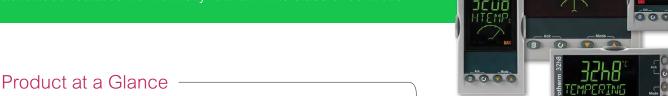
# Helps Improve Process Efficiency, Product Quality, and Minimize Waste

3200 Series Temperature/Process Controllers

The innovative range of 3200 controllers offer precision control of temperature and other process variables together with many 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 Eurotherm iTools, 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 detected faults are 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 ("guaranteed soak") can be used at the beginning of each segment. 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 Eurotherm iTools and downloaded to the 3200 controller to display when an event, alarm or process condition occurs. This provides the operator with good visibility of the status of the process.

- 8 Segment programmer
- · Heater failure detection
- Current monitoring
- Internal timer
- · Scrolling text messages
- Recipes
- Modbus comms
- Modbus SP retransmission
- · Analog retransmission
- Remote setpoint
- Help text
- Type approved to EN14597 TR, EAC (CUTR), CCC (Exempt)
- Multi-language support (English, French, German, Spanish, and Italian)

# 3200 Series Temperature/Process **Controllers Specification**

#### Remote Setpoint

An option exists for the 3200 controller to have a Remote Analog 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 Eurotherm iTools, recipes can be created that may be used to change the operating parameters of the 3200 controller simply by selecting a new recipe using the HMI or digital input. 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 controller to slave devices can be achieved either using conventional analog communications or using Master Modbus communications. Master Modbus in the 3200 controller allows a broadcast of a single 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**

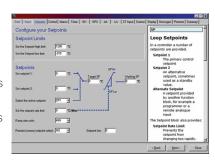
All units support both EIA232 and 2-wire EIA485 communications using the Modbus protocol. The 3216 supports 4-wire EIA485.

#### **Configuration Adaptor**

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

### Eurotherm 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.



#### **Environmental Performance**

Temperature limits: Operation: 0 to 55° C –10 to 70° C Storage:

Humidity limits: Operation: 5 to 90% RH non condensing Storage: 5 to 90% RH non condensing Panel sealing: IP65. Nema 12

Shock: BS EN61010 Vibration: 2 g peak, 10 to 150 Hz Altitude: <2000 metres

Atmospheres: Not suitable for use in explosive or corrosive atmosphere<sup>3</sup>

**EEPROM** Rated lifetime 100,000 write operations

#### 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.

EN14597 TR APPROVAL Registration Number TR1229.

#### Physical

Dimensions: 48 W X 48 H X 90 Dmm 48 W X 96 H X 90 Dmm 3204: 96 W X 96 H X 90 Dmm 32h8 (horizontal): 96 W X 48 H X 90 Dmm

Weiaht: 3216 250 g 350 g 3208: 3204: 420 g

32h8 (horizontal): Panel: 3216: 1/16 DIN mounting 45W x 45Hmm cut out 3208: 1/8 DIN mounting 45W x 92Hmm cut out 3204

1/4 DIN mounting 92W x 92Hmm cut out 32h8 (horizontal): 1/8 DIN mounting  $92W \times 45Hmm$  cut out

Panel depth:

#### Operator Interface

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

#### Power Requirements

100 to 240 V AC, -15%, +10%, 48 to 62 Hz, max 6 W 24 V AC, -15%, +10% 24 V DC, -15% +20%

±5% ripple voltage max 6 W 100 to 240 V AC, -15%, +10%, 3208, 32h8, 3204: 48 to 62 Hz, max 8 W

24 V AC, -15%, +10% 24 V DC, -15% +20% ±5% ripple voltage max 8 W

#### Approvals

CE, cUL liste d (file E57766), Gost-R May be field calibrated to control instrument accuracy required in AMS2750E EN14597 TR CCC Exempt

EAC (CUTR)

### Transmitter PSU (not 3216)

24 V DC, >28 mA, <33 mA 264 V AC double insulated Isolation:

#### Serial Communications Option Protocol:

Modbus RTU slave

Modbus RTU Master broadcast (1 parameter) 264V ac, double insulated Transmission standard: EIA232 or EIA485 (2-wire)

EIA485 (4-wire) on 3216 only

**Process Variable Input** 

Calibration accuracy: <±0.25% of reading ±1LSD (Note 1)

Sample rate: 4 Hz (250 ms)

Isolation: 264 V AC double insulation from the PSU and

communication

Resolution (µV): <0.5 µV with 1.6 sec filter Resolution (effective bits): >17 bits

Linearisation accuracy: < 0.1% of reading

Drift with temperature: <50 ppm (typical) <100 ppm (worst case)

Common mode rejection: 48-62 Hz, >-120 db 48-62 Hz, >-93 dB Series mode rejection:

Input impedance: 100 MO

Cold junction compensation: >30:1 rejection of ambient change

External cold junction: Reference of 0° C <±1° C at 25° C ambient Cold junction accuracy:

Linear(process) input range: –10 to 80 mV, 0 to 10 V with 100 K $\Omega$ /806  $\Omega$ 

external divider module

K, J, N, R, S, B, L, T, C, custom download (Note Thermocouple types:

2)

Resistance thermometer types: 3-wire Pt100 DIN 43760

Bulb current: 0.2 mA

Lead compensation: No compensation error for 22 Ω in all leads

Input filter: Off to 59.9 s

Zero offset: User adjustable over full range 2-point gain & offset User calibration:

**AA Relay** 

Form C (changeover) Type:

Min 100 mA @ 12 V DC, max 2 A @ 264 V AC Ratina:

resistive

Control outputs, alarms, events Functions:

**Current Transformer Input** 

Input range: 0-50 mA rms, 48/62 Hz

10  $\Omega$  burden resistor fitted inside module

<1% of reading (typical), Calibration accuracy: <4% of reading (worst case)

By using external CT Isolation:

Input impedance: <20 Ω

Measurement scaling: 10, 25, 50 or 100 Amps

Partial load failure, SSR detected fault **Functions** 

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

Open >600  $\Omega$ , closed <300  $\Omega$ Contact closure:

Input current: <13 mA

Isolation: None from PV or system

264 V AC double insulated from PSU and

communications Includes alarm acknowledge, SP2 select,

Functions: manual keylock, timer functions standby select,

RSP select

Logic I/O Module

Output

ON 12 V DC @ <44 mA, Rating

OFF <300 mV @ 100 μA None from PV or system

Isolation: 264 V AC double insulated from PSU and

communications

**Functions** Control outputs, alarms, events

Digital Input

Open >500  $\Omega$ , closed <150  $\Omega$ Contact closure: None from PV or system Isolation:

264 V AC double insulated from PSU and

communications

Includes alarm acknowledge, SP2 select, **Functions** manual keylock, timer functions standby select,

RSP select

**Relay Output Channels** 

Type: Form A (normally open)

Min 100 mA @ 12 V DC, max 2 A @264 V AC Ratina:

resistive

Control outputs, alarms, events Functions:

**Triac Output** 

Rating: 0.75 A (rms) 30 to 264 V (rms) resistive load

264 V AC double insulated Isolation: Control outputs, alarms, events Functions:

Analog Output (Note 3)

OP1, OP2

Rating: 0-20 mA into <500  $\Omega$ 

 $\pm$  (<1% of Reading + <100  $\mu$ A) Accuracy

13.5 bits Resolution:

264 V AC double insulated from PSU and comms Isolation:

Module code C provides full 264 V AC double

isolated

Functions: Control outputs, retransmission

OP 3 (not on 3216)

Rating: 0-20 mA into <500 Ω  $\pm$ (<0.25% of Reading + <50 µA) Accuracy:

Resolution: 13.6 hits

Isolation: 264 V AC double insulated Functions Control outputs, retransmission

Remote Setpoint Input

Calibration accuracy: <±0.25% or reading ±1LSD

Sample rate: 4 Hz (250 ms)

Isolation: 264 V AC double insulation from instrument <0.5 mV (for 0-10 V) or <2 µA (for 4-20 mA) Resolution

Resolution (effective bits): >14 bits

<50 ppm (typical) <150 ppm (worst case) Drift with temperature:

48-62 Hz, >-120 dB 48-62 Hz, >-90 dB Common mode refection: Series mode rejection:

Input impedance: Voltage: 223 KΩ and Current: 2R49

Normal input range: 0 to 10 V and 4 to 20 mA

-1 V to 11 V and 3.36 mA to 20.96 mA Max input range:

Software Features

Control

Number of loops: 250ms Loop update: Control types: PID, ON/OFF, VP Cooling types: Linear, fan, oil, water

Modes: Auto, manual, standby, forced manual

Overshoot inhibition: High, low

Alarms

Number:

Absolute high & low, deviation high, low or band, Type:

rate of change

Latching: Auto or manual latching, non-latching, event only Output assignment: Up to 4 conditions can be assigned to one O/P

Other Status Outputs

Functions: Including sensor break, manual mode, timer status, loop break, heater diagnostics, program event

Output assignment: Up to 4 conditions can be assigned to one O/P

Setpoint Programmer

Program function: 1 program x 8 segments with 1 event output (Note 4) Servo from PV or SP Start mode:

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 Numerical or ammeter

Indication type: **Custom Messages** 

15 scrolling text messages Number: 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 I/O

Notes

1. Calibration accuracy quoted over full ambient operating range and for all input linearization types

2. Contact Eurotherm for details of availability of custom downloads for alternative sensors.

- 3. Voltage output can be achieved by external adaptor.
- 4. By using recipes five SP programs can be stored.

## Order Code Hardware/Options Coding



#### 3216 48 x 48mm unit 3208 48 x 96mm unit 32h8 96 x 48mm horizontal unit 96 x 96mm unit 3204

1 Function	on
CC	Standard controller
CP	Standard programmer
VC	Motorized valve controller
VP	Motorized valve programmer

2 Supply Voltage	
VH	85-264 V AC
VL	24 V AC/DC

3 Outputs		
3216		
	OP1	OP2
XXXX	None fitted	None fitted
LXXX	Logic	None fitted
LRXX	Logic	Relay
RRXX	Relay	Relay
LLXX	Logic	Logic
LDXX	Logic	0-20 mA
DDXX	0-20 mA	0-20 mA
DRXX	0-20 mA	Relay
RCXX	Relay	Isolated 0-20 mA
LCXX	Logic	Isolated 0-20 mA
DCXX	0-20 mA	Isolated 0-20 mA
LTXX	Logic	Triac
TTXX	Triac	Triac
3208/32	h8/3204	

11700	mac	mac	
3208/32	2h8/3204		
	OP1	OP2	OP3
LRRX	Logic	Relay	Relay
RRRX	Relay	Relay	Relay
LLRX	Logic	Logic	Relay
LRDX	Logic	Relay	0-20 mA
RRDX	Relay	Relay	0-20 mA
DDDX	0-20 mA	0-20 mA	0-20 mA
LLDX	Logic	Logic	0-20 mA
LDDX	Logic	0-20 mA	0-20 mA
DRDX	0-20 mA	Relay	0-20 mA
Not available with Low Voltage PSU			
LTRX	Logic	Triac	Relay
TTRX	Triac	Triac	Relay
LTDX	Logic	Triac	0-20 mA
TDDX	Triac	0-20 mA	0-20 mA
TTDX	Triac	Triac	0-20 mA

4 AA Relay (OP4)	
Χ	Not fitted
R	Relay
5 Options Board	

5 Options Board	
XXX	Not fitted
XXL	Logic input
XCL	CT + Logic IP
2XL	RS232 Comms + Logic IP
4XL	2-wire RS485 comms +
	Logic IP
2CL	RS232 Comms CT +
	Logic IP
4CL	2-wire RS485 Comms CT
	+ Logic IPP

6 Fasci	a Color
G	Green
S	Silver
W	Washdown (not 32h8/04)
	-
7 Product Language	

RCL

Remote SP CT + Logic IP

7 Produc	t Language
ENG	English
FRA	French
GER	German
SPA	Spanish
ITA	Italian

8 Manua	Language
ENG	English
FRA	French
GER	German
SPA	Spanish
ITA	Italian

9 Warrar	nty
XXXXX	Standard
WL005	Extended
10 Certificates	

10 Certificates	
XXXXX	None
CERT1	Certificate of Conformity
CERT2	Factory Calibration
	certificate

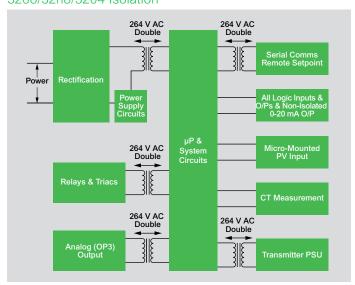
11 Custon	ı Label
XXXXX	None

12 Specials and Accessoriess	
XXXXX RES250	None
RES250	250R resistor for
	0-5 V DC OP
RES500	500R resistor for
	0-10 V DC OP

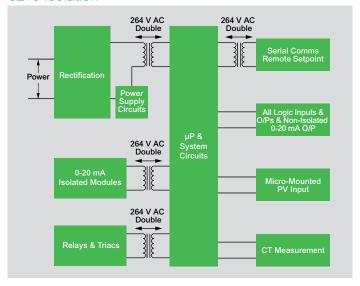
#### 3200 Controller Accessories

HA029714	Installation guide
HA027986	Engineering manual
SUB35/ACCESS/249R.1	2.49R Precision resistor
CTR100000/000	10 A Current transformer
CTR200000/000	25 A Current transformer
CTR400000/000	50 A Current transformer
CTR500000/000	100 A Current transformer
ITOOLS/NONE/USB U	SB configuration kit
SUB21/IV10	0-10 V input adaptor

## 3208/32h8/3204 Isolation



#### 3216 Isolation



## Optional Quick Start Code (Optional)



1 Input Type		
Thermo	Thermocouple	
В	Туре В	
J	Туре Ј	
K	Туре К	
L	Type L	
N	Type N	
R	Type R	
S	Type S	
T	Туре Т	
С	Custom/Type C	
RTD		
Р	Pt100	
Linear		
М	0-80 mV	
2	0-20 mA	
4	4-20 mA	
X	Unconfigured	

2 Setpoint Limits

Full PV Range		
С	Deg C full range	
F	Deg F full range	
Centigra	Centigrade	
0	0 to 100 deg C	
1	0 to 200 deg C	
2	0 to 400 deg C	
	0 to 600 deg C	
4	0 to 800 deg C	
5	0 to 1000 deg C	
6	0 to 1200 deg C	
7	0 to 1400 deg C	
8	0 to 1600 deg C	
9	9 0 to 1800 deg C	
Fahrenh	neit	
G	2 to 212 deg F	
Н	32 to 392 deg F	
J	32 to 752 deg F	
K	32 to 1112 deg F	
L	32 to 1472 deg F	
М	32 to 1832 deg F	
N	32 to 2192 deg F	
Р	32 to 2552 deg F	
R	32 to 2912 deg F	
Т	32 to 3272 deg F	
X	Unconfigured	

3 Outr	out 1 (OP1)
XX	Unconfigured
	DC, Triac or Logic outputs
Control	
Н	Heat (PID)
С	Cool (PID)
J	Heat (on/off)
K	Cool (on/off)
Alarm (	
Energiz	ed in alarm
0	High alarm
1	Low alarm
2	Deviation high
3	Deviation low
4	Deviation band
Alarm (	Dutput
De-ene	rgized in alarm
5	High alarm
6	Low alarm
7	Deviation high
8	Deviation low
9	Deviation band
DC Out	puts
Control	<u>'</u>
Н	4-20 mA heating
C	4-20 mA cooling
J	0-20 mA heating
K	0-20 mA cooling
	smission
D E	4-20 mA setpoint
F	4-20 mA process value 4-20 mA output
N	0-20 mA setpoint
Y	0-20 mA process value
Z	0-20 mA output
	·
Logic Ir	
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
В	Remote down button
G	Time/prog Run/reset
I   Q	Timer/prog Hol Standby select
Q	Stariuby Select

3.	8 9 10 208/h8 3208/h8 04 only 704 only	
	, romy	
	ut 2 (OP2)	7-
XX	Unconfigured	I X
	C, Triac or Logic Outputs	V
Control	LL (DID)	R
H	Heat (PID) Cool (PID)	L
J	Heat (on/off)	Р
K	Cool (on/off)	Т
Alarm C		L
	ed in alarm	\ \
0	High alarm	A
1	Low alarm	B
2	Deviation high	
3	Deviation low	G
4	Deviation band	
Alarm C		9
	rgized in alarm	×
5	High alarm	F
6 7	Low alarm	C
8	Deviation high Deviation low	
9	Deviation band	J
DC Out	puts	K
Control		Α
Н	4-20 mA heating	Е
С	4-20 mA cooling	0
J	0-20 mA heating	1
K	0-20 mA cooling	2
Retrans	mission	3
D	4-20 mA setpoint	4
Е	4-20 mA process value	Α
F	4-20 mA output	C
N	0-20 mA setpoint	5
Y Z	0-20 mA process value	6
	0-20 mA output	8
5 AAR	delay (OP4)	9
XX	Unconfigured	C
Relay, D	C, Triac or Logic Outputs	C
Control		H
Н	Heat (PID)	c
С	Cool (PID)	J
J	Heat (on/off)	K
K	Cool (on/off)	R
Alarm C		
	ed in Alarm High alarm	E
0	Low alarm	F.
2	Deviation high	N
3	Deviation low	Y
4	Deviation band	
Alarm C	Output	10
De-Ene	rgized in Alarm	×
		I -

High alarm

Low alarm Deviation high

Not fitted 10 Amps 25 Amps

50 Amps 100 <u>Amps</u>

6 CT Input Scaling

Deviation low

Deviation band

6

8

9

XX

2 5

6

	М	N
	R L	T K
	Р	S
	T U	T R
	V	R
1	A	R
	B G	R T
	ı	T
	Q	S
	9 Outp	
		U
	Relay, D Control	C,
	Н	Н
	С	С
	J K	Н
	Alarm C	
Ī	Energiz	
	0	H
	1 2	D
	3	D
	4	D
	Alarm C De-Ene	ut
	5	gi H
	6	L
	7	D
	8	D D
	DC Out	
	Control	
	Н	4
	C	0
	K	0
	Retrans	mi
	D	4
1	E F	4
	N	0
	Υ	0
	Z	0
		er I
	X T	S
	S	T
	Р	C
	R E	T
	1	1
	D	С
	C M	S
	A	L
	N	Ν
	1	

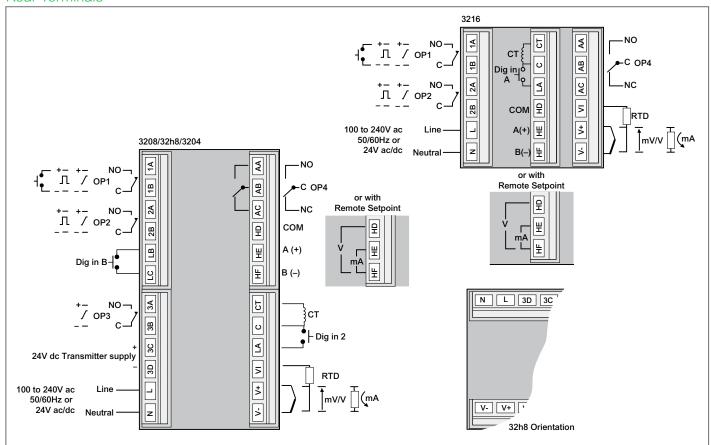
7-8 <b>Dig</b>	Input A, Dig Input B
X	Unconfigured
W	Alarm acknowledge
М	Manual select
R	Timer/Prog Run
L	Keylock
Р	Setpoint 2 select
Т	Timer/prog Reset
U	Remote SP select
V	Recipe 2/1 select
А	Remote up button
В	Remote down button
G	Time/prog Run/reset
1	Timer/prog Hold
Q	Standby select
9 Output 3 (OP3)	

-	Time/prog run/reset
1	Timer/prog Hold
Q	Standby select
0 0 1	1.0 (OD0)
	put 3 (OP3)
XX	Unconfigured
Relay,	DC, Triac or Logic Outputs
Contro	<u> </u>
Н	Heat (PID)
С	Cool (PID)
J	Heat (on/off)
K	Cool (on/off)
Alarm	Output
Energi:	zed in Alarm
0	High alarm
1	Low alarm
2	Deviation high
3	Deviation low
4	Deviation band
Alarm	Output
De-En	ergized in Alarm
5	High alarm
6	Low alarm
7	Deviation high
8	Deviation low
9	Deviation band
DC Ou	tputs
Contro	
Н	4-20 mA heating
С	4-20 mA cooling
J	0-20 mA heating
K	0-20 mA cooling
Retransmission	
D	4-20 mA setpoint
E	4-20 mA process value
F	4-20 mA output
	0-20 mA setpoint
N Y	0-20 mA process value
Z	0-20 mA output

10 Lower Display	
X	Unconfigured
Т	Setpoint
S	Target setpoint
Р	Output power %
R	Time remaining
E	Elapsed time
1	1st alarm setpoint
D	Dwell/ramp — time/target
С	SP with output meter
М	SP with ammeter
А	Load amps
Ν	None

# 3200 Series Temperature/Process Controllers Specification

#### Rear Terminals



### Mechanical Details

