



Product overview





elobau – Sensors and individual operator controls from Germany

As an expanding, globally active foundation company, we and our over 1,000 employees, develop and manufacture sensor solutions and operator controls for mechanical engineering and mobile machinery.

All solutions and products from the areas of operator controls, sensors, level measurement and machine safety meet the highest technical quality standards – and all of this is produced carbon-neutrally.

The high skill level of our employees, our innovative technologies and a vertical integration of 90% characterise us and contribute to our global success.

We support you in the development and production of machines and vehicles that set standards – in terms of performance, ease of use, safety, quality and ecological footprint.

We are a foundation company

As a foundation company, we are conscious of our economic, social and ecological responsibility and are actively committed to targets beyond simply maximising profit.



Company headquarters in **Leutkirch** im Allgäu, Germany

Founded in **1972**

3 production facilities

10 sales companies in **48** countries

More than **1,000** employees worldwide

108 million euros turnover (2020)

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Sustainability: society & environmental responsibility

Sustainability is deeply rooted in our corporate culture. As a foundation company, we combine economic success with high ethical standards and take responsibility for the social and environmental impact of our business activities.

The focus is on people – customers, suppliers and employees – followed by taking responsibility for direct and indirect environmental impacts.

We are serious about only taking as much out of the economic, ecological and social cycle for our business activities as we put back into it elsewhere.

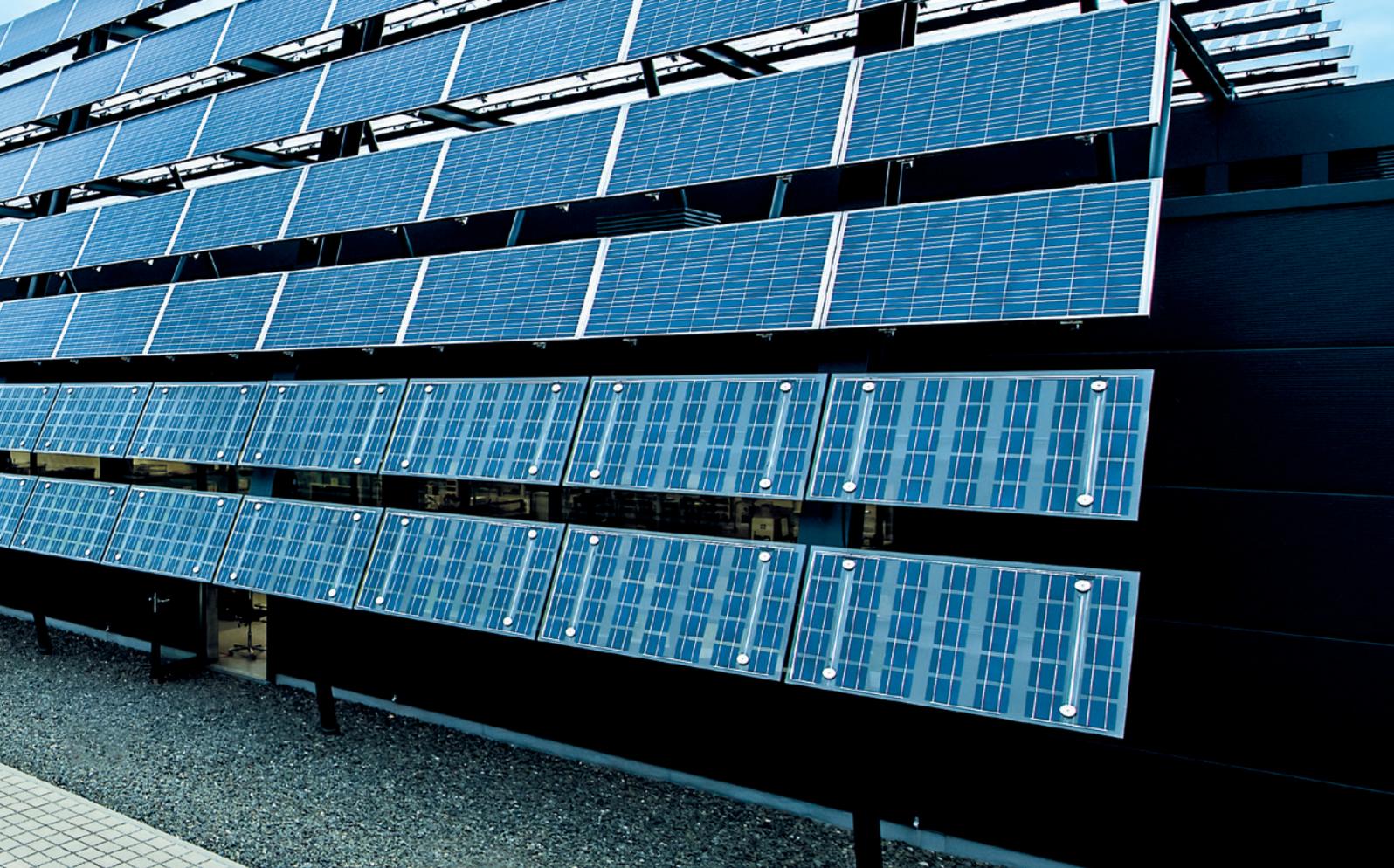
Since 2016, we have been committed to public welfare economics and thus to future-proofing our surroundings and the environment. Environmentally sustainable actions are also reflected in development and climate-neutral production.

Resource-saving development

We use simulation processes during the product development phase, to avoid resource-intensive development loops. This means that components can be optimally designed to meet material and strength requirements, which in turn leads to weight, material and cost savings. The simulation procedures make it possible to reduce field tests, which in addition to material savings, also means shorter development times.

Sustainability, right down to the product

We invest 10% of our turnover annually in research and development of innovative, efficient and ecological technologies. For example, the 225MA midi modular armrest is an operating system for mobile machinery, and consists of around 75% bio-based plastics. The modular design also saves resources and time when adapting to individual customer requirements.



Carbon neutral since 2010

We manufacture our products to be 100% climate-neutral. In order to achieve this, in addition to direct and indirect emissions (Scope 1 & 2), we record and compensate for all emissions that occur along the value creation chain of our products (Scope 3, cradle-to-gate). Unavoidable emissions are offset by gold-standard afforestation projects.

An important building block for the company's climate neutrality is working and manufacturing in 'energy-plus' buildings. In addition to tool manufacturing in Probstzella and Plant 2 in Leutkirch, the extension is also built in such a way that the building generates more energy than it consumes. Plant 2 and its extension were recognised as winners in the category "Commercial buildings – new builds" by the Federal Ministry of Food and Agriculture in the German HolzbauPlus competition.

Acting in line with the economy for the common good

In order to meet this requirement, we report in accordance with the standards of the economy for the common good and are externally audited every two years.

Success in this area is reflected in awards such as the National German Sustainability Award (2016), the Great Place-To-Work Award as one of the best employers in Germany (2019), the Baden-Württemberg Environmental Award (2020), the Lean & Green Management Award and the Sustainable Impact Award (2021).



Technical expertise meets hands-on skill

We offer you innovative products and tailor-made solutions that enable you to make progress. Firmly rooted in Allgäu, the company and its product range are internationally competitive and in demand. There

are three main reasons for success: highly qualified employees, innovative technologies and a high vertical integration of 90%.

Proven technology

We develop our products and solutions based on the most innovative technologies such as reed, hall, capacitive sensor technology, ultrasound, MEMS or RFID. In doing so, we attach great importance to the ongoing high performance of our products and therefore rely on contactless operation.

The use of innovative technologies enables safe and reliable switching. Thanks to the absence of mechanical connections between actuators and electronics, these solutions are virtually maintenance-free, particularly durable and enable maximum cost-effectiveness.



Electronic components are hermetically sealed to comply with IP69K protection class ratings. Combined with the use of a wide range of materials and special designs, the products can be used even under the most adverse environmental conditions and withstand chemical influences such as aggressive cleaning agents.

Focus on people

elobau puts people first. That's why we train our specialists ourselves, continue with professional development and try to keep them by offering a safe and exciting workplace. We also provide performance-based remuneration, a pleasant working atmosphere and the chance to voice their opinions; as well as a great deal of appreciation, elobau sets itself the highest ethical standards.

The success of these measures is demonstrated by how long our employees stay with us, as well as their technical expertise.

We have our own tool manufacturing department, which enables us to fulfil individual customer requirements quickly, efficiently and in a solution-oriented manner. The development of mechanical designs in the ongoing product development is also safeguarded in such a way that elobau is not dependent on other companies. We also have in-house hardware and software development as well as testing and test laboratories to meet the highest quality standards.

eloAcademy

Training and knowledge transfer is an essential component of elobau. Since the start of 2019, employees who wish to continue their training internally have had the opportunity to attend courses at the eloAcademy. The range of courses on offer is constantly increasing and the number of participants proves the success of the still young institution.



Applications in mobile machinery

We have been working with leading manufacturers of mobile machinery for many years and are familiar with the special challenges of the off-highway market. This expertise helps us to develop solutions that bring real added value to you, worldwide.

Due to the often very specialised tasks and areas of application, manufacturers face particular challenges.

We therefore rely on robust and reliable solutions that are either modular or can be modified as required.

In addition, individual customer requests can be fulfilled at any time. If necessary, unique items can be created in the research and development department.

Our customer base includes manufacturers of mobile machinery such as:

- Agricultural and forestry machinery
- Construction machinery
- Material handling



We are broadly positioned in the areas of operating systems and sensor technology. The different solutions are used in different areas of mobile machinery. As varied as the areas and functions of the individual solutions are, they are all high-quality, sustainable and have been produced in a carbon-neutral manner.

Operating systems in use

The driver's cab is the heart of every work machine. In order to control the machine precisely and safely, we develop operating systems that meet these requirements. They are also low-maintenance and can be individually adapted if required. From nano push buttons to modular armrests, elobau develops all solutions that make work easier for machine operators.

Robust, precise sensor technology

While tilt sensors detect the position of lifts or platforms, angle sensors with a resolution of 0.1° transmit the angle and its change. Ultrasonic sensors can be used in mobile machines to detect fill levels or reliably measure distances, for example.



Industrial applications

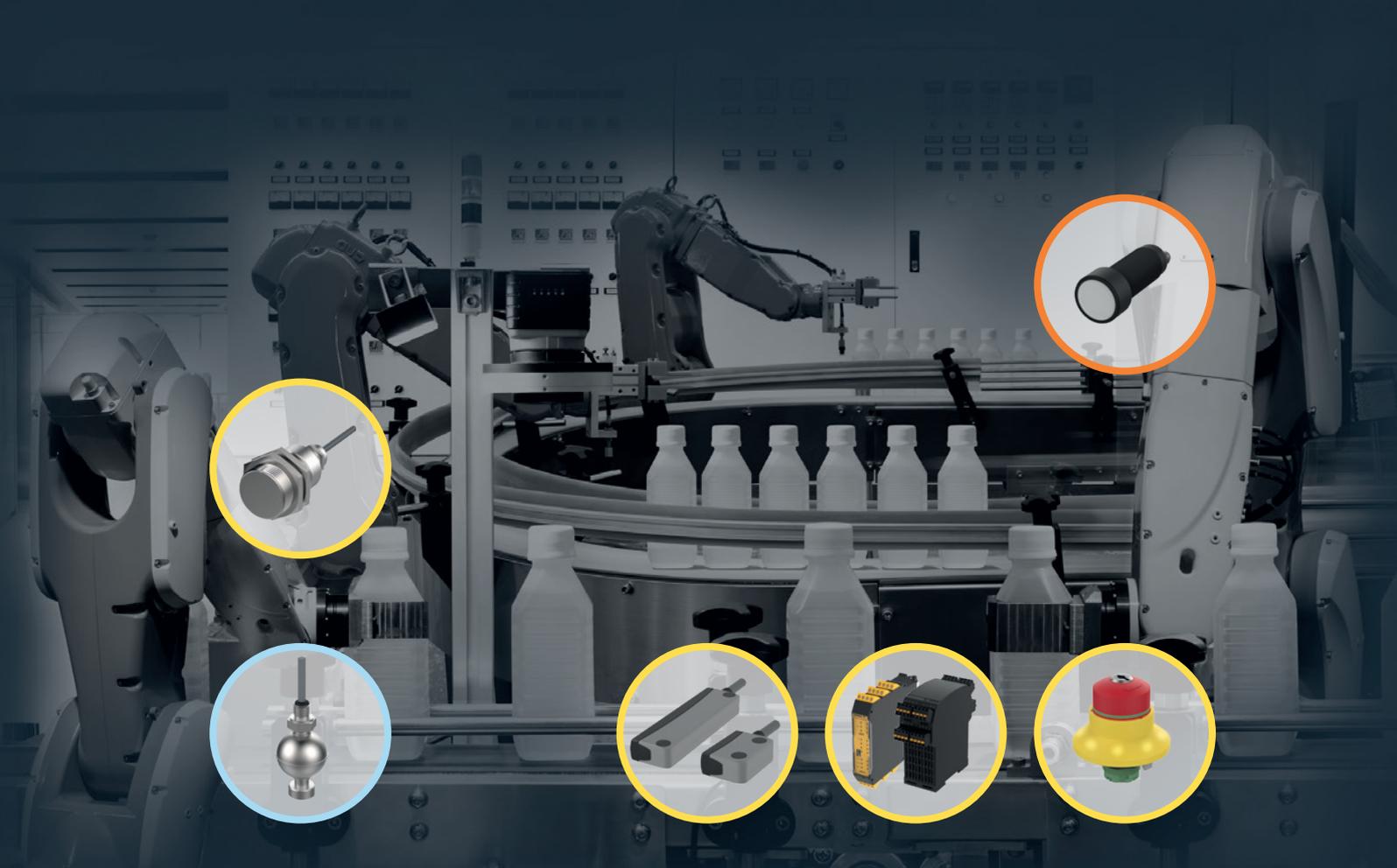
As one of the first German manufacturers of safety technology in mechanical engineering, we relied on reed switches as early as the 1970s. Since then, this technology has become increasingly popular, as contactless safety switches and sensors offer machine builders freedom when designing, while offering high reliability at a manageable cost.

In comparison to mechanical switches, hermetically sealed reed technologies are virtually maintenance-free and withstand the most adverse environmental conditions.

In addition to reed technology, we also use Hall, RFID or ultrasonic to offer a wide range of level measurement devices, magnetic proximity switches and safety sensors for mechanical engineering.

These skills make our components especially interesting for industrial applications from the following areas

- Packaging technology
- Special machinery construction
- Medical technology
- Water treatment
- Food processing machinery
- Environmental and process engineering
- Professional cleaning machines
- Dosing technology and systems



Measuring fill levels, ensuring safety and detecting the finest differences using sensors such as ultrasound – our solutions perform a wide range of functions within industrial machines.

Filling level measurement and level detection

Level measurement for almost all media, whether chemicals, food, water or fuel tanks. The different solutions are precisely tailored to the respective application. As an immersion sensor that is lowered from above with millimetre precision to the desired measuring point or as a float switch side mount that outputs the empty or preliminary empty signal at the defined limit point – elobau solutions fulfil their task reliably, precisely and for years to come in almost any application.

Safe for man and machine

The machine safety solutions are designed to protect people from the machine, so that it is safe even when

undertaking unusual, unpredictable activities. This claim has resulted in a complete security concept that can combine different technologies. (RFID or magnetically actuated sensors). Safe signal evaluation units form the second part of the safety concept in order to convert the incoming signals into immediate reactions.

Made-to-measure precision

Touchless, wear-free and maintenance-free – our sustainability concept is also reflected in the sensor technology product range. Sensors based on reed contacts or ultrasound can be used to measure position, angle and inclination – just as they change their position in the room. With a resolution of up to 0.1°, elobau solutions measure reliably. The sensors can be used for almost any application – and can be combined as desired thanks to the sophisticated concept.



Operator controls

Comfortable and precise operator controls are fundamental to any mobile machine – yet the requirements and functions are individual and highly specialised. That's why we offer a wide range of operator controls. The basis for this is provided by standardised solutions that are durable, thanks to contactless sensors.

Depending on requirements, the operator controls are equipped with push buttons, joysticks and other components. In this way, they are quickly and economically adapted to the respective requirements.

All solutions are inherently extremely robust and can withstand even the most adverse environmental conditions:

- Available with up to IP67 protection
- Available up to safety level PLd/SIL 2
- Work safely in the temperature range of -40°C to +85°C

Ergonomic design in a compact design increases working comfort. The night and function lighting as well as adjustable actuation forces help the operator in different ways in the cab. Analogue, digital, single-channel or redundant output signals and direct bus connections via CANopen or SAE J1939 simplify and accelerate the connection to the mobile machine.

Individual operating systems



Multifunctional operating system for STILL

Thanks to our many years of expertise, we already support you when it comes to the design and development of the operating concept. In this way, electronic and mechanical connections can be taken into account early in the development process and the ergonomic arrangement of the operator controls can be adapted according to the operating logic of the respective work steps.

We use the latest and most innovative materials and techniques, which we can offer you as a result of continuous research and development.

Touch panels and displays can be integrated to provide additional information and functions. Like all elobau products, all individual customer solutions are subject to the company's strict quality assurance.



Multifunctional armrest for Deutz-Fahr

Modular operating systems

Anyone who wants to avoid the costs of new development and the tool for their own operating concept can still create an application-specific, freely configurable, multifunctional armrest on the basis of the modular 225MA midi armrest. The modules available offer state-of-the-art technology and meet the requirements of functional safety.

The armrest is particularly sustainable and good for the environment, thanks to 75% bio-based plastics. The armrest is made of innovative apple leather and the production is climate-neutral.



**Modular armrest
225MA Midi**

Operate & control

For individual adaptation, we offer a wide range of joysticks and steering column switches, which in turn can be modularly designed. All functions of axes, buttons and thumbwheels are freely configurable and can therefore be easily adapted to the respective application.



**Universal switch
Shuttle Lever 151SL**



**Robust
Joystick J7**

The joysticks have ergonomic handles for fatigue-free operation and can be used with different operating angles. Customers can choose between no detent, detent, friction brake or overpressure points for the actuation types.

The tried-and-tested sensor technology developed over decades and the constantly updated design standard of elobau guarantee you reliability and efficient, ergonomic operation.



**Robust
Joystick J4F**



**Fingertip
Joystick JFT**



**Thumbwheel
switch 175D**



**Power Take Off
151PTO push button**

**Compact
Joystick J2**



**micro push
button switch
145MTR / MTG**



The push buttons are available in sizes M12 and M30 and as a Power Take Off (PTO) variant. Operating errors can be reduced through customisable colours, abrasion-resistant icons, different wiring variants such as NAMUR and the very tactile behaviour over the entire service life. Different sealed variants are available for the plugs.



Push button 145



**Nano push button
145 NT**



Sensors

Our sensors are precise, contactless, wear-free and maintenance-free. The electronic sensors are based on technologies such as the Hall, MEMS or ultrasonic principle.

Thanks to contactless technologies, the sensors offer a long service life and long switching distances, which only depend on the magnet selection. High resolution measuring methods reliably and accurately record the values in the temperature range between -40°C and $+150^{\circ}\text{C}$.

Installation is simple and time-saving. Convenient integration is enabled via various electrical connec-

tions, and digital as well as analogue output signals, bus connections via CANopen or SAE J1939. The IO-Link for Industry 4.0 applications as well as the wide range of technologies and designs allow use in most mobile and industrial applications.

In addition to the comprehensive standard range, we also develop individual solutions in close cooperation with you.

Measurement of angles and tilt



**Angle sensor
424A**

Angle sensors cover a measuring range of up to 360° and offer selectable signal paths as well as redundant versions. The sensors have analogue and digital outputs and allow bus connection via CANopen/SAE J1939.

The robust sensors are suitable for detecting angular positions of rotating elements under extreme environmental conditions and are therefore tailored to mobile machinery.

**Angle sensor
424Z**



**Angle sensor
424R**

Our one- and two-dimensional tilt sensors are used to measure angular ranges, such as in conveyor truck lifts or mobile work platforms.

Tilt sensors enable monitoring of one or two axes and have a measuring range of up to 360° with up to four freely combinable switching points. Turn-on and turn-off delays as well as vibration filters can also be individually adjusted to the requirements of your application. The zero point adjustment is carried out via an IR remote control.



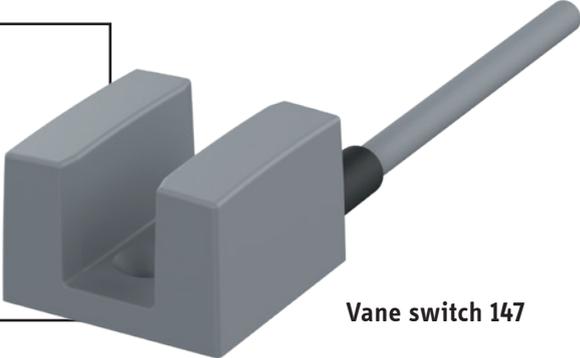
**Tilt sensors
N3 / N4 / N5**



Position detection

Our portfolio of position detection sensors is extensive and offers a wide range of applications based on different measurement principles.

Vane switches are ideal for controlling lifting platforms, construction machinery and special machines, enabling contactless actuation by ferrous material. Large offset tolerances can also be achieved.



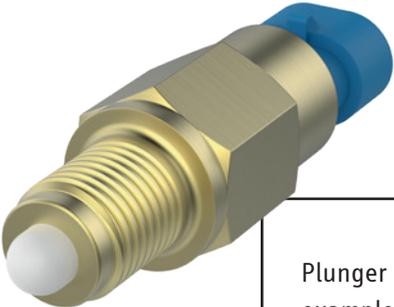
Vane switch 147



Magnetic sensor 128

Magnetic proximity switches are available with reed and reverb technology. This enables the realisation of different switching distances. With them, objects can be detected by non-ferromagnetic materials and allow maximum flexibility in integration.

Compared to the electromechanical principle, electronic magnetic sensors are more robust, i.e. highly resistant to vibration, shock or bumps as well as wear-free use. The field of application of magnetic sensors ranges from agricultural and construction machinery to a wide range of industrial applications.



Plunger switch 144

Plunger switches are suitable for checking the end position, for example of gear positions, or for piston monitoring. Depending on the application, the housing design, tappet and stroke can be adapted.



Magnetic sensor 153

Ultrasonic sensors

Ultrasonic sensors from elobau provide reliable solutions for almost any application. The simple and effective measuring principle detects both object distances and their position. Equipped with robust housings, these products are all-rounders - in industrial environments and for off-highway applications.

The ultrasonic sensors offer a measurement range of up to 8 m. Thanks to temperature compensation, they are suitable for use in a particularly wide temperature range from -20°C to 70°C. With the reflective barrier, window, hysteresis and switching point operation, they have four operating modes.



Ultrasonic sensors U*18S

Ultrasonic sensors U*18

Our sensors are equipped with digital and analogue outputs. An interface to IO-Link supports use in Industry 4.0 applications. With synchronization options, multiplex mode and the availability of an ATEX-approved ultrasonic sensor, elobau offers the right solution for even the most demanding applications.



Ultrasonic sensors U*30

Ultrasonic sensor U*30L



Level measurement

Whether level detection, continuous level measurement or integrated extraction of different liquids – we offer the right solution for every application with a comprehensive portfolio of level indicators.

With the help of various online configurators on the elobau website, you can quickly and efficiently modify standardised solutions individually and adapt them for your own applications. For special requirements in terms of installation situation, environmental influences or media resistance, you have the option of finding individual solutions in cooperation with our developers. Level indicators are particularly versatile in terms of application possibilities, thanks to their simple but

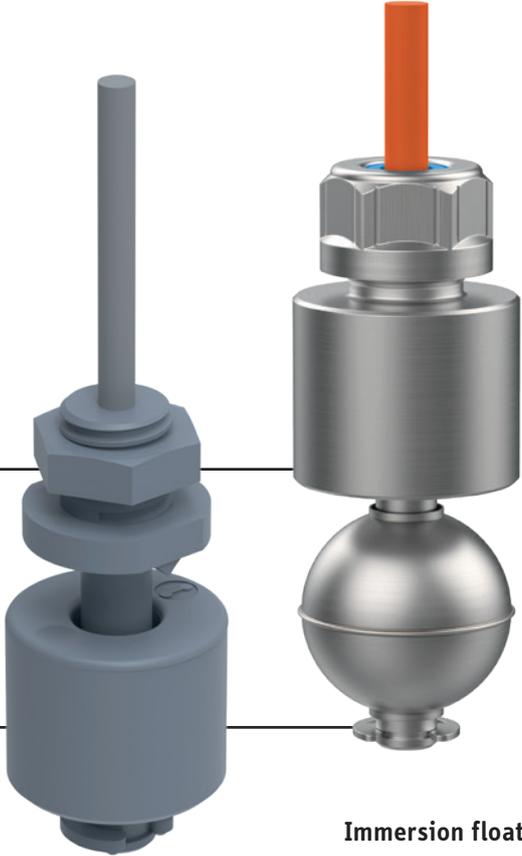
proven functionality. Its robust design with an ingress protection of up to IP69K and a temperature range of -40°C to +105°C ensures a long service life – even under tough operating conditions.

Depending on the application, you can choose between a variety of electrical connections, process connections, interfaces and materials.

Level detection

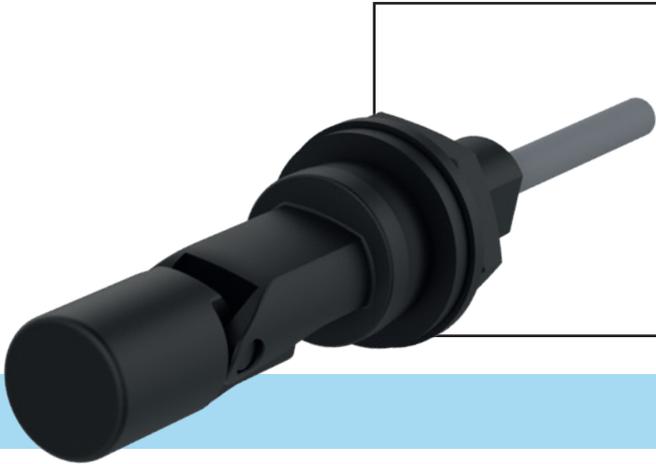
Level detection to avoid idling or overfilling is required in many forms of vessels, often in confined spaces. Depending on the operating conditions, different challenges arise, e.g. temperature fluctuations, atmospheric pressure or constant movement of the media. Our miniature float switches, immersion float switches and float switches side mount offer a wide range of application options thanks to simple and proven principles.

Our float switches and float switch side mounts are based on reed technology. Float switches have more than 20 freely definable switching points and can be easily modified.



Miniature float switch 2000

Immersion float switch 20991102



Float switch side mounts are a simple and cost-effective solution for level detection. Our range of float switch side mounts includes variants for dirty media, applications with high mechanical stress and vibrations, as well as small designs for confined installation situations.

Float switch 204KS

Ultrasonic level measurement

Ultrasonic sensor 2UF Off-Highway with sound tube



The optional use of a sound tube allows precise measurement even with an inconsistent medium or inclined position.

elobau offers a wide range of products for level measurement for numerous applications in industry and for mobile machinery. We use proven and optimised technologies for the sensors: reed technology and ultrasonic measurement methods.

Ultrasonic level sensors measure contactlessly and wear-free. With a measurement resolution of only 1 mm, they are very accurate – even when the sound tube is at an extreme angle. You will find a suitable solution for almost every application in our wide range of ultrasonic products.

Attention, product will be discontinued soon!



This version of the ultrasonic sensor is specially tailored for filling levels in mobile machines. The wide temperature range and high protection class are prerequisites for being able to survive in these applications.

Ultrasonic sensor 2UF Off-Highway

The 2U Industry ultrasonic sensor measures reliably and precisely in tough industrial environments. This series offers a suitable solution for almost any type of application. Different analogue output signals are available for this purpose, which are supplemented by up to four switching outputs. Parameterisation is intuitively carried out via the teach-in button and display.



Ultrasonic sensor 2U Industry

eloLance® – The new generation of suction lances

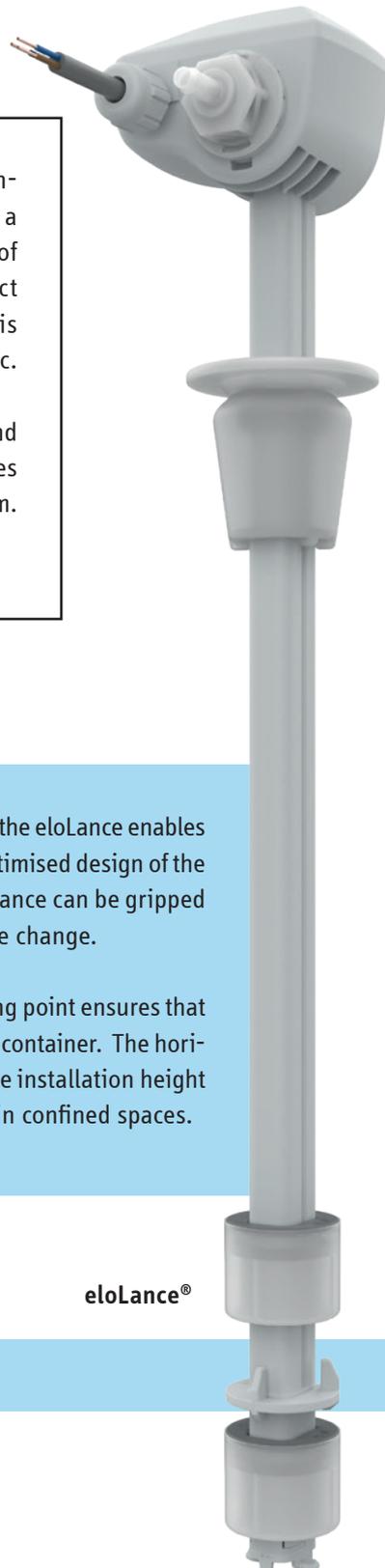
The seal-free construction in the area of the media contact as well as the optimised wall thickness lead to a high resistance. The material of the housing consists of PVC and PE. The material without direct media contact is made of PP and PVC. The ball of the outlet brake is available either in glass, PTFE, stainless steel or ceramic.

The eloLance is available in lengths from 260 - 1,200 mm and is compatible with the elobau hose connectors for hose sizes with an internal diameter of ID 4 mm, ID 6 mm or ID 8 mm. Wall thickness of wetted parts of at least 1.7 mm.

The redesigned container attachment of the eloLance enables a quick container change. Due to the optimised design of the suction lance head, the entire suction lance can be gripped easily, which additionally facilitates the change.

The low removal and emptying switching point ensures that significantly less residue remains in the container. The horizontal cable and hose outlet reduces the installation height so that the eloLance can also be used in confined spaces.

eloLance®





Machine safety

Our machine safety products not only increase the efficiency and usability of machines and complex systems – they also protect people, machines and the environment from hazards.

Magnetically operated or RFID-actuated safety sensors enable tailor-made solutions in the temperature range of -25°C to $+100^{\circ}\text{C}$ for monitoring moveable guards or positions up to PLe/SIL 3.

Our safety sensors are generally available up to protection class IP69K and enable space-saving and

time-saving installation. The different housing designs offer great flexibility for a wide range of applications, especially in confined spaces.

ATEX compliant solutions are available for potentially explosive environments. Hygienically designed designs allow use in hygienic applications. These variants are used in the Food & Beverage sector, among others.

Safe signal evaluation



**Safety relay
46212**



**eloProg
base module
485EPB**

Safety control units monitor safety signals and perform functions such as switching off the machine in the event of a fault. With up to 128 signal inputs and 16 redundant outputs, they are suitable for safety applications with a wide range of complexity up to PLe/SIL 3. They are compatible with all conventional signal transmitters.

LED displays allow fast on-site diagnostics while diagnostics outputs provide detailed information to the machine control. Different, compact housing designs and the option of pluggable terminals enable use in a wide variety of machines.

Safety control units ensure the monitoring of safety sensors and emergency stop buttons with minimal space requirements in the switch cabinet.

eloProg and eloFlex are safety evaluation units. The difference between the two systems is that the eloFlex is configured according to customer specifications and delivered with protection against manipulation, while the customer can configure the eloProg themselves. The included software enables flexible use, so that the eloProg can also be used as a stand-alone device.

An online configurator is available for configuring the eloFlex, which can be used to determine up to four safety functions.



eloFlex 471EFR



eloFlex Mini 470EFR

**Interfaces for
input expansion**

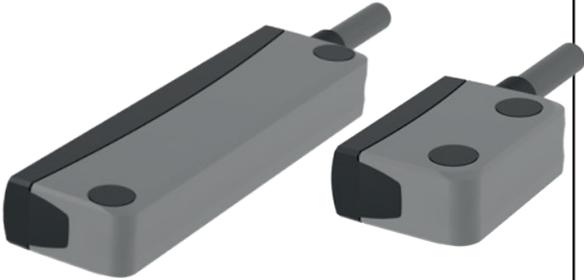


Input expansions are an inexpensive alternative to single wiring. You can connect up to 40 sensors to one evaluation unit and have a performance level up to PLd.

Safe condition detection

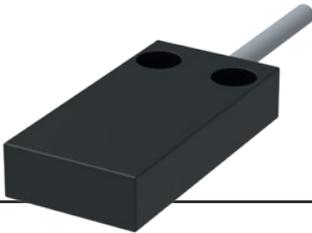
We offer a comprehensive range of RFID and magnetically actuated safety sensors. Compact systems with magnetic safety sensors and integrated evaluation are also part of the portfolio. These are supplemented by emergency stop buttons and contact elements for the safe shutdown of machines or systems. The focus is on the safety requirements of people and machines – without impairing the efficient use of the machine or system.

**Safety sensor
eloProtect E
163ESK and 153ESK**



eloProtect E sensors use RFID technology, which enables individual coding. The large offset values simplify installation. An additional advantage is that the integrated evaluation electronics and the high switching power enable direct monitoring via the EDM input as well as direct control of the contactors with up to 400 mA per contactor. This saves you wiring effort and expense, space in the switch cabinet and the costs for the respective safety component.

**Safety
sensor 114**



Available in all common contact forms, our safety sensors support series connection up to PLe and offer an LED display for fast diagnostics. Cable and plug connections as well as the option of concealed installation make them particularly flexible to use.



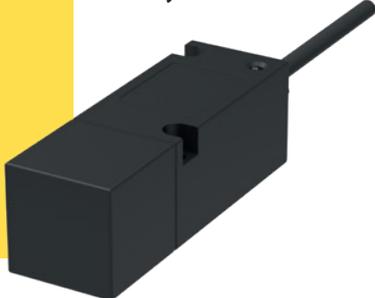
Safety sensor 122MSV

**Safety sensor
eloProtect M
153MSK**



Compact systems are safety sensors with integrated evaluation that save space and costs. They are particularly suitable for applications with only one safety function. Potential-free contacts enable the subsequent integration of safety functions into existing systems and are therefore also of interest in retrofits. Control contacts and LEDs are optionally available for diagnostic purposes.

Safety sensor 117



Emergency stop buttons for safe shutdown are fundamental for the safety of any machine. Depending on the application, there are emergency stop buttons in different versions, for example illuminated, lockable or hygienically designed.

Emergency stop button NHT04S



Emergency stop button NHT05D



Emergency stop button NHT01D

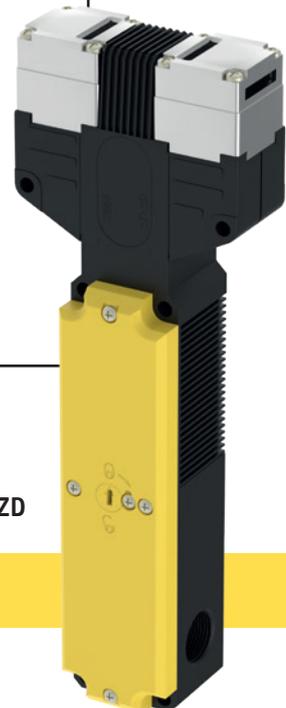
Safety interlock ZS



Safety interlocks mechanically lock protective caps, cover hoods and doors. With a locking force of up to 2500 N, impermissible access to the machine is prevented. Each of the variants is available with the closed-circuit or open-circuit principle.

The flexibility results from the fact that the installation can be carried out in any position and the heads can be turned in 90° increments on all models. The die-cast aluminium actuator head and the IP67 protection rating are testament to high resistance under extreme environmental conditions.

Safety interlock ZD



Safety interlock ZM



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