

Incremental encoders

Standard high resolution, optical	5805 / 5825 (shaft / hollow shaft)	Push-pull / RS422
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The incremental encoders type 5805 / 5825 offer resolutions up to max. 36000 pulses per revolution.

They are thus perfect for use in applications where a very high level of accuracy is required.



High rotational speed	Temperature range -20°...+85°C	High protection level IP	High shaft load capacity	Shock / vibration resistant	Magnetic field proof	Short-circuit proof	Optical sensor

High performance

- High shaft loading capability.
- Maximum speed up to 12000 revolutions per minute.
- High IP protection up to max. IP66.

Many variants

- With RS422 or push-pull interface.
- With cable or connector.

Order code	8.5805	.	XXXXX	.	XXXXX
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>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>6000, 7200, 8000, 8192, 9000, 10000, 18000, 36000 (e.g. 18000 pulses => 18000)</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>d Type of connection</p> <p>1 = axial cable, 1 m [3.28'] PUR</p> <p>A = axial cable, special length PUR *)</p> <p>2 = radial cable, 1 m [3.28'] PUR</p> <p>B = radial cable, special length PUR *)</p> <p>3 = axial M23 connector, 12-pin</p> <p>5 = radial M23 connector, 12-pin</p> <p>T = axial M12 connector, 8-pin</p> <p>G = radial M12 connector, 8-pin</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.: 8.5805.114A.6000.0030 (for cable length 3 m)

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Order code	8.5825	.XXXXX	.XXXXX
Hollow shaft	Type	a b c d	e

<p>a Flange</p> <p>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"]</p> <p>b Hollow shaft (insertion depth blind hollow shaft with flange 2 and 4 max. 30 mm [1.18"])</p> <p>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</p>	<p>c Output circuit / supply voltage</p> <p>1 = RS422 (with inverted signal) / 5 V DC 4 = RS422 (with inverted signal) / 10 ... 30 V DC 2 = push-pull (without inverted signal) / 10 ... 30 V DC 3 = push-pull (with inverted signal) / 10 ... 30 V DC</p> <p>d Type of connection</p> <p>1 = radial cable, 1 m [3.28'] PVC A = radial cable, special length PVC *) 2 = radial M23 connector, 12-pin C = radial M12 connector, 8-pin</p> <p>*) 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.: 8.5825.114A.6000.0030 (for cable length 3 m)</p>	<p>e Pulse rate</p> <p>6000, 7200, 8000, 8192, 9000, 10000, 18000, 36000 (e.g. 18000 pulses => 18000)</p> <p><i>Optional on request</i> - other pulse rates</p>
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Mounting accessory for shaft encoders	Order no.
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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	Dimensions in mm [inch]	Order no.
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Torque pin, \varnothing 4 mm	with fixing thread	8.0010.4700.0000
for flange with spring element (flange type 1 + 2)		

Stator coupling, \varnothing 63 mm [2.48"]		8.0010.4D00.0000
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Cables and connectors	Order no.
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Preassembled cables	M12 female connector with coupling nut, 8-pin, A coded, straight single ended 2 m [6.56'] PVC cable	05.00.6041.8211.002M
	M23 female connector with coupling nut, 12-pin, cw single ended 2 m [6.56'] PUR cable	for 5805 8.0000.6101.0002
	M23 female connector with coupling nut, 12-pin, cw single ended 2 m [6.56'] PVC cable	for 5825 8.0000.6901.0002
	M12 female connector with coupling nut, 8-pin, A coded, straight (metal)	05.CMB 8181-0
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		
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 ... +105 °C [-4 °F ... +221 °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	2014/30/EU
RoHS Directive	2011/65/EU
UKCA compliant in accordance with	
EMC Regulations	S.I. 2016/1091
RoHS Regulations	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. 90 mA / max. 135 mA
	with inverted signal	typ. 70 mA / max. 120 mA	typ. 115 mA / max. 160 mA
Permissible load / channel		max. +/- 20 mA	max. +/- 30 mA
Pulse frequency		max. 800 kHz	max. 600 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 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
 at +V = 5 V DC short circuit to channel, 0 V, or +V is permitted.
 at +V = 10 ... 30 V DC short circuit to channel or 0 V is permitted.

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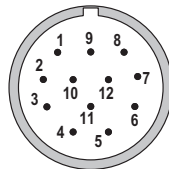
Terminal assignment

Output circuit	Type / Type of connection	Cable (isolate unused cores individually before initial start-up)											
1, 2, 3, 4, 5, 6, 7	5805: 1, 2, A, B	Signal:	0 V	+V	0Vsens ²⁾	+Vsens ²⁾	A	\bar{A}	B	\bar{B}	0	$\bar{0}$	\perp
		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	5825: 1, A	Signal:	0 V	+V	0Vsens ²⁾	+Vsens ²⁾	A	\bar{A}	B	\bar{B}	0	$\bar{0}$	\perp
		Core color:	WH	BN	GY/PK	BU/RD	GN	YE	GY	PK	BU	RD	shield
1, 2, 3, 4, 5, 6, 7	5805: 3, 5 5825: 2	M23 connector, 12-pin											
		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⁾
1, 2, 3, 4, 5, 6, 7	5805: G, T 5825: C	M12 connector, 8-pin											
		Signal:	0 V	+V	0Vsens ²⁾	+Vsens ²⁾	A	\bar{A}	B	\bar{B}	0	$\bar{0}$	\perp
		Pin:	1	2			3	4	5	6	7	8	PH ¹⁾

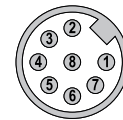
Using RS422 outputs and long cable distances, a wave impedance has to be applied at each cable end.

- +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



M12 connector, 8-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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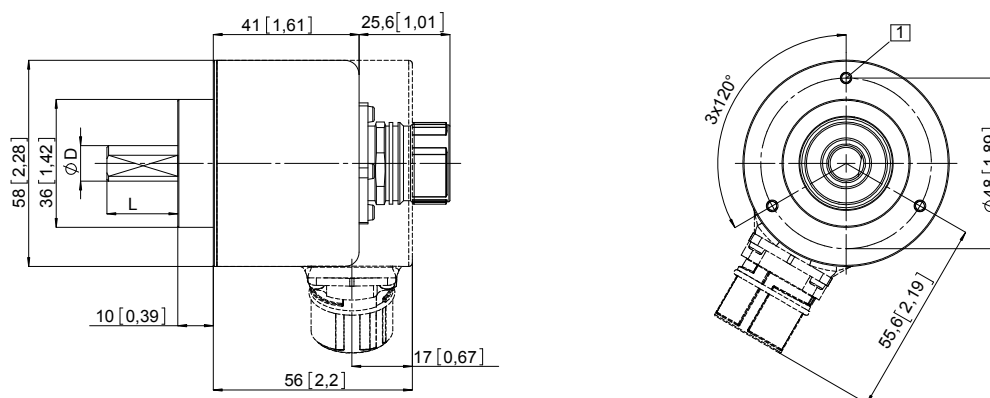
Dimensions shaft version

Dimensions in mm [inch]

Clamping flange, \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]

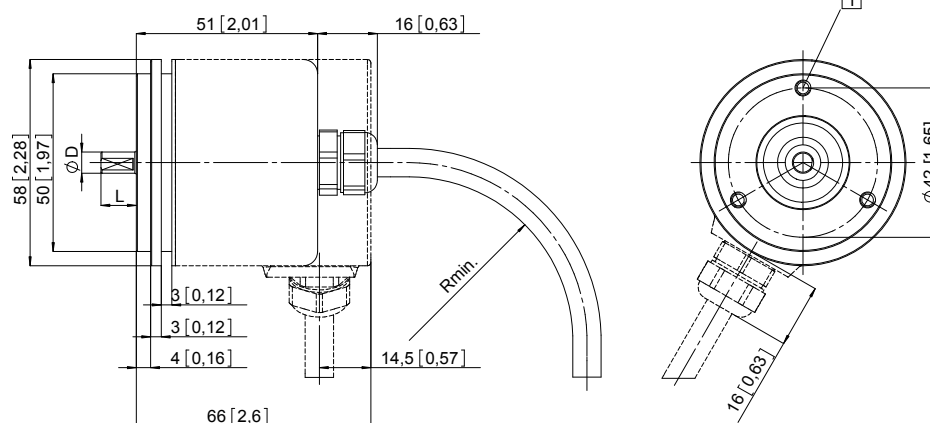
Synchro flange, \varnothing 58 [2.28]

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]

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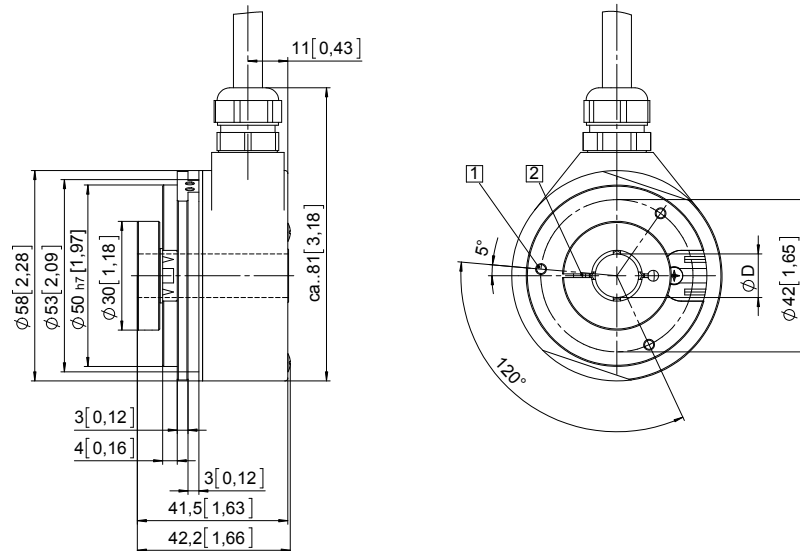
Push-pull / RS422

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

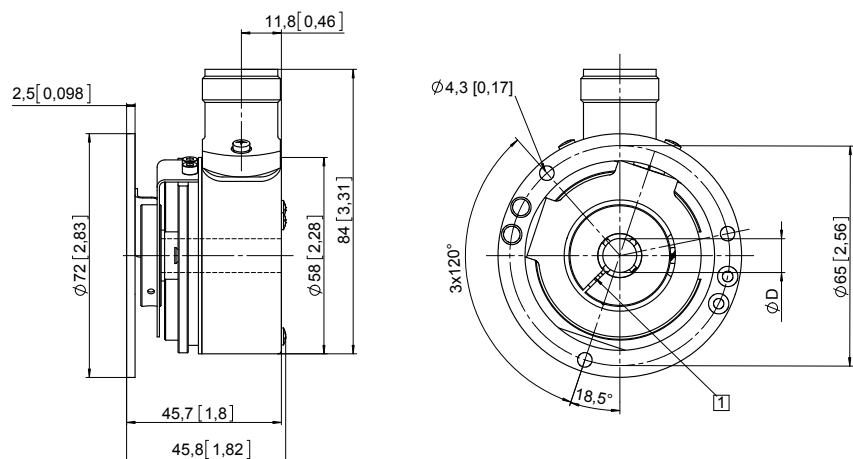


D	Fit
6 [0.24]	H7
8 [0.32]	H7
10 [0.39]	H7
12 [0.47]	H7

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"]