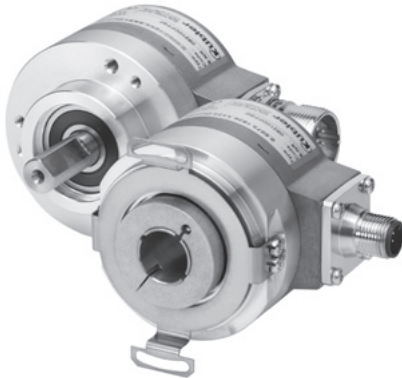


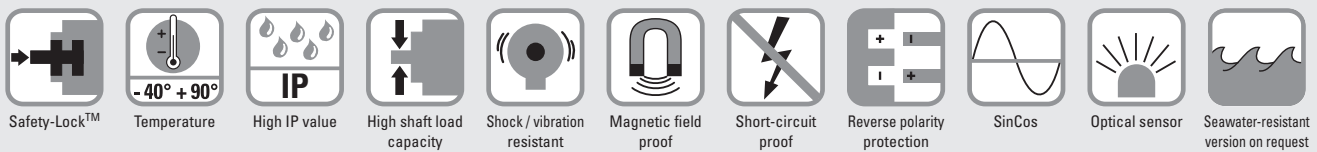
Absolute Encoders - Singleturn

Standard, optical **Sendix 5853 / 5873 (Shaft / Hollow shaft)** **SSI / BiSS**



The Sendix 5853 and Sendix 5873 singleturn encoders with SSI or BiSS interface and optical sensor technology can achieve a resolution of max. 17 bits.

These encoders are also available with an optional SinCos output or RS422 incremental track.



Reliable and magnetically insensitive

- Sturdy bearing construction in Safety Lock™ Design for resistance against vibration and installation errors
- Ideal for use outdoors thanks to IP67 protection and wide temperature range from -40°C up to +90°C

Versatile

- High-precision with a data refresh rate of the position value $\leq 1\mu s$
- High-resolution feedback in real-time via incremental outputs SinCos and RS422
- Short control cycles, clock rate with SSI up to 2 MHz / with BiSS up to 10 MHz

Absolute Encoders Singleturn

Order code

8.5853 . XXXX . XX2X
 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.



a Flange

- 1 = clamping flange, ø 58 mm, IP65**
- 2 = synchro flange, ø 58 mm, IP65**
- 3 = clamping flange, ø 58 mm, IP67
- 4 = synchro flange, ø 58 mm, IP67
- 5 = square flange, 63,5 mm (2,5"), IP65
- 7 = square flange, 63,5 mm (2,5"), IP67

b Shaft (ø x L), with flat

- 1 = 6 x 10 mm¹⁾**
- 2 = 10 x 20 mm²⁾**
- 3 = 6,35 x 22,2 mm (1/4" x 7/8")
- 4 = 9,5 x 22,2 mm (3/8" x 7/8")

c Interface / Power supply

- 1 = SSI or BiSS / 5 V DC
- 2 = SSI or BiSS / 10 ... 30 V DC**
- 3 = SSI or BiSS, 2048 ppr SinCos / 5 V DC
- 4 = SSI or BiSS, 2048 ppr SinCos / 10 ... 30 V DC
- 5 = SSI or BiSS / 5 V DC, with sensor output for monitoring the voltage on the encoder
- 6 = SSI oder BiSS, 2048 ppr SinCos / 5 V DC, with sensor output for monitoring the voltage on the encoder
- 7 = SSI or BiSS and 2048 ppr incremental signals RS422 (TTL-comp.) / 5 V DC
- 8 = SSI or BiSS and 2048 ppr incremental signals RS422 (TTL-comp.) / 10 ... 30 V DC
- 9 = SSI or BiSS and 2048 ppr incremental signals RS422 (TTL-comp.) / 5 V DC, with sensor output for monitoring the voltage on the encoder

d Type of connection

- 1 = axial cable (1 m PVC)
- 2 = radial cable (1 m PVC)**
- 3 = M23 connector, 12-pin, axial
- 4 = M23 connector, 12-pin, radial**
- 5 = M12 connector, 8-pin, axial⁴⁾
- 6 = M12 connector, 8-pin, radial⁴⁾

e Code

- B = SSI, Binary
- C = BiSS, Binary
- G = SSI, Gray**

f Resolution³⁾

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

g Inputs / Outputs³⁾

- 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
 - seawater-resistant
 - special cable length

1) Preferred type only in conjunction with Flange type 2
 2) Preferred type only in conjunction with Flange type 1
 3) Resolution, preset value and counting direction factory-programmable
 4) Can be combined only with output circuits 1 and 2

Absolute Encoders - Singleturn

Standard, optical **Sendix 5853 / 5873 (Shaft / Hollow shaft)** **SSI / BiSS**

Order code Hollow shaft	8.5873 Type	. X X X X . X X 2 X a b c d e f g h	<p>If for each parameter of an encoder the <u>underlined preferred option</u> 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.</p>
a Flange	c Output circuit / Power supply	d Type of connection	g Inputs / Outputs ¹⁾
1 = with torque stop set, IP65 2 = with torque stop set, IP67 3 = with stator coupling, ø 65, IP65 4 = with stator coupling, ø 65, IP67 <u>5 = with stator coupling, ø 63, IP65</u> 6 = with stator coupling, ø 63, IP67	1 = SSI or BiSS / 5 V DC <u>2 = SSI or BiSS / 10 ... 30 V DC</u> 3 = SSI or BiSS, 2048 ppr SinCos / 5 V DC 4 = SSI or BiSS, 2048 ppr SinCos / 10 ... 30 V DC 5 = SSI or BiSS / 5 V DC, with sensor output for monitoring the voltage on the encoder 6 = SSI oder BiSS, 2048 ppr SinCos / 5 V DC, with sensor output for monitoring the voltage on the encoder 7 = SSI or BiSS and 2048 ppr incremental signals RS422 (TTL-comp.) / 5 V DC 8 = SSI or BiSS and 2048 ppr incremental signals RS422 (TTL-comp.) / 10 ... 30 V DC 9 = SSI or BiSS and 2048 ppr incremental signals RS422 (TTL-comp.) / 5 V DC, with sensor output for monitoring the voltage on the encoder	2 = radial cable (1 m PVC) <u>4 = M23 connector, 12-pin, radial</u> 6 = M12 connector, 8-pin, radial ²⁾ <u>E = tangential cable outlet</u> <u>cable length 1 m (PVC cable)</u>	<u>2 = SET, DIR input</u> additional status output h Options (Service) 1 = no option 2 = Status LED <u>3 = SET button and Status LED</u>
b Hollow shaft		e Code	
3 = ø 10 mm <u>4 = ø 12 mm</u> 5 = ø 14 mm 6 = ø 15 mm 8 = ø 9.52 mm [3/8"] 9 = ø 12.7 mm [1/2"]		B = SSI, Binary C = BiSS, Binary <u>G = SSI, Gray</u>	
		f Resolution ¹⁾	
		A = 10 bit ST 1 = 11 bit ST 2 = 12 bit ST <u>3 = 13 bit ST</u> 4 = 14 bit ST 7 = 17 bit ST	<i>optional on request</i> - Ex 2/22 - seawater-resistant - special cable length

Mounting accessory for shaft encoders

Coupling	Bellows coupling ø 19 mm for shaft 6 mm	8.0000.1101.0606
	Bellows coupling ø 19 mm for shaft 10 mm	8.0000.1101.1010

Mounting accessory for hollow shaft encoders

Cylindrical pin, long for torque stops		With fixing thread	8.0010.4700.0000
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Connection Technology

Connector, self-assembly	M12	05.CMB-8181-0
	M23	8.0000.5012.0000
Cordset, pre-assembled with 2 m PVC cable	M12	05.WAKS8-2/P00
	M23	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) Can be combined only with output circuits 1 and 2

Absolute Encoders - Singleturn

Standard, optical	Sendix 5853 / 5873 (Shaft / Hollow shaft)	SSI / BiSS
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Mechanical characteristics		
Max. speed, shaft version		
without shaft seal (IP65) up to 70°C	12 000 min ⁻¹ , 10 000 min ⁻¹ (continuous)	
without shaft seal (IP65) up to T _{max}	8 000 min ⁻¹ , 5 000 min ⁻¹ (continuous)	
with shaft seal (IP67) up to 70°C	11 000 min ⁻¹ , 9 000 min ⁻¹ (continuous)	
with shaft seal (IP67) up to T _{max}	8 000 min ⁻¹ , 5 000 min ⁻¹ (continuous)	
Max. speed, hollow shaft version		
without shaft seal (IP65) up to 70°C	9 000 min ⁻¹ , 6 000 min ⁻¹ (continuous)	
without shaft seal (IP65) up to T _{max}	6 000 min ⁻¹ , 3 000 min ⁻¹ (continuous)	
with shaft seal (IP67) up to 70°C	8 000 min ⁻¹ , 4 000 min ⁻¹ (continuous)	
with shaft seal (IP67) up to T _{max}	4 000 min ⁻¹ , 2 000 min ⁻¹ (continuous)	
Starting torque, shaft version		
without shaft seal (IP65)	< 0.01 Nm	
with shaft seal (IP67)	< 0.05 Nm	
Starting torque, hollow shaft version		
without shaft seal (IP65)	< 0.03 Nm	
Moment of inertia		
Shaft version	3.0 x 10 ⁻⁶ kgm ²	
Hollow shaft version	6.0 x 10 ⁻⁶ kgm ²	
Load capacity of shaft		
radial	80 N	
axial	40 N	
Weight		
	approx. 0.35 kg	
Protection EN 60 529		
housing side	IP67	
shaft side	IP65, opt. IP67	
EX approval for hazardous areas		
	optional Zone 2 and 22	
Working temperature range		
	40°C ... +90°C ¹⁾	
Materials		
shaft/hollow shaft	stainless steel	
flange	aluminium	
housing	zinc die-cast housing	
cable	PVC	
Shock resistance acc. EN 60068-2-27		
	2500 m/s ² , 6 ms	
Vibration resistance acc. EN 60068-2-6		
	100 m/s ² , 55 ... 2000 Hz	

General electrical characteristics		
Power supply		
	5 V DC + 5% or 10 ... 30 V DC	
Current consumption (no load)		
5 V DC	max. 70 mA	
10 ... 30 V DC	max. 45 mA	
Reverse connection of the supply voltage (U_B)		
	yes (at 10 ... 30 V DC)	
UL-certified		
	File 224618	
CE compliant acc. to		
	EN 61000-6-2, EN 61000-6-4 and EN 61000-6-3	
RoHS compliant acc. to		
	EU guideline 2002/95/EG	

General interface characteristics		
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	
Short circuit proof outputs		
	yes ²⁾	

SSI Interface		
Singleturn resolution		
	10 ... 14 bit and 17 bit ³⁾	
Code		
	Binary or Gray	
SSI clock rate		
≤ 14 bit	50 kHz ... 2 MHz	
≥ 15 bit	50 kHz ... 125 kHz	
Monoflop time		
	≥ 15 μs	
<p>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.</p>		
Data refresh rate		
< 1 μs	up to 14 bit	
4 μs	with 15 ... 17 bit	
Status and Parity bit		
	on request	

BiSS Interface		
Singleturn resolution		
	10 ... 14 bit and 17 bit, Programmable at the customer ³⁾	
Code		
	Binary	
Clock rate		
	up to 10 MHz	
Max. update rate		
	< 10 μs, depends on the clock rate and the data length	
Data refresh rate		
	≤ 1 μs	
<p>Note:</p> <ul style="list-style-type: none"> - Bidirectional, 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 (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	
Response time (DIR input)		
	1 ms	
<p>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.</p>		

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	
<p>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 22k).</p>		
<p>An active status output (LOW) displays:</p> <ul style="list-style-type: none"> - Sensor error, singleturn or multturn (soiling, glass breakage etc.) - LED fault (failure or ageing) - over- or under-temperature 		
<p>In the SSI mode, the fault indication can only be reset by switching off the power-supply to the device.</p>		

1) Cable version: -30°C ... + 75°C
 2) Short circuit to 0V or to output, one channel at a time, supply voltage correctly applied
 3) Other options upon request

Absolute Encoders - Singleturn

Standard, optical	Sendix 5853 / 5873 (Shaft / Hollow shaft)	SSI / BiSS
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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 delay
 After Power-ON the encoder requires a time of approx. 150 ms before valid data can be read.

Option Incremental outputs (A/B), 2048 ppr		
	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	yes

Terminal assignment

For output circuit 1 or 2 and type of connection 1, 2, 3 or 4 (2 control inputs, 1 status output)

Signal:	GND	+V	+C	-C	+D	-D	SET	DIR	Stat	N/C	N/C	N/C	PE
Cable colour:	WH	BN	GN	YE	GY	PK	BU	RD	BK	-	-	-	Shield
M23 connector:	1	2	3	4	5	6	7	8	9	10	11	12	PH

For output circuit 5 and type of connection 1, 2, 3 or 4 (2 control inputs, 1 status output, sensor outputs for voltage)

Signal:	GND	+V	+C	-C	+D	-D	SET	DIR	Stat	N/C	0V sens	+U _B sens	PE
Cable colour:	WH	BN	GN	YE	GY	PK	BU	RD	BK	-	GY-PK	RD-BU	Shield
M23 connector:	1	2	3	4	5	6	7	8	9	10	11	12	PH

For output circuit 3, 4, 7 or 8 and type of connection 1, 2, 3 or 4 (2 control inputs, incremental track RS422 or SinCos)

Signal:	GND	+V	+C	-C	+D	-D	SET	DIR	A	A inv	B	B inv	PE
Cable colour:	WH	BN	GN	YE	GY	PK	BU	RD	BK	VT	GY-PK	RD-BU	Shield
M23 connector:	1	2	3	4	5	6	7	8	9	10	11	12	PH

For output circuit 6 or 9 and type of connection 1, 2, 3 or 4 (SinCos or Incremental track, sensor outputs for voltage)

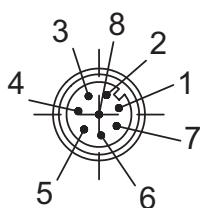
Signal:	GND	+V	+C	-C	+D	-D	A	A inv	B	B inv	0V sens	+U _B sens	PE
Cable colour:	WH	BN	GN	YE	GY	PK	BU	RD	BK	VT	GY-PK	RD-BU	Shield
M23 connector:	1	2	3	4	5	6	7	8	9	10	11	12	PH

For output circuit 1 or 2 and type of connection 5 or 6 (2 control inputs)

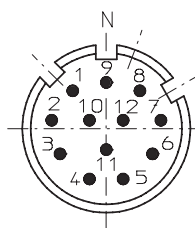
Signal:	GND	+V	+C	-C	+D	-D	SET	DIR	Shield/PE
M23 connector:	1	2	3	4	5	6	7	8	PH

- | | |
|---|--|
| <ul style="list-style-type: none"> +V: Encoder Power Supply +V DC GND: Encoder Power Supply Ground (0V) +C, -C: Clock signal +D, -D: Data signal SET: Set input. The current position is set to zero DIR: Direction input: If this input is active, the output values are counted backwards (decrease) when the shaft is turning clockwise. | <ul style="list-style-type: none"> Stat: Status output PE: Protective earth PH: Plug connector housing (shield) A, Ainv: Sine output (incremental) B, Binv: Cosine output (incremental) |
|---|--|

Top view of mating side, male contact base



M12 connector, 8-pin



M23 connector, 12-pin

Absolute Encoders - Singleturn

Standard, optical	Sendix 5853 / 5873 (Shaft / Hollow shaft)	SSI / BiSS
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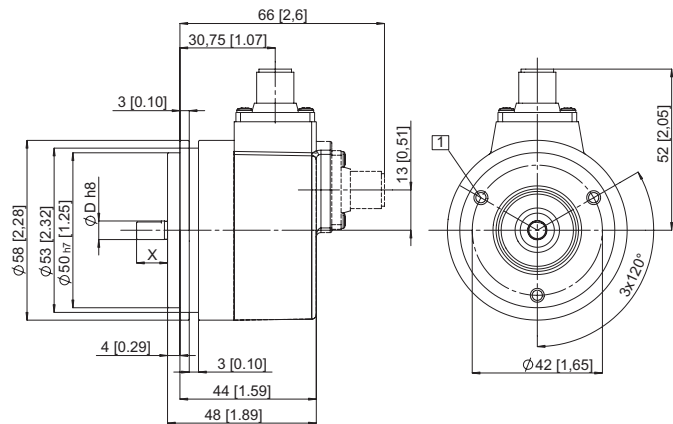
Dimensions shaft version

Synchro flange, ø 58 mm, M12, M23 connector, cable version

Flange type 2 and 4

(Drawing with M12 connector)

1 3 x M4, 6 [0.24] deep



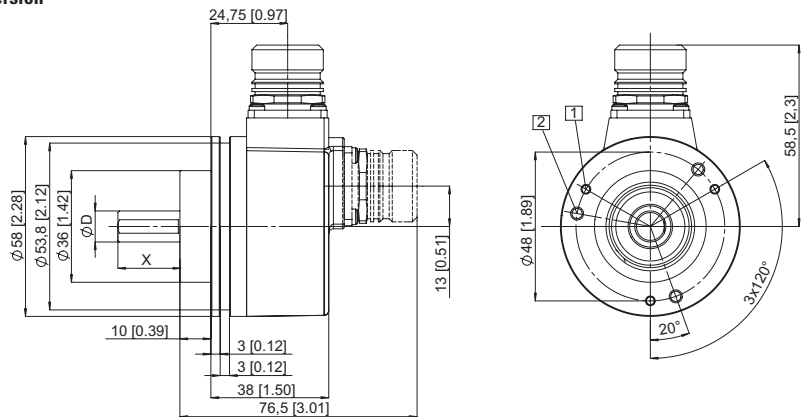
Clamping flange, ø 58 mm, M12, M23 connector, cable version

Flange type 1 and 3

(Drawing with M23 connector)

1 3 x M3, 6 [0.24] deep

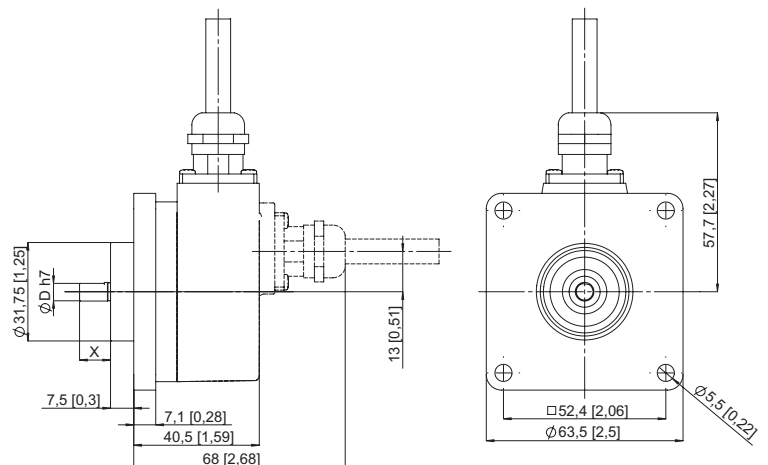
2 3 x M4, 8 [0.32] deep



Square flange, □ 63.5 mm, M12, M23 connector, cable version

Flange type 5 and 7

(Drawing with cable)



Absolute Encoders
Singleturn

Absolute Encoders - Singleturn

Standard, optical

Sendix 5853 / 5873 (Shaft / Hollow shaft)

SSI / BiSS

Dimensions hollow shaft version

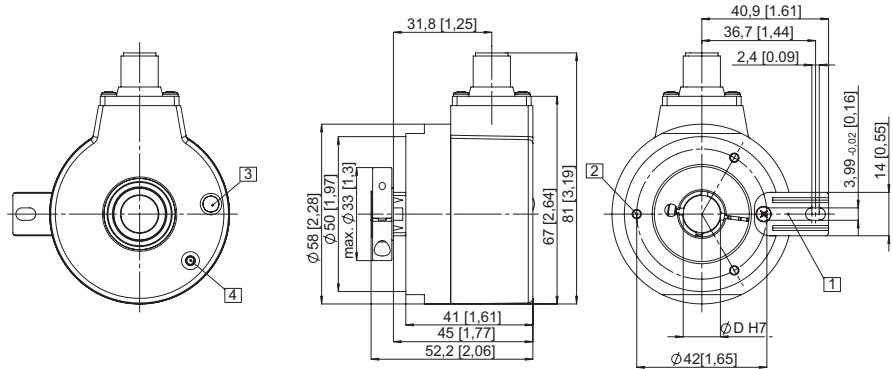
Flange with torque stop set, long, ø 58 mm

M12, M23 connector, cable version

Flange type 1 and 2

(Drawing with M12 connector)

- 1 Torque stop slot,
Recommendation:
Cylindrical pin DIN7, ø 4 mm
- 2 3 x M3, 6 [0.24] deep
- 3 Status LED
- 4 SET button



Flange with stator coupling, ø 58 mm

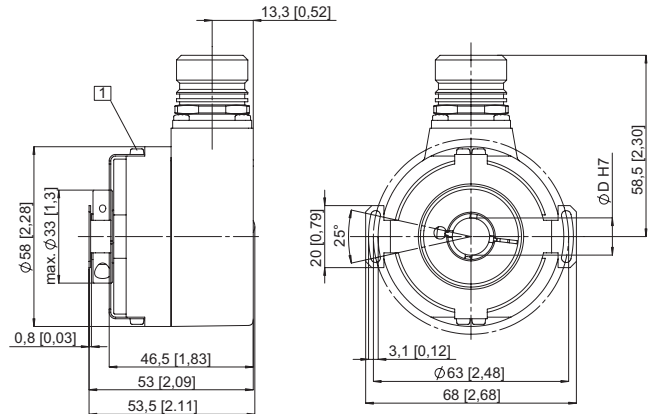
M12, M23 connector, cable version

Flange type 5 and 6

Pitch circle diameter for fixing screws 63 mm

(Drawing with M23 connector)

- 1 Fixing screws DIN 912 M3 x 8
(Washer included in delivery)



Flange with stator coupling, ø 58 mm

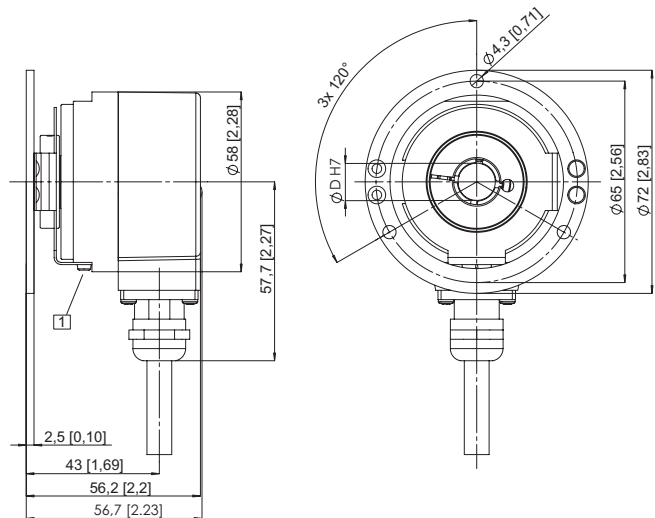
M12, M23 connector, cable version

Flange type 3 and 4

Pitch circle diameter for fixing screws 65 mm

(Drawing with cable)

- 1 Fixing screws DIN 912 M3 x 8
(Washer included in delivery)



Flange with torque stop set, long, ø 58 mm

tangential cable outlet

- 1 Torque stop slot,
Recommendation:
Cylindrical pin DIN7, ø 4 mm
- 2 3 x M3, 5.5 [0.21] deep
- 3 Status LED
- 4 SET button

