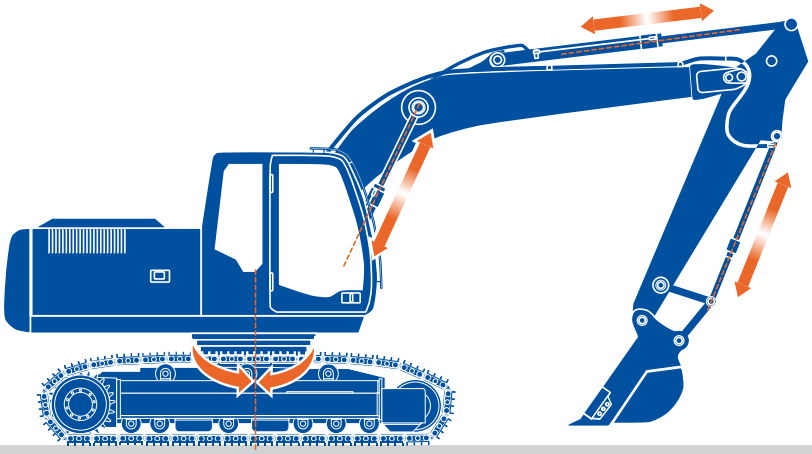
ASM®

perfect in sensors.

Sensor Solutions

Product Overview



DISPLACEMENT

ANGLE

INCLINATION

Robust Sensor Solutions for Displacement, Angle and Inclination.

Tailored to your requirements
The specialists at ASM have been developing robust sensors for displacement, angle and inclination for over 40 years. Thanks to innovative sensor technologies, ASM sensors can cope with harsh environmental conditions such as moisture, dirt, intensive cleaning, extreme temperature fluctuations, shock and vibration.

Robust components, long service life
All ASM sensors make use of innovative technologies. Contactless and wear-free measuring methods make ASM sensors robust against environmental influences and guarantee a long service life. Special solutions such as patented longitudinal water protection for the critical point of cable entry and hermetically sealed housings ensure functional reliability and measuring accuracy even under the most difficult operating conditions, as encountered by mobile machines, for instance.

ASM encoder technology
Encoder technologies currently available on the market quickly reach their limits under harsh operating conditions. ASM has therefore developed the magnetic absolute encoder technology posi**hall**®. The technology is so robust that the sensors even function when the housing is filled with water or oil. The true-absolute technology also ensures that correct measurement results are displayed immediately after a power failure. The product lines posi**tape**® and posi**wire**® are equipped with this technology.

ISO-certified quality management
The quality management system certified according to DIN EN ISO 9001:2015 and the use of state-of-the-art production technologies guarantee consistently high product quality – all day, every day, for every job.

Product Range

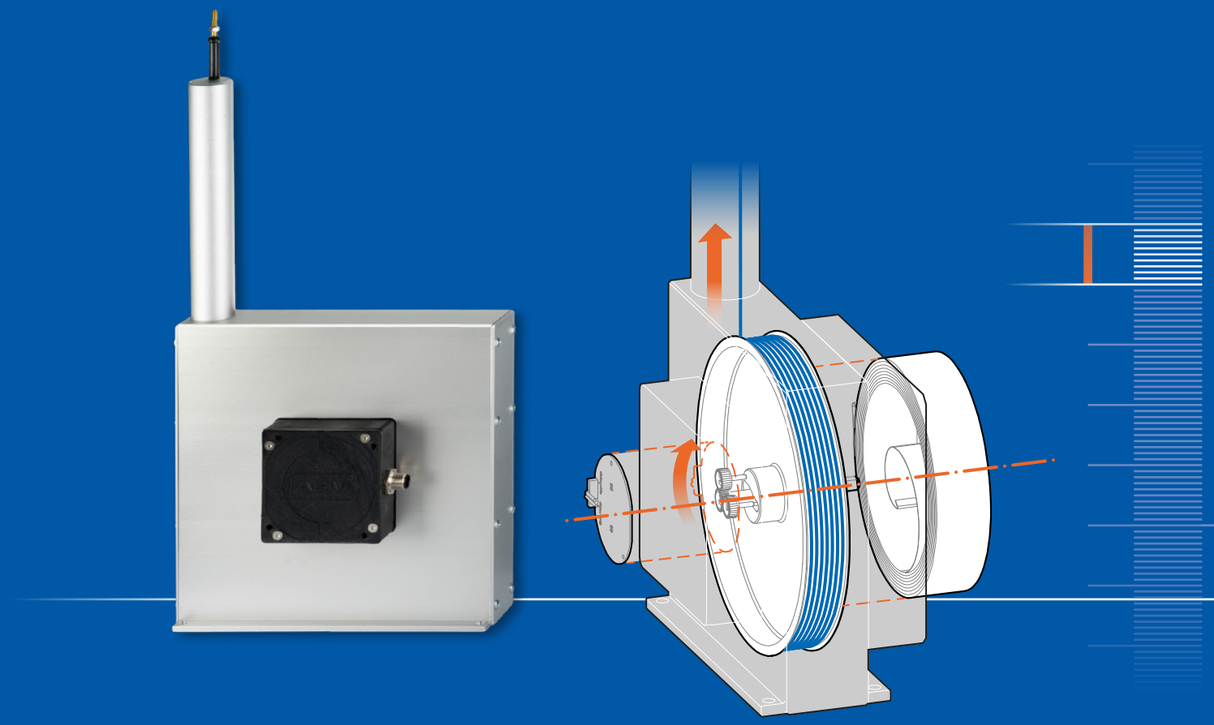
posiwire®

Cable Extension Position Sensors

The new generation of sensors. More robust than ever.

The new generation of posi**wire**® cable extension sensors with magnetic absolute encoders is significantly more robust than conventional cable sensors: The contactless magnetic Multi-Hall encoder technology is wear-free and far superior to optical encoders and potentiometer solutions – particularly in challenging environmental conditions.

The new generation of sensors is available with redundant encoder systems and also features models with optical encoders or potentiometers. The latest additions to the range include models with an integrated inclination sensor.



The technology

posi**wire**® cable extension sensors determine linear position by unrolling a measuring cable. This process incorporates the magnetic absolute encoder system in the new posi**wire**® sensors, which generates the readings of the cable drum rotation. The sensor electronics then convert the signal into conventional, industry-standard output types.

The applications

posi**wire**® cable extension sensors are used in applications where the precise positions of components that move linearly must be determined.

posi**wire**® sensors are also suitable for use in challenging environments. They ensure reliable operation in many areas of automation, process technology, industry and research, such as:

- Handling systems
- Elevator technology
- Lifting, conveying and storage technology
- Medical technology

NEW: Models with integrated inclination sensor (see page 8)

The advantages

- More robust than conventional cable sensors thanks to magnetic absolute encoders
- Degree of protection up to IP68/IP69
- Resistant to shock and vibration
- Linearity up to 0.01%
- Measurement length up to 40,000 mm

posiwire®

Cable Extension Position Sensors

Displacement

Measurement length	up to 40,000 mm
Linearity	up to 0.01%
Degree of protection	up to IP68/IP69
Sensor element	Magnetic absolute encoder
	Precision potentiometer
	Optical encoder

Measurement length up to 3,000 mm

WS31

Measurement length	750 mm
Linearity	to ±0.20%
Degree of protection	IP50
Explosion protection (dust) II 3D Ex tc IIIC T80 °C Dc X	–
Magnetic absolute encoder	
Voltage, current, SSI, CANopen, SAE J1939	–
Redundant version (except SSI)	–
Precision potentiometer	
Voltage divider 1 kΩ/10 kΩ, voltage, current	●
Voltage, current programmable	–
Optical encoder	
SSI, CANopen, SAE J1939, Profibus, Profinet, DeviceNet	–
Incremental (TTL, HTL, RS422)	●

WS42

Measurement length	1,000 mm
Linearity	to ±0.20%
Degree of protection	IP50
Explosion protection (dust) II 3D Ex tc IIIC T80 °C Dc X	–
Magnetic absolute encoder	
Voltage, current, SSI, CANopen, SAE J1939	–
Redundant version (except SSI)	–
Precision potentiometer	
Voltage divider 1 kΩ/10 kΩ, voltage, current	●
Voltage, current programmable	–
Optical encoder	
SSI, CANopen, SAE J1939, Profibus, Profinet, DeviceNet	–
Incremental (TTL, HTL, RS422)	●

WS10

Measurement length	2,000 mm
Linearity	to ±0.05%
Degree of protection	IP65
Explosion protection (dust) II 3D Ex tc IIIC T80 °C Dc X	●
Magnetic absolute encoder	
Voltage, current, SSI, CANopen, SAE J1939	●
Redundant version (except SSI)	–
Precision potentiometer	
Voltage divider 1 kΩ/10 kΩ, voltage, current	●
Voltage, current programmable	●
Optical encoder	
SSI, CANopen, SAE J1939, Profibus, Profinet, DeviceNet	–
Incremental (TTL, HTL, RS422)	●

WS12

Measurement length	3,000 mm
Linearity	to ±0.05%
Degree of protection	to IP67
Explosion protection (dust) II 3D Ex tc IIIC T80 °C Dc X	●
Magnetic absolute encoder	
Voltage, current, SSI, CANopen, SAE J1939	●
Redundant version (except SSI)	●
Precision potentiometer	
Voltage divider 1 kΩ/10 kΩ, voltage, current	●
Voltage, current programmable	●
Optical encoder	
SSI, CANopen, SAE J1939, Profibus, Profinet, DeviceNet	–
Incremental (TTL, HTL, RS422)	●

Measurement length 3,000 mm and higher

WS61

Measurement length	3,000 mm
Linearity	to ±0.05%
Degree of protection	to IP67/IP69
Explosion protection (dust) II 3D Ex tc IIIC T80 °C Dc X	–
Magnetic absolute encoder	
Voltage, current, SSI, CANopen, SAE J1939	●
Redundant version (except SSI)	●
Precision potentiometer	
Voltage divider 1 kΩ/10 kΩ, voltage, current	–
Voltage, current programmable	–
Optical encoder	
SSI, CANopen, SAE J1939, Profibus, Profinet, DeviceNet	–
Incremental (TTL, HTL, RS422)	–

WS85

Measurement length	6,000 mm
Linearity	to ±0.05%
Degree of protection	to IP67/IP69
Explosion protection (dust) II 3D Ex tc IIIC T80 °C Dc X	–
Magnetic absolute encoder	
Voltage, current, SSI, CANopen, SAE J1939	●
Redundant version (except SSI)	●
Precision potentiometer	
Voltage divider 1 kΩ/10 kΩ, voltage, current	–
Voltage, current programmable	–
Optical encoder	
SSI, CANopen, SAE J1939, Profibus, Profinet, DeviceNet	–
Incremental (TTL, HTL, RS422)	–

WS17KT

Measurement length	15,000 mm
Linearity	to ±0.05%
Degree of protection	IP64 (IP66)
Explosion protection (dust) II 3D Ex tc IIIC T80 °C Dc X	–
Magnetic absolute encoder	
Voltage, current, SSI, CANopen, SAE J1939	–
Redundant version (except SSI)	–
Precision potentiometer	
Voltage divider 1 kΩ/10 kΩ, voltage, current	●
Voltage, current programmable	●
Optical encoder	
SSI, CANopen, SAE J1939, Profibus, Profinet, DeviceNet	–
Incremental (TTL, HTL, RS422)	–

WS19KT

Measurement length	15,000 mm
Linearity	to ±0.01%
Degree of protection	IP64
Explosion protection (dust) II 3D Ex tc IIIC T80 °C Dc X	–
Magnetic absolute encoder	
Voltage, current, SSI, CANopen, SAE J1939	–
Redundant version (except SSI)	–
Precision potentiometer	
Voltage divider 1 kΩ/10 kΩ, voltage, current	–
Voltage, current programmable	–
Optical encoder	
SSI, CANopen, SAE J1939, Profibus, Profinet, DeviceNet	●
Incremental (TTL, HTL, RS422)	●

WS21

Measurement length	20,000 mm
Linearity	to ±0.05%
Degree of protection	to IP67/IP69
Explosion protection (dust) II 3D Ex tc IIIC T80 °C Dc X	–
Magnetic absolute encoder	
Voltage, current, SSI, CANopen, SAE J1939	●
Redundant version (except SSI)	●
Precision potentiometer	
Voltage divider 1 kΩ/10 kΩ, voltage, current	–
Voltage, current programmable	–
Optical encoder	
SSI, CANopen, SAE J1939, Profibus, Profinet, DeviceNet	–
Incremental (TTL, HTL, RS422)	–

WS7.5

Measurement length	40,000 mm
Linearity	to ±0.01%
Degree of protection	IP52
Explosion protection (dust) II 3D Ex tc IIIC T80 °C Dc X	–
Magnetic absolute encoder	
Voltage, current, SSI, CANopen, SAE J1939	●
Redundant version (except SSI)	●
Precision potentiometer	
Voltage divider 1 kΩ/10 kΩ, voltage, current	●
Voltage, current programmable	●
Optical encoder	
SSI, CANopen, SAE J1939, Profibus, Profinet, DeviceNet	●
Incremental (TTL, HTL, RS422)	●

WS100M

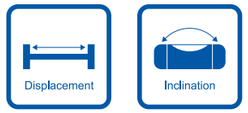
Measurement length	10,000 mm
Linearity	to ±0.05%
Degree of protection	IP68/IP69
Explosion protection (dust) II 3D Ex tc IIIC T80 °C Dc X	–
Magnetic absolute encoder	
Voltage, current, SSI, CANopen, SAE J1939	●
Redundant version (except SSI)	●
Precision potentiometer	
Voltage divider 1 kΩ/10 kΩ, voltage, current	●
Voltage, current programmable	●
Optical encoder	
SSI, CANopen, SAE J1939, Profibus, Profinet, DeviceNet	–
Incremental (TTL, HTL, RS422)	–

● Standard
● Optional

posiwire® WST

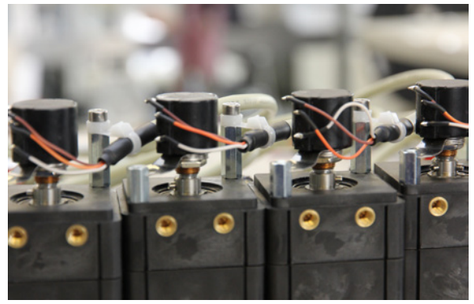
Cable Extension Position Sensors

With integrated inclination sensor



Measurement range	
Displacement	up to 20,000 mm
Inclination	±180°, with 1 axis
Linearity	
Displacement	up to ±0.05%
Inclination	up to 0.05°
Degree of protection	IP67/IP69
Digital outputs, absolute	CANopen
Sensor element	
Displacement	Magnetic absolute encoder
Inclination	MEMS component

From medical technology to combined displacement and inclination measurement in mobile machines: The posiwire® sensor range offers custom-tailored solutions.



Measurement length

	short	medium	long
	WST61	WST85	WST 21
Measurement length	3,000 mm	6,000 mm	20,000 mm
Redundant version	●	●	●

● Optional

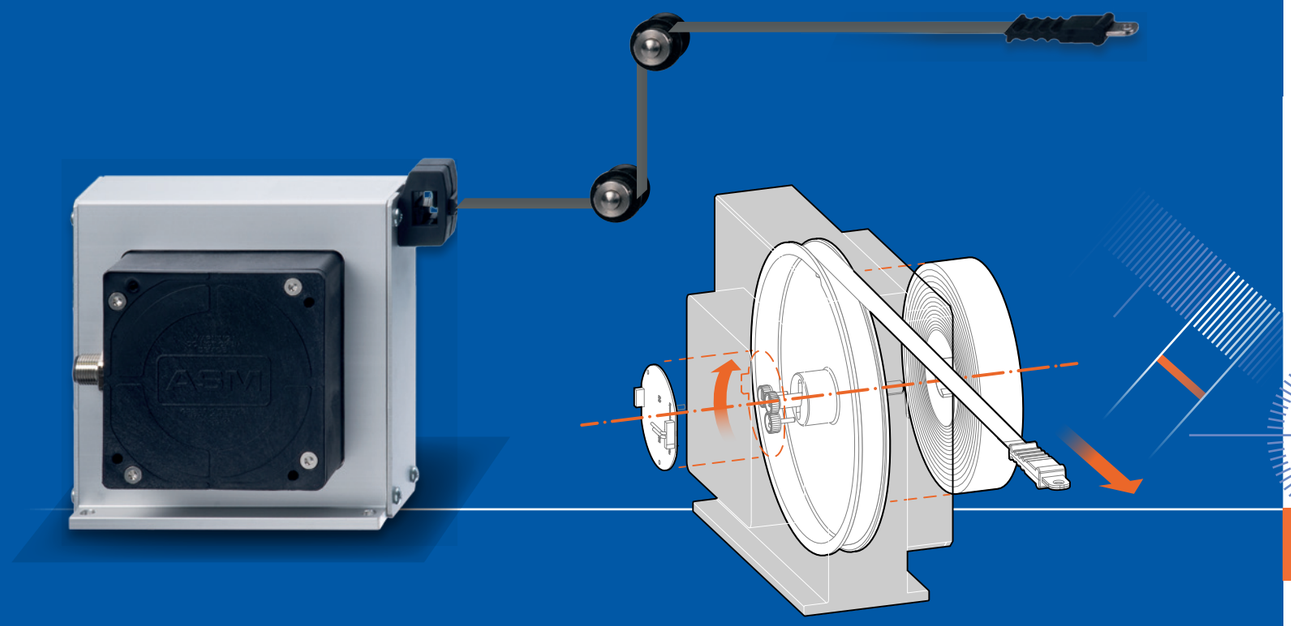
positape®

Tape Extension Position Sensors

Highly rugged.
Also suitable for pulleys.

posi**tape**® tape extension sensors measure linear positions using a robust, high-tech stainless steel measurement tape with a virtually infinite service life. The measurement tape can be deflected several times – even in opposite directions – without significant wear. posi**tape**® sensors are fitted exclusively with the new, robust absolute encoder technology. This makes posi**tape**® tape extension sensors the superior choice of technology for a range of applications, such as those in challenging environments, in areas at risk of icing over, and those in which the installation conditions require the use of pulleys.

The latest additions to the range include models with an integrated inclination sensor.



The technology

posi**tape**® tape extension sensors are based on the same principle as the posi**wire**® cable extension sensors. Instead of a cable extension, these rely on a high-tech, stainless-steel measurement tape that offers absolute position detection. Contactless, magnetic absolute encoders on the drum axle record the rotation. The interface electronics use this information to create conventional, industry-standard analog or digital output signals. The stainless-steel measurement tape can be redirected multiple times without suffering any notable wear.

The applications

posi**tape**® tape extension sensors are suited for many applications, especially for use in challenging environmental conditions, such as:

- Mobile machines
- Lifting and conveying technology
- Food and pharmaceuticals industry

The advantages

- Exceptionally long rugged measurement tape lifespan
- Multiple deflections possible – including in opposite directions
- Robust magnetic absolute encoder technology
- Degree of protection up to IP68/IP69
- Measurement length up to 20,000 mm

NEW: Models with integrated inclination sensor (see page 14)

positape®

Tape Extension Position Sensors

Linearity	up to ±0.05%
Degree of protection	up to IP68/IP69
Analog outputs	Voltage 0.5 ... 10 V
	Voltage 0.5 ... 4.5 V
	Current 4 ... 20 mA
	Voltage, current programmable (PMU)
Digital outputs, absolute	SSI
	CANopen
	SAE J1939
Sensor element	Magnetic absolute encoder

Displacement

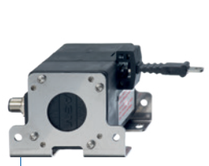
Standard industrial applications

WB10ZG

Measurement length: 2,000 mm

Degree of protection: IP65

Redundant version: –

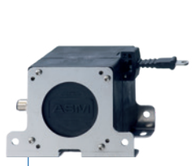


WB61

Measurement length: 4,000 mm

Degree of protection: to IP67/IP69

Redundant version: ●

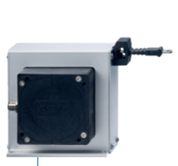


WB85

Measurement length: 6,000 mm

Degree of protection: to IP67/IP69

Redundant version: ●



WB21

Measurement length: 20,000 mm

Degree of protection: to IP67/IP69

Redundant version: ●

Heavy-duty industrial applications

WB12

Measurement length: 4,000 mm

Degree of protection: to IP67/IP69

Redundant version: ●

Underwater applications

WB100M

Measurement length: 10,000 mm

Degree of protection: IP68/IP69

Redundant version: ●

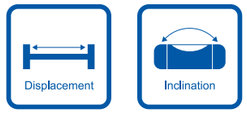
● Optional

positape® WBT

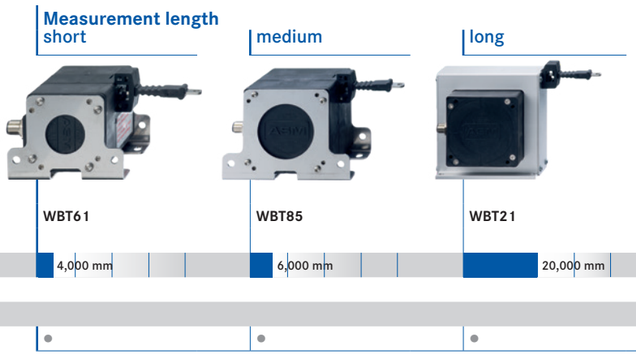
Tape Extension Position Sensors

With integrated inclination sensor

Measurement range	
Displacement	up to 20,000 mm
Inclination	±180 degrees with 1 axis
Linearity	
Displacement	up to ±0.05%
Inclination	up to 0.05°
Degree of protection	up to IP67/IP69
Digital outputs, absolute	CANopen
Sensor element	
Displacement	Magnetic absolute encoder
Inclination	MEMS component



Combined displacement and inclination sensors are suited for use in telescoping crane booms and in pharmaceutical production equipment, among other applications.



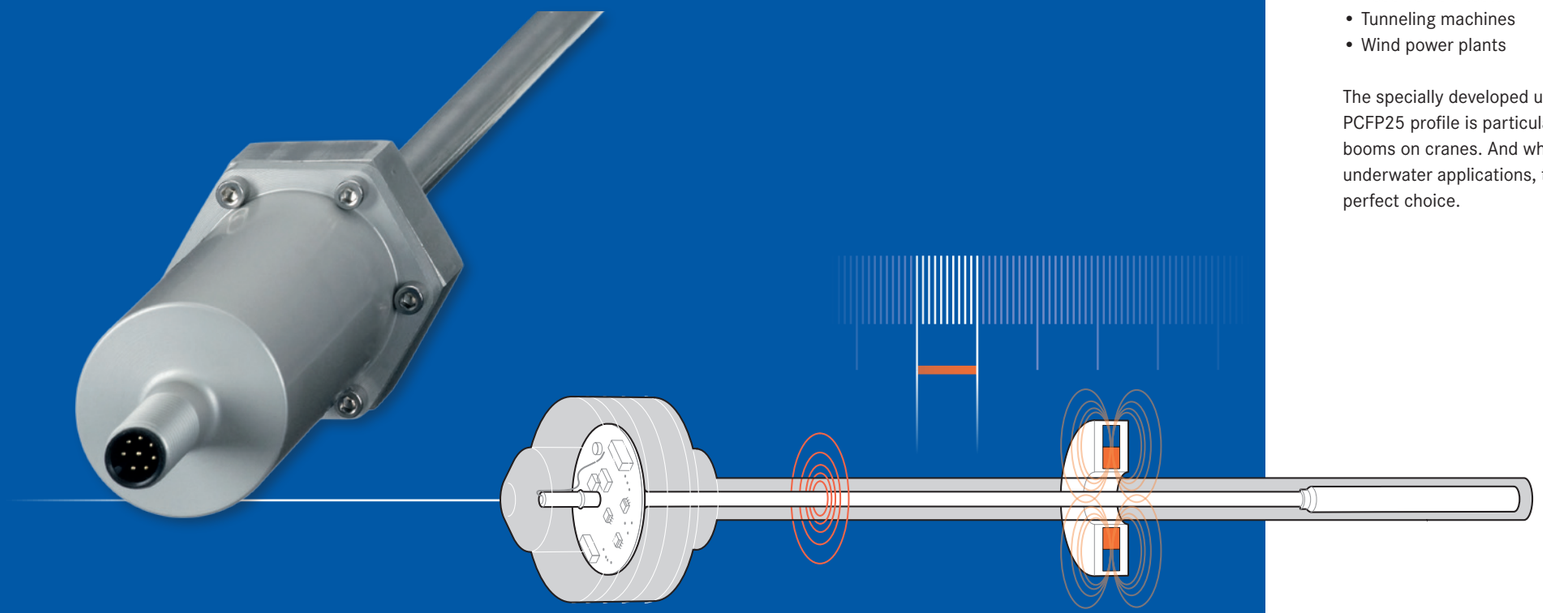
● Optional

posichron®

Magnetostrictive Position Sensors

Contactless.
Flexible installation.

posi**chron**® sensors offer absolute, contactless and wear-free measurement of linear positions. The posi**chron**® measurement system is extremely robust and offers a high level of shock resistance up to 50 g. This makes posi**chron**® also suitable for applications that other measurement principles simply cannot handle. The sensors are available in various designs, making them suitable for use in a wide range of installation conditions.



The technology

posi**chron**® sensors rely on the time-of-flight principle for determining positions. This involves the sensor sending an electromagnetic impulse through a magnetostrictive waveguide, which is reflected as a mechanical-elastic density wave by a movable position magnet. The position magnet can be accurately located using the time it takes for this wave to reach the sensor head. As the measurement takes place contactlessly, the sensor is not subject to wear and requires no maintenance. What's more, posi**chron**® sensors also offer a true-absolute measurement principle.

The applications

posi**chron**® position sensors are suitable for use in a wide range of applications, such as:

- Hydraulic cylinders and presses
- Level measurement systems
- Mobile machines
- Injection molding machines
- Road vehicle tests
- Tunneling machines
- Wind power plants

The specially developed ultra-flat posi**chron**® PCFP25 profile is particularly ideal for use in side booms on cranes. And when it comes to permanent underwater applications, the PCRP32 profile is the perfect choice.

The advantages

- Wear- and maintenance-free
- High level of shock resistance up to 50 g (100 shocks)
- Guiding distance of up to 19 mm (depending on magnet/profile)
- Degree of protection up to IP68/IP69
- Linearity up to 0.02% of the measurement range
- Measurement length up to 5,750 mm

posichron®

Magnetostrictive Position Sensors

Measurement range	100 ... 5,750 mm
Linearity	up to ±0.02%
Degree of protection	up to IP68/IP69
Analog outputs	Voltage 0.5 ... 10 V
	Voltage 0.5 ... 4.5 V
	Current 4 ... 20 mA
	Position and velocity programmable (PMU)
Digital outputs	SSI
	CANopen
	SAE J1939

Displacement

	Applications with tight installation spaces			Standard industrial applications			Underwater applications	Hydraulic and level measurement applications		
	PCFP23	**PCFP24**	**PCFP25**	**PCQA22**	**PCQA24**	**PCRP21**	**PCRP32**	**PCST24**	**PCST25**	**PCST27**
Profile cross-section										
	36 x 12 mm	43 x 12 mm	28 x 8 mm	35.5 x 37.25 mm	35.5 x 37.25 mm	Ø 25 mm	Ø 28 mm	Ø 10 mm	Ø 10 mm	Ø 10 mm
	Flat profile	Flat profile	Ultra-flat profile	Square profile	Square profile	Round profile	Round profile	Bar shape	Bar shape	Bar shape
Degree of protection										
	IP64	to IP67/IP69	to IP67	IP64	to IP67/IP69	IP64	IP68/IP69 (permanently pressure-resistant to 15 bar)	to IP67/IP69	to IP67/IP69	IP68/IP69 (permanently pressure-resistant to 15 bar)

posimag® lin

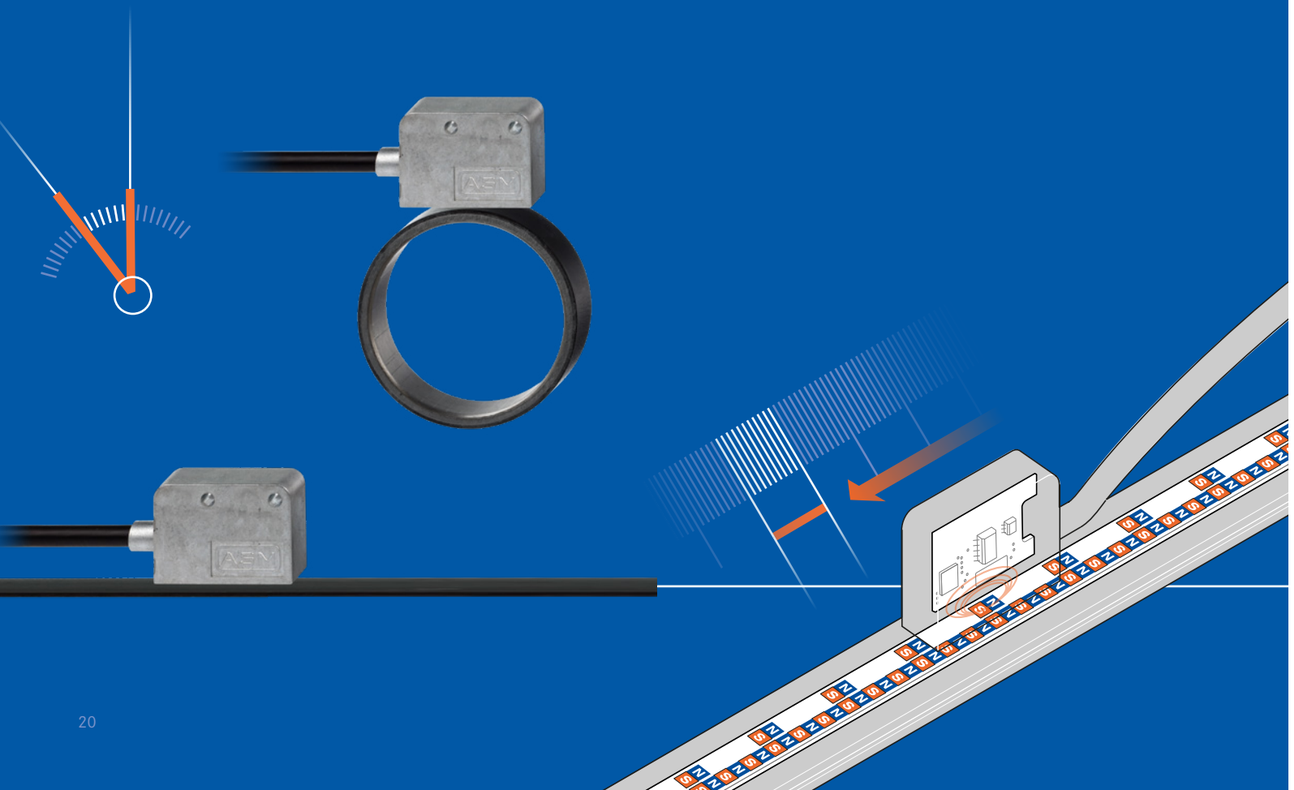
Magnetic Scale Position Sensors

posimag® rot

Magnetic Incremental Encoders

Contactless.
High resolution.

posi**mag**® is a contactless, high-resolution measurement system for measurement lengths of up to 30 meters (posi**mag**® **lin**) or angular positions of 0° to 360° (posi**mag**® **rot**). posi**mag**® sensors are robust, resistant to contamination and entirely wear-free, making them even suitable for use in challenging environmental conditions.



The technology

posi**mag**® sensors measure linear or rotary positions by means of a high-precision magnetic measurement principle. This involves the sensor head being moved along a measurement tape that is magnetized at regular intervals. This allows the measuring head to determine the position with resolutions of up to 1 micron.

The measuring principle is both contactless and wear-free, and different models are available both with and without sensor head guidance to suit a wide range of installation conditions.

The applications

posi**mag**® sensors are suitable for taking linear or rotative position measurements in industry applications – particularly those calling for a robust, wear-free solution, such as:

- Machine and plant engineering
- Precision engineering
- Handling systems

The advantages

- Contactless and wear-free
- Resistant to contamination
- Shielded metal housing
- Simple installation and adjustment
- Degree of protection IP67
- Measurement length up to 30,000 mm (posi**mag**® lin)
- Measurement range 0° to 360° (posi**mag**® rot)

posimag® lin

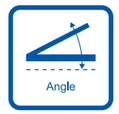
Magnetic Scale Position Sensors

Measurement range	0 ... 30,000 mm
Resolution	up to 1 µm
Linearity	up to 15 µm ±40 µm/m
Degree of protection (sensor head)	IP67
Digital outputs, incremental	HTL TTL

posimag® rot

Magnetic incremental encoders

Measurement range	0° ... 360°
Linearity	±0.1°
Degree of protection (sensor head)	IP67
Digital outputs, incremental	HTL TTL

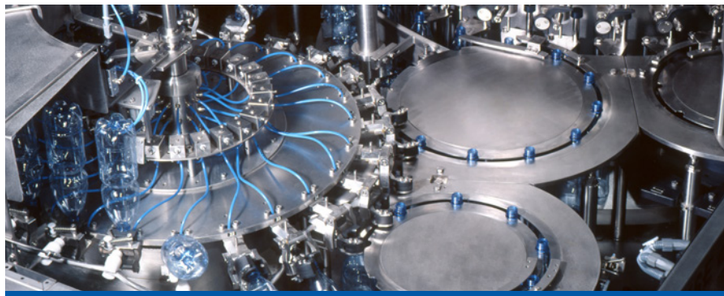


	Unguided sensor head	**Guided sensor head**	
			
	Sensor head PMIS3 **Magnetic tape PMIB3**	**Sensor head PMIS3** **Magnetic tape PMIB3** **Flat profile PMFP**	**Sensor head PMIS3** **Magnetic tape PMIB3** **High profile PMHP** **Slide carriage PMGW3**
Magnetic tape fastening method			
	Direct gluing	Pluggable flat profile	Pluggable high profile
Features			
Sensor head	●	●	●
Magnetic measurement tape	●	●	●
Flat profile	–	●	–
High profile	–	–	●
Slide carriage	–	–	●
Integrated linear guide	–	–	●

● Standard

	Patented slide-on assembly	**Screw mounting**
		
	Sensor head PMIS4 **Magnetic ring PMIR7**	**Sensor head PMIS4** **Magnetic ring PMIR5**
Assembly diameter		
	20, 27, 35, 50 mm	83, 133, 233 mm
Features		
Sensor head	●	●
Magnetic ring	●	●
Magnetic ring with hub	●	–

● Standard
● Optional



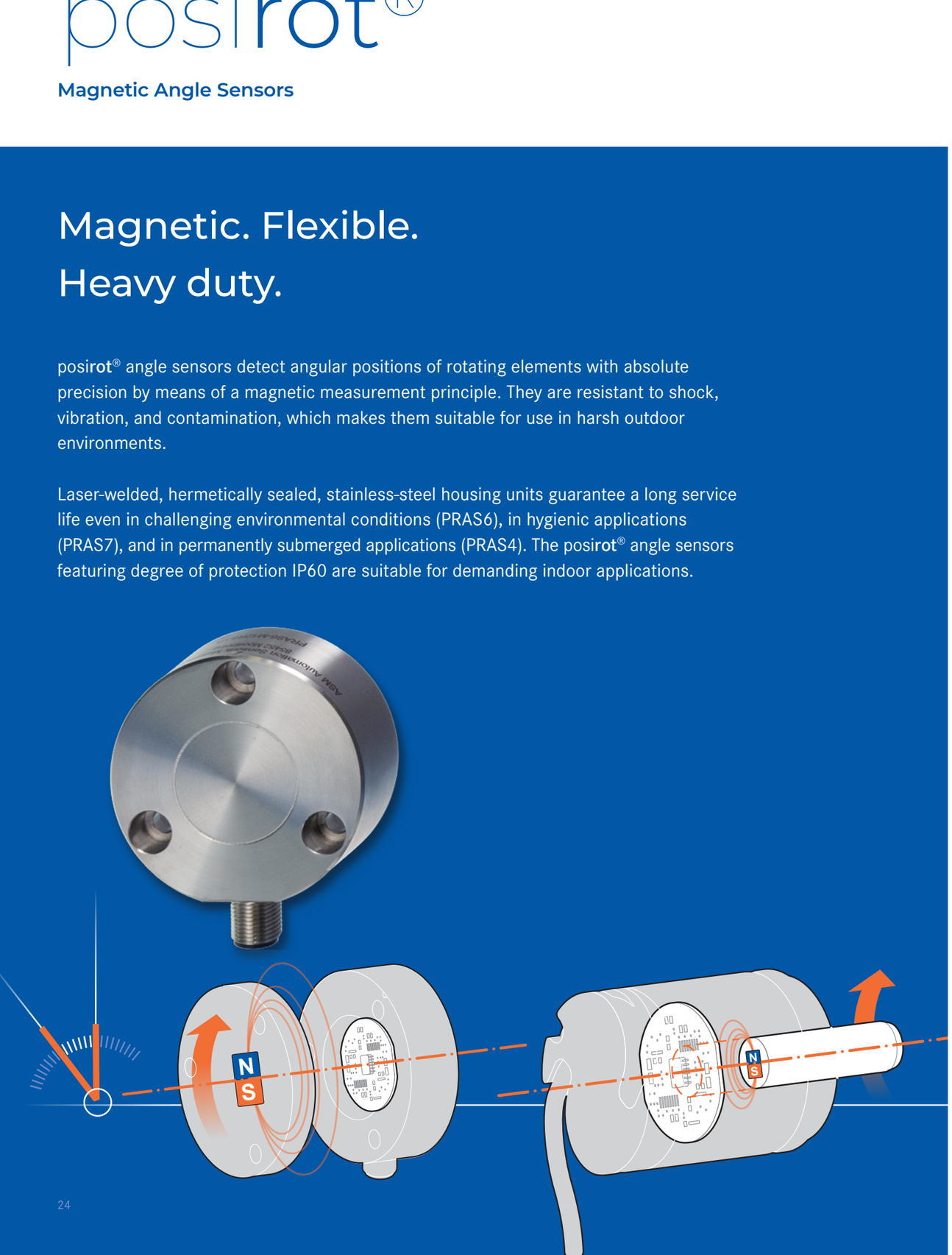
posirot®

Magnetic Angle Sensors

Magnetic. Flexible. Heavy duty.

posi**rot**® angle sensors detect angular positions of rotating elements with absolute precision by means of a magnetic measurement principle. They are resistant to shock, vibration, and contamination, which makes them suitable for use in harsh outdoor environments.

Laser-welded, hermetically sealed, stainless-steel housing units guarantee a long service life even in challenging environmental conditions (PRAS6), in hygienic applications (PRAS7), and in permanently submerged applications (PRAS4). The posi**rot**® angle sensors featuring degree of protection IP60 are suitable for demanding indoor applications.



The technology

posi**rot**® angle sensors rely on multi-Hall technology to take contactless and wear-free rotation measurements. This involves a magnetic measuring element being secured to the rotating component so that the change in magnetic field during rotation can be measured by a multi-Hall sensor. The sensor and magnet can either be integrated into a single housing or installed separately. The magnetic measurement method makes the sensor resistant to mechanical loads and contamination.

The applications

Depending on their design, posi**rot**® angle sensors are suitable for protected applications, such as:

- Large-scale medical equipment

With a robust housing, they are suitable for use in challenging environmental conditions, such as:

- Mobile machines
- Commercial vehicles
- Wind power plants
- Solar power systems

The advantages

- Measurement range 0° to 360°
- Contactless or with a 10 mm shaft
- Shock, vibration and dirt resistance
- Laser-welded, hermetically sealed housings available
- Degree of protection up to IP68/IP69

posirot®

Magnetic Angle Sensors

With analog output

Measurement range	0°... 360°
Linearity	up to ±0.3%
Degree of protection	up to IP67/IP69
Analog outputs	Voltage 0.5 ... 10 V
	Voltage 0.5 ... 4.5 V
	Current 4 ... 20 mA

Angle

	Protected applications				Standard industrial applications				Heavy-duty and hygienic applications				Underwater applications
	 **PRAS20**	 **PRAS20R**	 **PRAS21**	 **PRAS26**	 **PRAS27**	 **PRAS1**	 **PRAS2**	 **PRAS3**	 **PRAS29**	 **PRAS5**	 **PRAS6**	 **PRAS7**	 **PRAS4**
Linearity													
	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%	±0.3%	±0.3%	±0.3%	±0.5%	±0.3%	±0.3%	±0.3%	±0.3%
Degree of protection													
	IP60	IP60	IP60	IP60	IP67	to IP67/IP69	to IP67/IP69	to IP67/IP69	to IP69	IP67/IP69, optionally IP68	to IP67/IP69	to IP67/IP69	IP68 (permanently pressure-resistant to 10 bar)
Analog outputs													
Voltage 0.5 ... 10 V	●	–	–	●	●	●	●	●	●	●	●	●	●
Voltage 0.5 ... 4.5 V	●	●	●	●	●	●	●	●	●	●	●	●	●
Current 4 ... 20 mA	●	–	–	●	●	●	●	●	●	●	●	●	●
Redundant version	–	●	–	–	●	–	●	●	●	●	●	●	–

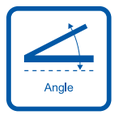
● Standard
● Optional

posirot®

Magnetic Angle Sensors

With explosion protection

Measurement range	0°... 360°
Linearity	±0.3%
Degree of protection	IP65
Analog outputs	Voltage 0.5 ... 10 V
	Voltage 0.5 ... 4.5 V
	Current 4 ... 20 mA
Explosion protection (dust)	Ⓔx II 3D Ex tc IIIC T80 °C Dc X



Applications in areas at risk of explosion

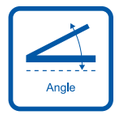
	PRAS2EX	PRAS3EX	PRAS5EX
Housing			
	Flat housing	Round housing	Flat housing
Diameter			
	Ø 36 mm	Ø 36 mm	Ø 48 mm

posirot®

Magnetic Angle Sensors

With digital output

Measurement range	0°... 360°
Linearity	±1°
Degree of protection	up to IP67/IP69



Standard industrial applications

Heavy-duty and hygienic applications

	PRDS27	PRDS1	PRDS2	PRDS3	PRDS29	PRDS5	PRDS6	PRDS7
Degree of protection								
	IP67	to IP67/IP69	to IP67/IP69	to IP67/IP69	to IP67/IP69	IP67/IP69, optionally IP68	to IP67/IP69	to IP67/IP69
Digital outputs, absolute								
SSI	–	●	●	●	–	●	●	●
CANopen	●	●	●	●	●	●	●	●
SAE J1939	●	–	●	●	●	●	●	●
Redundant version (CANopen/SAE J1939)	●	–	●	●	●	●	●	●
Digital outputs, incremental								
RS422	–	●	●	●	–	●	●	●
HTL	–	●	●	●	–	●	●	●

● Standard
● Optional

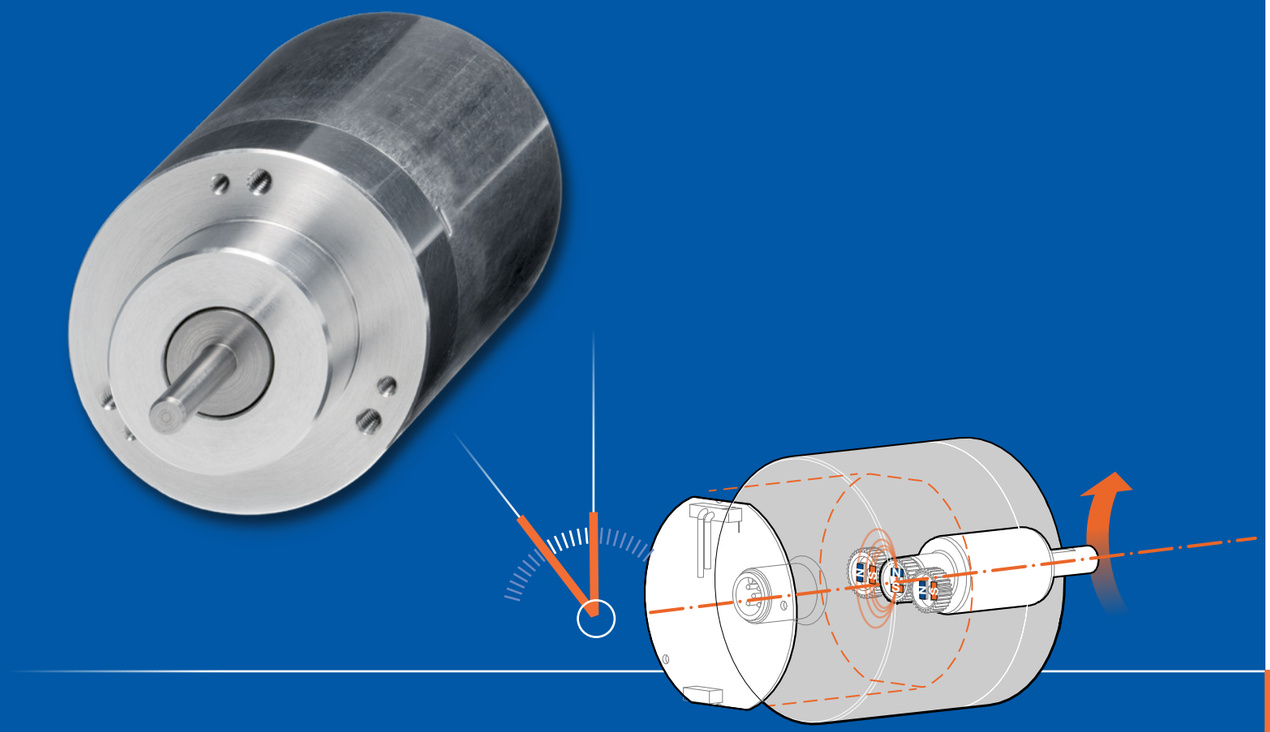
posihall®

Magnetic Multiturn Encoders

True-absolute. Highly rugged.

posi**hall**® magnetic multiturn encoders are the robust alternative to optical encoders, which often fall short in harsh conditions. posi**hall**® sensors measure angular positions over multiple revolutions with the help of a magnetic, true-absolute measurement principle. They are capable of maintaining failure-free, accurate functionality in the event of high vibrations, shocks, and temperatures between -40°C and +85°C. The robust housing complete with specially encapsulated electronics makes these sensors resistant to extreme environmental conditions and therefore the ideal solution for heavy-duty applications.

posi**hall**® sensors are also available with redundant outputs for safety-related applications.



The technology

posi**hall**® measure rotary angles by means of a contactless, magnetic measurement principle. Multiple mechanically coupled multihall sensors work together to measure up to 255 revolutions for a true-absolute position. This means that a correct measurement can always be displayed regardless of external interference – for example, after a power failure.

The applications

posi**hall**® multiturn encoders are suitable for applications such as:

- Mobile machines
- Packaging machines
- Food processing machines
- Offshore applications
- Solar and wind power plants

The advantages

- True-absolute measurement principle
- Measurement range
  31 x 360° (PH36)
  255 x 360° (PH58 and PH68)
- Shock, vibration and dirt resistance
- Integral shielding against magnetic fields
- Single-turn linearity 0.3%
- Degree of protection up to IP69

The robust alternative to optical encoders

posihall®

Magnetic Multiturn Encoders

Measurement range	up to 255 x 360°
Single-turn linearity	0.3%
Degree of protection	to IP67/IP69

Angle

Heavy-duty applications

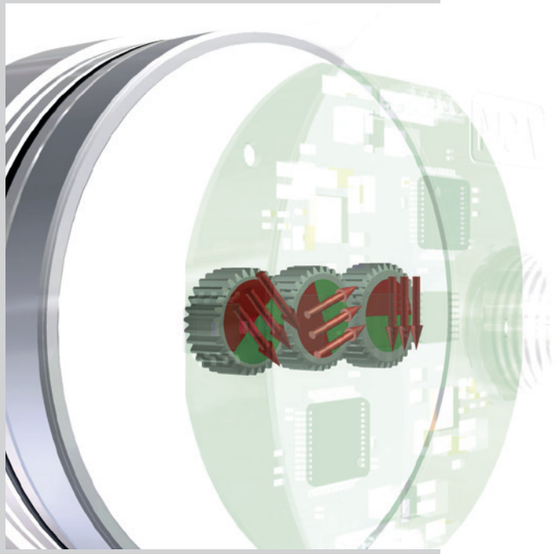
PH36

PH58

PH68

Measurement range			
	up to 31 x 360°	up to 255 x 360°	up to 255 x 360°
Housing diameter			
	36 mm	58 mm	68 mm
Analog outputs			
Voltage 0.5 ... 10 V	●	●	●
Voltage 0.5 ... 4.5 V, U_B = 5V	●	●	●
Voltage 0.5 ... 4.5 V, U_B = 8 ... 36 V	●	●	●
Current 4 ... 20 mA	●	●	●
Redundant version			
with one plug connector	–	●	–
with two separate plug connectors	–	–	●
Digital outputs, absolute			
SSI	●	–	–
CANopen	●	●	●
SAE J1939	●	●	●
Redundant version (CANopen/SAE J1939)			
with one plug connector	–	●	–
with two separate plug connectors	–	–	●

● Standard
● Optional



posi**hall**® sensors offer true-absolute measurement of rotary angles. This means that direct measurements can be taken even in the range above 360°, without incrementation or signal storage. As a result, correct measurements are still available even after a supply voltage failure.

This is achieved due to the gear coupling of several multihall sensors that work together according to the nonius principle. Their signals are offset against each other and reveal the total number of revolutions, which makes for a possible measuring angle of up to 255 revolutions.

For heavy-duty applications

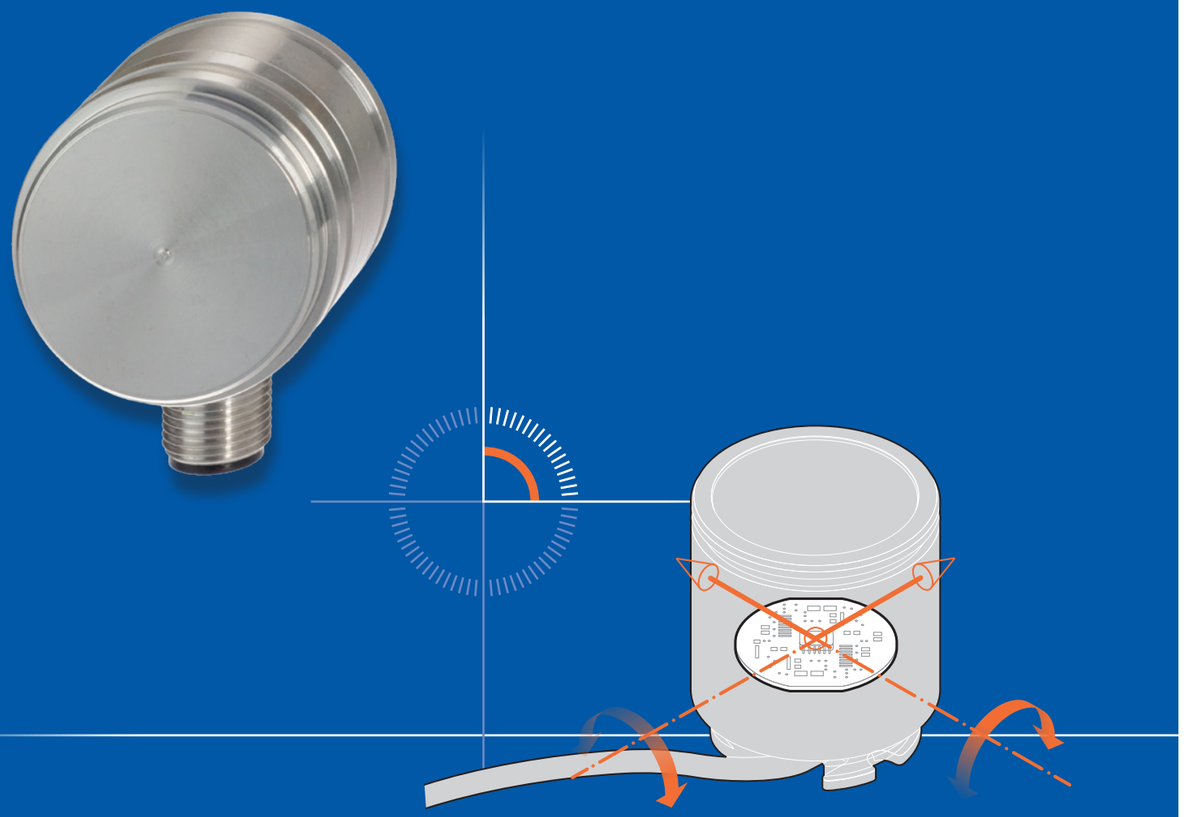
The magnetic measurement method and robust mechanical components make posi**hall**® sensors far superior to sensitive optical encoders in harsh environments. They are capable of functioning reliably and accurately when subjected to shocks and vibrations, and within a temperature range between -40°C and +85°C – even if water or oil manage to penetrate the housing.

positilt®

Inclination Sensors

Micromechanical. Wear-free.

positilt® inclination sensors offer contactless, wear-free and absolute measurement of tilt angles ranging from 0° to ±180°. The use of MEMS technology makes these sensors particularly resistant to shock, vibrations and contamination. As a result, positilt® inclination sensors are particularly suited for heavy-duty applications. A hermetically sealed housing prevents the penetration of moisture even in the harshest environments.



The technology

positilt® inclination sensors rely on micro-electro-mechanical systems (MEMS) to measure tilt angles. They utilize spring-mass systems that determine the deflection of small test masses and thereby measure the inclination of the system. The interface electronics use this information to create conventional, industry-standard analog or digital output types.

The applications

positilt® inclination sensors are the ideal solution for determining the angle of tilt in environments that call for highly accurate measurement, monitoring, and constant adjustment of the title position.

- Mobile machines
- Commercial vehicles
- Solar and wind power plants
- General industrial applications

The range also includes hermetically sealed housing units for use in heavy-duty or hygienic applications.

The advantages

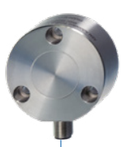
- Wear-free
- Measurement range ±180°
- Degree of protection up to IP68/IP69
- Impact resistant
- MEMS technology
- Single or dual axis measurement
- E1 approval on request (PTM27, PTM29)

positilt®

Inclination Sensors

Measurement range	±180°, 2 axes
Linearity	up to ±0.05°
Degree of protection	up to IP69
Analog outputs	Voltage 0.5 ... 10 V
	Voltage 0.5 ... 4.5 V
	Current 4 ... 20 mA

Inclination

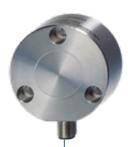
	Standard industrial applications		Heavy-duty and hygienic applications				Underwater applications
	 **PTM27**	 **PTAM2**	 **PTM29**	 **PTAM5**	 **PTAM6**	 **PTAM7**	 **PTAM4**
Linearity	up to ±0.05°	±0.5°	up to ±0.05°	±0.5°	±0.5°	±0.5°	±0.5°
Degree of protection	IP67	up to IP67/IP69	up to IP69	up to IP67/IP69	up to IP67/IP69	up to IP67/IP69	IP68 (permanently pressure-resistant to 10 bar)

positilt®

Inclination Sensors

Measurement range	±180°, 2 axes
Linearity	up to ±0.05°
Degree of protection	up to IP69
Digital outputs, absolute	CANopen
	SAE J1939

Inclination

	Standard industrial applications		Heavy-duty and hygienic applications			
	 **PTM27**	 **PTDM2**	 **PTM29**	 **PTDM5**	 **PTDM6**	 **PTDM7**
Linearity	up to ±0.05°	±0.5°	up to ±0.05°	±0.5°	±0.5°	±0.5°
Degree of protection	IP67	up to IP67/IP69	up to IP69	up to IP67/IP69	up to IP67/IP69	up to IP67/IP69

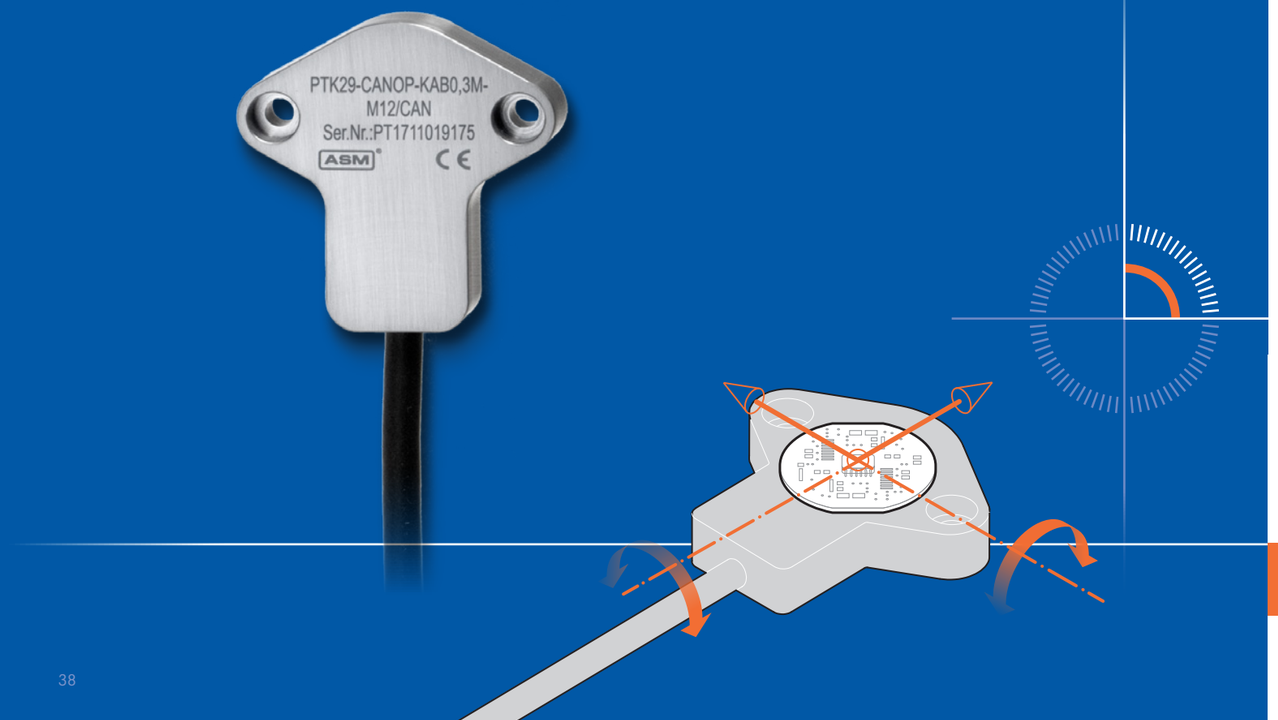
positilt® PTK

Gyro-compensated Inclination Sensors

Dynamic. Highly rugged.

Typical inclination sensors deliver incorrect measurement results in dynamic applications. positilt® **PTK** inclination sensors feature gyro-compensated MEMS technology that allows them to compensate for shock, vibration, and acceleration.

positilt® **PTK** sensors are available in two different stainless steel housing types. Both housing types are hermetically sealed, making them suitable for challenging environmental conditions.



The technology

positilt® **PTK** sensors rely on micro-electromechanical systems (MEMS) to measure the angle of tilt. They utilize spring-mass systems that determine the deflection of small test masses and thereby measure the inclination of the system. Outside influences such as shock, vibration and acceleration are eliminated through the use of gyro-compensated technology.

The applications

positilt® **PTK** inclination sensors are the ideal solution for dynamic applications, such as those found in mobile machines where movement, shock and vibration can impair the sensor accuracy. For applications involving harsh environmental conditions, positilt® **PTK** sensors are available in robust, hermetically sealed stainless steel housing.

New technology

The advantages

- Compensation for shock, vibration and acceleration
- Measurement range ±180° (2 axes)
- Static linearity up to 0.05°
- Hermetically sealed stainless steel housing
- Degree of protection up to IP69

positilt® PTK

Gyro-compensated Inclination Sensors

Measurement range	±180°, 2 axes
Linearity	up to ±0.05°
Degree of protection	up to IP69
Digital outputs, absolute	CANopen SAE J1939

Inclination

Heavy-duty and hygienic applications

PTK29

up to IP69

PTK6

up to IP67/IP69

PTK7

up to IP67/IP69

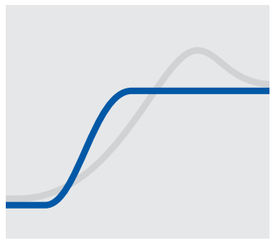
Dynamic inclination measurement

Inclination sensors are exposed to shock, vibration and acceleration in applications such as mobile machines. Under these influences, typical inclinometers will give incorrect values, affecting the sensor accuracy.

The sensor design of the posi**tilt**® PTK series compensates for these dynamic influences.

The sensors provide a static linearity up to 0.05°.

Compensated
Not compensated



Overview of degrees of protection as per DIN EN 60529

1st digit	Contact and foreign body protection
IP 0 ..	
	No protection
IP 1 ..	
	Size of the foreign body ≥ 50 mm
IP 2 ..	
	Size of the foreign body ≥ 12.5 mm
IP 3 ..	
	Size of the foreign body ≥ 2.5 mm
IP 4 ..	
	Size of the foreign body ≥ 1 mm
IP 5 ..	
	Dust protection
IP 6 ..	
	Dust-tight

2nd digit	Liquid ingress protection
IP .. 0	
	No protection
IP .. 1	
	Dripping water, vertical
IP .. 2	
	Dripping water, tilted
IP .. 3	
	Spraying water
IP .. 4	
	Splashing water
IP .. 5	
	Water jets
IP .. 6	
	Powerful water jets
IP .. 7	
	Temporary immersion, immersion depth and time must be specified!
IP .. 8	
	Continuous immersion, immersion depth and time must be specified!
IP .. 9	
	Powerful high-temperature water jets

How to contact us

Are you looking for a sensor solution for your application, do you have questions about a specific product, or would you like more detailed product information? We would be happy to talk things through and help you find the perfect sensor solution to suit your needs.

Europe:
Tel. +49 8123 986-0
info@asm-sensor.com

USA:
Tel. +1 630 832-3202
info@asm-sensor.com

perfect in sensors.

www.asm-sensor.com

Headquarters

ASM Automation Sensorik Messtechnik GmbH
Am Bleichbach 18 – 24
85452 Moosinning
Germany
Tel. +49 8123 986-0
info@asm-sensor.com

USA

ASM Sensors, Inc.
650 W. Grand Ave., Unit 205
Elmhurst, IL 60126
USA
Tel. +1 630 832-3202
info@asm-sensor.com

United Kingdom
Tel. +44 116 4030322
info@asm-sensor.co.uk

France
Tel. +33 3 8849-2535
france@asm-sensor.com

Italy
Tel. +49 8123 986-0
info@asm-sensor.com

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