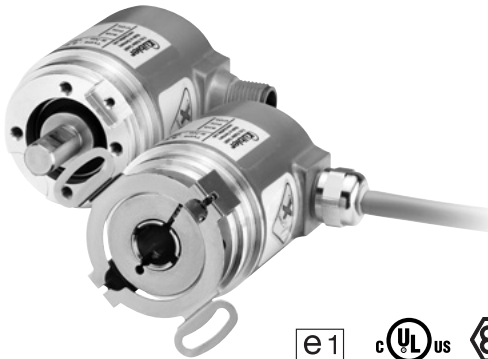


# Absolute encoders – multiturn

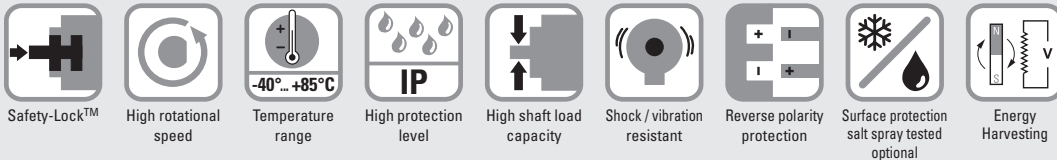
**Compact  
electronic multiturn, magnetic**

**Sendix M3661 / M3681 (shaft / hollow shaft)**

**Analog**



The Sendix M36 with Energy Harvesting Technology is an electronic multiturn encoder in miniature format, without gear and without battery. With a size of just 36 x 53 mm it offers a blind hollow shaft of up to 10 mm.



## 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.
- Without gear and without battery, thanks to the Energy Harvesting technology.

## Application oriented

- Current output 4 ... 20 mA.
- Voltage output 0 ... 10 V or 0 ... 5 V.
- Measuring range scalable.
- Limit switch function.

## Order code Shaft version

**8.M3661 . XXXXX . XX12**  
Type

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

- 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 <sup>1)</sup>

- 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
- \*) 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.M3661.433A.3112.0030 (for cable length 3 m)

### e Interface / resolution / power supply

- 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 = 16 revolutions / cw
- 2 = 16 revolutions / ccw
- 3 = scalable up to 65,536 revolutions, with limit switch function / cw
- 4 = scalable up to 65,536 revolutions, without limit switch function / cw
- 5 = scalable up to 65,536 revolutions, with limit switch function / ccw
- 6 = scalable up to 65,536 revolutions, without limit switch function / ccw

### Optional on request

- Ex 2/22 (only for connection types 3 and 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".

## Absolute encoders – multiturn

<b>Compact electronic multiturn, magnetic</b>	<b>Sendix M3661 / M3681 (shaft / hollow shaft)</b>	<b>Analog</b>
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<b>Order code</b> <b>Hollow shaft</b>	<b>8.M3681</b> Type	<b>.XXXX.XX12</b> <b>a b c d e f</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.
<b>a Flange</b> <b>2 = with stator coupling, IP65, ø 46 mm [1.81"]</b> 3 = with spring element, long, IP65 5 = with stator coupling, IP67, ø 46 mm [1.81"] 6 = with spring element, long, IP67	<b>d Type of connection</b> 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 <b>4 = radial M12 connector, 5-pin</b> *) 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.M3681.243A.3112.0030 (for cable length 3 m)	<b>f Measuring range</b> <b>1 = 16 revolutions / cw</b> 2 = 16 revolutions / ccw 3 = scalable up to 65,536 revolutions, with limit switch function / cw 4 = scalable up to 65,536 revolutions, without limit switch function / cw 5 = scalable up to 65,536 revolutions, with limit switch function / ccw 6 = scalable up to 65,536 revolutions, without limit switch function / ccw	<b>Optional on request</b> - Ex 2/22 (only for connection types 3 and 4) - surface protection salt spray tested
<b>b Blind hollow shaft</b> <i>(insertion depth max. 18.5 mm [0.73"])</i> 1 = ø 6 mm [0.24"] 3 = ø 8 mm [0.32"] <b>4 = ø 10 mm [0.39"]</b> 2 = ø 1/4"	<b>c Output circuit <sup>1)</sup></b> <b>3 = current output</b> <b>4 = voltage output</b>		

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		Order no.
Cylindrical pin, long for flange with spring element (flange type 3 + 6)	<p>with fixing thread</p>	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](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

Mechanical characteristics		
<b>Maximum speed</b>		
shaft or blind hollow shaft version without shaft seal (IP65)	6000 min <sup>-1</sup> 3000 min <sup>-1</sup> (continuous)	
shaft or blind hollow shaft version with shaft seal (IP67)	4000 min <sup>-1</sup> 2000 min <sup>-1</sup> (continuous)	
<b>Starting torque</b> at 20°C [68°F]		
without shaft seal	< 0.007 Nm	
with shaft seal (IP67)	< 0.01 Nm	
<b>Shaft load capacity</b>		
radial	40 N	
axial	20 N	

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

# Absolute encoders – multiturn

Compact electronic multiturn, magnetic		Sendix M3661 / M3681 (shaft / hollow shaft)	Analog
Electrical characteristics current interface 4 ... 20 mA		Electrical characteristics voltage interface 0 ... 10 V / 0 ... 5 V	
Power supply	10 ... 30 V DC	Power supply	output 0 ... 5 V 10 ... 30 V DC output 0 ... 10 V 15 ... 30 V DC
Current consumption (no load)	max. 30 mA	Current consumption (no load)	max. 30 mA
Reverse polarity protection of the power supply	yes	Reverse polarity protection of the power supply	yes
Short-circuit proof outputs	yes <sup>1)</sup>	Short-circuit proof outputs	yes <sup>1)</sup>
Measuring range	factory setting 2 <sup>4</sup> revolutions optionally scalable up to 2 <sup>16</sup> revolutions	Measuring range	factory setting 2 <sup>4</sup> revolutions optionally scalable up to 2 <sup>16</sup> revolutions
DA converter resolution	12 bit	DA converter resolution	0 ... 10 V 12 bit 0 ... 5 V 11 bit
Singleturn accuracy, at 25°C [77°F]	±1°	Singleturn accuracy, at 25°C [77°F]	±1°
Temperature coefficient	< 100 ppm/K	Temperature coefficient	< 100 ppm/K
Repeat accuracy, at 25°C [77°F]	±0.2°	Repeat accuracy, at 25°C [77°F]	±0.2°
Output load	at 10 V DC max. 200 Ohm at 24 V DC max. 900 Ohm at 30 V DC max. 1200 Ohm	Current output	max. 10 mA
Setting time	< 1 ms, R <sub>Burden</sub> = 900 Ohm, 25°C [77°F]	Setting time	< 1 ms, R <sub>Load</sub> = 1000 Ohm, 25°C [77°F]
LEDs (green/red)	<ul style="list-style-type: none"> <li>- system status</li> <li>- current loop interruption – input load too high</li> <li>- reference point display (only with factory settings) at cw: betw. 0° and 1° at ccw: betw. 0° and -1°</li> <li>- status in teach mode</li> </ul>	LEDs (green/red)	<ul style="list-style-type: none"> <li>- system status</li> <li>- reference point display (only with factory settings) at cw: betw. 0° and 1° at ccw: betw. 0° and -1°</li> <li>- status in teach mode</li> </ul>
Options	<ul style="list-style-type: none"> <li>- output signal scalable via the teach inputs</li> <li>- output signal scalable via the teach inputs + limit switch function</li> </ul>	Options	<ul style="list-style-type: none"> <li>- output signal scalable via the teach inputs</li> <li>- output signal scalable via the teach inputs + limit switch function</li> </ul>
Teach inputs	level = +V for 1 s min.	Teach inputs	level = +V for 1 s min.
PowerON Time	< 1 s	PowerON Time	< 1 s
Update rate	1 ms	Update rate	1 ms
e1 compliant acc. to (pending)	EU guideline 2009/19/EC (acc. to EN 55025, ISO 11452 and ISO 7637)	e1 compliant acc. to (pending)	EU guideline 2009/19/EC (acc. to EN 55025, ISO 11452 and ISO 7637)
UL approval	file no. E224618	UL approval	file no. E224618
CE compliant acc. to	EMC guideline 2014/30/EU RoHS guideline 2011/65/EU	CE compliant acc. to	EMC guideline 2014/30/EU RoHS guideline 2011/65/EU

<sup>1)</sup> When the power supply is correctly applied.  
But not output to +V. Power supply and sensor output signal are not galvanically isolated.

# Absolute encoders – multitrurn

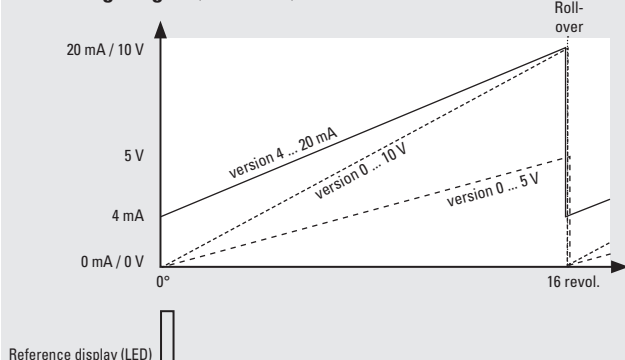
**Compact  
electronic multitrurn, magnetic**

**Sendix M3661 / M3681 (shaft / hollow shaft)**

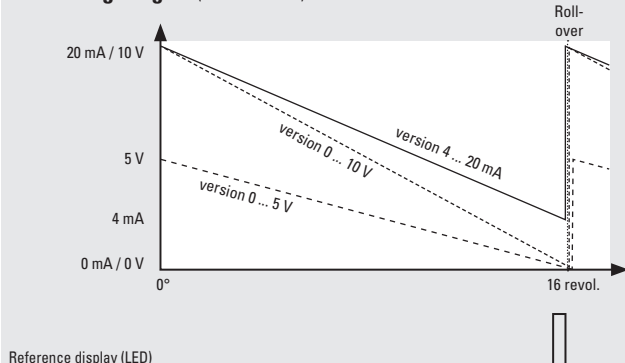
**Analog**

## Example (output signal evolution) – factory setting

### Measuring range 1 (cw version)

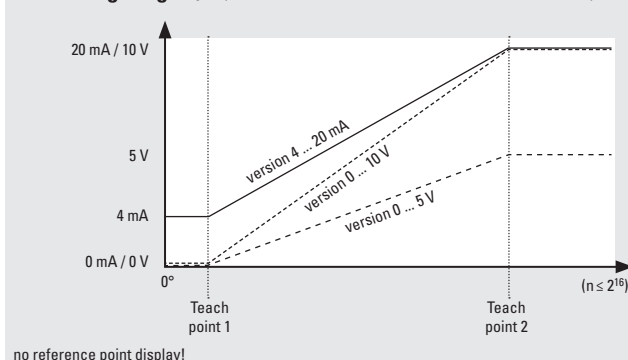


### Measuring range 2 (ccw version)

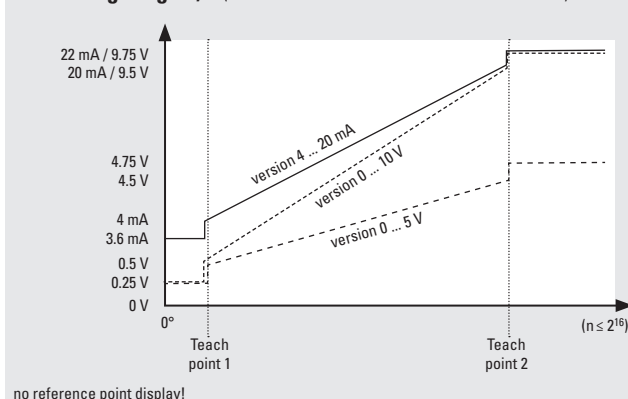


## Example (output signal evolution) – option: scalable

### Measuring range 4, 6 (scalable version without limit switch function)



### Measuring range 3, 5 (scalable version with limit switch function)



### Factory-set measuring range

2<sup>4</sup> revolutions with roll-over

Limit switch function	version	0 ... 10 V	0 ... 5 V	4 ... 20 mA
limit switch low		0.25 V	0.25 V	3.6 mA
limit switch high		9.75 V	4.75 V	22.0 mA

## 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 1 <sup>1)</sup>	SET 2 <sup>1)</sup>
		Core color:	WH	BN	GN	GY	PK

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

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 1 <sup>1)</sup>	SET 2 <sup>1)</sup>
		Core color:	WH	BN	GN	GY	PK

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

+V : encoder power supply +V DC

0 V : encoder power supply ground GND (0 V)

+U : voltage

+I : current

SET 1 : set input for teachpoint 1

SET 2 : set input for teachpoint 2

## Top view of mating side, male contact base



M12 connector, 5-pin

1) For scalable version.

# Absolute encoders – multiturn

<b>Compact electronic multiturn, magnetic</b>	<b>Sendix M3661 / M3681 (shaft / hollow shaft)</b>	<b>Analog</b>
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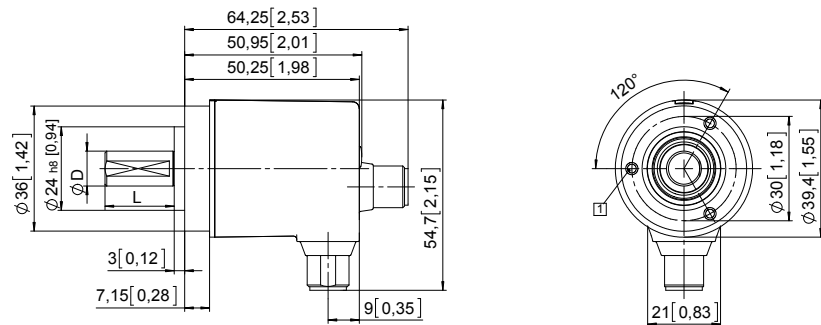
## Dimensions shaft version

Dimensions in mm [inch]

### Clamping flange, ø 36 [1.42]

#### Flange type 1 and 3

1 3 x M3, 6 [0.24] deep

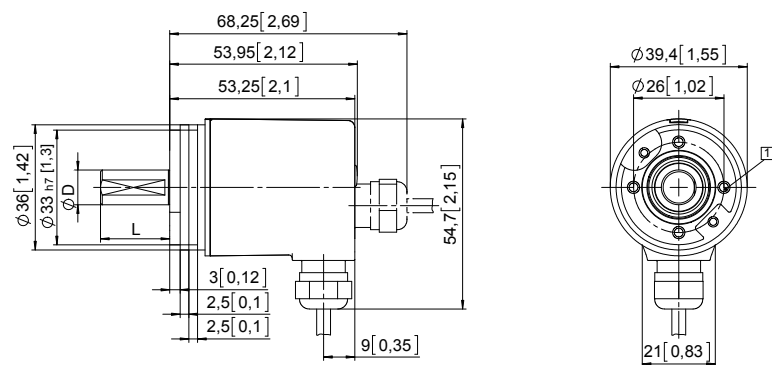


D	Fit	L
6 [0.24]	h7	12.5 [0.49]
8 [0.32]	h7	15 [0.59]
10 [0.39]	f7	20 [0.79]
1/4"	h7	12.5 [0.49]

### 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]

# Absolute encoders – multiturn

## Compact electronic multiturn, magnetic

Sendix M3661 / M3681 (shaft / hollow shaft)

Analog

### Dimensions hollow shaft version

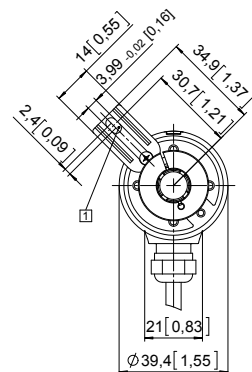
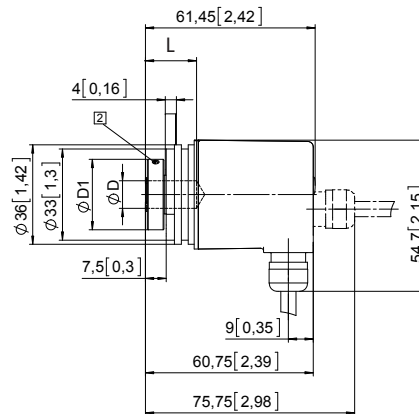
Dimensions in mm [inch]

#### Flange with spring element, long Flange type 3 and 6

- 1 Slot spring element, recommendation: cylindrical pin DIN 7,  $\varnothing 4$  [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, $\varnothing 46$ [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

