



## FEATURES

- Single program
- 2 controlled heating / cooling ramps + soak
- Suitable for pottery & ceramics use
- Soak times up to nearly 100 hours
- Ramp rates from 1 to 999°C/hour + full
- Program can be reviewed or altered while firing
- Program Pause & Segment Advance facilities
- Keyboard lockable
- Delayed start facility - up to 4 days
- Power failure recovery
- Energy used display
- Optional alarm/safety relay
- Power relay version available

## DESCRIPTION

**GENERAL** The ST312 is a single program controller designed for pottery & ceramics firing. It is fully adjustable with a detailed 6-lamp mimic display. The program comprises 2 ramps followed by a soak. Ramps can be heating or cooling. It executes a controlled ramp to temperature t1 then it executes another controlled ramp to temperature t2. It soaks at t2 for the required period. Natural cooling then follows.

**SETTING UP** To change any of the controller's settings press the  $\blackrightarrow$  key until the required lamp on the mimic display flashes. The current value will be displayed together with the units ( $^{\circ}\text{C}$ ,  $^{\circ}\text{C}/\text{hr}$  or  $\text{hr}.\text{min}$ ). Change the displayed settings with the  $\blackup$  &  $\blackdown$  keys which can be held down for acceleration. Use the  $\blackleftarrow$  key to correct mistakes. All settings are remembered while the controller is powered off. The keyboard can be locked to prevent tampering.

**FIRING** The START/STOP key is used to commence or halt a firing. The progress of the firing is shown on the mimic display. If a start delay has been set then the delay time remaining will be displayed. During firing the settings can be reviewed and altered if required, the program can be paused/resumed or a segment can be advanced. During soaking the soak time remaining and the soak temperature are alternately displayed. In the event of a power failure the controller will intelligently re-commence firing when power returns.

## ORDERING DETAILS

Code	No. Relays	Relay Type	Description
ST312	1	Signal	Standard programmer for kilns with contactors
ST312A	2	Signal	Standard programmer + alarm (safety) relay
ST312P	1	Power	Power programmer for directly driving small kilns (<30A)
ST312PA	2	Power	Power programmer + alarm (safety) relay

## SPECIFICATION

### Electrical

#### Power supply

Voltage range: 216.2 - 253V

Frequency: 50Hz (nom)

Phases: 1

Power: Controller 3VA (max)

Switched outputs:

75VA (standard version)

5kW (power version)

Fuse: 1.0A slow-blow HRC  
20mm x 5mm ceramic

#### Control Relay(s)

Contact type: SPST NO

Switched Live -

nominal 230VAC output

@300mA max (standard version)

@30A max (power version)

#### Connectors

Standard version:

Terminal blocks - Max. wire size 2.5mm<sup>2</sup>

Power version: Terminal block + Faston  
6.35mm power connectors

### Temperature

#### Temperature setting (t1 & t2)

Range: 0 to 1320 $^{\circ}\text{C}$  (R/S) 0 to 1200 $^{\circ}\text{C}$  (K/N)

Resolution: 1 $^{\circ}\text{C}$

#### Control Accuracy

P.I.D. Control

Reading accuracy:  $\pm 0.25\%$  FSD  $\pm 1$  digit

#### Thermocouple

R,S,K & N type (selectable)

#### Cold Junction Compensation

Yes - precision NTC thermistor

#### Time

Start delay range: 00:00 to 99hr 59min

Soak time range: 00:00 to 99hr 59min

Resolution: 1 min

#### Programs

Single program.

2 ramps & 1 soak

1st ramp rate: 1 to 999 $^{\circ}\text{C}/\text{hour}$  or full power

2nd ramp rate: 1 to 999 $^{\circ}\text{C}/\text{hour}$  or full power

Ramps can be heating or cooling

### Environmental

Operating temperature range: 0 to +40 $^{\circ}\text{C}$

Storage temperature range: -10 $^{\circ}$  to +55 $^{\circ}\text{C}$

### Enclosure

Material: ABS

Size: 120x122x58mm

Sealing: IP65

Fixings: 90x110mm

Colour: Light Grey

(4 off) + wall mounting

RAL 7035

bracket (optional)

### Error Handling

Thermocouple failure detection

Thermocouple reversal detection

Heater failure detection

Kiln over-temperature detection

Room over-temperature detection

Lock-up on error facility

### Other

Keyboard lock facility + indicator

Program running & kiln heating-on indicators

Energy used display

Program pause & segment advance features

## FURTHER DETAILS

Complete operating & installation instruction handbooks can be downloaded from our web site at <http://www.stafford-inst.co.uk>

Issue: 1.1 dated: 16 Feb 2005  
<http://www.stafford-inst.co.uk/docs/st312/data312.pdf>

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