

# 2216e

MODEL



## DIN rail mounting temperature controller, alarm unit and signal conditioner

### Ideal for:

- Plastic extrusion
- Conveyor furnaces and ovens
- Signal conditioning and isolation
- Overtemperature protection
- Process alarms

The DIN rail mounting 2216e can be used as an accurate temperature or process controller, independent alarm unit, or as an isolating signal conditioner. The back of panel mounting has the benefit of reducing cable runs and wiring costs.

The 2216e can operate standalone or be connected to an operator panel, Programmable Logic Controller or Supervisory Control System using Modbus or DeviceNet communications. Using a 2216e ensures repeatable, independent front end control.

A universal input is configurable for 9 internally stored thermocouple types. Other input types can be downloaded in the factory or with 'iTools' configuration software. Linear 4-20mA or 0-10Vdc inputs can be configured and scaled to the desired display range.

Three outputs are provided.

Output 1 is a modular logic, relay, triac or mA output

Output 2 is a modular logic, relay or triac output

Output 3 is a relay output

The outputs are configurable for heating, cooling, alarm or PV retransmission.

Configuration is 100% in software and can be performed either via the controller front panel or with 'iTools'.

### Features:

- Modular heating and cooling outputs
- Universal input for connection to thermocouples and process transmitters
- Modbus and DeviceNet digital communications
- Fan and water cooling algorithms for stable control
- Isolated PV retransmission
- High, low and deviations alarms, latching and non-latching
- Plug-in from front



**EUROTHERM**

CONTROLS  
DATA MANAGEMENT  
PROCESS AUTOMATION

## Electrical connections

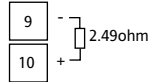


## Input sensor

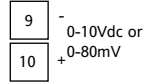
Thermocouple



mA input

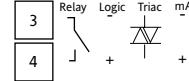


Volts or mV inputs

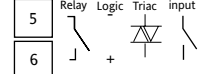


## Outputs 1, 2 and 3

Output 1



Output 2



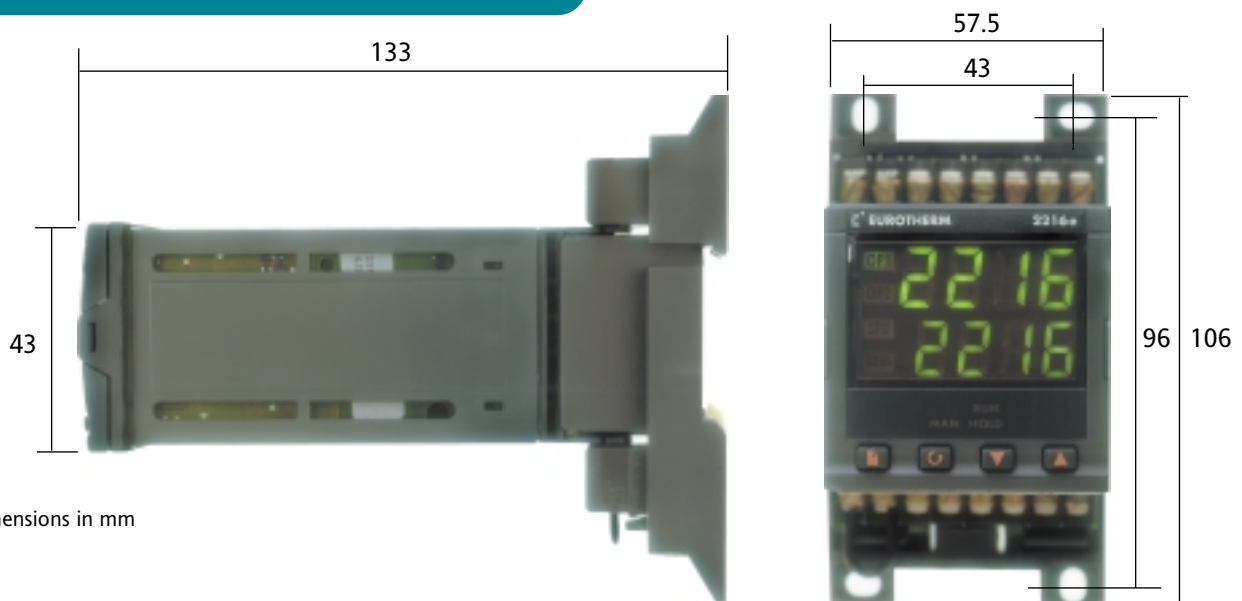
Output 3



## Digital communications

Terminal	Digital Communications			DeviceNet connections	
	RS232	2-wire RS485	4-wire RS485 /RS422	Can Label	Colour Chip
11	-----	Not used	-----	V+	Red
12	-----	Not used	Rx+	CAN_H	White
13	-----	Not used	Rx-	SHIELD	None
14	-----	Common	-----	CAN_H	Blue
15	Tx	A(+)	Tx+	CAN_H	Black
16	Rx	B(-)	Tx-	Not used	Not used

## Dimensional details



All dimensions in mm

## Ordering code

<b>Model Number</b>	Function	Supply Voltage	Output 1	Output 2	Output 3	Comms Module	Manual	DIN Labelling	DIN Rail Mounting
Hardware code	2216e							F0492	EU0492

Function	Output 1	Output 2	Digital Comms		
<b>CC</b> PID Control <b>NF</b> On/Off Control <b>VC</b> Motorised valve control <b>AL</b> Alarm unit	<b>XX</b> Not fitted <b>Relay</b> <b>R1</b> Fitted unconfigured <b>RH</b> Heating output <b>RU</b> Valve open output <b>FH</b> High alarm 1 <b>FL</b> Low alarm 1 <b>DB</b> Dev band alarm 1 <b>DL</b> Dev low alarm 1 <b>DH</b> Dev high alarm 1 <b>Logic - SSR drive</b> <b>L1</b> Fitted unconfigured <b>LH</b> Heating output <b>M1</b> PSDS Heater break detect <b>M2</b> PSDS current monitoring <b>Triac</b> <b>T1</b> Fitted unconfigured <b>TH</b> Heating output <b>TU</b> Valve open output	<b>DC control</b> <b>R3</b> Fitted unconfigured <b>H6</b> 0-20mA heating <b>H7</b> 4-20mA heating <b>C6</b> 0-20mA cooling <b>C7</b> 4-20mA cooling <b>DC retransmission</b> <b>R6</b> Fitted unconfigured <i>First character</i> <b>V-</b> PV retrans <b>P-</b> Setpoint retrans <b>0-</b> Output retrans <b>Z-</b> Error retrans <i>Second character</i> <b>-1</b> 0-20mA <b>-2</b> 4-20mA <b>-3</b> 0-5V <b>-4</b> 1-5V <b>-5</b> 0-10V	<b>XX</b> Not fitted <b>Relay</b> <b>R1</b> Fitted unconfigured <b>RC</b> Cooling output <b>RH</b> Heating output <b>RW</b> Valve close output <b>FH</b> High alarm 2 <b>FL</b> Low alarm 2 <b>DB</b> Dev band alarm 2 <b>DL</b> Dev low alarm 2 <b>DH</b> Dev high alarm 2 <b>AL</b> High & low alarms 1 & 2 <b>Logic - SSR drive</b> <b>L1</b> Fitted unconfigured <b>LC</b> Cooling output <b>LH</b> Heating output <b>Logic input</b> <b>AM</b> Auto manual select <b>S2</b> Setpoint 2 select <b>AC</b> Alarm ack/reset <b>EH</b> Integral hold <b>SB</b> Standby select <b>M5</b> Mode 5 current input <b>Triac</b> <b>T1</b> Fitted unconfigured <b>TC</b> Cooling output <b>TH</b> Heating output	<b>XX</b> Not fitted <b>Relay</b> <b>RF</b> Fitted unconfigured <b>RH</b> Heating output <b>RC</b> Cooling output <b>RW</b> Valve close output <b>FH</b> High alarm 3 <b>FL</b> Low alarm 3 <b>DB</b> Dev band alarm 3 <b>DL</b> Dev low alarm 3 <b>DH</b> Dev high alarm 3 <b>AL</b> High & low alarms 3 & 4 <b>PDS alarms</b> <b>LF</b> Heater break (PDS M1) <b>LC</b> Heater break (PDS M2) <b>LH</b> SSR failure (PDS M2)	<b>2X</b> Not fitted <b>Modbus comms</b> <b>2AM</b> RS232 <b>2YM</b> 2-wire RS485 <b>2RC</b> 4-wire RS485-422 <b>DeviceNet</b> <b>2DN</b> DeviceNet <b>Eurotherm Bisynch</b> <b>2AE</b> RS232 <b>2YE</b> 2-wire RS485 <b>2FE</b> 4-wire RS485/422
			<b>Manual</b> <b>XXX</b> None <b>ENG</b> English <b>FRA</b> French <b>GER</b> German <b>NED</b> Dutch <b>SPA</b> Spanish <b>SWE</b> Swedish <b>DEN</b> Danish <b>ITA</b> Italian		

<b>Sensor Input</b>	<b>Setpoint Min.</b>	<b>Setpoint Max.</b>	<b>Display Units</b>	<b>Control Options</b>	<b>Heating Options</b>	<b>Cooling Options</b>
Configuration code (optional)						

Sensor Input	Setpoint Min	Setpoint Max	Units	Control Options		
<b>Standard Sensor Inputs</b>			<b>C</b> °C <b>F</b> °F <b>K</b> Kelvin <b>X</b> Linear input	<b>XX</b> Reverse acting <b>DP</b> Direct acting		
<b>J</b> J Thermocouple	Min	Max				
<b>K</b> K Thermocouple	-210	1200				
<b>T</b> T Thermocouple	-200	400				
<b>L</b> L Thermocouple	-200	900				
<b>N</b> N Thermocouple-Nicrosil/Nisil	-200	1300				
<b>R</b> R Thermocouple-Pt/Pt13%Rh	-50	1700				
<b>S</b> S Thermocouple-Pt /Pt10%Rh	-50	1768				
<b>B</b> B Thermocouple-Pt/Pt30%Rh -6%Rh	0	1820				
<b>P</b> Platinel II Thermocouple	0	1369				
<b>Factory Downloaded Input</b>						
<b>C</b> C Thermocouple - W5%Re/W26%Re (Hoskins)	Min	Max				
<b>D</b> D Thermocouple - W3%Re/W25%Re	0	2319				
<b>E</b> E Thermocouple	-250	1000				
<b>1</b> Ni/Ni18%Mo Thermocouple	0	1399				
<b>2</b> Pt20%Rh/Pt40%Rh Thermocouple	0	1870				
<b>3</b> W/W26%Re (Engelhard) Thermocouple	0	2000				
<b>4</b> W/W26%Re (Hoskins) Thermocouple	0	2010				
<b>5</b> W5%Re/W26%Re (Engelhard) Thermocouple	10	2300				
<b>6</b> W5%Re/W26%Re (Bucose) Thermocouple	0	2000				
<b>7</b> Pt10%Rh/Pt40%Rh Thermocouple	200	1800				
<b>8</b> Exergen K80 I.R. pyrometer	-45	650				
<b>Process Inputs (Scaled to setpoint min and max)</b>						
<b>M</b> -9.99 to 80.00mV linear	Min	Max				
<b>Y</b> 0 to 20mA linear	-999	9999				
<b>A</b> 4 to 20mA linear	-999	9999				
<b>W</b> 0 to 5Vdc linear	-999	9999				
<b>G</b> 1 to 5Vdc linear	-999	9999				
<b>V</b> 0 to 10Vdc linear	-999	9999				
				<b>Heating Options</b> <b>XX</b> Enabled on logic, relay & triac heating outputs <b>PD</b> Feedback disabled		
				<b>Cooling options</b> <b>XX</b> Linear cooling <b>CF</b> Fan cooling <b>CW</b> Water cooling		

## Technical specification

### Process value input

Low level range	-10 to +80mV
High level range	0-20mA or 0-10Vdc
Sample rate	9Hz
Resolution	4uV for low level inputs 2mV for high level inputs
Linearity	Better than 0.1% of reading
Calibration accuracy	The greater of $\pm 1^{\circ}\text{C}$ or $\pm 0.25\%$ of reading
User calibration	Low and high offsets can be applied
Input filtering	OFF to 999.9 seconds
Thermocouple types	See sensor input table in ordering code
Cold junction compensation	> 30 to 1 rejection of ambient temperature change External references $0^{\circ}\text{C}$ , $45^{\circ}\text{C}$ and $50^{\circ}\text{C}$

### Digital output ratings

Relay	Min:12V, 100mA. Max: 2A, 264Vac resistive
Logic output	18Vdc, 20mA (non-isolated)
Triac	1A, 30-264Vac resistive

### Analogue output (OP1)

Range	0-20mA, (isolated)
Analogue output functions	Control or PV retransmission

### Control functions

Control modes	On/Off, PID or motorised valve control
Cooling algorithms	Linear, water, fan, oil
Tuning	One-shot tuning
Auto manual control	Bumpless transfer or forced manual output available
Setpoint rate limit	Display units per sec, per min or per hour

### Alarms

Number of alarms	Four
Alarm types	High, low, deviation high, deviation low, deviation band
Alarm modes	Latching or non-latching. Blocking. Energised or de-energised in alarm

### Communications

DeviceNet	500Kbaud, ODVA compliant
Modbus	RS232, 2-wire RS485, 4-wire RS485/RS422

### General

Display range	Four digits with up to two decimal places
Supply	100 to 240Vac -15%, +10%
Operating ambient	0 to $55^{\circ}\text{C}$ and 5 to 95f RH non-condensing
Storage temperature	-10 to $+70^{\circ}\text{C}$
Dimensions (mm)	56W x 107H x 133D
EMC standards	Meets generic emissions standards EN50081-2 and immunity standard EN50082-2 for industrial environments
Safety Standards	Meets EN61010, installation category II, pollution degree 2

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