2132\textit{i} and 2116\textit{i}

Temperature and Process Indicator and Alarm Units

Installing and Operating Instructions

Thank you for choosing the 2132\textit{i} or 2116\textit{i} indicator and alarm unit. It will provide accurate measurement and display of temperature and other process variables with up to two alarm outputs for operator alert and process protection.

Models 2132\textit{i}/AL and 2116\textit{i}/AL are \textit{indicating alarm units} which come with an alarm relay output and logic I/O fitted. Models 2132\textit{i}/ND and 2116\textit{i}/ND are \textit{indicator only units} which come without the alarm relay output or logic I/O fitted. Alarms can still be configured and flashed as messages in the main display but they will not be able to operate a physical output.

The indicator is supplied configured according to the ordering code given on page 5. Check the coding on the side labels to determine the configuration of your particular indicator.

\begin{itemize}
  \item This indicator meets the European directives on safety and EMC.
\end{itemize}

To install the indicator

Please read the safety information on pages 5 & 6 before proceeding.
1. Prepare the panel cut-out to the size shown.
2. Insert the indicator through the cut-out.
3. Spring the panel retaining clips into place. Secure the indicator in position by holding it level and pushing both retaining clips forward.
4. Peel off the protective cover from the display

Unplugging the indicator

The indicator can be unplugged from its sleeve by easing the latching ears outwards and pulling it forward out of the sleeve. When plugging the indicator back into its sleeve, ensure that the latching ears click into place to maintain the IP65 sealing.

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**DIMENSIONS AND INSTALLATION**

**Model 2132\textit{i}**

![Model 2132\textit{i} dimenstions and layout diagram]

**Model 2116\textit{i}**

![Model 2116\textit{i} dimenstions and layout diagram]

**ELECTRICAL CONNECTIONS**

**Model 2132\textit{i}**

![Model 2132\textit{i} electrical connections diagram]

**Model 2116\textit{i}**

![Model 2116\textit{i} electrical connections diagram]

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*Not fitted in indicator only units. Also terminals 1A and 1B not fitted in indicator only unit.*
**OPERATION**

Switch on the indicator. Following a 3 second self-test sequence, you will see the display shown below. It is called the HOME display.

```
Output 1 ➔ OP1 ➔ OP2
Output 2 ➔
```

The process value (PV)*

* See HOME display options for other possibilities

**ALARM INDICATION**

The indicator has three internal ‘soft’ alarm setpoints which can be attached to either the logic or relay outputs.

- **OP1** will flash when an alarm attached to the logic output becomes true. (This is normally alarm 1). It will go steady when the alarm is acknowledged but still true.

- **OP2** will flash when an alarm attached to the relay output becomes true. (This is normally alarm 2 or 3). It will go steady when the alarm is acknowledged but still true.

**TO ACKNOWLEDGE A NEW ALARM**

Press ≫ and ≫ together. This will also reset any latched alarms that are no longer true.

In addition to the OP beacons, alarm messages are flashed in the main display. The tables below list all of the possible messages and their meaning.

**ALARM MESSAGES**

<table>
<thead>
<tr>
<th>Process Alarms</th>
<th>Message</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>1FSL</td>
<td>Alarm 1 is active and it is a Low alarm.</td>
<td></td>
</tr>
<tr>
<td>1FSh</td>
<td>Alarm 1 is active and it is a High alarm.</td>
<td></td>
</tr>
<tr>
<td>2FSL</td>
<td>Alarm 2 is active and it is a Low alarm.</td>
<td></td>
</tr>
<tr>
<td>2FSh</td>
<td>Alarm 2 is active and it is a High alarm.</td>
<td></td>
</tr>
<tr>
<td>3FSL</td>
<td>Alarm 3 is active and it is a Low alarm.</td>
<td></td>
</tr>
<tr>
<td>3FSh</td>
<td>Alarm 3 is active and it is a High alarm.</td>
<td></td>
</tr>
<tr>
<td>Sbr</td>
<td>Sensor Break: Input sensor is open circuit or high resistance. Check the sensor.</td>
<td></td>
</tr>
</tbody>
</table>

In addition to the above messages, the displayed process value will flash if the input signal or the displayed value is out of range.

The table above shows normal process alarms. In the event of a failure in the indicator or the sensor the following diagnostic alarm messages are provided.

<table>
<thead>
<tr>
<th>Diagnostic alarms</th>
<th>Message</th>
<th>Meaning and (Action)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EEER</td>
<td>Electrically Erasable Memory Error: A parameter value has been corrupted. Contact Eurotherm Controls.</td>
<td></td>
</tr>
<tr>
<td>HErr</td>
<td>Hardware error: (Return for repair)</td>
<td></td>
</tr>
<tr>
<td>LLLL</td>
<td>Low display range exceeded: (Check input signal)</td>
<td></td>
</tr>
<tr>
<td>HHHH</td>
<td>High display range exceeded: (Check input signal)</td>
<td></td>
</tr>
<tr>
<td>Err 1</td>
<td>Error 1: ROM self-test fail: (Return for repair)</td>
<td></td>
</tr>
<tr>
<td>Err 2</td>
<td>Error 2: RAM self-test fail: (Return for repair)</td>
<td></td>
</tr>
<tr>
<td>Err 3</td>
<td>Error 3: Watchdog fail: (Return for repair)</td>
<td></td>
</tr>
<tr>
<td>Err 4</td>
<td>Error 4: Keyboard failure. Stuck button, or a button was pressed during power up.</td>
<td></td>
</tr>
<tr>
<td>Err 5</td>
<td>Error 5: Input circuit failure. (Return for repair)</td>
<td></td>
</tr>
<tr>
<td>PurF</td>
<td>Power failure. The line voltage is too low.</td>
<td></td>
</tr>
</tbody>
</table>

**To View the Display Units**

Press and release quickly the ≫ or ≫ button. The display units will be flashed for 0.5sec

```
°C
```

If you get lost, pressing ≫ and ≫ together will return you to the HOME display.

If, at any time, no key is pressed within 45 seconds, the display will always return to the HOME display.

**HOME DISPLAY OPTIONS**

Quickly press ≫ twice

```
di SP
```

Press ≫ to return to the HOME display

To prevent an Operator changing this option, see “To Hide Parameters”.

**To Change the Alarm Setpoints (Trip Levels)**

The ≫ button steps through parameter list headings. The first list is the alarm setpoints. The other lists are shown on the next page.

Pressing ≫ or ≫ displays L, SL
to indicate that this a list heading

```
0.5 sec
```

There are three alarm setpoints. The first character is the alarm setpoint number, the next three the alarm type, as follows:

- FSL Low alarm
- FSh High alarm

If an alarm has been disabled, it will not appear in this list.

```
0
```

Press ≫ or ≫ to change the setpoint.

```
0
```

Press ≫ or ≫ to change the setpoint.

```
0
```

Press ≫ and ≫ together to return to the HOME display.

```
0
```

Press ≫ and ≫ together to return to the HOME display.
PARAMETER LISTS

Use these lists to change: ● The alarm setpoints ● The alarm setpoint limits ● User calibration.

Selecting and adjusting a parameter
1. Press \( \uparrow \) to step across the list headings.
2. Press \( \downarrow \) to step down the parameters within a particular list. You will eventually return to the list heading.
3. Press \( \uparrow \) to view the value of a selected parameter. Keep pressing to decrease the value.
4. Press \( \downarrow \) to view the value of a selected parameter. Keep pressing to increase the value.

Parameter tables

- **HOME**: HOME display options
- **List**: Selectable options
- **AS**: Default setting

### AL
- **Alarm setpoints**: Adjustable Range
- **Default setting**:
  - ‘1’ -- Alarm 1 setpoint: Between low and high
  - ‘2’ -- Alarm 2 setpoint: setpoints limits
  - ‘3’ -- Alarm 3 setpoint: setpoint limits
  - ‘HY’ -- Alarm Hysteresis: 1-9999 PV units

### H
- **Setpoint high limit**: Adjustable Range
- **Default setting**:
  - SP L: Setpoint low limit: Between Process Value min & max
  - SP H: Setpoint high limit: As per order code

### P
- **Input List**: Adjustable Range
- **Default setting**:
  - \( \text{F1, L} \): Input filter time in secs: OFF-9999
  - \( \text{OF5} \): Process value offset: 0-9999 units
  - \( \text{CJC} \): Cold junction temperature at the rear terminals: Read-only
  - \( \text{mU} \): mV input at the rear terminals: Read-only
  - \( \text{CAL P} \): Calibration password: 0-9999
  - \( \text{CAL} \): Calibration type: \( \text{FACT} \) (Factory) \( \text{USER} \) (User)
  - \( \text{PnL} \): Low calibration point: See User Calibration
  - \( \text{OF5} \): Low point offset: 0
  - \( \text{PnH} \): High calibration point: 100
  - \( \text{OF5} \): High point offset: 0

### ACCS
- **Access list**: Used for re-configuring the indicator.

To Hide Parameters or Make Them Read-only

Press \( \uparrow \) to reach the Access List Heading.

Press \( \downarrow \) or \( \rightarrow \) to enter the password. The factory default is 1. \( \text{PASS} \) will be displayed when the correct password has been entered.

Press \( \uparrow \) or \( \rightarrow \) to select \( \text{EDIT} \) level. Other options are:
- For Operator level
  - Shows the ‘Full’ set of available parameters
  - Gives access to configuration level.

Press to return to the Access list header.

You are now in Edit level. Press \( \uparrow \) and \( \rightarrow \) to select a parameter in the normal way.

Example: High alarm 2 has been selected. When \( \uparrow \) or \( \rightarrow \) is pressed, instead of displaying the parameter value, its availability to Operator is shown as follows:
- \( \text{ALtr} \): The parameter will be alterable
- \( \text{Pro} \): The parameter will be ‘promoted’ into the HOME list
- \( \text{RFD} \): The parameter will be read-only
- \( \text{Hi de} \): The parameter will be hidden.

Repeat for all the parameters you wish to hide or make read-only then return to operator level:

Press \( \uparrow \) until you reach the \( \text{ACCS} \) list heading
Press \( \downarrow \) until you reach \( \text{Goto} \) heading
Press \( \uparrow \) to select \( \text{OPER} \)
Press \( \rightarrow \) to select \( \text{Goto} \) to return to Operator level

User Calibration

Your indicator has been calibrated for life against known reference sources in the factory. User calibration allows you to apply offsets to compensate for sensor and other system errors. The parameter \( \text{OF5} \) in the \( \text{P} \) list applies a fixed offset over the whole display range. You may also apply a 2-point calibration as follows:
- Press \( \uparrow \) until you reach the \( \text{P} \) list
- Press \( \rightarrow \) until you reach the \( \text{CAL P} \) parameter
- Press \( \rightarrow \) or \( \rightarrow \) to enter the password. The factory default is 3. \( \text{PASS} \) will be displayed when correct.
- Press \( \rightarrow \) to reach the \( \text{CAL} \) parameter
- Press \( \rightarrow \) or \( \rightarrow \) to select \( \text{USER} \) \( \text{FAC} \) will restore the factory configuration.
- Apply 2-point calibration as below:
CONFIGURING THE INDICATOR

Select configuration level to change: • The display units • The input sensor type • The scaling of linear inputs • The alarm configuration • The passwords.

To select configuration level

Press  to reach the Access List Heading.

Press

Code PASS

Press

Go to conf

Press

Conf PASS

Press to enter configuration level.

Having selected a list heading, press  or  to select a parameter within a particular list. Press  and  to change the setting.

Continued next column,...
**Ordering Code**

The indicator is supplied configured according to the ordering code shown below.

<table>
<thead>
<tr>
<th>Model number</th>
<th>Function</th>
<th>Supply voltage</th>
<th>Manual Logic I/O</th>
<th>Alarm Relay Output</th>
<th>Sensor input</th>
<th>Setpoint min</th>
<th>Setpoint max</th>
<th>Units</th>
<th>External relay module</th>
<th>Input adaptor</th>
</tr>
</thead>
<tbody>
<tr>
<td>2132/2116/</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Supply Voltage**
- VH 85-264Vac
- VL 20-29V dc or ac

**Logic I/O**
- XX Disabled
- AC Alarm ack/reset
- KL Keylock

**Non-latched alarms**
- FH High alarm 2
- AL Low alarm 2

**Latched alarms**
- HA High alarm 2
- LA Low alarm 2
- NW New alarm

**Alarm Relay Output**
- XX None
- ENG English
- FRA French
- GER German
- NED Dutch
- SPA Spanish
- SWE Swedish
- ITA Italian

**Sensor Input**

<table>
<thead>
<tr>
<th>Sensor Type</th>
<th>Display Range and Setpoint min &amp; max limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>J</td>
<td>-210 to 1200 -340 to 2192</td>
</tr>
<tr>
<td>K</td>
<td>-300 to 1372 -325 to 2500</td>
</tr>
<tr>
<td>T</td>
<td>-200 to 400 -325 to 750</td>
</tr>
<tr>
<td>L</td>
<td>-200 to 900 -325 to 1650</td>
</tr>
<tr>
<td>N</td>
<td>-200 to 1300 -325 to 2370</td>
</tr>
<tr>
<td>R</td>
<td>-50 to 1768 -58 to 3200</td>
</tr>
<tr>
<td>S</td>
<td>-50 to 1768 -58 to 3200</td>
</tr>
<tr>
<td>B</td>
<td>0 to 1820 32 to 3308</td>
</tr>
<tr>
<td>P</td>
<td>0 to 1399 32 to 2496</td>
</tr>
</tbody>
</table>

**Thermocouples**
- C: Type C -W5%Re/W26%Re
- K: Type K -W5%Re/W26%Re
- T: Type T -W5%Re/W26%Re
- L: Type L -W5%Re/W26%Re
- N: Type N -W5%Re/W26%Re
- R: Type R -W5%Re/W26%Re
- S: Type S -W5%Re/W26%Re
- B: Type B
- P: Platinum II
- F: Type F
- E: E thermocouple
- J: Type J

**Input Adaptors**
- XX None
- V1 0-10Vdc
- A1 0-20mA sense

**Technical Specification**

- Display: 4 digit, green. 10mm high characters
- Supply voltage: High voltage unit: 100Vac -15% to 240Vac +10%, 48-62Hz. Power consumption: 5Watts maximum
- Low voltage unit: 24Vdc or ac -15%, +20% DC to 62Hz, Power consumption: 5Watts maximum
- Operating ambient: 0 to 55°C. 5 to 95%RH, non condensing
- Storage temperature: -30°C to +75°C
- Output ratings: Relay(isolated): Maximum: 264Vac, 2A resistive. Minimum: 12Vdc, 100mA
- Logic I/O: 9Vdc at 18mA (non-isolated from sensor input). Can be used as alarm output or alarm acknowledge input
- Calibration accuracy: ± 1°C or ±0.25% of reading whichever is greater
- Cold junction compensation: >30 to 1 rejection of ambient temperature change. Uses INSTANT ACCURACY™ cold junction sensing technology to eliminate warm-up drift and respond rapidly to ambient temperature changes.
- Input filtering: Off to 999.9 seconds
- EMC standards: Generic emission standard EN50081-2 and immunity standard EN50082-2 for industrial environments
- Safety standard: EN 61010. Installation category II. (Voltage transients on the power supply must not exceed 2.5kV). Pollution degree 2. All isolated inputs and outputs have reinforced insulation to protect against electric shock.
- Atmosphere: Not suitable for use above 2000m or in explosive or corrosive atmospheres
- Panel sealing: IP65 (EN 60529), or NEMA 4X

**Safety and EMC Information**

**Safety**
This indicator complies with the European Low Voltage Directive 73/23/EEC, amended by 93/68/EEC, by the application of the safety standard EN 61010.

**Electromagnetic compatibility**
This indicator conforms with the essential protection requirements of the EMC Directive 89/336/EEC, amended by 93/68/EEC, by the application of a Technical Construction File. This indicator satisfies the general requirements of the industrial environment defined in EN 50081-2 and EN 50082-2.

**General**

The information contained in these instructions is subject to change without notice. While every effort has been made to ensure the accuracy of the information, Eurotherm Controls shall not be held liable for errors contained herein.

**Unpacking and storage**

The packaging should contain the indicator, two panel retaining clips, a 2.49Ω current sense resistor and this instruction leaflet.

If the packaging or the indicator are damaged, do not install the product but contact your nearest Eurotherm Controls agent.

Continued on the next page
Sensor and non-isolated inputs and outputs must be mains rated. When the indicator is removed from its sleeve, it is vulnerable to electrostatic discharge from someone handling the device for the indicator. A mild soap solution may be used to clean other exterior surfaces of the product. When condensation is likely, for example at low temperatures, include a thermostatically controlled heater in the cabinet. For the above reason the indicator should not be wired to a three phase supply with an unearthed star connection. Under fault conditions such a supply could rise above 264Vac with respect to ground and the product would not be safe. The installation must include a power isolating switch or circuit breaker that disconnects all current carrying conductors. The device should be mounted in close proximity to the indicator, within easy reach of the operator and marked as the disconnecting device for the indicator.

Wire the indicator in accordance with the wiring data given in these instructions. Take particular care not to connect AC supplies to the low voltage sensor input or logic outputs. Only use copper conductors for connections, (except thermocouple). Use a minimum of 0.5mm² or 16SWG wire for plant connections. Ensure that the installation complies with local wiring regulations.

Caution: Charged capacitors
Before removing the indicator from its sleeve, switch off the supply and wait two minutes to allow capacitors to discharge. Failure to observe this precaution may damage the indicator or cause some discomfort to the user.

Installation requirements for EMC
- For general guidance refer to Eurotherm Controls EMC Installation Guide, HA025464.
- It may be necessary to fit a filter across the relay output to suppress conducted emissions. The filter requirements will depend on the type of load. For typical applications we recommend Schaffner FN321 or FN612.

Wiring

Power Isolation

Conductive pollution
Electrically conductive pollution (for example carbon dust) must be excluded from the cabinet in which the indicator is mounted. Where condensation is likely, for example at low temperatures, include a thermostatically controlled heater in the cabinet.

Routing of wires

To minimise the pick-up of electrical noise, the sensor input wiring should be routed away from high-current power cables. Where it is impractical to do this, use shielded cables with the shield grounded at both ends.