

# Incremental Encoders

High temperature, optical

5803 / 5823 (Shaft / Hollow shaft)

Push-Pull / RS422



The incremental encoders of the high temperature series 5803 / 5823 can be used at up to max. 110°C.

The high heat resistance – at the same time as high speed – make these encoders the ideal solution for all applications in a high temperature environment.



High rotational speed



Temperature



High IP value



High shaft load capacity



Shock / vibration resistant



Magnetic field proof



Short-circuit proof



Reverse polarity protection



Optical sensor

## Powerful

- Can be used at temperatures of up to max. 110°C
- High resolution up to 5000 PPR
- Maximum speed of 12000 RPM

## Flexible

- Various connection types for different application purposes
- Shaft or hollow shaft version
- With push-pull or RS422 interface

### Order code Shaft version

8.5803 . XXXX . XXXX  
Type                      a b c d                      e

#### a Flange

- 1 = clamping flange  $\varnothing$  58 mm
- 2 = synchro flange  $\varnothing$  58 mm
- M = square flange 63.5 mm (2.5")
- P = synchro flange  $\varnothing$  63.5 mm (2.5")

#### b Shaft ( $\varnothing \times L$ ), with flat

- 1 =  $\varnothing$  6 x 10 mm
- 2 =  $\varnothing$  10 x 20 mm
- P =  $\varnothing$  9,5 x 22,2 mm (7/8" x 3/8")<sup>1)</sup>

#### c Output circuit / Power supply

- 4 = RS422 (with inverted signal) / 5 V DC
- 5 = RS422 (with inverted signal) / 10 ... 30 V DC
- 6 = Push-Pull (with inverted signal) / 10 ... 30 V DC
- 7 = Push-Pull (without inverted signal) / 10 ... 30 V DC

#### d Type of connection

- 1 = axial cable (1 m TPE cable)
- 2 = radial cable (1 m TPE cable)
- 3 = M23 connector, 12-pin, axial, without mating connector
- 5 = M23 connector, 12-pin radial, without mating connector
- W = 7-pin connector radial, „MIL“ specified without mating connector<sup>2)</sup>
- Y = 10-pin connector, „MIL“ specified without mating connector

#### e Pulse rate

- 25, 50, 60, 100, 125, 200, 250, 256, 300, 360, 500, 512, 600, 720, 800, 1000, 1024, 1200, 1250, 1500, 2000, 2048, 2500, 3000, 3600, 4000, 4096, 5000
- (e.g. 100 pulses => 0100)
- Other pulse rates on request

### Order code Hollow shaft

8.5823 . XXXX . XXXX  
Type                      a b c d                      e

#### a Flange

- 1 = with through shaft
- 2 = with blind hollow shaft<sup>3)</sup>
- 3 = with through shaft and stator coupling
- 4 = with blind hollow shaft<sup>3)</sup> and stator coupling

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

- 1 =  $\varnothing$  6 mm without seal
- 2 =  $\varnothing$  6 mm with seal
- 3 =  $\varnothing$  8 mm without seal
- 4 =  $\varnothing$  8 mm with seal
- 5 =  $\varnothing$  10 mm without seal
- 6 =  $\varnothing$  10 mm with seal
- 7 =  $\varnothing$  12 mm without seal
- 8 =  $\varnothing$  12 mm with seal

#### c Output circuit / Power supply

- 1 = RS422 (with inverted signal) / 5 V DC
- 2 = Push-Pull (without inverted signal) / 10 ... 30 V DC
- 3 = Push-Pull (with inverted signal) / 10 ... 30 V DC
- 4 = RS422 (with inverted signal) / 10 ... 30 V DC

#### d Type of connection

- 1 = radial cable (1 m TPE cable)
- 2 = M23 connector, 12-pin, radial, without mating connector

#### e Pulse rate

- 25, 50, 60, 100, 125, 200, 250, 256, 300, 360, 500, 512, 600, 720, 800, 1000, 1024, 1200, 1250, 1500, 2000, 2048, 2500, 3000, 3600, 4000, 4096, 5000
- (e.g. 100 pulses => 0100)
- Other pulse rates on request

1) Only in conjunction with flange M or P  
2) Only with output 7

3) Insertion depth  $\leq$  30 mm

# Incremental Encoders

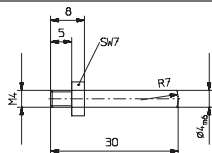
<b>High temperature, optical</b>	<b>5803 / 5823 (Shaft / Hollow shaft)</b>	<b>Push-Pull / RS422</b>
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## Mounting accessory for shaft encoders

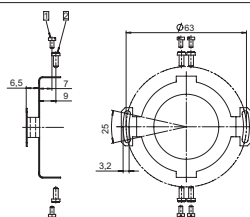
<b>Coupling</b>	Bellows coupling $\varnothing$ 19 mm for shaft 6 mm	<b>8.0000.1101.0606</b>
	Bellows coupling $\varnothing$ 19 mm for shaft 10 mm	<b>8.0000.1101.1010</b>

## Mounting accessory for hollow shaft encoders

<b>Cylindrical pin, long</b> for torque stops	With fixing thread	<b>8.0010.4700.0000</b>
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<b>Stator coupling</b>		<b>8.0010.4D00.0000</b>
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## Connection Technology

<b>Connector, self-assembly</b>	M23	<b>8.0000.5012.0000</b>
<b>Cordset, pre-assembled with 2 m PVC cable</b>	M23	<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).

Mechanical characteristics		
<b>Speed</b>	shaft	max. 12000 min <sup>-1</sup>
	hollow shaft without shaft seal	max. 12000 min <sup>-1</sup>
	hollow shaft with shaft seal <sup>1)</sup>	max. 6000 min <sup>-1</sup>
<b>Rotor 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</b>	without seal	< 0.01 Nm
	with seal	< 0.05 Nm
<b>Load capacity of shaft</b>	radial	80 N
	axial	40 N
<b>Weight</b>		approx. 0.4 kg
<b>Protection</b> acc. to EN 60 529	shaft	IP65
	hollow shaft without seal	IP40
	hollow shaft with seal	IP66
<b>Working temperature range</b>	without seal	-20°C ... +105°C
	with seal	-20°C ... +90°C
<b>Materials</b>	shaft	stainless steel H7
<b>Shock resistance</b> acc. EN 60068-2-27		1000 m/s <sup>2</sup> , 6 ms
<b>Vibration resistance</b> acc. EN 60068-2-6		100 m/s <sup>2</sup> , 10 ... 2000 Hz

Electrical characteristics		
<b>Output circuit:</b>	<b>RS422 (TTL compatible)</b>	<b>Push-Pull</b>
<b>Power supply</b>	5 V ( $\pm$ 5 %) or 10 ... 30 V DC	10 ... 30 V DC
<b>Power consumption (no load)</b>		
	without inverted signal	typ. 55 mA / max. 125 mA
	with inverted signal	typ. 40 mA / max. 100 mA
<b>Permissible load / channel</b>	max. $\pm$ 20 mA	max. $\pm$ 30 mA
<b>Pulse frequency</b>	max. 300 kHz	max. 300 kHz
<b>Signal level</b>	high	min. 2.5 V
	low	max. 0.5 V
<b>Rising edge time t<sub>r</sub></b>	max. 200 ns	max. 1 $\mu$ s
<b>Falling edge time t<sub>f</sub></b>	max. 200 ns	max. 1 $\mu$ s
<b>Short circuit proof outputs</b> <sup>2)</sup>	yes <sup>3)</sup>	yes
<b>Reverse connection of the supply voltage</b>	no; 10 ... 30 V: yes	yes
<b>CE compliant</b> acc. to EN 61000-6-1, EN 61000-6-4 and EN 61000-6-3		

1) For continuous operation max. 3000 min<sup>-1</sup>, ventilated  
2) If supply voltage correctly applied.  
3) Only one channel allowed to be shorted-out:  
If U<sub>B</sub>= 5 V, short-circuit to channel, 0 V, or +U<sub>B</sub> is permitted.  
If U<sub>B</sub>= 5 - 30 V, short-circuit to channel or 0 V is permitted.

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**Push-Pull / RS422**

## Terminal assignment

Signal		0 V	0 V Sensor <sup>2)</sup>	+U <sub>B</sub>	+U <sub>B</sub> Sensor <sup>2)</sup>	A	$\bar{A}$	B	$\bar{B}$	0	$\bar{0}$	shield
M23 connector, 12-pin	Pin	10	11	12	2	5	6	8	1	3	4	PH <sup>1)</sup>
MIL connector, 7-pin	Pin	F	–	D	E	A	–	B	–	C	–	G
MIL connector, 10-pin	Pin	F	–	D	E	A	G	B	H	C	I	J
Cable colour		WH 0.5 mm <sup>2</sup>	WH	BN 0.5 mm <sup>2</sup>	BN	GN	YE	GY	PK	BU	RD	

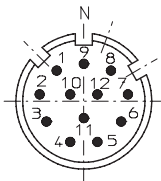
- 1) PH = Shield is attached to connector housing  
 2) The sensor cables are connected to the supply voltage internally. If long feeder cables are involved they can be used to adjust or control the voltage at the encoder.

If the circuits are not being used, then they should be individually isolated and not connected.

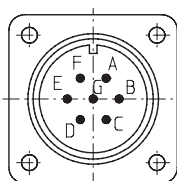
Using RS 422 outputs and long cable distances, a wave impedance has to be applied at each cable end.

**Isolate unused outputs before initial start-up.**

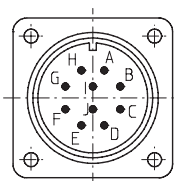
## Top view of mating side, male contact base



M23 connector, 12-pin



MIL connector, 7-pin

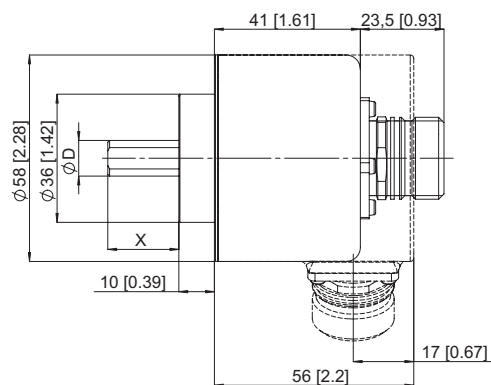


MIL connector, 10-pin

## Dimensions shaft version

**Clamping flange, ø 58 mm  
Flange type 1**

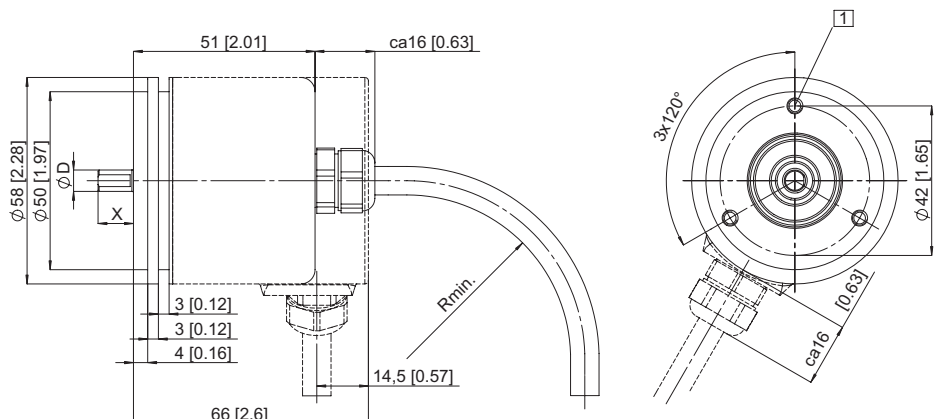
1 3 x M3, 5 [0.2] deep



**Clamping flange, ø 58 mm  
Flange type 2**

1 3 x M3, 5 [0.2] deep

R<sub>min</sub>:  
 - securely installed: 55 mm  
 - flexibly installed: 70 mm



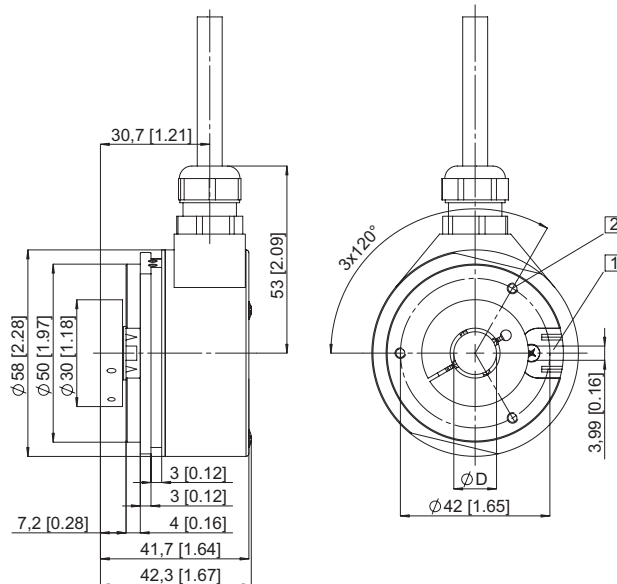
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## Dimensions hollow shaft version

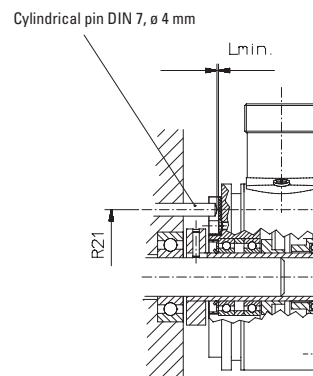
### Flange type 1 and 2

- 1 Torque stop slot,  
Recommendation: Cylindrical pin DIN7,  $\phi$  4 mm
- 2 M3, 5 [0.2] deep

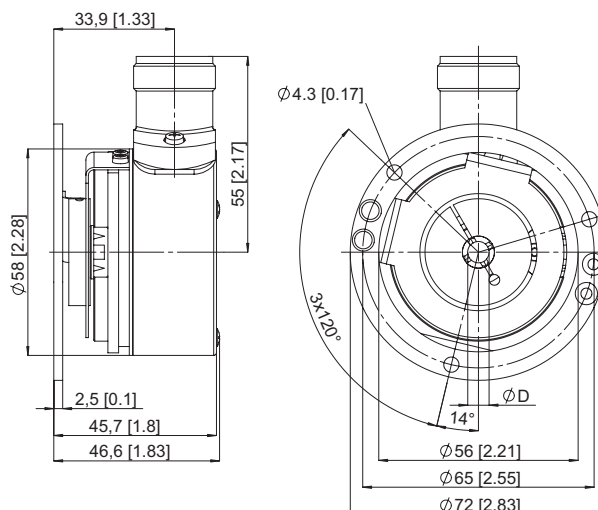


### Mounting advice:

- 1) The flanges and shafts of the encoder and drive should not both be rigidly coupled together at the same time.
- 2) When mounting a hollow shaft encoder, we recommend using a torque stop pin that fits into the torque stop slot or a stator coupling.
- 3) When mounting the encoder ensure the dimension  $L_{min}$  is greater than the axial maximum play of the drive. Otherwise there is a danger that the device could mechanically seize up.



### Flange type 3 and 4



### Note:

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