

# Absolute Encoders - Singleturn

**Compact  
Magnetic**

**Sendix 3651 / 3671 (Shaft / Hollow shaft)**

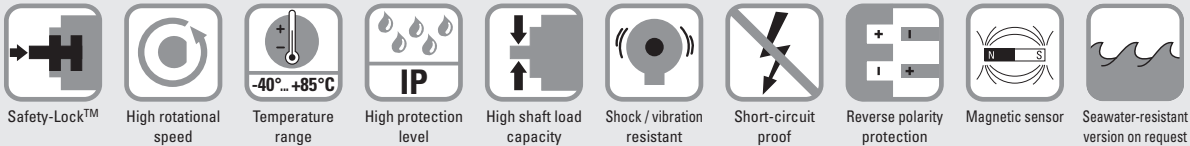
**Analogue**



Thanks to their different interfaces and measurement ranges, the Sendix 3651 and Sendix 3671 singleturn encoders with analogue 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

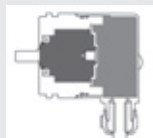
- Non-contact measuring system for long-life non-wear applications
- Rugged die-cast-housing and protection up to IP69k for an exceptional tightness
- High shock and vibration resistance for an exceptional robustness

## Compact and effective

- 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

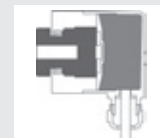
## Safety-Lockplus™

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 . 2XXX . XXXX  
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.



### 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 <sup>1)</sup>

3 = current output

4 = voltage output

### d Type of connection

1 = axial cable, 1 m [3.28'] PUR

2 = radial cable, 1 m [3.28'] PUR

3 = M12 connector, axial, 5-pin

4 = M12 connector, radial, 5-pin

### 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 <sup>2)</sup>

2 = count direction ccw <sup>3)</sup>

### h Option 2

1 = IP67

2 = IP69k

*optional on request*

- seawater-resistant

- special cable length

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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<b>Compact Magnetic</b>	<b>Sendix 3651 / 3671 (Shaft / Hollow shaft)</b>	<b>Analogue</b>
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<b>Order code</b>	<b>Hollow shaft</b>	8.3671	Type	. <b>X</b> <b>X</b> <b>X</b> <b>X</b> . <b>X</b> <b>X</b> <b>X</b> <b>X</b>	If for each parameter of an encoder the <u>underlined preferred option</u> 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 b c d e f g h			
<b>a Flange</b>		<b>d Type of connection</b>		<b>f Interface / Power supply</b>		<b>h Option 2</b>	
2 = with spring element long		1 = axial cable, 1 m [3.28'] PUR		<b>3 = 4 ... 20 mA / 10 ... 30 V DC</b>		1 = IP67	
<b>5 = with stator coupling, ø 46 mm [1.81"]</b>		<b>2 = radial cable, 1 m [3.28'] PUR</b>		<b>4 = 0 ... 10 V / 15 ... 30 V DC</b>		2 = IP69k	
<b>b Hollow shaft</b>		3 = M12 connector, axial, 5-pin		5 = 0 ... 5 V / 10 ... 30 V DC		optional on request - seawater-resistant - special cable length	
<b>2 = ø 6 mm [0.24"]</b>		<b>e Measuring range</b>		<b>g Option 1</b>			
4 = ø 8 mm [0.32"]		1 = 1 x 360°		1 = <u>count direction cw</u> <sup>2)</sup>			
6 = ø 10 mm [0.39"]		2 = 1 x 180°		2 = count direction ccw <sup>3)</sup>			
3 = ø 1/4"		3 = 1 x 90°					
<b>c Output circuit<sup>1)</sup></b>		4 = 1 x 45°					
<b>3 = current output</b>							
<b>4 = voltage output</b>							

Mounting accessory for shaft encoders		Order No.
<b>Coupling</b>	Bellows coupling ø 19 mm [0.75"] for shaft 6 mm [0.24"]	<b>8.0000.1101.0606</b>
<b>Mounting accessory for hollow shaft encoders</b>		
<b>Cylindrical pin, long</b>	With fixing thread	<b>8.0010.4700.0000</b>
for torque stops		
<b>Connection technology</b>		
<b>Connector, self-assembly (straight)</b>	M12 female connector with coupling nut	<b>8.0000.5116.0000</b>
<b>Cordset, pre-assembled</b>	M12 female connector with coupling nut, 2 m [6.56'] PVC cable	<b>05.00.6081.2211.002M</b>

Further accessories can be found in the accessories section or in the accessories area of our website at: [www.kuebler.com/accessories](http://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](http://www.kuebler.com/connection_technology)

Technical data		
<b>Mechanical characteristics</b>		
<b>Max. speed</b>		6000 min <sup>-1</sup>
<b>Starting torque - at 20°C [68°F]</b>		< 0.06 Nm
<b>Load capacity of shaft</b>	radial	40 N
	axial	20 N
<b>Weight</b>		approx. 0.2 kg [7.06 oz]
<b>Protection</b> acc. to EN 60529/DIN 40050-9		IP67 / IP69k
<b>Working temperature range</b>		-40°C ... +85°C [-40°F ... +185°F]
<b>Material</b>	shaft / hollow shaft	stainless steel
	flange	aluminium
	housing	zinc die-cast housing
	cable	PUR
<b>Shock resistance</b> acc. to EN 60068-2-27		5000 m/s <sup>2</sup> , 6 ms
<b>Vibration resistance</b> acc. to EN 60068-2-6		300 m/s <sup>2</sup> , 10 ... 2000 Hz
<b>Permanent shock resistance</b> acc. to EN 60068-2-27		1000 m/s <sup>2</sup> , 2 ms
<b>Vibration (broad-band random)</b> acc. to EN 60068-2-64		5 ... 2500 Hz, 100 m/s <sup>2</sup> - rms
<b>Electrical characteristics</b>		
<b>e1 compliant</b> acc. to		EU guideline 2009/19/EC (acc. to EN 55025, ISO 11452 and ISO 7637)
<b>CE compliant</b> acc. to		EMC guideline 2004/108/EC
<b>RoHS compliant</b> acc. to		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.

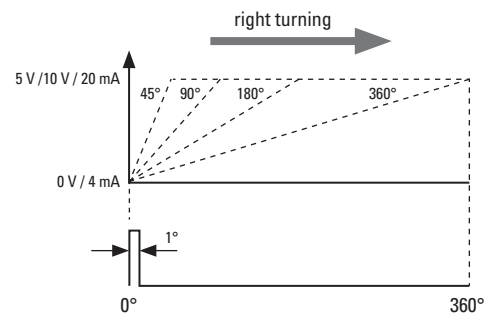
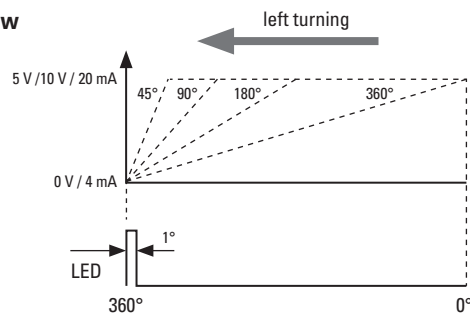
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<b>Electrical characteristics current interface 4 ... 20 mA</b>			
<b>Sensor</b>			
Power supply	10 ... 30 V DC		
Current consumption (no load)	max. 38 mA		
Reverse polarity protection of the power supply	yes		
Measuring range	45°, 90°, 180° or 360°		
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°	
<b>Current loop</b>			
Output load	max. 200 Ohm at 10 V DC max. 900 Ohm at 24 V DC		
Setting time	< 1 ms $R_{load} = 400 \text{ Ohm}, 25^\circ\text{C [77}^\circ\text{F]}$		
<b>Short-circuit proof outputs</b>			
When the power supply is correctly applied. But not output to +V. Power supply and sensor output signal are not galvanically isolated.			
<b>Electrical characteristics voltage interface</b>			
<b>Sensor</b>			
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°		
<b>Voltage output</b>			
Current output	max. 10 mA		
Setting time	< 1 ms $R_{load} \geq 1 \text{ KOhm}, 25^\circ\text{C [77}^\circ\text{F]}$		
<b>Short-circuit proof outputs</b>			
When the power supply is correctly applied. But not output to +V. Power supply and sensor output signal are not galvanically isolated.			
<b>Status LED (green)</b>			
Status LED	green	reference point display turns ON	
		at cw: betw. 0° and 1°	
		at ccw: betw. 0° and -1°	

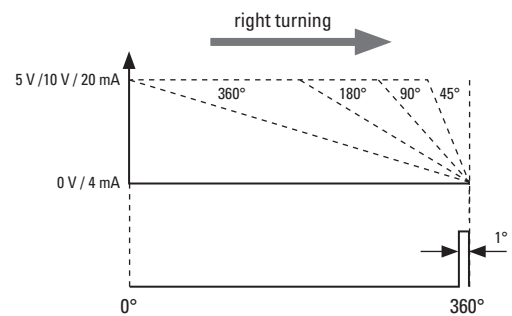
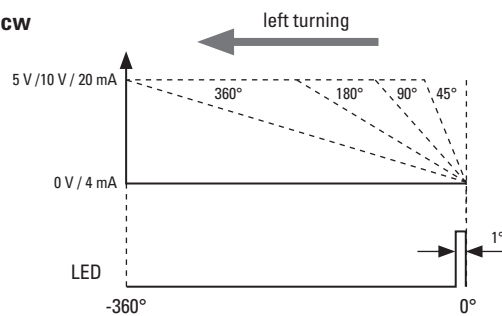
## Example (output signal profile)

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

### Version cw



### Version ccw



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## Terminal assignment

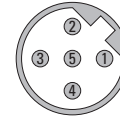
Interface	Type of connection	Cable (Isolate unused wires individually before initial start-up)
3 (current)	1, 2	Signal:
		Cable colour:

Interface	Type of connection	M12 connector, 5-pin
3 (current)	3, 4	Signal:
		Pin:

Interface	Type of connection	Cable (Isolate unused wires individually before initial start-up)
4, 5 (voltage)	1, 2	Signal:
		Cable colour:

Interface	Type of connection	M12 connector, 5-pin
4, 5 (voltage)	3, 4	Signal:
		Pin:

Top view of mating side, male contact base



M12 connector, 5-pin

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

## Dimensions shaft version

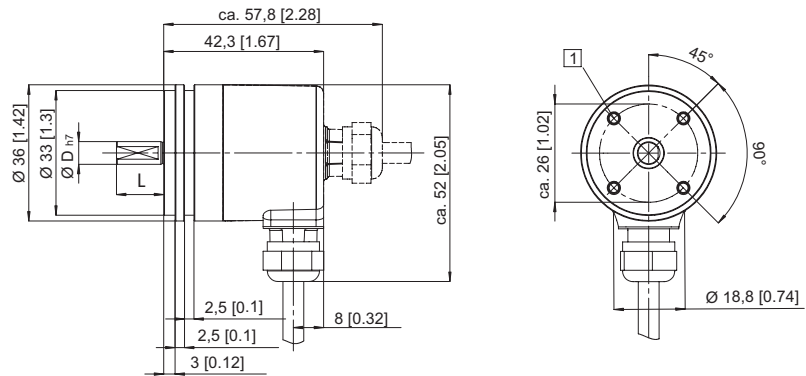
Dimensions in mm [inch]

### Synchro flange, $\varnothing$ 36 [1.42]

#### Flange type 2

(Drawing with cable)

1 M3, 6 [0.24] deep



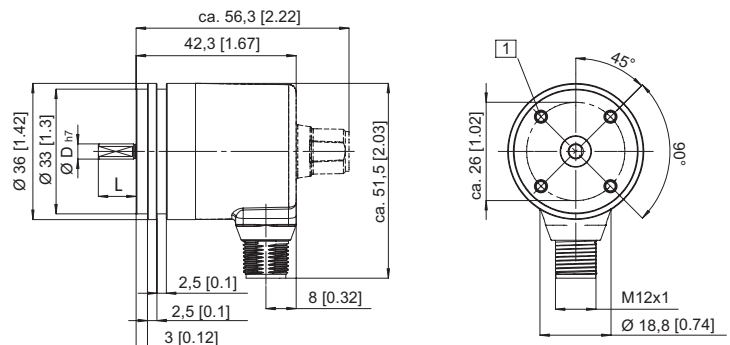
D	L	Fit
6 [0.24]	12.5 [0.49]	h7
8 [0.32]	12.5 [0.49]	h7
1/4"	12.5 [0.49]	h7

### Synchro flange, $\varnothing$ 36 [1.42]

#### Flange type 2

(Drawing with M12 connector)

1 M3, 6 [0.24] deep



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

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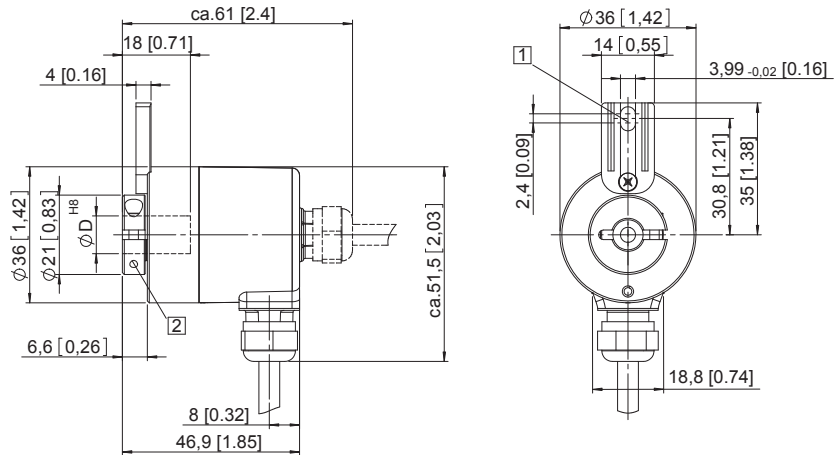
**Analogue**

## Dimensions hollow shaft version

Dimensions in mm [inch]

### Flange with spring element long Flange type 2

- 1 Torque stop slot,  
Recommendation:  
Cylindrical pin DIN 7,  $\varnothing$  4 [0.16]
- 2 Recommended torque for the  
clamping ring 0.7 Nm



### Flange with stator coupling, $\varnothing$ 46 [1.81] Flange type 5

- 1 Recommended torque for the  
clamping ring 0.7 Nm

