



Force measurement

# Force measurement is a matter of trust



Smart in sensing



## About us

As a family-run business acting globally, with over 9,300 highly qualified employees, the WIKA group of companies is a worldwide leader in pressure and temperature measurement. The company also sets the standard in the measurement of level, force and flow, and in calibration technology.

Founded in 1946, WIKA is today a strong and reliable partner for all the requirements of industrial measurement technology, thanks to a broad portfolio of high-precision instruments and comprehensive services.

With manufacturing locations around the globe, WIKA ensures flexibility and the highest delivery performance. Every year, over 50 million quality products, both standard and customer-specific solutions, are delivered in batches of 1 to over 10,000 units.

With numerous wholly owned subsidiaries and partners, WIKA competently and reliably supports its customers worldwide. Our experienced engineers and sales experts are your competent and dependable contacts locally.

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## Put your trust in a leading manufacturer

Force measurement technology is all about protecting people, high asset values, reliability and manufacturing safety. And that's why a trustworthy partner is important to you: A manufacturer that is also a privately-owned company with a long-term perspective. Our products, solutions and engineering skills are convincing customers from practically every industry.

### **tecsis – a division of the WIKA Group**

tecsis stands for innovative, quality solutions in measurement and sensor technology. For more than 90 years, teccis has developed into a globally recognised manufacturer of measurement technology – for large corporations as well as medium-sized companies.

Through the integration of teccis, the WIKA group of companies has been further strengthened and the extensive portfolio has been extended to include the measurand force.

Therefore we can offer you, in the breadth and depth of selection, an outstanding range of measurement technology solutions for a wide range of different applications.

### **Our production processes**

We manufacture force transducers at facilities on three continents: an economically efficient operation with consistent quality and reliable service along the entire value creation and delivery chain. Depending on requirements, we make use of three important technologies: strain gauges, thin-film sensors and hydraulic force measurement technology.

### **Our extensive portfolio**

The product range includes tension and compression force transducers, shear and bending beams, platform load cells, load pins, tension links, ring and special force transducers as well as electronics and complete systems. In every individual geometry and size.

# Put your trust in our know-how

Rapid time-to-market, precision, investment and reliability are what matters to you: whether it is for harbour logistics, machine building, cranes and lifting equipment, medical or agricultural technology, or any other application. We already have the right solution – or we will work with you to develop it.



## Standard products

A comprehensive range of products, high level of availability, fast delivery: We can offer you reliable quality for practically every application. A variety of force transducer models are already available as standard models. In many cases, we can flexibly adapt these to different applications.



## Constructive solutions

Whether in small quantities or a large production run: You can count on the engineering skills of our engineers and technicians for your special construction requirements and applications. For such projects, we start with a force transducer as an additive component to the module for an optimized integrated force measurement solution.

## Consistently high quality

Selected materials, high-quality components, consistent quality control: You can rely on WIKA experience when it comes to standard products and customised components. Our technical sales department will be with you every step of the way from your enquiry to scheduled delivery.

# Put your trust in technologies from one source

Functional safety - extreme operating conditions WIKA works in accordance with the Machinery Directive 2006/42/EC. The products you obtain from us are performance level (PL) and safety integrity level (SIL) rated and/or can be used in hazardous areas (ATEX, IECEx, FM, CSA, UL). We use three important force measurement technologies to meet the needs of any application.



## Thin-film technology

Redundant output signals and a high linearity level, patented technology and high-quantity availability due to an industrialised production process: Making thin-film cells the first choice for many requirements, even complex situations. The measuring bridge is connected at an atomic level to the measuring cell body ( $\varnothing 7$  or  $12$  mm) using a sputter process rather than with an adhesive connection.

### Advantages

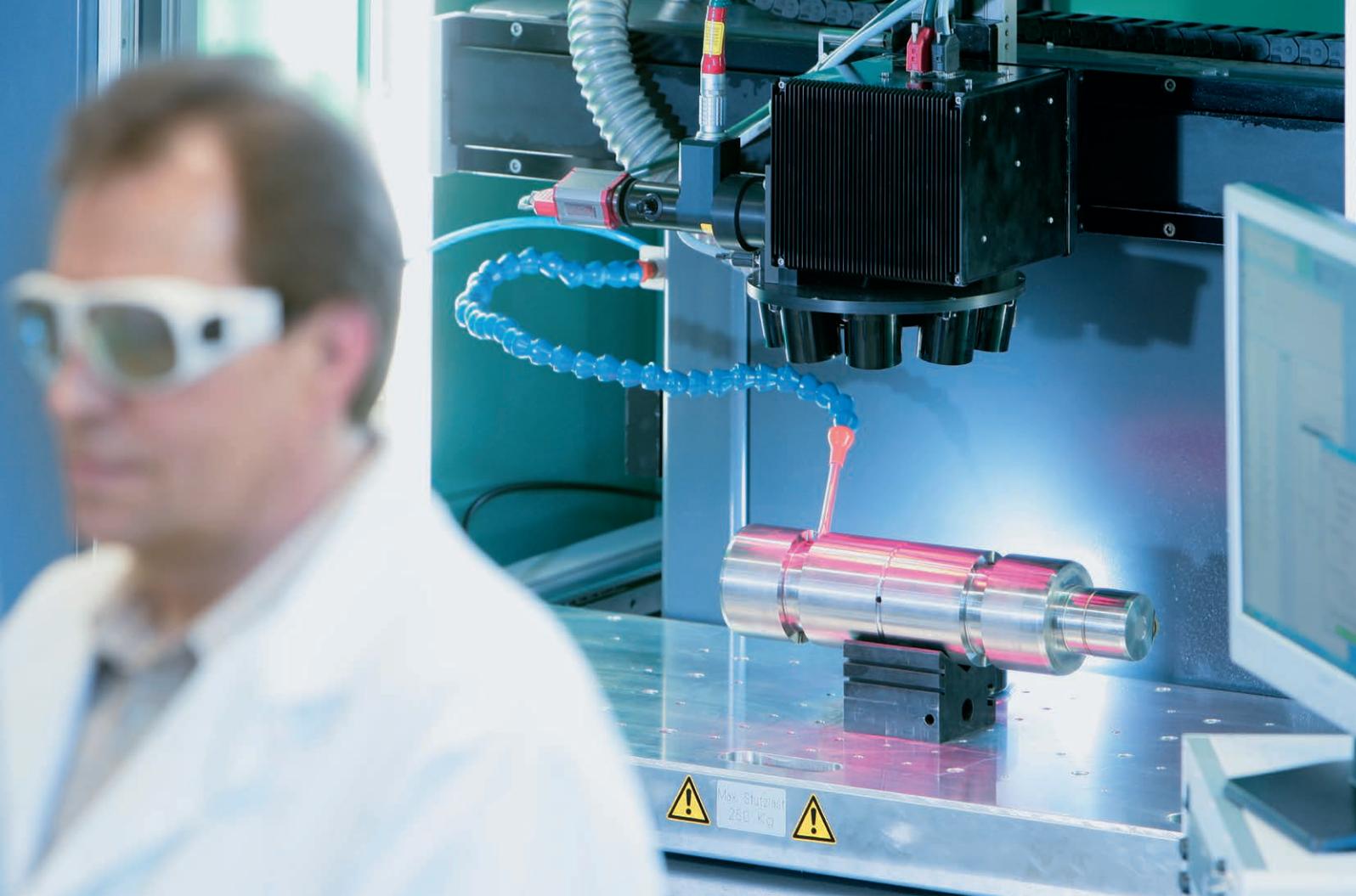
- Robust design and a high level of long-term stability
- Cost efficiency, even in high quantities
- Low space requirements
- Measuring ranges from 0 ... 1 kN to 0 ... 10,000 kN
- Amplifier integrated into the geometry
- Redundant 2-channel designs

## Foil strain gauges

Strain gauges make use of the piezoresistive resistance effect principle and the Thomson effect: Compression reduces and expansion increases the electrical resistance. The foil strain gauges adhere to the actual deformation element. The strain gauge technology offers a large geometrical variety and high accuracy, and it is well-suited for detecting the smallest forces.

### Advantages

- High level of geometric variability from miniature through to large formats
- High accuracy from 0.01 % of FS
- Measuring ranges from 0 ... 0.5 N to 0 ... 10,000 kN



## Hydraulic force measurement

Hydraulic force measurement makes use of a piston-case combination with different seals as a sensor unit.

### Advantages

- Autonomous systems without power supply, immediately ready to use, simple handling
- Robust and reliable, with high level of waterproofing, even in harsh environments
- Loss-free separation of the sensor from the evaluation unit
- Measuring ranges from 0 ... 160 N to 0 ... 10,000 kN



# Put your trust in technological diversity

Choose from a diverse range featuring several standard products: whether for minor measurements, safety-related measuring tasks (safety) or heavy-duty applications. Thanks to our universal interfaces, we can use this basis to efficiently and economically create customised force transducers for you.



## High quality

- Precision at every manufacturing stage: high-quality materials, received goods inspection, milling, sensor welding, electronic setup, final assembly, ageing cycle, temperature synchronisation, calibration, final inspection with documentation
- Advanced, robust electronics or reliable measurement data processing
- Certified systems comprising force transducers and control systems
- Retrofitting to existing applications in accordance with customer requirements with no need for adaptation
- Global, reliable product deliveries in compliance with AEO C/S status (formerly AEO-F) as an “authorised economic operator”
- Finite elements method (FEM) with variant comparisons and extreme case simulations

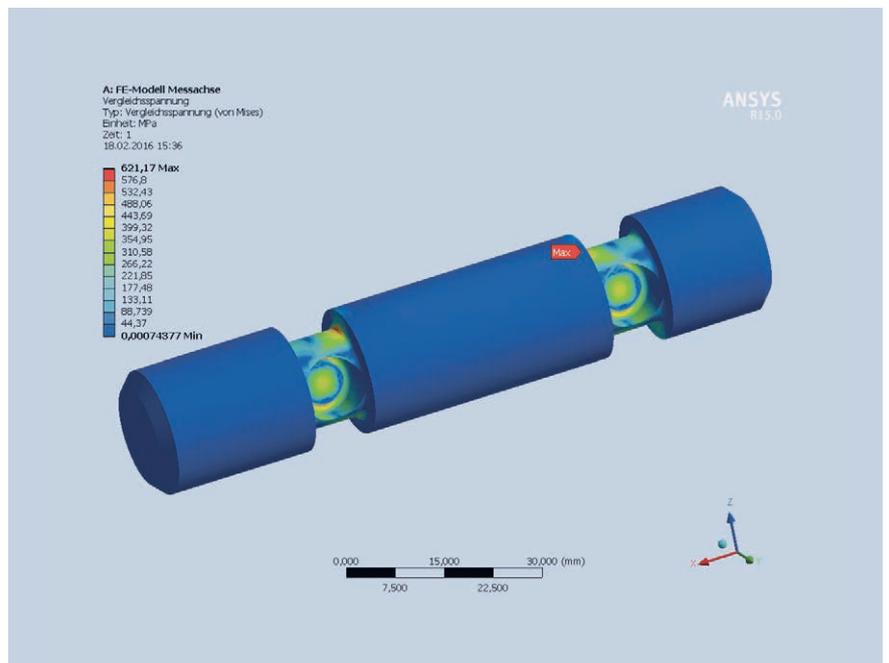
## Wide variety

- A wide variety of models can be created: living up to your expectations of accuracy and meeting geometric requirements
- Temperature resistance up to  $-40 \dots 250 \text{ C}^\circ$
- Force transducers for heavy-duty applications: under extreme influences and harsh environmental conditions
- Special transducers and constructive solutions
- For safety-related applications (SIL 3, safety)
- For explosion-protected areas (ATEX, IECEx, CSA, UL, FM)



## Product range

- Compression force transducers
- Tensile/compression force transducers
- Shear beams/bending beams
- Platform load cells
- Load pins
- Ring force transducers
- Tension links
- Special force transducers
- Electronics and systems



# Put your trust in our eye for essentials

Production facilities on three continents, decades of experience in practically every relevant field of application: WIKA sees the big picture and has an eye for constructive details. We know from experience what really matters – at every stage of our cooperation.



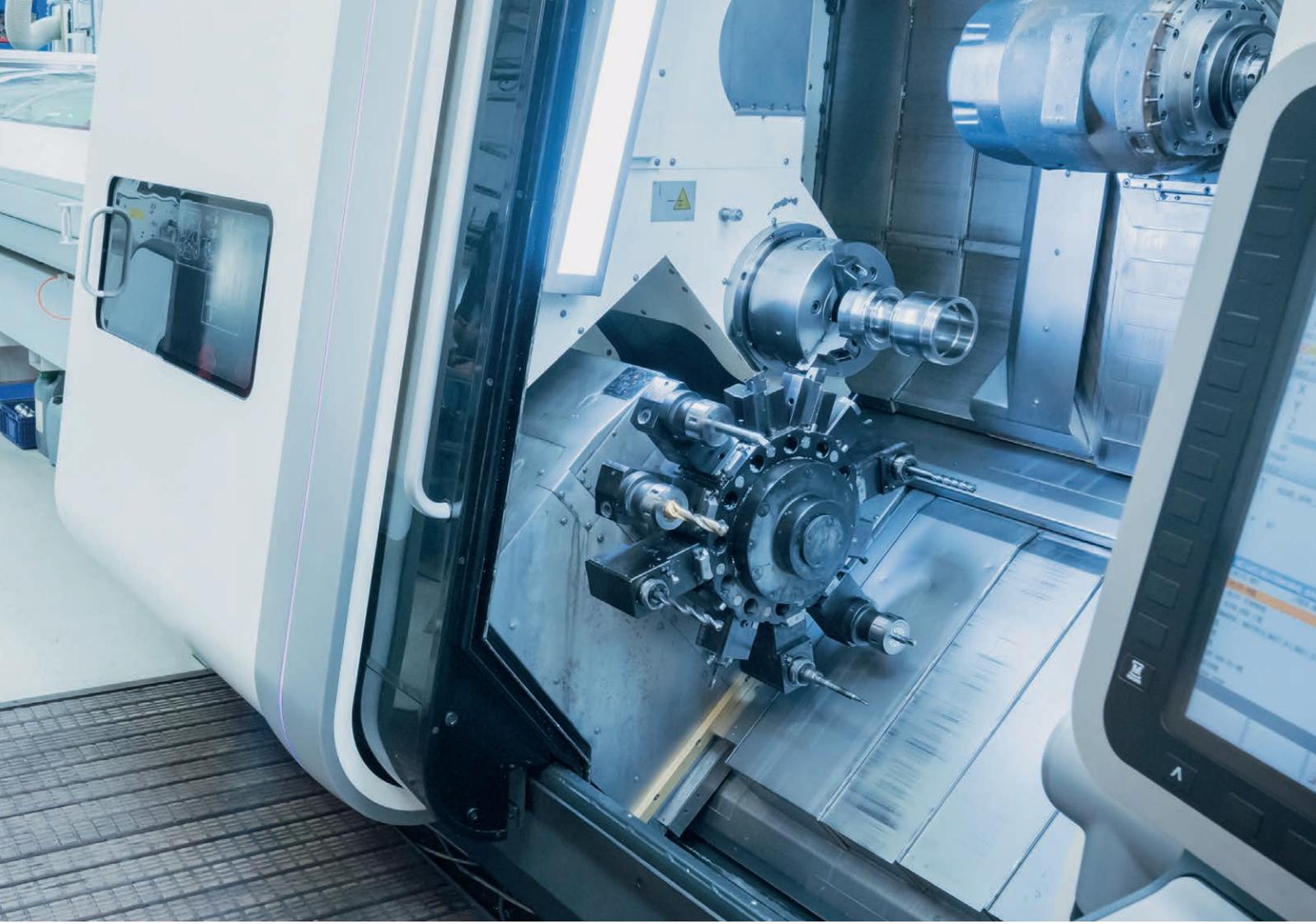
## Dedicated consulting

Find the right constructive solution for your application: We take the areas of application, environmental conditions and any special environmental influences into account: such as temperature fluctuations, moisture, dust accumulation, or special safety requirements (safety, performance level, SIL). Technically adept and internationally experienced contact persons will provide you with dedicated and competent consultation.

## Highly efficient production processes

We systematically aim to achieve a cost-benefit optimisation that will feature in every production phase: from semi-finished products and production materials through to electronic components. This includes careful processing of workpieces and standardised, certified processes with a properly documented final inspection.





## Secure delivery chain

Quality doesn't stop at the loading ramp: We deliver products all over the world. With hand-picked logistics partners, a well-thought-out goods management system and AEO C/S status (formerly AEO-F) as an "authorised economic operator". All with one objective: Your delivery should arrive quickly and safely.



# Applications in harbour logistics

Safely prevent overloading and protect people and materials: Leading harbour logistics companies and terminal operators rely on our force transducers, such as in deflection rollers, forked and roller bearings or as a direct replacement for retention bolts in existing structures. The ELMS1 overload protection unit evaluates the input signals and makes the data available. The system meets all requirements in accordance with SIL 2/PL d.





### Application: Ship-to-shore cranes

With high harbour container turnover, short handling times are what counts: Robust force transducers with associated overload protection electronics are thus used in ship-to-shore cranes.

- Heavy-duty load pins
- Safety electronics



### Application: Spreaders

Detect and reliably weigh loads directly at the spreader: WIKA offers two solutions here. Measuring the container weight and load distribution using ring force transducers or the integrated twistlock sensor.

- Ring force transducers
- Twistlock sensors

### Application: Harbour cranes

Handle containers and goods flexibly and economically: Here you will find robust force transducers that reliably deliver all data to the evaluation electronics.

- Tension links
- Heavy-duty load pins
- Inclinations sensors

# Applications in machine building

Technological edge and reliable quality: these are the key success factors in machine building. And this is why WIKA is close to the sector and its special construction requirements. Whether for drive and conveyor technology, in tool, packaging or paper processing, or in process technology and automation.





### Application: Presses and stamps

Ensuring reproducible pressing and stamping: The processes are evaluated via displays, limit switches and amplifiers.

- Strain transducers
- Compression force transducers
- Hydraulic force transducers
- Shear beams
- Ring force transducers
- Evaluation electronics
- Pressed-in sensors

### Application: Robotics

Measuring small forces in complex structures: Space-saving, lightweight, high-precision miniature force transducers are the first choice for automation technology.

- Compression force transducers
- Miniature tensile force/compression force transducers



### Application: Packaging machines

Enabling precise monitoring at several points of the packaging process: High-frequency measurements can be taken with our force transducers, even where maximum hygiene is required, such as in the food and pharmaceutical industries.

- Miniature compression force transducers
- Compression force transducers
- Shear and bending beams

### Application: Hot sealing units

Measuring the contact force of the heating track: Customised, adapted platform load cells are an excellent solution.

- Platform load cells
- Compression force transducers

# Applications for cranes and lifting equipment

Using machinery at the edge of their performance parameters, protecting people and equipment and minimising maintenance and service expenses: Load monitoring systems from WIKA contribute to the functional safety of systems and machines, whether in production areas, materials handling, storage and retrieval equipment or in the steel and metal processing industry.

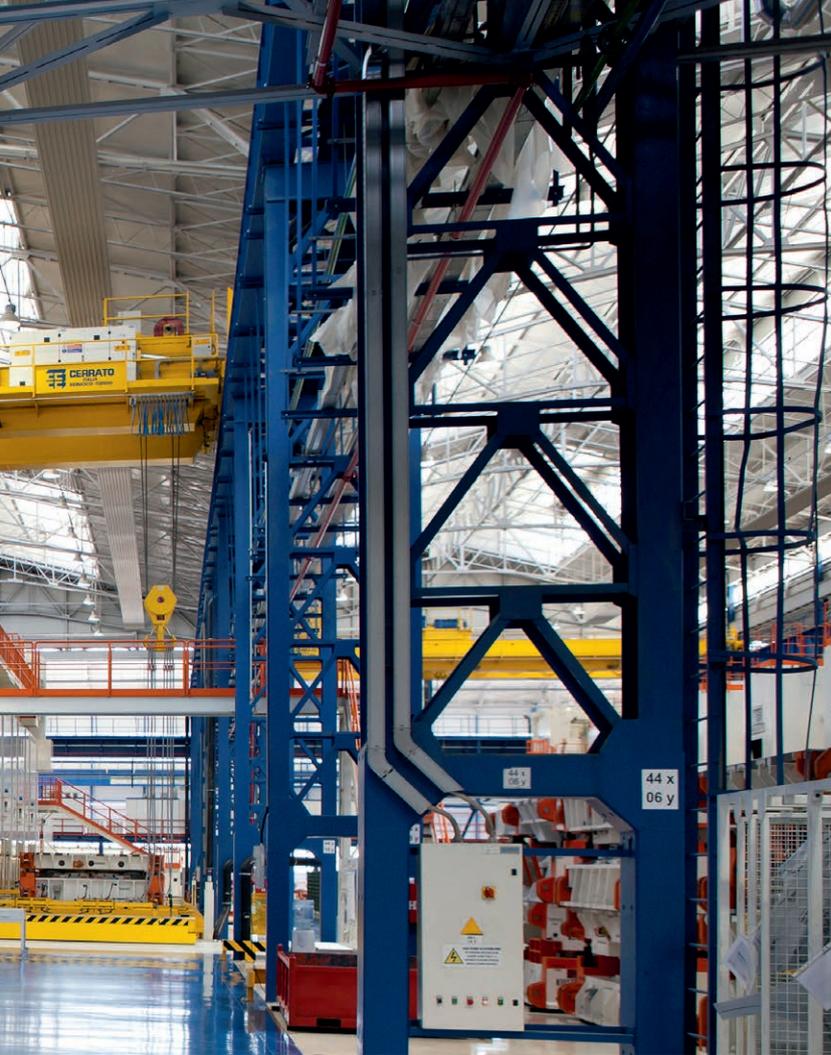


## Application: Mobile cranes

Safe for use even where ground conditions are poor or there is little room to extend the supports: all made possible by special measurement technology using variable support system for mobile cranes.

- Force transducers for support cylinders
- Tension links
- Inclinations sensors





### Application: Indoor and gantry cranes

Simply integrate force load pins into existing structures: WIKA measurement technology enables precise measurement without friction or lateral force impact when monitoring loads, e.g. on pulleys.

- Load pins
- Compression force transducers



### Application: Revolving tower cranes

Working safely at height requires a head for heights and first-class technology. Redundant force load pins and inclination sensors meet the high safety requirements for the crane with the highest level of precision and reliability, protecting people and machinery.

- Load pins
- Tension links
- Inclinations sensors

# Applications in medical engineering

Medical engineering is about people's well-being. This means force measurement technology has to meet high standards of precision and functional safety, often using as little space as possible. In addition to standard products, we also make use of customised, adapted solutions – one of WIKA's particular strengths.





### Application: Incubators

#### Monitoring the weight of newborns:

Platform load cells are integrated into the incubator below the bed surface.

- Platform load cells



### Application: Blood mixing scales

#### Making sure that taking blood is safe for donors:

Blood donation companies and clinics use blood mixing scales to check collection quantity per time unit and to monitor the absolute quantity collected.

- Platform load cells

### Application: Infusion pumps

#### Ensuring continuity of medication flow:

This is often achieved in infusion pumps with the aid of customised miniature compression force transducers.

- Miniature compression force transducers

# Applications in agriculture technology

Perfect metering is essential in agricultural technology. Weighing systems and force measurement technology from WIKA can achieve this even under unfavourable environmental conditions such as moisture, temperature fluctuations or dust accumulation, delivering reliable and precise measured values at all times.





### Application: Silos

Precise weighing and level monitoring, even when in contact with aggressive media: We provide the right products and kits for a range of silo sizes and containers for harvested goods and animal feed.

- Compression force transducers
- Shear beams
- Platform load cells
- Digital displays

### Application: Baling presses

Reliable determination of bale weight while moving or at rest, even under unfavourable operating conditions.

- Load pins
- Shear beams
- Inclinations sensors
- Strain transducers



### Application: Combine harvesters

Reliably determining the harvested quantities of various cultivated grains: Platform load cells are used for weighing grain tanks or determining flow volumes, for instance.

- Compression force transducers
- Shear beams
- Platform load cells
- Inclinations sensors

### Application: Fertilization spreaders

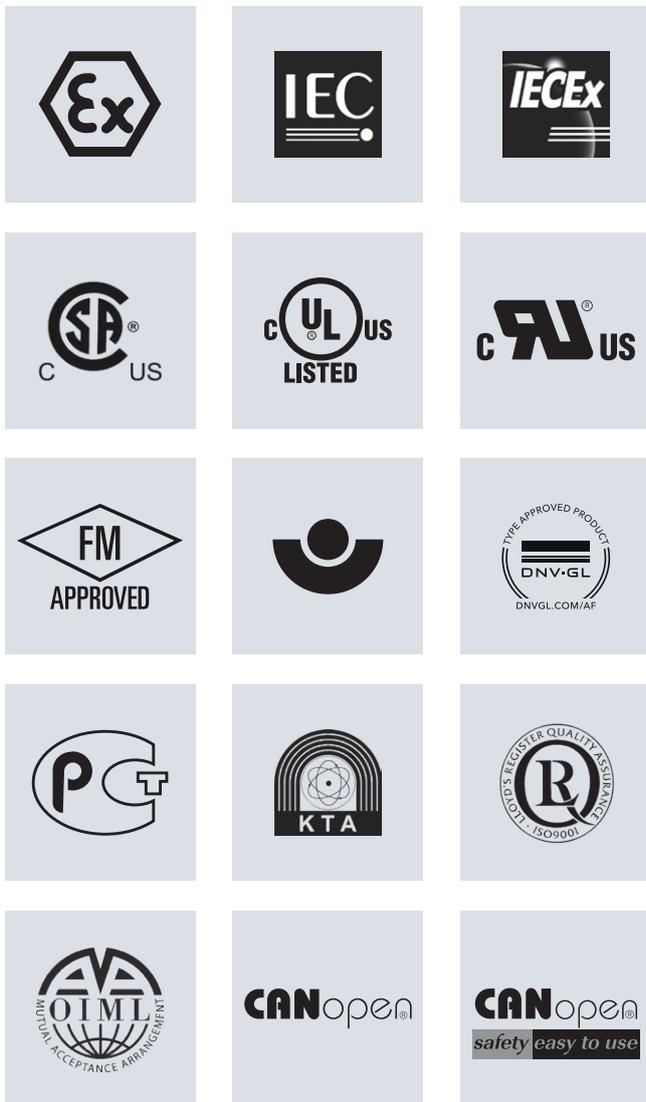
Accurately determine and reliably monitor flow volumes when fertilizing: tectis shear beams and inclination sensors help to ensure that dosage is precisely adjusted to requirements metering during the fertilization process.

- Shear beams
- Inclinations sensors

# Put your trust in certified safety

You are always on the safe side with WIKA force measurement technology: Even when the highest safety standards are essential and measuring components have to withstand extreme operating conditions. Whether offshore or on land, for gas, oil, dust or in the mining industry: Instruments and protective systems have to be certified and marked for hazardous areas. And so have force transducers, because primary explosion protection is not always possible. Our products are designed to achieve this and boast a range of certifications in accordance with ATEX, FM, CSA, UL or IECEx and SIL. Put your trust in WIKA experience and know-how: Because there can be no compromises when it comes to safety.





## ATEX approvals

WIKA force transducers with tried-and-tested thin-film measuring cell and integrated amplifier technology have been certified in accordance with the directive 94/9/EC: for group I instruments (mining) category M2, for group II instruments (other locations) and instrument category 2G for zones 1 and 2 (gas). Further zones are available upon request.

## Stages

Overload detection and load indication for upper and lower machinery on stage and in theatres: Our force transducers with 2-channel control systems achieve safety integrity level SIL 3.

## CANopen® and CANopen® Safety

We supply force transducers with CANopen® and CANopen® safety protocols for safety-related measuring tasks. This means that we deliver a standardised, safety-based fieldbus system with defined safe statuses through to performance level e.

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You can find further information here!



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