



FEATURES

- 9 programs—each with up to 9 segments
- 2 controlled heating / cooling ramps + soak per segment
- Suitable for ceramics or glass use
- Soak times up to nearly 100 hours
- Ramp rates from 1 to 999°C/hour + full
- Programs 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 ST316 is a 9-program controller designed for pottery, ceramics & glass firing. Each program can have from 1 to 9 segments. It is fully adjustable with a detailed 6-lamp mimic display & continuous display of program & segment numbers. Each segment 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 then executes the next segment. The end of the program is marked by selecting 'End' while entering a ramp rate. Natural cooling then follows.

SETTING UP Press the \rightarrow key to flash the program number display – this can be changed if required with the \uparrow & \downarrow keys. To change any of the controller's settings press the \rightarrow key (or reverse with the \leftarrow key) until the required lamp on the mimic display flashes. The current value will be displayed together with the units ($^{\circ}\text{C}$, $^{\circ}\text{C/hr}$ or hr.min). Change the displayed settings with the \uparrow & \downarrow keys which can be held down for acceleration. 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
ST316	1	Signal	Standard programmer for kilns with contactors
ST316A	2	Signal	Standard programmer + alarm (safety) relay
ST316P	1	Power	Power programmer for directly driving small kilns (<30A)
ST316PA	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 2.5mm²

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 ± 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

9 programs each with 1-9 segments

2 ramps & 1 soak per segment

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/st316/data316.pdf>

Stafford Instruments Ltd.
Unit 22 Wolseley Court,
Staffordshire Technology Park,
Stafford, ST18 0GA U.K.
Tel: +44 (0)1785 255588
Fax: +44 (0)1785 255589
email: sales@stafford-inst.co.uk

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