Compact magnetic | **Sendix 3651 / 3671 (shaft / hollow shaft)** | **Analog**

Thanks to their different interfaces and measurement ranges, the Sendix 3651 and Sendix 3671 singleturn encoders with analog interface, in shaft and hollow shaft versions, are particularly flexible in use. A green and a red LED, acting as reference point and fault indicators, ensure easy installation and troubleshooting.

Protected up to IP69k, resistance against shock and extreme temperature fluctuations, the Sendix are suitable even for demanding outdoor applications.

These encoders have an e1-approval from the German Federal Motor Transport Authority.

Safety-Lockplus™ | High rotational speed | Temperature range | High protection level | High shaft load capacity | Shock / vibration resistant | Short-circuit proof | Reverse polarity protection | Magnetic sensor | Surface protection salt spray-tested optional

Safe operation

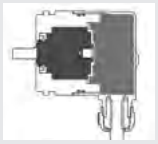
- Non-contact measuring system for long-life non-wear applications.
- Rugged die-cast-housing and protection up to IP69k for an exceptional tightness.
- High shock and vibration resistance for an exceptional robustness.

Compact and powerful

- Outer diameter of only 36 mm.
- The hollow shaft version is fitted with a blind hole with a diameter of up to 10 mm. It can be mounted as required with either a torque stop pin or a stator coupling.
- 360° with 12 bit resolution (4096 positions).
- For use in 12 V or 24 V vehicle electrical systems.

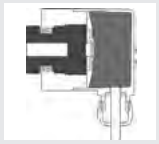
Safety-Lockplus™

IP69k protection on the flange side, robust bearing assemblies with interlocking bearings, mechanically protected shaft seal.



Sensor-Protect™

Fully encapsulated electronics, separate mechanical bearing assembly.



Order code Shaft version

8.3651	.	2	X	X	X	.	X	X	X	X
Type		a	b	c	d		e	f	g	h

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.

10 by 10

a *Flange*
2 = synchro flange, ø 36 mm [1.42"]

b *Shaft (ø x L), with flat*
3 = ø 6 x 12.5 mm [0.24 x 0.49"]
6 = ø 8 x 12.5 mm [0.32 x 0.49"]
5 = 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'] 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, 5-pin
4 = radial M12 connector, 5-pin
*) Available special lengths (connection types A, B): 2, 3, 5, 8, 10, 15 m [6.56, 9.84, 16.40, 26.25, 32.80, 49.21'] order code expansion .XXXX = length in dm ex.: 8.3651.233A.1311.0030 (for cable length 3 m)

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

f *Interface / power supply*
3 = 4 ... 20 mA / 10 ... 30 V DC
4 = 0 ... 10 V / 15 ... 30 V DC
5 = 0 ... 5 V / 10 ... 30 V DC

g *Option 1*
1 = count direction cw [2]
2 = count direction ccw [3]

h *Option 2*
1 = IP67
2 = IP69k

Optional on request
- Ex 2/22 (only for type of connection 3 + 4)
- 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".
2) cw = Increasing code values when shaft turning clockwise (cw). Top view on shaft.
3) ccw = Increasing code values when shaft turning counterclockwise (ccw). Top view on shaft.

Absolute encoders - singleturn

Compact magnetic | **Sendix 3651 / 3671 (shaft / hollow shaft)** | **Analog**

Order code Hollow shaft

8.3671 . X X X X . X X X X
Type — a b c d — e f g h

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.

10 by 10

a *Flange*
2 = with spring element, long
5 = with stator coupling, ø 46 mm [1.81"]

b *Blind hollow shaft (insertion depth max. 18 mm [0.71"])*
2 = ø 6 mm [0.24"]
4 = ø 8 mm [0.32"]
6 = ø 10 mm [0.39"]
3 = ø 1/4"

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

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, 5-pin
4 = radial M12 connector, 5-pin
*) Available special lengths (connection types A, B): 2, 3, 5, 8, 10, 15 m [6.56, 9.84, 16.40, 26.25, 32.80, 49.21'] order code expansion .XXXX = length in dm ex.: 8.3671.523A.1311.0030 (for cable length 3 m)

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

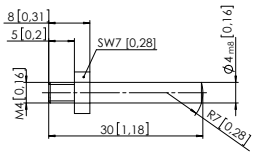
f *Interface / power supply*
3 = 4 ... 20 mA / 10 ... 30 V DC
4 = 0 ... 10 V / 15 ... 30 V DC
5 = 0 ... 5 V / 10 ... 30 V DC

g *Option 1*
1 = count direction cw [2]
2 = count direction ccw [3]

h *Option 2*
1 = IP67
2 = IP69k

Optional on request
- Ex 2/22 (only for type of connection 3 + 4)
- surface protection salt spray tested

Mounting accessory for shaft encoders		Order no.
Coupling	bellows coupling ø 19 mm [0.75"] for shaft 6 mm [0.24"]	**8.0000.1102.0606**

Mounting accessory for hollow shaft encoders	Dimensions in mm [inch]	Order no.
Cylindrical pin, long for flange with spring element (flange type 2)	with fixing thread 	**8.0010.4700.0000**

Connection technology		Order no.
Cordset, pre-assembled	M12 female connector with coupling nut, 5-pin 2 m [6.56'] PVC cable	**05.00.6081.2211.002M**
Connector, self-assembly (straight)	M12 female connector with coupling nut, 5-pin	**8.0000.5116.0000**

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.

Technical data

Mechanical characteristics

Maximum speed		6000 min^{-1}
Starting torque at 20°C [68°F]		< 0.06 Nm
Shaft load capacity	radial	40 N
	axial	20 N
Weight		approx. 0.2 kg [7.06 oz]
Protection acc. to EN 60529		IP67 / IP69k
Working temperature range		-40°C ... +85°C [-40°F ... +185°F]
Materials	shaft / hollow shaft	stainless steel
	flange	aluminum
	housing	zinc die-cast
	cable	PUR

Shock resistance acc. to EN 60068-2-27	5000 m/s^2, 6 ms
Vibration resistance acc. to EN 60068-2-6	300 m/s^2, 10 ... 2000 Hz
Permanent shock resistance acc. to EN 60068-2-27	1000 m/s^2, 2 ms
Vibration (broad-band random) acc. to EN 60068-2-64	5 ... 2500 Hz, 100 m/s^2 - rms

General electrical characteristics

e1 compliant acc. to	EU guideline 2009/19/EC (acc. to EN 55025, ISO 11452 and ISO 7637)
CE compliant acc. to	EMC guideline 2014/30/EU RoHS guideline 2011/65/EU

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

2) cw = increasing code values when shaft turning clockwise (cw). Top view on shaft.
3) ccw = increasing code values when shaft turning counterclockwise (ccw). Top view on shaft.

Compact magnetic | **Sendix 3651 / 3671 (shaft / hollow shaft)** | **Analog**

Electrical characteristics current interface 4 ... 20 mA

Sensor

Power supply		10 ... 30 V DC
Current consumption (no load)		max. 38 mA
Reverse polarity protection of the power supply		yes
Measuring range		45°, 90°, 180° or 360°
Resolution		12 bit
Absolute accuracy, 25°C [77°F]		±1°
Repeat accuracy, 25°C [77°F]		±0.2°
Status LED	red	break in current loop, input load too high.
	green	reference point display turns ON at cw: betw. 0° and 1° at ccw: betw. 0° and -1°

Current loop

Output load	max. 200 Ohm at 10 V DC max. 900 Ohm at 24 V DC
Setting time	< 1 ms R_{load} = 400 Ohm, 25°C [77°F]

Short-circuit proof outputs
When the power supply is correctly applied. But not output to +V.
Power supply and sensor output signal are not galvanically isolated.

Electrical characteristics voltage interface

Sensor

Power supply	output 0 ... 5 V	10 ... 30 V DC
	output 0 ... 10 V	15 ... 30 V DC
Current consumption (no load)		max. 35 mA
Reverse polarity protection of the power supply		yes
Measuring range		45°, 90°, 180° or 360°
Resolution		12 bit
Linearity, 25°C [77°F]		± 1°
Repeat accuracy, 25°C [77°F]		± 0.2°

Voltage output

Current output	max. 10 mA
Setting time	< 1 ms R_{load} ≥ 1 KOhm, 25°C [77°F]

Short-circuit proof outputs
When the power supply is correctly applied. But not output to +V.
Power supply and sensor output signal are not galvanically isolated.

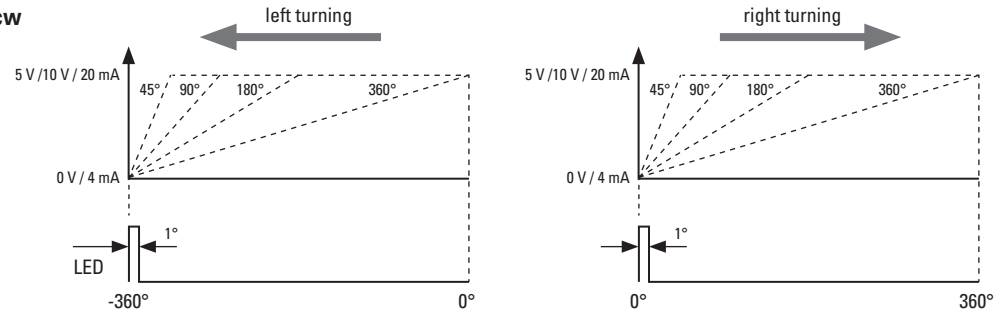
Status LED (green)

Status LED	green	reference point display turns ON at cw: betw. 0° and 1° at ccw: betw. 0° and -1°

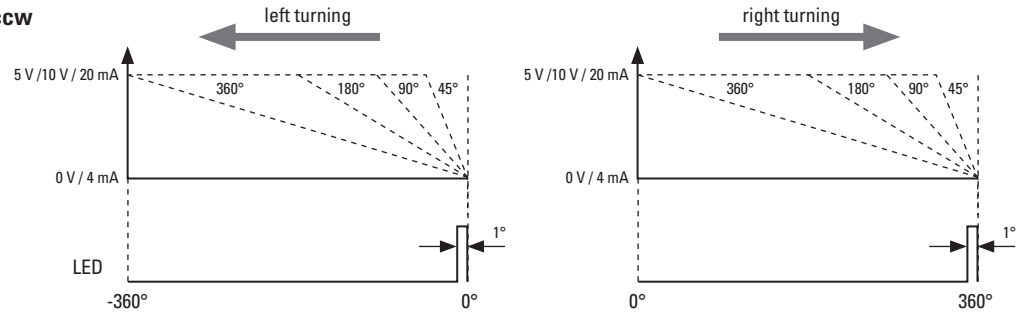
Example (output signal profile)

Measurement range 45° / 90° / 180° / 360°

Version cw



Version ccw



Compact magnetic | **Sendix 3651 / 3671 (shaft / hollow shaft)** | **Analog**

Terminal assignment

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

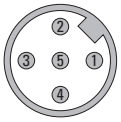
Interface	Type of connection	M12 connector, 5-pin				
3 (current)	3, 4	Signal:	0 V	+V	+I	-I
		Pin:	3	2	4	5

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

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

+V : Encoder power supply +V DC
0 V : Encoder power supply ground GND (0 V)
+U / -U : Voltage + / voltage -
+I / -I : Current + / current -

Top view of mating side, male contact base



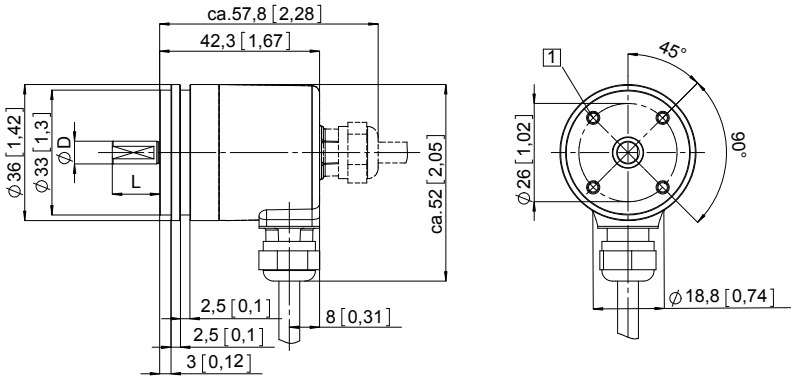
M12 connector, 5-pin

Dimensions shaft version

Dimensions in mm [inch]

Synchro flange, ø 36 [1.42]
Flange type 2
(drawing with cable)

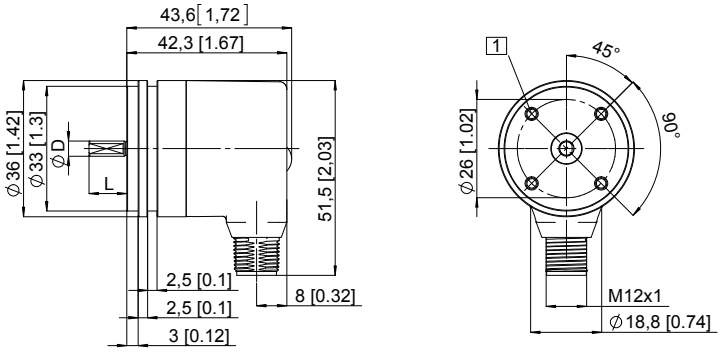
1 4 x M3, 6 [0.24] deep



D	Fit	L
6 [0.24]	h7	12.5 [0.49]
8 [0.32]	h7	12.5 [0.49]
1/4“	h7	12.5 [0.49]

Synchro flange, ø 36 [1.42]
Flange type 2
(drawing with M12 connector)

1 4 x M3, 6 [0.24] deep



D	Fit	L
6 [0.24]	h7	12.5 [0.49]
8 [0.32]	h7	12.5 [0.49]
1/4“	h7	12.5 [0.49]

Compact magnetic | **Sendix 3651 / 3671 (shaft / hollow shaft)** | **Analog**

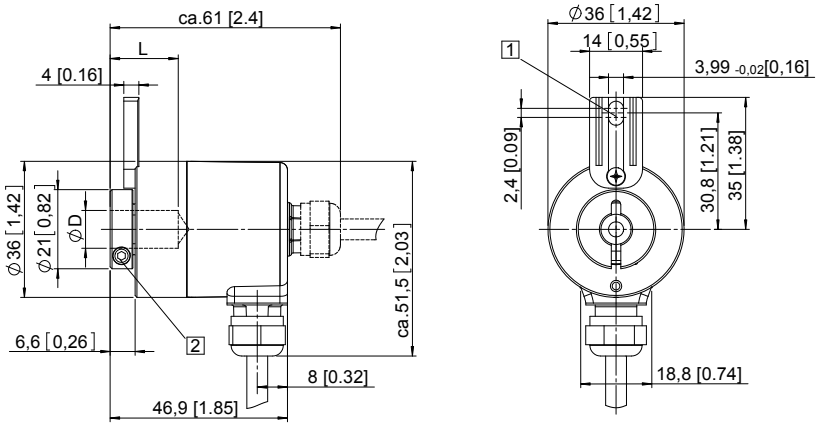
Dimensions hollow shaft version

Dimensions in mm [inch]

Flange with spring element, long
Flange type 2

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

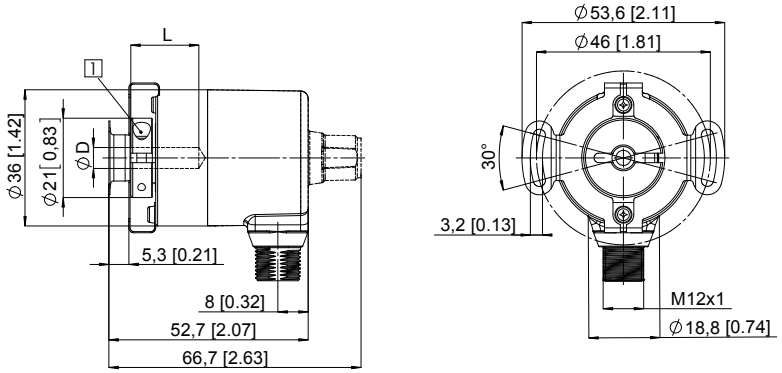
2 Recommended torque for the clamping ring 0.7 Nm



D	Fit	L
6 [0.24]	H7	18 [0.71]
8 [0.32]	H7	18 [0.71]
10 [0.39]	H7	18 [0.71]
1/4"	H7	18 [0.71]
L = insertion depth blind hollow shaft		

Flange with stator coupling, ø 46 [1.81]
Flange type 5

1 Recommended torque for the clamping ring 0.7 Nm



D	Fit	L
6 [0.24]	H7	18 [0.71]
8 [0.32]	H7	18 [0.71]
10 [0.39]	H7	18 [0.71]
1/4"	H7	18 [0.71]
L = insertion depth blind hollow shaft		