

Characteristics

Electrical

Power supply

Voltage range: 216.2 - 253V
 Frequency: 50Hz (nom)
 Phases: 1
 Power: Controller 5VA (max)
 Fuse: 1.0A slow-blow

Control Relay(s)

Contact type: SPST NO
 Switched Live -
 nominal 230VAC output
 @30A max.

Thermocouple

Types: R type standard
 (K,N & S type also available)

Error Handling

Thermocouple failure detection
 Thermocouple reversal detection
 Heater failure detection
 Over-temperature detection



This instrument complies with Council Directive 89/336/EEC (electromagnetic compatibility) & Council Directive 73/23/EEC (low voltage safety)

Temperature

Temperature Setting (t1 & t2)

Range: 0 to 1320°C
 Resolution: 1°C

Control Accuracy

P.I.D. Control
 Reading accuracy: $\pm 0.25\%$ FSD ± 1 digit

Time

Start delay range 00:00 to 19hr 59min
 Soak time range 00:00 to 19hr 59min
 Resolution: 1 min

Program

1 program with 2 ramps & 1 soak
 1st ramp rate: 10 to 399°C/hour or full power
 2nd ramp rate: 10 to 399°C/hour or full power

Environmental

Operating temperature range: 0 to +40°C
 Storage temperature range: -10° to +55°C

Enclosure

Sealing: IP65
 Material: ABS
 Colour: Light Grey RAL 7035
 Size: 120x122x58mm

POTCLAY KILNS

Hobbymaster 3

Temperature Programmer User Handbook

POWER VERSION

For smaller kilns without contactors

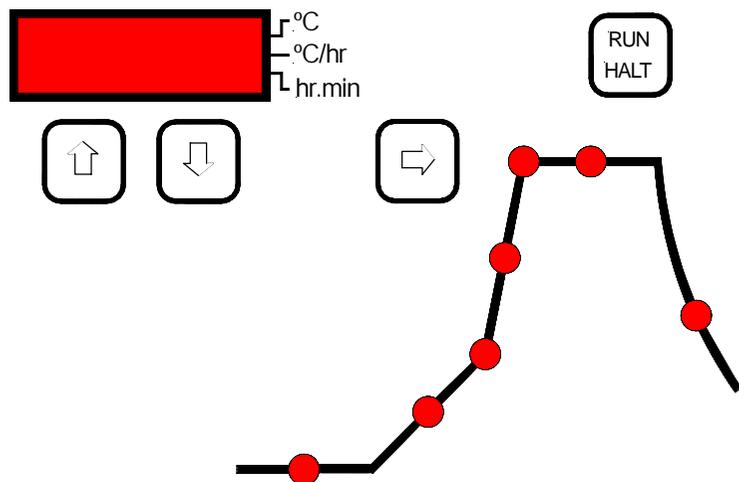
Potclay Kilns Ltd.,
 Etruria,
 Stoke-on-Trent,
 ST4 7BP

Tel: 01782 219816
 Fax: 01782 286506
 e-mail: potclays@btinternet.com



Issue: 1.0A
 Date: 24 May 2001

Setting

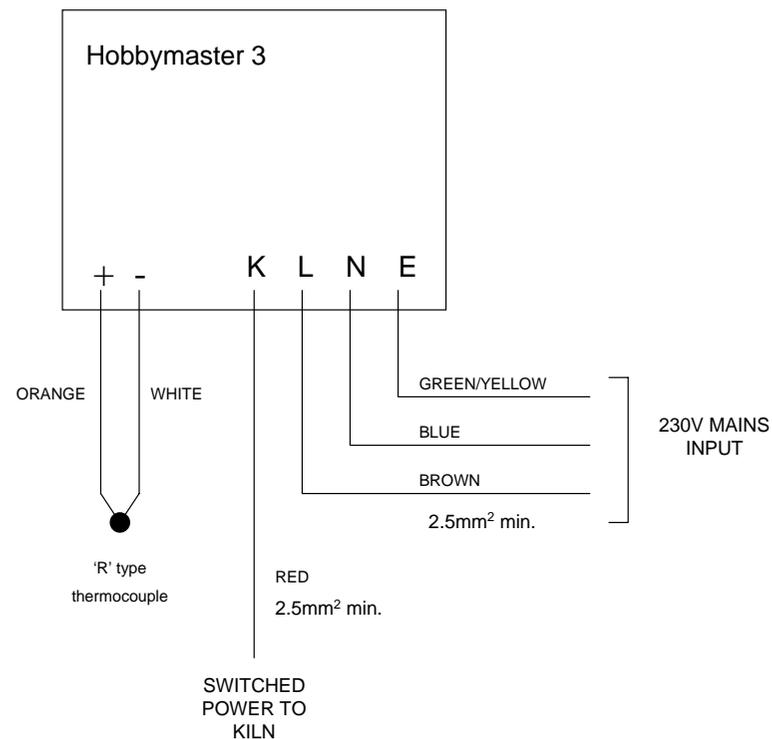


When the programmer is halted no lamps on the firing mimic curve are illuminated and the display shows the kiln temperature. The programmer settings can be reviewed by pressing the \rightarrow key. Each press of the \rightarrow key selects the next settable value as evidenced by a flashing lamp on the firing curve. The currently stored value will be displayed. This can be changed, if necessary, by using the \uparrow & \downarrow keys. Holding these keys down allows rapid change in the displayed value. If no keys are pressed for 5 seconds the display will revert to showing kiln temperature. All settings are remembered when the programmer is turned off.

-  Start delay: the start of a firing can be delayed in the range 00.00 to 19.59 hr.min
-  Ramp 1: this is settable in the range 10 to 399°C/hr or to FULL power. This is the initial rate of change of temperature to temperature t1
-  t1: this can be set in the range 0 to 1320°C and is the target temperature for the initial ramp
-  Ramp 2: this is settable in the range 10 to 399°C/hr or to FULL power. This is the final rate of change of temperature to temperature t2
-  t2: this can be set in the range 0 to 1320°C and is the final or soak temperature
-  Soak time: this can be set in the range 00.00 to 19.59 hr.min and is the time the programmer dwells or soaks at temperature t2

Kiln Connections

The programmer will normally be supplied pre-wired to the kiln. The wiring requirements are shown below. Note that live (brown) and switched live (red) wires should be at least 2.5mm². The neutral (blue) and earth (green/yellow) wires should be at least 0.5mm². The thermocouple cable should be 'R' type compensating.



IMPORTANT

This programmer incorporates a single phase power switch with a maximum rating of 30A suitable for kilns with a power rating not exceeding 6.5kW. The kiln, wiring & controller must be protected with a suitably rated mains fuse

Mounting

Mounting Location

Mount the instrument on a suitable vertical surface which will not get hot. Choose a position where the instrument is not exposed to direct heat from the kiln - especially when the kiln door or lid is open.

Mounting Bracket

The instrument can be mounted using a quick-release 2-part steel bracket (provided). Slide the detachable part of the bracket off the instrument and fasten it to a wall or other vertical surface using 2 screws vertically spaced 90mm.

Firing



Pressing this key will start a firing or stop a firing that is in progress. The status of the firing is shown on the firing mimic curve. If a start delay has been requested then the mimic start delay lamp will light and the delay time remaining will be displayed.

On commencing a firing the kiln is heated from the starting temperature to temperature **t1** at a rate determined by the **ramp 1** setting. Upon reaching **t1** the kiln will be heated at a rate determined by the **ramp 2** setting to temperature **t2**, the soak temperature. It will soak at this temperature for the **soak time**. It will then cool naturally with the lamp on the cooling section of the firing mimic curve lit. This lamp will stay on until the kiln has cooled to 40°C.

The **➡** key can be used at any time during firing to review the stored program. The **⬆** & **⬇** keys can also be used to modify program values during firing without interrupting the firing process.

During ramping the kiln temperature is displayed. During soaking the kiln temperature and the soak time remaining are displayed alternately for 5 seconds each.

An indicator in the top left of the display lights when the kiln is being heated. Another indicator near the top middle of the display lights when the keyboard is *locked* – this is an anti-tamper feature. To lock or unlock the keyboard press the **⬆** & **⬇** keys simultaneously.

Operating Notes

Negative Ramping

This programmer is capable of both controlled positive ramping and controlled negative ramping. Normally (for ceramics) temperature **t1** will be higher than the start temperature and ramp 1 will be positive. Temperature **t2** will be higher than **t1** and ramp 2 will also be positive.

If however **t2** is set to less than **t1** (as might be the case for glass making) then the programmer, upon reaching **t1**, will execute a controlled negative ramp down to **t2**. Also if **t1** is less than the starting temperature then the programmer will execute a controlled negative ramp down to **t1**.

Altering Settings While Firing

It is possible to modify program values both before and during a firing. During firing any value may be changed at any time. The new value will be immediately applied to the current firing and subsequent firings. The ramp polarity will be automatically changed as required. This feature allows extra ramps to be manually inserted.

Slow Kilns

If a positive (heating) ramp is selected that is greater than the heating capability of the kiln, then the programmer will enter full power mode. The ramp will be slower than that programmed. The programmer will wait until the target temperature (t1 or t2) is reached before continuing with the program.

If a negative (cooling) ramp is selected that is greater than the natural cooling rate of the kiln, then the programmer will enter zero power mode. The ramp will be slower than that programmed. The programmer will wait until the target temperature is reached before continuing with the program.

Power Failure Recovery

If there is an electrical power failure during firing then the programmer will automatically re-commence the firing when power is restored. If power fails during start delay then the firing starts immediately with no delay when power is restored. If power fails during soak then the full soak period is re-applied.

Errors

Errors

Err 1

The kiln temperature is not increasing as required. Possible causes are: kiln door or lid not closed properly, heater element failure, power phase failure or thermocouple short-circuit.

Err 2

Thermocouple or thermocouple wiring open circuit. Check wiring / replace thermocouple.

Err 3

Thermocouple reversed (temperature less than -50°C). Check wiring.

Err 4

Kiln temperature has exceeded required temperature by more than 20°C for 15 minutes. This indicates a programmer power switch fault – **SWITCH KILN OFF!**

Installation

Safety Warnings



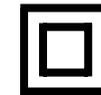
**ISOLATE
BEFORE
REMOVING
COVER**

WARNING

ISOLATE KILN & PROGRAMMER FROM ELECTRICAL SUPPLY BEFORE OPENING THIS INSTRUMENT FOR INSTALLATION, CONFIGURATION OR REPAIR PURPOSES

Installer Information

Installation Category: II
Pollution Class: 2



230V ~ 50HZ 30A

IP65

Fuse: 1.0A Anti-surge
Wickmann type TR5 T1A
250V



EMC

To meet Electromagnetic Compatibility requirements both the thermocouple lead and the power leads should not exceed 3.0m in length.

This instrument is designed for use mainly in Domestic & Light Industrial environments where electromagnetic interference may cause a loss of accuracy of the displayed temperature reading of up to 3°C. Specified accuracy will be restored when the interference is removed.

Installation