EN

INDUCTIVE SENSORS

Metals only

IPF ELECTRONIC

High-End in High-Tech.

SCAN QR CODE
AND READ FLYER DIGITALLY

POSITIONING AND QUERY OF METAL OBJECTS

Inductive sensors are very robust and therefore extremely tough. No matter whether high or low temperatures, high pressures, vibrations, acids, alkalis, oils, metal chips or external fields of welding systems, these non-contact proximity switches can handle almost anything and always work reliably.

Inductive sensors are therefore true specialists when it comes to use in demanding environments. And yet our range of devices is very versatile. You have not yet found a suitable sensor for your application? Perhaps you will find the ideal solution here!

Inductive proximity switches detect all conductive metals without contact, regardless of whether they are moving or not.

Here are some application examples:

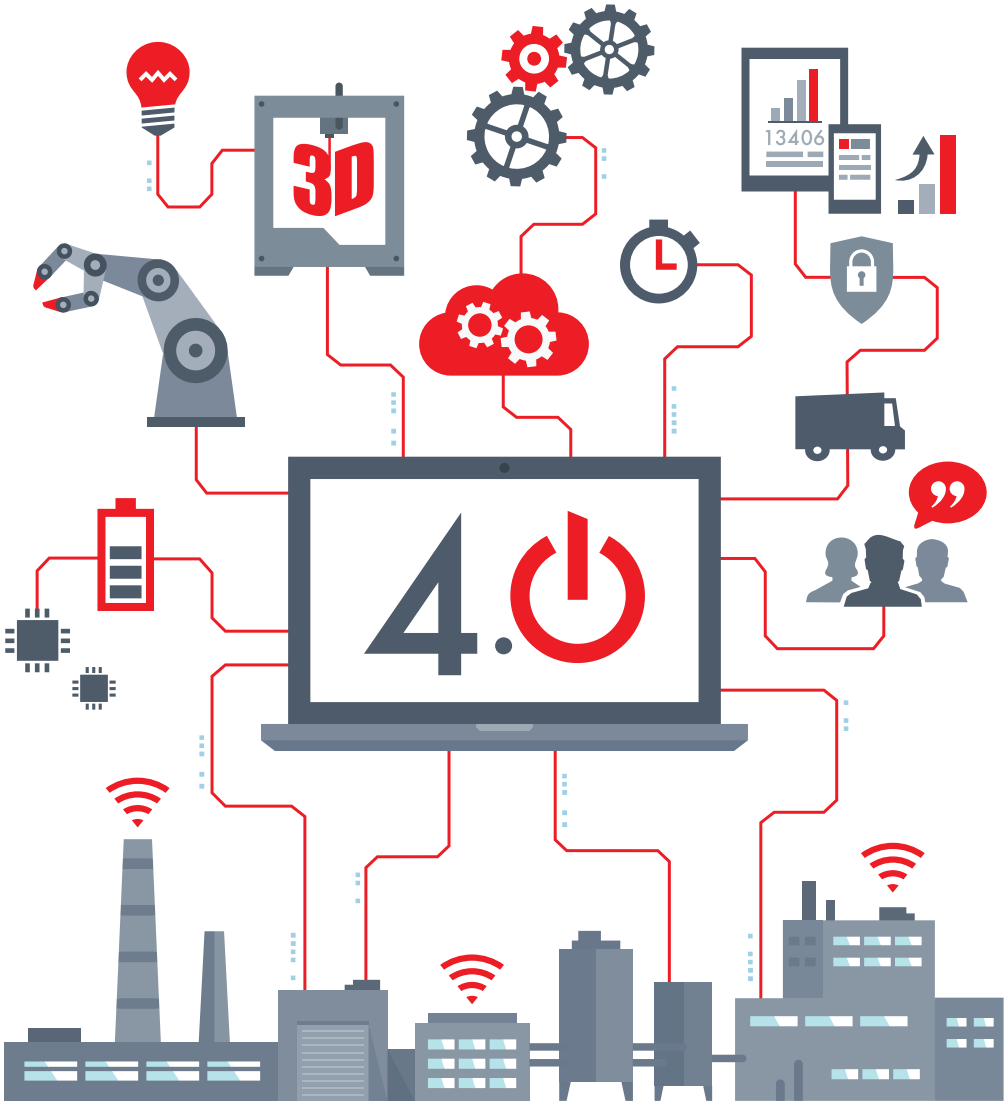
- Presence detection (e.g. goods carriers)
- Positioning (e.g. furnace flaps)
- Quantity control (e.g. nuts or screws)
- Rotational speed query (e.g. on gear wheels)
- Distance measurements (e.g. press-fit check of components)
- Use on conveyor systems (e.g. hose feeders)

INDUSTRY 4.0

IO-LINK: YOUR INTERFACE TO THE FUTURE

IO-Link makes our inductive sensors intelligent, as they can communicate with higher-level control systems via the device interface. Our sensors can thus be parameterized during operation and also provide extremely valuable process, diagnostic and device data for production automation.

The potential for your automation of the future is enormous: Through targeted process optimization and the use of condition-based maintenance strategies, you not only increase plant availability, but also transparency in highly automated production processes. Among other things, this can lead to sustainable cost savings. By the way, if you decide on an IO-Link capable sensor, you do not need to invest more than in a device without an intelligent interface.



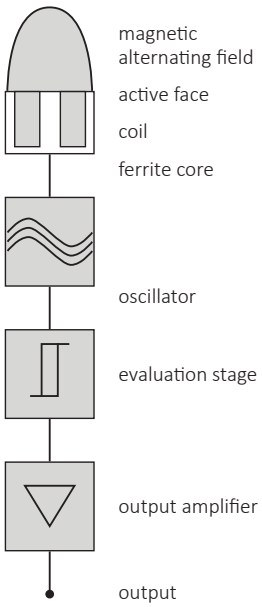
Offer completely new possibilities: Sensors with clocked coil in a one-piece full metal housing.

PROVEN FOR A LONG TIME

CONTINUOUSLY OPERATED OSCILLATING CIRCUIT

The oscillating circuit coil behind the active surface of a proximity switch generates an electromagnetic alternating field which is continuously excited and expands in the space in front of the active surface. If an electrically conductive material enters this field, eddy currents are induced in it, which draw energy from the oscillating circuit. This "damping" of the oscillator can be converted into a switching signal in the devices' output amplifiers.

From this long-proven operating principle results that all metals are detected without contact, regardless of whether they are moving or not. A further advantage: the high-frequency field does not lead to any measurable heating or magnetic influence on the object to be detected.



NEW POSSIBILITIES

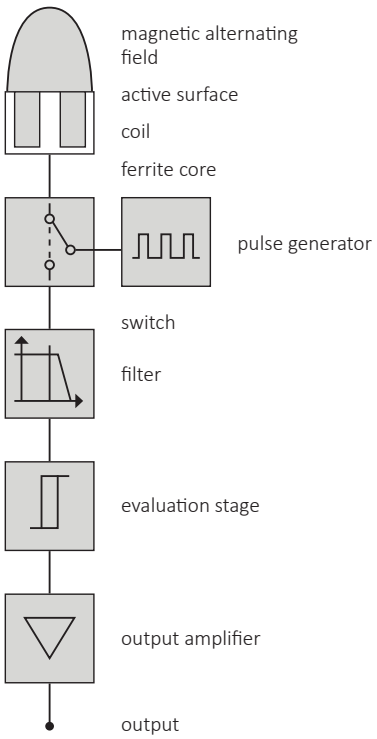
CLOCKED COIL

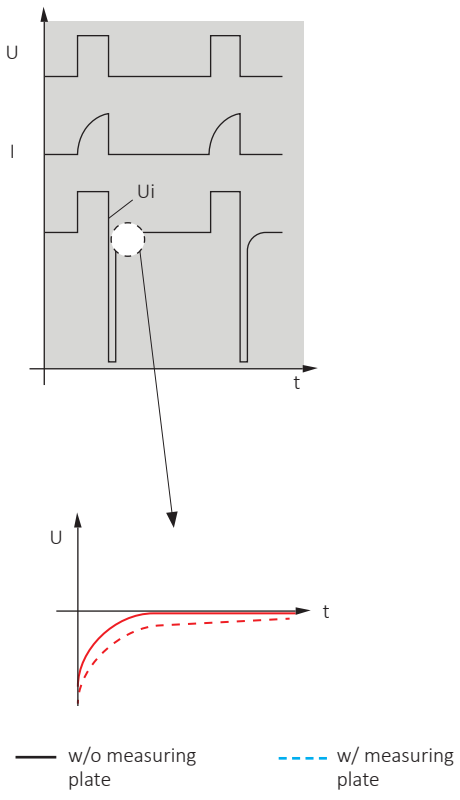
Of course, progress does not stop at inductive proximity switches and therefore leads to new developments. Best example: Inductive sensors that operate with a clocked coil behind the active surface. Here the coil for generating the magnetic field is not part of an oscillator. Instead, the magnetic field is generated by periodic, short pulses of transmitter current, flowing through the coil. This field induces a voltage in the object to be detected and generates an eddy current flow there.

When the transmission current pulse is switched off, the eddy current in the object decays. As a result, a voltage is re-induced in the coil. This induced voltage forms a signal that can be evaluated and is in principle independent of energy losses in the field.

The main advantage of this method is that the interaction between the object to be detected and the transmitting coil is rather transformational and thus temperature-independent. Also the object material has only a small influence on this, so that the high ranges that can be achieved are largely independent of the material. Exceptions are non-ferromagnetic metals and objects with only low electrical conductivity.

However, the decisive advantage of the new functional principle is that the sensor, including the active surface, can be completely integrated into a stainless steel housing. The result: Extremely robust sensors that still function reliably in applications where other solutions fail.





4 RANGES FROM STANDARD TO HIGH

IA120121
Sensor range: 2mm

IB120123
Sensor range: 4mm

IB120126
Sensor range: 6mm

IB12012H
Sensor range: 8mm

MORE SAFETY THROUGH HIGHER SWITCHING DISTANCES

In industrial applications, the "service life" of inductive sensors is decisively influenced by the distance from the object to be scanned. Sloppily one could say: the greater the distance, the higher is the "life expectancy". However, the range of inductive sensors in particular is strongly dependent on their size, i.e. small sensor - small range or large sensor - large range. The user is therefore often faced with the dilemma that the desired solution is limited by the installation space on a system or the installation location itself.

We therefore offer not only a comprehensive range of sensors, but also a wide spectrum of device ranges - and all this with identical sensor sizes. In many cases, up to four sensor ranges are available. Are you looking for the optimum sensor for your specific installation and application situation? Then you have come to the right place!

INSTALLATION SPACE: THE MEASURE OF ALL THINGS

In almost all industrial application areas, the tasks are becoming increasingly complex- and thus the challenges ever greater. This often includes the most diverse installation situations for sensor technology at and in plants. The range here extends from "extremely narrowly limited" to "extremely large"- and thus also the desire for solutions for large-area inspection. Our benchmark for both: application-oriented housing concepts and sensor systems.

DEVICE DIMENSIONS FROM MINI TO LARGE

IBR30106

Ø 3mm, length: 22 mm

IB080185

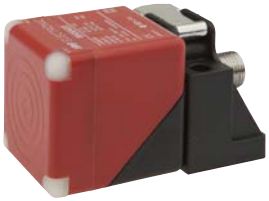
M8x1, length: 30mm

IB3001S2

M30x1.5mm, length: 18mm

IB250400

25x50x10mm



IB450423

40x40x67mm

IN990066

900x150x130mm

THE SPECIALISTS

THE MEASURING SENSORS

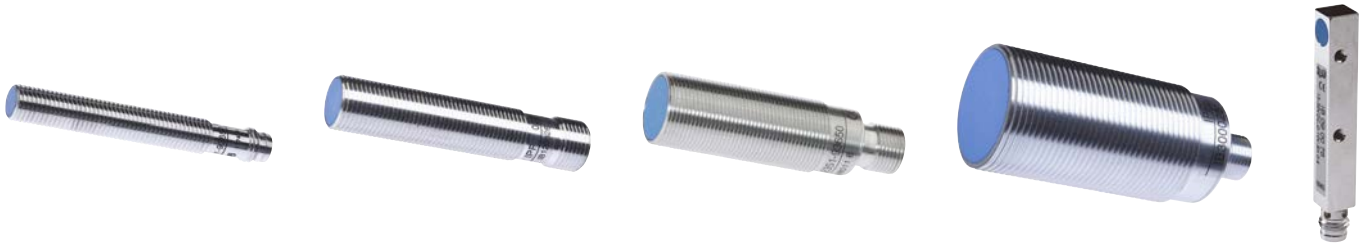
DISTANCE MEASUREMENT OF METALLIC OBJECTS

A very large detection range, high accuracy, stability, repeatability and low specimen scatter are the distinguishing features of these inductive analog sensors.

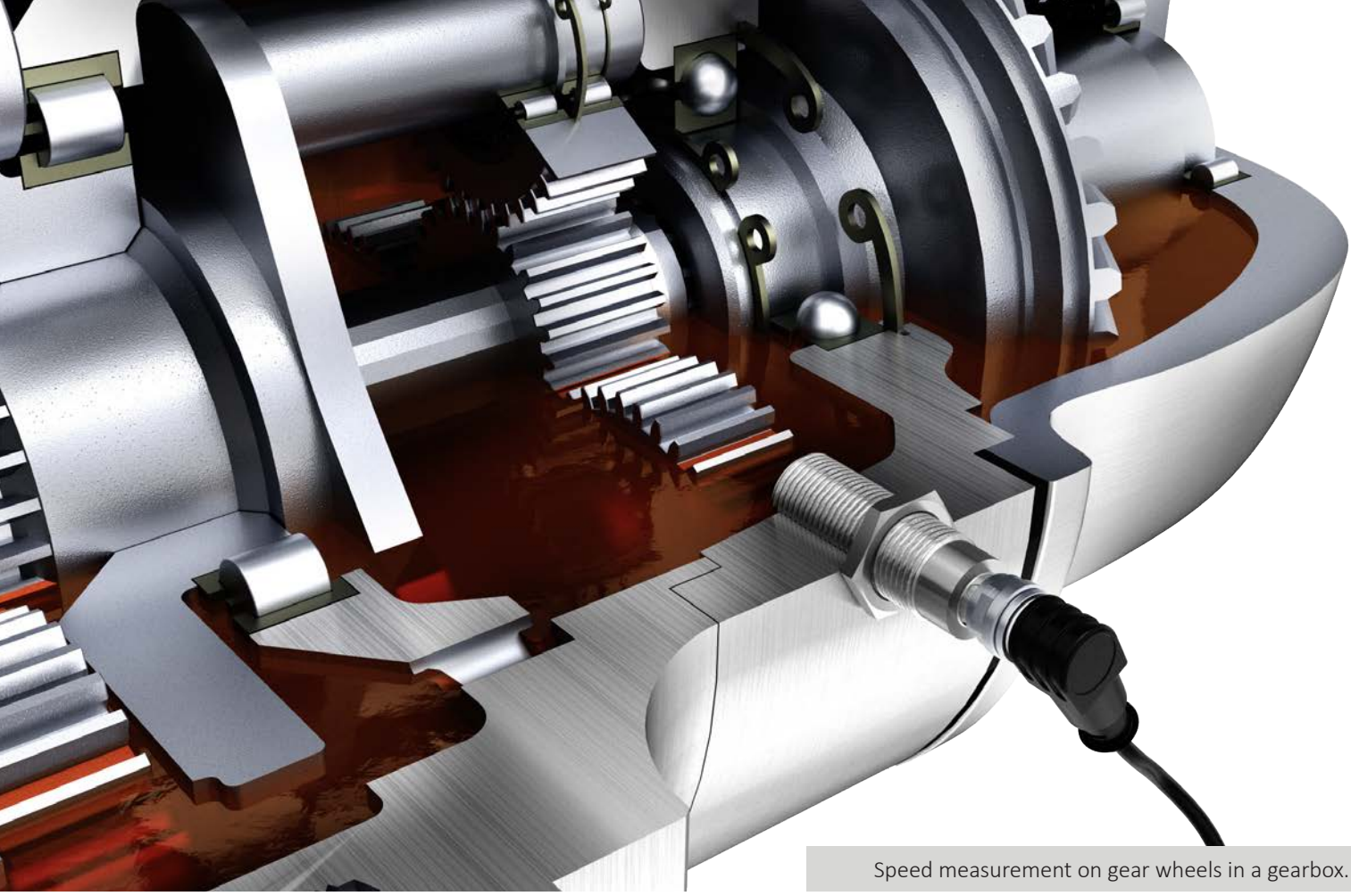
The sensors are available in sizes from M8 to M30 for semi-flush mounting and convert the object distance into electrical analog signals. Devices in size M8 have a voltage output (0 ... 10V). From size M12 upwards, the devices integrate an additional current output (4 ... 20mA). All sensors have all important protective functions.

Potential areas of application:

- Distance and position measurement
- Position sensing of rotating machine parts by means of eccentrics



Position measurement of a pressed-in component.



Speed measurement on gear wheels in a gearbox.

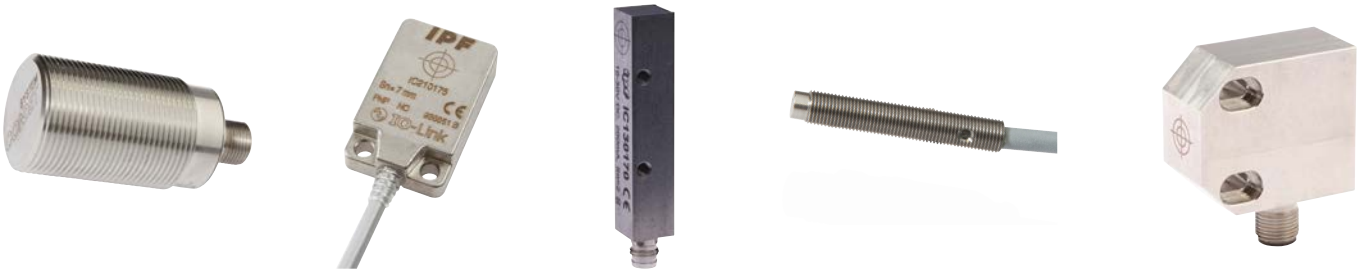
THE ROBUST SENSORS

ALL STAINLESS STEEL, INCLUDING ACTIVE SURFACE

A stainless steel housing manufactured in one piece is the special feature of these sensors. At the active surface, they are therefore absolutely tight against liquids and gases, as such media cannot even harm the housing material. Furthermore, these inductive sensors withstand much higher mechanical stresses than conventional proximity switches.

Potential areas of application:

- Integration in machine parts under harsh industrial conditions
- Presence check of metal parts with different dimensions
- Detection of object heights, e.g. metal parts on conveyor belts
- Object detection through non-metallic container and pipe walls
- Operation in extreme environments (oil, dirt, pressure)
- Use with very high demands on reliability and durability



THE SPECIALISTS

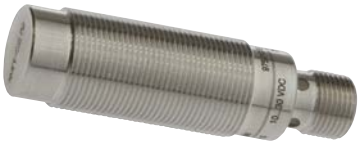
THE CHIPS-RESISTANT SENSORS

FADE OUT METAL CHIPS OR METAL DUST ON THE SENSOR SURFACE

These sensors only detect what they are supposed to and therefore do not detect the metal chips produced during milling, drilling or grinding. Steel or aluminum workpieces are reliably detected even if the sensors are covered with metal chips. With their extremely robust, one-piece stainless steel housings, these solutions are ideally equipped for the toughest manufacturing environments.

Potential areas of application:

- Position checking in metalworking and processing, e.g. drilling machines, grinding machines. Turning / milling centers, metal foil cutting machines etc.



Position detection of a machine table in metalworking. The active sensor surface reliably suppresses chips.

Predestined for high dynamic pressure loads such as in hydraulic cylinders.

THE PRESSURE-RESISTANT SENSORS

QUERYING THE PISTON POSITION IN HYDRAULIC CYLINDERS

When it comes to applications with high dynamic pressure stress up to 500bar (peak pressure up to 800bar), these sensors are the best choice. With conventional pressure-resistant inductive proximity switches, the active surface is usually made of a ceramic material that is several millimeters thick in order to achieve high pressure resistance. Our pressure-proof sensors, however, consist of a slim, one-piece stainless steel housing, which is excellently sealed in the hydraulic cylinder housing by means of an appropriate fit with an O-ring. The devices provide a switching distance of 2mm and are temperature resistant up to +100°C. Thus, there are no problems even with increased hydraulic oil temperatures.

Range of application:

/ End position query of piston rods in hydraulic cylinders

THE SPECIALISTS

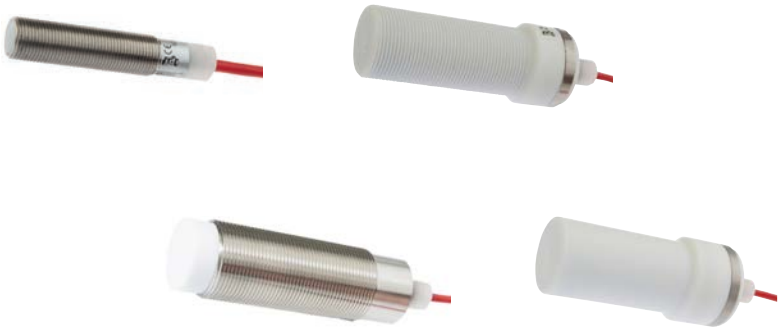
THE RESISTANT SENSORS

RESISTANT TO ACIDS, ALKALIS, OILS, SEAWATER AND TEMPERATURE CHANGE

Climatic change resistant inductive proximity switches and inductive sensors with Teflon housing are particularly suitable for use in corrosive environments with constantly changing temperatures and high humidity. The high corrosion resistance and simultaneous mechanical strength is achieved by the PTFE full housing or the combination of PTFE and titanium-stabilized stainless steel. The devices have excellent sealing properties, including special seals and the multiple sealing of the connection cable.

Potential areas of application:

- Washing systems (continuous operation)
- Climate cabinets
- Food and pharmaceutical industry
- Roll stands of cold rolling mills
- Seawater applications



Highly resistant to acids and alkalis, rapid temperature changes, wetness and water jets.

Position check of a hot furnace flap.

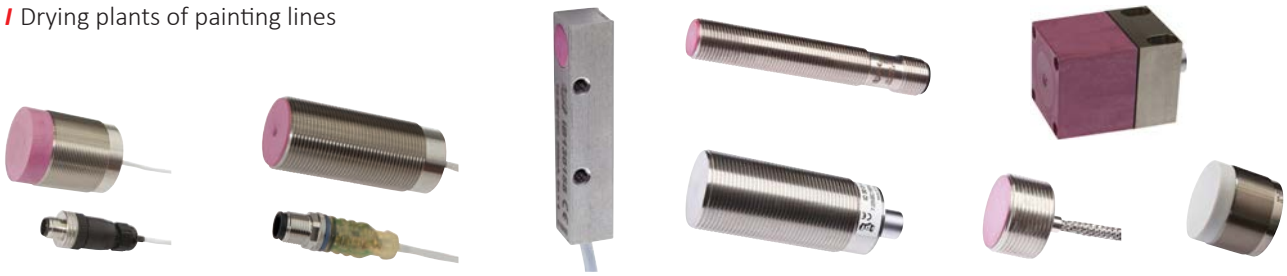
THE TEMPERATURE-RESISTANT SENSORS

EXTENDED OPERATING TEMPERATURE RANGE UP TO A MAXIMUM OF +230°C

Special applications require special solutions. If the material to be processed has high temperatures or if there is a high level of radiant heat in the immediate vicinity of the sensor, these very robust sensors are recommended. The devices are designed either in one or two parts. The one-piece systems with fully integrated electronics can withstand temperatures up to +180°C. The two-part versions with evaluation units separate from the actual sensor are suitable for applications with an ambient temperature of up to +230°C.

Potential areas of application:

- Furnaces
- Welding units
- Rolling stands
- Electroplating
- Injection moulding tools in the plastics industry
- Drying plants of painting lines



THE SPECIALISTS

THE WELDING-RESISTANT SENSORS

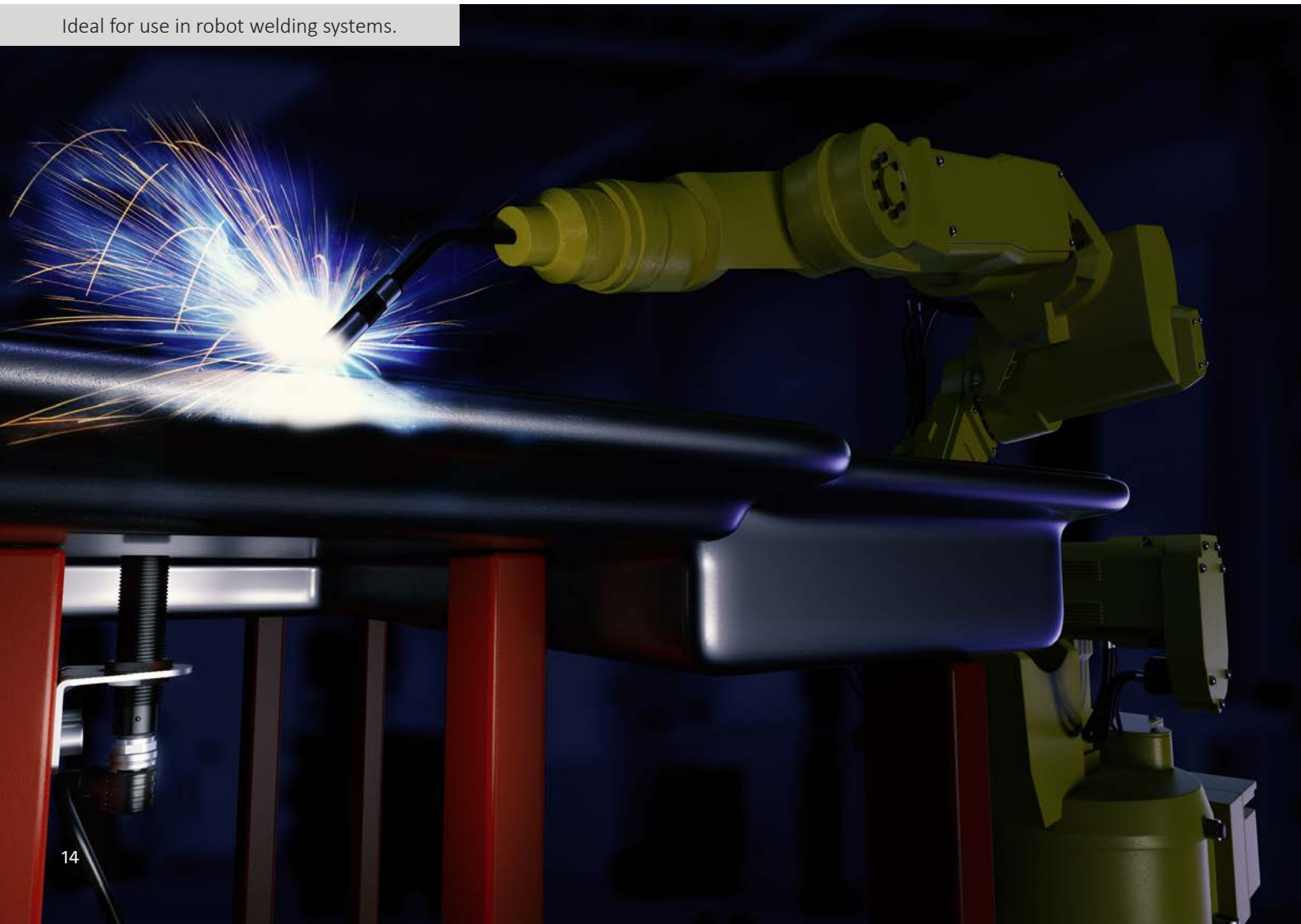
RELIABLE EVEN IN THE CASE OF INFLUENCING EXTERNAL FIELDS FROM WELDING SYSTEMS

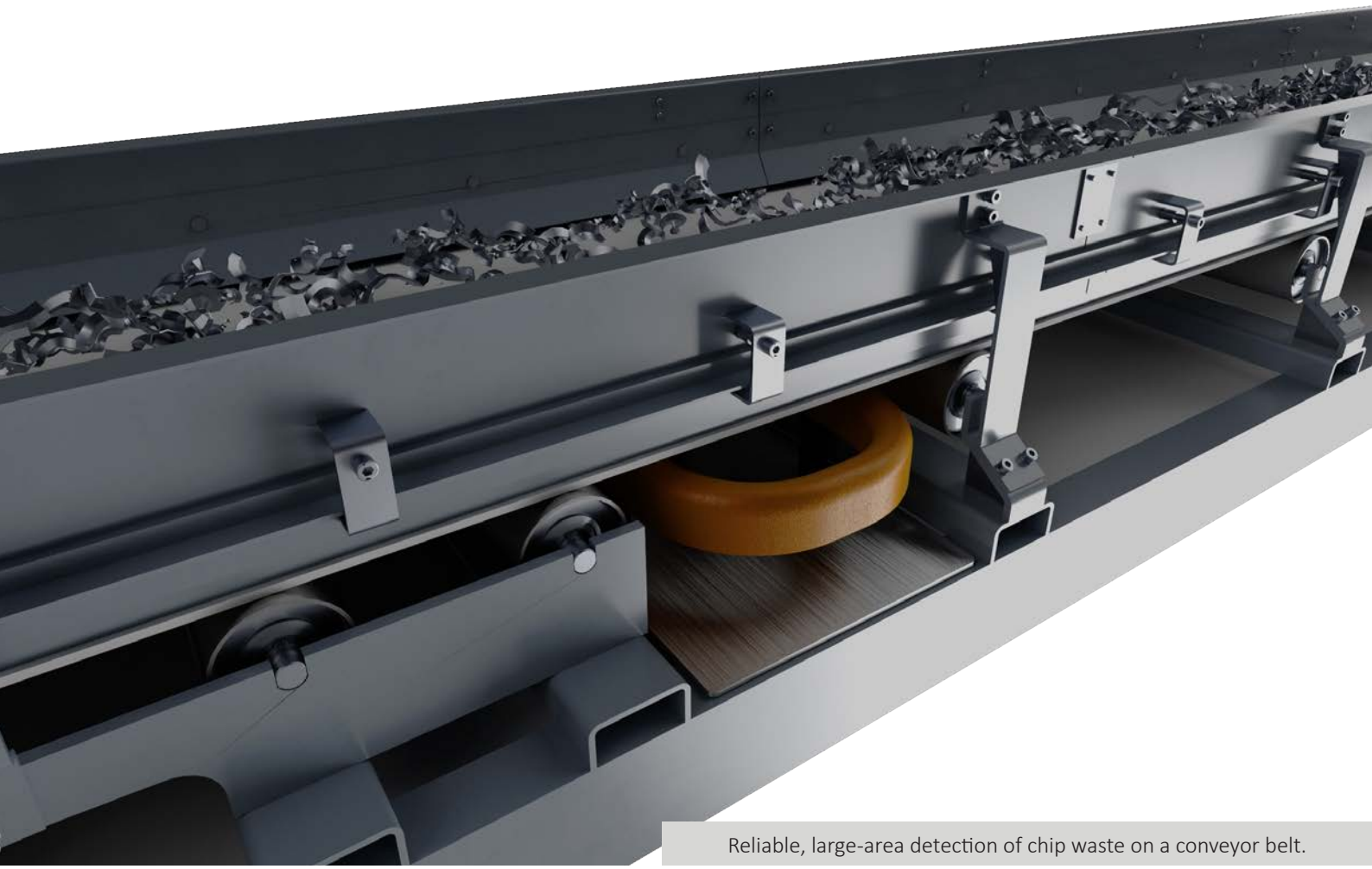
These sensors can be used in the immediate vicinity of welding guns or welding electrodes. Unlike standard initiators, the oscillator of these devices is not disturbed by the magnetic field of the welding current. Due to the special front cap material or its coating, no welding beads can stick to the active surface and lead to incorrect operation.

Potential fields of application:

- Positioning of workpieces in welding systems
- Monitoring of collets in the welding area

Ideal for use in robot welding systems.





Reliable, large-area detection of chip waste on a conveyor belt.

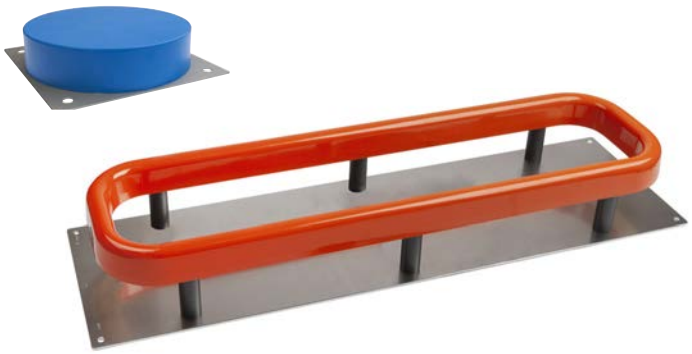
THE LARGE-SCALE SENSORS

MONITORING OF LARGE AREAS BY MEANS OF AN ACTIVE AREA

If metallic objects are to be detected in a larger area, e.g. material spread over a conveyor belt, then this is a task for inductive sensors with an area-shaped active zone.

Potential areas of application:

- Monitoring of conveyor belts
- Area inspection



THE SPECIALISTS

THE COLD-RESISTANT SENSORS

FOR LOW TEMPERATURES AND EXTREME CLIMATES

Whether in cold stores or geographical regions with extremely low temperatures, these sensors with an operating temperature of max.-60°C are ideal for such environments.
The compact, vibration-proof devices with protection class IP68/IP69K are also waterproof, cleanable and resistant to chemicals.

Potential areas of application:

- Position checks in cold stores
- Railway technology in very cold climate zones

Cold is not a problem. Position check of a piston rod in a cold store.

Quick and easy solution: query of metal screws in a hose feed.

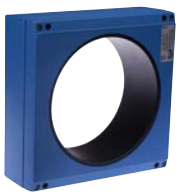
THE HOSE SPECIALISTS

FOR CONVEYING TECHNOLOGY IN NON-METALLIC HOSES OR PIPES

Detecting metallic objects in transparent or non-transparent tube feeders is only one of many possible applications for these sensors. Their active detection range is located within a ring-shaped opening. Metal objects passing through this opening trigger a defined output signal. In addition to the ring sensors, we offer sensors for hose mounting. Simply attached with a cable tie, they detect metallic objects conveyed through a tube. Our wire breakage sensors are specially designed for the breakage control of thin wires. They are characterized in particular by their short response time. The versions with an inner ring diameter of 4mm and 6mm have a ceramic insert to prevent possible damage.

Potential application areas:

- Process reliable detection of metallic foreign objects in bulk solids or food
- Ejection control of small parts with metal content in manufacturing processes
- Reliable selection of different part sizes in transport or assembly lines
- Safe wire breakage control during winding and drawing of wires
- Feeding control of metal parts



THE SPECIALISTS

THE ADAPTED SENSORS

CUSTOMIZED SPECIAL SOLUTIONS

You have not yet found the right sensor yourself among our "specialists"? Then you should contact us and ask for an individual solution that fits your special application.

We develop inductive sensors, whose housing designs and housing materials, including the connection plugs and cables, are designed to meet your specific requirements. Of course we also take into account the technical properties of the devices you require, such as temperature resistance, tightness, range, shock resistance, etc.

Application areas of some special solutions:

- Monitoring the "closed" position of plastic injection moulds
- Roll gap monitoring in cold rolling mills
- Position check for telescopic loaders

Position check of a tool during plastic injection moulding.

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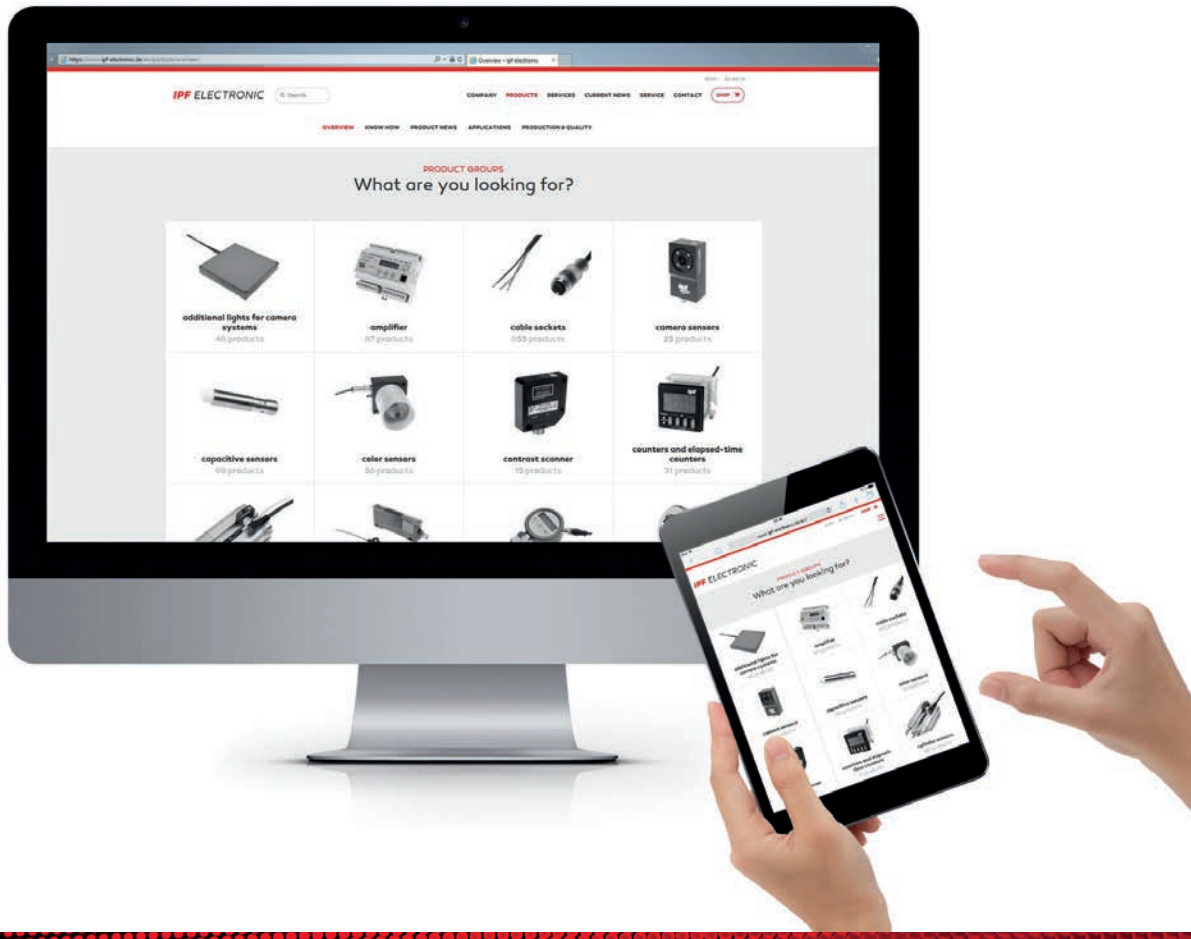


LEARN MORE!

Would you like to know more about inductive proximity switches, their properties and potential applications? Then we recommend reading our white paper "Inductive sensors", which is available for free download on our website.

Simply select "Inductive sensors" in the product overview, then click on a device and download the white paper under "Downloads".

SPECIAL SOLUTIONS FOR SPECIAL REQUIREMENTS

RELIABLE METAL DETECTION IN THE FOUNDRY INDUSTRY

To be able to recycle waste products, a foundry has set up a collection point where a conveyor belt is filled with recycled material. The material is fed via the belt and a discharge chute into a container below the collection point, which travels on a shuttle system to return the raw materials to production after melting.

The conveyor belt at the collection point is mounted on load cells. A PLC controls the uniform container filling with metal parts of various sizes and weights. Until now, however, the weighing belt could only be filled if there was also a container underneath the shaft, as otherwise casting could fall onto the travel path of the transport carriage during weighing. In view of high cycle times, however, the belt should also be filled without a container in the filling position.

After unsuccessful attempts with various systems, ipf electronic was finally able to help. The solution: an inductive metal detection coil in combination with an evaluation device for reliable detection of even the smallest parts.
The 950mm wide detector was mounted at a distance of 200mm below the weighing belt between two conveyor rollers to detect a large part of the weighing belt, protected from mechanical damage. If material approaches the discharge chute during the weighing process, the detector emits a signal that stops further transport over the belt and prevents uncontrolled falling of castings into the chute.

ipf's solution has increased the cycle times during recycling, so that the cast material now returns to the production process much faster.

A 950mm wide detector monitors a weighing belt and thus increases the cycle times.

EVEN HARDER TO TAKE

ROBUST SENSORS FOR FULLY AUTOMATIC PICKLING LINE

A company developed a continuous pickling line in which the oxide layer on the surface of copper sheets that is formed during rolling can be removed fully automatically.

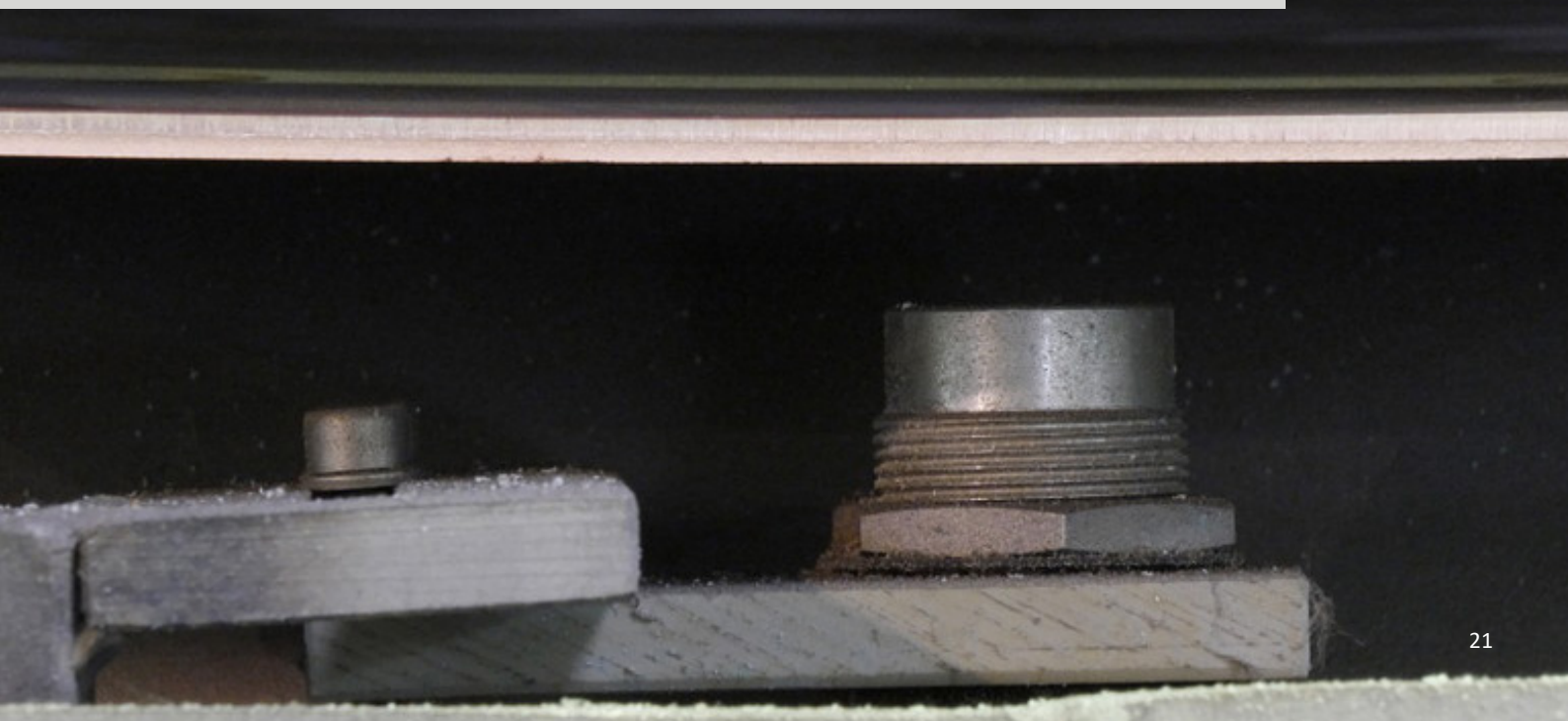
For this purpose, the copper sheets on roller conveyors are sprayed with pickling solution on the upper and lower sides in a chamber in reverse operation. For the reverse operation, the position of the sheets to be treated in the chamber must be precisely scanned.

Optical solutions were not suitable for this task, as the sensor system is permanently exposed to a spray mist containing sulphuric acid. Instead, the company opted for the **IO300106** inductive sensors from ipf electronic, which can withstand the aggressive environmental conditions. The particularly robust devices are designed for ambient temperatures of up to +70°C and have protection class IP68.

At the input and output of the pickling chamber, three inductive sensors operated in parallel were installed in such a way that at least one sensor detects the copper sheets from below. This arrangement was chosen deliberately, as it allows to compensate possible longitudinal displacements of the sheets in the chamber.

Although the inductive sensors are exposed to very extreme conditions in the pickling chamber, they function reliably, so that the company was able to implement this special automation solution.

The inductive sensors are positioned in a way that at least one device detects the copper plates from below.



High-End *in High-Tech.*

EFFICIENT ADVICE ON ALL MATTERS

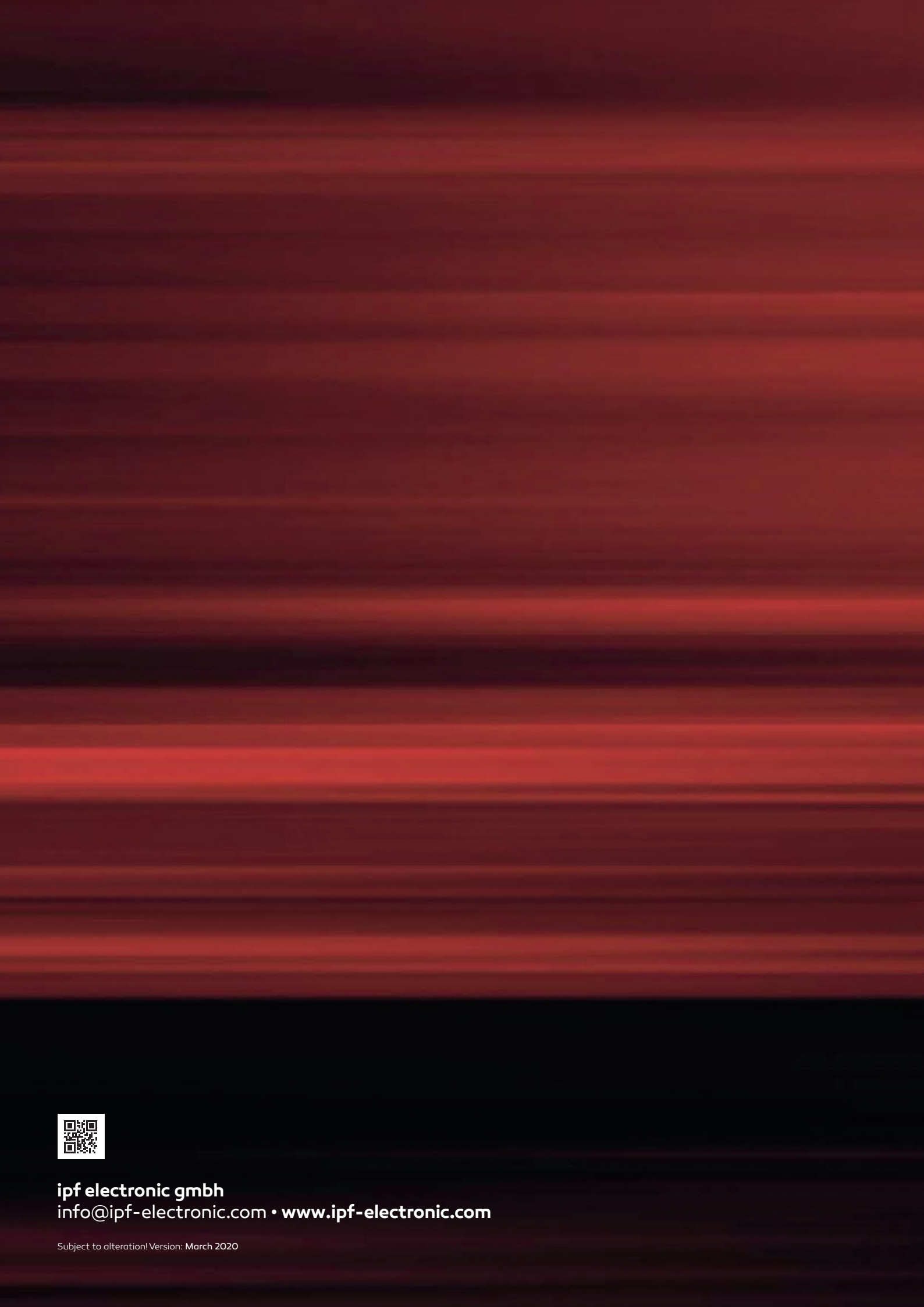
PERSONAL SERVICE AND PROBLEM-SOLVING ON SITE

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 are here to support you.
You can also contact your personal applications 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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