# 3200i SERIES

# Indicators and Alarm Units
## Specification Sheet

- Universal input
- Strain gauge input
- Changeover relay
- PV Retransmission
- FM/EN14597 TW Approval
- Scrolling text messages
- Parameter help text
- Recipes
- Modbus comms
- Multi-language support (French, German, Spanish and Italian)

The Eurotherm 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 iTools, 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 iTools 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.

### Recipes
iTools 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 a 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 0-10V dc. 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.
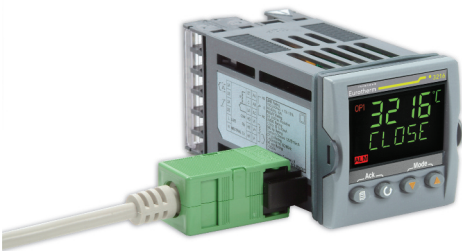
### iTools wizard
Used to simplify the set up of 3200i series indicators, the wizard guides the user through the configuration process with interactive help and graphical demonstrations of features.
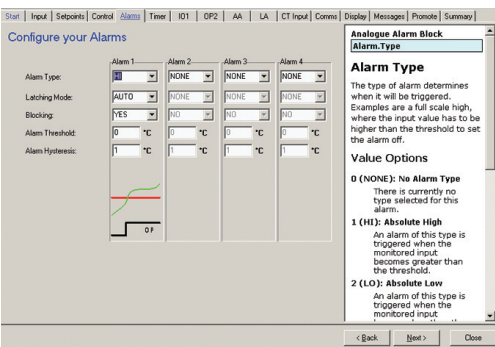
## Specification

### 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
| | | | |
|---|---|---|---|
| Dimensions | 3216i: | 48W x 48H x 90D mm | |
| | 3204i: | 96W x 96H x 90D mm | |
| | 32h8i: | 96W x 48H x 90D mm | |
| Weight | 3216i: | 250g | |
| | 3204i: | 420g | |
| | 32h8i: | 350g | |
| Panel | | Mounting | Cut out dimensions |
| | 3216i: | 1/16 DIN | 45W x 45H mm |
| | 3204i: | 1/4 DIN | 92W x 92H mm |
| | 32h8i: | 1/8 DIN, horizontal | 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: | 100 to 230Vac, ±15%, 48 to 62 Hz, max 6W |
| | 24Vac, -15%, +10%. |
| | 24Vdc, -15% +20%  ±5% ripple voltage max 6W |
| 32h8i, 3204i: | 100 to 230Vac, ±15%, 48 to 62 Hz, max 8W |
| | 24Vac, -15%, +10%. |
| | 24Vdc -15% +20%  ±5% ripple voltage max 8W |

#### Approvals
CE, cUL listed (file E57766), Gost, FM, EN14597 TW approval number TW1222

#### Transmitter PSU (not 3216i)
| | |
|---|---|
| Rating: | 24V dc, 20mA |
| Isolation: | 264V ac double insulated |

### Communications

#### Serial communications option
| | |
|---|---|
| Protocol: | Modbus RTU slave |
| | Modbus RTU Master broadcast (1 parameter) |
| Isolation: | 264V ac, double insulated |
| Transmission standard: | EIA232 or EIA485 (2 wire) |

## Process variable input

| | |
|---|---|
| Calibration accuracy: | <±0.25% of reading ±1LSD (Note 1) |
| Sample rate: | 10Hz(100ms) |
| Isolation: | 264V ac 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 (not 32h8i) |
| Thermocouple types: | K, J, N, R, S, B, L, T, C, custom download (Note 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 100s |
| Zero offset: | User adjustable over full range |
| User calibration: | 2-point gain & offset |

## 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: | 10Hz (100ms) |
| Isolation: | 264V ac 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@12V dc, max 2A@264V ac resistive |
| Functions: | Alarms, events |

## Digital input A/B

| | |
|---|---|
| Contact closure: | Open >600Ω, closed <300Ω |
| Input current: | <13mA |
| Isolation: | None from PV or system 264V ac 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)

### Output

| | |
|---|---|
| Rating: | ON 12Vcdc@<44mA, OFF <300mV@100µA |
| Isolation: | None from PV or system 264V ac double insulated from PSU and communications |
| Functions: | Alarms, events |

### Digital input

| | |
|---|---|
| Contact closure: | Open >500Ω, closed <150Ω |
| Isolation: | None from PV or system 264V ac double insulated from PSU and communications |
| Functions: | Includes alarm acknowledge, keylock, alarm inhibit, freeze display, tare, auto zero, peak reset |

## Relay output channels

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

## Analogue output

### OP1, OP2 (3216i only)

| | |
|---|---|
| Rating: | 0-20mA into <500Ω |
| Accuracy: | ± (<0.5% of Reading + <100µA) |
| Resolution: | 11.5 bits |
| Isolation: | None from PV or system 264V ac double insulated from PSU and communications |
| Functions: | Retransmission |

### OP 3 (not on 3216i)

| | |
|---|---|
| Isolation: | 264V ac double insulated |
| Functions: | Retransmission |

### Current Output

| | |
|---|---|
| Rating: | 0-20mA into <500Ω |
| Accuracy: | ±(<0.25% of Reading + <50µA) |
| Resolution: | 13.6 bits |

### Voltage Output (not on 3204i)

| | |
|---|---|
| Rating: | 0-10V into >500Ω |
| Accuracy: | ±(<0.25% of Reading +<25mV) |
| Resolution: | 13.6 bits |

## Software features

### Alarms

| | |
|---|---|
| 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 |

### Other status outputs

| | |
|---|---|
| Functions: | Including sensor break, power fail, new alarm, pre-alarm |
| Output assignment: | Up to four conditions can be assigned to one output |

### 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 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/EN14597 TW

| | |
|---|---|
| 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/EN14597 TW option prevents reconfiguration of alarm config |

### 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.

# Order codes

## Hardware/options coding

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|---|---|---|---|---|---|---|---|---|---|----|----|----|----|
| | | | | | | | | | | | | | |

### Basic Product

| | |
|---|---|
| 3216i | 48 x 48mm unit |
| 32h8i | 96 x 48mm horizontal unit |
| 3204i | 96 x 96mm unit |

### 1 Function

| | |
|---|---|
| AL | Standard alarm unit |
| FM | FM alarm unit |
| DN | EN14597TW alarm unit |
| SG | 32h8i Strain Gauge input |

### 2 Supply Voltage

| | |
|---|---|
| VH | 85-264V ac |
| VL | 24V ac or dc |

### 3 Outputs

**3216i**

| | OP1 | OP2 |
|---|---|---|
| LRXX | Logic | Relay |
| RRXX | Relay | Relay |
| LDXX | Logic | 0-20mA |
| DDXX | 0-20mA | 0-20mA |
| DRXX | Analogue | Relay |
| RXXX | Relay | None |

**32h8i/3204i**

| | OP1 | OP2 | OP3 |
|---|---|---|---|
| RXXX | Relay | | |
| RXDX | Relay | | Isolated 0-20mA |

### 4 AA Relay (OP4)

| | |
|---|---|
| X | Disabled |
| R | Changeover Relay |

### 5 Options Board

**3216i**

| | |
|---|---|
| XXX | None |
| XXL | Digital input A |
| 2XL | RS232 and Digital input A |
| 4XL | RS2485 and Digital input A |

**32h8i/3204i**

| | |
|---|---|
| XXX | None |
| XXL | Digital input A |
| 2XL | RS232 and Digital input A |
| 4XL | RS2485 and Digital input A |

**32h8i/SG Options**

| | |
|---|---|
| XXX | None |
| 2XX | RS232 |
| 4XX | RS2485 |

### 6 Fascia Colour

| | |
|---|---|
| G | Green |
| S | Silver |

### 7 Product Language

| | |
|---|---|
| ENG | English |
| FRA | French |
| GER | German |
| SPA | Spanish |
| ITA | Italian |

### 8 Manual Language

| | |
|---|---|
| ENG | English |
| FRA | French |
| GER | German |
| SPA | Spanish |
| ITA | Italian |

### 9 Input Adaptor

| | |
|---|---|
| XX | None |
| V1 | 0-10V dc |
| A1 | mA burden resistor (2.49R, 0.1%) |

### 10 Warranty

| | |
|---|---|
| XXXXX | Standard |
| WL005 | Extended |

### 11 Certificates

| | |
|---|---|
| XXXXX | None |
| CERT1 | Certificate of Conformity |
| CERT2 | Factory Calibration Certificate |

### 12 Custom Label

| | |
|---|---|
| XXXXX | None |

### 13 Specials and Accessories

| | |
|---|---|
| XXXXX | None |
| RES250 | 250R resistor for 0-5V dc OP |
| RES500 | 500R resistor for 0-10V dc OP |

## 3200i Accessories

| | |
|---|---|
| HA029005 | User guide |
| HA027986 | Engineering manual |
| SUB35/ACCESS/249R.1 | 2.49R Precision resistor |
| iTools/None/3000CK | Configuration clip |
| SUB21/IV10 | 0-10V input adaptor |
| SUB32/SNUBBER | RC Snubber |

### 32h8i/3204i Isolation



### 3216i Isolation
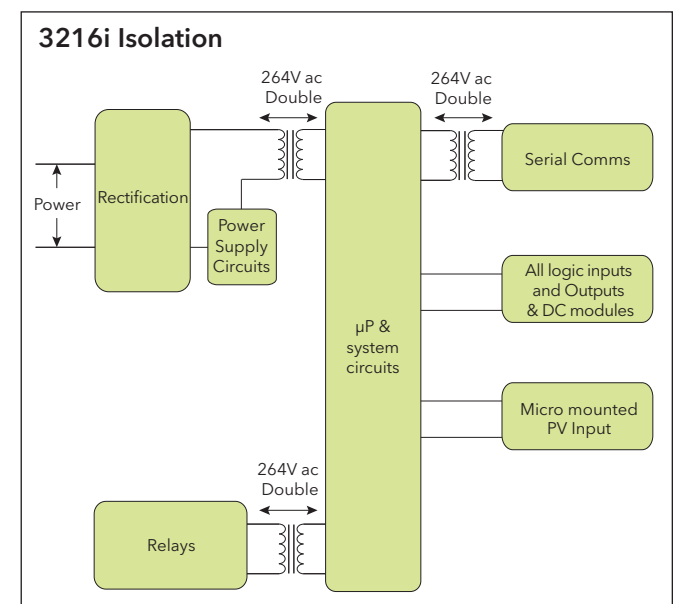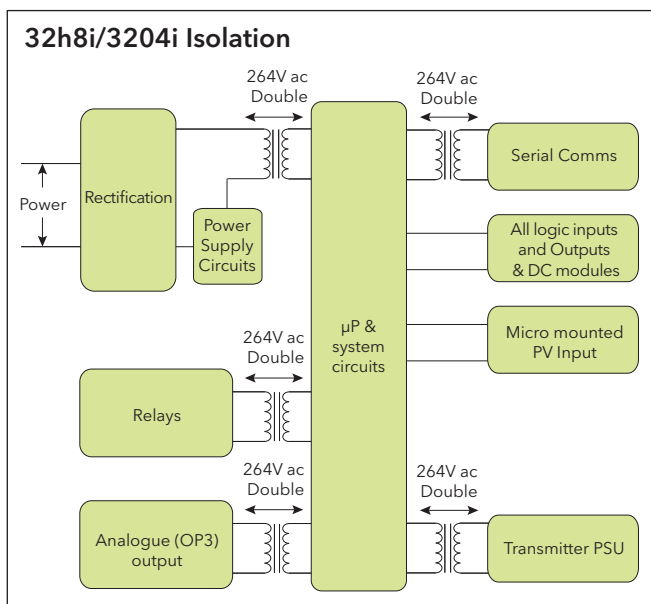
## Optional quick start code (Optional)

| 1 | 2 | 3 | 4 (32h8i only) | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|

### 1   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 |

**32h8i only**

**Linear**

| | |
|---|---|
| 0 | 0-10V dc |
| 1 | 1-5V dc |
| 3 | 2-10V |
| 6 | 0-5V |

**Strain Gauge**

| | |
|---|---|
| G | Strain guage |

### 2   Display Units

| | |
|---|---|
| X | None |
| C | Centigrade |
| F | Fahrenheit |
| K | Kelvin |
| P | Percentage |

**32h8i only**

**Pressure**

| | |
|---|---|
| 0 | Pa |
| 1 | mPa |
| 2 | Kpa |
| 3 | Bar |
| 4 | mBar |
| 5 | PSI |
| 6 | Kg/cm$^2$ |
| 7 | mmWG |
| 8 | inWG |
| 9 | mmHG |
| A | Torr |

**Flow Rate**

| | |
|---|---|
| B | L-H |
| D | L-m |

**General**

| | |
|---|---|
| E | %RH |
| G | %O2 |
| H | %CO2 |
| J | %CP |
| L | V |
| M | Amps |
| R | mA |
| T | MV |
| U | Ohm |
| W | ppm |
| Y | RPM |
| Z | m-s |

### 3   Decimal point

| | |
|---|---|
| 0 | nnnnn |
| 1 | nnnn.n |
| 2 | nnn.nn |
| 3 | nn.nnn |
| 4 | n.nnnn |

### 4   PV Colour (32h8i only)

| | |
|---|---|
| X | Not applicable |
| G | Green |
| R | Red |
| C | Change on any alarm. Green to Red |

### 5   Home Display

| | |
|---|---|
| N | PV only |
| A | First Alarm SP only |
| 1 | PV + Alarm SP |
| 2 | PV + Alarm SP (read only) |

### 6   Range Low

Enter Value
(Limited by decimal point position)

### 7   Range High

Enter Value
(Limited by decimal point position)

### 8   OP1

| | |
|---|---|
| X | Unconfigured |

**Relay, Triac or Logic outputs**

**Alarm 1**

| | |
|---|---|
| H | High Alarm |
| L | Low Alarm |
| R | Rising Rate of Change |
| N | New Alarm |
| O | Sensor Break |
| P | Power Fail |

**Combined with Sensor Break**

| | |
|---|---|
| 7 | High Alarm |
| 8 | Low Alarm |
| 9 | Rising Rate of Change |

**Combined with Power Fail**

| | |
|---|---|
| A | High Alarm |
| B | Low Alarm |
| C | Rising Rate of Change |

**Combined with Sensor Break and Power Fail**

| | |
|---|---|
| E | High Alarm |
| F | Low Alarm |
| G | Rising Rate of Change |

**Digital input (3216i only)**

**Logic input**

| | |
|---|---|
| W | Alarm Acknowledge |
| K | Keylock |
| U | Remote UP Button |
| D | Remote DOWN button |
| J | Alarm Inhibit |
| M | Peak Reset |
| Y | Freeze Displayed PV |
| V | Recipe 1/2 Select |

### 9   OP2 (3216i)/ OP3 (32h8i, 3204i)

| | |
|---|---|
| X | Unconfigured |

**Analogue outputs**

**PV Retransmission**

| | |
|---|---|
| 1 | 4-20mA |
| 2 | 0-20mA |
| 3 | 0-5V dc |
| 4 | 1-5V dc |
| 5 | 0-10V dc |
| 6 | 2-10V dc |

**Relay or Logic output**

**Alarm 2 (3216i only)**

| | |
|---|---|
| H | High Alarm |
| L | Low Alarm |
| R | Rising Rate of Change |
| N | New Alarm |
| O | Sensor Break |
| P | Power Fail |

**Combined with Sensor Break**

| | |
|---|---|
| 7 | High Alarm |
| 8 | Low Alarm |
| 9 | Rising Rate of Chang |

**Combined with Power Fail**

| | |
|---|---|
| A | High Alarm |
| B | Low Alarm |
| C | Rising Rate of Change |

**Combined with Sensor Break and Power Fail**

| | |
|---|---|
| E | High Alarm |
| F | Low Alarm |
| G | Rising Rate of Change |

### 10   OP4 (AA Relay)

| | |
|---|---|
| X | Unconfigured |

**Alarm 4**

**PV Retransmission**

| | |
|---|---|
| H | High Alarm |
| L | Low Alarm |
| R | Rising Rate of Change |
| N | New Alarm |
| O | Sensor Break |
| P | Power Fail |

**Combined with Sensor Break**

| | |
|---|---|
| 7 | High Alarm |
| 8 | Low Alarm |
| 9 | Rising Rate of Chang |

**Combined with Power Fail**

| | |
|---|---|
| A | High Alarm |
| B | Low Alarm |
| C | Rising Rate of Change |

**Combined with Sensor Break and Power Fail**

| | |
|---|---|
| E | High Alarm |
| F | Low Alarm |
| G | Rising Rate of Change |

### 11   Digital Input A

| | |
|---|---|
| X | Unconfigured |
| W | Alarm Acknowledge |
| K | Keylock |
| U | Remote UP Button |
| D | Remote DOWN button |
| J | Alarm Inhibit |
| M | Peak Reset |
| Y | Freeze Displayed PV |
| V | Recipe 1/2 Select |

### 12   Digital Input B

| | |
|---|---|
| X | Unconfigured |
| W | Alarm Acknowledge |
| K | Keylock |
| U | Remote UP Button |
| D | Remote DOWN button |
| J | Alarm Inhibit |
| M | Peak Reset |
| Y | Freeze Displayed PV |
| V | Recipe 1/2 Select |

**32h8i Strain Gauge**

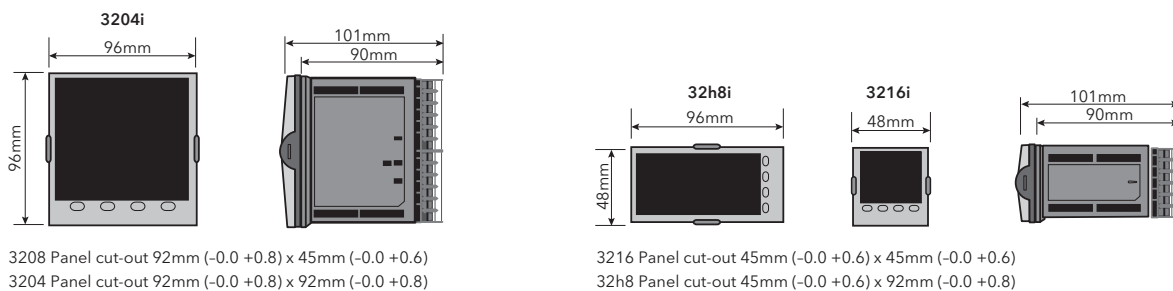| | |
|---|---|
| T | Tare correction |
| Z | Auto shunt (melt pressure) Calibration |

### Notes

1. Range low and range high values must be entered. These two values will scale the range of linear inputs and the low and high setpoint limits for all input types. By default all alarm outputs will be latched, energised in alarm manual resetting. This gives conformation to EN14597TW and FM.

2. Digital input B is always fitted in the 32h8i and 3204i. It is not available in 3216i.

## Rear Terminals

### 3216i



### 32h8i/3204i



### 32h8i Orientation
### Strain Guage Input



## Mechanical Details

### 3204i



3208 Panel cut-out 92mm (–0.0 +0.8) x 45mm (–0.0 +0.6)
3204 Panel cut-out 92mm (–0.0 +0.8) x 92mm (–0.0 +0.8)

### 32h8i    3216i



3216 Panel cut-out 45mm (–0.0 +0.6) x 45mm (–0.0 +0.6)
32h8 Panel cut-out 45mm (–0.0 +0.6) x 92mm (–0.0 +0.8)
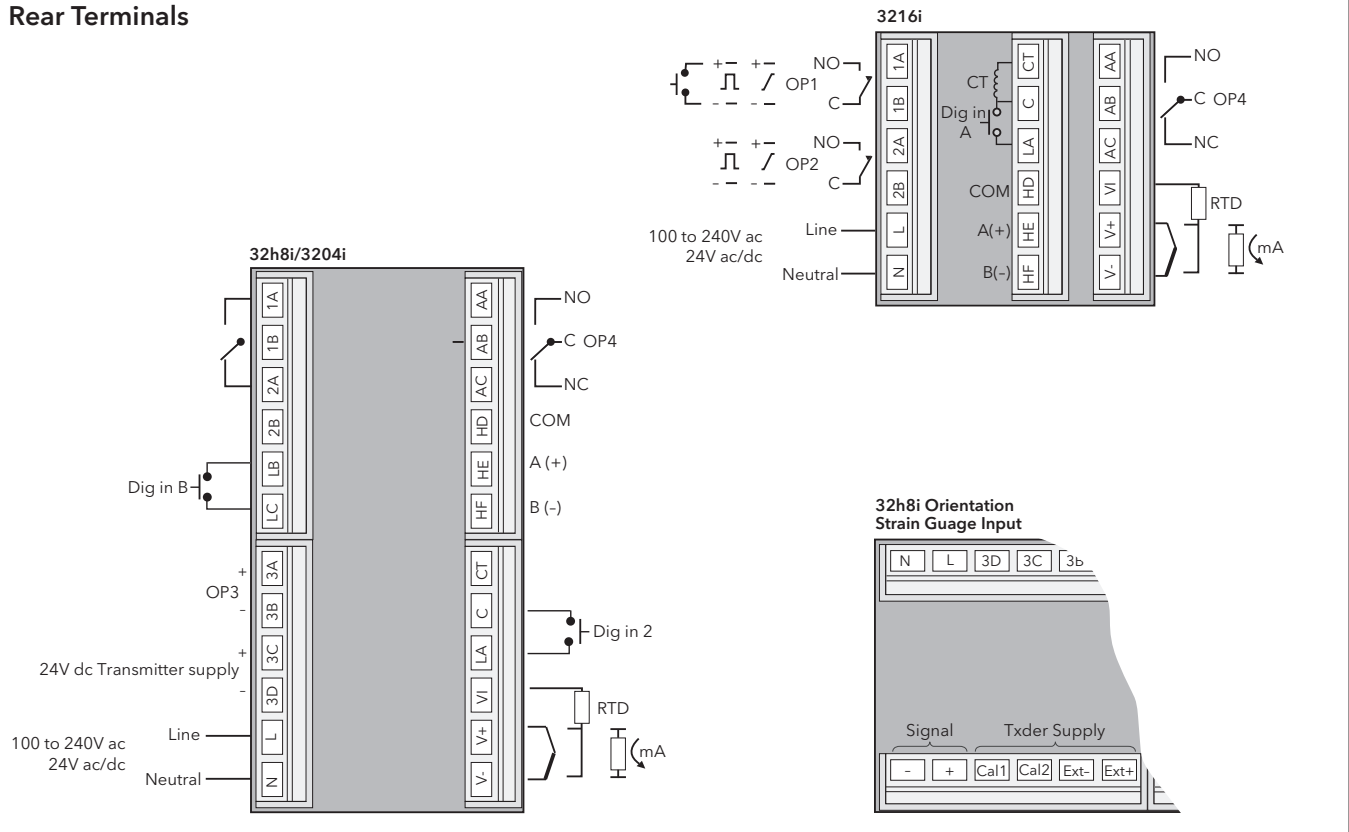
## Eurotherm: International sales and support        www.eurotherm.com

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