ENCODER SSI Multiturn



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Series 8.5863, 8.5883

Key-Features:

- Solid shaft: maximum diameter 10 mm
- Hollow shaft: maximum diameter 14 mm
- Blind hollow shaft: maximum diameter 15 mm
- Interfaces: SSI, BiSS-C, SSI/BiSS-C +, SinCos, SSI/BiSS-C + RS422
- Housing diameter 58 mm
- Protection class up to IP67
- Resolution up to 12 Bit in Multiturn Mode
- Maximum revolution speed 12000 turns/min
- Temperature range -40...+90°C



Standard mechanical multiturn, optical

Sendix 5863 / 5883 (shaft / hollow shaft)

SSI / BiSS + incremental



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.































High rotational

level

resistant

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**

a Flange

8.5863 Type

□ 63.5 mm [2.5"]

□ 63.5 mm [2.5"]

ø 63.5 mm [2.5"] 1)

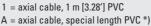
ø 63.5 mm [2.5"] 1)











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)

Code

B = SSI, binary

C = BiSS, binary

G = SSI, gray

• 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



1 = no option

2 = status LED

3 = SET button and status LED

b Shaft (ø x L), with flat

5 = square flange, IP65

7 = square flange, IP67

6 = servo flange, IP65

8 = servo flange, IP67

 $1 = 6 \times 10 \text{ mm} [0.24 \times 0.39"]^{2}$

 $2 = 10 \times 20 \text{ mm} [0.39 \times 0.79^{\circ}]^{3}$

3 = 1/4" x 7/8"

4 = 3/8" x 7/8"

Interface / power supply

SSI, BiSS / 5 V DC

2 = SSI, BiSS / 10 ... 30 V DC

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"]

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

Optional on request

- Ex 2/22 6)
- other singleturn 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:

8.5863.32X6.XX22-C

V4A 1.4404

stainless steel V4A: 8.5863.32X6.XX22-V4A

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



Standard

mechanical multiturn, optical

Sendix 5863 / 5883 (shaft / hollow shaft)

SSI / BiSS + incremental

Order code Hollow shaft

8.5883 0000 00 Type



Options (service)

1 = no option

2 = status LED

3 = SET button and

status LED

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"]

Through hollow shaft

- $3 = \emptyset 10 \text{ mm} [0.39"]$
- 4 = ø 12 mm [0.47"]
- $5 = \emptyset 14 \text{ mm } [0.55"]$
- $8 = \emptyset 3/8"$
- $9 = \emptyset 1/2$

Blind hollow shaft

(insertion depth max. 30 mm [1.18"])

 $6 = \emptyset 15 \text{ mm } [0.59"]$

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)

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

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

Optional on request

- Ex 2/22 (not for type of connection E, F) 3)
- other singleturn 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 hollow shaft encoders 8.0010.4700.0000 Cylindrical pin, long with fixing thread for flange with spring element 8 [0,31] (flange type 1 + 2) SW7 [0,28] 30[1,18]

Connection technology		Order no.
Cordset, pre-assembled	M12 female connector with coupling nut, 8-pin 2 m [6.56']	K8P2M-S-M12
	M23 female connector with coupling nut, 12-pin 2 m [6.56']	K12P02M-S-M23-SSI

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



Standard mechanical multiturn, optical

Sendix 5863 / 5883 (shaft / hollow shaft)

SSI / BiSS + incremental

Technical data

Mechanical c	haracteristics			
Maximum speed	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 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	IP65	< 0.01 Nm		
at 20°C [68°F]	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. t	o EN 60529			
	housing side	IP67		
	shaft side	IP65, opt. IP67		
Working temper	ature 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 resistanc	e 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
$ \begin{array}{c} \textbf{Current consumption} \ (\text{no load}) \qquad 5 \ \text{V DC} \\ 10 \ \dots \ 30 \ \text{V DC} \end{array} $	max. 80 mA 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 2014/30/EU RoHS guideline 2011/65/EU

SSI interface					
Output driver		RS485 transceiver type			
Permissible load	/ channel	max. +/- 20 mA			
Signal level HIGH LOW at I _{Load} = 20 mA		typ. 3.8 V typ 1.3 V			
Resolution single	eturn	10 14 bit and 17 bit			
Number of revolu	itions (multiturn)	4096 (12 bit)			
Code		binary or gray			
SSI clock rate		50 kHz 2 MHz			
Data refresh	ST resolution ≤ 14 bit	≤ 1 µs			
rate	ST resolution ≥ 15 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				
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	ion, alamo ana tranimgo
Status output and LED	
Status varpat and ELD	
Output driver	open collector, internal pull up resistor 22 kOhm

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.

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					



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

Standard mechanical multiturn, optical

Sendix 5863 / 5883 (shaft / hollow shaft)

SSI / BiSS + incremental

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

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

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.

The LED will come ON and the status output will switch to LOW.

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

Response time (DIR input)

1 ms

Power-ON

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

Hot plugging of the encoder should be avoided.



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

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	Ţ
1, 2	1, 2, A, D, L, 1	oei, biii, otatas	Cable color:	WH	BN	GN	YE	GY	PK	BU	RD	BK	-	-	-	shield
Interface	Type of connection	Features	M23 connecto	M23 connector, 12-pin												
1, 2	3, 4	SET, DIR, Status	Signal:	0 V	+V	C+	C-	D+	D-	SET	DIR	Stat	N/C	N/C	N/C	Ŧ
., -	0, 1	ozi, biii, otatao	Pin:	1	2	3	4	5	6	7	8	9	10	11	12	PH
Interface	Type of connection	Features	Cable (isolate	unused	wires ii	ndividua	ılly befo	re initia	l start-ι	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	Ť
J	I, Z, A, D, E, F	sensor output	Cable color:	WH	BN	GN	YE	GY	PK	BU	RD	ВК	-	GY-PK	RD-BU	shield
Interface	Type of connection	Features	M23 connecto	r, 12-pir	1											
5	3, 4	SET, DIR, Status	Signal:	0 V	+V	C+	C-	D+	D-	SET	DIR	Stat	N/C	0 Vsens	+Vsens	Ť
	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 ii	ndividua	ılly befo	re initia	l start-ι	ıp)						
2 4 7 0	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, 8	I, Z, A, B, E, F	or incr. RS422	Cable color:	WH	BN	GN	YE	GY	PK	BU	RD	BK	VT	GY-PK	RD-BU	shield
Interface	Type of connection	Features	M23 connecto	r, 12-pir	1											
0.4.7.0	0.4	SET, DIR, SinCos	Signal:	0 V	+V	C+	C-	D+	D-	SET	DIR	Α	Ā	В	B	Ť
3, 4, 7, 8	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 ii	ndividua	ıllv befo	re initia	l start-u	(aı						
		SinCos o. incr. RS422	Signal:	0 V	+V	C+	C-	D+	D-	Α	Ā	В	B	0 Vsens	+Vsens	Ť
6, 9	1, 2, A, B, E, F	sensor output	Cable color:	WH	BN	GN	YE	GY	PK	BU	RD	ВК	VT	GY-PK	RD-BU	shield
Interface	Type of connection	Features	M23 connecto	r, 12-pir	1											
0.0		SinCos o. incr. RS422	Signal:	0 V	+V	C+	C-	D+	D-	Α	Ā	В	B	0 Vsens	+Vsens	Ť
6, 9	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, 8-pin												
1.0	F 0		Signal:	0 V	+V	C+	C-	D+	D-	SET	DIR		Ť			
1, 2	5, 6 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 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, \overline{A} : Incremental output channel A (cosine) B, \overline{B} : Incremental output channel B (sine)

SET: SET input
DIR: Direction input
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 mechanical multiturn, optical

Sendix 5863 / 5883 (shaft / hollow shaft)

SSI / BiSS + incremental

Dimensions shaft version

Dimensions in mm [inch]

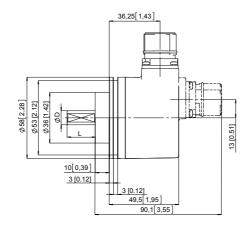
Clamping flange, ø 58 [2.28] Flange type 1 and 3

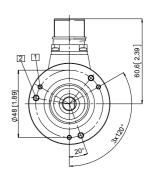
(drawing with M23 connector)

1 3 x M3, 6 [0.24] deep

2 3 x M4, 8 [0.32] deep

D	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"

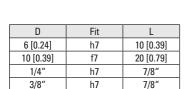


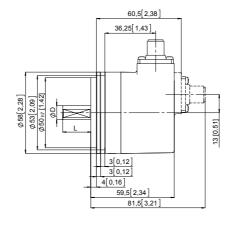


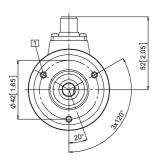
Synchro flange, ø 58 [2.28] Flange type 2 and 4

(drawing with M12 connector)

1 3 x M4, 6 [0.24] deep





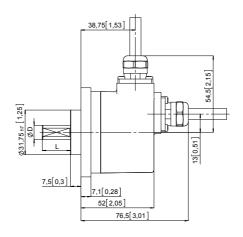


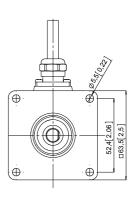
Square flange, 63.5 [2.5]

Flange type 5 and 7

(drawing with cable)

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







Standard mechanical multiturn, optical

Sendix 5863 / 5883 (shaft / hollow shaft)

SSI / BiSS + incremental

Dimensions hollow shaft version

Dimensions in mm [inch]

Flange with spring element, long Flange type 1 and 2

(drawing with M12 connector)

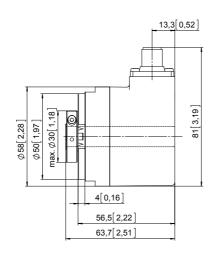
- Slot spring element, recommendation: cylindrical pin DIN 7, ø 4 [0.16]
- 2 3 x M3, 6 [0.24] deep
- 3 Recommended torque for the clamping ring 0.6 Nm

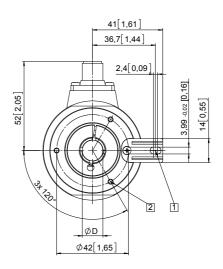
D	Fit	
10 [0.39]	H7	
12 [0.47]	H7	
14 [0.55]	H7	
15 [0.59] *)	H7	
3/8"	H7	
1/2"	H7	
*) Blind hollow shaft,		
insertion depth max. = 30 mm [1.18"]		

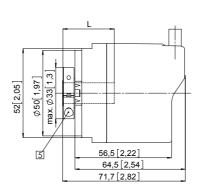
(drawing with tangential cable)

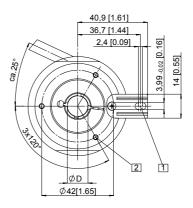
- Slot spring element, recommendation: cylindrical pin DIN 7, ø 4 [0.16]
- 2 3 x M3, 5.5 [0.22] deep
- 3 Status-LED
- 4 SET button
- 5 Recommended torque for the clamping ring 0.6 Nm

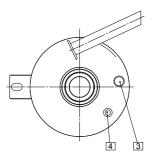
D	Fit	
10 [0.39]	H7	
12 [0.47]	H7	
14 [0.55]	H7	
15 [0.59] *)	H7	
3/8"	H7	
1/2"	H7	
*) Blind hollow shaft, insertion depth max = 30 mm [1 18"]		













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, ø 63 [2.48] Flange type 5 and 6

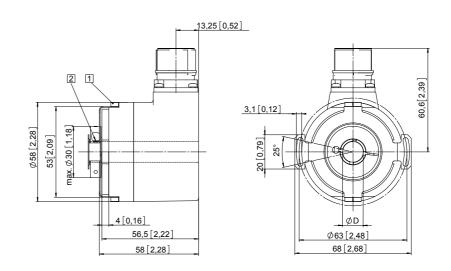
Pitch circle diameter for fixing screws 63 [2.48]

(drawing with M23 connector)

- 1 Fixing screws DIN 912 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"]



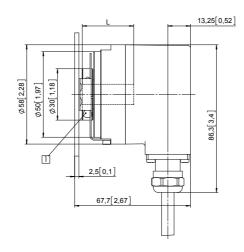
Flange with stator coupling, ø 65 [2.56] Flange type 3 and 4

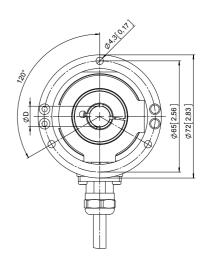
Pitch circle diameter for fixing screws 65 [2.56]

(drawing with cable)

1 Recommended torque for the clamping ring 0.6 Nm

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"]		





Subject to change without prior notice.

WayCon Positionsmesstechnik GmbH

email: info@waycon.de internet: www.waycon.biz

Head Office

Mehlbeerenstr. 4 82024 Taufkirchen

Tel. +49 (0)89 67 97 13-0 Fax +49 (0)89 67 97 13-250 Office Köln

Auf der Pehle 1 50321 Brühl

Tel. +49 (0)2232 56 79 44 Fax +49 (0)2232 56 79 45

