THM4, Ø36mm multi-turn encoder with analog output:
- Robust and compact conception.
- Ø 6 mm solid shaft version.
- Precision ball bearings with seal.
- High temperature performances -40°C to 85°C.
- Magnetic technology encoder.
- Patented battery backup free counter.
- Analog output 4-20mA, 0-20mA, 0.5-5Vdc, 0-5Vdc or 0-10Vdc.
- Analog output calibration possibility (minimum angle 22.5°).
- Resolution: 12 bits over entire measuring range.
- Polarity inversion and over-voltage-peak protection.
- Highly integrated circuit in SMD-technology.

**DIMENSIONS: THM4_06 AXIAL M12**

<table>
<thead>
<tr>
<th>Material</th>
<th>Cover: nickel, plated steel</th>
<th>Vibrations (EN 60068-2-6) ≤ 10 g (10Hz... 1 000Hz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximal loads</td>
<td>Body: aluminium</td>
<td>Weight (approx.) 150 g</td>
</tr>
<tr>
<td></td>
<td>Shaft: stainless steel</td>
<td>Operating temperature - 40 ... + 85°C</td>
</tr>
<tr>
<td>Shafts inertia</td>
<td>≤ 20 g.cm²</td>
<td>Storage temperature - 40 ... + 85°C</td>
</tr>
<tr>
<td>Torque</td>
<td>≤ 2 N.cm</td>
<td>Humidity 98% without condensation</td>
</tr>
<tr>
<td>Continuous max. speed</td>
<td>12 000 min⁻¹</td>
<td>Protection class Cover: IP64</td>
</tr>
<tr>
<td>Shocks (EN 60068-2-27)</td>
<td>≤ 100 g (half-sine, 6 ms)</td>
<td>Body: IP64</td>
</tr>
<tr>
<td>Shocks (EN 60028-2-29)</td>
<td>≤ 10 g (half-sine, 16ms)</td>
<td>Lifetime in 10⁸ revolutions with $F_0 / F_r$ [axial/radial]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20 N / 20 N</td>
</tr>
<tr>
<td></td>
<td></td>
<td>224</td>
</tr>
</tbody>
</table>
### Electrical Characteristics

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single turn technology</td>
<td>Magnetic 2 axis Hall sensor</td>
</tr>
<tr>
<td>Resolution of output</td>
<td>Max 12 bits over entire measuring range</td>
</tr>
<tr>
<td>Multiturn technology</td>
<td>Self supplied magnetic pulse counter</td>
</tr>
<tr>
<td>Max. number of turns</td>
<td>Programmable</td>
</tr>
<tr>
<td>Single turn accuracy</td>
<td>+/- 0.35°</td>
</tr>
<tr>
<td>Linearity</td>
<td>0.15 %</td>
</tr>
<tr>
<td>Supply voltage</td>
<td>12 – 30Vdc</td>
</tr>
<tr>
<td>Cycle period</td>
<td>&lt; 600 µs</td>
</tr>
<tr>
<td>Turn on time</td>
<td>&lt; 1 s</td>
</tr>
<tr>
<td>Current consumption</td>
<td>Typical: 50mA</td>
</tr>
<tr>
<td>Electrical life-time</td>
<td>&gt; 10⁵ h</td>
</tr>
<tr>
<td>EMC</td>
<td>EN 61000-6-4 EN 61000-6-2</td>
</tr>
<tr>
<td>Linearly</td>
<td>0.15 %</td>
</tr>
<tr>
<td>Load resistance</td>
<td>Current: &lt;500Ohms</td>
</tr>
<tr>
<td></td>
<td>Voltage: &gt;10kOhms</td>
</tr>
</tbody>
</table>

### Analog Connection

<table>
<thead>
<tr>
<th>Reference</th>
<th>Type</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Ground</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>M12 5 pinouts</td>
<td>Analog output</td>
<td>+Vcc</td>
<td>GND</td>
<td>SET 2</td>
<td>SET 1</td>
<td>Connector body</td>
</tr>
</tbody>
</table>

### Inputs

<table>
<thead>
<tr>
<th></th>
<th>Set 2</th>
<th>Set 1</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 (N.C. or GND)</td>
<td>0 (N.C. or GND)</td>
<td>Normal operation</td>
<td></td>
</tr>
<tr>
<td>0 (N.C. or GND)</td>
<td>1 (&gt; 12Vdc)</td>
<td>Preset zero point (non turning shaft)</td>
<td></td>
</tr>
<tr>
<td>1 (&gt; 12Vdc)</td>
<td>0 (N.C. or GND)</td>
<td>Preset max point (non turning shaft)</td>
<td></td>
</tr>
<tr>
<td>1 (&gt; 12Vdc)</td>
<td>1 (&gt; 12Vdc)</td>
<td>Pdefault scale (non turning shaft)</td>
<td></td>
</tr>
</tbody>
</table>

### Ordering Reference

<table>
<thead>
<tr>
<th>THM4_</th>
<th>06 // 5</th>
<th>L3 // 00800 // 00A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absolute multi-turn encoder</td>
<td>6mm Solid shaft encoder</td>
<td>Power supply: 12 to 30Vdc</td>
</tr>
<tr>
<td></td>
<td></td>
<td>L3 : 4-20mA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>L4 : 0-20mA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>L1 : 0-10Vdc</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Programmable encoder</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Absolute multi-turn encoder</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Standard configuration: 16 turns</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Axial M12 5 pinouts</td>
</tr>
</tbody>
</table>

Changes possible without further notice - Version 100301