

# 3200i

## MODELS

### Ideal for :

- Temperature measurement
- Level/pressure/flow
- Process protection
- Furnace overtemp
- Extrusion melt pressure
- Weighing platforms

### Features :

- Universal input
- Strain gauge input
- Changeover relay
- PV Retransmission
- FM/DIN 3440 Approval
- Scrolling text messages
- Parameter help text
- Recipes
- Modbus comms



## Indicators and Alarm Units Specification Sheet

Eurotherm's range of 3200i indicators offer accurate indication of temperature and process measurements. Process interlocks, including overtemperature furnace limits, are implemented using relay output channels.

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

### Universal Input

A wide range of temperature and process inputs can be selected using the front panel push buttons without the need for any hardware change. This provides easy on-site set up.

### Strain Gauge Input

Melt pressure and weigh scale inputs can be energised from an internal 10Vdc transducer supply. An automatic shunt calibration routine is provided to remove zero and span offsets. The display on the 32h8i can show a full 5 digit value.

### Process Alarms

Four internal alarm setpoints are provided. They can be used to energise up to three relay outputs, which can be latched if required. A special mode known, as 'Alarm Blocking' is available which ensures that when the unit is powered up an alarm must first enter a good state before the alarm becomes active. This is particularly useful for low alarms which can be blocked while the process is warming up.

### Custom Text Messaging

Custom messages can be created with a PC tool and downloaded to the 3200i to display when an event, alarm or process condition occurs. This provides the operator with good visibility of what is happening in the process and provides messages that they can understand and act upon.



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## Recipes

Using a PC tool recipes can be created that can be used to change the operating parameters of the 3200i simply by selecting a recipe using the 3200i push buttons. This is very useful where multiple products are processed but require different parameters to be set. It can also be used to change the set-up of an indicator therefore allowing one unit to be used as a spare for multiple applications.

## Analogue Retransmission

The measured process value can be retransmitted as either a mA or voltage signal with a selection of outputs including 4–20mA and 0–10Vdc. In the 32h8i this signal is isolated from all other electronics within the unit.

## Digital Communication

All units support both EIA232 and EIA485 communication using the Modbus protocol as a slave device. It is also possible to digitally retransmit one parameter using a Modbus broadcast to all other Modbus devices on the network.

## Configuration Adaptor

PC configuration to all 3200i indicators 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 3200i series indicators, 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 rate 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	3216i:	1/16 DIN
	3204i:	1/4 DIN
	32h8i:	1/8 DIN, horizontal
Dimensions and weight	3216i:	48W x 48H x 90D mm, 250g
	3204i:	96W x 96H x 90D mm, 420g
	32h8i:	96W x 48H x 90D mm, 350g
Panel cut-out dimensions:	3216i:	45W x 45H mm
	3204i:	92W x 92H mm
	32h8i:	92W x 45H mm

#### Operator interface

Type		LCD TN with backlight
Main PV display	3216i, 3204i:	4 digits, green
	32h8i:	5 digits, green or red
Lower display	3216i, 3204i:	5 character starburst, green
	32h8i:	9 character starburst, green
Status beacons		Units, outputs, alarms

#### Power requirements

3216i:	85 to 264Vac, -15%, +10%, 48 to 62 Hz, max 6W 24Vac, -15%, +10%. 24Vdc, -15% +20% ±5% ripple voltage max 6W
32h8i, 3204i:	85 to 264Vac, -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

#### Transmitter PSU (not 3216i)

Rating	24Vdc, 20mA
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 <sup>(1)</sup>
Sample rate	9Hz(110ms)
Isolation	264Vac double insulation from the PSU and communication
Resolution (µV)	<0.5µV with 1.6s filter (mV range) <0.25mV with 1.6s filter (Volts range)
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 (200KΩ on volts range C)
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 requires 100KΩ/806Ω external divider module
Thermocouple types	K, J, N, R, S, B, L, T, C, custom download <sup>(2)</sup>
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 100s
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

## Strain Gauge Input (32h8i)

Input type	350Ω Bridge
Connection	4 or 6 wire (6 uses internal shunt)
Calibration accuracy	+0.1% of full scale
Sample time	9hz (110ms)
Isolation	264Vac double isolation from the PSU and communications
Excitation	10Vdc +7%
Sensitivity	1.4 to 4mV/V
Input span	-27% to +127% of full scale (approx. -10mV to +5mV)
Zero balance	+ 25% of full scale
Tare	+ 25% of full scale
Resolution (mV)	0.3mV/V(typical) with 1.6s filter
Resolution (effective bits)	14.3 bits
Drift with temperature	<100ppm/°C of full scale
Common mode rejection	48-62Hz, >-120db
Series mode rejection	48-62Hz, >-60db
Input filter	Off to 100s

## AA Relay

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

## Digital Input A/B (B not on 3216i, A not on 32h8i/SG)

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, keylock, alarm inhibit, freeze display, tare, auto zero, peak reset

## Logic I/O Module (3216i only)

<b>Output</b>	
Rating	ON 12Vdc@<44mA, OFF <300mV@100µA
Isolation	None from PV or system. 264Vac double insulated from PSU and communications
Functions	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, keylock, alarm inhibit, freeze display, tare, auto zero, peak reset
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## Relay Output Channels

Type	3216i: Form A (normally open) 32h8i, 3204i: Form C (changeover)
Rating	Min 100mA@12vdc, max 2A@264Vac resistive
Functions	Alarms, events

## Analogue Output

<b>OP1, OP2 (3216i only)</b>	
Rating	0-20mA into <500Ω
Accuracy	±(<0.5% of Reading + <100µA)
Resolution	11.5 bits
Isolation	None from PV or system. 264Vac double insulated from PSU and communications
Functions	Retransmission
<b>OP 3 (not on 3216i)</b>	
Isolation	264Vac double insulated
Functions	Retransmission
Current Output	
Rating	0-20mA into <500Ω
Accuracy	±(<0.25% of Reading + <50µA)
Resolution	13.6 bits
Voltage Output	
Rating	0-10V into >500Ω
Accuracy	±(<0.25% of Reading +<25mV)
Resolution	13.6 bits

## Software Features

<b>Alarms</b>	
Number	4
Type	Absolute high & low, Rate of change (rising or falling)
Latching	Auto or manual latching, non-latching, event only
Output assignment	Up to four conditions can be assigned to one output
<b>Other Status Outputs</b>	
Functions	Including sensor break, power fail, new alarm
Output assignment	Up to four conditions can be assigned to one output
<b>Custom Messages</b>	
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 19 parameters
Selection	HMI interface, communications or digital IO

## Transducer Calibration

Calibration types	Shunt, load cell, comparison
Other features	Auto-zero, tare

## Other Features

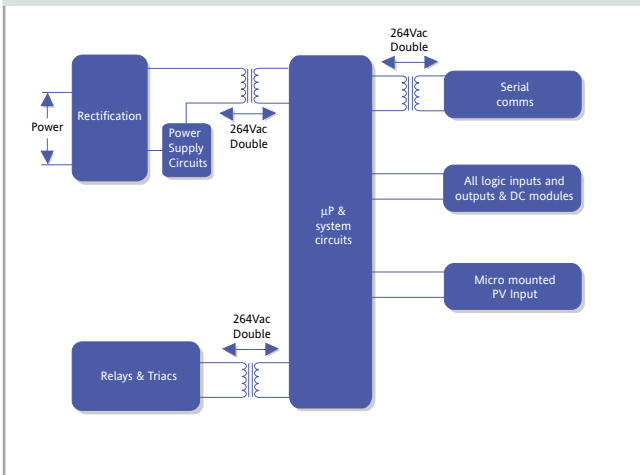
Display Colour (32h8i)	Upper display selectable green or red or change on alarm
Scrolling text	Parameter help, custom messages
Display filter	Off to zero last 2 digits
Peak monitor	Stores high and low values

## FM/DIN 3440 (approval applied for)

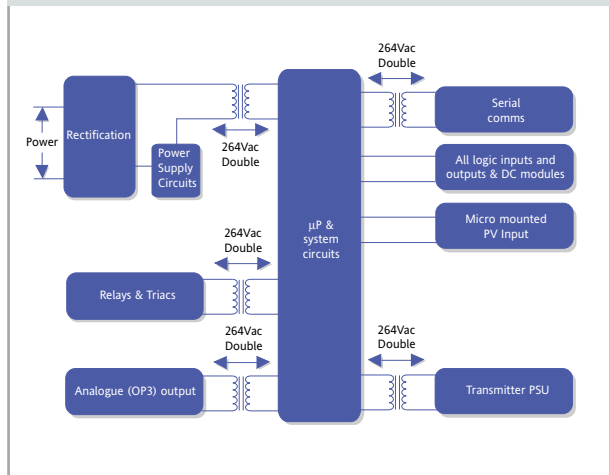
Alarm 1 configuration	Absolute hi or lo, de-energised in alarm Latching output on Form C (AA) Relay All alarms active on sensor break and power fail
Alarm setpoint	Adjustment protection via password
Configuration security	FM/DIN 3440 option prevents reconfiguration of alarm config

## ISOLATION DIAGRAMS

### 3216i

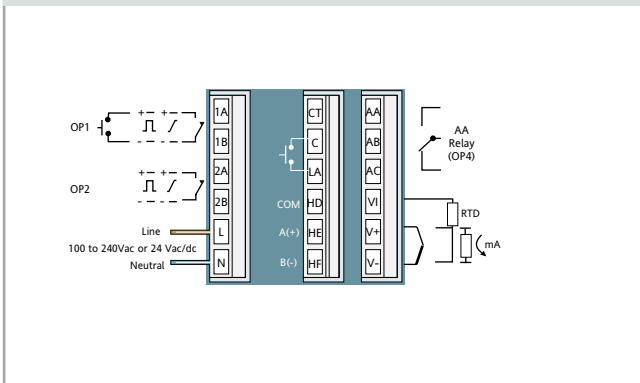


### 32h8i/04i

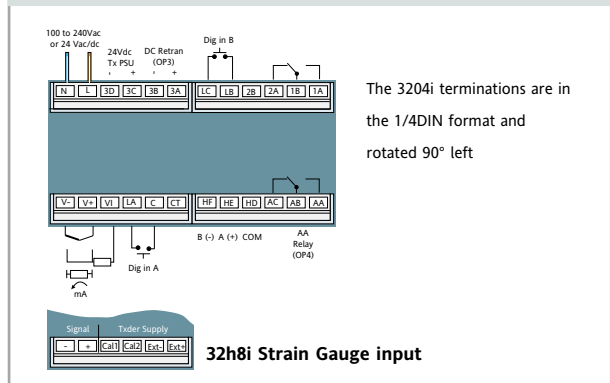


## ISOLATION DIAGRAMS

### 3216i



### 32h8i/3204i



## ORDERING CODE

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

Model Number	Power Supply	AA Relay	Fascia Colour	Warranty
3216i 1/16 DIN unit 32h8i 1/8 DIN horizontal unit 3204i 1/4 DIN unit	VH 85-264Vac VL 20-29Vac/dc	R Changeover Relay	G Green S Silver	XXXXX Standard WL005 Extended
Function	Outputs (OP1, OP2, OP3)	Options	Product Language	Calibration Certificates
AL Standard Unit FM FM Alarm Unit DN DIN 3440 Alarm Unit SG Strain Gauge Input (32h8i only)	3216i OP1 OP2 LRXX Logic Relay RRXX Relay Relay LDXX Logic Analogue DRXX Analogue Relay 32h8i/3204i OP1 OP3 RXXX Relay None RXDX Relay Analogue	XXX Not fitted XXL Digital input A 2XL RS232 plus digital input A 4XL RS485 plus digital Dig in A	ENG English FRA French GER German SPA Spanish ITA Italian	XXXXX None CERT1 Certificate of Conformity CERT2 5 Point Factory Calibration
			Manual Language	Custom Label
			ENG English FRA French GER German SPA Spanish ITA Italian	XXXXX None
			Input Adaptor	Specials and Accessories
			XX None V1 0-10Vdc A1 mA burden resistor (2.49R, 0.1%)	XXXXX None RES250 250R resistor for 0-5Vdc OP RES500 500R resistor for 0-10Vdc OP

### Example (order code)

32h8i/SG/VH/RXDX/R/4XL/S/ENG/ENG/XX/XXXXX/XXXXX/XXXXX/XXXXX

This code describes a Silver fascia 1/8 DIN strain gauge indicator with two relays and one analogue output. 85-264Vac supply. RS485 communications. English language product and manuals.

**OPTIONAL QUICK START CODE**

Input Type	Display Limits	Decimal Point	PV Colour	Home Display	Range Low	Range High	OP1	OP2, OP3	OP4 (AA Relay)	Dig in A	Dig in B
			32h8i only							Not 32h8i/SG	

Input Type	
Thermocouple	
<b>B</b> Type B	
<b>J</b> Type J	
<b>K</b> Type K	
<b>L</b> Type L	
<b>N</b> Type N	
<b>R</b> Type R	
<b>S</b> Type S	
<b>T</b> Type T	
<b>C</b> Custom/Type C	
RTD	
<b>P</b> Pt100	
Linear	
<b>M</b> 0-80mV	
<b>2</b> 0-20mA	
<b>4</b> 4-20mA	
32h8i only	
<b>0</b> 0-10Vdc	
<b>1</b> 1-5Vdc	
<b>3</b> 2-10V	
<b>6</b> 0-5V	
Strain Gauge	
<b>G</b>	

Display Limits	
<b>X</b> None	
<b>C</b> Deg C full range	
<b>F</b> Deg F full range	
<b>K</b> Kelvin	
<b>P</b> Percentage	
32h8i only	
Pressure	
<b>0</b> Pa	<b>B</b> L-H
<b>1</b> mPa	<b>D</b> L-m
<b>2</b> Kpa	General
<b>3</b> Bar	<b>E</b> %RH
<b>4</b> mBar	<b>G</b> %O2
<b>5</b> PSI	<b>H</b> %CO2
<b>6</b> Kg/cm <sup>2</sup>	<b>J</b> %CP
<b>7</b> mmWG	<b>L</b> V
<b>8</b> inWG	<b>M</b> Amps
<b>9</b> mmHG	<b>R</b> mA
<b>A</b> Torr	<b>T</b> MV
	<b>U</b> Ohm
	<b>W</b> ppm
	<b>Y</b> RPM
	<b>Z</b> m-s

Decimal Point	
<b>0</b> nnnnn	
<b>1</b> nnnn.n	
<b>2</b> nnn.nn	
<b>3</b> nn.nnn	} Only on 32h8i
<b>4</b> n.nnnn	

PV Colour (32h8i only)	
<b>X</b> Not applicable	
<b>G</b> Green	
<b>R</b> Red	
<b>C</b> Change on any alarm. Green to Red	

Home Display	
<b>N</b> PV only	
<b>A</b> First Alarm SP only	
<b>1</b> PV + Alarm SP	
<b>2</b> PV + Alarm SP (read only)	

Range Low	
Enter value	

Range High	
Enter value	

OP1	
<b>X</b> Unconfigured	3216i only
<b>H</b> High Alarm	Analogue Output
<b>L</b> Low Alarm	PV Retransmission
<b>R</b> Rising Rate of Change	<b>1</b> 4-20mA
<b>N</b> New Alarm	<b>2</b> 0-20mA
<b>O</b> Sensor Break	Digital Input
<b>P</b> Power Fail	Logic Input
Combined with Sensor Break	<b>W</b> Alarm
<b>7</b> High Alarm	<b>K</b> Acknowledge
<b>8</b> Low Alarm	<b>U</b> Remote UP Button
<b>9</b> Rising Rate of Change	<b>D</b> Remote DOWN button
Combined with Power Fail	<b>J</b> Alarm Inhibit
<b>A</b> High Alarm	<b>M</b> Peak Reset
<b>B</b> Low Alarm	<b>Y</b> Freeze
<b>C</b> Rising Rate of Change	<b>V</b> Displayed PV
Combined with Sensor Break and Power Fail	Recipe 1/2 Select
<b>E</b> High Alarm	
<b>F</b> Low Alarm	
<b>G</b> Rising Rate of Change	

OP2 (3216i), OP3 (32h8i, 3204i)	
<b>X</b> Unconfigured	
Analogue Output	
PV Retransmission	
<b>1</b> 4-20mA	
<b>2</b> 0-20mA	
32h8i/04i only	
<b>3</b> 0-5Vdc	
<b>4</b> 1-5Vdc	
<b>5</b> 0-10Vdc	
<b>6</b> 2-10Vdc	
3216i only	
Relay or Logic Output (Alarm 2)	Combined with Power Fail
<b>A</b> High Alarm	<b>A</b> High Alarm
<b>B</b> Low Alarm	<b>B</b> Low Alarm
<b>C</b> Rising Rate of Change	<b>C</b> Rising Rate of Change
<b>H</b> High Alarm	Combined with Sensor Break and Power Fail
<b>L</b> Low Alarm	<b>E</b> High Alarm
<b>R</b> Rising Rate of Change	<b>F</b> Low Alarm
<b>N</b> New Alarm	<b>G</b> Rising Rate of Change
<b>O</b> Sensor Break	
<b>P</b> Power Fail	
Combined with Sensor Break	
<b>7</b> High Alarm	
<b>8</b> Low Alarm	
<b>9</b> Rising Rate of Change	

OP4 (AA Relay)	
<b>X</b> Unconfigured	
<b>H</b> High Alarm	
<b>L</b> Low Alarm	
<b>R</b> Rising Rate of Change	
<b>N</b> New Alarm	
<b>O</b> Sensor Break	
<b>P</b> Power Fail	
Combined with Sensor Break	
<b>7</b> High Alarm	
<b>8</b> Low Alarm	
<b>9</b> Rising Rate of Change	
Combined with Power Fail	
<b>A</b> High Alarm	
<b>B</b> Low Alarm	
<b>C</b> Rising Rate of Change	
Combined with Sensor Break and Power Fail	
<b>E</b> High Alarm	
<b>F</b> Low Alarm	
<b>G</b> Rising Rate of Change	

Digital Input (Not 32h8i/SG)	
<b>X</b> Unconfigured	
<b>W</b> Alarm	
<b>K</b> Acknowledge	
<b>U</b> Remote UP Button	
<b>D</b> Remote DOWN button	
<b>J</b> Alarm Inhibit	
<b>M</b> Peak Reset	
<b>Y</b> Freeze	
<b>V</b> Displayed PV	
Recipe 1/2 Select	

Digital Input B	
<b>X</b> Unconfigured	
<b>W</b> Alarm	
<b>K</b> Acknowledge	
<b>U</b> Remote UP Button	
<b>D</b> Remote DOWN button	
<b>J</b> Alarm Inhibit	
<b>M</b> Peak Reset	
<b>Y</b> Freeze	
<b>V</b> Displayed PV	
Recipe 1/2 Select	
32h8i Strain Gauge	
<b>T</b> Tare correction	
<b>Z</b> Auto shunt (melt pressure) Calibration	

**Example (Quick Start)**

**G/5/0/R/N/0/5000/H/5/H/X/Z**

*This code configures the hardware example as a strain gauge input ranged 0-5000 PSI with two high alarm relay outputs. 0-10Vdc retransmission of PV. Digital input for auto-shunt calibration*

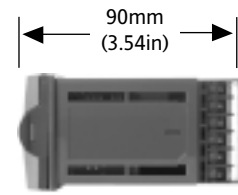
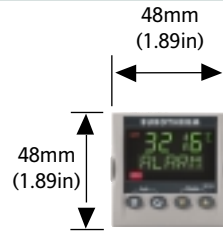
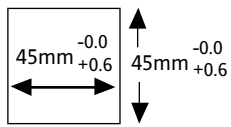
**3200i ACCESSORIES**

User guide	HA029005
Engineering manual	HA029006
2.49R Precision resistor	SUB35/ACCESS/249R.1
Configuration clip	iTools/None/3000CK
0-10V input adaptor	SUB21/IV10

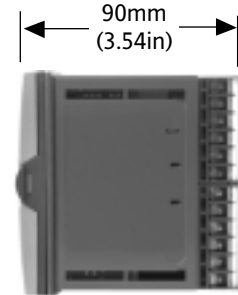
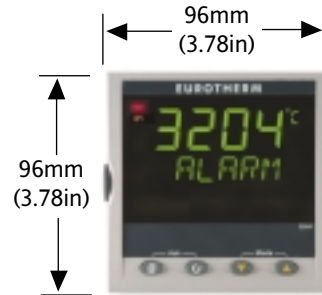
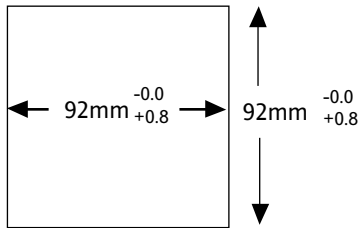
## DIMENSIONAL DETAILS

**3216i**

Panel cut-out



**3204i**



**32h8i**

