

# Incremental encoders

<b>Standard high temperature, optical</b>	<b>5803 / 5823 (shaft / hollow shaft)</b>	<b>Push-pull / RS422</b>
---	---	--------------------------



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.



Incremental encoders

High rotational speed	Temperature range	High protection level	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 pulses per revolution.
- Maximum speed of 12000 revolutions per minute.

### Flexible

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

**Order code**      **8.5803** . **XXXX** . **XXXX**  
**Shaft version**      Type      a b c d e

**a** Flange

- 1 = clamping flange    ø 58 mm [2.28"]
- 2 = synchro flange    ø 58 mm [2.28"]
- P = synchro flange    ø 63.5 mm [2.5"]
- M = square flange    □ 63.5 mm [2.5"]

**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"]
- P = ø 3/8" x 7/8" <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 [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
- W = radial MIL connector, 7-pin, without mating connector <sup>2)</sup>
- Y = radial MIL connector, 10-pin, 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)

*Optional on request*  
 - other pulse rates

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

# Incremental encoders

<b>Standard high temperature, optical</b>	<b>5803 / 5823 (shaft / hollow shaft)</b>	<b>Push-pull / RS422</b>
---	---	--------------------------

<b>Order code</b> <b>Hollow shaft</b>	<b>8.5823</b> Type	<b>.XXXXX</b> a b c d	<b>.XXXX</b> e
<b>a Flange</b>	1 = with hollow shaft and spring element, short 2 = with blind hollow shaft and spring element, short 3 = with hollow shaft and stator coupling, $\phi$ 65 mm [2.56"] 4 = with blind hollow shaft and stator coupling, $\phi$ 65 mm [2.56"]	<b>c Output circuit / power supply</b>	1 = RS422 (with inverted signal) / 5 V DC 4 = RS422 (with inverted signal) / 10 ... 30 V DC 3 = push-pull (with inverted signal) / 10 ... 30 V DC 2 = push-pull (without inverted signal) / 10 ... 30 V DC
<b>b Hollow shaft</b> (insertion depth blind hollow shaft with flange 2 and 4 max. 30 mm [1.18"])	1 = $\phi$ 6 mm [0.24"], IP40 2 = $\phi$ 6 mm [0.24"], IP66 3 = $\phi$ 8 mm [0.32"], IP40 4 = $\phi$ 8 mm [0.32"], IP66 5 = $\phi$ 10 mm [0.39"], IP40 6 = $\phi$ 10 mm [0.39"], IP66 7 = $\phi$ 12 mm [0.47"], IP40 8 = $\phi$ 12 mm [0.47"], IP66	<b>d Type of connection</b>	1 = radial cable, 1 m [3.28'] TPE 2 = radial M23 connector, 12-pin, without mating connector
		<b>e Pulse rate</b>	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)
			<i>Optional on request</i> - other pulse rates

Mounting accessory for shaft encoders	Order no.
---------------------------------------	-----------

<b>Coupling</b>	bellows coupling $\phi$ 19 mm [0.75"] for shaft 6 mm [0.24"] bellows coupling $\phi$ 19 mm [0.75"] for shaft 10 mm [0.39"]	<b>8.0000.1102.0606</b> <b>8.0000.1102.1010</b>
-----------------	---	--

Mounting accessory for hollow shaft encoders	Dimensions in mm [inch]	Order no.
--	-------------------------	-----------

<b>Cylindrical pin, long</b> for flange with spring element (flange type 1 + 2)	with fixing thread	<b>8.0010.4700.0000</b>

<b>Stator coupling, <math>\phi</math> 63 mm</b>		<b>8.0010.4D00.0000</b>
---	--	-------------------------

Connection technology	Order no.
-----------------------	-----------

<b>Cordset, pre-assembled</b>	M23 female connector with coupling nut, 12-pin 2 m [6.56'] PVC cable	<b>8.0000.6E01.0002</b>
<b>Connector, self-assembly (straight)</b>	M23 female connector with coupling nut, 12-pin	<b>8.0000.5012.0000</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).

# Incremental encoders

<b>Standard high temperature, optical</b>	<b>5803 / 5823 (shaft / hollow shaft)</b>	<b>Push-pull / RS422</b>
---	---	--------------------------

## 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</b> – at 20°C [68°F]	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</b> acc. to EN 60529	shaft	IP65
	hollow shaft without seal	IP40
	hollow shaft with seal	IP66
<b>Working temperature range</b>	shaft IP65 / hollow shaft IP40	-20°C ... +110°C [-4°F ... +230°F]
	hollow shaft IP66	-20°C ... +90°C [-4°F ... +194°F]
<b>Material</b>	shaft	stainless steel H7
<b>Shock resistance</b> acc. to EN 60068-2-27		1000 m/s <sup>2</sup> , 6 ms
<b>Vibration resistance</b> acc. to 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 DC (±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. +/- 20 mA	max. +/- 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	min. +V - 2.5 V max. 2.0 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</b> <sup>2)</sup>	yes <sup>3)</sup>	yes
<b>Reverse polarity protection of the power supply</b>	no; 10 ... 30 V DC: yes	yes
<b>UL approval</b>	file 224618	
<b>CE compliant</b> acc. to	EMC guideline 2014/30/EU RoHS guideline 2011/65/EU	

Incremental encoders

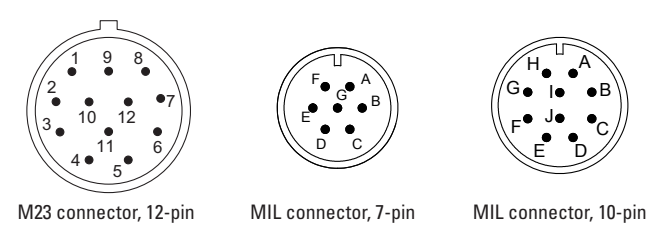
### Terminal assignment

Output circuit	Type of connection	Cable (isolate unused wires individually before initial start-up)											
1, 2, 3, 4, 5, 6, 7	5803: 1, 2	Signal:	0 V	+V	0Vsens <sup>5)</sup>	+Vsens <sup>5)</sup>	A	$\bar{A}$	B	$\bar{B}$	0	$\bar{0}$	$\perp$
	5823: 1	Cable color:	WH 0.5 mm <sup>2</sup>	BN 0.5 mm <sup>2</sup>	WH	BN	GN	YE	GY	PK	BU	RD	shield
1, 2, 3, 4, 5, 6, 7	5803: 3, 5	M23 connector, 12-pin											
	5823: 2	Signal:	0 V	+V	0Vsens <sup>5)</sup>	+Vsens <sup>5)</sup>	A	$\bar{A}$	B	$\bar{B}$	0	$\bar{0}$	$\perp$
7	5803: W	MIL connector, 7-pin											
	5823: –	Signal:	0 V	+V	0Vsens <sup>5)</sup>	+Vsens <sup>5)</sup>	A	$\bar{A}$	B	$\bar{B}$	0	$\bar{0}$	$\perp$
1, 2, 3, 4, 5, 6, 7	5803: Y	MIL connector, 10-pin											
	5823: –	Signal:	0 V	+V	0Vsens <sup>5)</sup>	+Vsens <sup>5)</sup>	A	$\bar{A}$	B	$\bar{B}$	0	$\bar{0}$	$\perp$
		Pin:	F	D	–	E	A	G	B	H	C	I	J

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,  $\bar{A}$ : 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



1) For continuous operation max. 3000 min<sup>-1</sup>, ventilated.  
 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 = 10 ... 30 V DC, short-circuit to channel or 0 V is permitted.  
 4) PH = shield is attached to connector housing.  
 5) 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

**Standard**  
high temperature, optical

5803 / 5823 (shaft / hollow shaft)

Push-pull / RS422

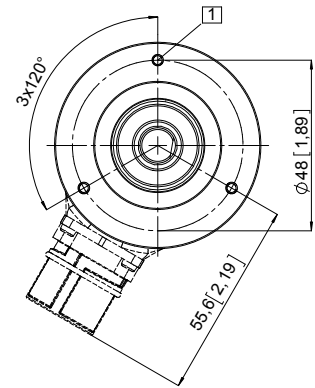
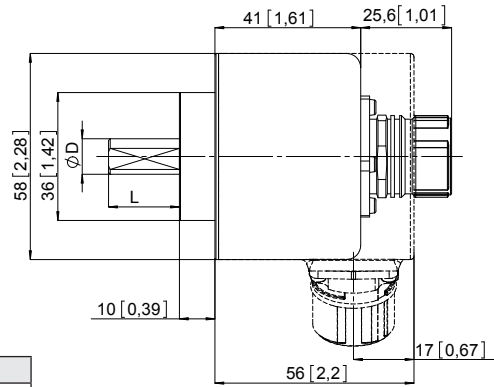
## Dimensions shaft version

Dimensions in mm [inch]

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

#### Flange type 1

1 3 x M3, 5 [0.2] deep



D	Fit	L
6 [0.24]	h7	10 [0.39]
10 [0.39]	f7	20 [0.79]
3/8"	h7	7/8"

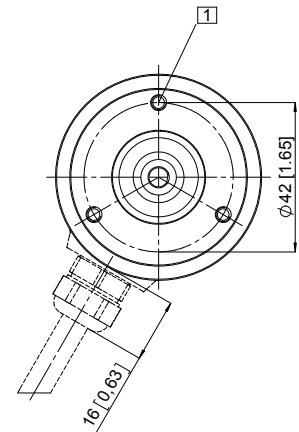
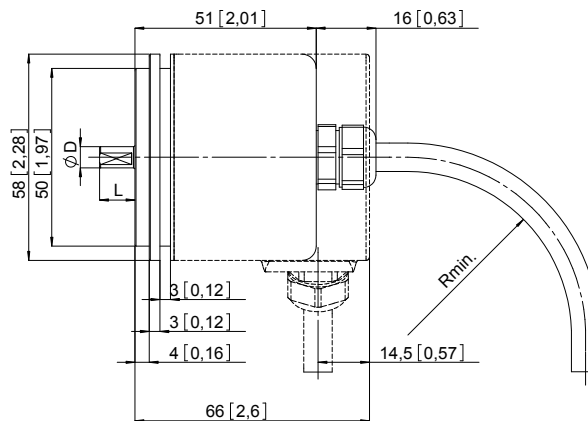
### Synchro flange, $\varnothing$ 58 [2.28]

#### 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]



D	Fit	L
6 [0.24]	h7	10 [0.39]
10 [0.39]	f7	20 [0.79]
3/8"	h7	7/8"

# Incremental encoders

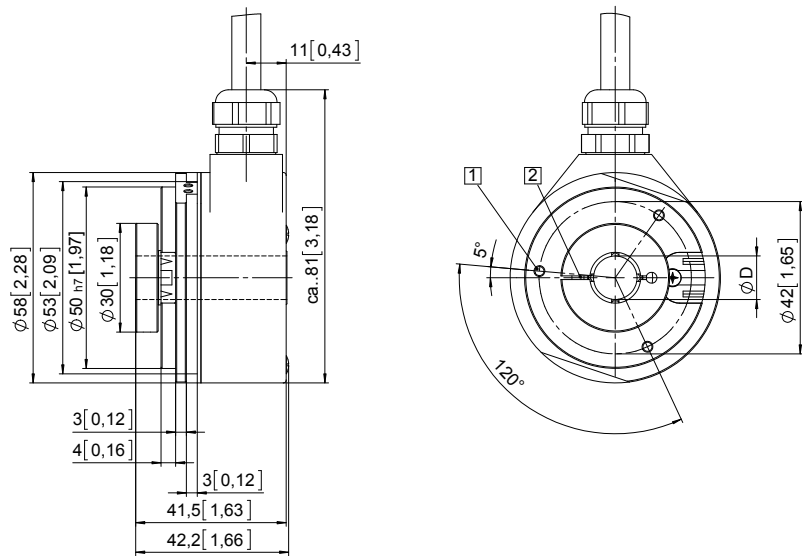
<b>Standard high temperature, optical</b>	<b>5803 / 5823 (shaft / hollow shaft)</b>	<b>Push-pull / RS422</b>
---	---	--------------------------

## Dimensions hollow shaft version

Dimensions in mm [inch]

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

- 1 3 x M3, 5 [0.2] deep
- 2 Recommended torque for the clamping ring 0.6 Nm

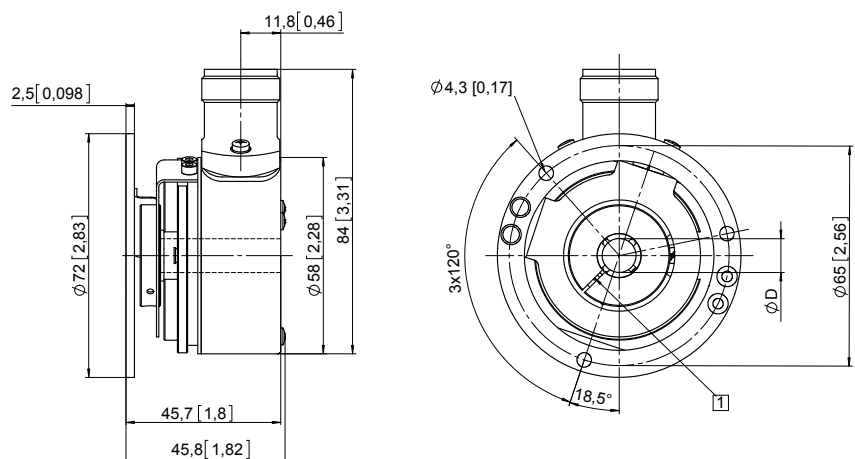


D	Fit
6 [0.24]	H7
8 [0.32]	H7
10 [0.39]	H7
12 [0.47]	H7

Insertion depth blind hollow shaft with flange 2:  
max. 30 mm [1.18"]

### Flange with stator coupling, ø 65 [2.56] Flange type 3 and 4

- 1 Recommended torque for the clamping ring 0.6 Nm



D	Fit
6 [0.24]	H7
8 [0.32]	H7
10 [0.39]	H7
12 [0.47]	H7

Min. insertion depth = 1.5 x D  
Insertion depth blind hollow shaft with flange 4:  
max. 30 mm [1.18"]