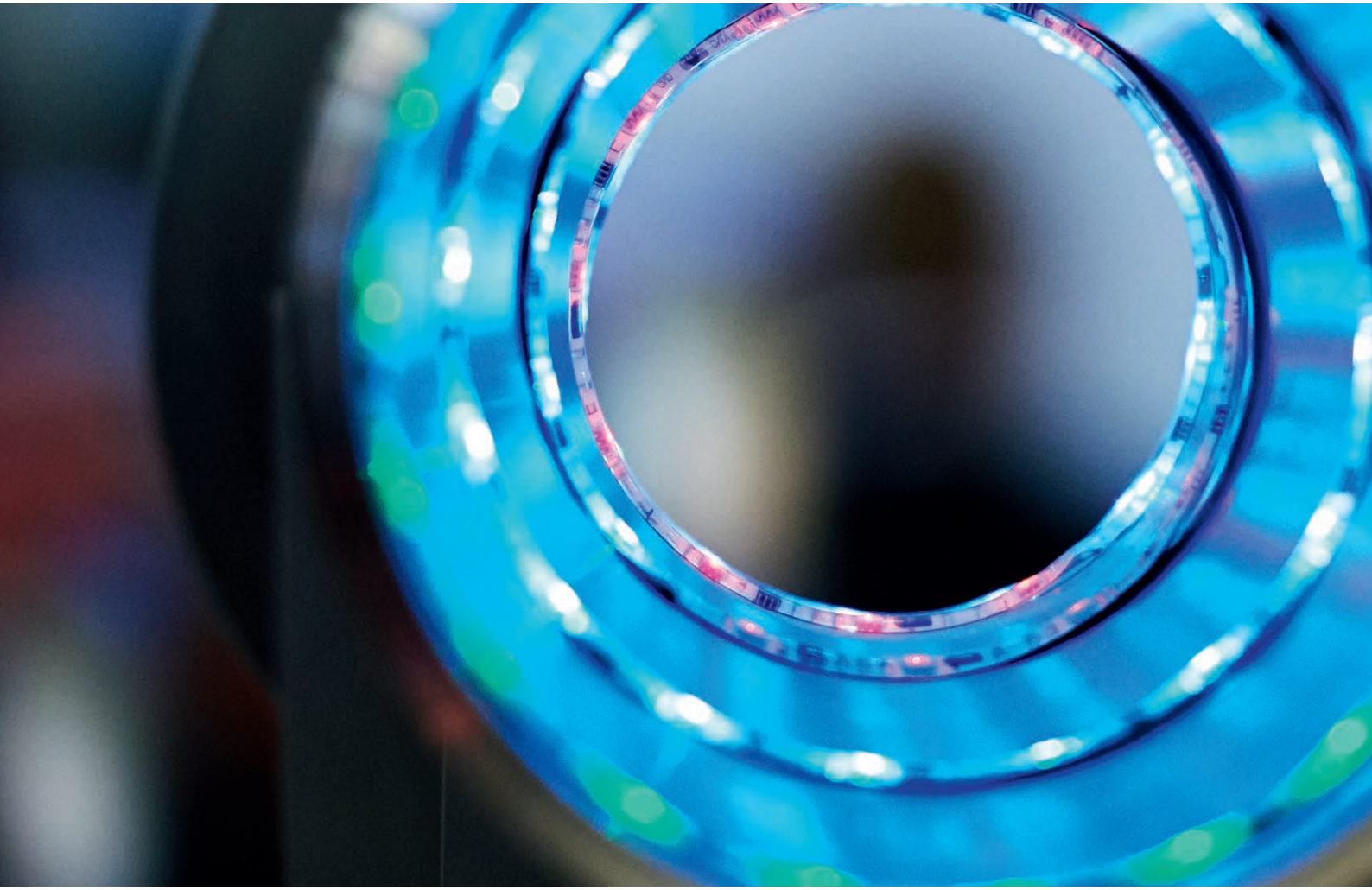
Flow measurement

Competence in flow measurement



WIKA

Part of your business

About us

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.

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.

Alexander Wiegand,
Chairman and CEO, WIKA

Able to meet any challenge

For the measured variable of flow, WIKA offers a wide-ranging portfolio of measuring instruments and solutions, including supporting services, from planning through to process integration. It is tailored to meet any requirement of our customers worldwide.

- Largest product range for primary flow components
- Global production and engineering network
- Subsidiary calculation centre and also flow calibration laboratory certified in accordance with ISO 17025

You will find us in all well-known supplier lists that are also used by the leading engineering and contractor companies.

In parallel to the technical implementation, we also pay attention to the operating costs of our customers.
Our measurement solutions contribute to value creation.

- High accuracy
- Ease of maintenance
- Low pressure loss
- Small footprint

The manufacturing sites

Euromisure, Italy

Micro Precision, India

WIKA Flow Division, USA

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Competent and reliable

High accuracy is a decisive criterion in many applications for flow measurement, especially in high-tech fields. It creates the conditions for the functionality and cost-effectiveness of each process.

In order to fulfil the accuracy requirements consistently, the measuring instruments must be calibrated regularly. Our calibration laboratory can check all types of flow meters, both primary (Venturi tubes, orifice plates) and secondary (MAG and ultrasonic flow meters).
The calibration is carried out in accordance with ISO/EC 17025 on the basis of gravimetric method (reference standard: ISO-4185:1980).

Calibration testing line

		RIG 2	RIG 3	RIG 4
Max. overall weight	32,000 kg	7,000 kg	1,500 kg	400 kg
Flow range	300 ... 2,700 m³/h	50 ... 700 m³/h	10 ... 125 m³/h	0.8 ... 25 m³/h
Line size	12 ... 20"	6 ... 10"	4 ... 6"	< 6"

Flow measuring instruments ...

The most common method for measuring flow is based around the differential pressure principle. It has proven itself and is applicable for all common types of media. The primary flow elements are based on this method of measurement.

For applications with liquids, gases and steam, a large selection of these flow measuring instruments are available from WIKA.

We combine the flow elements with differential pressure measuring instruments or accessories into efficient and economical complete solutions. Furthermore, on request, we can also assemble other measurement technology for process monitoring to fit your needs.

Primary flow elements

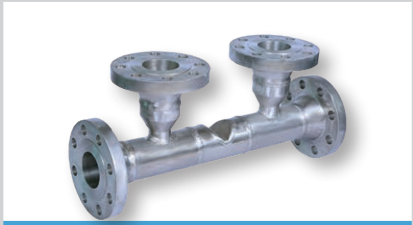
Orifice plates and flanges

Nozzles

Cone flow meters

Restriction orifices

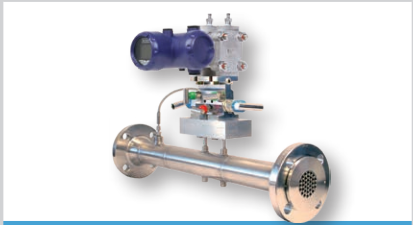
Venturi tubes



Wedge flow meters

Meter runs

Pitot tubes



Engineered solutions

… at a glance

With our extensive product range, from standard to customer-specific solutions, we are equal to all challenges in the field of flow measurement. The measuring instruments and accessories comply with all major international directives, feature worldwide approvals and meet the highest standards of quality and safety.

Additional products

Air flow sensors

Flow switches

Magnetic flow meters

Converters

Sensors

Compact and smart

We make it easier for our customers to implement their measuring points by supplying ready-made measuring arrangements, consisting of the respective flow element and high-quality measurement technology (differential pressure transmitters, electrical thermometer for temperature compensation). The compact assemblies can be effortlessly integrated into the process.

With smart solutions like this, not only do our customers reduce both their acquisition and installation costs, but they also lower their maintenance costs, since the number of leakages can be reduced by up to 70 percent with professionally installed and tested measuring systems.

Orifice plates

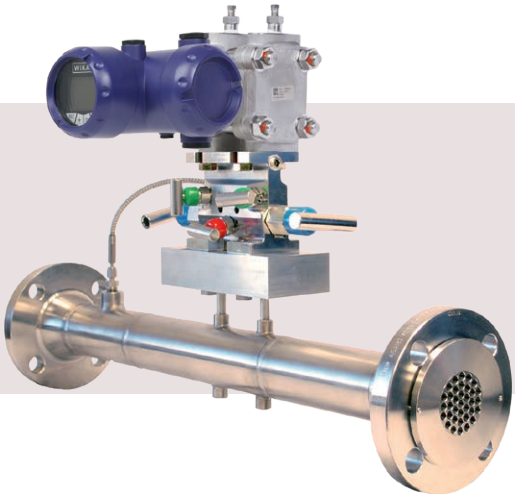
Simple to install and easy to maintain: Orifice plates are the most commonly used flow element. Depending on the application, there are also versions with measuring flanges and annular chambers.

FloTec pitot tube

This pitot tube (here shown in the fixed version) measures media in closed lines by multiple sensing. Due to its small footprint, it significantly reduces the permanent pressure loss.

HHR ProPak

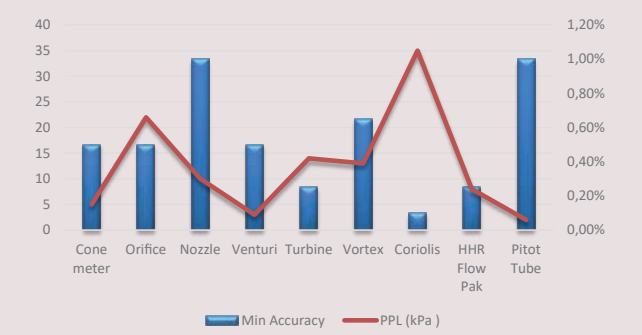
The ProPak flow meter has defined new performance standards for applications in the oil and gas industries. The instrument is approved for measurements requiring verification in accordance with API 22.2.



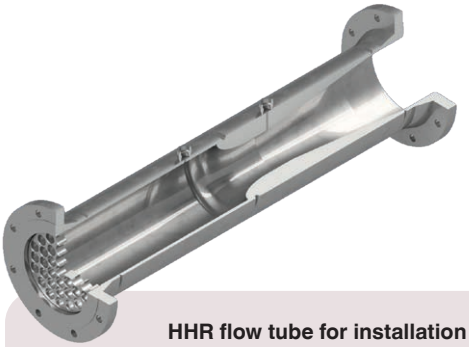
Energy-efficient

Differential pressure flow meters generally cause a permanent pressure drop in the process. This must be compensated by additional pumping capacity. The required energy demand for this can increase the annual operating costs, sometimes significantly.

HHR flow tubes, Venturi tubes and pitot tubes demonstrate that they can reduce the pressure drop and thus operate energy-efficiently. They have been designed for a wide range of applications.



Venturi tubes and HHR flow tubes provide the highest level of traceable accuracy with minimal pressure loss. The main advantage of the FloTec pitot tubes lies in an even lower pressure drop (<10 % of the differential pressure) as well as in the constant measurement accuracy over a wide range of Reynolds numbers.



HHR flow tube for installation in tight spaces

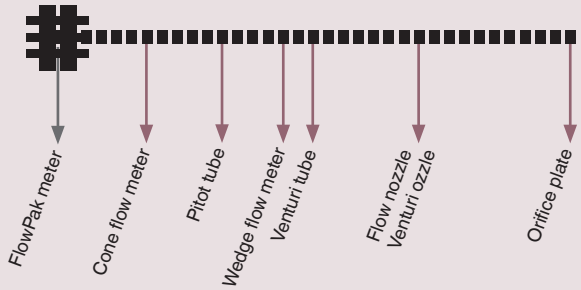
Fabricated Venturi tube for large pipes

Barstock Venturi tube for small pipes and special alloys

Extractable FloTec pitot tube

Space-saving

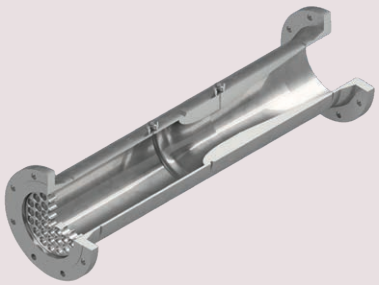
A flow measurement with primary elements requires, as a rule, a straight upstream and downstream pipe. This can be comparatively long, depending on the flow conditions and accuracy requirements, and calls for the corresponding space requirement. WIKA has therefore developed flow meters specifically for applications with limited mounting space which also offer a high accuracy without long meter runs.

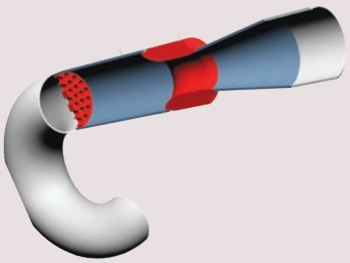


HHR FlowPak

The HHR FlowPak flow meter is a technological advancement in flow profile formation.
It does not require any upstream and downstream pipes and can even be fitted following two 90° pipe elbows.

The HHR FlowPak is thus the optimal solution for applications with limited space. At the same time, the instrument meets the requirements for high accuracy, low operating costs and a long service life.





FloCone cone flow meter

The cone flow meter is also ideal for compact installation situations. Due to an optimised flow profile, only a very short upstream and downstream pipe is required. Nevertheless, the robust instrument offers a wide and stable turndown and, at the same time, a high accuracy and repeatability.

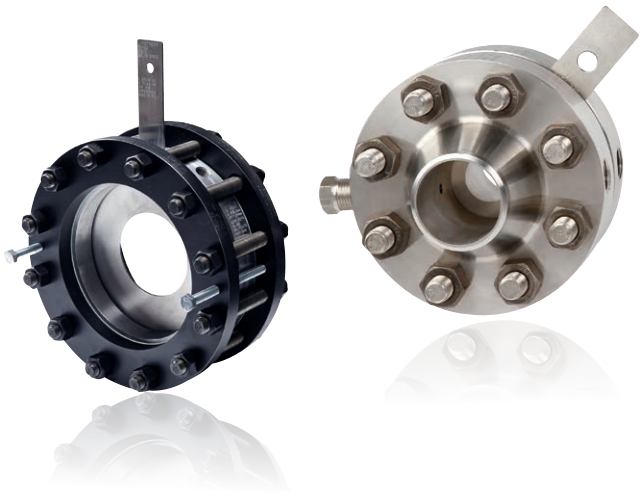
The FLC-FC cone flow meter is produced in accordance with the ISO 5167 reference standard. Part 5 of this standard refers to the installation and operating conditions and gives further information for calculating the flow rate and its uncertainties.

Critical media

For every flow measurement, critical media represent a special challenge. Whether aggressive or highly viscous liquids or erosive slurries: We have a solution for each application with corresponding measurement characteristics and durability.

Special orifice plates

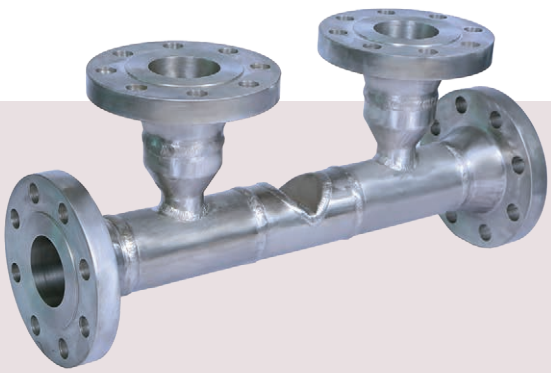
Quarter circle and conical entrance orifice plates, segmental orifice plates and eccentric orifice plates are, in many cases, the best choice for measuring liquids with low Reynolds numbers and liquids with higher densities. These instruments, which are as simple as they are effective, are proven over a long time. These orifice plates are also available in versions with orifice flanges and annular chambers.



Wedge flow meter

Due to its construction with a V-shaped wedge, the wedge flow meter is very well suited for measuring the flow of slurry and highly viscous media. It is also extremely robust against particle-laden, abrasive and erosive media.

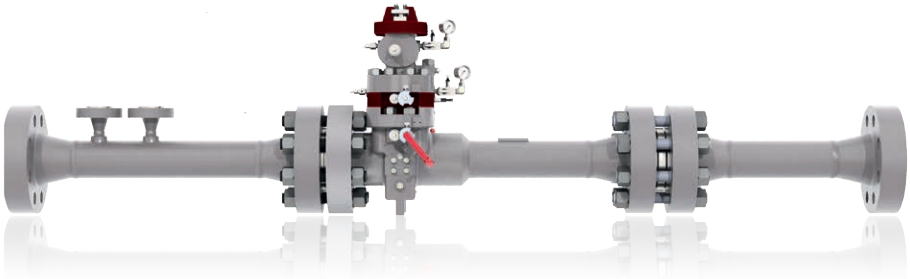
In the case of aggressive media, the differential pressure measuring instrument installed on the wedge element is subject to influences that can lead to measuring errors and damage the instrument. For continuous and problem-free measured value registration, WIKA therefore offers a complete solution with a diaphragm seal system. In this way, the process transmitter is securely separated from the process.



Meter runs

For the highest possible accuracy, primary flow elements are generally integrated into the process as meter runs, thus as a unit with upstream and downstream pipes. Meter runs are also available in a threaded design with a flow measurement add-on. If a higher accuracy is required, the instrument must be calibrated.

With the implementation of meter runs, WIKA relieves its customers of all effort: Even before the order is placed, our qualified on-site service team records all required dimensions and parameters. We design, build and test the meter run to the desired specification. Subsequently, we will then install it professionally and ready-for-operation into the plant.

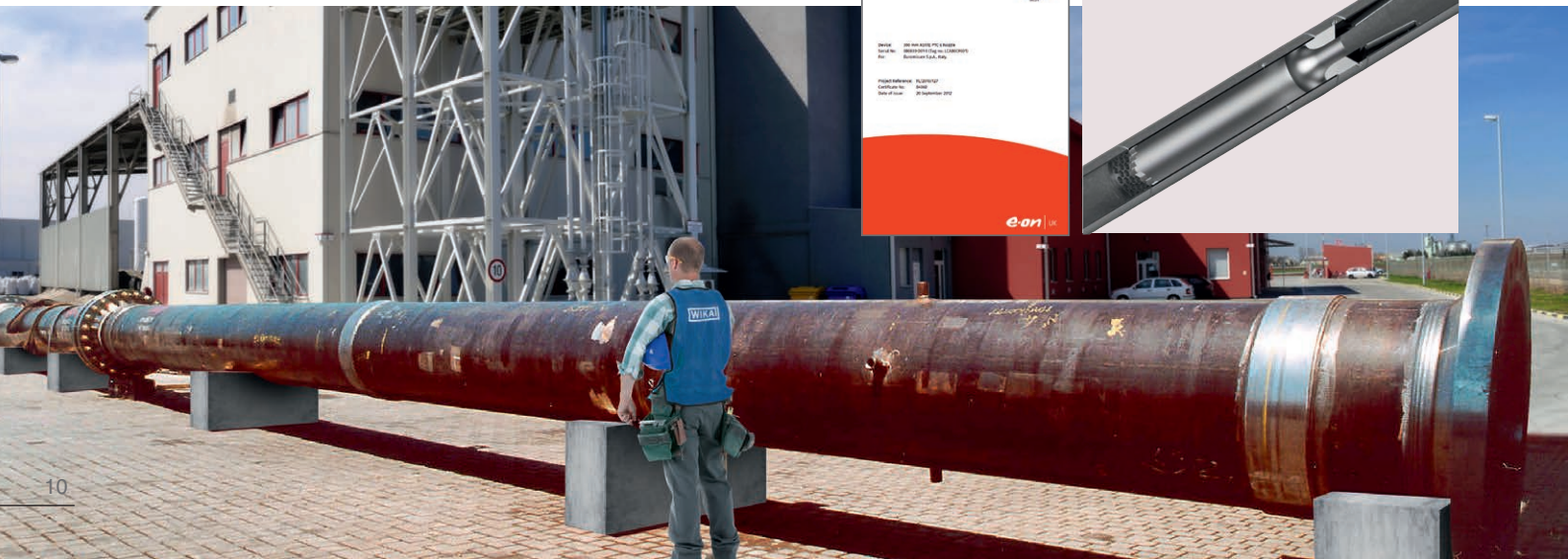


Designed in accordance with the following standards: ISO5167-1:2003, ASME MFC-3M or AGA3

Flow nozzle test sections

These precise measuring instruments are manufactured exactly in accordance with the provisions of the ASME PTC6 standard for steam turbines. The are used in the acceptance testing of power plant turbines.

The nozzles measure the flow of boiler feed water and condensate. WIKA has already delivered more than 300 assemblies of this type to energy companies.



Restriction orifices

To correctly perform the measurement task, in some processes, the flow rate must be limited or the pressure reduced. For this purpose, a restriction orifice is installed in the pipeline, either in a single-step design or – particularly in the case of high differential pressures – as a multi-step restrictor.

Each restriction orifice is an application-specific solution. It is designed by our experienced specialists, depending on media properties, pressure loss and process data. Performance and dimensions are calculated to exclude the potential negative effects of sound, noise levels and cavitation.

Safety is a top priority at WIKA. Since, in the chemical and pharmaceutical industries, different substances and active ingredients are often produced in the same plant, there must be no risk of leakage from the measuring instruments used in the process. For such processes, there is the multi-step restriction orifice as a special design without dissimilar material welds, which prevents potential media leakage.

Attractive solutions

Our comprehensive portfolio of electromagnetic flow meters, which are based on the Faraday principle, includes high-quality sensors and converters suitable for many different applications. These instruments can accurately measure the flow of any electrically conductive liquid and require minimal or no inlet/outlet straight runs.

In addition, all our flow meters are compatible with our field verificator device, a portable and totally automated unit of diagnostic and verification tool, allowing easy on-site check of meter's performance without the need to stop the flow. Maintenance-free and a wide range of nominal sizes are only a few advantages of these solutions.

Model FLC-406
Converters: Compatible with all sensor bodies, our signal converters offer a wide choice of performances, from the standard process monitoring up to highly accurate custody transfer measurement. A versatile power supply option offering enables the flow meter to be fully operative even in remote locations without power connectivity.

Model FLC-1000EL
Compact wafer sensors installed between two flanges surrounded by studs.

Model FLC-2300
Flanged sensors: For repeatable and accurate measurements, even in difficult/problematic applications with solid particles or very low flow rates

Model FLC-2770
Inserted sensors: The best solution when cost saving and good performance are needed

Model FLC-2400EL
Specifically designed for use in the food processing industry

Model FLC-2100F
Special version with Victaulic® connection for increasing safety, ensuring reliability and maximising efficiency in firefighting and anti-seismic systems

Long-term reliability

The technical reliability of our products for an accurate and repeatable flow measurement is critical to safe and efficient plant operation. Our solutions have been designed for long life without performance restrictions, even under harsh operating conditions.

This is ensured by simple configuration, process integration and maintenance as well as carefully selected materials and components.

Our delivery reliability doesn't allow for the creation of any bottlenecks. All flow measurement products are available in the long term and are delivered to customers on time.

High velocity

Flow nozzles provide reliable, accurate flow measurement and long-term repeatability, particularly in steam applications with high flow velocities.

Even distribution

Radiant Venturi nozzles are used, for example, in steam cracking furnaces and are installed there at the inlet of each radiant coil. The nozzles provide even flow distribution, even when the pressure loss increases due to uneven coking in one or more coils.

Control of the media mix

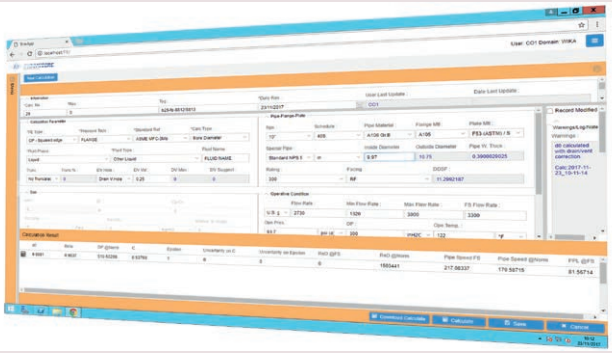
In the blower systems of combustion furnaces, the adjustment of the fuel-air ratio to the firing capacity is controlled by Venturi tubes.
In such cases, the flow meters are referred to as aspirators or proportional mixers.

We have the experts for your requirements

Many measuring tasks can be fulfilled with standard products. However, for a large number of requirements, an individual approach is essential. With our comprehensive technological know-how and a unique level of in-house production depth, we can provide you with the optimum solution for your application.

When developing a measurement solution, our experts around the world rely on internet-based dimensioning software that is protected by copyright. It enables a design calculation in accordance with the ISO 5167: 2003, ASME MFC-3M and AGA3 standards. In addition, there is an interface for the calculation of flow elements and restriction orifices, in the latter with special consideration of the problems of throttling, sound, noise and cavitation. In addition, the software includes a multi-stage calculation option for liquid and gas.

The parameters required for dimensioning the measurement solution can be transmitted by the customer via the input mask.



Trust through quality

We offer our customers outstanding quality, which is maintained through permanent checks. We place the same high demands on our suppliers. For only with excellent initial and intermediate products can we deliver consistently reliable products to you.

Extensive test procedures

Liquid penetrant inspection (LPI) is used to locate surface defects on relatively smooth and non-porous materials. This test method is normally used for welded parts to guarantee a good quality of the weld surface.

Magnetic particle inspection (MPI) is a non-destructive test method for the detection of surface and sub-surface discontinuities in ferrous materials.

X-ray testing based on the differing absorption of penetrating radiation. Thus it can detect differences in density due to material composition, thickenings, flaws and welded or soldered joints. X-ray tests are normally used for components that must fulfil critical requirements.

Hydrostatic pressure tests (HT) are used to (statically) test assemblies, piping systems and Venturi tubes under their working pressure. The hydrostatic pressure and strength test is conducted with water at ambient temperatures.

Ultrasonic testing is a method in which high-frequency sound waves are introduced into a material. Any surface or subsurface discontinuities or flaws that are present interrupt the sound waves and reflect a proportion of them. Ultrasonic testing often replaces X-ray methods.

Positive material identification commonly applies spectroscopy with X-ray fluorescence analysis.
This testing of material composition is ideally suited for proving the accuracy of material certificates or for identifying material.

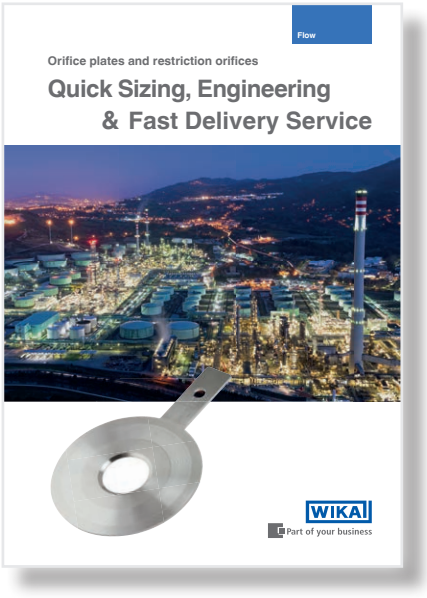
All around the world – close to our customers

Capability and flexibility

Proximity to our customers is essential for efficient solutions. Whether standard products or custom designs: Working with you we'll find the right concepts for your requirements.

As a provider of high added-value solutions to our customers, WIKA offers a quick dimensioning service combined with localised fast delivery shops.

Whether it be scheduled maintenance or unplanned urgent replacement, WIKA can always meet your needs.



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