

## Technical Specifications

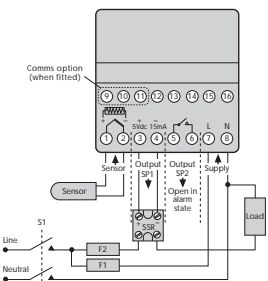
### Typical Connection Diagram

The SSR driver output is allocated to SP1 and wired to switch the load (heater) using an SSR.

**F1 Fuse:** Time lag type to IEC127. CSA/UL rating 1A 250Vac

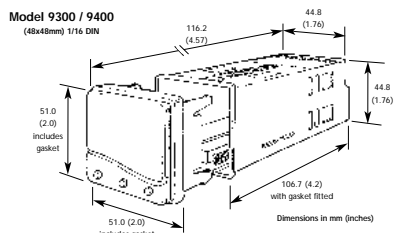
**F2 Fuse:** High Rupture Capacity (HRC) suitable for maximum rated load current

**S1 Switch:** IEC/CSA/UL approved disconnecting device



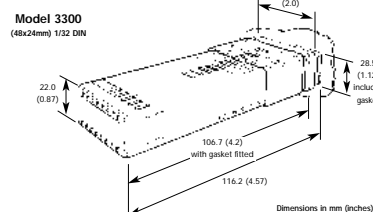
### Model 9300 / 9400

(48x48mm) 1/16 DIN



### Model 3300

(48x24mm) 1/32 DIN



### Ordering information codes 3300, 9300 & 9400

Model	Code	Ordering example 1	Ordering example 2
48 x 24 mm	33	Model 3300 48x24mm,	Model 9400 48x48mm dual display,
48 x 48 mm	93	SSd/relay, RS485, 12-24V	relay/relay, RS232, 100-240 VAC
48 x 48 mm dual display	94		
Outputs			
Reversible	00	33 00 00 4 3 0	94 11 00 2 0 0
2A SSd / relay	11		
2A relay / 1A relay	22		
SSd / SSd			
Unused	00		
Comms			
None fitted	0		
RS232 fitted	2		
RS485 fitted	4		
Supply			
100-240V AC	0		
12-24V AC/DC	3		
Custom code			
Standard code	0		
Please refer to CAL for details			

### Codes for additional software and hardware

CALCOMMS charting & logging software	10	01	XX	3	0	0
CALCOMMS CD Rom demo-disk	0	0	0	1	2	4
Communications board RS232	3C	00	00	2	0	0
Communications board RS485	3C	00	00	4	0	0
RS232 to RS485 converter	3C	24	00	0	0	0

### Notes

Models 3311, 9311, 9400, 9411 and 9422 are not currently available in low voltage 12-24V option.

Your nearest CAL contact:



### CAL Controls Ltd

Bury Mead Road, Hitchin, Herts, SG5 1RT. UK  
Tel: + 44 (0)1462-436161 Fax: + 44 (0)1462-451801  
email: sales@cal-controls.co.uk  
http://www.cal-controls.com

### CAL Controls Inc

1580 S. Milwaukee Avenue, Libertyville, IL 60048. USA  
Tel: (847) 680-7080 Fax: (847) 816-6852  
email: sales@cal-controls.com  
http://www.cal-controls.com

The CAL  
range of  
Temperature  
Controllers



## The range of Autotuning P.I.D. Temperature Controllers with RS232/485 Communications and Charting & Logging Software

### CAL the pioneer of temperature control

CAL is a dynamic modern company and was the first to develop the 48x48mm ( $1/16^{\text{th}}$  DIN) analogue controller in 1976, the first digital controller in 1986, and the first 24x48mm ( $1/32^{\text{nd}}$  DIN) digital controller in 1992. CAL prides itself on technical competence, customer support and long-term supply of its range of controllers.

### CAL's temperature controllers

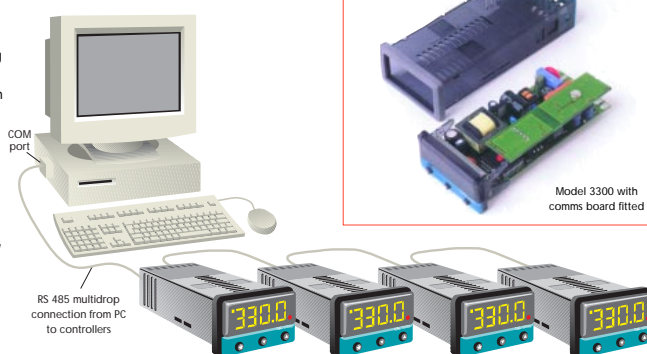
These controllers are designed for ease of use, low-cost and reliability in demanding applications. They are already widely used in many industrial applications such as plastics, packaging, drying, ovens & furnaces and laboratory & scientific equipment. CAL's auto-tune makes P.I.D. control simple, just a few button presses will start the controller's self-tune which automatically selects the optimum P.I.D. values. Also CAL's unique dAC function is designed to minimise the overshoot problem associated with conventional P.I.D. control.

#### Functionality

- Easy-to-use Auto-tune program
- Simple menu-driven programming
- Full P.I.D. operation
- Single ramp/soak (dwell) program
- Heat-cool operation
- IP66 protection
- CE compliant

#### Inputs and Outputs

- Thermocouple, PT100 (RTD) & mV
- Two outputs, SSR driver or Relay
- 5-alarm modes, full scale, deviation & band
- RS232 or RS485 (retrofitable)
- MODBUS RTU protocol



Model 9400  
48 x 48 mm  
( $1/16^{\text{th}}$  DIN)



Model 9300  
48 x 48 mm  
( $1/16^{\text{th}}$  DIN)



Model 3300  
48 x 24 mm  
( $1/32^{\text{nd}}$  DIN)

### Technical Specifications

<b>Thermocouple</b> 9 types: Standards: CJC rejection: External resistance:	Type B,E,J,K,L,N,R,S,T IPTS/68/DIN 43710 20:1 (0.05 °/°C) typical 100Ω maximum	<b>General</b> Displays: Main, 4 digits high brightness green LED, 10mm high Lower (9400 only), 4 digits high brightness orange LED, 9mm high LED output indicators – flashing SP1 square green, SP2 round red 3 full travel elastomeric buttons
<b>Resistance Temperature Detector – (RTD)</b> RTDIP1100 Standards: Bulb current:	2 wire DIN 43760 (100Ω 0°C/138.5Ω 100°C Pt) 0.2mA maximum	<b>Key pad:</b> Main, 4 digits high brightness green LED, 10mm high Lower (9400 only), 4 digits high brightness orange LED, 9mm high LED output indicators – flashing SP1 square green, SP2 round red 3 full travel elastomeric buttons
<b>Linear process inputs</b> mV range:	0 to 50mV (0 to 20mV, 4 to 20mV)	<b>Environmental</b> Safety: Humidity: Altitude: Installation: Pollution: Protection: EMC emission: EMC immunity: Ambient: Mouldings:
<b>Applicable to all inputs (SM = sensor maximum)</b> Calibration accuracy: Sampling frequency: Common mode rejection: Series mode rejection: Temperature coefficient: Reference conditions:	±0.25%SM ±1°C Input 10Hz, CJC 2 sec Negligible effect up to 140dB, 240V, 50-60Hz 60dB, 50-60Hz 150ppm/°C SM 22°C ±2°C, rated voltage after 15 minutes settling time	UL 873, EN 61010, CSA 22.2 No. 1010.1-92 Max 80% up to 2000m Categories II and III Degree II NEMA 4X, IP66 EN50081-1, FCC Rules 15 subpart J Class A EN50082-2 0-50°C Flame retardant polycarbonate
<b>Output devices</b> SSR: Miniature power relay: 2nd relay (option)	<b>(Maximum 2 outputs)</b> Solid state relay driver: to switch a remote SSR 5Vdc +0/-15% 15mA non-isolated Form A/SPST contacts (AgCdO) 2A/250 VAC resistive load Form A/SPST contacts (AgCdO) 1A/250 VAC resistive load	<b>Dimensions</b> Front face: Sleeve length Instrument Body Overall length <b>Weights</b>
		Models 9300/9400 – 51.0 x 51.0mm (includes gasket) Model 3300 – 51.0 x 28.5 (includes gasket) All models – 106.7mm (with gasket fitted) Models 9300/9400 – 44.8 x 44.8mm Model 3300 – 44.8 x 22.0mm All models – 116.2mm 3300-110g; 9300-120g; 9400-130g.

### CALCOMMS™ unique and easy-to-use

CALCOMMS™ charting and Logging software is incredibly easy to use. It is designed to connect up to 128 temperature controllers by RS485 (RS232 is for one controller only) into a standard or industrial PC. This allows the user to program all functions of the controller and to data-log the recorded temperature. Unlike complicated SCADA software, CALCOMMS™ is a mini-SCADA package that does not need specialist knowledge or training.



### Chart-recorder and Data-logging software

- Log up to 128 controllers
- Windows compatible NT or 95
- Easy to set-up

**FREE demo-disk**  
CD demo of CALCOMMS™  
charting & logging  
software

### CALCOMMS™ uses

- Easy configuration tool for controllers
- Data-logger for archiving process data
- Chart-recorder for viewing trend information
- On-screen display of temperature
- Software 'on-screen' alarms
- Cloning of controller settings to save time
- Save and re-use applications for multiple controllers
- Remote set-point adjustment

### Ideal for:

Recording temperature information for statistical process requirements, quality control or health and safety purposes.

### Applications:

Food industry, Dairy industry, Ovens, Furnaces, Kilns, Plastics machines, Laboratory and Scientific equipment, Bottling and beverage production and many other manufacturing industries.

Please ask for the applications guide for installing communicating controllers. CAL's technical manuals are available in French, German, Spanish, Italian and English, both in printed and Acrobat .pdf formats.

Visit our website for - pdf technical manuals, application notes, CALCOMMS demo and much more

[www.cal-controls.com](http://www.cal-controls.com)