

Absolute Encoders - Singleturn

ATEX, optical	Sendix 7053 SIL (Shaft)	SSI / BiSS-C + SinCos
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Ex protection and Functional Safety in one device.

The absolute singleturn encoders Sendix 7053 SIL are perfectly suited for use in safety-related applications up to SIL3 according to DIN EN ISO 61800-5-2 or PLe to DIN EN ISO 13849.

In addition, these devices ensure Ex protection in a compact 70 mm housing out of seawater-resistant aluminium.



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

Functional Safety

- Certified by the German Institute for Occupational Safety (IFA)
- Suitable for SIL3 applications acc. to DIN EN ISO 61800-5-2
- Suitable for PLe applications acc. to DIN EN ISO 13849
- SSI or BiSS-C interface with incremental SinCos tracks

ATEX compliant

- "Flameproof-enclosure" version: approved for zone 1, 2 and 21, 22
- Zone 1, 2 and 21, 22:

Order code	8.7053SIL . 1 X 4 X . X X 2 1 . XXXX
Shaft version	Type a b c d e f g h i ¹⁾



<p>a Flange 1 = clamping-synchronous flange ø 70 mm, IP67</p> <p>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</p> <p>c Interface / Power supply 4 = SSI / BiSS-C + 2048 ppr SinCos track / 10 ... 30 V DC</p> <p>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)</p>	<p>e Code B = SSI, Binary C = BiSS-C, Binary G = SSI, Gray</p> <p>f Resolution ²⁾ A = 10 bit ST 1 = 11 bit ST 2 = 12 bit ST 3 = 13 bit ST 4 = 14 bit ST 7 = 17 bit ST</p>	<p>g Inputs / Outputs ²⁾ 2 = SET, DIR input <i>optional on request</i> - special cable length</p> <p>h Options 1 = no option</p> <p>i Cable length in dm ¹⁾ 0050 = 5 m 0100 = 10 m 0150 = 15 m</p>
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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.
 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.

You will find an overview of our systems and components for Functional Safety under www.kuebler.com/safety

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

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Explosion protection					
EC type-examination certificate		PTB09 ATEX 1106 X			
Category (gas)		 II 2G Ex d IIC T6			
Category (dust)		 II 2D Ex tD A21 IP6X T85°C			
Directive 94/9 EC		EN 60079-0; DIN EN 60079-1 EN 61241-0; DIN EN 61241-1			
Mechanical characteristics					
Max. speed		continuous 6 000 min ⁻¹			
Starting torque		< 0.05 Nm			
Moment of inertia		4.0 x 10 ⁻⁶ kgm ²			
Load capacity of shaft		radial	80 N		
		axial	40 N		
Weight		approx. 0.6 kg			
Protection acc. to EN 60529		IP67			
Working temperature range		-40°C ... +60°C			
Materials		shaft	stainless steel		
		flange / housing	seawater-resistant Al, type AISiMgMn (EN AW-6082) or stainless steel		
		cable	PUR		
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		10 ... 30 V DC			
Current consumption (w/o output load)		max. 45 mA			
Reverse polarity protection for power supply (U_B)		yes			
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/EC			
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		
Short-circuit proof outputs		yes ¹⁾			
Singleturn resolution		10 ... 14 bit and 17 bit ²⁾			
Number of revolutions		4096 (12 bit)			
Code		Binary or Gray			
SSI clock rate		< 14 bit: 50 kHz ... 2 MHz			
Monoflop time		< 15 μs ²⁾			
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.					
Data refresh rate		up to 14 bit	< 1 μs		
		for 15 ... 17 bit	< 4 μs		
Status and parity bit		on request			
SET input					
Input		high active			
Input type		Comparator			
Signal level		high	min.	60 % of +V	
			max.	+V	
		low	max.	25 % of +V (+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. 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.					
DIR input					
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.					
Status output					
Output driver		Open Collector, internal pull-up resistor 22 kΩhm			
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 22k) in normal operation.					
Power-ON delay					
After Power-ON, the device requires a time of approximately 150 ms before valid data can be read.					
BiSS-C interface					
Singleturn resolution		10 ... 14 bit and 17 bit ²⁾			
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			
Note:		<ul style="list-style-type: none"> - Bidirectional, factory programmable parameters are: resolution, code, direction, alarms and warnings - CRC data verification 			

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

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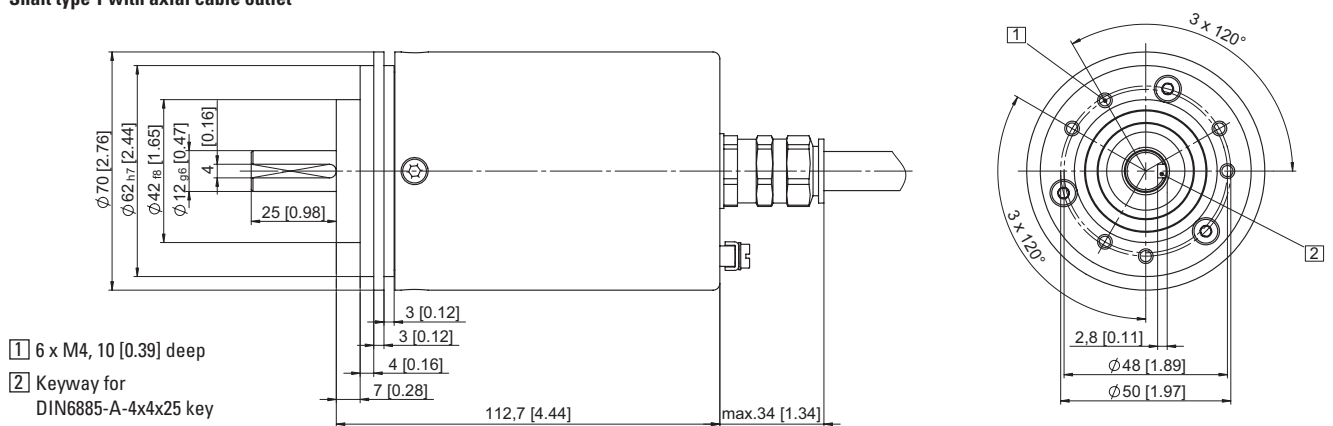
Terminal assignment

Interface	Type of connection	Features	Cable														
			Signal:	0 V	+V	+C	-C	+D	-D	SET	DIR	A	\bar{A}	B	\bar{B}	PE	PE
4	1, 2, A, B	SET, DIR	Cable marking:	6	1	2	3	4	5	11	12	7	8	9	10	YE/GN	Shield

- +V: Encoder power supply +V DC
- 0 V: Encoder Ground GND (0 V)
- +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.
- PE: Protective earth
- A, \bar{A} : Incremental output channel A
- B, \bar{B} : Incremental output channel B

Dimensions

Shaft type 1 with axial cable outlet



Shaft type 2 with radial cable outlet

