

Absolute encoders – multiturn

**Compact, robust
electronic multiturn, magnetic**

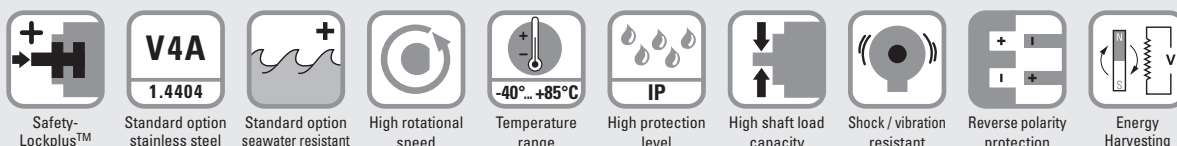
Sendix M3663R (shaft)

SSI



The Sendix M36 with Energy Harvesting Technology is an electronic multiturn encoder in miniature format, without gear and without battery.

The "R"obust version is particularly suitable for use in harsh environments. Protected up to IP69k, resistance against shock and extreme temperature fluctuations, the Sendix M36 encoder is suitable even for demanding outdoor applications.



Highest robustness

- Sturdy bearing construction in Safety-Lockplus™ design for particularly high resistance.
- Extra large bearings.
- Mechanically protected shaft seal.
- Protection level IP66, IP67 and IP69k in one device.
- Wide temperature range -40°C ... +85°C.
- Without gear and without battery, thanks to the Energy Harvesting technology.

Application oriented

- Absolute accuracy $\pm 1^\circ$.
- Repeat accuracy $\pm 0.2^\circ$.
- Short control cycles, clock frequency with SSI up to 2 MHz.
- Max. resolution 38 bit (14 bit ST + 24 bit MT).

Order code

Shaft version

8.M3663R

Type

.XX2X.XXX2

a b c d e f g

a Version

- 1 = standard ¹⁾
clamping flange \varnothing 42 mm [1.65"]
- 7 = stainless steel V4A ²⁾
clamping flange \varnothing 42 mm [1.65"]
all metal parts accessible from outside
are out of stainless steel V4A

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"]
- E = \varnothing 10 x 20 mm [0.39 x 0.79"],
stainless steel V4A

c Interface / supply voltage

- 2 = SSI / 10 ... 30 V DC

d Type of connection

- 2 = radial cable, 1 m [3.28'] PUR
- B = radial cable, special length PUR *)
- 4 = radial M12 connector, 8-pin

*) Available special lengths (connection type 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.M3663R.132B.G322.0030 (for cable length 3 m)

e Code

- B = SSI, binary
- G = SSI, gray

f Resolution (singleturn)

- A = 10 bit ST
- 2 = 12 bit ST
- 3 = 13 bit ST
- 4 = 14 bit ST

g Resolution (multiturn)

- 2 = 12 bit MT
- 6 = 16 bit MT
- A = 20 bit MT
- 4 = 24 bit MT

Optional on request

- Ex 2/22 (only for connection type 4)
- other shaft diameters out of V4A stainless steel

1) Not in conjunction with shaft type "E".

2) Only in conjunction with shaft type "E" + type of connection "4".

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Mounting accessory for shaft encoders			Order no.
Coupling	Bellows coupling ø 19 mm [0.75"] for shaft 8 mm [0.32"]		8.0000.1102.0808 ¹⁾
Cables and connectors			Order no.
Preassembled cables	M12 female connector with coupling nut, 8-pin, A coded, straight single ended 2 m [6.56'] PUR cable		05.00.6051.8211.002M ¹⁾
Connectors	M12 female connector with coupling nut, 8-pin, A coded, straight (metal)		05.CMB 8181-0 ¹⁾
	M12 female connector with coupling nut, 8-pin, A coded, straight (stainless steel V4A)		8.0000.5136.0000.V4A

Further Kübler accessories can be found at: kuebler.com/accessories

Further Kübler cables and connectors can be found at: kuebler.com/connection-technology

¹⁾ Not for version "7" (V4A stainless steel)

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Technical data

Mechanical characteristics		
Maximum speed	4000 min ⁻¹ 2000 min ⁻¹ (continuous)	
Starting torque at 20°C [68°F]	< 0.01 Nm	
Shaft load capacity	radial	80 N
	axial	40 N
Weight	approx. 250 g [8.82 oz]	
Protection acc. to EN 60529/DIN 40050-9	IP66, IP67, IP69k	
Working temperature range	-40°C ... +85°C [-40°F ... +185°F]	
Materials	version "1" (standard)	version "7" (stainless steel)
	shaft	V2A
	flange	aluminum
	housing	zinc die-cast
	cable	PUR
Shock resistance acc. to EN 60068-2-27	5000 m/s ² , 4 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. 30 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 singleturn	10 ... 14 bit
Absolute accuracy ²⁾	±1°
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 (+V = supply voltage)	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.

If this input is not used, it should be connected to 0 V (Encoder ground GND) in order to avoid interferences.

DIR input	
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.	
Response time (DIR input)	1 ms

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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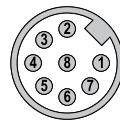
Terminal assignment

Interface	Type of connection	Features	Cable (isolate unused cores individually before initial start-up)									
2	2, 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	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

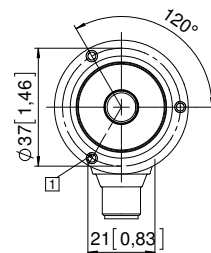
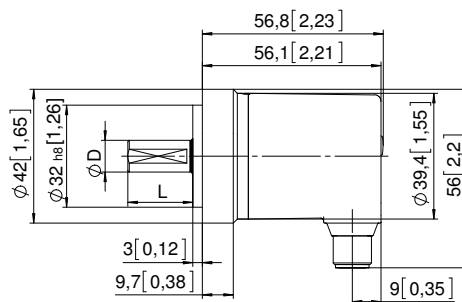
Dimensions

Dimensions in mm [inch]

Aluminum, clamping flange, ø 42 [1.65] version 1

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]



Stainless steel V4A clamping flange, ø 42 [1.65] version 7

1 4 x M4, 8 [0.31] deep

D	Fit	L
10 [0.39]	f7	20 [0.79]

