Product Information

ECN 1313
EQN 1325

Absolute Rotary Encoders with Tapered Shaft and 01r1 or 07r1 SSI interface

ID 1353127-xx
ID 1353128-xx
ID 1353130-xx
<table>
<thead>
<tr>
<th>Absolute</th>
<th>ECN 1313</th>
<th>EQN 1325</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Interface</strong></td>
<td>SSI</td>
<td></td>
</tr>
<tr>
<td><strong>Ordering designation</strong></td>
<td>SSI01r1</td>
<td>SSI07r1</td>
</tr>
<tr>
<td><strong>Position values per rev.</strong></td>
<td>8192 (13 bits)</td>
<td></td>
</tr>
<tr>
<td><strong>Revolutions</strong></td>
<td>–</td>
<td>4096 (12 bits)</td>
</tr>
<tr>
<td><strong>Electrically permissible speed error</strong></td>
<td>16 000 rpm/±12 LSB</td>
<td></td>
</tr>
<tr>
<td><strong>Calculation time ( t_{\text{cal}} )</strong></td>
<td>≤ 5 µs</td>
<td></td>
</tr>
<tr>
<td><strong>Incremental signals</strong></td>
<td>1 Vpp</td>
<td></td>
</tr>
<tr>
<td><strong>Line count</strong></td>
<td>512</td>
<td>2048</td>
</tr>
<tr>
<td><strong>Cutoff frequency –3 dB</strong></td>
<td>≥ 500 kHz</td>
<td></td>
</tr>
<tr>
<td><strong>System accuracy</strong></td>
<td>±15°; ±20°</td>
<td></td>
</tr>
<tr>
<td><strong>Shaft</strong></td>
<td>Tapered shaft Ø (9.25 mm); taper: 1:10</td>
<td></td>
</tr>
<tr>
<td><strong>Mech. perm. shaft speed ( n )</strong></td>
<td>≤ 15 000 rpm</td>
<td>≤ 12 000 rpm</td>
</tr>
<tr>
<td><strong>Starting torque (typical)</strong></td>
<td>0.01 Nm (at 20 °C)</td>
<td></td>
</tr>
<tr>
<td><strong>Moment of inertia of rotor</strong></td>
<td>2.6 · 10−6 kgm²</td>
<td></td>
</tr>
<tr>
<td><strong>Natural frequency ( f_N ) (typical)</strong></td>
<td>1800 Hz</td>
<td></td>
</tr>
<tr>
<td><strong>Permissible axial motion of measured shaft</strong></td>
<td>±0.5 mm</td>
<td></td>
</tr>
<tr>
<td><strong>Vibration</strong></td>
<td>55 Hz to 2000 Hz</td>
<td></td>
</tr>
<tr>
<td><strong>Shock</strong></td>
<td>6 ms</td>
<td></td>
</tr>
<tr>
<td><strong>Operating temperature</strong></td>
<td>−40 °C to 115 °C</td>
<td></td>
</tr>
<tr>
<td><strong>Protection</strong></td>
<td>EN 60529</td>
<td></td>
</tr>
<tr>
<td><strong>Mass</strong></td>
<td>≤ 0.25 kg</td>
<td></td>
</tr>
<tr>
<td><strong>ID number</strong></td>
<td>1332127xx</td>
<td>1353130xx</td>
</tr>
</tbody>
</table>

* Please select when ordering

1) More rigorous tolerances
2) Speed-dependent deviations between absolute and incremental signals
3) Valid as per standard at room temperature; at operating temperatures of up to 100 °C: ≤ 300 m/s²
4) Encoder with hybrid bearing
Mounting

The tapered shaft of the rotary encoder is pressed onto the measured shaft and fastened with a central screw. The stator coupling is clamped by means of an axially tightenable screw in a location hole.

Mounting accessories

Mounting aid
To avoid damage to the cable, use the mounting aid to connect and disconnect the cable assembly. The pulling force must be applied solely to the connector and not to the wires.

ID 107579-01

For more mounting information and mounting aids, see the Mounting Instructions and the Encoders for Servo Drives brochure. The mounting quality can be inspected with the PWM 21 and ATS software.

Electrical connection

Output cables for ECN 1313 with SSI01r1 / EQN 1325 with SSI07r1

EPG output cables inside the motor housing Ø 4.5 mm (with shield crimp Ø 8.1 mm), 16 × 0.057 mm² and TPE wires 2 × 0.25 mm² for temperature sensor

With 12-pin PCB connector and 17-pin M23 angle flange socket (male)

With 12-pin PCB connector and unstripped cable end

Pin layout SSI01r1 / SSI07r1

17-pin M23 coupling or flange socket

16- pin (12+ 4) PCB connector

Power supply

Incremental signals

Serial data transmission

<table>
<thead>
<tr>
<th>Power supply</th>
<th>Incremental signals</th>
<th>Serial data transmission</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 b Sensor</td>
<td>Up Sensor 0 V</td>
<td>Up SENSOR 0V</td>
</tr>
<tr>
<td>3a / 2a</td>
<td>A+ -</td>
<td>A+</td>
</tr>
<tr>
<td>5a / 4a</td>
<td>B+ -</td>
<td>B+</td>
</tr>
<tr>
<td>16</td>
<td>DATA</td>
<td>DATA</td>
</tr>
<tr>
<td>15</td>
<td>CLOCK</td>
<td>CLOCK</td>
</tr>
</tbody>
</table>

Cable shield connected to housing: Up = Power supply voltage, T = Temperature

Sensor: The sense line is connected in the encoder with the corresponding power line. Vacant pins or wires must not be used!

Connections for an external temperature sensor (only for output cables inside the motor, see Temperature measurement in motors); if used, please refer to the information about electromagnetic compatibility in the General electrical information section of the Interfaces of HEIDENHAIN Encoders brochure.

Interface

SSI position values

The position value is transmitted, starting with the most significant bit (MSB), over the data lines (DATA) in synchronism with a clock signal (CLOCK) provided by the control. The SSI standard data word length for singleturn encoders is 13 bits, and for multiturn encoders, 25 bits. In addition to the absolute position values, Incremental signals can be transmitted as well. For a description of the signals, see the Rotary Encoders brochure.

The following functions cannot be activated via programming inputs:

• Direction of rotation
• Zero reset (setting to zero)

Data transmission

T = 1 to 10 µs
f = See the specifications
n = 5 µs (without cable)
T = 17 to 20 µs
n = Data word length 13 bits for ECN/ROC 25 bits for EQN/ROQ

CLOCK and DATA not shown

Other signals

Brown / Green
Blue
White / Green
White
/ / Green / Black
Yellow / Black
Blue / Black
Red / Black
Gray
Pink
Violet
Yellow

Vacant pins or wires must not be used!

Connections for an external temperature sensor (only for output cables inside the motor, see Temperature measurement in motors); if used, please refer to the information about electromagnetic compatibility in the General electrical information section of the Interfaces of HEIDENHAIN Encoders brochure.

This Product Information document 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 placed.

More information:

Comply with the requirements described in the following documents to ensure correct and intended operation:

• Brochure: Encoders for Servo Drives 208922-xx
• Brochure: Cables and Connectors 1206103-xx
• Brochure: Interfaces of HEIDENHAIN Encoders 1078628-xx
• SSI Interface Description
• Mounting Instructions: ECN 1313, EQN 1325, ECN 1325, EQN 1337 1139530-xx

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