Do you know where you stand?

# Magnetic cylinder sensors








www.ipf-electronic.com

Our sensors ensure your success

ipf electronic

# Magnetic cylinder sensors

## The reliable choice for position determination

In many automated applications, pneumatic cylinders have become nearly indispensable, for example, in molding tools and in drive, conveyor and handling technology.
In these and many other areas of use, it is often necessary to receive a switching signal at certain piston positions. Ideally suited for this are our magnetic cylinder sensors, which query the position of piston rods in pneumatic cylinders contactlessly as well as wear-free and, thus, very reliably.

# The many advantages of fully electronic systems

## Convincing arguments for why you should choose our solutions

In practical use, our magnetic cylinder sensors must often withstand considerable stresses. These include not only high temperatures, but also extreme mechanical loads caused by vibrations, impacts, blows, etc., as well as the use of materials such as coolants, lubricants, oils, inks and cleaning agents and solvents, with which our sensors come into direct contact.

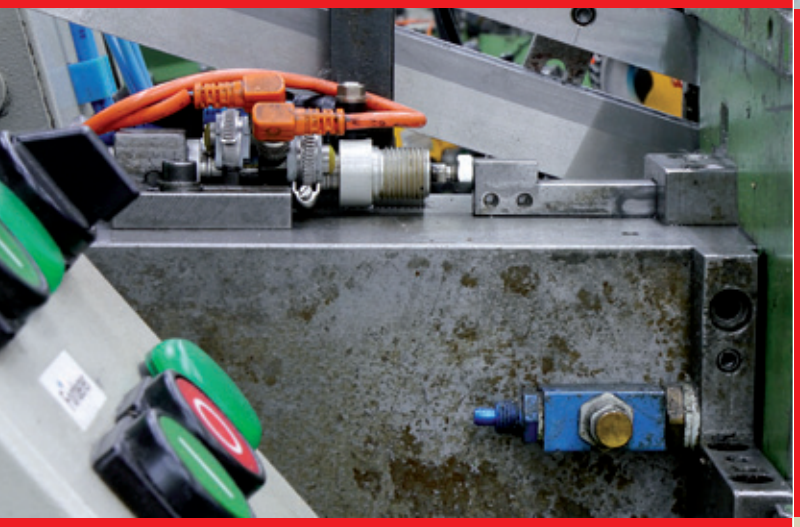
Regardless of what the surroundings demand of our devices, they always function trouble free – and do so over years or even decades.

The decisive reason: magnetic cylinder sensors are fully electronic solutions and, as a result, have numerous advantages over devices that use reed contacts for position sensing.

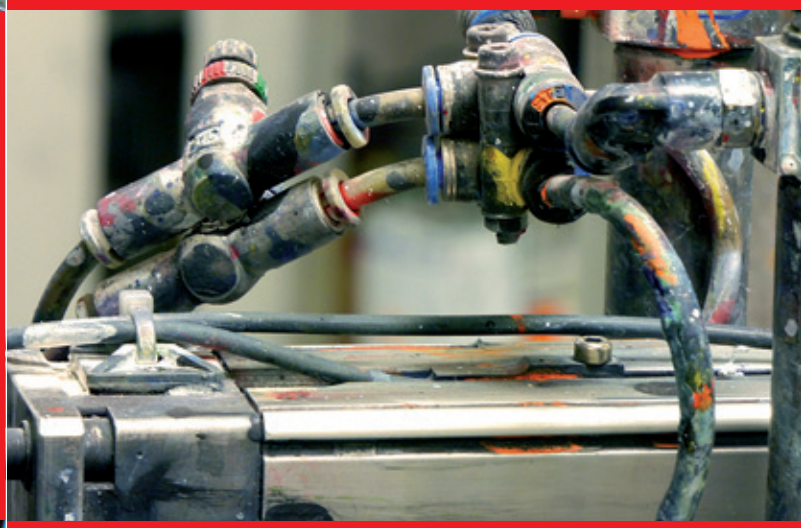
This means that our solutions are:

- Highly reliable and operate wear free, since they have absolutely no moving parts
- Extremely robust due to, among other reasons, the fully casted electronics and housing versions made of metal
- Very temperature resistant due to a possible operating temperature range from -40°C to +130°C depending on sensor version
- Extremely accurate, as – compared to devices with reed contacts – they feature higher accuracy with very good repeat accuracy
- Highly precise due to very short travel paths
- Extremely responsive, with a high switching frequency of up to 1kHz
- Well protected, as they all feature degree of protection IP67

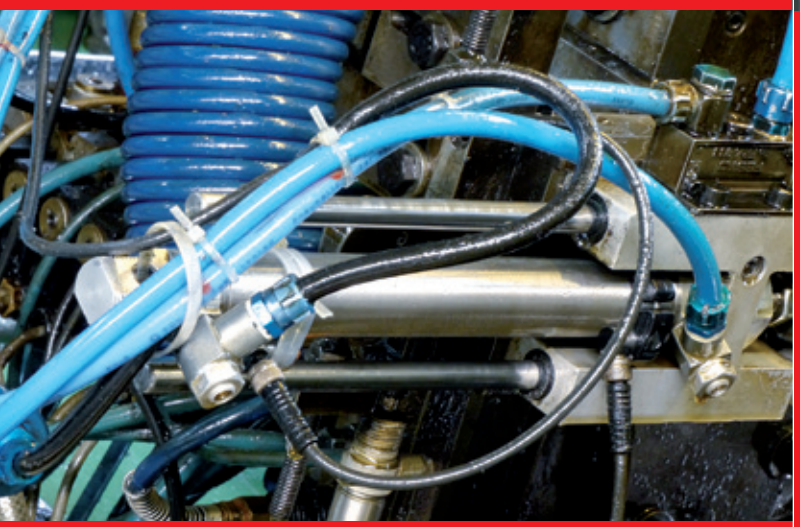
***Robust feature:*** *Magnetic cylinder sensors on a special hydraulic cylinder that need to withstand the most extreme conditions, including high temperatures of up to +100°C and extraordinary mechanical loads.*



***Exact switching behaviour in a very small space:*** *Two compact sensors on an extremely short pneumatic cylinder.*



***Always ready for use and reliable:*** *Even ink splashes and dried-on ink residues don't stop our sensors. They can also withstand the use of cleaning agents and solvents.*



***Sealed and wear-free:*** *Magnetic cylinder sensors on a machine in an extremely oily environment.*

# Versatile, variable, flexible, advanced

## Precise position determination that can benefit practical applications

**Our range of offerings are as diverse as the possible uses**
ipf electronic has an immense selection of widely varying magnetic cylinder sensors with diverse fastening concepts for simple mounting on all common pneumatic cylinders to flexibly fulfill all customer wishes and requirements down to the smallest detail.

**Variable variety**
We now offer well over 200 different device types in all conceivable sizes, with additional variations, e.g., in the line length, in the design of the connections, for flush mounting or as a surface-mounted solution, with pluggable or permanently installed connection lines, and, and, and. Of course, all cables are resistant to oil and are suitable for trailing chains.

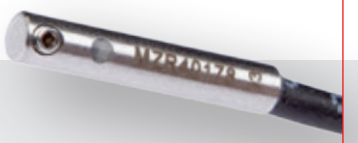
**Development 1: Individual and unique**
In addition to our devices available directly from our warehouse, we cooperate closely with our customers to develop custom magnetic cylinder sensors for very specific applications. With these individual and unique solutions, our customers receive numerous tangible benefits.

**Development 2: Flexible and modern**
The engineers at ipf electronic are also constantly working to optimize the fields of application and versatility of our magnetic cylinder sensors with respect to current and future customer requirements.

**One for all**
One example of this is our adapter concept, which facilitates the flexible fastening of a given sensor type to various pneumatic cylinders. Learn more in this brochure.

**Once instead of twice**
Our teachable cylinder sensors for pneumatic short stroke cylinders are another example. With these sensors, you receive a solution that requires just a single sensor to query two piston-rod positions in applications with extremely short pneumatic cylinders. These devices are described in this brochure as well.

**MZR4**
for C-groove or round-groove cylinders from all leading manufacturers, high locking power, very compact design



**MZR9**
for rods, pull-rods or profile cylinders from all leading manufacturers, metal housing, built-in amplifier, fastening with adapter

**MZ13**
for rods, pull-rods or profile cylinders, high switching frequency, LED indicator

**MZ15**
for dovetailed tenon, easy-to-install from above, independently of cylinder manufacturer

**MZ07 and MZA7**
for T-groove cylinders, metal housing (vibration-resistant). MZ07 and MZA7 can either be slid into the T-groove or inserted from above

# Advantages and highlights

**Magnetic cylinder sensors**

- Versatile, for cylinders from all leading manufacturers
- Simple mounting, simple connection
- Precise through high switching accuracy with small hysteresis
- Robust, housing versions in metal
- With integrated amplifier
- Very short travel paths
- High temperature resistance to +130°C
- Can also be used at very low temperatures to -40°C
- Wear- and trouble-free and thus very long lasting
- Impact and vibration resistant
- Short-circuit and reverse polarity protection
- High degree of protection IP67

**Adapter AM000081**
for T-groove cylinders

**Mounting clip AM000015**
**Strap retainer AM000004**
for round cylinders

**Adapter AM98A929**
for cylinder CP95

**Mounting clip AM000040**
for round cylinders

**Clamp AM000073**
for profile cylinders

**Adapter AM98A952**
for cylinder ECDQ2

**Adapter AM000036**
for dovetailed cylinders

# Advantages and highlights

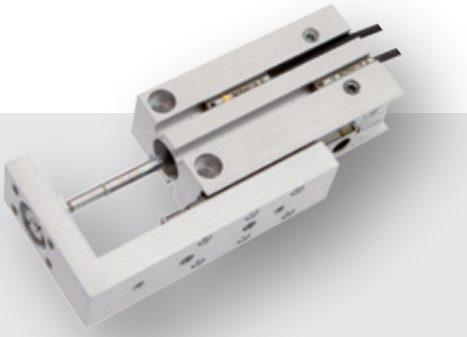
**Accessories / fastening**

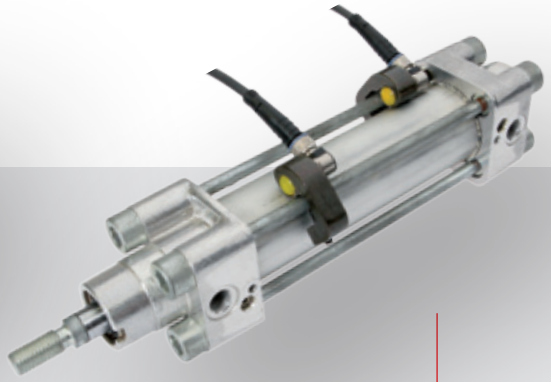
- Versatile system fastening
- Suitable for the respective cylinder types
- Fast mounting with standard tools
- In plastic or metal
- Secure retention
- Compact design

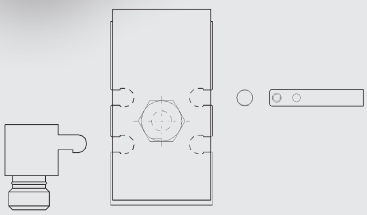
# "Tailor-made suits" from the rack

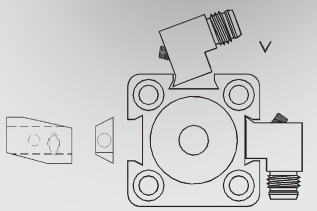
## Fasten, connect, get to work

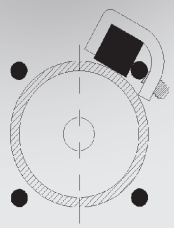
**Dovetailed cylinders**
Our magnetic cylinder sensors of the MZ15 series can easily be mounted from above in the dove-tailed tenon of a pneumatic cylinder. The sensors can be used completely independently of the respective cylinder manufacturer.











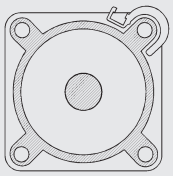
**Cylinders with C-groove (round groove)**
Pneumatic cylinders with C-groove require very compact magnetic cylinder sensors, such as our devices of the MZR4 series. With our MZR40787, a device-side teach button can be used to teach two piston-rod positions with just a single sensor and output a 24V DC signal for both positions via two separate PNP outputs.

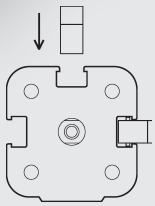
**Pull-rod cylinders**
Our MZ31 sensor series was specially developed for fast mounting on pull-rod cylinders. The devices feature a built-in amplifier and, like all of our solutions, are impact- and vibration-resistant.

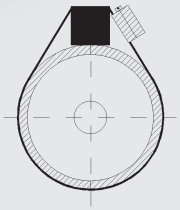
**Sensors that are a perfect fit ...**
Our wide-ranging selection of magnetic cylinder sensors leaves nothing to be desired, regardless which pneumatic cylinders you use for your applications. You can also select from a variety of device variants with pluggable or permanently installed connection lines, for flush or surface mounting as well as numerous fastening concepts, which facilitate fast and trouble-free installation.

**T-groove cylinders**

Our sensors of the MZ07 and MZA7 series are simply slid or inserted from above into the T-groove of pneumatic cylinders. Like the MZR40787, our MZ070787 features a teach button for teaching two piston-rod positions.







**Profile cylinders**

With their robust metal housing, our sensors of the MZR9 series, among others, can be fastened to profile and round cylinders. The devices can also be easily mounted to very short cylinders.

**Round cylinders**

Developed specifically for round cylinders is our MZ13 sensor series, which can be fastened with strap retainers. The strap retainers can be used independently of the diameter of the pneumatic cylinder.

Our sensors are thus immediately ready for use and, depending on the device type, are suitable for use at temperatures from -40°C to +130°C. "Fasten, connect, get to work," is our motto. Our solutions are extremely robust and wear- and trouble-free. As a result, you can safely forget about them once installed, because they always function reliably.

**Dovetailed cylinders**
**with adapters AM000081 + AM000036**
With the combination of adapters, sensors of the MZR4 series can be fastened to dovetailed cylinders.

**C-groove cylinders**
C-groove cylinders require no adapter for fastening to our MZR4 sensor series.

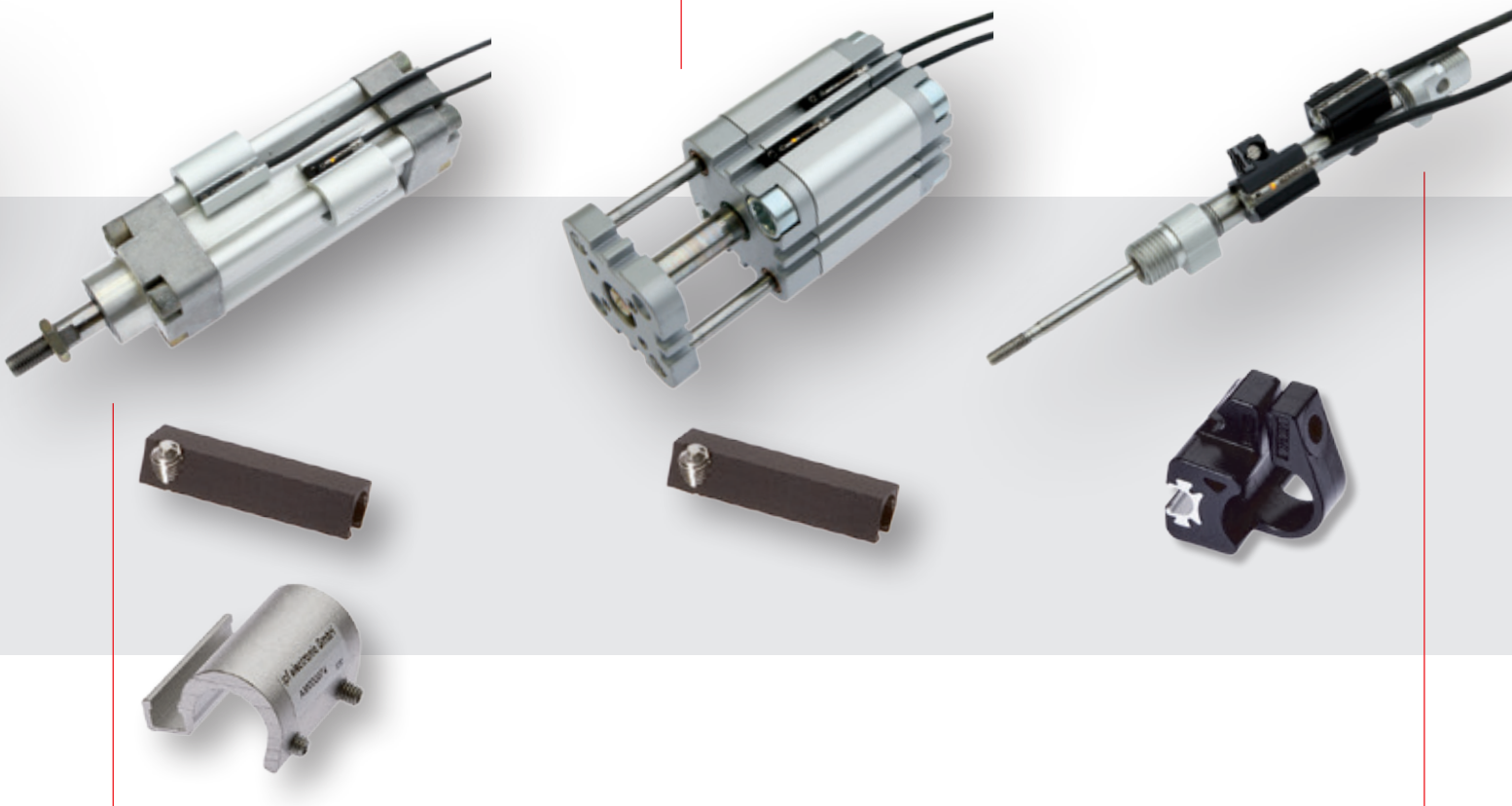
**Pull-rod cylinders**
**with adapter AM000081 + AM000070**
Adapters and clamps made of aluminum ensure reliable fastening of sensors of the MZR4 series to pull-rod cylinders.

**Stay flexible**
With our adapter concept, one sensor type can be fastened to various pneumatic cylinders, such as the MZR4 sensor series, which is shown here as an example. This helps reduce capital commitment, as a different sensor is not needed for every cylinder, eliminating the need to keep various sensor

# One for all

## High flexibility through adapters

**T-groove cylinders**
**with adapter AM000081**
Adapters made of aluminum for mounting sensors of the MZR4 series to cylinders with T-groove.



**Profile cylinders**
**with adapter AM000081 + AM000074**
Adapters and aluminum clamp for fastening sensors of the MZR4 series to profile cylinders.

**Round cylinders**
**with adapter AM000093**
Plastic clamp for fastening sensors of the MZR4 series to round cylinders.

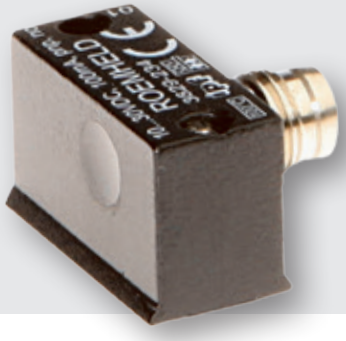
types on hand. Through simple mounting with standard tools, you also save time. True to the motto "one for all," you are always flexible with this economical solution, regardless of which pneumatic cylinders you use.

# Customer-specific special solutions

## Unique – for your specific application

**MZA7C879**

The customer-specific sensor with special fastening concept for 6.4mm round groove was developed especially for reliable use near coupling systems with rail vehicles. The device is extremely resistant to impacts as well as vibrations and can be used in a temperature range from -40°C to +80°C.

**MZ150182**

This extremely robust, customer-specific solution is used on special hydraulic cylinders. Unlike "normal" versions, these sensors have a cylinder housing made of stainless steel and an integrated position magnet. Here, the sensor must withstand very harsh operating conditions, e.g., on clamping tools for dies or interchangeable tools. Through the special fastening, the sensor always stays where it should and resists even extreme impacts as well as vibrations. This special solution can be used in temperatures from -15°C to +100°C.

**Doesn't fit? Not a chance!**

Do you have an application for which you cannot find suitable magnetic cylinder sensors in a standard design? Then speak with us. We will work closely together with you to develop a custom solution that meets the special requirements of your specific application. You benefit here from

**MZ07C431**

This special device was developed for use on a robot gripper. The fastening concept for the sensor is specially tailored to the already present pneumatic cylinder type, as are the electronics in the device, which are adapted to a non-interference-free (unclean) supply voltage. Furthermore, the solution includes a special line that is suitable for trailing chains, with a line outlet designed according to the customer's specifications.


**MZ07A108**

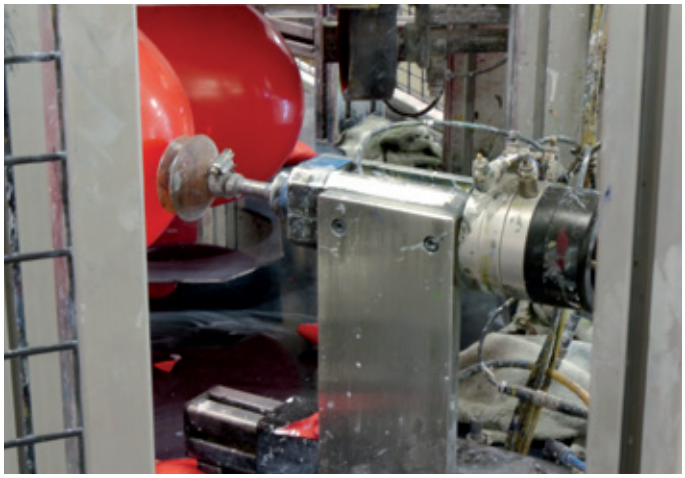
A sensor solution developed for mounting on pneumatic cylinders of large systems for handling bulk, mass-produced parts, such as the cleaning and drying of workpieces made of metal. The device can withstand even the most extreme impacts and includes a special solution for fastening with a 2.5mm Allen key. Moreover, the sensor was equipped with an M12 connection at the customer's request.

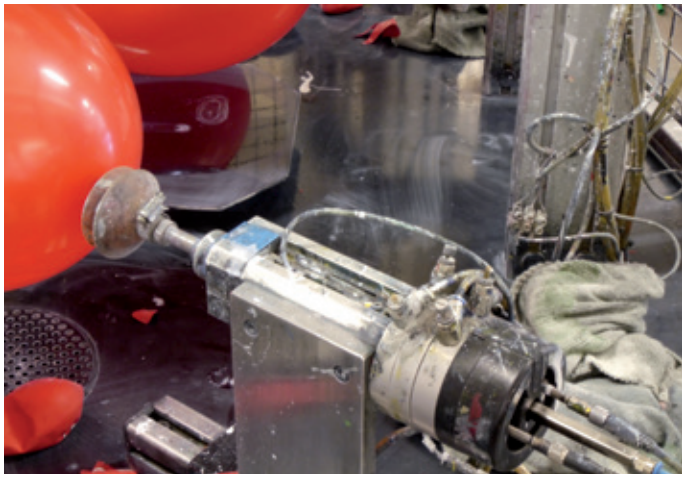
**MZ07C731**

This robust sensor in metal housing with M12 plug connector is used in the immediate vicinity of a welding system. The 1m-long connection line has a Teflon sheathing to prevent damage caused by weld splatter.

our extensive know-how and our decades of practical experience in the development of customer-specific sensors – including unique developments with which we have already overcome challenges for which there were not previously solutions.

# Practical example that convinces





## Practical applications show just what "robust" and "long-lasting" mean

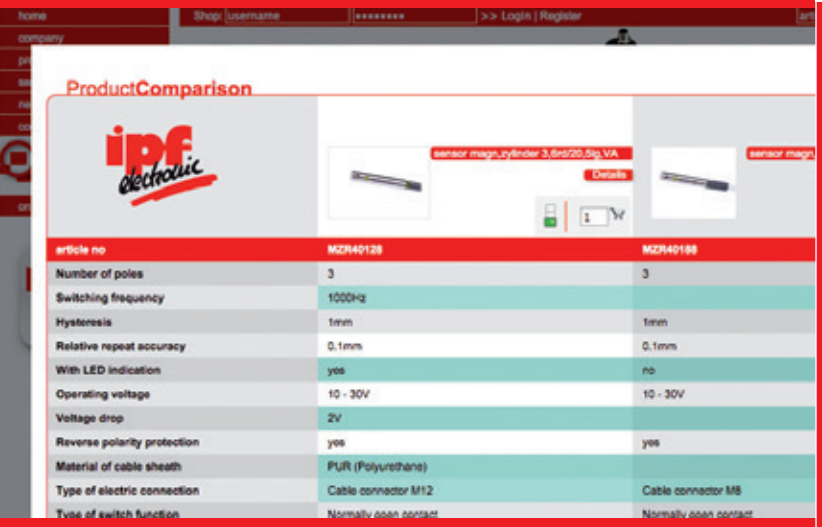
Magnetic cylinder sensors don't have it easy in day-to-day use. In spite of high mechanical loading from impacts, vibrations, extreme oscillations, etc., the devices must always function reliably.
In addition, they are often exposed to very low or very high temperatures and, particularly in the metalworking industry, they frequently come in direct contact with coolants, lubricants, emulsions and oils, to give just an overview.
In order to ensure that they always function properly and over many years or decades, inks as well as cleaning agents and solvents must likewise not affect our magnetic cylinder sensors, as the following application example shows.
A company prints promotional materials, including balloons, on which images with one or more colors are printed. In order to print the desired image on both sides, the balloons are inflated in an appropriate system to a fraction of their actual volume. In the printing station, the first side of the balloon is printed with an image and then it is turned with a turning device so that the image can also be applied to the second side. For this purpose, a vacuum head is moved towards the balloon in the turning station via a pneumatic cylinder. The head applies suction to the balloon and then moves back via the pneumatic cylinder, rotates 180°, advances again via the cylinder and places the balloon back on the receiver.
Because a balloon can easily explode during this "turning maneuver," ink splashes, and thus ink deposits, are not uncommon on our cylinder sensors.
In spite of these adverse conditions, our devices with degree of protection IP67 operate trouble-free and extremely reliably over the entire production process. The system is also cleaned regularly in order to remove ink deposits, e.g., from profiles and other system components. During this process, the cylinder sensors come into direct contact with highly effective cleaning agents and solvents. Our devices remain completely undamaged by this "treatment."
With the magnetic cylinder sensors from ipf electronic, the company has found a solution for a production environment that, in several respects, meets demands on high reliability and, thus wear- and interruption-free operation. An extremely robust and long-lasting solution, in fact.

To the application report


*It is not always easy to find the right sensor or the suitable accessory for a specific application. With the "ProductSelector", ipf electronic presents a new feature on its website (www.ipf-electronic.com) that takes care of this with just three clicks of the mouse.*


*In the first step, one selects the product area in the "ProductSelector" (e.g., cylinder sensors). The user can then further refine his search by specifying the cylinder manufacturer, type, piston rod Ø, dimensions, cylinder profile, groove shape, design, orientation of the sensor surface, mounting in cylinder groove, housing material, connection, output, etc.*


*Already in the third step, the "ProductSelector" returns a result list with products that meet the search criteria and displays, among other things, the current availability of the products.*




| article no | MZR40128 | MZR40188 |
|---|---|---|
| Number of poles | 3 | 3 |
| Switching frequency | 1000Hz | |
| Hysteresis | 1mm | 1mm |
| Relative repeat accuracy | 0.1mm | 0.1mm |
| With LED indication | yes | no |
| Operating voltage | 10 - 30V | 10 - 30V |
| Voltage drop | 2V | |
| Reverse polarity protection | yes | yes |
| Material of cable sheath | PUR (Polyurethane) | |
| Type of electric connection | Cable connector M12 | Cable connector M8 |
| Type of switch function | Normally open contact | Normally open contact |

*With a click of the mouse, up to three matches can be selected for a more detailed product comparison. In the comparison that follows, color markings allow the user to immediately see the specifications in which the products of his comparison differ.*

# Efficient advice on all matters

## Personal service and problem-solving on site

CONTACT

Every call is important! When you contact our technical hotline, you speak to experienced employees who will answer your questions competently and conscientiously. Our goal is to provide you with comprehensive and individual advice around the clock. Our expert team of in-house trained personnel is here to support you.

You can also contact your personal application consultant in our sales department. At ipf electronic, we work together very closely so that we are able to react quickly, competently and reliably to your specific query.

In almost all industrial applications, problems are becoming ever more complex and varied. Solutions to these problems often require external expertise. You will find this expertise together with a high level of specialist and problem-solving competence at ipf electronic. We are happy to discuss tasks which may seem small with you. For us, this is a matter of course!

ipf electronic is a renowned supplier of industrial sensor technology and a reliable partner. No customer query is ignored and no on-site customer appointment is missed. Our extremely broad range of products will convince you. Diversity, expertise, consultation and flexibility:

**This is ipf electronic's recipe for success.**

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