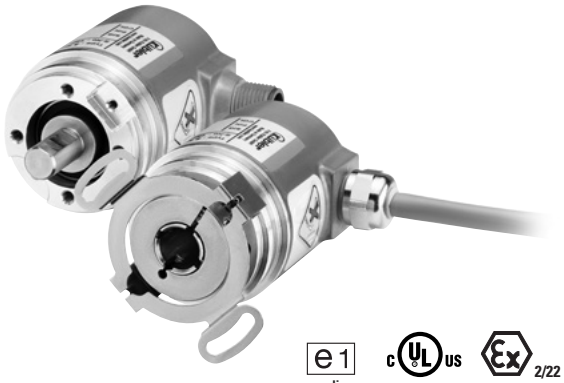
Compact electronic multiturn, magnetic | **Sendix M3661 / M3681 (shaft / hollow shaft)** | **Analog**



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.

e1 pending · cULus · Ex 2/22 · RoHS

Safety-Lock™ · High rotational speed · Temperature range · High protection level · 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
4 = radial M12 connector

*) 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
4 = scalable up to 65,536 revolutions, without limit switch function

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*
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
4 = radial M12 connector

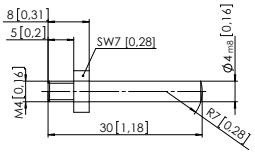
*) Available special lengths (connection types A, B): 2, 3, 5, 8, 10, 15 m [5.56, 9.84, 16.40, 26.25, 32.80, 49.21‘] order code expansion .XXXX = length in dm
Ex.: 8.M3681.243A.3112.0030 (for cable length 3 m)

e *Interface / resolution / 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
4 = scalable up to 65,536 revolutions, without limit switch function

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 with spring element		Order no.
Cylindrical pin, long for torque stops	 With fixing thread	**8.0010.4700.0000**

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

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		
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	< 0.007 Nm
	with shaft seal (IP67	< 0.01 Nm
Shaft load capacity	radial	40 N
	axial	20 N

Weight		approx. 0.2 kg [7.06 oz]
Protection acc. to EN 60529		IP65 or IP67
Working temperature range		-40°C ... +85°C [-40°F ... +185°F]
Materials	shaft / hollow shaft	stainless steel
	flange	aluminium
	housing	zinc die-cast
	cable	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

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

Electrical characteristics current interface 4 ... 20 mA

Power supply		10 ... 30 V DC
Current consumption (no load)		max. 30 mA
Reverse polarity protection of the power supply		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
Singleturn accuracy, at 25°C [77°F]		±1°
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
e1 compliant acc. to (pending)		EU guideline 2009/19/EC (acc. to EN 55025, ISO 11452 and ISO 7637)
UL approval		file 224618
CE compliant acc. to		EMC guideline 2014/30/EU RoHS guideline 2011/65/EU

Electrical characteristics voltage interface 0 ... 10 V / 0 ... 5 V

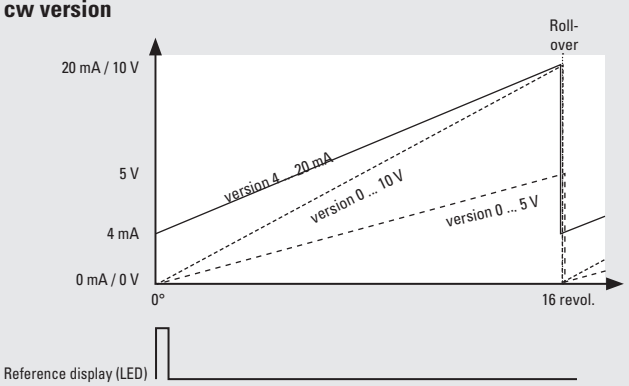
Power supply	output 0 ... 5 V output 0 ... 10 V	10 ... 30 V DC 15 ... 30 V DC
Current consumption (no load)		max. 30 mA
Reverse polarity protection of the power supply		yes
Short-circuit proof outputs		yes [1]
Measuring range	factory setting optionally scalable	2^4 revolutions up to 2^{16} revolutions
DA converter resolution	0 ... 10 V 0 ... 5 V	12 bit 11 bit
Singleturn accuracy, at 25°C [77°F]		±1°
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
e1 compliant acc. to (pending)		EU guideline 2009/19/EC (acc. to EN 55025, ISO 11452 and ISO 7637)
UL approval		file 224618
CE compliant acc. to		EMC guideline 2014/30/EU RoHS guideline 2011/65/EU

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

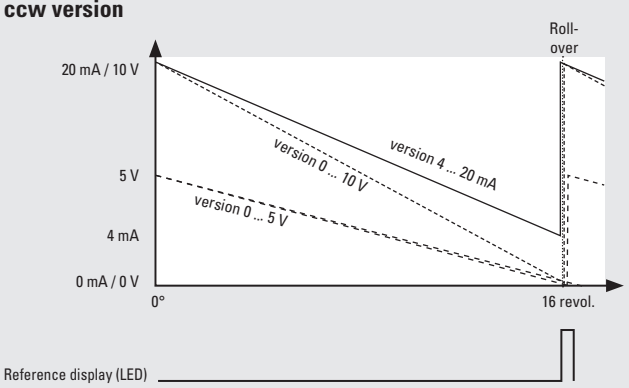
Compact electronic multiturn, magnetic | **Sendix M3661 / M3681 (shaft / hollow shaft)** | **Analog**

Example (output signal evolution) – factory setting

cw version

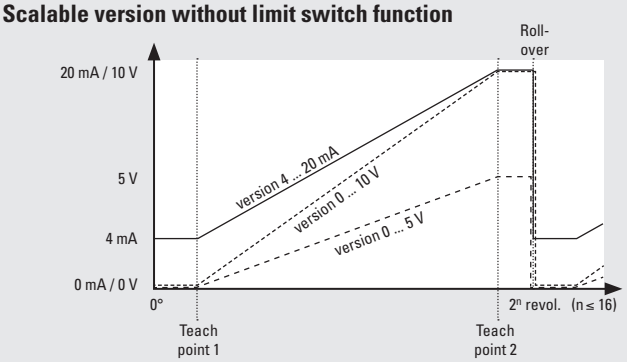


ccw version



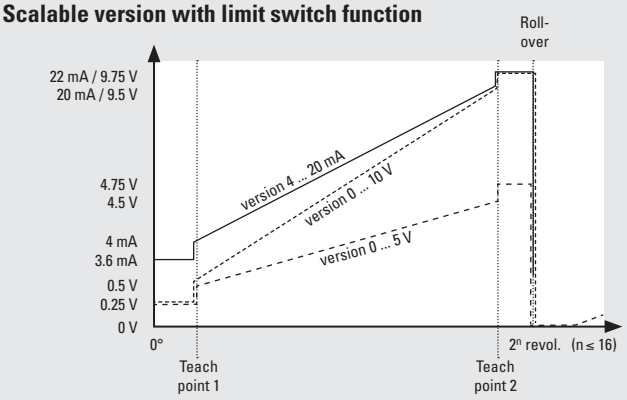
Example (output signal evolution) – option: scaleable

Scalable version without limit switch function



no reference point display!

Scalable version with limit switch function



no reference point display!

Rollover
if the signal scaled by the user is smaller than these ranges.
at 2^1, 2^2, 2^3 ... 2^{16}

Factory-set measuring range 2^4 revolutions

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 wires individually before initial start-up)					
3 (current)	1, 2, A, B	Signal:	0 V	+V	+I	SET 1 [1]	SET 2 [1]
		Cable colour:	WH	BN	GN	GY	PK

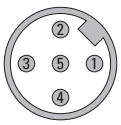
Interface	Type of connection	M12 connector, 5 pin					
3 (current)	3, 4	Signal:	0 V	+V	+I	SET 1 [1]	SET 2 [1]
		Pin:	3	2	1	5	4

Interface	Type of connection	Cable (isolate unused wires individually before initial start-up)					
4, 5 (current)	1, 2, A, B	Signal:	0 V	+V	+U	SET 1 [1]	SET 2 [1]
		Cable colour:	WH	BN	GN	GY	PK

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

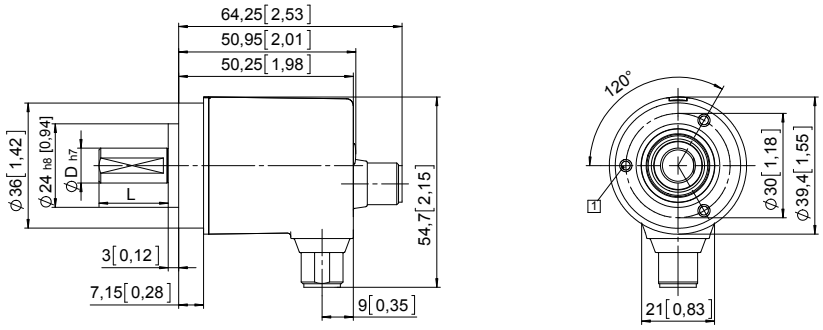
Compact
electronic multiturn, magnetic | **Sendix M3661 / M3681 (shaft / hollow shaft)** | **Analog**

Dimensions shaft version

Dimensions in mm [inch]

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

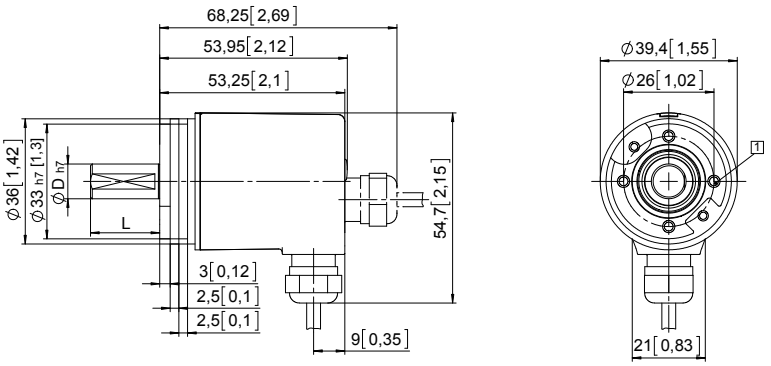
1 3 x M3, 6 [0.24] deep



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

Synchro flange, ø 36 [1.42]
Flange type 2 and 4

1 4 x M3, 6 [0.24] deep



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

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

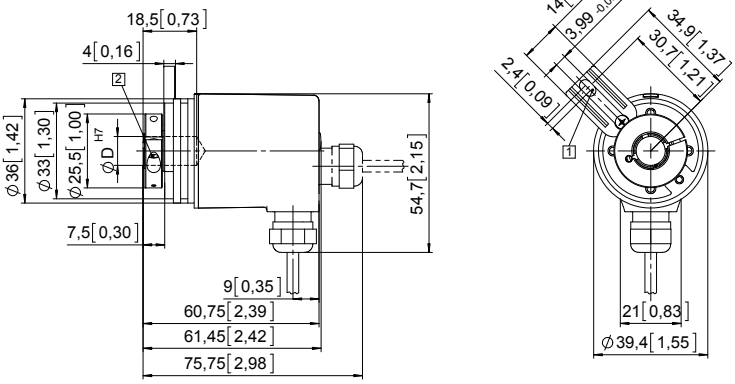
Dimensions hollow shaft version

Dimensions in mm [inch]

Flange with spring element, long
Flange type 3 and 6

1 Torque stop slot, recommendation: cylindrical pin DIN 7, ø 4 [0.16]

2 Recommended torque for the clamping ring 0.7 Nm

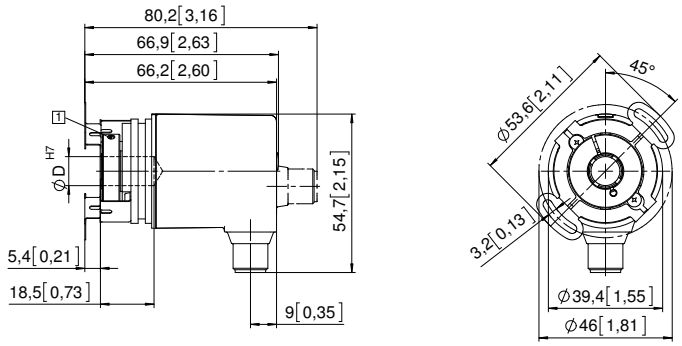


D	D1
6 [0.24]	24 [0.94]
8 [0.32]	25.5 [1.00]
10 [0.39]	25.5 [1.00]
1/4“	24 [0.94]

Insertion depth for blind hollow shaft 14.5 [0.57]

Flange with stator coupling, ø 46 [1.81]
Flange type 2 and 5

1 Recommended torque for the clamping ring 0.7 Nm



D	D1
6 [0.24]	24 [0.94]
8 [0.32]	25.5 [1.00]
10 [0.39]	25.5 [1.00]
1/4“	24 [0.94]

Insertion depth for blind hollow shaft 14.5 [0.57]