3200

MODELS

Ideal for :

- Plastic extrusion
- Hot runners
- Thermoforming
- Ovens
- Chillers
- Trace heating
- Stress relieving

Features :

- 8 Segment programmer
- Heater failure detection
- Current monitoring
- Internal timer
- Scrolling text messages
- Recipes
- Modbus comms
- Modbus SP retransmission
- Analogue retransmission
- Remote setpoint
- Help text

Temperature/Process Controllers

Specification Sheet

The innovative range of 3200 controllers offer precision control of temperature and other process variables together with a host of advanced features not normally found in this class of controller.

The emphasis is on ease of use. A simple 'Quick Start' code is used to configure all the functions essential for controlling your process. This includes input sensor type, measurement range, control options, and alarms, making 'Out the Box' operation truly achievable. In operator mode every parameter has a scrolling text message describing its function and is available in English, German, French, Spanish or Italian. More advanced features are configured using a PC based configuration wizard which is an easy to use and instructive guide to all the functions in the controller.

Heater Current Monitoring
A current transformer input provides display of the heater current and a health check on the load. Partial load failure, heater open circuit and SSR faults are detected and displayed as scrolling alarm messages as well as providing an alarm output. On the 3208 and 3204 a front panel ammeter displays the heater current.

Setpoint Programmer
Heat treatment profiles can be programmed using the 8-segment programmer. Holdback, at the beginning of each segment can be used to guarantee the soak periods. A digital event output can be triggered in any segment to initiate actions within the process.

Custom Text Messaging
Custom messages can be created with a PC tool and downloaded to the 3200 to display when an event, alarm or process condition occurs. This provides the operator with good visibility of the status of the process.

Remote Setpoint
An option exists for the 3200 to have a Remote Analogue Input. This can be either volts or mA and is used to allow the setpoint to be generated by a master controller or PLC.

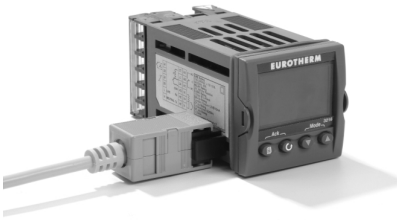
Recipes
Using a PC tool recipes can be created that can be used to change the operating parameters of the 3200 simply by selecting a new recipe using the 3200 HMI. This is very useful where multiple products are processed using the same controller but require different parameters to be set.

Timer
An internal timer is configurable as an interval timer, delay timer or to provide a soft start for hot runner control.

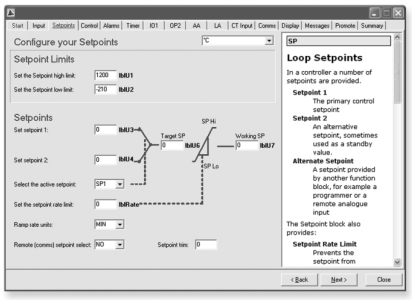
Setpoint Retransmission
Sending the setpoint or other parameters from the 3200 to slave devices can be achieved either using conventional analogue communications or using Master Modbus comms. Master Modbus in the 3200 allows a broadcast of 1 parameter to the network.
A typical application is a setpoint being retransmitted to a number of slave controllers in a multi-zone furnace.

Modbus Communications
All units support both EIA232 and 2-wire EIA485 communicating using the Modbus protocol.

Configuration Adaptor
PC configuration to all 3200 controllers can be achieved by using a configuration adaptor. It provides iTools with the ability to communicate with and configure devices without any power being connected.



iTools Wizard
Used to simplify the set up of 3200 series controllers. The wizard guides the user through the configuration process with interactive help and graphical demonstrations of features.



TECHNICAL SPECIFICATION

General

Environmental performance

Temperature Limits	Operation:	0 to 55°C
	Storage:	-10 to 70°C
Humidity limits	Operation:	5 to 90% RH non condensing
	Storage:	5 to 90% RH non condensing
Panel Sealing		IP65, Nema 4X
Shock		BS EN61010
Vibration		2g peak, 10 to 150Hz
Altitude:		<2000 metres
Atmospheres		Not suitable for use in explosive or corrosive atmosphere

Electromagnetic compatibility (EMC)

Emissions and immunity	BS EN61326

Electrical safety

(BS EN61010)	Installation cat. II; Pollution degree 2

INSTALLATION CATEGORY II
The rated impulse voltage for equipment on nominal 230V mains is 2500V.

POLLUTION DEGREE 2
Normally, only non-conductive pollution occurs. Occasionally, however, a temporary conductivity caused by condensation shall be expected

Physical

Panel mounting	3216:	1/16 DIN
	3208:	1/8 DIN
	3204:	1/4 DIN
	32h8:	1/8 DIN, horizontal
Weight	3216:	250g
	3208:	350g
	3204:	420g
	32h8:	350g
Panel cut-out dimensions:	3216:	45W x 45Hmm
	3208:	45W x 92Hmm
	3204:	92W x 92Hmm
	32h8:	92W x 45Hmm
Panel depth:	All:	90mm

Operator interface

Type		LCD TN with backlight
Main PV display		4 digits, green
Lower display	3216, 3208, 3204:	5 character starburst, green
	32h8:	9 character starburst, green
Status beacons		Units, outputs, alarms, active setpoint

Power requirements

3216:	100 to 240Vac, –15%, +10%, 48 to 62 Hz, max 6W 24Vac, -15%, +10%. 24Vdc, -15% +20% ±5% ripple voltage max 6W
3208/h8/04:	100 to 240Vac, –15%, +10%, 48 to 62 Hz, max 8W 24Vac, -15%, +10%. 24Vdc -15% +20% ±5% ripple voltage max 8W

Approvals

CE, cUL listed (file E57766), Gost, DIN 3440 (3216 only)
Suitable for use in Nadcap and AMS2750D applications under Systems Accuracy Test calibration conditions

Transmitter PSU (not 3216)

Rating	24Vdc, >28mA, <33mA
Isolation	264Vac double insulated

Communications

Serial communications option	
Protocol	Modbus RTU slave Modbus RTU Master broadcast (1 parameter)
Isolation	264Vac, double insulated
Transmission standard	EIA232 or EIA485 (2 wire)

Process Variable Input

Calibration accuracy	<±0.25% of reading ±1LSD [1]
Sample rate	4Hz(250ms)
Isolation	264Vac double insulation from the PSU and communication
Resolution (µV)	<0.5µV with 1.6sec filter
Resolution (effective bits)	>17 bits
Linearisation accuracy	< 0.1% of reading
Drift with temperature	<50ppm (typical) <100ppm (worst case)
Common mode rejection	48-62Hz, >-120db
Series mode rejection	48-62Hz, >-93dB
Input impedance	100MΩ
Cold junction compensation	>30:1 rejection of ambient change
External cold junction	Reference of 0°C
Cold junction accuracy	<±1°C at 25°C ambient
Linear(process) input range	-10 to 80mV, 0 to 10V with 100KΩ/ 806Ω external divider module
Thermocouple types	K, J, N, R, S, B, L, T, C, custom download [2]
Resistance Thermometer types	3-wire Pt100 DIN 43760
Bulb current	0.2mA
Lead compensation	No error for 22 ohms in all leads
Input filter	Off to 59.9s
Zero offset	User adjustable over full range
User calibration	2-point gain & offset

Notes
(1) Calibration accuracy quoted over full ambient operating range and for all input linearisation types
(2) Contact Eurotherm for details of availability of custom downloads for alternative sensors

AA Relay

Type	Form C (changeover)
Rating	Min 100mA@12Vdc, max 2A@264Vac resistive
Functions	Control outputs, alarms, events

Current Transformer Input

Input range	0-50mA rms, 48/62Hz. 10Ω burden resistor fitted inside module
Calibration accuracy:	<1% of reading (Typical), <4% of reading (Worst case)
Isolation	By using external CT
Input impedance	<20Ω
Measurement scaling	10, 25, 50 or 100 Amps
Functions:	Partial load failure, SSR fault

Digital Input (DigIn A/B, B not on 3216)

Contact closure	Open >600Ω, closed <300Ω
Input current	<13mA
Isolation	None from PV or system 264Vac double insulated from PSU and communications
Functions	Includes alarm acknowledge, SP2 select, manual keylock, timer functions, standby select, RSP select

Logic I/O Module

Output

Rating	ON 12Vdc@<44mA, OFF <300mV@100µA
Isolation	None from PV or system. 264Vac double insulated from PSU and communications
Functions	Control outputs, alarms, events

Digital Input

Contact closure	Open >500Ω, closed <150Ω
Isolation	None from PV or system 264Vac double insulated from PSU and communications
Functions	Includes alarm acknowledge, SP2 select, manual, keylock, timer functions, standby select, RSP select

Relay Output Channels

Type	Form A (normally open)
Rating	Min 100mA@12vdc, max 2A@264Vac resistive
Functions	Control outputs, alarms, events

Triac Output

Rating	0.75A (rms) 30 to 264V(rms) resistive load
Isolation	264Vac double insulated
Functions	Control outputs, alarms, events

Analogue Output [3]

OP1, OP2

Rating	0-20mA into <500Ω
Accuracy	± (<1% of Reading + <100µA)
Resolution	11.5 bits
Isolation	None from PV or system. 264Vac double insulated from PSU and communications
Functions	Control outputs, retransmission

OP 3 (not on 3216)

Rating	0-20mA into <500Ω
Accuracy	±(<0.25% of Reading + <50µA)
Resolution	13.6 bits
Isolation	264Vac double insulated
Functions	Control outputs, retransmission

Remote Setpoint

Calibration accuracy	<±0.25% or reading ±1LSD
Sample rate	4Hz (250ms)
Isolation	264Vac double insulation from instrument
Resolution	<0.5mV (for 0-10V) or <2µA (for 4-20mA)
Resolution (effective bits)	>14bits
Drift with temperature	<50ppm (typical) <150ppm (worst case)
Common mode refection	48-62Hz, >-120dB
Series mode rejection	48-62Hz, >-90dB
Input impedance	Voltage: 223KOhm and Current: 2R49
Normal input range	0 to 10V and 4 to 20mA
Max input range	-1V to 11V and 3.36mA to 20.96mA

Software Features

Control

Number of loops	1
Control types	PID, ON/OFF, VP
Cooling types	Linear, fan, oil, water
Modes	Auto, manual, standby, forced manual
Overshoot inhibition	High, low

Alarms

Number	4
Type	Absolute high & low, deviation high, low or band
Latching	Auto or manual latching, non-latching, event only
Output assignment	Up to four conditions can be assigned to one output

Other Status Outputs

Functions	Including sensor break, manual mode, timer status, loop break, heater diagnostics, program event
Output assignment	Up to four conditions can be assigned to one output

Setpoint Programmer

Program function	1 program x 8 segments with 1 event output [4]
Start mode	Servo from PV or SP
Power fail recovery	Continue at SP or Ramp back from PV
Guaranteed soak	Inhibits dwell timing until PV within limits

Timer

Modes	Dwell when setpoint reached Delayed control action, Soft start limits power below PV threshold

Current Monitor

Alarm types	Partial load failure, over current, SSR short circuit, SSR open circuit
Indication type	Numerical or ammeter

Custom Messages

Number	15 scrolling text messages
No of Characters	127 characters per message max
Languages	English, German, French, Spanish, Italian
Selection	Active on any parameter status using conditional command

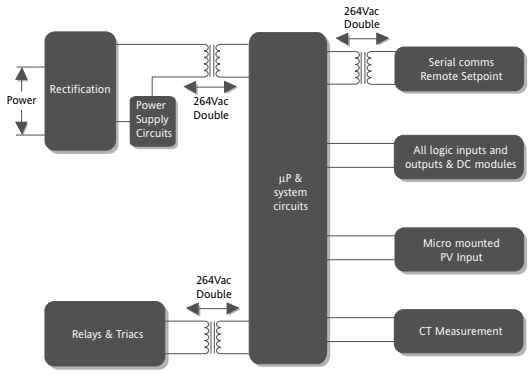
Recipes

Number	5 recipes with 38 parameters
Selection	HMI interface, communications or digital IO

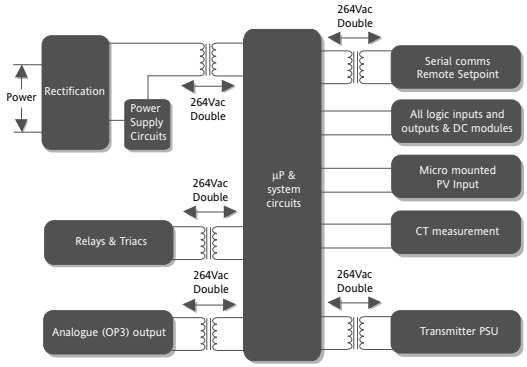
Notes
(3) Voltage output can be achieved by external adaptor
(4) By using recipes five SP programs can be stored

ISOLATION DIAGRAMS

3216

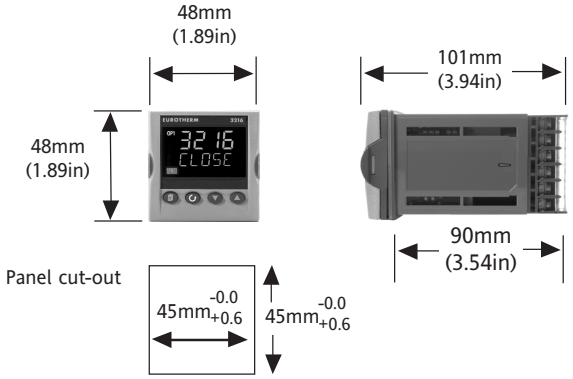


3208/h8/04

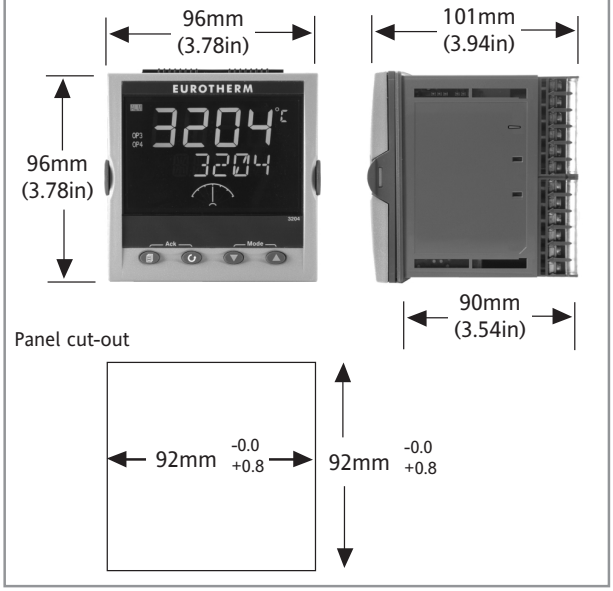


DIMENSIONAL DETAILS

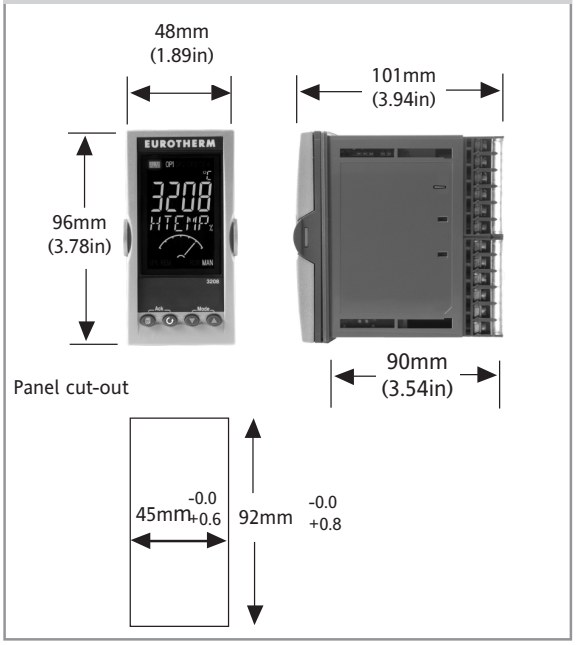
3216



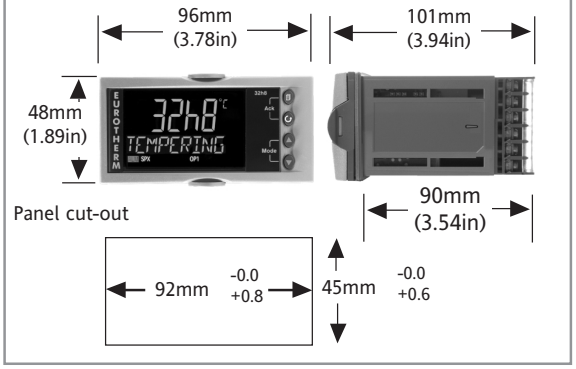
3204



3208



32h8



ORDERING CODE

Model Number	Function	Power Supply	Outputs OP1 OP2 OP3	AA Relay	Options	Fascia Colour	Product Language	Manual Language	Warranty	Calibration Certification	Custom Label	Specials & Accesories

Model Number

3216	1/16 DIN unit
3208	1/8 DIN vertical unit
32h8	1/8 DIN horizontal unit
3204	1/4 DIN unit

Function

CC	Controller
CP	Programmer
VC	Valve Controller
VP	Valve Programmer

Power Supply

VH	85 - 264Vac
VL	24Vac/dc

3216 OP1, OP2

OP1	OP2		
L	X	X	X
L	R	X	X
R	R	X	X
L	L	X	X
L	D	X	X
D	D	X	X
D	R	X	X
L	T	X	X
T	T	X	X

Not available with Low Voltage PSU

Where
L = Logic,
R = Relay,
D = 0-20mA,
T = Triac
X = Not fitted

3208/h8/04 OP1, OP2, OP3

OP1	OP2	OP3	
L	R	R	X
R	R	R	X
L	L	R	X
L	R	D	X
R	R	D	X
D	D	D	X
L	L	D	X
L	D	D	X
D	R	D	X
L	T	R	X
T	T	R	X
L	T	D	X
T	T	D	X

Not available with Low Voltage PSU

AA Relay

X	Disabled
R	Relay (Form C)

Options

XXX	Not fitted
RCL	Remote SP, CT & Dig in A
XCL	CT & Dig in A
2CL	RS232, CT & Dig in A
4CL	RS485, CT & Dig in A
2XL*	RS232 Dig in A
4XL*	RS485 Dig in A
XXL*	Dig in A

** 3216 only*

Fascia Colour

G	Green
S	Silver
W	Washdown (not 32h8/04)

Product Language

ENG	English
FRA	French
GER	German
SPA	Spanish
ITA	Italian

Manual Language

ENG	English
FRA	French
GER	German
SPA	Spanish
ITA	Italian

Warranty

XXXXX	Standard
WL005	5 Year

Calibration Certificates

XXXXX	None
CERT1	Certificate of Conformity
CERT2	Factory input calibration per input

Custom Label

XXXXX	None

Specials and Accesories

XXXXX	None
RES250	250R resistor for 0-5Vdc OP
RES500	500R resistor for 0-10Vdc OP

Example (order code)
3216/CP/VH/LDXX/R/4CL/S/ENG/ENG/WL005/XXXXX/XXXXX/RES250

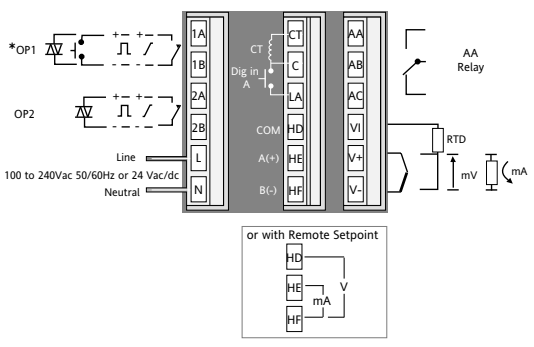
This code describes a 3216 controller with setpoint programmer, OP1 as Logic, OP2 as 0-20mA, AA Relay, RS485 Comms, CT Input, Dig In A, English languge, 5 year warranty, resistor for 0-5V output

3200 ACCESSORIES

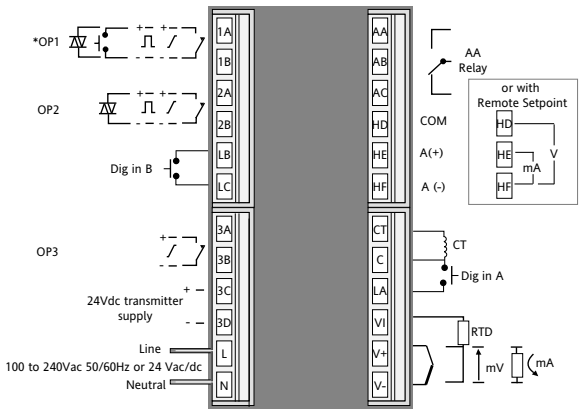
User guide	HA028582
Engineering manual	HA027986
2.49R Precision resistor	SUB35/ACCESS/249R.1
10A Current transformer	CTR100000/000
25A Current transformer	CTR200000/000
50A Current transformer	CTR400000/000
100A Current transformer	CTR500000/000
Configuration clip	iTools/None/3000CK
0-10V input adaptor	SUB21/IV10

REAR TERMINAL CONNECTIONS

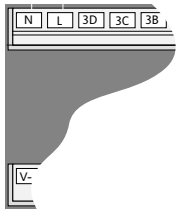
3216



3208/h8/04



32h8 orientation



OPTIONAL QUICK START CODE

Input Type	Setpoint Limits	OP1	OP2	AA Relay	CT Input	Dig in A	Dig in B	OP3	Lower Display
							3208/h8/ 04 only	3208/h8/ 04 only	

Input Type

Thermocouple	
B	Type B
J	Type J
K	Type K
L	Type L
N	Type N
R	Type R
S	Type S
T	Type T
C	Custom/Type C
RTD	
P	Pt100
Linear	
M	0-80mV
2	0-20mA
4	4-20mA
X	Unconfigured

Setpoint Limits

Temperature			
C	Deg C full range		
F	Deg F full range		
Centigrade		**Fahrenheit**	
0	0 to 100 °C	G	32 to 212 °F
1	0 to 200 °C	H	32 to 392 °F
2	0 to 400 °C	J	32 to 752 °F
3	0 to 600 °C	K	32 to 1112 °F
4	0 to 800 °C	L	32 to 1472 °F
5	0 to 1000 °C	M	32 to 1832 °F
6	0 to 1200 °C	N	32 to 2192 °F
7	0 to 1400 °C	P	32 to 2552 °F
8	0 to 1600 °C	R	32 to 2912 °F
9	0 to 1800 °C	T	32 to 3272 °F
X	Unconfigured		

OP1, OP2, AA Relay, OP3

X	Unconfigured
Relay, Triac or Logic outputs	
Control	
H	Heat (PID)
C	Cool (PID)
J	Heat (On/off)
K	Cool (On/off)
Alarm output	
Energised in alarm	
0	High alarm
1	Low alarm
2	Deviation high
3	Deviation low
4	Deviation band
Alarm output	
De-energised in alarm	
5	High alarm
6	Low alarm
7	Deviation high
8	Deviation low
9	Deviation band

DC outputs	
Control	
H	4-20mA heating
C	4-20mA cooling
J	0-20mA heating
K	0-20mA cooling
Retransmission	
D	4-20mA setpoint
E	4-20mA process value
F	4-20mA output
N	0-20mA setpoint
Y	0-20mA process value
Z	0-20mA output
Logic input	
W	Alarm acknowledge
M	Manual select
R	Timer/Prog Run
L	Keylock
P	Setpoint 2 select
T	Timer/prog reset
U	Remote SP select
V	Recipe 2/1 select
A	Remote up button
B	Remote down button
G	Time/prog run/reset
I	Timer/prog hold
Q	Standby select

CT Input

X	Unconfigured
1	10 Amps
2	25 Amps
5	50 Amps
6	100 Amps

Dig in A, Dig in B, OP1

X	Unconfigured
W	Alarm acknowledge
M	Manual select
R	Timer/Prog Run
L	Keylock
P	Setpoint 2 select
T	Timer/prog reset
U	Remote SP select
V	Recipe 2/1 select
A	Remote up button
B	Remote down button
G	Time/prog run/reset
I	Timer/prog hold
Q	Standby select

Lower Display

T	Working setpoint
S	Target setpoint
P	Output demand
R	Time to run
E	Elapsed time
1	Alarm setpoint
A	Load amps
D	Dwell/ramp - time/target
N	None

Example (Quick Start)
K/6/H/E/5/5/P/X/X/T

This code will provide a controller configured as 0-1200 °C, Type K, Heat Output, 4-20mA PV retrans, High Alarm, 50A CT measurement, SP select via Dig In A, Lower display showing working setpoint

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