2416

MODEL

Programmable Temperature/Process Controllers

The 2416 is a high stability controller with a wide range of options. PID, On/off or motorised valve control can be configured - satisfying both electrical and gas heating applications. Dual PID settings and advanced tuning algorithms optimise control performance.
Plug-in modules provide outputs for heating, cooling and analogue retransmission.
Four setpoint programs can be stored with 16 ramp-dwell segments and three event outputs per program.
High speed digital communications with industry standard protocols allowing easy connection to supervisory control and data logging systems.
Abolish ammeters by using Eurotherm's advanced load current monitoring facility. Heater current may be displayed and also open or short circuit faults detected.
Multi-zone programming can be implemented using 'PDS' retransmission to deliver a master setpoint to up to three slave controllers with holdback from any slave if the temperature deviates from the setpoint by more than a set value.

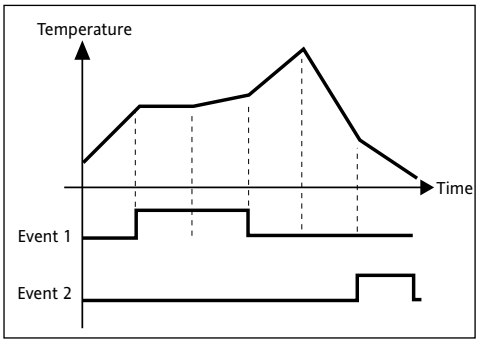
Ideal for

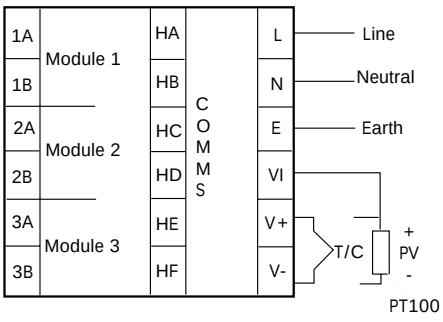
- single and multi-zone ovens and furnaces
- ceramic and brick kilns
- environmental chambers

Specifications

Dimensions:
48W x 48H x 150Dmm
Control modes:
PID or On/Off or motorised valve
Supply voltages:
85-264Vac, 10watts max.
20-29Vac or dc, 10watts max.
Operating ambient:
0-55°C, 0-90%RH non-condensing
Inputs:
See Sensor Inputs in the Configuration coding
Output ratings:
Relay: 2A, 264Vac resistive
Logic: 18Vdc, 20mA
Triac: 1A, 264Vac resistive
DC: 0-20mA, or 0-10Vdc configurable
Panel sealing:
IP65, plug-in from front panel

Programmer functionality





EUROTHERM

CONTROLS
PROCESS AUTOMATION
RECORDERS

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Ordering codes

Hardware coding

Model Number	Function	Supply Voltage	Module 1	Module 2	Module 3	Comms	Manual
2416							

Function

Standard PID control	
CC	Controller only
CG	1 x 8 seg Prog
CP	1 x 16 seg Prog
P4	4 x 16 seg Prog
On/Off Control	
NF	Controller only
NG	1 x 8 seg Prog
NP	1 x 16 seg Prog
N4	4 x 16 seg Prog
Motorised valve control	
VC	Controller only
VG	1 x 8 seg Prog
VP	1 x 16 seg Prog
V4	4 x 16 seg Prog

Supply Voltage

VH	85-264Vac
VL	20-29Vac/dc

Module 1

XX	None
Relay: 2-pin	
R2	Fitted unconfigured
RH	Heating output
RU	Valve raise output
FH	High alarm 1
FL	Low alarm 1
DB	Dev. band alarm 1
DL	Dev. low alarm 1
DH	Dev. high alarm 1
Logic	
L2	Fitted unconfigured
LH	Heating output
M1	PDS Heater break detect (note 1)
M2	PDS Current monitoring (note 2)
Triac	
T2	Fitted unconfigured
TH	Heating output
TU	Valve raise output
DC control (Non-isolated)	
D2	Fitted unconfigured
H1	0-20mA PID heating
H2	4-20mA PID heating
H3	0-5V PID heating
H4	1-5V PID heating
H5	0-10V PID heating

Module 2

XX	None
Relay: 2-pin	
R2	Fitted unconfigured
RC	Cooling output
RW	Valve lower output
FH	High alarm 2
FL	Low alarm 2
DB	Dev. band alarm 2
DL	Dev. low alarm 2
DH	Dev. high alarm 2
PO	Program event 1 (not with 8-seg prog)
PE	Program END output
Logic	
L2	Fitted unconfigured
LC	Cooling output
Triac	
T2	Fitted unconfigured
TC	Cooling output
TW	Valve lower output
DC control (Non-isolated)	
D2	Fitted unconfigured
C1	0-20mA PID cooling
C2	4-20mA PID cooling
C3	0-5V PID cooling
C4	1-5V PID cooling
C5	0-10V PID cooling

Module 3

XX	None
Relay: 2-pin	
R2	Fitted unconfigured
FH	High alarm 4
FL	Low alarm 4
DB	Dev. band alarm 4
DL	Dev. low alarm 4
DH	Dev. high alarm 4
RA	Rate of change alarm
PO	Program event 2 (not with 8-seg prog.)
PE	Program END output
PDS Alarms	
LF	Heater break detect
HF	Current monitoring heater break
SF	Current monitoring SSR failure
Logic	
L2	Fitted unconfigured
Triac	
T2	Fitted unconfigured
DC retran (Non-isolated)	
D2	Fitted unconfigured
First character	
V-	PV retrans
S-	Setpoint retrans
O-	Output retrans
Z-	Error retrans
Second character	
-1	0-20mA
-2	4-20mA
-3	0-5V
-4	1-5V
-5	0-10V

Comms

XX	None
2 wire, RS485	
Y2	Fitted unconfigured
YM	Modbus protocol
YE	EI-Bisynch protocol
RS232	
A2	Fitted unconfigured
AM	Modbus protocol
AE	EI-Bisynch protocol
4 wire, RS422	
F2	Fitted unconfigured
FM	Modbus protocol
FE	EI-Bisynch protocol
PDS Input	
M6	Fitted unconfigured
RS	Setpoint input
PDS Output	
M7	Fitted unconfigured
PT	PV retrans
TS	Setpoint retrans
OT	Output retrans

Manual

XXX	No manual
ENG	English
FRA	French
GER	German
NED	Dutch
SPA	Spanish
SWE	Swedish
ITA	Italian

Note 1.
PDS heater break detect will transmit the power demand to a TE10S Solid State Relay and read back a heater break alarm.

Note 2.
PDS current monitoring will transmit the power demand signal to a TE10S Solid State Relay (or PD/CTX) and read back load current and open and short circuit alarms.

Note 3.
Setpoint limits: Include the decimal position required in the displayed value. Up to one for temperature inputs, up to two for process inputs.

Note 4.
An external 1% current sense resistor is supplied as standard. If greater accuracy is required, a 0.1% 2.49Ω can be ordered as part no. SUB2K/249R.1.

Configuration coding (optional)

Sensor Input	Setpoint Min	Setpoint Max	Display Units	Options: Control	Options: Power	Options: Cooling	Options: Buttons	Options: Program
	note 3	note 3						

Sensor Input / Setpoint Min / Setpoint Max

	Sensor Input	Min	°C	Max
	Standard Sensor Inputs	**Min**	**°C**	**Max**
J	J Thermocouple	-210		1200
K	K Thermocouple	-200		1372
T	T Thermocouple	-200		400
L	L Thermocouple	-200		900
N	N Thermocouple-Nicrosil/Nisil	-250		1300
R	R Thermocouple-Pt/Pt13%Rh	-50		1700
S	S Thermocouple-Pt /Pt10%Rh	-50		1768
B	B Thermocouple-Pt/Pt30%Rh -6%Rh	0		1820
P	Platinel II Thermocouple	0		1369
Z	RTD/PT100 DIN 43760	-200		850
	Factory Downloaded Input	**Min**	**°C**	**Max**
C	C Thermocouple - W5%Re/W26%Re (Hoskins)	0		2319
D	D Thermocouple - W3%Re/W25%Re	0		2399
E	E Thermocouple	-250		1000
1	Ni/Ni18%Mo Thermocouple	0		1399
2	Pt20%Rh/Pt40%Rh Thermocouple	0		1870
3	W/W26%Re (Engelhard) Thermocouple	0		2000
4	W/W26%Re (Hoskins) Thermocouple	0		2010
5	W5%Re/W26%Re (Engelhard) Thermocouple	10		2300
6	W5%Re/W26%Re (Bucose) Thermocouple	0		2000
7	Pt10%Rh/Pt40%Rh Thermocouple	200		1800
8	Exergen K80 I.R. pyrometer	-45		650
	Process Inputs (Scaled to setpoint min and max)	**Min**	**°C**	**Max**
F	-100 to +100mV linear	-1999		9999
Y	0 to 20mA linear (note 4)	-1999		9999
A	4 to 20mA linear (note 4)	-1999		9999
W	0 to 5Vdc linear	-1999		9999
G	1 to 5Vdc linear	-1999		9999
V	0 to 10Vdc linear	-1999		9999

Display Units

C	Celsius
F	Fahrenheit
K	Kelvin
X	Blank

Options

Control action	
XX	Reverse acting (standard)
DP	Direct acting
Power feedback	
XX	Enabled on logic, relay and triac heating outputs
PD	Feedback disabled
Cooling options	
XX	Linear cooling
CF	Fan cooling
CW	Water cooling
CL	Oil cooling
CO	On/Off cooling
Front panel buttons	
XX	Enabled
MD	Auto/manual disabled
MR	Auto/man & run/hold disabled
RD	Run/hold disabled
Programmer timing	
XX	Ramp and dwell in mins
HD	Dwell time in hours
HR	Ramp rate in units/hour

Example ordering code

2416 - CC - VH - LH - RC - FH - YM - ENG - K - 0 - 1000 - C - XX - XX - XX - MD - XX

2416, Controller, 85 to 264Vac, Logic heating, Relay cooling, High alarm relay, RS485, Modbus comms, English manual, type K thermocouple, 0 to1000°C, Manual button disabled.

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