Highly concentrated know-how for your process
Intelligent measuring technology for the chemical industry
KROHNE.
For those who value precision

The Chemical Processing Industry (CPI) forms the foundation of the manufacturing industry and is affiliated with the most important economic sectors across the globe. The CPI also plays a central role when it comes to the sustainable development of our society. Without chemistry, we would not be able to meet many of today’s important challenges. Climate change, environmental protection, power generation and health care are just a few examples.

But the CPI is also facing other challenges: structural change, globalization and tapping into new markets, not to mention the demand for improved productivity and quality as well as constantly increasing safety requirements and new legal requirements.

KROHNE supports the CPI in its efforts to rise to these challenges. KROHNE’s contribution is in providing ingenious and reliable products in measuring technology, making processes more efficient, more reliable and more economical. It also provides complete solutions, consultancy services and other services for all your process automation needs. We have been active in the chemical industry for over 85 years. As an active partner for our customers, we make crucial contributions to their competitive ability. At the same time, we bring our experience and extensive knowledge of the processes and products concerned to the table. We are consistently setting standards, such as being the founder and world market leader in the world of electromagnetic flowmeters.

As a leader in process measuring technology, KROHNE provides the chemical industry with an extensive range of solutions and products for analysis, flow, level and temperature measurement. In a wide variety of applications, even for use in extreme conditions. We are there when you need us – with an extensive service network around the world, you can count on us.
1921
Ludwig KROHNE starts manufacturing variable area flowmeters in Duisburg to measure the flow of air, gases and liquids.

1952
The first electromagnetic flowmeter (EMF) for industrial measurement is created.

1955
The manufacture of mechanical level indicators for measuring liquids in tanks and containers commences.

1968
An EMF for hazardous areas allows for use in the chemical industry.

1974
Switched dc field with automatic zeroing enables the first high performance and low-maintenance EMF.

1978
The first EMF with a fully digital measuring range adjustment proves its value in the chemical industry.

The KROHNE Group with headquarters in Duisburg, Germany, employs more than 2700 people. Customer proximity is guaranteed with 15 production plants in 10 countries, 43 subsidiaries and 55 representatives.
1980
Compact EMF for hazardous areas. Converter can be replaced without removing the EMF.

1981
First EMF with measuring tube made of oxide ceramics and sintered platinum electrodes for outstanding chemical resistance.

1986
First EMF with capacitive pickup and no contact between the measuring electrodes and the medium, for measuring difficult chemicals.

1990
First radar level meter (FMCW) for process tanks.

1994
First straight tube Coriolis meter for determining the mass flow rate and density of polymers, methanol, etc.

2000
Construction of world’s most precise volumetric calibration rig for sensors up to DN 3000 with a certified accuracy of 0.013 %.

2003
First 3-beam ultrasonic flowmeter.

2004
Introduction of OPTIFLUX, the first EMF featuring 3x100%-diagnostics.

2006
Twin tube Coriolis meter with straight measuring tubes and secondary containment for the chemical industry.

2006
The first vortex flowmeter with integrated pressure and temperature compensation.

2008
First Coriolis meter featuring a tantalum alloy straight tube for determining the mass flow rate and density.

2012
Coriolis meter with twin bent tubes. All-purpose from cryogenic to high-temperature as a standard, non-stop performance at all void-ratios.
We make it simple for you – simply efficient

The performance of chemical processes depends not only on the size of the plant but also on factors such as quality, availability, safety and capacity. Other important aspects include minimal energy consumption and material use, the reduction of waste and accompanying substances and the lowering of the cost of ownership. Quick and simple start up and shut down as well as partial load operation are also in demand. And this is often required under extreme environmental conditions, the likes of which are rarely seen in other industries.

Ideally, this is achieved using superior and precise measurement and control technology, which in turn is based on innovative measuring and analysis methods. As an “early adopter”, the chemical industry relies on state-of-the-art technologies which need to be extremely robust and durable. KROHNE offers a portfolio which includes virtually every technologically significant measuring process and is specifically designed for universal use in the chemical and petrochemical industry.

As Main Instrumentation Vendor (MIV), KROHNE offers you a wide range of products. It includes standardized devices which cover most applications. The installation lengths, outputs, mechanical design and choice of materials are specifically designed for chemical applications. The advantage to you: Cost reduction through large quantities and a carefully limited model range. This reduces stock, ensuring easy ordering, project planning and design of measuring points.

It goes without saying that you always receive the perfect solution, both for out of the ordinary measuring tasks and for applications under extreme conditions – right down to special options that our engineers will gladly develop for you. Whatever product you choose, you can count on KROHNE to provide devices featuring maximum accuracy and are best in class.
Perfection on a grand scale

Chemical parks are a milestone in the success story of the chemical industry in Germany. This concept, unique in the world, provides companies with optimal economic conditions, comprehensive services and custom solutions for any business model. Both large and small companies benefit from close networking, common use of infrastructure and resources, and the resulting savings potential. It is no wonder that chemical parks have since become a global export hit.

Pipelines for the transport of gases, oils and other liquids connect both plants within the park as well as different parks to one another – some even crossing borders. They must meet high standards in terms of safety, reliability and efficiency in order to guarantee the protection of man and nature and to enable profitable operation.

Relying on KROHNE measurement technology when designing and equipping chemical parks and transport pipelines means playing it safe. These highly precision devices are also suitable to custody transfer measurement within plants or at transfer points. In addition, they are employed in conjunction with the KROHNE Pipeline Leak Detection and Localization System (LDS). Extremely fast detection and precise localization are guaranteed, by PipePatrol’s E-RTTM-Technology. This makes the KROHNE LDS the perfect choice for use in stationary and transient conditions.

If required, we will of course be on site with our own engineers, designing, commissioning and calibrating the systems and monitoring their continuous operation in terms of internal and external requirements.

For more information on PipePatrol go to: www.krohne.com
Challenge safety

Chemical processes are continually pushed to their limits. This requires high quality process control and accurate risk assessment. To this end, experts are designing comprehensive protection concepts, which typically involve several levels. For example, a so-called Layer Of Protection Analysis (LOPA) is often performed. This analysis has proven to be advantageous for analyzing danger to humans and the environment and is also used to estimate potential production downtime costs.

Regardless of which method is used and which Safety Integrity Level (SIL) you are aiming to achieve, what is important is to always state the reasoning behind the assumptions and decisions made. You can rely on the proverbial quality and operational reliability of KROHNE measuring devices. They have proven themselves in extensive testing and field use. Even in the harshest of conditions such as vibrations, extremely high or low temperatures and with corrosive and erosive media, they continue to perform without problems.

This is ensured, among other things, by measuring tubes made of materials like titanium and tantalum, housings made of stainless steel or aluminum and seals made of Kalrez, PTFE and PFA. There is also Ex protection for all zones up to protection category IP 68. In addition, KROHNE also holds nearly all certificates required around the world, including ATEX, SIL, CENELEC, MID, ISO/IEC, GOST, FM, CSA and NEPSI. In addition, KROHNE EMFs feature unique 3x100%-diagnostics, allowing them to detect application problems and errors early on and independently, thus exceeding NAMUR recommendations.

Please do not hesitate to take advantage of the knowledge and experience of our employees when it comes to safety issues. They are at your disposal to help with specifications, selection of products and maintenance from start to finish. There is no substitute for safety.

Improved production assured

Layers of Protection

- Emergency-measures
- Catch basin
- Protective barrier
- Pressure control valve
- Bursting disk
- Safety-oriented electronic system
- Operator-intervention
- Control system-

Public emergency plans
Company emergency plans
passive protective measures
active protective measures
Emergency shut down
Safety level
Process shut down
Trip warning message
Process warning message

Normal-operation

Control level
Chemical facilities and processes are becoming increasingly complex and extensive. Accordingly, high demands are placed on the personnel when engineering the systems. That’s why for us, customer service does not start at the time of the first maintenance or repair call but right from the initial contact – and it runs for the entire life cycle of your plant.

It starts with support when choosing and defining measuring principles and devices and continues right on through worldwide start-up and beyond. Portable measurements, on-site calibration, customer inspections (FAT, SAT, TPI), pre-manufacturing meetings (PMM) and pre-inspection meetings (PIM) are also a part of the service, as is support during quality audits, creating documentation and customer workshops to update on patent practices.

One focus is the international project coordination and placing engineering teams in your local office. Take advantage of the knowledge of our staff to solve project-specific jobs and handle difficult measuring tasks – down to complete redevelopment to satisfy local regulations. This gives you a critical headstart when it comes to expertise, setting you apart from the competition.

The knowledge and experience of our staff developed over a long period of time. We work closely with industry and university institutions such as Tongji University Shanghai (China), the universities in Kiel and Bochum (Germany) and Cambridge University (UK).

But cooperation is in no way limited to theoretical research. Instead, it leads to concrete product and application oriented development projects. And we keep future employees in mind: industry training facilities in Germany and overseas are partly equipped by KROHNE – free of charge. It’s worth it to us.
Inorganic primary chemicals
Inorganic primary chemicals

KROHNE makes modern processes easy

The important base chemicals chlorine, hydrogen and sodium hydroxide are produced from sodium chloride with the chloralkali electrolysis process. Common salt, primarily made up of sodium chloride, is dissolved in water and electrolyzed. The most modern industrial process for the manufacture of chlorine and sodium hydroxide – even more so than the amalgam and diaphragm processes – is now the membrane process. It delivers significant savings in terms of energy consumption and requires neither mercury nor asbestos. The end products, chlorine, hydrogen and sodium hydroxide are available in about the same purity as with the amalgam process. However, the membrane process does require high purity brine to operate the valuable membranes at their optimum for as long as possible and to not put their stability and life cycle at risk.

The measuring devices in this process are subject to particular extreme influences – corrosive properties of the source material and the products, enormous magnetic fields with changing poles, process-related electrical potential, current fields of several 10,000 Ampere. For this reason, extremely sturdy measuring technology is required both prior to and following the main step of electrolysis. An ideal application area for KROHNE flowmeters and level measuring devices – the standard in the chemical industry for decades.
The conventional grounding of electromagnetic flowmeters can be very costly during the chloralkali electrolysis via the membrane process. When using aggressive media in the application, the grounding rings for conventional procedures must usually be manufactured from expensive special material such as nickel, tantalum or titanium. This is very costly when it comes to large nominal sizes.

KROHNE developed the alternative to traditional grounding: virtual referencing. In this case, no additional grounding materials that come into contact with the product are necessary because the reference potential is created in the device itself according to a patented method. The devices function stably and are completely unaffected by strong magnetic fields and leakage electrical currents. This makes them perfectly suited to plants where classical grounding poses problems.

For chloralkali electrolysis, the OPTIFLUX 4300 electromagnetic flowmeter with virtual referencing is the first choice. The elimination of grounding rings represents significant cost savings and facilitates installation. In addition, virtual referencing creates increased safety since there are fewer potential leakage points.
H250 –
You can count on the standard in flow measurement

The principle is simple and proven: The position of the float is transferred magnetically to an analog indicator which indicates the measured value. No power is required. The robust all-metal version ensures high resistance to pressure, temperature and product and can withstand extreme usage and ambient conditions. This is the reason for using the H250 variable area flowmeters to measure difficult gases.

The H250 series is universally used for conducting and non-conducting liquids and gases and has established itself as the standard in the chemical industry.

H250
Variable area flowmeter

- Robust stainless steel construction
- Process temperature from –200 °C to +300 °C
- Optionally available with PTFE/ceramic liner for acids and alkalis
- High application safety, even with extremely low flows
- Excellent long-term stability
- Can be upgraded in modules with electrical signal outputs
- Accuracy 1.6 % of the measured value as per VDI/VDE 3513-2 (q0 = 50 %)
- SIL 2 (IEC 61508-2)
- Any installation position, e.g. horizontal or upside down
When diluting the sodium hydroxide to final concentrations, the OPTIMASS 6400 is used to precisely control the mixing ratio. It is extremely versatile, not only reliably measuring the mass flow but also the density, temperature and concentration of liquids and gases. In addition, the OPTIMASS 6400 features a user friendly interface with both optical and push buttons. This means freedom to change settings in hazardous areas or with open lid during commissioning. Effective diagnostics are providing clear instructions for the user in order to quickly optimise a process. The synthetic drive control ensures continuous measurement even with high entrained gas conditions. The synthetic drive system can be optimised to the application to correct for less than ideal operating conditions. This makes it – combined with the outstanding standard temperature range – an attractive universal solution for the process industry.
OPTIWAVE 7300 measures the level of the concentrated as well as the diluted sodium hydroxide without contact using FMCW radar. In this way, it is possible to monitor the storage tank continuously and to monitor the stock. The measuring results are more stable than those of pulse radar and the device is well suited to agitated surfaces. Compared to earlier models, the OPTIWAVE 7300 measures with a greater bandwidth and provides higher resolution and accuracy. This allows for exact measurement in difficult applications – even in tanks with foam, dust-raising solids and intruding parts.

- For liquids and solids
- Standardized converter with large, graphic display featuring spectrum display
- Converter can rotate 360° and can be replaced under process pressure
- Standard accuracy +/- 3 mm
- For flange temperatures up to +200 °C/+390 °F and 40 bar/580 psig
- Measuring range up to 80 m/260 ft
- Versions for corrosive liquids, pressurized containers and dangerous gases
Hydrocarbons
Precise, reliable, robust: Measuring technology for petroleum processing

Petroleum and natural gas are not only energy sources, they are also amongst the most important raw materials when it comes to producing chemical products. For example, alkanes are further processed into both polymers and superior quality fuels. The alkylation of alkanes with olefins is of considerable technical significance. Sulfuric acid, among other things, is added to the mixture of these two components as a catalyst. This is where exact metering is crucial – a perfect application area for KROHNE’s measuring devices, which not only monitors the flow but also the density and thus the acid concentration.

The increasing demand for lighter mineral oil products requires increasingly complex petroleum processing – as well as measuring equipment that is up to the task. Refineries are principally designed for the manufacture of primary chemicals but there are some considerable differences in yield. Research is thus focused on process improvements and new catalysts to produce monomers and compounds more cost-effectively using less energy. This is where KROHNE measuring equipment comes into play, employed even under difficult conditions for these new production processes. Materials like titanium, tantalum and oxide ceramics are used. Our electronics, developed in-house, are manufactured to Germany’s highest quality standards.
Plein feux sur : KROHNE

Steel corrosion can pose a problem during oil production and in the downstream processing using acidic catalysts. No problem for the OPTIMASS 7300 A – it boasts a straight measuring tube made of highly corrosion resistant tantalum alloy. Even difficult media such as hydrochloric acid, sulfuric acid, nitric acid and other acids for reaction processes do not attack the measuring tube. The device is also interesting in terms of the price as a much smaller amount of tantalum is required for the straight measuring tube than for devices featuring twin bent tubes.

OPTIMASS 7000 features the patented Adaptive Sensor Technology (AST), permanently providing precise and stable measuring results, even under difficult process conditions and non optimum installation. Regardless of whether you are filling phials or tankers, whether the mixtures are highly viscous or inhomogeneous, whether it is installed between flexible hoses or fixed pipelines, you can rely on the results. And as the picture above proves: no crosstalk with OPTIMASS.

OPTIMASS 7000 – corrosion-resistant in all applications

- Universally applied due to a wide range of models
- Available in titanium, stainless steel, hastelloy and tantalum
- Secondary containment complies with pressure equipment guidelines
- User-friendly software Flow Toolbox
Hydrocarbons

If you are searching for the best price/performance ratio and a solution with PED approved secondary containment your choice is OPTIMASS 1000 or 2000. These dual straight tube meters with optimized flow splitter feature a very low pressure drop and allow for smaller pump designs in your plant.

The OPTIMASS 1000 and 2000 are specially designed to meet the increasing demand for accurate measurements in the oil and gas industry. Thanks their superior accuracy, the devices are suitable for valuable products such as fuels, oils and raw chemicals. The OPTIMASS 2000 is also perfectly suited to custody transfer applications. With it, you can fill road tankers accurately, taking full advantage of their entire delivery capacity.

You can take benefit of the highest safety factor with standard pressure rating 100 bar/1450 psi (OPTIMASS 1000) and 180 bar/2610 psi (OPTIMASS 2000) and PED approved secondary containment. The OPTIMASS 2000 in super duplex can also be used in a sour environment with high H₂S content and is approved according to NACE MRO 0175.

The OPTIMASS instruments provide additional values such as volume flow, density and concentration and are used for low viscous, homogenous fluid applications like measurements of hydrocarbons, solvents and various agents. Products that require heating to prevent precipitation or coating such as paraffins for example, can be measured easily, using the optional heating jacket.

Both instrument series have absolutely no installation restrictions, together with the smaller footprint than bent tube meters, their installation is really easy and they can be supported on the meter body.

OPTIMASS 2000
Coriolis mass flowmeter
- Hydrodynamically optimized flow divider
- High flow rates
- Easy to drain and clean
- Modular concept makes replacing electronics and sensor electronics simple
- Large diameters for bulk products
- Suitable for custody transfer

OPTIMASS 1000
Coriolis mass flowmeter
- Innovative straight twin stainless steel measuring tubes
- Optimized flow splitter
- PED approved secondary pressure containment for sensor
- Optional heating jacket
- Modular design: Electronics and sensor easy to replace – plug and play
- Easily drained and easy to clean

Easy installation: OPTIMASS 1000, accurate invoice: OPTIMASS 2000
A reliable heat exchanger circuit is essential to the product quality, plant safety and efficiency in the alkylation process and other thermal processes (e.g. distillation). Contamination of the circulated water must be detected early on and avoided as it can cause serious damage. This is only possible with continuous monitoring of quality parameters. KROHNE offers a wide range of measuring devices for water analysis. This includes the conductivity sensors in the OPTISENS Cond 1200 series for measurements in the heat exchanger circuit on alkylate fractionation. They feature standardized and robust construction and a long life cycle. The conductive measuring principle ensures high sensitivity, especially with low conductivity values. Damaging deposits in steam or cooling circuits are avoided as they could lead to corrosion or local overheating. In addition, resulting leakages in the process can be detected immediately.
Plant safety is paramount in the chemical industry. Exact temperature measurement is thus indispensable, for example, in the boiler sump or feed. This is to ensure accident-free operation on the one hand but also to optimize plants and reduce downtime and maintenance. With the OPTITEMP series, KROHNE offers a wide range of temperature sensors that cover the needs of the industry and ensure maximum process reliability.

Whether it is an aggressive medium, a high pressure or high flow velocities, as they are common in steam pipes, OPTITEMP sensors can withstand almost any load. This is due, among other things, to the special design: We are using exclusively mineral isolated measuring inserts. They are characterized by high accuracy, good long term stability and a high mechanical load capacity. Their ceramic connection block is sealed in a way that welding connections to the clamps are hermetically sealed and therefore excellent protected against corrosion.

That helps avoiding failures and reducing costs over the entire life cycle. Available are standard thermowells following different standards as well as customized designs, welded multi-part types as well as bar stock types, with all common process connections. To resist high chemical loads flange thermowells from stainless steel can be PTFE coated or protected with a Titanium or Tantalum mantle. Other characteristics include explosion protection thanks to intrinsic safety or an explosion proof design of the thermometer which contributes to the safety of the plant.
Due to its high nitrogen content, urea is the world’s leading nitrogen based fertilizer. It is industrially produced, from natural gas for example, in large quantities using a variety of processes. In large plants, ammonia and finally urea, is produced from natural gas, air and water. Carbon dioxide is a by-product of ammonia production. It is removed from the mixture using a gas scrubbing process and then used in a later step in the urea. Thus the environmentally harmful carbon dioxide is not released into the atmosphere but is processed into a product.

Count on more precision

The urea, initially occurring in solution, is converted to pellets or sold as liquid fertilizer. The world’s largest facilities produce several thousand tonnes of urea per day. Due to the high energy requirement, the most efficient use of energy possible as well as a high carbon dioxide yield is the goal. Now is the time for KROHNE measuring devices optimising the gas scrubbing and monitoring the air intake.
During the production of urea, the carbon dioxide is removed from the mixture by washing with diethanolamine. The quantities of absorber chemicals used are balanced as they represent a cost factor.

In addition, the operating status of lye pumps must be monitored. KROHNE OPTIFLUX 4300 electromagnetic flowmeters (EMF) are ideally suited for these applications. They have proven themselves in large plants. Not only do they balance the flow of the product but they also provide valuable additional information about potential application problems such as gas bubbles, corrosion, short circuits, partial filling, etc. with their 3x100%-diagnostics. Potential damage to the valuable pumps is thus detected early and can be avoided.

OPTIFLUX 4000
Electromagnetic flowmeter

• Robust and reliable
• More than 250,000 units operating in the field
• Temperatures up to 180 °C
• Most stable PFA liner on the market thanks to stainless steel reinforced grid
• Sized range from DN 2.5–3000
• Chemically resistant to acids and lyes
• Easy to plan and install; maintenance-free
• Standard liners PTFE, PFA, ETFE
Ultrasonic flowmeters in the OPTISONIC family provide reliable measuring results even in the harshest of conditions. OPTISONIC 7300 is used to measure the air intake upstream of the heat exchanger in urea production. This is where it demonstrates its excellent durability and reliability, necessary for long-term process optimisation. Ultrasonic meters operate in a wide range of applications largely uninfluenced by process changes in density, pressure and temperature. OPTISONIC 7300 can also be used for measurement of superheated steam up to 180 °C or hydrocarbon gases.

The device features no moving or intruding parts into the gas flow thus minimising pressure loss. This reduces maintenance and pipelines do not need to be opened. The integrated cable connections, protected by their own pipe connections, ensure the robustness necessary for these harsh conditions.

OPTISONIC –
the specialists for gases and liquid

- Excellent long-term stability
- Integrated flow computer [with inputs for p and t] for conversion to standard conditions or calculation of enthalpy or mass flow
- No intruding or moving parts, therefore no pressure loss
- No wear, absolutely no maintenance requirements
Polymers
Étape d'épuration biologique
Polyurethane is a growth market. This is particularly true for isocyanates, a core product for which demand and production capacity has grown steeply over the years. MDI (Methane diphenyl diisocyanate) and TDI (Toluylene diisocyanate) are equally growing at a rapid rate. Part of the basis for the success of polyurethane manufacturers is local production in the target regions. For example, new production capacities for basic products and specialist chemicals were constructed in Asia. These plastics are converted into many products including sport shoes, refrigerators, building materials and cars.

When large chemical companies invest in the construction of integrated production sites for polyurethane, KROHNE measuring devices are often used. These devices help manufacturers reach their targets. It is not only investment costs that need to be reduced, energy and solvent costs are also a factor that contribute to costs and companies are constantly striving to reduce these costs as well.

It is necessary to improve formulations and selectivity to increase the yield of isocyanate and – depending on the manufacturing process – to reduce the use of phosgene. The safety of the plant as well as the ability to start it up and shut it down quickly play a crucial role. Parameters that can only be monitored and optimized with exact and reliable measuring data.
During polyurethane production, the OPTISWIRL 4070 measures the vapor on the heat exchanger of the distillation. This would traditionally be measured with orifice plates. It is the first vortex flowmeter with integrated pressure and temperature compensation in a 2-wire design. The device provides reliable measurement of operating and normal volumes as well as mass flow of conductive and non-conductive liquids, gases and vapors, even with fluctuating pressures and temperatures.

The results are more accurate not only because of the precise measurement of the vortices but also because of the integrated pressure and temperature compensation. Additionally, the need for additional process connections for external sensors is eliminated, reducing the expense involved in planning, assembling and wiring from sensors down to one measuring system. Robust stainless steel construction means that the OPTISWIRL features excellent long-term stability.

Three in one:
OPTISWIRL 4070

- Integrated pressure and temperature compensation
- Maintenance-free measuring sensor design
- Process temperature –40 °C to 240 °C
- Maximum measurement reliability thanks to Intelligent Signal Processing (ISP)
- Simple start up (plug and play)
- 2-wire technology
Analysis under control with AMADAS

The KROHNE AMADAS management system is software that is either used for monitoring the quality measurement of the raw product or e.g. in subsequent distillation processes. It monitors the state of the analysers such as chromatographs, humidity meters and photometers, collects the performance data of the instruments, statistically prepares them and presents them as clearly arranged management information. In addition, AMADAS uses statistical data to reliably predict disturbances in advance, even disturbances that have not yet been recognized by the analysers as critical. This ensures smooth operation of process analytics which can otherwise only be achieved with high personnel costs. AMADAS works regardless of manufacturer with all common device types and is available in various configurations, from manual right down to completely automatic and integrated systems.

KROHNE AMADAS
Integrated Analyzer Management and Data Acquisition System

- Monitoring and evaluation of quality measurement
- Performance test through statistical analysis
- Objective, repeatable and traceable data
- Plant-wide evaluations for every measuring device

Gas measurement in analyser cabinet with DK32 variable area flowmeters.
Aniline, the key chemical ingredient in aromatic chemistry, is produced on an industrial scale and used in the production of the polyurethane preliminary product MDA. Iron oxide is produced as a by-product and is dispersed with extremely high iron oxide particle content – this is separated from the process. The stability of measurement here is significant because the process can only be opened using elaborate and expensive protective measures with risk to humans and the environment.

A clear case for the OPTIFLUX 5300 electromagnetic flowmeter, which combines enormous abrasion resistance with maximum precision. For this reason, it is used to measure the iron oxide suspension. The measuring tube made of adamantine high performance ceramics, the stainless steel housing and the platinum measuring electrodes all ensure robustness. In addition, there is the special measuring tube design featuring a tapered inlet and outlet as well as flange connections. It is not surprising that leading calibration authorities use the OPTIFLUX 5300 as their master meter. Non-conducting deposits or very low conductivity can be handled using the OPTIFLUX 7300, which features capacitive pick-up. The wetted material then is solely ceramic.

Highly accurate and tough: OPTIFLUX 5300

OPTIFLUX 5300
Electromagnetic flowmeter

- 0.15% accuracy
- For aggressive and abrasive products
- Fully vacuum-resistant
- Ideally suited for dosing applications
- Repeatability < 0.06 %
- Unique measuring tube design for flow profile optimization
- Leak proof with fused-in Cermet electrodes
Communication at KROHNE:
Open for the future

Industrial automation in the process industry has been undergoing rapid change for the past twenty years. This is also reflected in the processes of the chemical and petrochemical industry. Where it was once centralized and largely self-contained control systems that dominated, today the pace is set by intelligent, decentralized architecture.

Thus, system concepts in which the products of the most diverse manufacturers work harmoniously together are becoming a reality via open, standard interfaces such as HART®, PROFIBUS® and FOUNDATION™ fieldbus.

KROHNE has been actively following this development for years. Whether the topic is batch dosing and mixing, new safety concepts or the use of special materials.

KROHNE is committed to making communication convenient. Which is why our field devices communicate reliably with controllers, process control systems (PLC/DCS) and standalone PCs.

They meet all of the prerequisites for integration into modern plant asset management systems, based on integration technologies such as DD/EDD and FDT/DTM.

We are a longstanding member of PACTware™ and the FDT Group®. Since 2003, we have made DTMs available for our field devices with HART®, PROFIBUS® or FOUNDATION™ fieldbus interfaces.

PACTware and all KROHNE DTMs are available free of charge and fully functional without a license. They are included on a CD with each delivery of the device and are available in the KROHNE download centre.
Calibration at KROHNE: 
Certainty you can count on

Calibration is one of KROHNE’s core areas of expertise. If you buy a KROHNE product, you will get a measuring device that performs most accurate with low uncertainty under real process conditions.

To achieve this, we operate more than 120 calibration facilities for volume flow, mass flow, level, temperature, density and pressure to (wet-)calibrate any device we manufacture. For example, every flowmeter is wet-calibrated using water or air as standard before leaving our facilities. We can also provide customer specific calibration.

For calibration we only use direct comparison of measurands [e.g. we calibrate our Coriolis mass flowmeters with a gravimetric weighing system]. Our calibration rigs are the most accurate used in measuring device production worldwide: the accuracy of the reference is usually 5 to 10 times better than that of the meter under test.

This goes for small as well as for very large sizes: KROHNE operates the world’s most precise volumetric calibration rig for flowmeters up to DN 3000/120” with a certified accuracy of 0.013 %. The reference vessel is a 44 m/144 ft high tank containing almost ½ million litres/132,000 gal (US) of water which allows for a maximum flow rate of 30,000 m³/h/7,925,000 gal (US)/h.

Our meters can be calibrated and certified according to various standards such as OIML, API, Measurement Instruments Directive (MID 001, 002, 004, 005), GOST, etc. The standards we use for calibration are ISO/IEC 17025 accredited and traceable to international or national standards. Regular inspections by national metrology institutes, round robin tests and alignments with national and international metrological standards according to ISO 9000 and EN 45000 guarantee the quality and comparability of our calibration rigs. Staff performing the calibrations are trained and given regular re-trainings to ensure quality and continuity.
KROHNE

product overview

- Electromagnetic flowmeters
- Variable area flowmeters
- Ultrasonic flowmeters
- Mass flowmeters
- Vortex flowmeters
- Flow controllers
- Level meters
- Temperature meters
- Pressure meters
- Analysis products
- Products and systems for the oil & gas industry
- Measuring systems for the marine industry

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