



perfect in sensors.

# Product overview



## Displacement

**POSIWIRE®** Cable Extension Position Sensors

**POSITAPE®** Tape Extension Position Sensors

**POSICHRON®** Magnetostrictive Position Sensors

**POSIMAG®** Magnetic Scale Position Sensors



## Angle

**POSIROT®** Magnetic Angle Sensors

Magnetic Incremental Encoders

**POSIHALL®** Magnetic Multiturn Encoders



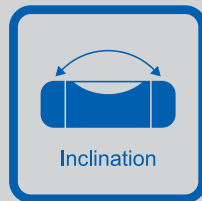
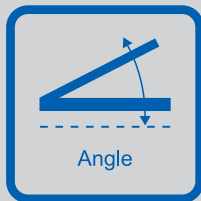
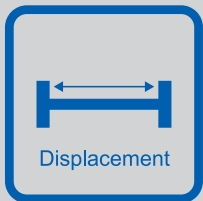
## Inclination

**POSITILT®** Gyro-compensated Inclination Sensors  
in MEMS Technology



# Innovative Sensor Solutions

## Displacement. Angle. Inclination.



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ASM Sensors offers innovative high-quality sensor solutions for displacement, angle and inclination. Based on more than 35 years of experience, ASM sensors has become a leading company in the development and production of position sensors. A unique product range of 7 product lines satisfies numerous application requirements.

### **Hightech made in Germany**

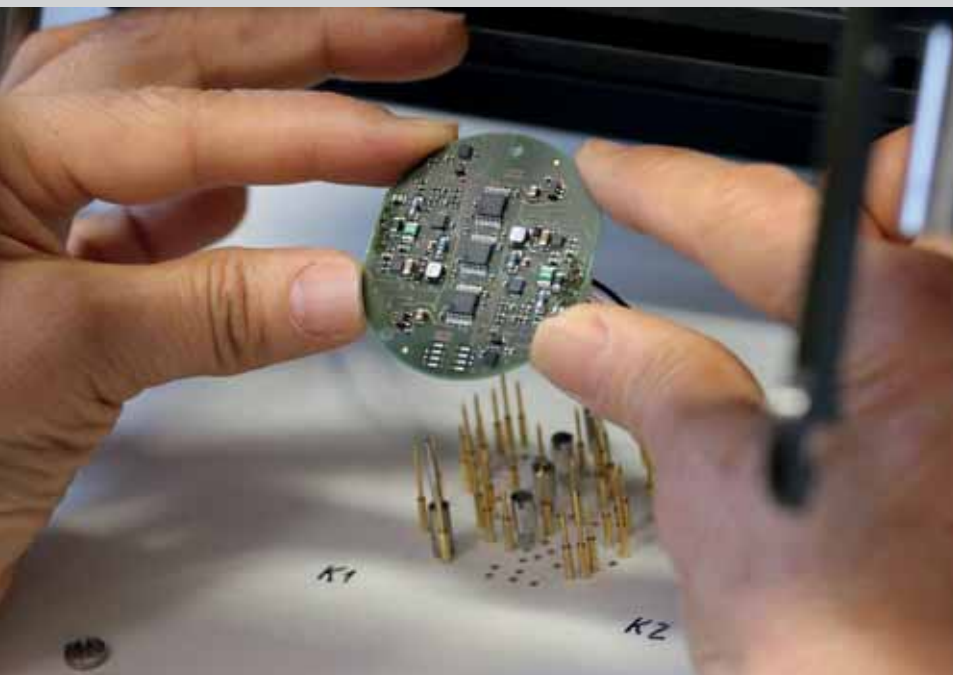
The company founded more than 35 years ago is today an innovation and development center for mechatronic High-Tech sensors. At the ASM global headquarters in Moosinning close to Munich the development of technology leading products is driven by close cooperation with research institutes and users. ASM's goal is always, to develop optimal solutions for application requirements and to continuously improve existing products.

### **Quality and Reliability**

ASM sensors are renowned for their superior quality ensuring smooth operations and consistent productivity. DIN EN ISO 9001:2008 certified quality management and the use of the most modern production technologies guarantee these high standards.

### **Your Partner Worldwide**

ASM is represented worldwide with a network of subsidiaries, sales offices and more than 30 distributors. The worldwide presence and involvement of local trained employees ensures closeness to customer and market needs and the quick availability of ASM products.



# POSIWIRE®

Cable Extension Position Sensors



## Proven concept. Now with new technology.

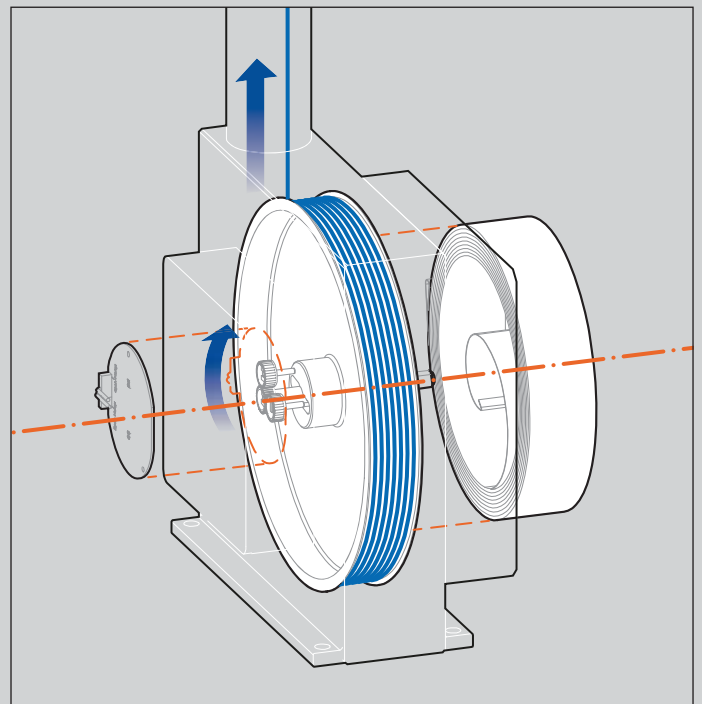
The new generation of POSIWIRE® Cable Extension Sensors takes a big leap forward in terms of robustness compared with conventional draw-wire sensors. The non-contact magnetic multihall-encoder-technology is wear-free and superior to optical encoders and potentiometers especially under harsh environmental conditions. The new sensor generation is available with redundant systems. Models with optical encoders or potentiometers are also available.

## new technology

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## The functional principle

POSIWIRE® Cable Extension Sensors determine linear position by unwinding a stainless steel cable from a drum that is under constant spring tension. The angular movement of the drum is captured by an angle sensor element. POSIWIRE® new generation sensors use robust magnetic absolute encoders. The sensor electronics convert the signal into a wide range of analog and digital output signals.

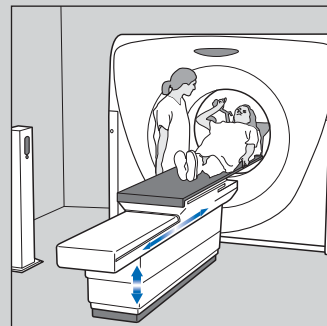


## Advantages at a glance

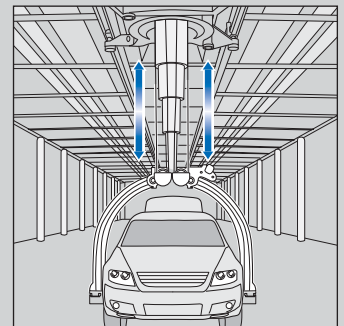
- With new technology more robust than conventional draw-wire sensors
- High environmental protection up to IP68/IP69
- Resistant to shock and vibration
- Linearity up to 0.01%
- Measurement range up to 40,000 mm

## Applications

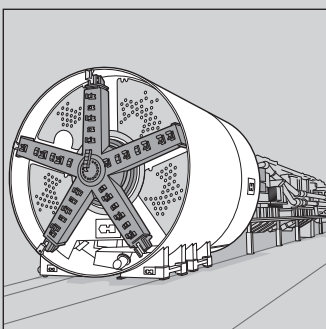
POSIWIRE® Cable Extension Sensors are used in applications where linear movements of elements have to be exactly positioned. The new generation POSIWIRE® sensors with magnetic absolute encoders are especially suited for use in harsh environments. The sensors assure reliable operation in many sectors of automation and processing as well as in the field of industry and research, e.g. in material handling systems, elevators, hoist and conveyor technologies, medical equipment and wind power plants.



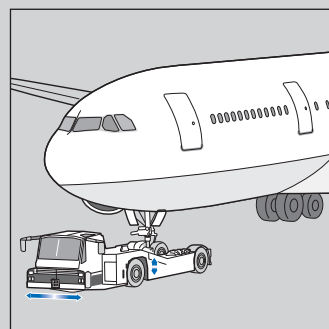
Magnetic resonance scanners



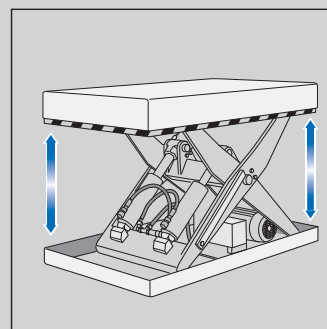
Overhead monorails



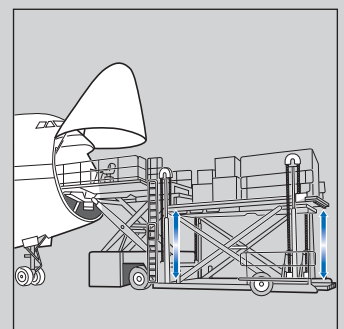
Tunneling machines



Aircraft tractors



Scissors lift tables



Cargo loaders



WS31 / WS42

WS10

WS12

WS17KT

WS19KT

Measurement range 0 to ... [mm]

40,000  
30,000  
25,000  
20,000  
17,500  
15,000  
**12,500**  
10,000  
8,000  
7,500  
6,250  
6,000  
5,000  
4,000  
**3,500**  
3,000  
2,500  
2,000  
1,500  
1,250  
1,000  
**750**  
500  
375  
250  
125  
100

	WS31 / WS42	WS10	WS12	WS17KT	WS19KT
<b>Sensing device</b>					
Precision potentiometer	●	●	●	●	
Encoder (optical)	●	●	●		●
<b>Magnetic multiturn encoder</b> <span style="background-color: orange; color: white; padding: 2px;">new</span>		●	●		
<b>Analog outputs</b>					
Potentiometer 1 kΩ/10 kΩ	●	●	●	●	
Voltage 0 ... 10 V (0.5 ... 10 V)	●	●	●	●	
Current 4 ... 20 mA	●	●	●	●	
programmable 0...10 V / 4...20 mA	–	●	●	●	
<b>Redundant version optional</b>			●		
<b>Incremental outputs</b>	TTL/HTL/RS422	TTL/HTL/RS422	TTL/HTL/RS422		TTL/HTL/RS422
<b>Digital outputs, absolute</b>					
SSI		●	●	●	●
Profibus					●
CAN / CANopen		●	●	●	●
DeviceNet					●
<b>Redundant version optional <sup>1)</sup></b>			●		
<b>Linearity</b>	up to ±0.20%	up to ±0.05%	up to ±0.05%	up to ±0.05%	up to ±0.01%
<b>Protection class</b>	IP50	IP65	IP67 <sup>2)</sup>	IP64 (IP66)	IP64
<b>Explosion protection (Dust-Ex)</b>		⊕ <sup>3)</sup>	⊕ <sup>3)</sup>		

<sup>1)</sup> = CAN / CANopen only

<sup>2)</sup> = connector version with a suitable connector

<sup>3)</sup> = Dust-Ex proof marking: II 3D Ex tc IIIC T80°C Dc X

new products



WS61



WS85



WS21



WS7.5



WS100M

					Measurement range 0 to ... [mm]
					40,000
					30,000
					25,000
					20,000
					17,500
					15,000
					<b>12,500</b>
					10,000
					8,000
					7,500
					6,250
					6,000
					5,000
					4,000
					<b>3,500</b>
					3,000
					2,500
					2,000
					1,500
					1,250
					1,000
					<b>750</b>
					500
					375
					250
					125
					100
					<b>Sensing device</b>
					Precision potentiometer
					Encoder (optical)
					<b>new</b> Magnetic multiturn encoder
					<b>Analog outputs</b>
					Potentiometer 1 kΩ/10 kΩ
					Voltage 0 ... 10 V (0.5 ... 10 V)
					Current 4 ... 20 mA
					programmable 0...10 V / 4...20 mA
					Redundant version optional
					TTL/HTL/RS422
					<b>Incremental outputs</b>
					<b>Digital outputs, absolute</b>
					SSI
					Profibus
					CAN / CANopen
					DeviceNet
					Redundant version optional <sup>1)</sup>
					<b>Linearity</b>
					up to ±0.05%
					up to ±0.05%
					up to ±0.05%
					up to ±0.01%
					up to ±0.05%
					<b>Protection class</b>
					IP67/IP69 <sup>2)</sup>
					IP67/IP69 <sup>2)</sup>
					IP67/IP69 <sup>2)</sup>
					IP52
					IP68/IP69
					<b>Explosion protection (Dust-Ex)</b>



# POSITAPE®

Tape Extension Position Sensors



## Very robust. Also for applications with pulleys.

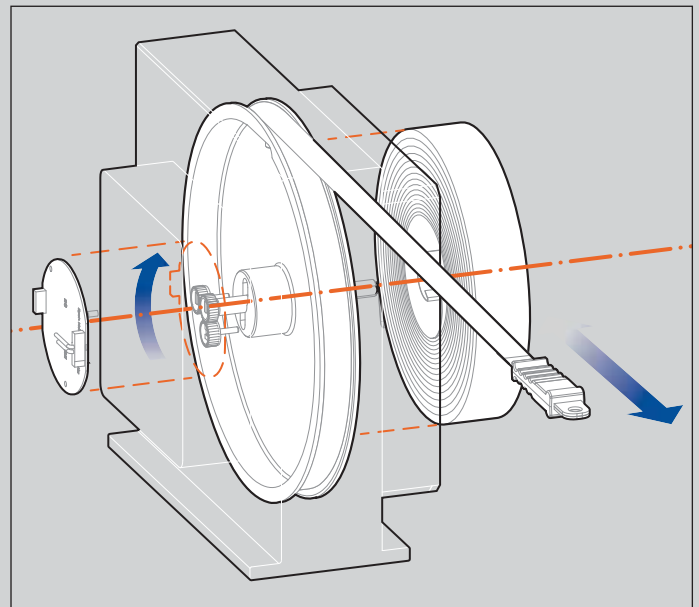
POSITAPE® Tape Extension Sensors measure linear position utilizing a robust stainless-steel tape. This high-tech robust stainless steel tape has a nearly unlimited life cycle. The measuring tape can be repeatedly deflected over pulleys in all directions without significant wear. Thus, POSITAPE® Tape Extension Sensors are perfectly suited for applications that require pulleys due to tight installation situations. The rugged design is shock and vibration resistant and makes POSITAPE® Tape Extension Sensors suitable for use in harsh environmental conditions. Utilizing exclusively robust magnetic encoder technology, POSITAPE® sensors are the superior technology for multiple applications and also suited for harsh environmental conditions.

## new technology

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## The functional principle

POSITAPE® Tape Extension Sensors are based on the principle of the POSIWIRE® technology. Instead of a measuring cable POSITAPE® utilizes a high-tech stainless steel tape, that determines linear position absolutely. The angular movement of the tape drum is determined by magnetic absolute encoders. The interface-electronic generates common output signals. The measuring tape can be repeatedly deflected over pulleys in all directions, with no major influence on the lifetime of the measuring tape.



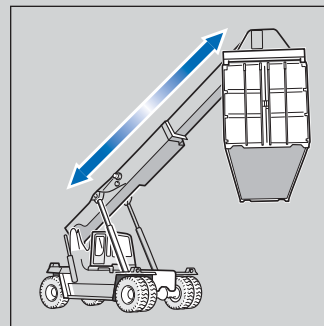


## Advantages at a glance

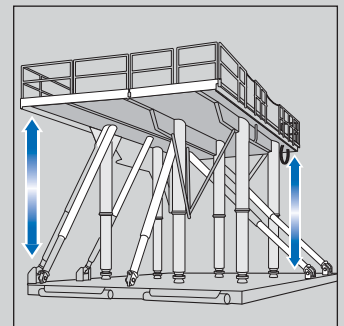
- Nearly unlimited life cycle of the measuring tape
- Continuous deflection over pulleys in all directions
- Robust magnetic absolute encoder technology
- High measurement accuracy due to electronic linearization (up to 0.05%)
- Measurement range up to 20,000 mm

## Applications

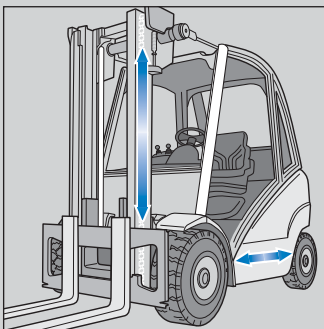
Due to the robustness of the stainless steel tape and the use of the magnetic absolute encoder technology, POSITAPE® sensors are also suited for applications in harsh environments, such as mobile working machines and for applications with pulleys. POSITAPE® is also suitable for areas that have to be free from particles due to hygienic requirements, as given in the food industry or in the pharmaceutical industry.



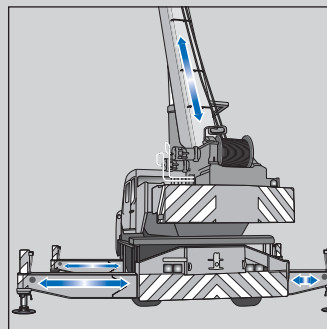
Material handling equipment



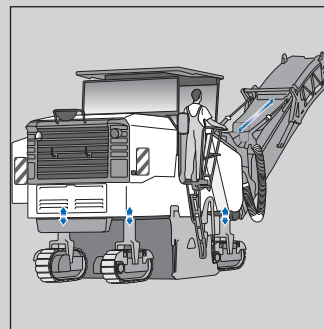
Lifting platforms



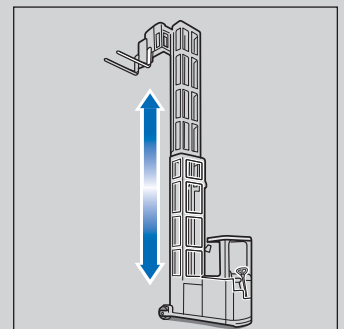
Forklifts



Mobile cranes



Cold milling machines



High-rack forklifts





WB85



WB21



WB100M

			Measurement range 0 to ... [mm]
			20,000
			17,500
			15,000
			12,500
			<b>10,000</b>
			8,000
			7,500
			6,000
			5,000
			4,000
			3,500
			3,000
			<b>2,500</b>
			2,000
			1,500
			1,250
			1,000
			750
			<b>500</b>
			375
			250
			Sensing device
•	•	•	magnetic absolute encoder
			Analog outputs <sup>1)</sup>
•	•	•	Voltage 0.5 ... 10 V
•	•	•	Voltage 0.5 ... 4.5 V
•	•	•	Current 4 ... 20 mA
•	•	•	Programmable (PMU)
•	•	•	<b>Redundant version optional</b>
			Digital outputs, absolute <sup>1)</sup>
•	•	•	SSI
•	•	•	CANopen
•	•	•	CAN SAE J1939
•	•	•	<b>Redundant version optional<sup>1)</sup></b>
			Linearity
±0.10 %	±0.10 %	±0.10 %	standard
±0.05 %	±0.05 %	±0.05 %	<b>optional (for meas. ranges ≥ 1000 mm)</b>
			Protection class
IP67 <sup>2)</sup>	IP67 <sup>2)</sup>	IP68/IP69	standard
IP67/IP69 <sup>2)</sup>	IP67/IP69 <sup>2)</sup>		optional

# POSICHRON®

Magnetostrictive Position Sensors



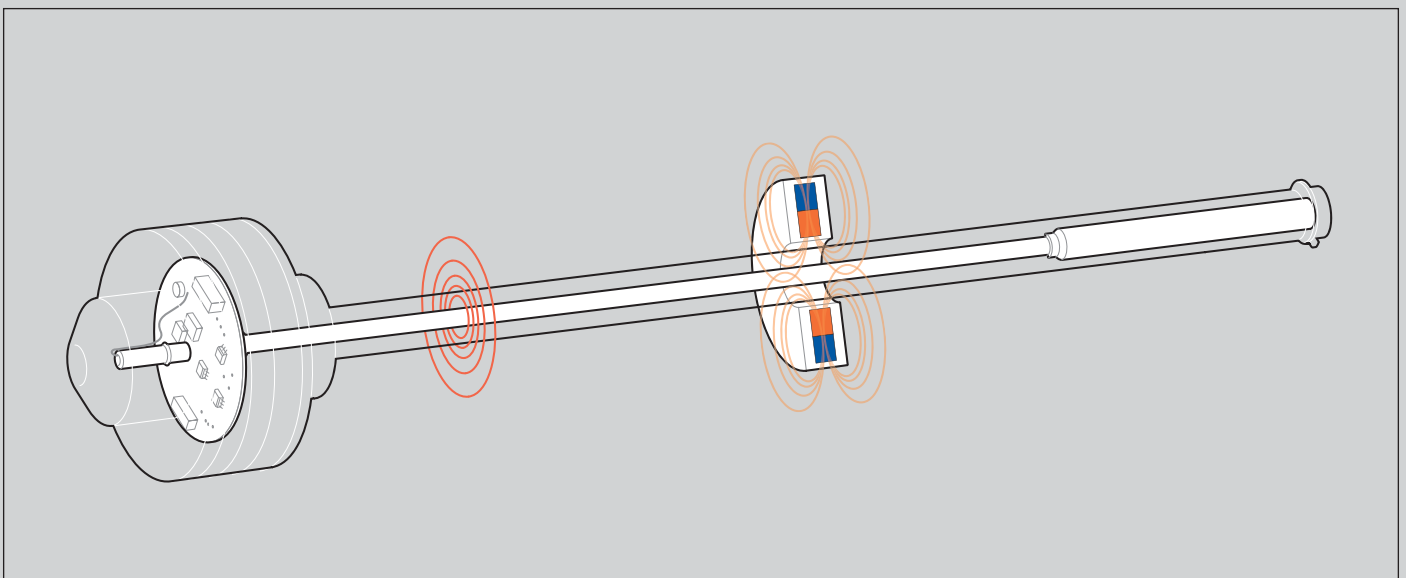
## Non-contact. Flexible installation.

POSICHRON® is an absolute, non-contact and wear-free position measuring system. The key feature of POSICHRON® is its extreme robustness and the high resistance to shock up to 50 g. Therefore POSICHRON® sensors are best suited for applications where other measuring principles would fail. Available in many different profile styles including rod, square, slim and submersible which allows use in many applications. The patented slim PCFP25 is particularly suited for crane outriggers and tailored to fit tight installation situations.

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## The functional principle

POSICHRON® sensors are based on the time-of-flight-principle. To determine the position, a current impulse is sent through a magnetostrictive waveguide. The current impulse is reflected as a tensional mechanical-elastic density wave by a movable position magnet. The position is determined by measuring the time difference between the electrical induction current impulse and the mechanical-elastic density wave generated by the magnet (time-of-flight-principle). The measurement is true-absolute and wear-free.



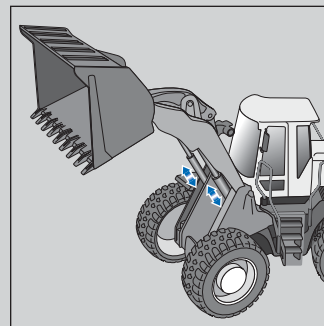
## Advantages at a glance

- Wear- and maintenance-free
- High resistance to shock up to 50 g (100 shocks, higher values on request)
- Magnet guidance distance up to 19 mm (depending on magnet/profile)
- Up to IP68/IP69
- Linearity up to  $\pm 0.02\%$  f.s.
- Measurement range up to 5,750 mm

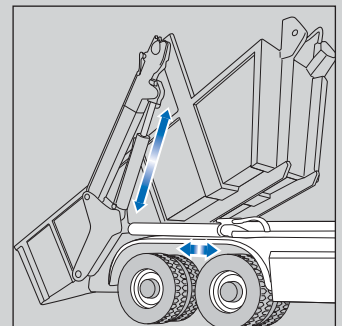
## Applications

POSICHRON® Magnetostrictive Position Sensors can be applied universally. Application examples are hydraulic cylinders and presses, liquid level measurement, injection molding machines, dosing and mixing systems, die-casting machines, road vehicle tests, tunneling machines, wind power plants and patient beds. Ultra-flat profiles are available for space-restricted applications, such as crane outriggers.

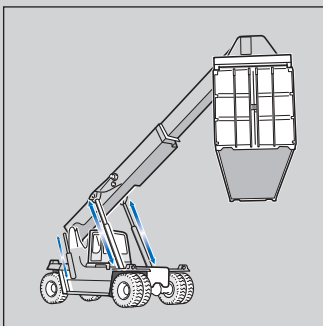
For underwater applications the submersible profile PCR32 is available.



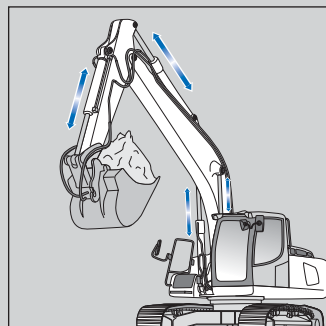
Wheel loaders



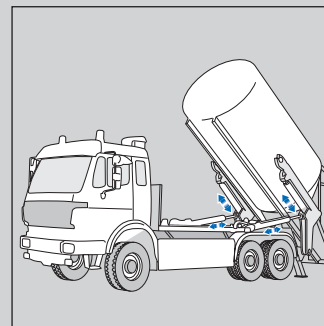
Skip loaders



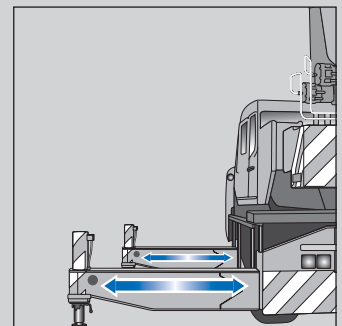
Material handling vehicles



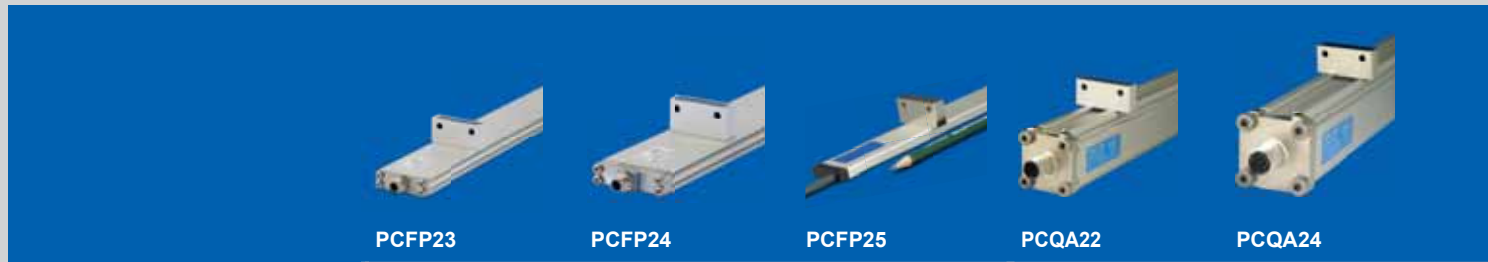
Hydraulic excavators








Commercial vehicles



Mobile crane outriggers



Applications	Tight mounting spaces, e.G. mobile crane outriggers			Standard industrial applications, also for guided magnets	
<b>Profile cross-section</b>	36 x 13 mm 	43 x 12 mm 	28 x 8 mm 	35.5 x 38.3 mm 	35.5 x 37.25 mm 
<b>Measurement range</b>					
100 ... 5,750 mm	●	●	●	●	●
<b>Analog outputs <sup>1)</sup></b>					
0.5 ... 10 V	●	●	●	●	●
0.5 ... 4.5 V	●	●	●	●	●
4 ... 20 mA	●	●	●	●	●
<b>Digital outputs, absolute</b>					
SSI	●	●	●	●	●
CANopen	●	●	●	●	●
CAN SAE J1939	●	●	●	●	●
<b>Protection class</b>					
standard	IP64	IP67 <sup>2)</sup>	IP64	IP64	IP67 <sup>2)</sup>
optional	–	IP67/IP69 <sup>2)</sup>	IP67	–	IP67/IP69 <sup>2)</sup>

<sup>1)</sup> = 1 or 2 position magnets; position and velocity; programmable (PMU)

<sup>2)</sup> = connector version with a suitable connector





PCR21



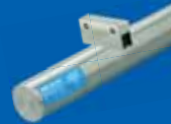
PCST24








PCST25



PCST27



PCR32

	Applications in hydraulic cylinders, level indicators			Underwater	Applications
Ø 25 mm	Ø 10 mm	Ø 10 mm	Ø 10 mm	Ø 28 mm	<b>Profile cross-section</b>
					
					<b>Measurement range</b>
•	•	•	•	•	100 ... 5,750 mm
					<b>Analog outputs <sup>1)</sup></b>
•	•	•	•	•	0.5 ... 10 V
•	•	•	•	•	0.5 ... 4.5 V
•	•	•	•	•	4 ... 20 mA
					<b>Digital outputs, absolute</b>
•	•	•	•	•	SSI
•	•	•	•	•	CANopen
•	•	•	•	•	CAN SAE J1939
					<b>Protection class</b>
IP64	IP67 <sup>2)</sup>	IP67	IP68/IP69	IP68/IP69	standard
–	IP67/IP69 <sup>2)</sup>	IP67/IP69	–	–	optional

# POSIMAG®

Magnetic Scale Position Sensors

**Non-contact.**

**High Resolution.**

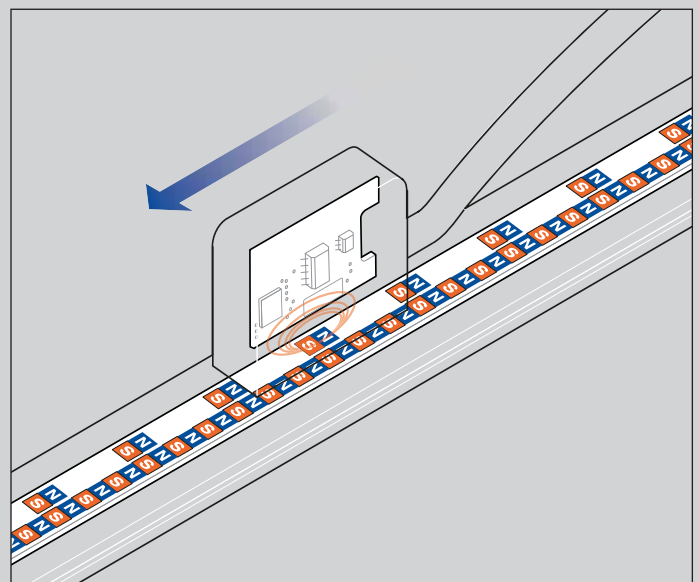
POSIMAG® is a non-contact, high resolution magnetic position measuring system for measuring lengths up to approx. 30 meters. POSIMAG® is a wear-free robust system which is suitable for use under challenging environmental conditions.



## The functional principle

POSIMAG® consists of a magnetic measuring scale and a non-contact magneto-resistive reading head. The magnetic measuring scale is periodically magnetized with magnetic north and south poles. To capture a position the magneto-resistive sensor head samples sinusoidal magnetic fields above the magnetic measuring scale. Standard resolutions up to 1  $\mu\text{m}$  are available.

The signals can be processed by all common industrial control units with suitable signal processing speeds, or can be displayed directly using a digital display unit from ASM's PRODIS® series.

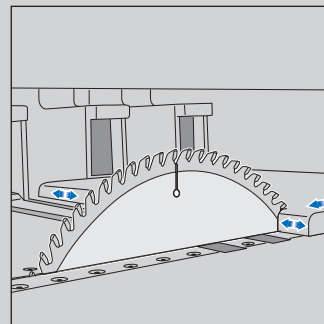


## Advantages at a glance

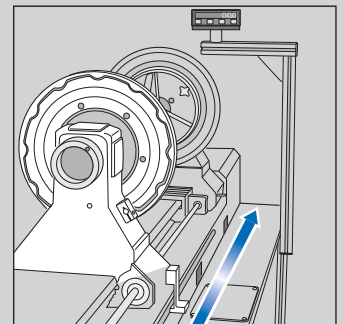
- Non-contact and wear-free
- Resistant to dirt
- Shielded metal housing
- Simple installation and adjustment
- Protection class IP67
- Measuring range up to 30,000 mm

## Applications

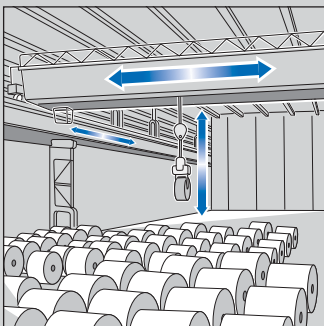
POSIMAG® Magnetic Scale Sensors are suitable for linear position measurement in many industrial applications where sturdiness and wear-free design play a crucial role, such as material handling systems. POSIROT® incremental encoders are available for rotary positioning applications (S. 24).



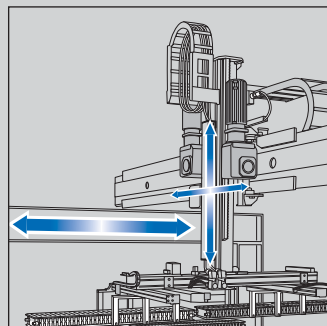
Dimensioning saws



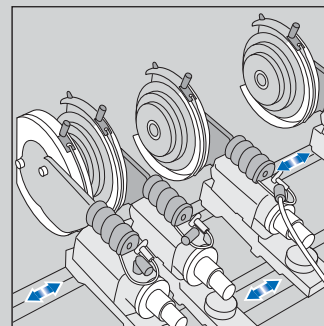
Special-purpose lathes



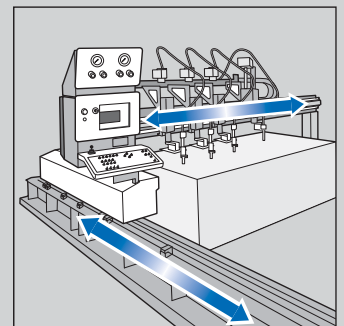
Overhead cranes



Handling systems



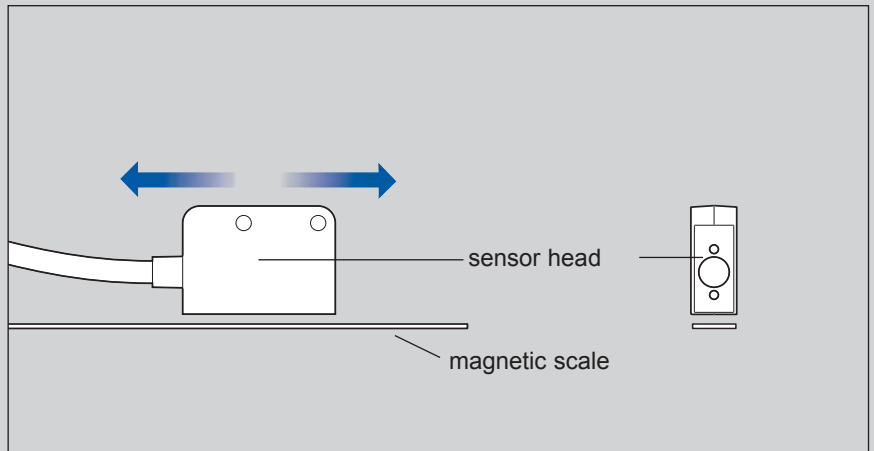
Slitter winders



Flame cutting machines

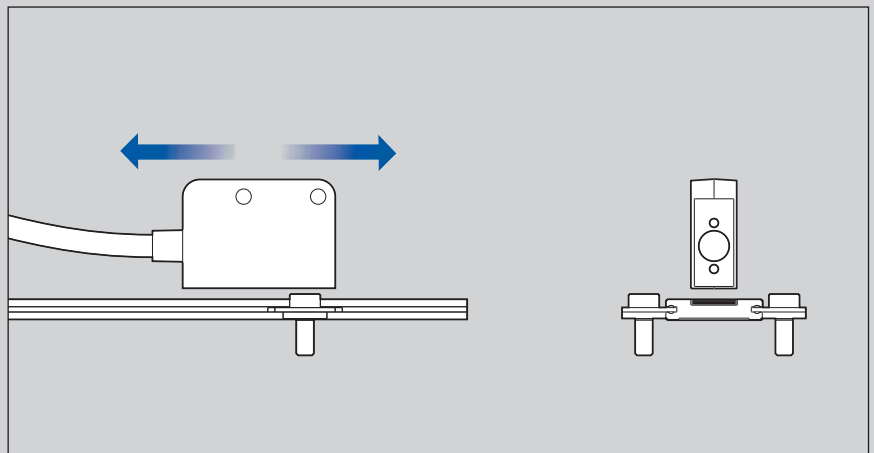
### Magnetic measuring scale and free floating unguided sensor head

For direct adhesive taping



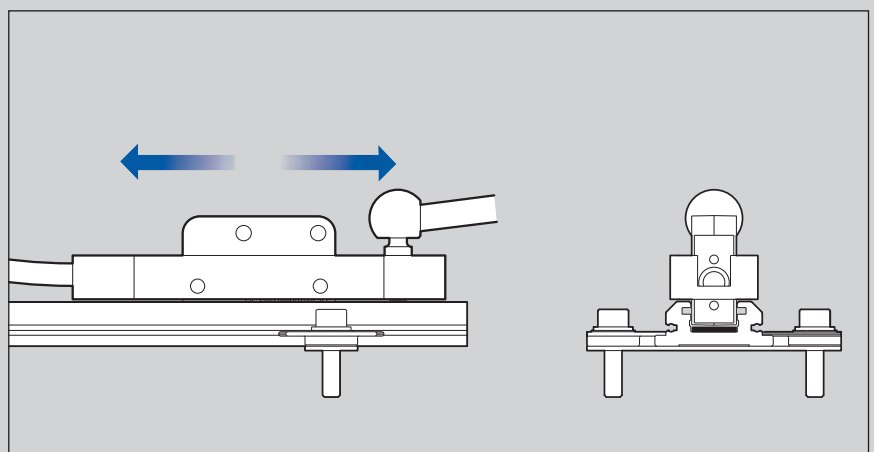
### Magnetic measuring scale in flat profile and unguided sensor head

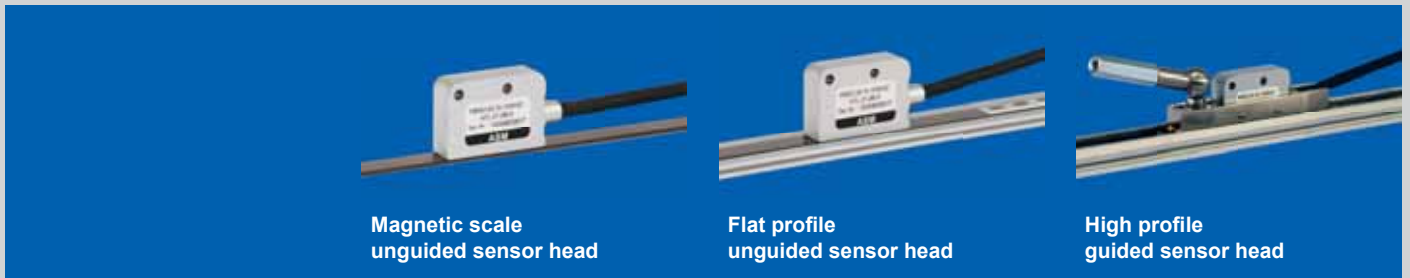
Easy mounting.  
On-site adjustment possible.  
Profile extendable in 3m increments  
up to 30 m length.



### Magnetic measuring scale with sensor guiding profile and mount

Provides integral linear guidance for  
applications without own linear guidance  
by system.

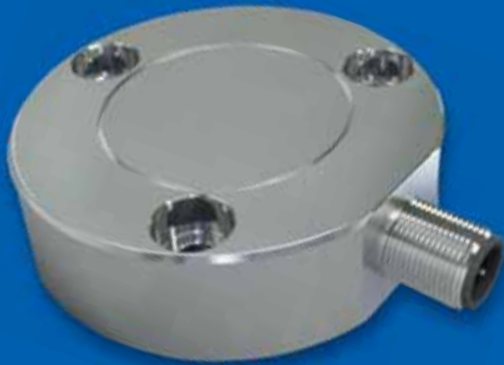




	<b>Magnetic scale unguided sensor head</b>		<b>Flat profile unguided sensor head</b>		<b>High profile guided sensor head</b>	
<b>Measurement range</b>	0 ... 30,000 mm		0 ... 30,000 mm		0 ... 30,000 mm	
Magnetic period	2 mm	5 mm	2 mm	5 mm	2 mm	5 mm
Resolution	up to 1 µm	up to 2.5 µm	up to 1 µm	up to 2.5 µm	up to 1 µm	up to 2.5 µm
<b>Digital outputs, incremental</b>						
HTL	•	•	•	•	•	•
TTL	•	•	•	•	•	•
TTL24V	•	•	•	•	•	•
<b>Linearity (standard)</b>	15 µm ±40 µm/m	30 µm ±40 µm/m	15 µm ±40 µm/m	30 µm ±40 µm/m	15 µm ±40 µm/m	30 µm ±40 µm/m
<b>Protection class (Sensor head)</b>	IP67	IP67	IP67	IP67	IP67	IP67

# POSIROT®

Magnetic Angle Sensors



## Magnetic. Suitable for Indoor. Outdoor. Underwater.

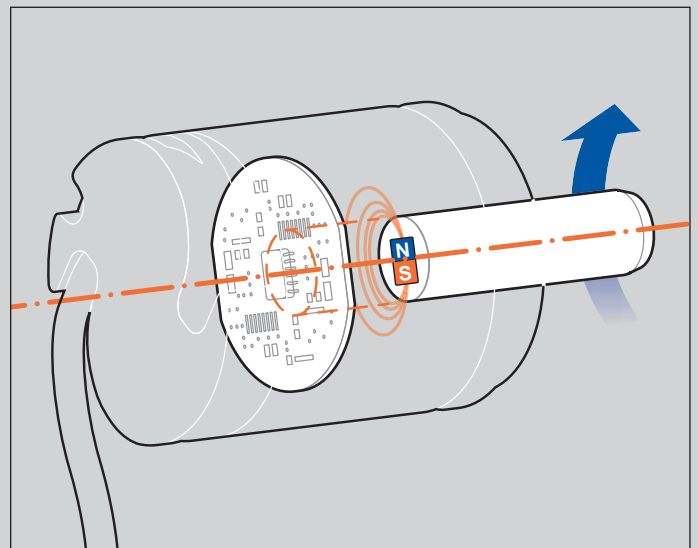
POSIROT® Magnetic Angle Sensors operate using a non-contact magnetic positioning system. Due to the resistance to shock, vibration and dirt POSIROT® magnetic angle sensors are especially suited for harsh applications in hostile environments. Laserwelded hermetically sealed stainless steel housings guarantee a long lifecycle in harsh environmental conditions (PRAS6), in cleaning-intensive hygienic applications (PRAS7) as well as in underwater use (PRAS4). For demanding indoor applications POSIROT® sensors are available with IP60 rating.

20

## The functional principle

POSIROT® Magnetic Angle Sensors provide rotary position by utilizing a multiple Hall-Effect sensor array and a position magnet. To determine the rotary position a magnetic measuring element is attached to the rotating component. The change of the magnetic field induced by the rotation is detected by a multi-hall sensor. Sensor and magnet are either integrated in one housing or can be mounted separately. Due to the magnetic measurement principle the sensor is suitable for use in harsh and rugged environments.

POSIROT® Incremental Encoders are based on the POSIMAG®-principle (p. 16).



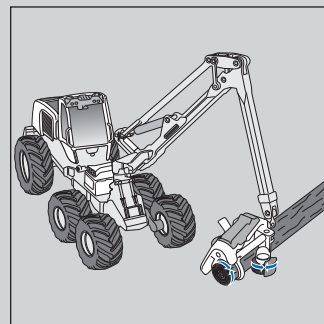


## Advantages at a glance

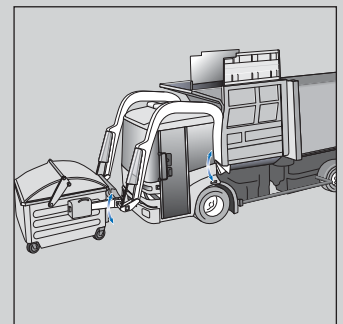
- Measurement range 0° to 360°
- Non-contact or with 10 mm-shaft
- Resistant to shock, vibration and dirt
- Laserwelded hermetically sealed housings
- Up to IP68/IP69

## Applications

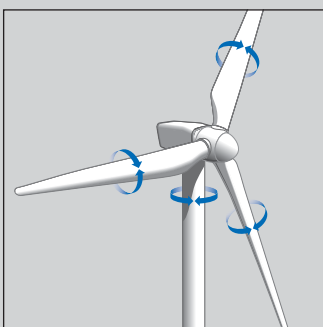
Due to the resistance to shock, vibration and dirt POSIROT® magnetic angle sensors are especially suited for applications in hostile environments. Laserwelded hermetically sealed stainless steel housings guarantee a long lifecycle in harsh environments (PRAS6), in cleaning-intensive hygienic applications (PRAS7) as well as in underwater use (PRAS4). POSIROT® sensors with IP60 rating are suited for demanding indoor applications.



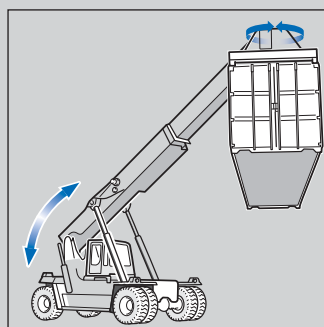
Harvesters



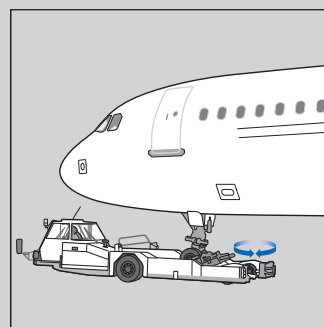
Communal vehicles



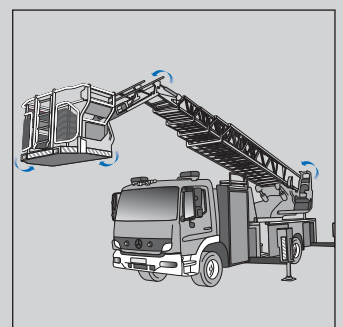
Wind power plants



Material handling vehicles



Aircraft tractors



Turnable ladder vehicles

# POSIROT®

## Magnetic Angle Sensors

### Selection Guide

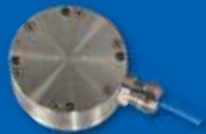
	 						
	PRAS20	PRAS20R	PRAS21	PRAS26	PRAS27	PRDS27	PRAS1
<b>Applications</b>	Indoor applications				Standard industrial applications		
<b>Measurement range</b>	A	A	A	A	A	D	A
0°... 360°	•	•	•	•	•	•	•
<b>Analog outputs</b>							
Voltage 0.5 ... 10 V	•			•	•		•
Voltage 0.5 ... 4.5 V	•	•	•	•	•		•
Current 4 ... 20 mA	•			•	•		•
Redundant version optional		•			•		
<b>Digital outputs, absolute</b>							
SSI - RSSI5V, RSSI24V							
CANopen						•	
CAN SAE J1939						•	
Redundant version optional <sup>1)</sup>						•	
<b>Digital outputs, incremental</b>							
RS5V, RS24V							
RS5VF, RS24VF							
HT24V							
HT24VF							
<b>Linearity (standard)</b>	±0.5%		±0.5%	±0.5%	±0.5%	±1°	±0.3%
<b>Protection class</b>							
Standard	IP60		IP60	IP60	IP67		IP67
Optional	–		–	–	–		IP67/IP69 <sup>2)</sup>

A = Analog output,

D = Digital output

<sup>1)</sup> = CAN / CANopen only

<sup>2)</sup> = with a suitable IP67/IP69 connector



PRAS2

PRDS2

PRAS3

PRDS3

PRAS4

PRAS6

PRDS6

PRAS7

PRDS7

Standard industrial applications

Underwater

Heavy duty applications

Hygienic applications

Applications

A	D	A	D	A	A	D	A	D	Measurement range
•	•	•	•	•	•	•	•	•	0°... 360°
<b>Analog outputs</b>									
•		•		•	•		•		Voltage 0.5 ... 10 V
•		•		•	•		•		Voltage 0.5 ... 4.5 V
•		•		•	•		•		Current 4 ... 20 mA
•		•			•		•		Redundant version optional
<b>Digital outputs, absolute</b>									
	•		•			•		•	SSI - RSSI5V, RSSI24V
	•		•			•		•	CANopen
	•		•			•		•	CAN SAE J1939
	•		•			•		•	Redundant version optional <sup>1)</sup>
<b>Digital outputs, incremental</b>									
	•		•			•		•	RS5V, RS24V
	•		•			•		•	RS5VF, RS24VF
	•		•			•		•	HT24V
	•		•			•		•	HT24VF
±0.3%	±1°	±0.3%	±1°	±0.3%	±0.3%	±1°	±0.3%	±1°	<b>Linearity (standard)</b>
<b>Protection class</b>									
IP67		IP67		IP68 (10 bar), continuous use	IP67/IP69 <sup>2)</sup>		IP67/IP69 <sup>2)</sup>		Standard
IP67/IP69 <sup>2)</sup>		IP67/IP69 <sup>2)</sup>							Optional




PMIS4/PMIR7(N)



PMIS4/PMIR5

<b>Mounting diameter</b>	20, 27, 35, 50 mm	83, 133, 233 mm
<b>Mounting method</b>	slide-on assembly, patented	screw mounting
<b>Measurement range</b>		
0°... 360°	•	•
<b>Digital outputs, incremental</b>		
HTL	•	•
TTL	•	•
TTL24V	•	•
<b>Linearity (standard)</b>	±0.1°	±0.1°
<b>Protection class</b>	IP67	IP67



	PRAS2EX	PRAS3EX	PRAS5EX
<b>Measurement range</b>			
0°... 360°	•	•	•
<b>Analog outputs</b>			
Voltage 0.5 ... 10 V	•	•	•
Voltage 0.5 ... 4.5 V	•	•	•
Current 4 ... 20 mA	•	•	•
<b>Linearity (standard)</b>	±0.3%	±0.3%	±0.3%
<b>Protection class</b>	IP65	IP65	IP65
<b>Ex Protection class (dust)</b>	 II 3D Ex tc IIIC T80°C Dc X		

# POSIHALL®

Magnetic Multiturn Encoders



## True-absolute. Very robust.

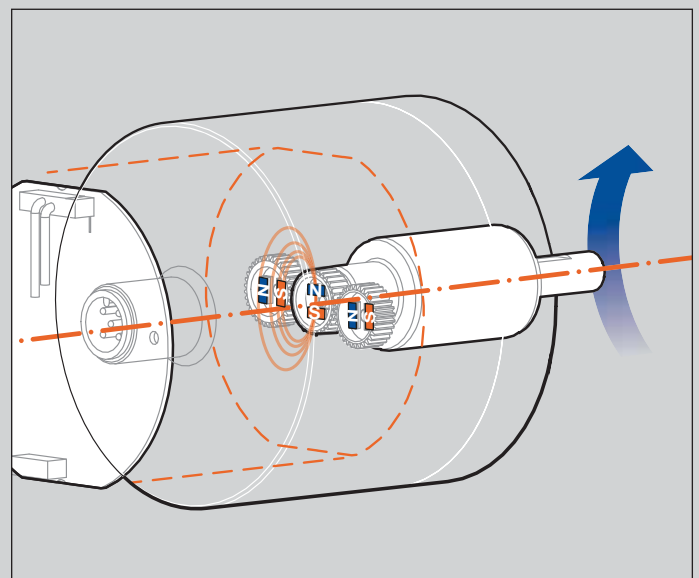
POSIHALL® Magnetic Multiturn Encoders are the robust alternative to optical encoders that are prone to fail in harsh environments. POSIHALL® is a non-contact magnetic multi-hall technology. The sensors work precisely and reliably with high levels of shock and vibration and under extreme temperatures of  $-40^{\circ}\text{C}$  up to  $+85^{\circ}$ . Measuring data can be detected even if ingress of water or oil into the sensor housing occurs. The true-absolute technology ensures correct positioning data after disturbances such as a power failure. The robust sensor housings with potted electronics are resistant to harsh environmental conditions and make them the ideal solution for "Heavy Duty" applications. For safety applications POSIHALL® sensors are available with redundant outputs.

## new product line

26

## The functional principle

POSIHALL® true absolute Magnetic Multiturn Encoders measure absolute angular position of a shaft over multiple revolutions (up to 255) by utilizing a magnetically coupled multihall sensor system that uses Vernier scale (Nonius) principles. This true-absolute technology ensures a correct position even in areas where high electromagnetic and external influences are present.



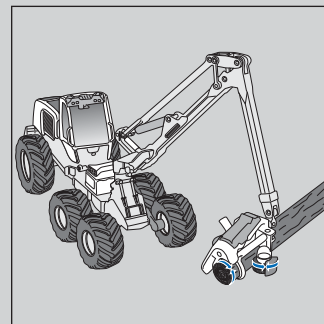


## Advantages at a glance

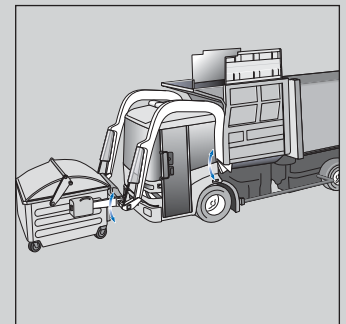
- True-absolute technology
- Measurement range  
31x360° (PH36)  
255x360° (PH58 and PH68)
- Resistant to shock, vibration and dirt
- Integral shielding against magnetic fields
- Singleturn-Linearity 0.3%
- Up to IP69

## Applications

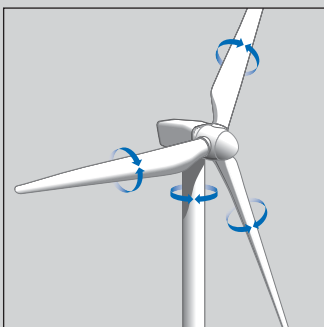
POSIHALL® Magnetic Multiturn Encoders are suited for applications such as mobile machines, packaging machines, food processing machines, offshore applications or wind and solar energy plants.



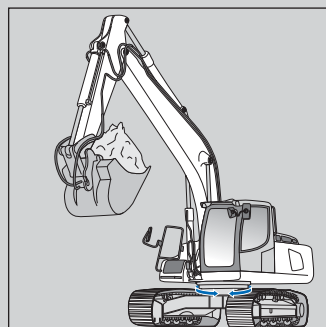
Harvesters



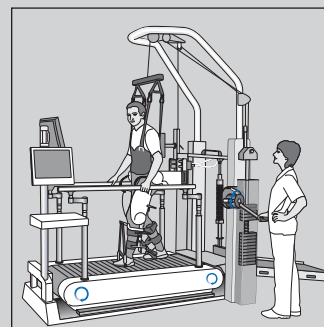
Communal vehicles



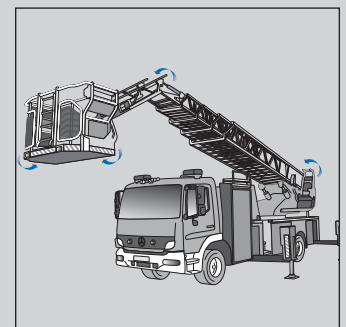
Wind power plants



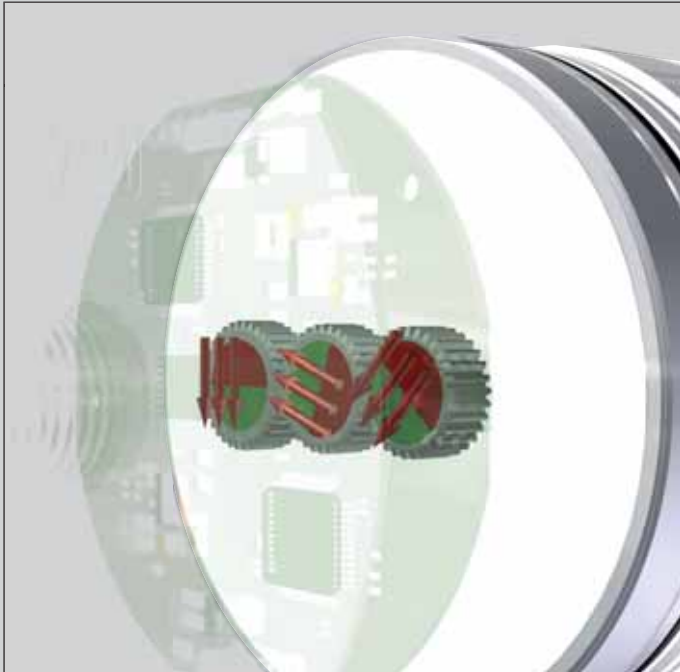
Hydraulic excavators



Therapeutic treadmill



Turnable ladder vehicles



## POSIHALL® - true-absolute

POSIHALL® sensors measure rotation in a "true-absolute" way. This means, that also for revolutions of more than 360°, measurement data is always being taken directly without incrementation and signal storage. Therefore correct measuring data is available immediately even after a power failure.

This is achieved by a gear-coupling of multiple hall sensors that work according to the nonius (vernier) principle. The sensor signals are continuously compared to each other and result in the total number of revolutions. The maximum number of detectable revolutions is 255.

## For "Heavy Duty" Applications

In harsh environmental conditions POSIHALL® sensors are superior to sensitive optical encoders due to the magnetic measurement principle and the robust mechanical sensor components. They work precisely and reliably with high levels of shock and vibration in a temperature range of -40°C to +85°C even in case of water or oil ingress into the sensor housing.





	<b>PH36</b>	<b>PH58</b>	<b>PH68</b>
<b>Measurement range</b>	up to 31 x 360°	up to 255 x 360°	up to 255 x 360°
<b>Analog outputs</b>			
Voltage 0.5 ... 10 V	●	●	●
Voltage 0.5 ... 4.5 V, U <sub>b</sub> = 5V	●	●	●
Voltage 0.5 ... 4.5 V, U <sub>b</sub> = 8 ... 36 V	●	●	●
Current 4 ... 20 mA	●	●	●
Redundant version optional		● 1)	● 2)
<b>Digital outputs, absolute</b>			
SSI	●		
CANopen	●	●	●
CAN SAE J1939	●	●	●
Redundant version optional 3)		● 1)	● 2)
<b>Protection class</b>			
Shaft		IP67	
Housing		IP67/IP69 (with IP69 mating connector)	

1) = with one output  
 2) = optional with two separate outputs  
 3) = CAN / CANopen only

# POSITILT® PTK Series

Gyro-compensated Inclination Sensors  
in MEMS Technology



## Dynamic. Immediate response.

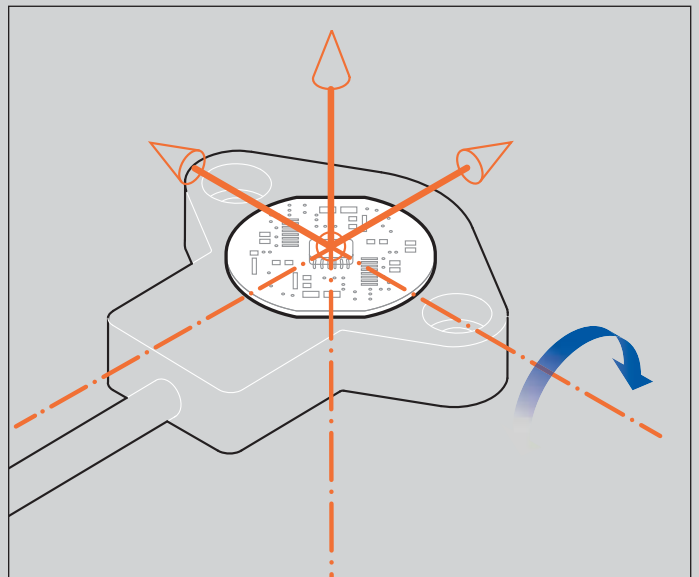
Conventional inclination sensors give incorrect values in moving applications. POSITILT® PTK Series Inclination Sensors compensate for shock, vibration and acceleration utilizing gyro-compensated MEMS-technology. POSITILT® PTK Series Sensors provide correct measuring data with no delay. POSITILT® PTK Series Sensors are available in two different hermetically sealed stainless steel housing types: a very compact one (PTK29) and one that fits redundant electronics (PTK6 / PTK7). All housing types are hermetically sealed and therefore suited for harsh environmental conditions. For underwater applications housing type PTK4 is available.

new technology

30

## The functional principle

POSITILT® PTK Series Sensors measure inclination utilizing micro-electromechanic sensor technology (MEMS). The MEMS technology allows the inclination angle to be measured then with the addition of gyro compensation. Disturbances such as shock and vibration can be eliminated giving a "Real Time" signal output.

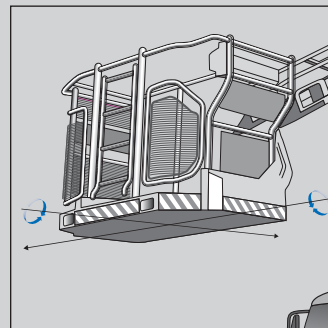


## Advantages at a glance

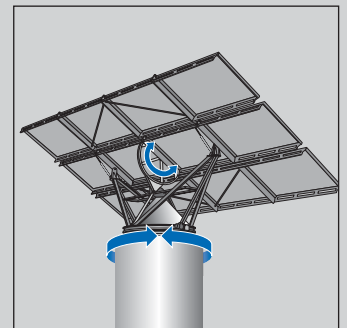
- Compensated signal data not affected by acceleration, shock and vibration
- Measurement range  $\pm 180^\circ$  (1 axis),  $\pm 60^\circ$  (2 axes)
- Signal transmission with no delay
- Static linearity up to  $0.05^\circ$
- Hermetically sealed stainless steel housings
- Up to IP68/IP69

## Applications

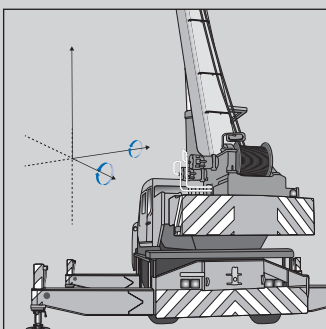
POSITILT® PTK Series Inclination Sensors are the ideal solution for dynamic applications such as mobile machines, where shock, vibration and acceleration can affect sensor accuracy. For applications in harsh environments POSITILT® PTK Series sensors are available in robust hermetically sealed stainless steel housings.



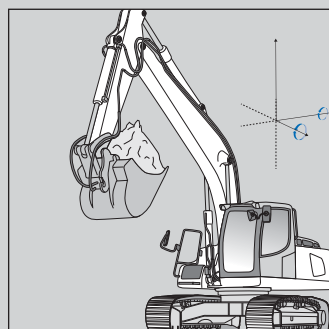
Turnable ladder vehicles



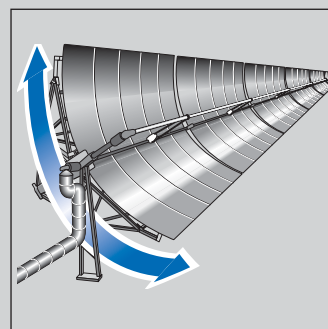
Photovoltaic modules



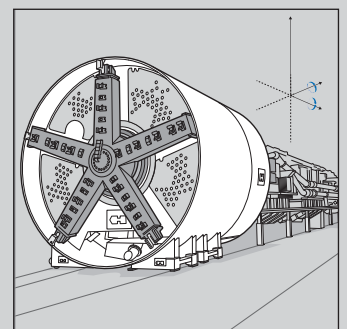
Mobile cranes



Excavators



Thermal solar collectors



Tunneling machines

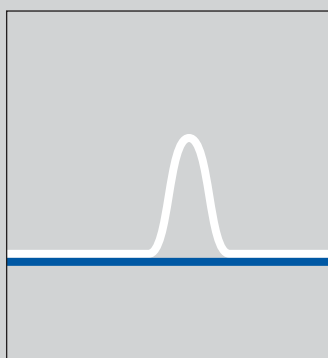
# POSITILT® PTK Series

Gyro-compensated Inclination Sensors in MEMS Technology

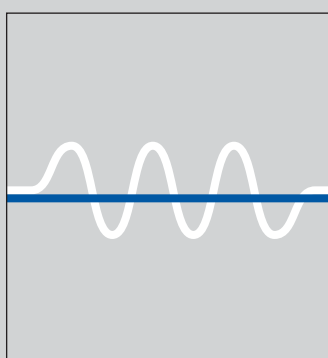
## Compensation of dynamic influences

Inclination measurement in mobile machines is affected by shock, vibration and acceleration. These influences lead to incorrect measuring data and affect sensor accuracy. POSITILT® PTK series inclination sensors are able to compensate these disturbances and provide correct measuring data even in dynamic applications. The sensors have a static linearity of up to 0.05°.

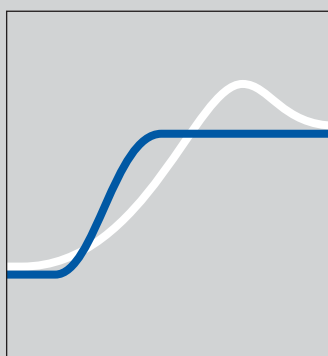
Shock



Vibration



High acceleration



— compensated  
— not compensated



# POSITILT® PTK Series

## Gyro-compensated Inclination Sensors in MEMS Technology Selection Guide



Applications	PTK29	PTK4	PTK6	PTK7
Applications	General industrial applications, mobile working machines	Underwater	Heavy duty Industrial applications	Hygienic applications
<b>Measurement range</b>				
1 Axis $\pm 180^\circ$	●	●	●	●
2 Axes $\pm 60^\circ$	●	●	●	●
<b>Analog outputs, absolute</b>				
Voltage 0.5...10 V	●	●	●	●
Voltage 0.5...4.5 V	●	●	●	●
Current 4 ... 20 mA	●	●	●	●
Redundant version optional		●	●	●
<b>Digital outputs, absolute</b>				
CANopen	●	●	●	●
CAN SAE J1939	●	●	●	●
Redundant version optional		●	●	●
Linearity, digital	Up to $0.05^\circ$ <sup>2)</sup>	Up to $0.05^\circ$ <sup>2)</sup>	Up to $0.05^\circ$ <sup>2)</sup>	Up to $0.05^\circ$ <sup>2)</sup>
Linearity, analog	Up to $0.1^\circ$ <sup>2)</sup>	Up to $0.1^\circ$ <sup>2)</sup>	Up to $0.1^\circ$ <sup>2)</sup>	Up to $0.1^\circ$ <sup>2)</sup>
Protection class, standard	IP67	IP68 (10 bar), continuous use	IP67/IP69 <sup>1)</sup>	IP67/IP69 <sup>1)</sup>

<sup>1)</sup> = with a suitable IP67/IP69 connector

<sup>2)</sup> = depends on measuring range

# Questions? We are at your service!

Are you looking for a sensor solution for your application, do you have questions on a product or would you like detailed product information? Visit us on our website, call us or send us an email. We are looking forward to providing reliable sensor solutions for your positioning needs.

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Email [info@asm-sensor.com](mailto:info@asm-sensor.com)

### USA:

Tel. +1 630 832-3202

Email [info@asmsensors.com](mailto:info@asmsensors.com)



## ASM website

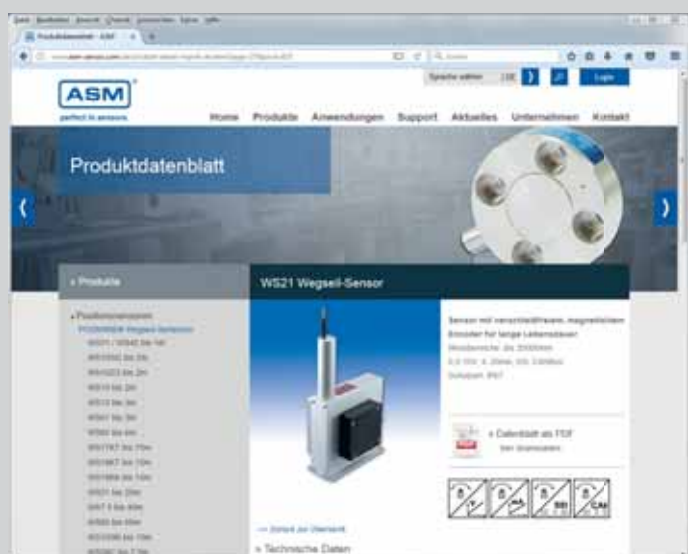
[www.asm-sensor.com](http://www.asm-sensor.com)

(Europe and International)

[www.asmsensors.com](http://www.asmsensors.com) (USA)

The ASM Website provides detailed information on all ASM products and latest product additions. Detailed product catalogs and data sheets are available in every product line section and are also available for download in the support category, subcategory "downloads". The support category also provides information on return shipments, RMA number request and additional services such as calibration certificates.

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