

Absolute encoders - singleturn

Compact magnetic

Sendix 3651 / 3671 (shaft / hollow shaft)

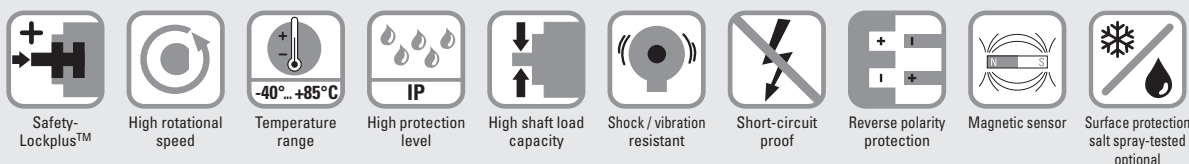
Analog



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.



Safe operation

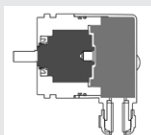
- Non-contact measuring system for long-life non-wear applications.
- Rugged die-cast-housing and protection up to IP69k for an exceptional tightness.
- High shock and vibration resistance for an exceptional robustness.

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.

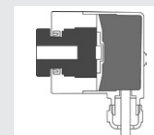
Safety-Lockplus™

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 . **2XXXX** . **XXXXX**
Type a b c d e f g h

a Flange

2 = synchro flange, $\varnothing$ 36 mm [1.42"]

b Shaft ($\varnothing$ x L), with flat

3 = $\varnothing$ 6 x 12.5 mm [0.24 x 0.49"]

6 = $\varnothing$ 8 x 12.5 mm [0.32 x 0.49"]

5 = $\varnothing$ 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 / supply voltage

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.

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Compact magnetic	Sendix 3651 / 3671 (shaft / hollow shaft)	Analog
Order code Hollow shaft	8.3671 Type . X X X X . X X X X	
a Flange 2 = with spring element, long 5 = with stator coupling, $\varnothing$ 46 mm [1.81"] b Blind hollow shaft (insertion depth max. 18 mm [0.71"]) 2 = $\varnothing$ 6 mm [0.24"] 4 = $\varnothing$ 8 mm [0.32"] 6 = $\varnothing$ 10 mm [0.39"] 3 = $\varnothing$ 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 / supply voltage 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 <i>Optional on request</i> - 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.
Torque pin, ø 4 mm 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".

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.

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Technical data

Electrical characteristics current interface 4 ... 20 mA

Sensor		
Supply voltage	10 ... 30 V DC	
Current consumption (no load)	max. 38 mA	
Reverse polarity protection of the supply voltage	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 $R_{load} = 400 \text{ Ohm}$, 25 °C [77 °F]	

Short-circuit proof outputs

When the supply voltage is correctly applied. But not output to +V.
Supply voltage and sensor output signal are not galvanically isolated.

Electrical characteristics voltage interface

Sensor		
Supply voltage	output 0 ... 5 V output 0 ... 10 V	10 ... 30 V DC 15 ... 30 V DC
Current consumption (no load)	max. 35 mA	
Reverse polarity protection of the supply voltage	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 $R_{load} \geq 1 \text{ KOhm}$, 25 °C [77 °F]	

Short-circuit proof outputs

When the supply voltage is correctly applied. But not output to +V.
Supply voltage and sensor output signal are not galvanically isolated.

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

Status LED (green)

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

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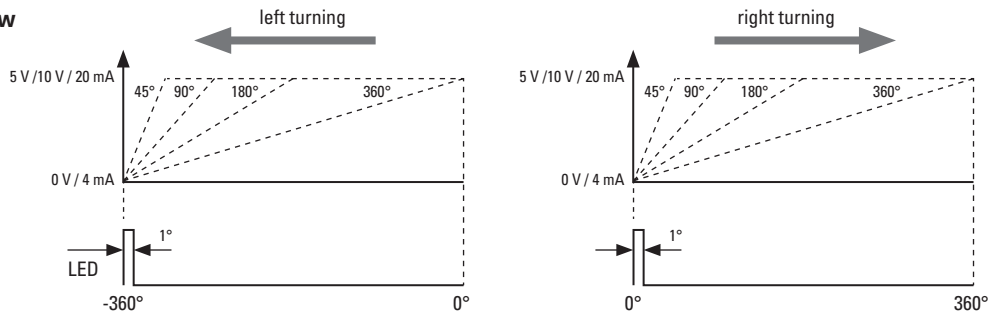
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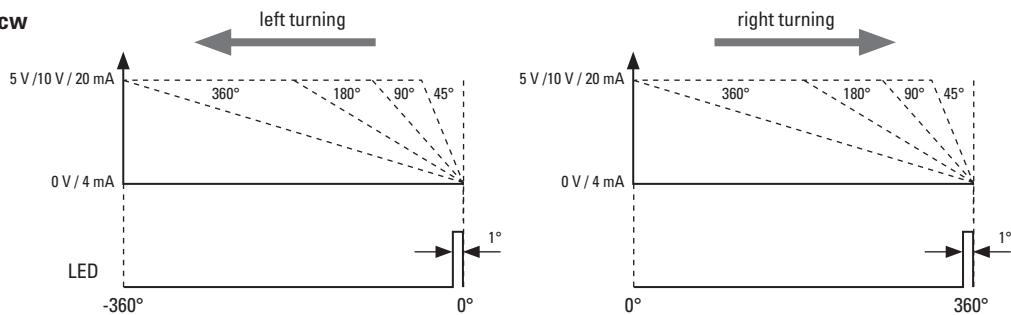
Example (output signal profile)

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

Version cw



Version ccw



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	-I
		Core color:	WH	BN	GN	YE

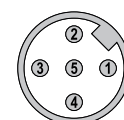
Interface	Type of connection	M12 connector, 5-pin				
3 (current)	3, 4	Signal:	0 V	+V	+I	-I
		Pin:	3	2	4	5

Interface	Type of connection	Cable (isolate unused cores individually before initial start-up)				
4, 5 (voltage)	1, 2, A, B	Signal:	0 V	+V	+U	-U
		Core 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 : Supply voltage encoder +V DC
 0 V : Supply voltage encoder ground GND (0 V)
 +U / -U : Voltage + / voltage -
 +I / -I : Current + / current -

Top view of mating side, male contact base



M12 connector, 5-pin

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Dimensions shaft version

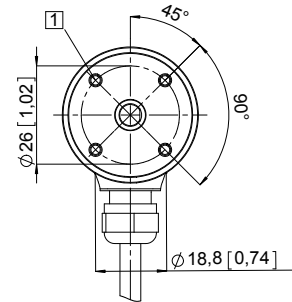
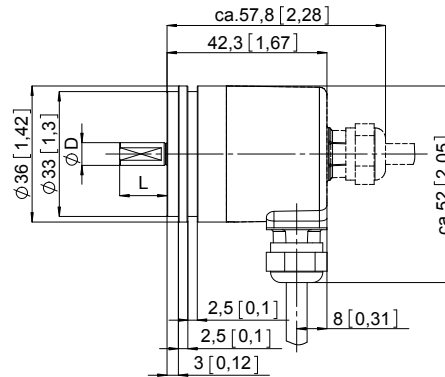
Dimensions in mm [inch]

Synchro flange, ø 36 [1.42]

Flange type 2

(drawing with cable)

① 4 x M3, 6 [0.24] deep



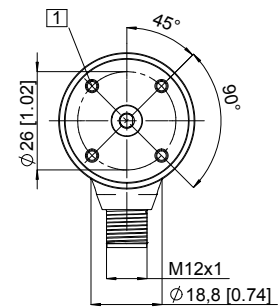
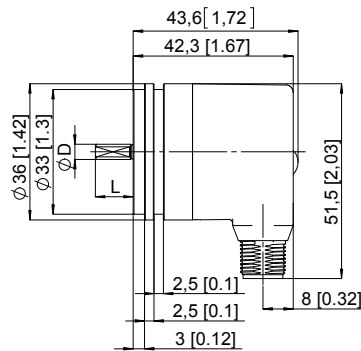
D	Fit	L
6 [0.24]	h7	12.5 [0.49]
8 [0.32]	h7	12.5 [0.49]
1/4"	h7	12.5 [0.49]

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]

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Analog

Dimensions hollow shaft version

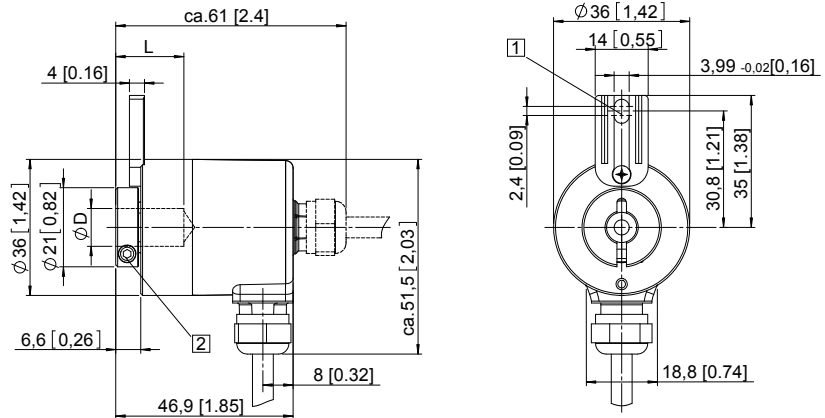
Dimensions in mm [inch]

Flange with spring element, long Flange type 2

- 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
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, $\varnothing$ 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

