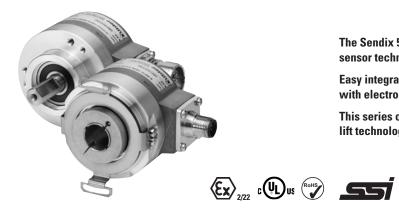


Standard optical

Sendix 5853 / 5873 (shaft / hollow shaft)

SSI / BiSS



The Sendix 5853 and Sendix 5873 singleturn encoders with optical sensor technology can achieve a resolution of max. 21 bits.

Easy integration in the application thanks to the BiSS interface, with electronic data sheet.

This series offers special versions for use on direct drives for the lift technology.

























Temperature

High protection

High shaft load

resistant

Reverse polarity

Reliable and insensitive

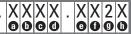
- Sturdy bearing construction in Safety-Lock™ design for resistance against vibration and installation errors.
- Ideal for use outdoors thanks to IP67 protection and wide temperature range from -40°C up to +90°C.

Versatile

- · High-precision with a data refresh rate of the position value $\leq 1 \mu s$.
- · High-resolution feedback in real-time via 21 bit fully digital or incremental outputs SinCos and RS422.
- BiSS-C BP3 encoder profile.
- · Short control cycles, clock rate with SSI up to 2 MHz / with BiSS up to 10 MHz.

Order code **Shaft version**

8.5853



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 Ots. up to 50 pcs. of these types generally have a delivery time of 15 working days



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 \square 63.5 mm [2.5"] 7 = square flange, IP67 □ 63.5 mm [2.5"]

b Shaft (ø x L), with flat

1 = 6 x 10 mm [0.24 x 0.39"] 1)

2 = 10 x 20 mm [0.39 x 0.79"] 2)

3 = 1/4" x 7/8"

4 = 3/8" x 7/8"

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

1 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 3) 6 = radial M12 connector, 8-pin 3)

*) 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.: 8.5853.112A.G323.0030 (for cable length 3 m)

Code B = SSI, binary C = BiSS, binary

G = SSI, gray

 Resolution 4) A = 10 hit

1 = 11 bit

2 = 12 bit

3 = 13 bit

4 = 14 bit

7 = 17 bit

C = 21 bit 5

Inputs / outputs 4)

2 = SET, DIR input additional status output

O Options (service)

1 = no option

2 = status LFD

3 = SET button and status LED

Optional on request

- Ex 2/22 ⁶⁾

- surface protection salt spray tested

- other resolutions

¹⁾ Preferred type only in conjunction with flange type 2.

²⁾ Preferred type only in conjunction with flange type 1.

Can be combined only with interface 1 and 2.

⁴⁾ Resolution, preset value and counting direction factory-programmable

⁵⁾ Only in conjunction with interface 1 or 2 and code C.

⁶⁾ For the cable connection type, cable material PUR.



Standard optical

Sendix 5853 / 5873 (shaft / hollow shaft)

SSI / BiSS

Order code **Hollow shaft**

|X|X|X|X|XX2X 8.5873 0000 000 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. ${\tt Qts.}\ {\tt up}\ {\tt to}\ {\tt 50}\ {\tt pcs.}$ of these types generally have a delivery time of 15 working days.



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"]
- E = with stator coupling, IP65 mounting without screws 1)
- F = with stator coupling, IP67 mounting without screws 1)
- G = with stator coupling, IP65 ø 72 mm [2.83"] 1)
- H = with expanding coupling, IP65ø 65 mm [2.56"] 1)
- **b** Hollow shaft
- $3 = \emptyset 10 \text{ mm} [0.39"]$
- $K = \emptyset$ 10 mm [0.39"], with tapered shaft
- 4 = ø 12 mm [0.47"]
- 5 = ø 14 mm [0.55"]
- $6 = \emptyset 15 \text{ mm } [0.59"]$
- $8 = \emptyset 3/8"$
- $9 = \emptyset 1/2"$

- 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

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.: 8.5873.542B.G323.0030 (for cable length 3 m)
- B = SSI, binary
- C = BiSS, binary
- G = SSI, gray

• Resolution 3)

- A = 10 bit
- 1 = 11 bit
- 2 = 12 bit3 = 13 bit
- 4 = 14 bit
- 7 = 17 bit
- $C = 21 \text{ bit }^{4)}$

- Inputs / outputs 3)
- 2 = SET, DIR input additional status output
- **(b)** Options (service)
- 1 = no option
- 2 = status LED
- 3 = SET button and status LED

Optional on request

- Ex 2/22 (not with type of connection E or F) 5)
- surface protection salt spray tested
- other resolutions

Mounting accessory	for shaft encoders		Order no.
Coupling		bellows coupling ø 19 mm [0.75"] for shaft 6 mm [0.24"] bellows coupling ø 19 mm [0.75"] for shaft 10 mm [0.39"]	8.0000.1102.0606 8.0000.1102.1010
Mounting accessory	for hollow shaft encoders		Order no.
Cylindrical pin, long for torque stops	8[0.31] 5[0.2] SW7 [0.28] 9 30[1,18]	with fixing thread	8.0010.4700.0000
Connection technolog	37		Order no.
Connector, self-assem	bly (straight)	M12 female connector with coupling nut M23 female connector with coupling nut	05.CMB 8181-0 8.0000.5012.0000
Cordset, pre-assemble	ed	M12 female connector with coupling nut, 2 m [6.56'] PVC cable	05.00.6041.8211.002M 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) Can be combined only with shaft K and type of connection E or F.
- 2) Can be combined only with interface 1 and 2.
- 3) Resolution, preset value and counting direction factory-programmable
- 4) Only in conjunction with interface 1 or 2 and code C.
- 5) For the cable connection type, cable material PUR.



Standard optical

Sendix 5853 / 5873 (shaft / hollow shaft)

SSI / BiSS

Technical data

Mechanical	characteristics	
Maximum spee	d shaft version	
	IP65 up to 70°C [158°F]	12000 min ⁻¹ , 10000 min ⁻¹ (continuous)
	IP65 up to Tmax	8000 min ⁻¹ , 5000 min ⁻¹ (continuous)
	IP67 up to 70°C [158°F]	11000 min ⁻¹ , 9000 min ⁻¹ (continuous)
	IP67 up to Tmax	8000 min ⁻¹ , 5000 min ⁻¹ (continuous)
Maximum spee	d hollow shaft version	
	IP65 up to 70°C [158°F]	9000 min ⁻¹ , 6000 min ⁻¹ (continuous)
	IP65 up to Tmax	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	IP65	< 0.01 Nm
at 20°C [68°F]	IP67	< 0.05 Nm
Mass moment o	f inertia	
	shaft version	3.0 x 10 ⁻⁶ kgm ²
	hollow shaft version	6.0 x 10 ⁻⁶ kgm ²
Load capacity o	of shaft radial	80 N
	axial	40 N
Weight		approx. 0.35 kg [12.35 oz]
Protection	housing side	IP67
acc. to EN 60529	9 shaft side	IP65, opt. IP67
Working tempe	rature range	-40°C +90°C [-40°F +194°F] ¹⁾
Materials	shaft/hollow shaft	stainless steel
	flange	aluminium
	housing	zinc die-cast
	cable	PVC
Shock resistant	ce acc. EN 60068-2-27	2500 m/s², 6 ms
Vibration resist	ance acc. EN 60068-2-6	100 m/s ² , 55 2000 Hz

Electrical characteristics							
Power supply	5 V DC (+5 %) or 10 30 V DC						
$ \begin{array}{c} \textbf{Current consumption} \ (\text{no load}) \ \ 5 \ \text{V DC} \\ 10 \ \dots \ 30 \ \text{V DC} \end{array} $	max. 70 mA max. 45 mA						
Reverse polarity protection of the power supply	yes						
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	10 14 bit and 17 bit
Code	binary or gray
SSI clock rate	50 kHz 2 MHz
Monoflop time	≤ 15 µs
mononop timo	3 10 μ0

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	resolution ≤ 14 bit	≤ 1 µs
	resolution ≥ 15 bit	4 μs

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

BiSS interface						
Output driver	RS485 transceiver type					
Permissible load / channel	max. +/- 20 mA					
Signal level HIGH	typ. 3.8 V					
LOW at $I_{Load} = 20 \text{ mA}$	typ. 1.3 V					
Resolution	10 14 bit; 17, 19 and 21 bit					
Code	binary					
Clock rate	50 kHz 10 MHz					
Max. update rate	$<15\mu s,$ depends on the clock rate and the data length					
Data refresh rate	< 1 μs					
Protocol	BiSS-C BP3 encoder profile					
	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.

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



Standard optical

Sendix 5853 / 5873 (shaft / hollow shaft)

SSI / BiSS

Option incremental outputs (A/B), 2048 ppr								
	SinCos RS422 TTL compati							
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						

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.

Avoid encoder hot-plugging.

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	Ť
1, 2	I, Z, A, D, E, F	SEI, DIN, Status	Cable colour:	WH	BN	GN	YE	GY	PK	BU	RD	BK	-	-	-	shield
Interface	Type of connection	Features	M23 connecto	r												
1, 2	3, 4	SET, DIR, Status	Signal:	0 V	+V	C+	C-	D+	D-	SET	DIR	Stat	N/C	N/C	N/C	Ť
., 2	0, 1	021, 5111, Otatao	Pin:	1	2	3	4	5	6	7	8	9	10	11	12	PH
Interface	Type of connection	Features	Cable (isolate	unused	wires ir	ndividua	ılly befo	re initia	l start-u	ıp)						
5	1, 2, A, B, E, F	SET, DIR, Status	Signal:	0 V	+V	C+	C-	D+	D-	SET	DIR	Stat	N/C	0 Vsens	+Vsens	Ŧ
	1, 2, 1, 0, 2, 1	sensor output	Cable colour:	WH	BN	GN	YE	GY	PK	BU	RD	BK	-	GY-PK	RD-BU	shield
Interface	Type of connection	Features	M23 connecto	r												
5	3, 4	SET, DIR, Status	Signal:	0 V	+V	C+	C-	D+	D-	SET	DIR	Stat	N/C	0 Vsens	+Vsens	Ŧ
J	3, 4	sensor output	Pin:	1	2	3	4	5	6	7	8	9	10	11	12	PH
Interface	Type of connection	Features	Cable (isolate	unused	wires ir	ndividua	ılly befo	re initia	l start-u	ıp)						
3, 4, 7, 8	1, 2, A, B, E, F	SET, DIR, SinCos	Signal:	0 V	+V	C+	C-	D+	D-	SET	DIR	Α	Ā	В	B	Ť
3, 4, 7, 0	1, 2, A, B, L, 1	or incr. RS422	Cable colour:	WH	BN	GN	YE	GY	PK	BU	RD	BK	VT	GY-PK	RD-BU	shield
Interface	Type of connection	Features	M23 connecto	r												
3, 4, 7, 8	3, 4	SET, DIR, SinCos	Signal:	0 V	+V	C+	C-	D+	D-	SET	DIR	Α	Ā	В	B	Ŧ
3, 4, 7, 0	3, 4	or incr. RS422	Pin:	1	2	3	4	5	6	7	8	9	10	11	12	PH
Interface	Type of connection	Features	Cable (isolate	unused	wires ir	ndividua	ılly befo	re initia	l start-u	ıp)						
6, 9	1, 2, A, B, E, F	SinCos o. incr. RS422	Signal:	0 V	+V	C+	C-	D+	D-	Α	Ā	В	B	0 Vsens	+Vsens	Ť
0, 9	I, Z, A, D, E, F	sensor output	Cable colour:	WH	BN	GN	YE	GY	PK	BU	RD	ВК	VT	GY-PK	RD-BU	shield
Interface	Type of connection	Features	M23 connecto	r												
6, 9	3, 4	SinCos o. incr. RS422	Signal:	0 V	+V	C+	C-	D+	D-	А	Ā	В	B	0 Vsens	+Vsens	Ŧ
0, 3	3, 4	sensor output	Pin:	1	2	3	4	5	6	7	8	9	10	11	12	PH
Interface	Type of connection	Features	M12 connecto	r												
		Signal:	0 V	+V	C+	C-	D+	D-	SET	DIR	Ť					
1, 2	5, 6	SET, DIR														

+V: Encoder power supply +V DC

0 V: Encoder power supply ground GND (0 V)

0 $\ensuremath{\text{Vsens}}\xspace$ / +Vsens: Using the sensor outputs of the encoder, the voltage

present can be measured and if necessary increased

accordingly. Clock signal

C+, C-: Clock signa 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



Standard optical

Sendix 5853 / 5873 (shaft / hollow shaft)

13[0,51]

24,75[0,97]

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

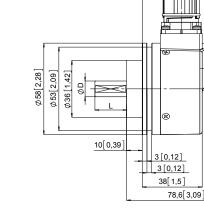
2 3 x M4, 8 [0.32] deep

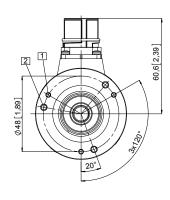
D

6 [0.24]

10 [0.39]

1/4"





3/8" 7/8" h7

Synchro flange, ø 58 [2.28]

10 [0.39]

20 [0.79]

7/8"

Fit

h7

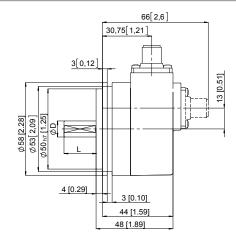
f7

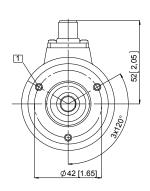
h7

Flange type 2 and 4 (drawing with M12 connector)

1 3 x M4, 6 [0.24] deep

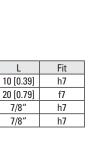
D	L	Fit
6 [0.24]	10 [0.39]	h7
10 [0.39]	20 [0.79]	f7
1/4"	7/8"	h7
3/8"	7/8"	h7

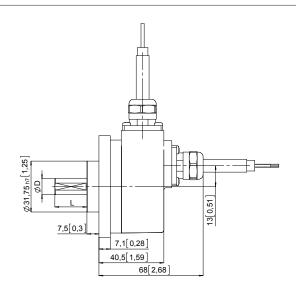


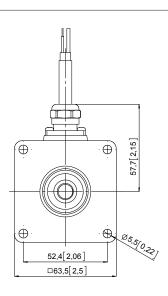


Square flange, \square 63.5 [2.5] Flange type 5 and 7

(drawing with cable)







D

6 [0.24]

10 [0.39]

1/4"

3/8"



Standard optical

Sendix 5853 / 5873 (shaft / hollow shaft)

SSI / BiSS

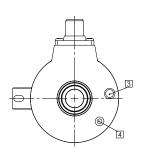
Dimensions hollow shaft version

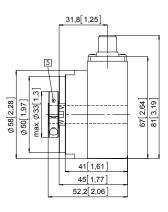
Dimensions in mm [inch]

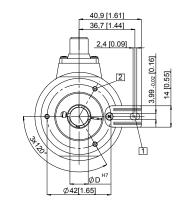
Flange with spring element, long Flange type 1 and 2

(drawing with M12 connector)

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





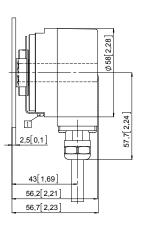


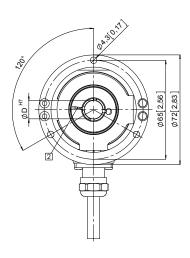
Flange with stator coupling, ø 65 [2.56] Flange type 3 and 4 $\,$

Pitch circle diameter for fixing screws 65 [2.56]

(drawing with cable)

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

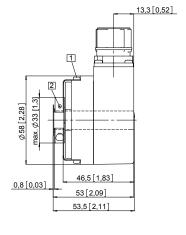


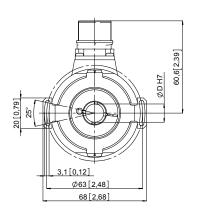


Flange with stator coupling, ø 63 [2.48] Flange type 5 and 6 $\,$

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







Standard optical

Sendix 5853 / 5873 (shaft / hollow shaft)

SSI / BiSS

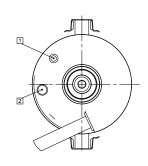
Dimensions hollow shaft version

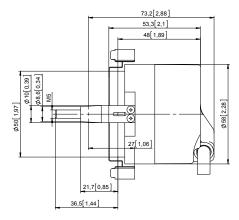
Dimensions in mm [inch]

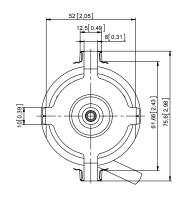
Flange with stator coupling, mounting without screws Flange type E and F

(with tapered shaft K and tangential cable)

- 1 Status LED
- 2 SET button



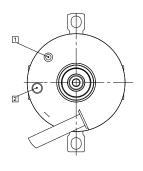


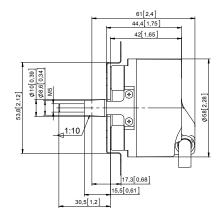


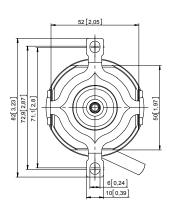
Flange with stator coupling, ø 72 [2.83] Flange type G

(with tapered shaft K and tangential cable)

- 1 Status LED
- 2 SET Button







Flange with expanding coupling, ø 65 [2.56"] Flange type H $\,$

- 1 Recommended torque for (SW 2) tightening screw 1 Nm
- $\fbox{2}$ Recommended torque for (SW 4) tightening screw 3 $^{+0,5}$ Nm
- 3 Status-LED
- 4 SET button

