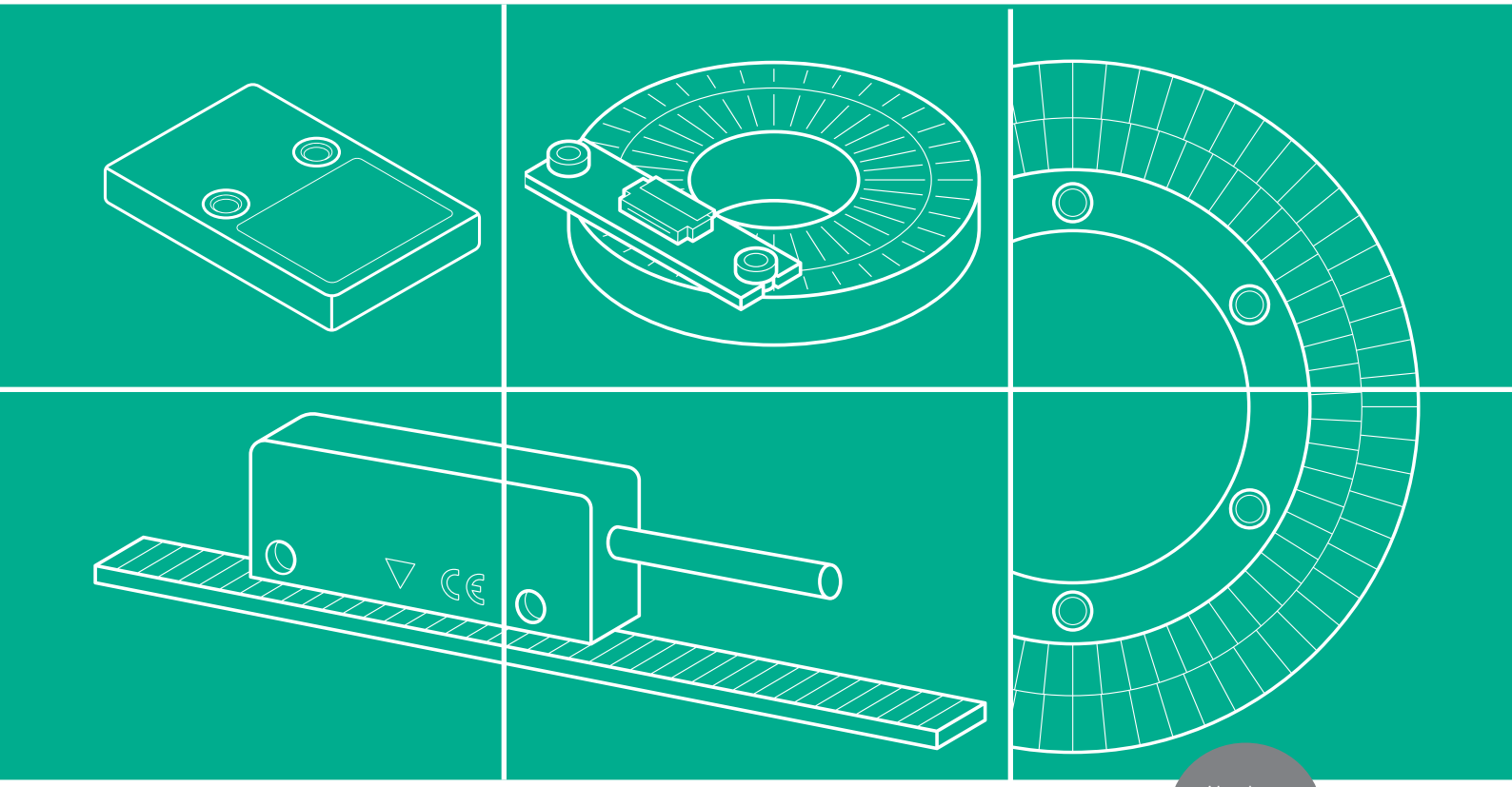
BOGEN

Magnetics that count

Magnetic Measurement Solutions

for Motion Control and Positioning



Absolute Measuring

Rotary Linear Applications

Positioning

Contents

Magnetic Measurement Technology „Made in Germany“

BOGEN was founded in 1951 as a family business. In the beginning we concentrated on the development and production of magnetic heads for writing and reading data for tape recorders, cassette recorders, credit card and parking ticket applications, but also for secure banknote validation.

Today, BOGEN is an internationally recognized specialist for high-performance magnetic measurement solutions in industry and has years of experience in the development and manufacturing of systems for complex measurement and control tasks. These include absolute and incremental measurements of lengths, angles, speeds and rotational speeds.

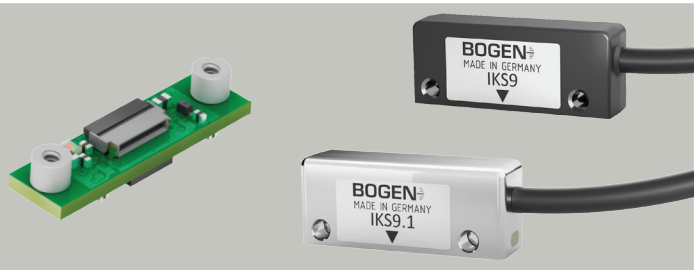
With our high-precision production facilities, we have extensive expertise in manufacturing a complete range of standard magnetic sensors, magnetic rings and tapes for demanding positioning, rotation and motion applications. From prototype to high volume production, our components and magnetic measurement solutions ensure the highest accuracy requirements while maintaining high working distance tolerances.

In 2020 BOGEN Magnetics GmbH was taken over by Lika Electronic s.r.l., Italy.

Complete Range of Magnetic Measurement Components

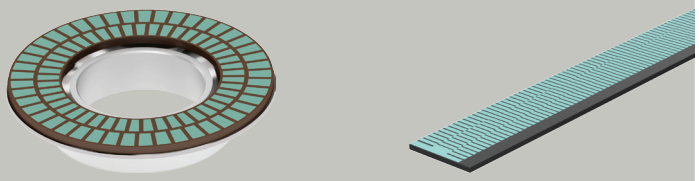
Magnetic Sensing Heads

BOGEN offers a complete range of magnetic sensing heads for incremental, absolute, linear and rotary measurement for many different applications in industry.



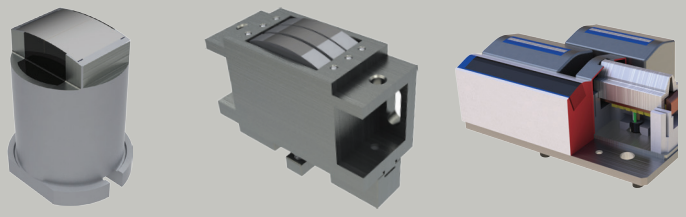
Rotary and Linear Magnetic Scales

BOGEN manufactures and offers a vast choice of linear and rotary magnetic scales for a large variety of different applications. Production processes at BOGEN allow any magnetic pole pattern to be created: single or multiple tracks, with or without reference mark, different accuracy classes, and much more... BOGEN magnetic scales can be as individual as the customer requires.

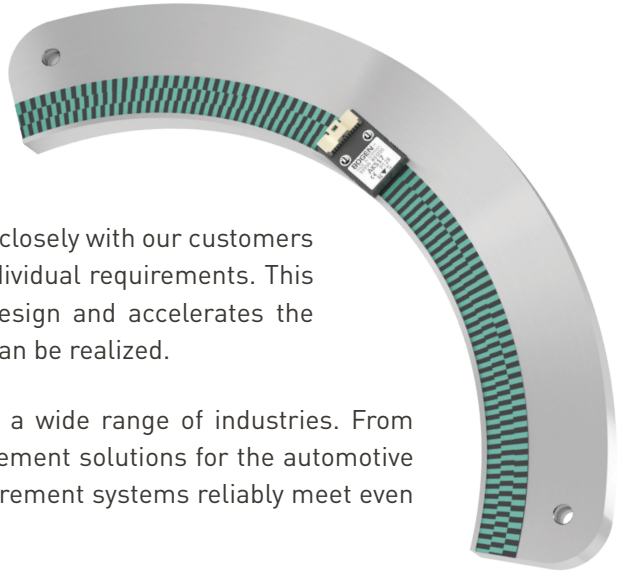


Magnetic Reading and Writing Heads

BOGEN magnetic heads can be found in countless applications in everyday life wherever information must be read and written magnetically: for example in car parks or in ATMs when withdrawing money. BOGEN also offers solutions for banknote authentication. For more information on our magnetic heads please refer to our website.



Magnetic Measuring Solutions Tailored to Your Requirements



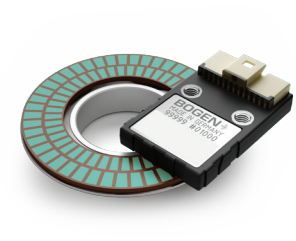
BOGEN not only offers a complete range of standard components and products, but also develops customized special solutions.

Instead of designing around an existing standard solution, we work closely with our customers to create product configurations that are 100% tailored to their individual requirements. This increases our customers' degrees of freedom in development design and accelerates the development of new products, and very compact encoder designs can be realized.

Over the past decades, we have worked closely with partners in a wide range of industries. From manufacturers of advanced surgical and service robots to measurement solutions for the automotive imaging industry and aerospace applications, our magnetic measurement systems reliably meet even the most stringent requirements.

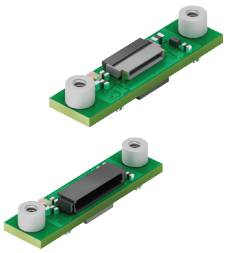
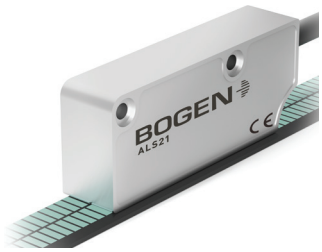
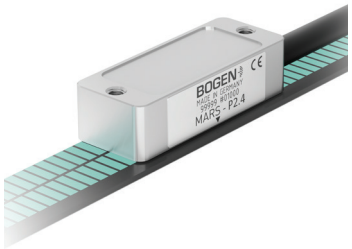
Absolute Magnetic Sensing Heads

BOGEN absolute encoders and the corresponding magnetic scales offer cost-efficient solutions for industrial applications where positions and motions have to be measured with a high degree of accuracy and reliability, even in harsh environments. All encoders are available for linear, rotary-radial or rotary-axial measurement and include multiple sensor output protocols. Small dimensions ensure implementation even in confined spaces.

	 AKS16	 AKS16-MT	 AKS17
description	• for two-track scales • linear and rotary applications	• for two-track scales • linear and rotary applications	• for three track magnetic scales • linear and rotary applications
max. resolution	• up to 0.15 µm • 18 to 20 bit absolute resolution • 18 bit incremental resolution	• 18 to 20 bit single-turn • up to 28 bit multi-turn	• 21 - 24 bit absolute resolution • 18 bit incremental resolution
distance sensor/scale	• 0.4 - 0.6 mm, depending on pole pitch	• 0.4 mm	• 0.4 - 0.5 mm, depending on pole pitch
movement speed	• up to 28 m/s • 6.000 - 24.000 rpm, depending on resolution	• 6.000 - 24.000 rpm, depending on resolution	• up to 21 m/s • 375 - 3.000 rpm, depending on resolution
output signals interface	• absolute: BISS-C, SSI • incremental: ABZ, UVW, STEP, CW/CCW	• absolute: BISS-C, SSI • incremental: sin/cos 1 V_{PP}	• absolute: BISS-C, SSI • incremental: ABZ, UVW, STEP, CW/CCW
power supply	• 5 V ± 5 %	• 5 V ± 5 %	• 5 V ± 5 %
electric connections	• FFC 12 pin • Molex 12pin	• Molex 12pin	• FFC 12 pin • Molex 12 pin
dimensions	• 1.28 and 1.50 mm pole pitch: FFC: 24.2 x 16 x 3.6 mm Molex: 24.2 x 16 x 6.6 mm • 2 mm pole pitch: FFC: 28 x 16 x 3.4 mm Molex: 28 x 16 x 6.6 mm	• 24.2 x16 x6.6 mm	• FFC: 28 x 16 x 3.4 mm • Molex: 28 x 16 x 6.6 mm
max. operating temperature	• -25 to + 85 °C (-13 to +185 °F)	• -25 to + 85 °C (-13 to +185 °F)	• -25 to + 85 °C (-13 to +185 °F)
IP code	• IP67 (with FFC connector)	• IP67 (except connector)	• IP67 (with FFC connector)
applications	• robotics and handling systems • factory automation • electro-medical devices	• robotics and handling systems • factory automation • electro-medical devices	• robotics and handling systems • factory automation • electro-medical devices

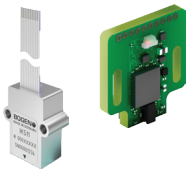
Absolute Magnetic Sensing Heads

BOGEN absolute encoders and the corresponding magnetic scales offer cost-efficient solutions for industrial applications where positions and motions have to be measured with a high degree of accuracy and reliability, even in harsh environments. All encoders are available for linear, rotary-radial or rotary-axial measurement and include multiple sensor output protocols. Small dimensions ensure implementation even in confined spaces.

			
	AKP18	**ALS21**	**MARS**
description	• space-saving implementation • daisy-chainable with wire to board connector	• linear applications • absolute measuring	• Multi Adaptive Range Sensor • high resolution absolute sensing • virtually unlimited ring sizes and tape lengths
max. resolution	• up to 0.15 µm • 18 - 20 bit absolute resolution	• up to 1 µm	• up to 0.25 µm • max. 40 bits
distance sensor/scale	• 0.4 - 0.6 mm, depending on pole pitch	• 0.1 - 0.6 mm	• 0.1 - 1.2 mm
movement speed	• 6.000 - 24.000 rpm, depending on resolution • up to 28 m/s	• 1.4 - 7 m/s, depending on resolution	• up to 24000 rpm • up to 10 m/s
output signals interface	• absolute: BISS-C, SSI	• absolute: SSI, BiSS-C • incremental: NPN o.c. (AB)	• absolute: SSI, BiSS-C • incremental: 1 V_{PP}
power supply	• 5 V ± 5 %	• 5 Vdc ± 5 %	• 5 Vdc ± 5 %
electric connections	• FFC 10 pin, 0.5 mm pitch • wire to board	• Hi-flex cable M8 2,0 m or M12 8 pin inline plug	• Hi-flex cable, length 2 m
dimensions	• 22.5 x 6 x 3.9 mm (1.28 and 1.50 mm pole pitch) • 22.5 x 8 x 3.9 mm (2.00 mm pole pitch)	• 62 x 25 x 14 mm	• 29 x 14 x 8 mm
max. operating temperature	• -25 to + 100 °C (-13 to +212 °F)	• -25 to +85 °C (-13 to +185 °F)	• -25 to +85 °C (-13 to +185 °F)
IP code	• IP00	• IP67	• IP67
applications	• robotics and handling systems • factory automation • electro-medical devices	• linear motors • factory automation	• linear motors • torque motors • handling systems

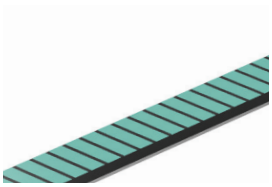
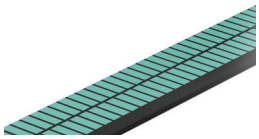
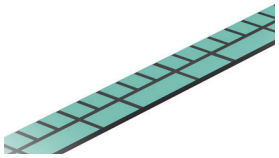
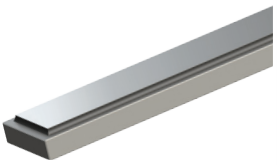
Incremental Magnetic Sensing Heads

BOGEN offers compact incremental magnetic sensing heads featuring extremely high accuracy and a particularly high degree of modularity. They deliver reliable measuring results even for fast movement speeds and an almost unlimited measuring length. BOGEN sensing heads come with a robust design for customers in automation, instrumentation and motion control applications. Several adjustable parameters allow easy modification of the sensing heads to application-specific needs.

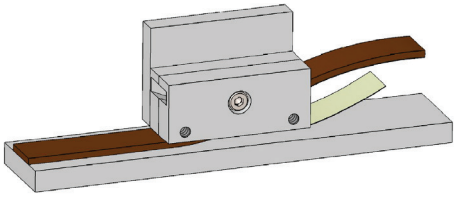
				
	IKS9 / IKS9.1	**IKS11/ IKP11**	**IKS15 / IKS15.1**	**IKS23**
description	• high performance encoder for high speed measuring • linear and rotary applications • available in plastic or die cast housing	• compact size • linear and rotary applications • for scales with or without index mark	• fast analog output interface (1 Vpp, 2 Vpp) • non-contact quick position measurement	• linear and rotary applications • non-contact quick position measurement
max. resolution	• 0.02 to 500 µm, depending on pole pitch	• 0.02 to 500 µm, depending on pole pitch and interpolation	• depending on pole pitch	• 0.5 - 50 µm
distance sensor/scale (mm)	• 0.1 to 2.5, depending on pole pitch	• 0.1 to 2.5, depending on pole pitch	• 0.1 to 2.5, depending on pole pitch	• 0.1 - 2.0 mm • depending on pole pitch and cover tape
movement speed	• > 100 m/s, depending on pole pitch, resolution and max. output frequency	• >100 m/s, depending on pole pitch, resolution and max. output frequency	• up to 5000 m/s, depending on pole pitch	• max. 16 m/s
output signals interface	• Line Driver RS422 • Push-Pull (TTL)	• TTL	• sin/cos 1 V_{PP} • sin/cos 2 V_{PP}	• Line Driver RS422 • Push-Pull (HTL)
power supply	• 5 V ± 5 %	• 5 V ± 10% (3.3 V on request)	• 5 V ± 5 %	• + 5 Vdc ± 5%, • + 10 - 30 Vdc
electric connections	• cable • cable + DSub/MI2 inline connector	• FFC connector • solder pads	• cable • cable + DSub/MI2 inline connector	• cable • cable + MI2 inline connector
dimensions (mm)	• IKS9 (plastic housing): 9 x 13.6 x 35 • IKS9.1 (die cast housing): 11 x 14.1 x 36	• 15.8 x 15.4 x 4.5 (FFC connector, solder pads) • 15.8 x 13.4 x 4.5 (FFC connector) • 7.8 x 13.4 x 4.5 (FFC connector)	• IKS9 (plastic housing): 9 x 13.6 x 35 • IKS9.1 (die cast housing): 11 x 14.1 x 36	• 10 x 25.4 x 40
max. operating temperature	• - 25 to + 85 °C (-13 to +185 °F)	• - 40 to + 125 °C (-40 to + 257 °F)	• - 25 to + 85 °C (-13 to +185 °F)	• - 25 to + 85 °C (-13 to +185 °F)
IP code	• IP67	• IKP11: IP00 • IKS11: IP67	• IP67	• IP67
applications	• linear motors • printing • factory automation	• robotics and handling systems • automation • medical technology	• linear motors • printing • factory automation	• linear motors • factory automation

Linear Magnetic Scales

BOGEN's extensive portfolio of linear magnetic scales ensure highly reliable and accurate results up to 3 microns wherever positions and motions have to be measured. They are resistant against humidity, contamination, temperature fluctuations and vibrations and therefore ideal for use in harsh industrial environment.

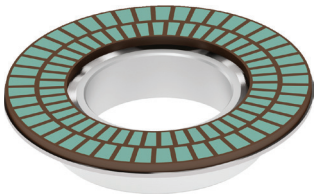
	 Linear Magnetic Scale Incremental LMSI	 Linear Magnetic Scale Absolute Nonius LMSN	 Customized Incremental and Absolute Scales	 Linear Magnetic Scale Bar Incremental LMSB
accuracy class	• ± 3 µm, ± 10 µm, ± 20 µm, ± 40 µm, ± 100 µm	• ± 3 µm, ± 10 µm, ± 20 µm	• ± 3 µm, ± 10 µm, ± 20 µm, ± 40 µm, ± 100 µm • others on request	• ± 3 µm/m, ± 10 µm/m, ± 20 µm/m
material	• elastomer-bonded ferrite	• elastomer-bonded ferrite	• depending on application	• elastomer-bonded ferrite
width	• 5, 6, 8, 10, 12, 15, 20, 25 ±0.2 mm (others on request)	• 2 tracks: 6, 8, 10 mm • 3 tracks: 12, 15, 20 mm	• 5, 6, 8, 10, 12, 15, 20, 25 ±0.2 mm (others on request)	• 5, 6, 8, 10, 12, 15, 20, 25 ±0.2 mm (others on request)
length	• max. 100 m	• 2 tracks: max. 256 mm • 3 tracks: max. 2300 mm	• n.a.	• max. 2000 mm
thickness	• 0.5 to 1.66 mm (depending on scale setup)	• 0.5 to 1.66 mm (depending on scale setup)	• 0.5 to 1.66 mm (depending on scale setup)	• 0.5 to 1.66 mm (depending on scale setup)
pole pitch	• from 0.5 - 20 mm	• 1.28 mm • 1.5 mm • 2 mm	• custom code pattern	• custom code pattern
operating temperature	• - 20 °C to + 100 °C max.	• - 20 °C to + 100 °C max.	• depending on material	• - 20 °C to + 100 °C max.
mounting holes	• div. options available	• div. options available	• div. options available	• div. options available

Accessories

 Aluminum Extrusion Profile	 Scale Applicator
• material: aluminum	• for easier application of long linear scales
• width: 20 mm (for scale width of 8 mm)	
• length: max. 6000 mm	
• thickness: 4 mm	
• div. options available	

Rotary Magnetic Scales

Motion control and angle measuring have never been easier and more reliable with BOGEN's rotary magnetic scales. Different magnetic and hub materials and customizable dimensions ensure that our rotary scales suit various tasks and applications.

	 Rotary Magnetic Scale Incremental RMSI	 Rotary Magnetic Scale Nonius RMSN	 Custom Rotary Scales
outer diameter	• from Ø 14 mm	• from Ø 15 mm	• custom size
inner diameter	• from Ø 8 mm	• from Ø 3 mm	• custom size
magnetic pattern/ # tracks	• incremental tracks • reference track • multiple tracks	• master, nonius, segment	• pseudo random code • incremental tracks • special code pattern
hub (incl./without)	• with or without hub • available hub materials: steel, aluminum, sheet metal	• available hub materials: steel, aluminum, sheet metal	• with or without hub • available hub materials: steel, aluminum, sheet metal
magnet material	• hard ferrite • elastomer bonded ferrite • vulcanized ferrite • plastoferrite	• hard ferrite • elastomer bonded ferrite • vulcanized ferrite • plastoferrite	• hard ferrite • elastomer bonded ferrite • vulcanized ferrite • plastoferrite
accuracy	• min. ± 25 arcsec., depending on outer diameter	• min. ± 25 arcsec., depending on outer diameter	• min. ± 25 arcsec., depending on outer diameter
pole pitch	• from 0.5 - 20 mm	• 1.28, 1.5, 2 mm	• custom size
operating temperature	• - 40 to 250 °C (-40 to 482 °F), depending on magnetic material	• - 40 to 250 °C (-40 to 482 °F), depending on magnetic material	• - 40 to 250 °C (-40 to 482 °F), depending on magnetic material

Where to Find Us

BOGEN has a distribution network with subsidiaries and partner companies worldwide.

This is how we ensure competent and technical support on site

BOGEN

Magnetics that count

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