



POSICHRON® – the functional principle

POSICHRON® is an absolute, contact-free and wear-free position measuring system. It is extremely sturdy making it suitable even for applications where other measuring principles would fail. The availability of various constructions - rod, square profile and ultra-flat profile - means that the system can be adapted to suit all kinds of installation conditions.

The POSICHRON® linear measuring system consists of a magnetostrictive wave guide and a movable magnet for determining position. The measuring principle of POSICHRON® position sensors is based on two physical effects: the Wiedemann effect and the Villary effect.

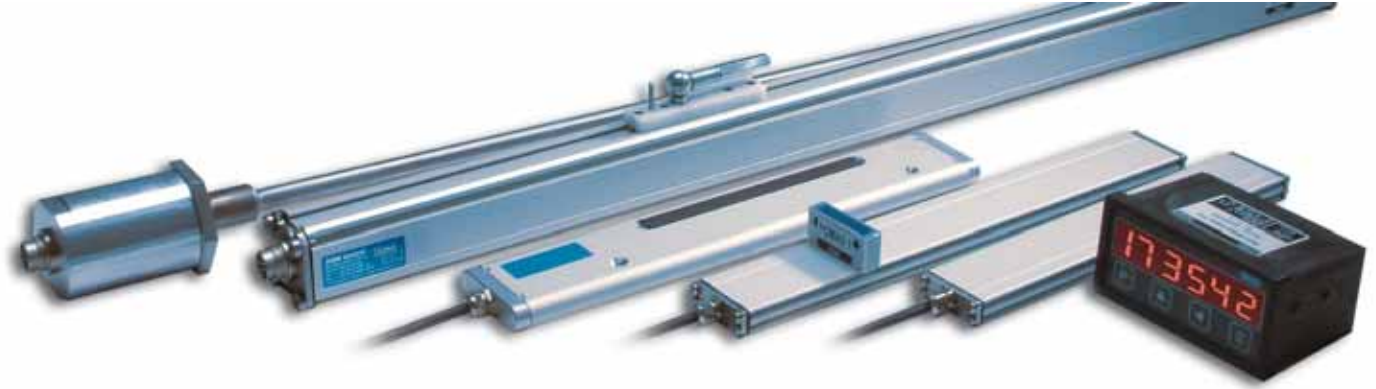
To create the Wiedemann effect, a current impulse is sent through the POSICHRON® positional sensor's wave guide. This current impulse generates a circular magnetic field which propagates at the speed of light around the wave guide. If this circular magnetic field makes contact with the magnetic field of the position magnet which is moved lengthways, a torsional mechanical-elastic density wave is triggered at the overlap area of the two magnetic fields as a result of magnetostriction. This wave propagates in the POSICHRON® positional sensor at ultrasonic speed.

The sensor head of the POSICHRON® position sensor contains a detector which detects the arrival of this wave. The magneto-elastic Villary effect is used as the method of detection. The position between the detector coil and the magnet which can be moved lengthways along the POSICHRON® sensor is determined by measuring the time difference between the electrical induction current impulse and the voltage pulse generated via the Villary effect in the detector coil (time-of-flight principle).

This time difference can be converted using various well-known methods into analogue or digital output signals. The time-of-flight signals can however also be evaluated directly by commonly-available interface modules or counter and time-measuring devices.

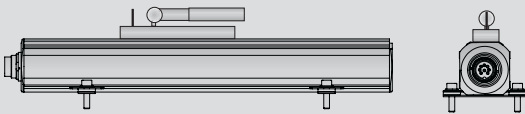
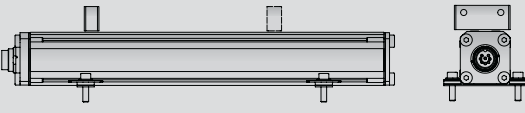
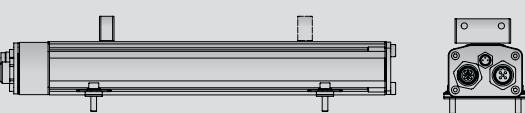
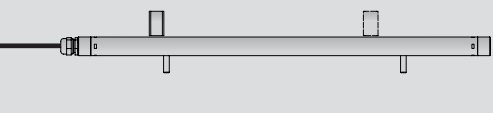
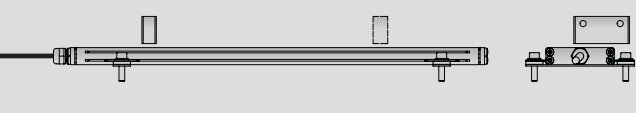
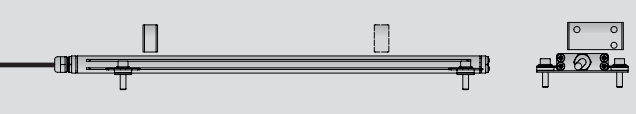
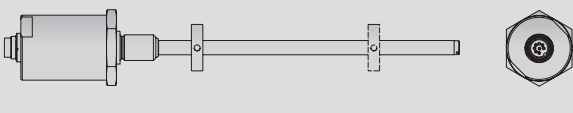
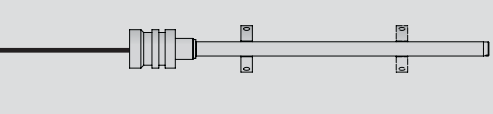
Technical advantages:

- Absolute measuring principle
- Totally wear- and maintenance-free
- Resistant to dirt, humidity and dust
- Protection category to IP68
- Highly resistant to vibration and shock
- Resolution is virtually unlimited
- Linearity of up to 0.01%
- No energy feed for positional magnets
- Measuring lengths of up to 5,750 mm



○ via subsequent electronics

Model Selection Guide for POSICHRON® Position Sensors

Models	Outputs							Protection class	Special Characteristics	
	Start/Stop	0 ... 10 V	4 ... 20 mA	SSI	CANopen	DeviceNet	Profibus			
PCQA21 	●	●	●	●		○		IP67	<ul style="list-style-type: none"> ● Quad profile for strap mounting ● Three-sided mounting ● Unguided position magnet 	
PCQA22 	●	●	●	●		○		IP64	<ul style="list-style-type: none"> ● Quad profile for strap mounting ● Three sided mounting ● Unguided position magnet ● Guided position magnet 	
PCQA23 						○	○	●	IP64	<ul style="list-style-type: none"> ● Quad profile for strap mounting ● Three sided mounting ● Unguided position magnet ● Guided position magnet ● Resolution 2 µm
PCFP21 	●	●	●	●		○		IP67	<ul style="list-style-type: none"> ● Standard flat profile for screw mounting ● W x H = 50 mm x 13 mm ● Unguided position magnet ● Manifold arrangements 	
PCFP22 				●		○	○	IP64	<ul style="list-style-type: none"> ● Ultra-flat profile for strap mounting ● W x H = 48 mm x 12 mm ● Unguided position magnet 	
PCFP23 	●	●	●					IP64	<ul style="list-style-type: none"> ● Ultra-flat profile for strap mounting ● W x H = 36 mm x 12 mm ● Unguided position magnet 	
PCST21 	●	●	●	●		○	○	IP67	<ul style="list-style-type: none"> ● Rod version for cylinder mounting ● Rod diameter 10 mm ● Suitable for applications in hydraulic cylinders 	
PCST22 	●	●	●	●		○	○	○	IP65	<ul style="list-style-type: none"> ● Rod version for cylinder mounting ● Rod diameter 10 mm ● Separate electronics for a very compact design