

Incremental encoders

Standard high temperature, optical	5803 / 5823 (shaft / hollow shaft)	Push-Pull / RS422
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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	.XXXXX.	XXXX
Shaft version	Type	a b c d	e

<p>a Flange</p> <p>1 = clamping flange ø 58 mm [2.28"]</p> <p>2 = synchro flange ø 58 mm [2.28"]</p> <p>P = synchro flange ø 63.5 mm [2.5"]</p> <p>M = square flange □ 63.5 mm [2.5"]</p>	<p>c Output circuit / power supply</p> <p>4 = RS422 (with inverted signal) / 5 V DC</p> <p>5 = RS422 (with inverted signal) / 10 ... 30 V DC</p> <p>6 = Push-Pull (with inverted signal) / 10 ... 30 V DC</p> <p>7 = Push-Pull (without inverted signal) / 10 ... 30 V DC</p>	<p>e Pulse rate</p> <p>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)</p> <p><i>Optional on request</i> - other pulse rates</p>
<p>b Shaft (ø x L), with flat</p> <p>1 = ø 6 x 10 mm [0.24 x 0.39"]</p> <p>2 = ø 10 x 20 mm [0.39 x 0.79"]</p> <p>P = ø 3/8" x 7/8" ¹⁾</p>	<p>d Type of connection</p> <p>1 = axial cable, 1 m [3.28'] TPE</p> <p>2 = radial cable, 1 m [3.28'] TPE</p> <p>3 = axial M23 connector, 12-pin, without mating connector</p> <p>5 = radial M23 connector, 12-pin, without mating connector</p> <p>W = radial MIL connector, 7-pin, without mating connector ²⁾</p> <p>Y = radial MIL connector, 10-pin, without mating connector</p>	

Order code	8.5823	.XXXXX.	XXXX
Hollow shaft	Type	a b c d	e

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

1) Only in conjunction with flange M or P.

2) Only with output circuit 7.

3) Insertion depth ≤ 30 mm [1.18"].

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Mounting accessory for shaft encoders		Order no.
Coupling	bellows coupling \varnothing 19 mm [0.75"] for shaft 6 mm [0.24"]	8.0000.1102.0606
	bellows coupling \varnothing 19 mm [0.75"] for shaft 10 mm [0.39"]	8.0000.1102.1010
Mounting accessory for hollow shaft encoders		Order no.
Cylindrical pin, long	with fixing thread	8.0010.4700.0000
for torque stops		
Stator coupling \varnothing 63 mm [2.48"]		8.0010.4D00.0000
Connection technology		Order no.
Connector, self-assembly (straight)	M23 female connector with coupling nut	8.0000.5012.0000
Cordset, pre-assembled	M23 female connector with coupling nut, 2 m [6.56'] PVC cable	8.0000.6901.0002

Further accessories can be found in the accessories section or in the accessories area of our website at: 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.

Technical data			
Mechanical characteristics			
Maximum speed	shaft IP65	12000 min ⁻¹	
	hollow shaft IP40	12000 min ⁻¹	
	hollow shaft IP66 ¹⁾	6000 min ⁻¹	
Mass moment of inertia	shaft	approx. 1.8 x 10 ⁻⁶ kgm ²	
	hollow shaft	approx. 6.0 x 10 ⁻⁶ kgm ²	
Starting torque – at 20°C [68°F]	shaft IP65 / hollow shaft IP40	< 0.01 Nm	
	hollow shaft IP66	< 0.05 Nm	
Load capacity of shaft	radial	80 N	
	axial	40 N	
Weight		approx. 0.4 kg [14.11 oz]	
Protection acc. to EN 60529	shaft	IP65	
	hollow shaft without seal	IP40	
	hollow shaft with seal	IP66	
Working temperature range	shaft IP65 / hollow shaft IP40	-20°C ... +110°C [-4°F ... +230°F]	
	hollow shaft IP66	-20°C ... +90°C [-4°F ... +194°F]	
Material	shaft	stainless steel H7	
Shock resistance acc. to EN 60068-2-27		1000 m/s ² , 6 ms	
Vibration resistance acc. to EN 60068-2-6		100 m/s ² , 10 ... 2000 Hz	
Electrical characteristics			
Output circuit	RS422 (TTL compatible)	Push-Pull	
Power supply	5 V DC (\pm 5 %) or 10 ... 30 V DC	10 ... 30 V DC	
Power consumption (no load)	without inverted signal	–	typ. 55 mA / max. 125 mA
	with inverted signal	typ. 40 mA / max. 100 mA	typ. 80 mA / max. 150 mA
Permissible load / channel	max. +/- 20 mA		max. +/- 30 mA
Pulse frequency	max. 300 kHz		max. 300 kHz
Signal level	HIGH	min. 2.5 V	min. +V - 2.5 V
	LOW	max. 0.5 V	max. 2.0 V
Rising edge time t_r	max. 200 ns		max. 1 μ s
Falling edge time t_f	max. 200 ns		max. 1 μ s
Short circuit proof outputs ²⁾	yes ³⁾		yes
Reverse polarity protection of the power supply	no; 10 ... 30 V DC: yes		yes
UL approval	file 224618		
CE compliant acc. to	EMC guideline 2004/108/EC		RoHS guideline 2011/65/EU

1) For continuous operation max. 3000 min⁻¹, 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.

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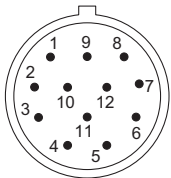
Terminal assignment

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 ²⁾	+Vsens ²⁾	A	\bar{A}	B	\bar{B}	0	$\bar{0}$	\perp
	5823: 1	Cable colour:	WH 0.5 mm ²	BN 0.5 mm ²	WH	BN	GN	YE	GY	PK	BU	RD	shield
Output circuit	Type of connection	M23 connector, 12-pin											
1, 2, 3, 4, 5, 6, 7	5803: 3, 5	Signal:	0 V	+V	0Vsens ²⁾	+Vsens ²⁾	A	\bar{A}	B	\bar{B}	0	$\bar{0}$	\perp
	5823: 2	Pin:	10	12	11	2	5	6	8	1	3	4	PH ¹⁾
Output circuit	Type of connection	MIL connector, 7-pin											
7	5803: W	Signal:	0 V	+V	0Vsens ²⁾	+Vsens ²⁾	A	\bar{A}	B	\bar{B}	0	$\bar{0}$	\perp
	5823: –	Pin:	F	D	–	E	A	–	B	–	C	–	G
Output circuit	Type of connection	MIL connector, 10-pin											
1, 2, 3, 4, 5, 6, 7	5803: Y	Signal:	0 V	+V	0Vsens ²⁾	+Vsens ²⁾	A	\bar{A}	B	\bar{B}	0	$\bar{0}$	\perp
	5823: –	Pin:	F	D	–	E	A	G	B	H	C	I	J

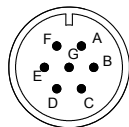
Using RS422 outputs and long cable distances, a wave impedance has to be applied at each cable end.

- +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)

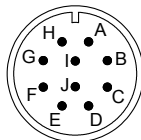
Top view of mating side, male contact base



M23 connector, 12-pin



MIL connector, 7-pin



MIL connector, 10-pin

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.

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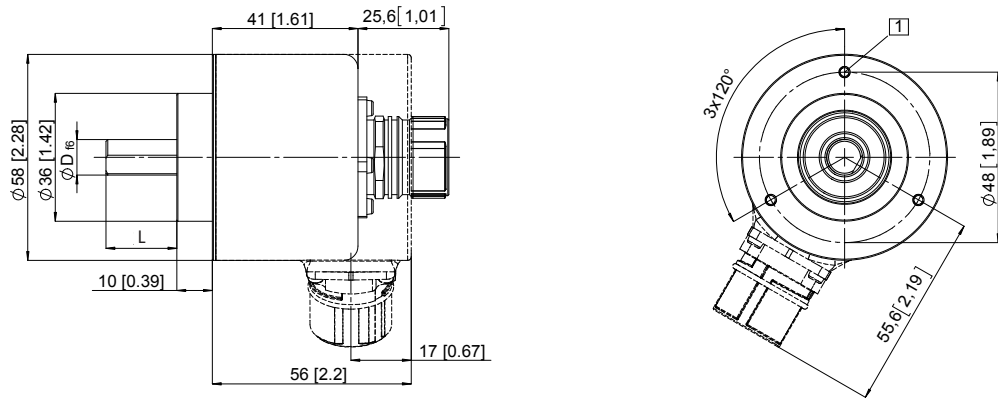
Dimensions shaft version

Dimensions in mm [inch]

Clamping flange, ø 58 [2.28]

Flange type 1

1 3 x M3, 5 [0.2] deep

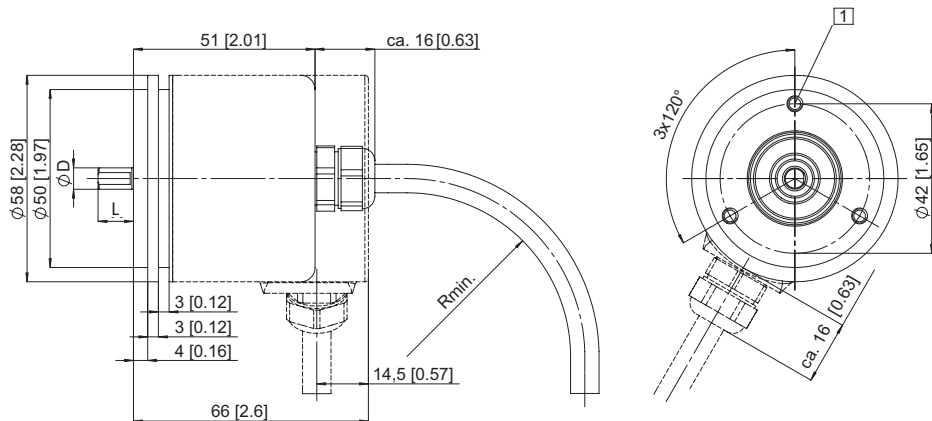


Synchro flange, ø 58 [2.28]

Flange type 2

1 3 x M4, 5 [0.2] deep

R_{min} :
- securely installed: 55 [2.17]
- flexibly installed: 70 [2.76]



Incremental encoders

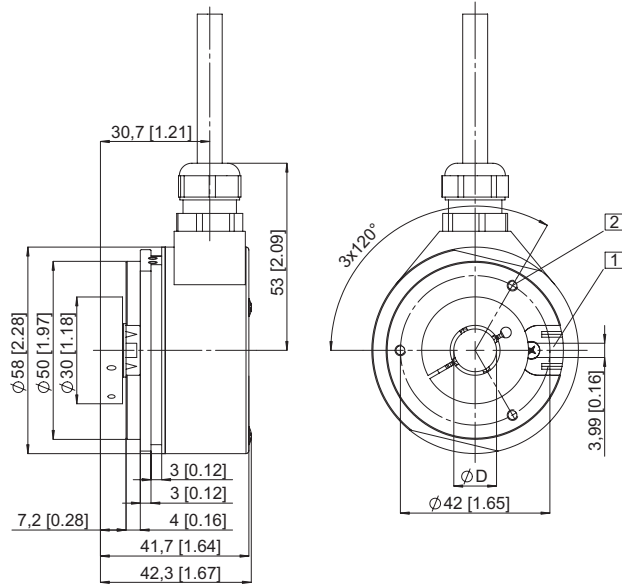
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Dimensions hollow shaft version

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 $1.5 \times D_{\text{hollow shaft}}$

