

# Absolute Encoders - Singleturn

<b>ATEX, optical</b>	<b>Sendix 7053 (Shaft)</b>	<b>SSI / BiSS-C</b>
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The Sendix 7053 Absolute Encoders – Singleturn offer Ex protection in a compact 70 mm seawater resistant housing, with an SSI or BiSS-C 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 IP value	High shaft load capacity	Shock / vibration resistant	Magnetic field proof	Short-circuit proof	Reverse polarity protection	Optical sensor	Seawater-resistant

### Safe

- “Flameproof-enclosure” version: approved for zone 1, 2 and 21, 22
- Zone 1, 2 and 21, 22:  
 Ex II 2G Ex d IIC T6 and Ex II 2D Ex tD A21 IP6X T85°C
- Can be operated in marine environments – housing and flange manufactured from seawater-resistant aluminium
- Remains sealed even in harsh everyday use and ensures highest safety against field breakdowns. IP67 protection

### Compact

- Can be used even when space is tight
- Minimal installation depth, diameter 70 mm
- Compact cable outlet axial or radial

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<b>Order code</b>	<b>8.7053</b>	<b>1</b>	<b>X</b>	<b>2</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>2</b>	<b>1</b>	<b>XXXX</b>
<b>Shaft version</b>	Type	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>e</b>	<b>f</b>	<b>g</b>	<b>h</b>	<b>i</b> <sup>1)</sup>

- a** Flange  
1 = clamping-synchronous flange ø 70 mm, IP67
- b** Shaft (ø x L)  
1 = 12 x 25 mm, with keyway for 4 x 4 mm key  
2 = 10 x 20 mm, with flat
- c** Interface / Power supply  
2 = SSI or BiSS-C / 10 ... 30 V DC
- d** Type of connection  
1 = axial cable (2 m PUR)  
2 = radial cable (2 m PUR)  
A = axial cable (length > 2 m)  
B = radial cable (length > 2 m)  
(preferred lengths, see **i**, e.g.: 0100 = 10 m)

- e** Code  
B = SSI, Binary  
C = BiSS-C, Binary  
G = SSI, Gray
- f** Resolution <sup>2)</sup>  
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 / Outputs <sup>2)</sup>  
2 = SET, DIR input  
additional status output
- h** Options  
1 = no option
- i** Cable length in dm <sup>1)</sup>  
0050 = 5 m  
0100 = 10 m  
0150 = 15 m

*optional on request - special cable length*



### Mounting accessory for shaft encoders

<b>Coupling</b>	Bellows coupling ø19 mm for shaft 10 mm	<b>8.0000.1101.1010</b>
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Further accessories can be found in the Accessories section or in the Accessories area of our website at: [www.kuebler.com/accessories](http://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](http://www.kuebler.com/connection_technology).

2) Not applicable with connection types 1 and 2  
 1) Resolution, preset value and counting direction factory-programmable

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<b>Explosion protection</b>					
<b>EC type-examination certificate</b>		PTB09 ATEX 1106 X			
<b>Category (gas)</b>		 II 2G Ex d IIC T6			
<b>Category (dust)</b>		 II 2D Ex tD A21 IP6X T85°C			
<b>Directive 94/9 EC</b>		EN 60079-0; DIN EN 60079-1 EN 61241-0; DIN EN 61241-1			
<b>Mechanical characteristics</b>					
<b>Max. speed</b>		continuous 6 000 min <sup>-1</sup>			
<b>Starting torque</b>		< 0.05 Nm			
<b>Moment of inertia</b>		4.0 x 10 <sup>-6</sup> kgm <sup>2</sup>			
<b>Load capacity of shaft</b>		radial	80 N		
		axial	40 N		
<b>Weight</b>		approx. 0.6 kg			
<b>Protection EN 60 529</b>		IP67			
<b>Working temperature range</b>		-40°C ... +60°C			
<b>Materials</b>		shaft	stainless steel		
		flange / housing	seawater-resistant Al, type AISiMgMn (EN AW-6082) or stainless steel		
		cable	PUR		
<b>Shock resistance acc. EN 60068-2-27</b>		2500 m/s <sup>2</sup> , 6 ms			
<b>Vibration resistance acc. EN 60068-2-6</b>		100 m/s <sup>2</sup> , 55 ... 2000 Hz			
<b>General electrical characteristics</b>					
<b>Power supply</b>		10 ... 30 V DC			
<b>Current consumption (w/o output load)</b>		max. 45 mA			
<b>Reverse polarity protection for power supply (U<sub>B</sub>)</b>		yes			
<b>CE compliant acc. to</b>		EN 61000-6-2, EN 61000-6-4 and EN 61000-6-3			
<b>RoHS compliant acc. to</b>		EU guideline 2002/95/EG			
<b>SSI interface</b>					
<b>Output driver</b>		RS485 Transceiver type			
<b>Permissible load/channel</b>		max. 20 mA			
<b>Signal level</b>		high	typ 3.8 V		
		low at I <sub>Load</sub> = 20 mA	typ 1.3 V		
<b>Short-circuit proof outputs</b>		yes <sup>1)</sup>			
<b>Singleturn resolution</b>		10...14 bit and 17 bit <sup>2)</sup>			
<b>Number of revolutions</b>		4096 (12 bit)			
<b>Code</b>		Binary or Gray			
<b>SSI clock rate</b>		< 14 bit: 50 kHz ... 2 MHz			
<b>Monoflop time</b>		< 15 µs <sup>2)</sup>			
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.					
<b>Data refresh rate</b>		up to 14 bit	< 1 µ		
		for 15 ... 17 bit	< 4 µs		
<b>Status and Parity bit</b>		on request			
<b>SET input</b>					
<b>Input</b>		high active			
<b>Input type</b>		Comparator			
<b>Signal level</b>		high	min.	60 % of +V	
			max.	+V	
		low	max.	25 % of +V (+V = Power supply)	
<b>Input current</b>		< 0.5 mA			
<b>Min. pulse duration (SET)</b>		10 ms			
<b>Timeout after SET signal</b>		14 ms			
<b>Response time (DIR input)</b>		1 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.					
<b>DIR input</b>					
A High signal switches the direction of rotation from the default CW to CCW. The reverse 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.					
<b>Status output</b>					
<b>Output driver</b>		Open Collector, internal pull-up resistor 22 kOhm			
<b>Permissible load</b>		max. 20 mA			
<b>Signal level</b>		high	+V		
		low	< 1 V		
<b>Active at</b>		low			
The status output serves to display various alarm or error messages. The status output is high (Open Collector with internal pull-up 22k) in normal operation.					
<b>Power-ON delay</b>					
After Power-ON, the device requires a time of approximately 150 ms before valid data can be read.					
<b>BiSS-C Interface</b>					
<b>Singleturn resolution</b>		10...14 bit and 17 bit, Programmable at the customer <sup>3)</sup>			
<b>Code</b>		Binary			
<b>Clock rate</b>		up to 10 MHz			
<b>Max. update rate</b>		< 10 µs, depends on the clock rate and the data length			
<b>Data refresh rate</b>		≤ 1 µs			
<b>Note::</b>		<ul style="list-style-type: none"> <li>- Bidirectional, programmable parameters are: resolution, code, direction, alarms and warnings</li> <li>- CRC data verification</li> </ul>			

1) Short-circuit with 0V or output, only one channel at a time, supply voltage correctly applied

2) Other options on request

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## Terminal assignment

For output circuit 1 or 2

Signal	GND	+V	+C	-C	+D	-D	SET	DIR	Stat	PE	PE
Cable marking	1	2	3	4	5	6	7	8	9	yellow/green	shield

+V: Encoder power supply +V DC

GND: Encoder Ground GND (0V)

+C, -C: Clock signal

+D, -D: Data signal

SET: Set input. The current position becomes defined as position zero.

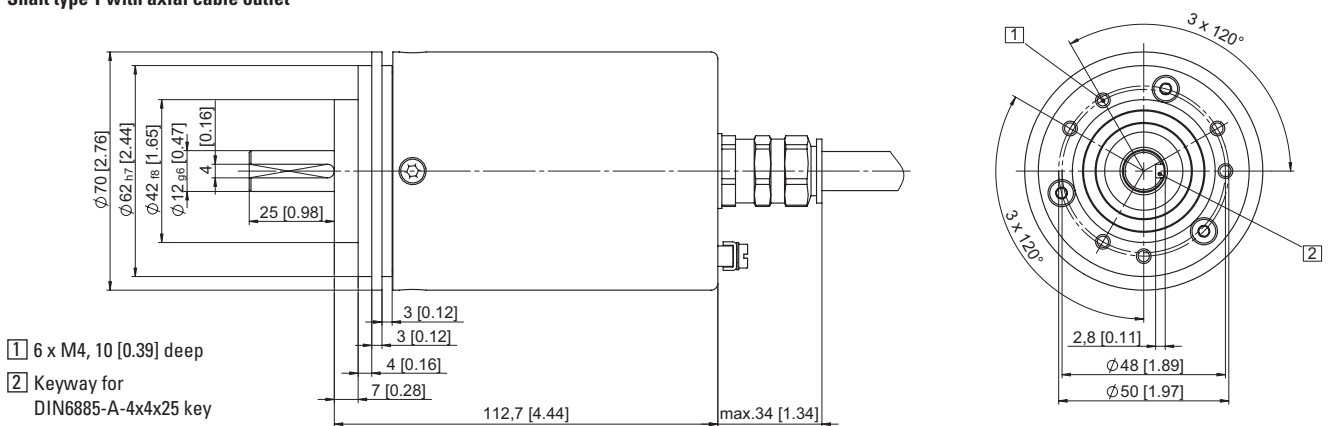
DIR: Direction input. If this input is active, output values are decreasing when shaft is turned clockwise

Stat: Status output

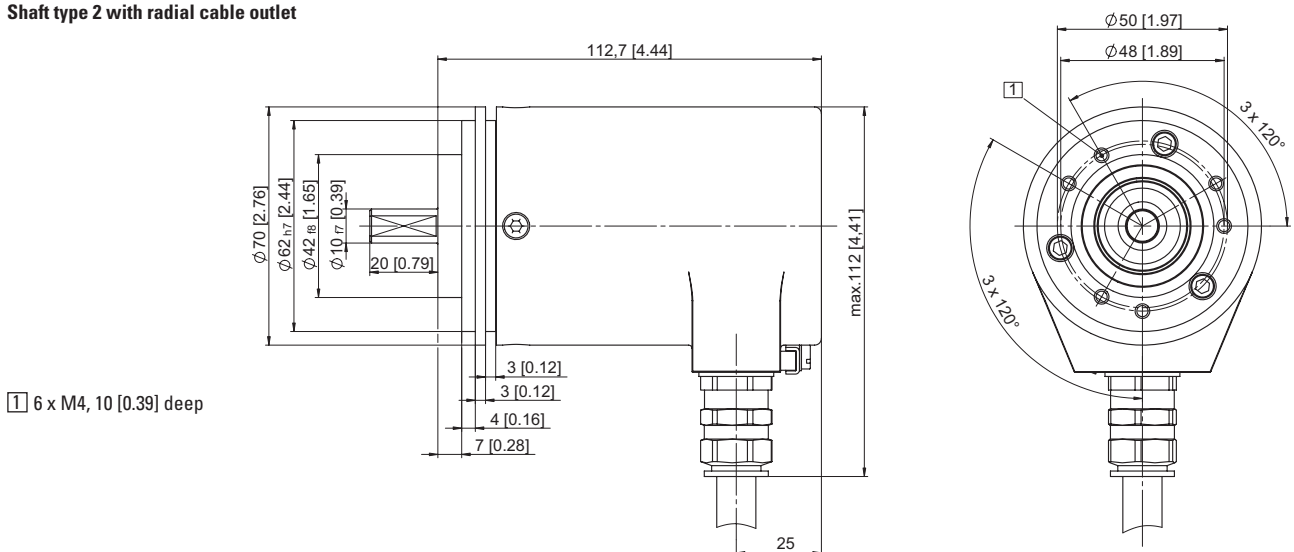
PE: Protective earth

## Dimensions

### Shaft type 1 with axial cable outlet



### Shaft type 2 with radial cable outlet



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