

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.



High rotational speed	Temperature range -20°...+110°C	High protection level IP	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 \varnothing 58 mm [2.28"]</p> <p>2 = synchro flange \varnothing 58 mm [2.28"]</p> <p>P = synchro flange \varnothing 63.5 mm [2.5"]</p> <p>M = square flange \square 63.5 mm [2.5"]</p>	<p>c Output circuit / supply voltage</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 (\varnothing x L), with flat</p> <p>1 = \varnothing 6 x 10 mm [0.24 x 0.39"]</p> <p>2 = \varnothing 10 x 20 mm [0.39 x 0.79"]</p> <p>P = \varnothing 3/8" x 7/8" ¹⁾</p>	<p>d Type of connection</p> <p>1 = axial cable, 1 m [3.28'] TPE</p> <p>A = axial cable, special length TPE *)</p> <p>2 = radial cable, 1 m [3.28'] TPE</p> <p>B = radial cable, special length TPE *)</p> <p>3 = axial M23 connector, 12-pin</p> <p>5 = radial M23 connector, 12-pin</p> <p>W = radial MIL connector, 7-pin ²⁾</p> <p>Y = radial MIL connector, 10-pin</p>	
<p>*) Available special lengths (connection types A, B): 2, 3, 5, 8, 10, 15 m [5.56, 9.84, 16.40, 26.25, 32.80, 49.21'] order code expansion .XXXX = length in dm ex.: 8.5803.114A.0100.0030 (for cable length 3 m)</p>		

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	.XXXX a b c d	.XXXX 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, ϕ 65 mm [2.56"] 4 = with blind hollow shaft and stator coupling, ϕ 65 mm [2.56"]	c Output circuit / supply voltage	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 Hollow shaft (insertion depth blind hollow shaft with flange 2 and 4 max. 30 mm [1.18"])	1 = ϕ 6 mm [0.24"], IP40 2 = ϕ 6 mm [0.24"], IP66 3 = ϕ 8 mm [0.32"], IP40 4 = ϕ 8 mm [0.32"], IP66 5 = ϕ 10 mm [0.39"], IP40 6 = ϕ 10 mm [0.39"], IP66 7 = ϕ 12 mm [0.47"], IP40 8 = ϕ 12 mm [0.47"], IP66	d Type of connection	1 = radial cable, 1 m [3.28'] TPE A = radial cable, special length TPE *) 2 = radial M23 connector, 12-pin
		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)
		*) Available special lengths (connection types A):	2, 3, 5, 8, 10, 15 m [5.56, 9.84, 16.40, 26.25, 32.80, 49.21'] order code expansion .XXXX = length in dm ex.: 8.5823.114A.0100.0030 (for cable length 3 m)
			<i>Optional on request</i> - other pulse rates

Mounting accessory for shaft encoders		Order no.
Coupling	bellows coupling ϕ 19 mm [0.75"] for shaft 6 mm [0.24"]	8.0000.1102.0606
	bellows coupling ϕ 19 mm [0.75"] for shaft 10 mm [0.39"]	8.0000.1102.1010

Mounting accessory for hollow shaft encoders		Dimensions in mm [inch]	Order no.
Torque pin, ϕ 4 mm	with fixing thread		8.0010.4700.0000

Stator coupling, ϕ 63 mm [2.48"]		8.0010.4D00.0000
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Cables and connectors		Order no.
Preassembled cables	M23 female connector with coupling nut, 12-pin, cw single ended 2 m [6.56'] PVC cable	8.0000.6E01.0002
Connectors	M23 female connector with coupling nut, 12-pin, cw	8.0000.5012.0000

Further Kübler accessories can be found at: kuebler.com/accessories
Further Kübler cables and connectors can be found at: kuebler.com/connection-technology

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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

Approvals	
UL compliant in accordance with	File no. E224618
CE compliant in accordance with	EMC Directive
	RoHS Directive
	2014/30/EU 2011/65/EU
UKCA compliant in accordance with	EMC Regulations
	RoHS Regulations
	S.I. 2016/1091 S.I. 2012/3032

Electrical characteristics		
Output circuit	RS422 (TTL compatible)	Push-pull
Supply voltage	5 V DC (±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
	LOW	max. 0.5 V min. +V - 2.5 V max. 2.0 V
Rising edge time t_r	max. 200 ns	max. 1 µs
Falling edge time t_f	max. 200 ns	max. 1 µs
Short circuit proof outputs ²⁾	yes ³⁾	yes
Reverse polarity protection of the supply voltage	no; 10 ... 30 V DC: yes	yes

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

2) If supply voltage 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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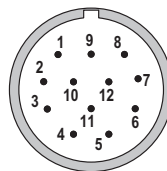
Terminal assignment

Output circuit	Type of connection	Cable (isolate unused cores individually before initial start-up)												
1, 2, 3, 4, 5, 6, 7	5803: 1, 2, A, B	Signal:	0 V	+V	0Vsens ²⁾	+Vsens ²⁾	A	\bar{A}	B	\bar{B}	0	$\bar{0}$	\perp	
	5823: 1, A	Core color:	WH 0.5 mm ²	BN 0.5 mm ²	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 ²⁾	+Vsens ²⁾	A	\bar{A}	B	\bar{B}	0	$\bar{0}$	\perp	
		Pin:	10	12	11	2	5	6	8	1	3	4	PH ¹⁾	
7	5803: W	MIL connector, 7-pin												
	5823: –	Signal:	0 V	+V	0Vsens ²⁾	+Vsens ²⁾	A	\bar{A}	B	\bar{B}	0	$\bar{0}$	\perp	
		Pin:	F	D	–	E	A	–	B	–	C	–	G	
1, 2, 3, 4, 5, 6, 7	5803: Y	MIL connector, 10-pin												
	5823: –	Signal:	0 V	+V	0Vsens ²⁾	+Vsens ²⁾	A	\bar{A}	B	\bar{B}	0	$\bar{0}$	\perp	
		Pin:	F	D	–	E	A	G	B	H	C	I	J	

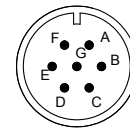
Using RS422 outputs and long cable distances, a wave impedance has to be applied at each cable end.

- +V: Supply voltage encoder +V DC
- 0 V: Supply voltage encoder 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)

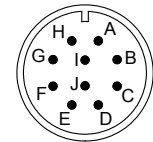
Top view of mating side, male contact base



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 supply voltage internally. If long feeder cables are involved they can be used to adjust or control the voltage at the encoder.

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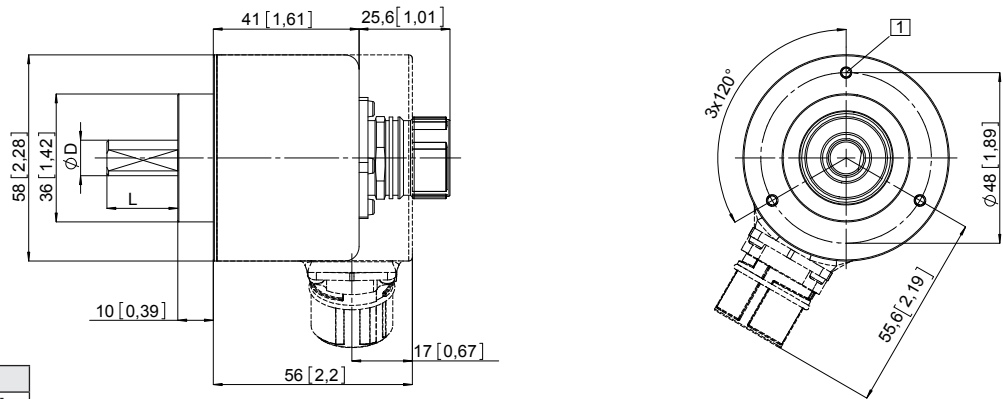
Dimensions shaft version

Dimensions in mm [inch]

Clamping flange, ø 58 [2.28]

Flange type 1

1 3 x M3, 5 [0.2] deep



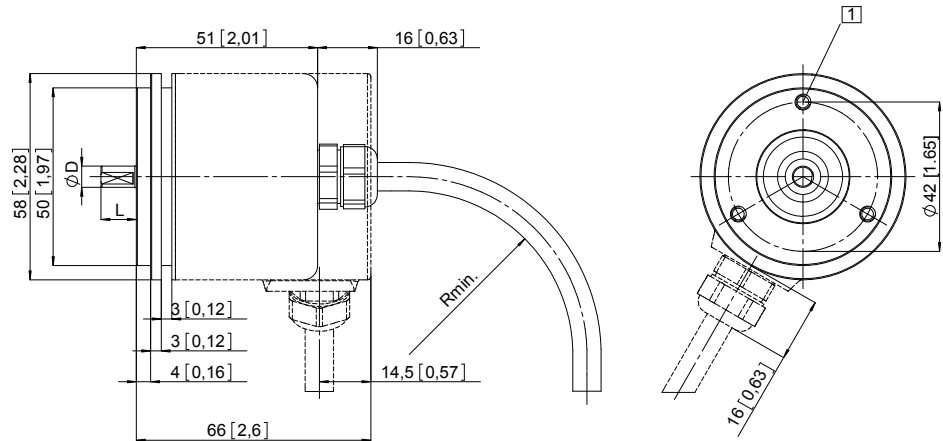
D	Fit	L
6 [0.24]	h7	10 [0.39]
10 [0.39]	f7	20 [0.79]
3/8"	h7	7/8"

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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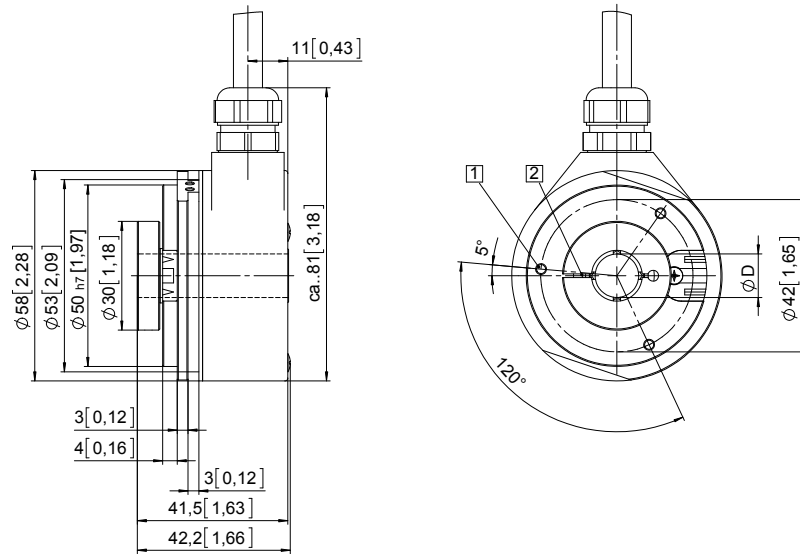
Push-pull / RS422

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

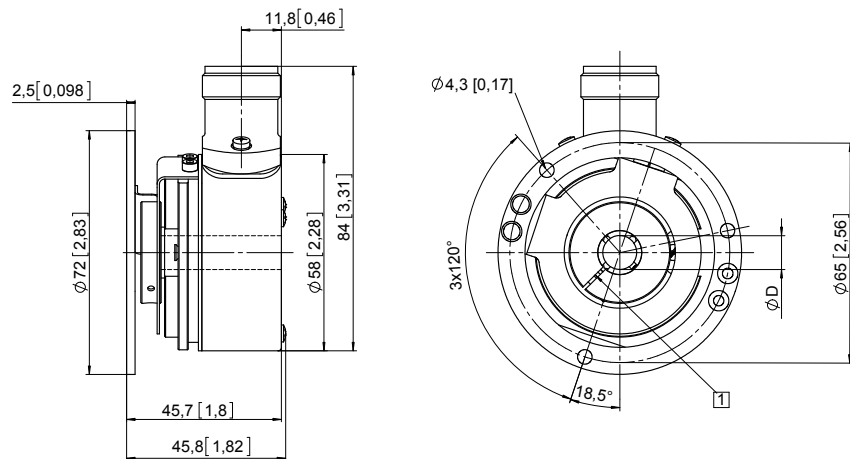


D	Fit
6 [0.24]	H7
8 [0.32]	H7
10 [0.39]	H7
12 [0.47]	H7

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"]