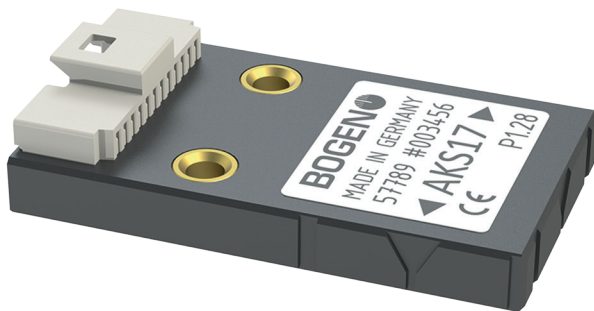




Measuring



Positioning



AKS17

Absolute Magnetic Sensing Head

- Rotary applications
- Linear applications
- Non-contact, quick position measurement

Features

- Lower case incremental
- 21 to 24 Bit absolute resolution
- 16 Bit incremental resolution
- Single piece unit
- No wear from usage
- Resistant to dust, cooling lubricant emulsion, oil, etc.
- Different diameters and length offered
- Application for Industrial Goods, Automation, Life Science and High-Tech Industry

Optimal motion control with the AKS17 – solution for rotary and linear scales

The absolute magnetic sensing head AKS17 for linear and rotary applications:

With the new absolute measuring head AKS17 and the associated scales BOGEN offers inexpensive magnetic linear and rotary measurement solutions for absolute measurements. The AKS17 provides linear measurements up to 2350 mm and rotational solutions both radially and axially, each with three different sizes. The measuring head also provides both BISS-C or SSI as output, plus incremental signal output in parallel. With a resolution of 21-24 bits this hollow shaft sensor surpasses typical shaft end applications many times over. With dimensions of 28 mm in length, 16 mm width at a maximum height of 6.6 mm, the measuring head is extremely compact.

Features

Absolute resolution	21-Bit (128/127/120 Nonius) 22-Bit (256/255/240 Nonius) 23-Bit (512/511/496 Nonius) 24-Bit (1024/1023/992 Nonius)
Commutation signal	For 1 to 16 pole pairs (UVW)
Rotation speed	tbd
Optimal distance magnetic target ↔ sensing head	0.4 mm
Supply voltage	5 V ± 5 %
Maximum output load	50 mA per Channel
Energy consumption (without load)	<120 mA ± 5 % (UB = 5,0 V)
LED	Green LED = device on Red LED = bad set up (adjustment required)
Operating temperature	-20 to +60 °C
Storage temperature	-40 to +80 °C
Protection class	IP67 (with FFC connector)
ABZ Incremental resolution	4 and 262144 in intervals of 4 steps
Weight	ca. 2.5 g
Pole pitch	1.28 or 1.50 mm

Output Signals ABZ

Signals / Inverted signals	A, /A, B, /B, Z, /Z
Signal amplitude (without load)	RS422 (± 5 V)
Phase shift A and B	90° ± 10° electrical
Signal period length Z	90°

Output Signals UVW

Signals / Inverted signals	U, /U, V, /V, W, /W
Signal amplitude (without load)	RS422 (± 5 V)

Output Signals STEP

Signals / Inverted signals	STEP, DIR, NCLR
Signal amplitude (without load)	RS422 (± 5 V)

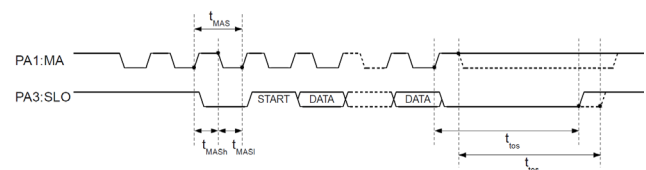
Output Signals CW/CCW

Signals / Inverted signals	CW, CCW, NCLR
Signal amplitude (without load)	RS422 (± 5 V)

Output Signals BISS

Signals	Clock (MA+, MA-) Data (SLO+, SLO-)
Signal amplitude (without load)	RS422 (± 5 V)
Protocol	BISS-C BP3 encoder profile
Multiturn	output possible
Timeout (t _{tos})	150-380 ns
Permissible clock period (t _{MAS})	100 ns up to 2 * timeout
Clock signal hi level duration (t _{MASH})	50 ns up to timeout
Clock signal lo level duration (t _{MASl})	50 ns

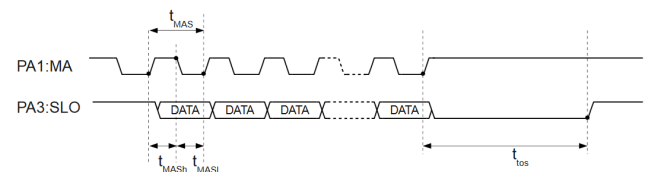
Timing Diagram BISS



Output Signals SSI

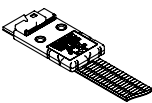
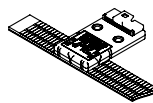
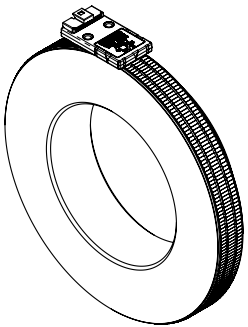
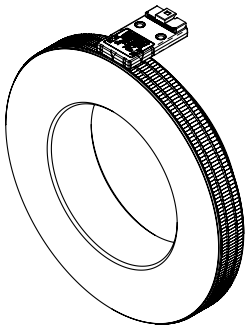
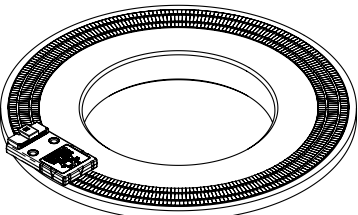
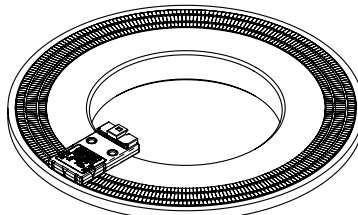
Signals	Clock (MA+, MA-) Data (SLO+, SLO-)
Signal amplitude (without load)	RS422 (± 5 V)
Multiturn	output possible
Timeout (t _{tos})	375-605 ns
Permissible clock period (t _{MAS})	250 ns up to 2 * timeout
Clock signal hi level duration (t _{MASH})	125 ns up to timeout
Clock signal lo level duration (t _{MASl})	125 ns

Timing Diagram SSI



Follow standard ESD precautions!
Turn power off before connecting the sensor.
Do not touch the electrical pins without static protection such as a grounded wrist strap.

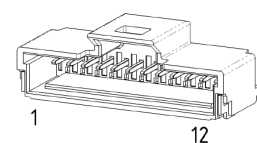
Orientation Options

	Orientation Option 1 (Parallel)	Orientation Option 2 (Perpendicular)
Linear Scale		
Rotary Scale Radial		
Rotary Scale Axial		

Pin Assignment

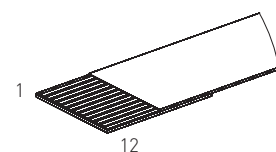
Pin No.	Output signals depending on selected interface incremental (D-Parameter)			
	D2 - ABZ	D3 - UVW	D4 - STEP	D5 - CW/CCW
1	/Z	/W	/NCLR	/NCLR
2	Z	W	NCLR	NCLR
3	/B	/V	DIR	/CCW
4	SLO-	SLO-	SLO-	SLO-
5	SLO+	SLO+	SLO+	SLO+
6	V-	V-	V-	V-
7	V+	V+	V+	V+
8	MA-	MA-	MA-	MA-
9	MA+	MA+	MA+	MA+
10	B	V	DIR	CCW
11	/A	/U	/STEP	/CW
12	A	U	STEP	CW

Connector C1



Molex 501568-1207
(12 pin male connector)

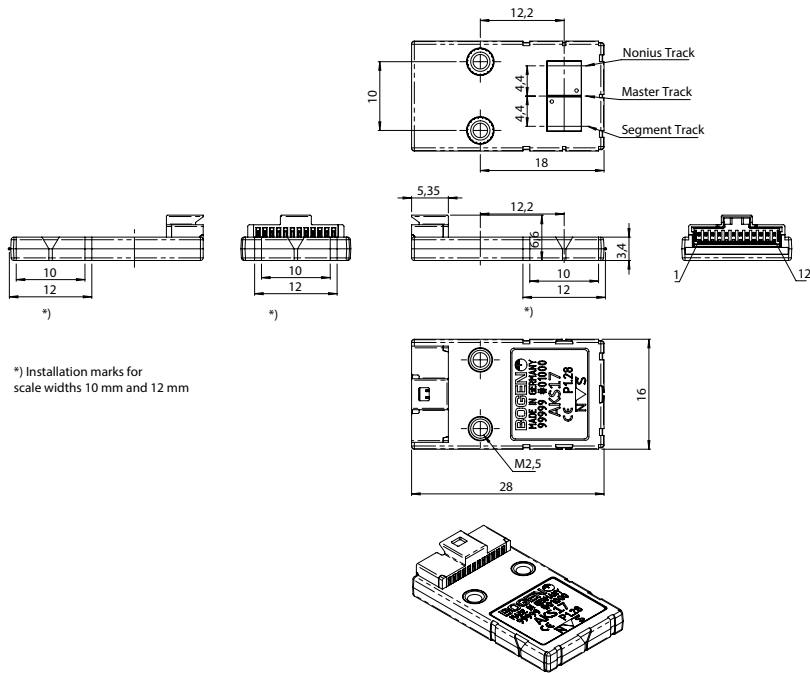
Connector C3



FFC
(12 pin, 0.5 mm pitch)

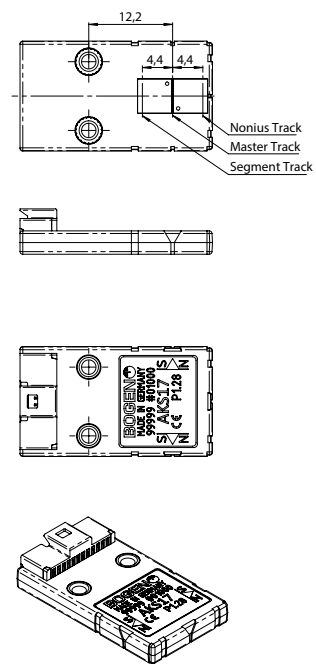
Dimensions Molex

Orientation Option 1 (parallel)

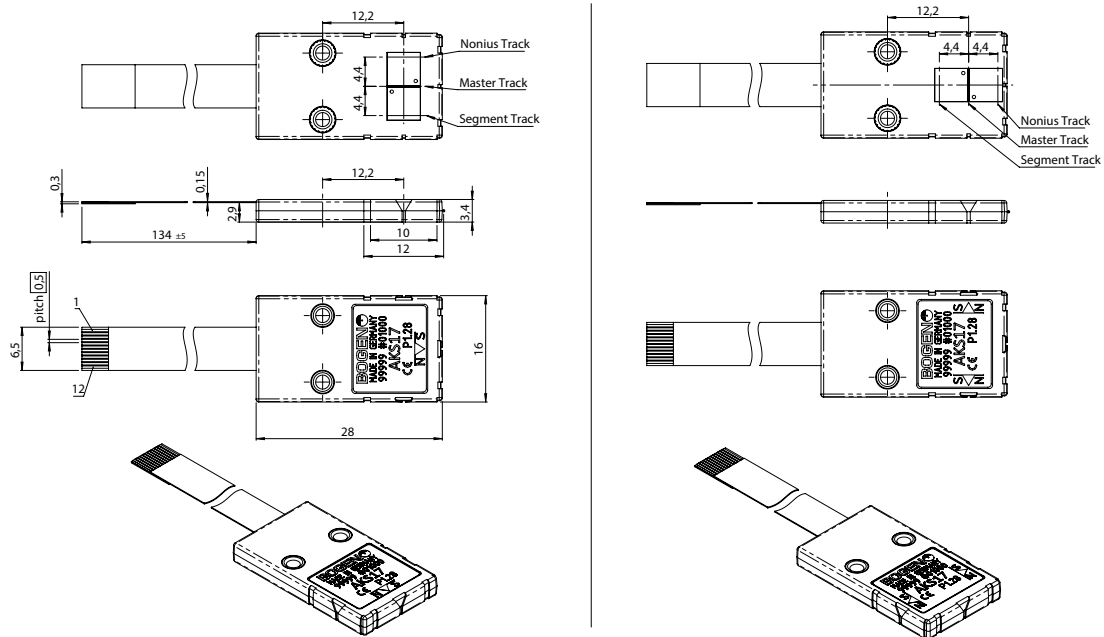


*) Installation marks for scale widths 10 mm and 12 mm

Orientation Option 2 (perpendicular)



Dimensions FFC



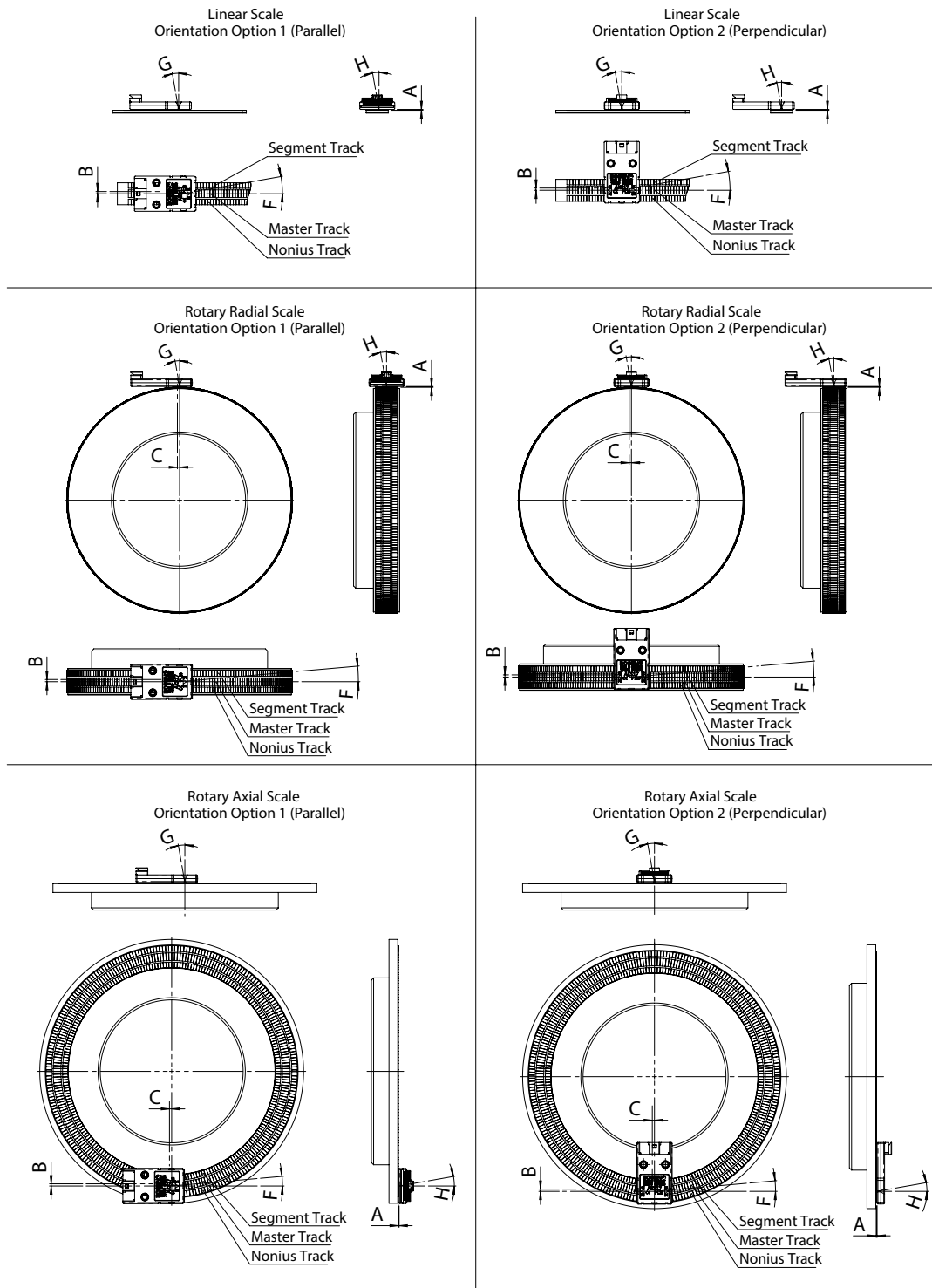
Note:

Not mentioned dimensions are equivalent to specification of dimensions Molex

Calibration

Each unit needs to be calibrated in final assembly with a nonius scale. For the calibration, the scale needs to be moved over the whole measuring length. For calibration, the programming unit including cables and the BOGEN software will be needed. A PC is required for the calibration. The use of non BOGEN approved software may result in loss of performance or operation of the encoder!

Installation Tolerances



Assembly Values and Tolerances

A [mm]	0.4 ± 0.05
B [mm]	± 0.5
C [mm]	± 0.5
F [°]	tbd
G [°]	tbd
H [°]	tbd

Note:

- For tolerance purposes the bracket for mounting the AKS17 should have adjustment options.
- Maximum eccentricity of rotary scale must be < 0.06 mm.
- Angular displacement: to be defined (tbd)
- The installation tolerance is the same for both orientation options

Order Code

Parameters

AKS17	-	Z	O	P	A	D	C	H
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			Code ⁽¹⁾	Explanation ⁽¹⁾
Parameters	Z	Size	Z4	128/127/120 Nonius
			Z5	256/255/240 Nonius
			Z6	512/511/496 Nonius
			Z7	1024/1023/992 Nonius
	O	Orientation Option	O1	Parallel
			O2	Perpendicular
	P	Pole Pitch [mm]	P1.28	1.28 mm
			P1.50	1.50 mm
	A	Interface Absolute ⁽²⁾	A1	BISS
			A2	SSI
	D	Interface Incremental ⁽²⁾	D1	None (on request)
			D2.<C>	ABZ (<C> counts of scale, value between 4 and 262144 in steps of 4, default is 16384)
			D3	BLDC motor commutation (UVW) (on request)
			D4	Step / direction (on request)
			D5	CW / CCW Incremental (on request)
	C	Connector	C1	Molex 12 pin
			C3.134	FFC 12 pin, 0.5 mm pitch, length 134 mm
	H	Housing	H1	Standard case
			H2	PCB only (on request)

⁽¹⁾ standard parameters are bold

⁽²⁾ programmable with programming unit

Ordering Example

AKS17-Z5O1P1.28A1D2.16384C1H1 AKS17 Magnetic Sensing Head, size 20-Bit, orientation option parallel, 1.28 mm pole pitch, with BISS and ABZ interface with 16384 counts per scale, connector Molex 12 Pin, housing standard

AKS17-Z4O2P1.28A1D1C1H2 AKS17 Magnetic Sensing Head, size 19-Bit, orientation option perpendicular, 1.28 mm pole pitch, with BISS interface only, connector Molex 12 Pin, PCB only

AKS17-Z6O1P1.28A1D2.16384C3.134H1 AKS17 Magnetic Sensing Head, size 21-Bit, orientation option parallel, 1.28 mm pole pitch, with BISS and ABZ interface with 16384 counts per scale, connector 12 Pole FFC 0.5 mm pole pitch length 100 mm, housing standard

Optional Accessory

00052040: Programming unit (includes adapter and cable)

00022305: Receptacle connector housing 12 pol (Molex Part No.: 501330-1200)

00022306: Cable assembly 28 AWG, 300mm (Molex Part No.: 92001-1198)

Optional Accessory – linear and rotary scales

See separate data sheet for scales for further possibilities.

Data sheet LMSN (linear) Data sheet RMSN (rotary)

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