

# Incremental encoders

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



Incremental encoders

Magnetic field proof	Reverse polarity protection	Short-circuit proof	High protection level	Optical sensor

### 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.

<b>Order code</b>	<b>8.3700</b>	<b>. XXXXX . XXXX</b>
<b>Shaft version</b>	Type	a b c d e

If for each parameter of an encoder the underlined preferred option is selected, then the delivery time will be 10 working days for a maximum of 10 pieces. Qts. up to 50 pcs. of these types generally have a delivery time of 15 working days.



<p><b>a Flange</b></p> <p><b>1 = clamping-synchro flange, ø 36.8 mm [1.45"]</b> A = flange adapter, mounted, ø 36.8 mm [1.45"]</p> <p><b>b Shaft (ø x L), with flat</b></p> <p>1 = ø 4 x 12.5 mm [0.16 x 0.49"] 2 = ø 5 x 12.5 mm [0.20 x 0.49"] <b>3 = ø 6 x 12.5 mm [0.24 x 0.49"]</b> 6 = ø 8 x 12.5 mm [0.32 x 0.49"] 4 = ø 1/4" x 12.5 mm [1/4" x 0.49"]</p>	<p><b>c Output circuit / power supply</b></p> <p>1 = RS422 / 5 V DC (±5 %)</p> <p><b>3 = Push-Pull (with inverted signal) / 5 ... 30 V DC</b> 4 = Push-Pull (with inverted signal) / 10 ... 30 V DC</p> <p><b>d Type of connection <sup>1)</sup></b></p> <p>1 = axial cable, 1 m [3.28'] PVC <b>2 = radial cable, 1 m [3.28'] PVC</b> 3 = axial cable, 2 m [6.56'] PVC 4 = radial cable, 2 m [6.56'] PVC 5 = axial cable, 3 m [9.84'] PVC 6 = radial cable, 3 m [9.84'] PVC 7 = axial cable, 5 m [16.40'] PVC 8 = radial cable, 5 m [16.40'] PVC</p>	<p><b>e Pulse rate</b></p> <p>10, 25, 50, 60, 100, 200, 250, 300, <b>360</b>, 400, <b>500</b>, <b>512</b>, 600, <b>1000</b>, <b>1024</b> (e.g. 360 pulses =&gt; 0360)</p> <p><b>Stock types</b></p> <p>8.3700.1332.0360 8.3700.1332.0500 8.3700.1332.1000 8.3700.1332.1024</p> <p><i>Optional on request</i> - other pulse rates</p>
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<b>Order code</b>	<b>8.3720</b>	<b>. XXXXX . XXXX</b>
<b>Hollow shaft</b>	Type	a b c d e

If for each parameter of an encoder the underlined preferred option is selected, then the delivery time will be 10 working days for a maximum of 10 pieces. Qts. up to 50 pcs. of these types generally have a delivery time of 15 working days.



<p><b>a Flange</b></p> <p>1 = with spring element, short 2 = with spring element, long <b>5 = with stator coupling, ø 46 mm [1.81"]</b></p> <p><b>b Hollow shaft</b></p> <p>1 = ø 4 mm [0.16"] 2 = ø 5 mm [0.20"] 3 = ø 6 mm [0.24"] <b>6 = ø 8 mm [0.32"]</b> 4 = ø 1/4"</p>	<p><b>c Output circuit / power supply</b></p> <p>1 = RS422 / 5 V DC (±5 %)</p> <p><b>3 = Push-Pull (with inverted signal) / 5 ... 30 V DC</b> 4 = Push-Pull (with inverted signal) / 10 ... 30 V DC</p> <p><b>d Type of connection <sup>1)</sup></b></p> <p>1 = radial cable, 1 m [3.28'] PVC <b>2 = radial cable, 2 m [6.56'] PVC</b> 3 = radial cable, 3 m [9.84'] PVC 4 = radial cable, 5 m [16.40'] PVC</p>	<p><b>e Pulse rate</b></p> <p>10, 25, 50, 60, 100, 200, 250, 300, <b>360</b>, 400, <b>500</b>, <b>512</b>, 600, <b>1000</b>, <b>1024</b> (e.g. 360 pulses =&gt; 0360)</p> <p><b>Stock types</b></p> <p>8.3720.5631.0360 8.3720.5611.1024</p> <p><i>Optional on request</i> - other pulse rates</p>
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1) "Tube Tech" cable outlet guarantees 10 x higher strain relief than traditional cabling methods plus higher IP protection.

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<b>Mounting accessory for shaft encoders</b>		Order no.
<b>Coupling</b>	bellows coupling $\varnothing$ 15 mm [0.59"] for shaft 6 mm [0.24"]	<b>8.0000.1202.0606</b>

Further accessories can be found in the accessories section or in the accessories area of our website at: [www.kuebler.com/accessories](http://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](http://www.kuebler.com/connection_technology).

## Technical data

Mechanical characteristics		Electrical characteristics			
<b>Maximum speed</b>	6000 min <sup>-1</sup>	<b>Output circuit</b>	<b>RS422</b> (TTL compatible)	<b>Push-Pull</b> (7272 comp.) <sup>4)</sup>	<b>Push-Pull</b> (7272 comp.) <sup>4)</sup>
<b>Mass moment of inertia</b>	shaft version approx. $0.4 \times 10^{-6}$ kgm <sup>2</sup> hollow shaft version $1.4 \times 10^{-6}$ kgm <sup>2</sup>	<b>Power supply</b>	5 V DC ( $\pm 5$ %)	5 ... 30 V DC	10 ... 30 V DC
<b>Starting torque - at 20°C [68°F]</b>	shaft version < 0.007 Nm hollow shaft version < 0.01 Nm	<b>Power consumption with inverted signal (no load)</b>	typ. 40 mA max. 90 mA	typ. 50 mA max. 100 mA	typ. 50 mA max. 100 mA
<b>Shaft load capacity</b>	radial 20 N axial 10 N	<b>Permissible load / channel</b>	max. +/- 20 mA	max. +/- 20 mA	max. +/- 20 mA
<b>Weight</b>	approx. 0.1 kg [35.27 oz]	<b>Pulse frequency</b>	max. 250 kHz	max. 250 kHz	max. 250 kHz
<b>Protection acc. to EN 60529</b>	bearings, shaft IP65 cable outlet IP67	<b>Signal level</b>	HIGH min. 2.5 V LOW max. 0.5 V	min. +V - 2.0 V max. 0.5 V	min. +V - 2.0 V max. 0.5 V
<b>Working temperature range</b>	-20°C ... +70°C [-4°F ... 158°F] <sup>1)</sup>	<b>Rising edge time t<sub>r</sub></b>	max. 200 ns	max. 1 $\mu$ s	max. 1 $\mu$ s
<b>Materials</b>	shaft / hollow shaft stainless steel housing, flange plastic PPA, 40 % CF (carbon fibre) cable PVC	<b>Falling edge time t<sub>f</sub></b>	max. 200 ns	max. 1 $\mu$ s	max. 1 $\mu$ s
<b>Shock resistance acc. to EN 60068-2-27</b>	1000 m/s <sup>2</sup> , 6 ms	<b>Short circuit proof outputs<sup>2)</sup></b>	yes <sup>3)</sup>	yes	yes
<b>Vibration resistance acc. to EN 60068-2-6</b>	100 m/s <sup>2</sup> , 10 ... 2000 Hz	<b>Reverse polarity protection of the power supply</b>	no	no	yes
		<b>UL approval</b>	file 224618		
		<b>CE compliant acc. to</b>	EMC guideline 2004/108/EC RoHS guideline 2011/65/EU		

## Terminal assignment

Output circuit	Type of connection	Cable (isolate unused wires individually before initial start-up)								
1, 3, 4	1 ... 8	Signal:	0 V	+V	A	$\bar{A}$	B	$\bar{B}$	0	$\bar{0}$
		Cable colour:	WH	BN	GN	YE	GY	PK	BU	RD

- +V: Encoder power supply +V DC
- 0 V: Encoder power supply ground GND (0 V)
- A,  $\bar{A}$ : Incremental output channel A
- B,  $\bar{B}$ : Incremental output channel B
- 0,  $\bar{0}$ : Reference signal

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

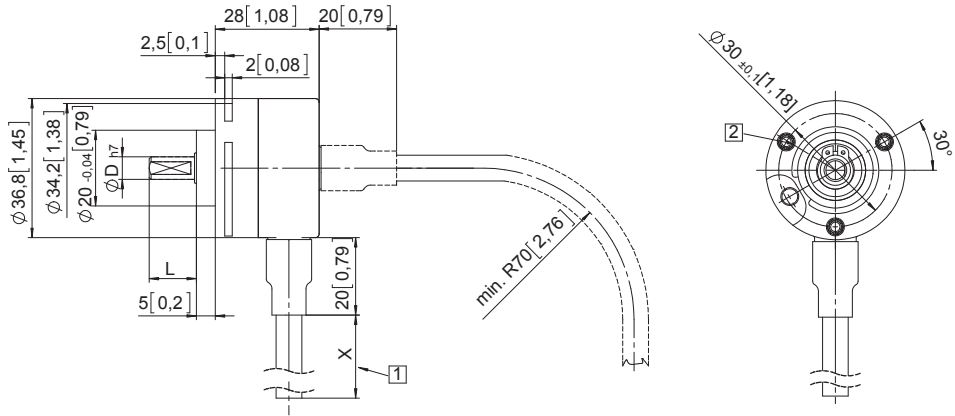
<b>Compact plastic housing, optical</b>	<b>3700 / 3720 (shaft / hollow shaft)</b>	<b>Push-Pull / RS422</b>
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## Dimensions shaft version

Dimensions in mm [inch]

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

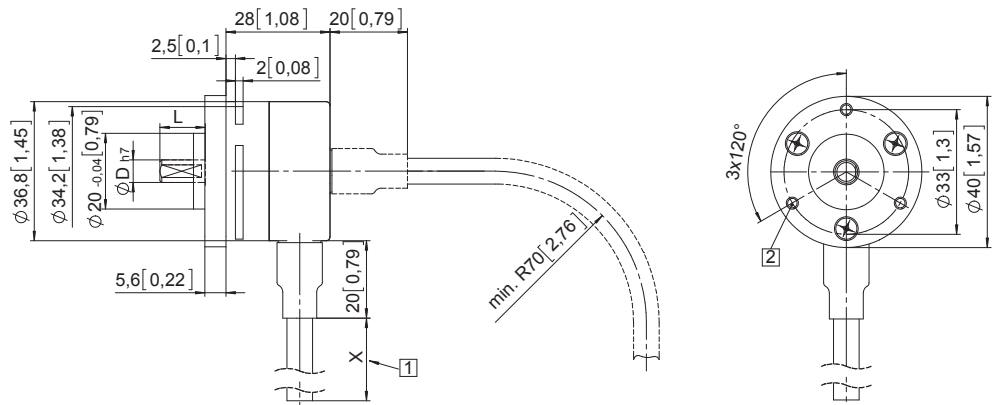
- 1 Cable length 1, 2, 3 or 5 m [3.28', 6.56', 9.84' or 16.40']
- 2 M3, 6 [0.24] deep



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### 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

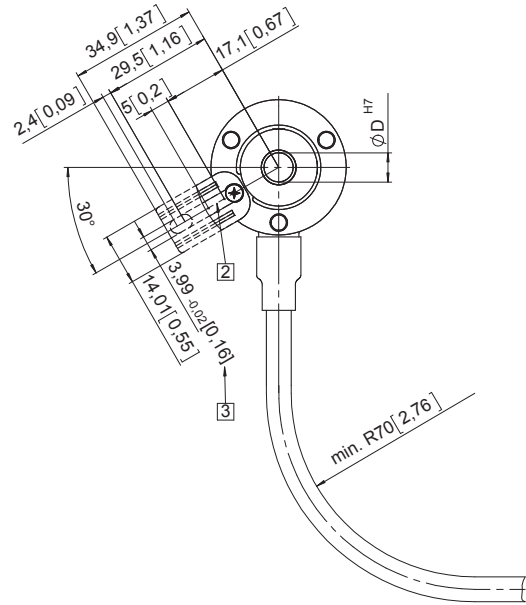
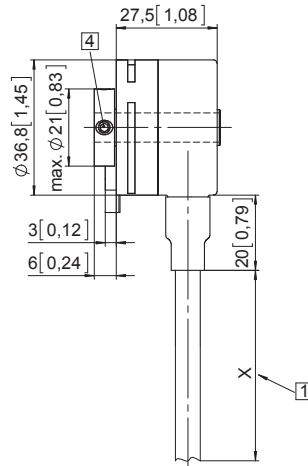
Dimensions in mm [inch]

### 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,  $\varnothing$  4 [0.16]
- 4 Recommended torque for the clamping ring 1.0 Nm



### Flange with stator coupling, $\varnothing$ 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

