

Pharmaceuticals
Food
Biotechnology
Cosmetics

Sanitary applications



 Part of your business

About us



Alexander Wiegand,
Chairman and CEO, WIKA

As a family-run business acting globally, with over 10,000 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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WIKA - Your partner for sanitary applications

In the manufacture of food and pharmaceuticals, safety in production and the prevention of any risks to those using the finished product is of the highest priority.

In the chain of all the process components within a plant, measurement technology plays a key role. Measurement technology delivers process-specific information which enables high-quality production. For this, the safety and hygienic requirements in the design of the measuring instruments and the connection of the sensors to the production plant must be fulfilled optimally with respect to ease of cleaning.

This brochure will assist you in selecting hygienic measuring instruments to solve pressure, temperature and level measurement challenges. In co-operation with you, we will develop tailored solutions geared to the individual requirements of your process.

Hygienic design

The hygienic design of plant components in contact with products is an essential prerequisite for avoiding microbiological contamination, and with that, ensuring product quality. As part of the overall hygienic concept of a plant, the measuring instruments used must comply with special requirements on material, surface quality, process safety, connection engineering and cleanability in the scope of the CIP process.



As a company member of the European Hygienic Engineering and Design Group (EHEDG), WIKA contributes to the international standards and combines hygienic design with high-quality measurement technology.

Materials

Austenitic stainless steel is used as a standard material for wetted areas. In the food and beverage industry and also in the pharmaceutical industry, 1.4404 and 1.4435 grades are preferred.

Stainless steels are inert to the majority of foods and pharmaceuticals, while also offering good corrosion resistance to disinfectants and cleaning agents. In this respect, 1.4435 displays a better corrosion resistance than 1.4404. For specific applications, special alloys are used, such as the fully austenitic stainless steel, 1.4539 (904L), or Hastelloy C and Inconel, and also plastic coatings such as PFA (perfluoroalkoxy) or PTFE (poly-tetra-fluoro-ethylene). With diaphragm measuring instruments, we use the highly corrosion-resistant nickel chrome alloy, 2.4668 (N07718), in order to achieve an optimal measurement performance with higher robustness.

As a standard material for all those metallic surfaces that will come into contact with the process medium, we use stainless steel 1.4435.

Surfaces

An important aspect in the cleaning of a plant using CIP/SIP processes is the quality of the surfaces in contact with the process medium.

To enable the easy cleaning of the measuring instruments, and also to prevent biofilms, the wetted surfaces must be passive and free from microscopic flaws. In addition to the surface topography, the surface roughness is an important criterion for cleanability. In the standards, such as EHEDG Doc. No. 8, "Hygienic equipment design criteria", a roughness of $Ra < 0.8 \mu m$ is considered as sufficient for normal cleaning processes.

For sensitive biotechnology processes, surfaces with a lower roughness are needed, e.g. $Ra < 0.38 \mu m$ per ASME BPE.

Electropolishing

By using electrolytic polishing, the cleanability of the surfaces can be improved. In this way, essentially, the topographical structure of the surfaces is smoothed and therefore the roughness is decreased. A further advantage is that electropolishing increases the passive layer of stainless steel, and thus the corrosion resistance is improved, especially with reducing media.



Sealing materials

In the selection of suitable sealing material, various process parameters and also the process media are important. Sealing materials must be toxicologically harmless and sufficiently resistant to abrasion, be resistant against aggressive cleaning and disinfecting media, and be stable in superheated steam at high sterilisation temperatures.



Predominantly, special compounds are used for O-rings or form seals, for example fluororubber-based (FKM) such as VITON®, ethylene-propylene-diene material (EPDM) or poly-tetra-fluoro-ethylene (PTFE). The materials used for the sealing elements, and also their manufacturing processes, must conform to the rules of the regulatory authorities and organisations.



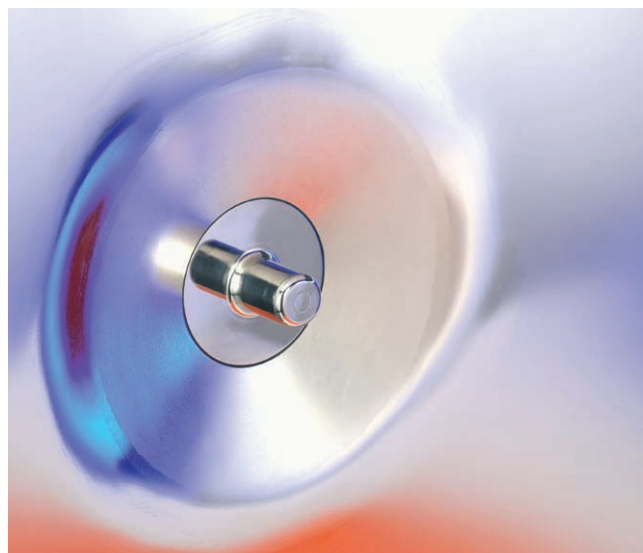
Process connections

Process connections which are used in CIP-capable equipment should not constitute any risk in respect to cleaning. They are characterised by the following features:

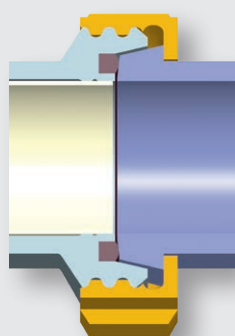
- A defined compression of the sealing element through a metallic stop
- Centring via a cylindrical guide
- Crevice-free sealing on the inside of the pipe

For this, there are connections such as those in accordance with DIN 11864, NEUMO BioConnect®, BioControl® and VARIVENT®.

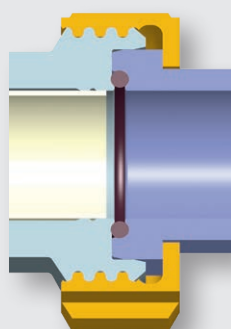
The widely used connections in accordance with DIN 11851 (milk thread fitting) and DIN 32676 (clamp) were originally developed to disassemble plant components easily. They are therefore ideally suited to equipment that needs to be removed for cleaning. If measuring instruments with these process connections are operated with CIP cleaning, the appropriate profile sealing has to be used.



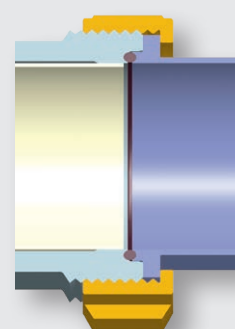
Process connections with metallic sealing components (thread with sealing cone) form a gap at the sealing point and must therefore be assessed very critically with regard to their cleanability, especially with repeated sealing and fitting following the calibration of the measuring instruments.



Threaded pipe connection
per DIN 11851



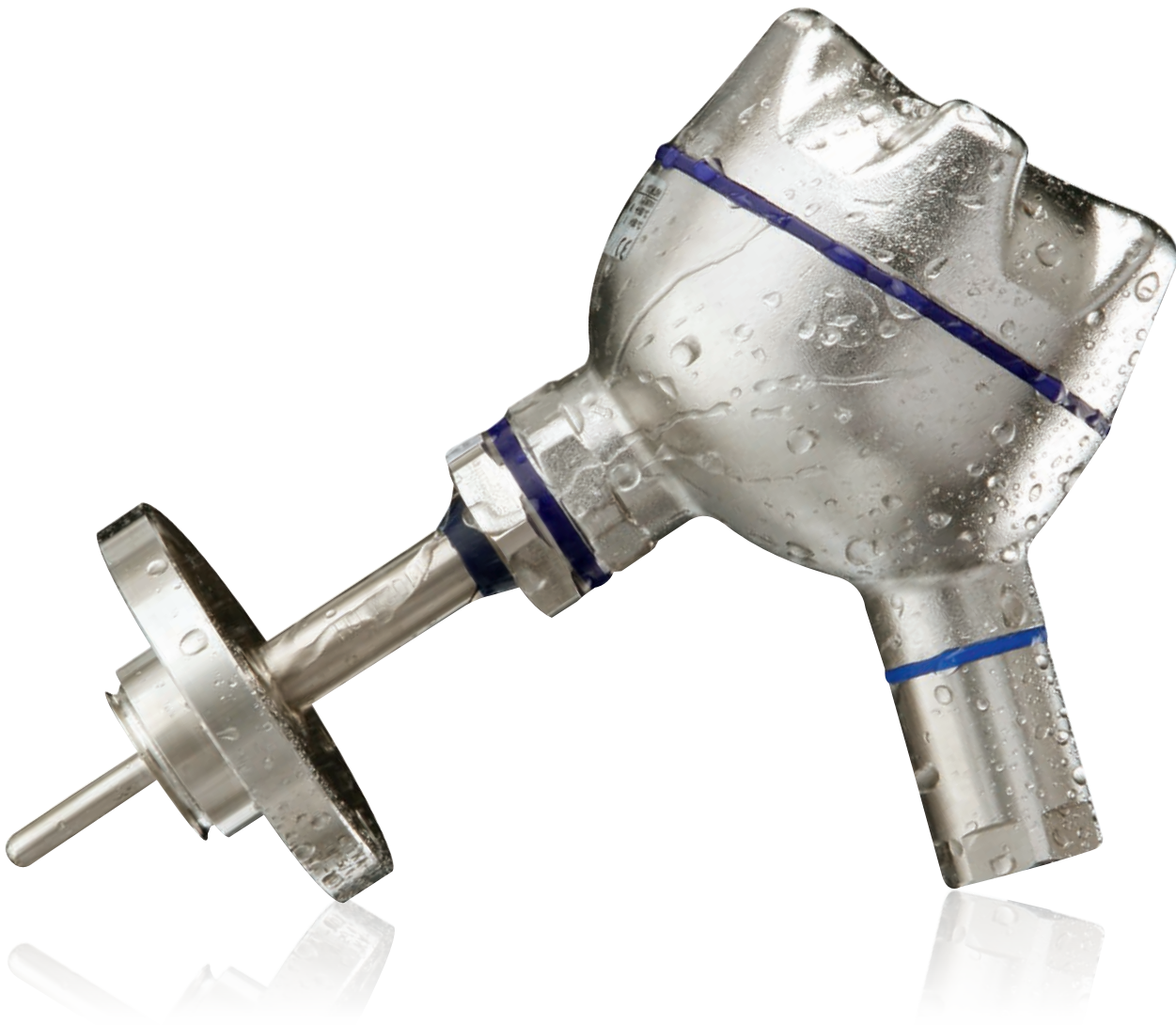
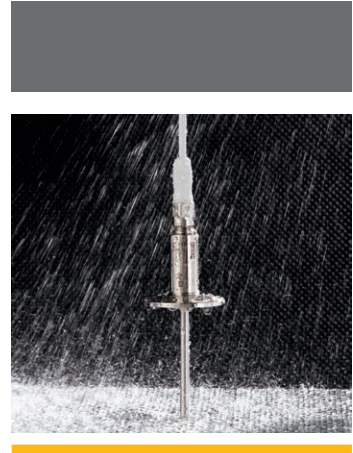
Threaded pipe connection
per DIN 11864-1, form A



Thread NEUMO
BioConnect®

Case

The design of the non-wetted parts must be made so that the equipment is easy to clean from the outside as well. Particularly with open processes in food production, the machinery and equipment must be cleaned after production. For this, WIKA has developed specific hygienically designed cases. These are easy to clean from the outside. Without any gaps or corners and with a high IP protection, these are especially suited to the harsh conditions of washdowns.



Directives and standards

WIKA combines hygienic design with high-quality measurement technology. We actively participate in international standards committees such as EHEDG, 3-A and ASME BPE. The latest market requirements flow into our product development.

FDA FDA (Food and Drug Administration)

ATEX



EHEDG (European Hygienic Engineering & Design Group)

IECEx



3-A Sanitary Standards, Inc.

FM



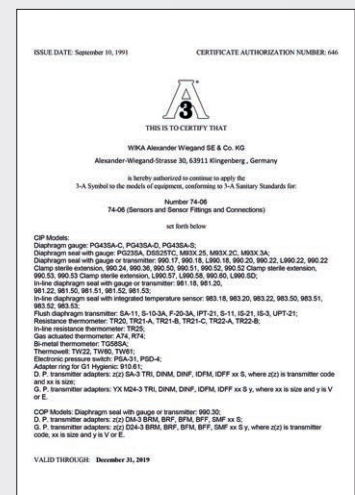
NSF (National Sanitation Foundation)

CSA



USP (U. S. Pharmacopeia)

EAC



Connection to the process with diaphragm seals

The connection of pressure measuring instruments to the process is ideally performed by means of diaphragm seals with hygienic connections.

Diaphragm seals

Diaphragm seals separate the pressure measuring instrument, pressure sensor or pressure switch from the medium and ensure a process connection which is either free of dead spaces or where dead spaces are reduced to a minimum. The isolation is achieved by means of a flexible metal diaphragm. The internal space between the diaphragm and the pressure measuring instrument is completely filled with a fluid. The process pressure is transmitted by the elastic diaphragm into the fluid and from there to the measuring instrument.

Advantages of diaphragm seals

In contrast to ceramic principles, with diaphragm seals - as a result of the measuring cell's metallic construction - additional sealing elements are eliminated, and so the maintenance burden is significantly reduced. Ceramic measuring cells exhibit a high sensitivity to dynamic loads. With any sudden pressure spikes, the ceramic cell can be destroyed. In these cases, combinations of measuring instruments and diaphragm seals are clearly preferable.



Possibilities for combination and assembly

The combination of mechanical or electronic pressure measuring instruments with flush diaphragm seals meets the stringent demands made on hygienic instrumentation and is suitable for even the most difficult measuring requirements. Mounting of the diaphragm seal to the measuring instrument may be made via a direct connection, for high temperatures via a cooling element or via a flexible capillary.



System fill fluids for diaphragm seal systems

The media used by us are FDA conform.

| Name | Code no. | Permissible medium temperature | | Density at temperature | | Viscosity at temperature | | Conformities |
|-----------------------------|----------|--------------------------------|---------------------|------------------------|------|---|------|---|
| | | P ≥ 1,000 mbar abs. | P < 1,000 mbar abs. | [g/cm ³] | [°C] | [m ² /s • 10 ⁻⁶] | [°C] | |
| Glycerine | 7 | +17 ... +230 °C | – | 1.26 | +20 | 1110 | +20 | FDA 21 CFR 182.1320 |
| Neobee® M-20 | 59 | -20 ... +200 °C | -20 ... +160 °C | 0.92 | +20 | 10.1 | +25 | FDA 21 CFR 172.856, 21 CFR 174.5 |
| Medicinal white mineral oil | 92 | -10 ... +260 °C | -10 ... +160 °C | 0.85 | +20 | 23 | +40 | FDA 21 CFR 172.878, 21 CFR 178.3620(a); USP, EP, JP |

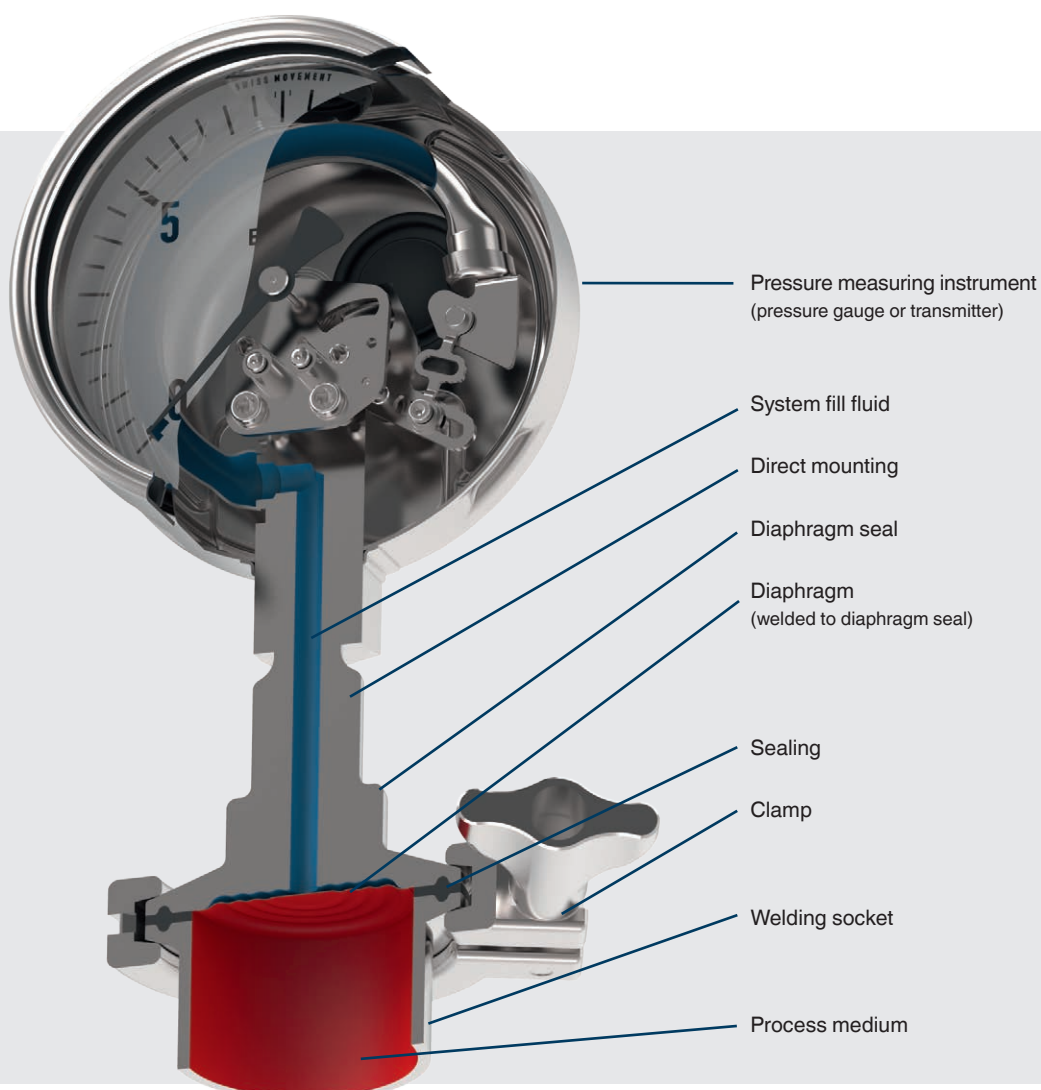
Neobee® is a registered trademark of the Stepan Company.

Further system fill fluids can be used for special applications after technical application support.

Diaphragm seals

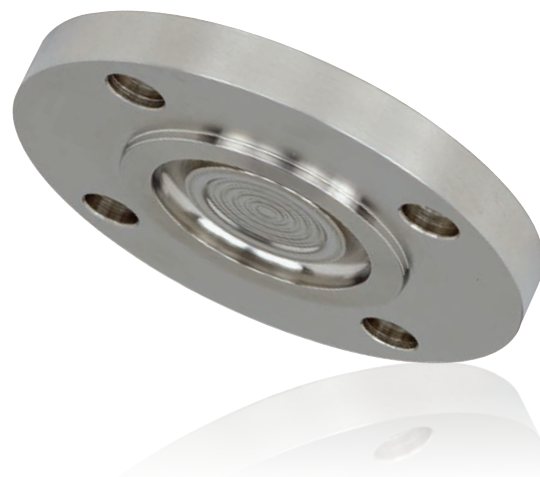
Diaphragm seals are mounted to existing fittings. Usually the fittings consist of T-pieces which are integrated into a pipeline, or of welding sockets which are welded to a pipeline, the process reactor or a tank.

Diaphragm seals offer the advantage that the “contact surface” between pressure medium and diaphragm is relatively large, thus ensuring accurate pressure measurement. Furthermore, they can be easily removed for cleaning or calibration.



990.17
DRD connection


| | |
|--------------------|----------------|
| Process connection | DRD connection |
| PN max. | 25 bar |
| Data sheet | DS 99.39 |


990.18
Milk thread fitting per DIN 11851


| | |
|--------------------|-------------------------------|
| Process connection | Thread with grooved union nut |
| PN max. | 40 or 25 bar |
| Data sheet | DS 99.40 |

990.22
Tri-clamp


| | |
|--------------------|--|
| Process connection | Tri-clamp, DIN 32676 or BS4825 |
| PN max. | ■ 40 bar (DN 20 ... 50) ■ 25 bar (from DN 65) |
| Data sheet | DS 99.41 |

990.24
VARIVENT® connection


| | |
|--------------------|---|
| Process connection | For installation into the VARINLINE® access unit or connecting flange |
| PN max. | 25 bar |
| Data sheet | DS 99.49 |

990.50
NEUMO BioConnect® connection


| | |
|--------------------|---|
| Process connection | NEUMO BioConnect® thread or flange |
| PN max. | ■ 16 bar (thread) ■ 70 bar (flange) ■ Higher pressures on request |
| Data sheet | DS 99.50 |

990.51
Aseptic connection per DIN 11864


| | |
|--------------------|---|
| Process connection | ■ DIN 11864-1 threaded connection ■ DIN 11864-2 flange ■ DIN 11864-3 clamp connection |
| PN max. | 16 ... 40 bar depending on the process connection |
| Data sheet | DS 99.51 |

990.60
NEUMO BioControl®


| | |
|--------------------|--|
| Process connection | For installation into the NEUMO BioControl® system |
| PN max. | ■ 16 bar (size 50 ... 80) ■ 70 bar (size 25) |
| Data sheet | DS 99.55 |

Diaphragm seal systems

These diaphragm seal systems have been developed for hygienic applications in the pharmaceutical industry and for food and beverage production. They are suitable for quick, residue-free cleaning, in particular for cleaning in place (CIP) and sterilisation in place (SIP).

The clamp connections are fast and easy to open for cleaning or seal replacement.

M932.25

Compact pressure gauge in accordance with ASME with ¾" clamp connection



| | |
|--------------------|-------------------------------|
| Process connection | Tri-clamp per ASME BPE ¾", 1" |
| PN max. | 600 psi (40 bar) |
| System fill fluid | KN7 |
| Data sheet | M93x.25 |

DSS18F, DSS19F

With pressure gauge per EN 837-1, with milk thread fitting or SMS threaded connection



| | |
|--------------------|--|
| Process connection | DSS18F: Grooved union nut/ threaded coupling DSS19F: Threaded connection per SMS standard (SS 3352) |
| PN max. | 25 bar |
| System fill fluid | KN92 |
| Data sheet | DS 95.04, DS 95.21 |

DSS22F

With pressure gauge per EN 837-1, with clamp connection



| | |
|--------------------|--------------------------------|
| Process connection | Tri-clamp, DIN 32676 or BS4825 |
| PN max. | 25 bar |
| System fill fluid | KN92 |
| Data sheet | DS 95.06 |

DSS22P

With pressure gauge in hygienic design, with clamp connection



| | |
|--------------------|---|
| Process connection | Tri-clamp, DIN 32676 or BS4825 |
| PN max. | 25 bar |
| System fill fluid | KN92 |
| Special feature | <ul style="list-style-type: none"> External zero point setting Electropolished case Autoclavable |
| Data sheet | DS 95.07 |

DSS18T

With high-quality pressure sensor, with milk thread fitting



| | |
|--------------------|-----------------------------------|
| Process connection | Milk thread fitting per DIN 11851 |
| PN max. | 25 bar |
| System fill fluid | KN92 |
| Data sheet | DS 95.05 |

DSS19T

With high-quality pressure sensor, with SMS threaded connection



| | |
|--------------------|---|
| Process connection | Threaded connection per SMS standard (SS 3352) |
| PN max. | 25 bar |
| System fill fluid | KN92 |
| Data sheet | DS 95.06 |

DSS22T

With high-quality pressure sensor, with clamp connection



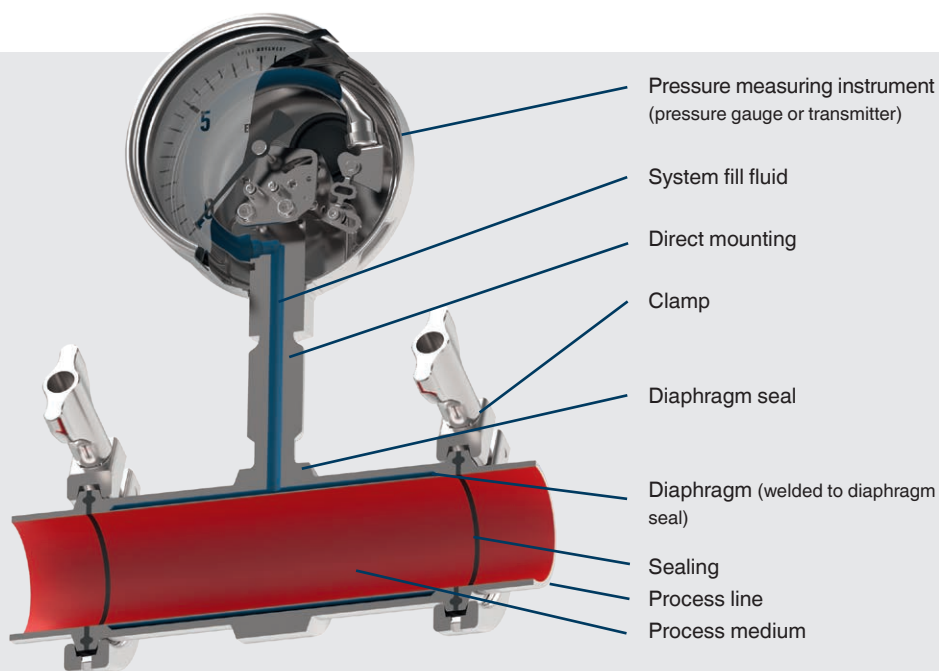
| | |
|--------------------|--------------------------------|
| Process connection | Tri-clamp, DIN 32676 or BS4825 |
| PN max. | 25 bar |
| System fill fluid | KN92 |
| Data sheet | DS 95.08 |

In-line diaphragm seal

The in-line diaphragm seal is perfectly suited for use with flowing media. With the seal being completely integrated into the process line, measurements do not cause any turbulences, corners, dead spaces or other obstructions in the flow direction.

The measured medium flows, without obstruction, through the in-line diaphragm seal. This effects an additional self-cleaning of the measuring chamber.

The in-line diaphragm seal is installed directly into the pipeline.



981.18

Milk thread fitting DIN 11851



| Process connection | Thread |
|--------------------|--|
| PN max. | <ul style="list-style-type: none"> ■ 40 bar (DN 20 ... 40) ■ 25 bar (from DN 50) |
| Data sheet | DS 98.40 |

981.22

Tri-clamp



| | |
|--------------------|--|
| Process connection | Tri-clamp, clamp DIN 32676, ISO 2852 |
| PN max. | <ul style="list-style-type: none"> ■ 40 bar (DN 20 ... 40) ■ 25 bar (from DN 50) |
| Data sheet | DS 98.52 |

981.51

Aseptic connection



| | |
|--------------------|---|
| Process connection | <ul style="list-style-type: none"> ■ DIN 11864-1 threaded connection ■ DIN 11864-2 flange ■ DIN 11864-3 clamp connection |
| PN max. | 16 ... 40 bar depending on the process connection |
| Data sheet | DS 98.51 |

981.50

NEUMO BioConnect®



| | |
|--------------------|---|
| Process connection | NEUMO BioConnect® thread or flange |
| PN max. | <ul style="list-style-type: none"> ■ 16 bar (thread) ■ 70 bar (flange) ■ Higher pressures on request |
| Data sheet | DS 98.50 |

Precision digital pressure gauge with diaphragm seal

CPG1500

Precision digital pressure gauge



| | |
|-------------------------|--|
| Measuring range | -1 ... 10,000 bar |
| Accuracy (% of span) | Down to 0.05 FS |
| Special feature | <ul style="list-style-type: none"> ■ Integrated data logger ■ WIKAI-Cal compatible ■ Data transfer via WIKAI-Wireless ■ Password protection possible ■ Robust case IP65 |
| Data sheet | CT 10.51 |

When assembled with the model 990.22 diaphragm seal, the CPG1500 is optimally suited for processes in the food and pharmaceutical industries. The large display enables the measured values to be read easily and precisely. The instrument can also be used for leakage monitoring on sterile vessels, in particular for vessels with low pressure blankets. With the help of the data logging function, the measured values can be recorded over a long period of time.

Pressure measuring instruments for homogenisers

Pressure measuring instruments with model 990.30 diaphragm seals have been specifically developed for homogenising processes, where there are extremely dynamic pressure loads.

Complex structural features allow pressures of up to 2,500 bar and ensure a long service life. The model is available as a purely mechanical solution or with a 4 ... 20 mA output signal.

Further information on model 990.30 can be found in data sheet DS 99.33.

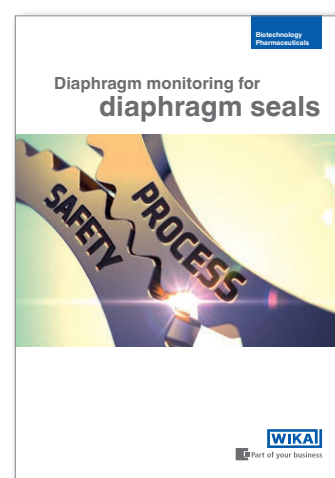


Diaphragm monitoring

WIKA's patented (patent no. DE19949831) double diaphragm offers a solution for critical processes where the product must not find its way into the environment, or where the fill fluid in the diaphragm seal assembly must not find its way into the product.

The space between the two diaphragms is evacuated.

The emerging vacuum is monitored by means of a measuring instrument, for example a pressure switch. Should a diaphragm rupture, there will be an optical, acoustic or electrical warning. The damaged system can be exchanged. Further information on model DMS-FP can be found in data sheet DS 95.20.



WIKA flyer "Diaphragm monitoring for diaphragm seals"

DMS-FP

Diaphragm monitoring system



| | |
|--------------------|--|
| Process connection | Clamp connection per DIN 32676 |
| Application | Sanitary applications |
| Material | Stainless steel 1.4435 (316L), UNS S31603 |
| Data sheet | DS 95.20 |



Electronic pressure measuring instruments



Electronic pressure measurement contributes to the precise and energy-saving control and regulation of processes. Alongside temperature, pressure is the most important and most common technology for monitoring and controlling plants and machinery.

With pressure measuring instruments, alongside the monitoring of process pressure and hydrostatic level measurement, a full range of process steps can be controlled, such as the dosing of inert gas blankets, the monitoring of filters in downstream areas and filling pressures. For the various applications there are a number of pressure sensors available.



S-20

Pressure sensor for superior industrial applications



| | |
|--------------------------------|--|
| Non-linearity (± % of span) | ≤ 0.125, 0.25 or 0.5 BFSL |
| Measuring range | <ul style="list-style-type: none"> ■ 0 ... 0.4 to 0 ... 1,600 bar ■ 0 ... 0.4 to 0 ... 40 bar abs. ■ -1 ... 0 to -1 ... +59 bar |
| Special feature | <ul style="list-style-type: none"> ■ Extreme operating conditions ■ Customer-specific variants ■ Free test report |
| Data sheet | PE 81.61 |

IS-3

Pressure sensor, intrinsic safety Ex i



| | |
|---------------------------|---|
| Accuracy (± % of span) | ≤ 0.5 |
| Measuring range | <ul style="list-style-type: none"> ■ 0 ... 0.1 to 0 ... 6,000 bar ■ 0 ... 0.25 to 0 ... 25 bar abs. ■ -1 ... 0 to -1 ... +24 bar |
| Special feature | <ul style="list-style-type: none"> ■ Further worldwide Ex approvals ■ High-pressure version (optional) ■ Flush process connection (optional) ■ Suitable for SIL 2 per IEC 61508/IEC 61511 |
| Data sheet | PE 81.58 |

PSD-4

Electronic pressure switch with display



| | |
|-------------------------|---|
| Accuracy (% of span) | ≤ 0.5 |
| Measuring range | <ul style="list-style-type: none"> ■ 0 ... 0.4 to 0 ... 1,000 bar ■ 0 ... 0.4 to 0 ... 25 bar abs. ■ -1 ... 0 to -1 ... +24 bar |
| Special feature | <ul style="list-style-type: none"> ■ Easily readable, robust display ■ Intuitive and fast setup ■ Easy and flexible mounting configurations ■ Flexibly configurable and scalable output signals |
| Data sheet | PE 81.86 |

UPT-20

Universal process transmitter, with pressure port



| | |
|------------------------------|--|
| Non-linearity (% of span) | ≤ 0.1 |
| Output signal | 4 ... 20 mA, HART® |
| Measuring range | <ul style="list-style-type: none"> ■ 0 ... 0.4 to 0 ... 1,000 bar ■ 0 ... 1.6 to 0 ... 40 bar abs. ■ -0.2 ... +0.2 to -1 ... +40 bar |
| Special feature | <ul style="list-style-type: none"> ■ Multi-functional display ■ Simple menu navigation ■ Conductive plastic case ■ Large LC display, rotatable |
| Data sheet | PE 86.05 |

IPT-20

Process transmitter in industrial version



| | |
|------------------------------|--|
| Non-linearity (% of span) | <ul style="list-style-type: none"> ■ ≤ 0.075 ... 0.1 |
| Measuring range | <ul style="list-style-type: none"> ■ 0 ... 0.1 to 0 ... 4,000 bar ■ -1 ... 0 to -1 ... +60 bar ■ 0 ... 0.1 to 0 ... 60 bar abs. |
| Output signal | <ul style="list-style-type: none"> ■ 4 ... 20 mA, HART®, PROFIBUS® PA, FOUNDATION™ Fieldbus |
| Special feature | <ul style="list-style-type: none"> ■ Freely scalable measuring ranges (turndown to 30 : 1) ■ Case from plastic, aluminium or stainless steel |
| Data sheet | PE 86.06 |

DPT-10

Differential pressure transmitter, intrinsically safe or with flameproof enclosure



| | |
|------------------------------|--|
| Non-linearity (% of span) | ≤ 0.075 ... 0.15 |
| Measuring range | 0 ... 10 mbar to 0 ... 40 bar |
| Output signal | <ul style="list-style-type: none"> ■ 4 ... 20 mA, HART®, PROFIBUS® PA |
| Special feature | <ul style="list-style-type: none"> ■ Freely scalable measuring ranges ■ Case from plastic, aluminium or stainless steel ■ Optionally with integrated display and instrument mounting bracket for wall/pipe mounting |
| Data sheet: | PE 86.21 |

Pressure sensors

SA-11

For hygienic processes



| | |
|---------------------------|--|
| Accuracy (± % of span) | ≤ 0.2 |
| Measuring range | <ul style="list-style-type: none"> ■ -0.25 ... 0 to -1 ... +24 bar ■ 0 ... 0.25 to 0 ... 25 bar gauge ■ 0 ... 0.25 to 0 ... 16 bar abs. |
| Special feature | <ul style="list-style-type: none"> ■ Flush diaphragm with a surface roughness of Ra < 0.4 µm ■ All welded |
| Data sheet | PE 81.80 |

The flush metal measuring cell of the SA-11 is directly welded to the process connection and fulfils the high demands of sanitary applications. With the gap-free connection without additional sealing between the process connection and the measuring cell, risks of leakage are eliminated.

For dead-space free instrumentation, numerous hygienic process connections are available. This is certified per 3-A Sanitary Standards as well as EHEDG.

The SA-11 pressure transmitter is exceptionally suitable for both the cleaning processes Cleaning-in-Place (CIP) and also for Sterilisation-in-Place (SIP) with elevated temperatures.



Cable outlet IP68

Angular connector, 4-pin,
EN 175301-803,
form A, IP65

Circular connector
4-pin, with screw cap
M12 x 1, IP65

Stainless steel
Field case IP67

Pressure switches

The PSA-31 electronic pressure switch is recommended, among other things, for applications in filling and packaging machinery for the food and pharmaceutical industries.

The 3-key operation makes simple, intuitive menu navigation possible, with no need for additional assistance, for setting the two switch points.

The instrument is extremely robust and the wetted parts are particularly easy to clean.

With its case that can be turned through 300 degrees, this electronic pressure switch can be easily adjusted to any individual installation situation. The large, angled display, which is also rotatable, is easy to read from any position.

PSA-31

Pressure switch with display



| | |
|-------------------------------|---|
| Accuracy (± % of span) | ≤ 1 |
| Measuring range | <ul style="list-style-type: none"> ■ 0 ... 1 to 0 ... 25 bar ■ 0 ... 1 to 0 ... 25 bar abs. ■ -1 ... 0 to -1 ... +24 bar |
| Switching output | 1 or 2 (PNP or NPN) |
| Analogue output (optional) | <ul style="list-style-type: none"> ■ 4 ... 20 mA ■ DC 0 ... 10 V |
| Data sheet | PE 81.85 |

Process pressure transmitters

Through its robust stainless steel case in hygienic design, the UPT-21 process transmitter is suitable for almost all applications.

Via the display and operating module or via the HART® interface, it is scalable from 0 ... 400 mbar up to 0 ... 600 bar with the 4 ... 20 mA output signal.

The process connections are available in all popular connection geometries.

Through the hygienic case, no unwanted germs can accumulate on the instrument's surfaces. The robust design also permits cleaning with high-pressure equipment. Particularly for the measurement in tanks, the integrated firmware offers the possibility to display the filling volume directly.

UPT-21

**Universal process transmitter
with flush process connection**



| | |
|---------------------------|---|
| Non-linearity (% of span) | ≤ 0.1 |
| Output signal | 4 ... 20 mA, HART® |
| Measuring range | <ul style="list-style-type: none"> ■ 0 ... 0.4 to 0 ... 600 bar ■ 0 ... 1.6 to 0 ... 40 bar abs. ■ -0.2 ... +0.2 to -1 ... +40 bar |
| Special feature | <ul style="list-style-type: none"> ■ Multi-functional display (optional) ■ Freely scalable measuring range ■ Simple menu navigation ■ Conductive plastic case or stainless steel case in hygienic design ■ Large LC display, rotatable |
| Data sheet | PE 86.05 |

IPT-21

**Process pressure transmitter
in stainless steel case**



| | |
|-----------------|--|
| Accuracy | 0.075 to 0.25 % |
| Measuring range | <ul style="list-style-type: none"> ■ 0 ... 0.1 to 0 ... 600 bar ■ -1 ... 0 to -1 ... +60 bar ■ 0 ... 0.1 to 0 ... 60 bar abs. |
| Output signal | <ul style="list-style-type: none"> ■ 4 ... 20 mA ■ 4 ... 20 mA, HART® ■ PROFIBUS® PA ■ FOUNDATION™ Fieldbus |
| Data sheet | PE 86.06 |

The IPT-21 process pressure transmitter, with its 4 ... 20 mA/HART®, PROFIBUS® PA or FOUNDATION™ Fieldbus output signal, combined with the intrinsically safe or flameproof enclosure ignition protection type (in accordance with ATEX or FM), is ideally suited for application in appropriate systems. The instruments can be used for standard pressure measurement and also for hydrostatic level measurement. The programming of the tank linearisation can be made graphically and very simply with the assistance of the DTM (Device Type Manager).

Easy configuration and operation

The operation and configuration at the instrument can be made, optionally, on a display and operating module via 4 membrane keys. The operating menu has a simple and self-explanatory structure and has 9 selectable languages as standard.

Special features

- High measurement accuracy
- Best long-term stability
- Freely scalable measuring ranges (turndown to 30 : 1)
- Configuration via DTM (Device Type Manager) in accordance with the FDT (Field Device Tool) concept (e.g. PACTware) and primary standards

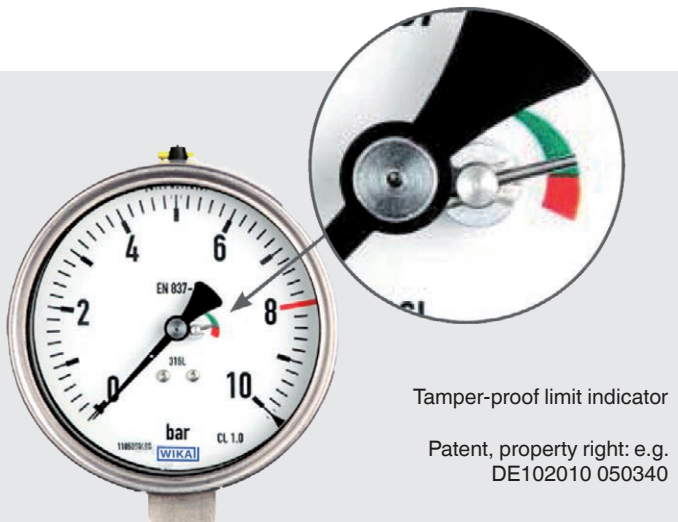
Pressure gauges

For a reliable on-site display of the operating pressure, a wide range of mechanical pressure measuring instruments is available. Our product line ranges from proven Bourdon tube instruments, through diaphragm element and capsule gauges to robust pressure gauges for the measurement of over-, absolute and differential pressure. The measuring instruments are characterised, in particular, by mechanics made completely from stainless steel.

Limit indicator

The limit indicator, which is available as an option, finds its application wherever overpressures must be displayed with certainty and not be tampered with.

The limit indicator is a mechanical indicator mounted on the dial with two settings:



Tamper-proof limit indicator

Patent, property right: e.g.
DE102010 050340

If the indicator is in the green area, the pressure limit being monitored has not been exceeded.

If the indicator is found in the red area, the set pressure range has been exceeded at least once. In this case, the indicator will remain permanently locked and protected from tampering in the red area.



Internal workings of a
mechanical pressure
measuring instrument

Pressure gauges with electrical output signal or switch contacts

Wherever the process pressure has to be indicated locally and, at the same time, a signal transmission to the central control or remote centre is desired, the model PGT23 intelliGAUGE® can be used.

Through the combination of a mechanical measuring system and electronic signal processing, the process pressure can be read securely, even if the voltage supply is lost.

Our offer is completed by the pressure gauges with switch contacts, e.g. switchGAUGE model PGS23, making it possible to simultaneously monitor the equipment and to switch circuits.

The following measuring instruments are particularly recommended for use in sanitary applications and for combination with diaphragm seals for a hygienic adaption to the process.

131.11

**Stainless steel version,
standard**



| | |
|--------------------|----------------------------|
| Nominal size | 40, 50, 63 mm |
| Scale range | 0 ... 1 to 0 ... 1,000 bar |
| Accuracy class | 2.5 |
| Ingress protection | IP54 |
| Data sheet | PM 01.05 |

232.50, 233.50

Stainless steel version



| | |
|--------------------|------------------------------|
| Nominal size | 63, 100, 160 mm |
| Scale range | 0 ... 0.6 to 0 ... 1,600 bar |
| Accuracy class | 1.0/1.6 (NS 63) |
| Ingress protection | IP65 |
| Data sheet | PM 02.02 |

232.36, 233.36

**Safety version, stainless steel,
high overload safety**



| | |
|--------------------|---------------------------|
| Nominal size | 100, 160 mm |
| Scale range | 0 ... 0.6 to 0 ... 40 bar |
| Accuracy class | 1.0/1.6 (NS 63) |
| Ingress protection | IP65 |
| Data sheet | PM 02.15 |

PGS23

**Pressure measuring instru-
ment with switch contacts**



| | |
|--------------------|------------------------------|
| Nominal size | 100, 160 mm |
| Scale range | 0 ... 0.6 to 0 ... 1,600 bar |
| Accuracy class | 1.0 |
| Ingress protection | IP65 |
| Data sheet | PV 22.02 |

PGT23

**Pressure measuring instrument
with electrical output signal**



| | |
|--------------------|------------------------------|
| Nominal size | 100, 160 mm |
| Scale range | 0 ... 0.6 to 0 ... 1,600 bar |
| Accuracy class | 1.0 |
| Ingress protection | IP54, filled IP65 |
| Data sheet | PV 12.04 |

Diaphragm pressure gauges

No risk of contamination by system fill fluid

The diaphragm measuring instruments operate without any system fill fluid. These transmit the pressure from the process to the easily readable pressure indication purely mechanically. By eliminating any liquids, the “dry measuring cell” increases the process safety for sterile pressure measurement.

Robust diaphragm element with high overload safety

Proven over decades, diaphragm elements can also withstand pressure spikes and overloads thanks to their strong diaphragms. Through this, the danger of damage to the flush diaphragm is clearly reduced.

Hygienic design

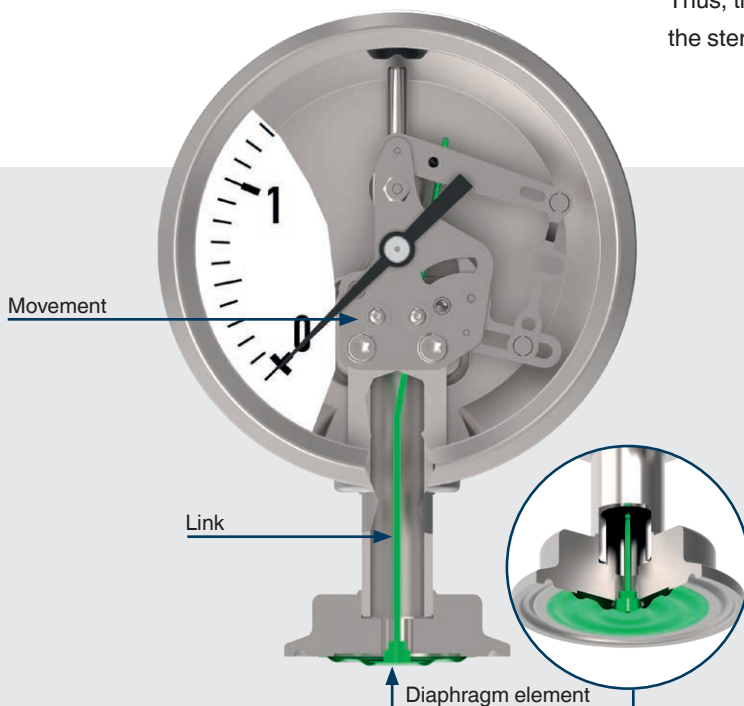
The measuring instruments have been developed for the pressure display during the processing and transport of high-value and critical media. This means that they can be cleaned easily and quickly during batch changes and are ideally suited for CIP, SIP and washdown processes.



Autoclavability

The instruments can be completely autoclaved. This means that they can be steam-sterilized together with the sterile container in an autoclave.

Thus, the measuring instruments can be installed just before the sterilization in order to save time and effort in preparation.



The video for this instrument family can be found here:



PG43SA-S

Pressure measuring instrument
with flush diaphragm element



| | |
|-----------------|--|
| Nominal size | 100 mm |
| Scale range | -1 ... 0.6 to -1 ... 15 bar 0 ... 1.6 to 0 ... 16 bar |
| Accuracy class | 1.6 |
| Overload safety | 2 ... 5 x full scale value, max. pressure rating of the process connection |
| Special feature | Completely autoclavable (optional) |
| Data sheet | PM 04.16 |

PG43SA-C

Compact pressure measuring
instrument with flush
diaphragm element



| | |
|-----------------|---|
| Nominal size | 63 mm |
| Scale range | -1 ... 2 to -1 ... 9 bar 0 ... 3 to 0 ... 10 bar |
| Accuracy class | 2.5 |
| Overload safety | 5 x full scale value, max. pressure rating of the process connection |
| Special feature | Back mount version |
| Data sheet | PM 04.15 |



Flyer
"PG43SA family"



For the highest safety aspects

PG43SA-D

Pressure measuring instrument
with integrated diaphragm
element monitoring



| | |
|-----------------|--|
| Application | For the production of active pharmaceutical ingredients (API) |
| Nominal size | 100 mm |
| Scale range | -1 ... 1.5 to -1 ... 15 bar 0 ... 2.5 to 0 ... 16 bar |
| Accuracy class | 1.6 |
| Overload safety | 1.5 ... 4 x full scale value, max. pressure rating of the process connection |
| Special feature | <ul style="list-style-type: none"> Fully autoclavable Optional sterilisation of the reference chamber per ISO 20857/2010 |
| Data sheet | PM 04.17 |

Diaphragm element monitoring

The model PG43SA-D is fitted with
a patented system for diaphragm
element monitoring (e.g. patent
DE102015006524). The risk of an
undetected diaphragm element rupture
is eliminated.

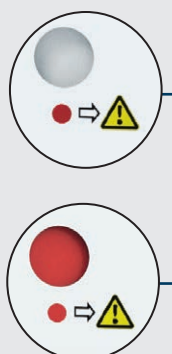
In the event that the diaphragm element
is damaged, either through improper
handling or through extreme process
conditions, this can lead to a crack.
This is immediately indicated on the
dial by a red warning point. If this point
on the dial remains white, then the
pressure element is intact and cost-
intensive maintenance is not required.

Second barrier

For double safety, the measuring
instrument has an integrated
secondary barrier which, in the event of
a diaphragm element break maintains
the hermetic sealing of the process.
This prevents the escape of hazardous
substances from the process to the
environment and vice versa - excluding
contamination of the process media
with particles from the environment.
This increases the operational and
process safety in a pharmaceutical
plant. Optionally, this space between
the diaphragm element and the
secondary barrier can be sterilised with
dry heat.

White dot:
Diaphragm element
intact

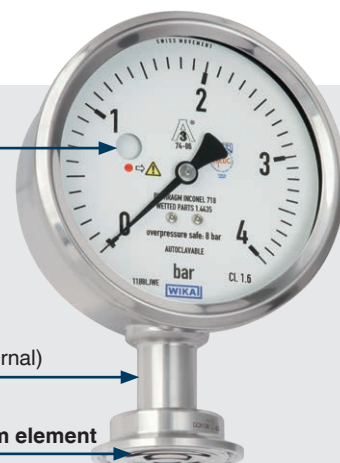
Red dot:
Diaphragm element
defective



Status display

Secondary barrier (internal)

Diaphragm element



Patent, property right: e.g.
DE102016005568, US2016349128A1, CN106197792

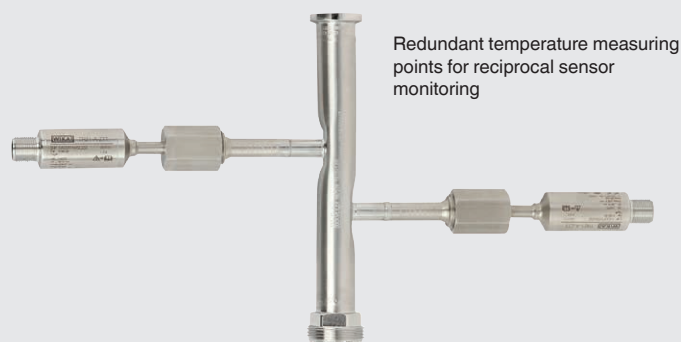
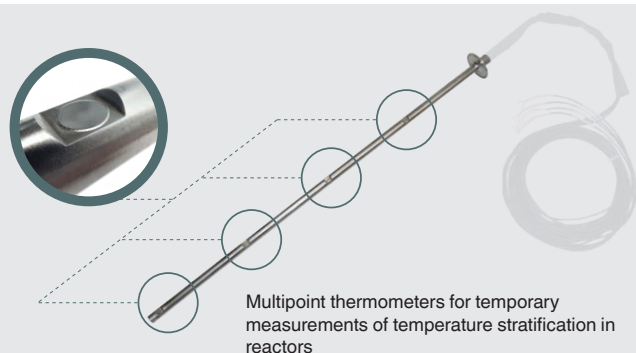
Electrical temperature measurement

Resistance thermometers are equipped with metallic-conductor based sensor elements which change their electrical resistance as a function of temperature. The connection to the evaluation electronics (transmitter, controller, display, chart recorder, etc.) can be made with a 2-, 3- or 4-wire circuit, depending on the application. In the food and beverage industry, as well as in pharmaceuticals, biotechnology and cosmetics manufacturing, the focus is on more than just providing temperature readings.

The instruments for electrical temperature measurement are characterised by the following features:

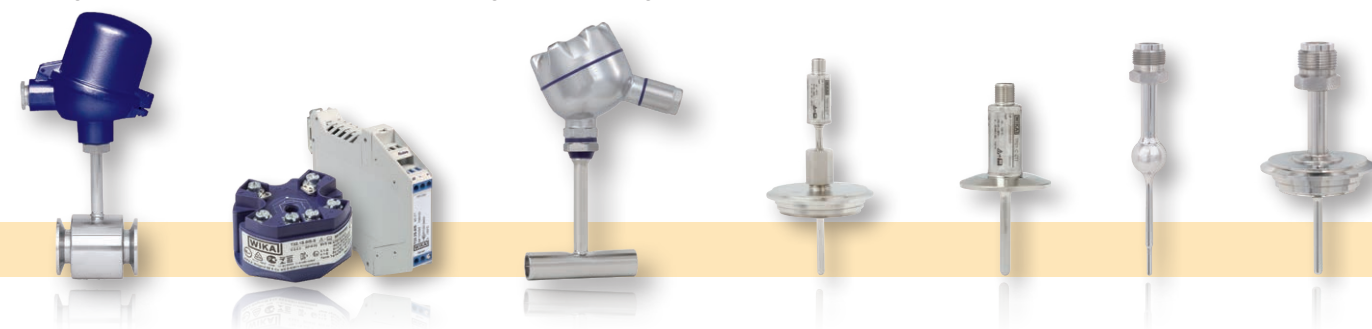
Individuality

Through tailored thermometer designs corresponding to your process and the available space



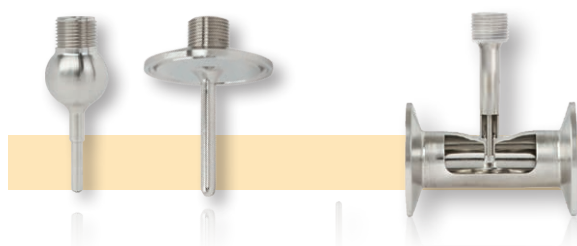
Flexibility

Through different thermowells, sensors and signal processing possibilities

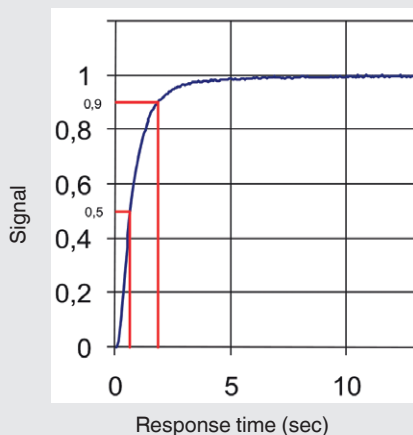


Modularity

Through detachable thermometer-thermowell connections and standardised measuring inserts for simplified storage

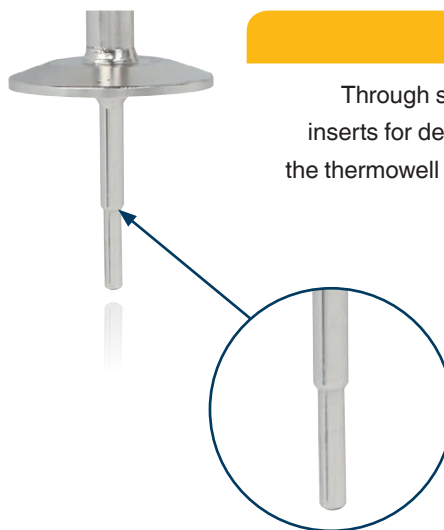


Step-response behaviour following
a temperature change



Speed

Through spring-loaded measuring
inserts for defined fitting conditions in
the thermowell and optimised response
times



Reliability and high plant availability

Through a high IP protection of up to IP69K for particularly harsh environmental
conditions during a washdown. Through easy and quick cleanability with dead-
space free and patented measuring instruments, 3-A and also EHEDG certified



Compact and safe

Through space-saving cases, for hazardous areas



A photograph of a glass of milk and a bottle of milk. The glass is in the foreground, filled with white milk. Behind it is a glass bottle, also filled with milk. To the left of the glass is a red and white striped cloth. The background is a plain, light-colored surface.

Easy calibration or maintenance, without having to open the process, is possible in both series with connection to the process via thermowell. In this way, hygiene risks can be minimised and downtimes can be reduced. Suitability for use in sanitary applications is confirmed by the successful 3-A auditing and EHEDG certification.

| | |
|--------------------------|----------------------------|
| Sensor element | Pt100, Pt1000 |
| Measuring range | -30 ... +250 °C |
| Output | Pt100, Pt1000, 4 ... 20 mA |
| Connection to thermowell | Welded |
| Ingress protection | IP69K autoclavable |
| Data sheet | TE 60.28 |

TR20

Flush



| | |
|-------------------|---|
| Application | For flush vessel mounting when using wipers |
| Sensor element | Pt100 |
| Measuring range | -50 ... +250 °C |
| Output | Pt100, 4 ... 20 mA |
| Connection method | 2-, 3- and 4-wire |
| Data sheet | TE 60.20 |

TR22-A

With flange connection



| | |
|--------------------------|--------------------|
| Sensor element | Pt100 |
| Measuring range | -50 ... +250 °C |
| Output | Pt100, 4 ... 20 mA |
| Connection to thermowell | Removable M24 |
| Data sheet | TE 60.22 |

TR22-B

For orbital welding



| | |
|--------------------------|--|
| Application | Invasive temperature measurement in the product stream |
| Sensor element | Pt100 |
| Measuring range | -50 ... +150 °C |
| Output | Pt100, 4 ... 20 mA |
| Connection to thermowell | Removable M24 |
| Data sheet | TE 60.23 |

TR25

In-line resistance thermometer



| | |
|-----------------|--|
| Application | For piggable systems and powdery media |
| Sensor element | Pt100 |
| Measuring range | -50 ... +150 °C |
| Output | Pt100, 4 ... 20 mA |
| Pin assignment | 3- or 4-wire |
| Data sheet | TE 60.25 |

TR57-M

Pipe surface resistance thermometer for clamping



| | |
|-----------------|--------------------|
| Sensor element | 1 x Pt100 |
| Measuring range | -20 ... +150 °C |
| Output | Pt100, 4 ... 20 mA |
| Data sheet | TE 60.57 |



Temperature transmitters

Transmitters convert the temperature-dependent change in resistance of resistance thermometers or the temperature-dependent voltage change in a thermocouple into a proportional standard signal. The most commonly used standard signal is the analogue 4 ... 20 mA signal, though digital signals (fieldbus) are gaining more and more importance.

By using intelligent circuit concepts with analogue 4 ... 20 mA signals, any sensor errors that occur are signalled and simultaneously transmitted with the measured value over a two-wire line (current loop). The conversion and transmission of the standard signals (analogue or digital) is made over long distances and completely fail-safe. A temperature transmitter can either be mounted directly at the measuring point in the connection head or on a DIN rail in a control cabinet.



Interoperability: Internal and external tests certify the compatibility of our transmitters with almost all open software and hardware tools.

T32

HART® transmitter



| | |
|-----------------|--|
| Input | Resistance thermometers, thermocouples, potentiometers |
| Accuracy | < 0.1 % |
| Output | 4 ... 20 mA, HART® protocol |
| Special feature | TÜV certified SIL version (full assessment) |
| Data sheet | TE 32.04 |

T15

Digital temperature transmitter for resistance sensors



| | |
|-----------------|--|
| Input | Resistance thermometers, potentiometers |
| Accuracy | < 0.1 % |
| Output | 4 ... 20 mA |
| Special feature | The fastest and simplest configuration on the market |
| Data sheet | TE 15.01 |

T53

FOUNDATION™ Fieldbus and PROFIBUS® PA transmitter



| | |
|-----------------|--|
| Input | Resistance thermometers, thermocouples |
| Accuracy | < 0.1 % |
| Special feature | PC configurable |
| Data sheet | TE 53.01 |

T12

Universally programmable digital transmitter



| | |
|-----------------|--|
| Input | Resistance thermometers, thermocouples |
| Accuracy | < 0.2 % |
| Output | 4 ... 20 mA |
| Special feature | PC configurable |
| Data sheet | TE 12.03 |



Dial thermometers

For temperature measurement with dial thermometers, WIKA manufactures bimetal and gas-actuated thermometers.

Due to their simple design, bimetal thermometers are suitable for displaying temperature reliably, even under difficult conditions such as shocks or vibrations.

If, however, fast temperature measurement is required or if long distances have to be bridged without power supply, gas-actuated thermometers are recommended.

Based on these measurement methods, there is a comprehensive range of instruments.

For hygienic applications in areas such as the food, beverage, pharmaceutical, cosmetics manufacturing and biotechnology industries, some examples of mechanical temperature measuring instruments with stainless steel cases are listed below.

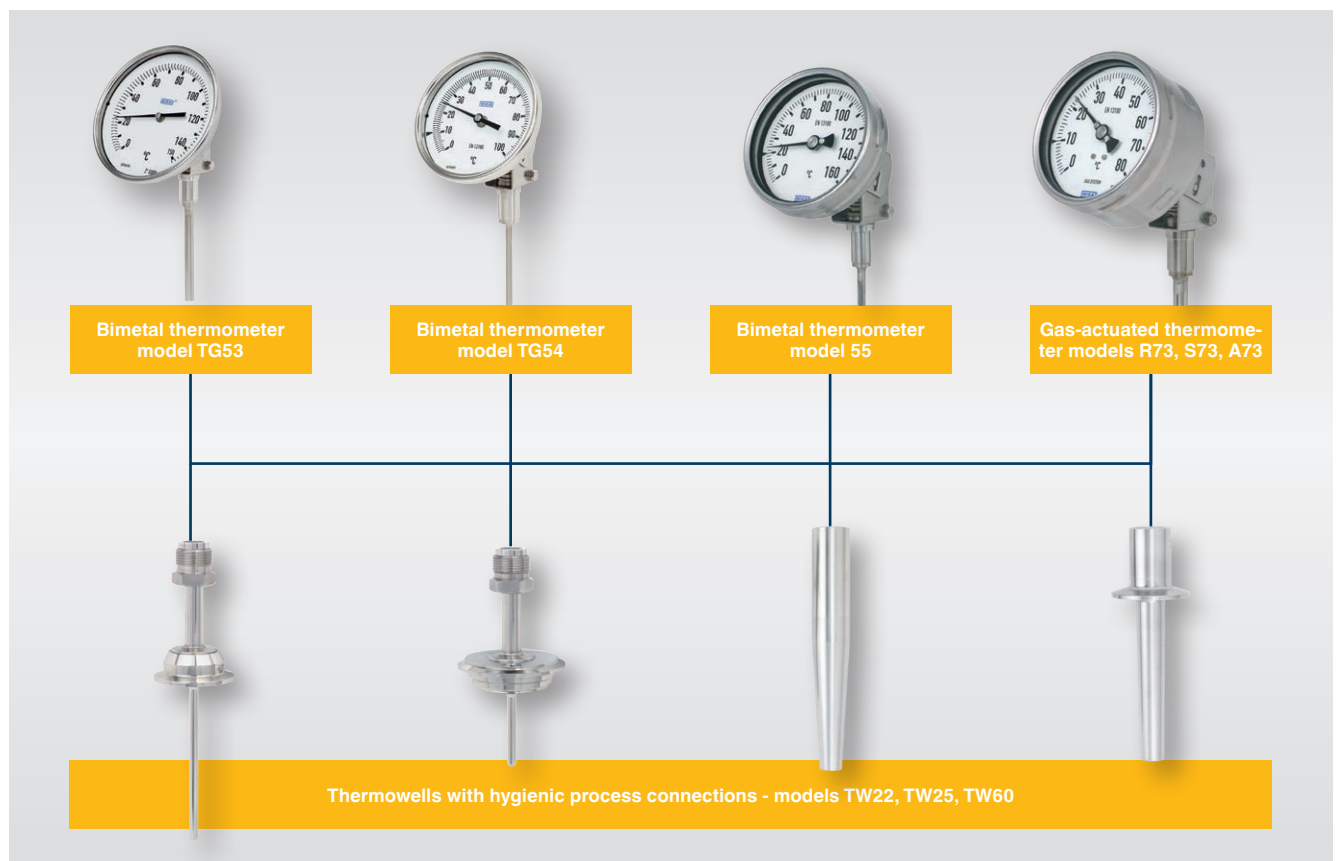
74

For sanitary applications



| | |
|--------------|--|
| Nominal size | 100 mm |
| Scale range | 0 ... 120 or 0 ... 160 °C |
| Wetted parts | Stainless steel 1.4435 |
| Option | ■ Liquid dampening (case) ■ Wetted parts with electropolished surface |
| Data sheet | TM 74.01 |

Combination possibilities for dial thermometers with hygienic thermowells



Gravimetric level measurement and weighing with force measurement

Gravimetric level monitoring refers to the control of levels through measuring the weight of vessels and the contents within them. From the measured data, the filling height is calculated. Gravimetric level measurement is in demand in temperature-critical applications and where robustness and high durability are required. High-accuracy weight detection without any material contact is possible with this method.

Typical areas of application include gravimetric level monitoring of vessels and silos as well as weighing in process plants and dosing systems.

This method of measurement offers the following advantages:

- The operator can simultaneously determine the level and the exact mass
- No intrusion into the tank or vessel is needed
- High-accuracy weight determination without any contact with the media
- The measurement is independent of the material, its properties and the vessel geometry
- Simple replacement of the bending or shear beams
- Verifiable measurement is possible
- As suitable for small vessels as it is for large silos up to 40 t
- Long-term stability
- Low maintenance effort

F3831

Shear beam to 10 t



| | |
|--------------------------|---|
| Rated load F_{nom} | 0 ... 500 to 0 ... 10,000 kg |
| Relative linearity error | 0.03 % F_{nom} |
| Output signal | ■ 2.0 ± 1 % mV/V ■ 3.0 ± 1 % mV/V (optional) |
| Ingress protection | IP67 |
| Data sheet | FO 51.21 |

This bending beam can be delivered with the AZK02 mounting kit.

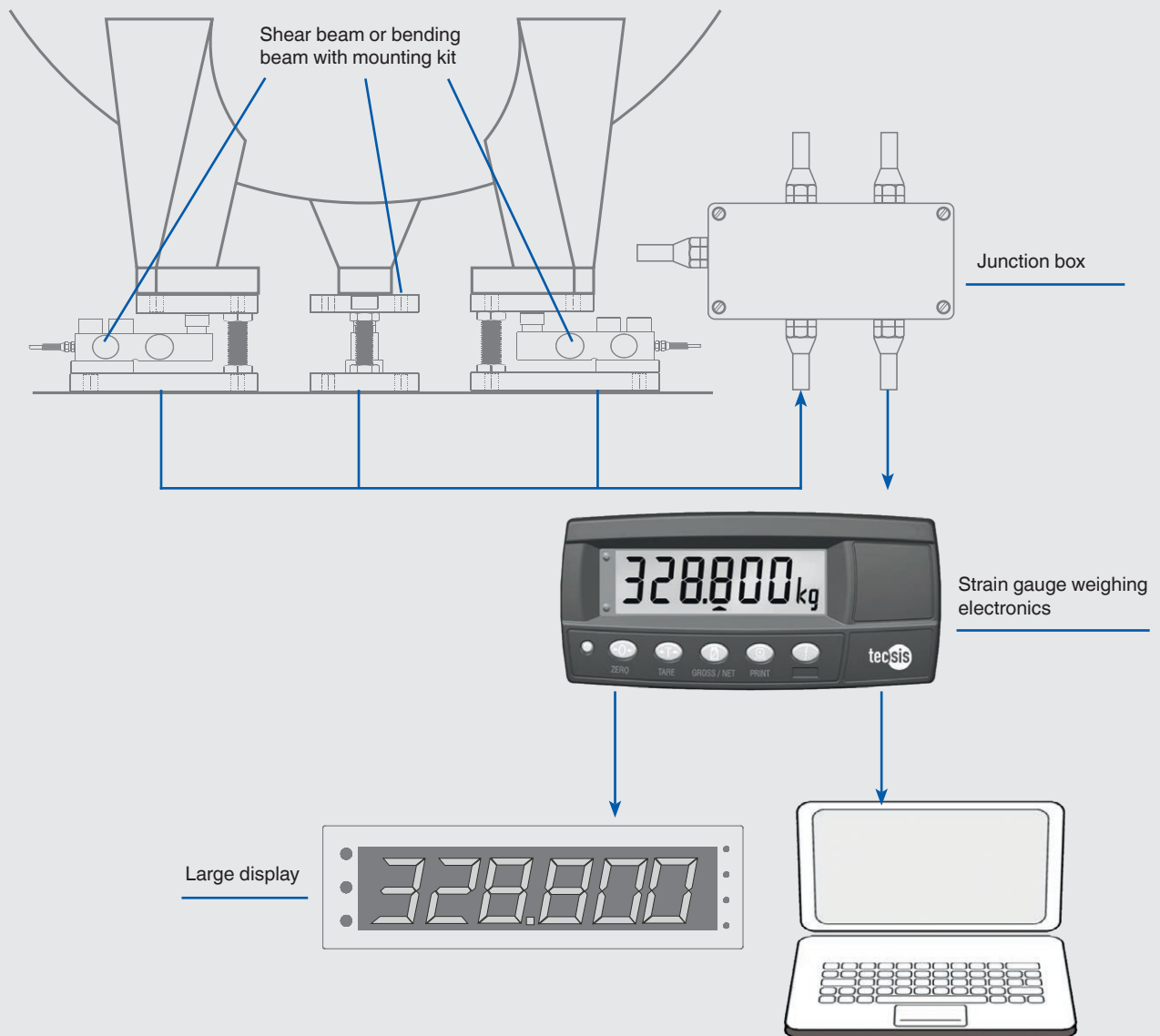
F3833

Bending beam to 500 kg



| | |
|--------------------------|-------------------------|
| Rated load F_{nom} | 0 ... 5 to 0 ... 500 kg |
| Relative linearity error | 0.02 % F_{nom} |
| Output signal | 2.0 ± 1 % mV/V |
| Ingress protection | IP68 |
| Data sheet | FO 51.22 |

This bending beam can be delivered with the AZK03 mounting kit.



Accessories

Matching mounting kits, weighing modules, terminal boxes (summation units) and evaluation electronics as well as large displays are available and allow easy and safe installation in the application.



E1930 large display



E1932 strain gauge weighing electronics



B6578 junction box

Continuous level measurement

The float-based level measurement is not influenced by moving surfaces, electrical conductivity, dielectric constants, foaming and boiling surfaces.


When selecting the correct measurement principle for sanitary applications, e.g. use in fermenters, various criteria need to be considered with which float-based measurement technology brings advantages. Generally, in the process of fermentation, agitators and their movement cause foaming on the surface of the medium, where the foam can be fine-pored or coarse-pored, depending on the process.

Reed chain

For continuous level and interface measurement, depending on the application and measuring length, different sensor systems are available. The quasi-continuous system is based on a resistance measuring chain with reed contacts as 3-wire potentiometer circuits. With contact pitches from 5 to 20 mm – depending on the measuring length – a measurement accuracy of 1 % in 500 mm can be achieved.

FLR-H


Level sensor, with reed measuring chain



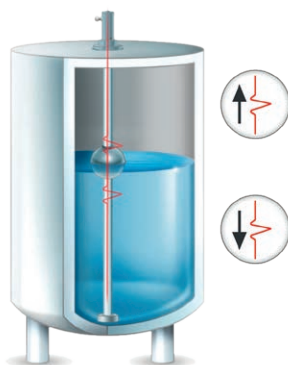
| | |
|--------------------|---|
| Process connection | All common process connections in hygienic design |
| Guide tube length | Max. 6,000 mm |
| Pressure | 0 ... 10 bar |
| Temperature | -40 ... +200 °C |
| Density | ≥ 400 kg/m ³ |
| Contact separation | 5, 10, 15, 18 mm |
| Ingress protection | IP68 |
| Data sheet | LM 20.02 |

FLM-H

Level sensor, magnetostrictive, high-resolution measurement principle



| | |
|--------------------|---|
| Process connection | All common process connections in hygienic design |
| Guide tube length | Max. 6,000 mm |
| Pressure | 0 ... 10 bar |
| Temperature | -40 ... +250 °C |
| Density | > 715 kg/m ³ |
| Output signal | 4 ... 20 mA |
| Accuracy | < ±0.5 mm |
| Resolution | < 0.1 mm |
| Ingress protection | IP68 |
| Data sheet | LM 20.03 |



Magnetostriction


For high-accuracy measuring requirements, sensors which operate on the magnetostrictive measurement principle are available. They achieve an accuracy of 0.1 mm. These level sensors are used as measured value pick-ups for the continuous detection of liquid levels, and are based on determining the position of a magnetic float according to the magnetostrictive principle.

Level switches

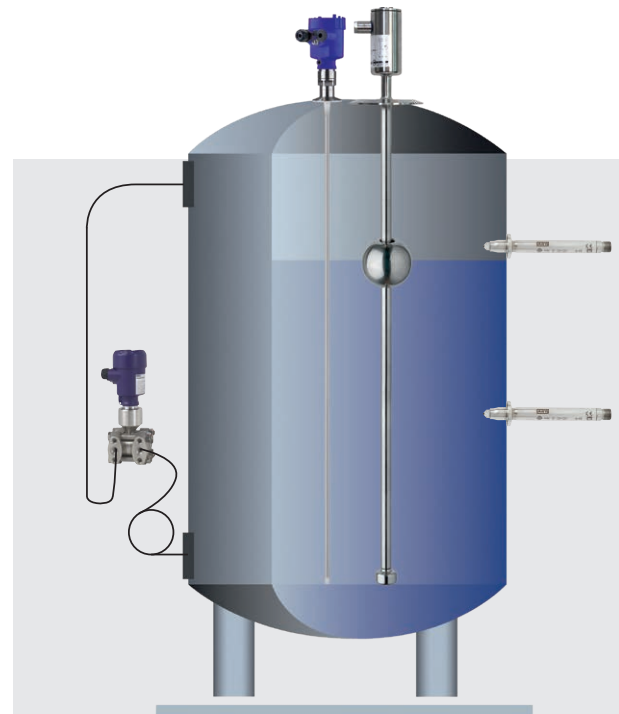
For the point-based monitoring of levels, float switches are available, which are generally fitted at the top of the tank. It makes no difference whether only one or several level limits are monitored. Within the guide tube, the inert gas contacts (reed contacts) set to the pre-defined switching positions are activated magnetically and without contact. Depending on requirements, it is possible to define a minimum/maximum alarm value and also an emergency shut-down level. The float switches are simple to mount and maintenance-free.

FLS-H

Float switch, for vertical installation



| | |
|--------------------|---|
| Process connection | All common process connections in hygienic design |
| Guide tube length | Max. 6,000 mm |
| Pressure | 0 ... 6 bar |
| Temperature | -40 ... +200 °C |
| Density | $\geq 300 \text{ kg/m}^3$ |
| Pressure | 0 ... 10 bar |
| Switching function | Alternatively normally open, normally closed or change-over |
| Number of contacts | Max. 6 x normally open or normally closed, or 4 x change-over |
| Ingress protection | IP68 |
| Data sheet | LM 30.01 |



Principles of level measurement

OLS-F1

Optoelectronic level switch, autoclavable



| | |
|----------------------|--|
| Process connection | Clamp connections |
| Measurement accuracy | $\pm 0.5 \text{ mm}$ |
| Output signal | PNP transistor, protected against reverse polarity |
| Switching function | Normally open (closed in medium) or normally closed (open in medium) |
| Operating pressure | 0 ... 2.5 MPa (0 ... 25 bar) |
| Ingress protection | IP65 with connector IP69K with protection cap |
| Special feature | Autoclavable to 134 °C |
| Data sheet | LM 31.05 |

The OLS-F1 optoelectronic level switch is suitable for a variety of applications and can be installed in all positions. Thanks to its compact design, it is also suitable for small pipe cross-sections and installation situations in tightly limited spaces.

Digital indicators and temperature controllers

With digital indicators, the measured values from electrical temperature probes or from pressure and temperature transmitters are shown on a display. Integrated alarm outputs enable, in addition, the control of the measured process values. Even simple two-position control, such as level control, is possible with the switching outputs from the digital indicators.

Temperature controllers are used to control the temperature in production processes or for the temperature regulation of raw materials and finished products in storage and transport vessels. With the help of switchable set points, different set points can be easily selected. Via optional serial interfaces, controllers can be connected to a network and connected to a higher-level control room.

DI10, DI25, DI30, DI32-1, DI35

For panel mounting, 48 x 24, 96 x 48, 96 x 96 mm



| | |
|---------------------------|--|
| Input | Standard signals or multi-function input for resistance thermometers, thermocouples and standard signals |
| Output | 2 ... 4 switch points |
| Power supply | <ul style="list-style-type: none"> ■ DC 9 ... 28 V (DI32-1, DI25) ■ AC 100 ... 240 V (DI25, DI30, DI35) ■ Supply from the 4 ... 20 mA current loop (DI10) |
| Optional special features | <ul style="list-style-type: none"> ■ Integrated transmitter supply (DI25, DI30, DI35) ■ Analogue output signal (DI25, DI35) ■ Wall-mounting case (DI10, DI30) |
| Data sheet | AC 80.06, AC 80.13, AC 80.02, AC 80.05, AC 80.03 |

A-AI-1, A-IAI-1

LCD attachable indicators for transmitters



| | |
|-----------------|---|
| Dimensions | 50 x 50 mm (case) |
| Input | 4 ... 20 mA, 2-wire |
| Power supply | From the 4 ... 20 mA current loop |
| Special feature | Model A-IAI-1 intrinsically safe per ATEX |
| Data sheet | AC 80.07 |

CS4M

For panel mounting, 48 x 24 mm



| | |
|-------------------|---|
| Input | Multi-function input for resistance thermometers, thermocouples and standard signals |
| Control mode | PID, PI, PD, P, ON/OFF (configurable) |
| Monitoring output | Relay or logic level DC 0/12 V for 3-point control to control an electronic switch relay (SSR) or analogue current signal 4 ... 20 mA |
| Power supply | <ul style="list-style-type: none"> ■ AC 100 ... 240 V ■ AC/DC 24 V |
| Data sheet | AC 85.06 |

CS6S, CS6H, CS6L

For panel mounting, 48 x 48, 48 x 96, 96 x 96 mm

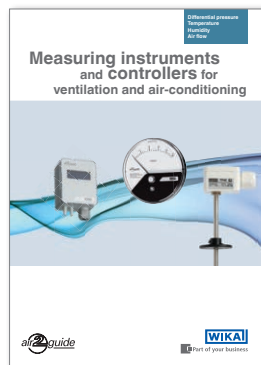


| | |
|-------------------|--|
| Input | Multi-function input for resistance thermometers, thermocouples and standard signals |
| Control mode | PID, PI, PD, P, ON/OFF (configurable) |
| Monitoring output | Relay (AC 250 V, 3A (R) or 1A (L)) or logic level DC 0/12 V for 3-point control to control an electronic switch relay (SSR) or analogue current signal 4 ... 20 mA |
| Power supply | <ul style="list-style-type: none"> ■ AC 100 ... 240 V ■ AC/DC 24 V |
| Data sheet | AC 85.08 |

Ventilation and air-conditioning

With air2guide, WIKA offers a comprehensive range of measuring instruments for ventilation and air-conditioning applications.

The measuring instruments are used for differential pressure monitoring on filters, monitoring of ventilators and blowers, overpressure monitoring for clean rooms, temperature monitoring on heat exchangers, measuring of the air flow and the air velocity in air ducts and air-conditioning systems, and also for the control of air and fire shutters.



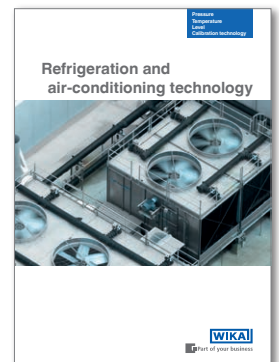
WIKA segment brochure
"Ventilation and air-conditioning"



Refrigeration and air-conditioning technology

Within the refrigeration cycle and its periphery there are many points where pressure and temperature are measured and monitored. This serves to control the plant in order to guarantee a secure process run.

In addition to the multitude of applications, the size of the refrigeration system, the refrigerant, etc. place particular demands on the measuring instruments. Here, WIKA is the competent partner for measuring instruments for pressure, temperature and calibration in all parts of refrigeration plants.



WIKA segment brochure "Refrigeration and air-conditioning technology"



Installation examples



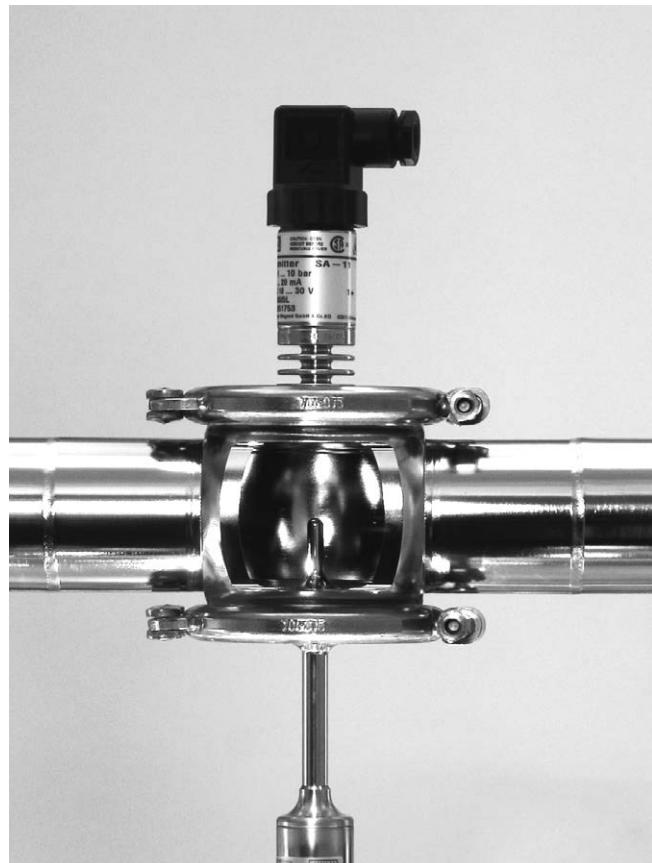
Process connection of the BioControl® system

The pharmaceutical BioControl® system is used to connect pressure and temperature measuring instruments to piping systems and vessels. For the different types of problems encountered in sanitary applications, there are various designs of the BioControl® system with component approvals available.

An advantage to the user is that the system is highly flexible. In the design of the plant, it makes no difference whether the port is fitted with a pressure or a temperature measuring instrument. Design errors can be avoided due to the modular system with standardised interfaces. Furthermore, storage costs are reduced to a minimum since only a few components need to be kept in stock.

Process connection of the VARINLINE® system

To connect the pressure and temperature measuring instruments to the aseptic processes, aseptic fittings are required. For this, VARIVENT® connections are available to the process engineer in the production of food, which ensure a dead-space free transition from the process line to the measuring instrument. WIKA pressure and temperature measuring instruments with VARIVENT® connections fit smoothly into the VARINLINE® access units.



BioControl® is a registered trademark of NEUMO.
VARIVENT® and VARINLINE® are registered trademarks of the company GEA Tüchenhagen.

Clamp model 990.22 with sterile extension

WIKA has developed a diaphragm seal system with a process connection that is specifically suited to pressure measurement in sanitary applications. The EHEDG (European Hygienic Engineering & Design Group) has tested the model 990.22 clamp with sterile extension and has certified it as having exceptional suitability for sanitary applications.

The model 990.22 clamp with sterile extension is easy to handle when installing and removing. With the help of a special welding socket, a flush sealing to vessels and pipelines is ensured. Thus it offers the user an easy-to-clean pressure measuring point, which is suitable for CIP and SIP.



Weld-on adapter for flush pressure transmitters

In open vessels or vented tanks, the operator measures the level hydrostatically with a pressure transmitter. For this, one installs the measuring instrument in the bottom or close to the bottom. This measurement can be used on practically all liquids whose density remains constant. The measurement is not affected by pastes, emulsions or blends of solid ingredients. Also, hydrostatic level measurement is not affected by foaming on the liquid surface.

To mount the measuring instrument, a socket is welded into the vessel wall and the inside smoothed. This enables a flush and easy-to-clean measuring point for pressure measurement in a vessel.



Process adapter system

The WIKA process adapter system has been developed to meet the requirements of the food, beverage and pharmaceutical industries. The adapter system consists of a pressure measuring instrument or transmitter with a built-in process adapter.

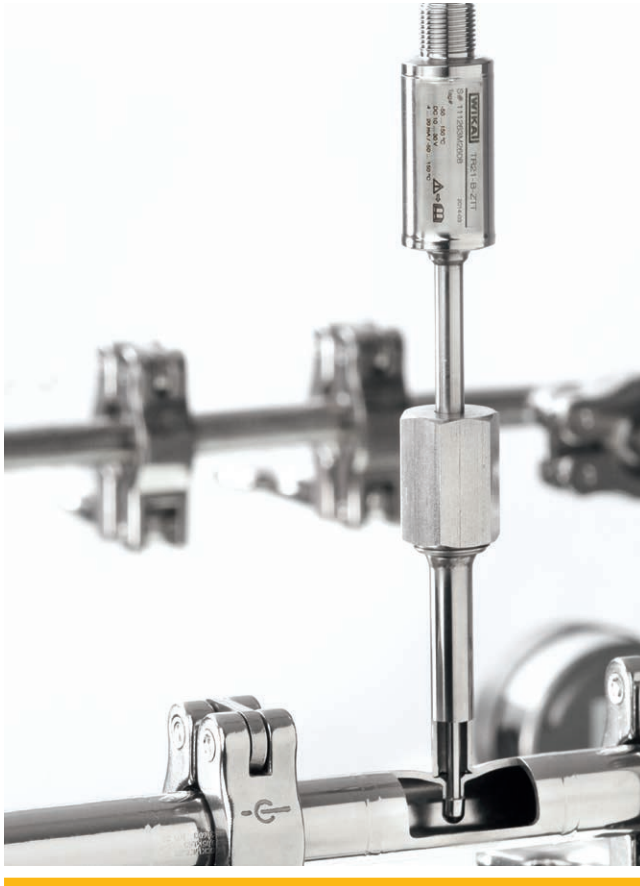
The flexible, modular system allows connection to a wide range of aseptic process connections (e.g. clamp, threaded, VARIVENT® or NEUMO®).

All parts are made of 316L/1.4435 stainless steel. The O-ring for sealing the process (optional) is supplied with a 3.1 material certificate per EN 10204. It is available in either EPDM or FKM and is listed as FDA, USP class VI, as well as 3-A 18-03.

The WIKA adapter system meets the high requirements of sterile processes and has been developed in accordance with the 3-A Sanitary Standards.



Installation examples for temperature measuring instruments



Thermowell for orbital welding

Flow-through housing

The model TW61 thermowell serves as the process connection for a model TR21-B or TR22-B resistance thermometer. The thermowell is especially suitable for the adaption of temperature measurement into pipelines for sanitary applications and for CIP and SIP processes. The ease of cleaning is ensured through the optimal hygienic design. To integrate it into the process, the thermowell is directly orbitally welded into a pipeline. The connection ends are smooth and prepared for orbital welding.

The measuring insert can be withdrawn together with the connection head. This makes it possible to calibrate the thermometer with the entire measuring chain, on-site, without disconnecting the electrical connections. In addition, this avoids having to open the process, and thus the risk of contamination is minimised.

Angular housing

For small nominal pipe sizes and in cramped conditions, angular housing thermowells are available.

The thermowell is dead-space optimised and is welded automatically, thus it is preferable to thermowells with welding balls and hand-welded seams. The measuring instruments should be aligned horizontally in order to avoid air pockets in the cupola.



Calibration technology

From individual components ...



Portable pressure generation

Test pumps serve as pressure generators for the testing of mechanical and electronic pressure measuring instruments through comparative measurements. These pressure tests may be carried out in the laboratory, workshop, or on site at the measuring point.



Measuring components

High-accuracy pressure sensors and very stable standard thermometers are ideal for applications as references in industrial laboratories. Due to their analogue or digital interfaces, they can be connected to existing evaluation instruments.



Hand-helds, calibrators

Our hand-held measuring instruments (process tools) offer a simple capability for measurement or simulation of all established measurands on site. They can be operated with a wide variety of pressure sensors or thermometers.



... to a fully automated system



Digitally indicating precision measuring instruments

High-accuracy digital precision measuring instruments are ideal for applications as reference standards in industrial laboratories or metrology, enabling high-accuracy calibration. They feature exceptionally simple handling and an extensive range of functionality.



Digital precision instruments and controllers

Due to their integrated controller, these instruments offer exceptional convenience. Typically, a fully automated setting of the required value can be done via the interface.



Fully automated calibration systems as complete solutions

Fully automated calibration systems are customer-specific, turnkey installations which can be fitted in laboratories as well as in the production environment. With integrated reference instruments and calibration software, calibration certificates can be generated and archived in a simple and reproducible way.



Calibration services



Our calibration laboratories have been calibrated for pressure and temperature for over 30 years. Since 2014, our calibration laboratory has also been accredited for the electrical measurands DC current, DC voltage and DC resistance.

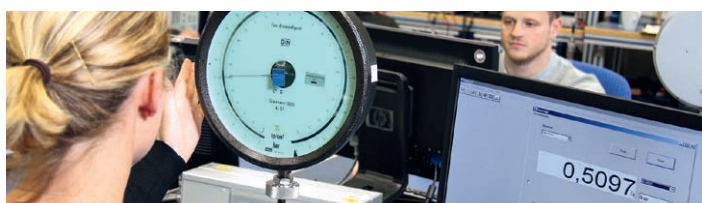
We have expanded our factory calibration portfolio to force and length measuring instruments.



- ISO 9001 certified
- DKD/DAkkS accredited
(in accordance with DIN EN ISO/IEC 17025)
- Cooperation in the DKD/DAkkS working groups
- Over 60 years of experience in pressure and temperature measurement
- Highly qualified, individually trained personnel
- Latest reference instruments with the highest accuracy

Manufacturer-independent calibration - fast and precise for ...

Pressure



- -1 bar ... +10,000 bar
- Calibration using working standards (precise electrical pressure measuring instruments) or high-accuracy reference standards (pressure balances)
- With an accuracy of 0.003 % ... 0.01 % of reading
- In accordance with the directives DIN EN 837, DAkkS-DKD-R 6-1 or EURAMET cg-3

Temperature



- --196 ... +1,200 °C (to +1,600 °C possible with factory calibration)
- Comparative calibration in calibration baths and tube furnaces with an accuracy of down to 1.5 mK
- Calibration at fixed points of ITS90 with the smallest possible measurement uncertainties
 - Triple point of mercury (-38.8344 °C)
 - Triple point of water (0.01 °C)
 - Melting point of gallium (29.7646 °C)
 - Solidification point of tin (231.928 °C)
 - Solidification point of zinc (419.527 °C)
 - Solidification point of aluminium (660.323 °C)
- In accordance with the appropriate DKD/DAkkS directives

Current, voltage, resistance



- DC current from 0 mA ... 100 mA
- DC voltage from 0 V ... 100 V
- DC resistance from 0 Ω ... 10 kΩ
- In accordance with the directives VDI/VDE/DGQ/DKD 2622

On site (pressure and temperature)



In order to have the least possible impact on the production process, we offer you a time-saving, on-site DAkkS calibration throughout Germany.

- In our calibration van or on your workbench
- With a DAkkS accreditation for pressure
 - from -1 bar ... +8,000 bar
 - with accuracies between 0.025 % and 0.1 % of full scale for the standard used
- With a DAkkS accreditation for temperature from -55 °C ... +1,100 °C

WIK A worldwide

| Europe | North America | Asia | Africa / Middle East |
|---|--|---|--|
| Austria WIK A Messgerätevertrieb Ursula Wiegand GmbH & Co. KG Perfektastr. 73 1230 Vienna Tel. +43 1 8691631 Fax: +43 1 8691634 info@wika.at www.wika.at | Canada WIK A Instruments Ltd. Head Office 3103 Parsons Road Edmonton, Alberta, T6N 1C8 Tel. +1 780 4637035 Fax: +1 780 4620017 info@wika.ca www.wika.ca | China WIK A Instrumentation Suzhou Co., Ltd. 81, Ta Yuan Road, SND Suzhou 215011 Tel. +86 512 6878 8000 Fax: +86 512 6809 2321 info@wika.cn www.wika.com.cn | Egypt WIK A Near East Ltd. Villa No. 6, Mohamed Fahmy Elmohdar St. - of Eltayaran St. 1st District - Nasr City - Cairo Tel. +20 2 240 13130 Fax: +20 2 240 13113 info@wika.com.eg www.wika.com.eg |
| Belarus WIK A Belarus Ul. Zaharova 50B, Office 3H 220088 Minsk Tel. +375 17 2244164 Fax: +375 17 2635711 info@wika.by www.wika.by | Romania WIK A Instruments Romania S.R.L. 050897 Bucuresti Calea Rahovei Nr. 266-268 Corp 61, Etaj 1 Tel. +40 21 4048327 Fax: +40 21 4563137 info@wika.ro www.wika.ro | India WIK A Instruments India Pvt. Ltd. Village Kesnand, Wagholi Pune - 412 207 Tel. +91 20 66293-200 Fax: +91 20 66293-325 sales@wika.co.in www.wika.co.in | Namibia WIK A Instruments Namibia Pty Ltd. P.O. Box 31263 Pionierspark Windhoek Tel. +26 4 61238811 Fax: +26 4 61233403 info@wika.com.na www.wika.com.na |
| Benelux WIK A Benelux Industrial estate De Berk Newtonweg 12 6101 WX Echt Tel. +31 475 535500 info@wika.nl www.wika.nl | Russia AO "WIK A MERA" Sosenskoye settlement Nikolo-Khovanskoye, 1011A / 1 office 2 / 2.09 142770, Moscow Tel. +7 495-648018-0 info@wika.ru www.wika.ru | Japan WIK A Japan K. K. MG Shibaura Bldg. 6F 1-8-4, Shibaura, Minato-ku Tokyo 105-0023 Tel. +81 3 5439-6673 Fax: +81 3 5439-6674 info@wika.jp www.wika.jp | Saudi Arabia WIK A Saudi Arabia Llc Wh#3, Al Tawuun Al Khobar 34644 Baghlaf Al Sanaiya Aziziya Plan Sh-Kh 564, Land No 13&15 Al Khobar Tel. +966 53 555 0874 mohammed.khaiz@wika.com www.wika.ae |
| Bulgaria WIK A Bulgaria EOOD Akad.Ivan Geshov Blvd. 2E Business Center Serdika, building 3 Office 3/104 1330 Sofia Tel. +359 2 82138-10 Fax: +359 2 82138-13 info@wika.bg www.wika.bg | Serbia WIK A Merna Tehnika d.o.o. Sime Solaje 15 11060 Beograd Tel. +381 11 2763722 Fax: +381 11 2753674 info@wika.rs www.wika.rs | Kazakhstan TOO WIK A Kazakhstan Microdistrict 1, 50/2 050036 Almaty Tel. +7 727 225 9444 Fax: +7 727 225 9777 info@wika.kz www.wika.kz | South Africa WIK A Instruments Pty. Ltd. Chilvers Street, Denver Johannesburg, 2094 Tel. +27 11 62100-00 Fax: +27 11 62100-59 sales@wika.co.za www.wika.co.za |
| Croatia WIK A Croatia d.o.o. Hrastovicka 19 10250 Zagreb-Lucko Tel. +385 1 6531-034 Fax: +385 1 6531-357 info@wika.hr www.wika.hr | Spain Instrumentos WIK A S.A.U. C/Josep Carner, 11-17 08205 Sabadell Barcelona Tel. +34 933 9386-30 Fax: +34 933 9386-66 info@wika.es www.wika.es | Korea WIK A Korea Ltd. 39 Gajangsaneopseo-ro Osan-si Gyeonggi-do 447-210 Tel. +82 2 869-0505 Fax: +82 2 869-0525 info@wika.co.kr www.wika.co.kr | United Arab Emirates WIK A Middle East FZE Warehouse No. RB08JB02 P.O. Box 17492 Jebel Ali, Dubai Tel. +971 4 883-9090 Fax: +971 4 883-9198 info@wika.ae www.wika.ae |
| Denmark WIK A Danmark A/S Banevaenge 13 3460 Birkerød Tel. +45 4581 9600 info@wika.as www.wika.as | Switzerland WIK A Schweiz AG Industriestrasse 11 6285 Hitzkirch Tel. +41 41 91972-72 Fax: +41 41 91972-73 info@wika.ch www.wika.ch | Malaysia WIK A Instrumentation (M) Sdn. Bhd. No. 23, Jalan Jurukur U1/19 Hicom Glenmarie Industrial Park 40150 Shah Alam, Selangor Tel. +60 3 5590 6666 info@wika.my www.wika.my | Australia WIK A Australia Pty. Ltd. Unit K, 10-16 South Street Rydalmere, NSW 2116 Tel. +61 2 88455222 Fax: +61 2 96844767 sales@wika.com.au www.wika.com.au |
| Finland WIK A Finland Oy Melkonkatu 24 00210 Helsinki Tel. +358 9 682492-0 Fax: +358 9 682492-70 info@wika.fi www.wika.fi | Turkey WIK A Instruments Endüstriyel Ölçüm Cihazları Tic. Ltd. Şti. Şerifali Mah. Bayraktar Bulvarı No:17 34775 Ümraniye, İstanbul Tel. +90 216 41590-66 Fax: +90 216 41590-97 info@wika.com.tr www.wika.com.tr | Philippines WIK A Instruments Philippines Inc. Ground Floor, Suite A Rose Industries Building #11 Pioneer St., Pasig City Philippines 1600 Tel. +63 2 234-1270 Fax: +63 2 654-9662 info@wika.ph www.wika.ph | New Zealand WIK A Instruments Limited Unit 7 / 49 Sainsbury Road St Lukes - Auckland 1025 Tel. +64 9 8479020 Fax: +64 9 8465964 info@wika.co.nz www.wika.co.nz |
| France WIK A Instruments s.a.r.l. Immeuble Le Trident 38 avenue du Gros Chêne 95220 Herblay Tel. +33 1 787049-46 Fax: +33 1 787049-59 info@wika.fr www.wika.fr | Ukraine TOV WIK A Prylad Str. Generala Almazova, 18/7 Office 101 01133 Kiev Tel. +38 044 496 83 80 Fax: +38 044 496 83 80 info@wika.ua www.wika.ua | Singapore WIK A Instrumentation Pte. Ltd. 13 Kian Teck Crescent 628878 Singapore Tel. +65 6844 5506 Fax: +65 6844 5507 info@wika.sg www.wika.sg | |
| Germany WIK A Alexander Wiegand SE & Co. KG Alexander-Wiegand-Str. 30 63911 Klingenberg Tel. +49 9372 132-0 Fax: +49 9372 132-406 info@wika.de www.wika.de | United Kingdom WIK A Instruments Ltd Merstham, Redhill RH13LG Tel. +44 1737 644-008 Fax: +44 1737 644-403 info@wika.co.uk www.wika.co.uk | Taiwan WIK A Instrumentation Taiwan Ltd. Min-Tsu Road, Pinjen 32451 Taoyuan Tel. +886 3 420 6052 Fax: +886 3 490 0080 info@wika.tw www.wika.tw | |
| Italy WIK A Italia S.r.l. & C. S.a.s. Via G. Marconi 8 20020 Arese (Milano) Tel. +39 02 93861-1 Fax: +39 02 93861-74 info@wika.it www.wika.it | | Thailand WIK A Instrumentation Corporation (Thailand) Co., Ltd. 850/7 Ladkrabang Road, Ladkrabang Bangkok 10520 Tel. +66 2 32668-73 Fax: +66 2 32668-74 info@wika.co.th www.wika.co.th | |

WIK A Alexander Wiegand SE & Co. KG

Alexander-Wiegand-Straße 30 · 63911 Klingenberg · Germany

Tel. +49 9372 132-0 · Fax +49 9372 132-406

info@wika.de · www.wika.de



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