Incremental encoders

Compact plastic housing, optical

3700 / 3720 (shaft / hollow shaft)

Push-Pull / RS422

The incremental economy encoders type 3700 / 3720 with optical sensor technology are a particularly compact and economical solution.

The carbon-fibre reinforced plastic housing of these incremental encoders is, nevertheless, extremely robust and resistant.

Reliable

- Tube Tech® cable outlet with extremely high strain relief.
- Ideal for outdoor use thanks to high IP protection.

Versatile

- Through hollow shaft up to 8 mm.
- Compact size of only 37 mm.
- Up to 1024 pulses per revolution.

Order code

<table>
<thead>
<tr>
<th>Type</th>
<th>X</th>
<th>X</th>
<th>X</th>
<th>X</th>
<th>XXXX</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.3700</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>XXXX</td>
</tr>
</tbody>
</table>

- Flange
  1 = clamping-syncro flange, ø 36.8 mm [1.45”]
  A = flange adapter, mounted, ø 36.8 mm [1.45”]

- Shaft (ø x L), with flat
  1 = ø 4 x 12.5 mm [0.16 x 0.49”]
  2 = ø 5 x 12.5 mm [0.20 x 0.49”]
  3 = ø 6 x 12.5 mm [0.24 x 0.49”]
  4 = ø 1/4” x 12.5 mm [1/4” x 0.49”]

- Output circuit / power supply
  1 = RS422 / 5 V DC (±5 %)
  3 = Push-Pull (with inverted signal) / 5 ... 30 V DC
  4 = Push-Pull (with inverted signal) / 10 ... 30 V DC

- Type of connection
  1 = axial cable, 1 m [3.28’] PVC
  2 = radial cable, 1 m [3.28’] PVC
  3 = axial cable, 2 m [6.56’] PVC
  4 = radial cable, 2 m [6.56’] PVC
  5 = axial cable, 3 [9.84’] PVC
  6 = radial cable, 3 [9.84’] PVC
  7 = axial cable, 5 m [16.40’] PVC
  8 = radial cable, 5 m [16.40’] PVC

- Pulse rate
  10, 25, 50, 60, 100, 200, 250, 300, 360
  400, 500, 512, 600, 1000, 1024
  (e.g. 360 pulses => 0360)

- Stock types
  8.3700.1332.0360
  8.3700.1332.0500
  8.3700.1332.1000
  8.3700.1332.1024
  Optional on request - other pulse rates

Order code

<table>
<thead>
<tr>
<th>Type</th>
<th>X</th>
<th>X</th>
<th>X</th>
<th>X</th>
<th>XXXX</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.3720</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>XXXX</td>
</tr>
</tbody>
</table>

- Flange
  1 = with spring element, short
  2 = with spring element, long
  5 = with stator coupling, ø 46 mm [1.81”]

- Hollow shaft
  1 = ø 4 mm [0.16”]
  2 = ø 5 mm [0.20”]
  3 = ø 6 mm [0.24”]
  6 = ø 8 mm [0.32”]
  4 = ø 1/4”

- Output circuit / power supply
  1 = RS422 / 5 V DC (±5 %)
  3 = Push-Pull (with inverted signal) / 5 ... 30 V DC
  4 = Push-Pull (with inverted signal) / 10 ... 30 V DC

- Type of connection
  1 = radial cable, 1 m [3.28’] PVC
  2 = radial cable, 2 m [6.56’] PVC
  3 = radial cable, 3 [9.84’] PVC
  4 = radial cable, 5 m [16.40’] PVC

- Pulse rate
  10, 25, 50, 60, 100, 200, 250, 300, 360
  400, 500, 512, 600, 1000, 1024
  (e.g. 360 pulses => 0360)

- Stock types
  8.3720.5631.0360
  8.3720.5611.1024
  Optional on request - other pulse rates

1) “Tube Tech®” cable outlet guarantees 10 x higher strain relief than traditional cabling methods plus higher IP protection.
### Incremental encoders

**Compact plastic housing, optical**

**3700 / 3720 (shaft / hollow shaft)**  
**Push-Pull / RS422**

**Mounting accessory for shaft encoders**

<table>
<thead>
<tr>
<th>Coupling</th>
<th>Order no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>bellows coupling ø 15 mm [0.59&quot;] for shaft 6 mm [0.24&quot;]</td>
<td>8.0000.1202.0606</td>
</tr>
</tbody>
</table>

Further accessories can be found in the accessories section or in the accessories area of our website at: www.kuebler.com/accessories. Additional connectors can be found in the connection technology section or in the connection technology area of our website at: www.kuebler.com/connection_technology.

### Technical data

#### Mechanical characteristics

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum speed</td>
<td>6000 min⁻¹</td>
</tr>
<tr>
<td>Mass moment of inertia shaft version</td>
<td>approx. 0.4 x 10⁻⁴ kgm²</td>
</tr>
<tr>
<td>Mass moment of inertia hollow shaft version</td>
<td>1.4 x 10⁻⁶ kgm²</td>
</tr>
<tr>
<td>Starting torque - at 20°C [68°F] shaft version</td>
<td>&lt; 0.007 Nm</td>
</tr>
<tr>
<td>Starting torque - at 20°C [68°F] hollow shaft version</td>
<td>&lt; 0.01 Nm</td>
</tr>
<tr>
<td>Shaft load capacity radial</td>
<td>20 N</td>
</tr>
<tr>
<td>Shaft load capacity axial</td>
<td>10 N</td>
</tr>
<tr>
<td>Weight</td>
<td>approx. 0.1 kg [35.27 oz]</td>
</tr>
<tr>
<td>Protection acc. to EN 60529</td>
<td>IP65</td>
</tr>
<tr>
<td>Working temperature range</td>
<td>-20°C ... +70°C [-4°F ... 158°F] ¹</td>
</tr>
<tr>
<td>Materials</td>
<td>stainless steel shaft / hollow shaft, plastic PPA, 40 % CF (carbon fibre) housing, flange, PVC cable</td>
</tr>
<tr>
<td>Shock resistance acc. to EN 60068-2-27</td>
<td>1000 m/s², 6 ms</td>
</tr>
<tr>
<td>Vibration resistance acc. to EN 60068-2-6</td>
<td>100 m/s², 10 ... 2000 Hz</td>
</tr>
</tbody>
</table>

#### Electrical characteristics

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output circuit</td>
<td><strong>RS422</strong> (TTL compatible)</td>
</tr>
<tr>
<td>Power supply</td>
<td>5 V DC (±5 %)</td>
</tr>
<tr>
<td>Power consumption with inverted signal (no load)</td>
<td>typ. 40 mA max. 90 mA</td>
</tr>
<tr>
<td>Power consumption with inverted signal (no load)</td>
<td>typ. 50 mA max. 100 mA</td>
</tr>
<tr>
<td>Power consumption with inverted signal (no load)</td>
<td>typ. 50 mA max. 100 mA</td>
</tr>
<tr>
<td>Permissible load / channel</td>
<td>max. +/- 20 mA max. +/- 20 mA max. +/- 20 mA</td>
</tr>
<tr>
<td>Pulse frequency</td>
<td>max. 250 kHz</td>
</tr>
<tr>
<td>Signal level HIGH</td>
<td>max. +V - 2.0 V</td>
</tr>
<tr>
<td>Signal level LOW</td>
<td>max. +V - 2.0 V</td>
</tr>
<tr>
<td>Rising edge time tr</td>
<td>max. 200 ns</td>
</tr>
<tr>
<td>Rising edge time tr</td>
<td>max. 1 µs</td>
</tr>
<tr>
<td>Falling edge time tf</td>
<td>max. 200 ns</td>
</tr>
<tr>
<td>Falling edge time tf</td>
<td>max. 1 µs</td>
</tr>
<tr>
<td>Short circuit proof</td>
<td>yes</td>
</tr>
<tr>
<td>Reverse polarity protection of the power supply</td>
<td>no</td>
</tr>
<tr>
<td>UL approval</td>
<td>file 224618</td>
</tr>
<tr>
<td>CE compliant acc. to</td>
<td>EMC guideline 2004/108/EC RoHS guideline 2011/65/EU</td>
</tr>
</tbody>
</table>

#### Terminal assignment

<table>
<thead>
<tr>
<th>Output circuit</th>
<th>Type of connection</th>
<th>Cable (isolate unused wires individually before initial start-up)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1, 3, 4</td>
<td>1 ... 8</td>
<td>Signal: 0 V (+V) A, A, B, B, 0, 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cable colour: WH, BN, GN, YE, GY, PK, BU, RD</td>
</tr>
</tbody>
</table>

1. For versions with push-pull output and power supply > 15 V DC: max. 55°C [+131°F].
2. If power supply correctly applied.
3. Only one channel allowed to be shorted-out:
   - if +V = 5 V DC short circuit to channel, 0 V or +V is permitted.
   - if +V = 5 ... 30 V DC short circuit to channel or 0 V is permitted.
4. Max. recommended cable length 30 m [98.43'].

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¹ For versions with push-pull output and power supply > 15 V DC: max. 55°C [+131°F].
² If power supply correctly applied.
³ Only one channel allowed to be shorted-out:
   - if +V = 5 V DC short circuit to channel, 0 V or +V is permitted.
   - if +V = 5 ... 30 V DC short circuit to channel or 0 V is permitted.
⁴ Max. recommended cable length 30 m [98.43'].
Incremental encoders

Compact plastic housing, optical 3700 / 3720 (shaft / hollow shaft) Push-Pull / RS422

Dimensions shaft version
Dimensions in mm [inch]

Clamping-synchro flange, ø 36.8 [1.45]
Flange type 1

1 Cable length 1, 2, 3 or 5 m [3.28', 6.56', 9.84' or 16.40']
2 M3, 6 [0.24] deep

Flange adapter, ø 36.8 [1.45]
Flange type A

1 Cable length 1, 2, 3 or 5 m [3.28', 6.56', 9.84' or 16.40']
2 M3, 6 [0.24] deep
Incremental encoders

**Compact plastic housing, optical**

3700 / 3720 (shaft / hollow shaft)  Push-Pull / RS422

**Dimensions hollow shaft version**
Dimensions in mm [inch]

**Flange with spring element, short**
(long spring element version is shown dashed)

**Flange type 1 (2)**

1. Cable length 1, 2, 3 or 5 m [3.28', 6.56', 9.84' or 16.40']
2. Slot for torque stop, 3 [0.12] deep
3. Torque stop slot, recommendation: cylindrical pin DIN 7, ø 4 [0.16]
4. Recommended torque for the clamping ring 1.0 Nm

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**Flange with stator coupling, ø 46 [1.81]**

**Flange type 5**

1. Cable length 1, 2, 3 or 5 m [3.28', 6.56', 9.84' or 16.40']
2. Recommended torque for the clamping ring 1.0 Nm

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