

# Incremental Encoders

**Compact  
Optical**

**3610 / 3620 (Shaft / Hollow shaft)**

**Push-Pull / RS422**



The compact incremental encoders type 3610 / 3620 with optical sensor technology are available with a resolution of up to 2500 ppr.

The versions with hollow shaft are designed for diameters up to 8 mm.



High rotational speed



Temperature range  
-20°...+85°C



Shock / vibration resistant



Short-circuit proof



Reverse polarity protection



Magnetic field proof



Optical sensor

## Compact

- Only 36 mm outer diameter
- Through hollow shaft up to 8 mm
- Ideally suited for use where space is tight

## Versatile

- Available with cable outlet or M12 connector
- Maximum resolution of 2500 pulses per revolution
- Supply voltage 5 ... 18 V DC or 8 ... 30 V DC

## Order code Shaft version

**8.3610** . **XXXX** . **XXXX**  
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.



### **a** Flange

- 2 = synchro flange,  $\varnothing$  36.5 mm [1.44"]
- 3 = clamping flange,  $\varnothing$  36.5 mm [1.44"]

### **b** Shaft ( $\varnothing \times L$ )

- 1 =  $\varnothing$  4 x 10 mm [0.16 x 0.39"]
- 2 =  $\varnothing$  5 x 10 mm [0.20 x 0.39"]
- 3 =  $\varnothing$  6 x 12.5 mm [0.24 x 0.49"], with flat
- 5 =  $\varnothing$  1/4" x 12.5 mm [1/4" x 0.49"], with flat

### **c** Output circuit / Power supply

- 2 = Push-Pull (with inverted signal) / 5 ... 18 V DC
- 4 = Push-Pull (with inverted signal) / 8 ... 30 V DC
- 3 = Push-Pull (without inverted signal) / 8 ... 30 V DC
- 6 = RS422 (with inverted signal) / 5 V DC
- 5 = RS422 (with inverted signal) / 8 ... 30 V DC

### **d** Type of connection

- 1 = axial cable, 2 m [6.56'] PVC cable
- 2 = radial cable, 2 m [6.56'] PVC cable
- 3 = M12 connector, 8-pin, axial
- 4 = M12 connector, 8-pin, radial

### **e** Pulse rate

- 25, 100, 200, 360, 500, 512, 600, 1000, 1024, 1500, 2000, 2048, 2500
- (e.g. 500 pulses => 0500)
- Other pulse rates on request

## Order code Hollow shaft

**8.3620** . **XXXX** . **XXXX**  
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.



### **a** Flange

- 1 = with spring element short
- 2 = with spring element long
- 5 = with stator coupling,  $\varnothing$  46 mm [1.81"]

### **b** Hollow shaft

- 2 =  $\varnothing$  6 mm [0.24"]
- 4 =  $\varnothing$  8 mm [0.32"]
- 3 =  $\varnothing$  1/4"

### **c** Output circuit / Power supply

- 2 = Push-Pull (with inverted signal) / 5 ... 18 V DC
- 4 = Push-Pull (with inverted signal) / 8 ... 30 V DC
- 3 = Push-Pull (without inverted signal) / 8 ... 30 V DC
- 6 = RS422 (with inverted signal) / 5 V DC
- 5 = RS422 (with inverted signal) / 8 ... 30 V DC

### **d** Type of connection

- E = radial cable, 2 m [6.56'] PVC cable
- 4 = M12 connector, 8-pin, radial

### **e** Pulse rate

- 25, 100, 200, 360, 500, 512, 600, 1000, 1024, 1500, 2000, 2048, 2500
- (e.g. 500 pulses => 0500)
- Other pulse rates on request

# Incremental Encoders

<b>Compact Optical</b>	<b>3610 / 3620 (Shaft / Hollow shaft)</b>	<b>Push-Pull / RS422</b>
<b>Mounting accessory for shaft encoders</b>		Order No.
<b>Coupling</b>	Bellows coupling ø 15 mm [0.59"] for shaft 6 mm [0.24"]	<b>8.0000.1201.0606</b>
<b>Connection technology</b>		
<b>Connector, self-assembly (straight)</b>	M12 female connector with coupling nut	<b>05.CMB 8181-0</b>
<b>Cordset, pre-assembled</b>	M12 female connector with coupling nut, 2 m [6.56'] PVC cable	<b>05.00.6041.8211.002M</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>Speed</b>	shaft version	max. 12000 min <sup>-1</sup>	<b>Output circuit</b>	<b>RS422</b>	<b>Push-Pull <sup>1)</sup></b> (7272 comp.)	<b>Push-Pull <sup>1)</sup></b> (7272 comp.)
	hollow shaft version	max. 6000 min <sup>-1</sup>	<b>Power supply</b>	5 V DC ±5% / 8 ... 30 V DC	5 ... 18 V DC	8 ... 30 V DC
<b>Moment of inertia</b>		approx. 0.2 x 10 <sup>-6</sup> kgm <sup>2</sup>	<b>Power consumption with inverted signal (no load)</b>	typ. 40 mA / max. 90 mA	max. 40 mA	max. 40 mA
<b>Starting torque - at 20°C [68°F]</b>		< 0.05 Nm	<b>Permissible load / channel</b>	max. ±20 mA	max. ±20 mA	max. ±20 mA
<b>Shaft load capacity</b>	radial	40 N	<b>Pulse frequency</b>	max. 300 kHz	max. 200 kHz	max. 200 kHz
	axial	20 N	<b>Signal level</b>	HIGH min. 2.5 V LOW max. 0.5 V	min. +V - 2.5 V max. 0.5 V	min. +V - 3 V max. 0.5 V
<b>Weight</b>		approx. 0.08 kg [2.82 oz]	<b>Rising edge time t<sub>r</sub></b>	max. 200 ns	max. 1 µs	max. 1 µs
<b>Protection acc. to EN 60529</b>	housing side	IP65	<b>Falling edge time t<sub>f</sub></b>	max. 200 ns	max. 1 µs	max. 1 µs
	flange side	IP50 (IP64 on request)	<b>Short circuit proof outputs <sup>2)</sup></b>	yes	yes	yes
<b>Working temperature range</b>		-20°C ... +85°C [-4°F ... +185°F]	<b>Reverse polarity protection of the power supply</b>	yes	yes	yes
<b>Materials</b>	shaft	stainless steel	<b>UL approval</b>	File 224618		
	hollow shaft	brass	<b>CE compliant acc. to</b>	EMC guideline 2004/108/EC		
	housing	aluminium	<b>RoHS compliant acc. to</b>	guideline 2002/95/EC		
	cable	PVC				
<b>Shock resistance acc. to EN 60068-2-27</b>		1000 m/s <sup>2</sup> , 6 ms				
<b>Vibration resistance acc. to EN 60068-2-6</b>		100 m/s <sup>2</sup> , 55 ... 2000 Hz				

## Terminal assignment

Output circuit	Type of connection	Cable (isolate unused wires individually before initial start-up)
2, 4, 5, 6 with inv. signal	1, 2, E	Signal: 0 V +V A $\bar{A}$ B $\bar{B}$ 0 $\bar{0}$
		Cable colour: WH BN GN YE GY PK BU RD
3 without inv. signal	1, 2, E	Signal: 0 V +V A $\bar{A}$ B $\bar{B}$ 0 $\bar{0}$
		Cable colour: WH BN GN - YE - GY -
2, 4, 5, 6 with inv. signal	3, 4	M12 connector
		Signal: 0 V +V A $\bar{A}$ B $\bar{B}$ 0 $\bar{0}$
3 without inv. signal	3, 4	Pin: 1 2 3 4 5 6 7 8
		Signal: 0 V +V A $\bar{A}$ B $\bar{B}$ 0 $\bar{0}$
3 without inv. signal	3, 4	Pin: 1 2 3 - 5 - 7 -
		Signal: 0 V +V A $\bar{A}$ B $\bar{B}$ 0 $\bar{0}$

Top view of mating side, male contact base



M12 connector, 8-pin

- +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) Max. recommended cable length 30 m [98.43']

2) If supply voltage correctly applied

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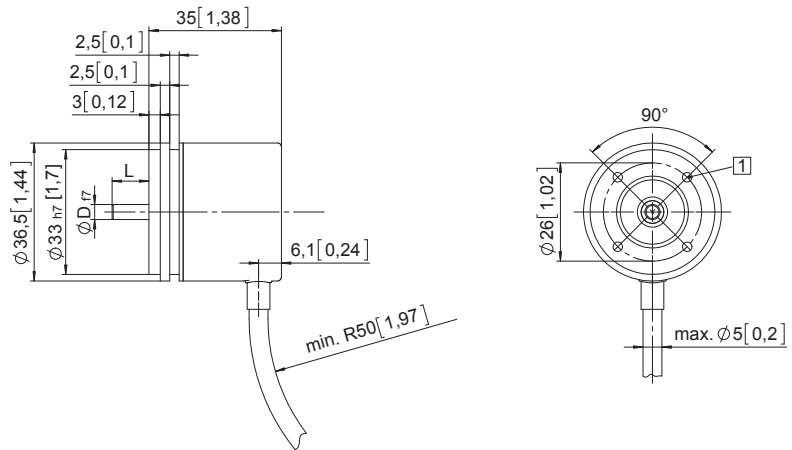
**Push-Pull / RS422**

## Dimensions shaft version

Dimensions in mm [inch]

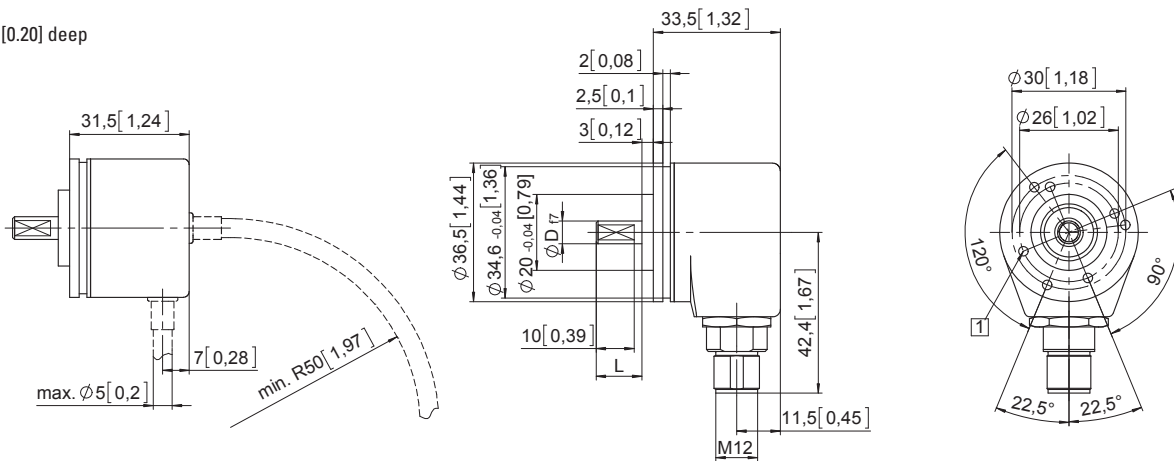
**Synchro flange, ø 36.5 [1.44]  
Flange type 2**

1 M3, 5 [0.20] deep



**Clamping flange, ø 36.5 [1.44]  
Flange type 3**

1 M3, 5 [0.20] deep



# Incremental Encoders

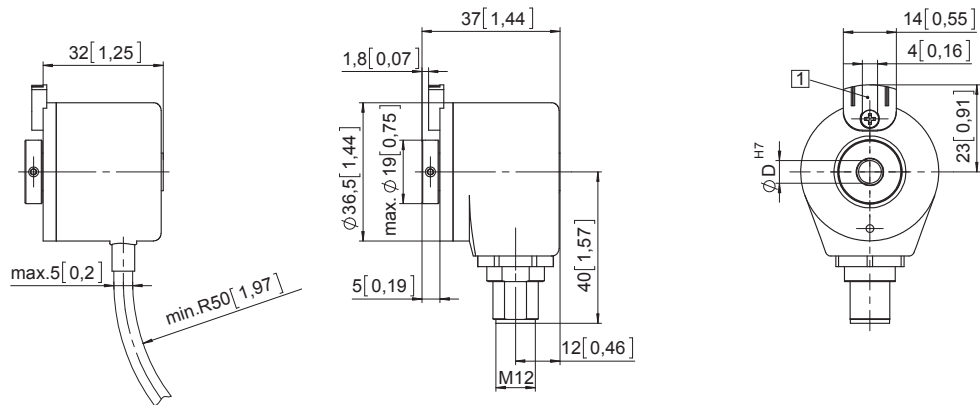
<b>Compact Optical</b>	<b>3610 / 3620 (Shaft / Hollow shaft)</b>	<b>Push-Pull / RS422</b>
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## Dimensions hollow shaft version

Dimensions in mm [inch]

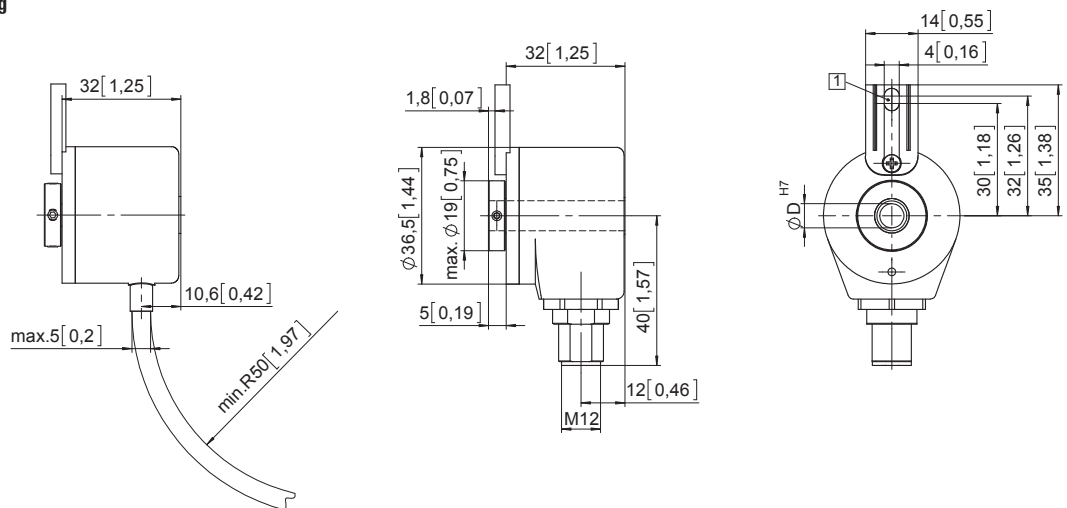
### Flange with spring element short Flange type 1

- 1 Torque stop slot  
Recommendation:  
Cylindrical pin DIN 7,  
ø 4 [0.16]



### Flange with spring element long Flange type 2

- 1 Torque stop slot  
Recommendation:  
Cylindrical pin DIN 7,  
ø 4 [0.16]



### Flange with stator coupling, ø 46 [1.81] Flange type 5

Shaft: Minimum insertion  
depth 1.5 x D

