

Absolute encoders – singleturn

Compact magnetic	Sendix M3653A / M3673A (shaft / hollow shaft)	SSI
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The Sendix M36 is a magnetic singleturn encoder in compact design. It is characterized by robustness, reliability and cost-efficiency.



Safety-Lock™	High rotational speed	Temperature range -40°... +85°C	High protection level IP	High shaft load capacity	Shock / vibration resistant	Reverse polarity protection	Surface protection salt spray tested optional

Reliable and insensitive

- Sturdy bearing construction in Safety-Lock™ design for resistance against vibration and installation errors.
- Reduced number of components ensures magnetic insensitivity.
- IP67 protection and wide temperature range -40 °C ... +85 °C.

Application oriented

- Angular measurement deviation $\pm 0,5^\circ$.
- Repeat accuracy $\pm 0,2^\circ$.
- Short control cycles, clock frequency with SSI up to 2 MHz.
- Max. resolution 14 bit.

Order code
Shaft version

8.M3653A . **XX2X . XX **1** **2****
Type

If for each parameter of an encoder the underlined preferred option is selected, then the delivery time will be 10 working days for a maximum of 10 pieces. Qts. up to 50 pcs. of these types generally have a delivery time of 15 working days.



- a** Flange
- 1 = clamping flange, IP67, \varnothing 36 mm [1.42"]
 - 3 = clamping flange, IP65, \varnothing 36 mm [1.42"]
 - 2 = synchro flange, IP67, \varnothing 36 mm [1.42"]
 - 4 = synchro flange, IP65, \varnothing 36 mm [1.42"]

- b** Shaft ($\varnothing \times L$), with flat
- 1 = \varnothing 6 x 12.5 mm [0.24 x 0.49"]
 - 3 = \varnothing 8 x 15 mm [0.32 x 0.59"]
 - 5 = \varnothing 10 x 20 mm [0.39 x 0.79"]
 - 2 = \varnothing 1/4" x 12.5 mm [0.49"]

- c** Interface / supply voltage
- 2 = SSI / 10 ... 30 V DC

- d** Type of connection
- 1 = axial cable, 1 m [3.28'] PUR
 - A = axial cable, special length PUR *)
 - 2 = radial cable, 1 m [3.28'] PUR
 - B = radial cable, special length PUR *)
 - 3 = axial M12 connector, 8-pin
 - 4 = radial M12 connector, 8-pin

*) Available special lengths (connection types A, B):
2, 3, 5, 8, 10, 15 m [5.56, 9.84, 16.40, 26.25, 32.80, 49.21']
order code expansion .XXXX = length in dm
ex.: 8.M3653A.432A.G312.0030 (for cable length 3 m)

- e** Code
- B = SSI, binary
 - G = SSI, gray

- f** Resolution
- A = 10 bit
 - 2 = 12 bit
 - 3 = 13 bit
 - 4 = 14 bit

Optional on request

- Ex 2/22 (only for connection types 3 and 4)
- surface protection salt spray tested

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Technical data

Mechanical characteristics

Maximum speed		
shaft or blind hollow shaft version without shaft seal (IP65)		6000 min ⁻¹ 3000 min ⁻¹ (continuous)
shaft or blind hollow shaft version with shaft seal (IP67)		4000 min ⁻¹ 2000 min ⁻¹ (continuous)
Starting torque at 20°C [68°F]		
	without shaft seal	< 0.007 Nm
	with shaft seal (IP67)	< 0.01 Nm
Shaft load capacity		
	radial	40 N
	axial	20 N
Weight		
		approx. 210 g [7.41 oz]
Protection acc. to EN 60529		
		IP65 or IP67
Working temperature range		
		-40 °C ... +85 °C [-40 °F ... +185 °F]
Materials		
	shaft / hollow shaft	stainless steel
	flange	aluminum
	housing	zinc die-cast
	shaft seal	PUR
Shock resistance acc. to EN 60068-2-27		
		2500 m/s ² , 6 ms
Vibration resistance acc. to EN 60068-2-6		
		300 m/s ² , 10 ... 2000 Hz

Electrical characteristics

Supply voltage	10 ... 30 V DC
Current consumption (no load)	max. 40 mA
Reverse polarity protection of the supply voltage	yes
Short-circuit proof outputs	yes ¹⁾

SSI interface

Output driver	RS485 transceiver type
Permissible load / channel	max. +/- 30 mA
Signal level	HIGH typ 3.8 V LOW with I _{Load} = 20 mA typ 1.3 V
Resolution	10 ... 14 bit
Angular measurement deviation ²⁾	±0,5°
Repeat accuracy	±0.2°
Number of revolutions (multiturn)	max. 24 bit
Code	binary or gray
SSI clock rate	50 kHz ... 2 MHz
Data refresh rate	2 ms
Monoflop time	≤ 15 μs

Note: If the clock cycle starts within the monoflop time a second data transfer begins with the same data. If the clock cycle starts after the monoflop time the cycle begins with the new values. The update rate is dependent on the clock speed, data length and monoflop time.

SET input

Input	active HIGH
Input type	comparator
Signal level	HIGH min. 60 % of +V, max: +V LOW max. 30 % of +V
Input current	< 0.5 mA
Min. pulse duration (SET)	10 ms
Input delay	1 ms
New position data readable after	1 ms
Internal processing time	200 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 processing time of approx. 1 ms, after which the new position data can be read via SSI. Once the SET function has been triggered, the encoder requires an internal processing time of typ. 200 ms; during this time the supply voltage must not be switched off. The SET function should be carried out whilst the encoder is at rest. The number of preset value writing cycles is limited to 10,000. If this input is not used, it should be connected to 0 V (Encoder ground GND) in order to avoid interferences.

DIR input

Response time (DIR input)	1 ms
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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 this input is not used, it should be connected to 0 V (Encoder ground GND) in order to avoid interferences.

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

UL compliant in accordance with	File no. E224618
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)

1) Short circuit proof to 0 V or to output when supply voltage correctly applied.
2) Over the whole temperature range.

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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	⊥
			Core color:	WH	BN	GN	YE	GY	PK	BU	RD	shield

Interface	Type of connection	Features	M12 connector, 8-pin									
2	3, 4	SET, DIR	Signal:	0 V	+V	C+	C-	D+	D-	SET	DIR	⊥
			Pin:	1	2	3	4	5	6	7	8	PH

- +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
- PH ⊥: Plug connector housing (shield)

Top view of mating side, male contact base



M12 connector, 8-pin

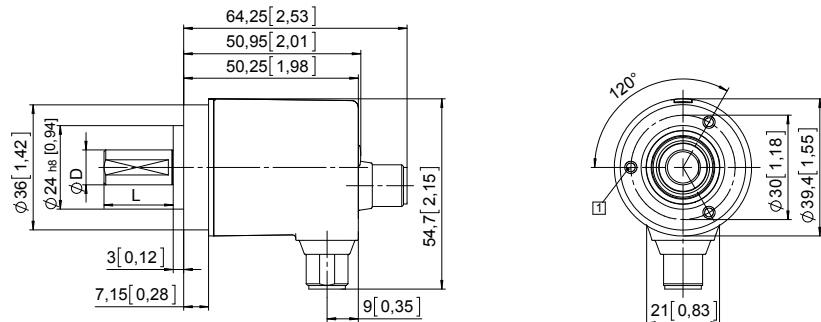
Dimensions shaft version

Dimensions in mm [inch]

Clamping flange, ø 36 [1.42]

Flange type 1 and 3

- 1 3 x M3, 6 [0.24] deep

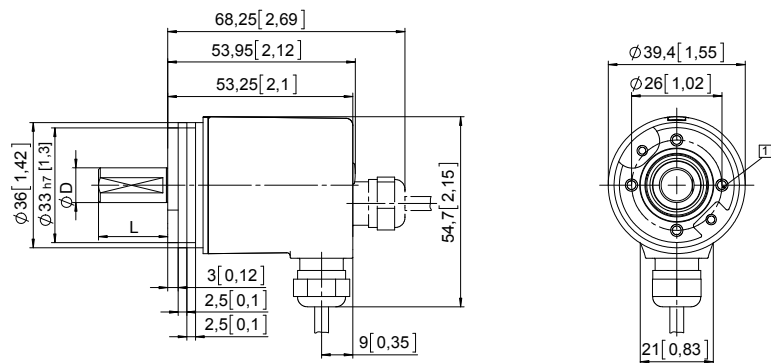


D	Fit	L
6 [0.24]	h7	12.5 [0.49]
8 [0.32]	h7	15 [0.59]
10 [0.39]	f7	20 [0.79]
1/4"	h7	12.5 [0.49]

Synchro flange, ø 36 [1.42]

Flange type 2 and 4

- 1 4 x M3, 6 [0.24] deep



D	Fit	L
6 [0.24]	h7	12.5 [0.49]
8 [0.32]	h7	15 [0.59]
10 [0.39]	f7	20 [0.79]
1/4"	h7	12.5 [0.49]

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Dimensions hollow shaft version

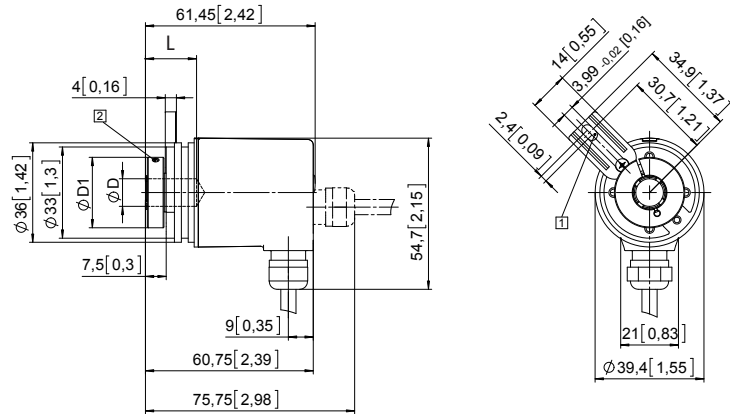
Dimensions in mm [inch]

Flange with spring element, long Flange type 3 and 6

- 1 Slot spring element, recommendation: torque pin DIN 7, \varnothing 4 [0.16]
- 2 Recommended torque for the clamping ring 0.7 Nm

D	Fit	L	D1
6 [0.24]	H7	18.5 [0.73]	24 [0.94]
8 [0.32]	H7	18.5 [0.73]	25.5 [1.00]
10 [0.39]	H7	18.5 [0.73]	25.5 [1.00]
1/4"	H7	18.5 [0.73]	24 [0.94]

L = insertion depth max. blind hollow shaft



Flange with stator coupling, \varnothing 46 [1.81] Flange type 2 and 5

- 1 Recommended torque for the clamping ring 0.7 Nm

D	Fit	L	D1
6 [0.24]	H7	18.5 [0.73]	24 [0.94]
8 [0.32]	H7	18.5 [0.73]	25.5 [1.00]
10 [0.39]	H7	18.5 [0.73]	25.5 [1.00]
1/4"	H7	18.5 [0.73]	24 [0.94]

L = insertion depth max. blind hollow shaft

