Characteristics

Electrical

Power supply
Voltage range: 216.2 - 253V
Frequency: 50Hz (nom)
Phases: 1
Power: Controller 3VA (max)
Switched output(s) 75VA
Fuse: 1.0A slow-blow

Control Relay(s)
Contact type: SPST NO
Switched Live -
nominal 230VAC output
@300mA max.

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

Connectors
2-part connectors
Max. wire size 2.5mm²

Error Handling

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

CE 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 1320ºC
Resolution: 1ºC

Control Accuracy
P.I.D. Control
Reading accuracy: ±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: -10º to +55ºC

Enclosure

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

POTCLAY KILNS

Hobbymaster 3

Temperature Programmer User Handbook

STANDARD VERSION
For larger kilns fitted with contactors

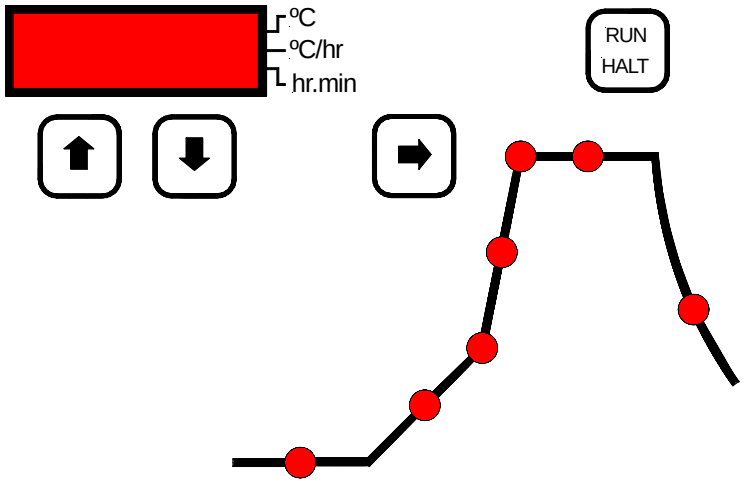
Potclay Kilns Ltd.,
Etruria,
Stoke-on-Trent,
ST4 7BP

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

CE

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 ➡ key. Each press of the ➡ 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 ⬆ & ⬇ 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

Notes

Notes

Firing

RUN
HALT

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.

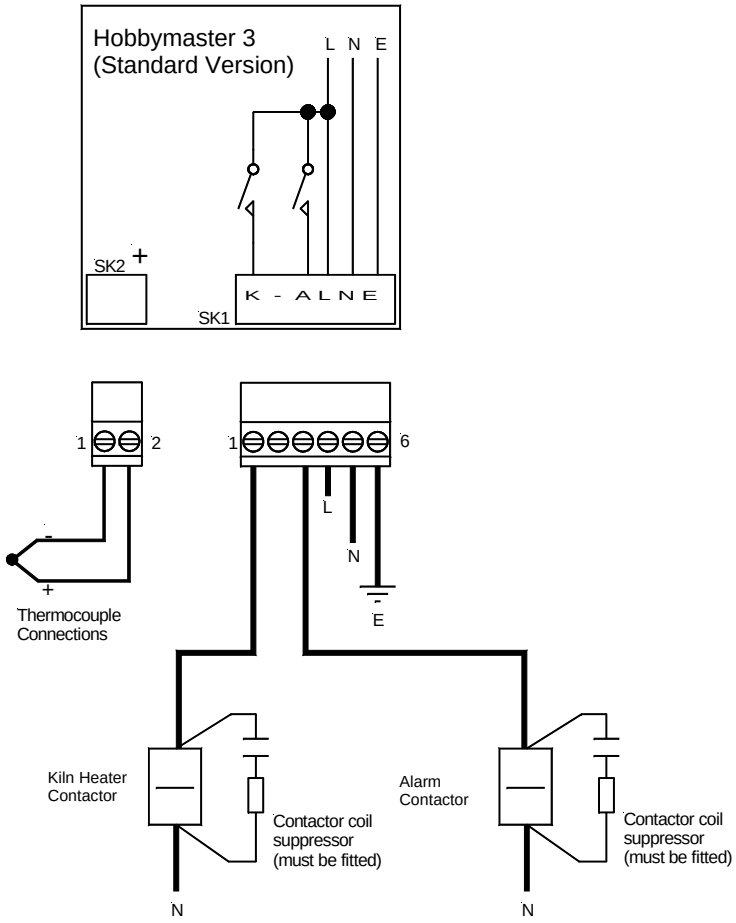
If a negative (cooling) ramp is selected that is greater than the natural cooling rate of the kiln, then the programmer will enter zero power mode. The ramp will be slower than that programmed. The programmer will wait until the target temperature is reached before continuing with the program.

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.

Wiring In

If a pre-wired cable & plug is not fitted then the instrument can be wired to the kiln as shown below. The instrument is fitted with 2-part connectors to facilitate wiring. The maximum wire size is 2.5mm².



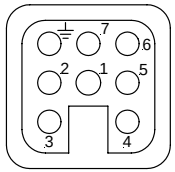
Note
The (optional) alarm relay contacts close at the start of firing and open when firing is complete. The contacts also open if the kiln temperature exceeds the required temperature by 20°C for more than 15 minutes. This relay can be used to drive a secondary contactor to isolate kiln power.

Wiring

Connector

If the instrument has been pre-wired with a cable & plug ensure that the plug is compatible with the connector fitted to the kiln. The standard connector is Harting type HAN 7D or similar.

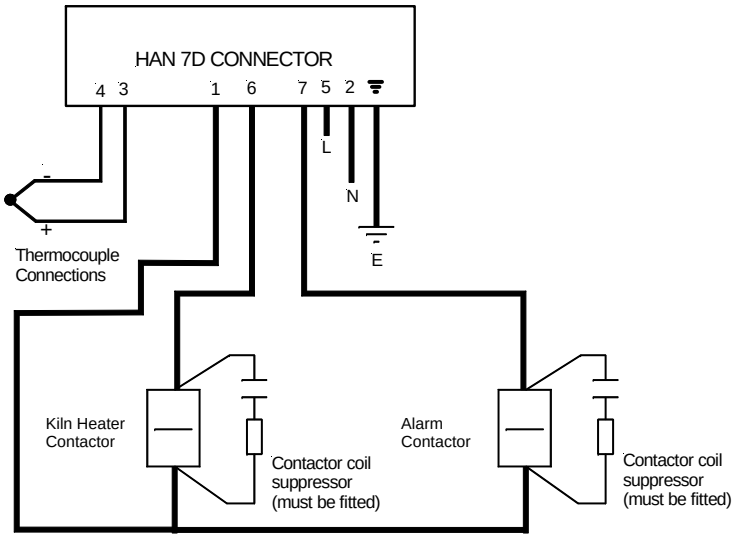
HAN 7D Pinout



View on pins

Kiln Connections

Compatible kiln connector wiring is shown below:-



Connector Pin List

1	Neutral to contactors	5	Mains Live supply
2	Mains Neutral supply	6	Kiln Power contactor Live
3	Thermocouple +	7	Alarm contactor Live
4	Thermocouple -	Earth	Earth

Errors

Err1 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.

Err2 Thermocouple or thermocouple wiring open circuit. Check wiring / replace thermocouple.

Err3 Thermocouple reversed (temperature less than -50°C). Check wiring.

Err4 Kiln temperature has exceeded required temperature by more than 20°C for 15 minutes. The alarm relay (if fitted) has been de-energised. This indicates a kiln contactor fault. Check contactor & wiring.

Installation

Safety Warnings

ISOLATE BEFORE REMOVING COVER

WARNING

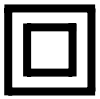
ISOLATE KILN & PROGRAMMER FROM ELECTRICAL SUPPLY BEFORE OPENING THIS INSTRUMENT FOR INSTALLATION, CONFIGURATION OR REPAIR PURPOSES

Installer Information

Installation Category: II
Pollution Class: 2

230V ~ 50HZ 1.0A

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



IP65

CE

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.

Contact Suppression

The coil of each contactor ***must be suppressed*** with an RC filter network. The RC network must be connected directly across the coil terminals on the contactor.

Suitable proprietary RC filter networks fitted with insulated wire leads are:-

1.	RS Components	Part No. 210-364
2.	RS Components (tab fixing)	Part No. 210-370
3.	Farnell Electronic Components	Part No. 218-893

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.