

The CAL
range of
Temperature
Controllers



CAL Controls

Technical Specifications

Thermocouple

9 types: Type B,E,J,K,L,N,R,S,T
 Standards: IPTS/68/DIN 43710
 CJC rejection: 20:1 (0.05°C) typical
 External resistance: 100Ω maximum

Resistance Temperature Detector – (RTD)

RTD/Pt100 2 wire
 Standards: DIN 43760 (100Ω 0°C/138.5Ω 100°C Pt)
 Bulb current: 0.2mA maximum

Linear process inputs

mV range: 0 to 50mV (0 to 20mV, 4 to 20mV)

Applicable to all inputs (SM = sensor maximum)

Calibration accuracy: ±0.25% SM ±1°C
 Sampling frequency: Input 10Hz, CJC 2 sec
 Common mode rejection: Negligible effect up to 140dB, 240V, 50-60Hz
 Series mode rejection: 60dB, 50-60Hz
 Temperature coefficient: 150ppm/°C SM
 Reference conditions: 22°C ±2°C, rated voltage after 15 minutes settling time

Output devices

(Maximum 2 outputs)
 Ssd: Solid state relay driver: to switch a remote SSR 5Vdc +0/-15% 15mA non-isolated
 Miniature power relay: Form A/SPST contacts 2A/250 VAC resistive load
 2nd relay (option): Form A/SPST contacts 1A/250 VAC resistive load

General

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
 Keypad: 3 full travel elastomeric buttons

Environmental

Safety: UL 873, EN 61010, CSA 22.2 No. 1010.1-92
 Humidity: Max 80%
 Altitude: up to 2000m
 Installation: Categories II and III
 Pollution: Degree II
 Protection: NEMA 4X, IP66
 EMC emission: EN50081-1, FCC Rules 15 subpart J Class A
 EMC immunity: EN50082-2
 Ambient: 0-50°C
 Mouldings: Flame retardant polycarbonate

Dimensions

Front facia: Models 9300/9400 – 51.0 x 51.0mm (includes gasket)
 Model 3300 – 51.0 x 28.5 (includes gasket)
 Sleeve length: All models – 106.7mm (with gasket fitted)
 Instrument Body: Models 9300/9400 – 44.8 x 44.8mm
 Model 3300 – 44.8 x 22.0mm
 Overall length: All models – 116.2mm

Weights

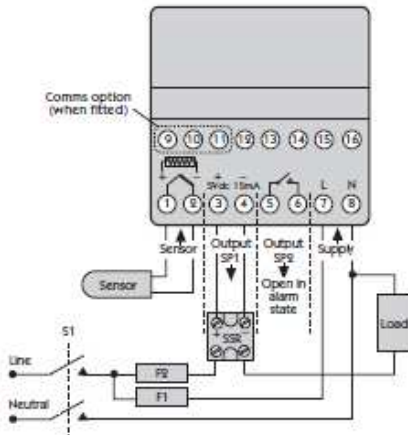
3300-110g; 9300-120g; 9400-130g.

Technical Specifications

Typical Connection Diagram

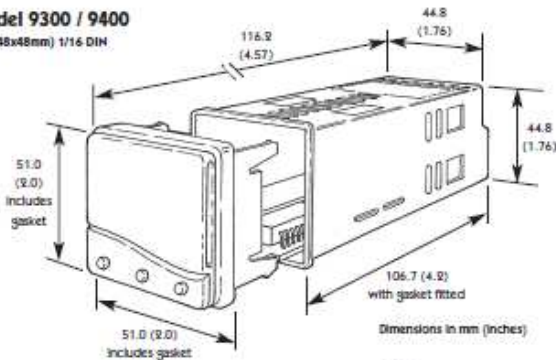
The SSR driver output is allocated to SP1 and wired to switch the load (heater) using an SSR.

- 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



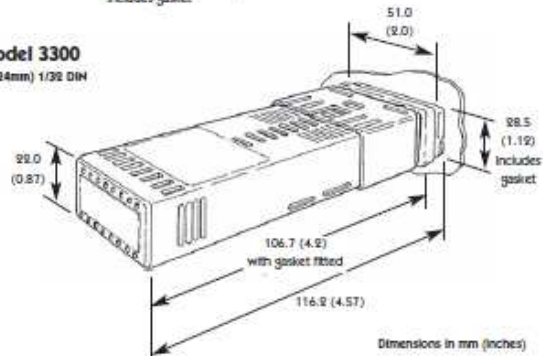
Model 9300 / 9400

(48x48mm) 1/16 DIN



Model 3300

(48x24mm) 1/32 DIN



Ordering information codes 3300, 9300 & 9400

		Code
Model	48 x 24 mm	33
	48 x 48 mm	93
	48 x 48 mm dual display	94
Outputs	2A Ssd / relay	00
	2A relay / 1A relay	11
	Ssd / Ssd	22
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

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	GR	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.