Standard
ATEX, SIL3 / PLe, optical

Sendix SIL 7014FS3 (Shaft)

SinCos

Ex protection and Functional Safety in one device.

The incremental encoders 7014FS3 of the Sendix SIL family are suited for use in safety-related applications up to SIL3 acc. to EN 61800-5-2 or PLe to EN ISO 13849-1.

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 protection level | High shaft load capacity | Shock / vibration resistant | Magnetic field proof | Short-circuit proof | Reverse polarity protection | Optical sensor | Seawater-resistant

Functional Safety

- Encoder with individual certificate from IFA / TÜV
- Suitable for applications up to SIL3 acc. to EN 61800-5-2
- Suitable for applications up to PLe acc. to EN ISO 13849-1
- With incremental SinCos tracks
- Certified mechanical mounting + electronic

Explosion protection

- "Flameproof-enclosure" version
- ATEX with EC type examination certificate
- IECEx with Certificate of Conformity (CoC)

Order code Shaft version

8.7014 FS3	.	1	X	X	X	.	XXXX	.	XXXX
Type		a	b	c	d		e		f

a *Flange*
1 = clamping-synchronous flange, IP67 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 *Output circuit / Power supply*
1 = SinCos / 5 V DC
2 = SinCos / 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 *Pulse rate*
1024, 2048

f *Cable length in dm* [1)]
0050 = 5 m [16.40']
0100 = 10 m [32.81']
0150 = 15 m [49.21']

optional on request
- special cable length

Accessories – Safety control		Order-No.
Safety-M, basic modules	Speed monitoring for 1 axis	**8.MS1.000**
	Speed monitoring for 2 axes (analogue inputs optional)	**8.MS2.XXX**

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 in the safety technology section or under www.kuebler.com/safety

1) Not applicable with connection types 1 and 2

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Technical data

Explosion protection ATEX

EC type-examination certificate	PTB09 ATEX 1106 X
Category (gas)	Ex II 2 G Ex d IIC T4 - T6 Gb
Category (dust)	Ex II 2D Ex tb IIIC T135°C - T85°C Db IP6x
Directive 94/9/EC	EN 60079-0: 2009; EN 60079-1: 2007; EN 60079-31: 2009

Explosion protection IECEx

Certificate of Conformity (CoC)	IECEx PTB 13.0026 X
Category (gas)	Ex d IIC T4 - T6 Gb
Category (dust)	Ex tb IIIC T135°C - T85°C Db IP6x
IECEx	IEC 60079-0:2007; IEC 60079-1:2007; IEC 60079-31:2008

Notes regarding "Functional Safety"

These encoders are suitable for use in safety-related systems up to SIL3 acc. to EN 61800-5-2 and PLe to EN ISO 13849-1 in conjunction with controllers or evaluation units, which possess the necessary functionality.

Additional functions can be found in the operating manual.

Safety characteristics

Relevant standards	EN ISO 13849-1 / EN 61800-5-2, EN 61508
Classifiction	PLe / SIL3
System structure	2 channel (Cat. 4 / HFT = 1)
PFH_d value [1]	1.09×10^{-8} h^{-1}
Proof-test interval	20 years

Mechanical characteristics

Max. speed		continuous 6 000 min^{-1}
Starting torque – at 20°C [68°F]		< 0.05 Nm
Moment of inertia		4.0×10^{-6} kgm^2
Load capacity of shaft	radial axial	80 N 40 N
Weight		approx. 1.3 kg [45.86 oz]
Protection acc. to EN 60529		IP67
Working temperature range		-40°C ... +60°C [-40 ... +140°F]
Materials	shaft flange / housing cable	stainless steel seawater-resistant Al, type AlSiMgMn (EN AW-6082) (stainless steel on request) PUR
Shock resistance acc. EN 60068-2-27		500 m/s^2, 11 ms
Vibration resistance acc. EN 60068-2-6		200 m/s^2, 10 ... 150 Hz

Electrical characteristics

Power supply	10 ... 30 V DC
Current consumption (no load)	max. 45 mA
Reverse polarity protection for power supply (+V)	yes
CE compliant acc. to	EMC guideline 2004/108/EC ATEX guideline 94/9/EC Machinery directive 2006/42/EC
RoHS compliant acc. to	guideline 2002/95/EC

SinCos interface

Max. frequency -3dB	400 kHz
Signal level	1 Vpp (± 10%)
Short circuit proof	yes [2]
Pulse rate	1024 / 2048 ppr

Terminal assignment

Output circuit	Type of connection	Cable (isolate unused wires individually before initial start-up)							
1, 2	1, 2, A, B	Signal:	0 V	+V	A	$\overline{A}$	B	$\overline{B}$	⏚
		Cable marking:	6	1	7	8	9	10	shield

+V: Encoder power supply +V DC
0 V: Encoder power supply ground GND (0 V)
A, $\overline{A}$: Cosine signal
B, $\overline{B}$: Sine signal
⏚: Plug connector housing (Shield)

1) The specified value is based on a diagnostic coverage of 99%, that must be achieved with an encoder evaluation unit.
The encoder evaluation unit must meet at least the requirements for SIL3.
2) Short-circuit with 0 V or output, only one channel at a time, supply voltage correctly applied

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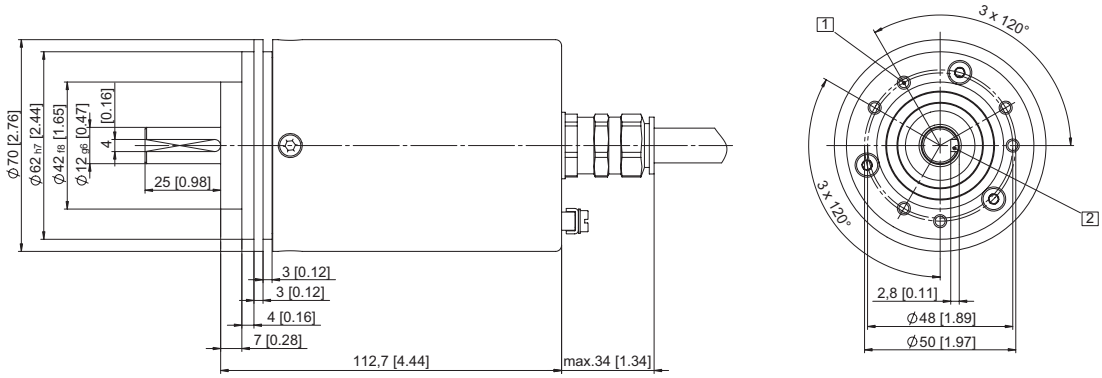
Dimensions

Dimensions in mm [inch]

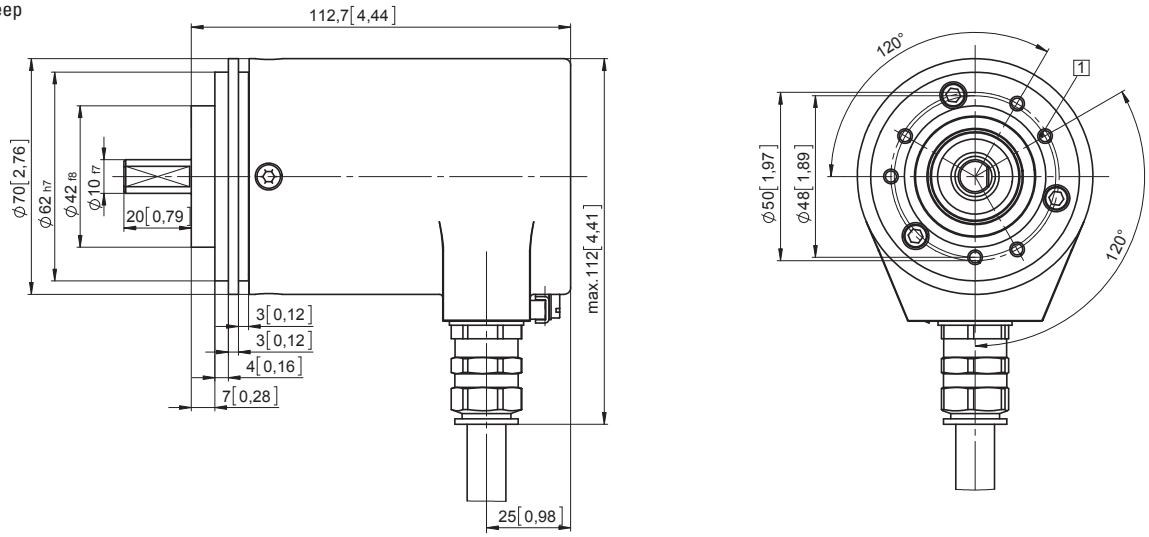
Clamping-synchronous flange, ø 70 [2.76]
Shaft type 1 with axial cable outlet

1 6 x M4, 10 [0.39] deep
2 Keyway for DIN 6885-A-4x4x25 key



Clamping-synchronous flange, ø 70 [2.76]
Shaft type 2 with radial cable outlet

1 6 x M4, 10 [0.39] deep



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