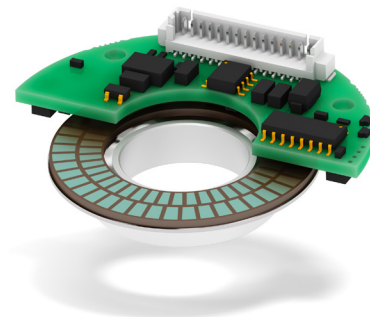


- Ultra flat Kit-encoder
- Absolute magnetic sensing
- BiSS-C, SSI, SPI, Incremental +UVW interfaces
- Resolution up to 19 bit (524288 cpr)
- Incremental resolution up to 65536 PPR
- Axial or radial connector output

Applications:

- Cobots
- Drones/UAV
- Camera/surveillance systems
- Servo motors



SMAR1

ENVIRONMENTAL SPECIFICATIONS

Shock:	250 g, 6 ms acc. to CEI EN 60068-2-27
Vibrations:	10 g, 5-2000 Hz acc. to CEI EN 60068-2-6
Protection:	IP00
Operating temperature range:	-25°C +100°C (-13°F +212°F) (-25°C +110°C, -13°F +230°F on request)
Storage temperature range:	-25°C +85°C (-13°F +185°F)

MECHANICAL SPECIFICATIONS

Dimensions:	see drawing
Hollow shaft diameter:	Ø14, 16, 18 mm (others on request)
Shaft rotational speed:	10000 rpm max. (mechanical)
Gap sensor/ring:	0,2 ÷ 0,4 mm typ.
Radial/tangential misalignment:	0,5 mm max.
Electrical connections:	PCB connector (connection cable to be ordered separately)
Weight:	<15 g (0,53 oz)

ELECTRICAL SPECIFICATIONS

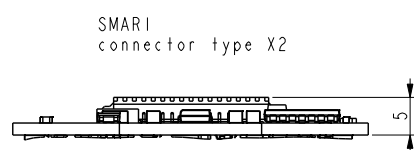
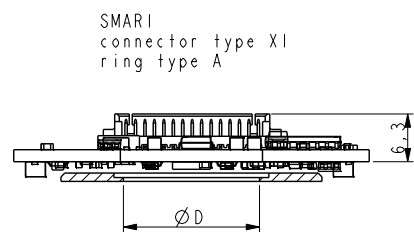
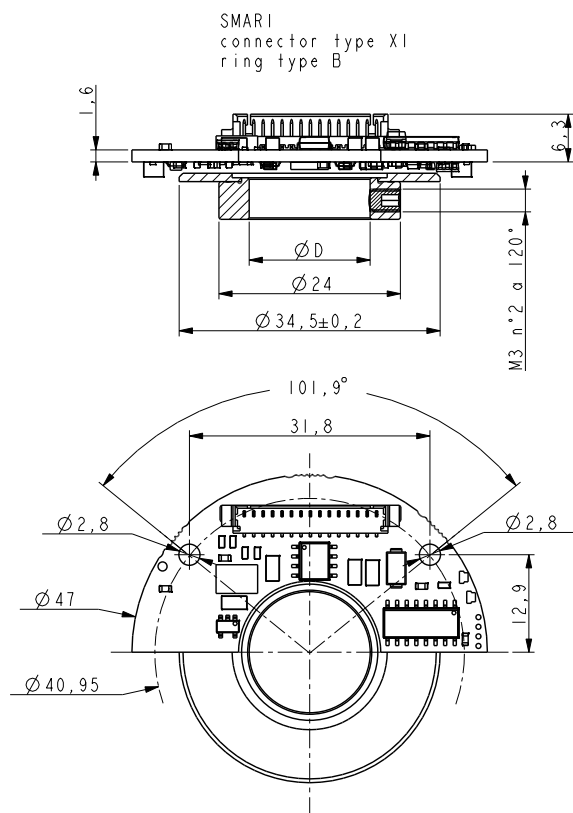
Resolution:	absolute: 19 bit (524288 cpr) max. incremental: 65536 PPR + 32 poles max.
Accuracy:	typ. ±0,05°
Output circuits:	BiSS-C (clock max. 5MHz) + AB0 /AB0 RS422 SSI (MSB aligned, clock 100 kHz ÷ 2MHz, Tp = 20µs) + AB0 /AB0 RS422 SPI (clock max. 10 MHz) TTL Line Driver (RS422) + UVW (2MHz max.)
Power supply:	+5Vdc ± 5%
Power consumption:	typ. 105 mA (max. 150 mA)

MATERIALS

Encoder:	open PCB
Ring:	metal + plastoferrite

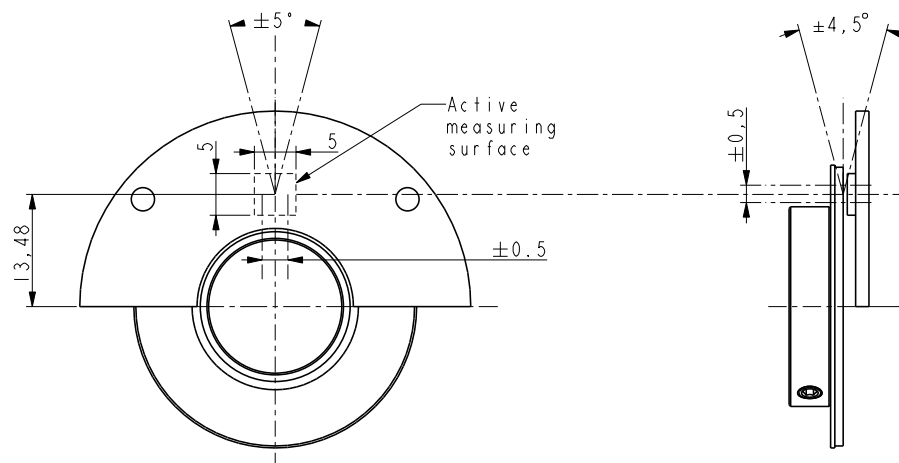
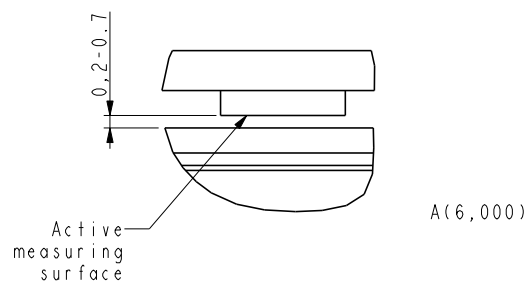
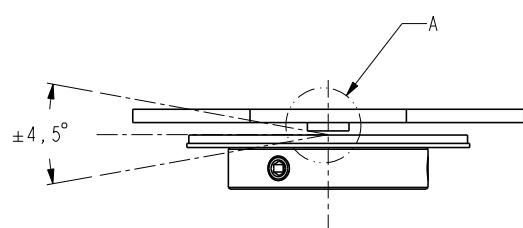
ACCESSORIES

EC-X15-LK-KT16-xx:	Connection cable, xx mm
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RING TYPE CODE	INSIDE Ø D
A8	18 ^{+0,03} _{-0,02}
B4	14 H7
B6	16 H7

SMAR1



SMAR1- Mounting requirements

Order code – absolute version

SMAR1	-	XXX (a)	-	XXX (b)	/	XXXXX (c)	-	XX (d)	-	XX (e)	/XXXX (f)
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(a) INTERFACE / POWER SUPPLY SC1 = BiSS-C mode + AB0 (+5Vdc $\pm$ 5%) BG1 = SSI Binary + AB0 (+5Vdc $\pm$ 5%) SP1 = SPI (+5Vdc $\pm$ 5%)	(b) RESOLUTION (ABS) 016 = 16 bit 017 = 17 bit 018 = 18 bit 019 = 19 bit 15M = 15 bit (*) 17M = 17 bit (*) 18M = 18 bit (*) 19M = 19 bit (*)	(c) RESOLUTION (INC) 00000 = no incr. output 01024 = 1024 (not possible with SP1) 02048 = 2048 (not possible with SP1) 04096 = 4096 (not possible with SP1) see complete list ①	(e) CONNECTION X1 = Molex conn vertical outlet (mating type: 51021-1500) X2 = Molex conn. axial outlet (mating type: 51021-1500)
(d) CODING 32 = 32/31 nonius			(f) CUSTOM VERSION /Sxxx = special version /Pxxx = special firmware setting

(*) M = the multturn counter is 65536 turns (16 bit). Counting is available only with power supply ON.

Order code – incremental version

SMAR1	-	XX (a)	-	XXX (b)	/	XXXXX (c)	-	XX (d)	-	XX (e)	/XXXX (g)
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(a) OUTPUT CIRCUIT / POWER SUPPLY L1 = Line Driver RS422 (+5Vdc $\pm$ 5%)	(c) RESOLUTION (INC) 01024, 01250, 02048 02500, 04096, 05000 (others on request, see complete list) ①	(d) NR° OF UVW POLES 02 = 2 poles 04 = 4 poles 32 = 32 poles see complete list ②	(e) CONNECTION X1 = Molex conn vertical outlet (mating type: 51021-1500) X2 = Molex conn. axial outlet (mating type: 51021-1500)
(b) CODING 032 = 32/31 nonius			(f) CUSTOM VERSION /Sxxx = special version /Pxxx = special firmware setting

① List of Resolution (INC) available:

16384, 32768, 65536 PPR

From 1 to 65536 PPR (4 to 262144 edges) any resolution possible.

Binary resolutions are preferable and have best performance.

② List of UVW nr. of poles available:

02, 04, 06, 08, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32 poles.
(eg. 8 poles = 4 pole pairs).

Order code – MRA/34A flat ring without fixing collar

MRA/34A	-	XX (a)	-	X (b)	-	X (c)	-	XXXX (d)	-	X (e)	/XXXX (g)
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(a) INNER Ø 18 = 18 mm	(b) HUB S = Steel	(c) SCALE E = Elastomer	(d) CODING 32NB = 32/31 nonius, 1.5	(e) ORIENTATION A = Axial
				(f) CUSTOM VERSION /Sxxx = special version

Order code – MRA/34B ring with fixing collar

MRA/34B	-	XX (a)	-	X (b)	-	X (c)	-	XXXX (d)	-	X (e)
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(a) INNER Ø 14 = 14 mm 16 = 16 mm 18 = 18 mm	(b) HUB S = Steel	(c) SCALE E = Elastomer	(d) CODING 32NB = 32/31 nonius, 1.5	(e) ORIENTATION A = Axial
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Document release	Date	Description
1.1	30.10.2025	Order codes updates
1.0	November 2023	New order code