



# MC200



## Users Instructions

**BSI Registered Firm**

FM 414  
Ind. & Comm. Air Heaters;  
Air Moving Equipment;  
Flues & Chimneys; Natural  
Smoke & Heat Ventilators;  
Powered Supply & Extract  
Fans & Systems.



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Every effort is made to ensure accuracy at time of going to press. However as part of our policy of continual product improvement, we reserve the right to alter specifications without prior notice.

## 1. General Description

The MC200 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.

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 control uses a simple menu based structure for entering User settings.

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

## 2. Specifications

### General

Electricity supply	230V 50Hz Fused at 6A.
Internal Fuses	F1 20mm 6.3A 230V.(HRC), F2 20mm 500mA 230V. (Non replaceable)
Display	2 line 5mm L.C.D.
Day set point range	10 - 30°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	Red L.E.D.when the heater is a single-stage burner, Green when the burner is a Hi-Low type, and Yellow when the is a Modulating type.
Fault (Lockout) Indicator	Orange L.E.D.
Protection Rating	IP20
Software version	3.0

### Clock

- The date may be set 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.

### Time Switch

- 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).
- 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 23:59 and the other starting at 00:00. At midnight, all manual over-rides and extensions are cleared.

### Optimum Start

- The MC200 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 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

### Optimum Stop

- The MC200 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 switches off the heating that number of minutes early.

### 3 Keypad Layout

#### 3.1 User keypad (3 Buttons)

**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 cancelled.

- 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** -

In WINTER mode and OFF mode, the Fan button has no control over the air 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 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).

#### 3.2 Indicators



**Heating On** - Is illuminated when the MC200 is calling for heat (It does not confirm that the heating is actually working). It shows Red when the heater is a single-stage burner, Green when the heater is a Hi-Low type, and Yellow when the heater has a Modulating burner.



**Fault** - Is illuminated when the burner control is at lockout or when a service call is due (if this has been set) or when there is a sensor fault.

#### 3.3 Display

The display normally shows

- the current air temperature as measured by the 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.
- 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 and Modulating burners an indication of the heat demand: HEAT HI or HEAT LO for Hi-Low burners, or a simple bar-graph display for modulating control heaters where 1 bar is low fire and 10 bars is high fire.
- Pn where n represents the active programme number.

#### 3.4 Programming keypad (6 Buttons)



**Select Button** - Press to accept changes.



**Decrease Button** - Press to decrease values.



**Increase Button** - Press to increase values.



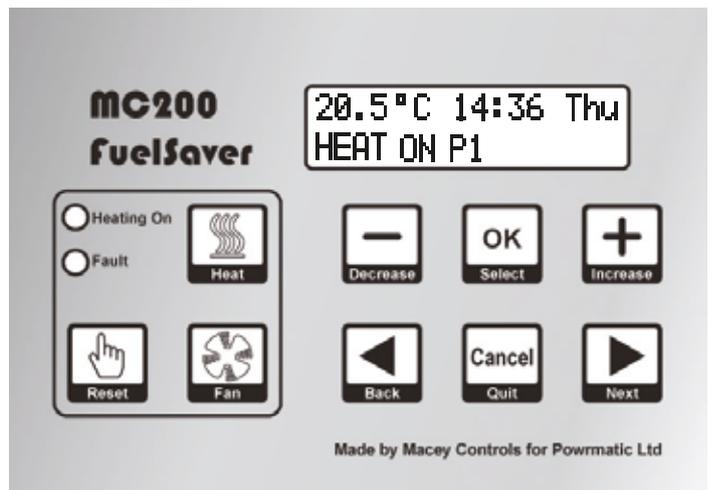
**Cancel Button** - Press to exit without saving change values.



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



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



## 4 User Controls

### 4.1 Direct Control

If configured during the commissioning stage the User has the following direct control of the heater without using the 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 on or off heating 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.

### 4.2 User Settings

#### 4.2.1 General

The second line of the display shows what keypad buttons are active.

After changing settings press OK to save the new setting. To return to the normal display press **Cancel** or do not touch any keys for 15 or more seconds.

Keys ◀, ▶, – and + will auto-repeat if held down longer than approximately half a second. The + key will automatically wrap round from the maximum value to the minimum value and the – key will wrap the other way.

#### 4.2.2 Description of 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.

##### 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.

##### 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.

##### 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.

##### 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).

### **User Button Permissions**

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

### **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, the user password being set to 0000. Entering a password of 0000 will remove all restrictions.

### **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: 1hour. Maximum setting 3hours.

### **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.

### **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 OK without entering any digits. The display will show 'Password CLOSED'.

### **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.

### 4.2.3 User Operation flow chart

Use ◀ or ▶ to navigate through menu. Pressing **Cancel (Quit)** at any of the displays shown below will return you to the normal display. Bottom line of display shows which keys can be used in menu programming modes. Displays shown shaded are the only ones visible when the MC200 is password protected.

