Compact magnetic | **Sendix M3651A / M3671A (shaft / hollow shaft)** | **Analog**

The Sendix M3651A and Sendix M3671A singleturn encoders with analog interface and magnetic sensor technology are particularly flexible in use due to their diverse interfaces and measuring ranges.

A green LED as reference point and a red LED as error indicator simplify both installation and error diagnosis.

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

- Current output 4 ... 20 mA.
- Voltage output 0 ... 10 V or 0 ... 5 V.
- Different measuring ranges.
- SET input for easy start-up.

Order code Shaft version

8.M3651A . X X X X . X X X 2
Type — a b c d — e f g

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

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

c *Output circuit* [1)]
3 = current output
4 = voltage output

d *Type of connection*
1 = axial cable, 1 m [3.28'] PVC
A = axial cable, special length PVC *)
2 = radial cable, 1 m [3.28'] PVC
B = radial cable, special length PVC *)
3 = axial M12 connector, 5-pin
4 = radial M12 connector, 5-pin

Type of connection with changed terminal assignment (see page 5)
C = axial M12 connector, 5-pin
D = radial M12 connector, 5-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.M3651A.433A.3112.0030 (for cable length 3 m)

e *Interface / resolution / supply voltage*
3 = 4 ... 20 mA / 12 bit / 10 ... 30 V DC
4 = 0 ... 10 V / 12 bit / 15 ... 30 V DC
5 = 0 ... 5 V / 11 bit / 10 ... 30 V DC

f *Measuring range*
1 = 1 x 360°
2 = 1 x 180°
3 = 1 x 90°
4 = 1 x 45°

g *Counting direction*
1 = cw
2 = ccw

Optional on request
- Ex 2/22
- surface protection salt spray tested

1) Output circuit "3" only in conjunction with interface "3", output circuit "4" only in conjunction with interface "4" or "5".

Compact magnetic | **Sendix M3651A / M3671A (shaft / hollow shaft)** | **Analog**

Order code Hollow shaft

8.M3671A.[a][b][c][d].[e][f][g]2 (Type)

a *Flange*
2 = with stator coupling, IP65, ø 46 mm [1.81“]
3 = with spring element, long, IP65
5 = with stator coupling, IP67, ø 46 mm [1.81“]
6 = with spring element, long, IP67

b *Blind hollow shaft*
(insertion depth max. 18.5 mm [0.73“])
1 = ø 6 mm [0.24“]
3 = ø 8 mm [0.32“]
4 = ø 10 mm [0.39“]
2 = ø 1/4“

c *Output circuit* [1)]
3 = current output
4 = voltage output

d *Type of connection*
1 = axial cable, 1 m [3.28‘] PVC
A = axial cable, special length PVC *)
2 = radial cable, 1 m [3.28‘] PVC
B = radial cable, special length PVC *)
3 = axial M12 connector, 5-pin
4 = radial M12 connector, 5-pin
Type of connection with changed terminal assignment (see page 5)
C = axial M12 connector, 5-pin
D = radial M12 connector, 5-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.M3671A.243A.3112.0030 (for cable length 3 m)

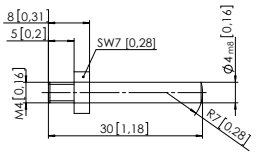
e *Interface / resolution / supply voltage*
3 = 4 ... 20 mA / 12 bit / 10 ... 30 V DC
4 = 0 ... 10 V / 12 bit / 15 ... 30 V DC
5 = 0 ... 5 V / 11 bit / 10 ... 30 V DC

f *Measuring range*
1 = 1 x 360°
2 = 1 x 180°
3 = 1 x 90°
4 = 1 x 45°

g *Counting direction*
1 = cw
2 = ccw

Optional on request
- Ex 2/22
- surface protection salt spray tested

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**

Mounting accessory for hollow shaft encoders Dimensions in mm [inch]		Order no.
Cylindrical pin, long for flange with spring element (flange type 3 + 6)	with fixing thread 	**8.0010.4700.0000**

Cables and connectors		Order no.
Preassembled cables	M12 female connector with coupling nut, 5-pin, A coded, straight open ended 2 m [6.56‘] PVC cable	**05.00.6081.2211.002M**
Connectors	M12 female connector with coupling nut, 5-pin, A coded, straight (metal)	**8.0000.5116.0000**

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

1) Output circuit “3“ only in conjunction with interface “3“, output circuit “4“ only in conjunction with interface “4“ or “5“.

Compact magnetic | **Sendix M3651A / M3671A (shaft / hollow shaft)** | **Analog**

Technical data

Electrical characteristics current interface 4 ... 20 mA

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]
Measuring range		45°, 90°, 180° or 360°
DA converter resolution		12 bit
Angular measurement deviation [2]		±0,5°
Temperature coefficient		< 100 ppm/K
Repeat accuracy, at 25°C [77°F]		±0.2°
Output load	at 10 V DC at 24 V DC at 30 V DC	max. 200 Ohm max. 900 Ohm max. 1200 Ohm
Setting time		< 1 ms, R_{Burden} = 900 Ohm, 25°C [77°F]
LEDs (green/red)		- system status - current loop interruption – input load too high - reference point display (only with factory settings) at cw: betw. 0° and 1° at ccw: betw. 0° and -1°
SET input		level = +V for 1 s minimum
PowerON Time		< 1 s
Update rate		1 ms

Electrical characteristics voltage interface 0 ... 10 V / 0 ... 5 V

Supply voltage	output 0 ... 5 V output 0 ... 10 V	10 ... 30 V DC 15 ... 30 V DC
Current consumption (no load)		max. 30 mA
Reverse polarity protection of the supply voltage		yes
Short-circuit proof outputs		yes [1]
Measuring range		45°, 90°, 180° or 360°
DA converter resolution	0 ... 10 V 0 ... 5 V	12 bit 11 bit
Angular measurement deviation [2]		±0,5°
Temperature coefficient		< 100 ppm/K
Repeat accuracy, at 25°C [77°F]		±0.2°
Current output		max. 10 mA
Setting time		< 1 ms, R_{Load} = 1000 Ohm, 25°C [77°F]
LEDs (green/red)		- system status - reference point display (only with factory settings) at cw: betw. 0° and 1° at ccw: betw. 0° and -1°
SET input		level = +V for 1 s minimum
PowerON Time		< 1 s
Update rate		1 ms

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 with shaft seal (IP67	< 0.007 Nm < 0.01 Nm
Shaft load capacity	radial axial	40 N 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 flange housing cable	stainless steel aluminum zinc die-cast PVC
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

SET input

Input		active HIGH
Input type		comparator
Signal level (+V = supply voltage)	HIGH LOW	min. 60 % of +V, max: +V 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. 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.

Approvals

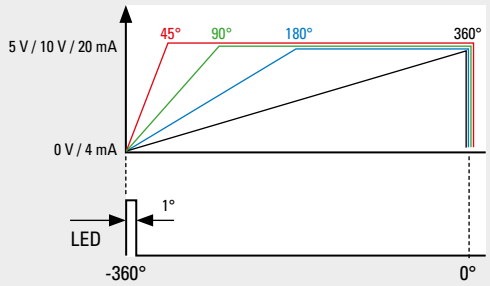
E1 compliant in accordance with		ECE guideline
UL compliant in accordance with		File no. E224618
CE compliant in accordance with		
	EMC Directive	2014/30/EU
	RoHS Directive	2011/65/EU
	ATEX Directive	2014/34/EU (for Ex 2/22 variants)

1) When the supply voltage is correctly applied.
But not output to +V. Supply voltage and sensor output signal are not galvanically isolated.
2) Over the whole temperature range.

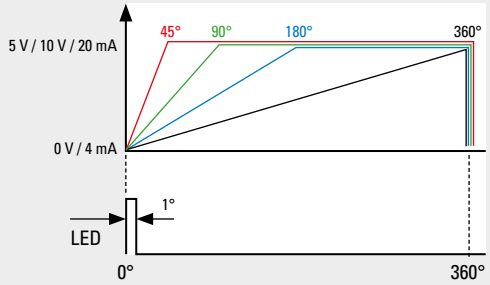
Compact magnetic	Sendix M3651A / M3671A (shaft / hollow shaft)	Analog

Example (output signal evolution) Variante counting direction cw

Direction of rotation left

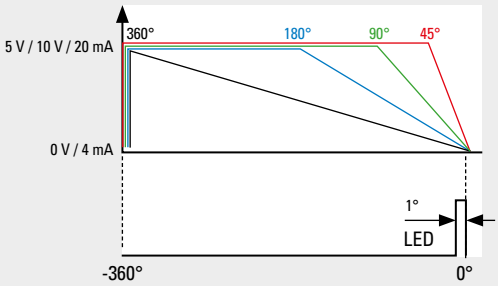


Direction of rotation right

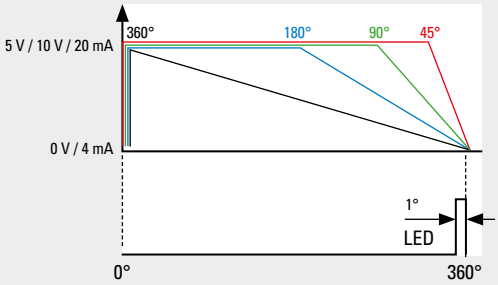


Example (output signal evolution) Variante counting direction ccw

Direction of rotation left



Direction of rotation right



Compact magnetic | **Sendix M3651A / M3671A (shaft / hollow shaft)** | **Analog**

Terminal assignment

Interface	Type of connection	Cable (isolate unused cores individually before initial start-up)					
3 (current)	1, 2, A, B	Signal:	0 V	+V	+I	SET	
		Core color:	WH	BN	GN	GY	

Interface	Type of connection	M12 connector, 5 pin					
3 (current)	3, 4	Signal:	0 V	+V	+I	SET	–
		Pin:	3	2	1	5	4

Interface	Type of connection	M12 connector, 5 pin					
3 (current)	C, D	Signal:	0 V	+V	+I	SET	–
		Pin:	3	1	2	4	5

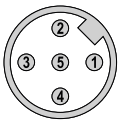
Interface	Type of connection	Cable (isolate unused cores individually before initial start-up)					
4, 5 (voltage)	1, 2, A, B	Signal:	0 V	+V	+U	SET	
		Core color:	WH	BN	GN	GY	

Interface	Type of connection	M12 connector, 5 pin					
4, 5 (voltage)	3, 4	Signal:	0 V	+V	+U	SET	–
		Pin:	3	2	1	5	4

Interface	Type of connection	M12 connector, 5 pin					
4, 5 (voltage)	C, D	Signal:	0 V	+V	+U	SET	–
		Pin:	3	1	2	4	5

+V : Supply voltage encoder +V DC
0 V : Supply voltage encoder ground GND (0 V)
+U : Voltage
+I : Current
SET : SET input

Top view of mating side, male contact base



M12 connector, 5-pin

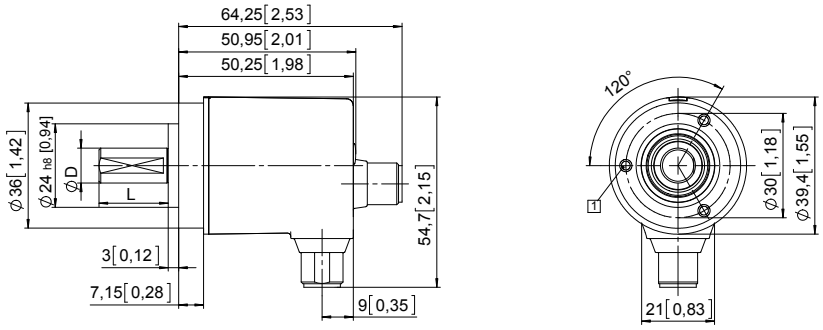
Compact magnetic | **Sendix M3651A / M3671A (shaft / hollow shaft)** | **Analog**

Dimensions shaft version

Dimensions in mm [inch]

Clamping flange, ø 36 [1.42]
Flange type 1 and 3

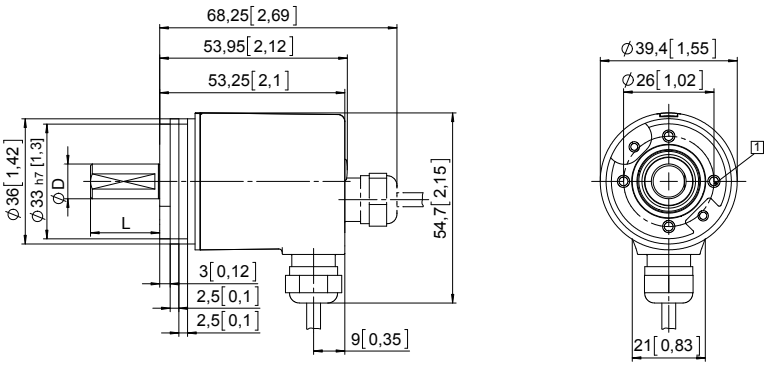
1 3 x M3, 6 [0.24] deep



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]

Compact magnetic | **Sendix M3651A / M3671A (shaft / hollow shaft)** | **Analog**

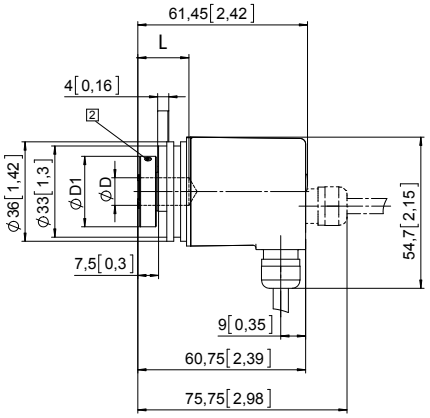
Dimensions hollow shaft version

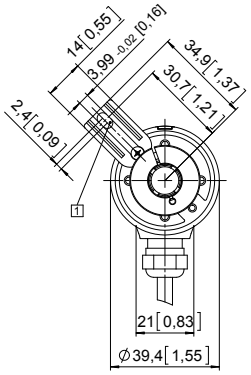
Dimensions in mm [inch]

Flange with spring element, long
Flange type 3 and 6

1 Slot spring element, recommendation: cylindrical pin DIN 7, ø 4 [0.16]

2 Recommended torque for the clamping ring 0.7 Nm

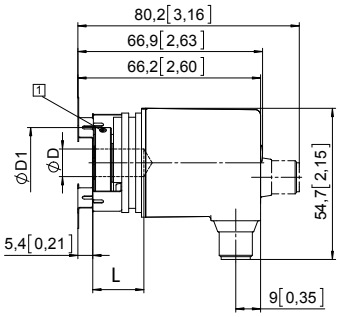


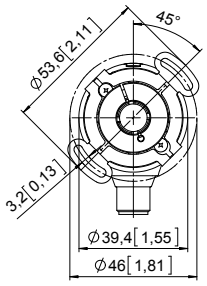


D	Fit	L	D1
6 [0.24]	H7	18.5 [0.73]	24 [0.94]
8 [0.32]	H7	18.5 [0.73]	25.5 [1.00]
10 [0.39]	H7	18.5 [0.73]	25.5 [1.00]
1/4"	H7	18.5 [0.73]	24 [0.94]
L = insertion depth max. blind hollow shaft			

Flange with stator coupling, ø 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			