

Absolute encoders - singleturn

Standard, ATEX/IECEx – zone 1/21
optical

Sendix 7053 / 7073 (shaft / hollow shaft)

SSI / BiSS



The Sendix 7053 / 7073 absolute encoders – singleturn offer Ex protection in a compact 70 mm seawater durable aluminum housing, with an SSI or BiSS interface and optical sensor technology.

These shock and vibration-resistant encoders operate flexibly with a resolution of up to 17 bits; they are also available with axial and radial cable outlets.



Ex approval



Safety-Lock™



High rotational speed



High protection level



High shaft load capacity



Shock / vibration resistant



Magnetic field proof



Short-circuit proof



Reverse polarity protection



Optical sensor



Seawater durable

Compact and safe

- Can be used even when space is tight.
- Minimal installation depth, diameter 70 mm.
- Compact cable outlet axial or radial.
- Can be operated in marine environments – housing and flange manufactured from seawater durable aluminum.
- Remains sealed even in harsh everyday use and ensures highest safety against field breakdowns (IP67 protection).

Explosion protection

- “Flameproof-enclosure” version.
- ATEX with EU type examination certificate.
- IECEx with certificate of conformity (CoC).

Order code

Shaft version

8.7053

Type

. 1 X 2 X . X X 2 1 . XXXX

a Flange

1 = clamping / synchronous flange, ø 70 mm [2.76"]

b Shaft (ø x L)

2 = 10 x 20 mm [0.39 x 0.79"], with flat
1 = 12 x 25 mm [0.47 x 0.98"], with keyway
for 4 x 4 mm [0.16 x 0.16"] key

c Interface / supply voltage

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

d Type of connection

1 = axial cable, 2 m [6.56'] PUR
2 = radial cable, 2 m [6.56'] PUR
A = axial cable, length > 2 m [6.56']
B = radial cable, length > 2 m [6.56']

e Code

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

f Resolution²⁾

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

g Inputs / outputs²⁾

2 = SET, DIR input
additional status output

h Options

1 = no option

i Cable length in dm¹⁾

0050 = 5 m [16.40']
0100 = 10 m [32.81']
0150 = 15 m [49.21']

Optional on request

- special cable length
- other resolutions
- seawater resistant (stainless steel V4A)

1) Not applicable with connection types 1 and 2.

2) Resolution, preset value and counting direction factory-programmable.

Absolute encoders - singleturn

Standard, ATEX/IECEX – zone 1/21 optical		Sendix 7053 / 7073 (shaft / hollow shaft)		SSI / BiSS
Order code Hollow shaft		8.7073 Type	.XX2X.XX21.XXXX a b c d e f g h i ¹⁾	
a Flange 1 = with spring element, short 5 = with stator coupling, ø 65 mm [2.56"]		e Code B = SSI, binary C = BiSS, binary G = SSI, gray		i Cable length in dm ¹⁾ 0050 = 5 m [16.40'] 0100 = 10 m [32.81'] 0150 = 15 m [49.21']
b Blind hollow shaft (insertion depth max. 41.5 mm [1.63"])		f Resolution ²⁾ A = 10 bit 1 = 11 bit 2 = 12 bit 3 = 13 bit 4 = 14 bit 7 = 17 bit		Optional on request - special cable length - other resolutions - seawater resistant (stainless steel V4A)
c Interface / supply voltage 2 = SSI, BiSS / 10 ... 30 V DC		g Inputs / outputs ²⁾ 2 = SET, DIR input additional status output		
d Type of connection 1 = axial cable, 2 m [6.56'] PUR 2 = radial cable, 2 m [6.56'] PUR A = axial cable, length > 2 m [6.56'] B = radial cable, length > 2 m [6.56']		h Options 1 = no option		

Mounting accessory for shaft encoders		Order no.
Coupling	bellows coupling ø 19 mm [0.75"] for shaft 10 mm [0.39"]	8.0000.1102.1010

Further Kübler accessories can be found at: kuebler.com/accessories
Further Kübler cables and connectors can be found at: kuebler.com/connection-technology

Technical data	
Explosion protection	
ATEX	
EU type-examination certificate	IBExU 15 ATEX 1091 X
Category (gas)	Sendix 7053 – 6000 rpm II 2G Ex db IIC T4 Gb Sendix 7053 – 2000 rpm II 2G Ex db IIC T5 Gb Sendix 7073 – 3000 rpm II 2G Ex db IIC T4 Gb Sendix 7073 – 2000 rpm II 2G Ex db IIC 120°C (T4) Gb
Category (dust)	Sendix 7053 – 6000 rpm II 2D Ex tb IIIC T135°C Db Sendix 7053 – 2000 rpm II 2D Ex tb IIIC T100°C Db Sendix 7073 – 3000 rpm II 2D Ex tb IIIC T135°C Db Sendix 7073 – 2000 rpm II 2D Ex tb IIIC T120°C Db
Relevant standards	EN 60079-0:2018 ATEX guideline 2014/34/EU EN 60079-1:2014 EN 60079-31:2014
IECEX	
Certificate of Conformity (CoC)	IECEX IBE 15.0020 X
Category (gas)	Sendix 7053 – 6000 rpm Ex db IIC T4 Gb Sendix 7053 – 2000 rpm Ex db IIC T5 Gb Sendix 7073 – 3000 rpm Ex db IIC T4 Gb Sendix 7073 – 2000 rpm Ex db IIC 120°C (T4) Gb
Category (dust)	Sendix 7053 – 6000 rpm Ex tb IIIC T135°C Db Sendix 7053 – 2000 rpm Ex tb IIIC T100°C Db Sendix 7073 – 3000 rpm Ex tb IIIC T135°C Db Sendix 7073 – 2000 rpm Ex tb IIIC T120°C Db
Relevant standards	IEC 60079-0:2017 IEC 60079-1:2014 IEC 60079-31:2013
Electrical characteristics	
Supply voltage	10 ... 30 V DC
Current consumption (no load)	max. 45 mA
Reverse polarity protection for supply voltage	yes
Short-circuit proof outputs	yes ³⁾
EMC	
Relevant standards	EN 55011 class B EN (IEC) 61326-1

1) Not applicable with connection types 1 and 2.
2) Resolution, preset value and counting direction factory-programmable.
3) Short-circuit with 0 V or output, only one channel at a time, supply voltage correctly applied.

Absolute encoders - singleturn

Standard, ATEX/IECEX – zone 1/21 optical		Sendix 7053 / 7073 (shaft / hollow shaft)	SSI / BiSS
Mechanical characteristics Maximum speed shaft 6000 min ⁻¹ (continuous) hollow shaft 3000 min ⁻¹ (continuous) Starting torque - at 20 °C [68 °F] < 0.05 Nm Mass moment of inertia 4.0 x 10 ⁻⁶ kgm ² Load capacity of shaft radial 80 N axial 40 N Weight approx. 1.5 kg [52.91 oz] Protection acc. to EN 60529 IP67 Ambient temperature -40 °C ... +60 °C [-40 °F ... +140 °F] Please note the specifications for temperature class in EU type-examination certificate! Material shaft stainless steel flange / housing seawater durable Al, type AlSiMgMn (EN AW-6082) cable PUR Shock resistance to EN/IEC 60068-2-27 2500 m/s ² , 6 ms Vibration resistance to EN/IEC 60068-2-6 100 m/s ² , 55 ... 2000 Hz		Status output Output driver open collector, internal pull-up resistor 22 kOhm Permissible load max. 20 mA Signal level HIGH +V LOW < 1 V Active at LOW The status output serves to display various alarm or error messages. The status output is HIGH (open collector with internal pull-up 22 kOhm) in normal operation.	
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 Data refresh rate ST resolution ≤ 14 bit < 1 μs ST resolution ≥ 15 bit 4 μs Monoflop time ≤ 15 μs Note: if clock starts cycling within monoflop time a second data transfer starts with the same data. If clock starts cycling after monoflop time, the data transfer starts with updated values. The update rate depends on clock speed, data length and monoflop time.		SET input Input HIGH active Input type comparator Signal level (+V = supply voltage) HIGH min. 60% of +V max. +V LOW max. 25% of +V 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. Other preset values can be factory-programmed. The SET input has a signal delay time of approximately 1 ms. Once the SET function has been triggered, the encoder requires an internal processing time of approximately 15 ms before the new position data can be read. If this input is not used, it should be connected to 0 V (Encoder ground GND) in order to avoid interferences.	
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 10 ... 14 bit and 17 bit 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 ST resolution ≤ 14 bit ≤ 1 μs ST resolution 17 bit 2.4 μs Note: – bidirectional, factory programmable parameters are: resolution, code, direction, alarms and warnings – CRC data verification		DIR input Direction input: A HIGH signal switches the direction of rotation from the default cw to ccw. This inverted function can also be factory-programmed. If DIR is reversed when the device is already switched on, this will be interpreted as an error. The status output switches 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.	
		Approvals CE compliant in accordance with EMC Directive 2014/30/EU RoHS Directive 2011/65/EU ATEX Directive 2014/34/EU	

Absolute encoders - singleturn

**Standard, ATEX/IECEX – zone 1/21
optical**

Sendix 7053 / 7073 (shaft / hollow shaft)

SSI / BiSS

Terminal assignment

Interface	Type of connection	Features	Cable (isolate unused cores individually before initial start-up)											
2	1, 2, A, B	SET, DIR	Signal:	0 V	+V	C+	C-	D+	D-	SET	DIR	Stat	⊥	⊥
			Core marking:	1	2	3	4	5	6	7	8	9	YE/GN	shield

+V: Supply voltage encoder +V DC
 0 V: Supply voltage encoder ground GND (0 V)
 C+, C-: Clock signal
 D+, D-: Data signal
 SET: Set input

DIR: Direction input
 Stat: Status output
 ⊥: Protective earth

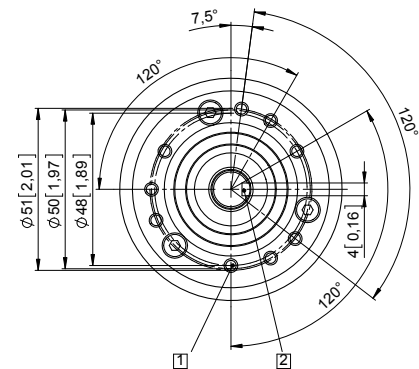
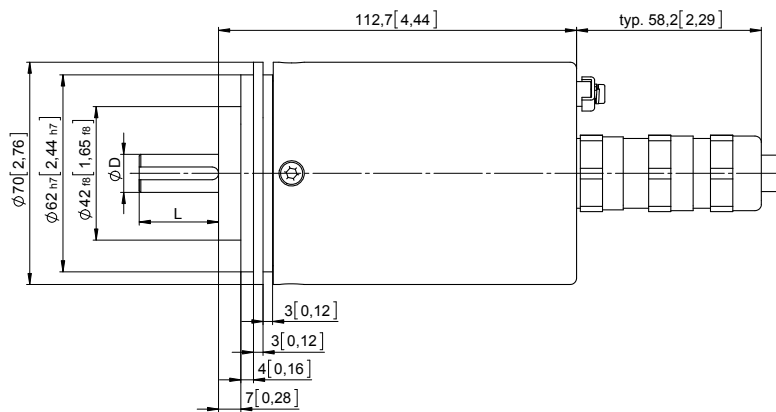
Dimensions shaft version

Dimensions in mm [inch]

Clamping / synchronous flange, ø 70 [2.76]

Shaft type 1 with axial cable outlet

- 1 9 x M4, 10 [0.39] deep
- 2 Keyway for DIN 6885-A-4x4x25 key

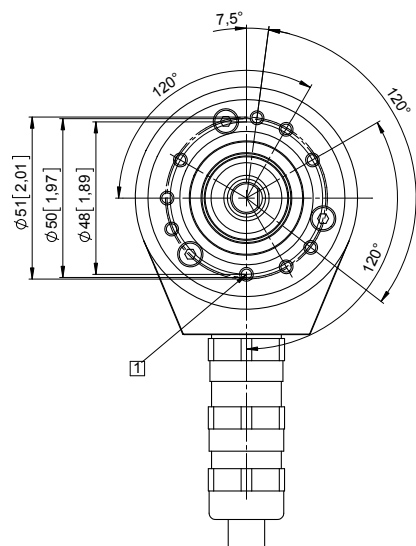
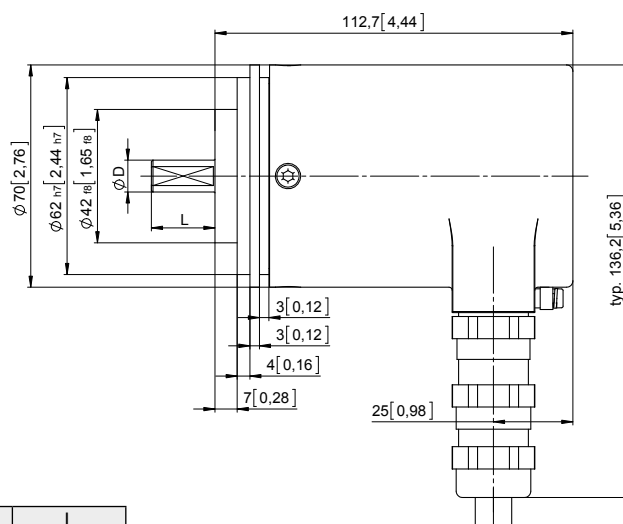


D	Fit	L
12 [0.47]	g6	25 [0.98]

Clamping / synchronous flange, ø 70 [2.76]

Shaft type 2 with radial cable outlet

- 1 9 x M4, 10 [0.39] deep



D	Fit	L
10 [0.39]	f7	20 [0.79]

Absolute encoders - singleturn

**Standard, ATEX/IECEx – zone 1/21
optical**

Sendix 7053 / 7073 (shaft / hollow shaft)

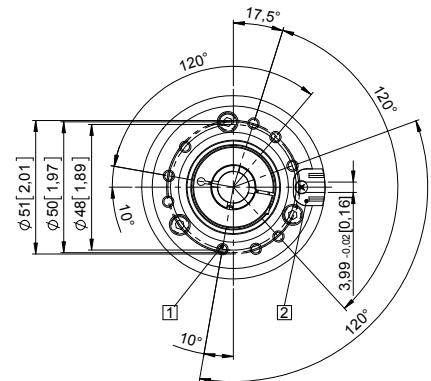
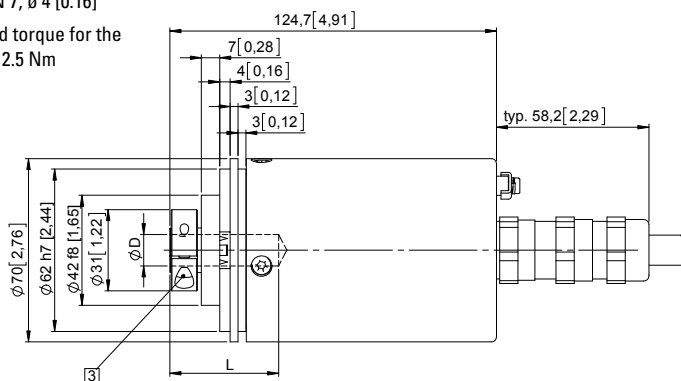
SSI / BiSS

Dimensions hollow shaft version

Dimensions in mm [inch]

Flange with spring element, short Flange type 1

- 1 9 x M4, 10 [0.39] deep
- 2 Slot spring element, recommendation: torque pin DIN 7, $\varnothing$ 4 [0.16]
- 3 Recommended torque for the clamping ring 2.5 Nm

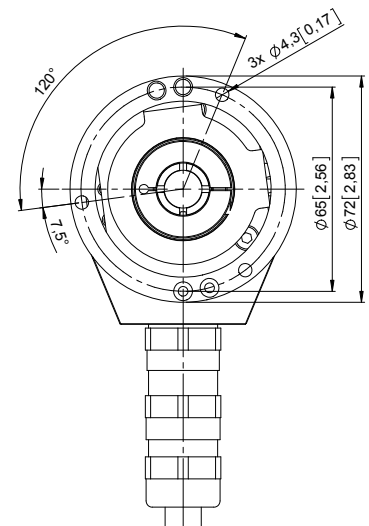
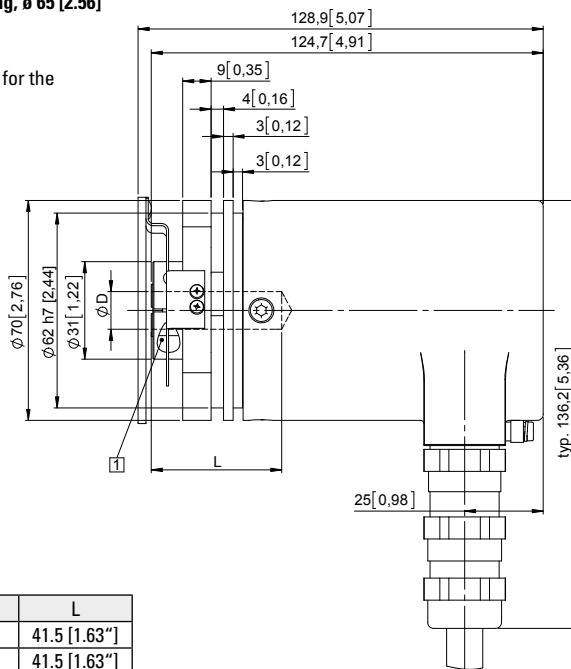


D	Fit	L
12 [0.47]	H7	41.5 [1.63"]
14 [0.55]	H7	41.5 [1.63"]

L = insertion depth max. blind hollow shaft

Flange with stator coupling, $\varnothing$ 65 [2.56] Flange type 5

- 1 Recommended torque for the clamping ring 2.5 Nm



D	Fit	L
12 [0.47]	H7	41.5 [1.63"]
14 [0.55]	H7	41.5 [1.63"]

L = insertion depth max. blind hollow shaft