

# Measurement technology for industrial gases





### About us

The WIKA Group is a global market leader in pressure and temperature measurement. The company also sets the standard in the measurement of level, force and flow, and in calibration technology.

The broad portfolio of high-precision instruments, IIoT solutions and comprehensive services makes WIKA a strong and reliable partner for all the requirements of industrial measurement technology. The family-run business, founded in 1946, has a global presence with 11,200 employees.

This includes our own subsidiaries, production sites and development departments, such as the Innovation Center in Klingenberg. There alone, over 100 engineers work on innovative sensing solutions that provide answers to global challenges.

WIKA's unique experience and know-how make sensing technology smarter, add more value and prepare it for a sustainable future: "Smart in sensing".

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# WIKA – Your partner for industrial gas measurement

Whether in metal processing, water treatment, medicine and healthcare, firefighting, alternative fuels industry, in technology and research, the food and beverage industry or manufacturing applications: Modern industrial and medical gas supply technologies enable us to store, distribute and use compressed and liquefied air and chemical gases efficiently and sustainably.

Metalworking companies, carbonated drink distributors, users of cryogenic and compressed gas storage equipment, industrial gas distributors, breathing air supply systems and firefighting infrastructure, usage of LPG, CNG and LNG as gaseous fuels; all these serve as good examples of gas usage in today's world.

All the gas applications listed are subject to stringent standards and regulations. In this context, a high level of occupational safety, energy and labour cost savings and the optimisation of supply chain costs are required. To meet these challenges, WIKA offers manufacturers, distributors and operators of industrial gas equipment a comprehensive range of measuring instruments to cover a wide range of requirements.

We of course back this up with individual consultancy and customisation support. Together, we will find appropriate solutions for your measurement task. Through its competence, reliability and a worldwide sales and service network, WIKA has become a global contract partner to renowned international companies in the industrial and medical gases sector.

You too can benefit from our services! With this brochure, you will receive an overview of our products and services for industrial and medical gas technology. We will be pleased to assist you with any questions you may have.



# **Cryogenic tanks**

Measuring instruments in cryogenic tanks, ISO containers and tank trailers are used to monitor the level of cryogenic gases. Pressure indicating instruments normally show the absolute pressure or differential pressure. Measuring instruments in tank trailers, in addition, show the pressure before and after the cryogenic pump. On request from OEM manufactures and gas companies, tanks and trailers are equipped with integrated or standalone transmitters. Our customers in this field are manufacturers of cryogenic vessels, companies maintaining and refurbishing cryogenic vessels, industrial gas companies, companies leasing ISO containers and suppliers of associated cryogenic monitoring systems.



### Product selection Cryogenic tanks



# Welding and other industrial equipment

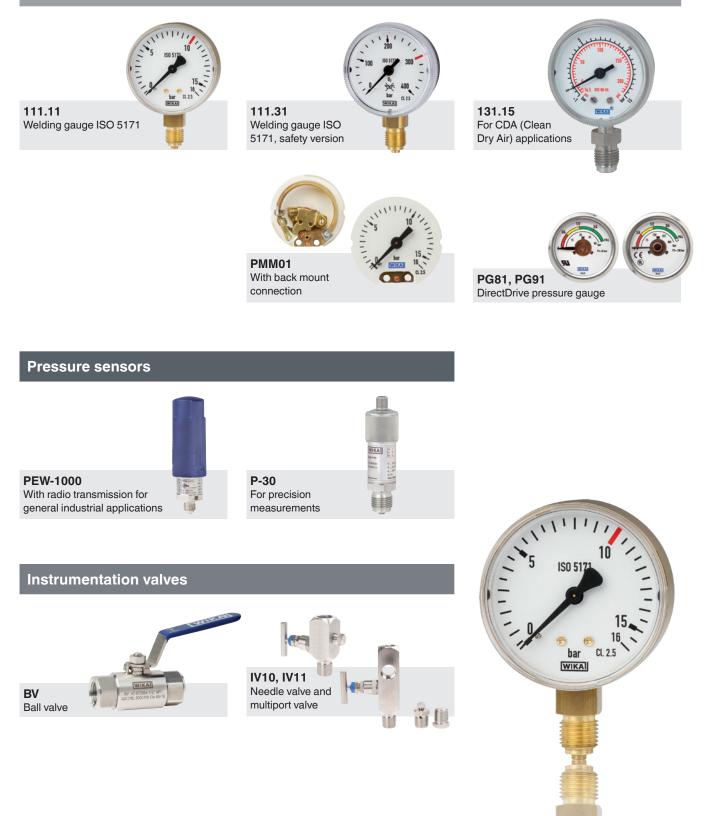
Pressure measuring instruments with a Bourdon tube are frequently used in welding regulators. Such measuring instruments are used in conventional regulators in the traditional "mickey mouse" design as well as in regulators with flow meters, and also as an integrated component in the plastic case of a regulator unit.

One measuring instrument shows the pressure in the gas cylinders and the other in the gas distribution line. With the exception of traditional welding applications with brass regulators, such measuring instruments on nickel-plated regulators can be used in laboratories and in the speciality gas industry and drinks distribution. Users in this field are OEM valve manufacturers, gas companies, distributors and manufacturers of welding, beverage and other industrial equipment.





### Pressure gauges



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# Valves with integrated pressure regulators (VIPR)

WIKA cooperates with several renowned valve and regulator manufacturers. As time has passed, the design of regulators has become ever more complex in order to ensure higher protection and better utilisation of the measuring instruments.

This has led to the development of measuring instruments that are directly integrated in the valves (VIPR = valve with integrated pressure regulator). Initially as mechanical, and then later as mechatronic/electronic instruments.

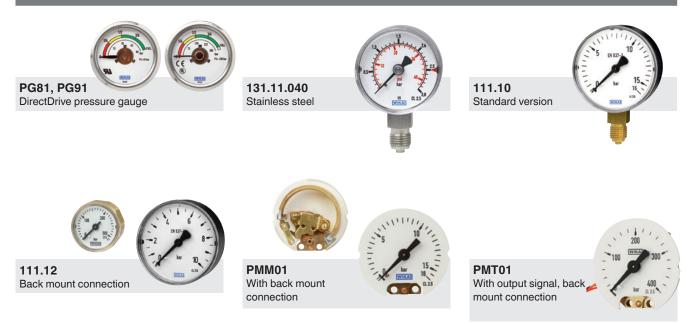
The task of measuring instruments in such regulators is to indicate the pressure in a gas container and in the supply line. Modern electronic versions can indicate the remaining usage time, the gas flow rate and the level and also send an alarm when gas contents are low and communicate this wirelessly.







### Pressure gauges



Pressure sensors

0-10

MTF-1

OEM version





Metal thin-film sensor assembly

MPR-1 Sensor module





9

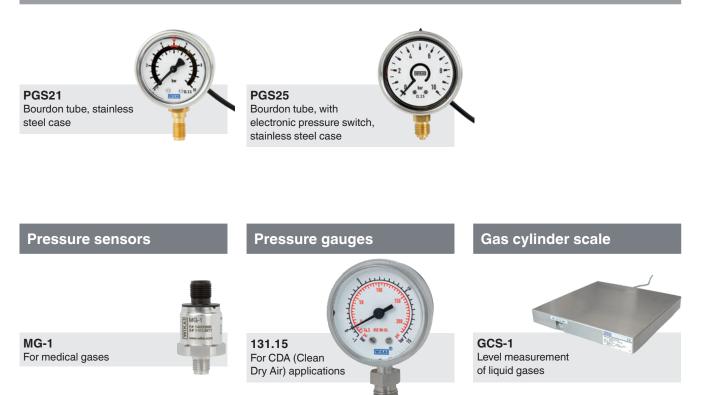
### Gas cabinets

Gas cabinets are used for firefighting. The gas cylinders contain inert, non-reactive and non-toxic gases. The market offers a variety of gas cabinets in different configurations, e.g. 1-, 2- and 3-cylinder designs (or based on company configuration). They can be either new, used, or reconditioned. A gas cabinet can have different features depending on the specific gas. These features include a gas sensor, a sprinkler head, an overflow sensor, automatic operation with automatic purging and overpressure sensor. The connection and valve specifications for gas cabinets and distribution systems are important in selecting the correct measuring and transmitting instruments.





### Pressure switches



#### Instrumentation valves

fittings and accessories



## **Medical gases**

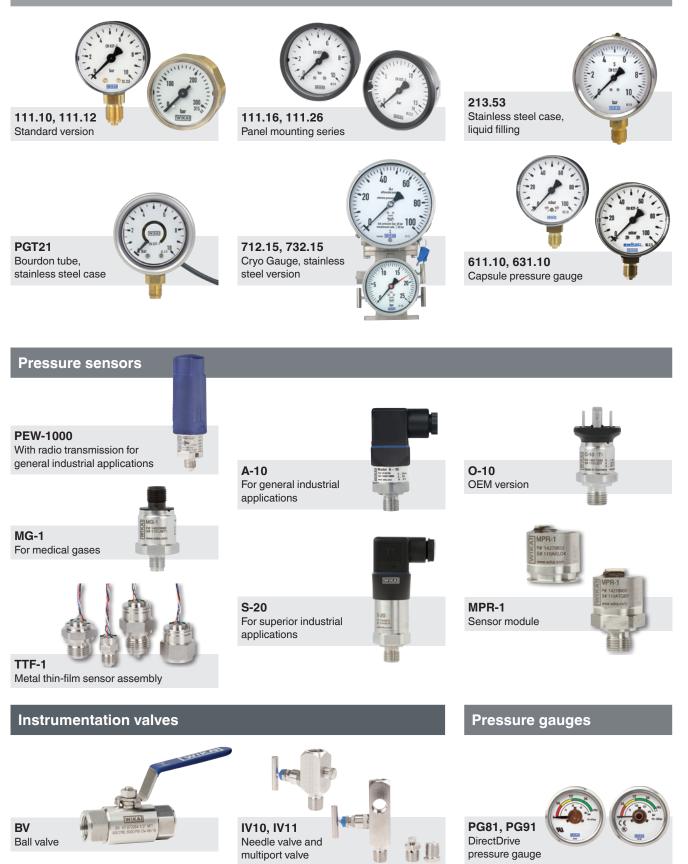
Whether in the emergency room, the operating room, the intensive care unit, the hospital ward or in ambulance vehicles: Medical gases are widely used in hospitals. There is a variety of medical gases: medical air, carbon dioxide  $(CO_2)$ , helium (He), laughing gas  $(N_2O)$ , nitrogen  $(N_2)$ , nitrogen monoxide (NO), oxygen  $(O_2)$ , xenon.

To secure smooth supply and distribution of gases, measuring instruments are installed on gas storage tanks or cylinders, valve manifolds, pressure controllers, closure control cabinets as secondary regulators at gas distribution systems and at user stations. For vacuum monitoring, pressure gauges are used. Our customers in this area are gas companies, manufacturers of medical devices and also manufacturers of pressure reducers for medical applications.





#### **Pressure gauges**



# Hydrogen

Because of its calorific value, hydrogen is often used as fuel. Hydrogen fuel cells generate electricity from oxygen and hydrogen. Fuel cells are used in automobiles, spacecraft, remote weather stations and submarines. Other uses for hydrogen are in the fertiliser and paint industries, in laboratories, in the food industry and the chemical industry. Hydrogen is also used in welding processes. TIG welding and plasma welding are particularly noteworthy here. Hydrogen is required as a reducing agent in chemical industries. Hydrogen has higher requirements for material stability than other gases. Our customers who use instruments in hydrogen applications are often in the automotive industry, the manufacturing of fuel stations, gas supply systems, test benches for laboratories, gas analysing equipment, etc.





### Pressure sensors



#### **Process transmitter**



**UPT-20** Universal process transmitter, intrinsically safe, Ex i

**TF44** Strap-on temperature sensor with connection lead

**Resistance thermometers** 

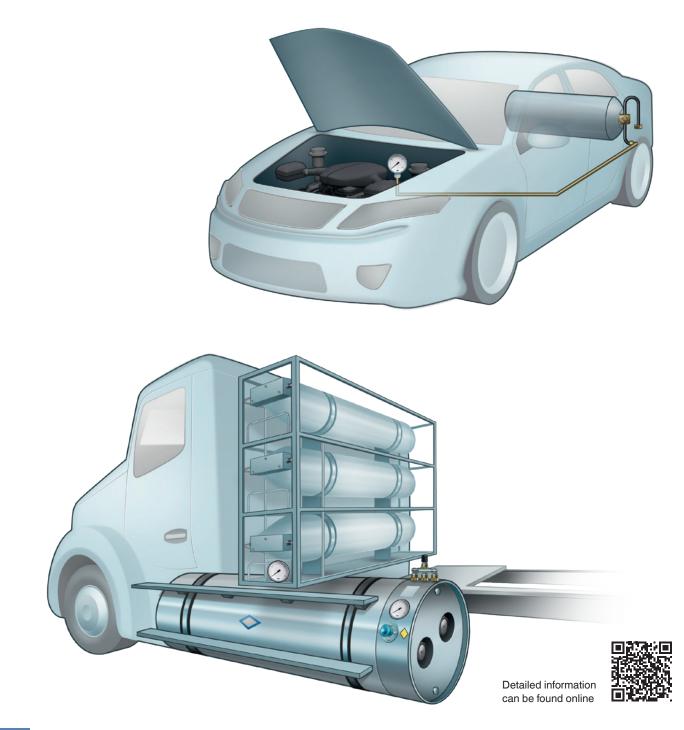
**TR10-H** 

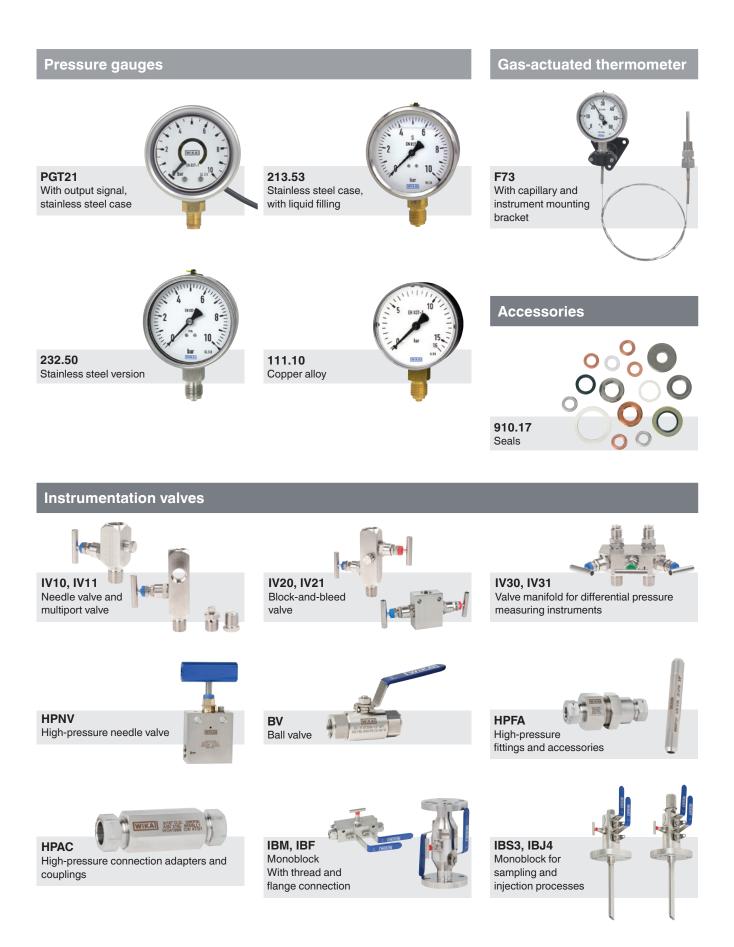
### For insertion, screw-in with optional process connection

Products for use in hydrogen applications are available on request.

## LNG and CNG accessories

When travelling with a natural gas fuelled car one can save up to 60 % on fuel costs. Moreover, natural gas is one of the cleanest energy sources: It generates no unburned hydrocarbon emissions, which are considered hazardous and carcinogenic, and reduces  $CO_2$  emissions by 20 %. This is why these vehicles are allowed on roads on which others are not. WIKA measuring instruments are used to indicate the level of compressed (CNG) or liquefied (LNG) natural gas inside of a tank.





## **Protective breathing apparatus**

Protective breathing apparatus are often referred to as self-contained breathing apparatus (SCBA), compressed air breathing apparatus (CABA) or simply breathing apparatus (BA).

Protective breathing apparatus is worn by rescue workers, firefighters or others to provide breathable air in life-threatening or unhealthy atmospheres.

The pressure gauges from WIKA are installed on the valve of the breathing apparatus cylinder or on a mobile hand-held instrument. They are used to display the oxygen remaining in the cylinder, so that appropriate measures can be taken in good time. WIKA supplies its products to leading international manufacturers of protective breathing apparatus.





### Pressure gauges





#### **Pressure sensors**



TTF-1 Wetal thin-film sensor assembly



MTF-1 Pressure sensor module **M-10** Spanner width 19, miniature design



MG-1 For medical gases



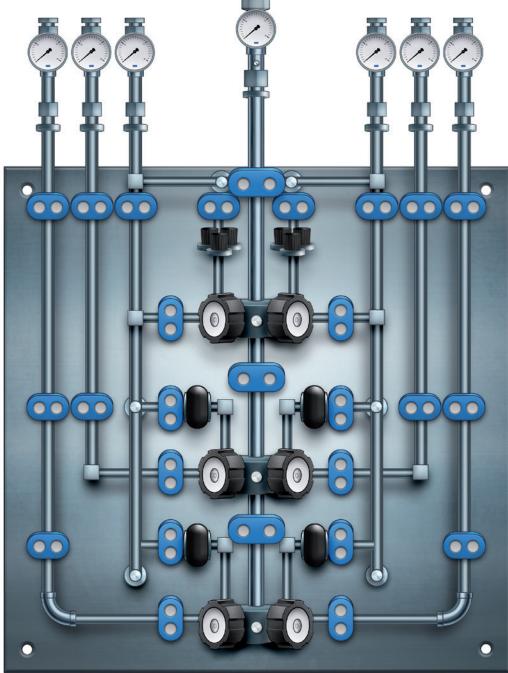
Instrumentation valves



## Gas supply and control systems

In the gas industry, where safety and reliability are of critical importance, the correct regulators equipped with appropriate measuring and control instruments are vital to regulate gases precisely.

The control is ensured through a system of regulators, mechanical measuring and switching instruments as well as transmitters. For these applications, WIKA supplies products to industrial gas companies and manufacturers of gas supply systems (e.g. point of use panels, primary pressure control panels etc.), particularly in the speciality gas and chemical industries.



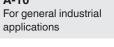


### **Pressure switches**



Pressure gauges
Pressure gauge
Press

### Pressure sensors





**PEW-1000** With radio transmission for general industrial applications

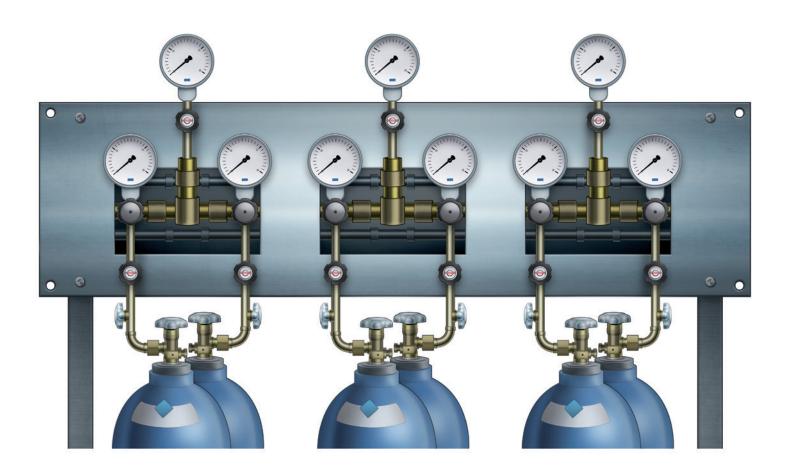
#### Valves and protective devices



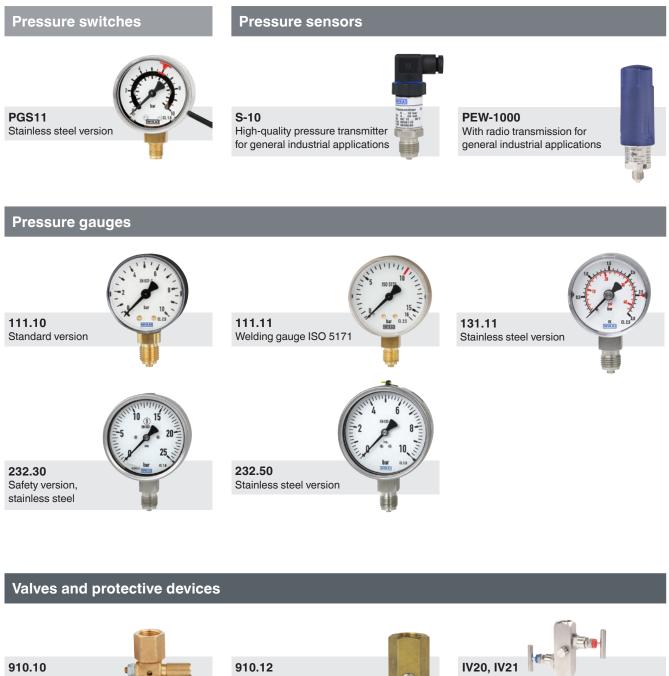
Monoblock

## **Cylinder/valve manifolds**

A cylinder manifold is a group of gas cylinders, commonly used to supply gases via a pipeline. Via a valve manifold, the cylinders are often grouped into a primary and a secondary bundle. Initially, the gas from the primary bundle is used first, where the gas is consumed equally from all cylinders, as they are connected in parallel through a common outlet. Once the levels in the cylinders are sufficiently low, a pressure transmitter switches to the secondary valve manifold, so that the primary cylinder bundle can be exchanged. Valve manifolds are used to supply gas from one central source to different usage points. In hospitals, for instance, manifolds are used to supply nitrous oxide, Entonox or oxygen.









Check valve

BV

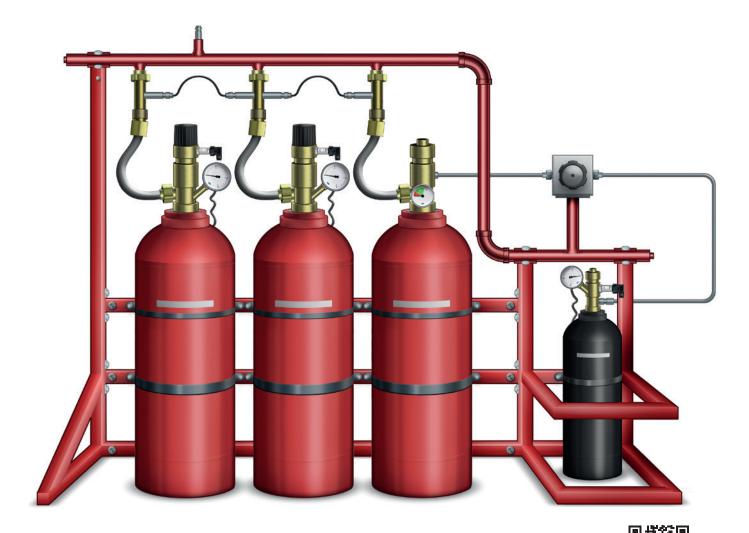
Ball valve

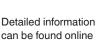
WIKA can supply valve manifolds equipped with flange connections in accordance with IEC 61518. We can also offer customer-specific air distribution manifolds.

# Gas-based fire suppression systems

The firefighting industry covers a variety of applications in industrial, commercial and residential markets. This typically functions in one of two ways: The first reduces the oxygen content in the atmosphere to a level where self-sustained combustion can no longer occur. The second is to react chemically with the fire-absorbing heat and initiate a chain reaction that stops the combustion.

Gas-based fire suppression systems ( $CO_2$ , FM200<sup>®</sup>, Novec<sup>TM</sup>, Inergen<sup>®</sup>, Argonite) are a critical component for protecting property and human life in a wide range of buildings such as apartments, data centres, hospitals, hotels, parking garages, restaurants and universities as well as in manufacturing and processing plants. The task of pressure gauges is to monitor and trigger an alarm when the pressure in gas cylinders deviates from the required values. To use instruments in stationary systems, a VdS or LPCB approval is required. In contrast, pressure switches for mobile firefighting systems do not need this approval. Here WIKA works in close cooperation with OEMs in the firefighting industry and with valve manufacturers.





### **Pressure switches**



### **Further applications**

### **Dispensing systems in pubs**



The design of beer dispensing systems is subject to stringent technical specifications and performance requirements. The pressure gauges are used with regulators to control the flow of beer push gas, i.e. a mixture of  $CO_2$  and  $N_2$ .

These can be found in pubs, smaller breweries with bars, restaurants, etc. The customer base ranges from specialised OEM valve manufacturers to service and installation companies within this market.



### Nitrogen and oxygen generators



Nitrogen and oxygen generators represent an alternative to generating and storing oxygen and nitrogen for laser cutting, electronics, shipping, healthcare or the beverage industry. Generators substitute and eliminate the use of high-pressure gas cylinders.

Measuring instruments in generators are used to define the gas flow in the take-off line as well as to monitor the pressure swing adsorption process (PSA) and, alternatively, to monitor the pressure inside the vessel, where the required gas is generated. Here, both mechanical pressure gauges (with liquid filling) as well as transmitters, such as the MG-1, are used.

### **IIoT providers and telemetry integrators**



Manual inventory checks are a thing of the past. The telemetry subsegment in the industrial gas market is represented by companies that deliver the inventory level, the pressure and the temperature as data – via connected sensors and a cloud data platform. The customers communicate online with their stocks of compressed or liquefied gas to generate forecasts, set alerts and optimise supply chain costs.



### **End-to-end IIoT solutions**



WIKA offers intelligent sensor solutions to provide answers to global challenges and promote mutual growth in the packaged industrial gases sector.

As the market leader, WIKA has the potential to make data profitable along the entire value chain and develop it as one of the most valuable resources. The WIKA portfolio offers IIoT-capable devices, connectivity and cloud solutions, as well as mobile applications and customised dashboards.





### **Further applications**

### Gas mixing systems

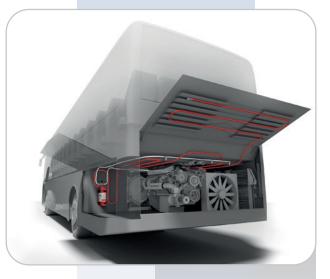


Gas mixers and gas mixing systems are used in many industries. Amongst these are protective atmosphere packaging in the food industry, welding in the automotive industry, glass manufacturing, etc.

Measuring locations can include mechanical pressure gauges, such as 213.53 and also pressure sensors, such as O-10.



### **Firefighting in vehicles**



To prevent fires on buses, caused by engine overheating, modern vehicles are equipped with on-board firefighting systems based on inert gases for fire suppression and dry chemical extinguishing agents.

Typical customers are manufacturers of automatic fire suppression systems for critical and harsh environments. In these applications the PSM02 pressure switch, for example, can be used.

### **Ambulance vehicles**



OEM manufacturers of ambulance vehicles are involved in the design of on-board oxygen supply systems which must satisfy stringent healthcare requirements.

These on-board oxygen systems not only include high-pressure gas cylinders with regulators but also built-in vacuum suction, monitoring and supply systems to control the stock of required gas.



### Gas cylinder bundles



Manufacturers of gas cylinder bundles (also called "cradles" in the USA) are often companies who maintain and refurbish gas cylinders.

The size and pressure of the bundles vary greatly and, thus, also the associated measurement technology: from mechanical pressure gauges up to sensors, transmitters and telemetry.

### **Push-pull market strategy**



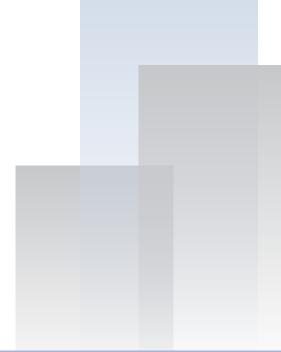
To meet the market requirements and learn the technical product requirements, WIKA maintains healthy business relationships with stakeholders in the industrial gas sector.

The peculiarity of the industrial gases market segment is that WIKA's customer base is mainly represented by relevant OEM manufactures - manufacturers of valves, gas supply systems, gas cabinets, cryogenic tanks, protective breathing apparatus, etc.

The major part of all of the industrial gases infrastructure which contains measuring units is used and owned by major industrial gas companies and gas distributors. That is why their involvement in the start-up phases at WIKA is becoming increasingly important in order to understand the market requirements and the industry standards. In some applications it is feasible to go to such users as fire services, hospitals, beverage distributors or users of welding equipment to learn further specifics about the market.

Knowing the requirements of the end users helps WIKA, on the one hand, to develop a PUSH strategy; and on the other hand, close relationships with the users' OEM suppliers are the basis for a PULL strategy.





### **Customer focus is at the forefront**

#### WIKA is a customer-oriented organisation.

To approach the market as closely as possible, WIKA conducts dedicated value innovation workshops with its customers. In such a way, WIKA generates ideas on further product development and market adoption requirements for individual customers.

Consequently the ideas collected are processed by one of the specialised development departments at WIKA for customer-specific solutions. This helps to establish good relations with the engineering departments of customer organisations. The lasting relationship with key customers has ensured the transfer and systematisation of knowledge on measuring instruments since WIKA was founded over seventy years ago. This is a solid base for the development of new products.

Even if quality, delivery performance and cost pressure represent hygiene factors in current day-to-day business with industrial gases, with its go-to-market strategy WIKA has confidently started dialogues relating to new, digitally communicating products. Image recognition, Bluetooth data transmission and higher pressure requirements are just a few of the challenges that WIKA has been successfully tackling since the start of the new millennium.

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