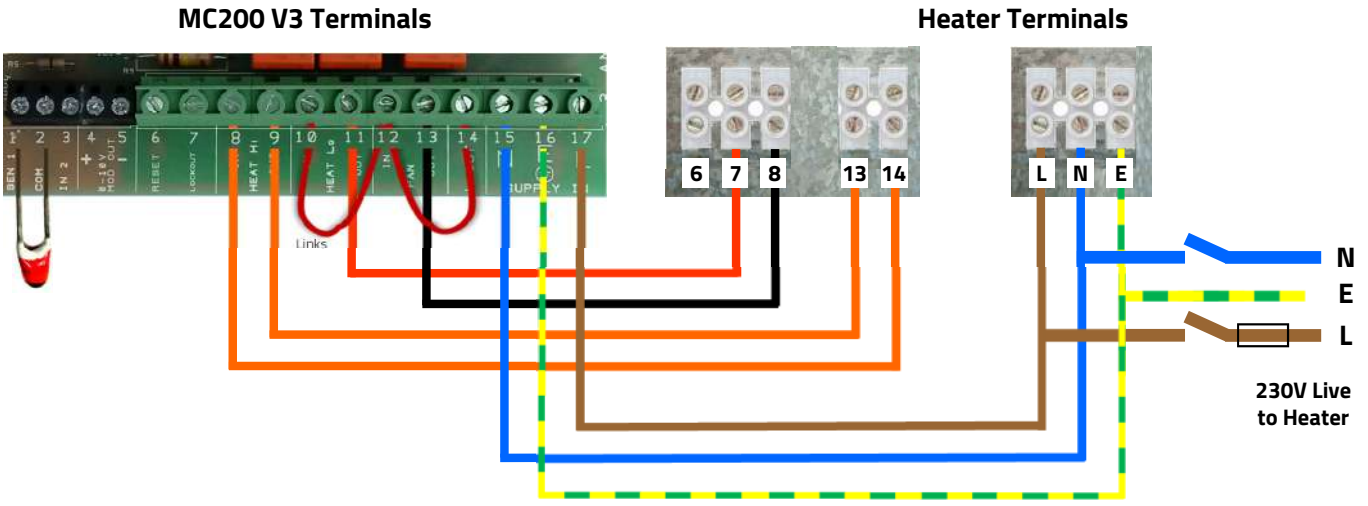


2.3 Interconnecting Wiring Diagrams

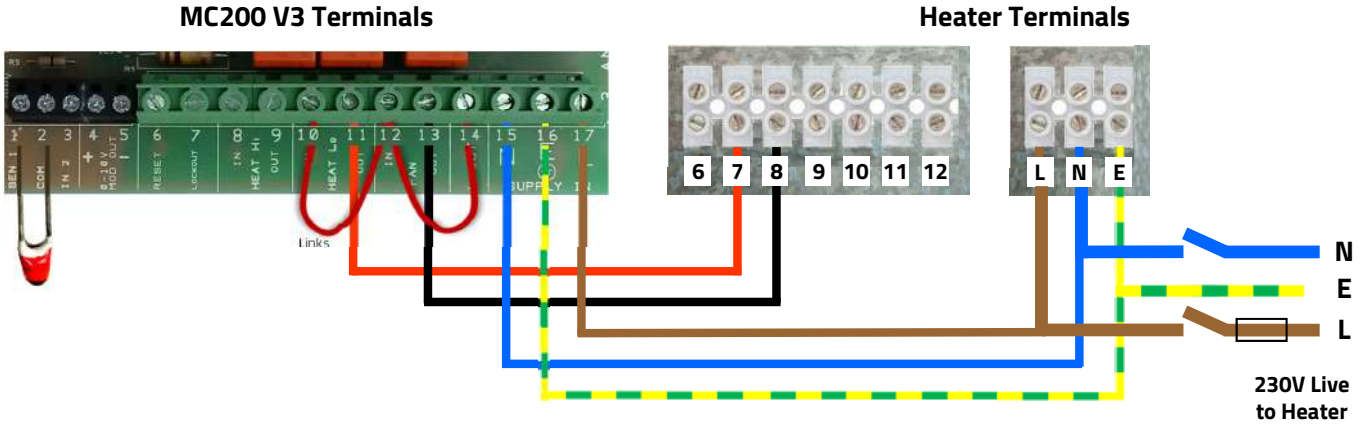
MC200 Controlling CPx Cabinet Heaters with On/Off Control



MC200 Controlling CPx Cabinet Heaters with optional High/Low Control

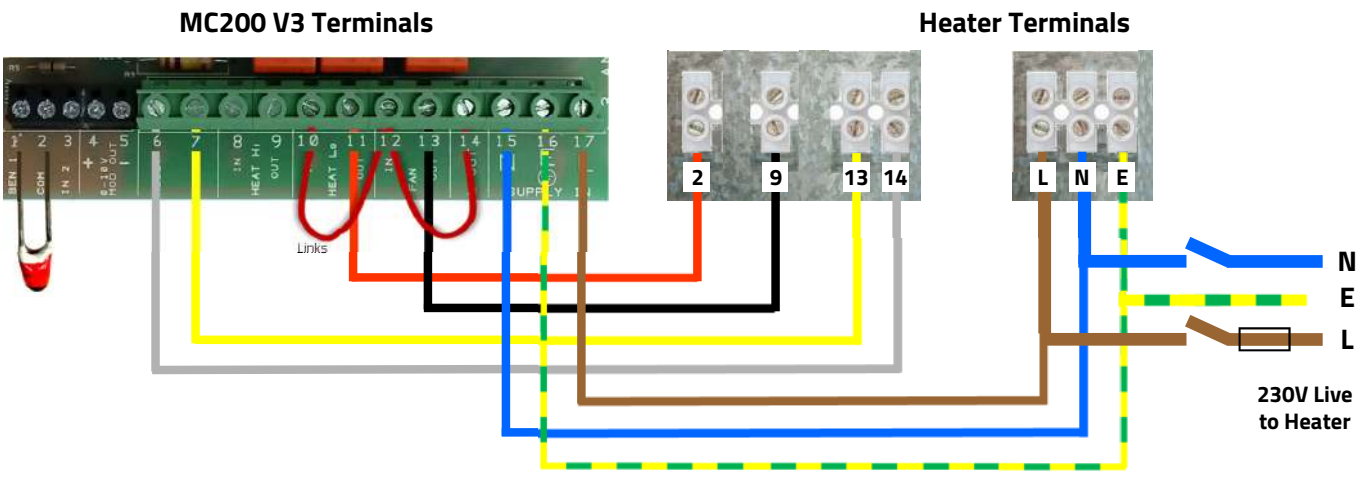


MC200 Controlling OUH Heaters with On/Off Control

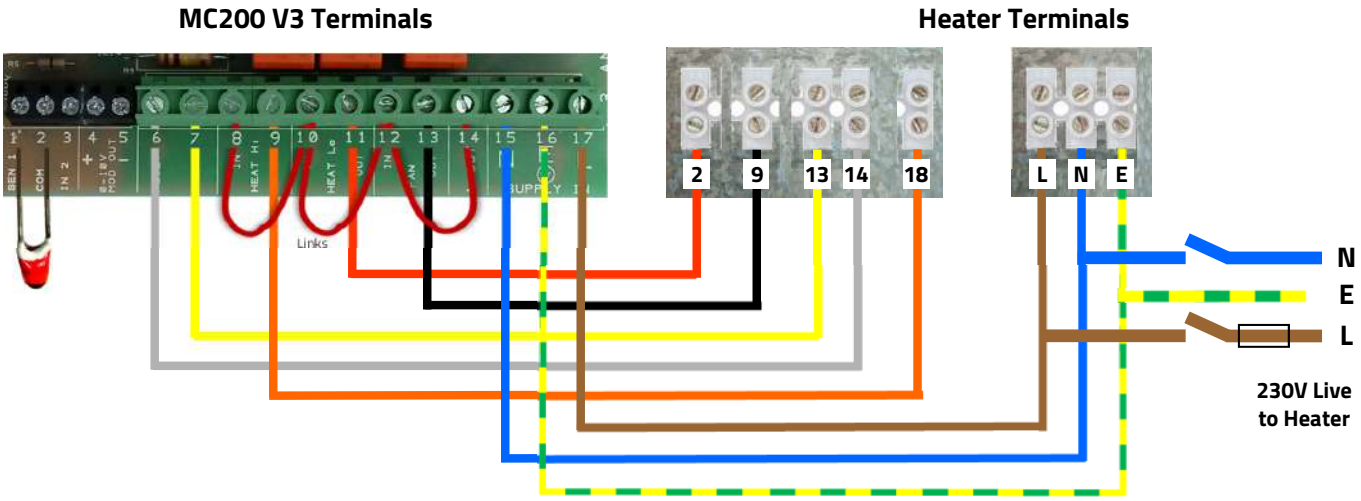


2.3 Interconnecting Wiring Diagrams

MC200 Controlling NVS Heaters with On/Off Control



MC200 Controlling NVS Heaters with optional High/Low Control



To utilise a BMS input function on a MC200. *(refer to section 2.5.2 for details)*

Either **a. when using a normally open switched circuit**

Wire a two core cable on terminals **'IN2'** and **'COM'**. Take the other ends to a volt free - **normally open** switch.

Alter any saved programs to read ***'OFF'***

Alter **'Snsr2'** parameter within Engineers menu to read: ***Close=BMS***

When this circuit is open (ie BMS is not calling for heat) the display will read ***"HEAT OFF FAN OFF"*** and heater will not fire.

When the circuit is closed (ie BMS calls for heat) the display will read ***"BMS HEAT ON"*** and heater will fire normally during this switched period under temperature control of the MC200

or **b. when using a normally closed switched circuit**

Wire a two core cable on terminals **'IN2'** and **'COM'**. Take the other ends to a volt free - **normally closed** switch.

Alter any saved programs to read ***'OFF'***

Alter **'Snsr2'** parameter within Engineers menu to read: **Open=BMS**

When the circuit is open (ie BMS calls for heat) the display will read ***"BMS HEAT ON"*** and heater will fire normally during this switched period under temperature control of the MC200*

When this circuit is close (ie BMS is not calling for heat) the display will read ***"HEAT OFF FAN OFF"*** and heater will not fire.

** If BMS is to control both time and temperature, set temperature with any saved programs to max °C.*

To utilise a remote OFF* input function on a MC200. *(refer to section 2.5.2 for details)*

** BMS OFF example, Door Switch, Outdoor Ambient Thermostat, Last Man Out Switch etc..*

Either **a. when using a normally closed switch**

Wire a two core cable on terminals **'IN2' and 'COM'.** Take the other ends to a volt free - **normally closed** switch.

Alter **'Snsr2'** parameter within Engineers menu to read: **Open=off**

When this circuit is closed (ie door closed, contacts closed), the display will read ***"P1 HEAT ON"*** and heater will fire normally under time and temperature control.

When the circuit is open (ie door open, contacts open) the display will read ***"P1 REMOTE OFF"*** and heater will not fire.

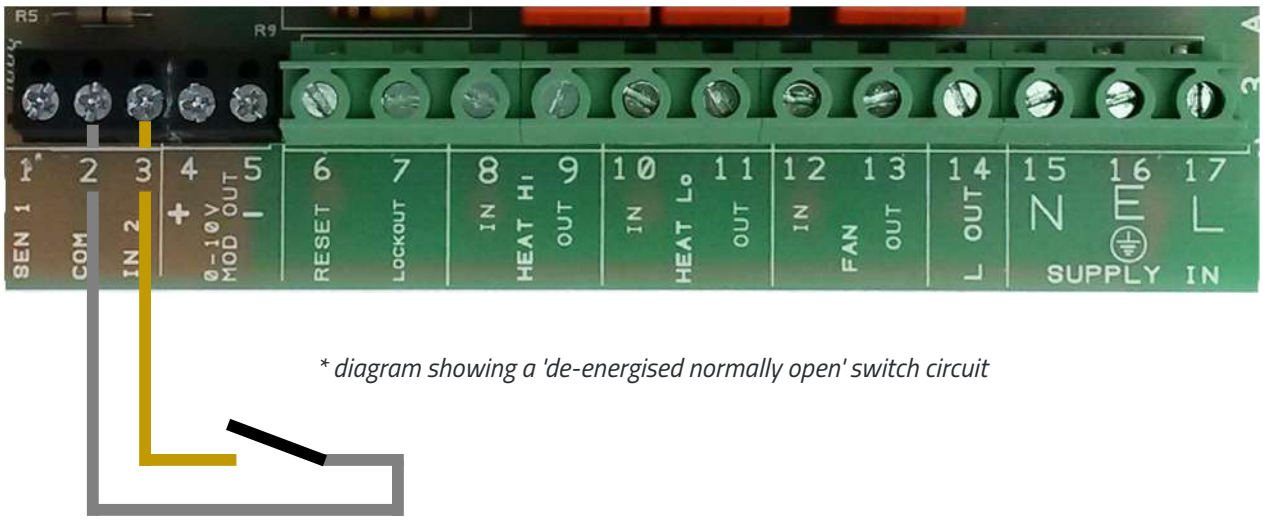
or **b. when using a normally open switch**

Wire a two core cable on terminals **'IN2' and 'COM'.** Take the other ends to a volt free - **normally open** switch.

Alter **'Snsr2'** parameter within Engineers menu to read: **Close=off**

When this circuit is open (ie door closed, contacts open) the display will read: ***"P1 HEAT ON"*** and heater will fire normally under time and temperature control.

When the circuit is closed (ie door open, contacts closed) the display will read ***"P1 REMOTE OFF"*** and heater will not fire.



** diagram showing a 'de-energised normally open' switch circuit*

2.4 External Inputs

To utilise a remote sensor function on a MC200. *(refer to section 2.5.2 for details)*

Where the MC200 is not fitted within the heated space, a remote sensor can be fitted.

Alter **'Snsr2'** parameter within Engineers menu to read: **Remote**

Open the bottom electrical cover of the MC200. Unscrew and remove the exiting internal thermistor bead from terminals t1 (SEN1) and t2 (COM).

Wire a 2 core screened cable into the sensor terminals and refit cover. Wire back to the MC200 into the terminals t1 (SEN1) and t2 (COM).

The remote sensor should be installed 1.7m above floor level and away from draughty areas or areas subjected to direct heat from sunlight, radiators etc. and should be sited no further than 100m from the main unit.

Additionally, Radiant Black Bulb sensors should also be in sight of at least one of the radiant tubes. Duct sensors should be placed in a position to receive a representation of the duct temperature.

Remove cover and offer the sensor up to the intended mounting position and mark two fixing holes. Fix sensor base plate to the wall.



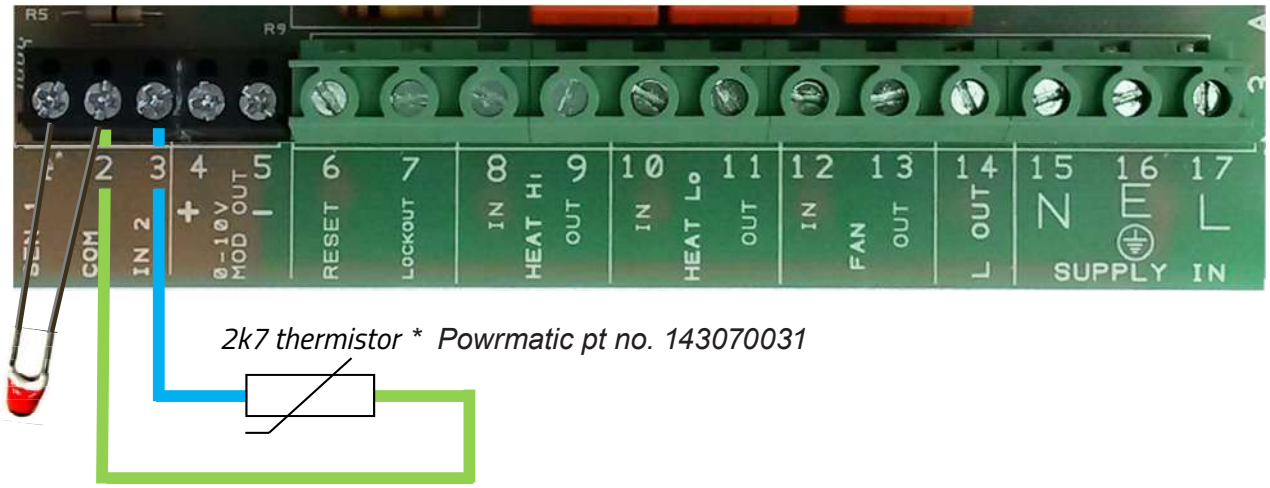
Warning: Only sensors supplied by the manufacturer can be used remotely. NEVER use a domestic style room thermostat!



To utilise an averaging remote sensor function on a MC200.

An aditional remote sensor can be fitted within spaces, wired as described below to create an average space temperature between the internal thermistor and the remote sensor.

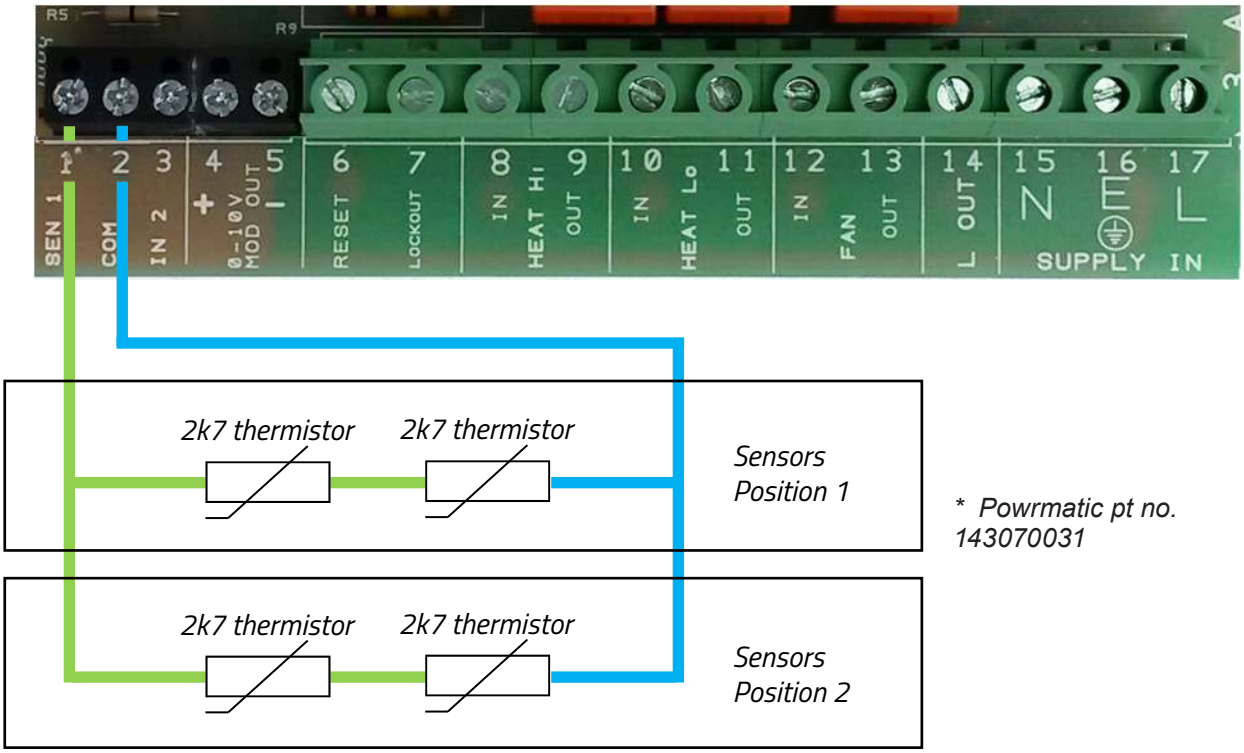
Alter **'Snsr2'** parameter within Engineers menu to read: **Remote**



Multiple remote sensors for averaging temperature input. *(refer to section 2.5.2 for details)*

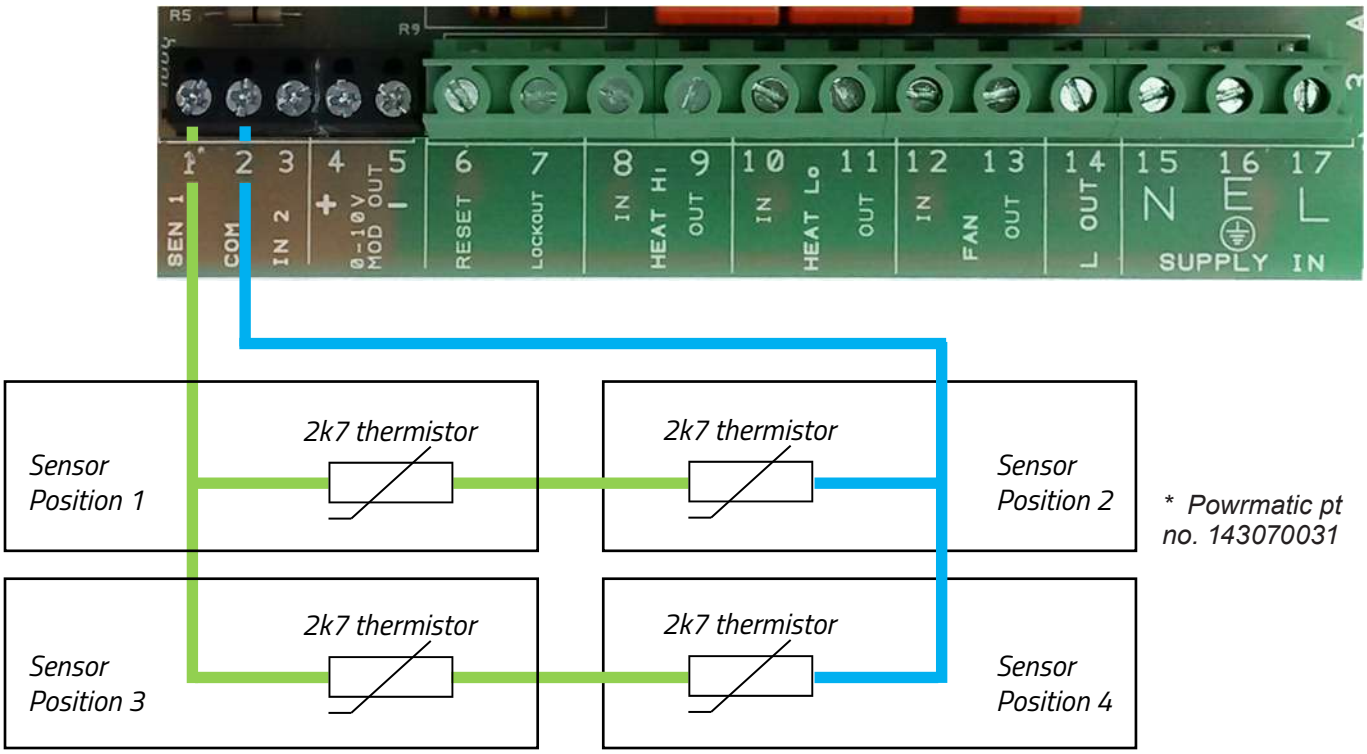
Multiple sensors can be fitted within larger spaces, wired as described below to create an average space temperature. Methodology: Two pairs of thermistors (ie wired in series), when wired in parallel give the same resistance as a single thermistor. Two thermistors is series doubles the resistance, two thermistors in parallel halves the resistance. Therefore pairing them up is the same resistance as one thermistor. Alter **'Snsr2'** parameter within Engineers menu to read: **Remote**

a. averaging the temperatures in two areas (zones).



* Powrmatic pt no. 143070031

b. averaging the temperatures in four areas (zones).



* Powrmatic pt no. 143070031

2.5 Commissioning and Output Sequences

2.5.1. Engineers Settings

The engineer menu is enabled by entering the engineer passcode at the Password menu option.



Use the **+** button to increase or the **-** button to decrease the first digit. Use the ► button to move to the next digit (*). Once the passcode has been entered, press the ✓ button to select. If '**FAIL**' appears on the display, try again.



Note: Once the engineer code has been correctly entered no user or engineer codes will be required for a period of 1 hour.

Pressing the ◄ button will move to the Engineers menus. Press the ✓ button to select.



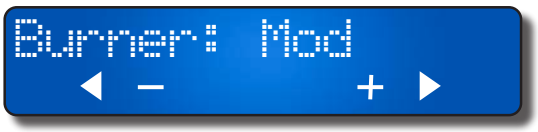
Press the ◄ or ► buttons to move through the options.
Press the **+** or **-** buttons to alter a setting.
Press the ✓ button to affect the change.



At any point, press the **X** button to exit from the engineer sub-menu back to the User menu.

Many of the Engineer settings are determined by the installed equipment however others will be to the end users preferences. The latter should be left at default settings if there is no end user when the control is being commissioned. If the Users menu is password protected the Engineer code permits access to both the Engineer menu and the User menu.

2.5.2. Engineers Menus



Defines the type of controlled burner. *(Default: Mod)*
Options: Modulating, Radiant, RadiantC, ErP Comp, On/Off, High-Low

your setting here



Defines the high heat input (in kW) of the controlled burner for cost calculations. *(Default: 120kW)*

your setting here



*

**Note: This menu item only appears when Hi/Lo burner type has been selected.*

Defines the Low heat input (in kW) of the controlled burner for cost calculations. *(Default: 12kW)*

your setting here



Facilitates direct testing of the controlled burner(s) irrespective of current control settings, times etc.
*(Modulation Options: level 1 thro level 10. *where 1 is lowest heat output and 10 is high heat output)*
*(On/Off Options: BURNER OFF, BURNER ON)
*(Hi/Low Options: BURNER OFF, BURNER HI, BURNER LO)

**Note: dependent upon which burner type is set above.*



*

**Note: This menu item only appears when Hi/Lo burner type has been selected.*

Sets the temperature difference between the Hi and Lo stages of Hi/Lo burners. *(Default: 1.0°C)*
Range of adjustment: 0.5°C to 10.0°C

your setting here

2.5 Commissioning and Output Sequences



Sets the temperature at which the 0-10V signal will be 10V and the burner will be at High Fire. *(Default: 2°C)*
Range of adjustment: 0.5°C to 30.0°C

your setting here



Sets whether the control will complete an automatic reset of lockout, If lockout signal is not removed by a manual reset the MC200 will initiate an automatic reset 30 minutes after the lockout signal and then once every 24hrs.
(Default: OFF)
Options - ON, OFF

your setting here



Sets how long the lockout reset terminal is connected to neutral when the reset button is pressed.
(Default: 1 second)
Options: 1 second, 3 seconds, 5 seconds)

your setting here



Sets the function of sensor 2 input (also known as IN2).
(Default: Not used)
Options: Not Used, Remote, Close = off, Close = on, Open = off, Open = on, NC = BMS, NO = BMS

Not used: The sensor 2 terminals are ignored

Remote: A temperature sensor is connected

Close = off A switch is fitted. When it closes, heating goes off

Close = on A switch is fitted. When it closes, heating goes on

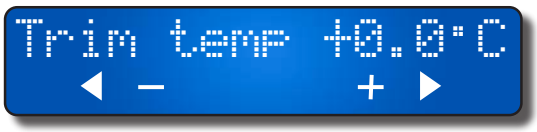
Open = off A switch is fitted. When it opens, heating goes off

Open = on A switch is fitted. When it opens, heating goes on

Close = BMS BMS contact closed turns heating on

Open = BMS BMS contact open turns heating on

your setting here



A temperature offset can be entered here to adjust the displayed temperature to agree with the sensor temperature. *(Default: 0.0°C)*
Range of adjustment: -5°C to +5°C

your setting here



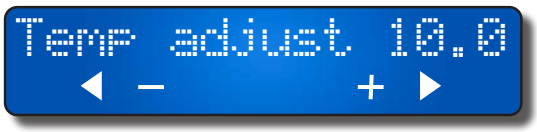
Sets the minimum temperature that the User can select.
(Default: 5°C)
Range of adjustment: 5°C - 20°C.

your setting here



Sets the maximum temperature that the user can select.
(Default: 30°C)
Range of adjustment: 20°C - 60°C.

your setting here



Sets °C that User can temporarily adjust the current set point up or down. *(Default: ±10°C),* Range is 0.5°C to 30°C.

your setting here



Sets the mode of Fan operation between:
OFF: Only during Summer mode - fan only operates when Fan button is pressed and will remain on until either Fan button is pressed again or until midnight.

Auto: fan runs only when heat lo relay is in operation. i.e below the set point and within a Heat On period

Const: fan runs continuously when timer is in Heat On period, regardless of temperature

ON: fan runs continually 24/7. *(Default: OFF)*

your setting here

2.5 Commissioning and Output Sequences



Sets frost protection/night setback to active or inactive.
(Default: OFF)
Options: ON, OFF

your setting here



Set back temperature value for burner to enable outside a program period . *(Default: 5.0°C)*
Range of adjustment: 1°C to 15°C

your setting here



Hysteresis (°C) Switching differential band.
(Default: 0.5°C)
Range of adjustment: 0.5°C to 5.0°C

On the default setting, the heat demand will switch on & off at 0.5° of the target temperature. i.e. target temperature is 20°C, the heater will turn OFF at 20.5°C and turn back ON again once the temperature falls below 19.5°C.

If the Hysteresis is set to for example 3°C and the target temperature is 20°C, the heating will turn OFF at 20.5°C and turn back ON again once the temperature has fallen below 17.0°C. (-3° of target temperature).

your setting here



Sets whether Optimum Start is active.
(Default: OFF)
Options: ON, OFF

your setting here



Sets the Optimum Stop temperature.
(Default: 0.0°C)
Range of adjustment: 0°C - 6°C.

your setting here



Allows a service date to be set
(Default: 27th Dec 2099)



Displays the most recent lockout time and date

Note: If lockout log is not cleared newer events will over-write older ones.



Restore Resets all parameters to factory default settings.

Note: This action returns the unit to the main screen and also clears the Users password.

2.5.3 Outputs

2.5.3.1 Modulating

The 0-10Vdc output stays at zero and the Low heat relay (Terminals Heat In Lo and Heat Out Lo) will remain de-energised while the sensor temperature is at or above the set temperature.

Below the set temperature, the Low heat relay (Terminals Heat In Lo and Heat Out Lo) will operate and the modulating output voltage (Terminals 0-10v+ and 0-10v-) increases, reaching 10v when the sensor temperature falls to the threshold set i.e 0V at low fire, 10V at High Fire.

2.5.3.2 Radiant

When configured for Radiant, the Low heat relay (Terminals Heat In Lo and Heat Out Lo) operates when the sensor temperature is below the set temperature (as per ON/OFF mode).

The High heat relay (Terminals Heat In Hi and Heat Out Hi) operates when the sensor temperature is below the set temperature by more than the number of degrees set in the Hi/Lo differential parameter to switch from low fire to high fire. The Low Level relay remains operated while the High heat relay is operated.

When the heat relay(s) are energised, power will be applied to the burner(s). The fan relay* (Terminals Fan In

and Fan Out) will be delayed for a period of 30 seconds (indicated by a flashing red LED) after which time, the fan relay will become active and the red LED will go solid.

When the heat relay(s) are disabled, the fan relay will remain active for a period of 180 seconds (indicated by a flashing red LED) after which time, the fan relay will become deactive.

If heat relays are required during the post purge 180 second period, these are delayed for a period of 30 seconds before being made active.

2.5.3.3 RadiantC

When configured for RadiantC (Continuous Radiant Heaters), the menu option for Sensor 2 will be hidden, as Sensor 2 contacts will be used only as a normally-open volt-free contact input for a system pressure switch. ***NOTE: If the pressure switch is already closed (faulty) the Heat LED will not start flashing and this will be treated as a lockout fault.*

The fan relay* (Terminals Fan In and Fan Out) will be delayed for a few seconds (indicated by a flashing red LED) after which time, the fan relay will become active.

The Low heat relay (Terminals Heat In Lo and Heat Out Lo) operates when the sensor temperature is below the set temperature (as per ON/OFF mode). This is indicated by a solid red LED.

The High heat relay (Terminals Heat In Hi and Heat Out Hi) operates when the sensor temperature is below the set temperature by more than the number of degrees set in the Hi/Lo differential parameter to switch from low fire to high fire. This is indicated by a solid red LED. The Low Level relay remains operated while the High heat relay is operated.

When the heat relay(s) are energised, power will be applied to the burner(s).

When the set point has been reached, the low heat relay is disabled, the fan relay will remain active for a period of 180 seconds (indicated by a flashing red LED) after which time, the fan relay will become deactive.

If the heat demand is re-established during this post purge period, the fan will turn off. A delay of 30 seconds allows the normally-open volt-free contact input for the system pressure switch to go open circuit after which delay, the fan will restart.

** If for any reason the pressure switch opens whilst the unit is demanding heat, this will be treated as a lockout fault as follows:

- The heat demand will be stopped.
- The fan will continue to be driven for the 180-second purge time.
- The display will show “Heater lockout”. Both LED’s will initially flash, changing over to just the Fault LED flashing.
- After the purge time has elapsed, the Reset button may be used to clear the lockout fault.
- If required, the existing Auto Reset feature in Engineer Settings may be enabled to attempt unattended lockout reset.
- The unit will wait for 30 seconds with the fan off (Red LED flashing).
- Normal standby mode is resumed.

2.5.3.4 ErP Comp

When configured for ErP Comp, the controller will give three stages of control signal.

- Low power: The Low Fire relay will pulse on/off. ON time of 3 minutes (default), followed by a delay off time of 1½ minutes (default), repeating during this configuration.
- Medium power: Low Fire relay on continually.
- High power: Low and High fire relays both on.

Mod Off set (default 2°C)

When this mode of operation is selected the user display will be shown (which mimics the 0 to 10V control output). Using the bar graph as a reference, the following sets out power outputs via the bar-graph :- 0 to 2 bars output = OFF; 2 to 4 bars output = Low power (pulsing Low Fire); > 4 bars output = Medium power (Low fire on steady); > 7 bars output = High power (High fire on (+low fire))

In the ERP mode the fan control will operate as below:- once a heat demand is produced, the fan relay will be energised after a 30 second delay. When the heat “demand” (not low power pulsing) is stopped the fan will continue to run for a further 2½ minutes.

When any heat relay is turned OFF the Heating On LED will flash RED (for the duration of the OFF time). When any heat relay is turned ON then the LED will flash amber (for the duration of the ON time). When the heat demand is steady the LED will also be a steady amber.

2.5.3.5 On/Off

When configured for a single burner heater, the Low heat relay (Terminals Heat In Lo and Heat Out Lo) operates when the sensor temperature is below the set temperature.

2.5.3.6 High/Low

When configured for a two-stage burner heater, the Low heat relay (Terminals Heat In Lo and Heat Out Lo) operates when the sensor temperature is below the set temperature (as per ON/OFF mode).

The High heat relay (Terminals Heat In Hi and Heat Out Hi) operates when the sensor temperature is below the set temperature by more than the number of degrees set in the Hi/Lo differential parameter to switch from low fire to high fire e.g. If the set temperatures is 18°C and the Hi/Lo differential is set to 4°C the high heat relay will operate at <14°C. The Low Level relay remains operated while the High heat relay is operated.

3.1 Fault displays and Fault Finding

Heater Lockout

'Heater lockout' appears on he display if the MC200 receives a fault voltage onto terminal 7. The Fault LED will also be illuminated.



The lockout can be cleared by pressing the reset button on the front of the controller. This will send a pulse of neutral back up to the heater to remove the lockout condition.

If the lockout continues to display once the reset has been pressed, it may mean the interconnecting reset cable to the heater is not wired correctly or the heater has developed a permanent fault that requires a service engineer to identify.

Sensor Fault

'Sensor fault' appears when there is a break in the circuit between terminals 'SEN1' and 'COM' or if fitted, 'IN2 and 'COM'.



This could be either a faulty sensor bead, an incorrect terminal connection or a break in a cable.

Clock Fault

'Clock failure' will appear on the screen if the in-built battery has gone flat. This specially occurs if the power has been turned off to the controller for a long period.



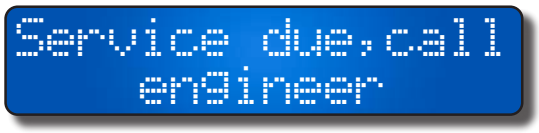
Leave the power connected for at least 48hrs to re-charge the battery (one whole week is more realistic dependent on the age of the battery itself)

Also check the ribbon cable between the two pcb's is making good contact

Service Date

When the MC200 is installed the Commissioning Engineer may have entered a date for when the heating equipment requires servicing.

When this date is reached the MC200 fault indicator will be illuminated and the display will alternate between the normal display and "Service due, call engineer".



The Service Engineer can clear this display by entering a new service date when the heating equipment has been serviced.

Blank Screen

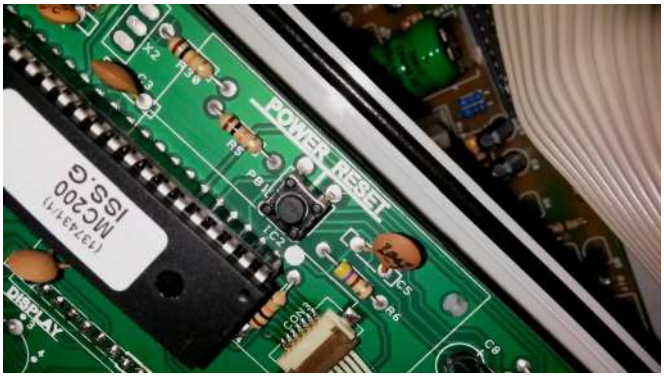
A blank screen is present on the display but the backlit light is still on.



Before replacing the MC200 ensure the controller has been powered up for more than 10-15 minutes.

If the screen is still blank, isolate the power and remove the controller fascia pad. Ensure the ribbon cable is connected between the two p.c.b's.

*For a complete Hard Reset - With the power back on check the display. If still blank, push the power reset button on the rear of the pcb.



only be undertaken by a competent person.

If the screen remains blank, contact Powrmatic technical department.

3.1 Fault displays and Fault Finding

No Supply to Heat In/Fan In

If there is voltage at the mains terminals (L,N & E) and there is no mains supply on the Heat In or Fan IN terminals and you are utilising terminal 14 (L Out) to energise these terminals, then the 6.3A fuse requires replacing.



Isolate the power and remove the controller fascia pad. Pull off the clear plastic fuse cover and replace with new fuse.

No Heat

If the display shows 'HEAT ON' but no heat output, then the room temperature may be greater than set point.



Follow the 'PROGRAMMING' procedure and raise the programme temperature. Also check above.

No Heat On LED

Pressing the Heat Button has no effect - no heating on LED.

1. The room temperature may be greater than the set point.



Navigate to the 'Temperature' setting and increase the day set point using the + button.
If the temperature wont adjust, check the permissions setting as above.
If the temperature doesn't increase past a particular point, the range could be limited within the engineers setting.



Increase the max available temperature.

2. The heat button may be turned off within the permissions settings



3.2 Spare Parts & Options

Item	Description	Part No.
	Internal Sensor Bead	143070034
	Warm Air Sensor	143070031
	Black Bulb Sensor	143070032
	Duct Sensor	143070035



Getting In Touch

Powrmatic Limited
Hort Bridge, Ilminster
Somerset
TA19 9PS
tel: **+44 (0) 1460 53535**
fax: **+44 (0) 1460 52341**
e-mail: **info@powrmatic.co.uk**
web: **www.powrmatic.co.uk**

Powrmatic Ireland
45 Broomhill Close
Tallaght
Dublin 24
tel: **+353 (0) 1452 1533**
fax: **+353 (0) 1452 1764**
e-mail: **info@powrmatic.ie**
web: **www.powrmatic.ie**

More information is available from our website by scanning the following QR code.

FM00414

EMS 750440

Powrmatic pursues a policy of continues improvement in both design and performance of its products and therefore reserves the right to change, amend or vary specifications without notice. Whilst the details contained herein are believed to be correct they do not form the basis of any contract and interested parties should contact the Company to confirm whether any material alterations have been made since publication of this brochure.