Pressure
Temperature
Level
Flow
Force
Calibration

Chemical & Petrochemical

Process Instrumentation

WIKA

"The success of our customers is our motivation. This is a long tradition. When my grandfather, Alexander Wiegand, founded WIKA in 1946, he devoted himself to absolute quality, reliability, and customer focus. Although much has changed since then, it is precisely these values that form the core of the WIKA Group today."

Alexander Wiegand,
Chairman and CEO, WIKA

Ability to Meet any Challenge

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, flow, force, and in calibration technology.

Founded in 1946, WIKA is a 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 performance. Every year, over 50 million quality products in both standard or customer-specific configurations are delivered in batches of 1 to over 10,000 units.

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

Contents

WIKA – Your Partner in the Chemical and Petrochemical Industries

The demands placed on instruments used in the petrochemical and chemical processing industries are extremely high, including strict international guidelines such as the PED and ATEX. Electronic, mechatronic, and mechanical measuring instruments for pressure, temperature, and level are used in both general applications and potentially explosive areas. Therefore, instruments must be up to the test in both aggressive and non-aggressive environments.

WIKA provides a large selection of pressure, temperature, and level measuring instruments to suit the specific requirements of the chemical and petrochemical industries.

Fine-Tune Productivity & Maximize Life with Tubeskin Thermocouples

Furnaces are often the most important piece of equipment in a chemical plant. Their control is vital to the reliable processing of plant intermediates and final products. Temperature measurement is utilized to monitor and control furnace performance and is most often accomplished with tubeskin temperature sensors. Furnace environments are unforgiving – to provide accurate and consistent readings demanded by chemical operations, tubeskin thermocouples must be well designed for application-specific needs by experienced engineers.

There are well over 120,000 tubeskin sensors globally supplied by Gayesco-WIKA. As your competent partner, we develop products and solutions with you that are specifically tailored to your requirements. WIKA's high level of performance is characterized by proficient service capabilities and a reliable global presence.

Ski Slope

The WIKA Ski Slope holder with removable thermocouple provides an easy way to replace surface sensors with no fabrication work or insulation removal. The Ski Slope is engineered to deliver accurate and repeatable measurements.

V-Pad®

The WIKA V-Pad® allows a full penetration weld between the junction and tube surface, eliminating potential air gaps and substantial measurement inaccuracies. The thermocouple is welded into the base of the V-Pad® for maximum accuracy and fast response time. Compaction of the mineral insulation inside of the V-Pad® protects the measuring point from radiant temperature influences.

Refracto-Pad®

In harsh environments, Refracto-Pad® sensors ensure reliable readings due to their patented shield design, which utilizes an exclusive molded insulation. Radial or longitudinal mounting onto tube or pipes allows for layout flexibility which, along with the heat shield, allows for quick routing out of the radiant heat, increasing sensor life.

Xtracto-Pad®

The Xtracto-Pad® system includes all of the features of a RefractoPad™ plus a removable thermocouple design allowing for thermocouple replacement without any additional grinding or welding. Weldable parts are attached without the presence of the sensor, making it possible for the guide channel, heat shield, and clips to be attached by the manufacturer of the heater/boiler, or even by the tube manufacturer in the case of special furnace tubes. The Xtracto-Pad® patented shielded design ensures reliable temperature readings.

Accurate Temperature Profiling: Optimizing Operation & Prolonging Catalyst Life

Chemical plant operations face an increased focus on productivity and efficiency. At the same time, there are demands for greater reliability and longer periods between planned maintenance activities. In the operation of equipment such as reactors, reformers, crackers, and distillation columns, accurate temperature profiling is key to plant performance. For this reason, it is crucial to have an accurate knowledge of temperature profiles within critical equipment such as reactors.

WIKA and Gayesco have over 60 years of experience in the development and manufacturing of multipoint thermocouple systems required for recording complex temperature profiles in reactors. Knowledge of these temperatures is key in the detection of localized heat concentrations (“hotspots”) or critical exothermic reactions - known as “thermal runaway”. Monitoring these temperatures is key to detecting hotspots, or localized heat concentrations, and thermal runaways, or critical exothermic reactions.

Flex-R® Radial Multipoints

Conventional pipewell style multipoints do not provide operators with a full temperature profile. These limitations, as well as the industry’s need of flexibility and accuracy led Gayesco-WIKA to develop the FLEX-R® system, which provides a more comprehensive array of measurement points.

- Real Time Temperature Readings
- High Point Density Potential
- Secondary Containment
- Adaptability To Existing Reactor Nozzles
- Greater Process Control (Higher efficiency and operator confidence)
- Hot Spot Identification
- Thorough Coverage For Vessel Protection
- High Redundancy - Individual Measurement Points Less Critical

Flex-O®
Pipewell Multipoints

In a pipewell multipoint configuration, thermocouples are strategically placed at varying points or levels within a pipewell – which separates them from the process environment. Speed and accuracy depend on each thermocouple's proximity to the process temperatures. The patented FLEX-O® system combines ease of installation with an innovative method of achieving fast and correct measurements.

Speed and Accuracy

- Direct contact between the measuring point and the pipewell stem results in faster response time.

Flexibility

- Simpler, easier, and more cost-effective transport.
- Ease of installation onsite without need for a double-high crane.

Optional Purge System

- Patented purge tube design can purge the pipewell continuously or as needed.

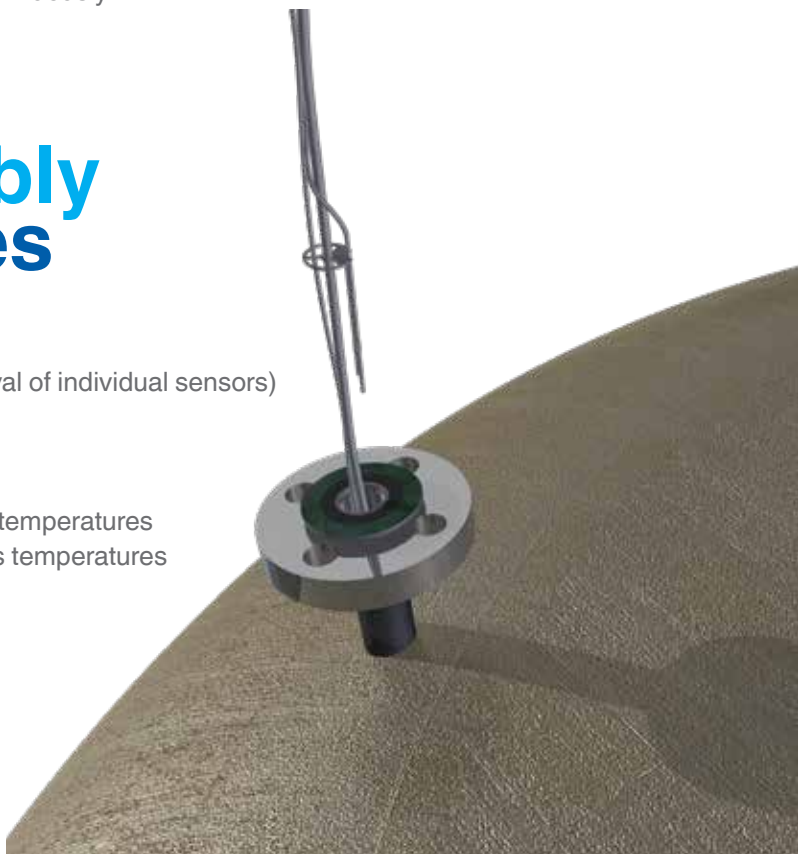
Additional Assembly
Types and Services

Pipewell Arrangements

- High-temperature version with bimetal spring loading
- Individual thermowells within pipewell (allows for removal of individual sensors)

Miniature Multipoints

- Smaller scale and mass
- Designed to avoid influencing process conversion and temperatures
- Axial centering in the catalyst tube for accurate process temperatures



Diverse Temperature Measurement: Options for Demanding Processes

Thermocouples, RTDs, & Thermowells

While traditional thermocouple and RTD assemblies are found throughout processing facilities, the chemical industry places demands on measuring elements that require higher resistance to aggressive media, high pressures, and extreme temperatures. As measuring elements are typically placed in the process stream they can also be subjected to high velocity flows, which cause significant mechanical stress.

For all installations, from the routine to the more difficult, WIKA has the industry expertise and product capability to meet the challenge. These products carry most approvals required for petrochemical and chemical plants and can be certified through various test, inspection or calibration reports.

High Pressure Thermocouple (WIKA Model TC90)

This high-pressure thermocouple enables reliable temperature measurement for extreme pressure reactors (i.e. low density polyethylene production). It is sealed by means of metal-to-metal seals, high-pressure threaded connectors, or sealing lenses.

Sapphire Design High Temperature Thermocouple (WIKA Model TC84)

The high temperatures and pressures in gasification processes place stringent demands on protection tubes and thermocouples. The TC84 high-temperature thermocouple with a gas-tight sapphire protection tube has been specifically developed for use in harsh environments such as gas reactors.
TC84 features include:

- Sapphire protect the precious metal of the thermocouple from poisonous toxic media.
- Multifold sealing system in the connection case prevents toxic gases from escaping the reactor.
- 3 times longer service life in comparison to purely ceramic protection tubes due to the monocrystalline structure of the sapphire sensor.
- Suitable for processes up to 1,700 °C (3,092 °F) and 65 bar (943 psi).
- Cost savings through the elimination of a purge system and the repairability of the sensor.

Thermowells

Thermowells provide vital protection to thermocouple and RTD probes, allowing midstream temperature measurements in treacherous flow conditions. While these are widely seen as just a simple sleeve, there are actually many different configurations, both mechanical and metallurgical, to help you get the perfect solution for your particular process.

The exterior surface of the ScrutonWell® thermowell (pictured on the left) has machined helical strakes that serve to dampen vibration excited by high or turbulent flow. This allows for longer thermowells with narrower roots where wake frequencies are an issue.

Mechanical Pressure Measurement

WIKA pressure gauges have been designed to provide the ruggedness and dependability you require, which ensures that they are there for you during process shutdowns, unit re-starts, and normal operating conditions. At the same time, you avoid unwanted events such as containment loss, injuries, fires, or worse.

Ready Insights Through Reliable Readings with Proven Quality Pressure Instruments

XSEL Process Gauge

- Excellent bourdon tube strength and durability.
  - Bourdon tube profile designed for greater fatigue resistance.
  - Included restrictor reduces pulsation effects, minimizing fatigue cracking.
- Hardened and lubricated internal mechanisms for extended life.
- Solid-front thermoplastic case for operator safety.

Direct Drive Process Gauge (Model 232.34DD)

- Excellent vibration and shock resistance – perfect for the most demanding applications.
- High temperature capability
- Longest service life of any gauge design.
- Helical bourdon tube directly connected to pointer shaft.

39.6%

of pressure gauges reviewed have failed or are in danger of failing

Based on over 250 processing audits by WIKA

FAST℠

FULL AUDIT SERVICE TEAM

WIKA's process gauge design is a result of extensive time spent by our engineers in chemical plants and refineries. Our FAST (Full Audit Service Team) has assisted downstream end-users by performing thorough on-site evaluations of their existing gauge installations.

The first-hand studies of installations on all types of equipment and in all process have guided our design features so that you can rest assured you are getting a pressure gauge made specifically for your needs.

Diaphragm Seal Systems

Diaphragm seal systems protect gauges from hot, viscous, contaminated, or corrosive media. This added layer of protection ensures that the media doesn't reach the gauge, helping to prevent failures and possibly safety issues.

Diaphragm Seals

- Prevent clogging, corrosion or contamination of pressure gauges.
- Reduce fugitive emissions.
- Extend the service life of the pressure instrument, which reduces process downtimes.
- Reduce or eliminate maintenance costs.

WIKA Combines Expertise and Technology to Provide Custom, Quality Systems

Chemical plants, in particular, need the added protection provided from diaphragm seals because they process some of the most corrosive and hazardous media. Constant exposure to these chemicals cause rapid deterioration of instruments. Having the appropriate diaphragm seal with compatible materials will not only greatly improve the life of your instruments, but could prevent health or environmental hazards resulting from a release.

Diaphragm Seals: Precise Protection for Your Harshest Conditions

Diaphragm Monitoring System

WIKA's patented diaphragm monitoring system offers a solution for critical applications where the product must not find its way into the environment, or where the fill fluid in the diaphragm seal assembly must not come in contact with the product for any reason. Should the outer diaphragm breach occur, a visual, acoustic, or electrical warning will be given. The damaged system can be replaced during the next feasible shutdown.

All Welded Seal

Combining an XSEL process gauge with an all-welded diaphragm seal (AWS) provides the ruggedness and protection of a conventional diaphragm seal in a compact product that easily replaces conventional gauges in hazardous installations. A strong solution for all failure modes, many processing plants have made the AWS their standard for all process safety management areas.

Flange Mounted Seals

Flanged seals, such as the 990.FC shown here, accommodate a wide range of severe media, pressures, temperatures, and connection sizes. WIKA fabricates seal components from raw materials using state-of-the-art CNC machining equipment, and uses innovative technologies such as metal bonding and laser welding to produce durable finished systems.

Electronic Pressure Measurement

Hazardous Area Applications

For those applications in your plant where a transmitter is needed in place of local indication, WIKA offers solutions for all area classifications. Having received approval by most all major safety certifications, you can trust WIKA's hazardous area transmitters to reliably give you the data you need while keeping your plant and people safe.

FM APPROVED · CSA US · EAC Ex · Ex · IEC · IECEx

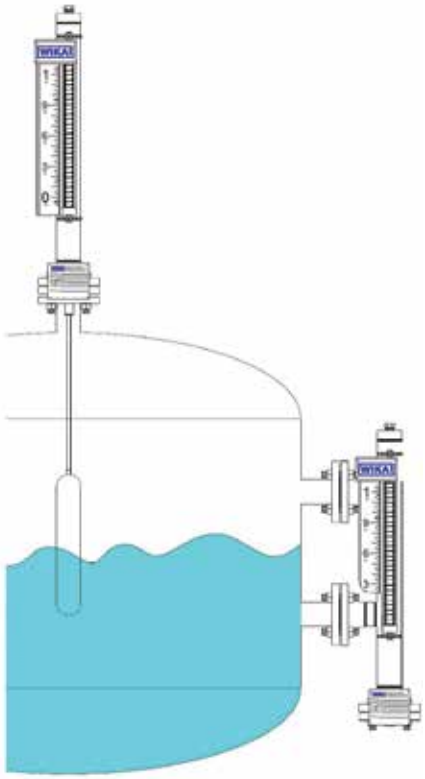
IS-3 Pressure Sensor

Ideally suited for high-pressure applications, such as the production of low-density polyethylene (LDPE). This robust model is designed for harsh applications with high vibrations and also carries the hazardous area approvals your process requires.

Level Measurement

Level measurement in a petrochemical plant can range from simple sight glasses to highly accurate sensors. WIKA offers level instrumentation in multiple combinations of highly visible local indication, switches, sensors and transmitters.

The Bypass Magnetic Level Indicator uses magnetic tiles that rotate with the vertical movement of a custom float for the liquid to be measured. A level transmitter or switch is often combined with this device, providing the plant control room with timely process knowledge.



Continuous and Clear Readability with Magnetic Level Measurement

Confidence Through Accuracy

Flow Measurement

Products include orifice plates, meter runs, flow nozzles, venturi tubes, pitot tubes, wedge meters, and proprietary designs. All elements are designed and can be calibrated in accordance with the principles and requirements of international standards (ISO 5167/ISO TR 15377, ASME MFC, ASME PTC6, and ASME PTC 19.5).

The FlowPak flow meter (pictured right) is a combination of proven and innovative technologies for limited physical space. With no need for straight upstream and downstream piping, even installations between two 90° elbows present no problem.

Pressure loss has been reduced to a minimum, therefore achieving the highest energy efficiency of all flow meters. Even Venturi tubes exhibit poorer values.

Orifice Plates

The most economical and widely utilized primary flow elements. WIKA manufactures everything from individual plates to full meter runs incorporating all of the required fittings and instrumentation.

Certified Safety & Reliability

Chemical processing plants typically come with some level of dangerous atmospheres or materials such as explosive gases, combustible dusts, or flammable liquids. Instrumentation installed in these areas needs to be designed to prevent it from becoming a source of ignition. To ensure that instrumentation is sufficiently designed and tested to provide the necessary level of protection, third-party agencies provide certifications that show a particular device meets the desired performance standards for hazardous locations.

WIKA's pressure, temperature, level, and flow solutions have met the rigorous testing standards of national and international authorizing bodies, and have earned a wide range of approvals and certifications worldwide.

Given the increasing demands in terms of quality and product safety of chemical products, certified measuring instruments for pressure, temperature, and level contribute considerably to the safety of the production processes. Therefore WIKA offers a wide range of approvals and certificates, many of which are listed below.

Instruments used in chemical plants are either designed to contain any explosion within the device (explosion-proof) or not to produce sparks with sufficient energy to trigger an explosion (intrinsically safe). WIKA provides both methodology options with its sensors and transmitters so that you have options, based on your specific process needs.

Repair & Calibration Services

RJ Global WIKA's Repair Services for Diaphragm Seals leverages more than 30 years of in-house expertise in diaphragm seal design and manufacturing to expedite your instrument repair times – as little as 24-48 hours for rush turnarounds.

An ISO 9001 accredited facility, RJ Global WIKA can repair any brand of diaphragm seal assembly regardless of the OEM process transmitter manufacturer, helping you save as much as 60-70% over the cost of a new transmitter assembly.

Mensor is a leading manufacturer of precision pressure transducers, indicators and automated controllers/calibrators. All new Mensor pressure measuring, and controlling products are provided with an A2LA accredited calibration certificate traceable to NIST.

Field Services

Gayesco Services Experience

With over 25 years' installation experience, we use industry best practices to exceed the expectations of our customers and licensor specifications to develop the best solution for all types of unit installations.

Experience means we can complete the installation quicker than contractors who are unfamiliar with the process, saving you money.

To qualify as a supervisor, a Gayesco services member must have a minimum of 2,500 safe on-site work hours and demonstrated field service supervisor proficiencies. The average tenure for a Gayesco services supervisor is 11 years.

Application Experts

Gayesco services, a division of the WIKA group, has experience in a wide range of refining and petrochemical applications including:

- Syngas
- Ammonia
- Methanol
- Hydrogen
- Ethylene Glycol
- Cumene
- Styrene
- Ethylene
- Acrylic acid production
- Maleic anhydride
- Olefins
- Others

Multipoint Applications

Designing and building the world's best profiling systems isn't enough to ensure the best possible solution, it has to be installed correctly - by trained, experienced installers. Gayesco installers are trained in the manufacture, installation, and applications of the thermocouples. That means they are trained in how the thermocouples are used in the units, the internals of those units, and what goes on in the units. Gayesco installers give you the confidence to know you will get an installation you can trust.

Fired Heater Applications

WIKA offers the top leading tubeskin application products in the industry. Gayesco Field Services is the key to ensuring that the installation of your tubeskin thermocouple system is exactly what the engineers intended during design, and follows best practices in the industry.

Additional Services

Ask us about In-situ verification, heater surveys, and field repairs for instrumentation inside your chemical unit.

For 70 years, WIKA has continuously advanced instrumentation for pressure, temperature, level, flow, and force measurement. Our broad selection of standard and custom solutions, as well as services, work to support operational safety, productivity, and profitability. A global leader in Lean manufacturing, WIKA is your reliable partner anywhere in the world.

WIKA Instrument, LP
1000 Wiegand Boulevard
Lawrenceville, GA 30043
Toll Free 1-888-WIKA-USA (945-2872)
Tel (770) 513-8200 Fax (770) 338-5118
info@wika.com • www.wika.com

B060 - 1500 11/18