

BALLUFF

B *innovating automation*

Hydraulics and pneumatics –
Intelligently
networked digitalization

**SOLUTIONS
FOR FLUID POWER
TECHNOLOGY**

Balluff and fluid power technology

WE ARE AT HOME IN MANY
DIFFERENT SECTORS



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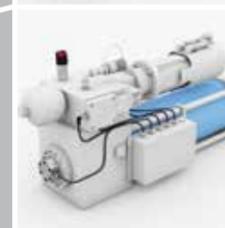
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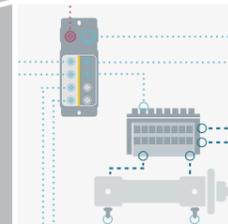
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**ALL-IN-ONE SOLUTION FOR CONNECTING
SENSORS AND ACTUATORS**



Turn off fluid drives safely

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For traditional use with digital IIoT-capable solutions

PROCESS AND SERVICE DATA FOR PNEUMATICS AND HYDRAULICS.

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For your hydraulic and pneumatic systems Balluff offers innovative, state-of-the-art solutions. With various technologies for monitoring temperature, flow, level and travel as well as for intelligent position feedback, this wide range provides users with both process and service data. Whether you choose traditional solutions or wish to implement IIoT-capable applications, Balluff offers partnering support tailored to your needs from a single source.

The field of intelligent hydraulics is very broad, ranging from ultra-fast feedback in flight simulators or plastic injection molding machines to the harshest underground applications. But in energy production the watchword is high security. This is ensured by hydraulic systems using Balluff sensors, whether in blade adjustment for wind power systems or controlling steam valves on generators.

When assembly and automation technology calls for simple movements from A to B or gripping, holding, clamping or pressing in parts, pneumatic drive systems with Balluff position sensors are in demand. They stand out with simple topology construction, light and compact design and high energy efficiency, which is especially advantageous in holding or clamping applications such as on robotic grippers.

Innovative solutions assist in high system availability

VERSATILE PERFORMANCE RANGE – WITH IO-LINK.

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With Balluff you have at your disposal a wide, versatile performance range consisting of compact sensors, easy to integrate systems and intelligent network technology. Our know-how lets you reliably monitor pressure, level, temperature and travel.

For cylinders, valves and grippers you have high-quality solutions for position and end-of-travel detection as well as level and flow measurement. We provide solutions for virtually any cylinder type – including those made of non-magnetic material or for use in explosion hazard areas. With our redundant systems, you meet the highest safety regulations. Our sensors and systems detect cylinder stroke reliably and in virtually any situation. At the same time our process sensors monitor process media reliably, ensuring, for example, the proper viscosity of hydraulic oil.

Whether hydraulic or pneumatic drives, we offer perfect linear feedback. Our intelligent magnetostrictive linear position sensors are ideal for integration in the pressure area of the cylinder. This makes the drive IIoT-capable.

Our performance range at a glance

- Sensors for position and end-of-travel detection in hydraulic cylinders and valves
- Capacitive sensors for monitoring liquids
- Pressure sensors for monitoring the hydraulic circuit
- Temperature sensors and flow controllers
- Network and connection technology for industrial communication
- Worldwide locations with technical consulting, sales, after-sales service and spare parts provision

 Sensor signals
 Hydraulic circuit

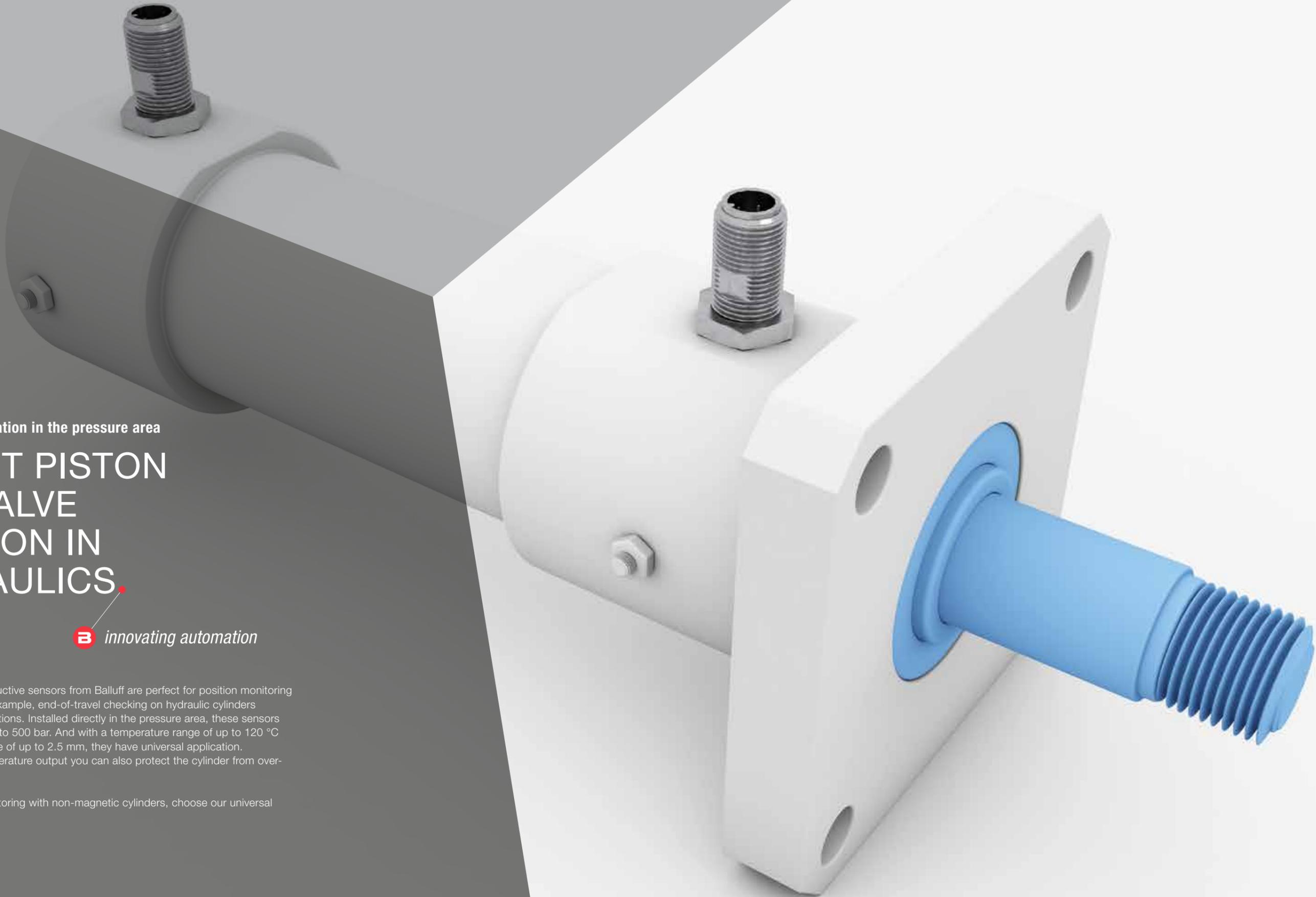
For perfect integration in the pressure area

DETECT PISTON AND VALVE POSITION IN HYDRAULICS

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High pressure rated inductive sensors from Balluff are perfect for position monitoring of your hydraulics, for example, end-of-travel checking on hydraulic cylinders or monitoring valve positions. Installed directly in the pressure area, these sensors withstand pressures up to 500 bar. And with a temperature range of up to 120 °C and a switching distance of up to 2.5 mm, they have universal application. Using the optional temperature output you can also protect the cylinder from over-heating.

To handle position monitoring with non-magnetic cylinders, choose our universal magnetic field sensors.





END OF CYLINDER STROKE DETECTION

With BHS pressure-rated inductive sensors

High pressure-rated sensors are the established standard for end-of-travel monitoring on hydraulic cylinders. These detect the end position of the stroke in hydraulic cylinders without contact and wear-free. By using the sensor for end position damping you significantly increase the reliability of the axis. To handle high forces even when space is at a premium, choose our high pressure rated M5 and M8 sensors.

Features

- Reliable standard for up to 500 bar
- For any cylinder or valve size – versions from M5 to M16

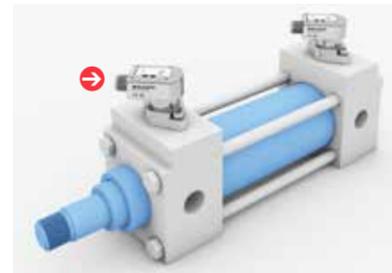


ELECTRONIC END POSITION DAMPING Using BAW high pressure-rated inductive distance sensors

High pressure-rated inductive distance sensors from Balluff detect those last millimeters before the end stop with high precision. Their analog 0 to 10 V signal is ideal for electronic end position damping. These sensors are easy to integrate for reliable monitoring of the valve position. The conical actuation element expands the measure range, making them flexible when it comes to installation.

Features

- Analog signal 0...10 V
- Easy to integrate
- Pressure-rated up to 500 bar



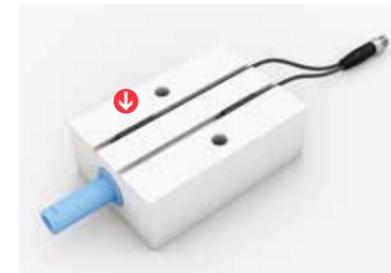
MONITOR END POSITIONS ON TIE ROD CYLINDERS

With BHS pressure-rated inductive sensors with fixed stop

For precise end-of-travel monitoring on hydraulic cylinders choose our pressure-rated inductive sensors with fixed stop. This end stop makes simple installation possible. You also benefit from great freedom of design because the pressure-rated housing swivels, allowing you to position the cable exit as needed. Another plus: A wide range of sizes lets you select the right sensor for your cylinder type.

Features

- Fixed stop and pressure-rated housing for ease of installation
- Cable and connector exit can be ideally positioned thanks to swivel housing
- Established US standard – supports systems builders in international competition

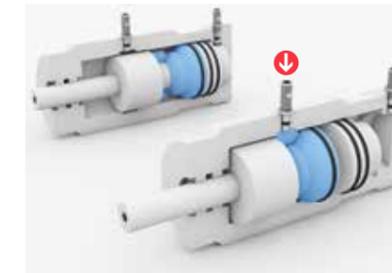


DETECT POSITIONS IN NON-MAGNETIC BLOCK CYLINDERS With BMF magnetic field sensors

Varying piston positions can be reliably detected from the outside on block cylinders made of non-magnetic materials such as aluminum or stainless steel because our magnetic field sensors detect both end positions and intermediate positions. Thanks to IO-Link you can even define up to eight switching points. These universal sensors detect the permanent magnet ring attached to the piston through the cylinder wall.

Features

- Detect end and intermediate positions – universal application
- IO-Link versions – up to eight switchpoints can be programmed
- Highly compact – can be installed in C- or T-slots
- Single connector versions in M8 or M12 for two sensors – easily double the sensors on a multi-interface block or sensor distributor

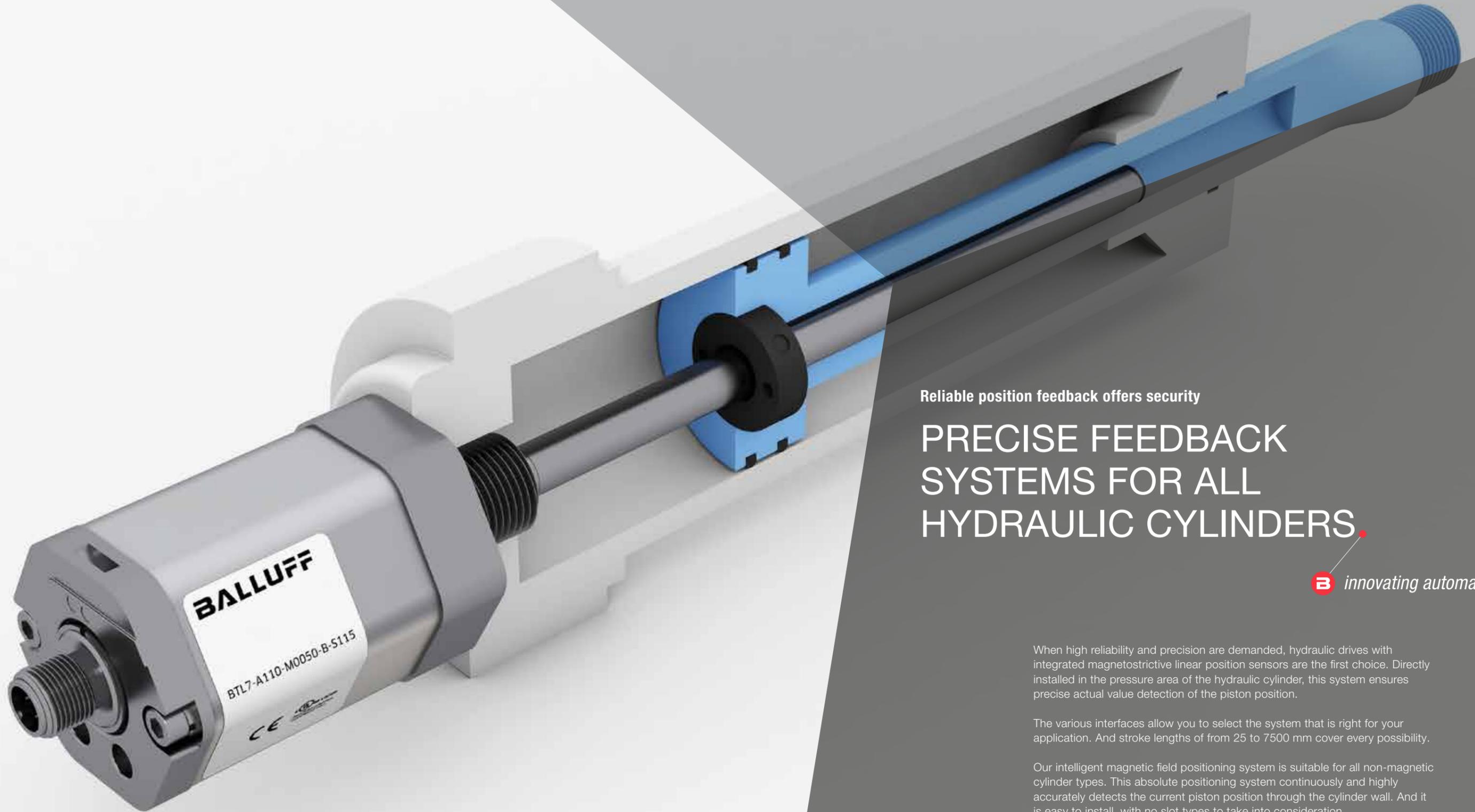


DETECT POSITIONS ON THE LOCKING CYLINDER With BHS pressure-rated inductive sensors

Our pressure-rated inductive sensors detect changing positions of the locking cylinder reliably and indicate whether it is locked or unlocked. This increases the reliability of the application and ensures efficiency. By using locking cylinders you can, for example, improve the energy efficiency of the hydraulic drive on injection molding machines. Locking during the injection phase makes high holding pressure unnecessary, in turn allowing the size of the hydraulic drive system to be reduced.

Features

- Increase the energy efficiency of machines
- Small drive system reduces costs
- With optional diagnostics function – for controlled locking



Reliable position feedback offers security

PRECISE FEEDBACK SYSTEMS FOR ALL HYDRAULIC CYLINDERS.

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When high reliability and precision are demanded, hydraulic drives with integrated magnetostrictive linear position sensors are the first choice. Directly installed in the pressure area of the hydraulic cylinder, this system ensures precise actual value detection of the piston position.

The various interfaces allow you to select the system that is right for your application. And stroke lengths of from 25 to 7500 mm cover every possibility.

Our intelligent magnetic field positioning system is suitable for all non-magnetic cylinder types. This absolute positioning system continuously and highly accurately detects the current piston position through the cylinder wall. And it is easy to install, with no slot types to take into consideration.



MEASURE POSITIONS IN INDUSTRIAL HYDRAULICS WITH HIGH PRECISION
With BTL magnetostrictive linear position sensors

Magnetostrictive linear position sensors from Balluff have become the standard for reliable, high-precision position measurement in industrial hydraulics. Their pressure rating of up to 1000 bar matches that of the hydraulic cylinder. The non-contact operating principle guarantees freedom from wear and virtually unlimited life expectancy. Our absolute systems also require no homing move. Their precise output signal is presented as an absolute signal when starting up.

Features

- Pressure rated to 1000 bar – expanded range of application
- Measuring lengths of up to 7620 mm
- Analog, digital, fieldbus or Ethernet interfaces
- High shock and vibration resistance

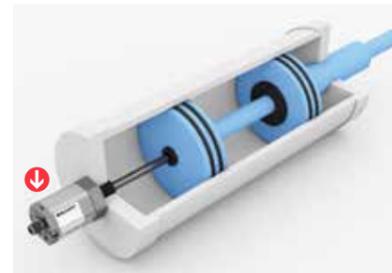


DETECT PISTON POSITION REDUNDANTLY AND IN EX ZONES
With redundant or flameproof BTL magnetostrictive linear position sensors

The highest safety requirements, such as redundant systems, are required in power plants. The compact, redundant magnetostrictive linear position sensor from Balluff feature up to three independent measuring tracks and three independent electronic circuits in one rod. This rugged, absolute system can be freely configured and easily placed in service. Are your hydraulic cylinders destined for Ex zones? For safe use in Ex zones 0 and 1, Balluff offers flameproof magnetostrictive linear position sensors.

Features

- Compact and space-saving
- Non-contact and wear-free
- Monitoring of all channels via LEDs
- Versions for Ex zones 0, 1 and 2
- Pressure rated versions up to 600 bar
- Range of interfaces available
- Many international approvals



DETECT TWO POSITIONS AT THE SAME TIME IN DOUBLE PISTON DRIVES
With BTL magnetostrictive linear position sensors

Do you need to detect two position with one system in a double piston drive? Now you can with the magnetostrictive linear position sensors from Balluff. The second piston position is detected with a magnet through the non-magnetic piston rod of Piston 1. In joining and fastening technology, for example, nothing more stands in the way of correct and precise clinching, riveting or crimping.

Features

- One system for two strokes, highly economical
- Compact design, saves space



DETECT POSITION IN MOBILE HYDRAULICS
With BTL magnetostrictive linear position sensors

Sensors can be used to significantly extend the service life of mobile machinery. You can also use sensors to increase their safety. The BTL AR position sensor reliably detects the piston position on mobile hydraulic cylinders. The compact form factor of the sensor makes it ideal for use in narrow spherical bearings and swivel eye cylinders as well as in larger diameter cylinders.

Features

- EMC approvals enable interference-free use
- E1 certified for mobile applications
- Small housing for perfect integration
- With clever click-plug system for simple installation



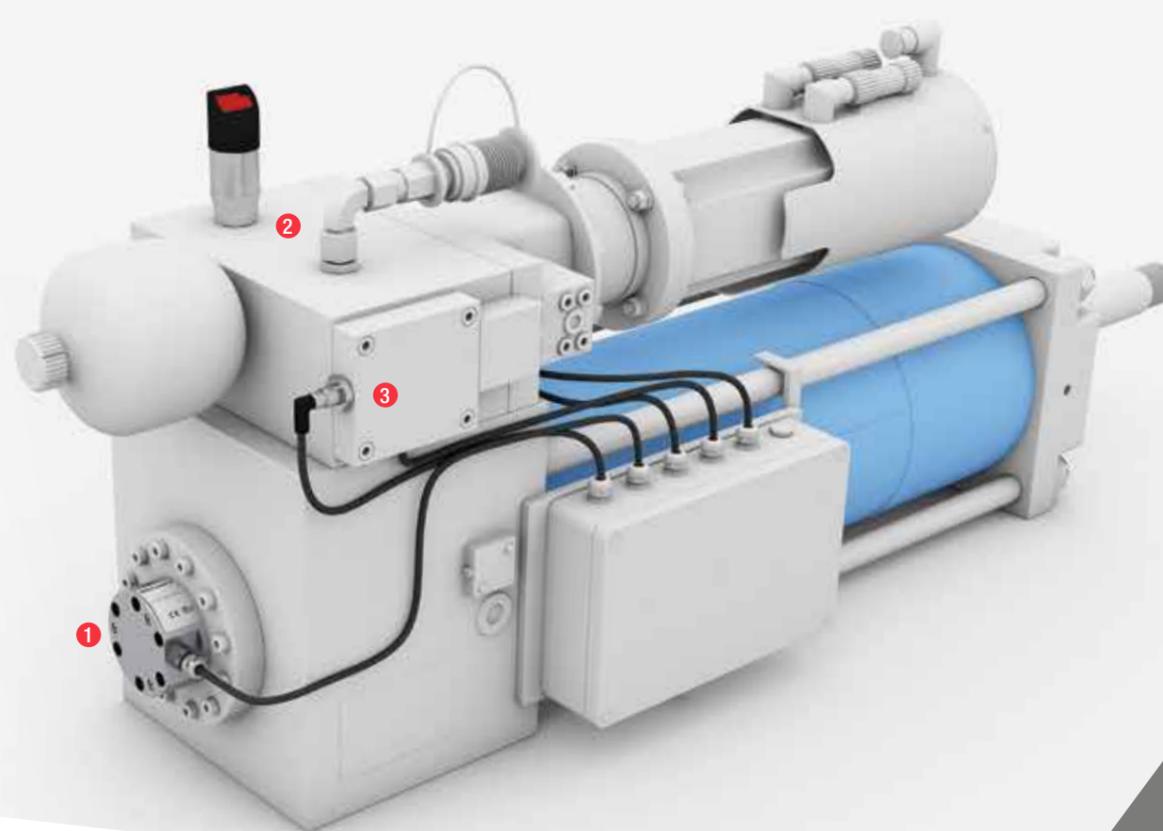
PISTON POSITION MEASURED THROUGH BLOCK CYLINDER WALL
With BMP magnetic field positioning systems

With the non-contact and wear-free BMP magnetic field positioning system you can turn your non-magnetic block cylinder into an IIoT-capable drive system.

This absolute positioning system continuously and highly accurately detects the current piston position through the cylinder wall. And with IO-Link it opens up additional parameterization and diagnostic possibilities. In addition to the process data, you also obtain information about device status, operating temperature and current ambient conditions.

Features

- Flexibility with modular concept: for a variety of cylinders over a total stroke of from 32 to 256 mm
- Ready for Industry 4.0: Condition monitoring and predictive maintenance
- Easy installation



CYLINDER FEEDBACK FOR COMPACT DRIVES
With BTL magnetostrictive linear position sensors

Very small sensors are needed in compact cylinders. The BTL K compact magnetostrictive linear position sensor meets this requirement ideally. Its short housing of just 34 mm in length saves valuable space in and around the cylinder. The stainless steel housing with plug-in flange and rugged hex screw fastening means you will not need an additional protective housing.

Features

- Easy characteristic curve setting
- IP67/68, shock and vibration proof
- Optional pressure-rated housing, suitable for offshore
- With analog signals, digital interfaces, fieldbuses or Ethernet



MONITOR PRESSURE IN THE COMPLETE DRIVE SYSTEM
With BSP pressure sensors

With our pressure sensors you monitor the pressure in the entire drive system. And benefit from easy handling and high accuracy. The large display and simple operating concept per VDMA means it is simple and quick to configure. At the same time the current system pressure is shown on the bright LED display. Since the display and electrical output can be turned into a position independent of the flange, Balluff pressure sensors can be installed flexibly while saving space.

Features

- Binary switching outputs or analog output signals
- With IO-Link for thorough diagnostics
- Available up to -40 °C for handling demanding environments



CONTINUOUSLY MONITOR OIL TEMPERATURE
With BFT temperature sensors

Media contacting temperature sensors allow the hydraulic fluid temperature to be reliably monitored in the hydraulic power unit. Since this takes place within the hydraulic circuit, our sensors ensure the proper viscosity of the fluid and thereby the performance capability of your machine. Critical process conditions such as a temperature limit can be controlled directly via the switching output. An analog output provides continuous measurement results. This assists with process stability.

Features

- M12 connector for simple installation
- With rotating, easy to read display: flexible installation and operating convenience
- Compact form factor and high resistance to vibration

Energy efficiency and high positioning accuracy

THE AUTONOMOUS HYDRAULIC COMPACT DRIVE

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Modern hydraulic compact drives, a union of hydraulics and electronics, are the combination of intelligence and power. This reduces installation and maintenance costs. And saves up to 80 % energy consumption by the axes.

The compact drive consists of a closed fluid circuit with cylinder, pump, control block and accumulator as well as the servomotor for the pump, the control unit with interface, and the sensors for monitoring pressure, temperature and travel.

For integration in the closed fluid circuit of the compact drive, Balluff offers linear position sensors for reliable feedback to ensure high positioning accuracy. Also, Balluff offers compact intelligent sensors for pressure and temperature measurement. These report actual operating conditions and enable predictive maintenance. The data interfaces built into the drive – fieldbus, Ethernet, OPCUA or IO-Link – are used by the autonomous axis to communicate with the machine controller or directly to the cloud.

Networked and highly flexible

FROM THE HYDRAULIC SYSTEM TO THE DIGITAL DRIVE SOLUTION

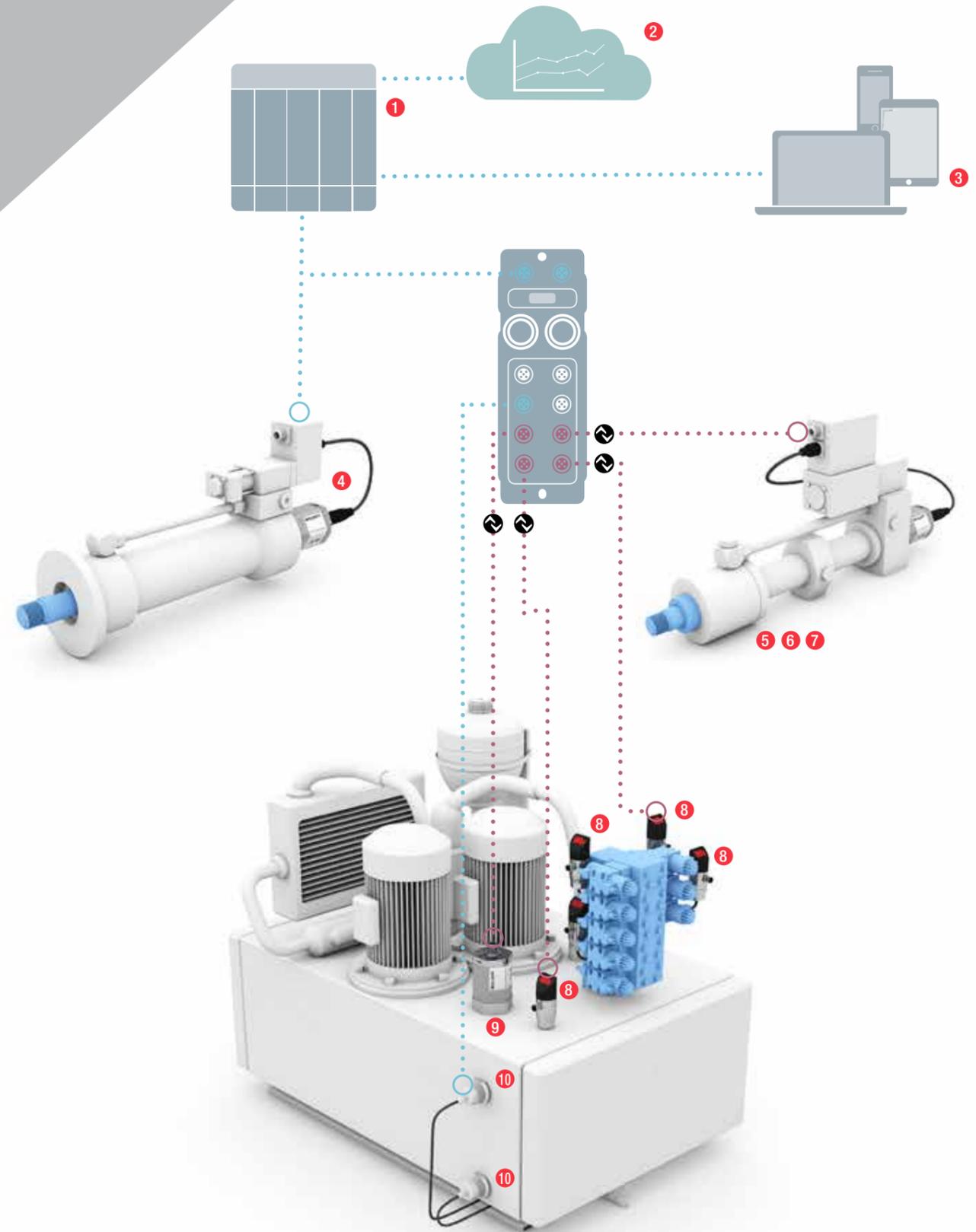
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Universal sensors and actuators handle any number of tasks and provide information and values in digital format using the standardized IO-Link protocol (IEC 61131-9). An IO-Link master communicates with the fieldbus level and the controller.

The values transmitted also provide information for diagnostics, can be documented and can be directly visualized or analyzed in the cloud.

This solution offers significant IO-Link advantages

- Simple installation with pre-assembled standard cables
- High level of economy thanks to cost effective unshielded standard cables
- Noise-free signals over a digital interface
- Ease of handling since the software for parameter setting and service data is manufacturer-neutral
- Easy monitoring, analysis and documenting since individual service data are available



- 1 Machine controller
- 2 Analysis, data documentation in the cloud
- 3 Monitoring, visualization of the acquired data
- 4 Autonomous axis in the field level
- 5 Detecting liquid media flow with BFF thermal flow controller
- 6 Temperature measurement with BFT temperature sensors
- 7 Valve parameterization via IO-Link
- 8 Pressure measurement with BSP pressure sensors
- 9 Continuous level detection BTL magnetostrictive linear position sensors
- 10 Level monitoring using limit value detection with BCS capacitive sensors



IO-Link enables perfect linear feedback

THE INTELLIGENT PNEUMATIC DRIVE

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Non-contact, wear-free magnetic field sensors for indicating end-of-travel and intermediate positions have long been a standard in pneumatic automation technology. They reliably detect the actual position in both pneumatically powered actuators such as cylinders and grippers and in special pneumatic applications such as on screwdrivers, maintenance units, motors, tensioners and slides.

Because of their capability of increasing digitalization of automation technology, more intelligent, networkable pneumatic actuators are in demand. For one thing, the piston travel needs to be continuously monitored so that automated position setting can be achieved. For another, it should be possible – beyond the actual process data – to obtain comprehensive service and diagnostics information.

Our magnetic field positioning systems and sensors with IO-Link meet this specification completely. This intelligent technology provides all the desired data and ensures perfect linear feedback. It turns your pneumatic actuator into an optimal IIoT solution which moves you to the front row of digitalization in pneumatic drive technology.



MONITOR POSITIONS AND PROCESSES IN A FASTENING SYSTEM

Using BES inductive sensors for hoses, BMP magnetic field positioning systems and BMF magnetic field sensors

As screws are fed, our BES inductive tube sensors monitor each individual screw. Our BMP magnetic field positioning systems monitor the screwing process by continuously measuring the feed while the screw is being turned. And our BMF magnetic field sensors check for correct end stopping of the screwing unit.

Features

- The right sensor technology for each function
- Intelligent sensors use IO-Link to make the screw system IIoT-capable
- IO-Link reduces setup times since the parameters are set in the controller



MONITOR POSITIONS IN PNEUMATIC SLIDES

With BMF magnetic field sensors

You can use our compact magnetic field sensors in pneumatic slides to monitor the slide position without contact. The wear-free, compact sensors feature great holding force and are highly reliable even at fast traverse speeds. There are also single-connector versions for two sensors. They are available in M8 and M12 to save plug space. This is an economical solution that reduces your assembly and wiring effort and expense.

Features

- Precise switching point for reliable position detection
- Versions for flush mounting in C- or T-slot
- For space-critical applications, can be inserted from above
- Impervious to contamination
- Universal slot nuts reduce number of different versions



FOR PERFECT INTEGRATION IN GRIPPERS AND SLIDES

With BMF magnetic field sensors with IO-Link

Especially on grippers, where space is extremely valuable, you can use our intelligent magnetic field sensor to define and check up to eight switching points within the sensor's working range. And this digital solution lets you set the hysteresis individually for each switching point. As a result, up to eight different object sizes can be detected in one gripper, thus making the use of several conventional sensors superfluous. This means significantly more comfort for you as well as greater flexibility and cost savings.

Features

- Extremely large, 60 mm travel path
- Sensor head length 20 mm, with remote electronics – ideal for compact applications
- Remote teaching of up to eight switchpoints via IO-Link
- IO-Link PNP NO
- M12 and M8 sensor with cable and plug, M8 sensor with 2 m cable available
- Temperature range $-25...+80^{\circ}\text{C}$



MONITOR PISTON POSITION ON CYLINDERS

With BMF magnetic field sensors

Our compact standard magnetic field sensors are the optimal classic solution for monitoring the piston position on cylinders. The sensor recognizes the field of the magnet integrated into the piston through the actuator wall, even at high travel speeds. With its non-contact position detection these magnetic field sensors from Balluff are absolutely reliable and wear-free. This means: no contact erosion or bounce. You get only clean switching points.

Features

- Can be installed in T- or C-slot from above
- Short, compact form factors with great holding force as well as miniature sizes for short stroke cylinders and grippers
- No double switching points
- Large, extremely bright LED for simple diagnostics



PNEUMATIC DRIVE TECHNOLOGY NOW IIOT-CAPABLE

With BMP magnetic field positioning systems

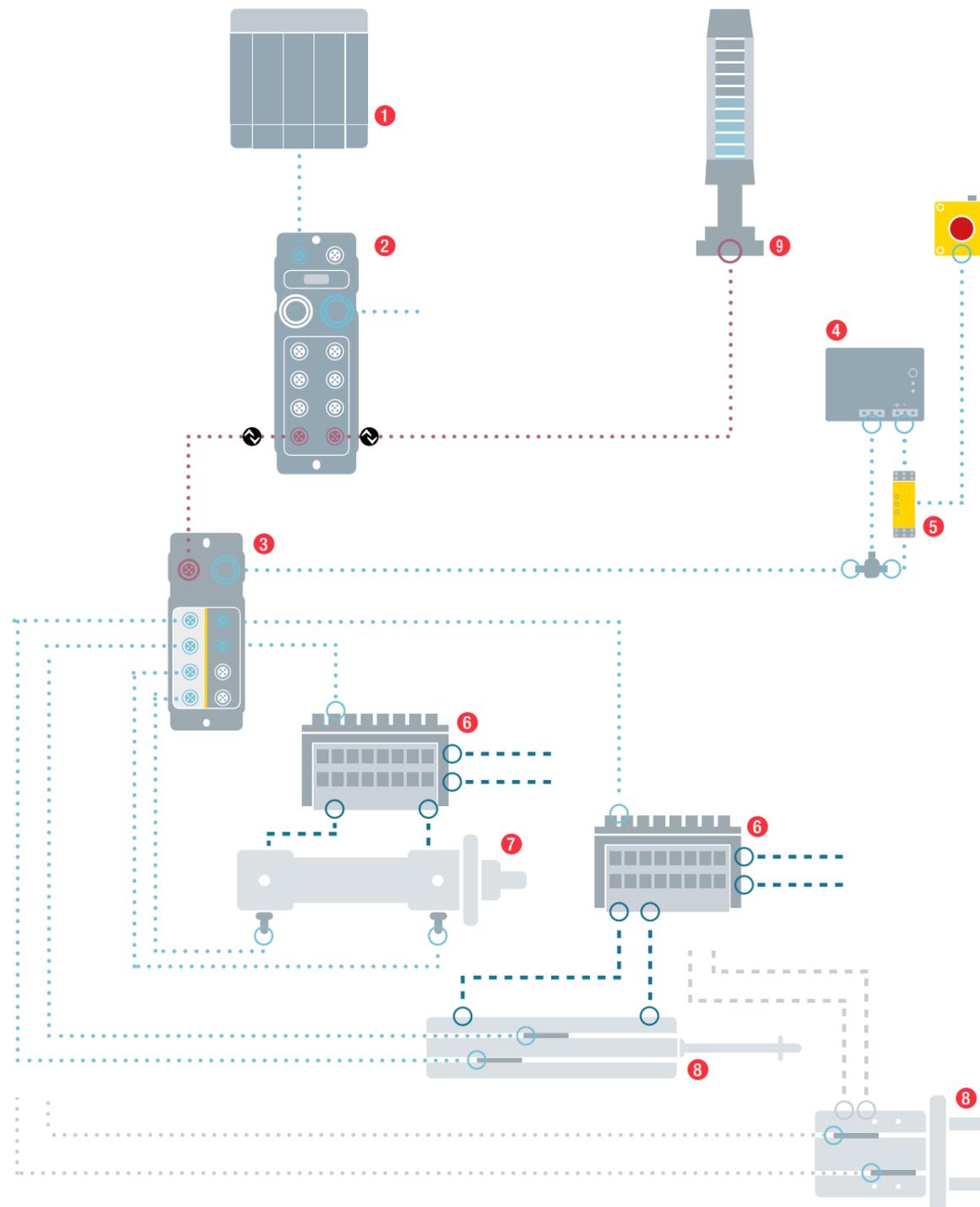
Turn a standard cylinder into an IIoT-capable pneumatic drive system with our BMP magnetic field positioning systems with IO-Link, which is compatible with virtually all cylinder types and takes up hardly any space. This absolute positioning system continuously and highly accurately detects the current piston position through the cylinder wall. The IO-Link interface gives you expanded parameter setting options and comprehensive diagnostic data. You also get information about the device status, operating temperature or current ambient conditions.

Features

- Flexibility with modular concept: for a variety of cylinders over a total stroke of 32 to 256 mm
- Reliable results: high linearity and repeat accuracy
- Ready for Industry 4.0: Condition monitoring and predictive maintenance

All-in-one solution for connecting sensors and actuators

TURN OFF FLUID DRIVES SAFELY.

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- | | |
|--|---|
| 1 Controller connected through IO-Link master module | 6 Valve manifold |
| 2 IO-Link master module | 7 Hydraulic actuator, e.g. cylinder drive with high pressure-rated BHS inductive sensors for position detection |
| 3 BNI IOL-355 sensor/actuator hub | 8 Pneumatic actuators, e.g. cylinder or gripper with BMF magnetic field sensors |
| 4 Power supply with separate sensor/actuator circuit | 9 SmartLight stack light for visualizing system status |
| 5 Safety relay for safe shut-off of the actuator segment | |

Our galvanically isolated sensor/actuator hub provides safety on pneumatic and hydraulic axes and actuators. This all-in-one solution allows you to connect both sensors and actuators to just one module. The sensor segment provides the position feedback.

At the same time, you can safely turn off the actuator segment using its separately switchable safety circuit, since the IO-Link I/O hub is divided into two galvanically isolated segments. To safely interrupt the supply voltage to the actuator segment, you need an external safety device. Then you can implement safety functions up to SIL2 in accordance with EN62061. Also reassuring: the rugged IP67 metal housing is designed even for the harshest surroundings.

Diagnostics are provided by IO-Link and several status LEDs. You can also reliably monitor the signal quality using IO-Link. Up to digital in- and outputs can be controlled with the module. If the IO-Link connection is interrupted, the outputs assume predefined states which are maintained until the IO-Link connection is restored. Because of this unambiguous machine status, you can continue to produce without a reference move and save valuable time once the connection is made again.

The SmartLight stack light incorporated into the IO-Link network visualizes the current status of the cylinder, gripper or slide.

INNOVATIVE SOLUTIONS FOR ALL REQUIREMENTS



PRODUCT OVERVIEW



Application	Product group	Example	Functions, interfaces and properties
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DETECT PISTON AND VALVE POSITION IN HYDRAULICS

End of cylinder stroke detection	Inductive sensors	BHS001L	Pressure-rated inductive sensor with switching output
Electronic end position damping	Inductive distance sensors	BAW0040	Pressure-rated inductive distance sensor with analog output
Monitor end-of-travel on tie rod cylinders	Inductive sensors	BHS003J	Pressure-rated inductive sensor with positive stop
Detect positions in non-magnetic block cylinders	Magnetic field sensors	BMF00J1	Single-connector version with two BMF magnetic field sensors
Detect positions on the locking cylinder	Inductive sensors	BHS001L	Pressure-rated inductive sensor with switching output

PRECISE FEEDBACK SYSTEMS FOR ALL HYDRAULIC CYLINDERS

Measure positions in industrial hydraulics with high precision	Magnetostrictive linear position sensors	BTLOCNU	Rod-style magnetostrictive linear position sensor
Redundant detection of piston positions	Magnetostrictive linear position sensors	BTL2WM5	Magnetostrictive linear position sensors 2 or 3 times redundant
Detect cylinder positions in Ex zones	Magnetostrictive linear position sensors	BTL1500	Magnetostrictive linear position sensor, explosion proof
Detect two positions at the same time in double piston drives	Magnetostrictive linear position sensors	BTLOCNU	Rod-style magnetostrictive linear position sensor
Detect position in mobile hydraulics	Magnetostrictive linear position sensors	BTL1Y00	Integrable rod-style magnetostrictive linear position sensor
Piston position measured through block cylinder wall	Magnetostrictive linear position sensors	BMP000Z	Magnetic field positioning system with IO-Link, 4 switching points

THE AUTONOMOUS HYDRAULIC COMPACT DRIVE

Cylinder feedback for compact drives	Magnetostrictive linear position sensors	BTL161P	Magnetostrictive linear position sensor in short compact design
Monitor pressure in the complete drive system	Pressure sensors	BSP0086	Pressure transmitter with display and IO-Link
Continuously monitor oil temperature	Temperature sensors	BFT0001	Media-contacting temperature sensor with analog output

Application	Product group	Example	Functions, interfaces and properties
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THE INTELLIGENT PNEUMATIC DRIVE

Monitor positions and processes in a fastening system	Inductive sensor for hoses	BES0428	Inductive sensor for hoses with switching output
	Magnetic field positioning systems	BSP0086	Magnetic field positioning system with IO-Link, 4 switching points
	Magnetic field sensors	BMF003Z	Magnetic field sensor with switching output
Monitor positions in pneumatic slides	Magnetic field sensors	BMF003Z	Magnetic field sensor with switching output
For perfect integration in grippers and slides	Magnetic field sensors	BMF00K9	Magnetic field positioning system with IO-Link, 8 switching points
Monitor piston position on cylinders	Magnetic field sensors	BMF003Z	Magnetic field sensor with switching output
Pneumatic drive technology now IIoT-capable	Magnetic field positioning systems	BMP000Z	Magnetic field positioning system with IO-Link, 4 switching points

Balluff

WE OPEN UP NEW PERSPECTIVES

Balluff is one of the leading suppliers of high-quality sensor, identification, network and software solutions for your automation requirements. Family-owned for more than 90 years, with around 4000 employees worldwide in 37 wholly-owned subsidiaries for sales, production and development, we are dedicated to the highest quality.

We provide innovative solutions that increase your competitive ability with our top products and services. Through many years of experience, we deliver the expertise of a manufacturer and high personal dedication.

We follow our motto "Innovating Automation" as pacesetters of automation, refiners and new developers, and technological trailblazers. In open exchange with associations, universities and research institutes, as well as in close contact with our customers, we create new industrial sector solutions for automation. With innovative Balluff solutions you are well equipped for a successful future.

You can always rely on us, our products and our adherence to delivery dates and schedule – all in the name of mutually beneficial partnership.

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Global Project Management

WE ARE EVERYWHERE FOR YOU

Always where you need us

Wherever you are doing business, we will support you locally. We work closely with machine and systems builders, systems integrators, planning offices and maintenance engineers. Balluff has constructed a global network for you consisting of technical consulting, sales and after-sales services.

Project manuals and approval lists

We provide you with custom tailored product data for smooth running of your projects. You receive project-specific manuals and approval lists. And personal contacts from Balluff are at your side throughout the entire project.

Individual services

If our services need to be even more personalized, we make this possible as well: with individual e-catalogs, application-specific product modifications, integrated software and system solutions and comprehensive logistics concepts.

Questions? Contact us. We are happy to help.



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REFERENCES

The demands in automobile production are high and getting higher. Our complete commitment is to the success of our customers. Future-looking technologies, market-oriented solutions and the expertise of an experienced manufacturer are what we draw on to increase your competitiveness. This is why companies worldwide trust in Balluff solutions for hydraulics and pneumatics.

We work together with such companies as



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