2208

MODEL

Temperature Controller

- **Heating and cooling with two modular outputs**
- **Customised operation**
- **Heater current display**
- **Load diagnostics**
- **Up to three alarm relays**
- **Self-tuning with overshoot inhibition**
- **Optimised fan, water and oil cooling**
- **Setpoint rate limit**
- **EIA 485 communications**
- **Plug-in from front**
- **IP65, NEMA 4X panel sealing**
- **Compliant with European EMC and low voltage safety directives**

The 2208 is a precision PID temperature controller, with self-tuning, in an 1/8 DIN size (48x96x103mm). It has a modular hardware build with the option of two control outputs, two alarm relays, and a communications port. Two digital inputs are included as standard. The control outputs can be configured for heating, cooling or alarms. The 2208 is fully configurable on-site.

Precise control

An advanced PID control algorithm gives stable 'Straight-line' control of the process.
A one-shot tuner is provided to set up the PID values and to calculate the overshoot inhibition parameters. On electrically heated loads, power feedback is used to stabilise the output power and hence the controlled temperature against supply voltage fluctuations. Dedicated cooling algorithms ensure optimum control on fan, water and oil cooled systems.

Universal input

A universal input circuit with an advanced analogue to digital convertor samples the input at 9Hz and continuously corrects it for drift. This gives high stability and rapid response to process changes. High noise immunity is achieved by rejection of 50/60Hz pick-up and other sources of noise. The input covers all standard thermocouples, the Pt100 resistance thermometer and linear millivolts, milliamps or DC volts.
Input filtering from 1.0 to 999.9 seconds is included.

Customised operation

Custom LEDs provide a bright, clear display of the process value and setpoint. Tactile push buttons ensure positive operation. Access to other parameters is simple and easy to understand and can be customised to present only those parameters that need to be viewed or adjusted. All other parameters are locked away under password protection.

CE

EUROTHERM CONTROLS

Temperature Controller

PDSIO Load diagnostics

PDSIO (Pulse Density Signalling I/O) is a major innovation in the 2208. When used in combination with a Eurotherm TE10 solid state relay (SSR), it allows the logic output of a 2208 to transmit the power demand signal and simultaneously read back load fault alarms. These alarms will be flashed as messages on the controller front panel. Two alarm conditions will be detected, either SSR failure indicating an open or short circuit condition in the SSR and heater circuit failure indicating either fuse failure, heater open circuit or line supply absent.

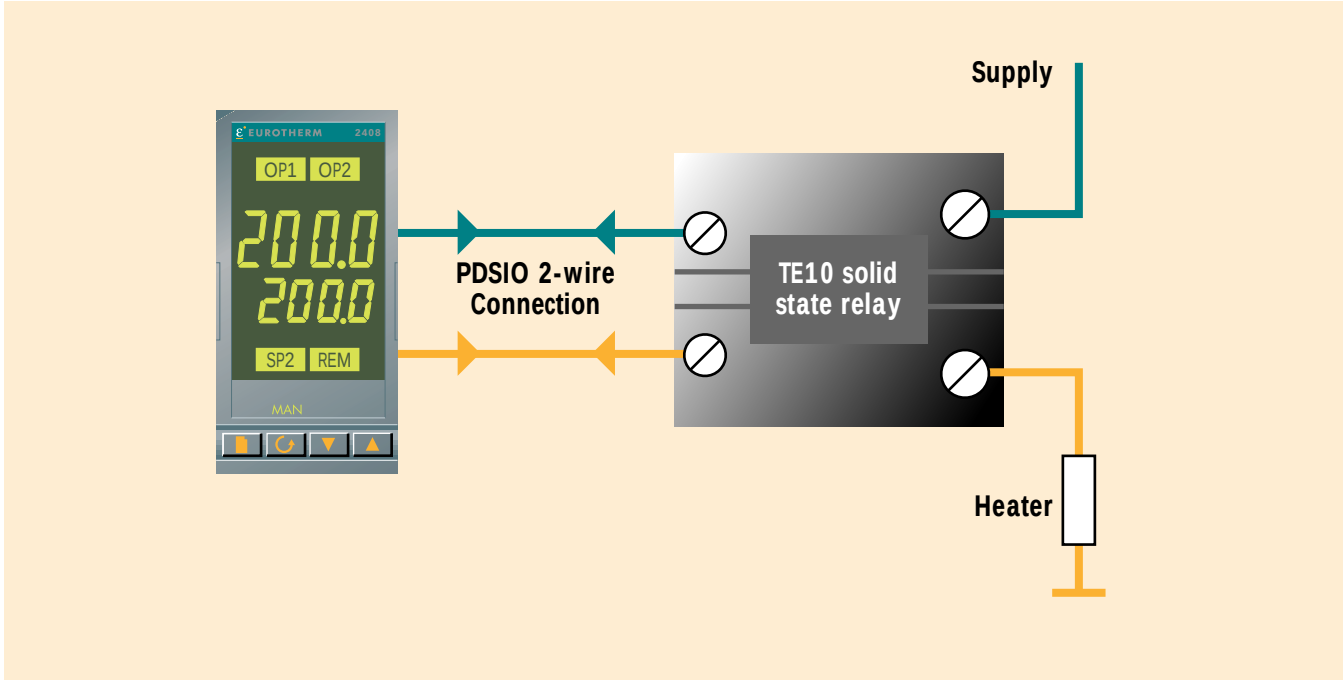
Alarms

Up to four process alarms can be combined onto a single output. They can be full scale high or low, deviation from setpoint or load failure alarms. Alarms messages are flashed on the main display. Alarms can be configured as latching or non-latching and also as 'blocking' type alarms which means that they will become active only after they have first entered a safe state.

Digital communications

EIA 485 serial communications is available with industry-standard protocols including: Modbus®, Eurotherm Bisynch, and SPI.

Load diagnostic using Pulse Density Signalling Input/Output (PDSIO)



Sensor inputs and display ranges (Temperature scales conform to the ITS90 standard)

	Celsius		Fahrenheit	
Standard Sensor Inputs	Min	Max	Min	Max
J thermocouple	-210	1200	-350	2192
K thermocouple	-200	1372	-325	2500
T thermocouple	-200	400	-325	750
L thermocouple	-200	900	-325	1650
N thermocouple	-200	1300	-325	2370
C thermocouple - W5%Re/W26%Re (Hoskins)	0	2319	32	4200
R thermocouple	-50	1768	-60	3200
S thermocouple	-50	1768	-60	3200
B thermocouple	0	1820	32	3310
Platinel II thermocouple	0	1369	32	2500
RTD/PT100DIN 43760	-200	850	-325	1560
Custom Sensor Inputs (replaces type C thermocouple)				
E thermocouple	-200	1000	-325	1830
Ni/Ni18%Mo thermocouple	0	1100	32	2012
Pt10%Rh/P140%Rh thermocouple	200	1800	392	3272
Pt20%Rh/Pt40%Rh thermocouple	0	2000	32	3632
W/W26%Re (Englehard) thermocouple	0	2000	32	3632
W/W26%Re (Hoskins) thermocouple	0	2010	32	3650
W5%Re/W26%Re (Englehard) thermocouple	10	2300	50	4172
W5%Re/W26%Re (Bucose) thermocouple	0	2000	32	3632
D thermocouple - W3%Re/W25%Re	0	2400	32	4352
Linear Inputs	-999	9999		

2208 CONTROLLER TECHNICAL SPECIFICATION

Inputs

General	Range	± 100mV and 0 to 10Vdc (auto ranging)
	Sample rate	9Hz (110mS)
	Calibration accuracy	0.25% of reading or ±1°C or ± 1 LSD whichever is the greater
	Resolution	<1µV for ± 100mV range, <0.2mV for 10Vdc range
	Linearisaton accuracy	<0.1% of reading
	Input filter	1.0 to 999.9secs
	Zero offset	User adjustable over the fully display range
Thermocouple	Types	See sensor inputs table
	Cold junction compensation	Automatic compensation typically >30 to 1 rejection of ambient temperature change External references 0, 45 and 50°C
RTD/PT100	Type	3-wire, Pt100 DIN43760.
	Bulb current	0.2mA
	Lead compensation	No error for 22 ohms in all 3 leads
Process	Linear	±100mV, 0 to 20mA or 0 to 10Vdc (configurable between limits)
Digital	Type	Contact closure
	Application	Manual select, 2nd setpoint

Outputs

Relay	Rating: 2-pin relay	Min: 12V, 100mA dc. Max: 2A, 264Vac resistive
	Rating: change-over, alarm relays	Min: 6V, 1mA dc. Max: 2A, 264Vac resistive
	Application	Heating, cooling or alarms
Logic	Rating	18Vdc at 24mA (non-isolated)
	Application	Heating, cooling or alarms
		PDSIO mode 1: Logic heating with load failure alarm
		PDSIO mode 2: Logic heating with load/SSR failure alarm and load current display
Triac	Rating	1A, 30 to 264Vac resistive
	Application	Heating or cooling
Analogue	Range	Non-isolated, 0 to 20mA (configurable between limits). 600Ω max load resistance
	Application	Heating or cooling

Communications

Digital	Transmission standard	EIA 485 at 1200, 2400, 4800, 9600 and 19,200 baud
	Protocols	Modbus® or Eurotherm Bisynch or SPI
PDSIO	Setpoint input	Setpoint input from master PDSIO controller. Holdback to master controller

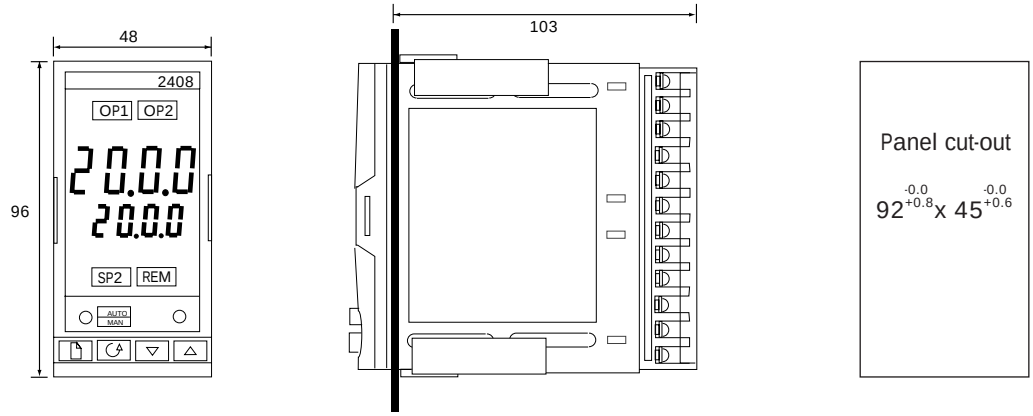
Control functions

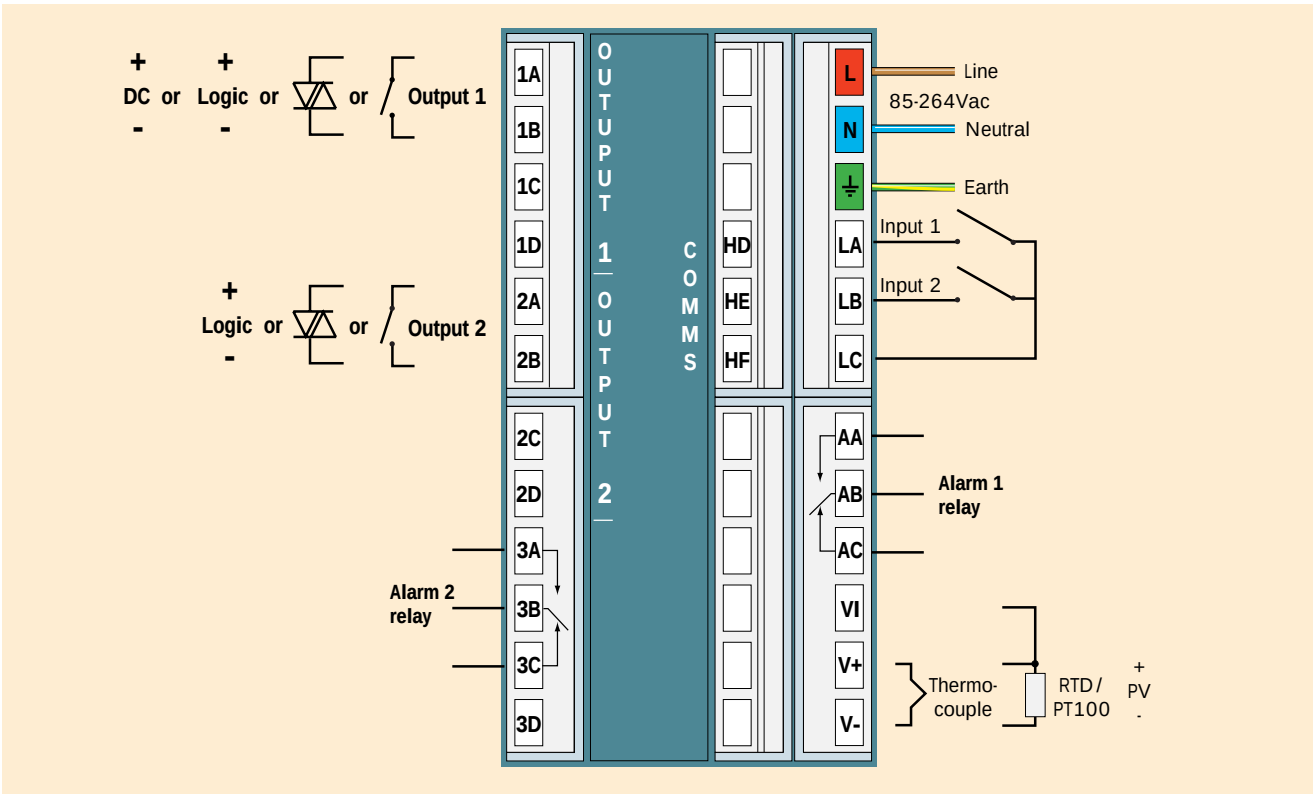
Control	Modes	PID or PI with overshoot inhibition, PD, P only or On/Off
	Application	Heating and cooling
	Auto/manual	Bumpless transfer
	Setpoint rate limit	0.01 to 99.99 degrees or display units per second
	Cooling algorithms	Linear; Water (non-linear); Fan (minimum on time), Oil
Tuning	One-shot tune	Automatic calculation of PID and overshoot inhibition parameters
	Automatic droop compensation	Automatic calculation of manual reset value when using PD control
Alarms	Types	Full scale high or low. Deviation high, low, or band. Rate of change
	Modes	Latching or non-latching. Normal or blocking action
		Up to four process alarms can be combined onto a single output

General

Display	Dual, 4 digit x 7 segment high intensity LED
Dimensions and weight	48mm wide x 96mm high x 103mm deep. 400g
Supply	85 to 264Vac -15%, +10%. 48 to 62Hz. 10watts max
Temperature and RH	Operating: 0 to 55°C, RH: 5 to 90% non-condensing. Storage: -10 to 70°C
Panel sealing	IP65
Electromagnetic compatibility	Meets generic emissions standard EN50081-2 for industrial environments Meets general immunity requirements of EN50082-2 for industrial environments
Safety standards	EN61010, installation category 2. (voltage transients must not exceed 2.5kV)
Atmospheres	Electrically conductive pollution must be excluded from the cabinet in which this controller is mounted. This product is not suitable for use above 2000m or in corrosive or explosive atmospheres without further protection.

2208 Rear Terminal Connections and Outline Dimensions (mm)





Ordering Code

Basic Product	Function	Output 1	Output 2	Alarm 1	Alarm 2	Comms	Manual
2208	CC Controller	XX None	XX None	XX None	XX None	XX None	XXX No Manual
		L1 Logic	L1 Logic	RF Relay	RF Relay	RS PDSIO SP input	ENG English
		R1 Relay	R1 Relay			YM 485 Modbus	FRA French
		T1 Triac	T1 Triac				GER German
		D1 DC: isolated					ITA Italian

The above ordering code specifies only the hardware build. The input type and output control functions must then be configured on-site to suit a particular application. If you require pre-configuration by us ask for details of the full ordering code.

EUROTHERM CONTROLS LIMITED

UK SALES OFFICE
Eurotherm Controls Limited
Faraday Close, Durrington
Worthing
West Sussex BN13 3PL
Telephone Sales: (01903) 695888
Technical: (01903) 695777
Service: (01903) 695444
Fax (01903) 695666

Sales and support in over 30 countries worldwide
For countries not listed
enquiries/orders to:
Eurotherm Controls Limited
Export Dept.,
Faraday Close, Durrington, Worthing
West Sussex, BN13 3PL
Telephone (01903) 268500
Fax (01903) 265982
Telex 87114 EUROWG G

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