

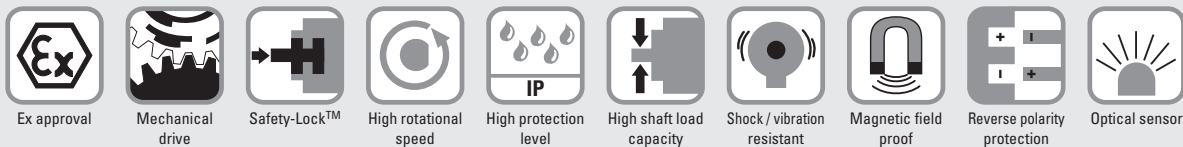
Absolute encoders – multiturn

Standard, ATEX/IECEX – mining mechanical multiturn, optical **Sendix 7168 / 7188 (shaft / hollow shaft)** **PROFIBUS DP**



The Sendix 7168 / 7188 absolute multiturn encoders in a compact 70 mm stainless-steel housing, with a PROFIBUS interface and optical sensor technology have an ATEX/IECEX mining approval.

These shock and vibration-resistant encoders operate flexibly with a resolution of up to 28 bits; they are also available with axial and radial cable outlets.



Compact and safe

- Can be used even when space is tight.
- Minimal installation depth, diameter 70 mm.
- Compact cable outlet axial or radial.
- Remains sealed even in harsh everyday use and ensures highest safety against field breakdowns (IP67 protection).

Explosion protection

- Mining approval.
- “Flame-proof enclosure” construction.
- ATEX with EC type examination certificate.
- IECEX with certificate of conformity (CoC).

Order code	8.7168	. 2 X 3 X .	31 11 .	XXXX
Shaft version	Type	a b c d	e	f ¹⁾
a Flange	2 = 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 / power supply	3 = PROFIBUS DP V0 / 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 Fieldbus profile	31 = PROFIBUS DP V0 encoder profile class 2			
f Cable length in dm ¹⁾	0050 = 5 m [16.40'] 0100 = 10 m [32.81'] 0150 = 15 m [49.21']			
				<i>Optional on request - special cable length</i>

Order code	8.7188	. X X 3 X .	31 11 .	XXXX
Hollow shaft	Type	a b c d	e	f ¹⁾
a Flange	2 = with spring element, short 6 = with stator coupling, ø 65 mm [2.56"]			
b Blind hollow shaft (insertion depth max. 41.5 mm [1.63"])	1 = ø 12 mm [0.47"] 2 = ø 14 mm [0.55"]			
c Interface / supply voltage	3 = PROFIBUS DP V0 / 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 Fieldbus profile	31 = PROFIBUS DP V0 encoder profile class 2			
f Cable length in dm ¹⁾	0050 = 5 m [16.40'] 0100 = 10 m [32.81'] 0150 = 15 m [49.21']			
				<i>Optional on request - special cable length</i>

1) Not applicable with connection types 1 and 2.

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Sendix 7168 / 7188 (shaft / hollow shaft)

PROFIBUS DP

Technical data

Explosion protection 7168

ATEX	
EC type-examination certificate	IBExU 14 ATEX 1047 X
Category	⊕ I M2 Ex d I/IIC T4 - T6 Mb
Relevant standards ATEX guideline 94/9/EC	EN 60079-0:2012; EN 60079-1:2007
IECEX	
Certificate of Conformity (CoC)	IECEX IBE 14.0023 X
Category	Ex d I/IIC T4 - T6 Mb
Relevant standards	IEC 60079-0:2011; IEC 60079-1:2007

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. 2.8 kg [98.77 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 EC type-examination certificate!
Materials	shaft	stainless steel
	flange / housing	stainless steel
	cable	PUR
Shock resistance		
	acc. to EN/IEC 60068-2-27	1000 m/s ² , 6 ms
Vibration resistance		
	acc. to EN/IEC 60068-2-6	100 m/s ² , 55 ... 2000 Hz

Explosion protection 7188

ATEX	
EU type-examination certificate	IBExU 15 ATEX 1057 X
Category	⊕ I M2 Ex db I/IIC T4/120°C (T4)/T6 Mb
Relevant standards ATEX guideline 2014/34/EU	EN 60079-0:2012 + A11:2013; EN 60079-1:2014
IECEX	
Certificate of Conformity (CoC)	IECEX IBE 15.0019 X
Category	Ex db I/IIC T4/120°C (T4)/T6 Mb
Relevant standards	IEC 60079-0:2011; IEC 60079-1:2014

Electrical characteristics

Supply voltage	10 ... 30 V DC
Current consumption (no load)	max. 120 mA
Reverse polarity protection for supply voltage	yes

EMC

Relevant standards	EN 55011 class B:2009 / A1:2010 EN 61000-6-2:2005 / AC:2005 EN 61000-6-3:2007 / A1:2011 EN 61326-1:2013
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Approvals

CE compliant in accordance with	
EMC Directive	2014/30/EU
RoHS Directive	2011/65/EU
ATEX Directive	2014/34/EU (for Ex 2/22 variants)
UKCA compliant in accordance with	
EMC Regulations	S.I. 2016/1091
RoHS Regulations	S.I. 2012/3032
UKEX Regulations	S.I. 2016/1107 (for Ex 2/22 variants)

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Interface characteristics PROFIBUS DP	
Resolution singleturn (MUR)	scalable 1 ... 65 536 (16 bit) default 8 192 (13 bit)
Number of revolutions (NDR)	1 ... 4 096 (12 bit) scalable only via the total resolution
Total resolution (TMR)	scalable 1 ... 268 435 456 (28 bit) default 33 554 432 (25 bit)
Interface	specification according to PROFIBUS DP 2.0 / standard (DIN 19245 Part 3) / RS485 driver galvanically isolated
Protocol	Profibus encoder profile V1.1 class 1 and class 2 with manufacturer-specific add-ons
Baud rate	maximum 12 Mbit/s
Device address	software controlled setting of the device address via the SSA-service with a CLASS 2-master, default address: 125
Termination	active termination can only be switched on externally

PROFIBUS encoder profile V1.1

The PROFIBUS DP device profile describes the functionality of the communication and the manufacturer-specific component within the PROFIBUS fieldbus system. The Encoder Profile applies to encoders and defines the individual objects independently of the manufacturer. In addition, the profile makes provision for additional extended functions specific to the manufacturer. The use of PROFIBUS compatible devices ensures that the systems of today are ready to meet the demands of the future.

The following parameters can be programmed

- Direction of rotation.
- Scaling – number of steps per revolution.
- Preset value.
- Diagnostics mode.

The following functionality is integrated

- Galvanic isolation of the Bus stage with DC/DC converter.
- Line driver acc. to RS485 max. 12 MB.
- Full class 1 and class 2 functionality.
- Speed value.

Terminal assignment

Interface	Type of connection	Cable (isolate unused cores individually before initial start-up)								
		Signal:	0 V	+V	PB_A IN	PB_B IN	BUS_GND	BUS_VDC	PB_A OUT	PB_B OUT
3	1, 2, A, B	Core marking:	1	2	4	5	6	7	8	9

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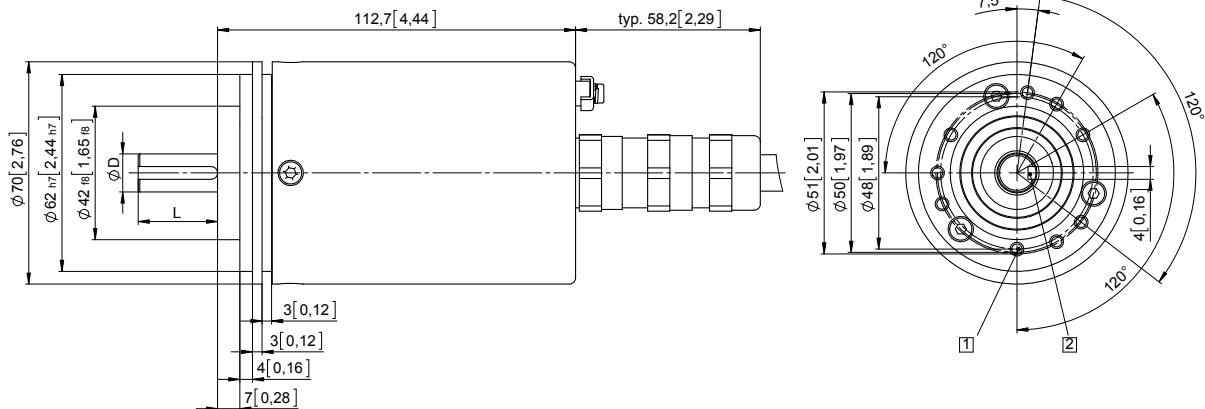
PROFIBUS DP

Dimensions shaft version

Dimensions in mm [inch]

Clamping / synchronous flange, \varnothing 70 [2.76]
Shaft type 1 with axial cable outlet

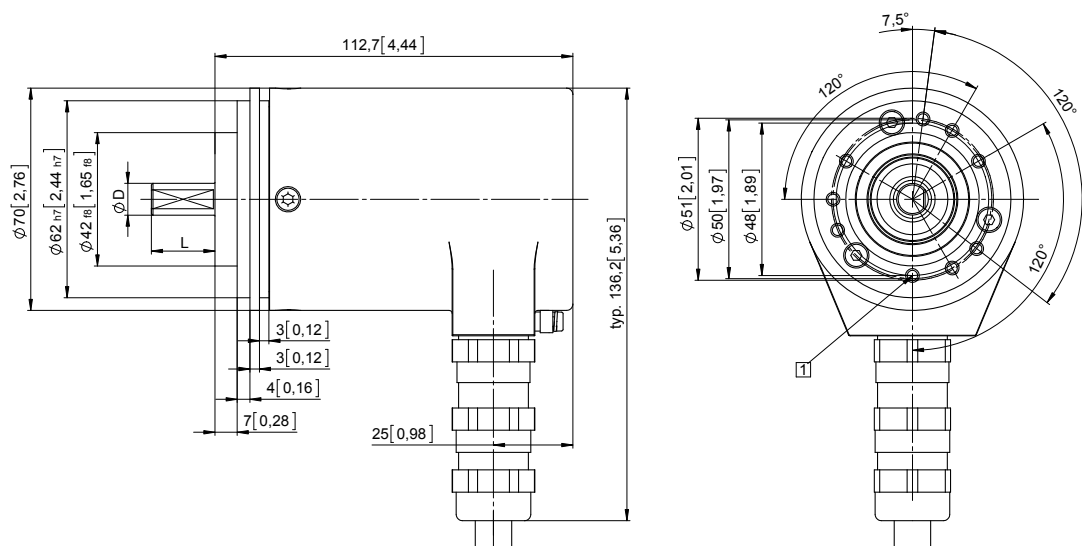
- 1 9 x M4, 10 [0.39] deep
- 2 Keyway for DIN 6885-A-4x4x25 key



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

Clamping / synchronous flange, \varnothing 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 – multiturn

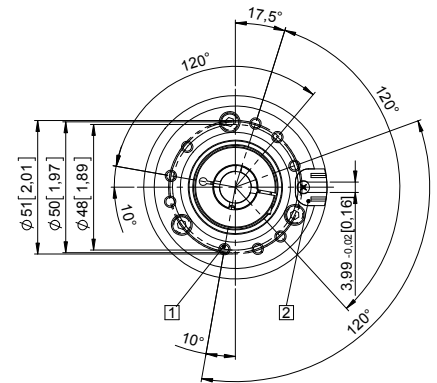
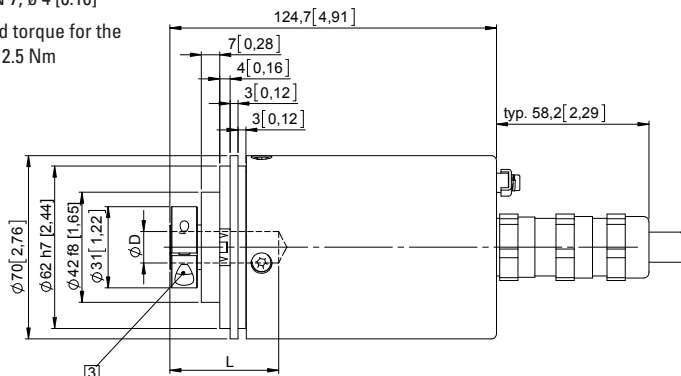
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Dimensions hollow shaft version

Dimensions in mm [inch]

Flange with spring element, short Flange type 2

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

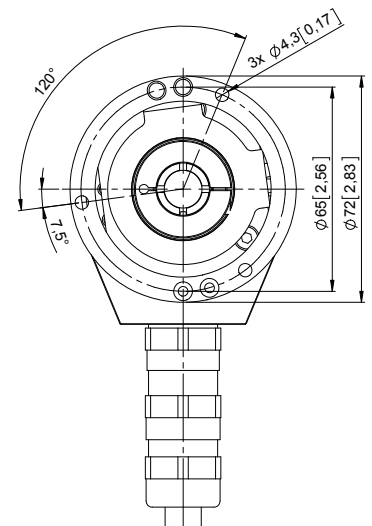
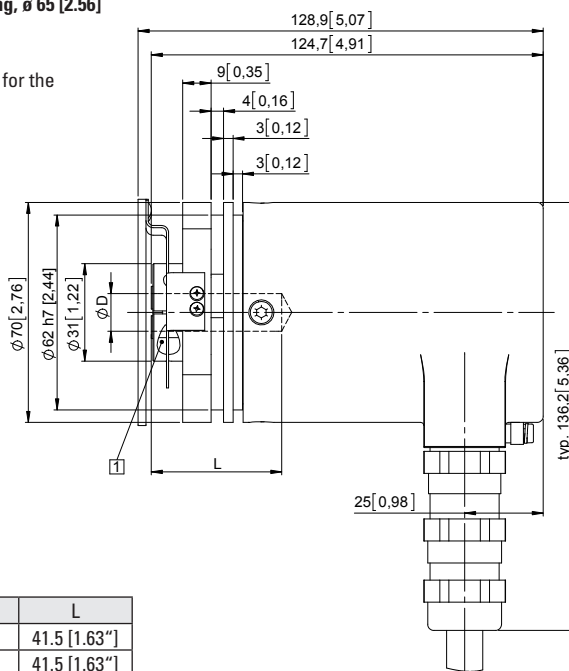


D	Fit	L
12 [0.47]	H7	41.5 [1.63"]
14 [0.55]	H7	41.5 [1.63"]

L = insertion depth max. blind hollow shaft

Flange with stator coupling, ϕ 65 [2.56] Flange type 6

- 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