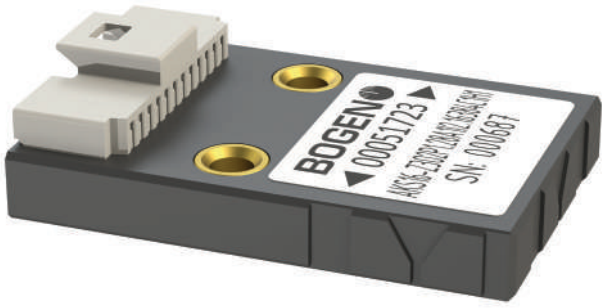

Measuring

Positioning

AKS16
Absolute Magnetic Sensing Head

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

Features

- Lower case incremental
- 16 to 18 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

Easy absolute encoder - solution for rotary and linear applications

The absolute magnetic sensing head AKS16 for linear and rotary applications:
With the AKS16 and the associated scales BOGEN offers inexpensive magnetic linear and rotary absolute measurements. The AKS16 provides linear measurements up to 192 mm and rotational solutions both radially and axially, each with six different sizes. The measuring head also provides both BISS-C or SSI as output, plus incremental signal output in parallel. With a resolution of 16-18 bits this hollow shaft sensor surpasses typical shaft end applications many times over. With dimensions of 24.2 mm in length, 16 mm width at a height of 6.6 mm (Molex version) or 3.4 mm (FFC version), the measuring head is extremely compact.

AKS16 - Rev0.8 (2016/05/12)

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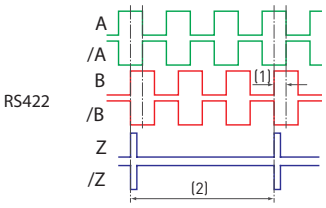
Features

Absolute resolution	Small 16 Bit Medium 17 Bit Large 18 Bit
Commutation signal	For 1 to 16 pole pairs (UVW)
Rotation speed	Small up to 24 000 rpm Medium up to 12 000 rpm Large up to 6 000 rpm
Supply voltage	5 V ± 5 %
Maximum output load	50 mA per Channel
Energy consumption (without load)	<60 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 (without connector)
ABZ Incremental resolution	4 and 262144 in steps of four based on pole pitch
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)

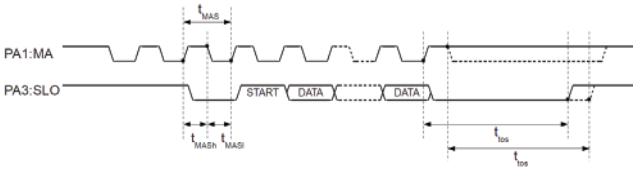


(1) Phase shift A and B 90° ± 10° electrical
(2) Signal period depending on the reference track pattern
Z Length default is 1 count

Output Signals BISS

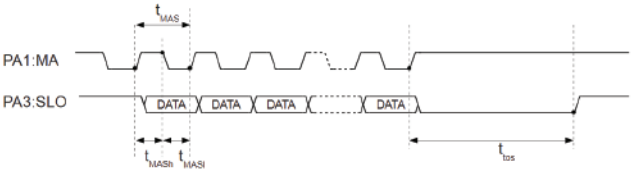
Signals	SLO-, SLO+, MA-, MA+
Signal amplitude (without load)	RS422 (± 5 V)
Multiturn	output possible
Timeout [ttos]	150-380 ns
Permissible clock period [tMAS]	100 ns up to 2 * timeout
Clock signal hi level duration [tMASh]	50 ns up to timeout
Clock signal lo level duration [tMASl]	50 ns

Timing Diagram BISS



Output Signals SSI

Signals	SLO-, SLO+, MA-, MA+
Signal amplitude (without load)	RS422 (± 5 V)
Multiturn	output possible
Timeout [ttos]	375-605 ns
Permissible clock period [tMAS]	250 ns up to 2 * timeout
Clock signal hi level duration [tMASh]	125 ns up to timeout
Clock signal lo level duration [tMASl]	125 ns



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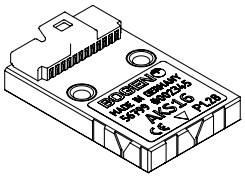
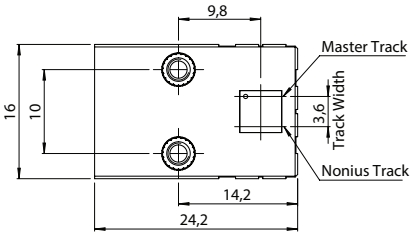
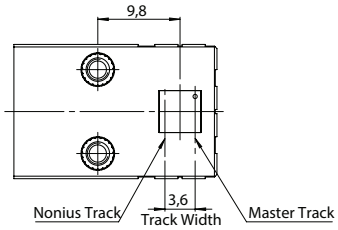
Dimensions Molex

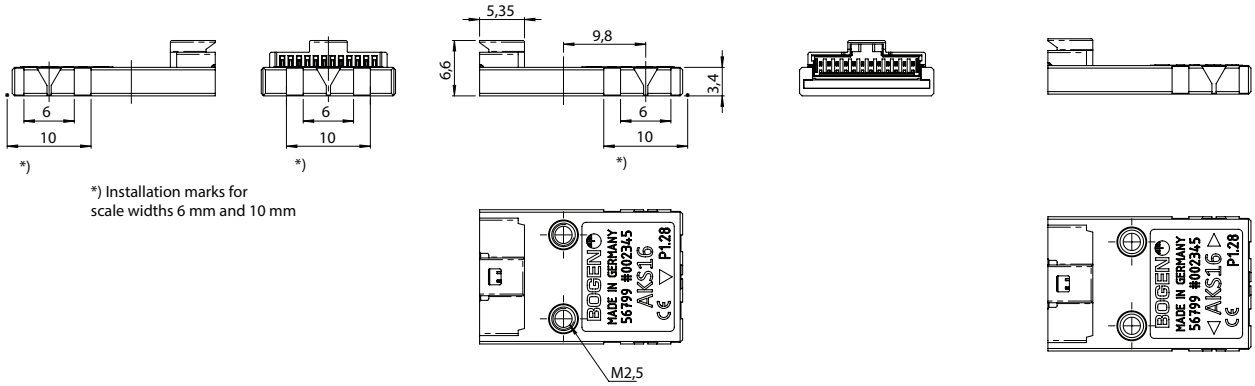
Orientation Option 1 (parallel)





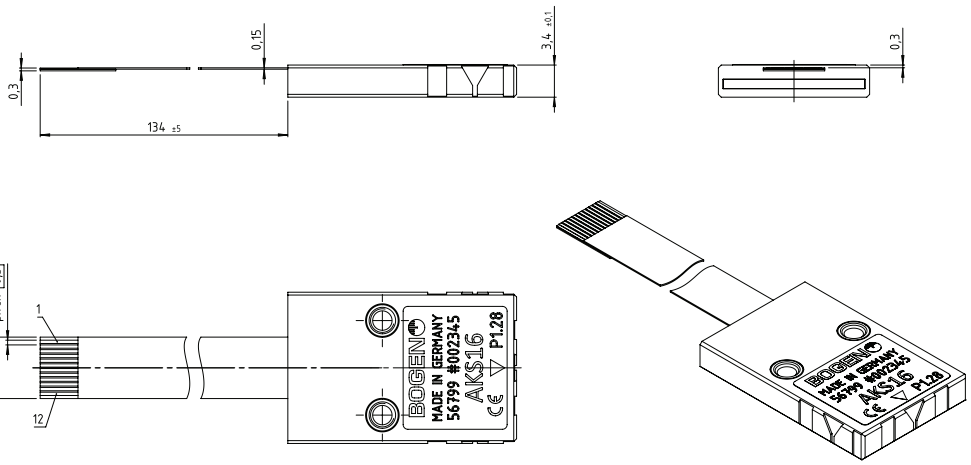
Orientation Option 2 (perpendicular)





*) Installation marks for scale widths 6 mm and 10 mm

Dimensions FFC



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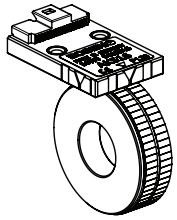
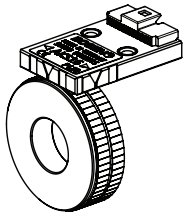
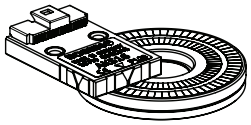
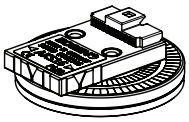
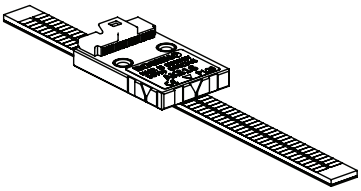
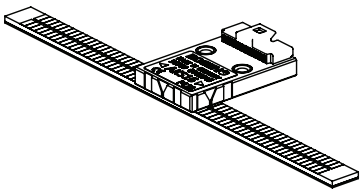
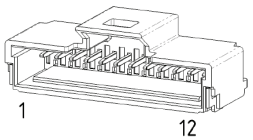
Orientation Options

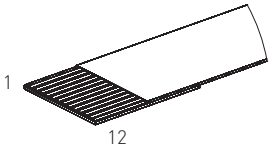
	Orientation Option 1 (parallel)	Orientation Option 2 (perpendicular)
Radial Magnetization		
Axial Magnetization		
Linear Magnetization		

Pin Assignment

Signal	Pin No.	
	Connector C1	Connector C3
	Molex 501568-1207 (12 pin male connector)	FFC (12 pin, 0.5mm pitch)
/Z	1	1
Z	2	2
/B	3	3
SLO-	4	4
SLO+	5	5
V -	6	6
V+	7	7
MA-	8	8
MA+	9	9
B	10	10
/A	11	11
A	12	12



Molex 501568-1207



FFC

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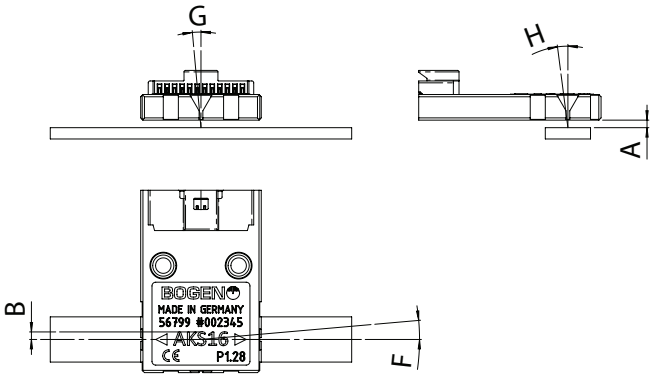
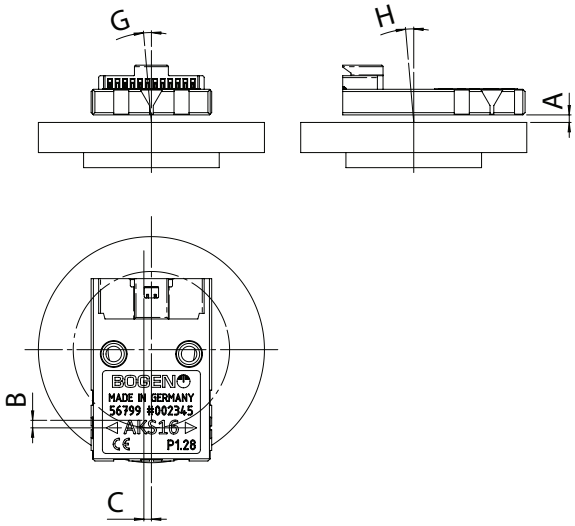
Installation Tolerances

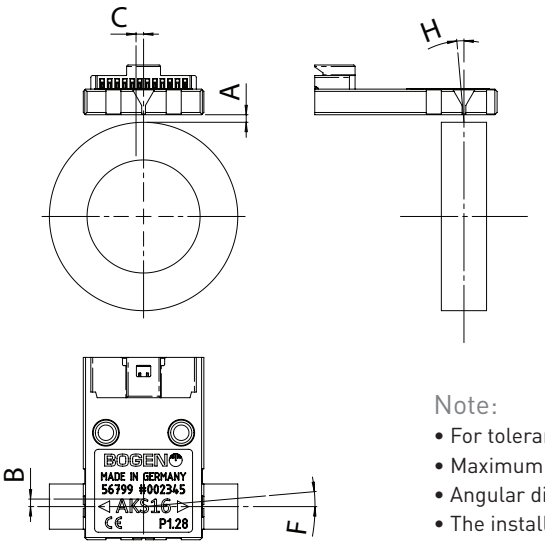
Linear Scale



Rotary Scale Axial



Rotary Scale Radial



Maximum Displacement

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

Note:

- For tolerance purposes the bracket for mounting the AKS16 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

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.

Optional Accessory

00051712: 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 – rotary and linear scales

See separate data sheet for scales for further possibilities. >>

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Order Code

Parameters

AKS16	-	Z	O	P	A	D	C	H

			Code [1]	Explanation [1]
Parameters	Z	Size [2]	Z1	small 16-Bit (16/15 Nonius)
			Z2	**medium 17-Bit (32/31 Nonius)**
			Z3	large 18-Bit (64/63 Nonius)
	O	Orientation Option	**O1**	**Parallel**
			O2	Perpendicular
	P	Pole Pitch [mm]	**P1.28**	**1.28 mm**
			P1.50	1.50 mm (available Q2/2016)
	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 134mm
	H	Housing	**H1**	**Standard case**
			H2	PCB only (on request)

[1] standard parameters are bold
[2] programmable with programming unit

Ordering Example

AKS16-Z1O1P1.28A1D2.16384C1H1	AKS16 Magnetic Sensing Head, for small size, 16-Bit, orientation option parallel, 1.28 mm pole pitch, with BISS and ABZ interface with 16384 counte per scale, connector Molex 12 Pin, housing standard
AKS16-Z3O2P1.28A1D1C1H2	AKS16 Magnetic Sensing Head, for large size, 18-Bit, orientation option perpendicular, 1.28 mm pole pitch, with BISS interface only, connector Molex 12 Pin, PCB only
AKS16-Z201P1.28A1D2.16384C3H1	AKS16 Magnetic Sensing Head, for medium size, 18-Bit, orientation option parallel, 1.28 mm pole pitch, with BISS and ABZ interface with 16384 counte per scale, connector 12 Pole FFC 0.5 mm pole pitch length 100mm, housing standard

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Revision History

Date	Revision	Note	4Pages
20.04.15	B	First edition	ALL
31.07.15	0.3	- Update all Information's - Add Pictures	ALL
31.07.15	0.4	-Minimal Edits for consistent Upper Case & Typos corrected	ALL
04.08.15	0.5	-Changed from ARS to AKS, order code corrected, Alignment angles removed	ALL
05.08.15	0.6	- update Dimensions and Installation Tolerances - update connector pictures - order code corrected (M2 is obsolete)	3 4 7
22.01.16	0.7	- transfer into an InDesign Dokument - add FFC - update output signals - update order codes	All 4 4 5
18.04.16	0.7	- update output signals - update connector	2
22.04.16	0.8	- update order code (D - Interface) - new dimensions/drawing	6 3-4

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