

# Incremental encoders

**Standard**  
sine wave output, with zero pulse, optical

5804 / 5824 (shaft / hollow shaft)

SinCos



The incremental encoders type 5804 / 5824 offer a SinCos interface.

They are ideal for use in drive engineering.

These encoders are used preferably in applications for which a standard SinCos interface is sufficient.



High rotational speed



Temperature range  
-20°...+85°C



High protection level  
IP



High shaft load capacity



Shock / vibration resistant



Magnetic field proof



Short-circuit proof



Optical sensor

## High performance

- High resolution up to 5000 pulses per revolution.
- Maximum speed up to 12000 revolutions per minute.
- High IP protection up to max. IP66.

## Adaptable

- Shaft or hollow shaft version.
- With cable or connector.

## Order code

**8.5804** . **XXXXX** . **XXXX**  
Type                      a   b   c   d                      e

### a Flange

- 1 = clamping flange ø 58 mm [2.28"]
- 2 = synchro flange ø 58 mm [2.28"]

### b Shaft (ø x L), with flat

- 1 = ø 6 x 10 mm [0.24 x 0.39"]
- 2 = ø 10 x 20 mm [0.39 x 0.79"]

### c Output circuit / power supply

- 1 = SinCos, 1 Vpp (with inverted signal) / 5 V DC
- 2 = SinCos, 1 Vpp (with inverted signal) / 10 ... 30 V DC

### d Type of connection

- 1 = axial cable, 1 m [3.28'] TPE
- 2 = radial cable, 1 m [3.28'] TPE
- 3 = axial M23 connector, 12-pin, without mating connector
- 5 = radial M23 connector, 12-pin, without mating connector

### e Pulse rate

- 512, 1000, 1024, 1200, 1250, 1500, 2000, 2048, 2500, 3000, 3600, 4000, 4096, 5000 (e.g. 512 pulses => 0512)

Optional on request  
- other pulse rates

## Order code

**8.5824** . **XXXXX** . **XXXX**  
Type                      a   b   c   d                      e

### a Flange

- 1 = with hollow shaft and spring element, short
- 2 = with blind hollow shaft <sup>1)</sup> and spring element, short
- 3 = with hollow shaft and stator coupling, ø 65 mm [2.56"]
- 4 = with blind hollow shaft <sup>1)</sup> and stator coupling, ø 65 mm [2.56"]

### b Hollow shaft

- 1 = ø 6 mm [0.24"], IP40
- 2 = ø 6 mm [0.24"], IP66
- 3 = ø 8 mm [0.32"], IP40
- 4 = ø 8 mm [0.32"], IP66
- 5 = ø 10 mm [0.39"], IP40
- 6 = ø 10 mm [0.39"], IP66
- 7 = ø 12 mm [0.47"], IP40
- 8 = ø 12 mm [0.47"], IP66

### c Output circuit / power supply

- 1 = SinCos, 1 Vpp (with inverted signal) / 5 V DC
- 2 = SinCos, 1 Vpp (with inverted signal) / 10 ... 30 V DC

### d Type of connection

- 1 = radial cable, 1 m [3.28'] TPE
- 2 = radial M23 connector, 12-pin, without mating connector

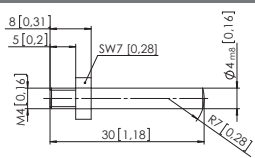
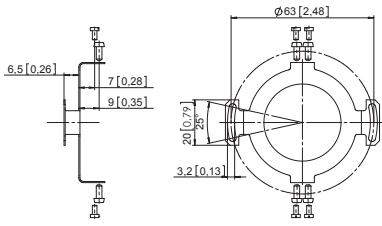
### e Pulse rate

- 512, 1000, 1024, 1200, 1250, 1500, 2000, 2048, 2500, 3000, 3600, 4000, 4096, 5000 (e.g. 512 pulses => 0512)

Optional on request  
- other pulse rates

<sup>1)</sup> Insertion depth ≤ 30 mm [1.18"].

# Incremental encoders

<b>Standard sine wave output, with zero pulse, optical</b>		<b>5804 / 5824 (shaft / hollow shaft)</b>	<b>SinCos</b>
<b>Mounting accessory for shaft encoders</b>			Order no.
<b>Coupling</b>	bellows coupling ø 19 mm [0.75"] for shaft 6 mm [0.24"]		<b>8.0000.1102.0606</b>
	bellows coupling ø 19 mm [0.75"] for shaft 10 mm [0.39"]		<b>8.0000.1102.1010</b>
<b>Mounting accessory for hollow shaft encoders</b>			Order no.
<b>Cylindrical pin, long</b> for torque stops		with fixing thread	<b>8.0010.4700.0000</b>
<b>Stator coupling</b> ø 63 mm [2.48"]			<b>8.0010.4D00.0000</b>
<b>Connection technology</b>			Order no.
<b>Connector, self-assembly (straight)</b>	M23 female connector with coupling nut		<b>8.0000.5012.0000</b>
<b>Cordset, pre-assembled</b>	M23 female connector with coupling nut, 2 m [6.56'] PVC cable		<b>8.0000.6901.0002</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		
<b>Maximum Speed</b>	shaft IP65	12000 min <sup>-1</sup>
	hollow shaft IP40	12000 min <sup>-1</sup>
	hollow shaft IP66 <sup>1)</sup>	6000 min <sup>-1</sup>
<b>Mass moment of inertia</b>	shaft	approx. 1.8 x 10 <sup>-6</sup> kgm <sup>2</sup>
	hollow shaft	approx. 6.0 x 10 <sup>-6</sup> kgm <sup>2</sup>
<b>Starting torque – at 20°C [68°F]</b>	shaft IP65 / hollow shaft IP40	< 0.01 Nm
	hollow shaft IP66	< 0.05 Nm
<b>Load capacity of shaft</b>	radial	80 N
	axial	40 N
<b>Weight</b>	approx. 0.4 kg [14.11 oz]	
<b>Protection acc. to EN 60529</b>	shaft	IP65
	hollow shaft without seal	IP40
	hollow shaft with seal	IP66
<b>Working temperature range</b>	shaft IP65 / hollow shaft IP40	-20°C ... +85°C [-4°F ... +185°F] <sup>2)</sup>
	hollow shaft IP66	-20°C ... +80°C [-4°F ... +176°F] <sup>2)</sup>
<b>Material</b>	shaft	stainless steel H7
<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> , 10 ... 2000 Hz	
Electrical characteristics		
<b>Output circuit</b>	<b>SinCos, U = 1 Vpp</b>	<b>SinCos, U = 1 Vpp</b>
<b>Power supply</b>	5 V DC (±5 %)	10 ... 30 V DC
<b>Power consumption with inverted signal (no load)</b>	typ. 65 mA max. 110 mA	typ. 65 mA max. 110 mA
<b>-3 dB frequency</b>	≤ 180 kHz	
<b>Signal level</b>	channels A/B	1 Vpp (±20 %)
	channel 0	0.1 ... 1.2 V
<b>Short circuit proof outputs <sup>3)</sup></b>	yes	yes
<b>Reverse polarity protection of the power supply</b>	no	yes
<b>UL approval</b>	file 224618	
<b>CE compliant acc. to</b>	EMC guideline 2004/108/EC RoHS guideline 2011/65/EU	

1) For continuous operation max. 3000 min<sup>-1</sup>, ventilated.  
2) 70°C [158°F] for cable version.  
3) If power supply correctly applied.

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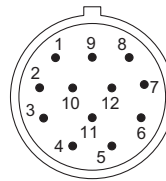
## Terminal assignment

Output circuit	Type of connection	Cable (isolate unused wires individually before initial start-up)											
1, 2	5804: 1, 2	Signal:	0 V	+V	0Vsens <sup>2)</sup>	+Vsens <sup>2)</sup>	A	$\bar{A}$	B	$\bar{B}$	0	$\bar{0}$	$\perp$
	5824: 1	Cable colour:	WH 0.5 mm <sup>2</sup>	BN 0.5 mm <sup>2</sup>	WH	BN	GN	YE	GY	PK	BU	RD	shield
Output circuit	Type of connection	M23 connector, 12-pin											
1, 2	5804: 3, 5	Signal:	0 V	+V	0Vsens <sup>2)</sup>	+Vsens <sup>2)</sup>	A	$\bar{A}$	B	$\bar{B}$	0	$\bar{0}$	$\perp$
	5824: 2	Pin:	10	12	11	2	5	6	8	1	3	4	PH <sup>1)</sup>

Using RS422 outputs and long cable distances, a wave impedance has to be applied at each cable end.

- +V: Encoder power supply +V DC
- 0 V: Encoder power supply ground GND (0 V)
- 0 Vsens / +Vsens: Using the sensor outputs of the encoder, the voltage present can be measured and if necessary increased accordingly.
- A,  $\bar{A}$ : Cosine signal
- B,  $\bar{B}$ : Sine signal
- 0,  $\bar{0}$ : Reference signal
- PH  $\perp$ : Plug connector housing (shield)

## Top view of mating side, male contact base



M23 connector, 12-pin

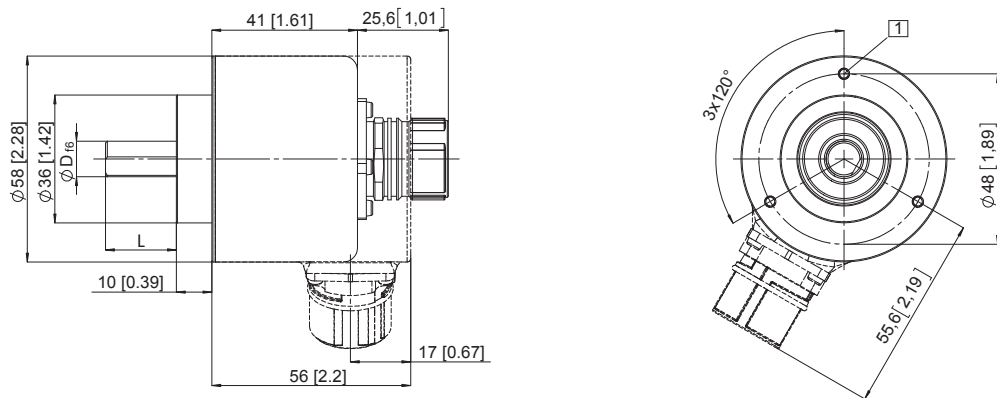
## Dimensions shaft version

Dimensions in mm [inch]

### Clamping flange, $\varnothing$ 58 [2.28]

#### Flange type 1

- 1 3 x M3, 5 [0.2] deep

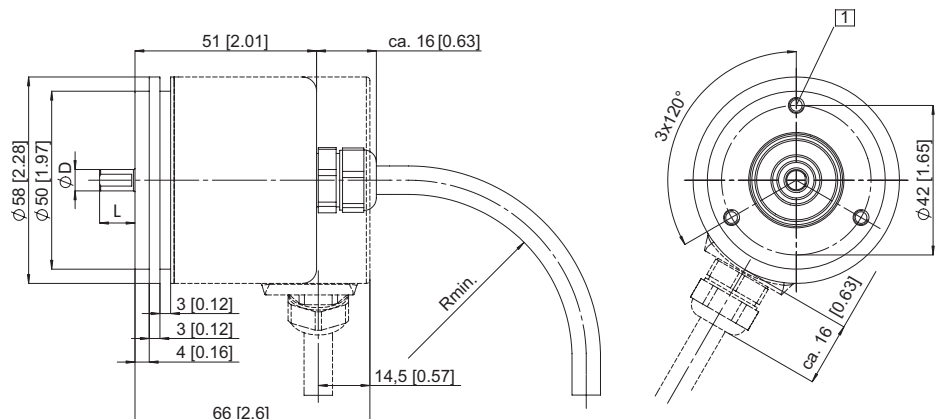


### Synchro flange, $\varnothing$ 58 [2.28]

#### Flange type 2

- 1 3 x M4, 5 [0.2] deep

- R<sub>min</sub>..
- securely installed: 55 [2.17]
- flexibly installed: 70 [2.76]



1) PH = shield is attached to connector housing.  
2) The sensor cables are connected to the power supply internally. If long feeder cables are involved they can be used to adjust or control the voltage at the encoder.

# Incremental encoders

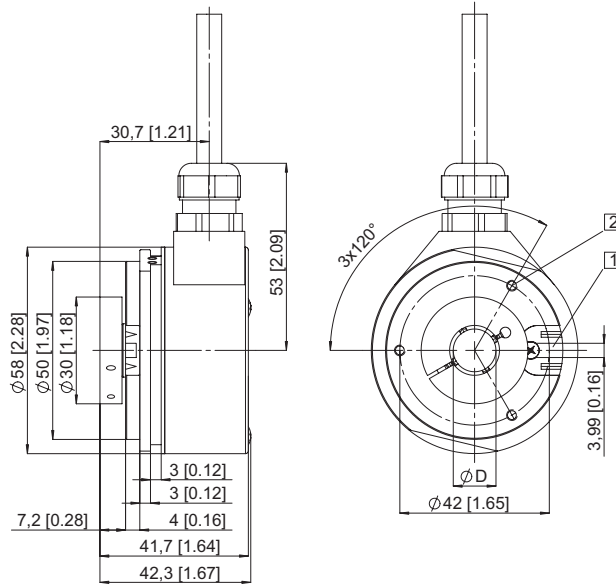
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## Dimensions hollow shaft version

Dimensions in mm [inch]

### Flange with spring element, short Flange type 1 and 2

- 1 Torque stop slot, recommendation:  
cylindrical pin DIN 7,  $\varnothing 4$  [0.16]
- 2 M3, 5 [0.2] deep  
Recommended torque for the clamping ring 0.6 Nm



Incremental encoders

### Flange with stator coupling, $\varnothing 65$ [2.56] Flange type 3 and 4

Recommended torque for the clamping ring 0.6 Nm

**Note:**  
Minimum insertion depth  $1.5 \times D_{\text{hollow shaft}}$

