

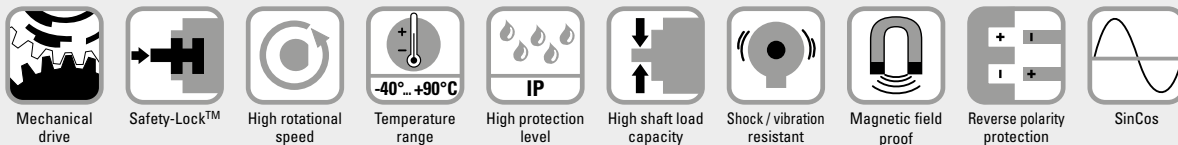
Absolute encoders – multiturn

Standard mechanical multiturn, optical	Sendix 5863 / 5883 (shaft / hollow shaft)	SSI / BiSS + incremental
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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.



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 . **XXXX** . **XX2X**
Type a b c d e f g

<p>a Flange</p> <p>1 = clamping flange, IP65 ø 58 mm [2.28"] 3 = clamping flange, IP67 ø 58 mm [2.28"]</p> <p>2 = synchro flange, IP65 ø 58 mm [2.28"] 4 = synchro flange, IP67 ø 58 mm [2.28"]</p> <p>5 = square flange, IP65 □ 63.5 mm [2.5"] 7 = square flange, IP67 □ 63.5 mm [2.5"]</p> <p>6 = servo flange, IP65 ø 63.5 mm [2.5"]¹⁾ 8 = servo flange, IP67 ø 63.5 mm [2.5"]¹⁾</p> <p>b Shaft (ø x L), with flat</p> <p>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"</p> <p>c Interface / supply voltage</p> <p>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</p>	<p>d Type of connection</p> <p>1 = axial cable, 1 m [3.28'] PVC A = axial cable, special length PVC *)</p> <p>2 = radial cable, 1 m [3.28'] PVC B = radial cable, special length PVC *)</p> <p>3 = axial M23 connector, 12-pin 4 = radial M23 connector, 12-pin 5 = axial M12 connector, 8-pin⁴⁾ 6 = radial M12 connector, 8-pin⁴⁾</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.: 8.5863.112A.G323.0030 (for cable length 3 m)</p>	<p>e Code</p> <p>B = SSI, binary C = BiSS, binary G = SSI, gray</p> <p>f Resolution⁵⁾</p> <p>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 9 = 19 bit ST + 12 bit MT</p>	<p>g Options (service)</p> <p>1 = no option 2 = status LED 3 = SET button and status LED</p> <p><i>Optional on request</i></p> <ul style="list-style-type: none"> - Ex 2/22⁶⁾ - other resolutions - surface protection salt spray tested - seawater resistant (stainless steel V4A) <p><i>Salt spray tested / stainless steel V4A as standard types (deliverable as from 1 unit)</i></p> <p>salt spray tested: 8.5863.32X6.XX22-C</p> <div style="border: 1px solid black; padding: 2px; display: inline-block;">V4A 1.4404</div> <p>stainless steel V4A: 8.5863.32X6.XX22-V4A</p>
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1) US version. 3) Preferred type only in conjunction with flange type 1. 5) Resolution, preset value and counting direction factory-programmable.
2) Preferred type only in conjunction with flange type 2. 4) Only in conjunction with interface type 1 and 2. 6) For the cable connection type, cable material PUR.

Absolute encoders – multitrurn

Standard mechanical multitrurn, optical	Sendix 5863 / 5883 (shaft / hollow shaft)	SSI / BiSS + incremental
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Order code	8.5883	.XXXX.XX2X
Hollow shaft	Type	a b c d e f g

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 Through hollow shaft
 3 = ø 10 mm [0.39"]
4 = ø 12 mm [0.47"]
 5 = ø 14 mm [0.55"]
 8 = ø 3/8"
 9 = ø 1/2"
Blind hollow shaft
(insertion depth max. 30 mm [1.18"])
 6 = ø 15 mm [0.59"]

c Interface / supply voltage
 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-pin²⁾

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

f Resolution¹⁾
 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
 9 = 19 bit ST + 12 bit MT

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

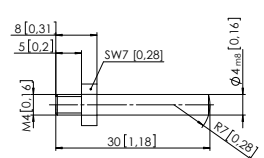
Optional on request
 - Ex 2/22 (not for type of connection E, F)³⁾
 - other resolutions
 - surface protection salt spray tested
 - seawater resistant (stainless steel V4A)

Salt spray tested / stainless steel V4A as standard types (deliverable as from 1 unit)
 salt spray tested:
 8.5883.24X6.XX22-C
 8.5883.25X6.XX22-C

V4A
 1.4404

stainless steel V4A:
 8.5883.24X6.XX22-V4A

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.
Torque pin, ø 4 mm for flange with spring element (flange type 1)	with fixing thread 	8.0010.4700.0000

Cables and connectors		Order no.
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'] PVC cable	8.0000.6901.0002.0031
Connectors	M12 female connector with coupling nut, 8-pin, A coded, straight (metal)	05.CMB 8181-0
	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

1) Resolution, preset value and counting direction factory-programmable.
 2) Only in conjunction with interface type 1 and 2.
 3) For the cable connection type, cable material PUR.

Absolute encoders – multiturn

Standard mechanical multiturn, optical	Sendix 5863 / 5883 (shaft / hollow shaft)	SSI / BiSS + incremental
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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	aluminum	
housing	zinc die-cast	
cable	PVC (PUR for Ex 2/22)	
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		
Supply voltage		
	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 supply voltage		
	yes (at 10 ... 30 V DC)	
Short circuit proof outputs		
	yes ²⁾	

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, 17 bit and 19 bit	
Number of revolutions (multiturn)		
	4096 (12 bit)	
Code		
	binary or gray	
SSI clock rate		
	50 kHz ... 2 MHz	
Data refresh rate		
ST resolution ≤ 14 bit	≤ 1 μs	
ST resolution > 14 bit	≤ 4 μs	
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.		

BiSS 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, 17 bit and 19 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		
ST resolution ≤ 14 bit	≤ 1 μs	
ST resolution > 14 bit	≤ 4 μs	
Note:		
	<ul style="list-style-type: none"> - bidirectional, factory programmable parameters are: resolution, code, direction, alarms and warnings - CRC data verification 	

Status output and LED		
Output driver		
	open collector, internal pull up resistor 22 kΩhm	
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 kΩhm).		
An active status output (LOW) displays:		
	<ul style="list-style-type: none"> - 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.		

Incremental outputs (A/B)		
	SinCos	RS422 TTL compatible
Max. frequency -3dB	400 kHz	400 kHz
Signal level	1 V _{pp} (±20 %)	HIGH: min. 2.5 V LOW: max. 0.5 V
Short circuit proof	yes ²⁾	yes ²⁾
Pulse rate	2048 ppr	2048 ppr

1) Cable version: -30 °C ... +75 °C [-22 °F ... +167 °F].

2) Short circuit to 0V or to output, one channel at a time, supply voltage correctly applied.

Absolute encoders – multiturn

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

If this input is not used, it should be connected to 0 V (Encoder ground GND) in order to avoid interferences.

DIR input	
<p>Direction 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.</p> <p>The LED will come ON and the status output will switch to LOW.</p> <p>If this input is not used, it should be connected to 0 V (Encoder ground GND) in order to avoid interferences.</p>	
Response time (DIR input)	1 ms

Power-ON	
<p>After Power-ON the device requires a time of approx. 150 ms before valid data can be read.</p>	
<p>Hot plugging of the encoder should be avoided.</p>	

Approvals	
UL compliant in accordance with	File no. E224618
CE compliant in accordance with	
EMC Directive	2014/30/EU
RoHS Directive	2011/65/EU
ATEX Directive	2014/34/EU (for Ex 2/22 variants)

Absolute encoders – multiturn

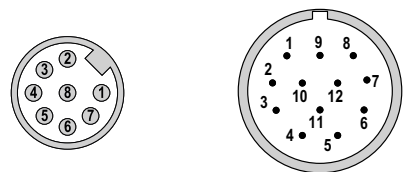
Standard mechanical multiturn, optical	Sendix 5863 / 5883 (shaft / hollow shaft)	SSI / BiSS + incremental
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Terminal assignment

Interface	Type of connection	Features	Cable (isolate unused cores 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 ERR\ N/C N/C N/C \perp
			Core color: WH BN GN YE GY PK BU RD BK - - - shield
1, 2	3, 4	SET, DIR, Status	M23 connector, 12-pin
			Signal: 0 V +V C+ C- D+ D- SET DIR ERR\ N/C N/C N/C \perp Pin: 1 2 3 4 5 6 7 8 9 10 11 12 PH
5	1, 2, A, B, E, F	SET, DIR, Status sensor output	Cable (isolate unused cores individually before initial start-up)
			Signal: 0 V +V C+ C- D+ D- SET DIR ERR\ N/C 0Vsens +Vsens \perp Core color: WH BN GN YE GY PK BU RD BK - GY-PK RD-BU shield
5	3, 4	SET, DIR, Status sensor output	M23 connector, 12-pin
			Signal: 0 V +V C+ C- D+ D- SET DIR ERR\ N/C 0Vsens +Vsens \perp Pin: 1 2 3 4 5 6 7 8 9 10 11 12 PH
3, 4, 7, 8	1, 2, A, B, E, F	SET, DIR, SinCos or incr. RS422	Cable (isolate unused cores individually before initial start-up)
			Signal: 0 V +V C+ C- D+ D- SET DIR A \bar{A} B \bar{B} \perp Core color: WH BN GN YE GY PK BU RD BK VT GY-PK RD-BU shield
3, 4, 7, 8	3, 4	SET, DIR, SinCos or incr. RS422	M23 connector, 12-pin
			Signal: 0 V +V C+ C- D+ D- SET DIR A \bar{A} B \bar{B} \perp Pin: 1 2 3 4 5 6 7 8 9 10 11 12 PH
6, 9	1, 2, A, B, E, F	SinCos o. incr. RS422 sensor output	Cable (isolate unused cores individually before initial start-up)
			Signal: 0 V +V C+ C- D+ D- A \bar{A} B \bar{B} 0Vsens +Vsens \perp Core color: WH BN GN YE GY PK BU RD BK VT GY-PK RD-BU shield
6, 9	3, 4	SinCos o. incr. RS422 sensor output	M23 connector, 12-pin
			Signal: 0 V +V C+ C- D+ D- A \bar{A} B \bar{B} 0Vsens +Vsens \perp Pin: 1 2 3 4 5 6 7 8 9 10 11 12 PH
1, 2	5, 6	SET, DIR	M12 connector, 8-pin
			Signal: 0 V +V C+ C- D+ D- SET DIR \perp Pin: 1 2 3 4 5 6 7 8 PH

- +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.
- C+, C-: Clock signal
- D+, D-: Data signal
- A, \bar{A} : Incremental output channel A (cosine)
- B, \bar{B} : Incremental output channel B (sine)
- SET: SET input
- DIR: Direction input
- ERR: Status output
- PH \perp : Plug connector housing (shield)

Top view of mating side, male contact base



M12 connector, 8-pin

M23 connector, 12-pin

Absolute encoders – multiturn

**Standard
mechanical multiturn, optical**

Sendix 5863 / 5883 (shaft / hollow shaft)

SSI / BiSS + incremental

Dimensions shaft version

Dimensions in mm [inch]

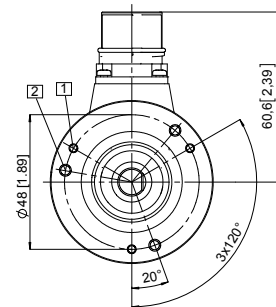
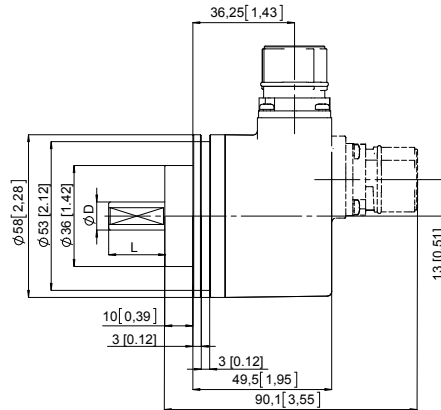
Clamping flange, \varnothing 58 [2.28]

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



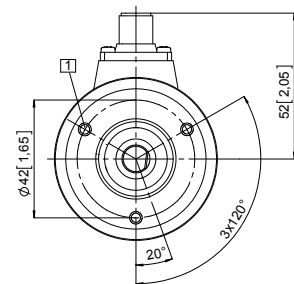
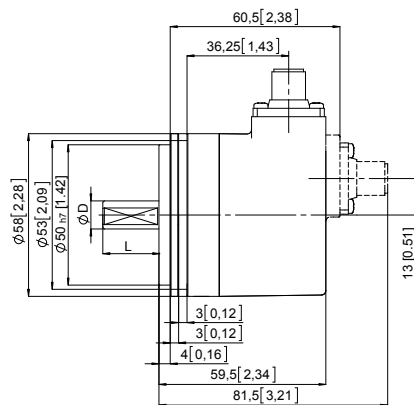
Synchro flange, \varnothing 58 [2.28]

Flange type 2 and 4

(drawing with M12 connector)

- 1 3 x M4, 6 [0.24] deep

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

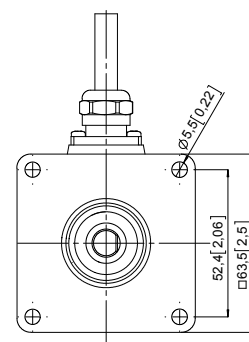
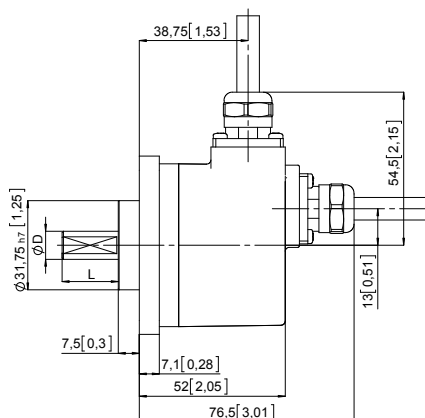


Square flange, \square 63.5 [2.5]

Flange type 5 and 7

(drawing with cable)

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



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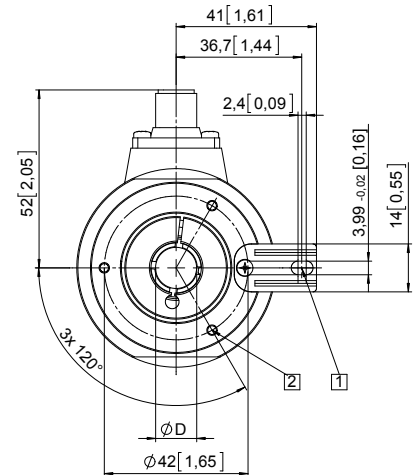
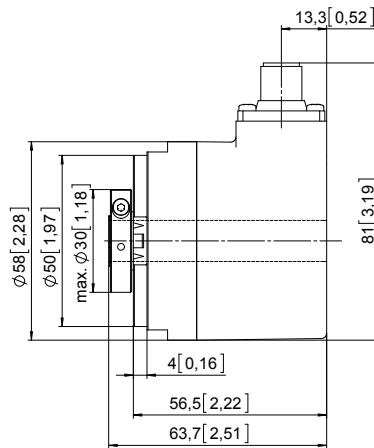
Dimensions hollow shaft version

Dimensions in mm [inch]

Flange with spring element, long Flange type 1 and 2

(drawing with M12 connector)

- 1 Slot spring element, recommendation: torque pin DIN 7, ϕ 4 [0.16]
- 2 3 x M3, 6 [0.24] deep
- 3 Recommended torque for the clamping ring 0.6 Nm

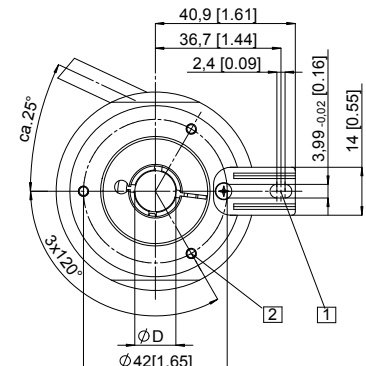
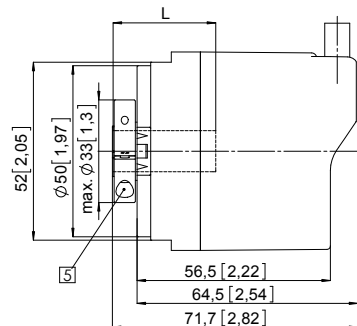


D	Fit
10 [0.39]	H7
12 [0.47]	H7
14 [0.55]	H7
15 [0.59] *)	H7
3/8"	H7
1/2"	H7

*) Blind hollow shaft, insertion depth max. = 30 mm [1.18"]

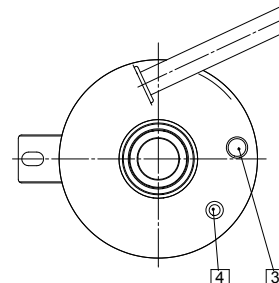
(drawing with tangential cable)

- 1 Slot spring element, recommendation: torque pin DIN 7, ϕ 4 [0.16]
- 2 3 x M3, 5.5 [0.22] deep
- 3 Status-LED
- 4 SET button
- 5 Recommended torque for the clamping ring 0.6 Nm



D	Fit
10 [0.39]	H7
12 [0.47]	H7
14 [0.55]	H7
15 [0.59] *)	H7
3/8"	H7
1/2"	H7

*) Blind hollow shaft, insertion depth max. = 30 mm [1.18"]



Absolute encoders – multiturn

**Standard
mechanical multiturn, optical**

Sendix 5863 / 5883 (shaft / hollow shaft)

SSI / BiSS + incremental

Dimensions hollow shaft version

Dimensions in mm [inch]

Flange with stator coupling, \varnothing 63 [2.48]

Flange type 5 and 6

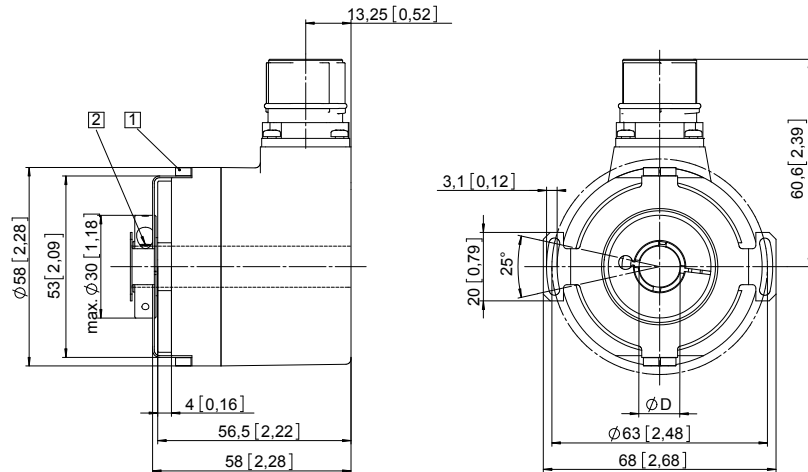
Pitch circle diameter for fixing screws
63 [2.48]

(drawing with M23 connector)

- 1 Fixing screws DIN 912 M2,5 x 6
(washer included in delivery)
- 2 Recommended torque for the
clamping ring 0.6 Nm

D	Fit
10 [0.39]	H7
12 [0.47]	H7
14 [0.55]	H7
15 [0.59] *)	H7
3/8"	H7
1/2"	H7

*) Blind hollow shaft,
insertion depth max. = 30 mm [1.18"]



Flange with stator coupling, \varnothing 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

D	Fit
10 [0.39]	H7
12 [0.47]	H7
14 [0.55]	H7
15 [0.59] *)	H7
3/8"	H7
1/2"	H7

*) Blind hollow shaft,
insertion depth (L) max. = 30 mm [1.18"]

