

Incremental encoders

**Standard
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.



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
Shaft version**

8.5803 . **XXXX** . **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"]
- 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" ¹⁾

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 ²⁾
- 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.

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

Mounting accessory for shaft encoders		Order no.
Coupling	bellows coupling $\varnothing$ 19 mm [0.75"] for shaft 6 mm [0.24"] bellows coupling $\varnothing$ 19 mm [0.75"] for shaft 10 mm [0.39"]	8.0000.1102.0606 8.0000.1102.1010
Mounting accessory for hollow shaft encoders		Order no.
Cylindrical pin, long for flange with spring element (flange type 1 + 2)	with fixing thread 	8.0010.4700.0000
Stator coupling, $\varnothing$ 63 mm		8.0010.4D00.0000
Connection technology		Order no.
Cordset, pre-assembled	M23 female connector with coupling nut, 12-pin 2 m [6.56'] PVC cable	8.0000.6E01.0002
Connector, self-assembly (straight)	M23 female connector with coupling nut, 12-pin	8.0000.5012.0000

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.

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Technical data

Mechanical characteristics			Electrical characteristics		
Maximum speed	shaft IP65 hollow shaft IP40 hollow shaft IP66 ¹⁾	12000 min ⁻¹ 12000 min ⁻¹ 6000 min ⁻¹	Output circuit	RS422 (TTL compatible)	Push-pull
Mass moment of inertia	shaft hollow shaft	approx. 1.8 x 10 ⁻⁶ kgm ² approx. 6.0 x 10 ⁻⁶ kgm ²	Power supply	5 V DC (±5 %) or 10 ... 30 V DC	10 ... 30 V DC
Starting torque – at 20°C [68°F]	shaft IP65 / hollow shaft IP40 hollow shaft IP66	< 0.01 Nm < 0.05 Nm	Power consumption (no load)	without inverted signal with inverted signal	typ. 55 mA / max. 125 mA typ. 80 mA / max. 150 mA
Load capacity of shaft	radial axial	80 N 40 N	Permissible load / channel	max. +/- 20 mA	max. +/- 30 mA
Weight		approx. 0.4 kg [14.11 oz]	Pulse frequency	max. 300 kHz	max. 300 kHz
Protection acc. to EN 60529	shaft hollow shaft without seal hollow shaft with seal	IP65 IP40 IP66	Signal level	HIGH LOW	min. 2.5 V max. 0.5 V
Working temperature range	shaft IP65 / hollow shaft IP40 hollow shaft IP66	-20°C ... +110°C [-4°F ... +230°F] -20°C ... +90°C [-4°F ... +194°F]	Rising edge time t_r	max. 200 ns	max. 1 µs
Material	shaft	stainless steel H7	Falling edge time t_f	max. 200 ns	max. 1 µs
Shock resistance acc. to EN 60068-2-27		1000 m/s ² , 6 ms	Short circuit proof outputs ²⁾	yes ³⁾	yes
Vibration resistance acc. to EN 60068-2-6		100 m/s ² , 10 ... 2000 Hz	Reverse polarity protection of the power supply	no; 10 ... 30 V DC: yes	yes
			UL approval	file 224618	
			CE compliant acc. to	EMC guideline 2014/30/EU RoHS guideline 2011/65/EU	

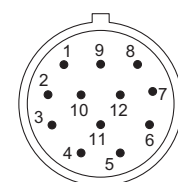
Terminal assignment

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 ⁵⁾	+Vsens ⁵⁾	A	$\bar{A}$	B	$\bar{B}$	0	$\bar{0}$	$\perp$
	5823: 1	Cable color:	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 ⁵⁾	+Vsens ⁵⁾	A	$\bar{A}$	B	$\bar{B}$	0	$\bar{0}$	$\perp$
	5823: 2	Pin:	10	12	11	2	5	6	8	1	3	4	PH ⁴⁾
Output circuit	Type of connection	MIL connector, 7-pin											
7	5803: W	Signal:	0 V	+V	0Vsens ⁵⁾	+Vsens ⁵⁾	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 ⁵⁾	+Vsens ⁵⁾	A	$\bar{A}$	B	$\bar{B}$	0	$\bar{0}$	$\perp$
	5823: –	Pin:	F	D	–	E	A	G	B	H	C	I	J

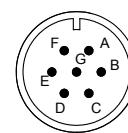
Using RS422 outputs and long cable distances, a wave impedance has to be applied at each cable end.

+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)

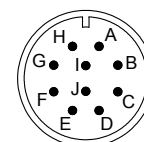
Top view of mating side, male contact base



M23 connector, 12-pin



MIL connector, 7-pin



MIL connector, 10-pin

- 1) 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.

- 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.

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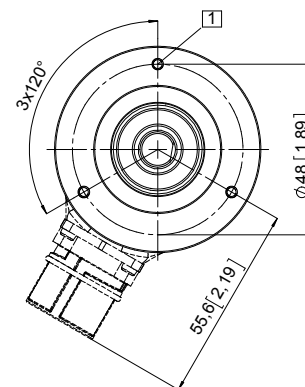
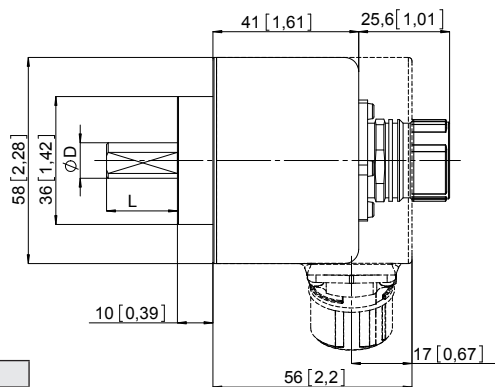
Dimensions shaft version

Dimensions in mm [inch]

Clamping flange, ø 58 [2.28]

Flange type 1

1 3 x M3, 5 [0.2] deep



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

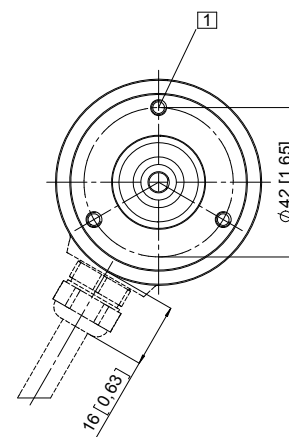
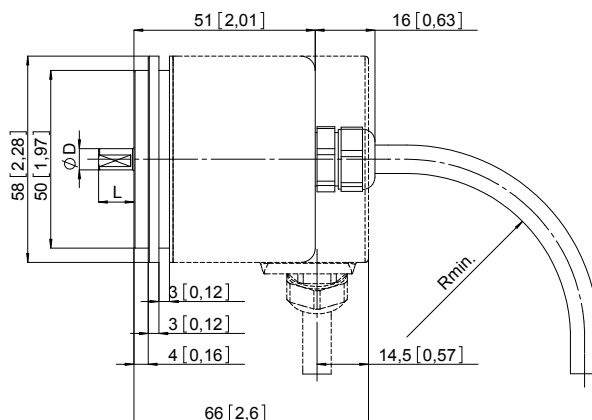
Synchro flange, ø 58 [2.28]

Flange type 2

1 3 x M4, 5 [0.2] deep

R_{min}..:

- securely installed: 55 [2.17]
- flexibly installed: 70 [2.76]



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

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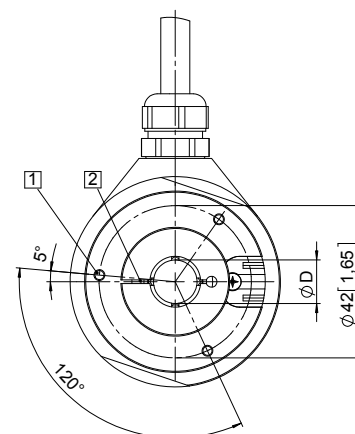
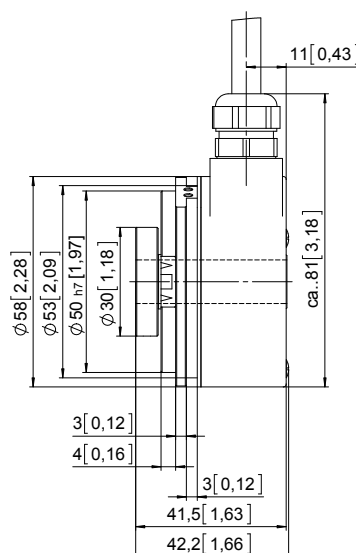
Push-pull / RS422

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

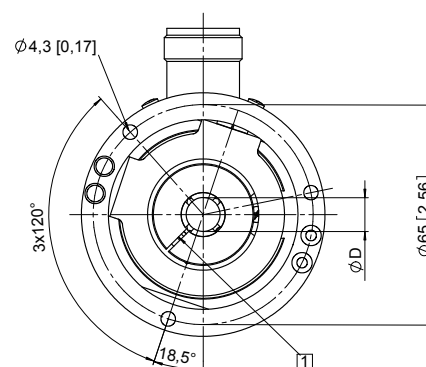
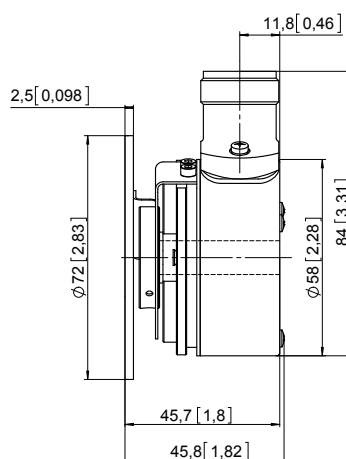


D	Fit
6 [0.24]	H7
8 [0.32]	H7
10 [0.39]	H7
12 [0.47]	H7

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"]