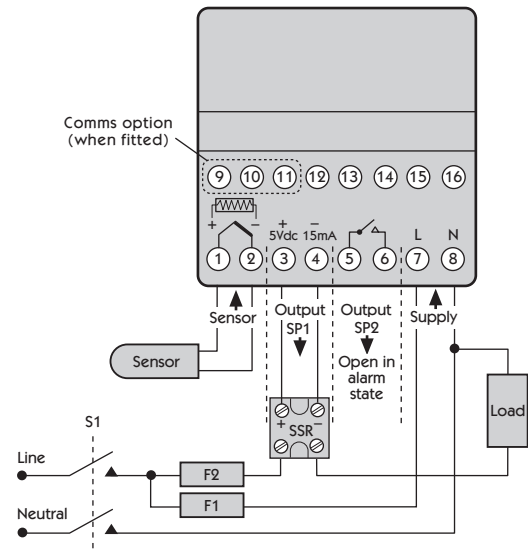


# Technical Specifications

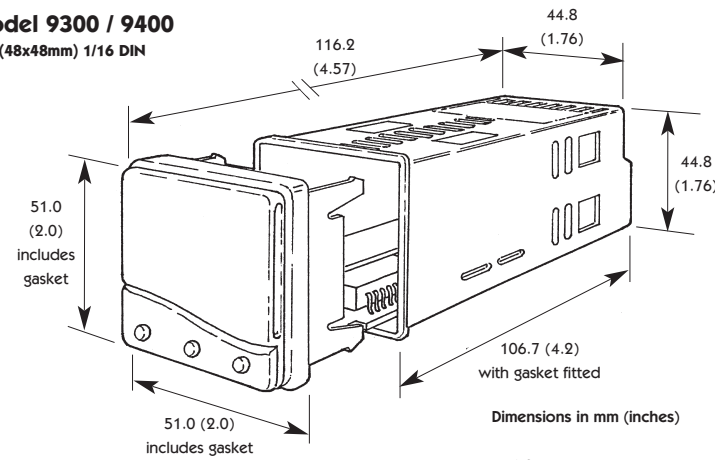
## Typical Connection Diagram

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

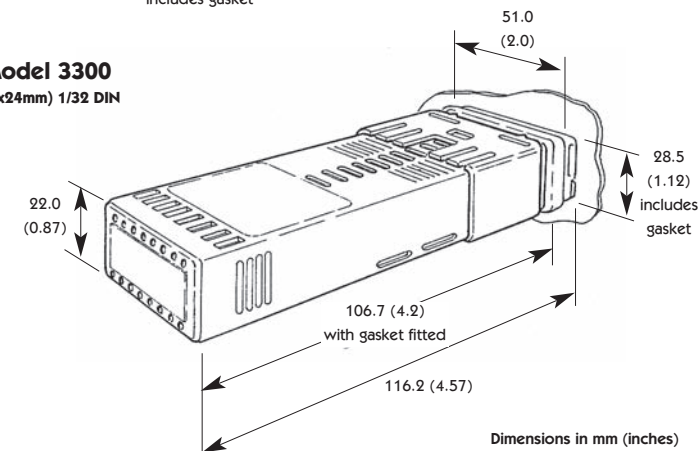
- F1 Fuse:** Time lag type to IEC127. CSA/UL rating 1A 250Vac
- F2 Fuse:** High Rupture Capacity (HRC) suitable for maximum rated load current
- S1 Switch:** IEC/CSA/UL approved disconnecting device



**Model 9300 / 9400**  
(48x48mm) 1/16 DIN



**Model 3300**  
(48x24mm) 1/32 DIN



## Ordering information codes 3300, 9300 & 9400

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

### Ordering example 1

Model 3300 48x24mm, SSd/relay, RS485, 12-24V

33 00 00 4 3 0

### Ordering example 2

Model 9400 48x48mm dual display, relay/relay, RS232, 100-240 VAC

94 11 00 2 0 0

### Codes for additional software and hardware

CALgrafix	10	03	GB	0	0	0
Communications board RS232	3C	00	00	2	0	0
Communications board RS485	3C	00	00	4	0	0
RS232 to RS485 converter	3C	25	00	0	K	3

### Notes

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

Your nearest CAL contact;



### West Control Solutions

The Hyde Business Park, Brighton BN2 4JU. UK  
 Tel: + 44 (0) 1273 606271 Fax: + 44 (0) 1462 592  
 email: sales@cal-controls.co.uk  
 http://www.cal-controls.com

### West Control Solutions

1675 North Delany Road, Gurnee, IL 60031. USA  
 Tel: (800) 866-6659 Fax: (847) 782-5223  
 email: sales@cal-controls.com  
 http://www.cal-controls.com

**WEST**  
Control Solutions

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<sup>TH</sup>DIN) analogue controller in 1976, the first digital controller in 1986, and the first 24x48mm (1/32<sup>ND</sup>DIN) digital controller in 1992. CAL prides itself on technical competence, customer support and long-term supply of its range of controllers.



Model 9400  
48 x 48 mm  
(1/16<sup>TH</sup> DIN)



Model 9300  
48 x 48 mm  
(1/16<sup>TH</sup> DIN)



Model 3300  
48 x 24 mm  
(1/32<sup>ND</sup> DIN)

## 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.

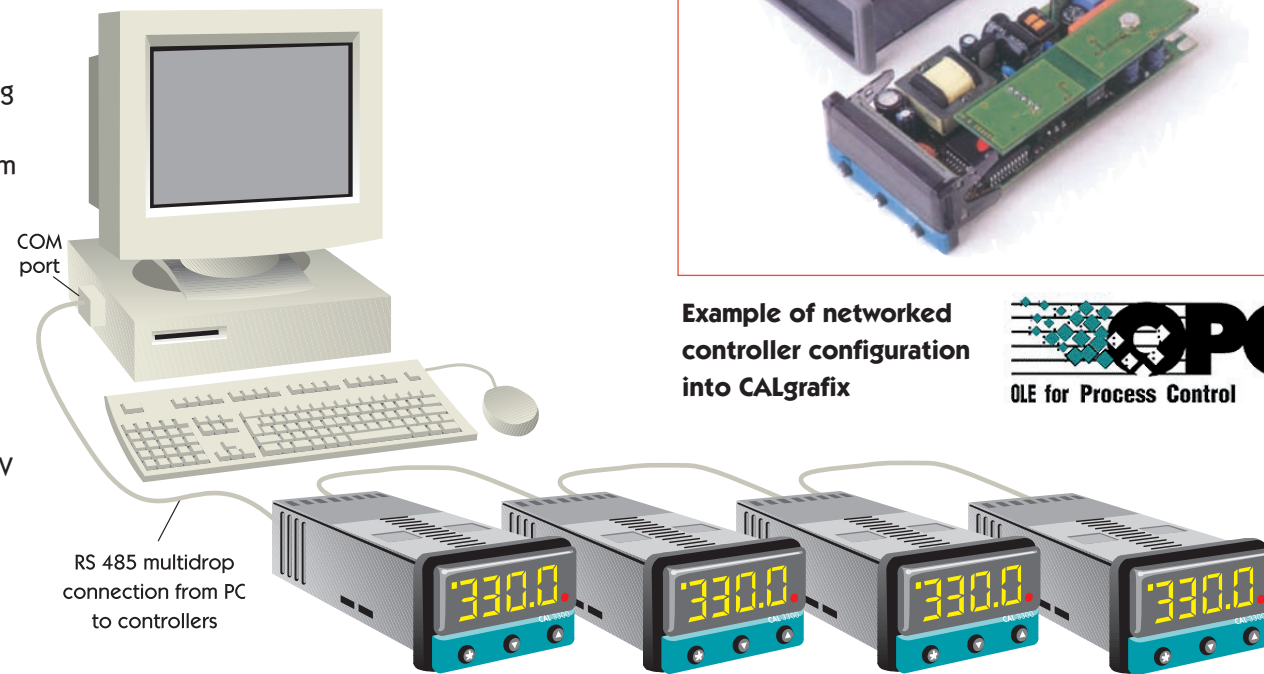
### Functionality

- 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

**3-YEAR WARRANTY**

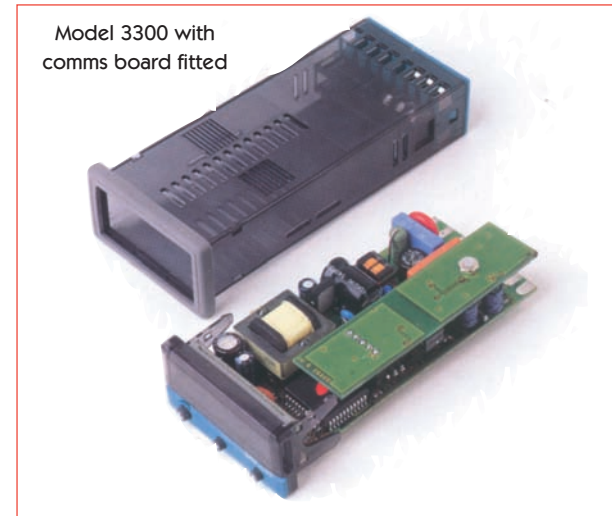
### Inputs and Outputs

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



## CALgrafix Process Monitoring and Configuration Software

CALgrafix is cost-effective process monitoring and controller configuration software that provides added value to using CAL's range of temperature and process controllers.

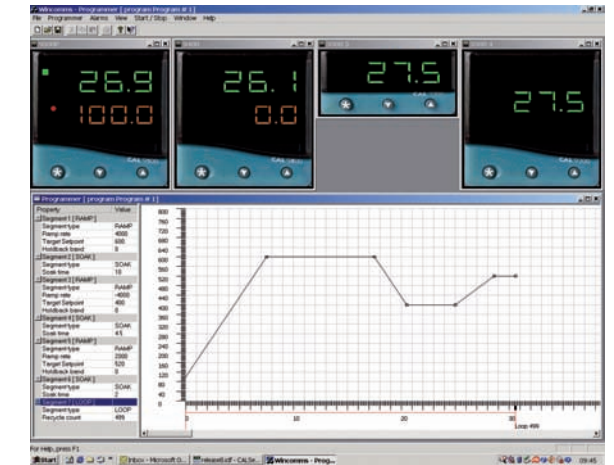


Example of networked controller configuration into CALgrafix



### Functions

- Data-logger with archiving process data
- Chart-recorder for on-screen viewing of trends
- Virtual instrument display
- On-screen alarm displays with audible notification
- A unique drag'n'drop feature for programming 9500P profiles
- 'Cloning' of instrument settings
- Saving of applications for multiple controller set-ups
- Configuration/programming tool for controllers
- OPC client/server architecture



## 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: Keypad: Environmental Safety: Humidity: Altitude: Installation: Pollution: Protection: EMC emission: EMC immunity: Ambient: Mouldings:	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 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>Resistance Temperature Detector – (RTD)</b> RTD/Pt100 Standards: Bulb current:	2 wire DIN 43760 (100Ω 0°C/138.5Ω 100°C Pt) 0.2mA maximum	<b>Dimensions</b> Front facia Sleeve length Instrument Body Overall length Weights	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.
<b>Linear process inputs</b> mV range:	0 to 50mV (0 to 20mV, 4 to 20mV)	<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
<b>Output devices</b> SSd: Miniature power relay: 2nd relay (option)	<b>(Maximum 2 outputs)</b> Solid state relay driver: to switch a remote SSR 5Vdc +/-15% 15mA non-isolated Form A/SPST contacts 2A/250 VAC resistive load Form A/SPST contacts 1A/250 VAC resistive load		

### Ideal for:

Recording process data for manufacturing reporting, quality control, health & safety purposes, or OEM system development

### Applications:

Food industry, Dairy industry, Carbon fibre, Glass, Rubber & Plastics manufacturing, Ovens, Furnaces, Kilns, Autoclaves, Environmental cabinets, Plastics machines, Laboratory and Scientific equipment, Bottling and beverage production and many other process industries.

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

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