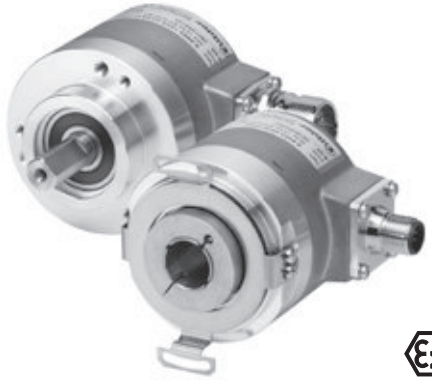
Standard mechanical multiturn, optical | **Sendix 5863 / 5883 (shaft / hollow shaft)** | **SSI / BiSS**



The Sendix 5863 and 5883 multiturn encoders with SSI or BiSS interface and optical sensor technology can achieve a resolution of max. 29 bits.

A through hollow shaft up to 14 mm and a blind hollow shaft up to 15 mm are available, as well as versions with additional SinCos or RS422 incremental track.

Ex 2/22 | cULus | RoHS | SSI | BiSS INTERFACE

Mechanical drive | Safety-Lock™ | High rotational speed | Temperature range -40°...+90°C | High protection level IP | High shaft load capacity | Shock / vibration resistant | Magnetic field proof | Reverse polarity protection | SinCos | Surface protection salt spray-tested optional

Reliable

- Tried-and-tested in applications with the highest demands, such as in wind energy or mobile automation.
- Absolutely reliable operation in areas with strong magnetic fields, thanks to mechanical gear with optical sensor technology.
- Rugged die-cast housing, remains sealed even in harsh everyday use.
- -40°C ... +90°C: use in wide temperature range and protection IP67.

Versatile

- Available with SSI or BiSS interface and combined with SinCos incremental signals.
- The right fixing solution or type of connection available for every application.
- SET button and LED for simple start-up.

Order code Shaft version

8.5863 (Type) . X(a) X(b) X(c) X(d) . X(e) X(f) 2(g) X(h)

If for each parameter of an encoder the **underlined preferred option** is selected, then the delivery time will be 10 working days for a maximum of 10 pieces. Qts. up to 50 pcs. of these types generally have a delivery time of 15 working days.

10 by 10

a *Flange*

1 = clamping flange, IP65	**ø 58 mm [2.28"]**
3 = clamping flange, IP67	ø 58 mm [2.28"]
2 = synchro flange, IP65	**ø 58 mm [2.28"]**
4 = synchro flange, IP67	ø 58 mm [2.28"]
5 = square flange, IP65	□63.5 mm [2.5"]
7 = square flange, IP67	□63.5 mm [2.5"]
6 = servo flange, IP65	ø 63.5 mm [2.5"] 1)
8 = servo flange, IP67	ø 63.5 mm [2.5"] 1)

b *Shaft (ø x L), with flat*

- **1 = 6 x 10 mm [0.24 x 0.39"]** 2)
- **2 = 10 x 20 mm [0.39 x 0.79"]** 3)
- 3 = 1/4" x 7/8"
- 4 = 3/8" x 7/8"

c *Interface / power supply*

- 1 = SSI, BiSS / 5 V DC
- **2 = SSI, BiSS / 10 ... 30 V DC**
- 3 = SSI, BiSS + 2048 ppr. SinCos / 5 V DC
- 4 = SSI, BiSS + 2048 ppr. SinCos / 10 ... 30 V DC
- 5 = SSI, BiSS / 5 V DC, with sensor output
- 6 = SSI, BiSS + 2048 ppr. SinCos / 5 V DC, with sensor output
- 7 = SSI, BiSS + 2048 ppr. RS422 (TTL-comp.) / 5 V DC
- 8 = SSI, BiSS + 2048 ppr. RS422 (TTL-comp.) / 10 ... 30 V DC
- 9 = SSI, BiSS + 2048 ppr. RS422 (TTL-comp.) / 5 V DC, with sensor output

d *Type of connection*

- 1 = axial cable, 1 m [3.28'] PVC
- A = axial cable, special length PVC *)
- **2 = radial cable, 1 m [3.28'] PVC**
- B = radial cable, special length PVC *)
- 3 = axial M23 connector, 12-pin
- **4 = radial M23 connector, 12-pin**
- 5 = axial M12 connector, 8-pin 4)
- 6 = radial M12 connector, 8-pin 4)

*) 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.: 8.5863.112A.G323.0030 (for cable length 3 m)

e *Code*

- B = SSI, binary
- C = BiSS, binary
- **G = SSI, gray**

f *Resolution* 5)

- A = 10 bit ST + 12 bit MT
- 1 = 11 bit ST + 12 bit MT
- 2 = 12 bit ST + 12 bit MT
- **3 = 13 bit ST + 12 bit MT**
- 4 = 14 bit ST + 12 bit MT
- 7 = 17 bit ST + 12 bit MT

Optional on request

- Ex 2/22
- surface protection salt spray tested
- other singleturn resolutions

g *Inputs / outputs* 5)

- **2 = SET, DIR input** additional status output

h *Options (service)*

- 1 = no option
- 2 = status LED
- **3 = SET button and status LED**

1) US version.
2) Preferred type only in conjunction with flange type 2.
3) Preferred type only in conjunction with flange type 1.
4) Only in conjunction with interface type 1 and 2.
5) Resolution, preset value and counting direction factory-programmable.

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Standard mechanical multiturn, optical | **Sendix 5863 / 5883 (shaft / hollow shaft)** | **SSI / BiSS**

Order code Hollow shaft

8.5883 . X X X X . X X 2 X
Type — a b c d — e f g h

If for each parameter of an encoder the **underlined preferred option** is selected, then the delivery time will be 10 working days for a maximum of 10 pieces. Qts. up to 50 pcs. of these types generally have a delivery time of 15 working days.

10 by 10

a *Flange*
1 = with spring element, long, IP65
2 = with spring element, long, IP67
3 = with stator coupling, IP65 ø 65 mm [2.56"]
4 = with stator coupling, IP67 ø 65 mm [2.56"]
5 = with stator coupling, IP65 ø 63 mm [2.48"]
6 = with stator coupling, IP67 ø 63 mm [2.48"]

b *Hollow shaft*
3 = ø 10 mm [0.39"]
4 = ø 12 mm [0.47"]
5 = ø 14 mm [0.55"]
6 = ø 15 mm [0.59"] – blind hollow shaft
8 = ø 3/8"
9 = ø 1/2"

c *Interface / power supply*
1 = SSI, BiSS / 5 V DC
2 = SSI, BiSS / 10 ... 30 V DC
3 = SSI, BiSS + 2048 ppr. SinCos / 5 V DC
4 = SSI, BiSS + 2048 ppr. SinCos / 10 ... 30 V DC
5 = SSI, BiSS / 5 V DC, with sensor output
6 = SSI, BiSS + 2048 ppr. SinCos / 5 V DC, with sensor output
7 = SSI, BiSS + 2048 ppr. RS422 (TTL-comp.) / 5 V DC
8 = SSI, BiSS + 2048 ppr. RS422 (TTL-comp.) / 10 ... 30 V DC
9 = SSI, BiSS + 2048 ppr. RS422 (TTL-comp.) / 5 V DC, with sensor output

d *Type of connection*
2 = radial cable, 1 m [3.28'] PVC
B = radial cable, special length PVC *)
E = tangential cable, 1 m [3.28'] PVC
F = tangential cable, special length PVC *)
4 = radial M23 connector, 12-pin
6 = radial M12 connector, 8-pin [2]

*) Available special lengths (connection types B, F): 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.: 8.5883.542B.G323.0030 (for cable length 3 m)

e *Code*
B = SSI, binary
C = BiSS, binary
G = SSI, gray

f *Resolution* [1]
A = 10 bit ST + 12 bit MT
1 = 11 bit ST + 12 bit MT
2 = 12 bit ST + 12 bit MT
3 = 13 bit ST + 12 bit MT
4 = 14 bit ST + 12 bit MT
7 = 17 bit ST + 12 bit MT

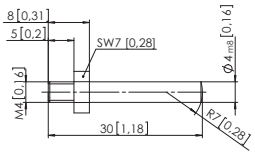
g *Inputs / outputs* [1]
2 = SET, DIR input
additional status output

h *Options (service)*
1 = no option
2 = status LED
3 = SET button and status LED

Optional on request
- Ex 2/22 (not for type of connection E, F)
- surface protection salt spray tested
- other singleturn resolutions

Mounting accessory for shaft encoders		Order no.
Coupling	bellows coupling ø 19 mm [0.75"] for shaft 6 mm [0.24"]	**8.0000.1102.0606**
	bellows coupling ø 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 for torque stops	with fixing thread	**8.0010.4700.0000**



Connection technology		Order no.
Connector, self-assembly (straight)	M12 female connector with coupling nut	**05.CMB 8181-0**
	M23 female connector with coupling nut	**8.0000.5012.0000**
Cordset, pre-assembled	M12 female connector with coupling nut, 2 m [6.56'] PVC cable	**05.00.6041.8211.002M**
	M23 female connector with coupling nut, 2 m [6.56'] PVC cable	**8.0000.6901.0002.0031**

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.

1) Resolution, preset value and counting direction factory-programmable.
2) Only in conjunction with interface type 1 and 2.

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Absolute encoders – multiturn

Standard mechanical multiturn, optical | **Sendix 5863 / 5883 (shaft / hollow shaft)** | **SSI / BiSS**

Technical data

Mechanical characteristics

Maximum speed shaft version		
	IP65 up to 70°C [158°F]	12000 min^{-1}, 10000 min^{-1} (continuous)
	IP65 up to T_{max}	8000 min^{-1}, 5000 min^{-1} (continuous)
	IP67 up to 70°C [158°F]	11000 min^{-1}, 9000 min^{-1} (continuous)
	IP67 up to T_{max}	8000 min^{-1}, 5000 min^{-1} (continuous)
Maximum speed hollow shaft version		
	IP65 up to 70°C [158°F]	9000 min^{-1}, 6000 min^{-1} (continuous)
	IP65 up to T_{max}	6000 min^{-1}, 3000 min^{-1} (continuous)
	IP67 up to 70°C [158°F]	8000 min^{-1}, 4000 min^{-1} (continuous)
	IP67 up to T_{max}	4000 min^{-1}, 2000 min^{-1} (continuous)
Starting torque at 20°C [68°F]	IP65	< 0.01 Nm
	IP67	< 0.05 Nm
Mass moment of inertia		
	shaft version	4.0 x 10^{-6} kgm^2
	hollow shaft version	7.0 x 10^{-6} kgm^2
Load capacity of shaft	radial	80 N
	axial	40 N
Weight		approx. 0.45 kg [15.87 oz]
Protection acc. to EN 60529		
	housing side	IP67
	shaft side	IP65, opt. IP67
Working temperature range		-40°C ... +90°C [-40°F ... +194°F] [1]
Material	shaft/hollow shaft	stainless steel
	flange	aluminium
	housing	zinc die-cast
	cable	PVC
Shock resistance acc. to EN 60068-2-27		2500 m/s^2, 6 ms
Vibration resistance acc. to EN 60068-2-6		100 m/s^2, 55 ... 2000 Hz

Electrical characteristics

Power supply		5 V DC (+5%) or 10 ... 30 V DC
Current consumption (no load)	5 V DC	max. 80 mA
	10 ... 30 V DC	max. 50 mA
Reverse polarity protection of the power supply		yes (at 10 ... 30 V DC)
Short circuit proof outputs		yes [2]
UL approval		file 224618
CE compliant acc. to		EMC guideline 2004/108/EC RoHS guideline 2011/65/EU

SSI interface

Output driver		RS485 transceiver type
Permissible load / channel		max. +/- 20 mA
Signal level	HIGH	typ. 3.8 V
	LOW at I_{Load} = 20 mA	typ 1.3 V
Resolution singleturn		10 ... 14 bit and 17 bit
Number of revolutions (multiturn)		4096 (12 bit)
Code		binary or gray
SSI clock rate		50 kHz ... 2 MHz
Monoflop time		≤ 15 µs

Note: If the clock starts cycling within the monoflop time, a second data transfer starts with the same data. If the clock starts cycling after the monoflop time, the data transfer starts with the new values The update rate is dependent on the clock speed, data length and monoflop-time.

Data refresh rate	ST resolution ≤ 14 bit	≤ 1 µs
	ST resolution ≥ 15 bit	4 µs

BiSS interface

Resolution singleturn	10 ... 14 bit and 17 bit
Number of revolutions (multiturn)	4096 (12 bit)
Code	binary
Clock rate	50 kHz ... 10 MHz
Max. update rate	< 10 µs, depends on the clock rate and the data length
Data refresh rate	≤ 1 µs

Note:
- bidirectional, factory programmable parameters are: resolution, code, direction, alarms and warnings
- CRC data verification

SET input or SET button

Input		active HIGH
Input type		comparator
Signal level	HIGH	min: 60 % of +V (power supply) max: +V
	LOW	max: 25 % of +V (power supply)
Input current		< 0.5 mA
Min. pulse duration (SET)		10 ms
Timeout after SET signal		14 ms
Response time (DIR input)		1 ms

The encoder can be set to zero at any position by means of a HIGH signal on the SET input or by pressing the optional SET button (with a pencil, ball-point pen or similar).
Other preset values can be factory-programmed. The SET input has a signal processing time of approx. 1 ms. Once the SET function has been triggered, the encoder requires an internal processing time of approx. 15 ms before the new position data can be read. During this time the status output is at LOW.

Option incremental outputs (A/B), 2048 ppr

	SinCos	**RS422 TTL compatible**
Max. frequency -3dB	400 kHz	400 kHz
Signal level	1 Vpp (± 20%)	HIGH: min. 2.5 V LOW: max. 0.5 V
Short circuit proof	yes	yes

1) Cable version: -30°C ... +75°C [-22°F ... +167°F].
2) Short circuit to 0V or to output, one channel at a time, power supply correctly applied.

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Standard
mechanical multiturn, optical | **Sendix 5863 / 5883 (shaft / hollow shaft)** | **SSI / BiSS**

Status output and LED

Output driver	open collector, internal pull up resistor 22 kOhm
Permissible load	max. 20 mA
Signal level	HIGH: +V / LOW: < 1 V
Active	LOW

The optional LED (red) and the status output serve to display various alarm or error messages. In normal operation the LED is OFF and the status output is HIGH (open collector with int. pull up 22 kOhm).

An active status output (LOW) displays:
- sensor error, singleturn or multiturn (soiling, glass breakage etc.)
- LED fault (failure or ageing)
- over- or under-temperature

In the SSI mode, the fault indication can only be reset by switching off the power-supply to the device.

DIR input

A HIGH signal switches the direction of rotation from the default cw to ccw. This function can also be factory-programmed to be inverted. If DIR is changed when the device is already switched on, then this will be interpreted as an error. The LED will come ON and the status output will switch to LOW.

Power-ON time

After Power-ON the encoder requires a time of approx. 150 ms before valid data can be read.

Terminal assignment

Interface	Type of connection	Features	Cable (isolate unused wires individually before initial start-up)													
1, 2	1, 2, A, B, E, F	SET, DIR, Status	Signal:	0 V	+V	C+	C-	D+	D-	SET	DIR	Stat	N/C	N/C	N/C	⏚
			Cable colour:	WH	BN	GN	YE	GY	PK	BU	RD	BK	-	-	-	shield

Interface	Type of connection	Features	M23 connector													
1, 2	3, 4	SET, DIR, Status	Signal:	0 V	+V	C+	C-	D+	D-	SET	DIR	Stat	N/C	N/C	N/C	⏚
			Pin:	1	2	3	4	5	6	7	8	9	10	11	12	PH

Interface	Type of connection	Features	Cable (isolate unused wires individually before initial start-up)													
5	1, 2, A, B, E, F	SET, DIR, Status sensor output	Signal:	0 V	+V	C+	C-	D+	D-	SET	DIR	Stat	N/C	0 Vsens	+Vsens	⏚
			Cable colour:	WH	BN	GN	YE	GY	PK	BU	RD	BK	-	GY-PK	RD-BU	shield

Interface	Type of connection	Features	M23 connector													
5	3, 4	SET, DIR, Status sensor output	Signal:	0 V	+V	C+	C-	D+	D-	SET	DIR	Stat	N/C	0 Vsens	+Vsens	⏚
			Pin:	1	2	3	4	5	6	7	8	9	10	11	12	PH

Interface	Type of connection	Features	Cable (isolate unused wires individually before initial start-up)													
3, 4, 7, 8	1, 2, A, B, E, F	SET, DIR, SinCos or incr. RS422	Signal:	0 V	+V	C+	C-	D+	D-	SET	DIR	A	$\overline{A}$	B	$\overline{B}$	⏚
			Cable colour:	WH	BN	GN	YE	GY	PK	BU	RD	BK	VT	GY-PK	RD-BU	shield

Interface	Type of connection	Features	M23 connector													
3, 4, 7, 8	3, 4	SET, DIR, SinCos or incr. RS422	Signal:	0 V	+V	C+	C-	D+	D-	SET	DIR	A	$\overline{A}$	B	$\overline{B}$	⏚
			Pin:	1	2	3	4	5	6	7	8	9	10	11	12	PH

Interface	Type of connection	Features	Cable (isolate unused wires individually before initial start-up)													
6, 9	1, 2, A, B, E, F	SinCos o. incr. RS422 sensor output	Signal:	0 V	+V	C+	C-	D+	D-	A	$\overline{A}$	B	$\overline{B}$	0 Vsens	+Vsens	⏚
			Cable colour:	WH	BN	GN	YE	GY	PK	BU	RD	BK	VT	GY-PK	RD-BU	shield

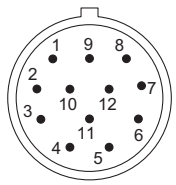
Interface	Type of connection	Features	M23 connector													
6, 9	3, 4	SinCos o. incr. RS422 sensor output	Signal:	0 V	+V	C+	C-	D+	D-	A	$\overline{A}$	B	$\overline{B}$	0 Vsens	+Vsens	⏚
			Pin:	1	2	3	4	5	6	7	8	9	10	11	12	PH

Interface	Type of connection	Features	M12 connector									
1, 2	5, 6	SET, DIR	Signal:	0 V	+V	C+	C-	D+	D-	SET	DIR	⏚
			Pin:	1	2	3	4	5	6	7	8	PH

+V: Encoder power supply +V DC
0 V: Encoder power supply ground GND (0 V)
0 V_{sens} / +V_{sens}: Using the sensor outputs of the encoder, the voltage present can be measured and if necessary increased accordingly.
C+, C-: Clock signal
D+, D-: Data signal
A, $\overline{A}$: Incremental output channel A (cosine)
B, $\overline{B}$: Incremental output channel B (sine)
SET: SET input. The current position becomes defined as position zero.
DIR: Direction input: If this input is active, output values are counted backwards (decrease) when the shaft is turning clockwise.
Stat: Status output
PH ⏚: Plug connector housing (shield)

Top view of mating side, male contact base

M12 connector, 8-pin



M23 connector, 12-pin

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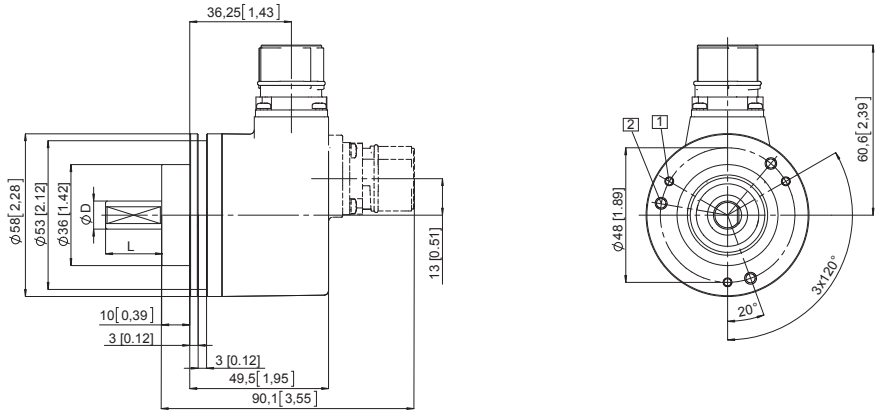
Standard mechanical multiturn, optical | **Sendix 5863 / 5883 (shaft / hollow shaft)** | **SSI / BiSS**

Dimensions shaft version

Dimensions in mm [inch]

Clamping flange, ø 58 [2.28]
Flange type 1 and 3
(drawing with M23 connector)

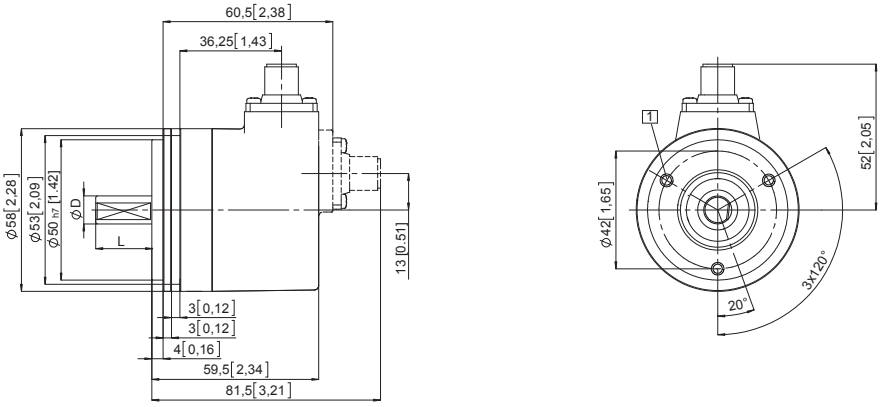
1 3 x M3, 6 [0.24] deep
2 3 x M4, 8 [0.32] deep



D	L	Fit
6 [0.24]	10 [0.39]	h7
10 [0.39]	20 [0.79]	f7
1/4"	7/8"	h7
3/8"	7/8"	h7

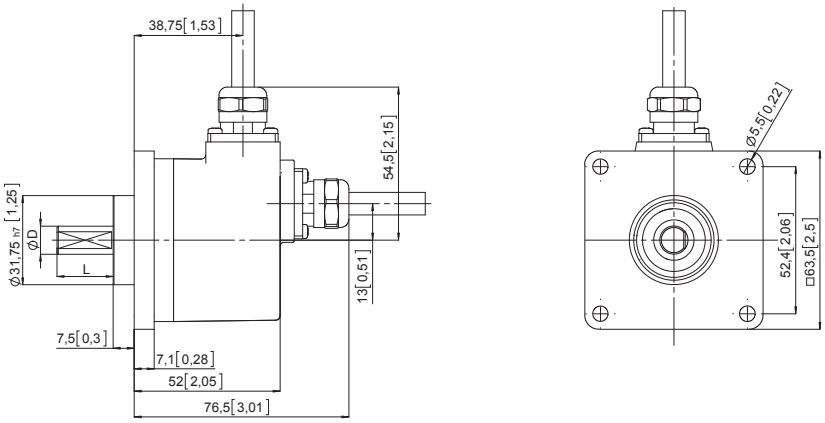
Synchro flange, ø 58 [2.28]
Flange type 2 and 4
(drawing with M12 connector)

1 M4, 6 [0.24] deep



D	L	Fit
6 [0.24]	10 [0.39]	h7
10 [0.39]	20 [0.79]	f7
1/4"	7/8"	h7
3/8"	7/8"	h7

Square flange, □ 63.5 [2.5]
Flange type 5 and 7
(drawing with cable)



D	L	Fit
6 [0.24]	10 [0.39]	h7
10 [0.39]	20 [0.79]	f7
1/4"	7/8"	h7
3/8"	7/8"	h7

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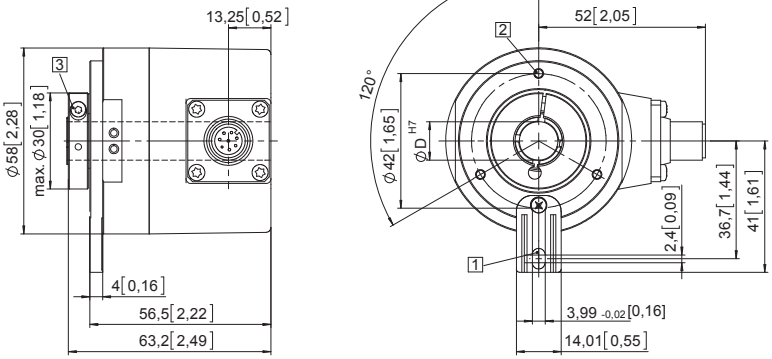
Standard
mechanical multiturn, optical | **Sendix 5863 / 5883 (shaft / hollow shaft)** | **SSI / BiSS**

Dimensions hollow shaft version

Dimensions in mm [inch]

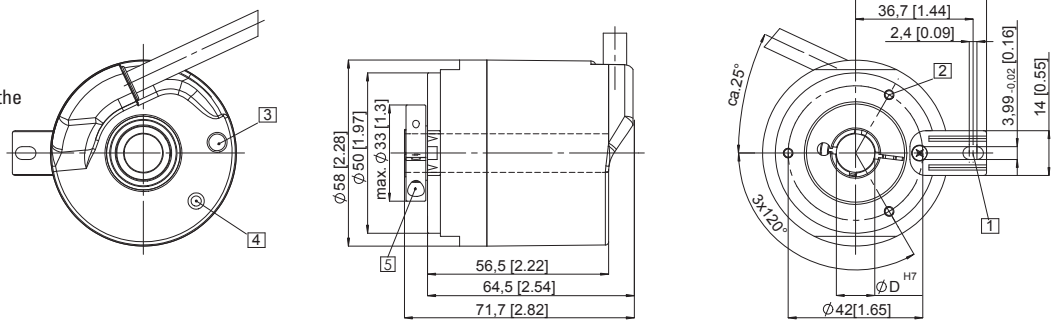
Flange with spring element, long
Flange type 1 and 2
(drawing with M12 connector)

1 Torque stop slot, recommendation: cylindrical pin DIN 7, ø 4 [0.16]
2 M3, 6 [0.24] deep
3 Recommended torque for the clamping ring 0.6 Nm



Flange with spring element, long
Flange type 1 and 2
(drawing with tangential cable)

1 Torque stop slot, recommendation: cylindrical pin DIN 7, ø 4 [0.16]
2 M3, 5.5 [0.21] deep
3 Status-LED
4 SET button
5 Recommended torque for the clamping ring 0.6 Nm



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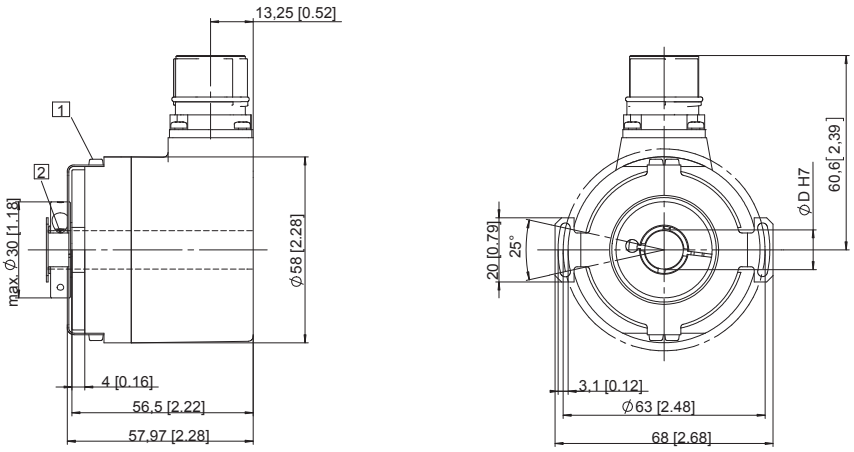
Standard mechanical multiturn, optical | **Sendix 5863 / 5883 (shaft / hollow shaft)** | **SSI / BiSS**

Dimensions hollow shaft version

Dimensions in mm [inch]

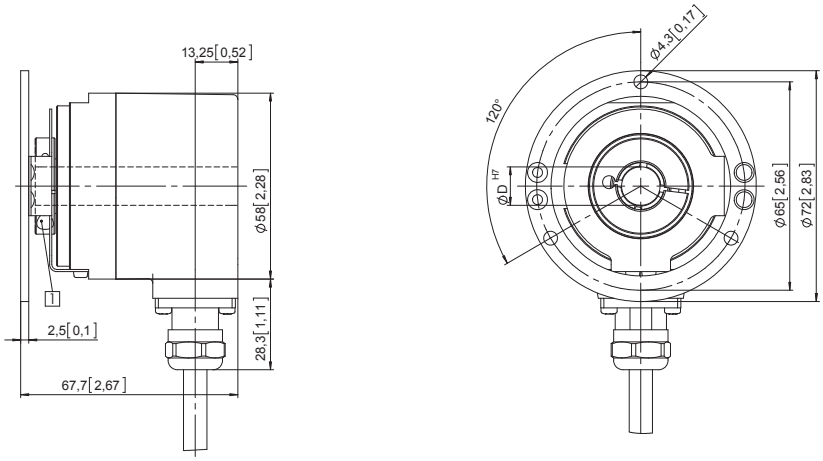
Flange with stator coupling, ø 63 [2.48]
Flange type 5 and 6
Pitch circle diameter for fixing screws 63 [2.48]
(drawing with M23 connector)

1 Fixing screws DIN 912 M3 x 8 (washer included in delivery)
2 Recommended torque for the clamping ring 0.6 Nm



Flange with stator coupling, ø 65 [2.56]
Flange type 3 and 4
Pitch circle diameter for fixing screws 65 [2.56]
(drawing with cable)

1 Recommended torque for the clamping ring 0.6 Nm



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