

# Incremental encoders

<b>Large hollow shaft optical</b>	<b>5821 (hollow shaft)</b>	<b>Push-pull / RS422</b>
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**Optimized proportions, optimized costs:**

**With an overall diameter of just 58 millimeters the series 5821 boasts a hollow shaft of up to 28 millimeters diameter.**

Temperature range	Shock / vibration resistant	Magnetic field proof	Short-circuit proof	Reverse polarity protection

### Adaptable

- Through hollow shaft from 16 mm up to 28 mm.
- With cable connection or M12 connector.
- High resolution up to 5000 pulses per revolution.

<b>Order code</b>	<b>8.5821</b>	<b>. XXXXX</b>	<b>. XXXX</b>
<b>Hollow shaft</b>	Type	a b c d	e

- |  |   |  |
|--|---|--|
| <p><b>a Flange</b><br/>1 = with spring element<br/>6 = with torque stop</p> <p><b>b Through hollow shaft</b><br/>K = ø 16 mm [0.63"]<br/>C = ø 20 mm [0.79"]<br/>8 = ø 22 mm [0.87"]<br/>6 = ø 24 mm [0.94"]<br/>5 = ø 25 mm [0.98"]<br/>3 = ø 28 mm [1.10"]</p> | <p><b>c Output circuit / supply voltage</b><br/>1 = RS422 (with inverted signal) / 5 V DC<br/>4 = RS422 (with inverted signal) / 8 ... 30 V DC<br/>3 = Push-pull (with inverted signal) / 8 ... 30 V DC</p> <p><b>d Type of connection</b><br/>1 = radial cable, 1 m [3.28'] PVC<br/>A = radial cable, special length PVC *)<br/>E = radial M12 connector, 8-pin</p> <p>*) Available special lengths (connection types A):<br/>2, 3, 5, 8, 10, 15 m [5.56, 9.84, 16.40, 26.25, 32.80, 49.21']<br/>order code expansion .XXXX = length in dm<br/>ex.: 8.5821.1K1A.0100.0030 (for cable length 3 m)</p> | <p><b>e Pulse rate</b><br/>50, 60, 100, 125, 250, 400, 500, 512, 960, 1000, 1024, 2000, 2048, 4096, 5000 (e.g. 100 pulses =&gt; 0100)</p> <p><i>Optional on request</i><br/>- other pulse rates<br/>- other hollow shaft diameters</p> |
|--|---|--|

Connection technology		Order no.
<b>Cordset, pre-assembled</b>	M12 female connector with coupling nut, 8-pin, A coded, straight single ended 2 m [6.56'] PVC cable	<b>05.00.6041.8211.002M</b>
<b>Connector, self-assembly</b>	M12 female connector with coupling nut, 8-pin, A coded, straight (metal)	<b>05.CMB 8181-0</b>

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## Technical data

Mechanical characteristics	
<b>Maximum speed</b>	2500 min <sup>-1</sup>
<b>Mass moment of inertia</b>	approx. 3.5 x 10 <sup>-6</sup> kgm <sup>2</sup>
<b>Starting torque – at 20 °C [68 °F]</b>	< 0.1 Nm
<b>Weight</b>	approx. 0.4 kg [14.11 oz]
<b>Protection acc. to EN 60529</b>	IP64
<b>Working temperature range</b>	
at max. speed 2000 min <sup>-1</sup>	-20 °C ... +70 °C [-4 °F ... +158 °F]
at max. speed 2500 min <sup>-1</sup>	-20 °C ... +60 °C [-4 °F ... +140 °F]
<b>Material</b>	hollow shaft steel
<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> , 35 ... 2000 Hz

Electrical characteristics		
Output circuit	RS422	Push-pull (7272 compatible)
<b>Supply voltage</b>	5 V DC (±5 %) or 8 ... 30 V DC	8 ... 30 V DC
<b>Power consumption with inverted signal (no load)</b>	typ. 40 mA max. 90 mA	typ. 40 mA max. 100 mA
<b>Permissible load / channel</b>	max. +/- 20 mA	max. +/- 40 mA
<b>Pulse frequency</b>	max. 300 kHz	max. 200 kHz
<b>Signal level</b>	HIGH min. 2.5 V LOW max. 0.5 V	min. +V - 3.0 V max. 2.5 V
<b>Rising edge time t<sub>r</sub></b>	max. 200 ns	max. 1 μs
<b>Falling edge time t<sub>f</sub></b>	max. 200 ns	max. 1 μs
<b>Short circuit proof outputs <sup>1)</sup></b>	yes	yes
<b>Reverse polarity protection of the supply voltage</b>	yes	yes
<b>UL approval</b>	File no. E224618	
<b>CE compliant acc. to</b>	EMC guideline 2014/30/EU RoHS guideline 2011/65/EU	

### Terminal assignment

Output circuit	Type of connection	Cable (isolate unused cores individually before initial start-up)										
1, 3, 4	1, A	Signal:	0 V	+V	A	$\bar{A}$	B	$\bar{B}$	0	$\bar{0}$	$\perp$	
		Core color:	WH	BN	GN	YE	GY	PK	BU	RD	Schirm	
Output circuit	Type of connection	M12 connector, 8-pin										
1, 3, 4	E	Signal:	0 V	+V	A	$\bar{A}$	B	$\bar{B}$	0	$\bar{0}$	$\perp$	
		Pin:	1	2	3	4	5	6	7	8	PH <sup>2)</sup>	

- +V: Supply voltage encoder +V DC
- 0 V: Supply voltage encoder ground GND (0 V)
- A,  $\bar{A}$ : Incremental output channel A
- B,  $\bar{B}$ : Incremental output channel B
- 0,  $\bar{0}$ : Reference signal
- PH  $\perp$ : Plug connector housing (shield)

### Top view of mating side, male contact base



M12 connector, 8-pin

1) If supply voltage correctly applied.  
2) PH = shield is attached to connector housing.

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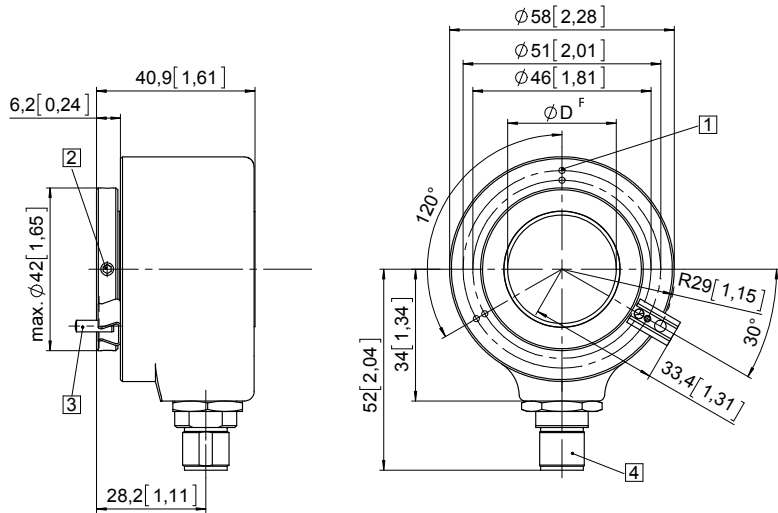
## Dimensions

Dimensions in mm [inch]

### Flange with spring element M12 connector, connection type E

- 1 M1.6 / 5 [0.2] deep
- 2 4 x socket set screw M4x6 DIN 913
- 3 Torque pin 3m6x12 DIN 6325 included
- 4 Connector M12

D	Fit
16 [0.63]	F7
20 [0.79]	F7
24 [0.94]	F7
25 [0.98]	F7
28 [1.10]	F7



### Flange with torque stop Cable radial, connection type 1

- 1 Torque stop positionable in 30° steps
- 2 4 x socket set screw M4x6 DIN 913
- 3 Cable gland PG7
- 4 Cable 1 m

D	Fit
16 [0.63]	F7
20 [0.79]	F7
24 [0.94]	F7
25 [0.98]	F7
28 [1.10]	F7

