Product Information

ERN 1185
Incremental Rotary Encoder with Z1 Track
ERN 1185

Rotary encoders with integral bearing for integration in motors

- Mounted stator coupling Ø 45 mm
- Compact design
- Blind hollow shaft

- Bearing of mating shaft
- Required mating dimensions
- Measuring point for operating temperature
- Rotary encoder shown without cover
- To fasten the coupling, turn the eccentric screw (M4) to the right by approx. 90°. Tightening torque 2±0.1 Nm
- Cable outlet for cables with crimp sleeve 4.3±0.1 - 7 long
- FCI connector, 14-pin
- Variable depending on the coupling
- Screw M3 x 10 ISO 4762 SW2.5 with patch coating, tightening torque 1.1±0.1 Nm
- Removable cover
- Compensation of mounting tolerances and thermal expansion, no dynamic motion permitted
- Direction of shaft rotation for output signals as per the interface description
### Incremental ERN 1185

#### Incremental signals
- \( \sim V_{PP}^{1) \}

#### Line count*/system accuracy
- 512/\( \pm 60^\circ \)
- 2048/\( \pm 40^\circ \)

#### Reference mark
- One

#### Cutoff frequency
- \(-3\,\text{dB}\)
- 512 lines: \( \geq 100\,\text{kHz} \)
- 2048 lines: \( \geq 350\,\text{kHz} \)

#### Absolute position values
- \( \sim V_{PP}^{1) \}

#### Position values/revolution
- Z1 track\(^2\)

#### Electrical connection
- Via PCB connector, 14-pin

#### Voltage supply
- DC 5 V ±0.5 V

#### Current consumption
- (without load) \( \leq 120\,\text{mA} \)

#### Shaft
- Blind hollow shaft \( \varnothing 6\,\text{mm} \)

#### Mechanically permissible speed
- 12000 rpm

#### Starting torque
- \( \leq 0.001\,\text{Nm (at +20 °C)} \)

#### Moment of inertia of rotor
- Approx. \( 0.3 \cdot 10^{-6}\,\text{kgm}^2 \)

#### Natural frequency of the stator coupling
- \( \geq 1500\,\text{Hz} \)

#### Permissible axial motion of measured shaft
- \( \pm 0.5\,\text{mm} \)

#### Vibration
- 55 Hz to 2000 Hz
- \( \leq 100\,\text{m/s}^2 \) (EN 60068-2-6)
- \( \leq 1000\,\text{m/s}^2 \) (EN 60068-2-27)

#### Shock
- 6 ms
- \( \leq 100\,\text{m/s}^2 \) (EN 60068-2-27)

#### Max. operating temperature
- +115 °C

#### Min. operating temperature
- -30 °C

#### Protection
- EN 60529
- IP40 when mounted

#### Mass
- \( \approx 0.1\,\text{kg} \)

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* Please select when ordering

1) Restricted tolerances
- Signal amplitude: \( 0.75\,V_{PP} \) to \( 1.2\,V_{PP} \)
- Asymmetry: \( 0.05 \)
- Amplitude ratio: \( 0.9 \) to \( 1.1 \)
- Phase angle: \( 90^\circ \pm 5^\circ \) elec.
- Signal-to-noise ratio E, F: \( 100\,mV \)

2) For sine commutation: One sine and one cosine signal per revolution
## Electrical connection

### Pin layout

<table>
<thead>
<tr>
<th>Voltage supply</th>
<th>Incremental signals</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 10 11 4</td>
<td>15 16 12 3 2</td>
</tr>
</tbody>
</table>

- **HEIDENHAIN coupling or flange socket M23**
- **14-pin PCB connector**

- **Voltage supply**: 7, 10, 11, 4
- **Incremental signals**: 15, 16, 12, 3, 2

<table>
<thead>
<tr>
<th>Pin</th>
<th>Description</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>1b</td>
<td>Brown/Green</td>
<td></td>
</tr>
<tr>
<td>7a</td>
<td>Blue</td>
<td></td>
</tr>
<tr>
<td>5b</td>
<td>White/Black</td>
<td></td>
</tr>
<tr>
<td>3a</td>
<td>White</td>
<td></td>
</tr>
<tr>
<td>6b</td>
<td>Green/Black</td>
<td></td>
</tr>
<tr>
<td>2a</td>
<td>Yellow/Black</td>
<td></td>
</tr>
<tr>
<td>3b</td>
<td>Blue/Black</td>
<td></td>
</tr>
<tr>
<td>5a</td>
<td>Red/Black</td>
<td></td>
</tr>
<tr>
<td>4b</td>
<td>Red</td>
<td></td>
</tr>
<tr>
<td>4a</td>
<td>Black</td>
<td></td>
</tr>
</tbody>
</table>

- **UP Sensor**: UP = Voltage supply; T = Temperature
- **Sensor**: The sensor line is connected internally with the corresponding power line. Vacant pins or wires must not be used!

### Cables inside the motor housing

- **Cable design**: \( A_P = 16 \times 0.057 \text{ mm}^2 \)
- **Cable diameter**: 4.5 mm with crimp sleeve diameter 4.5 mm

- **Complete**
  - PCB connector 14-pin/M23 right-angle flange socket, male, 17-pin
  - **316594-xx**

- **With one connector**
  - PCB connector 14-pin
  - **317900-xx**

- **AP**: Cross section of power supply lines

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**HEIDENHAIN**

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This Product Information supersedes all previous editions, which thereby become invalid. The basis for ordering from HEIDENHAIN is always the Product Information document edition valid when the order is made.

**For more information:**

Comply with the requirements described in the following documents to ensure the correct operation of the encoder:
- Brochure Encoders for Servo Drives
- Brochure Interfaces of HEIDENHAIN Encoders
- Brochure Cables and Connectors

For brochures and product information documents, visit [www.heidenhain.de](http://www.heidenhain.de).

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642269 - 03 - A - 02 - 12/2017 - PDF