invensys
Eurotherm

3200
SERIES

Temperature/Process Controllers
Manual

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. 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 iTools, a PC based configuration wizard which is an easy to use and instructive guide to all the functions in the controller.

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.

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 communications. Master Modbus in the 3200 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

iTools 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 the need for any power being connected.

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) EIA485(4 wire) on 3216 only

Process variable input

Calibration accuracy:	<±0.25% of reading ±1LSD
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:	13.5 bits
Isolation:	264Vac double insulated from PSU and communications Module code C provides full 264Vac double isolated
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 input

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
Loop update:	250ms
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, rate of change
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

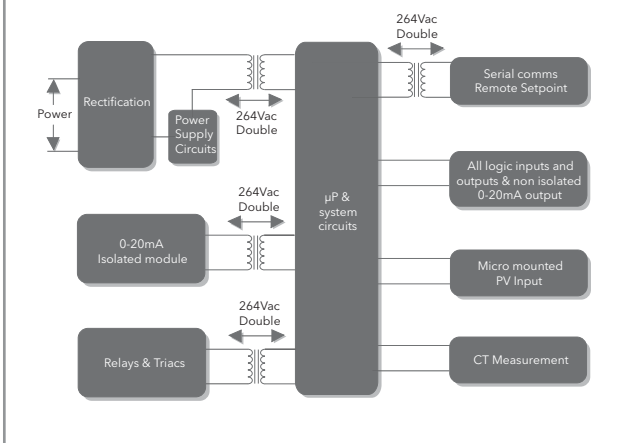|	
Number:	15 scrolling text messages
No of characters:	127 characters per message max
Languages:	English, German, French, Spanish, Italian
Selection:	Active on any parameter status using conditional command

Recipes

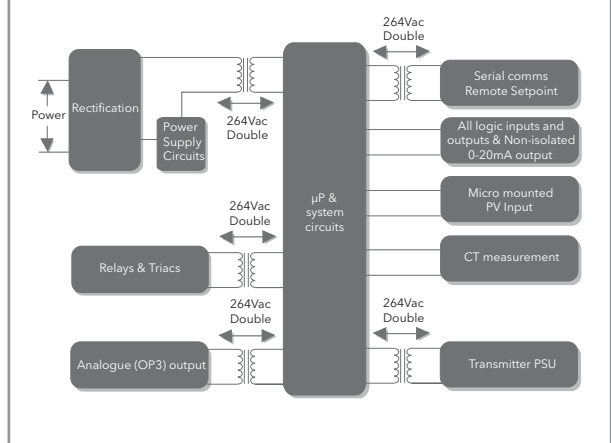|	
Number:	5 recipes with 38 parameters
Selection:	HMI interface, communications or digital IO

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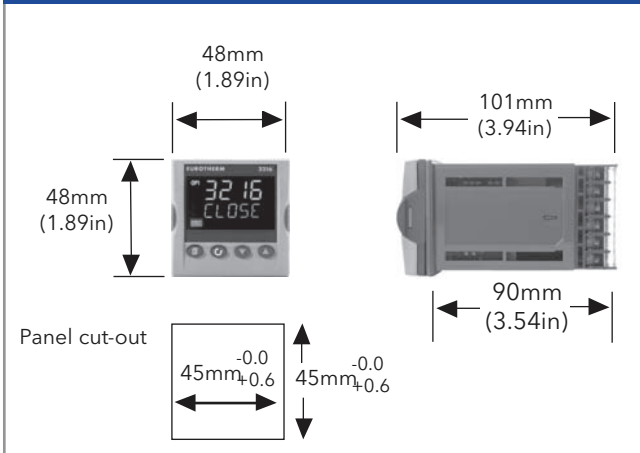(4) By using recipes five SP programs can be stored
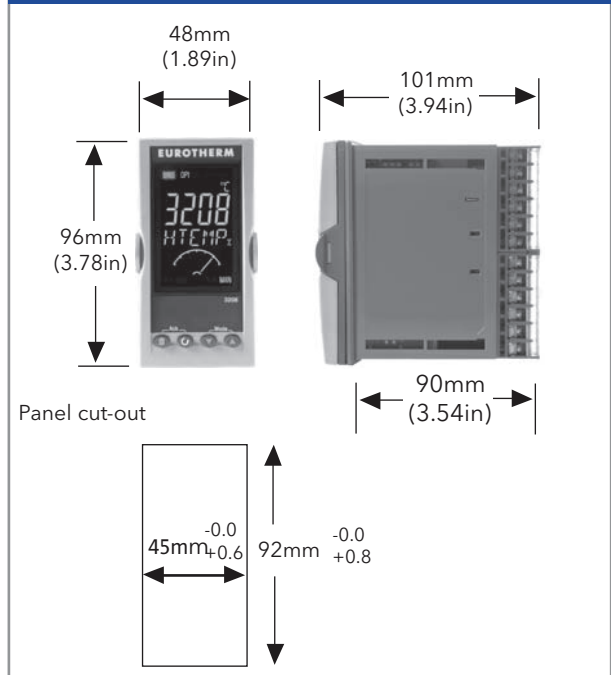
Isolation diagrams

3216

Power → Rectification → Power Supply Circuits

264Vac Double

μP & system circuits

0-20mA Isolated module

264Vac Double

Relays & Triacs

264Vac Double

264Vac Double

Serial comms Remote Setpoint

All logic inputs and outputs & non isolated 0-20mA output

Micro mounted PV Input

CT Measurement

3208/h8/04

Power → Rectification → Power Supply Circuits

264Vac Double

μP & system circuits

264Vac Double

Relays & Triacs

264Vac Double

Analogue (OP3) output

264Vac Double

264Vac Double

Serial comms Remote Setpoint

All logic inputs and outputs & Non-isolated 0-20mA output

Micro mounted PV Input

CT measurement

Transmitter PSU

Dimensional details

3216

48mm (1.89in)

48mm (1.89in)

101mm (3.94in)

90mm (3.54in)

Panel cut-out

45mm −0.0 +0.6   45mm −0.0 +0.6

3208

48mm (1.89in)

96mm (3.78in)

101mm (3.94in)

90mm (3.54in)

Panel cut-out

45mm −0.0 +0.6   92mm −0.0 +0.8

3204

96mm (3.78in)

96mm (3.78in)

101mm (3.94in)

90mm (3.54in)

Panel cut-out

92mm −0.0 +0.8   92mm −0.0 +0.8

32h8

96mm (3.78in)

101mm (3.94in)

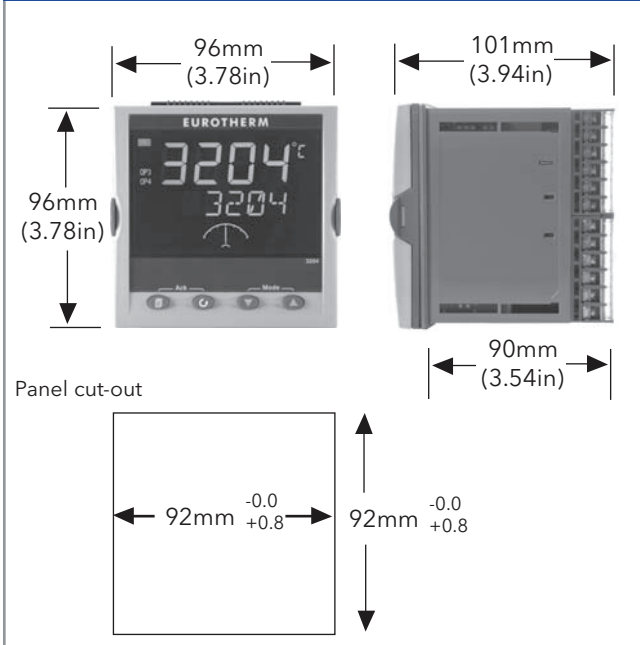48mm (1.89in)

90mm (3.54in)

Panel cut-out

92mm −0.0 +0.8   45mm −0.0 +0.6
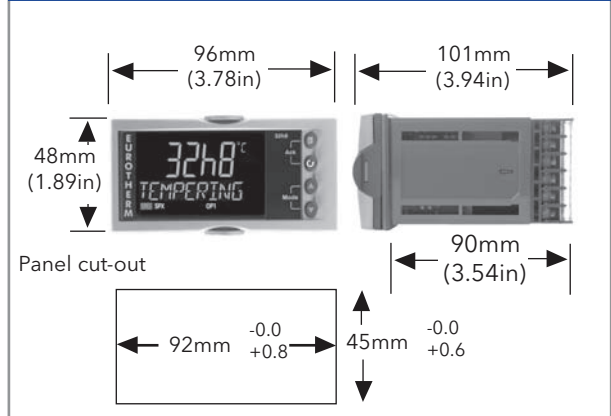
For more information on Eurotherm controllers, contact Mokon's Sales department today. Should you need technical assistance, please dial 716-876-9951 and ask for our Customer Service department. A technician is available 24/7.

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