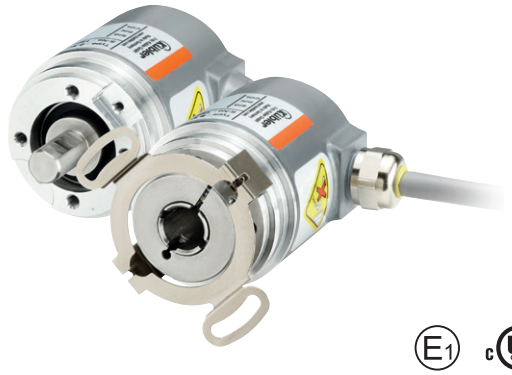
Compact electronic multiturn, magnetic | **Sendix M3661 / M3681 (shaft / hollow shaft)** | **Analog**



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.

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 | Energy Harvesting

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	.	X	X	X	X	.	X	X	1	2
Type		a	b	c	d		e	f		

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*
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

*) 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 / 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 = 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".

Compact
electronic multiturn, magnetic | **Sendix M3661 / M3681 (shaft / hollow shaft)** | **Analog**

Order code Hollow shaft

8.M3681	.	X	X	X	X	.	X	X	1	2
Type		a	b	c	d		e	f		

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 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

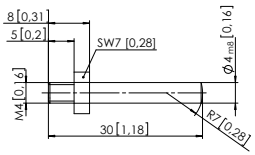
d *Type of connection*
1 = axial cable, 1 m [3.28‘] PVC
A = axial cable, special length PVC *)
2 = radial cable, 1 m [3.28‘] PVC
B = radial cable, special length PVC *)
3 = axial M12 connector, 5-pin
4 = radial M12 connector, 5-pin
*) Available special lengths (connection types A, B):
2, 3, 5, 8, 10, 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)

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 = 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

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.
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“.

Compact
electronic multiturn, magnetic | **Sendix M3661 / M3681 (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	factory setting optionally scalable	2^4 revolutions up to 2^{16} revolutions
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° - status in teach mode
Options		- output signal scalable via the teach inputs - output signal scalable via the teach inputs + limit switch function
Teach inputs		level = +V for 1 s min.
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	factory setting optionally scalable	2^4 revolutions up to 2^{16} revolutions
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° - status in teach mode
Options		- output signal scalable via the teach inputs - output signal scalable via the teach inputs + limit switch function
Teach inputs		level = +V for 1 s min.
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

Approvals

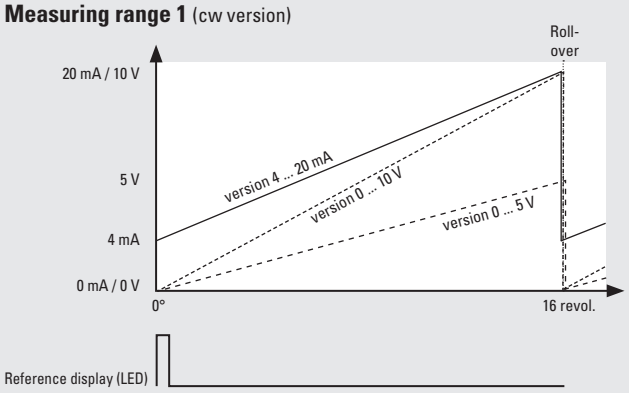
E1 compliant in accordance with		ECE guideline
UL compliant in accordance with		File no. E224618
CE compliant in accordance with		
	EMC Directive	2014/30/EU
	RoHS Directive	2011/65/EU
	ATEX Directive	2014/34/EU (for Ex 2/22 variants)

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.

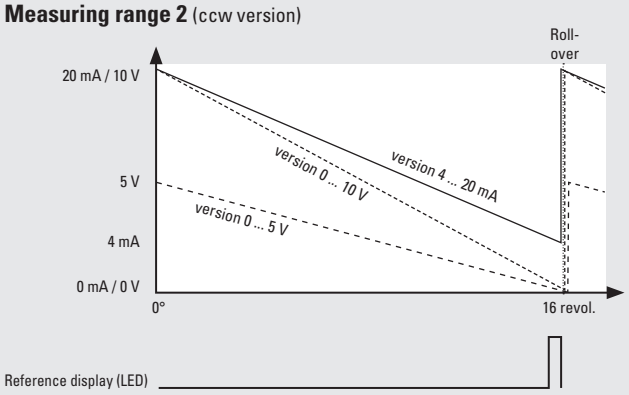
Compact
electronic multiturn, magnetic | **Sendix M3661 / M3681 (shaft / hollow shaft)** | **Analog**

Example (output signal evolution) – factory setting

Measuring range 1 (cw version)

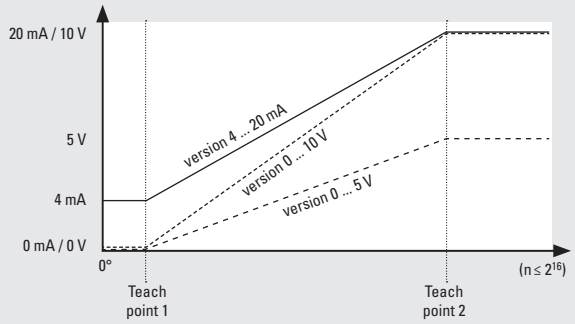


Measuring range 2 (ccw version)



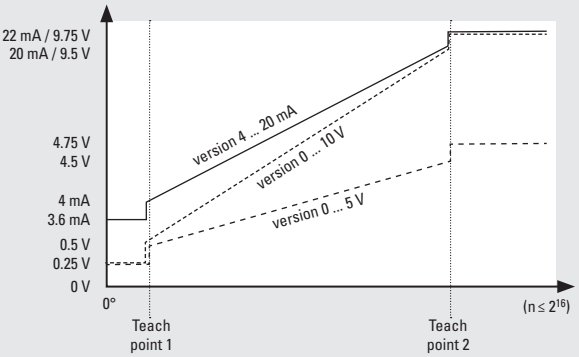
Example (output signal evolution) – option: scalable

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



no reference point display!

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



no reference point display!

Factory-set measuring range 2^4 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

1) For scalable version.

Compact
electronic multiturn, magnetic | **Sendix M3661 / M3681 (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 1 [1)]	SET 2 [1)]
		Core color:	WH	BN	GN	GY	PK

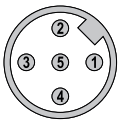
Interface	Type of connection	M12 connector, 5 pin					
3 (current)	3, 4	Signal:	0 V	+V	+I	SET 1 [1)]	SET 2 [1)]
		Pin:	3	2	1	5	4

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 [1)]	SET 2 [1)]
		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 [1)]	SET 2 [1)]
		Pin:	3	2	1	5	4

+V : supply voltage encoder +V DC
0 V : supply voltage encoder 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

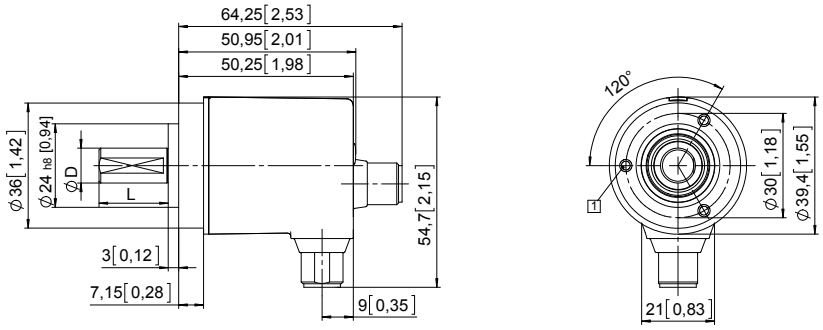
Compact
electronic multiturn, magnetic | **Sendix M3661 / M3681 (shaft / hollow shaft)** | **Analog**

Dimensions shaft version

Dimensions in mm [inch]

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

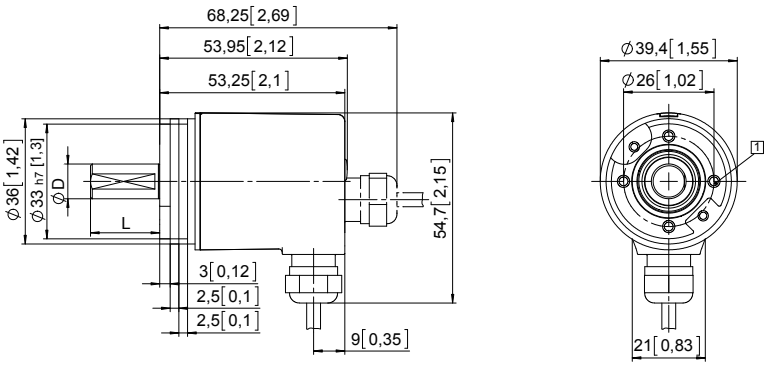
1 3 x M3, 6 [0.24] deep



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
electronic multiturn, magnetic | **Sendix M3661 / M3681 (shaft / hollow shaft)** | **Analog**

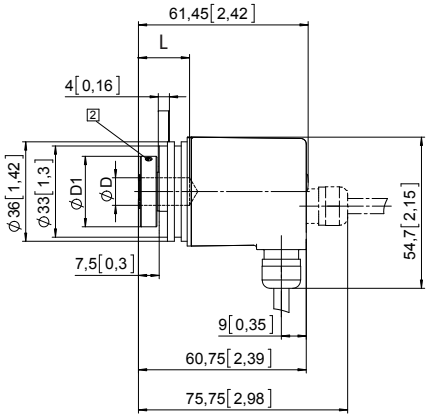
Dimensions hollow shaft version

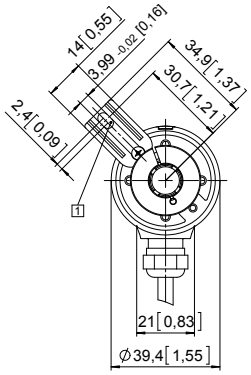
Dimensions in mm [inch]

Flange with spring element, long
Flange type 3 and 6

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

2 Recommended torque for the clamping ring 0.7 Nm

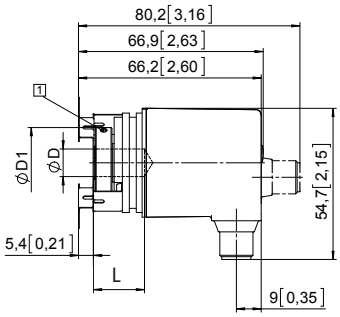


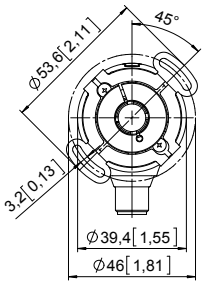


D	Fit	L	D1
6 [0.24]	H7	18.5 [0.73]	24 [0.94]
8 [0.32]	H7	18.5 [0.73]	25.5 [1.00]
10 [0.39]	H7	18.5 [0.73]	25.5 [1.00]
1/4"	H7	18.5 [0.73]	24 [0.94]
L = insertion depth max. blind hollow shaft			

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			