



The catalogue has been presented by: We would be pleased to help you with any questions you may have. You can reach your contact person on +49 7135 102-**Sales Group Industrial Technology** Pressure. Temperature. Level. Germany -300 Export -266 Sales group gas analysis Gas analysis and service instruments Germany -166 Export -450 Service and repairs Hotline -211 www.afriso.com/contact



Dear business partner

Whether you are looking for products for groundwater protection, flue gas monitoring or industrial measuring and control technology solutions for process engineering – the AFRISO range provides proven, competitively priced series products.

The catalogue DOMESTIC TECHNOLOGY covers all products for safety and measuring equipment for heating systems, solutions for energy savings and water technology as well as alarm units, sensors, actuators and smart building systems for wireless building automation.

The catalogue INDUSTRIAL TECHNOLOGY comprises the complete range of high-quality measuring instruments and system solutions for pressure, temperature and level as well as customised, industrial solutions for stationary gas analysis – for your specific industrial application.

The catalogue PORTABLE MEASURING INSTRUMENTS covers certified mobile service measuring instruments for flue gas analysis as well as testing and inspection equipment for maintenance and diagnostics. Ready to be used in any industry.

In addition, we develop and manufacture complex customised products as well as complete system solutions – precisely to your specifications. Going against the general trend, we insist on a high degree of vertical manufacturing integration from our own tool design and construction department all the way to fully automatic assembly machines for electronic components. This makes us fast, flexible and independent.

For us, globalisation is an opportunity to market our products – manufactured in Germany and Europe – on a global scale.

As a medium sized company, we place particular importance on personal contact with you. There are many factors that set AFRISO apart from others – one of them is the people who make up the company. Competent experts provide you with optimum solutions – both technically and economically. And whenever you need it, a well trained team of service experts is at your disposal.

We look forward to a successful cooperation.

Best regards

Matthias Blasinger

Managing Director Sales and Distribution

AFRISO-EURO-INDEX GmbH

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Contents and Product Range

Capsule pressure gauges, Bourdon tube pressure gauges, diaphragm pressure gauges, pressure gauges with electrical contacts, differential pressure gauges, accessories for pressure gauges
Diaphragm seals, piston type chemical seals, in-line chemical seals
Pressure transducers, digital pressure gauges, differential pressure switches
Electronic and mechanical temperature measuring instruments, bimetal chemical, stainless steel and industrial thermometers, gas filled thermometer in chemical version, pipe temperature sensors, thermowells, industrial thermometers, resistance thermometers
Level – Continuous: Hydrostatic, capacitance, ultrasound, potentiometric, magnetostrictive, guided micropulse Level – Switches: Conductive, capacitance, vibration, ultrasound
Alarm units for layer thickness alarm, overflow alarm, sand alarm or and oil-on-water alarm Gas alarm units in DIN rail housing, gas sensors, test gas units
Gas sampling probes, heated analysis lines/frost protection lines, temperature controllers, universal filters, absorption/adsorption filters, ambient air filters, acid filters, gas treatment systems, gas purifiers, zero air generators, gas coolers, infrared gas analysers, oxygen probes, oxygen analysers, gas analyser BIOLYZER, screw fittings and accessories, measuring system for scrubbers
Isolation amplifiers, supply isolation amplifiers, trip amplifiers, selectors, EX safety barriers, EX supply isolation amplifiers, multifunction transducers, digital plug-in displays, digital display/control units, combined warning light and horn, additional alarm unit, event reporting systems, AFRISO Net web service, WATCHDOG LINE alarm units for event reporting systems

AFRISO service, training, AFRISO PartCommunity, checklists for enquiries, conversion table for pressure units, selection criteria for pressure gauges, dials for pressure gauges, information on the Pressure Equipment Directive, information on flanges and materials,

certificates, General Terms of Delivery

How to work with this catalogue

Table of Contents

Our product range covers measuring, control and monitoring technology for domestic, industrial and environmental applications.

This includes products for groundwater protection, flue gas monitoring, efficient use of energy, use of the sun, geothermal and rain as well as a complete range of pressure, temperature and level instruments.

In addition to the products presented in the catalogues, we manufacture special versions to customer specifications.

Please enquire.

Finding information

The catalogue Industrial Technology is divided into 9 chapters. A chapter overview is provided on pages II and III. The blue chapter tabs on the side of the page let you easily find the desired chapter. Each chapter contains a detailed table of contents as well as an overview table and the main features of the products in that chapter to help you find the product page you need fast.

To find products, you can also use the comprehensive index in the appendix.

Usually, all information on a product is contained on one page and cross references guide you to other pages for fast and easy access to additional information such as fact sheets.

Enquiries

To make enquiries as simple as possible and to assist you in gathering all the necessary information, the appendix contains a number of checklists for enquiries, e.g. for pressure gauges, thermometers and level indicators.

Contact

Our sales department is divided into three industry-specific sales groupes. Please visit www.afriso.de/contact or see the second page of this catalogue for further information on your specific contact person.

Delivery times / stock items

All stock items have part numbers printed in blue in the price lists. Please enquire for the delivery times of non-stock items as they vary greatly depending on the product specifications.

Minimum order quantities / packing units

Many products can be manufactured in small quantities – in many cases, you may even order a single piece.

However, for some items there are minimum ordering quantities or packing units. The price list sections provide the appropriate information.



The product package contains the specified number of products or can be delivered in the specified order quantity



An additional package contains the specified number of products

Small order handling fee / minimum order value

For very small orders with net values below € 100 a handling fee of € 15 will be charged. No other minimum order conditions apply.

Return of goods

Goods can only be returned after prior approval by us and only up to 3 months after delivery. Please note that only standard stock items can be returned; products not available from stock and devices with ATEX approval cannot be returned. For returned stock items we charge 30 % of the price for testing and handling or at least \in 40. Shipping costs for returns are to be borne by the customer.

Prices / terms of delivery

Please refer to your local AFRISO representation or get in touch with the AFRISO headquarters for detailed price information and conditions. We will charge a fee of € 10,– per shipment for drop shipping.

Our Terms of Delivery apply (see www.afriso.com or appendix). This catalogue supersedes all previous versions, including previous prices. All prices subject to change; the catalogue may contain printing errors.

Technical modifications

As we are constantly improving our products, we reserve the right to technical modifications without prior notice.

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AFRISO quality products

AFRISO quality products are continuously being enhanced and are subject to stringent inspections. Quality labels, approvals and certificates designate special features and application areas of our products. For certificates and manufacturer's declarations, please refer to chapter 9 or the Downloads > Certificates section of www.afriso.com.



Det Norske Veritas AS (DNV) is global, independent classification society organised as a foundation with the purpose of safeguarding life, property and the environment, specially in maritime applications. AFRISO products with the DNV label have been tested, classified and certified for compliance with the DNV classifications and standards.



IEC 61508/ IEC 61511 defines the requirements concerning safety-related systems in plants. This standard for functional safety describes Safety Instrumented Systems (SIS) and categorises them into Safety Integrity Levels (SIL 1 to SIL 4). AFRISO pressure transducers are optionally available with Safety Integrity Level 2. The safety-related characteristics are provided via the manufacturer's declaration.



The GOSSTANDART is required as an official certificate for the use or operation of measuring instruments in Russia. The certificate is issued by the Russian Meteorological Institute.





AFRISO is a company member of the expert network of the EHEDG (European Hygienic Engineering & Design Group). The EHEDG issues directives describing characteristics for the hygienic design of devices for processing food. It provides recommendations for the design of components and test methods for using and cleaning devices.. All AFRISO products with the EHEDG certificate label are tested and certified for hygienic design.



The FDA (Food and Drug Administration) is an agency of the United States Department of Health and Human Services. It issues recommendations, directives and test methods for the examination of materials. AFRISO products with the corresponding designations have been tested for material compatibility.



3-A Sanitary Standards, Inc. is a not-for-profit organisation in the USA dedicated to product safety in processes in the pharmaceutical and food industries.



The PED (Pressure Equipment Directive 97/23/EC) specifies the requirements for selling pressure equipment within the European Economic Area. Please refer to chapters 1–3 for further details on our mechanical and electronic pressure gauges.

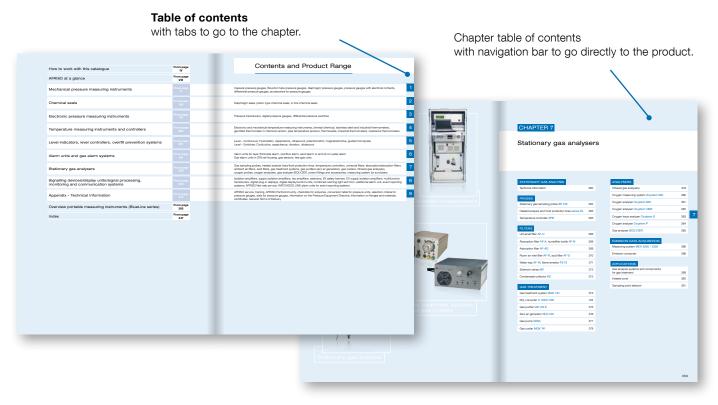


The DVGW is the German technical and scientific association for gas and water. The association is concerned with technical and scientific aspects of the supply of gas and water, implements results in the form of the national German DVGW rules and also contributes to DIN, EN and ISO standards. AFRISO products bearing the DVGW label have been tested and approved in compliance with the stringent safety requirements of the DVGW.



How to work with this catalogue

AFRISO catalogue INDUSTRIAL TECHNOLOGY: Clear structure and layout



Overview table

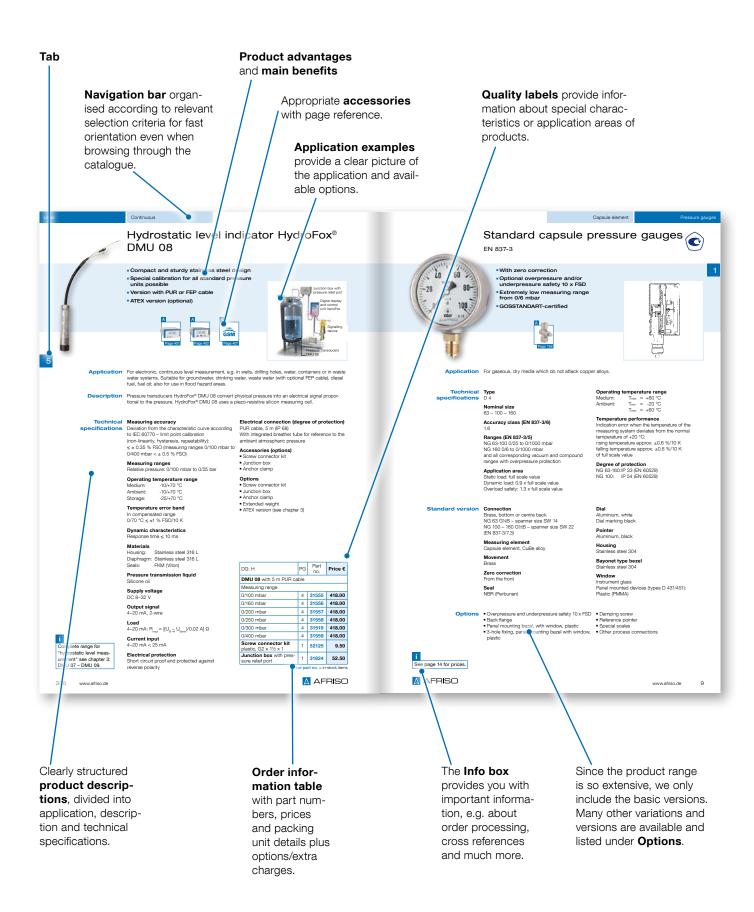
to help you make your selection with comparison of product features.



Find the desired product fast:

- Clear user guidance
- Detailed tables of contents
- Overview tables with product features
- Easy-to-find tabs
- Everything at a glance







Technology for environmental protection

AFRISO monitors, controls and protects the elements fire, water, earth and air – in the broadest sense. On the one hand, these elements symbolically stand for the relief and protection of the environment – and on the other, they illustrate our fields of activity:

- Flue gas control
- Energy savings
- Groundwater protection
- Conservation of resources

Product development revolves around our motto "Technology for Environmental Protection". We strive to improve the environment, to make processes which work with greater environmental compatibility and to avoid putting a strain on the environment. With a balanced portfolio of innovations, proven products, systems and services, we offer our customers efficient solutions which are of great benefit.



Tank. Heating. Water Technology.

With a comprehensive range of building technology products, AFRISO prides itself in "Making Heating Systems Safe". Irrespective of whether the heating system uses regenerative energy or fossil fuels. In addition to this extensive range, a large selection of alarm instruments for the fast detection of level, liquid spillage, leakage, gas or smoke is available.

- Mechanical/pneumatic level indicators
- Overfill prevention systems/overfill alarm systems
- Leak detectors/leak monitoring systems
- Inner tank linings
- Equipment for fuel oil storage tanks, oil carrying pipes, boiler rooms, boilers and heating systems
- Heating controllers
- Distribution manifolds for heating, cooling and geothermal systems
- Smart home systems for building automation
- Valves and control technology for radiators and hydraulic balancing
- Equipment for drinking water supply



Gas analysis and service instruments

The BlueLine series is the perfect solution for official measurements, adjustment, servicing, maintenance and repair work. You benefit from an optimally tuned range of measuring instruments which is continuously setting new standards – from basic devices all the way to portable all-in-one flue gas analysers. AFRISO offers gas analysers, gas sampling probes and turnkey analysis systems with data acquisition systems for continuous emission monitoring.

- Portable gas analysers
- Portable measuring instruments, analysers and testers
- Modular sensor module systems
- Gas alarm units
- Stationary gas analysers
- Emission measurement technology
- Measurement data acquisition systems













Pressure. Temperature. Level.

In addition to our comprehensive range of mechanical and electronic pressure, temperature and level instruments, we also offer suitable mounting and installation accessories as well as display, control and evaluation devices.

AFRISO measuring instruments cover the following ranges:

Pressure: 0/2.5 mbar to 0/4,000 bar Temperature: -50 $^{\circ}$ C to +1,100 $^{\circ}$ C Level: 0/20 cm to 0/250 m

- Pressure gauges
- Accessories for pressure gauges
- Chemical seals
- Pressure transducers
- Bimetal thermometers and gas filled thermometers
- Thermostats
- Resistance thermometers
- Electronic level indicators
- Display, evaluation and control units
- Event reporting systems/communication systems



Special designs and system solutions

In addition to our comprehensive range of standardised, proven off-the-shelf products, we also offer customised special products made exactly to your requirements. We are constantly setting new standards with innovative concepts, e.g. using plastic fittings instead of metal ones or a combination of plastic and brass materials in complex assemblies. Our range does not only cover the delivery of individual sensors, but includes suitable components for power supply and evaluation of the measurement signals. In the case of system solutions, we do the entire engineering for you, all the way to the production of the finished system.

Adapted to your specific requirements

- Housing geometry
- Shape and colour
- Mechanical or electrical connections
- Pre-assembled, tested, ready-to-connect assemblies



We know your industry

AFRISO is at home wherever there is measuring, controlling or monitoring required. As a full-range manufacturer, we offer our customers a broad product portfolio from a single source. A wealth of experience from numerous applications as well as our knowledge of the requirements in the individual markets make us a reliable partner in your industry. We know what is necessary as



The subject of saving energy has been our focus for more than 45 years. From the start, we have supported the move towards geothermal and solar systems as well as the use of biogenous fuels by supplying professional components and assemblies. Our range for the secure storage of fuel oil and professional equipment for heating systems reduces operating costs, helps make optimum use of fuels, provides timely warnings if hazardous situations arise and constitutes an active contribution to

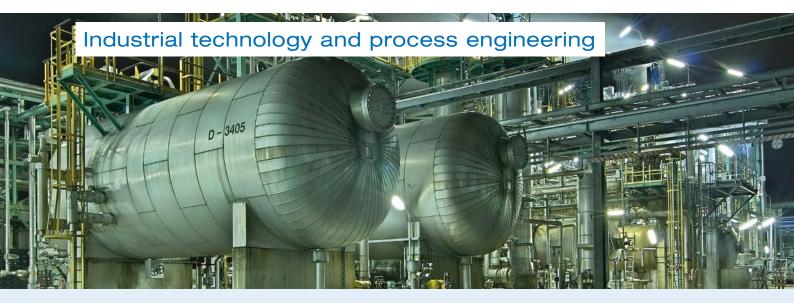
environmental protection. Innovative measuring instruments for flue gas analysis yield high-precision and reproducible results so that your customers can achieve their goals: the right amount of heat at the right time, low energy consumption and low emissions. And we always respond to sustainable new technologies, for example, be providing compelling sensors and systems for increasing security and convenience in smart homes.

Target markets

- Manufacturer of heat generators
- Manufacturers of solar thermal systems
- System suppliers of panel heating systems
- Tank protection/revision
- Tank manufacturers
- Heating and plumbing system wholesalers
- Electrical wholesalers
- Engineering and planning consultancies
- Smart home and building automation
- Manufacturers of fittings
- Chimney sweeps
- Public institutions, municipalities



a result of our many years as a supplier in the OEM business and our intensive contact with standardisation committees, associations and guilds. We tap our employees' know-how and expertise in the industry to make our customers' processes simpler, safer and more competitive. In process engineering, in building technology or facilities – you benefit with a strong partner at your side.



Reliability, precision and a long service life are crucial when it comes to highly automated processes. Our robust measuring devices deliver perfect measurement results and reliably monitor and control simple to highly complex processes – even under

the most adverse conditions. AFRISO solutions meet the pertinent directives and standards. Certificates, for example for food-quality materials, explosion protection and resistance to media and temperatures attest to this.

AFRISO products meet the requirements

- Wide variety of process connections
- Large selection of materials
- Compact designs
- Hygienic and easy to clean
- Suitable for CIP and SIP
- FDA-listed materials
- Silicone-free versions
- Resistant to corrosive and abrasive media
- High overload safety
- Resistant to vibration and temperature

Target markets

- Machines and plants
- Tanks
- Food and beverages industry
- Chemical industry
- Pharmaceutical industry
- Cosmetics industry
- Biotechnology
- Refineries
- Offshore industry
- Mineral oil industry
- Raw materials industry
- Hydraulic and pneumatics (fluid engineering)
- Medical technology, safety engineering
- Energy production
- Technical trade



ΧI

AFRISO quality

Although we serve an extremely wide variety of markets and industries, all AFRISO employees work according to the same values. Reliability, flexibility and independence are the basis of our day-to-day work.

Our corporate culture is marked by a sense of responsibility. We want our employees to be content here with us. Numerous offers for ensuring an optimum work/life balance and continuous optimisation measures within the framework of the occupational health and

safety management system help us show this to the outside world. At AFRISO, quality is systematically planned and, at every stage of product development and production, managed and monitored. This is attested to by national and international approvals and certificates. Quality Assurance as per ISO 9001 and environmental management in accordance with ISO 14001 are a matter of course for us and implemented in every process.





























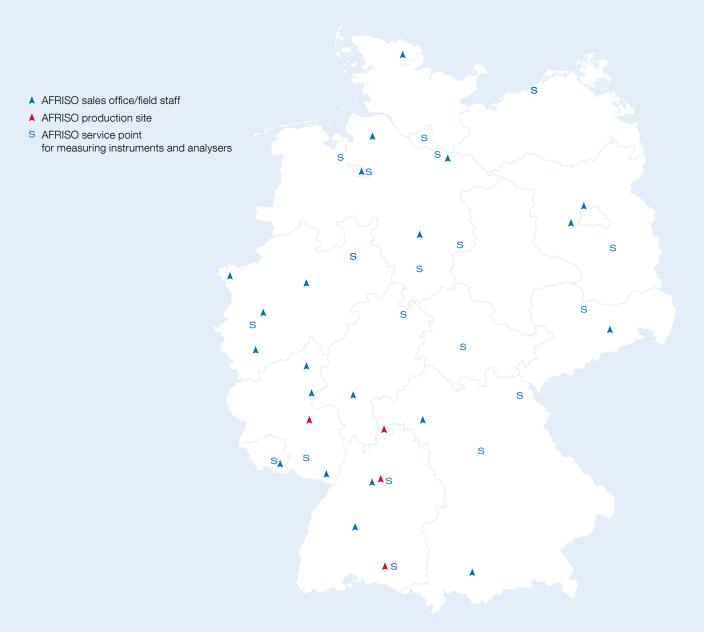








Sites in Germany



We ensure that you get professional,

personal service.

With a staff of more than 80 field and internal experts! Please visit www.afriso.de/contact for further information on your specific contact person.

Business hours:

Monday - Thursday: 7:00 a.m. - 4:50 p.m.

Friday: 7:00 a.m.- 3:00 p.m.

Stocks and logistics

Maximum availability, short delivery times. Our range comprises more than 25,000 different products. More than 3,000 of them are on stock. A total of more than 1,500,000 individual devices and instruments are available ex stock.



AFRISO production sites in Germany

Headquarters AFRISO-EURO-INDEX GmbH Lindenstr. 20 74363 Güglingen Baden-Württemberg



A staff of more than 550 are at work for you in our four German production sites.



Plant Amorbach AFRISO-EURO-INDEX GmbH Friedhofstr. 3 63916 Amorbach Odenwald/Bavaria



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On site worldwide for you

A tightly woven network of branches, distribution partners and service centres guarantees optimum consulting and delivery. More than 1,000 AFRISO employees respond to country-specific challenges with close customer contact and individual service on site – worldwide!

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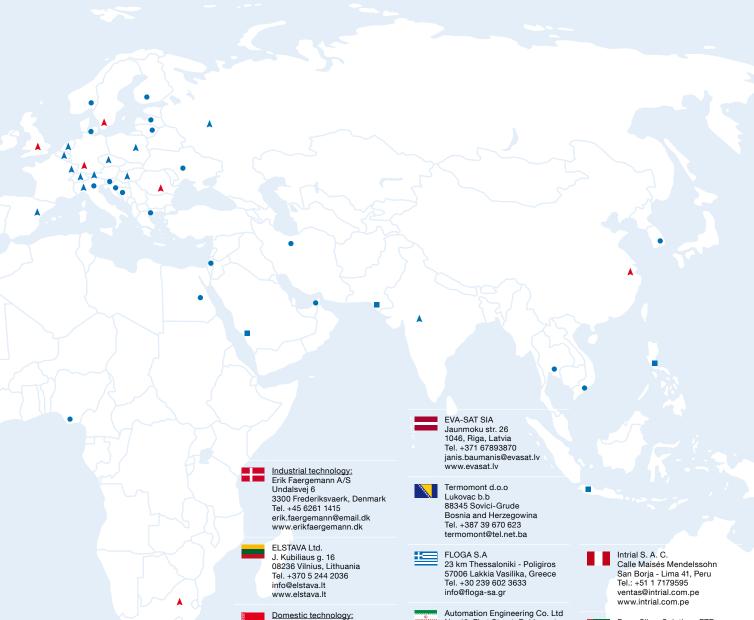
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Tradition and innovation perfectly in tune



Jürgen and Elmar Fritz, great-grandsons of the company founder

In 1869, our great-grandfather Adalbert Fritz founded his company in Thuringia. When his son Franz Fritz, our grandfather, entered the company, the company name changed to "Adalbert Fritz & Sohn", or, in short, AFRISO – which became a renowned brand for temperature and pressure measurement.

For 50 years, the company focussed on glass thermometers, medical glass instruments and laboratory equipment.

A small, thin-walled, circular and concentrically shaped metal sheet completely changed the AFRISO world around 1920. Two diaphragm half shells form a capsule element which expands or contracts depending on the pressure.

Precision pressure gauges, blood pressure measurement instruments and temperature controllers became the most important products for the time up to 1945 and the new beginning after that. After World War II, Franz Fritz and his son Georg, our father, rebuilt the company in Kleingartach and in Güglingen/Württemberg. Pneumatic level measurement devices were developed on the basis of pressure measurement instruments, primarily for fuel oil storage tanks. Other innovations included overfill alarms and leak monitoring systems for the safe storage of mineral oil products. Technology for environmental protection became the main focus of the product range. AFRISO secured the market leadership in this sector.



Georg Fritz 1922-2004



Franz Fritz 1890-1968



Adalbert Fritz 1846-1918

The early 1960s marked the beginning of the internationalisation of AFRISO. AFRISO founded sales and production companies in almost all Western European countries and changed its name to AFRISO-EURO-INDEX.

After the oil crisis in 1973/1974, AFRISO developed a comprehensive range of products for the efficient and environmentally friendly operation of heating systems. After the political change in Eastern Europe, subsidiaries were founded in Hungary, Romania, the Czech Republic, Poland, the Ukraine, Russia and China.

We are now the fourth Fritz generation to lead the company. We are very well aware of the benefits of a medium-sized company with a long tradition of innovation, run by its owners. And we will continue to be reliable partners for our customers, suppliers and employees.

Flmar Fritz

Jürgen Fritz



AFRISO milestones

Products for electronic level measurement extend the range for industrial applications.









Rebuilding of the company in Kleingartach and Güglingen/ Württemberg by Franz Fritz and son Georg Fritz.

Founding of sales and production companies in Western Europe. AFRISO renamed AFRISO-EURO-INDEX.

The future lies in the economical and environmentally compatible operation of heating systems. AFRISO launches a broad product portfolio on the market.

1869 1920 1950 1955 1958 1960 1972 1974

A new era begins: Production of capsule elements as the basis for precision pressure gauges, blood pressure measurement devices and temperature controllers.

Market launch: Level indicators for fuel oil tanks. This is followed by overfill prevention systems and leak monitoring systems for the safe storage of oil products.





Market launch of the first portable electronic flue gas analyser.







Market launch: Product portfolio for solar thermal systems.





Future-orientated: The Stationary Gas Analysis division engineers and implements system solutions for emission data acquisition.



Industry focus: Pressure transducer range DMU 02 Vario with high-flexibility connection technology



Internationalisation: Founding of subsidiaries in Eastern Europe and Russia.

1981 1994 1996

2006 2008 2009 2011

Market launch of the first compact manifold made of plastic.



Founding of subsidiaries in South Africa, China, India and South America.



Innovation: AFRISO presents the EUROLYZER ST, the first all-in-one flue gas analyser.

Market launch:
Product range for hydraulic balancing





Expansion and new brand identity of the AFRISO group

■ New company logo launched:



Measurement technology a step ahead: Modular sensor system AFRISO CAPBs® for BlueLine measuring instruments, smartphones and tablets.

2012

2014

2016



Wireless AFRISO smart home system for building automation



Catalogue Industrial Technology

2017/2018



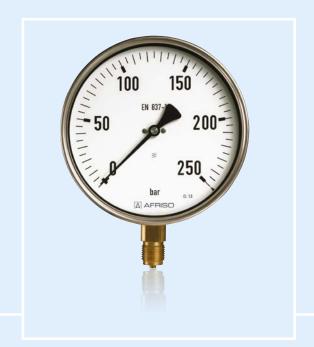
Capsule pressure gauges



Pressure gauges for special applications



Diaphragm pressure gauges



Bourdon tube pressure gauges

CHAPTER 1

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Mechanical pressure measuring instruments (pressure gauges)

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Shut-off cocks/valves for pressure gauges

Pressure gauge push-button stop cock

Overpressure safety device,

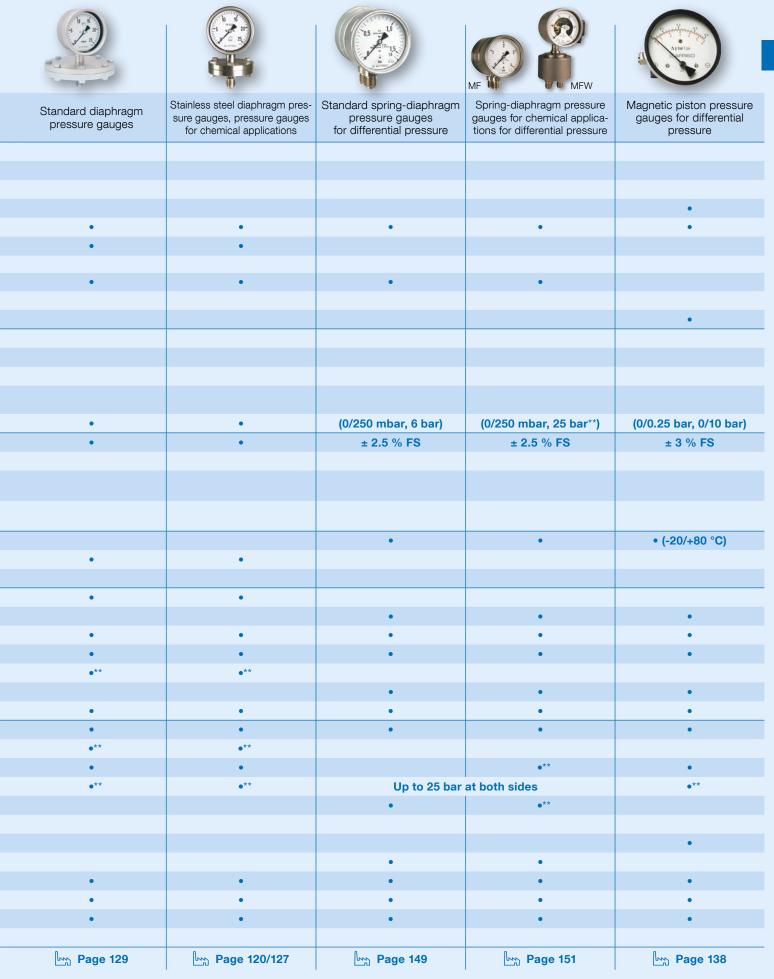
Accessories for pressure gauges

155

156 157

Mechanical pressure measuring instruments at a glance

		150 150 200 - 250	10 60	la seminaria	200 300 400 500 = 100 000 000 000 000 000 000 000 000
		Standard capsule pressure gauges	Capsule pressure gauges for chemical applications	Standard Bourdon tube pressure gauges/gauges for industrial applications	Bourdon tube pressure gauges / stainless steel pressure gauges Pressure gauges for chemical applications
NG 40				•	•
NG 50				•	•
NG 63		•	•	•	•
NG 80	size	•		•	•
NG 100	ng s	•	•	•	•
NG 160	Housing	•	•	•	•
NG 250	운			•	
Bottom process connection		•	•	•	•
Centre back process connection		•	•	•	•
Process connection both ends					
-25/0 mbar to -1000/0 mbar		•	•	• (-1 bar)	• (-1 bar)
0/25 mbar to 0/1000 mbar	Ø	•	•		
0/0.6 bar to 0/1600 bar	Ranges			• (max. 1,000 bar)	•
0/2500 bar to 0/4000 bar	Rai				Pressure gauges for high pressures
0/10 mbar to 0/25 bar					
≥ Class 1.6		•	•	•	•
≥ Class 1.0	acy	•**		•	•
≥ Class 0.6	Accuracy			Precision pressure gauges	Precision pressure gauges
≥ Class 0.25				Precision pressure gauges	
Operating temperature range -20/+60 °C	tion	•		•	
Operating temperature range -20/+100 °C	plica		•		●**
Operating temperature range -20/+60 °C Operating temperature range -20/+100 °C Operating temperature range -20/+150 °C Relative pressure measurement Differential pressure measurement	Ap				●**
Relative pressure measurement	10	•	•	•	•
Differential pressure measurement	reas	•		•	•
Measurement of gases	n B	•	•	•	•
Measurement of liquids	atio			•	•
Crystallising media	Application area			•*	•*
Thermal engineering/pneumatics	Apr	•	•	•	•
Process engineering		•	•	•	•
Housing filling (glycerine, paraffin)			•**	•	•
Safety version					Safety pressure gauges
Electrical contacts	ŧ			•**	•**
Overload safety 10 x FSD	Options/extra equipment	•			
Back flange	ädiip	•	•	•	•
Clamp fixing	a ec	•	•	•	•
3-hole fixing, panel mounting bezel	extr	•	•	•	•
Damping screw	ns/e	•	•	•	•
Reference pointer	otio	•	•	•	•
Max. pointer	ŏ	≥ 250 mbar	≥ 250 mbar	•	•
Special scale		•	•	•	•
Bezel for panel mounting				•	•
*Only in connection with chemical seal. **Depending on version.		Page 7	Page 16	Page 21/32	Page 52/55



Pressure gauges - Mechanical pressure measuring instruments with elastic measuring elements



Bourdon tube pressure gauges

The measuring element of a Bourdon tube pressure gauge is a C shaped or helical metal tube closed at one end. For pressure ranges up to a maximum of 60 bar, the tube has an oval cross section and the shape of a C. For higher pressure ranges, the tube is bent into the shape of a helix. The oval cross section is obtained during bending. When pressure is applied, both types of bent tubes try to regain their original shapes, the straight tube. In this process, the radius increases and this displacement is converted into a circular movement by the movement. Bourdon tube pressure gauges are suitable for a wide variety of applications in measuring liquids and gases; they are the most commonly used pressure gauges. They are used for pressure measurements from 600 mbar up to several 1000 bar.



Capsule pressure gauges

Capsule pressure gauges are used in gas technology applications for low pressure ranges. Two concentrically shaped diaphragms are connected at the outer edges by means of welding or soldering. One diaphragm has an opening in the centre through which the gas to be measured can flow in. The pressure in the capsule causes it to arch to the outside. A deflection lever at the opposite side of the inlet opening transmits the linear displacement to a movement and converts it into a rotary movement. As early as in the 1920s, AFRISO patented this system as the "fine pressure gauge".

Capsule pressure gauges are exclusively used for dry and clean gases at measuring ranges from 6 mbar to 1,000 mbar.



Diaphragm pressure gauges

Diaphragm pressure gauges use a concentrically shaped diaphragm which is directly connected to the process connection. The pressure is applied to the process side of the diaphragm. A rod at the opposite side which is fitted with a movement converts the displacement of the diaphragm into a rotary movement. Diaphragm pressure gauges are used for gaseous and liquid media within the range from 10 mbar to 25 bar; the media can even be viscous or crystallising if the process connection opening (open flange) is sufficiently large.

With a flush welded diaphragm, they are ideal for measurements in hygienic processes.



Spring-diaphragm pressure gauges

Spring-diaphragm pressure gauges are ideal for measuring low differential pressures at high static pressures. The pressures act on two pressure chambers separated by an elastic diaphragm. If there are different pressures in the chambers, the diaphragm is axially displaced against a compression spring. This displacement is transmitted to a movement by a rod and converted into a rotary movement. The differential pressure is directly indicated by a pointer. The diaphragm is held by a metallic support which results in an overpressure safety of up to 25 bar at both sides. Diaphragm pressure gauges are used for liquids that are not highly viscous and for differential pressure from 250 mbar to 25 bar.



Magnetic piston and magnetic diaphragm pressure gauges

Magnetic piston type pressure gauges and magnetic diaphragm pressure gauges are primarily used for measuring differential pressure at filters which are subject to high static pressures. The pressures act on two pressure chambers separated by a diaphragm and/or a piston. If there are different pressures in the chambers, a rod with a permanent magnet is axially displaced against a compression spring. The permanent magnet transmits this displacement to the pointer by means of a ring magnet mounted to the pointer hub. The pointer indicates the pressure difference. Magnetic piston pressure gauges and magnetic diaphragm pressure gauges are used for the measurement of differential pressure of gases from 2.5 mbar to 10 bar; a static pressure of up to 350 bar is permissible.



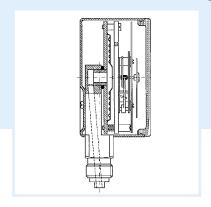
Capsule element

EN 837-3



- With zero correction
- Ideal for low pressure ranges
- GOSSTANDART-certified





Application For gaseous, dry media which do not attack copper alloys.

Technical Types specifications

D2 / D3

Nominal size

63 - 80 - 100

Accuracy class (EN 837-3/6)

Ranges (EN 837-3/5)

0/25 to 0/1000 mbar and all corresponding vacuum and compound ranges with overpressure protection

Application area

Static load: full scale value Dynamic load: 0.9 x full scale value Overload safety: 1.3 x full scale value

Operating temperature range

Medium: $T_{max} = +60 \, ^{\circ}C$ $T_{min} = -20 \, ^{\circ}C$ Ambient: $T_{max} = +60 \, ^{\circ}C$

Temperature performance

Indication error when the temperature of the measuring system deviates from the normal temperature of 20 °C:

rising temperature approx. ±0.6 %/10 K falling temperature approx. ±0.6 %/10 K of full scale value

Degree of protection

NG 63-80: IP 33 (EN 60529) NG 100: IP 44 (EN 60529)

Standard version Connection

Brass, bottom or centre back NG 63 G1/4B - spanner size SW 14 NG 80 - 100 G1/2B - spanner size SW 22 (EN 837-3/7.3)

Measuring element

Capsule element, CuBe alloy

Movement

Brass

Zero correction

From the front

Seal

NBR (Perbunan)

Aluminium, white Dial marking black

Pointer

Aluminium, black

D 2 - black, sheet steel D 3 – stainless steel 304

Window

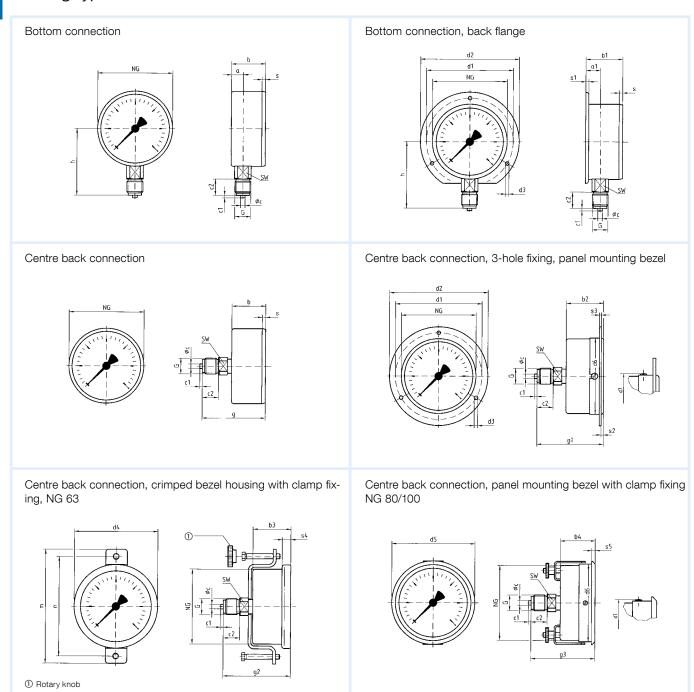
Clip-in plastic

- Options Back flange
 - Panel mounting bezel (D3)
 - 3-hole fixing, panel mounting bezel
 - Measuring system stainless steel (NG 100)
- Damping screw
- Reference pointer
- Special scales
- Other process connections



Type D 2/D 3 - NG 63/80/100

Housing types and dimensions



Dimensions (mm)

•	•																				
Nominal size (NG)	а	a ₁	b	b ₁	b ₂	bз	b4	Øc	C1	C 2	dı*	d2	d 3*	d4	d 5	d6	d7	G	g	g1	g ₂
63	9.5	12	33.7	36.2	35.7	30.5	-	5	2	13	75	85	3.5	68	68	64	66	G¼B	56.7	58.7	53.5
80	14.8	17.8	43.3	46.3	44.6	-	46.5	6	3	20	95	110	4.8	-	86	81	83	G½B	75.3	76.6	-
100	15.6	19.1	44	47.5	45.6	-	47	6	3	20	116	132	4.8	-	107	101	105	G½B	76	77.6	-
Nominal size (NG)	g 3	h	m	n	S	S1	S 2	S 3	S4	S 5	SW										
63	-	52.7	94	82	3.7	5.5	3	2	7	4	14										
80	78	69	-	-	3.8	5.5	3.5	2	-	4.5	22										
100	79	87	-	-	3.5	5.5	3.5	2	-	4.5	22										

 $^{^{\}ast}$ Dimensions for NG 100 according to DIN 16014.

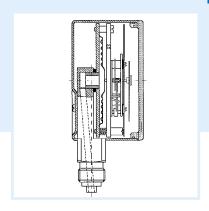
Capsule element

EN 837-3



- With zero correction
- Optional overpressure and/or underpressure safety 10 x FSD
- Extremely low measuring range from 0/6 mbar
- GOSSTANDART-certified





Application For gaseous, dry media which do not attack copper alloys.

Technical Type specifications

Nominal size

63 - 100 - 160

Accuracy class (EN 837-3/6)

Ranges (EN 837-3/5)

NG 63-100 0/25 to 0/1000 mbar NG 160 0/6 to 0/1000 mbar and all corresponding vacuum and compound ranges with overpressure protection

Application area

Static load: full scale value Dynamic load: 0.9 x full scale value Overload safety: 1.3 x full scale value

Operating temperature range

Medium: $T_{max} = +60 \, ^{\circ}C$ $T_{min} = -20 \, ^{\circ}C$ Ambient: $T_{max} = +60 \, ^{\circ}C$

Temperature performance

Indication error when the temperature of the measuring system deviates from the normal temperature of +20 °C:

rising temperature approx. ±0.6 %/10 K falling temperature approx. ±0.6 %/10 K of full scale value

Degree of protection

NG 63-160:IP 33 (EN 60529) NG 100: IP 54 (EN 60529)

Standard version Connection

Brass, bottom or centre back NG 63 G1/4B - spanner size SW 14 NG 100 - 160 G1/2B - spanner size SW 22 (EN 837-3/7.3)

Measuring element

Capsule element, CuBe alloy

Movement

Brass

Zero correction

From the front

Seal

NBR (Perbunan)

Dial

Aluminium, white Dial marking black

Pointer

Aluminium, black

Housing

Stainless steel 304

Bayonet type bezel

Stainless steel 304

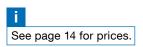
Window

Instrument glass

Panel mounted devices (types D 431/451):

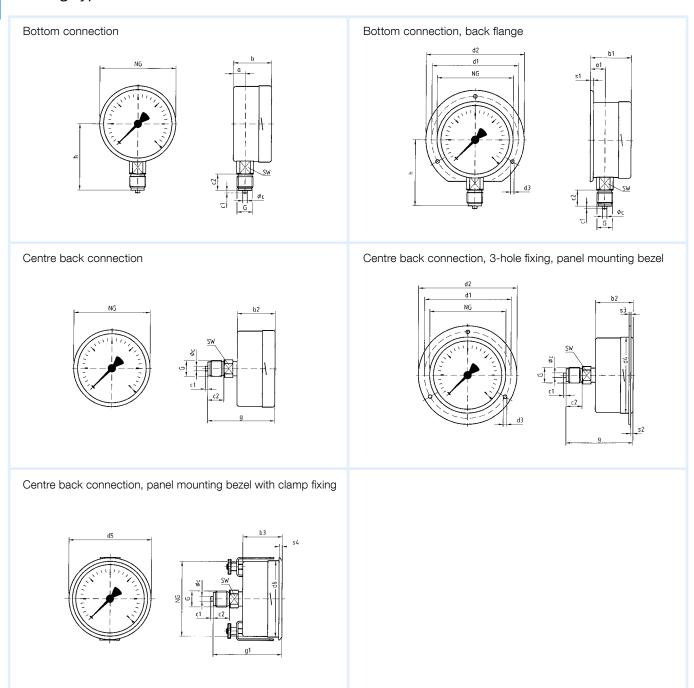
Plastic (PMMA)

- Overpressure and underpressure safety 10 x FSD
- Back flange
- Panel mounting bezel, with window, plastic
- 3-hole fixing, panel mounting bezel with window,
- Damping screw
- Reference pointer
- Special scales
- Other process connections



Type D 4 - NG 63/100/160

Housing types and dimensions



Dimensions (mm)

Nominal size (NG)	а	a1	b	b1	b2	рз	Øc	C1	C 2	d1*	d2	d 3*	d4	d5	d6	G	g	g1	h	S 1	S 2
63	10.8	13.4	40	42.1	37	37	5	2	13	75	85	3.5	64	68	64	G¼B	60	60	53	5.2	3
100	15.6	19.1	49	52.5	49	49	6	3	20	116	132	4.8	104	107	101	G1/2B	81	81	86	5.5	4
160	17.5	20.5	50	53	50	52	6	3	20	178	196	5.8	164	167	161	G1/2B	82	84	116	6	4
Nominal size (NG)	S 3	S 4	SW																		
63	2	3	14																		
100	2	4	22																		
160	2	4.5	22																		

 $^{^{\}star}$ Dimensions for NG 100 according to DIN 16014.



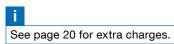
EN 837-3

DG: M, PG: 2

Туре	KP63, D201	KP63, D211	KP80, D201				
Version	Ū,						
Housing Ø	63	63	80				
Housing	Bla	ack sheet steel, plastic clip-in win	dow				
Measuring element		Capsule element, CuBe alloy					
Accuracy class	1.6	1.6	1.6				
Connection	G¼B	G¼B	G½B				
Range (mbar)	Part no.	Part no.	Part no.				
Price €							
-25/0	35004201	35004211	35054201				
-40/0	35005201	35005211	35055201				
-60/0	35006201	35006211	35056201				
-100/0	35007201	35007211	35057201				
-160/0	35008201	35008211	35058201				
-250/0	35009201	35009211	35059201				
-400/0	35010201	35010211	35060201				
-600/0	35011201	35011211	35061201				
-1000/0	35012201	35012211	35062201				
Price €							
0/25	35016201	35016211	35066201				
0/40	35017201	35017211	35067201				
0/60	35018201	35018211	35068201				
0/100	35019201	35019211	35069201				
0/160	35020201	35020211	35070201				
0/250	35021201	35021211	35071201				
0/400	35022201	35022211	35072201				
0/600	35023201	35023211	35073201				
0/1000	35024201	35024211	35074201				

Minimum order quantity for non-stock items = 10 pieces.

Blue part no. = in-stock items





EN 837-3

DG: M, PG: 2

Туре	KP100, D201	KP100, D211	KP100, D221	KP63, D301	KP63, D311	KP63,D331	KP63, D351				
Version											
Housing Ø	100	100	100	63	63	63	63				
Housing	Blac	k sheet steel, pl clip-in window	astic,	Stair	nless steel 304, _I	plastic clip-in window					
Measuring element	Capsu	le element, CuE	Be alloy		Capsule eleme	ent, CuBe alloy					
Accuracy class	1.6	1.6	1.6	1.6	1.6	1.6	1.6				
Connection	G½B	G½B	G½B	G¼B	G¼B	G¼B	G¼B				
			3-hole fixing, panel mounting bezel, black			3-hole fixing, panel mounting bezel, stainless steel 304, polished	Clamp fixing				
Range (mbar)	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.				
Price €											
-25/0	35104201	35104211	35104221	35004301	35004311	35004331	35004351				
-40/0	35105201	35105211	35105221	35005301	35005311	35005331	35005351				
-60/0	35106201	35106211	35106221	35006301	35006311	35006331	35006351				
-100/0	35107201	35107211	35107221	35007301	35007311	35007331	35007351				
-160/0	35108201	35108211	35108221	35008301	35008311	35008331	35008351				
-250/0	35109201	35109211	35109221	35009301	35009311	35009331	35009351				
-400/0	35110201	35110211	35110221	35010301	35010311	35010331	35010351				
-600/0	35111201	35111211	35111221	35011301	35011311	35011331	35011351				
-1000/0	35112201	35112211	35112221	35012301	35012311	35012331	35012351				
Price €											
0/25	35116201	35116211	35116221	35016301	35016311	35016331	35016351				
0/40	35117201	35117211	35117221	35017301	35017311	35017331	35017351				
0/60	35118201	35118211	35118221	35018301	35018311	35018331	35018351				
0/100	35119201	35119211	35119221	35019301	35019311	35019331	35019351				
0/160	35120201	35120211	35120221	35020301	35020311	35020331	35020351				
0/250	35121201	35121211	35121221	35021301	35021311	35021331	35021351				
0/400	35122201	35122201 35122211 3		22201 35122211 35122221 35022301 35022311		35022331	35022351				
0/600	35123201	35123211	35123221	35023301	35023311	35023331	35023351				
0/1000	35124201	35124211	35124221	35024301	35024311	35024331	35024351				

Minimum order quantity for non-stock items = 10 pieces.

Blue part no. = in-stock items



See page 20 for extra charges.



Standard capsule pressure gauges

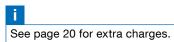
EN 837-3

DG: M, PG: 2

Туре	KP80, D301	KP80, D311	KP80, D331	KP80, D351	KP100, D301	KP100, D311
Version						
Housing Ø	80	80	80	80	100	100
Housing		S	tainless steel 304, ¡	olastic clip-in windc)W	
Measuring element			Capsule eleme	ent, CuBe alloy		
Accuracy class	1.6	1.6	1.6	1.6	1.6	1.6
Connection	G½B	G½B	G½B	G½B	G½B	G½B
			3-hole fixing, panel mounting bezel, chrome-plated	Panel mounting bezel, chrome plated, with clamp fixing		
Range (mbar)	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €						
-25/0	35054301	35054311	35054331	35054351	35104301	35104311
-40/0	35055301	35055311	35055331	35055351	35105301	35105311
-60/0	35056301	35056311	35056331	35056351	35106301	35106311
-100/0	35057301	35057311	35057331	35057351	35107301	35107311
-160/0	35058301	35058311	35058331	35058351	35108301	35108311
-250/0	35059301	35059311	35059331	35059351	35109301	35109311
-400/0	35060301	35060311	35060331	35060351	35110301	35110311
-600/0	35061301	35061311	35061331	35061351	35111301	35111311
-1000/0	35062301	35062311	35062331	35062351	35112301	35112311
Price €						
0/25	35066301	35066311	35066331	35066351	35116301	35116311
0/40	35067301	35067311	35067331	35067351	35117301	35117311
0/60	35068301	35068311	35068331	35068351	35118301	35118311
0/100	35069301	35069311	35069331	35069351	35119301	35119311
0/160	35070301	35070311	35070331	35070351	35120301	35120311
0/250	35071301	35071311	35071331	35071351	35121301	35121311
0/400	35072301	35072311	35072331	35072351	35122301	35122311
0/600	35073301	35073311	35073331	35073351	35123301	35123311
0/1000	35074301	35074311	35074331	35074351	35124301	35124311

Minimum order quantity for non-stock items = 10 pieces.

Blue part no. = in-stock items



Standard capsule pressure gauges

EN 837-3

DG: M, PG: 2

Туре	KP63, D401	KP63, D411	KP63, D431	KP63, D451	KP100, D401	KP100, D411	KP100, D431	KP100, D451
Version								
Housing Ø	63	63	63	63	100	100	100	100
Housing		S	tainless steel 3	04 with bayon	et bezel, windo	w, see data sh	neet	
Measuring element				Capsule eleme	ent, CuBe alloy	,		
Accuracy class	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Connection	G¼B	G¼B	G¼B	G¼B	G½B	G½B	G½B	G½B
			3-hole fixing, panel mounting bezel, 304, pol- ished	Panel mounting bezel, 304, pol- ished, with clamp fixing			3-hole fixing, panel mounting bezel, 304, pol- ished	Panel mounting bezel, 304, pol- ished, with clamp fixing
Range (mbar)	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €								
-25/0	35004401	35004411	35004431	35004451	35104401	35104411	35104431	35104451
-40/0	35005401	35005411	35005431	35005451	35105401	35105411	35105431	35105451
-60/0	35006401	35006411	35006431	35006451	35106401	35106411	35106431	35106451
-100/0	35007401	35007411	35007431	35007451	35107401	35107411	35107431	35107451
-160/0	35008401	35008411	35008431	35008451	35108401	35108411	35108431	35108451
-250/0	35009401	35009411	35009431	35009451	35109401	35109411	35109431	35109451
-400/0	35010401	35010411	35010431	35010451	35110401	35110411	35110431	35110451
-600/0	35011401	35011411	35011431	35011451	35111401	35111411	35111431	35111451
-1000/0	35012401	35012411	35012431	35012451	35112401	35112411	35112431	35112451
Price €								
0/25	35016401	35016411	35016431	35016451	35116401	35116411	35116431	35116451
0/40	35017401	35017411	35017431	35017451	35117401	35117411	35117431	35117451
0/60	35018401	35018411	35018431	35018451	35118401	35118411	35118431	35118451
0/100	35019401	35019411	35019431	35019451	35119401	35119411	35119431	35119451
0/160	35020401	35020411	35020431	35020451	35120401	35120411	35120431	35120451
0/250	35021401	35021411	35021431	35021451	35121401	35121411	35121431	35121451
0/400	35022401	35022411	35022431	35022451	35122401	35122411	35122431	35122451
0/600	35023401	35023411	35023431	35023451	35123401	35123411	35123431	35123451
0/1000	35024401	35024411	35024431	35024451	35124401	35124411	35124431	35124451

Minimum order quantity for non-stock items = 10 pieces.

Blue part no. = in-stock items



See page 20 for extra charges.



Capsule pressure gauges

EN 837-3

DG: M, PG: 2

Туре	KP160, D401	KP160, D411	KP160, D431	KP160, D451
Version				
Housing Ø	160	160	160	160
Housing		Stainless steel 30	4 with bayonet bezel	
Measuring element		Capsule elem	nent, CuBe alloy	
Accuracy class	1.6	1.6	1.6	1.6
Connection	G½B	G½B	G½B	G½B
			3-hole fixing, panel mounting bezel, 304, polished	Panel mounting bezel, 304, polished, with clamp fixing
Range (mbar)	Part no.	Part no.	Part no.	Part no.
Price €				
-6/0	35151401	35151411	35151431	35151451
-10/0	35152401	35152411	35152431	35152451
-16/0	35153401	35153411	35153431	35153451
	1	1		
Price €				
-25/0	35154401	35154411	35154431	35154451
-40/0	35155401	35155411	35155431	35155451
-60/0	35156401	35156411	35156431	35156451
-100/0	35157401	35157411	35157431	35157451
-160/0	35158401	35158411	35158431	35158451
-250/0	35159401	35159411	35159431	35159451
-400/0	35160401	35160411	35160431	35160451
-600/0	35161401	35161411	35161431	35161451
-1000/0	35162401	35162411	35162431	35162451
	1			
Price €				
0/6	35163401	35163411	35163431	35163451
0/10	35164401	35164411	35164431	35164451
0/16	35165401	35165411	35165431	35165451
Duice 6				
Price €	35166401	35166411	35166421	35166451
0/25	35166401	35166411	35166431	35166451
0/40	35167401	35167411	35167431	35167451
0/60	35168401	35168411	35168431	35168451
0/100	35169401	35169411	35169431	35169451
0/160	35170401	35170411	35170431	35170451
0/250	35171401	35171411	35171431	35171451
0/400	35172401	35172411	35172431	35172451
0/600	35173401	35173411	35173431	35173451
0/1000	35174401	35174411	35174431	35174451

Minimum order quantity for non-stock items = 10 pieces.

Blue part no. = in-stock items



See page 20 for extra charges.



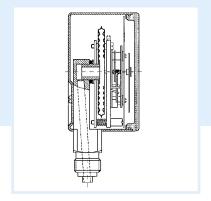
Capsule pressure gauges for chemical applications





- With zero correction
- Robust stainless steel housing (with bayonet bezel)
- Wetted parts and movement made of stainless steel
- GOSSTANDART-certified
- ATEX version (optional)





Application For corrosive gaseous and dry media, also for use in corrosive environments.

Technical Type specifications

Nominal size

63 - 100 - 160

Accuracy class (EN 837-3/6)

Ranges (EN 837-3/5)

0/25 to 0/1000 mbar and all corresponding vacuum and compound ranges with overpressure protection

Application area

Static load: full scale value Dynamic load: 0.9 x full scale value Overload safety: 1.3 x full scale value Operating temperature range

Medium: $T_{max} = +100 \, ^{\circ}C$ $T_{min} = -20 \, ^{\circ}C$ Ambient: $T_{max} = +60 \, ^{\circ}C$

Temperature performance

Indication error when the temperature of the measuring system deviates from the normal temperature of 20 °C:

rising temperature approx. ±0.6 %/10 K falling temperature approx. ±0.6 %/10 K of full scale value

Degree of protection

IP 32 (EN 60529)

Standard version Connection

Stainless steel 316 Ti/316 L, bottom or centre back NG 63 G1/4B - spanner size SW 14 NG 100 - 100 G1/2B - spanner size SW 22 (EN 837-3/7.3)

Measuring element

Capsule element, stainless steel 316 Ti/316 L

Movement

Stainless steel

Zero correction

From the front

Seal

FKM (Viton)

Dial

Aluminium, white Dial marking black

Pointer

Aluminium, black

Housing

Stainless steel 304

Bayonet type bezel

Stainless steel 304

Window

Laminated safety glass Panel mounted devices (types D 432/452): Plastic (PMMA)

- Options Back flange
 - Panel mounting bezel
 - 3-hole fixing, panel mounting bezel
 - ATEX version



- Damping screw
- Special scales
- Other process connections

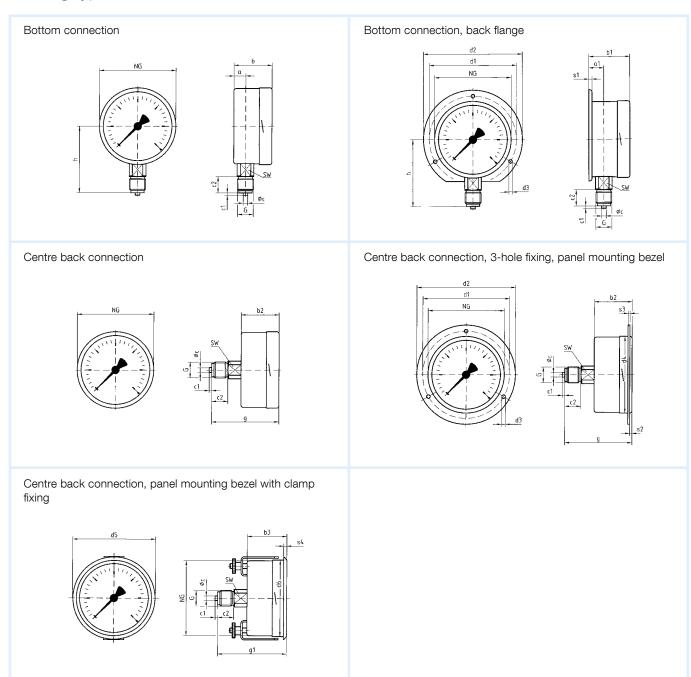




Capsule pressure gauges for chemical applications

Type D 4 - NG 63/100/160

Housing types and dimensions



Nominal size (NG)	а	a1	b	b1	b2	bз	Øc	C1	C 2	d1*	d2	d 3*	d4	d5	d6	G	g	g1	h	S1	S 2
63	10.8	13.4	40	42.1	37	37	5	2	13	75	85	3.5	64	68	64	G14B	60	60	53	5.2	3
100	15.6	19.1	49	52.5	49	49	6	3	20	116	132	4.8	104	107	101	G1/2B	81	81	86	5.5	4
160	17.5	20.5	50	53	50	52	6	3	20	178	196	5.8	164	167	161	G1/2B	82	84	116	6	4
Nominal size (NG)	S 3	S 4	SW																		
63	2	3	14																		
100	2	4	22																		
160	2	4.5	22																		

^{*} Dimensions for NG 100 according to DIN 16014.



Capsule pressure gauges for chemical applications

EN 837-3

DG: M, PG: 3

Туре	KP63Ch, D402	KP63Ch, D412	KP63Ch, D432	KP63Ch, D452	KP100Ch, D402	KP100Ch, D412	KP100Ch, D432	KP100Ch, D452
Version								
Housing Ø	63	63	63	63	100	100	100	100
Housing		Stainless	steel 304 with	bayonet beze	l, window, see	data sheet	,	
Measuring elemen	t	(Capsule eleme	nt, stainless st	teel 316 Ti/316	L		
Accuracy class	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Connection	G¼B	G¼B	G¼B	G¼B	G½B	G½B	G½B	G½B
			3-hole fixing, panel mounting bezel, 304, pol- ished	Panel mounting bezel 304 with clamp fixing			3-hole fixing, panel mounting bezel 304 polished	Panel mounting bezel 304 with clamp fixing
Range (mbar)	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €								
-25/0	35004402	35004412	35004432	35004452	35104402	35104412	35104432	35104452
-40/0	35005402	35005412	35005432	35005452	35105402	35105412	35105432	35105452
-60/0	35006402	35006412	35006432	35006452	35106402	35106412	35106432	35106452
-100/0	35007402	35007412	35007432	35007452	35107402	35107412	35107432	35107452
-160/0	35008402	35008412	35008432	35008452	35108402	35108412	35108432	35108452
-250/0	35009402	35009412	35009432	35009452	35109402	35109412	35109432	35109452
-400/0	35010402	35010412	35010432	35010452	35110402	35110412	35110432	35110452
-600/0	35011402	35011412	35011432	35011452	35111402	35111412	35111432	35111452
-1000/0	35012402	35012412	35012432	35012452	35112402	35112412	35112432	35112452
Price €								
0/25	35016402	35016412	35016432	35016452	35116402	35116412	35116432	35116452
0/40	35017402	35017412	35017432	35017452	35117402	35117412	35117432	35117452
0/60	35018402	35018412	35018432	35018452	35118402	35118412	35118432	35118452
0/100	35019402	35019412	35019432	35019452	35119402	35119412	35119432	35119452
0/160	35020402	35020412	35020432	35020452	35120402	35120412	35120432	35120452
0/250	35021402	35021412	35021432	35021452	35121402	35121412	35121432	35121452
0/400	35022402	35022412	35022432	35022452	35122402	35122412	35122432	35122452
0/600	35023402	35023412	35023432	35023452	35123402	35123412	35123432	35123452
0/1000	35024402	35024412	35024432	35024452	35124402	35124412	35124432	35124452

Minimum order quantity for non-stock items = 10 pieces.

Blue part no. = in-stock items



See page 20 for extra charges.



Capsule pressure gauges for chemical applications

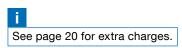
EN 837-3

DG: M, PG: 3

Туре	KP160Ch, D402	KP160Ch, D412	KP160Ch, D432	KP160Ch, D452
Version				
Housing Ø	160	160	160	160
Housing	St	ainless steel 304 with bayone	et bezel, window, see data she	eet
Measuring ele- ment		Capsule element, stair	nless steel 316 Ti/316 L	
Accuracy class	1.6	1.6	1.6	1.6
Connection	G½B	G½B	G½B	G½B
			3-hole fixing, panel mounting bezel, 304, polished	Panel mounting bezel 304, with clamp fixing
Range (mbar)	Part no.	Part no.	Part no.	Part no.
Price €				
-25/0	35154402	35154412	35154432	35154452
-40/0	35155402	35155412	35155432	35155452
-60/0	35156402	35156412	35156432	35156452
-100/0	35157402	35157412	35157432	35157452
-160/0	35158402	35158412	35158432	35158452
-250/0	35159402	35159412	35159432	35159452
-400/0	35160402	35160412	35160432	35160452
-600/0	35161402	35161412	35161432	35161452
-1000/0	35162402	35162412	35162432	35162452
Price €				
0/25	35166402	35166412	35166432	35166452
0/40	35167402	35167412	35167432	35167452
0/60	35168402	35168412	35168432	35168452
0/100	35169402	35169412	35169432	35169452
0/160	35170402	35170412	35170432	35170452
0/250	35171402	35171412	35171432	35171452
0/400	35172402	35172412	35172432	35172452
0/600	35173402	35173412	35173432	35173452
0/1000	35174402	35174412	35174432	35174452

Minimum order quantity for non-stock items = 10 pieces.

Blue part no. = in-stock items





Extra charges for capsule pressure gauges

DG: M

Housing diameter (mm)	PG	63	80	100	160
Description		Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.
Overpressure safety 10 x FSD for ranges > 25 mbar (only for measuring system brass/CuBe, only for instruments with bayonet bezel)	2	38192		38194	38195
Overpressure and underpressure safety 10 x FSD for ranges > 25 mbar (only for measuring system brass/CuBe, only for gauges with bayonet bezel)	2	38197		38199	38200
Accuracy class 1.0 (only for Ms/CuBe measuring systems)	-			38180	38181
3-hole fixing, panel mounting bezel, stainless steel 304 (only for gauges with bayonet bezel, also for bottom connection)	3	37608		37609	37610
Back flange, stainless steel 304, bare metal surface (only for gauges with stainless steel housing)	3	38048	38049	38050	38051
Housing stainless steel 304 polished	-	37611	37612	37613	37614
Bayonet bezel stainless steel 304 polished	-	38052		38053	38055
Laminated safety glass window (only for gauges with bayonet bezel)	-	38072		38074	38075
Connection socket nickel-plated	3	38084	38085	38086	38087
Connection socket with special thread	-	On request	On request	On request	On request
Damping screw brass – hole D.3 – 0.5 – 0.7 mm (please specify)	2	38097	38098	38099	38100
Damping screw stainless steel 316 Ti – hole D.3 – 0.5 – 0.7 mm (please specify)	3	38103	38104	38105	38106
Red mark on dial	-	38184	38185	38186	38187
1 reference pointer red – external screwdriver adjustment (window = plastic)	1	38115	38116	38117	
1 reference pointer red – external rotary knob adjustment (window = plastic)	1	38188	38189	38190	38191
Max pointer – for ranges greater than 0/250 mbar (only for gauges without filling, not possible for overpressure safety 10 x FSD or overpressure/underpressure safety 10 x FSD as well as negative ranges)	1	38127	38128	38129	38130
Special mounting position	-	38147	38148	38149	38150
Oil and grease removed from wetted parts (not for oxygen!), label 'Oil and grease free" (only for stainless steel measuring system)	-	37615	37616	37617	37618
Glycerine filling (glycerine/water), only for pressure gauges for chemical applications, for range 0/60 and greater, accuracy class 2.5	-	37619		37620	37621
Higher degree of protection IP 54 (only for gauges with bayonet pezel)	1			38160	
Printing block costs per scale and colour (scale design as per EN 837-3, others on request)	-	38153	38154	38155	38156
Printing costs per additional colour	-	38165	38166	38167	38168

Minimum order quantity for non-stock items = 10 pieces

Blues part no. = in-stock items



See the overview "Accessories for panel mounting and wall mounting" on page 154.

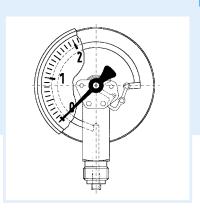


EN 837-1



- For pneumatic and heating system applications
- Design as per EN 837-1
- Accuracy class 1.6
- Corrosion-resistant, highly impactresistant plastic housing
- Many customised versions available





Application For gaseous and liquid media which are not highly viscous, do not crystallise and do not attack copper

! For measuring gas or vapour, these gauges must be used in accordance with the table "Selection Criteria as per EN 837-2" (see appendix)!

Technical Type specifications D1

Nominal size

40 - 50 - 63 - 80 - 100

Accuracy class (EN 837-1/6)

Ranges (EN 837-1/5)

-1/0 to -1/+15 bar 0/0.6 to 0/400 bar

Application area

Static load: ¾ x full scale value Dynamic load: 2/3 x full scale value Short-term: full scale value

Operating temperature range

Medium: $T_{max} = +60 \, ^{\circ}C$ Ambient: $T_{min} = -20 \, ^{\circ}C$ $T_{max} = +60 \, ^{\circ}C$

Temperature performance

Indication error when the temperature of the measuring system deviates from the normal temperature of 20 °C:

rising temperature approx. ± 0.4 %/10 K falling temperature approx. ±0.4 %/10 K of full scale value

Degree of protection

IP 32 (EN 60529)

Standard version Connection

Brass, bottom or centre back NG 40 G¹/₈B - SW 12 NG 50-63 G1/4B - SW 14 NG 80-100 bottom G1/2B - spanner size SW 22 NG 80-100 centre back G1/4B - spanner size SW 14 (EN 837-1/7.3)

Bourdon tube, copper alloy ≤ 60 bar "C" type tube

Movement

Brass

Measuring element

> 60 bar helical tube

- Options Damping screw
 - Reference pointer
 - Special scales
 - Other process connections

Dial

Plastic, white Dial marking black

Pointer

Plastic, black

Housing

Black ABS, highly impact-resistant and corrosion-resistant

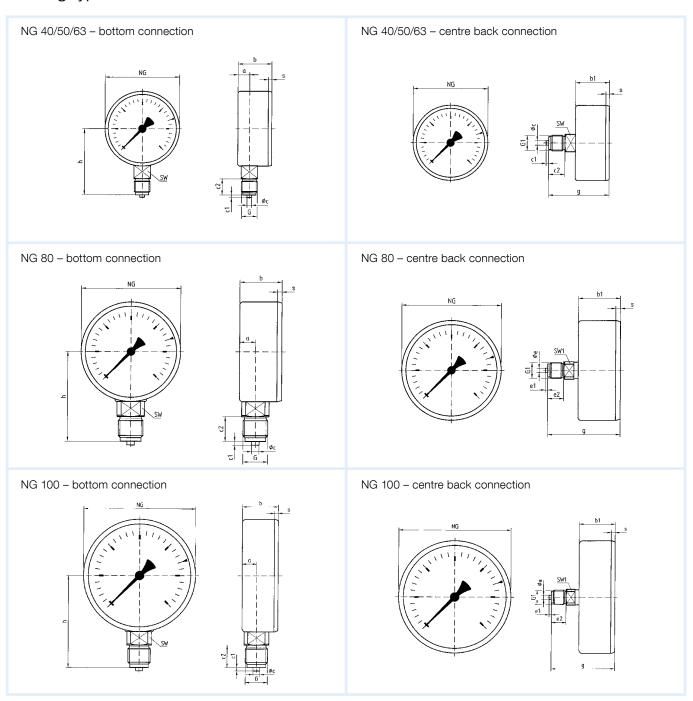
Clip-in plastic, NG 80-100 with adjustable red reference pointer



See the catalogue DOMESTIC **TECHNOLOGY** for special heating and sanitary versions. See page 297 for prices.

Type D 1 - NG 40/50/63/80/100

Housing types and dimensions



Nominal size (NG)	а	b	b1	Øc	C1	C 2	Øe	e 1	e 2	g	G	G1	h	s	SW	Spanner size SW1
40	9.5	25	25	4	2	10	-	-	-	41.5	G¹%B	G⅓B	36	3	12	-
50	10.3	26.8	27.1	5	2	13	-	-	-	47.1	G1/4B	G1/4B	45	3.8	14	-
63	9.8	29.7	30.4	5	2	13	-	-	-	50.4	G¼B	G1/4B	51.5	3.7	14	-
80	12.8	32.8	32.8	6	3	20	5	2	13	55.8	G½B	G1/4B	72	2.8	22	14
100	15.5	34.5	32	6	3	20	5	2	13	55	G½B	G1/4B	82	3.5	22	14

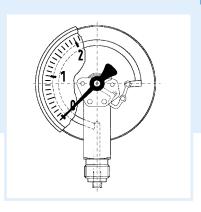


EN 837-1



- For pneumatic and heating system applications
- Robust steel or stainless steel housing
- Accuracy class 1.6
- Many customised versions available





Application For gaseous and liquid media which are not highly viscous, do not crystallise and do not attack copper alloys.

! For measuring gas or vapour, these gauges must be used in accordance with the table "Selection Criteria as per EN 837-2" (see appendix)!

Technical Type specifications D 2/D 3

Nominal size

40 - 50 - 63

Accuracy class (EN 837-1/6)

Ranges (EN 837-1/5)

-1/0 to -1/+15 bar 0/0.6 to 0/400 bar

Application area

Static load: 3/4 x full scale value Dynamic load: 2/3 x full scale value Short-term: full scale value

Operating temperature range

Medium: $T_{max} = +60 \, ^{\circ}C$ Ambient: $T_{min} = -20 \, ^{\circ}C$ $T_{max} = +60 \, ^{\circ}C$

Temperature performance

Indication error when the temperature of the measuring system deviates from the normal temperature of 20 °C:

rising temperature approx. ±0.4 %/10 K falling temperature approx. ±0.4 %/10 K of full scale value

Degree of protection

IP 32 (EN 60529)

Standard version Connection

Brass, bottom or centre back NG 40 G1/8B - spanner size SW 12 NG 50-63 G1/4B - spanner size SW 14 (EN 837-1/7.3)

Measuring element

Bourdon tube, copper alloy ≤ 60 bar "C" type tube > 60 bar helical tube

Movement

Brass

- Options Panel mounting bezel
 - 3-hole fixing, panel mounting bezel
 - Damping screw

Dial

Plastic, white Dial marking black

Pointer

Plastic, black

Housing

D 2 – black sheet steel D 3 - stainless steel 304

Window

Clip-in plastic

- Reference pointer
- Special scales
- Other process connections

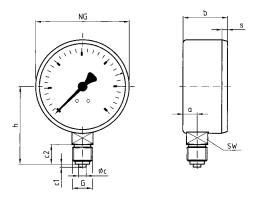
See the catalogue DOMESTIC **TECHNOLOGY** for special heating and sanitary versions. See page 297 for prices.



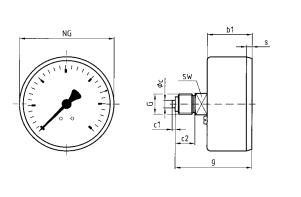
Type D 2/D 3 - NG 40/50/63

Housing types and dimensions

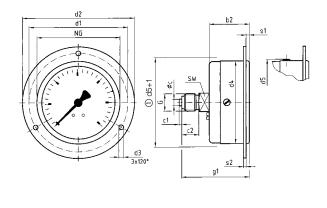
Bottom connection



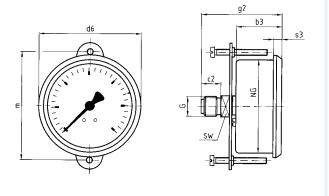
Centre back connection



Centre back connection, 3-hole fixing, panel mounting bezel



Centre back connection, panel mounting bezel with clamp fixing



① Panel cut-out

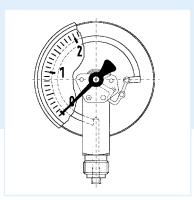
Nominal size (NG)	а	b	b1	b2	bз	Øc	C1	C2	d1	d2	dз	d4	d 5	d6	g	g1	g2	G	h	m
40	8.5	23.5	25	26	28	4	2	10	51	61	3.6	41	45	44	41.5	42.5	46.6	G1/8B	36	50
50	10.5	26	26	27.5	30.3	5	2	13	60	71	3.6	50	54	54	47	49	51.3	G¼B	45	58
63	9.5	29.4	29.4	30.3	30.3	5	2	13	75	85	3.6	63	66.5	67.8	50.4	51.3	53.3	G¼B	51.5	72
Nominal size (NG)	S	S1	S 2	S 3	SW															
40	3	2.5	2	5.2	12															
50	3.8	2.5	2	5.4	14															
63	3.7	2.5	2	5.6	14															

EN 837-1



- For domestic and mechanical engineering applications
- Robust steel housing
- Window with adjustable reference pointer
- Many customised versions available





Application For gaseous and liquid media which are not highly viscous, do not crystallise and do not attack copper

! For measuring gas or vapour, these gauges must be used in accordance with the table "Selection Criteria as per EN 837-2" (see appendix)!

Technical Type specifications D2

Nominal size

80 - 100

Accuracy class (EN 837-1/6)

Ranges (EN 837-1/5)

-1/0 to -1/+15 bar 0/0.6 to 0/400 bar

Application area

Static load: ¾ x full scale value Dynamic load: 2/3 x full scale value Short-term: full scale value

Operating temperature range

Medium: $T_{max} = +60 \, ^{\circ}C$ Ambient: T_{min} = -20 °C $T_{max} = +60 \, ^{\circ}C$

Temperature performance

Indication error when the temperature of the measuring system deviates from the normal temperature of 20 °C:

rising temperature approx. ± 0.4 %/10 K falling temperature approx. ±0.4 %/10 K of full scale value

Degree of protection

IP 32 (EN 60529)

Standard version Connection

Brass, bottom:

NG 80 – 100 G $\frac{1}{2}$ B – spanner size SW 22

Brass, centre back:

NG 80 - 100 G1/4B - spanner size SW 14

(EN 837-1/7.3)

Measuring element

Bourdon tube, copper alloy

≤ 60 bar "C" type tube

> 60 bar helical tube

Movement

Brass

Dial

Plastic, white Dial marking black

Pointer

Plastic, black

Housing

Sheet steel, black

Window

Clip-in plastic, with adjustable red reference pointer

- Options Stainless steel housing (NG 100)
 - Push on bezel
 - Instrument glass window

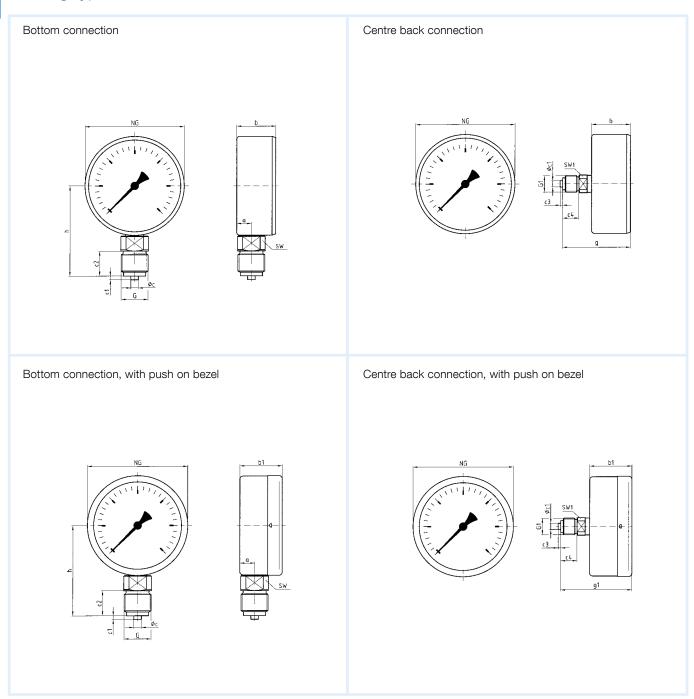
- Damping screw
- Special scales
- Other process connections

See the catalogue DOMESTIC **TECHNOLOGY** for special heating and sanitary versions. See page 297 for prices.



Type D 2 - NG 80/100

Housing types and dimensions



Nominal size (NG)	а	b	b1	Øc	C1	C 2	Øc1	C 3	C4	g	g1	G	G1	h	SW	Spanner size SW1
80	11.7	31	33.5	6	3	20	5	2	13	54	56.5	G½B	G¼B	72	22	14
100	11	29.5	34	6	3	20	5	2	13	52.5	57	G½B	G¼B	82	22	14

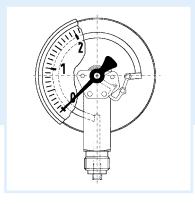


EN 837-1



- For domestic and mechanical engineering applications
- With reference pointer on dial
- Robust steel housing
- Many customised versions available





Application For gaseous and liquid media which are not highly viscous, do not crystallise and do not attack copper alloys.

! For measuring gas or vapour, these gauges must be used in accordance with the table "Selection Criteria as per EN 837-2" (see appendix)!

Technical Type specifications D2

Nominal size

Accuracy class (EN 837-1/6)

Ranges (EN 837-1/5)

-1/0 to -1/+15 bar 0/0.6 to 0/40 bar

Application area

Static load: ¾ x full scale value Dynamic load: 2/3 x full scale value Short-term: full scale value

Standard version

Connection

Brass, bottom: G1/2B - spanner size SW 22

Measuring element

Bourdon tube, copper alloy ≤ 60 bar "C" type tube > 60 bar helical tube

Movement

Brass

Dial

Aluminium, white Dial marking black with adjustable reference pointer

Pointer

Aluminium, black

Housing

Sheet steel, black

Push on bezel

Sheet steel, black

See the catalogue DOMESTIC TECHNO-LOGY for special heating and sanitary versions.

See page 297 for prices.

Options

- Damping screw
- Special scales
- Other process connections

Operating temperature range

Medium: $T_{max} = +60 \, ^{\circ}C$ Ambient: $T_{min} = -20 \, ^{\circ}C$ $T_{max} = +60 \, ^{\circ}C$

Temperature performance

Indication error when the temperature of the measuring system deviates from the normal temperature of 20 °C:

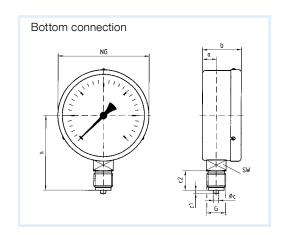
rising temperature approx. ±0.4 %/10 K falling temperature approx. ±0.4 %/10 K of full scale value

Degree of protection

IP 32 (EN 60529)

Window

Instrument glass



Nominal size (NG)	а	b	Øc	C1
160	15.5	50	6	3
Nominal size (NG)	C 2	G	h	SW
160	20	G½B	116	22

EN 837-1

DG: M, PG: 2

Туре	RF40, D101	RF40, D111	RF50, D101	RF50, D111	RF63, D101	RF63, D111	RF80, D101	RF100, D101
Version								
Housing Ø	40	40	50	50	63	63	80	100
Housing			ABS highly	impact-resista	ant, clip-in plas	tic window		
Measuring element				Bourdon tube	e, copper alloy			
Accuracy class	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Connection	G1/8B	G⅓B	G¼B	G¼B	G¼B	G¼B	G½B	G½B
PU*	100 pieces	100 pieces	100 pieces	100 pieces	100 pieces	100 pieces	50 pieces	50 pieces
								d reference pointer
Range (bar)	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €								
-1/0	85001101	85001111	85051101	85051111	85101101	85101111	85151101	85201101
-1/+0.6					85102101	85102111	85152101	85202101
-1/+1.5					85103101	85103111	85153101	85203101
-1/+3					85104101	85104111	85154101	85204101
-1/+5					85105101	85105111	85155101	85205101
-1/+9					85106101	85106111	85156101	85206101
-1/+15					85107101	85107111	85157101	85207101
Price €								
0/0.6	85009101	85009111	85059101	85059111	85109101	85109111	85159101	85209101
0/1	85010101	85010111	85060101	85060111	85110101	85110111	85160101	85210101
0/1.6	85011101	85011111	85061101	85061111	85111101	85111111	85161101	85211101
0/2.5	85012101	85012111	85062101	85062111	85112101	85112111	85162101	85212101
0/4	85013101	85013111	85063101	85063111	85113101	85113111	85163101	85213101
0/6	85014101	85014111	85064101	85064111	85114101	85114111	85164101	85214101
0/10	85015101	85015111	85065101	85065111	85115101	85115111	85165101	85215101
0/16	85016101	85016111	85066101	85066111	85116101	85116111	85166101	85216101
0/25	85017101	85017111	85067101	85067111	85117101	85117111	85167101	85217101
0/40	85018101	85018111	85068101	85068111	85118101	85118111	85168101	85218101
Price €								
0/60	85019101	85019111	85069101	85069111	85119101	85119111	85169101	85219101
0/100	85020101	85020111	85070101	85070111	85120101	85120111	85170101	85220101
0/160	85021101	85021111	85071101	85071111	85121101	85121111	85171101	85221101
0/250	85022101	85022111	85072101	85072111	85122101	85122111	85172101	85222101
0/400			85073101	85073111	85123101	85123111	85173101	85223101

 $^{^{\}star}$ Minimum order quantity for non-stock items = 100 pieces.

Blue part no. = in-stock items



See page 31 for extra charges.



EN 837-1

DG: M, PG: 2

Туре	RF40, D201	RF40, D211	RF40, D231*	RF40, D251*	RF50, D201	RF50, D211	RF50, D231*	RF50, D251*
Version								
Housing Ø	40	40	40	40	50	50	50	50
Housing			Black	sheet steel, p	lastic clip-in wi	ndow		,
Measuring element				Bourdon tube	e, copper alloy			
Accuracy class	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Connection	G1⁄8B	G¹%B	G⅓B	G¹%B	G¼B	G¼B	G¼B	G¼B
			3-hole fixing, panel mounting bezel, stainless steel	Panel mounting bezel stainless steel, polished, with clamp fixing			3-hole fixing, panel mounting bezel, stainless steel	Panel mounting bezel stainless steel, polished, with clamp fixing
Range (bar)	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €								
-1/0	85001201	85001211	85001231	85001251	85051201	85051211	85051231	85051251
-1/+0.6								
-1/+1.5								
-1/+3								
-1/+5								
-1/+9								
-1/+15								
Price €								
0/1	85010201	85010211	85010231	85010251	85060201	85060211	85060231	85060251
0/1.6	85011201	85011211	85011231	85011251	85061201	85061211	85061231	85061251
0/2.5	85012201	85012211	85012231	85012251	85062201	85062211	85062231	85062251
0/4	85013201	85013211	85013231	85013251	85063201	85063211	85063231	85063251
0/6	85014201	85014211	85014231	85014251	85064201	85064211	85064231	85064251
0/10	85015201	85015211	85015231	85015251	85065201	85065211	85065231	85065251
0/16	85016201	85016211	85016231	85016251	85066201	85066211	85066231	85066251
0/25	85017201	85017211	85017231	85017251	85067201	85067211	85067231	85067251
0/40	85018201	85018211	85018231	85018251	85068201	85068211	85068231	85068251
Price €								
0/60	85019201	85019211	85019231	85019251	85069201	85069211	85069231	85069251
0/100	85020201	85020211	85020231	85020251	85070201	85070211	85070231	85070251
0/160	85021201	85021211	85021231	85021251	85071201	85071211	85071231	85071251
0/250	85022201	85022211	85022231	85022251	85072201	85072211	85072231	85072251
0/400					85073201	85073211	85073231	85073251

^{*} Dual scale, bar outer, black – psi inner, red. Minimum order quantity for non-stock items = 100 pieces.

Blue part no. = in-stock items



See page 31 for extra charges.



EN 837-1

DG: M, PG: 2

Туре	RF63, D201	RF63, D211	RF63, D231*	RF63, D251*	RF80, D201	RF100, D201	RF100, D211	RF160, D20
Version								
Housing Ø	63	63	63	63	80	100	100	160
Housing			Black sheet	steel, plastic c	lip-in window		,	Push on bezel, instrument glass
Measuring element				Bourdon tube	e, copper alloy			I
Accuracy class	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Connection	G¼B	G¼B	G¼B	G¼B	G½B	G½B	G¼B	G½B
			3-hole fixing, panel mounting bezel, stainless steel	Panel mounting bezel stainless steel, polished, with clamp fixing		With adjustable re	d reference pointer	
Range (bar)	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €								
-1/0	85101201	85101211	85101231	85101251	85151201	85201201	85201211	85251201
-1/+0.6			85102231	85102251	85152201	85202201	85202211	85252201
-1/+1.5	5 85103201 8510321		85103231	85103251	85153201	85203201	85203211	85253201
-1/+3	85104201 85104211		85104231	85104251	85154201	85204201	85204211	85254201
-1/+5	85105201	85105211	85105231	85105251	85155201	85205201	85205211	85255201
-1/+9	85106201	85106211	85106231	85106251	85156201	85206201	85206211	85256201
-1/+15	85107201	85107211	85107231	85107251	85157201	85207201	85207211	85257201
Price €								
0/0.6	85109201	85109211	85109231	85109251	85159201	85209201	85209211	85259201
0/1	85110201	85110211	85110231	85110251	85160201	85210201	85210211	85260201
0/1.6	85111201	85111211	85111231	85111251	85161201	85211201	85211211	85261201
0/2.5	85112201	85112211	85112231	85112251	85162201	85212201	85212211	85262201
0/4	85113201	85113211	85113231	85113251	85163201	85213201	85213211	85263201
0/6	85114201	85114211	85114231	85114251	85164201	85214201	85214211	85264201
0/10	85115201	85115211	85115231	85115251	85165201	85215201	85215211	85265201
0/16	85116201	85116211	85116231	85116251	85166201	85216201	85216211	85266201
0/25	85117201	85117211	85117231	85117251	85167201	85217201	85217211	85267201
0/40	85118201	85118211	85118231	85118251	85168201	85218201	85218211	85268201
0/40	00110201	00110211	00110201	00110201	00100201	00210201	00210211	00200201
Price €								
0/60	85119201	85119211	85119231	85119251	85169201	85219201	85219211	
0/100	85120201	85120211	85120231	85120251	85170201	85220201	85220211	
0/160	85121201	85121211	85121231	85121251	85171201	85221201	85221211	
0/250	85122201	85122211	85122231	85122251	85172201	85222201	85222211	
0/400	85123201	85123211	85123231	85123251	85173201	85223201	85223211	

^{*} Dual scale, bar outer, black - psi inner, red.

Minimum order quantity for non-stock items = 100 pieces (RF 160, D 201 = 10 pieces)

Blue part no. = in-stock items



See page 31 for extra charges.



Extra charges* for standard Bourdon tube pressure gauges

DG: M

Housing diameter (mm)	PG	40	50	63	80	100	160
Description		Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.
Housing nickel-plated	3	38064	38065	38066			
Push on bezel nickel-plated	3	38250	38251	38252	38253	38254	
Housing stainless steel 304, vibratory-finished (extra charge, instead of steel housing)	3	38256	38257	38258		38300	
Housing stainless steel 304, polished (extra charge, instead of steel housing)	3	38259	38260	38261		38314	
Push on bezel stainless steel 304, polished	3	38262	38263	38264			
Connection socket nickel-plated	3	38082	38083	38084	38085	38086	38087
Connection socket with special thread	-	On request	On request	On request	On request	On request	On request
Damping screw brass – hole 0.3 – 0.5 – 0.7 mm (please specify)	2	38095	38096	38097	38098	38099	38100
Red mark on dial	-	38182	38183	38184	38185	38186	38187
1 reference pointer, red, printed on window	1	38315	38316	38109	Standard	Standard	
2 reference pointers, red, on dial, adjustable	1					38123	
Printing block costs per scale and colour (scale design as per EN 837-1, others on request)	-	38151	38152	38153	38154	38155	38156
Printing costs per additional colour	-	38163	38164	38165	38166	38167	38168

^{*} Minimum order quantity for special versions (non-stock items) = 100 pieces per version and delivery.

Blue part no. = in-stock items

Spare windows for standard Bourdon tube pressure gauges

DG: M, PG: 1

Housing diameter (mm)	40	50	63	80	100	160
Description	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.
Plastic window, clip-in, for plastic housing	38285	38271	38272	38273	38274	
Plastic window, clip-in, for steel housing	38275	38276	38277	38317	38318	
Instrument glass window				38278	38279	38280

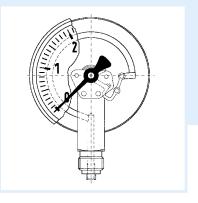
Blue part no. = in-stock items





- For machine and plant engineering
- Robust steel or stainless steel housing
- Many customised versions available





Application For gaseous and liquid media which are not highly viscous, do not crystallise and do not attack copper alloys. For high measuring accuracy.

! For measuring gas or vapour, these gauges must be used in accordance with the table "Selection Criteria as per EN 837-2" (see appendix)!

Technical Type specifications D2/D3

Nominal size

100

Accuracy class (EN 837-1/6)

Ranges (EN 837-1/5)

-1/0 to -1/+15 bar 0/0.6 to 0/1000 bar

Application area

Static load:

≤ 600 bar = full scale value

 $> 600 \text{ bar} = \frac{3}{4} \text{ x full scale value}$

Dynamic load:

 \leq 600 bar = 0.9 x full scale value

 $> 600 \text{ bar} = \frac{2}{3} \times \text{ full scale value}$

Short-term:

 \leq 600 bar = 1.3 x full scale value

> 600 bar = full scale value

Operating temperature range

 $T_{max} = +60 \, ^{\circ}C$ Medium: Ambient: $T_{min} = -20 \, ^{\circ}C$ T_{max}= +60 °C

Temperature performance

Indication error when the temperature of the measuring system deviates from the normal temperature of 20 °C:

rising temperature approx. ±0.4 %/10 K falling temperature approx. ±0.4 %/10 K of full scale value

Degree of protection

IP 32 (EN 60529)

Standard version Connection

Brass, bottom or bottom back G½B – spanner size SW 22 (EN 837-1/7.3)

Measuring element

Bourdon tube,

≤ 60 bar "C" type tube, copper alloy

> 60 bar helical tube.

stainless steel 316 Ti/316 L

Movement

Brass

- **Options** Damping screw
 - Reference pointer
 - Electrical contacts

Dial

Aluminium, white Dial marking black

Pointer

Aluminium, black

Housing

D 2 - black, sheet steel D3 - stainless steel 304

Window

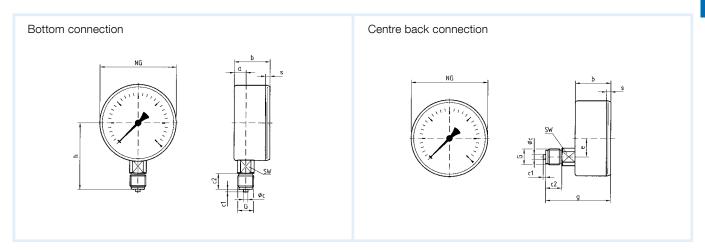
Clip-in plastic

- Special scales
- Other process connections



Bourdon tube pressure gauges for industrial applications Type D 2 / D 3 - NG 100

Housing types and dimensions



Nominal size (NG)	а	b	Øc	C1	C 2	е	G	g	h	S	SW		
100	15.6	44	6	3	20	26.5	G1/2B	76	86	3.5	22		



Bourdon tube pressure gauges for industrial applications EN 837-1

DG: M, PG: 2

Туре	RF100 I, D201	RF100 I, D211	RF100 I, D301	RF100 I, D311
Version				
Housing Ø	100	100	100	100
Housing		steel, plastic, window		el 304, plastic window
Measuring element	Bourdon tube	e, copper alloy (> 60) bar stainless steel	316 Ti/316 L)
Accuracy class	1.0	1.0	1.0	1.0
Connection	G½B	G½B	G½B	G½B
Range (bar)	Part no.	Part no.	Part no.	Part no.
Price €				
-1/0	85301201	85301211	85301301	85301311
-1/+0.6	85302201	85302211	85302301	85302311
-1/+1.5	85303201	85303211	85303301	85303311
-1/+3	85304201	85304211	85304301	85304311
-1/+5	85305201	85305211	85305301	85305311
-1/+9	85306201	85306211	85306301	85306311
-1/+15	85307201	85307211	85307301	85307311
Price €				
0/0.6	85309201	85309211	85309301	85309311
0/1	85310201	85310211	85310301	85310311
0/1.6	85311201	85311211	85311301	85311311
0/2.5	85312201	85312211	85312301	85312311
0/4	85313201	85313211	85313301	85313311
0/6	85314201	85314211	85314301	85314311
0/10	85315201	85315211	85315301	85315311
0/16	85316201	85316211	85316301	85316311
0/25	85317201	85317211	85317301	85317311
0/40	85318201	85318211	85318301	85318311
Price €				
0/60	85319201	85319211	85319301	85319311
0/100	85320201	85320211	85320301	85320311
0/160	85321201	85321211	85321301	85321311
0/250	85322201	85322211	85322301	85322311
0/400	85323201	85323211	85323301	85323311
Price €				
0/600	85324201	85324211	85324301	85324311
0/1000	85325201		85325301	
	or non stock itoms – 1			

Minimum order quantity for non-stock items = 10 pieces.

Blue part no. = in-stock items

Bourdon tube pressure gauges for industrial applications EN 837-1

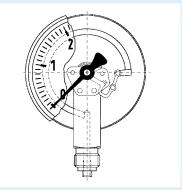






- For machine and plant engineering
- Robust, stainless steel housing with bayonet bezel
- Optionally available up to nominal size 250 mm
- Can be equipped with electrical contact
- DNV type approval GOSSTANDARTcertified





Application For gaseous and liquid media which are not highly viscous, do not crystallise and do not attack copper alloys. For high accuracy and rough application conditions.

> ! For measuring gas or vapour, these gauges must be used in accordance with the table "Selection Criteria as per EN 837-2" (see appendix)!

Technical Type specifications D4

Nominal size

100 - 160

Accuracy class (EN 837-1/6)

Ranges (EN 837-1/5)

-1/0 to -1/+15 bar 0/0.6 to 0/1000 bar

Application area

Static load:

- ≤ 600 bar = full scale value
- $> 600 \text{ bar} = \frac{3}{4} \times \text{ full scale value}$

Dynamic load:

- \leq 600 bar = 0.9 x full scale value
- $> 600 \text{ bar} = \frac{2}{3} \times \text{ full scale value}$

Short-term:

 \leq 600 bar = 1.3 x full scale value

> 600 bar = full scale value

Operating temperature range

Medium: $T_{max} = +60 \, ^{\circ}C$ Ambient: $T_{min} = -20 \, ^{\circ}C$ $T_{max} = +60 \, ^{\circ}C$

Temperature performance

Indication error when the temperature of the measuring system deviates from the normal temperature of 20 °C:

rising temperature approx. ±0.4 %/10 K falling temperature approx. ±0.4 %/10 K of full scale value

Degree of protection

IP 54 (EN 60529)

Standard version Connection

Brass, bottom or bottom back G½B – spanner size SW 22 (EN 837-1/7.3)

Measuring element

Bourdon tube, ≤ 60 bar "C" type tube, copper alloy> 60 bar helical tube, stainless steel 316 Ti/316 L

Movement

Brass

Dial

Aluminium, white; dial marking black

Pointer

Aluminium, black

Housing

Stainless steel 304 with blow-out

Bayonet type bezel

Stainless steel 304

Window

Instrument glass

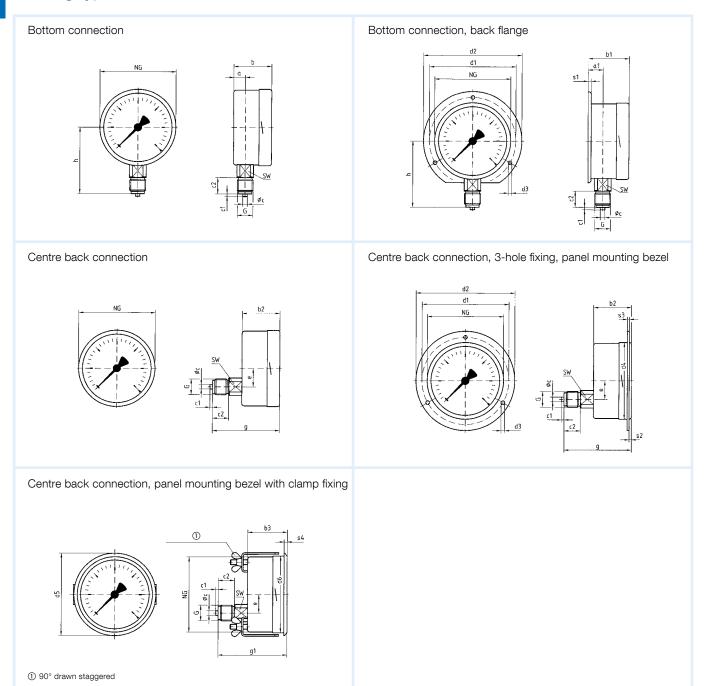
- **Options** Nominal size 250 (bottom connection)
 - Back flange
 - Panel mounting bezel
 - 3-hole fixing, panel mounting bezel
 - Laminated safety glass window
- Damping screw
- Reference pointer
- Electrical contacts
- Special scales
- Other process connections





Bourdon tube pressure gauges for industrial applications Type D 4 - NG 100/160

Housing types and dimensions



Nominal size (NG)	а	a1	b	b1	b ₂	bз	Øc	C1	C 2	d1*	d2	d 3*	d4	d ₅	d6	е	G	g	g1	h	S1
100	15.6	19.1	49	52.5	49	49	6	3	20	116	132	4.8	104	107	101	26.5	G½B	81	81	86	5.5
160	17.5	20.5	50	53	50	52	6	3	20	178	196	5.8	164	167	161	26.5	G½B	82	84	116	6
250	16	-	57	59	-	-	6	3	20	270	285	5.8	-	-	-	-	G½B	-	-	165	2
Nominal size (NG)	S 2	S 3	S 4	SW																	
100	4	2	4	22																	
160	4	2	4.5	22																	
250	-	-	-	22																	

^{*} Dimensions for NG 100 according to DIN 16064.

Bourdon tube pressure gauges for industrial applications EN 837-

DG: M, PG: 2

Туре	RF100 I, D401	RF100 I, D411	RF100 I, D431	RF100 I, D451	RF160 I, D401	RF160 I, D411	RF160 I, D431	RF160 I, D451
Version								
Housing Ø	100	100	100	100	160	160	160	160
Housing		Sta	ainless steel 30	04 with bayone	t bezel, instrun	nent glass win	dow	'
Measuring element		Bourdon t	ube, copper al	loy (> 60 bar st	tainless steel 3	16 Ti/316 L)		
Accuracy class	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Connection	G½B	G½B	G½B	G½B	G½B	G½B	G½B	G½B
			3-hole fixing, panel mounting bezel, 304, pol- ished	Panel mounting bezel, 304, pol- ished, with clamp fixing			3-hole fixing, panel mounting bezel, 304, pol- ished	Panel mounting bezel, 304, pol- ished, with clamp fixing
Range (bar)	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €								
-1/0	85301401	85301411	85301431	85301451	85351401	85351411	85351431	85351451
-1/+0.6	85302401	85302411	85302431	85302451	85352401	85352411	85352431	85352451
-1/+1.5	85303401	85303411	85303431	85303451	85353401	85353411	85353431	85353451
-1/+3	85304401	85304411	85304431	85304451	85354401	85354411	85354431	85354451
-1/+5	85305401	85305411	85305431	85305451	85355401	85355411	85355431	85355451
-1/+9	85306401	85306411	85306431	85306451	85356401	85356411	85356431	85356451
-1/+15	85307401	85307411	85307431	85307451	85357401	85357411	85357431	85357451
Price €								
0/0.6	85309401	85309411	85309431	85309451	85359401	85359411	85359431	85359451
0/1	85310401	85310411	85310431	85310451	85360401	85360411	85360431	85360451
0/1.6	85311401	85311411	85311431	85311451	85361401	85361411	85361431	85361451
0/2.5	85312401	85312411	85312431	85312451	85362401	85362411	85362431	85362451
0/4	85313401	85313411	85313431	85313451	85363401	85363411	85363431	85363451
0/6	85314401	85314411	85314431	85314451	85364401	85364411	85364431	85364451
0/10	85315401	85315411	85315431	85315451	85365401	85365411	85365431	85365451
0/16	85316401	85316411	85316431	85316451	85366401	85366411	85366431	85366451
0/25	85317401	85317411	85317431	85317451	85367401	85367411	85367431	85367451
0/40	85318401	85318411	85318431	85318451	85368401	85368411	85368431	85368451
Price €								
0/60	85319401	85319411	85319431	85319451	85369401	85369411	85369431	85369451
0/100	85320401	85320411	85320431	85320451	85370401	85370411	85370431	85370451
0/160	85321401	85321411	85321431	85321451	85371401	85371411	85371431	85371451
0/250	85322401	85322411	85322431	85322451	85372401	85372411	85372431	85372451
0/400	85323401	85323411	85323431	85323451	85373401	85373411	85373431	85373451
Price €								
0/600	85324401	85324411	85324431	85324451	85374401	85374411	85374431	85374451
0/1000	85325401	85325411	85325431	85325451	85375401	85375411	85375431	85375451
Extra charge €								
Nominal size 250								



See page 72 for extra charges.

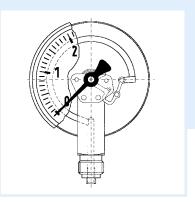
Minimum order quantity for non-stock items = 10 pieces.

Blue part no. = in-stock items





- Can be used in case of heavy vibrations and high, dynamic pressure loads
- Longer service life due to less wear and corrosion protection of the measuring system
- No steaming up of the inside of the window in case of outdoor applications



Application For gaseous and liquid media which are not highly viscous, do not crystallise and do not attack copper alloys. For measurements in areas with high vibration levels and high, dynamic pressure loads. ! For measuring gas or vapour, these gauges must be used in accordance with the table "Selection Criteria as per EN 837-2" (see appendix)!

Technical Type specifications

Nominal size

Accuracy class (EN 837-1/6)

Ranges (EN 837-1/5)

0/1 bar to 0/400 bar

-1/0 bar

Application area

Static load: ¾ x full scale value Dynamic load: 2/3 x full scale value

Short-term: full scale value

Operating temperature range

Medium: $T_{max} = +60 \, ^{\circ}C$ $T_{min} = -20 \, ^{\circ}C$ Ambient: $T_{max} = +60 \, ^{\circ}C$

Temperature performance

Indication error when the temperature of the measuring system deviates from the normal temperature of +20 °C:

rising temperature approx. ±0.4 %/10 K falling temperature approx. ±0.4 %/10 K of full scale value

Degree of protection

IP 65 (EN 60529) with housing vent (≤ 25 bar) IP 54

Standard version

Connection

Brass, centre back G¹/₈B - spanner size SW 12 (EN 837-1/7.3)

Measuring element

Bourdon tube, copper alloy ≤ 60 bar "C" type tube > 60 bar helical tube

Movement

Brass

Plastic, white; dial marking black

Pointer

Plastic, black

Housing

Plastic (ABS), black, with blow-out

Window

Plastic, ultrasonically welded to housing

Filling liquid

Glycerine (99.5 %)

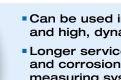
Centre connection back - NG 40

Nominal size (NG)	b	Øc	C 2	-
40	25	4	10	-
Nominal size (NG)	D	G	g	SW
40	40	G¹/8B	43	12



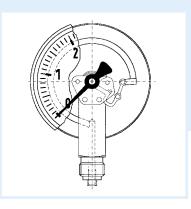
- Options Special scales
 - Damping screw
 - Other process connections





- Can be used in case of heavy vibrations and high, dynamic pressure loads
- Longer service life due to less wear and corrosion protection of the measuring system
- No steaming up of the inside of the window in case of outdoor applications





Application For gaseous and liquid media which are not highly viscous, do not crystallise and do not attack copper alloys. For measurements in areas with high vibration levels and high, dynamic pressure loads. ! For measuring gas or vapour, these gauges must be used in accordance with the table "Selection Criteria as per EN 837-2" (see appendix)!

Technical Type specifications

Nominal size

50 - 63

Accuracy class (EN 837-1/6)

1.6

Ranges (EN 837-1/5)

-1/0 to -1/+15 bar 0/0.6 to 0/400 bar

Application area

Static load: 3/4 x full scale value Dynamic load: 2/3 x full scale value Short-term: full scale value

Standard version Connection

Brass, bottom or centre back G1/4B - spanner size SW 14 (EN 837-1/7.3)

Measuring element

Bourdon tube, copper alloy ≤ 60 bar "C" type tube > 60 bar helical tube

Movement

Brass

Dial

Aluminium, white Dial marking black

- Options Back flange (NG 63)
 - Clamp fixing
 - 3-hole fixing, panel mounting bezel (NG 63)

Operating temperature range

 $T_{max} = +60 \, ^{\circ}C$ Medium: $T_{min} = -20 \, ^{\circ}C$ Ambient: $T_{max} = +60 \, ^{\circ}C$

Temperature performance

Indication error when the temperature of the measuring system deviates from the normal temperature of 20 °C:

rising temperature approx. ±0.4 %/10 K falling temperature approx. ±0.4 %/10 K of full scale value

Degree of protection

IP 65 (EN 60529) with housing vent (≤ 25 bar) IP 54

Pointer

Aluminium, black

Housing

Polyamide black With blow-out

Crimped bezel

Aluminium, black

Window

Plastic

Filling liquid

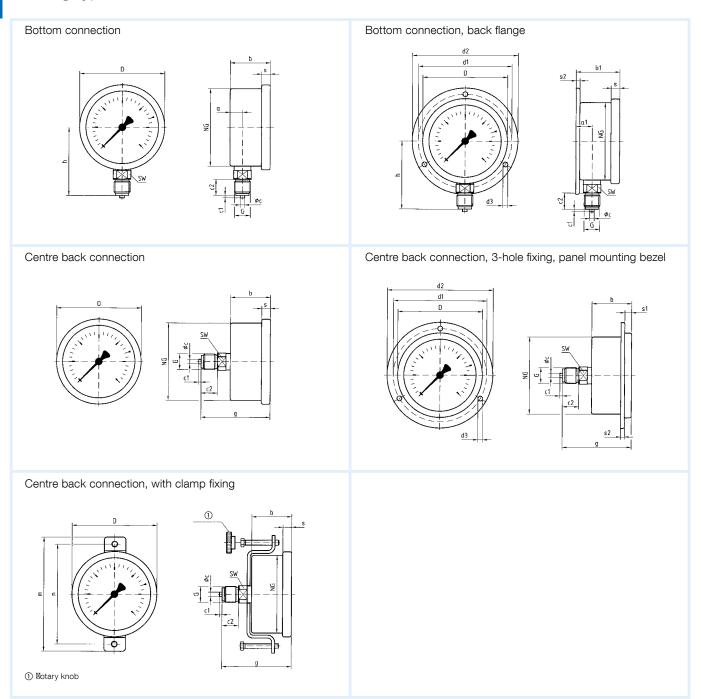
Glycerine (99.5 %)

- Damping screw
- Special scales
- Other process connections



Type D 6 - NG 50/63

Housing types and dimensions



Nominal size (NG)	а	a ₁	b	b ₁	Øc	C1	C2	dı*	d ₂	d 3*	D	G	g	h	m	n	S	S 1	S 2	SW
50	12	-	31.5	-	5	2	13	-	-	-	53	G1/4B	54.5	47	82	73	5	-	-	14
63	10	13	32	35	5	2	13	75	85	3.6	68	G¼B	55	53	94	82	7	5.5	3	14

EN 837-1

DG: M, PG: 2

Туре	RF40Gly, D611	RF50Gly, D601	RF50Gly, D611	RF50Gly, D641	RF63Gly, D601	RF63Gly, D611	RF63Gly, D621	RF63Gly, D641
Version								
Housing Ø	40	50	50	50	63	63	63	63
Housing	ABS black		Polyami	de, black, with	crimped bezel	, black, plastic	window	
Measuring element				Bourdon tube	, copper alloy			
Accuracy class	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Connection	G1/8B	G¼B	G¼B	G¼B	G¼B	G¼B	G¼B	G¼B
				Clamp fixing			3-hole fixing, panel mounting bezel, black	Clamp fixing
Range (bar)	Part no.	Part no.						
Price €								
-1/0	85001611	85051601	85051611	85051641	85101601	85101611	85101621	85101641
-1/+0.6		85052601	85052611	85052641	85102601	85102611	85102621	85102641
-1/+1.5		85053601	85053611	85053641	85103601	85103611	85103621	85103641
1/+3		85054601	85054611	85054641	85104601	85104611	85104621	85104641
-1/+5		85055601	85055611	85055641	85105601	85105611	85105621	85105641
-1/+9	85056601		85056611	85056641	85106601	85106611	85106621	85106641
-1/+15		85057601	85057611	85057641	85107601	85107611	85107621	85107641
Price €								
0/0.6		85059601	85059611	85059641	85109601	85109611	85109621	85109641
0/1	85010611	85060601	85060611	85060641	85110601	85110611	85110621	85110641
0/1.6	85011611	85061601	85061611	85061641	85111601	85111611	85111621	85111641
0/2.5	85012611	85062601	85062611	85062641	85112601	85112611	85112621	85112641
0/4	85013611	85063601	85063611	85063641	85113601	85113611	85113621	85113641
0/6	85014611	85064601	85064611	85064641	85114601	85114611	85114621	85114641
0/10	85015611	85065601	85065611	85065641	85115601	85115611	85115621	85115641
0/16	85016611	85066601	85066611	85066641	85116601	85116611	85116621	85116641
0/25	85017611	85067601	85067611	85067641	85117601	85117611	85117621	85117641
0/40	85018611	85068601	85068611	85068641	85118601	85118611	85118621	85118641
Price €								
0/60	85019611	85069601	85069611	85069641	85119601	85119611	85119621	85119641
0/100	85020611	85070601	85070611	85070641	85120601	85120611	85120621	85120641
0/160	85021611	85071601	85071611	85071641	85121601	85121611	85121621	85121641
0/250	85022611	85072601	85072611	85072641	85122601	85122611	85122621	85122641
0/400	85023611	85073601	85073611	85073641	85123601	85123611	85123621	85123641

^{*} Minimum order quantity for non-stock items = 25 pieces

Blues part no. = in-stock items



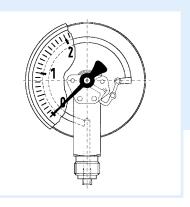
See page 72 for extra charges.





- Robust stainless steel housing
- Can be used in case of heavy vibrations and high, dynamic pressure loads
- Longer service life due to less wear and corrosion protection of the measuring system
- No steaming up of the inside of the window in case of outdoor applications





Application For gaseous and liquid media which are not highly viscous, do not crystallise and do not attack copper alloys. For measurements in areas with high vibration levels and high, dynamic pressure loads. ! For measuring gas or vapour, these gauges must be used in accordance with the table "Selection Criteria as per EN 837-2" (see appendix)!

Technical Type specifications D7

Nominal size

50 - 63

Accuracy class (EN 837-1/6)

Ranges (EN 837-1/5)

-1/0 to -1/+15 bar 0/0.6 to 0/400 bar NG 63 to 0/600 bar

Application area

Static load: ¾ x full scale value Dynamic load: 2/3 x full scale value Short-term: full scale value

Operating temperature range

Medium: $T_{max} = +60 \, ^{\circ}C$ Ambient: $T_{min} = -20 \, ^{\circ}C$ $T_{max} = +60 \, ^{\circ}C$

Temperature performance

Indication error when the temperature of the measuring system deviates from the normal temperature of 20 °C:

rising temperature approx. ±0.4 %/10 K falling temperature approx. ±0.4 %/10 K of full scale value

Degree of protection

IP 65 (EN 60529) with housing vent (≤ 25 bar): IP 54

Standard version Connection

Brass, bottom or centre back G1/4B - spanner size SW 14 (EN 837-1/7.3)

Measuring element

Bourdon tube, copper alloy ≤ 60 bar "C" type tube > 60 bar helical tube

Movement

Brass

Dial

Aluminium, white Dial marking black

- **Options** Filling liquid silicone oil
 - Back flange (NG 63)
 - Clamp fixing
 - 3-hole fixing, panel mounting bezel
 - Crimped bezel polished

Pointer

Aluminium, black

Housing

Stainless steel 304 with blow-out

Crimped bezel

Stainless steel 304

Window

Plastic

Filling liquid

Glycerine (99.5 %)

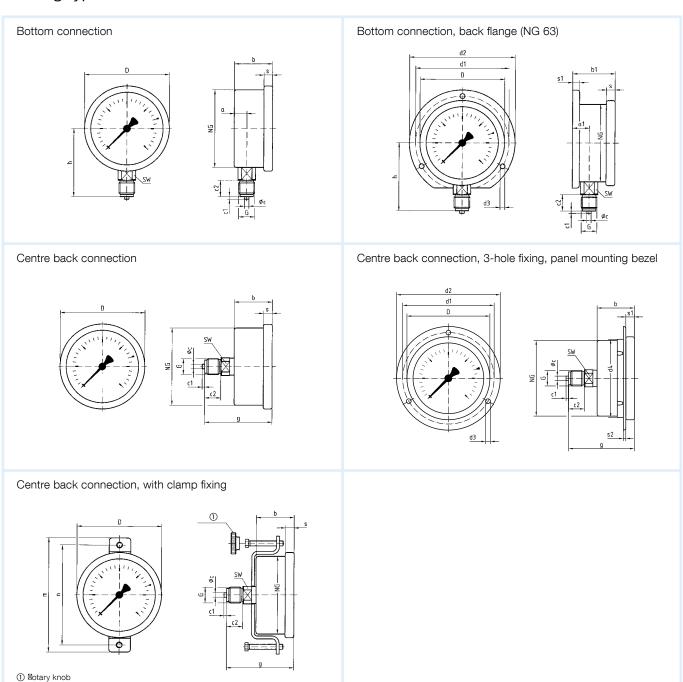
- Special scales
- Clip reference pointer, red, adjustable (NG 63)
- Damping screw
- Other process connections





Type D 7 - NG 50/63

Housing types and dimensions



Nominal size (NG)	а	a ₁	b	b ₁	Øc	C1	C 2	dı*	d ₂	d 3*	d4	D	G	g	h	m	n	S	S1	S 2	SW
50	11	-	28	-	5	2	13	-	-	-	-	53	G1/4B	51	45.5	82	73	4.5	-	-	14
63	9.5	13	30.5	34	5	2	13	75	85	3.6	64	68	G¼B	53.3	53	94	82	7	5.5	2	14

^{*} Dimensions as per DIN 16063.

EN 837-1

DG: M, PG: 2

	RF50Gly, D701	RF50Gly, D711	RF50Gly, D751	RF63Gly, D701	RF63Gly, D711	RF63Gly, D731	RF63Gly, D751
			H				n
Version							
VCISION							
Hausing Ø	50	50	50	63	63	63	63
Housing Ø Housing	50		nless steel 304 v				63
		Stal		don tube, coppe		TIGOW	
Measuring element	1.6	1.6	1.6	, , , ,	1.6	1.6	1.6
Accuracy class				1.6			
Connection	G¼B	G¼B	G¼B	G¼B	# Dual scale, har oute	G1/4B r, black - psi inner, red	G¼B
			Clamp fixing		Duai scale, bai oute	3-hole fixing, panel	Clamp fixing
Range (bar)	Part no.	Part no.	Part no.	Part no.	Part no.	mounting bezel 304 Part no.	Part no.
Price €	Fait iio.	Fait iio.	Fait no.	Fait IIO.	raitiio.	raitiio.	Fait iio.
-1/0	85051701	85051711	85051751	85101701	85101711	85101731	85101751
-1/+0.6	85051701	85051711	85051751	85101701	85101711	85101731 85102731	
							85102751
-1/+1.5	85053701	85053711	85053751	85103701	85103711	85103731	85103751
-1/+3	85054701	85054711	85054751	85104701	85104711	85104731	85104751
-1/+5	85055701	85055711	85055751	85105701	85105711	85105731	85105751
-1/+9	85056701	85056711	85056751	85106701	85106711	85106731	85106751
-1/+15	85057701	85057711	85057751	85107701	85107711	85107731	85107751
		I	I	I	I	I	I
Price €							
0/0.6	85059701	85059711	85059751	85109701	85109711	85109731	85109751
0/1	85060701	85060711	85060751	85110701	85110711	85110731	85110751
0/1.6	85061701	85061711	85061751	85111701	85111711	85111731	85111751
0/2.5	85062701	85062711	85062751	85112701	85112711	85112731	85112751
0/4	85063701	85063711	85063751	85113701	85113711	85113731	85113751
0/6	85064701	85064711	85064751	85114701	85114711	85114731	85114751
0/10	85065701	85065711	85065751	85115701	85115711	85115731	85115751
0/16	85066701	85066711	85066751	85116701	85116711	85116731	85116751
0/25	85067701	85067711	85067751	85117701	85117711	85117731	85117751
0/40	85068701	85068711	85068751	85118701	85118711	85118731	85118751
Price €							
0/60	85069701	85069711	85069751	85119701	85119711	85119731	85119751
0/100	85070701	85070711	85070751	85120701	85120711	85120731	85120751
0/160	85071701	85071711	85071751	85121701	85121711	85121731	85121751
0/250	85072701	85072711	85072751	85122701	85122711	85122731	85122751
0/315				86818701	86818711	86818731	86818751
0/400	85073701	85073711	85073751	85123701	85123711	85123731	85123751
	1	1	1	1	1		1
Price €							
0/600				85124701	85124711	85124731	85124751

 $^{^{\}star}$ Append the code Z001 to the part number for single scales. Minimum order quantity for non-stock items = 25 pieces.

Blue part no. = in-stock items



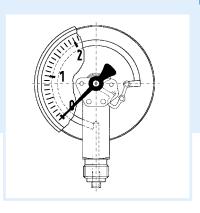
See page 72 for extra charges.





- Compact design
- Can be used in case of heavy vibrations and high, dynamic pressure loads
- Longer service life due to less wear and corrosion protection of the measuring system
- No steaming up of the inside of the window in case of outdoor applications





Application For gaseous and liquid media which are not highly viscous, do not crystallise and do not attack copper alloys. For measurements in areas with high vibration levels and high, dynamic pressure loads. ! For measuring gas or vapour, these gauges must be used in accordance with the table "Selection Criteria as per EN 837-2" (see appendix)!

Technical Type specifications D7

Nominal size

80 - 100

Accuracy class (EN 837-1/6)

Ranges (EN 837-1/5)

-1/0 to -1/+15 bar 0/1 to 0/400 bar

Application area

Static load: ¾ x full scale value Dynamic load: 2/3 x full scale value Short-term: full scale value

Operating temperature range

Medium: $T_{max} = +60 \, ^{\circ}C$ Ambient: $T_{min} = -20 \, ^{\circ}C$ $T_{max} = +60 \, ^{\circ}C$

Temperature performance

Indication error when the temperature of the measuring system deviates from the normal temperature of 20 °C:

rising temperature approx. ±0.4 %/10 K falling temperature approx. ±0.4 %/10 K of full scale value

Degree of protection

IP 65 (EN 60529) with housing vent (≤ 25 bar): IP 54

Standard version Connection

Brass, bottom NG 80-100 G1/2B - spanner size SW 22

Brass, centre back NG 80 G1/4B - spanner size SW 14

NG 100 G1/2B - spanner size SW 22 (EN 837-1/7.3)

Measuring element

Bourdon tube, copper alloy ≤ 60 bar "C" type tube > 60 bar helical tube

Movement

Brass

Dial

- Options Filling liquid silicone oil
 - Clamp fixing
 - 3-hole fixing, panel mounting bezel (NG 100)
 - Back flange
 - Crimped bezel polished

Aluminium, white Dial marking, black

Pointer

Aluminium, black

Housing

Stainless steel 304 with blow-out

Crimped bezel

Stainless steel 304

Plastic (Makrolon)

Filling liquid

Glycerine (99.5 %)

- Measuring system stainless steel (up to 1000 bar)
- Special scales
- Damping screw
- Other process connections

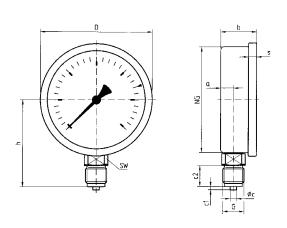


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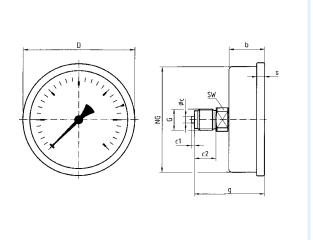
Type D 7 - NG 80/100

Housing types and dimensions

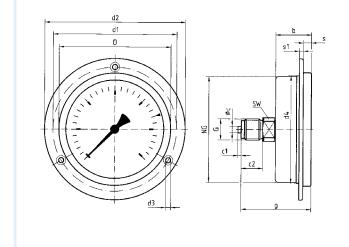
Bottom connection



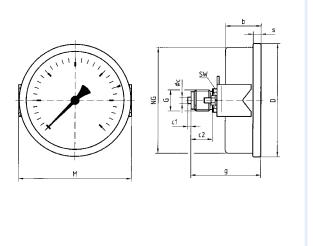
Centre back connection



Centre back connection, 3-hole fixing, panel mounting bezel (NG 100) $\,$



Centre back connection, clamp fixing



Nominal size (NG)	а	b	Øc	C1	C 2	d1*	d ₂	d 3*	d4	D	g	G	h	М	S	S1	SW
80 Ms ax	-	33.5	5	2	13	-	-	-	-	85	56.5	G¼B	-	82	7	-	14
80 VA ax	-	33.5	5	2	13	-	-	-	-	85	59	G¼B	-	82	7	-	14
80 Ms rad	12.2	33.5	6	3	20	-	-	-	-	85	-	G½B	71	-	7	-	22
80 VA rad	12.2	33.5	6	3	20	-	-	-	-	85	-	G½B	79.5	-	7	-	22
100 Ms	12.2	33.5	6	3	20	116	132	4.8	101	106	65.5	G½B	81	106	7	3.8	22
100 VA	11.8	33.5	6	3	20	116	132	4.8	101	106	76.5	G½B	90	106	7	3.8	22

^{*} Dimensions as per DIN 16064.



EN 837-1

DG: M, PG: 2

Measuring system copper alloy

	wiedsuring syst		
Туре	RF80Gly, D701	RF80Gly, D711	RF80Gly, D751
Version			
Housing Ø	80	80	80
Housing	Stainless ste	el 304 with crimp plastic window	ed bezel 304,
Measuring element	Boul	rdon tube, coppei	alloy
Accuracy class	1.6	1.6	1.6
Connection	G½B	G¼B	G¼B
			Clamp fixing
Range (bar)	Part no.	Part no.	Part no.
Price €			
-1/0	85151701	85151711	85151751
-1/+0.6	85152701	85152711	85152751
-1/+1.5	85153701	85153711	85153751
-1/+3	85154701	85154711	85154751
-1/+5	85155701	85155711	85155751
-1/+9	85156701	85156711	85156751
-1/+15	85157701	85157711	85157751
.,	00.0.70.	00.01.1.1	00.00.
Price €			
0/1	85160701	85160711	85160751
0/1.6	85161701	85161711	85161751
0/2.5	85162701	85162711	85162751
0/4	85163701	85163711	85163751
0/6	85164701	85164711	85164751
0/10	85165701	85165711	85165751
0/16	85166701	85166711	85166751
0/25	85167701	85167711	85167751
0/40	85168701	85168711	85168751
			
Price €			
0/60	85169701	85169711	85169751
0/100	85170701	85170711	85170751
0/160	85171701	85171711	85171751
0/250	85172701	85172711	85172751
0/400	85173701	85173711	85173751
		1	1
Price €			
0/600			
0/1000			
Potos al so			
Extra charges (without PG)			
Class 1.0			

$\cap \cap$	ΝЛ	PG:	2
DCJ.	IVI.	ru.	O

RF80EGly, D702	RF80EGly, D712	RF80EGly, D752
		[]
80	80	80
Stainless ste	eel 304 with crimpe plastic window	ed bezel 304,
Bourdon tuk	oe, stainless steel	316 Ti/316 L
1.6	1.6	1.6
G½B	G¼B	G¼B
		Clamp fixing
Part no.	Part no.	Part no.
85151702	85151712	85151752
85152702	85152712	85152752
85153702	85153712	85153752
85154702	85154712	85154752
85155702	85155712	85155752
85156702	85156712	85156752
85157702	85157712	85157752
85160702	85160712	85160752
85161702	85161712	85161752
85162702	85162712	85162752
85163702	85163712	85163752
85164702	85164712	85164752
85165702	85165712	85165752
85166702	85166712	85166752
85167702	85167712	85167752
85168702	85168712	85168752
85169702	85169712	85169752
85170702	85170712	85170752
85171702	85171712	85171752
85172702	85172712	85172752
85173702	85173712	85173752
85174702	85174712	85174752
85175702	85175712	85175752
Price €	Price €	Price €

Blue part no. = in-stock items



See page 72 for extra charges.

Minimum order quantity = 10 pieces.



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EN 837-1

DG: M, PG: 2

Measuring system copper alloy

DG: M, PG: 3

Measuring system stainless steel	Measuring	system	stainless	steel
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RF100EGly, D702	RF100EGly, D712	RF100EGly, D732	RF100EGly, D752		
100	100	100	100		
Stainless steel 304 with crimped bezel 304, plastic window					

100	100	100	100		
Stainle		ith crimped bez window	el 304,		
Bourd	on tube, stainl	ess steel 316 Ti/316 L			
1.6	1.6	1.6	1.6		
G½B	G1/2B	G½B	G1/2B		
		3-hole fixing, panel mounting bezel, stainless steel	Clamp fixing		
Part no.	Part no.	Part no.	Part no.		
85201702	85201712	85201732	85201752		
85202702	85202712	85202732	85202752		
85203702	85203712	85203732	85203752		
85204702	85204712	85204732	85204752		
85205702	85205712	85205732	85205752		
85206702	85206712	85206732	85206752		
85207702	85207712	85207732	85207752		
05010700	05010710	05010700	05010750		
85210702	85210712	85210732	85210752		
85211702	85211712	85211732	85211752		
85212702	85212712	85212732	85212752		
85213702	85213712	85213732	85213752		
85214702	85214712	85214732	85214752		
85215702	85215712	85215732	85215752		
85216702	85216712	85216732	85216752		
85217702	85217712	85217732	85217752		
85218702	85218712	85218732	85218752		
85219702	85219712	85219732	85219752		
85220702	85220712	85220732	85220752		
85221702	85221712	85221732	85221752		
85222702	85222712	85222732	85222752		
85223702	85223712	85223732	85223752		

Price €	Price €	Price €	Price €	

85224712

85225712

85224702

85225702

Measuring system copper alloy							
Туре	RF100Gly, D701	RF100Gly, D711	RF100Gly, D731	RF100Gly, D751			
Version							
Housing Ø	100	100	100	100			
Housing	Stainle		rith crimped bez window	el 304,			
Measuring element		Bourdon tub	e, copper alloy				
Accuracy class	1.6	1.6	1.6	1.6			
Connection	G1/2B	G½B	G½B	G½B			
			3-hole fixing, panel mounting bezel, stainless steel	Clamp fixing			
Range (bar)	Part no.	Part no.	Part no.	Part no.			
Price €							
-1/0	85201701	85201711	85201731	85201751			
-1/+0.6	85202701	85202711	85202731	85202751			
-1/+1.5	85203701	85203711	85203731	85203751			
-1/+3	85204701	85204711	85204731	85204751			
-1/+5	85205701	85205711	85205731	85205751			
-1/+9	85206701	85206711	85206731	85206751			
-1/+15	85207701	85207711	85207731	85207751			
Price €							
0/1	85210701	85210711	85210731	85210751			
0/1.6	85211701	85211711	85211731	85211751			
0/2.5	85212701	85212711	85212731	85212751			
0/4	85213701	85213711	85213731	85213751			
0/6	85214701	85214711	85214731	85214751			
0/10	85215701	85215711	85215731	85215751			
0/16	85216701	85216711	85216731	85216751			
0/25	85217701	85217711	85217731	85217751			
0/40	85218701	85218711	85218731	85218751			
Price €							
0/60	85219701	85219711	85219731	85219751			
0/100	85220701	85220711	85220731	85220751			
0/160	85221701	85221711	85221731	85221751			
0/250	85222701	85222711	85222731	85222751			
0/400	85223701	85223711	85223731	85223751			
Price €							
0/600							
0/1000							
Extra charges (without PG)							
Class 1.0							

See page 72 for extra charges.

Minimum order quantity for non-stock items = 10 pieces. Blue part no. = in-stock items

85224732

85225732



85224752

85225752

Glycerine filled Bourdon tube pressure gauges EN 837-1

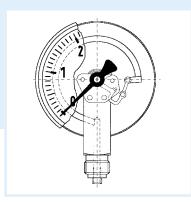




Robust, stainless steel housing with bayonet bezel

- Can be used in case of heavy vibrations and high, dynamic pressure loads
- Longer service life due to less wear and corrosion protection of the measuring system
- No steaming up of the inside of the window in case of outdoor applications
- DNV-certified





Application For gaseous and liquid media which are not highly viscous, do not crystallise and do not attack copper alloys. For measurements in areas with high vibration levels and high, dynamic pressure loads. ! For measuring gas or vapour, these gauges must be used in accordance with the table "Selection Criteria as per EN 837-2" (see appendix)!

Technical Type specifications

D 751

Nominal size

100 - 160

Accuracy class (EN 837-1/6)

Ranges (EN 837-1/5)

-1/0 to -1/+15 bar 0/0.6 to 0/1000 bar

Application area

Static load:

≤ 600 bar = full scale value

> 600 bar = 3/4 x full scale value

Dynamic load:

 \leq 600 bar = 0.9 x full scale value

 $> 600 \text{ bar} = \frac{2}{3} \times \text{ full scale value}$

Short-term:

 \leq 600 bar = 1.3 x full scale value

> 600 bar = full scale value

Operating temperature range

Medium: $T_{max} = +60 \, ^{\circ}C$ Ambient: $T_{min} = -20 \, ^{\circ}C$ $T_{max} = +60 \, ^{\circ}C$

Temperature performance

Indication error when the temperature of the measuring system deviates from the normal temperature of 20 °C:

rising temperature approx. ±0.4 %/10 K falling temperature approx. ±0.4 %/10 K of full scale value

Degree of protection

IP 65 (EN 60529)

with housing vent (≤ 25 bar): IP 54

Standard version Connection

Brass, bottom or bottom back G½B - spanner size SW 22 (EN 837-1/7.3)

Measuring element

Bourdon tube. ≤ 60 bar "C" type tube, copper alloy > 60 bar helical tube,

stainless steel 316 Ti/316 L

Movement

Brass

Aluminium, white Dial marking, black

- Options Back flange
 - 3-hole fixing, panel mounting bezel

Pointer

Aluminium, black

Housing

Stainless steel 304 with blow-out

Bayonet type bezel

Stainless steel 304 (D 751 = crimped bezel)

Window

Instrument glass (D 751 = plastic)

Filling liquid

Glycerine (99.5 %)

- Special scales
- Other process connections



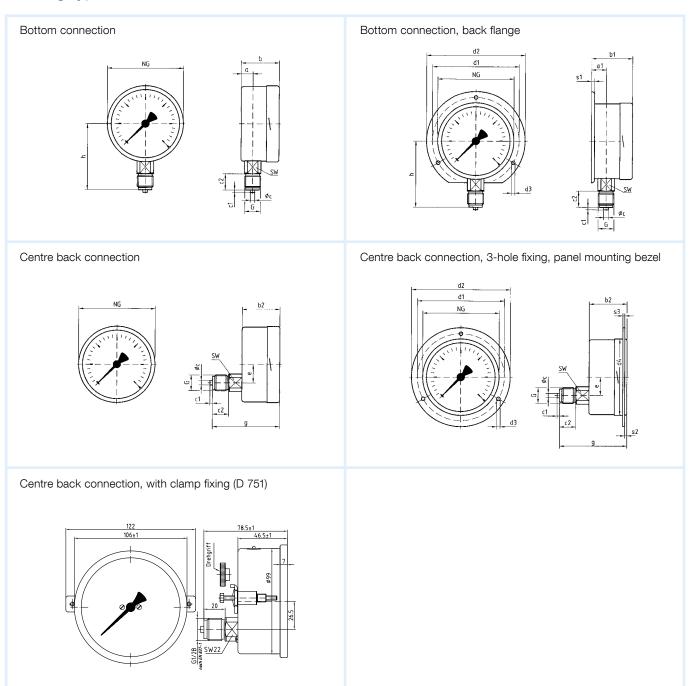


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Glycerine filled Bourdon tube pressure gauges

Type D 8/D 751 - NG 100/160

Housing types and dimensions



Nominal size (NG)	а	a1	b	b1	b2	Øc	C1	C 2	dı*	d ₂	d 3*	d4	е	G	g	h	S 1
100	15.6	19.1	49	52.5	49	6	3	20	116	132	4.8	104	26.5	G½B	81	86	5.5
160	17.5	20	50	53	50	6	3	20	178	196	5.8	164	26.5	G1/2B	82	116	6
									•								
Nominal size (NG)	S2	S 3	SW														
100	4	2	22														
160	4	2	22														

^{*} Dimensions as per DIN 16064.

Glycerine filled Bourdon tube pressure gauges

EN 837-1

DG: M, PG: 2

Туре	RF100Gly, D801	RF100Gly, D811	RF100Gly, D831	RF100Gly, D751	RF160Gly, D801	RF160Gly, D811	RF160Gly, D831
Version							
Housing Ø	100	100	100	100	160	160	160
Housing			Stainless stee	el 304, window, s	ee data sheet		
Measuring element		Bourdo	n tube, copper a	lloy (> 60 bar sta	inless steel 316	Ti/316 L)	
Accuracy class	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Connection	G½B	G½B	G½B	G½B	G½B	G½B	G½B
			3-hole fixing, panel mounting bezel, 304, polished	Crimped bezel 304 with clamp fixing			3-hole fixing, panel mounting bezel, 304, polished
Range (bar)	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €							
-1/0	85201801	85201811	85201831	85301751	85251801	85251811	85251831
-1/+0.6	85202801	85202811	85202831	85302751	85252801	85252811	85252831
-1/+1.5	85203801	85203811	85203831	85303751	85253801	85253811	85253831
-1/+3	85204801	85204811	85204831	85304751	85254801	85254811	85254831
-1/+5	85205801	85205811	85205831	85305751	85255801	85255811	85255831
-1/+9	85206801	85206811	85206831	85306751	85256801	85256811	85256831
-1/+15	85207801	85207811	85207831	85307751	85257801	85257811	85257831
Price €							
0/0.6	85209801	85209811	85209831	85309751	85259801	85259811	85259831
0/1	85210801	85210811	85210831	85310751	85260801	85260811	85260831
0/1.6	85211801	85211811	85211831	85311751	85261801	85261811	85261831
0/2.5	85212801	85212811	85212831	85312751	85262801	85262811	85262831
0/4	85213801	85213811	85213831	85313751	85263801	85263811	85263831
0/6	85214801	85214811	85214831	85314751	85264801	85264811	85264831
0/10	85215801	85215811	85215831	85315751	85265801	85265811	85265831
0/16	85216801	85216811	85216831	85316751	85266801	85266811	85266831
0/25	85217801	85217811	85217831	85317751	85267801	85267811	85267831
0/40	85218801	85218811	85218831	85318751	85268801	85268811	85268831
Price €							
0/60	85219801	85219811	85219831	85319751	85269801	85269811	85269831
0/100	85220801	85220811	85220831	85320751	85270801	85270811	85270831
0/160	85221801	85221811	85221831	85321751	85271801	85271811	85271831
0/250	85222801	85222811	85222831	85322751	85272801	85272811	85272831
0/400	85223801	85223811	85223831	85323751	85273801	85273811	85273831
Price €							
0/600	85224801	85224811	85224831	85324751	85274801	85274811	85274831
0/1000	85225801	85225811	85225831	85325751	85275801	85275811	85275831
0, 1000	00220001	00220011	00220001	00020101	00210001	00210011	00210001

Minimum order quantity for non-stock items = 10 pieces.

Blues part no. = in-stock items



See page 72 for extra charges.



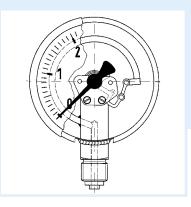
Stainless steel Bourdon tube pressure gauges EN 837-1





Extremely compact design

- Wetted parts and movement made of stainless steel
- Housing welded to pressure connection
- Optional for control cabinet mounting
- Tightness-tested with helium
- GOSSTANDART-certified



Application For corrosive gaseous and liquid media which are not highly viscous and do not crystallise. ! For measuring gas or vapour, these gauges must be used in accordance with the table "Selection Criteria as per EN 837-2" (see appendix)!

Technical Type specifications D3

Nominal size

40

Accuracy class (EN 837-1/6)

Ranges (EN 837-1/5)

Type RF40 rad D302 0/1.6 bar to 0/600 bar Type RF40 ax D312/D332 0/1.6 bar to 0/60 bar

Application area

Static load: 34 x full scale value Dynamic load: 2/3 x full scale value Short-term:

Full scale value

Operating temperature range

Medium: $T_{max} = +100 \, ^{\circ}C$ Ambient: $T_{min} = -20 \, ^{\circ}C$ $T_{max} = +60 \, ^{\circ}C$

Temperature performance

Indication error when the temperature of the measuring system deviates from the normal temperature of 20 °C: rising temperature approx. ±0.4 %/10 K falling temperature approx. ±0.4 %/10 K of full scale value

Degree of protection

IP 32 (EN 60529)

Standard version Connection

Stainless steel 316 L G1/8B - spanner size SW 14 bottom or centre back (EN 837-1/7.3)

Measuring element

Bourdon tube, stainless steel 316 L ≤ 60 "C" type tube > 60 bar helical tube tightness-tested with helium

Movement

Stainless steel

- **Options** Other process connections
 - 3-hole fixing, panel mounting bezel
 - Special scales
 - Oil- and grease-free version

Dial

Aluminium, white Dial marking black

Pointer

Aluminium, black

Housing

Stainless steel 304

Window

Clip-in plastic

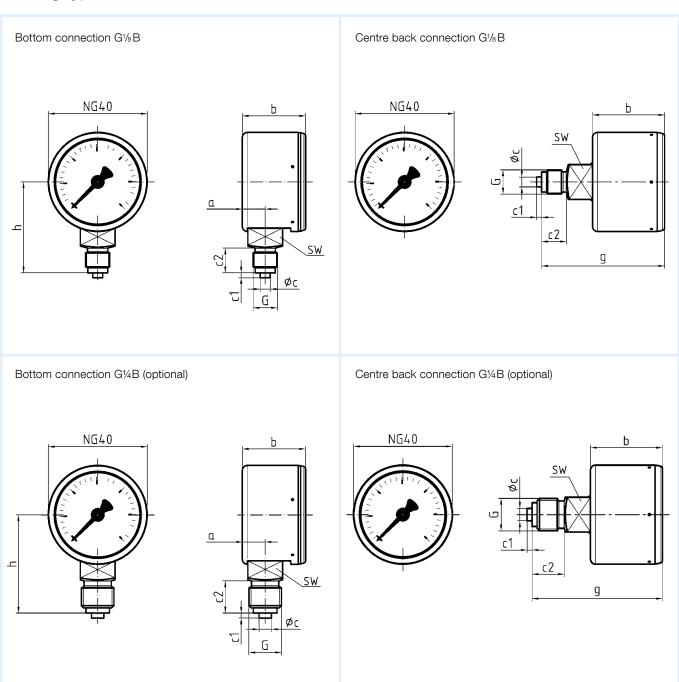




Stainless steel Bourdon tube pressure gauges

Type D3 - NG 40

Housing types and dimensions



Connection (G)	а	b	Øc	C1	C2	g	h	SW
G¹/ ₈ B bottom	9.2	25.5	4	2	10	-	36.5	14
G¹/8B centre back	-	29	4	2	10	49.5	-	14
G1/4B bottom	9.2	25.5	5	2	13	-	39.5	14
G¼B centre back	-	29	5	2	13	52.5	-	14



Stainless steel Bourdon tube pressure gauges

EN 837-1

DG: M, PG: 3

Туре	RF40E, D302	RF40E, D312	RF40E, D332
Version			
Housing Ø	40	40	40
Housing		Stainless steel 304	
Measuring element	Bourdo	n tube, stainless ste	el 316 L
Accuracy class	2.5	2.5	2.5
Connection	G¹/ ₈ B	G¹/₅B	G¹/8B
			3-hole fixing, panel mounting bezel 304
Range (bar)	Part no.	Part no.	Part no.
-1/0			
-1/+0.6			
-1/+1.5			
-1/+3			
-1/+5			
-1/+9			
-1/+15			
Price €			
0/0.6			
0/1			
0/1.6	85011302	85011312	85011332
0/2.5	85012302	85012312	85012332
0/4	85013302	85013312	85013332
0/6	85014302	85014312	85014332
0/10	85015302	85015312	85015332
0/16	85016302	85016312	85016332
0/25	85017302	85017312	85017332
0/40	85018302	85018312	85018332
	000.0002	000.00.1	000.0002
Price €			
0/60	85019302	85019312	85019332
0/100	85020302		
0/160	85021302		
0/250	85022302		
0/400	85023302		
Price €			
0/600	85024302		

 $\label{eq:minimum} \mbox{Minimum order quantity for non-stock items = 10 pieces.}$

Blue part no. = in-stock items



See page 72 for extra charges.

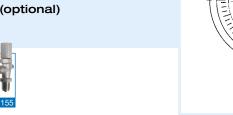
Bourdon tube pressure gauges for chemical applications

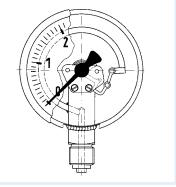






- For chemical and process engineering applications
- Measuring system fully welded to housing
- Extremely robust design
- For medium temperatures up to 150 °C
- Tightness-tested with helium
- GOSSTANDART-certified
- ATEX version (optional)





Application For corrosive gaseous and liquid media which are not highly viscous and do not crystallise; suitable for corrosive environments.

> ! For measuring gas or vapour, these gauges must be used in accordance with the table "Selection Criteria as per EN 837-2" (see appendix)!

Technical Type specifications D9

Nominal size

50 - 63

Accuracy class (EN 837-1/6)

Ranges (EN 837-1/5)

NG 50:

-1/0 to -1/+15 bar

0/0.6 to 0/600 bar

NG 63:

-1/0 to -1/+15 bar

0/0.6 to 0/1000 bar

Application area

Static load: ¾ x full scale value Dynamic load: 2/3 x full scale value Short-term: full scale value

Operating temperature range

Medium: $T_{max} = +150 \, ^{\circ}C$ Ambient: $T_{min} = -20 \, ^{\circ}C$

$T_{max} = +60 \, ^{\circ}C$ Temperature performance

Indication error when the temperature of the measuring system deviates from the normal temperature of 20 °C:

rising temperature approx. ±0.4 %/10 K falling temperature approx. ±0.4 %/10 K of full scale value

Degree of protection

IP 65 (EN 60529) with housing vent (≤ 25 bar): IP 54

Standard version

Connection

Stainless steel 316 L NG 50 bottom or bottom back NG 63 bottom or centre back G1/4B - spanner size SW 14 (EN 837-1/7.3)

Measuring element

Bourdon tube, stainless steel 316 Ti/316 L ≤ 60 bar "C" type tube > 60 bar helical tube tightness-tested with helium

Movement

Stainless steel

Dial

Aluminium, white Dial marking black

Pointer

Aluminium, black

Housing

Stainless steel 304 with blow-out

Crimped bezel

Stainless steel 304

Window

NG 50 plastic

NG 63 laminated safety glass

- Options Plastic window (NG 63)

 - Clamp fixing



- Back flange (NG 63)
- ATEX version



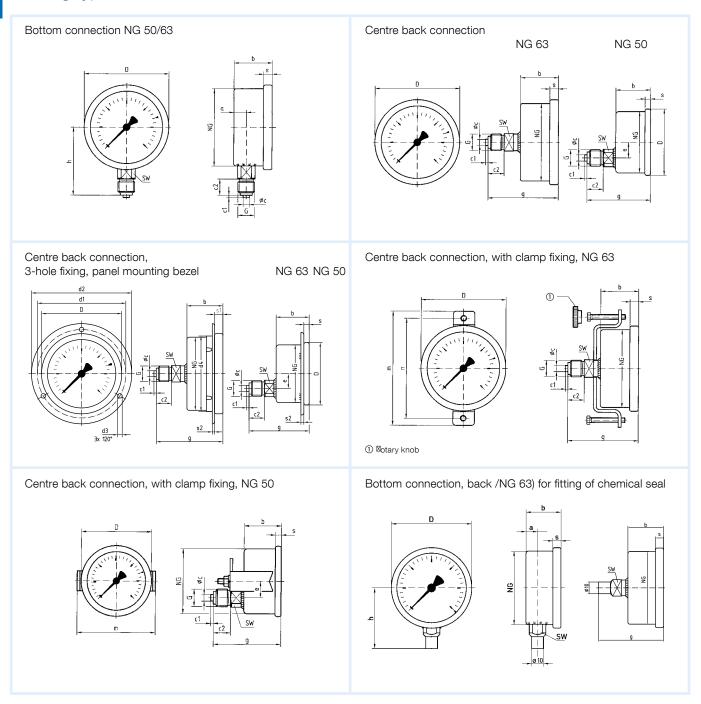


- Crimped bezel, polished
- Special scales
- Other process connections

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Bourdon tube pressure gauges for chemical applications Type D 9 - NG 50/63

Housing types and dimensions



Nominal size (NG)	а	a1	b	b1	Øc	C 1	C 2	d1*	d 2*	d 3*	d4	D	е	G	g	h	m	n	S	S 1	s
50	10.5	-	28	-	5	2	13	60	70	3.6	-	53	12.5	G¼B	51	46	59	-	4.5	-	2.5
63	9.5	13	30.5	34	5	2	13	75	85	3.6	64	68	-	G¼B	56	53	94	82	7	5.5	2
Nominal size (NG)	SW																				
50	14																				
63	14																				

^{*} Dimensions as per DIN 16063.

Bourdon tube pressure gauges for chemical applications

EN 837-1

DG: M, PG: 3

Туре	RF50Ch, D902	RF50Ch, D912	RF50Ch, D932	RF50Ch, D952	RF63Ch, D902	RF63Ch, D912	RF63Ch, D932	RF63Ch, D952
Version								
Housing Ø	50	50	50	50	63	63	63	63
Housing			Stainle	ss steel 304 w	ith crimped be	zel 304		
Measuring element			Bourd	lon tube, stainl	ess steel 316	Γi/316 L		
Accuracy class	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Connection	G¼B	G¼B	G¼B	G¼B	G¼B	G¼B	G¼B	G¼B
			3-hole fixing, panel mounting bezel, 304, bare metal surface	Clamp fixing			3-hole fixing, panel mounting bezel, 304, bare metal surface	Clamp fixing
Range (bar)	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €								
-1/0	85051902	85051912	85051932	85051952	85101902	85101912	85101932	85101952
-1/+0.6	85052902	85052912	85052932	85052952	85102902	85102912	85102932	85102952
-1/+1.5	85053902	85053912	85053932	85053952	85103902	85103912	85103932	85103952
-1/+3	85054902	85054912	85054932	85054952	85104902	85104912	85104932	85104952
-1/+5	85055902	85055912	85055932	85055952	85105902	85105912	85105932	85105952
-1/+9	85056902	85056912	85056932	85056952	85106902	85106912	85106932	85106952
-1/+15	85057902	85057912	85057932	85057952	85107902	85107912	85107932	85107952
Dries 6								
Price €	05050000	05050010	05050000	05050050	05100000	05100010	05100000	05100050
0/0.6	85059902 85060902	85059912 85060912	85059932 85060932	85059952 85060952	85109902 85110902	85109912 85110912	85109932 85110932	85109952
0/1.6	85061902	85061912	85061932	85061952			85111932	85110952 85111952
					85111902	85111912		
0/2.5	85062902	85062912	85062932	85062952	85112902	85112912	85112932	85112952
0/4	85063902 85064902	85063912	85063932	85063952	85113902	85113912	85113932	85113952
0/6		85064912	85064932	85064952 85065952	85114902 85115902	85114912	85114932	85114952 85115952
0/16	85065902 85066902	85065912 85066912	85065932 85066932	85066952	85116902	85115912 85116912	85115932 85116932	85116952
0/16	85067902	85067912	85067932	85067952	85117902	85117912	85117932	85117952
0/40	85068902	85068912	85068932	85068952	85118902	85118912	85118932	85118952
Price €								
0/60	85069902	85069912	85069932	85069952	85119902	85119912	85119932	85119952
0/100	85070902	85070912	85070932	85070952	85120902	85120912	85120932	85120952
0/160	85071902	85071912	85071932	85071952	85121902	85121912	85121932	85121952
0/250	85072902	85072912	85072932	85072952	85122902	85122912	85122932	85122952
0/400	85073902	85073912	85073932	85073952	85123902	85123912	85123932	85123952
Price €								
0/600	85074902	85074912	85074932	85074952	85124902	85124912	85124932	85124952
0/1000					85125902	85125912	85125932	85125952

Minimum order quantity for non-stock items = 10 pieces.

Blue part no. = in-stock items



See page 72 for extra charges.



Bourdon tube pressure gauges for chemical applications

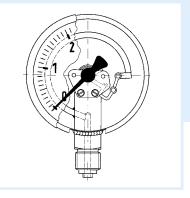






- For chemical and process engineering applications
- Measuring system fully welded to housing
- Extremely robust design
- For medium temperatures up to 150 °C
- Tightness-tested with helium
- DNV- and GOSSTANDART-certified
- ATEX version (optional)





Application For corrosive gaseous and liquid media which are not highly viscous and do not crystallise; suitable for corrosive environments.

> ! For measuring gas or vapour, these gauges must be used in accordance with the table "Selection Criteria as per EN 837-2" (see appendix)!

Technical Type specifications D4

Nominal size

100 - 160

Accuracy class (EN 837-1/6)

Ranges (EN 837-1/5)

-1/0 to -1/+15 bar NG 100 0/0.6 to 0/1000 bar NG 160 0/0.6 to 0/1600 bar

Application area

Static load:

≤ 600 bar = full scale value

 $> 600 \text{ bar} = \frac{3}{4} \text{ x full scale value}$

Dynamic load:

 \leq 600 bar = 0.9 x full scale value

 $> 600 \text{ bar} = \frac{2}{3} \times \text{ full scale value}$

Short-term:

≤ 600 bar = 1.3 x full scale value

> 600 bar = full scale value

Operating temperature range

Medium: $T_{max} = +150 \, ^{\circ}C$ Ambient: $T_{min} = -20 \, ^{\circ}C$ $T_{max} = +60 \, ^{\circ}C$

Temperature performance

Indication error when the temperature of the measuring system deviates from the normal temperature of 20 °C:

rising temperature approx. ±0.4 %/10 K falling temperature approx. ±0.4 %/10 K of full scale value

Degree of protection

IP 65 (EN 60529)

with housing vent (≤ 25 bar): IP 54

Standard version Connection

Stainless steel 316 L, bottom or bottom back G½B – spanner size SW 22 (EN 837-1/7.3)

Measuring element

Bourdon tube, stainless steel 316 Ti/316 L ≤ 60 bar "C" type tube > 60 bar helical tube tightness-tested with helium

Movement

Stainless steel

Dial

Aluminium, white Dial marking black

Aluminium, black

Housing

Stainless steel 304 with blow-out

Bayonet type bezel

Stainless steel 304

■ Special scales

Electrical contacts

■ Other process connections

Window

Laminated safety glass

- Options Back flange
 - Panel mounting bezel
 - 3-hole fixing, panel mounting bezel



- - ATEX version (Ex)

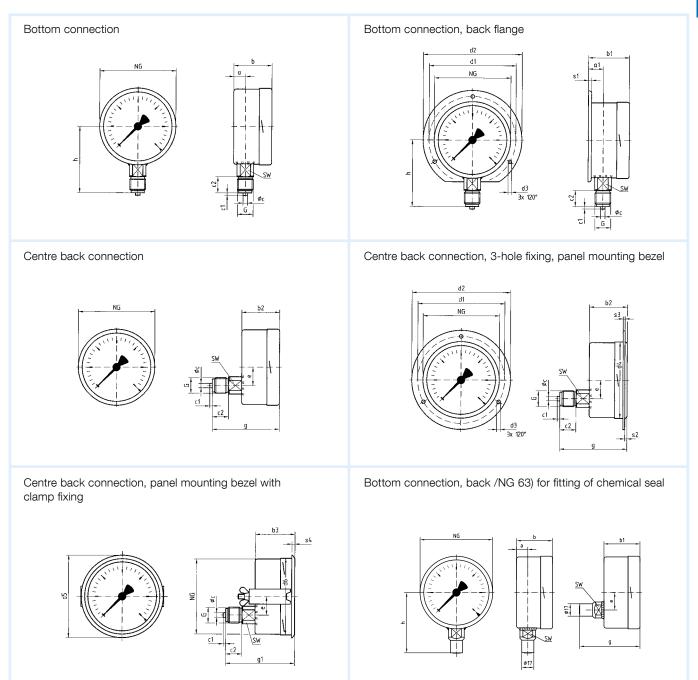






Bourdon tube pressure gauges for chemical applications Type D 4 - NG 100/160

Housing types and dimensions (mm)



Nominal size (NG)	а	a1	b	b1	b2	bз	Øc	C1	C 2	dı*	d2*	d 3*	d4	d5	d6	е	G	g	g1	h	S1
100	15.6	19.1	49	52.5	49	49	6	3	20	116	132	4.8	104	107	101	34.5	G½B	83	83	86	5.5
160	17.5	20.5	50	53	50	52	6	3	20	178	196	5.8	164	167	161	34.5	G1/2B	84	86	116	6
																					•
Nominal size (NG)	S 2	S 3	S 4	SW																	
100	4	2	4	22																	
160	4	2	4.5	22																	

^{*} Dimensions as per DIN 16064.



Bourdon tube pressure gauges for chemical applications EN 837-1

DG: M, PG: 3

Туре	RF100Ch, D402	RF100Ch, D412	RF100Ch, D432	RF100Ch, D452	RF160Ch, D402	RF160Ch, D412	RF160Ch, D432	RF160Ch, D452
Version								
Housing Ø	100	100	100	100	160	160	160	160
Housing		St	ainless steel 304	4 with bayonet be	ezel, laminate	d safety glas	ss window	
Measuring element			Bou	rdon tube, stainle	ess steel 316	Ti/316 L		
Accuracy class	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Connection	G½B	G½B	G½B	G½B	G½B	G½B	G½B	G½B
			3-hole fixing, panel mounting bezel, 304, polished	Panel mounting bezel, 304, polished, with clamp fixing			3-hole fixing, panel mounting bezel, 304, polished	Panel mounting bezel, 304, polished with clamp fixing
Range (bar)	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €								
-1/0	85201402	85201412	85201432	85201452	85251402	85251412	85251432	85251452
-1/+0.6	85202402	85202412	85202432	85202452	85252402	85252412	85252432	85252452
-1/+1.5	85203402	85203412	85203432	85203452	85253402	85253412	85253432	85253452
-1/+3	85204402	85204412	85204432	85204452	85254402	85254412	85254432	85254452
-1/+5	85205402	85205412	85205432	85205452	85255402	85255412	85255432	85255452
-1/+9	85206402	85206412	85206432	85206452	85256402	85256412	85256432	85256452
-1/+15	85207402	85207412	85207432	85207452	85257402	85257412	85257432	85257452
Price €								
0/0.6	85209402	85209412	85209432	85209452	85259402	85259412	85259432	85259452
0/1	85210402	85210412	85210432	85210452	85260402	85260412	85260432	85260452
0/1.6	85211402	85211412	85211432	85211452	85261402	85261412	85261432	85261452
0/2.5	85212402	85212412	85212432	85212452	85262402	85262412	85262432	85262452
0/4	85213402	85213412	85213432	85213452	85263402	85263412	85263432	85263452
0/6	85214402	85214412	85214432	85214452	85264402	85264412	85264432	85264452
0/10	85215402	85215412	85215432	85215452	85265402	85265412	85265432	85265452
0/16	85216402	85216412	85216432	85216452	85266402	85266412	85266432	85266452
0/25	85217402	85217412	85217432	85217452	85267402	85267412	85267432	85267452
0/40	85218402	85218412	85218432	85218452	85268402	85268412	85268432	85268452
Price €								
0/60	85219402	85219412	85219432	85219452	85269402	85269412	85269432	85269452
0/100	85220402	85220412	85220432	85220452	85270402	85270412	85270432	85270452
0/160	85221402	85221412	85221432	85221452	85271402	85271412	85271432	85271452
0/250	85222402	85222412	85222432	85222452	85272402	85272412	85272432	85272452
0/400	85223402	85223412	85223432	85223452	85273402	85273412	85273432	85273452
5, 100	30220102	30220712	33220102	00220102	302,0402	30210712	00210102	33270 102
Price €								
0/600	85224402	85224412	85224432	85224452	85274402	85274412	85274432	85274452
0/1000	85225402	85225412	85225432	85225452	85275402	85275412	85275432	85275452
Duin - C								
Price €					05070400	05070440	05070400	05070450
0/1600					85276402	85276412	85276432	85276452



See page 72 for extra charges.

Minimum order quantity for non-stock items = 10 pieces.

Blue part no. = in-stock items



Bourdon tube

Bourdon tube pressure gauges for chemical applications with glycerine filling EN 837-1

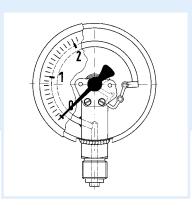






- For chemical and process engineering applications
- Measuring system fully welded to housing
- Extremely robust design
- Can be used in case of heavy vibrations and high, dynamic pressure loads
- Tightness-tested with helium
- DNV- and GOSSTANDART-certified
- ATEX version (optional)





Application For corrosive gaseous and liquid media which are not highly viscous and do not crystallise; suitable for corrosive environments. For measurements in areas with high vibration levels and high, dynamic pressure loads.

> ! For measuring gas or vapour, these gauges must be used in accordance with the table "Selection Criteria as per EN 837-2" (see appendix)!

Technical Type specifications D7

Nominal size

50 - 63

Accuracy class (EN 837-1/6)

Ranges (EN 837-1/5)

NG 50:

-1/0 to -1/+15 bar 0/0.6 to 0/600 bar

NG 63:

-1/0 to -1/+15 bar 0/0.6 to 0/1000 bar

Application area

Static load: ¾ x full scale value Dynamic load: 2/3 x full scale value Short-term: full scale value

Operating temperature range

Medium: $T_{max} = +100 \, ^{\circ}C$ Ambient: $T_{min} = -20 \, ^{\circ}C$

 $T_{max} = +60 \, ^{\circ}C$

Temperature performance

Indication error when the temperature of the measuring system deviates from the normal temperature of 20 °C:

rising temperature approx. ±0.4 %/10 K falling temperature approx. ±0.4 %/10 K of full scale value

Degree of protection

IP 65 (EN 60529)

with housing vent (< 25 bar): IP 54

Standard version

Connection

Stainless steel 316 L NG 50 bottom or bottom back NG 63 bottom or centre back G1/4B - spanner size SW 14 (EN 837-1/7.3)

Measuring element

Bourdon tube, stainless steel 316 Ti/316 L ≤ 60 bar "C" type tube > 60 bar helical tube tightness-tested with helium

Movement

Stainless steel

Dial

Aluminium, white Dial marking black

Pointer

Aluminium, black

Housing

Stainless steel 304 with blow-out

Crimped bezel

Stainless steel 304

Window

NG 50 plastic NG 63 laminated safety glass

Filling liquid

Glycerine (99.5 %)



See page 63 for prices.

- Options Filling liquid silicone oil
 - Plastic window (NG 63)
 - Back flange (NG 63)
 - Clamp fixing



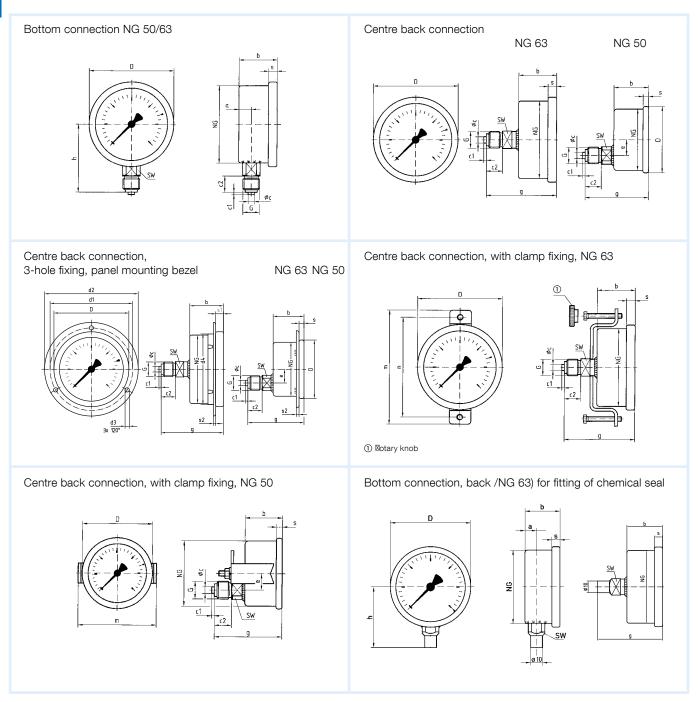


- Crimped bezel, polished
- Special scales
- Other process connections



Bourdon tube pressure gauges for chemical applications with glycerine filling Type D 7 - NG 50/63

Housing types and dimensions



Nominal size (NG)	а	a1	b	b1	Øc	C1	C 2	dı*	d 2*	d 3*	d4	D	е	G	g	h	m	n	S	S1	S 2
50	10.5	-	28	-	5	2	13	60	70	3.6	-	53	12.5	G1/4B	51	46	59	-	4.5	-	2.5
63	9.5	13	30.5	34	5	2	13	75	85	3.6	64	68	-	G¼B	56	53	94	82	7	5.5	2
N																					
Nominal size (NG)	SW																				
	SW 14																				

^{*} Dimensions as per DIN 16063.

Bourdon tube pressure gauges for chemical applications with glycerine filling EN 837-1

DG: M, PG: 3

Туре	RF50ChGly, D702	RF50ChGly, D712	RF50ChGly, D732	RF50ChGly, D752	RF63ChGly, D702	RF63ChGly, D712	RF63ChGly, D732	RF63ChGly, D752
Version								
Housing Ø	50	50	50	50	63	63	63	63
Housing			Stainle	ss steel 304 w	ith crimped be	zel 304		
Measuring element			Bourd	on tube, stainle	ess steel 316 T	ï/316 L		
Accuracy class	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Connection	G¼B	G¼B	G¼B	G¼B	G¼B	G¼B	G¼B	G¼B
			3-hole fixing, panel mounting bezel, 304, bare metal surface	Clamp fixing			3-hole fixing, panel mounting bezel, 304, bare metal surface	Clamp fixing
Range (bar)	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €								
-1/0	85051702	85051712	85051732	85051752	85101702	85101712	85101732	85101752
-1/+0.6	85052702	85052712	85052732	85052752	85102702	85102712	85102732	85102752
-1/+1.5	85053702	85053712	85053732	85053752	85103702	85103712	85103732	85103752
-1/+3	85054702	85054712	85054732	85054752	85104702	85104712	85104732	85104752
-1/+5	85055702	85055712	85055732	85055752	85105702	85105712	85105732	85105752
-1/+9	85056702	85056712	85056732	85056752	85106702	85106712	85106732	85106752
-1/+15	85057702	85057712	85057732	85057752	85107702	85107712	85107732	85107752
Price €								
0/0.6	85059702	85059712	85059732	85059752	85109702	85109712	85109732	85109752
0/1	85060702	85060712	85060732	85060752	85110702	85110712	85110732	85110752
0/1.6	85061702	85061712	85061732	85061752	85111702	85111712	85111732	85111752
0/2.5	85062702	85062712	85062732	85062752	85112702	85112712	85112732	85112752
0/4	85063702	85063712	85063732	85063752	85113702	85113712	85113732	85113752
0/6	85064702	85064712	85064732	85064752	85114702	85114712	85114732	85114752
0/10	85065702	85065712	85065732	85065752	85115702	85115712	85115732	85115752
0/16	85066702	85066712	85066732	85066752	85116702	85116712	85116732	85116752
0/25	85067702	85067712	85067732	85067752	85117702	85117712	85117732	85117752
0/40	85068702	85068712	85068732	85068752	85118702	85118712	85118732	85118752
Duice 6								
Price €	95060700	95060710	95060700	05060750	05110700	05110710	05110700	05110750
0/60	85069702	85069712	85069732	85069752	85119702	85119712	85119732	85119752
0/100	85070702	85070712	85070732	85070752	85120702	85120712	85120732	85120752
0/160	85071702	85071712	85071732	85071752	85121702	85121712	85121732	85121752
0/250	85072702	85072712	85072732	85072752	85122702	85122712	85122732	85122752
0/400	85073702	85073712	85073732	85073752	85123702	85123712	85123732	85123752
Price €								
0/600	85074702	85074712	85074732	85074752	85124702	85124712	85124732	85124752
0/1000					85125702	85125712	85125732	85125752

Minimum order quantity for non-stock items = 10 pieces.

Blue part no. = in-stock items



See page 72 for extra charges.



Bourdon tube pressure gauges for chemical applications with glycerine filling EN 837-1

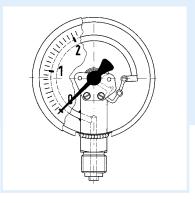






- For chemical and process engineering applications
- Measuring system fully welded to housing
- Extremely robust design
- Tightness-tested with helium
- DNV- and GOSSTANDART-certified
- ATEX version (optional)





Application For corrosive gaseous and liquid media which are not highly viscous and do not crystallise; suitable for corrosive environments. For measurements in areas with high vibration levels and high, dynamic pres-

> ! For measuring gas or vapour, these gauges must be used in accordance with the table "Selection Criteria as per EN 837-2" (see appendix)!

Technical Type specifications D8

Nominal size

100 - 160

Accuracy class (EN 837-1/6)

Ranges (EN 837-1/5)

-1/0 to -1/+15 bar NG 100 0/0.6 to 0/1000 bar NG 160 0/0.6 to 0/1600 bar

Application area

Static load:

≤ 600 bar = full scale value

 $> 600 \text{ bar} = \frac{3}{4} \text{ x full scale value}$

Dynamic load:

 \leq 600 bar = 0.9 x full scale value

> 600 bar = 2/3 x full scale value

Short-term:

≤ 600 bar = 1.3 x full scale value > 600 bar = full scale value

Operating temperature range

Medium: $T_{max} = +100 \, ^{\circ}C$ Ambient: $T_{min} = -20 \, ^{\circ}C$ $T_{max} = +60 \, ^{\circ}C$

Temperature performance

Indication error when the temperature of the measuring system deviates from the normal temperature of 20 °C: rising temperature approx. ±0.4 %/10 K

falling temperature approx. ±0.4 %/10 K of full scale value

Degree of protection

IP 65 (EN 60529)

with housing vent (< 25 bar): IP 54

Standard version Connection

Stainless steel 316 L, bottom or bottom back G½B – spanner size SW 22 (EN 837-1/7.3)

Measuring element

Bourdon tube, stainless steel 316 Ti/316 L ≤ 60 bar "C" type tube > 60 bar helical tube tightness-tested with helium

Movement

Stainless steel

Dial

Aluminium, white Dial marking black

Pointer

Aluminium, black

Housing

Stainless steel 304 with blow-out

Bayonet type bezel

Stainless steel 304

Window

Laminated safety glass

Filling liquid

Glycerine (99.5 %)

See page 66 for prices.

- Options Filling liquid silicone oil
 - Brass movement
 - Back flange
 - 3-hole fixing, panel mounting bezel



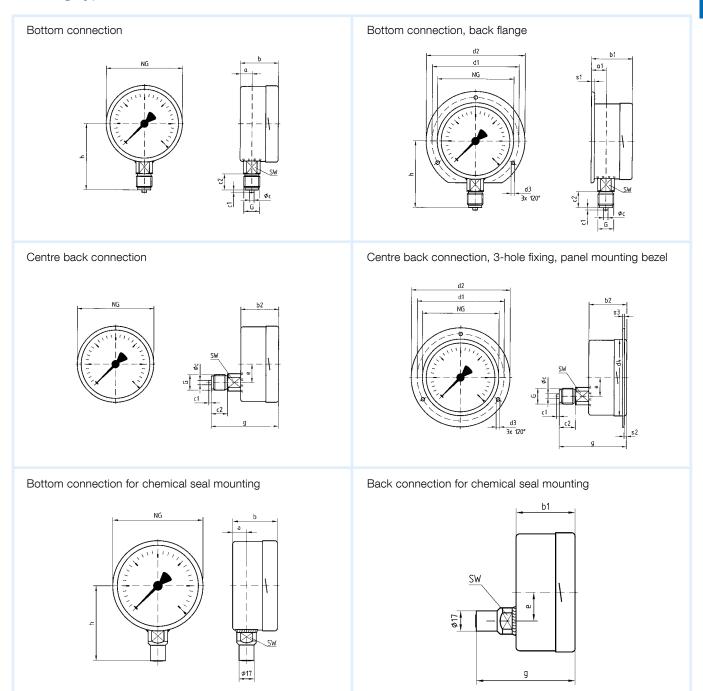


- Electrical contacts
- Special scales
- Other process connections



Bourdon tube pressure gauges for chemical applications with glycerine filling Type D 8 - NG 100/160

Housing types and dimensions (mm)



Dimensions (mm)

Nominal size (NG)	а	a1	b	b1	b2	Øc	C1	C2	dı*	d 2*	d 3*	d4	е	G	g	h	S1
100	15.6	19.1	49	52.5	49	6	3	20	116	132	4.8	104	34.5	G½B	83	86	5.5
160	17.5	20.5	50	53	50	6	3	20	178	196	5.8	164	34.5	G½B	84	116	6
														,			
Nominal size (NG)	S 2	S 3	SW														
100	4	2	22														
160	4	2	22														

^{*} Dimensions for NG 100 as per DIN 16064.



65

Bourdon tube pressure gauges for chemical applications with glycerine filling

EN 837-1

DG: M, PG: 3

Туре	RF100ChGly, D802	RF100ChGly, D812	RF100ChGly, D832	RF160ChGly, D802	RF160ChGly, D812	RF160ChGly, D832
Version						
Housing Ø	100	100	100	160	160	160
Housing		Stainless steel	304 with bayonet be	ezel, laminated safe	ty glass window	
Measuring element		В	ourdon tube, stainle	ess steel 316 Ti/316	3 L	
Accuracy class	1.0	1.0	1.0	1.0	1.0	1.0
Connection	G½B	G½B	G½B	G½B	G½B	G½B
			3-hole fixing, panel mounting bezel, 304, polished			3-hole fixing, panel mounting bezel, 304 polished
Range (bar)	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €						
-1/0	85201802	85201812	85201832	85251802	85251812	85251832
-1/+0.6	85202802	85202812	85202832	85252802	85252812	85252832
-1/+1.5	85203802	85203812	85203832	85253802	85253812	85253832
-1/+3	85204802	85204812	85204832	85254802	85254812	85254832
-1/+5	85205802	85205812	85205832	85255802	85255812	85255832
-1/+9	85206802	85206812	85206832	85256802	85256812	85256832
-1/+15	85207802	85207812	85207832	85257802	85257812	85257832
	I	I			I	1
Price €						
0/0.6	85209802	85209812	85209832	85259802	85259812	85259832
0/1	85210802	85210812	85210832	85260802	85260812	85260832
0/1.6	85211802	85211812	85211832	85261802	85261812	85261832
0/2.5	85212802	85212812	85212832	85262802	85262812	85262832
0/4	85213802	85213812	85213832	85263802	85263812	85263832
0/6	85214802	85214812	85214832	85264802	85264812	85264832
0/10	85215802	85215812	85215832	85265802	85265812	85265832
0/16	85216802	85216812	85216832	85266802	85266812	85266832
0/25	85217802	85217812	85217832	85267802	85267812	85267832
0/40	85218802	85218812	85218832	85268802	85268812	85268832
Price €						
0/60	85219802	85219812	85219832	85269802	85269812	85269832
0/100	85220802	85220812	85220832	85270802	85270812	85270832
0/160	85221802	85221812	85221832	85271802	85271812	85271832
0/250	85222802	85222812	85222832	85272802	85272812	85272832
0/400	85223802	85223812	85223832	85273802	85273812	85273832
Price €						
0/600	85224802	85224812	85224832	85274802	85274812	85274832
0/1000	85225802	85225812	85225832	85275802	85275812	85275832
Duigo <i>E</i>						
Price €				05070000	05070040	05070000
0/1600				85276802	85276812	85276832



See page 72 for extra charges.

Minimum order quantity for non-stock items = 10 pieces

Blue part no. = in-stock items



Bourdon tube safety pressure gauges

EN 837-1



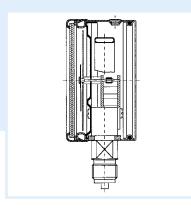






- Safety pressure gauge S3 as per EN 837-1/9.7.2
- Measuring system fully welded to housing
- Tightness-tested with helium
- DNV- and GOSSTANDART-certified
- ATEX version (optional)





Application For corrosive gaseous and liquid media which are not highly viscous and do not crystallise; suitable for corrosive environments. This gauge is designed for applications as per EN 837-1/9.7.2.

Technical specifications

Type

D 4

Nominal size

Accuracy class (EN 837-1/6)

1.6 (> 0/600 bar 2.5)

Ranges (EN 837-1/5)

-1/0 to -1/+15 bar 0/0.6 to 0/1000 bar

Application area

Static load: 3/4 x full scale value Dynamic load: 2/3 x full scale value Short-term: full scale value

Operating temperature range

Medium: $T_{max} = +100 \, ^{\circ}C$ Ambient: $T_{min} = -20 \, ^{\circ}C$ $T_{max} = +60 \, ^{\circ}C$

Temperature performance

Indication error when the temperature of the measuring system deviates from the normal temperature of 20 °C:

rising temperature approx. ±0.4 %/10 K falling temperature approx. ±0.4 %/10 K of full scale value

Degree of protection

IP 54 (EN 60529)

Standard version Connection

Stainless steel 316 L, bottom or bottom back G1/4B - spanner size SW 14 (EN 837-1/7.3)

Measuring element

Bourdon tube, stainless steel 316 Ti/316 L ≤ 60 bar "C" type tube > 60 bar helical tube tightness-tested with helium

Movement

Dial

Aluminium, white Dial marking black

Stainless steel

Pointer

Aluminium, black

Stainless steel 304 with solid baffle wall and blow-out (S3)

Bayonet type bezel

Stainless steel 304

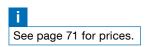
Window

Laminated safety glass

- **Options** Glycerine filling (bottom version)
 - 3-hole fixing, panel mounting bezel
 - ATEX version (Ex)



- Special scales
- Other process connections

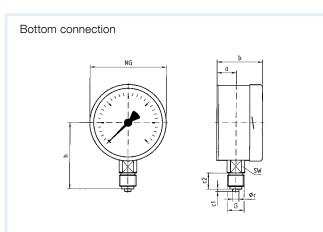


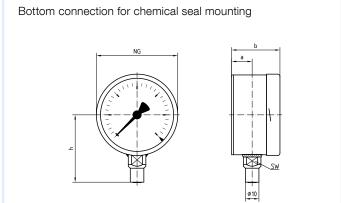


Bourdon tube safety pressure gauges

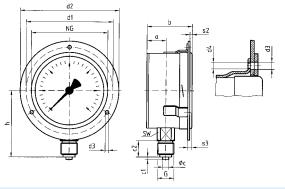
Type D 4 - NG 63

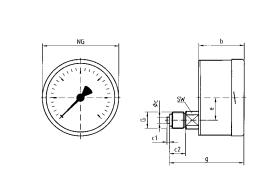
Housing types and dimensions





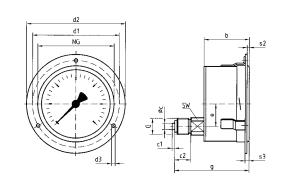
Bottom connection, 3-hole fixing, panel mounting bezel





Centre back connection

Centre back connection, 3-hole fixing, panel mounting bezel



Nominal size (NG)	а	a1	b	b1	Øc	C1	C 2	d1	d2	dз	d4	е	g	G	h	S1	S 2	S 3	SW
63	18	38	41	61	5	2	13	75	85	3.6	МЗ	18	60	G1/4B	53	21	3	5	14



Bourdon tube





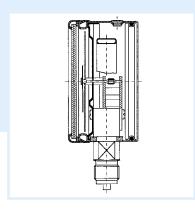




Safety housing S3 as per EN 837-1/9.7.2

- Measuring system fully welded to housing
- Tightness-tested with helium
- DNV- and GOSSTANDART-certified
- ATEX version (optional)





Application For corrosive gaseous and liquid media which are not highly viscous and do not crystallise; suitable for aggressive environments. This gauge is designed for applications as per EN 837-1/9.7.2.

Technical Type specifications

Nominal size

100 - 160

Accuracy class (EN 837-1/6)

Ranges (EN 837-1/5)

-1/0 to -1/+15 bar 0/0.6 to 0/1000 bar

Application area

Static load:

≤ 600 bar = full scale value

 $> 600 \text{ bar} = \frac{3}{4} \times \text{ full scale value}$ Dynamic load:

 \leq 600 bar = 0.9 x full scale value

> 600 bar = 2/3 x full scale value

Short-term:

 \leq 600 bar = 1.3 x full scale value

> 600 bar = full scale value

Operating temperature range

Medium: $T_{max} = +100 \, ^{\circ}C$ Ambient: $T_{min} = -20 \, ^{\circ}C$ $T_{max} = +60 \, ^{\circ}C$

Temperature performance

Indication error when the temperature of the measuring system deviates from the normal temperature of 20 °C:

rising temperature approx. ±0.4 %/10 K falling temperature approx. ±0.4 %/10 K of full scale value

Degree of protection

IP 54 (EN 60529)

Standard version

Connection

Stainless steel 316 L, bottom G½B – spanner size SW 22 (EN 837-1/7.3)

Measuring element

Bourdon tube, stainless steel 316 L ≤ 60 bar "C" type tube > 60 bar helical tube tightness-tested with helium

Movement

Stainless steel

Dial

Aluminium, white Dial marking black

Pointer

Aluminium, black

Housing

Stainless steel 304 with solid baffle wall and blow-out (S3)

Bayonet type bezel

Stainless steel 304

Window

Laminated safety glass

- 3-hole fixing, panel mounting bezel
- ATEX version (Ex)



- **Options** Glycerine filling (bottom version)





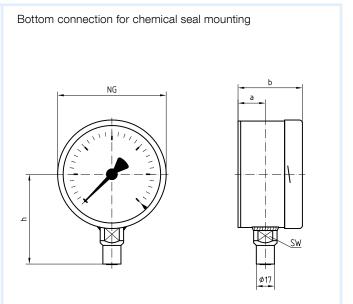
- Special scales
- Other process connections

Bourdon tube safety pressure gauges

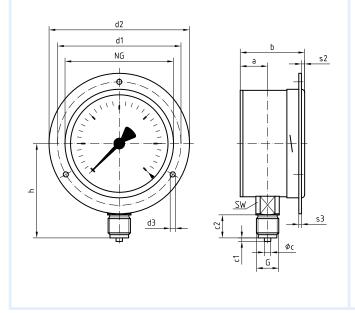
Type D 4 - NG 100/160

Housing types and dimensions

Bottom connection



Bottom connection, 3-hole fixing, panel mounting bezel



Nominal size (NG)	а	b	Øc	C1	C 2	d1*	d2*	d 3*	G	h	S 2	S 3	SW		
100	25	57	6	3	20	116	132	4.8	G½B	86	4	2	22		
160	26	65	6	3	20	178	196	5.8	G½B	116	4	2	22		

^{*} Dimensions as per DIN 16064.

Bourdon tube safety pressure gauges

EN 837-1

DG: M, PG: 3

						VOI OIOII WILL	i giycerine ti	iiiig
Туре	RF63Si, D402	RF63Si, D412	RF63Si D432	RF100Si, D402	RF160Si, D402	RF63SiGly, D802	RF100SiGly, D802	RF160SiGly, D802
Version								
Housing Ø	63	63	63	100	160	63	100	160
Housing (S3)	Stainless	steel 304 with b	ayonet bezel, lam blow out baffle w	ninated safety gla all	ss window,		304 with bayone ss window, blow	
Measuring element		Bourdon tube	, stainless ste	el 316 Ti/316	_	Bourdon tube	e, stainless stee	el 316 Ti/316 L
Accuracy class	1.6*	1.6*	1.6*	1.0	1.0	1.6*	1.0	1.0
Connection	G¼B	G¼B	G¼B	G½B	G½B	G1/4B	G½B	G½B
	-	-	3-hole fixing, panel mounting bezel, 304, polished	-	-	-	-	-
Range (bar)	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €								
-1/0	85401402	85401412	85401432	85451402	85501402	85401802	85451802	85501802
-1/+0.6	85402402	85402412	85402432	85452402	85502402	85402802	85452802	85502802
-1/+1.5	85403402	85403412	85403432	85453402	85503402	85403802	85453802	85503802
-1/+3	85404402	85404412	85404432	85454402	85504402	85404802	85454802	85504802
-1/+5	85405402	85405412	85405432	85455402	85505402	85405802	85455802	85505802
-1/+9	85406402	85406412	85406432	85456402	85506402	85406802	85456802	85506802
-1/+15	85407402	85407412	85407432	85457402	85507402	85407802	85457802	85507802
Price €								
0/0.6	85409402	85409412	85409432	85459402	85509402	85409802	85459802	85509802
0/1	85410402	85410412	85410432	85460402	85510402	85410802	85460802	85510802
0/1.6	85411402	85411412	85411432	85461402	85511402	85411802	85461802	85511802
0/2.5	85412402	85412412	85412432	85462402	85512402	85412802	85462802	85512802
0/4	85413402	85413412	85413432	85463402	85513402	85413802	85463802	85513802
0/6	85414402	85414412	85414432	85464402	85514402	85414802	85464802	85514802
0/10	85415402	85415412	85415432	85465402	85515402	85415802	85465802	85515802
0/16	85416402	85416412	85416432	85466402	85516402	85416802	85466802	85516802
0/25	85417402	85417412	85417432	85467402	85517402	85417802	85467802	85517802
0/40	85418402	85418412	85418432	85468402	85518402	85418802	85468802	85518802
Price €								
0/60	85419402	85419412	85419432	85469402	85519402	85419802	85469802	85519802
0/100	85420402	85420412	85420432	85470402	85520402	85420802	85470802	85520802
0/160	85421402	85421412	85421432	85471402	85521402	85421802	85471802	85521802
0/250	85422402	85422412	85422432	85472402	85522402	85422802	85472802	85522802
0/400	85423402	85423412	85423432	85473402	85523402	85423802	85473802	85523802
Drico €								
Price € 0/600	95494400	05/04/10	05404400	05.474.400	95504400	85424802	85474802	85524802
	85424402	85424412	85424432	85474402	85524402			
0/1000 Minimum order quantity t	85425402	85425412	85425432	85475402	85525402	85425802	85475802 Blue part no	85525802

Minimum order quantity for non-stock items = 10	pieces
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^{* &}gt; 0/600 bar class 2.5.



See page 72 for extra charges. See page 117 for extra charges for electrical contacts.

RF63SiGly, D802 RF100SiGly, D802 RF160SiGly, D802 63 100 160 Stainless steel 304 with bayonet bezel, laminated safety glass window, blow out baffle wall Bourdon tube, stainless steel 316 Ti/316 L 1.6* 1.0 63 1.0 1.0 1.0 G½B G½B - - Part no. Part no. Part no. Part no. 85401802 85501802 85402802 85452802 85403802 85503802 85404802 85454802 85405802 85505802 85406802 85456802 85407802 85507802
63 100 160 Stainless steel 304 with bayonet bezel, laminated safety glass window, blow out baffle wall Bourdon tube, stainless steel 316 Ti/316 L 1.6* 1.0 1.0 G¼B G½B G½B Part no. Part no. Part no. 85401802 85451802 85501802 85402802 85452802 85502802 85403802 85454802 85504802 85405802 85455802 85505802 85406802 85456802 85506802
63 100 160 Stainless steel 304 with bayonet bezel, laminated safety glass window, blow out baffle wall Bourdon tube, stainless steel 316 Ti/316 L 1.6* 1.0 1.0 G¹/4B G¹/2B G¹/2B Part no. Part no. Part no. 85401802 85451802 85501802 85402802 85452802 85502802 85403802 85453802 85503802 85404802 85454802 85504802 85405802 85455802 85505802 85406802 85456802 85506802
63 100 160 Stainless steel 304 with bayonet bezel, laminated safety glass window, blow out baffle wall Bourdon tube, stainless steel 316 Ti/316 L 1.6* 1.0 1.0 G½B G½B G½B Part no. Part no. Part no. 85401802 85451802 85501802 85402802 85452802 85502802 85403802 85453802 85503802 85404802 85454802 85504802 85405802 85455802 85505802 85406802 85456802 85506802
63 100 160 Stainless steel 304 with bayonet bezel, laminated safety glass window, blow out baffle wall Bourdon tube, stainless steel 316 Ti/316 L 1.6* 1.0 1.0 G¹/4B G¹/2B G¹/2B Part no. Part no. Part no. 85401802 85451802 85501802 85402802 85452802 85502802 85403802 85453802 85503802 85404802 85454802 85504802 85405802 85455802 85505802 85406802 85456802 85506802
Stainless steel 304 with bayonet bezel, laminated safety glass window, blow out baffle wall Bourdon tube, stainless steel 316 Ti/316 L 1.6* 1.0 1.0 G½B G½B - - - Part no. Part no. Part no. 85401802 85451802 85501802 85402802 85452802 85502802 85404802 85454802 85504802 85405802 85455802 85505802 85406802 85456802 85506802
ed safety glass window, blow out baffle wall Bourdon tube, stainless steel 316 Ti/316 L 1.6* 1.0 G1/4B G1/2B G1/2B G1/2B G1/2B G1/2B G1/2B Part no. Part no. Part no. Part no. 85401802 85451802 85501802 85402802 85453802 85503802 85404802 85454802 85504802 85405802 85406802 85406802 85506802
Bourdon tube, stainless steel 316 Ti/316 L 1.6* 1.0 Gl/4B Gl/2B - Part no. Part no. Part no. Part no. 85401802 85402802 85452802 85403802 85453802 85504802 85404802 85405802 85405802 85406802 85406802 85506802
G1/4B G1/2B G1/2B - - - Part no. Part no. Part no. 85401802 85451802 85501802 85402802 85452802 85502802 85403802 85453802 85503802 85404802 85454802 85504802 85405802 85455802 85505802 85406802 85456802 85506802
Part no. Part no. Part no. 85401802 85451802 85501802 85402802 85452802 85502802 85403802 85453802 85503802 85404802 85454802 85504802 85405802 85456802 85506802
85401802 85451802 85501802 85402802 85452802 85502802 85403802 85453802 85503802 85404802 854544802 85504802 85405802 85455802 85505802 85406802 85456802 85506802
85401802 85451802 85501802 85402802 85452802 85502802 85403802 85453802 85503802 85404802 854544802 85504802 85405802 85455802 85505802 85406802 85456802 85506802
85401802 85451802 85501802 85402802 85452802 85502802 85403802 85453802 85503802 85404802 854544802 85504802 85405802 85455802 85505802 85406802 85456802 85506802
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00.10002 00.10002 000.10002
85419802 85469802 85519802
85420802 85470802 85520802
85421802 85471802 85521802
85422802 85472802 85522802
85423802 85473802 85523802
33.2332 33.7332 3323002
85424802 85474802 85524802
85425802 85475802 85525802

Blue part no. = in-stock items

Extra charges for Bourdon tube pressure gauges

(industrial, glycerine, chemical, safety versions)

DG: M

Housing diameter (mm)	PG	50	63	100	160
Description	-	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.
Housing stainless steel 304 polished	3	38281	38282	38283	38284
Bayonet bezel stainless steel 304 polished	3		38286	38287	38288
Crimped bezel stainless steel 304 polished	3	38289	38290	38291	
Housing 316 Ti	3		On request	On request	
Laminated safety glass window	-	38071	38072	38074	38075
Connection socket nickel-plated	3	38083	38084	38086	38087
Connection socket with special thread	-	On request	On request	On request	On request
Damping screw brass – hole 0.3 – 0.5 – 0.7 mm (please specify)	2	38096	38097	38099	38100
Damping screw stainless steel 316 Ti – hole 0.3 – 0.5 – 0.7 mm (please specify)	3	38102	38103	38105	38106
Red mark on dial	-	38183	38184	38186	38187
1 reference pointer red, external knob adjustment for unfilled gauges (plastic window)	1		38188	38190	38191
Clip reference pointer, red, adjustable for housing types D7/D9	1		38193		
1 reference pointer red, external knob adjustment for filled gauges (plastic window)	1		38301	38302	38303
Max. pointer for unfilled gauges * (only for gauges with bayonet bezel, plastic window)	1			38129	38130
Max. pointer for filled gauges * (only for gauges with bayonet bezel, plastic window)	1			38306	38307
Knife edge pointer	3		38133	38135	38136
Micro-adjustable pointer for zero correction	3		38335	38308	38309
Damped movement, brass	3	On request	On request	38293	38294
Measuring system hard-soldered, suitable for medium temperature of T _{max} of +180°C (gauges with filling T _{max} of medium +100°C)	3		38295	38296	38297
Version suitable for calibration approval – housing can be sealed, serial number on dial (only for housing with bayonet bezel)	3			On request	On request
Special mounting position	-	38146	38147	38149	38150
Wetted parts cleaned for oxygen ¹⁾ – label "Oxygen", symbol "Free from oil and grease" (gauges without filling only)	-	38138	38139	38141	38142
Printing block costs per scale and colour (scale design as per EN 837-1, others on request)	-	38152	38153	38155	38156
Printing costs per additional colour	-	38164	38165	38167	38168

Blue part no. = in-stock items items



See the overview "Accessories for panel mounting and wall mounting" on page 154.



¹⁾ Observe table "Selection criteria according to EN 837-2" (see appendix).

* Accuracy no longer classes 1 and 1.6, but possible from measuring range 6 bar.

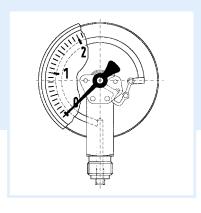
Bourdon tube pressure gauges with screw bezel housing EN 837-1





- For machine and plant engineering
- Available with or without glycerine filling
- Extremely robust plastic housing (PA 6.6 **GB30**)
- Laminated safety glass window
- Higher accuracy class optional





Application For gaseous and liquid media which are not highly viscous, do not crystallise and do not attack copper alloys. For high measuring accuracy.

! For measuring gas or vapour, these gauges must be used in accordance with the table "Selection Criteria as per EN 837-2" (see appendix)!

Technical Type specifications D1/D6

Nominal size

100

Accuracy class (EN 837-1/6)

1.0

Ranges (EN 837-1/5)

-1/0 to -1/+15 bar 0/0.6 to 0/1000 bar

Application area

Static load:

- ≤ 600 bar = full scale value
- > 600 bar = 3/4 x full scale value Dynamic load:
- \leq 600 bar = 0.9 x full scale value
- $> 600 \text{ bar} = \frac{2}{3} \text{ x full scale value}$

Short-term:

- \leq 600 bar = 1.3 x full scale value
- > 600 bar = full scale value

Operating temperature range

Medium: T_{max}= +60 °C Ambient: $T_{min} = -20 \, ^{\circ}C$ T_{max}= +60 °C

Temperature performance

Indication error when the temperature of the measuring system deviates from the normal temperature of 20 °C:

rising temperature approx. ±0.4 %/10 K falling temperature approx. ±0.4 %/10 K of full scale value

Degree of protection

IP 65 (EN 60529) with housing vent (≤ 25 bar): IP 54

Standard version Measuring element

Bourdon tube, ≤ 60 bar "C" type tube, copper alloy > 60 bar helical tube. stainless steel 316 Ti/316 L

Movement

Brass

Dial

Aluminium, white Dial marking black

Pointer

Aluminium, black

Housing

Plastic (PA 6.6 GB30) with screw type bezel (PA 6.6 GB30) with blow-out

Window

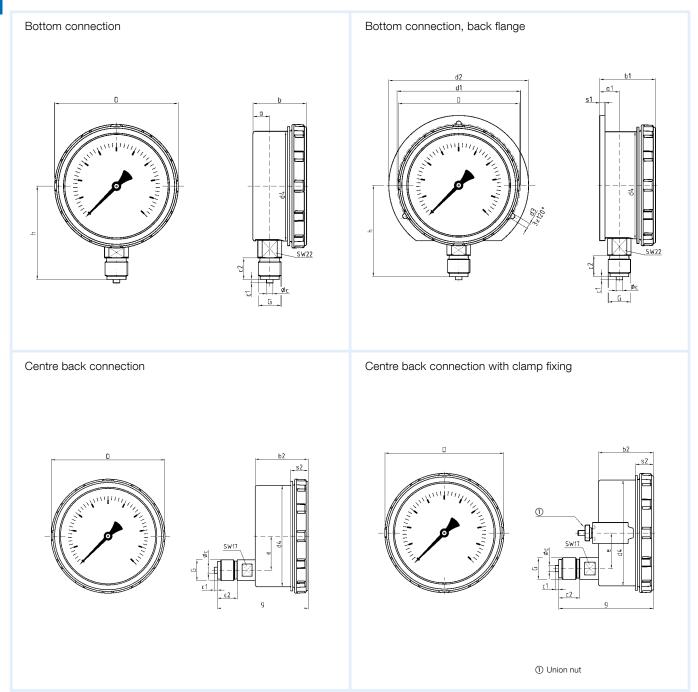
Laminated safety glass

- **Options** Glycerine filling (type D 6)
 - Higher accuracy class
 - Damping screw
 - Special scales
 - Other process connections
 - Micro-adjustable pointer



Bourdon tube pressure gauges with screw bezel housing Type D1/D6 - NG 100

Housing types and dimensions



Connec (G)	tion	а	a1	b	b1	b2	Øc	c1	c2	d1	d2	d3	d4	D	е	g	h	s1	s2
G½E	3	15.5	18.5	50	52.5	52.5	6	3	20	116	131.5	5	101	114	34	91	86	5	17.5

Bourdon tube pressure gauges with screw bezel housing Type D1/D6 - NG 100



DG: M, PG: 2

DG: M, PG: 2					Version with	n glycerine fil	ling	
Туре	RF100ISR, D101	RF100ISR, D111	RF100 ISR, D141	RF100ISR, D171	RF 100 GlySR, D601	RF 100 GlySR, D611	RF 100 GlySR, D641	RF 100 GlySR, D671
Version								
Housing Ø	100	100	100	100	100	100	100	100
Housing	Plastic (PA 6		h screw type b safety glass	ezel, window:	Plastic (PA		safety glass	zel, window:
Measuring element	(> 60		e, copper alloy s steel 316 Ti/3		(> 6	Bourdon tube 0 bar stainless	e, copper alloy steel 316 Ti/3	16 L)
Accuracy class	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Connection	G½B	G½B	G½B	G1/2	G½B	G1/2B	G½B	G½B
			With clamp fixing	With back flange			With clamp fixing	With back flange
Range (bar)	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €								
-1/0	85301101	85301111	85301141	85301171	85201601	85201611	85201641	85201671
-1/+0.6	85302101	85302111	85302141	85302171	85202601	85202611	85202641	85202671
-1/+1.5	85303101	85303111	85303141	85303171	85203601	85203611	85203641	85203671
-1/+3	85304101	85304111	85304141	85304171	85204601	85204611	85204641	85204671
-1/+5	85305101	85305111	85305141	85305171	85205601	85205611	85205641	85205671
-1/+9	85306101	85306111	85306141	85306171	85206601	85206611	85206641	85206671
-1/+15	85307101	85307111	85307141	85307171	85207601	85207611	85207641	85207671
Price €								
0/0.6	85309101	85309111	85309141	85309171	85209601	85209611	85209641	85209671
0/1	85310101	85310111	85310141	85310171	85210601	85210611	85210641	85210671
0/1.6	85311101	85311111	85311141	85171171	85611601	85611611	85611641	85611671
0/2.5	85312101	85312111	85312141	85312171	85212601	85212611	85212641	85212671
0/4	85313101	85313111	85313141	85313171	85213601	85213611	85213641	85213671
0/6	85314101	85314111	85314141	85314171	85214601	85214611	85214641	85214671
0/10	85315101	85315111	85315141	85315171	85215601	85215611	85215641	85215611
0/16	85316101	85316111	85316141	85316171	85216601	85216611	85216641	85216671
0/25	85317101	85317111	85317141	85317171	85217601	85217611	85217641	85217671
0/40	85318101	85318111	85318141	85318171	85218601	85218611	85218641	85218671
Price €								
0/60	85319101	85319111	85319141	85319171	85219601	85219611	85219641	85219671
0/100	85320101	85320111	85320141	85320171	85220601	85220611	85220641	85220671
0/160	85321101	85321111	85321141	85321171	85221601	85221611	85221641	85221671
0/250	85322101	85322111	85322141	85322171	85222601	85222611	85222641	85222671
0/400	85323101	85323111	85323141	85323171	85223601	85223611	85223641	85223671
Price €								
0/600	85324101	8530/111	85324141	8539/171	85224601	85224611	85224641	85224671
		85324111		85324171	85225601	85225611	85225641	85225671
0/1000	85325101	85325111	85325141	85325171	00220001	00220011	00220041	00220011

Minimum order quantity for non-stock items = 10 pieces.

Blue part no. = in-stock items

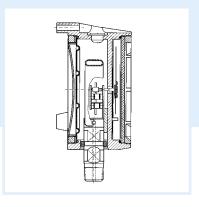


Bourdon tube pressure gauges type "Process Gauge"





- Extremely robust pressure gauge for offshore and onshore applications
- Glass-fibre reinforced safety housing with solid baffle wall and blow-out
- Integrated pressure compensation diaphragm
- Tightness-tested with helium
- GOSSTANDART-certified



Application For corrosive gaseous and liquid media which are not highly viscous and do not crystallise. Specially suitable for the oil and chemical industries.

Technical Type specifications

Nominal size

41/2"

Accuracy class

Grade 2A as per ASME B 40.100 (corresponds to class 0.5)

Ranges (EN 837-1/5)

-1/0 to -1/+15 bar 0/0.6 to 0/600 bar

Application area

Static load: full scale value Dynamic load: 0.9 x full scale value Short-term: 1.3 x full scale value

Operating temperature range

Medium: $T_{max} = +100 \, ^{\circ}C$ Ambient: $T_{min} = -40 \, ^{\circ}C$

 $T_{max} = +65 \, ^{\circ}C$

with glycerine filling -20/+65 °C

Temperature performance

Indication error when the temperature of the measuring system deviates from the normal temperature of 20 °C:

rising temperature approx. ±0.4 %/10 K falling temperature approx. ±0.4 %/10 K of full scale value

Degree of protection

IP 45 (EN 60529)

Standard version Connection

Stainless steel 316 L bottom or bottom back ½-14 NPT - spanner size SW 22

Measuring element

Bourdon tube, stainless steel 316 Ti/316 L ≤ 60 bar "C" type tube > 60 bar helical tube tightnesstested with helium

Movement

Stainless steel

Aluminium, white Dial marking black

Options • Glycerine filling (type D6)

- Silicone oil filling (type D 6)
- Special scales
- Measuring system copper alloy (type 1x1)
- Measuring system Monel (type 1x3)

Pointer

Micro-adjustable pointer, brass, black Gear brass, nickel-plated

Housing

PP-GF20, black, with solid baffle wall and blow-out Integrated back flange

Screw type bezel

PP-GF20, black, internal

Window

Plastic (PMMA)

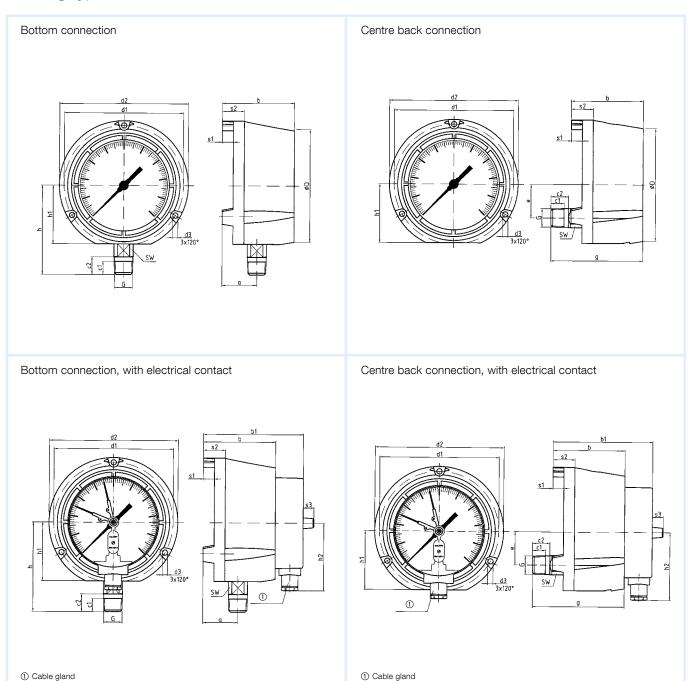
- Laminated safety glass window
- Reference pointer
- Max. pointer
- Electrical contacts
- Other process connections





Bourdon tube pressure gauges type "Process Gauge" Type D 1/D 6 - NG 41/2"

Housing types and dimensions



Dimensions (mm)

Nominal size (NG)	а	b	b1	C1	C2	d1	d2	d 3	ØD	е	G	g	h	h ₁	h2	S1	S 2	S 3	SW
4½" (D 1/D 6)	40	82.5	114.5	15	20	137	148	6	129	38	½-14 NPT	105.5	102	67	78	12.5	25	12.5	22

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Bourdon tube pressure gauges type "Process Gauge"

DG: M

Туре	RF 130PG, D101	RF 130PG, D111	RF 130PG, D102	RF 130PG, D112
Version				
Housing Ø	4 ½"	4 ½"	4 ½"	4 ½"
Housing	PP-GF 20), black, with	internal screw	type bezel
Measuring element	(> 60 bar 3			el 316Ti/316L
Accuracy class			er ASME B 40. Is to class 0.5)	100
Connection	½-14 NPT	½-14 NPT	½-14 NPT	½-14 NPT
PG	2	2	3	3
Range (bar)*	Part no.	Part no.	Part no.	Part no.
Price €				
-1/0	87901101	87901111	87901102	87901112
-1/+0.6	87902101	87902111	87902102	87902112
-1/+1.5	87903101	87903111	87903102	87903112
-1/+3	87904101	87904111	87904102	87904112
-1/+5	87905101	87905111	87905102	87905112
-1/+9	87906101	87906111	87906102	87906112
-1/+15	87907101	87907111	87907102	87907112
Price €				
0/0.6	87909101	87909111	87909102	87909112
0/1	87910101	87910111	87910102	87910112
0/1.6	87911101	87911111	87911102	87911112
0/2.5	87912101	87912111	87912102	87912112
0/4	87913101	87913111	87913102	87913112
0/6	87914101 87915101	87914111 87915111	87914102 87015102	87914112
0/10	87916101	87916111	87915102 87916102	87915112 87916112
0/25				
0/40	87917101	87917111	87917102	87917112
U/4U	87918101	87918111	87918102	87918112
Price €				
0/60	87919101	87919111	87919102	87919112
0/100	87920101	87920111	87920102	87920112
0/160	87921101	87921111	87921102	87921112
0/250	87922101	87922111	87922102	87922112
0/400	87923101	87923111	87923102	87923112
Price €				
			87924102	I and the second se

Version with	glycerine fil	ling	
RF 130PG Gly, D601	RF 130PG Gly, D611	RF 130PG Gly, D602	RF 130PG Gly, D612
4 ½"	4 ½"	4 ½"	4 ½"
PP-GF 20	D, black, with in	nternal screw t	ype bezel
	er alloy 16 Ti/316 L)	Stainless ste	el 316Ti/316L
G		ASME B 40.10 to class 0.5)	00
½-14 NPT	½-14 NPT	½-14 NPT	½-14 NPT
2	2	3	3
Part no.	Part no.	Part no.	Part no.
87901601	87901611	87901602	87901612
87902601	87902611	87902602	87902612
87903601	87903611	87903602	87903612
87904601	87904611	87904602	87904612
87905601	87905611	87905602	87905612
87906601	87906611	87906602	87906612
87907601	87907611	87907602	87907612
87909601	87909611	87909602	87909612
87910601	87910611	87910602	87910612
87911601	87911611	87911602	87911612
87912601	87912611	87912602	87912612
87913601	87913611	87913602	87913612
87914601	87914611	87914602	87914612
87915601	87915611	87915602	87915612
87916601	87916611	87916602	87916612
87917601	87917611	87917602	87917612
87918601	87918611	87918602	87918612
87919601	87919611	87919602	87919612
87920601	87920611	87920602	87920612
87921601	87921611	87921602	87921612
87922601	87922611	87922602	87922612
87923601	87923611	87923602	87923612
87924601	87924611	87924602	87924612

Minimum order quantity for non-stock items = 10 pieces.

* Pressure unit psi available at no extra charge

Blue part no. = in-stock items

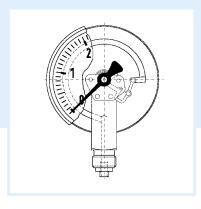






- High accuracy (class 0.6)
- Housing can be sealed
- Serial number on dial
- Suitable as measuring equipment according to QA requirements
- DNV- and GOSSTANDART-certified





Application For gaseous and liquid media which are not corrosive and not highly viscous and which do not crystallise. For high measuring accuracy.

! For measuring gas or vapour, these gauges must be used in accordance with the table "Selection Criteria as per EN 837-2" (see appendix)!

Technical Type specifications D4

Nominal size

160 - 250

Accuracy class (EN 837-1/6)

0.6

Ranges (EN 837-1/5)

-1/0 bar to -1/+15 bar 0/0.6 to 0/400 bar

Calibration medium

≤ 40 bar: air > 40 bar: water

Application area

Static load: full scale value Dynamic load: 0.9 x full scale value

Operating temperature range

Medium: $T_{max} = +60 \, ^{\circ}C$ Ambient: $T_{min} = -20 \, ^{\circ}C$ $T_{max} = +60 \, ^{\circ}C$

Temperature performance

Indication error when the temperature of the measuring system deviates from the normal temperature of 20 °C:

rising temperature approx. ±0.4 %/10 K falling temperature approx. ±0.4 %/10 K of full scale value

Degree of protection

IP 54 (EN 60529)

Standard version

Connection

Brass, bottom or bottom back (NG 160 only) G½B - spanner size SW 22 (EN 837-1/7.3)

Measuring element

Bourdon tube

≤ 100 bar "C" type tube, copper alloy

> 100 bar helical tube,

stainless steel 316 Ti/316 L

Movement

Brass/nickel silver jewel bearing

- **Options** Factory test certificates
 - Glycerine filling (NG 160/type D 8) > 2.5 bar
 - Wetted parts stainless steel (type D 4X2)
 - Laminated safety glass window (NG 160)
 - Back flange (NG 160)

Dial

Aluminium, white Dial marking black

Pointer

Knife edge pointer aluminium, black

Housing

Stainless steel 304

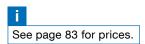
Bayonet type bezel

Stainless steel 304

Window

Plastic (PMMA)

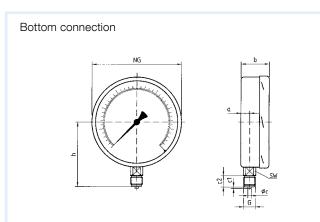
- 3-hole fixing, panel mounting bezel (NG 160)
- Damping screw
- Special scales
- Other process connections





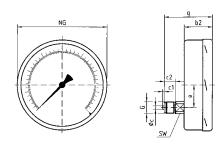
Type D 4 - NG 160/250

Housing types and dimensions

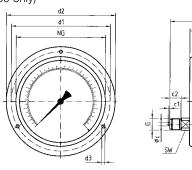


Bottom connection, back flange (NG 160 only)

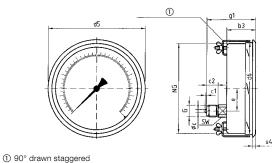
Centre back connection (NG 160 only)



Centre back connection, 3-hole fixing, panel mounting bezel (NG 160 only)



Centre back connection, panel mounting bezel with clamp fixing (NG 160 only) $\,$



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,	-,																				
Nominal size (NG)	а	a1	b	b1	b ₂	bз	Øc	C1	C 2	dı*	d2	d 3*	d4	d 5	d ₆	е	G	g	g ₁	h	S1
160	17.5	20.5	50	53	50	52	6	3	20	178	196	5.8	164	167	161	44.5	G½B	82	84	116	6
250	16	-	57	-	-	-	6	3	20	-	-	-	-	-	-	-	G1/2B	-	-	165	-
Nominal size (NG)	S 2	S 3	S 4	SW																	
160	4	2	4.5	22																	
250	-	-	-	22																	

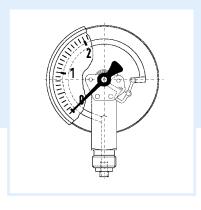
^{*} Dimensions as per DIN 16070.







- Very high measuring accuracy (class 0.25) with mirror scale
- Housing can be sealed
- Serial number on dial
- Suitable as measuring equipment according to QA requirements
- DNV- and GOSSTANDART-certified



Application For gaseous and liquid media which are not corrosive and not highly viscous and which do not crystallise. For very high measuring accuracy.

! For measuring gas or vapour, these gauges must be used in accordance with the table "Selection Criteria as per EN 837-2" (see appendix)!

Technical Type specifications D4

Nominal size

160 - 250

Accuracy class (EN 837-1/6)

0.25

Ranges (EN 837-1/5)

-1/0 bar to -1/+15 bar 0/0.6 to 0/400 bar

Calibration medium

≤ 40 bar: air > 40 bar: water

Application area

Static load: full scale value Dynamic load: 0.9 x full scale value

Operating temperature range

Medium: $T_{max} = +60 \, ^{\circ}C$ Ambient: $T_{min} = -20 \, ^{\circ}C$

 $T_{max} = +60 \, ^{\circ}C$

Temperature performance

Indication error when the temperature of the measuring system deviates from the normal temperature of 20 °C:

rising temperature approx. ±0.4 %/10 K falling temperature approx. ±0.4 %/10 K of full scale value

Degree of protection

IP 54 (EN 60529)

Standard version

Connection

Brass, bottom or bottom back (NG 160 only)

G½B - spanner size SW 22 (EN 837-1/7.3)

Measuring element

Bourdon tube

≤ 100 bar "C" type tube, copper alloy

> 100 bar helical tube, copper alloy

Movement

Brass/nickel silver, ball bearing

Dial

Aluminium, white Dial marking black NG 160 mirror scale 270° NG 250 mirror scale 330° with zero correction

Pointer

Knife edge pointer Aluminium

Housing

Stainless steel 304

Bayonet type bezel

Stainless steel 304

Window

Plastic (PMMA)



for prices.

Options

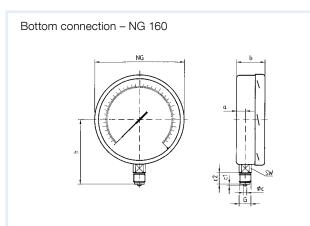
- Factory test certificates
- Back flange (NG 160)
- 3-hole fixing, panel mounting bezel (NG 160)
- Special scales
- Other process connections

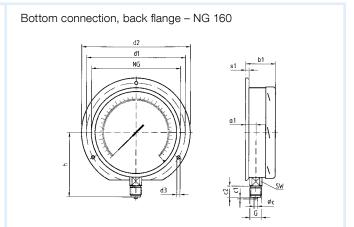


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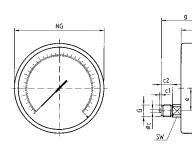
Type D 4 - NG 160/250

Housing types and dimensions

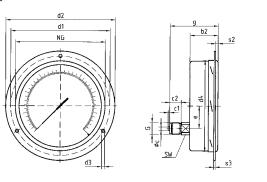




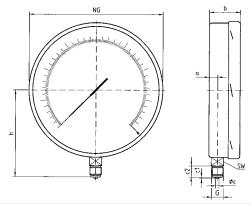
Centre connection back - NG 160



Centre back connection, 3-hole fixing, panel mounting bezel -



Bottom connection - NG 250



Nominal size (NG)	а	a1	b	b1	b ₂	bз	Øc	C1	C 2	d1*	d ₂	d 3*	d4	d 5	d6	е	G	g	g1	h	S1
160	17.5	20.5	50	53	50	52	6	3	20	178	196	5.8	164	167	161	44.5	G½B	82	84	116	6
250	16	-	57	-	-	-	6	3	20	-	-	-	-	-	-	-	G1/2B	-	-	165	-
Nominal size (NG)	S2	S 3	S 4	SW																	
160	4	2	4.5	22																	
250	-	-	-	22																	

^{*} Dimensions as per DIN 16070.

DG: M

Туре	RF160F, D401	RF160F, D411	RF160F, D431	RF160ChF, D402	RF160ChF, D412	RF160ChF, D432	RF250F, D401
Version							
Housing Ø	160	160	160	160	160	160	250
Housing			Stainless s	teel 304 with bay	yonet bezel		
Measuring element		lon tube, coppe 10 bar 316 Ti/316		Bourdon tuk	oe, stainless stee	el 316 Ti/316 L	Cu alloy
Accuracy class	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Connection	G½B	G½B	G½B 3-hole fixing, panel mounting bezel, stainless steel	G½B	G½B	G½B 3-hole fixing, panel mounting bezel, stainless steel	G½B
PG	2	2	2	3	3	3	2
Range (bar)	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €							
-1/0	85701401	85701411	85701431	85701402	85701412	85701432	85751401
-1/+0.6	85702401	85702411	85702431	85702402	85702412	85702432	85752401
-1/+1.5	85703401	85703411	85703431	85703402	85703412	85703432	85753401
Price €							
-1/+3	85704401	85704411	85704431	85704402	85704412	85704432	85754401
-1/+5	85705401	85705411	85705431	85705402	85705412	85705432	85755401
-1/+9	85706401	85706411	85706431	85706402	85706412	85706432	85756401
-1/+15	85707401	85707411	85707431	85707402	85707412	85707432	85757401
Price €							
0/0.6	85709401	85709411	85709431	85709402	85709412	85709432	85759401
0/1	85710401	85710411	85710431	85710402	85710412	85710432	85760401
0/1.6	85711401	85711411	85711431	85711402	85711412	85711432	85761401
D: 6							
Price €	05710404	05740444	05740404	05710400	05740440	05710400	05700404
0/2.5	85712401 85713401	85712411 85713411	85712431 85713431	85712402 85713402	85712412	85712432	85762401
0/4	85713401 85714401	85713411	85713431 85714431	85713402 85714402	85713412 85714412	85713432 85714432	85763401 85764401
0/10	85715401	85715411	85715431	85715402	85715412	85715432	85765401
0/16	85716401	85716411	85716431	85716402	85716412	85716432	85766401
0/25	85717401	85717411	85717431	85717402	85717412	85717432	85767401
0/40	85718401	85718411	85718431	85718402	85718412	85718432	85768401
Price €							
0/60	85719401	85719411	85719431	85719402	85719412	85719432	85769401
0/100	85720401	85720411	85720431	85720402	85720412	85720432	85770401
0/160	85721401	85721411	85721431	85721402	85721412	85721432	85771401
0/250	85722401	85722411	85722431	85722402	85722412	85722432	85772401
0/400	85723401	85723411	85723431	85723402 (for NG 160 > 2.	85723412	85723432	85773401

Blue part no. = in-stock items



DG: M, PG: 2

Туре	RF160F, D401	RF160F, D411	RF160F, D431	RF250F, D401
Version				
Housing Ø	160	160	160	250
Housing		Stainless steel 304	4 with bayonet bezel	
Measuring element		Сорре	er alloy	
Dial		Mirror scale 330°		
Accuracy class	0.25	0.25	0.25	0.25
Connection	G½B	G½B	G½B	G½B
			3-hole fixing, panel mounting bezel 304	
Range (bar)	Part no.	Part no.	Part no.	Part no.
Price €				
-1/0	88201401	88201411	88201431	88231401
-1/+0.6	88202401	88202411	88202431	88232401
-1/+1.5	88203401	88203411	88203431	88233401
-1/+3	88204401	88204411	88204431	88234401
-1/+5	88205401	88205411	88205431	88235401
-1/+9	88206401	88206411	88206431	88236401
-1/+15	88207401	88207411	88207431	88237401
0/0.6	88209401	88209411	88209431	88239401
0/1	88210401	88210411	88210431	88240401
0/1.6	88211401	88211411	88211431	88241401
0/2.5	88212401	88212411	88212431	88242401
Price €				
0/4	88213401	88213411	88213431	88243401
0/6	88214401	88214411	88214431	88244401
0/10	88215401	88215411	88215431	88245401
0/16	88216401	88216411	88216431	88246401
0/25	88217401	88217411	88217431	88247401
0/40	88218401	88218411	88218431	88248401
Price €				
0/60	88219401	88219411	88219431	88249401
0/100	88220401	88220411	88220431	88250401
0/160	88221401	88221411	88221431	88251401
0/250	88222401	88222411	88222431	88252401
0/400	88223401	88223411	88223431	88253401

Blue part no. = in-stock items

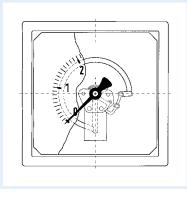


Bourdon tube pressure gauges for panel mounting



- Suitable for various standard cut-out dimensions
- For installation in control panels
- For positive and negative pressure ranges





Application For gaseous and liquid media which are not highly viscous, do not crystallise and do not attack copper alloys. For panel mounting.

! For measuring gas or vapour, these gauges must be used in accordance with the table "Selection Criteria as per EN 837-2" (see appendix)!

Technical Type specifications D3

Nominal size

72 x 72, 96 x 96

Accuracy class (EN 837-1/6)

1.6

Ranges (EN 837-1/5)

-1/0 bar to -1/+15 bar 0/0.6 to 0/400 bar

Application area

Static load: ¾ x full scale value Dynamic load: 2/3 x full scale value Short-term: full scale value

Operating temperature range

Medium: $T_{max} = +60 \, ^{\circ}C$ Ambient: $T_{min} = -20 \, ^{\circ}C$ $T_{max} = +60 \, ^{\circ}C$

Temperature performance

Indication error when the temperature of the measuring system deviates from the normal temperature of 20 °C:

rising temperature approx. ±0.4 %/10 K falling temperature approx. ±0.4 %/10 K of full scale value

Degree of protection

IP 54 (EN 60529)

Standard version Connection

Brass, bottom G1/4B - SW14 (EN 837-1/7.3)

Measuring element

Bourdon tube, copper alloy ≤ 60 bar "C" type tube > 60 bar helical tube

Movement

Brass

Dial

Aluminium, white Dial marking black

- **Options** Zero correction (NG 96)
 - Wetted parts stainless steel (NG 96)
 - Special scales

Pointer

Aluminium, black

Housing

Stainless steel 304

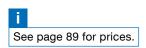
Bezel

Aluminium, black

Window

Plastic

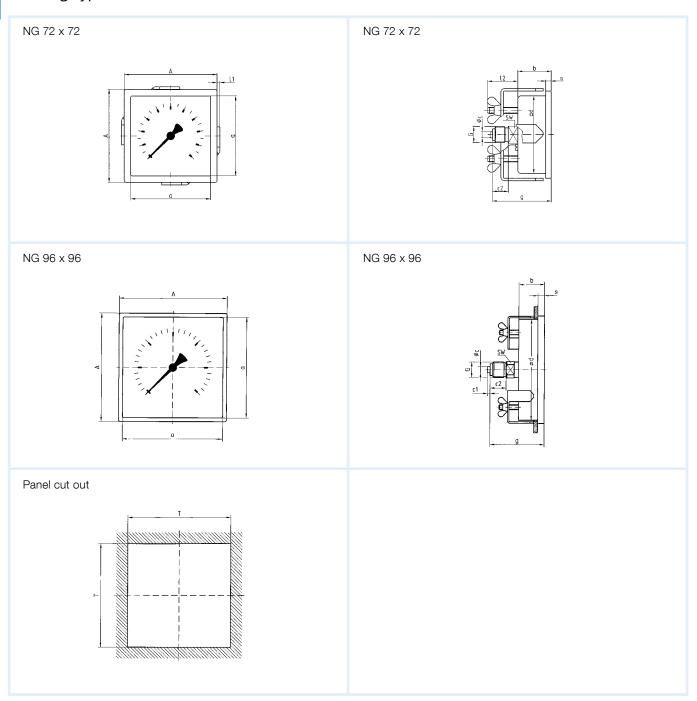
- Damping screw
- Reference pointer
- Other process connections



Bourdon tube pressure gauges for panel mounting

NG 72 x 72/96 x 96

Housing types and dimensions

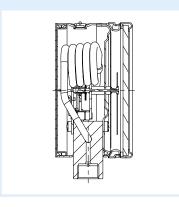


Nominal size (NG)	Α	а	b	Øc	C1	C 2	d	е	G	g	l ₁	l 2	S	SW	Т
72 x 72	72	62	27.5	5	2	13	64	-	G1/4B	44.5	2	25	4.5	14	66
96 x 96	96	88	32	5	2	13	88	-	G¼B	55	-	-	6.5	14	90

Bourdon tube pressure gauges for high pressure



- For pressure ranges up to 4,000 bar
- Housing with solid baffle wall and blow-out



Application For measurement of extremely high pressures in gaseous and liquid corrosive media which are not highly viscous and do not crystallise; also suitable for corrosive atmospheres

Technical specifications

Type

D 4

Nominal size

100 - 160

Accuracy class (EN 837-1/6)

1.0

Ranges

0/2,500 bar 0/4,000 bar

Application area

Static load: full scale value Dynamic load: 65 % of full scale value

Standard version

Connection

Stainless steel 316 L, bottom HP connection for 1/4" pipe Female thread M 16 x 1.5 or 9/16-18 UNF (option) Each with sealing cone 60°

Measuring element

Bourdon tube, NiFe alloy Helical tube

Movement

Stainless steel

Aluminium, white Dial marking black

Pointer

Aluminium, black

- **Options** Glycerine filling (type D802)
 - 3-hole fixing, panel mounting bezel
 - Other process connections

Operating temperature range

Medium: $T_{max} = +100 \, ^{\circ}C$ Ambient: $T_{min} = -20 \, ^{\circ}C$ $T_{max} = +60 \, ^{\circ}C$

Temperature performance

Indication error when the temperature of the measuring system deviates from the normal temperature of 20 °C:

rising temperature approx. ±0.4 %/10 K falling temperature approx. ±0.4 %/10 K of full scale value

Degree of protection

IP 54 (EN 60529)

Housing

Stainless steel 304 with solid baffle wall and blow-out

Bayonet type bezel

Stainless steel 304

Window

Laminated safety glass

Mounting

Wall mounting by means of instrument bracket, protrusion 60 mm (not included in scope of delivery) or panel mounting by means of 3-hole fixing, panel mounting bezel (option). Direct mounting to rigid measuring line possible.



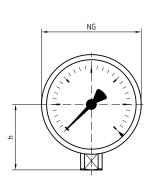
Bourdon tube pressure gauges for high pressure

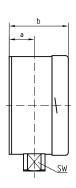
Type D 4 - NG 100 - 160

Bottom connection

Housing types and dimensions

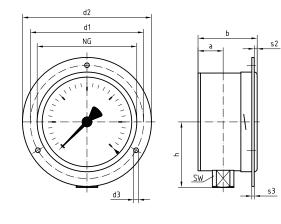
iodonig typos and annoncions



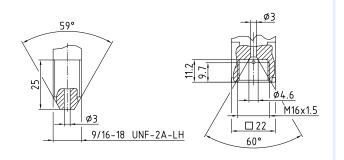


Bottom connection, with instrument bracket

Bottom connection, 3-hole fixing, panel mounting bezel



HP connection Male thread 9/16-18 UNF-2A-LH HP connection Female thread M 16 x 1.5



Nominal size (NG)	а	b	dı*	d2	d 3*	d4	G	h	0	S 2	S 3	u	U1	SW			
100	25	57	116	132	4.8	M 4	M16	97	-	4	2	-	-	22			
160	26	65	178	196	5.8	M 5	1.5	127	63	4	2	65	56	22			

^{*} Dimensions as per DIN 16064.

Bourdon tube pressure gauges for panel mounting Bourdon tube pressure gauges for high pressure

					Glycerine filling		Glycerine fillin
Туре	RF72, D311	RF96, D311	RF96, D312	RF100HD, D402	RF100HDGly, D802	RF160HD, D402	RF160HDGly, D802
Version							
Housing Ø	72 x 72	96 x 96	96 x 96	100	100	160	160
Housing	Stainless steel	Stainless steel	Stainless steel		Stainless	steel 304	
Measuring element	Bourdon tube	, copper alloy	Stainless steel		NiFe	alloy	
Accuracy class	1.6	1.6	1.6	1.0	1.0	1.0	1.0
Connection	G¼B	G¼B	G1/4B		HP connection 1/4" M16 x 1.5 with s		
PG	2	2	3	3	3	3	3
Range (bar)	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €							
-1/0	85828311	85801311	85801312				
-1/+0.6	85844311	85802311	85802312				
-1/+1.5	85845311	85803311	85803312				
-1/+3	85846311	85804311	85804312				
-1/+5	85847311	85805311	85805312				
-1/+9	85848311	85806311	85806312				
-1/+15	85849311	85807311	85807312				
Price €							
0/0.6	85829311	85809311	85809312				
0/1	85830311	85810311	85810312				
0/1.6	85831311	85811311	85811312				
0/2.5	85832311	85812311	85812312				
0/4	85833311	85813311	85813312				
0/6	85834311	85814311	85814312				
0/10	85835311	85815311	85815312				
0/16	85836311	85816311	85816312				
0/25	85837311	85817311	85817312				
0/40	85838311	85818311	85818312				
Price €							
0/60	85839311	85819311	85819312				
0/100	85840311	85820311	85820312				
0/160	85841311	85821311	85821312				
0/250	85842311	85822311	85822312				
0/400	85843311	85823311	85823312				
Price €							
0/2,500				85247402	85247802	85277402	85277802
×			1				11111111
Price €							
0/4,000				85248402	85248802	85278402	85278802

Blue part no. = in-stock items



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Bourdon tube pressure gauges for refrigeration applications with glycerine filling







- Can be used in case of heavy vibrations and high, dynamic pressure loads
- Longer service life due to less wear and corrosion protection of the measuring system
- Various refrigerants measurable with multiple scales
- DNV- and GOSSTANDART-certified



Application For simultaneous measurement of vapour pressures and temperatures in refrigeration engineering. ! For measuring gas or vapour, these gauges must be used in accordance with the table "Selection Criteria as per EN 837-2" (see appendix)!

Technical Type specifications D7/D8

Nominal size

63 - 80 - 100 (D 7) 100 (D 8)

Accuracy class (EN 837-1/6)

NG 63: 1.6 NG 80/NG 100: 1.0

Ranges

-1/+ 9 bar -1/+12.5 bar -1/+15 bar -1/+24 bar

-1/+30 bar

each with temperature scale

Temperature scales

For refrigerants:

R 134a R 290 R 404A R 407A R 744 R 717 (NH₃)

Brass, bottom or centre back

R 507

Application area

Static load: 3/4 x full scale value Dynamic load: 2/3 x full scale value Short-term: full scale value

Operating temperature range

Medium: according to refrigerant Ambient: $T_{min} = -20 \, ^{\circ}C$ $T_{max} = +60 \, ^{\circ}C$

Temperature performance

Indication error when the temperature of the measuring system deviates from the normal temperature of 20 °C:

rising temperature approx. ±0.4 %/10 K falling temperature approx. ±0.4 %/10 K of full scale value

Degree of protection

IP 65 (EN 60529), with housing vent (≤ 25 bar) IP 54

Standard version

Connection

NG 63 - 100 D 7 centre back NG 100 D 8 bottom back 7/16-20 UNF SAE J514 / ISO 8434-2 (37°), G1/4B, G½B (for R 717 stainless steel 316 Ti/316 L)

Measuring element

Bourdon tube, copper alloy "C" type tube (for R 717 stainless steel 316 Ti/316 L)

Movement

Brass

Aluminium, white

Pressure dial marking black

Temperature dial marking coloured (see appendix for examples)

Pointer

Aluminium, black

Housing

Stainless steel 304 with blow-out

D 7 - NG 63 - 80 - 100: crimped bezel stainless steel 304

D 8 - NG 100: bayonet bezel stainless steel 304

Window

Plastic

Filling liquid

Glycerine (99.5 %)



for prices.

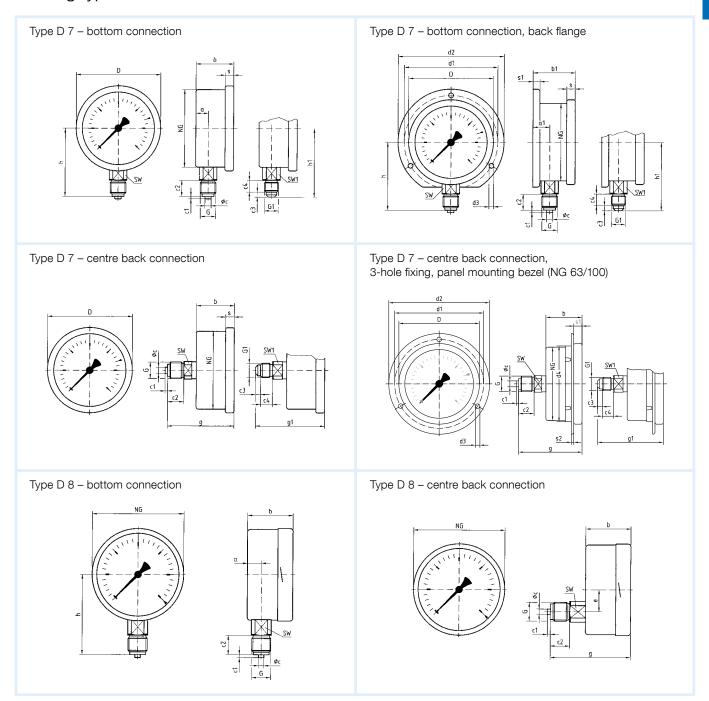
Options

- Temperature scales for other refrigerants
- Back flange
- Clamp fixing
- 3-hole fixing, panel mounting bezel (NG 63/100)
- Damping screw
- Special scales
- Other process connections
- 7/16 20 UNF SAE J513 (45°)



Bourdon tube pressure gauges for refrigeration applications Type D 7/D 8 - NG 63/80/100

Housing types and dimensions



Nominal size (NG)	а	a1	b	b1	Øc	C1	C 2	C 3	C4	dı*	d2*	d 3*	d4	D	е	g	g1	G	G1	h	h1
63 (D 7)	9.5	13	30.5	34	5	2	13	4	9.5	75	85	3.6	64	68	-	53.5	55.5	G1/4B	7/16-20 UNF	53	55
80 (D 7)	12.2	15.2	33.5	36.5	6	3	20	4	9.5	95	110	5	-	85	-	65.5	58.5	G1/2B	7/16-20 UNF	71	62.5
100 (D 7)	12.2	15.7	33.5	37	6	3	20	4	9.5	116	132	4.8	101	106	-	65.5	58.5	G½B	7/16-20 UNF	81	72.5
100 (D 8)	15.6	19.1	49	52.5	6	3	20	-	-	-	-	-	-	-	26.5	81	-	G1/2B	-	86	-
Nominal size (NG)	S	S1	S 2	SW	Spanner size SW ₁																
63 (D 7)	7	5.5	2	14	14																
80 (D 7)	7	5.5	-	22	14																
100 (D 7)	7	5.5	3.8	22	14																
100 (D 8)	-	5.5	2	22	-																

^{*} Dimensions as per DIN 16063 (NG 63) and 16064 (NG 80/100).

Bourdon tube pressure gauges for refrigeration applications with glycerine filling

DG: M

Туре	RF63k D7		RF63KTGly, D711	RF80KTGly, D701	RF80KTGly, D711	RF100KTGly, D701	RF100KTGly, D711	RF100KTGly, D802	RF100KTGly, D812
Version									
Housing Ø	60	3	63	80	80	100	100	100	100
Housing			Stair	nless steel 304	with crimped	bezel			eel 304 with et bezel
Measuring element				Bourdon tube	e, copper alloy				oe, stainless eel /316 L
Scale				according to	selection table			Temperature	scale R 717
Accuracy class	1.	6	1.6	1.0	1.0	1.0	1.0	1.0	1.0
Connection	7/16-20	UNF	7/16-20 UNF	7/16-20 UNF	7/16-20 UNF	7/16-20 UNF	7/16-20 UNF	G½B	G½B
PG	2		2	2	2	2	2	3	3
Range (bar)	Part	no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €									
-1/+9	85130	0701	85130711	85180701	85180711	85230701	85230711	-	-
-1/+12.5	8513 ⁻	1701	85131711	85181701	85181711	85231701	85231711	85231802	85231812
-1/+15	85132	2701	85132711	85182701	85182711	85232701	85232711	85232802	85232812
-1/+24	85130	3701	85133711	85183701	85183711	85233701	85233711	85233802	85233812
-1/+30	85134	4701	85134711	85184701	85184711	85234701	85234711	-	-
Extra charges	PG				Price €				
Wetted parts 316 Ti/316 L*	3								_

^{*} Wetted parts stainless steel connection NG 63/80 = $G\frac{1}{4}B - NG$ 100 = $G\frac{1}{2}B$.

Blue part no. = in-stock items



See pages 72 and 117 for other extra charges.

Selection table - temperature scales for refrigerants (see appendix for examples)

Please specify the code of the required temperature scale along with the part number of the basic gauge. Temperature scales for other refrigerants on request.

Temperature scale for refrigerant	Code
R 134a	А
R 404a/R 134a	В
R 502	С
R 404A	E
R 717 (NH3) – stainless steel with wetted parts only	F
R 407A	G
R 410A	Н

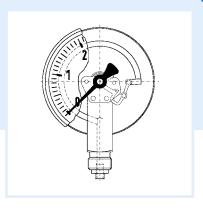
Minimum order quantity = 10 pieces.



Bourdon tube pressure gauges for welding applications



- Design as per ISO 5171
- Rear blow-out
- Measuring system cleaned, oil-free and grease-free
- Many customised versions available



Application For welding and cutting machines and systems as well as similar processes.

Technical Type specifications D 2/D 3

Nominal size

50 - 63

Version

ISO 5171

Accuracy class

2.5

Ranges

-1/0 to -1/+15 bar 0/1 to 0/400 bar

Application area

Static load: 3/4 x full scale value Dynamic load: 2/3 x full scale value Short-term: full scale value

Operating temperature range

Medium: $T_{max} = +60 \, ^{\circ}C$ $T_{min} = -20 \, ^{\circ}C$ Ambient: $T_{max} = +60 \, ^{\circ}C$

Temperature performance

Indication error when the temperature of the measuring system deviates from the normal temperature of 20 °C:

rising temperature approx. ±0.4 %/10 K falling temperature approx. ±0.4 %/10 K of full scale value

Degree of protection

IP 32 (EN 60529)

Standard version Connection

Brass, bottom or centre back, with damping in the pressure inlet G1/4B - spanner size SW 14 (EN 837-1/7.3)

Measuring element

Bourdon tube, copper alloy ≤ 40 bar "C" type tube > 40 bar helical tube (copper portion in case of acetylene < 70 %)

Degree of cleanliness

Wetted parts oil-free and grease-free

Movement

Brass

Aluminium, white Dial marking black

- **Options** Litre scales for argon/CO₂
 - Special scales
 - Other connection threads

Marking

Label "Oxygen" and symbol "Free from oil and grease" for oxygen Label "Acetylene" for acetylene

Pointer

Aluminium, black

Housing

D 2 - sheet steel (gold or black)

D 3 - stainless steel 304 with rear blow-out

Window

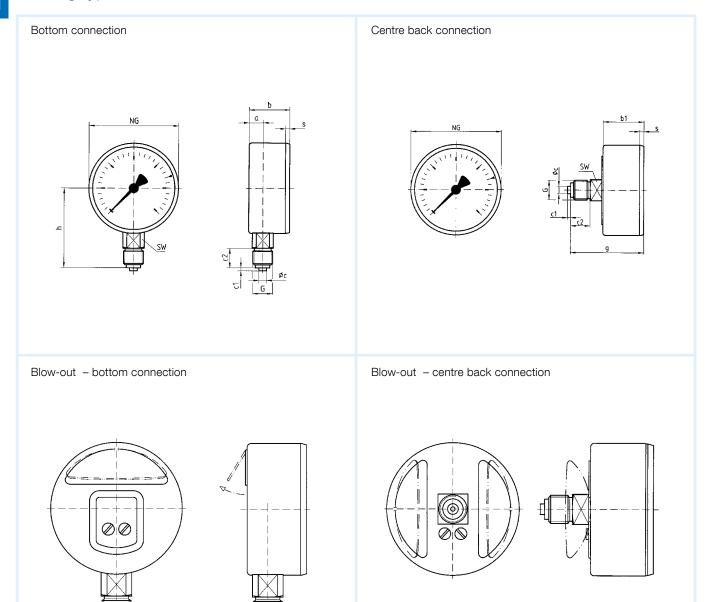
Plastic, snap-in



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Bourdon tube pressure gauges for welding applications Type D 2/3 - NG 50/63

Housing types and dimensions



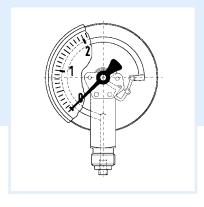
Nominal size (NG)	а	b	b1	Øc	C1	C 2	G	g	h	s	SW
50	10.5	29	26	5	2	13	G¼B	47	46	3.8	14
63	11	29.5	29.5	5	2	13	G¼B	50.5	53	3.7	14

Bourdon tube pressure gauges for gas applications EN 837-1-S2



- Version safety pressure gauge S2 as per EN 837-1
- Dual scale for measurement of different media (option)
- Rear blow-out
- Many customised versions available





Application For gaseous and liquid media which are not highly viscous and do not crystallise. Specially designed for gas technology devices, fittings and installations.

> ! For measuring gas or vapour, these gauges must be used in accordance with the table "Selection Criteria as per EN 837-2" (see appendix)!

Technical Type specifications D3

Nominal size

40 - 50 - 63

Version

EN 837-1 S2

Accuracy class (EN 837-1/6)

Ranges (EN 837-1/5)

-1/0 to -1/+15 bar 0/1 to 0/400 bar

Application area

Static load: 3/4 x full scale value Dynamic load: 2/3 x full scale value Short-term: full scale value

Operating temperature range

Medium: $T_{max} = +60 \, ^{\circ}C$ Ambient: $T_{min} = -20 \, ^{\circ}C$ $T_{max} = +60 \, ^{\circ}C$

Temperature performance

Indication error when the temperature of the measuring system deviates from the normal temperature of 20 °C:

rising temperature approx. ±0.4 %/10 K falling temperature approx. ±0.4 %/10 K of full scale value

Degree of protection

IP 32 (EN 60529)

Standard version

Connection

Brass bottom or centre back G1/4B - SW14 (EN 837-1/7.3) NG 40: G½ B - SW14 (EN 837-1/7.3)

Measuring element

Bourdon tube, copper alloy ≤ 40 bar "C" type tube > 40 bar helical tube

Movement

Brass

Dial

Aluminium, white

Dial marking black

Pointer

Aluminium, black

Housing

Stainless steel 304 with rear blow-out

Window

Plastic, snap-in

Options

- Wetted parts stainless steel
- Wetted parts oil-free and grease-free
- Helium leak test

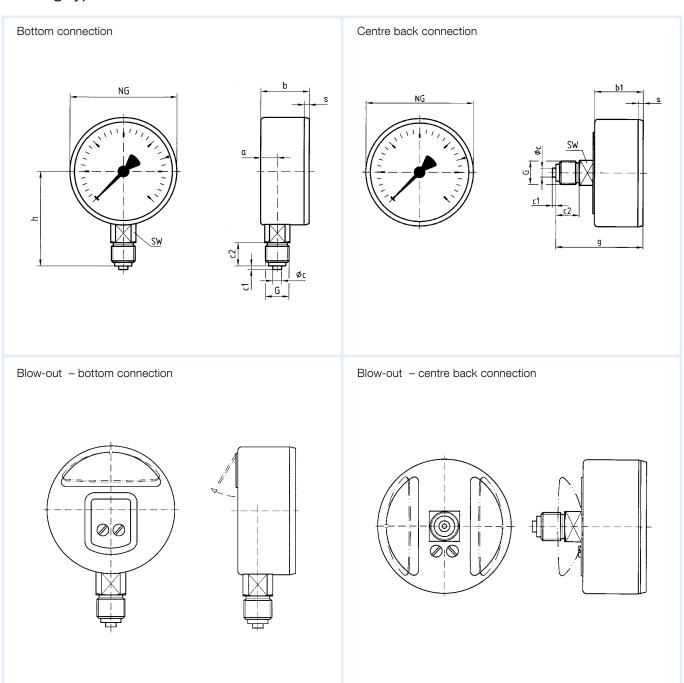
- Special scales
- Other connection threads
- Damping screw



Bourdon tube pressure gauges for gas applications

Type D 3 - NG 40/50/63

Housing types and dimensions



Nominal size (NG)	а	b	b1	Øc	C1	C 2	G	g	h	S	SW
40	8.2	23.5	25	4	2	10	G⅓B	41.5	36	3	12
50	10.5	29	26	5	2	13	G¼B	47	46	3.8	14
63	11	29.5	29.5	5	2	13	G¼B	50.5	53	3.7	14



Bourdon tube pressure gauges for welding/gas applications

DG: M

DG. W	Varaian for	I.						
	Version for welding applica- tions ISO 5171							
Туре	RF63ST, D301	RF40GT, D301 ⁵⁾	RF50GT, D301	RF50GT, D311	RF63GT, D301	RF63GT, D311	RF50GT, D302 4)	RF63GT, D302 4)
Version								
Housing Ø	63	40	50	50	63	63	50	63
Housing			St	ainless steel 3	04 with blow-c	out	ı	J.
Measuring element	CU alloy, oil-free and grease-free			Copper alloy			Stainless ste	el 316Ti/316L
Accuracy class	2.5	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Connection	G¼B	G¹/₅B	G¼B	G¼B	G¼B	G¼B	G¼B	G¼B
PG	2	2	2	2	2	2	3	3
Range (bar)	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €								
-1/0			85051301GT	85051311GT	85101301GT	85101311GT	85051302GT	85101302GT
-1/+0.6			85052301GT	85052311GT	85102301GT	85102311GT	85052302GT	85102302GT
-1/+1.5			85053301GT	85053311GT	85103301GT	85103311GT	85053302GT	85103302GT
-1/+3			85054301GT	85054311GT	85104301GT	85104311GT	85054302GT	85104302GT
-1/+5			85055301GT	85055311GT	85105301GT	85105311GT	85055302GT	85105302GT
-1/+9			85056301GT	85056311GT	85106301GT	85106311GT	85056302GT	85106302GT
-1/+15			85057301GT	85057311GT	85107301GT	85107311GT	85057302GT	85107302GT
Price €								
0/0.6			85059301GT	85059311GT	85109301GT	85109311GT	85059302GT	85109302GT
0/1	883003011)		85060301GT	85060311GT	85110301GT	85110311GT	85060302GT	85110302GT
0/1.6	883013011)		85061301GT	85061311GT	85111301GT	85111311GT	85061302GT	85111302GT
0/2.5	883023011)		85062301GT	85062311GT	85112301GT	85112311GT	85062302GT	85112302GT
0/4	88303301	85013301GT	85063301GT	85063311GT	85113301GT	85113311GT	85063302GT	85113302GT
0/6	883043012)	85014301GT	85064301GT	85064311GT	85114301GT	85114311GT	85064302GT	85114302GT
0/10	88305301	85015301GT	85065301GT	85065311GT	85115301GT	85115311GT	85065302GT	85115302GT
0/10	88306301 ³⁾							
0/16	883073012)	85016301GT	85066301GT	85066311GT	85116301GT	85116311GT	85066302GT	85116302GT
0/25	88308301	85017301GT	85067301GT	85067311GT	85117301GT	85117311GT	85067302GT	85117302GT
0/40	883093011)	85018301GT	85068301GT	85068311GT	85118301GT	85118311GT	85068302GT	85118302GT
0/40	883103012)							
Price €								
0/60		85019301GT	85069301GT	85069311GT	85119301GT	85119311GT	85069302GT	85119302GT
0/100		85020301GT	85070301GT	85070311GT	85120301GT	85120311GT	85070302GT	85120302GT
0/160		85021301GT	85071301GT	85071311GT	85121301GT	85121311GT	85071302GT	85121302GT
0/250	88314301	85022301GT	85072301GT	85072311GT	85122301GT		85072302GT	85122302GT
0/315	883153012)	85023301GT	85079301GT	85079311GT	85129301GT	85129311GT	85079302GT	85129302GT
0/315	88316301							
0/400	88317301		85073301GT		85123301GT		85073302GT	
G, TOO	00017001	3002700101	3007000101	3007001101	3012000101	5012001101	3007000201	3012000201

¹⁾ With label "Acetylene" 2) With label "Oxygen" 3) Scale 0/30 I/min "Argon" red, 0/28 I/min "CO₂" black 4) Extra charge centre back connection € (type D311) Minimum order quantity: 10 pieces

Blue part no. = in-stock items



See page 72 for extra charges.



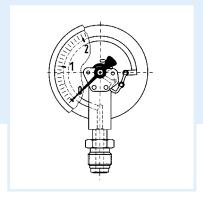
Bourdon tube pressure gauges for ultra-pure gas applications







- Wetted parts specially cleaned, flushed and electropolished
- Tightness-tested with helium
- Rear blow-out
- Versatile connection technology
- GOSSTANDART-certified



Application Designed for highly demanding applications in terms of surface quality and purity of the wetted parts, particularly for measuring ultra-pure gases.

Technical Type specifications D3

Nominal size

Accuracy class (EN 837-1/6)

Ranges (EN 837-1/5)

-1/0 to -1/+15 bar 0/0.6 to 0/400 bar

Calibration medium

Nitrogen or dried air

Application area

Static load: 34 x full scale value Dynamic load: 2/3 x full scale value Short-term: full scale value

Operating temperature range

Medium: $T_{max} = +150 \, ^{\circ}C$ Ambient: $T_{min} = -20 \, ^{\circ}C$

 $T_{max} = +60 \, ^{\circ}C$

Temperature performance

Indication error when the temperature of the measuring system deviates from the normal temperature of 20 °C: rising temperature approx. ±0.4 %/10 K falling temperature approx. ±0.4 %/10 K

Degree of protection

IP 32 (EN 60529)

of full scale value

Standard version Connection

Bottom, either: 1/4-18 NPT 9/16-18 UNF, with pressure screw 9/16-18 UNF, with union nut

Measuring element

Bourdon tube ≤ 60 bar "C" type tube > 60 bar helical tube tightness-tested with helium, leak rate ≤ 10-9 mbar x l/s

Wetted parts

Connection stainless steel 316 Ti/316 L Measuring element stainless steel 316 Ti/316 L Cleaned, flushed with nitrogen, electropolished, surface roughness ≤ Ra 0.6 µm

Movement

- **Options** Surface roughness Ra 0.4 μm
 - Housing polished
 - Push on bezel polished
 - Electrical contacts

Stainless steel

Dial

Aluminium, white Dial marking black Label "Ultra-pure gas"

Pointer

Aluminium, black

Stainless steel 304 with rear blow-out

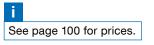
Push on bezel

Stainless steel 304, bare metal surface

Window

Plastic

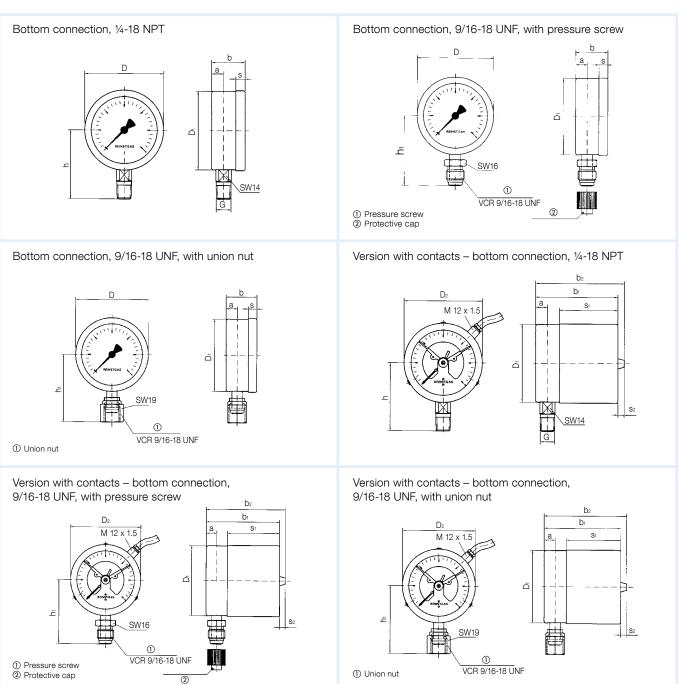
- Special scales
- NG 50
- Other process connections





Bourdon tube pressure gauges for ultra-pure gas applications Type D 3 - NG 63

Housing types and dimensions



Nominal size (NG)	а	b	b1	b ₂	D	D1	D2	G	h	h1	S	S ₁	S ₂
63	9	28	66	74	63	62	64	14-18 NPT	54	57	8	48	8

Bourdon tube pressure gauges for ultra-pure gas applications

DG: M, PG: 3

Version	with	electrical	contacts

				Version with el	ectrical contac	ts	
Туре	RF63RG, D302	RF63RG, D302	RF63RG, D302	RF63RG, MK1, D302	RF63RG, MK2, D302	RF63RG, IK1, D302	RF63RG, IK2, D302
Version							
Housing Ø	63	63	63	63	63	63	63
Contact type				Single magnetic spring contact	Dual magnetic spring contact	Single inductive contact	Dual inductive contact
Housing			Stainless steel	304 with push on	bezel, plastic wir	ndow	
Measuring element			Bourdon	tube, stainless st	eel 316 Ti/316 L		
Accuracy class	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Connection	1/4-18 NPT	9/16-18 UNF with pressure screw	9/16-18 UNF with union nut	1/4-18 NPT	1/4-18 NPT	1/4-18 NPT	14-18 NPT
Range (bar)	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €							
-1/0	87001302	87051302	87101302				
-1/+0.6	87002302	87052302	87102302	87352302	87202302	87252302	87302302
-1/+1.5	87003302	87053302	87103302	87353302	87203302	87253302	87303302
-1/+3	87004302	87054302	87104302	87354302	87204302	87254302	87304302
-1/+5	87005302	87055302	87105302	87355302	87205302	87255302	87305302
-1/+9	87006302	87056302	87106302	87356302	87206302	87256302	87306302
-1/+15	87007302	87057302	87107302	87357302	87207302	87257302	87307302
Price €							
0/0.6	87009302	87059302	87109302				
0/1	87010302	87060302	87110302				
0/1.6	87011302	87061302	87111302	87361302	87211302	87261302	87311302
0/2.5	87012302	87062302	87112302	87362302	87212302	87262302	87312302
0/4	87013302	87063302	87113302	87363302	87213302	87263302	87313302
0/6	87014302	87064302	87114302	87364302	87214302	87264302	87314302
0/10	87015302	87065302	87115302	87365302	87215302	87265302	87315302
0/16	87016302	87066302	87116302	87366302	87216302	87266302	87316302
0/25	87017302	87067302	87117302	87367302	87217302	87267302	87317302
0/40	87018302	87068302	87118302	87368302	87218302	87268302	87318302
Price €							
0/60	87019302	87069302	87119302	87369302	87219302	87269302	87319302
0/100	87020302	87070302	87120302	87370302	87220302	87270302	87320302
0/160	87021302	87071302	87121302	87371302	87221302	87271302	87321302
0/250	87022302	87072302	87122302	87372302	87222302	87272302	87322302
0/400	87023302	87073302	87123302	87373302	87223302	87273302	87323302
					a charge 9/16-18	UNF pressure scr nut €	

Blue part no. = in-stock items



SF6 gas density monitor







- Housing permanently tight because welded and crimped
- Bimetal-compensated
- Robust and reliable
- With or without electrical contact
- With application-specific process connection
- DNV- and GOSSTANDART-certified

Application SF6 gas density monitors are designed to monitor the density of sulphur hexafluoride (SF 6) insulated high voltage switchgear (GIS), converters, gas-insulated transmission lines (GIL) and transformers.

Description SF6 gas density monitors excel with outstanding reliability. The application-specific process connection is fully factory-welded to the measuring instrument. This means that a second, potentially leaky screw connection at the sealing point is not required. Made to specific customer specifications.

> The integrated bimetal compensation allows for maximum accuracy and thus reliability of SF6 gas insulated switchgear.

Technical Type specifications D7

Nominal size

Accuracy

± 1.5 % of full scale value at 20 °C ± 2.5 % of full scale value at -20/+60 °C (compensated range)

Ranges

-1/+5 bar

-1/+9 bar

Others on request

Application area

Full scale value

Contact types

Magnetic spring contact (MK) Inductive contact (IK)

Operating temperature range

 $T_{min} = -40 \, ^{\circ}C$ Ambient:

 $T_{max} = +65 \, ^{\circ}C$

Medium: $T_{max} = +100 \, ^{\circ}C$ -20/+60 °C Compensated:

Degree of protection

IP 65 (EN 60529) with housing vent: IP 54

Standard version

Connection

Stainless steel 316 L, bottom or bottom back G½B - spanner size SW 22 (EN 837-1/7.3)

Electrical connection

Junction box

Measuring element

Bourdon tube, stainless steel 316 Ti/316 L

Movement

Stainless steel

Dial

Aluminium, white

Pointer

Aluminium, black

Housing

Stainless steel 304 with pressure relief port

Crimped bezel

Stainless steel 304

Window

Laminated safety glass

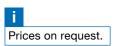
Filling liquid

Silicone oil

Options

- Without electrical contacts
- Special scales

• Other process connections (e.g. DILO DN 8)



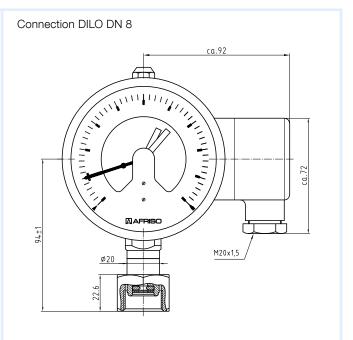


SF6 gas density monitor

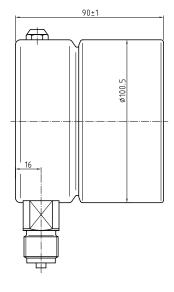
Type D 7 - NG 100

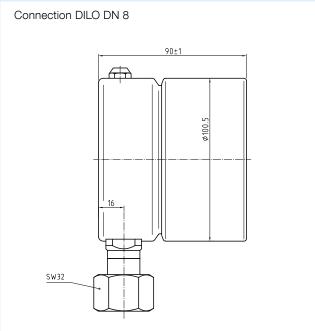
Housing types and dimensions

Bottom connection, G1/2B – spanner size SW 22



Bottom connection, G1/2B - spanner size SW 22

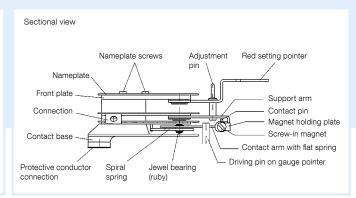




Electrical contacts electromechanical







Magnetic spring contact

Electrical contacts (electromechanical magnetic spring contacts) in measuring devices with pointers are auxiliary electrical switches which open or close electrical circuits at set limit values by means of a contact arm which is moved in accordance with the indicated value. They consist of:

- An adjustable red setting pointer
- A support arm which is connected to the setting pointer and which holds the contact pin
- A contact arm which is moved by the gauge pointer and which carries the second contact pin

A contact adjustment lock in the window of the gauge allows the user to adjust the setting pointer to the value at which the device is to switch. The gauge pointer can move beyond the adjusted setting pointer after the contact has been made (however, the contact remains active).

Two types of electromechanical contacts are available: magnetic spring contacts and sliding contacts (which are not described in detail here).

Principle of operation

Magnetic spring contacts have a permanent magnet screwed to the setting pointer at the contact support arm. To close the circuit, the contact pin of the moving contact arm is attracted by the magnet so that the contact snaps closed. When the circuit opens, the magnet attracts the contact arm until the resetting force of the measuring element overcomes the effective force of the magnet so that the contact snaps open.

The snap action reduces arcing between the contacts, thus allowing for greater switch ratings. Due to the increased contact force, this type of contact is also less sensitive to vibrations. Furthermore, the contact stability is increased by greater contacting pressure.

Application

Magnetic spring contacts can be used under almost any type of operating condition. They can also be integrated into devices with filling. In order to prevent switching errors (particularly in the case of greater inductive switch ratings or considerable system vibration or in gauges with filling) we recommend installing our pulse-controlled series MSR contact protection relays.

Technical specifications

Supply voltage

Max. 250 V

Making current and breaking current

Max. 1.0 A

Continuous current

Max. 0.6 A

Switch rating

Max. 30 W 50 VA (no filling) Max. 15 W 20 VA (with filling)

Contact material

Ag80 Ni20 Au 10 μ (extra charge for special materials)

Switching accuracy

Approx. 2-5 % of full scale value

Operating temperature range

-20/+70 °C or corresponding to the respective gauges

Adjustment range

5-95 % measuring range of gauge

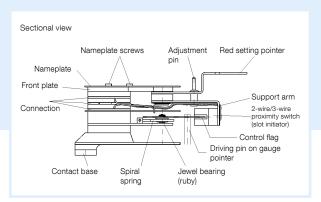


103

Electrical contacts electronic







Electronic contact Electronic contacts have non-contact electrical displacement pick-ups (proximity sensors). They consist of:

- An adjustable red setting pointer
- A support arm which is connected to the setting pointer and which carries the control head (initiator) with the completely encapsulated electronics
- A control flag which is moved by the gauge pointer

A contact adjustment lock in the window of the gauge allows the user to adjust the setting pointer to the value at which the device is to switch. The gauge pointer can move beyond the adjusted setting pointer after the contact has been made (however, the contact remains active).

operation

Principle of The proximity switches used in the electronic contacts are simple 2-wire or 3-wire DC voltage switches. Due to the slot design, the proximity switches are also referred to as slot initiators. The electromagnetic field is concentrated between 2 opposing coils. The switch is activated when the aluminium control flag moved by the gauge pointer reaches the gap between the two coils (slot). The signal is generated without a delay, according to the motion of the gauge pointer.

> The switching behaviour of the PNP switches used in these contacts is usually defined as a normally open contact, i.e.: Control flag in the slot initiator

- Contact closed
- Output active

Control flag not in the slot initiator

- Contact open
- Output not active

Application Due to non-contact switching, the high switching accuracy and the long service life, electronic contacts with PNP output are ideal for any type of industrial application.

> The use of these contacts is particularly advantageous in applications with liquid-filled measuring instruments, at low voltages (DC 10-30 V) and low DC loads \leq 100 mA), e.g.

- For PLC signal input
- To control opto-isolators
- For other electronic evaluation units

Version Standard electronic contacts are shipped with a 3-wire initiator type Si2-K08-AP6. The contacts are also available with the 2-wire initiator Si2-K08-AG6.

specifications DC 10-30 V

Technical Supply voltage

Switching current

≤ 100 mA

Switching accuracy

Approx. 0.5 % of full scale value

Operating temperature range

-25/+70 °C or corresponding to the respective gauges

Adjustment range

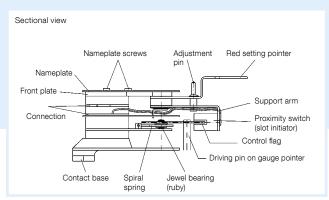
5-95 % measuring range of gauge



Electrical contacts inductive







Inductive contact Inductive contacts have non-contact proximity sensors as per EN 60947-5-6 / NAMUR worksheet NA 001. They consist of:

- An adjustable red setting pointer
- A support arm which is connected to the setting pointer and which carries the control head (initiator) with the completely encapsulated electronics
- A control flag which is moved by the gauge pointer

A contact adjustment lock in the window of the gauge allows the user to adjust the setting pointer to the value at which the device is to switch. The gauge pointer can move beyond the adjusted setting pointer after the contact has been made (however, the contact remains active).

operation

Principle of Inductive contacts are used together with an isolating switching amplifier. The switching amplifier supplies the control head with direct voltage. As soon as the control flag reaches the control head, the internal resistance in the control head increases (high-resistance initiator). This causes the current to change which is used to control the switching amplifier. The amplifier converts the input signal into a binary output signal. Therefore, the switching function of inductive contacts is not only determined by the slot initiator, but also by the switching amplifier.

Application

Due to non-contact switching, the high switching accuracy and the long service life, inductive contacts are ideal for industrial applications and should be used in liquid filled pressure gauge. Inductive contacts are particularly recommended when the switching function must be extremely reliable or when the switching frequency is high. The electronics are fully encapsulated so that this type of contact is also suitable for corrosive environments.

If suitable isolating switching amplifiers (such as KFA6-SR2-Ex) are used, the system will have the type of protection "intrinsic safety i". It is marked 😥 II 1G Ex ia IIC T6 and is approved for use in hazardous areas, zones 1 and 2 together with an isolating switching amplifier. The isolation switching amplifier must always be installed outside of the hazardous area.

For standard industrial applications that do not require EX protection or that require only low EX protection (zone 2), we recommend our cost-efficient multifunctional series MSR-I relays.

Version Inductive contacts are shipped with a 2-wire initiator type Si2-K08-Y1.

Technical Nominal voltage

specifications ≈ DC 8 V = (Ri 1 kOhm)

Supply voltage

5-25 V

Current input

≥ 2.1 mA (active area free) ≤ 1.2 mA (active area covered)

Switching accuracy

Approx. 0.5 % of full scale value

Operating temperature range

-20/+70 °C

or corresponding to the respective gauges

Adjustment range

5-95 % measuring range of gauge

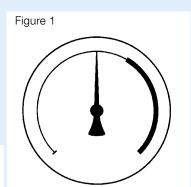
Option

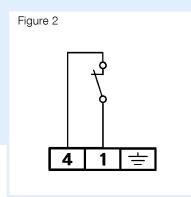
Contact systems with safety integrity level SIL 2

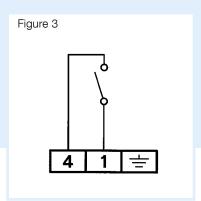




Switching functions and definitions







- **Definition of 1** = Contact closes clockwise when the setpoint is reached
- switching function 2 = Contact opens clockwise when the setpoint is reached
 - W = 1 contact opens and 1 contact closes at the same time (changeover contact)

The switching function of a contact is always specified in terms of a clockwise movement of the pointer. If the gauge pointer moves counterclockwise, the switching function is inverted! If several contacts are fitted to a gauge, the contact closest to the left start value or end value of the scale is defined as the first contact. This also applies to vacuum ranges!

Optimisation of Application-related specifications, such as the operating behaviour of the contact (e.g. contact switchthe switching es with increasing or decreasing pressure), the switching point or the speed of pressure changes, help performance to optimise contact adjustment to achieve a more accurate switching performance.

switching functions

Selection table The selection tables on the following pages show the switching functions of single, double and the most common triple contacts (with switching scheme and wiring diagram).

This allows you to quickly and easily find the correct contact designation for the required switching

Description of Figure 1:

- **switching** Thin line means: contact open, circuit open
 - scheme Thick line means: contact closed, circuit closed

Description Figure 2: wiring diagram

- Contact closed
- Circuit closed

Figure 3:

- Contact open
- Circuit open

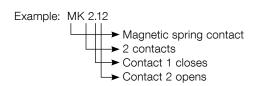
Definition of MK = magnetic spring contact

the contact type SK = sliding contact

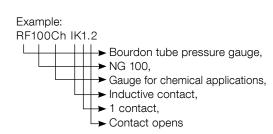
EK = electronic contact

= inductive contact

Depending on the type of the pressure gauge, up to 4 contacts can be installed per gauge. The number of contacts is indicated by means of a figure (1-4) after the contact type designation.



Definition of The code for the contact is appended to the type complete gauge designation of the measuring instrument.



Switching functions of electrical contacts (electromechanical)

		Switching function	Contact type				
Switching scheme	Wiring diagram	(pointer moves clockwise)	Magnetic spring contact	Sliding contact			
		Single contact					
	4 1 🚖	Contact closes	MK1.1	SK1.1			
	4 1 =	Contact opens	MK1.2	SK1.2			
	2 4 1 1 =	Contact switches over, i.e. 1 contact opens 1 contact closes	MK1.W	SK1.W			
		Double contact					
	4 1 2 =	Contact 1 closes Contact 2 closes	MK2.11	SK2.11			
	4 1 2 =	Contact 1 closes Contact 2 opens	MK2.12	SK2.12			
	4 1 2 =	Contact 1 opens Contact 2 closes	MK2.21	SK2.21			
	4 1 2 =	Contact 1 opens Contact 2 opens	MK2.21	SK2.2			
		Triple contact					
	4 1 2 3 =	Contact 1 opens Contact 2 closes Contact 3 opens	MK3.212	SK3.212			
	4 1 2 3 =	Contact 1 closes Contact 2 opens Contact 3 closes	MK3.121	SK3.121			



Switching functions of inductive electrical contacts

Switching scheme	Wiring diagram	Switching function	When the setpoint is exceeded, the gauge pointer moves the control flag	Contact type
		Pointer move	es clockwise	Inductive contact
		Single contact		
	1 2 =	Contact closes	out of the control head	IK1.1
	1 2 =	Contact opens	into the control head	IK1.2
		Double contact		
	1 2 3 4 =	Contact 1 closes Contact 2 closes	of the 1st and 2nd contact out of the control head	IK2.11
	1 2 3 4 =	Contact 1 closes Contact 2 opens	of contact 1 out of the control head of contact 2 into the control head	IK2.12
	1 2 3 4 =	Contact 1 opens Contact 2 closes	of contact 1 into the control head of contact 2 out of the control head	IK2.21
	1 2 3 4 =	Contact 1 opens Contact 2 opens	of the 1st and the 2nd contact into the control head	IK2.22
		Triple contact		
	1 2 3 4 5 6 =	Contact 1 opens Contact 2 closes Contact 3 opens	of the 1st and the 3rd contact into the control head of contact 2 out of the control head	IK3.212
	1 2 3 4 5 6 =	Contact 1 closes Contact 2 opens Contact 3 closes	of the 1st and the 3rd contact out of the control head of contact 2 into the control head	IK3.121



Bourdon tube pressure gauges with electrical contacts nominal size 63

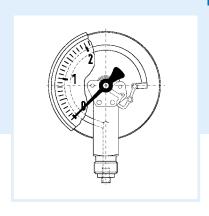


- Up to two contacts possible
- Wetted parts and movement made of stainless steel
- Available with MK, EK, IK
- Safety housing S2 as per EN 837-1 (blow-out)









Application For corrosive gaseous and liquid media which are not highly viscous and do not crystallise. For measuring in areas with limited space. Especially suitable for monitoring minimum pressure in gas cylinders together with AFRISO alarm unit for low gas level.

Technical Type specifications

Nominal size

Accuracy class (EN 837-1/6)

Ranges (EN 837-1/5)

-1/+0.6 to -1/+15 bar 0/1.6 to 0/600 bar

Application area

Static load: ¾ x full scale value Dynamic load: 2/3 x full scale value Short-term: full scale value

Contact types

Magnetic spring contact (MK) Electronic contact (EK) Inductive contact (IK) See page 103 for technical specifications.

Minimum ranges

Contact

MK single 1.6 bar MK double 1.6 bar EK/IK single 1,6 bar

EK/IK double 1.6 bar

Operating temperature range

 $T_{\text{max}} = +150 \text{ °C}$ Medium: $T_{min} = -20 \, ^{\circ}C$ Ambient:

= +60 °C

Temperature performance

Indication error when the temperature of the measuring system deviates from the normal temperature of 20 °C:

rising temperature approx. ±0.4 %/10 K falling temperature approx. ±0.4 %/10 K of full scale value

Degree of protection

IP 42 (EN 60529)

Standard version

Connection

Stainless steel 316 L, bottom or bottom back G1/4B - spanner size SW 14 (EN 837-1/7.3)

Electrical connection

Cable gland M 12 x 1.5 1 metre cable

Measuring element

Bourdon tube, stainless steel 316 Ti/316 L ≤ 60 bar "C" type tube > 60 bar helical tube

Movement

Stainless steel

Dial

Aluminium, white Dial marking black

Pointer

Aluminium, black

Housing

Stainless steel 304, safety housing S2 as per EN 837-1, with rear blow-out

Push on bezel

Stainless steel 304

Makrolon, with contact adjustment lock



See page 115 for prices.

Options

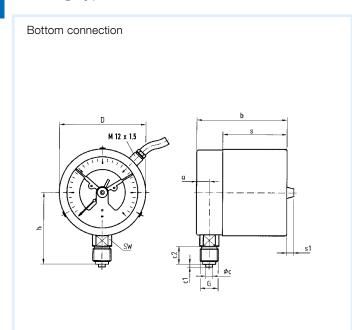
- Wetted parts oil-free and grease-free $(\leq 0/400 \text{ bar})$
- Ultra-pure gas version
- Back flange

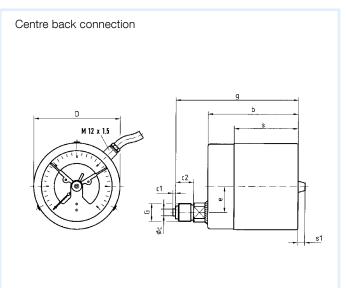
- Damping screw
- Special scales
- Other process connections



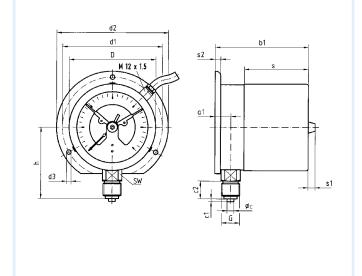
Bourdon tube pressure gauges with electrical contacts nominal size 63 Type D3

Housing types and dimensions





Bottom connection, back flange



Nominal size (NG)	а	a1	b	b1	Øc	C1	C2	D*	dı*	d2*	d 3*	g	G	h	S	S1	S 2	SW
63	9.5	13	66	69.5	5	2	13	64	75	85	3.6	89	G¼B	46	47.5	8	5.5	14

^{*} Dimensions as per DIN 16063

Pressure gauges for industrial applications with electrical contacts

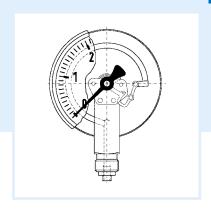


- Robust stainless steel housing
- Excellent readability
- Up to three contacts
- Available with MK, EK, IK









Application For gaseous and liquid media which are not highly viscous, do not crystallise and do not attack copper alloys.

Technical Type specifications D4

Nominal size

100 - 160

Accuracy class (EN 837-1/6)

Ranges (EN 837-1/5)

-1/0 to -1/+15 bar 0/1 to 0/1000 bar

Application area

Static load:

≤ 600 bar = full scale value

> 600 bar = 3/4 x full scale value

Dynamic load:

 \leq 600 bar = 0.9 x full scale value

 $> 600 \text{ bar} = \frac{2}{3} \times \text{ full scale value}$

 \leq 600 bar = 1.3 x full scale value

> 600 bar = full scale value

Contact types

Magnetic spring contact (MK) Electronic contact (EK) Inductive contact (IK)

See page 103 for technical specifications.

Minimum ranges

Contact

MK single 1.6 bar double 1.6 bar MK EK/IK single 1 bar EK/IK double 1 bar

Operating temperature range

Medium: $T_{max} = +60 \, ^{\circ}C$ $T_{min} = -20 \, ^{\circ}C$ Ambient:

Temperature performance

Indication error when the temperature of the measuring system deviates from the normal temperature of 20 °C:

rising temperature approx. ±0.4 %/10 K falling temperature approx. $\pm 0.4~\%/10~K$ of full scale value

Degree of protection

IP 54 (EN 60529)

Standard version

Connection

Brass, bottom or bottom back G1/2B - spanner size SW 22 (EN 837-1/7.3)

Electrical connection

Cable gland M 12 x 1.5 1 metre cable

Measuring element

Bourdon tube, ≤ 60 bar "C" type tube, copper alloy, > 60 bar helical tube, 316 Ti/316 L

Movement

Brass

Dial

Aluminium, white Dial marking black

Pointer

Aluminium, black

Housing

Stainless steel 304 with blow-out

Bayonet type bezel

Stainless steel 304

Window

Makrolon, with contact adjustment lock

- Connector
- Special scales
- Other process connections



See page 116 for prices.

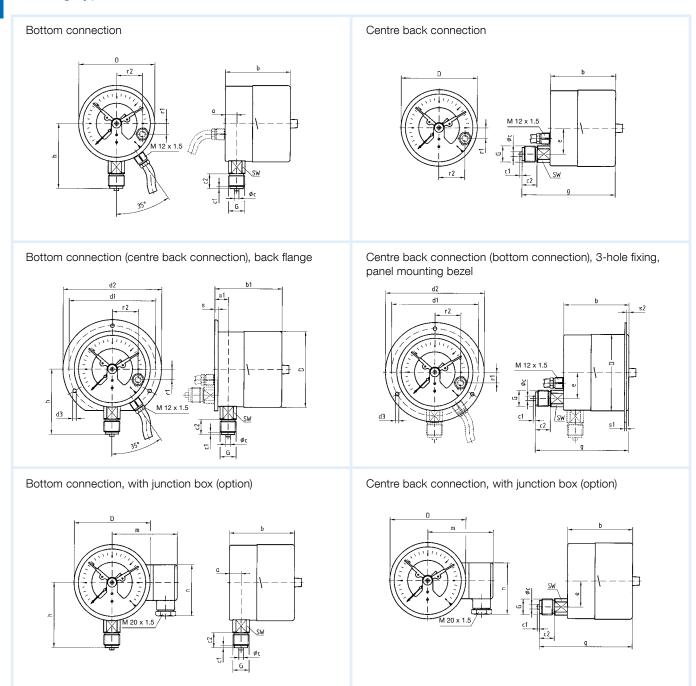
Options

- Back flange
- 3-hole fixing, panel mounting bezel
- Damping screw
- Junction box



Pressure gauges for industrial applications with electrical contacts Type D 4 - NG 100

Housing types and dimensions



	-																				
Nominal size (NG)	а	a1	b	b1	Øc	C1	C 2	dı*	d 2*	d 3*	D	е	g	G	h	m	n	r1	r2	S	S 1
100	15.6	19.1	87	90.5	6	3	20	116	132	4.8	101.5	26.5	119	G½B	86	92	72	14	34.5	5.5	2
160	17.5	20.5	97	100	6	3	20	178	196	5.8	161.5	26.5	129	G½B	116	122	72	14	34.5	6	2
Nominal size (NG)	S 2	SW																			
100	4	22																			
160	4	22																			

^{*} Dimensions as per DIN 16064.

Bourdon tube pressure gauges for chemical applications with electrical contact



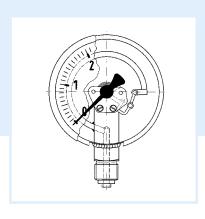


- Measuring system fully welded to housing
- Robust mechatronical pressure gauge
- Up to three contacts
- Tightness-tested with helium
- GOSSTANDART-certified









Application For corrosive gaseous and liquid media which are not highly viscous and do not crystallise; suitable for corrosive environments.

Technical Type specifications D4

Nominal size

100 - 160

Accuracy class (EN 837-1/6)

Ranges (EN 837-1/5)

-1/0 to -1/+15 bar 0/1 to 0/1000 bar

Application area

Static load:

≤ 600 bar = full scale value

> 600 bar = 3/4 x full scale value

Dynamic load:

 \leq 600 bar = 0.9 x full scale value

 $> 600 \text{ bar} = \frac{2}{3} \text{ x full scale value}$

 \leq 600 bar = 1.3 x full scale value

> 600 bar = full scale value

Contact types

Magnetic spring contact (MK) Electronic contact (EK) Inductive contact (IK)

See page 103 for technical specifications.

Minimum ranges

Contact

MK single 1.6 bar MK double 1.6 bar EK/IK single 1 bar EK/IK double 1 bar

Operating temperature range

Medium: $T_{\text{max}} = +150 \, ^{\circ}\text{C}$ $T_{min} = -20 \, ^{\circ}C$ Ambient:

Temperature performance

Indication error when the temperature of the measuring system deviates from the normal temperature of 20 °C:

rising temperature approx. ±0.4 %/10 K falling temperature approx. $\pm 0.4~\%/10~K$ of full scale value

Degree of protection

IP 54 (EN 60529)

Standard version

Connection

Stainless steel 316 L, bottom or bottom back, G1/2B- spanner size SW 22 (EN 837-1/7.3)

Electrical connection

Junction box

Measuring element

Bourdon tube, stainless steel 316 Ti/316 L ≤ 60 bar "C" type tube

> 60 bar helical tube

Movement

Stainless steel

Dial

Aluminium, white Dial marking black

Pointer

Aluminium, black

Housing

Stainless steel 304 with blow-out

Bayonet type bezel

Stainless steel 304

Window

Makrolon, with contact adjustment lock

- Connector
- Special scales
- Other process connections



See page 116 for prices.

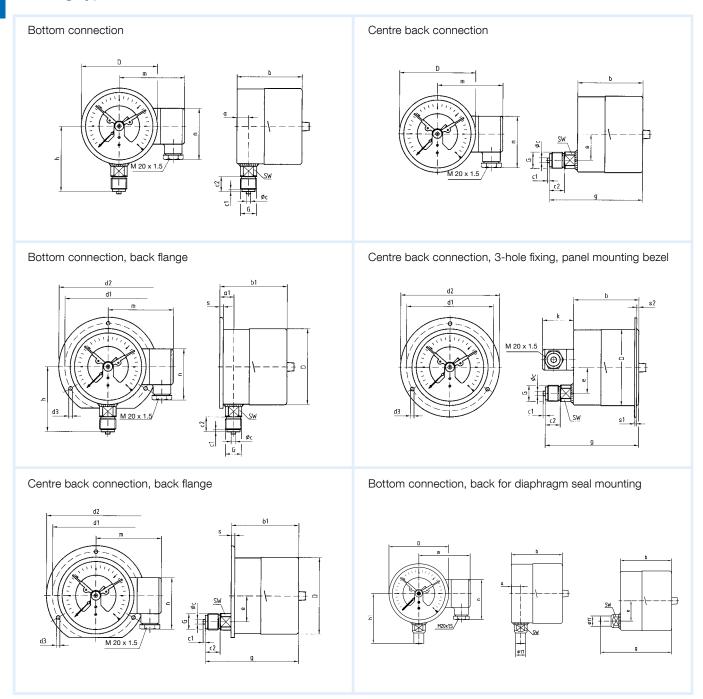
Options

- Liquid filling (silicone oil)
- Back flange
- 3-hole fixing, panel mounting bezel
- Damping screw



Bourdon tube pressure gauges with electrical contacts for chemical applications type D 4 - NG 100/160

Housing types and dimensions



Nominal size (NG)	а	a1	b	b1	Øc	C1	C 2	dı*	d2*	d 3*	D	е	g	G	h	h1	k	m	n	s	S1
100	15.6	19.1	87	90.5	6	3	20	116	132	4.8	101.5	34.5	121	G½B	86	83.5	40	92	72	5.5	2
160	17.5	20.5	97	100	6	3	20	178	196	5.8	161.5	34.5	131	G½B	116	116	40	122	72	6	2
Nominal size (NG)	S2	SW																			
100	4	22																			
160	4	22																			

^{*} Dimensions as per DIN 16064.

Bourdon tube pressure gauges with electrical contacts

DG: M

Туре	RF63MK1, D302	RF63MK2, D302	RF63IK1, D302	RF63IK2, D302
Version				
Housing Ø	63	63	63	63
Housing		Stainless steel 304	with nuch on heze	
Measuring element	R	ourdon tube, stainle	<u> </u>	
Accuracy class	1.6	1.6	1.6	1.6
Connection	G1/4B	G¼B	G1/4B	G1/4B
Contact type	Magnetic spring single	Magnetic spring double	Inductive, single	Inductive, double
PG	3	3	3	3
Range (bar)	Part no.	Part no.	Part no.	Part no.
Price €	i ditiio.	i aitilo.	i di tilo.	i artiio.
-1/0				
-1/+0.6	87402302	87502302	87452302	87552302
-1/+1.5	87403302	87503302	87453302	87553302
-1/+3	87404302	87504302	87454302	87554302
-1/+5	87405302	87505302	87455302	87555302
-1/+9	87406302	87506302	87456302	87556302
-1/+15	87407302	87507302	87457302	87557302
1, 1 10	07 107 002	07007002	01101002	0,00,002
Price €				
0/0.6				
0/1				
0/1.6	87411302	87511302	87461302	87561302
0/2.5	87412302	87512302	87462302	87562302
0/4	87413302	87513302	87463302	87563302
0/6	87414302	87514302	87464302	87564302
0/10	87415302	87515302	87465302	87565302
0/16	87416302	87516302	87466302	87566302
0/25	87417302	87517302	87467302	87567302
0/40	87418302	87518302	87468302	87568302
Price €				
0/60	87419302	87519302	87469302	87569302
0/100	87420302	87520302	87470302	87570302
0/160	87421302	87521302	87471302	87571302
0/250	87422302	87522302	87472302	87572302
0/400	87423302	87523302	87473302	87573302
Price €				
0/600	87424302	87524302	87474302	87574302
0/1000				

Blue part no. = in-stock items

Please specify required switching function (normally closed/normally open). See page 117 for other versions.



Bourdon tube pressure gauges with electrical contacts

DG: M

Туре	RF100I MK1, D401	RF100I MK2, D401	RF100I IK1, D401	RF100I IK2, D401	RF100Ch MK1, D402	RF100Ch MK2, D402	RF100Ch IK1, D402	RF100Ch IK2, D402
Version								
Housing Ø	100	100	100	100	100	100	100	100
Housing			Stair	nless steel 304	with bayonet I	oezel		
Measuring element	(> 6	Bourdon tube 0 bar stainless		16 L)	Bourde	on tube, stainle	ess steel 316 T	ï/316 L
Accuracy class	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Connection	G½B	G½B	G½B	G½B	G½B	G½B	G½B	G½B
Contact type	Magnetic spring single	Magnetic spring double	Inductive single	Inductive double	Magnetic spring single	Magnetic spring double	Inductive single	Inductive double
PG	2	2	2	2	3	3	3	3
Range (bar)	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €								
-1/0			87701401	87751401			87701402	87751402
-1/+0.6	87602401	87652401	87702401	87752401	87602402	87652402	87702402	87752402
-1/+1.5	87603401	87653401	87703401	87753401	87603402	87653402	87703402	87753402
-1/+3	87604401	87654401	87704401	87754401	87604402	87654402	87704402	87754402
-1/+5	87605401	87655401	87705401	87755401	87605402	87655402	87705402	87755402
-1/+9	87606401	87656401	87706401	87756401	87606402	87656402	87706402	87756402
-1/+15	87607401	87657401	87707401	87757401	87607402	87657402	87707402	87757402
Price €								
0/0.6			87709401	87759401			87709402	87759402
0/1			87710401	87760401			87710402	87760402
0/1.6	87611401	87661401	87711401	87761401	87611402	87661402	87711402	87761402
0/2.5	87612401	87662401	87712401	87762401	87612402	87662402	87712402	87762402
0/4	87613401	87663401	87713401	87763401	87613402	87663402	87713402	87763402
0/6	87614401	87664401	87714401	87764401	87614402	87664402	87714402	87764402
0/10	87615401	87665401	87715401	87765401	87615402	87665402	87715402	87765402
0/16	87616401	87666401	87716401	87766401	87616402	87666402	87716402	87766402
0/25	87617401	87667401	87717401	87767401	87617402	87667402	87717402	87767402
0/40	87618401	87668401	87718401	87768401	87618402	87668402	87718402	87768402
Price €								
0/60	87619401	87669401	87719401	87769401	87619402	87669402	87719402	87769402
0/100	87620401	87670401	87720401	87770401	87620402	87670402	87720402	87770402
0/160	87621401	87671401	87721401	87771401	87621402	87671402	87721402	87771402
0/250	87622401	87672401	87722401	87772401	87622402	87672402	87722402	87772402
0/400	87623401	87673401	87723401	87773401	87623402	87673402	87723402	87773402
							I	
Price €								
0/600	87624401	87674401	87724401	87774401	87624402	87674402	87724402	87774402
0/1000	87625401	87675401	87725401	87775401	87625402	87675402	87725402	87775402

Blue part no. = in-stock items



Please specify required switching function (normally closed/normally open). See page 117 for other versions.



Extra charges for electrical contacts

DG: M, PG: 3

Design			Magne	etic spring o	ontact	Inductive contact				
Code			MK 1	MK 2	MK 3	IK 1	IK 2	IK 3		
Number of contacts			1	2	3	1	2	3		
Switching function: 1 = closes, 2 (pointer moves clockwise)	1 2	11 , 12 21 , 22	As spec- ified	1 2	11 , 12 21 , 22	As spec- ified				
The extra charges indicated i gauge not included										
Version	Nominal size	Housing	Price €	Price €	Price €	Price €	Price €	Price €		
Bourdon tube pressure gauges for industrial applications type D4 (only without filling)	100	No filling								
Pressure gauges for chemical applications type D4/D8	160	No filling								
Safety pressure gauges type D4/D8	100	With filling								
Stainless steel diaphragm pres- sure gauges type D4/D8 Diaphragm pressure gauges for	160	With filling								
differential pressure type MFW	100	NI - £111:								
	100	No filling								
Standard diaphragm pressure gauges type D4/D8	160	No filling								
gauges type D4/D6	100	With filling								
	160	With filling								
S	100	No filling								
Diaphragm pressure gauges for chemical applications type	160	No filling								
D4/D8	100	With filling								
	160	With filling								

DG: M, PG: 4

Blue part no. = in-stock items

Extra charges for special versions	NG 100	NG 160	
	1 contact (EK 1)		
Electronic contact with 3-wire slot initiator (extra over and above magnetic spring contact)	2 contacts (EK 2)		
(oxtra ever and above magnetic opining contact)	3 contacts (EK 3)		
Separate circuits for double magnetic spring contacts			
Separate circuits for triple magnetic spring contacts			
Oakla NIVI IIV (manus them disease) manus tur	Up to 4 wires		
Cable NYLHY (more than 1 metre) per metre	5 wires / 7 wires		
Junction box	for gauges without filling		
Additional cable for junction box, 1 m long			
Single changeover contact (extra charge over and above si	ingle magnetic spring contact)		
Double changeover contact (extra charge over and above tact) *	double magnetic spring con-		
Contact pine mode of apocial material (pay contact)	Gold-silver		
Contact pins made of special material (per contact)	Platinum-iridium		
Inductive contact, safety version	Type IK SN		
(per contact) (can only be used in conjunction with isolating switching amplifier KHA6-SH-Ex!)	Type IK S1N (NG 100 only 1 contact possible)		

 $^{^{\}star}$ Also available for nominal size 63, enquire for price.

Blue part no. = in-stock items



Versions with 4 electrical contacts on request.



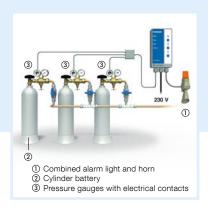


- Logistics made easy: Just in time information on empty gas cylinders
- With visual/audible alarms, Test and Acknowledge buttons
- Relay output for event reporting system EMS









For monitoring the pressure in gas-filled containers (e.g. pressure control panels, cylinder batteries or bundle stations).

Function The alarm signal is generated by a pressure gauge with an electrical contact. The alarm threshold can be set to any value from 5 to 95 % of the range by means of the contact arm of the pressure gauge.

> A green LED indicates normal operation. In case of a power outage, the device does not generate an alarm signal; when power becomes available again, the unit immediately resumes operation. If, in the meantime, the gas pressure has fallen below the set limit, an alarm signal is generated. In the case of an alarm, the red LED lights up; in addition, the system generates an audible alarm. The audible alarm can be acknowledged. The red LED remains lit.

> Proper operation of the system can be checked at all times by means of the Test button. If this button is pressed, the system must generate an alarm, i.e. the red LED must light up and the audible alarm

Description The system consists of one or several pressure gauges with electrical contacts (connected in series), a control unit (alarm unit for low gas level) and, if required, an additional alarm unit.

> The pressure gauge is equipped with a magnetic spring contact which is actuated by the pointer of the pressure gauge. The ranges of the pressure gauges can be selected as required. If several gas containers are to be monitored, several pressure gauges with electrical contacts can be connected in series and monitored by a single alarm unit for low gas level. It is also possible to connect a separate alarm unit for each measuring point.

An EMS event reporting system can be connected to the relay output of the alarm unit for low gas level for remote monitoring.

specifications Ambient: -20/+50 °C

Technical Operating temperature range

Supply voltage

AC 230 V ±10 %

Power input

5 VA

Circuit to pressure gauge

Intrinsically safe, maximum values:

Ui = 16.8 V

li = 57 mA

P = 240 mW

c = 180 NF for IIC

675 NF for IIB

Li = 1 MH for IIC

8 MH for IIB

Switching output

Relay contact: 1 voltage-free changeover contact Contact rating: Max. 250 V, 2 A, (resistive load)

Response delay

None

Intrinsic safety

[Ex ia] IIC / Ex ia IIB

Housing

Wall mounting housing made of impact-resistant plastic (ABS) W x H x D: 100 x 188 x 65 mm

Degree of protection

IP 30 (EN 60529)

c	2	_	
	Ī		
	-		

ee the catalogue DOMESTIC TECHNOLOGY for additional WATCHDOG LINE alarm units for the detection of level, liquids, leaks, gases or smoke.



Blue part no. = in-stock items



Contact protection relays/isolating switching amplifiers for electrical contacts





Contact protection relay MSR/MSR-I

Application Controlling the electromechanical contacts with pulse-shaped voltage avoids unwanted switching. This protects the contacts and prolongs their service life due to a dropout delay. Specially recommended for liquid-filled measuring instruments.

Technical specifications

Supply voltage

AC 230 V, 50-60 Hz Power input approx. 6 VA

Control voltage

MSR DC 35-40 V pulses

Relay output

1 x voltage-free changeover contact Switch rating max. 250 V/8 A

Supply voltage

DC 24 V, max. 20 mA for external devices or LED indicators

Housing

Polyamide 6.6, DIN rail mounting 35 x 7.5 as per EN 60715 W x H x D: 50 x 75 x 100 mm

Degree of protection

IP 20 (as per EN 60529)

Operating temperature range

0/70 °C

Isolating switching amplifier KFA/KHA

This isolation is suitable for intrinsically safe applications. The device transmits binary signals from SN/S1N proximity sensors and approved mechanical contacts from the hazardous area/Ex area to safe areas.

Supply voltage

AC 207-253 V, 45-65 Hz

Open circuit voltage/short circuit current

Standard version approx DC 8 V/8 mA Safety version approx DC 8.4 V/11.7 mA

Relay output (not intrinsically safe)

1 x voltage-free changeover contact Standard version AC 250 V/2 A (DC 40 V)/2 A Safety version AC 250 V (DC 24 V)/1 A

Type of protection

Ex II(1)G [Ex ia Ga] IIC Ex II(1)D [Ex ia Da] IIIC PTB 00 ATEX 2081

Housing

Makrolon, DIN rail mounting 35 x 7.5 mm as per EN 60715

Degree of protection

IP 20 as per IEC 529

Operating temperature range

-20/+60 °C

Up to SIL 2 as per IEC 61508/IEC 61511



Please enquire for complete data sheets for the individual versions.

DG: H, PG: 4	Part no.	Price €
MSR 010, 1 contact	38201	
MSR 020, 2 contacts	38202	
MSR 011, interval	38203	

Blue part no. = in-stock items

DG: H, PG: 4	Part no.	Price €
KFA6-SR2-Ex1.W	38215	
KFA6-SR2-Ex2.W	38216	
KHA 6-SH-Ex 1	38217	

Blue part no. = in-stock items



Stainless steel diaphragm pressure gauges

EN 837-3





- Robust and compact design
- Various process connections possible
- Flush mounted versions without transmission liquid
- Welded, so no seals required in wetted area
- GOSSTANDART-certified
- ATEX version (optional)



Application For corrosive gaseous and liquid media, also for use in corrosive environments. With open connection flange also suitable for viscous and polluted media; with hygienic connections specially suitable for pharmaceutical processes.

> ! For measuring gas or vapour, these gauges must be used in accordance with the table "Selection Criteria as per EN 837-2" (see appendix)!

Technical Type specifications D4

Nominal size

100 - 160

Accuracy class (EN 837-3/6)

Ranges (EN 837-3/5)

0/100 mbar to 0/25 bar

Application area

Static load: full scale value Dynamic load: 0.9 x full scale value

Overpressure safety

Overpressure safety 5 FSD, however, max. 60 bar

Operating temperature range

 $T_{max} = +100 \, ^{\circ}C$ Medium: Ambient: = -20 °C

 $T_{max} = +60 \, ^{\circ}C$

Temperature performance

Indication error when the temperature of the measuring system deviates from the normal temperature of 20 °C: rising temperature approx. ±0.8 %/10 K

falling temperature approx. ±0.8 %/10 K of full scale value

Degree of protection

IP 65 (EN 60529)

with housing vent (≤ 25 bar): IP 54

Standard version

Connection

Stainless steel 316, bottom

G½B - spanner size SW 22 with channel hole 10 mm

Lower measuring flange

Stainless steel 316Ti/316L

Upper measuring flange

Stainless steel 316 L

Measuring element

100 mbar to 2.5 bar stainless steel 316 Ti/316 L 4 bar to 25 bar Duratherm

Movement

Stainless steel

Dial

Aluminium, white Dial marking black

Pointer

Aluminium, black

Housing

Stainless steel 304 with blow-out

Bayonet type bezel

Stainless steel 304

Window

Laminated safety glass

- **Options** Glycerine filling (≥ 4 bar)
 - Wetted parts with special coating
 - Clamp connection
 - Varivent or BioControl connection
 - ATEX version (Ex)

- Flush mounted connection flanges as per EN
- Open connection flanges as per EN/ANSI
- Other connection threads
- Electrical contacts (≥ 0/0.6 bar)



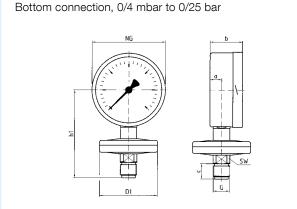


Stainless steel diaphragm pressure gauges

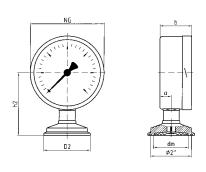
Type D 4 - NG 100/160

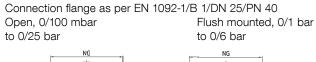
Housing types and dimensions

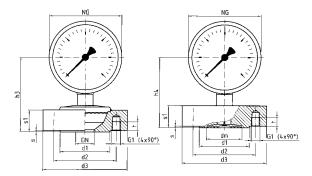
Bottom connection, 0/100 mbar to 0/2.5 bar



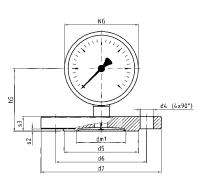
Clamp connection 2" as per ISO 2852, 0/1 bar to 0/6 bar



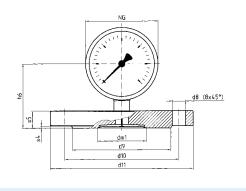




Flush mounted connection flange as per EN 1092-1/B 1 DN 50/PN 40, 0/100 mbar to 0/25 bar



Flush mounted connection flange as per EN 1092-1/B 1 DN 80/PN 40, 0/40 mbar to 0/25 bar



Nominal size (NG)	а	b	С	d1	d ₂	dз	d4	d ₅	d6	d7	d8	d9	d10	d11	dm	dm ₁	D	D1	D2	DN
100	15.6	49	20	68	85	115	4xØ18	102	125	165	8xØ18	138	160	200	48	68	69	78	64	25
160	17.5	50	20	68	85	115	4xØ18	102	125	165	8xØ18	138	160	200	48	68	69	78	64	25
		,																		
Nominal size (NG)	G	G1	h	h ₁	h2	hз	h4	h ₅	h6	S	S 1	S 2	S 3	S 4	S 5	SW				
100	G½B	4xM12	117	117	86	102	96	86	90	2	30	3	20	3	24	22				
160	G½B	4xM12	148	148	117	133	127	117	121	2	30	3	20	3	24	22				



Stainless steel diaphragm pressure gauges

EN 837-3

DG: H, PG: 3

Туре	PF100E, D402	PF160E, D402	PF100CP, D402	PF160CP, D402	PF100FLO, D402	PF160FLO, D402	PF100FL, D402	PF160FL, D402
Version								
Housing Ø	100	160	100	160	100	160	100	160
Housing				Stainless	steel 304			
Measuring element	316 Ti/ ≥ 4 bar D	,	Stainless s	steel 316 L	(4 bar ar	steel 316 L, nd higher herm)	L (4 bar ar	el 316 Ti/316 -, nd higher herm)
Flanges				Stainless stee	el 316 Ti/316 L			
Accuracy class	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Connection	G½B	G½B	Clamp 2" ISO 2852	Clamp 2" ISO 2852	per EN	etion flange as 1092-1/ 25/PN 40	flange EN 10	ed connection as per 092-1/ 50/PN 40
Range (mbar)	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €								
0/100	85886402	85926402			88906402	88926402	88946402	88966402
0/160	85887402	85927402			88907402	88927402	88947402	88967402
0/250	85888402	85928402			88908402	88928402	88948402	88968402
0/400	85889402	85929402			88909402	88929402	88949402	88969402
Range (bar)								
Price €								
0/0.6	85890402	85930402			88910402	88930402	88950402	88970402
0/1	85891402	85931402	88980402	88990402	88911402	88931402	88951402	88971402
0/1.6	85892402	85932402	88981402	88991402	88912402	88932402	88952402	88972402
0/2.5	85893402	85933402	88982402	88992402	88913402	88933402	88953402	88973402
Price €								
0/4	85894402	85934402	88983402	88993402	88914402	88934402	88954402	88974402
0/6	85895402	85944402	88984402	88994402	88915402	88935402	88955402	88975402
0/10	85896402	85936402			88916402	88936402	88956402	88976402
0/16	85897402	85937402			88917402	88937402	88957402	88977402
0/25	85898402	85938402			88918402	88938402	88958402	88978402

Blue part no. = in-stock items



See page 126 for extra charges.



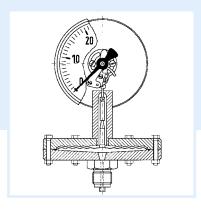
Stainless steel diaphragm pressure gauges high overload protection EN 837-3





- Overpressure safety 10 bar
- Smallest ranges
- Robust and compact design
- Welded, so no seals required in wetted area
- ATEX version (optional)





Application For corrosive gaseous and liquid media, also for use in corrosive environments.

! For measuring gas or vapour, these gauges must be used in accordance with the table "Selection Criteria as per EN 837-2" (see appendix)!

Technical Type specifications D4

Nominal size

100 - 160

Accuracy class (EN 837-3/6)

Ranges (EN 837-3/5)

0/10 mbar to 0/60 mbar

Application area

Static load: full scale value Dynamic load: 0.9 x full scale value

Overpressure safety

10 bar

Operating temperature range

Medium:

Ambient:

Temperature performance

Indication error when the temperature of the measuring system deviates from the normal temperature of 20 °C:

rising temperature approx. ±0.8 %/10 K falling temperature approx. ±0.8 %/10 K of full scale value

Degree of protection

IP 54 (EN 60529)

Standard version

Connection

Stainless steel 316, bottom G½B – spanner size SW 22 with channel hole 10 mm

Lower measuring flange

Stainless steel 316 L

Upper measuring flange

Stainless steel 316 L

Measuring element

Diaphragm

Stainless steel 316 Ti/316 L

Movement

Stainless steel

Dial

Aluminium, white Dial marking black

Pointer

Aluminium, black

Housing

Stainless steel 304 with blow-out

Bayonet type bezel

Stainless steel 304

Window

Laminated safety glass

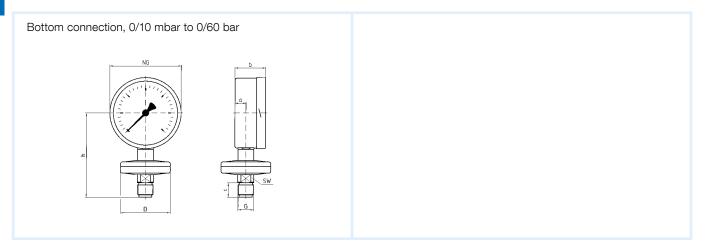
- Options ATEX version (Ex)
 - Other connection threads
 - Special scales
 - Version with lower overpressure safety ("not suitable for high overload")







Housing types and dimensions



Nominal size (NO	i) a	b	С	D	G	h	SW							
100	15.6	49	20	130	G½B	125	22							
160	17.5	50	20	130	G1/2B	156	22							

Stainless steel diaphragm pressure gauges – high overload protection EN 837-3



DG: H, PG: 3

Туре	PF100E-H, D402	PF160E-H, D402
Version		
Housing Ø	100	160
Housing	Stainless	steel 304
Measuring element	Stainless ste	el 316Ti/316L
Flanges	Stainless s	steel 316 L
Accuracy class	1.6	1.6
Connection	G½B	G½B
Range (mbar)	Part no.	Part no.
Price €		
0/10	86912402	86917402
0/16	86913402	86918402
0/25	86914402	86919402
0/40	86915402	86920402
0/60	86916402	86921402

Enquire for price for version with lower overpressure safety ("not suitable for high overload")

Blue part no. = in-stock items

Extra charges

DG: H

Process connection		Price €
Connection G1/4B (channel hole Ø 6 mm)		
Connection 1/4 NPT (channel hole Ø 6 mm)		
Connection ½ NPT (channel hole Ø 10 mm)		
Connection M 20 x 1.5 (channel hole Ø 10 mm)		
Other connection threads		On request



Extra charges for stainless steel diaphragm pressure gauges

DG: H

Process connection			Price €
Groove/tongue as per EN 1092-1			
Connection G1/4B			
Connection 1/4 NPT			
Connection ½ NPT			
Connection M 20 x 1.5			
Other connection threads			On request
Channel hole Ø 10 mm with connection G½B			Standard
VARIVENT®/VARINLINE®	Type N (D=68 mm)	PN 25	On request
Neumo BioControl	D65 and D80	PN 25	On request
Flush mounted connection flange as per EN 1092-1/B1 (extra charge over and above connection G½B)	Nominal diameter	Nominal pressure	Price €
	DN 25 (0/1 bar to 0/6 bar)	PN 40	
	DN 50	PN 40	
	DN 80	PN 40	
Other connection flanges			On request
Special coating for diaphragm and lower flange (only for flush mounting connection flange)	Nominal diameter	Nominal pressure	Price €
PTFE coating	DN 25	PN 40	
PTFE coating	DN 50	PN 40	
PTFE coating	DN 80	PN 40	
PFA coating	DN 25	PN 40	
PFA coating	DN 50	PN 40	
PFA coating	DN 80	PN 40	
Other materials			On request
Glycerine filling			Price €
Nominal size 100			
Nominal size 160			
Other			Price €
Vacuum proof (≥ 0/4 bar)			Standard
Electrical contacts (≥ 0/0.6 bar)			See page 117.

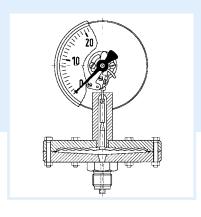


Diaphragm pressure gauges for chemical applications



- For low pressure ranges
- High overload protection
- High resistance
- Optional flange connections





Application For corrosive gaseous and liquid media, also for use in corrosive environments. With open connection flange also suitable for viscous and polluted media.

> ! For measuring gas or vapour, these gauges must be used in accordance with the table "Selection Criteria as per EN 837-2" (see appendix)!

Technical Type specifications D4

Nominal size

100 - 160

Accuracy class (EN 837-3/6)

1.6

Ranges (EN 837-3/5)

0/10 to 0/250 mbar (flange Ø 160) 0/0.4 to 0/25 bar (flange Ø 100)

Application area

Static load: full scale value Dynamic load: 0.9 x full scale value

Overpressure safety

High overload: Up to 5 x FSD, max. 40 bar / max. 2,5 bar with measuring flange \emptyset 160 mm

Operating temperature range

Medium: $T_{max} = +100 \, ^{\circ}C$ Ambient: = -20 °C

$T_{max} = +60 \, ^{\circ}C$

Temperature performance Indication error when the temperature of the measuring system deviates from the normal temperature of 20 °C:

rising temperature approx. ±0.8 %/10 K falling temperature approx. ±0.8 %/10 K of full scale value

Degree of protection

IP 54 (EN 60529)

Standard version

Connection

Stainless steel 316 Ti/316 L, bottom G½B - spanner size SW 22 (EN 837-3/7.3)

Lower measuring flange

Stainless steel 316Ti/316L

Upper measuring flange

Stainless steel 304

Measuring element

Diaphragm Measuring flange Ø 100: Duratherm

Measuring flange Ø 160: stainless steel 316 Ti/316 L

Seal

FPM (Viton)

Options

- Safety housing
- Overpressure safety 10 x FSD (measuring flange Ø 100 to max. 40 bar, measuring flange Ø 160 to max. 2.5 bar)
- Electrical contacts

Movement

Stainless steel

Dial

Aluminium, white Dial marking black

Pointer

Aluminium, black

Housing

Stainless steel 304 with blow-out

Bayonet type bezel

Stainless steel 304

Window

Laminated safety glass

- Glycerine filling (≥ 40 mbar, ≤ 250 mbar accuracy class 2.5)
- Wetted parts with special coating
- Open connection flanges as per EN/ASME



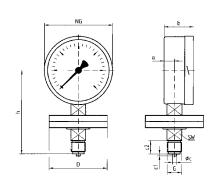
See page 131

for prices.

Diaphragm pressure gauges for chemical applications Type D 4 - NG 100/160

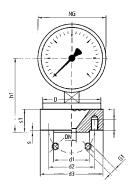
Housing types and dimensions

Bottom connection, measuring flange \emptyset 100

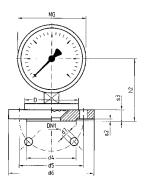


Bottom connection, measuring flange Ø 160

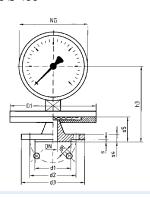
Connection flange as per EN 1092-1, DN 25 Measuring flange \varnothing 100



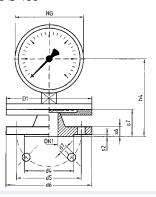
Connection flange as per EN 1092-1, DN 50 Measuring flange \varnothing 100



Connection flange as per EN 1092-1, DN 25 Measuring flange Ø 160 $\,$



Connection flange as per EN 1092-1, DN 50 Measuring flange \varnothing 160



Nominal size (NG)	а	b	Øc	C1	C 2	d1	d2	dз	d4	d5	d6	d7	d8	D	D ₁	DN	DN ₁	G	G1	h	h ₁
100	20	55	6	3	20	68	85	115	102	125	165	4x18	4x14	100	160	25	50	G½B	4xM12	127	111
160	20	55	6	3	20	68	85	115	102	125	165	4x18	4x14	100	160	25	50	G1/2B	4xM12	156	141
Nominal size (NG)	h2	hз	h4	S	S1	S 2	S 3	S 4	S 5	S6	S 7	t	SW								
100	101	129	137	2	30	3	20	18	48	20	56	12	22								
160	131	159	167	2	30	3	20	18	48	20	56	12	22								

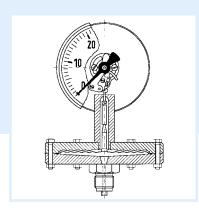
Standard diaphragm pressure gauges

EN 837-3



- For low pressure ranges
- High overpressure safety
- Robust design
- Optional flange connections





Application For non-corrosive gaseous and liquid media. With open connection flange also suitable for viscous and polluted media.

> ! For measuring gas or vapour, these gauges must be used in accordance with the table "Selection Criteria as per EN 837-2" (see appendix)!

Technical Type specifications D4

Nominal size

100 - 160

Accuracy class (EN 837-3/6)

Ranges (EN 837-3/5)

0/10 to 0/250 mbar (flange Ø 160) 0/0.4 to 0/25 bar (flange Ø 100)

Application area

Static load: full scale value Dynamic load: 0.9 x full scale value

Overpressure safety

1.3 x full scale value ≥ 0.6 bar overpressure safety 5 x FSD, however, 40 bar max.

Operating temperature range

 $T_{max} = +100 \, ^{\circ}C$ Medium: $T_{min} = -20 \, ^{\circ}C$ Ambient: T_{max} = +60 °C

Temperature performance

Indication error when the temperature of the measuring system deviates from the normal temperature of 20 °C:

rising temperature approx. ±0.8 %/10 K falling temperature approx. ±0.8 %/10 K of full scale value

Degree of protection

IP 54 (EN 60529)

Standard version

Connection

Steel, bottom G½B - spanner size SW 22 (EN 837-3/7.3)

Lower measuring flange

Steel

Upper measuring flange

Stainless steel 304

Measuring element

Diaphragm, measuring flange Ø 100: up to 1.6 bar Duratherm, \geq 2.5 bar steel, galvanised. Measuring flange Ø 160: stainless steel 316 Ti/316 L

NBR (Perbunan)

Movement

Brass

Dial

Aluminium, white Dial marking black

Pointer

Aluminium, black

Housing

Stainless steel 304 with blow-out

Bayonet type bezel

Stainless steel 304

Window

Instrument glass

- Options Safety housing
 - Overpressure safety 10 x FSD (measuring flange Ø 100 to max. 40 bar, measuring flange Ø 160 to max. 2.5 bar)
 - Electrical contacts



 $(\ge 40 \text{ mbar}, \le 250 \text{ mbar accuracy class } 2.5)$

- Wetted parts with special coating
- Open connection flanges as per EN/ASME



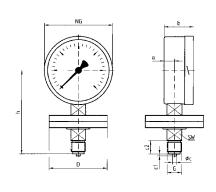


Standard diaphragm pressure gauges

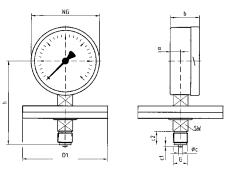
Type D 4 - NG 100/160

Housing types and dimensions

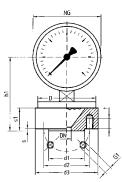
Bottom connection, measuring flange \emptyset 100



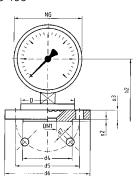
Bottom connection, measuring flange \varnothing 160



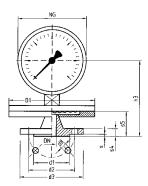
Connection flange as per EN 1092-1, DN 25 Measuring flange \varnothing 100



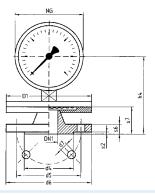
Connection flange as per EN 1092-1, DN 50 Measuring flange \varnothing 100



Connection flange as per EN 1092-1, DN 25 Measuring flange Ø 160 $\,$



Connection flange as per EN 1092-1, DN 50 Measuring flange \varnothing 160



Nominal size (NG)	а	b	Øc	C1	C2	d1	d2	dз	d4	d 5	d6	d7	d8	D	D1	DN	DN ₁	G	G1	h	h1
100	20	55	6	3	20	68	85	115	102	125	165	4x18	4x14	100	160	25	50	G1½B	4xM12	127	111
160	20	55	6	3	20	68	85	115	102	125	165	4x18	4x14	100	160	25	50	G½B	4xM12	156	141
Nominal size (NG)	h2	hз	h4	s	S1	S2	S 3	S 4	S 5	S 6	S7	t	SW								
100	101	129	137	2	30	3	20	18	48	20	56	12	22								
160	131	159	167	2	30	3	20	18	48	20	56	12	22								

Standard diaphragm pressure gauges

Diaphragm pressure gauges for chemical applications

DG: H, PG: 3					appli	Cation	13	
Da. 11, Fa. 5			With glyce	erine filling			With glyce	erine filling
Туре	PF100, D401	PF160, D401	PF100Gly, D801	PF160Gly, D801	PF100Ch, D402	PF160Ch, D402	PF100ChGly, D802	PF160ChGly, D802
Version								
Housing Ø	100	160	100	160	100	160	100	160
Housing			Sta	ainless steel 30)4 with bayone	t bezel		
Measuring element				Diaphragm,	see data shee	t.		
Lower flange		S	teel			Stainless st	eel 316Ti/316L	
Accuracy class	1.6	1.6	1.6*	1.6*	1.6	1.6	1.6*	1.6*
Connection	G½B	G½B	G½B	G½B	G½B	G½B	G½B	G½B
Range (mbar)	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €								
0/10	85901401	85951401			85901402	85951402		
0/16	85902401	85952401			85902402	85952402		
0/25	85903401	85953401			85903402	85953402		
0/40	85904401	85954401	85904801	85954801	85904402	85954402	85904802	85954802
Price €								
0/60	85905401	85955401	85905801	85955801	85905402	85955402	85905802	85955802
0/100	85906401	85956401	85906801	85956801	85906402	85956402	85906802	85956802
0/160	85907401	85957401	85907801	85957801	85907402	85957402	85907802	85957802
0/250	85908401	85958401	85908801	85958801	85908402	85958402	85908802	85958802
Range (bar)	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €								
0/0.4	85909401	85959401	85909801	85959801	85909402	85959402	85909802	85959802
0/0.6	85910401	85960401	85910801	85960801	85910402	85960402	85910802	85960802
0/1	85911401	85961401	85911801	85961801	85911402	85961402	85911802	85961802
0/1.6	85912401	85962401	85912801	85962801	85912402	85962402	85912802	85962802
0/2.5	85913401	85963401	85913801	85963801	85913402	85963402	85913802	85963802
0/4	85914401	85964401	85914801	85964801	85914402	85964402	85914802	85964802
0/6	85915401	85965401	85915801	85965801	85915402	85965402	85915802	85965802
0/10	85916401	85966401	85916801	85966801	85916402	85966402	85916802	85966802
0/16	85917401	85967401	85917801	85967801	85917402	85967402	85917802	85967802
0/25	85918401	85968401	85918801	85968801	85918402	85968402	85918802	85968802
	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·						

Blue part no. = in-stock items



 * ≤ 250 mbar cl. 2.5, see page 132 for extra charges.



Extra charges for standard diaphragm pressure gauges / diaphragm pressure gauges for chemical applications

DG: H, PG: 3

Open connection flanges			to 250 mbar lange Ø 160	Ranges 0.4 to 25 mbar Measuring flange Ø 100			
	Material	Steel	Stainless steel	Steel	Stainless steel		
Version	Nominal diameter	Price €	Price €	Price €	Price €		
EN 1092-1, PN 40	DN 15						
	DN 20						
	DN 25						
	DN 50						
ASME B 16.5 CL 150	DN ½"						
	DN 1"						
	DN 2"						

Special connection	Material steel	Material stainless steel 316 Ti or 316 L
	Price €	Price €
Channel hole Ø 10 mm		
Groove/tongue as per EN 1092-1		
RJT groove ANSI B16.5		
Special materials for diaphragms	Ranges 10 to 250 mbar Measuring flange Ø 160	Ranges 0.4 to 25 mbar Measuring flange Ø 100
Material	Price €	Price €
PTFE film (≥ 40 mbar)		
Silver foil (≥ 160 mbar)	On request	On request
Tantalum foil (≥ 160 mbar)		
Other materials	On re	quest

max. 40 bar, measuring flange Ø 160 to max. 2.5 bar)		Price €			Price €	
Overpressure safety 10 x FSD (measuring flange Ø 100 to		nges 10 to 250 m asuring flange Ø			nges 0.4 to 25 m asuring flange Ø	
Other materials			On re	quest		
PTFE lining						
Material	Price €	Price €	Price €	Price €	Price €	Price €
Connection	G½B	Flange, EN 1092-1, DN 15–25 flange ANSI ½", 1"	Flange, EN 1092-1, DN 50 flange ANSI 2"	G½B	Flange, EN 1092-1 ,DN 15–25 flange ANSI ½", 1"	Flange, EN 1092-1 ,DN 50 flange ANSI 2"
Special materials for lower measuring flange (wetted part) for types D402 and D802		nges 10 to 250 m asuring flange Ø			nges 0.4 to 25 m asuring flange Ø	

Blue part no. = in-stock items



See page 117 for extra chargesfor electrical contacts.



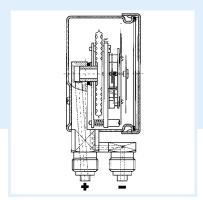
Standard capsule pressure gauges for differential pressure

Differential pressure



- Measurement of extremely small differential pressures
- Robust design
- Static pressures up to 400 mbar
- Direct indication of the differential pressure
- Many customised versions available





Application For differential pressure measurement of non-corrosive, gaseous, dry media. Especially suitable for filter loss measurement in air conditioning and ventilation applications.

> ! For measuring gas or vapour, these gauges must be used in accordance with the table "Selection Criteria as per EN 837-2" (see appendix)!

Technical Type specifications D9/D4

Nominal size

63 - 100 - 160

Function

The "plus" pressure (= high pressure) is applied to the inside of the diaphragm. The "minus" pressure (= low pressure) is applied to the inside of the pressure-tight housing. The pressure difference causes the diaphragm to change its shape, thus generating the movement required to measure the pressure. This displacement is picked up by the movement. The differential pressure is directly indicated by a pointer.

Accuracy class (EN 837-3/6)

 $1.6 (\leq 10 \text{ mbar: } 2.5)$

Ranges (EN 837-3/5)

NG 63 0/16 to 0/400 mbar NG 100 0/6 to 0/400 mbar NG 160 0/4 to 0/400 mbar

Standard version Connection (wetted part)

NG 63:

2 x G1/4B – spanner size SW 14 centre back (brass) NG 100&160:

2 x G½B – spanner size SW 22 bottom (stainless steel)

2 x G½B - spanner size SW 22 centre back (brass) (EN 837-3/7.3)

Measuring element (wetted part)

Capsule element, CuBe alloy

Movement (wetted part)

Brass

Seal (wetted part)

NBR (Perbunan)

See page 137 for prices.

Options

- Back flange
- 3-hole fixing, panel mounting bezel
- Hose connections

Application area

Static load: full scale value Dynamic load: 0.9 x full scale value

Overpressure safety

Full scale value

Maximum static pressure

400 mbar

Operating temperature range

Medium: $I_{max} = +60 \, ^{\circ}\text{C}$ Ambient: -20 °C $T_{min} =$ = +60 °C

Temperature performance

Indication error when the temperature of the measuring system deviates from the normal temperature of 20 °C:

rising temperature approx. ±0.6 %/10 K falling temperature approx. ±0.6 %/10 K of full scale value

Degree of protection

IP 66 (EN 60529)

Dial (wetted part)

Aluminium, white, dial marking black

Pointer (wetted)

Aluminium, black

Housing (wetted part)

Stainless steel 304

Bayonet type bezel/crimped bezel

Stainless steel 304

Window (wetted part)

Plastic (PMMA)

Mounting

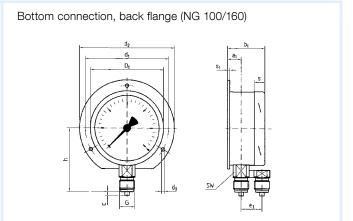
Wall mounting by means of back flange or 3-hole fixing, panel mounting bezel (each as option). Direct mounting to rigid measuring line possible.

- Special scales
- Other process connections

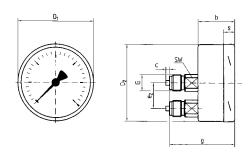
Standard capsule pressure gauges for differential pressure Type D 9 - NG 63/type D 4 - NG 100/160

Housing types and dimensions

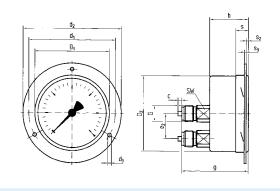
Bottom connection (NG 100/160)



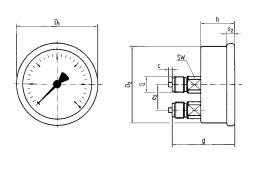
Centre back connection (NG 100/160)



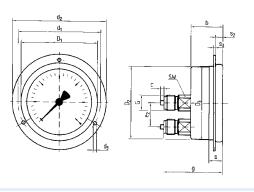
Centre back connection, 3-hole fixing, panel mounting bezel (NG 100/160)



Centre back connection (NG 63)



Centre back connection, 3-hole fixing, panel mounting bezel (NG 63)



	Nominal size (NG)	а	a1	b	b1	С	d1*	d2	d 3*	D1	D2	Dз	e 1	e 2	g	G	h	S	S ₁	S ₂	S ₃	SW
ſ	63	-	-	30.5	-	2	75	85	3.6	68	62	64.3	-	20	53	G¼B	-	14	-	6	2	14
	100	16	18	49	51	3	116	133	4.5	101	99	-	32	34.5	79	G½B	86	20	5	2.5	3	22
ſ	160	16	19	49	52	3	178	196	4.5	161	159	-	32	34.5	79	G½B	118	20	6	4.5	2	22

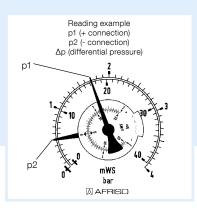
^{*} Dimensions as per DIN 16063/16064.

Standard Bourdon tube pressure gauges for differential pressure



- Indication of plus pressure, minus pressure and differential pressure
- Excellent price/performance ratio
- Two independent Bourdon tube systems
- Housing and wetted parts also available in stainless steel (option)





Application For differential pressure measurement of gaseous and liquid media which are not highly viscous, do not crystallize and do not attack copper alloys. Specially suitable for heating systems (supply and return pipes). ! For measuring gas or vapour, these gauges must be used in accordance with the table "Selection Criteria as per EN 837-2" (see appendix)!

Technical Type specifications D2

Nominal size

100

Function

The pressures are measured in two independent Bourdon tube systems ("plus" pressure = high pressure, "minus" pressure = low pressure). The pressure is indicated by means of a dial and a pointer. The differential pressure scale covers 50 % of the range of the "plus" pressure and 50 % of the range of the "minus" pressure. The black pointer ("plus" connection) and the red pointer ("minus" connection) at the differential pressure gauge scale allow you to read the pressures in both systems on the fixed scale.

Accuracy class (EN 837-1/6)

Ranges (EN 837-1/5)

0/0.6 to 0/60 bar

Application area

The maximum pressure in the system must not exceed the full scale value. For good readability, the differential pressure to be measured should not be less than approx. 20 % of the full scale value.

Operating temperature range

Medium: $T_{max} = +60 \, ^{\circ}C$ Ambient: $T_{min} =$

Temperature performance

Indication error when the temperature of the measuring system deviates from the normal temperature of 20 °C:

rising temperature approx. ±0.4 %/10 K falling temperature approx. $\pm 0.4~\%/10~K$ of full scale value

Degree of protection

IP 32 (EN 60529)

Standard version Connection

Brass, bottom; parallel in line 2 x G1/2B - spanner size SW 22 (EN 837-1/7.3)

Measuring element

Bourdon tube, "C" type tube, copper alloy

Movement

Brass

Dial

Aluminium, white

Dial marking black (bar/mWC)

Pointer/dial

Aluminium

Housing

Sheet steel, black

Push on bezel

Sheet steel, black

Window

Instrument glass

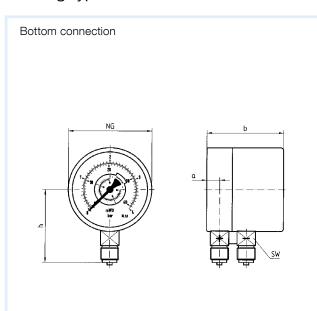
- Options Wetted parts stainless steel
 - Housing and push on bezel stainless steel
 - Push on bezel sheet steel, black
 - Nominal size 160 (type D1, housing plastic)
 - Back flange (with stainless steel housing only)
- 3-hole fixing, panel mounting bezel
- Damping screw
- Special scales
- Other process connections

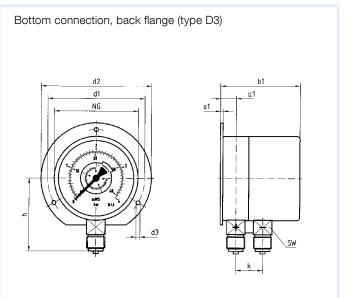




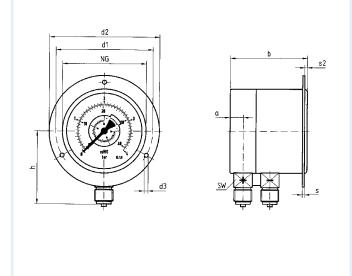
Standard Bourdon tube pressure gauges for differential pressure type D 2 - NG 100

Housing types and dimensions





Bottom connection, 3-hole fixing, panel mounting bezel



Nominal size (NG)	а	a1	b	b1	Øc	C1	C 2	d1*	d2*	d 3*	G	h	k	S	S1	S 2	SW
100	15.6	19.1	84	87.5	6	3	20	116	132	4.8	G½B	86	32	2	5.5	3	22

^{*} Dimensions as per DIN 16064.

Standard capsule/Bourdon tube pressure gauges for differential pressure

DG: M, PG: 2

Туре	KP63Dif, D 911	KP100Dif, D 401	KP100Dif, D 411	KP160Dif, D 401	KP160Dif, D 411	RF100Dif, D 201	RF100Dif, D 301	RF160Dif, D 101
Version	4 <u>+</u>	<u>+</u> +	1	<u>+</u> +=	d+ dI	ŢĦŢ	<u>+</u> H <u>-</u>	++-
Housing Ø	63	100	100	160	160	100	100	160
Housing		Stainless	steel 304, plas	stic window		Sheet steel	Stainless steel	Plastic
Measuring element		Capsul	e element, Cu	Be alloy		Bourdo	on tube, copp	er alloy
Accuracy class	1.6	1.6*	1.6*	1.6*	1.6*	1.6	1.6	1.6
Connection	G¼B	G½B	G½B	G½B	G½B	G½B	G½B	G½B
						Dual s	cale bar/mWC	, black
Range	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €								
0/4 mbar				35612401	35612411			
0/6 mbar		35563401	35563411	35613401	35613411			
0/10 mbar		35564401	35564411	35614401	35614411			
0/16 mbar	35515911	35565401	35565411	35615401	35615411			
0/25 mbar	35516911	35566401	35566411	35616401	35616411			
0/40 mbar	35517911	35567401	35567411	35617401	35617411			
0/60 mbar	35518911	35568401	35568411	35618401	35618411			
0/100 mbar	35519911	35569401	35569411	35619401	35619411			
0/160 mbar	35520911	35570401	35570411	35620401	35620411			
0/250 mbar	35521911	35571401	35571411	35621401	35621411			
0/400 mbar	35522911	35572401	35572411	35622401	35622411			
Price €								
0/0.6 bar						85609201	85609301	
0/1 bar						85610201	85610301	85660101
0/1.6 bar						85611201	85611301	85661101
0/2.5 bar						85612201	85612301	85662101
0/4 bar						85613201	85613301	85663101
0/6 bar						85614201	85614301	85664101
0/10 bar						85615201	85615301	85665101
0/16 bar						85616201	85616301	85666101
0/25 bar						85617201	85617301	85667101
0/40 bar						85618201	85618301	85668101
Price €								
0/60 bar						85619201	85619301	85669101
0/100 bar								85670101
0/160 bar								85671101
0/250 bar								85672101
0/400 bar								85673101
Extra charges (PG: 3)						Price €	Price €	Price €
Wetted parts stainless steel								On request

^{* ≤ 10} mbar = accuracy class 2.5

Blue part no. = in-stock items



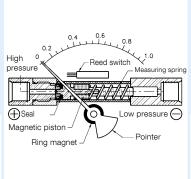
See page 154 for extra charges for mounting accessories.



Magnetic piston pressure gauge for differential pressure - high overload protection



- Extremely compact and robust stainless steel measuring system
- Max. static pressure PN 100, 250, 400
- Leak-proof due to mechanical separation of pressure chamber and display
- Various types of connections
- Easy retrofitting of electrical contacts without intervention in the measuring system



Application For differential pressure measurements at very high static pressures. For gaseous and liquid, non-adhesive media that are not highly viscous. Particularly suitable for monitoring filters, pumps, pipe systems and cooling circuits.

Description The pressures act on two pressure chambers separated by a magnetic piston. If there are different pressures in the chambers, the magnetic piston is axially displaced against a compression spring. The magnetic piston transmits this displacement to the pointer by means of a ring magnet mounted to the pointer hub. The differential pressure is directly indicated. The complete mechanical separation of pressure chamber and display excludes the possibility of leaks.

Technical Type specifications MAG 80/100 Dif D312

Nominal size

80-100 mm

Accuracy

±3 % of full scale value (at increasing differential pressure)

Ranges (EN 837-3/5)

0/0.25 bar to 0/10 bar

Standard version Connection (wetted part)

Stainless steel 316, on left and right sides, opposite each other 2 x G1/4 female thread spanner size SW 17 (EN 837-3/7.3)

Connection cover

Plastic, glass-fibre reinforced, black

Measuring element (wetted part)

Compression spring Stainless steel 301

Magnetic piston (wetted part)

Stainless steel 316/strontium ferrite

Seal (wetted part)

NBR (Perbunan)

Dial

Aluminium, white Dial marking black/red (bar/psi) Scale angle 90°

Pointer

Aluminium, black

Housing

Stainless steel 304 with rubber sealing ring at the front

Maximum static pressure

100 bar

Overpressure safety

Up to the maximum static pressure at both sides

Operating temperature range

Medium: $T_{max} = 80 \, ^{\circ}C$ Ambient: $T_{min} =$ 0°C $T_{max} = 80 \, ^{\circ}C$

Degree of protection

IP 65 (EN 60529)

Window

Instrument glass

Mounting

Wall mounting via mounting plate (option) or pipe mounting by means of mounting plate and fixing clamp (option) for 2" pipe

Options

- Mounting plate with fixing clamp
- 3-hole fixing, panel mounting bezel
- Max. static pressure PN 250/400
- Other connection threads
- Other connection designs
- Window acrylic glass
- Electrical contacts (Reed contacts)
- Filter in "plus" connection
- Glycerine filling
- Max. pointer
- Special scales



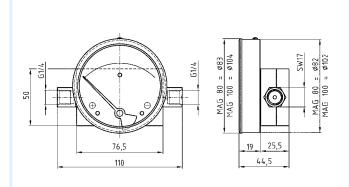


Magnetic piston pressure gauge for differential pressure – high overload protection

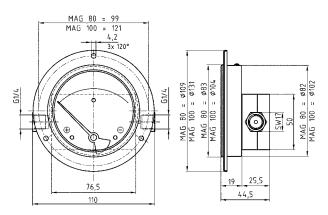
Type D 3 NG 80/100

Types and dimensions (mm)

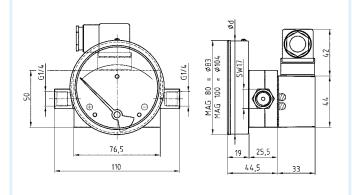
Connection on right and left sides



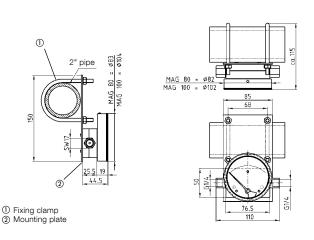
Connection on right and left sides 3-hole fixing, panel mounting bezel



Connection on right and left sides With electrical contact



Mounting plate and fixing clamp



Technical specifications electrical contact

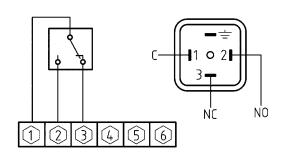
Version: Reed contact, single, changeover contact (SPDT)

Max. switching voltage: AC/DC 30 V
Max. switch rating: AC 3 VA -- DC 3 W
Max. current: AC/DC 300 mA
Switching hysteresis: approx. 5 %

Adjustment range: 20–80 % of full scale value

Electrical connection: ISO 4400 connector (DIN 43650-A)

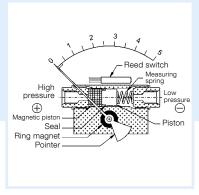
Wiring diagram



Magnetic piston pressure gauge with display at both sides - high overload protection



- 2 displays for site condition independence
- Extremely compact and robust stainless steel measuring system
- IP 65 degree of protection for pressure gauge and switching contact
- Leak-proof due to mechanical separation of pressure chamber and display



Application For differential pressure measurements at very high static pressures. For gaseous and liquid, non-adhesive media that are not highly viscous. Particularly suitable for monitoring filter elements in process technology applications. Displays on both sides for site condition independence.

Description The pressures act on two pressure chambers separated by a magnetic piston. If there are different pressures in the chambers, the magnetic piston is axially displaced against a compression spring. The magnetic piston transmits this displacement to the pointers by means of a ring magnet mounted to the pointer hub. The differential pressure is directly indicated on both sides. The complete mechanical separation of pressure chamber and display excludes the possibility of leaks.

Technical Type specifications

MAG 63/80/100 Dif D301

Nominal size

63-100 mm

Accuracy

±5 % of full scale value (at increasing differential pressure)

Ranges (EN 837-3/5) 0/0.25 bar to 0/70 bar

Maximum static pressure

350 bar

Overpressure safety

Up to the maximum static pressure at both sides

Operating temperature range

Medium: $T_{max} = +80 \, ^{\circ}C$ $T_{min} = 0 °C$ Ambient: $T_{max} = +80 \, ^{\circ}C$

Degree of protection

IP 65 (EN 60529)

Standard version

Connection (wetted part)

2 x G1/4 female thread, parallel, bottom, distance 54 mm

Connection block

Aluminium

Measuring element (wetted part)

Compression spring stainless steel 301

Magnetic piston (wetted part)

Aluminium, stainless steel 301, strontium ferrite and sealing materials

Seal (wetted part)

FKM (Viton)

Dial

Aluminium, white Dial marking black (bar) Scale angle 90°

Pointer

Aluminium, black

Housing

Stainless steel 304 with rubber sealing ring at the front

Window

Instrument glass

- **Options** Other connection threads
 - Connection on left and right sides
 - Window acrylic glass
 - Electrical contacts (Reed contacts)
 - Filter in "plus" connection

- Glycerine filling
- Max. pointer
- Special scales
- Connection block brass, stainless steel

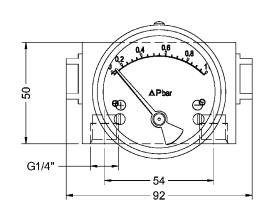




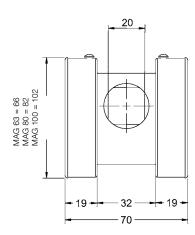
Magnetic piston pressure gauge for differential pressure – high overload protection Type D 3 NG 63/80/100

Types and dimensions (mm)

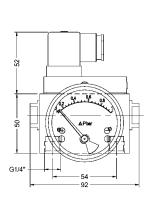
Connection on right and left sides

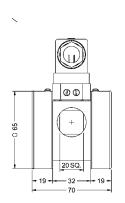


Connection on left and right sides

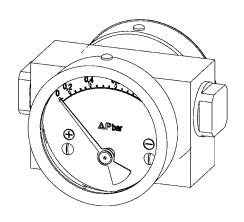


Connection on right and left sides With electrical contact





3D view



Technical specifications electrical contact

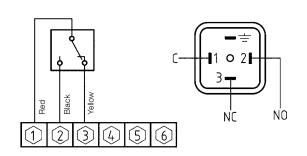
Version:

Reed contact, single, changeover contact (SPDT) AC/DC 30 V

AC 3 VA-DC 3 W

Max. switching voltage: Max. switch rating: Max. current: Switching hysteresis: Adjustment range: Electrical connection:

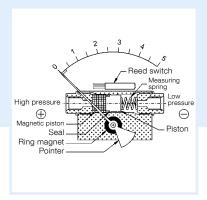
AC/DC 300 mA approx. 5 % 35–100 % of full scale value ISO 4400 connector (DIN 43650-A) Wiring diagram



Magnetic piston pressure gauge for differential pressure - industrial version - high overload protection



- Extremely compact and robust measuring system, can also be used for critical media
- Maximum static pressure PN 400
- High ranges up to 0/70 bar
- Leak-proof due to mechanical separation of pressure chamber and display
- Massive connection block for various mounting positions



Application For differential pressure measurements at very high static pressures. For gaseous and liquid, non-adhesive media that are not highly viscous. Particularly suitable for monitoring filter elements in process technology and pumping applications. Can also be used for corrosive media.

Description The pressures act on two pressure chambers separated by a magnetic piston. If there are different pressures in the chambers, the magnetic piston is axially displaced against a compression spring. The magnetic piston transmits this displacement to the pointers by means of a ring magnet mounted to the pointer hub. The differential pressure is directly indicated. The complete mechanical separation of pressure chamber and display excludes the possibility of leaks.

Technical Type specifications MAG 80 I/100 I Dif

Nominal size

80-100 mm

Accuracy

±2 % of full scale value (at increasing differential pressure)

Ranges (EN 837-3/5)

0/0.25 bar to 0/70 bar

Maximum static pressure

200 bar (aluminium, brass) 400 bar (stainless steel, Monel)

Overpressure safety

Up to the maximum static pressure

Operating temperature range

Medium: 80°C 0°C Ambient: = 80 °C

Degree of protection

IP 65 (EN 60529)

Standard version Connection block (wetted part)

Aluminium, sides, opposite each other 2 x G1/4 female thread (EN 837-3/7.3)

Measuring element (wetted part)

Compression spring stainless steel 301

Magnetic piston (wetted part)

Stainless steel 316/strontium ferrite

Seal (wetted part)

NBR

Dial

Aluminium, white Dial marking black (bar) Scale angle 90°

- **Options** Other connection threads
 - Window acrylic glass
 - Electrical contacts (Reed contacts)
 - Connection block brass, stainless steel, Monel
 - Mounting plate for wall mounting
 - Mounting plate and fixing clamp for pipe mounting (2")

Pointer

Aluminium, black

Housing

Stainless steel 304 with rubber sealing ring at the front

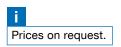
Window

Instrument glass

Mounting

Wall mounting via mounting plate (option) or pipe mounting by means of mounting plate and fixing clamp (option) for 2" pipe

- Filter in "plus" connection
- Glycerine filling
- Max. pointer
- Special scales
- 3-hole fixing, panel mounting bezel
- Other connection designs
- Other seal materials

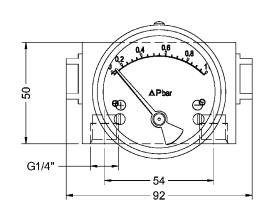




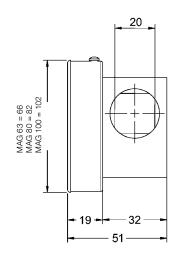
Magnetic piston pressure gauge for differential pressure – industrial version – high overload protection

Type D 3 NG 80/100
Types and dimensions (mm)

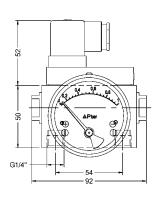
Connection on right and left sides

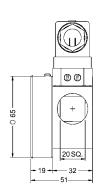


Connection on left and right sides

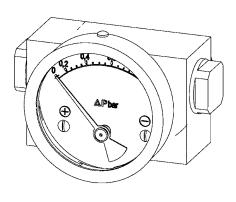


Connection on right and left side, with electrical contact





3D view



Technical specifications electrical contact

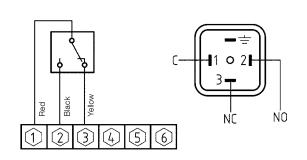
Version:

Max. switching voltage: Max. switch rating: Max. current: Switching hysteresis: Adjustment range: Electrical connection: Reed contact, single, changeover contact (SPDT)

AC/DC 30 V AC 3 VA-DC 3 W AC/DC 300 mA approx. 5 %

35–100 % of full scale value ISO 4400 connector (DIN 43650-A)

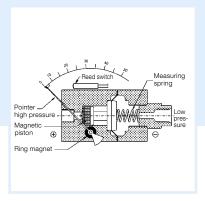
Wiring diagram



Magnetic piston diaphragm pressure gauges for medium differential pressure - high overload protection



- Separating diaphragm between + and -
- Extremely compact and robust stainless steel measuring system
- Maximum static pressure PN 100
- IP 65 degree of protection for pressure gauge and switching contact
- Leak-proof due to mechanical separation of pressure chamber and display



Application For differential pressure measurements at very high static pressures. For gaseous and liquid, non-adhesive media that are not highly viscous. Particularly suitable for monitoring and checking backflow prevention systems.

Description The pressures act on two pressure chambers separated by a magnetic piston and an additional diaphragm. If there are different pressures in the chambers, the magnetic piston is axially displaced against a compression spring. The magnetic piston transmits this displacement to the pointers by means of a ring magnet mounted to the pointer hub. The differential pressure is directly indicated. The complete mechanical separation of pressure chamber and display excludes the possibility of leaks.

Technical Type specifications

MAG 80 M/100 M Dif

Nominal size

80-100 mm

Accuracy

±2 % of full scale value (at increasing differential pressure)

Ranges (EN 837-3/5)

0/0.075 bar to 4 bar

Maximum static pressure

100 bar

Overpressure safety

Up to the maximum static pressure

Operating temperature range

Medium: 0°C Ambient: $T_{min} =$ 80 °C

Degree of protection

IP 65 (EN 60529)

Standard version

Connection block (wetted part)

Aluminium, sides, opposite each other 2 x 1/4 NPT female thread (EN 837-3/7.3)

Measuring element (wetted part)

Compression spring stainless steel 301

Magnetic piston (wetted part)

Stainless steel 316/strontium ferrite

Seal (wetted part)

NBR

Aluminium, white Dial marking black (bar) Scale angle 90°

- Options Other connection threads
 - Window acrylic glass
 - Electrical contacts (Reed contacts)
 - Connection block brass, stainless steel
 - Mounting plate for wall mounting
 - Mounting plate and fixing clamp for pipe mounting (2")
 - Filter in "plus" connection

Pointer

Aluminium, black

Housing

Stainless steel 304 with rubber sealing ring at the front

Window

Instrument glass

Mounting

Wall mounting via mounting plate (option) or pipe mounting by means of mounting plate and fixing clamp (option) for 2" pipe

- Glycerine filling
- Max. pointer
- Special scales
- 3-hole fixing, panel mounting bezel
- Other connection designs
- Other seal materials

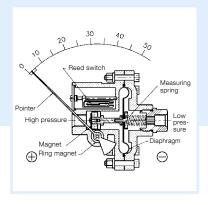




Magnetic diaphragm pressure gauges for very low differential pressure



- Differential pressure ranges starting at 0/2.5 mbar
- Switching contacts can be retrofitted
- IP 65 degree of protection for pressure gauge and switching contact
- Side or back connection
- Delivery includes adapter for hose connection and brackets for control panel mounting



Application For differential pressure measurement at very low differential pressure. Specially for gaseous media. Particularly suitable for monitoring filters and fans in air supply, air conditioning and clean room applications.

Description The pressures act on two pressure chambers separated by a diaphragm. If there are different pressures in the chambers, the diaphragm is axially displaced against a compression spring by a magnet. This displacement is transmitted to the pointer by means of a ring magnet mounted to the pointer hub. The differential pressure is directly indicated.

Technical Type specifications

MAG 115 Dif D311

Nominal size

115 mm

Accuracy

±3 % of full scale value (at increasing differential pressure)

Ranges (EN 837-3/5)

0/2.5 mbar to 0/100 mbar

Maximum static pressure

2.4 bar

Overpressure safety

Up to 2.4 bar at both sides

Operating temperature range

Medium: $T_{min} = 0 °C$ Ambient: $T_{max} = +60 \, ^{\circ}C$

Degree of protection

IP 65 (EN 60529)

Standard version

Connection (wetted part)

Plastic, glass-fibre reinforced, choice of left and right sides, opposing or back (use enclosed blind plugs) 2 x 1/8 NPT female thread or 2 x hose connection 5 mm (use enclosed adapters)

Measuring element (wetted part)

Diaphragm: NBR (Perbunan) Compression spring: Stainless steel 301 Transmission unit: Stainless steel 316

Magnet (wetted part)

Strontium ferrite

Seal (wetted part)

NBR (Perbunan)

Dial

Aluminium, white Dial marking black Scale angle 90° (first graduation after zero at 15 % of full scale value)

Pointer

Aluminium, black

Housing

Stainless steel 304 with rubber sealing ring at the front

Window

Instrument glass

Mounting

Panel mounting by means of mounting clips (standard), wall mounting by means of mounting plate (option) or pipe mounting by means of mounting plate and fixing clamp (option) for 2" pipe

- Options Mounting plate with fixing clamp
 - Window acrylic glass
 - Electrical contacts (Reed contacts)
 - Special scales

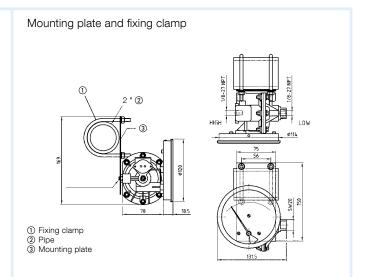


Types and dimensions (mm)

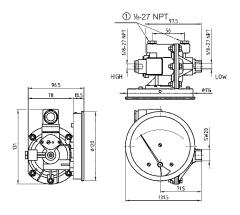
Connection on right and left sides or on rear

1 1/8-27 NPT

1 1/8-27 N



Connection on right and left sides or on rear, with electrical contact



① Plug

Technical specifications electrical contact

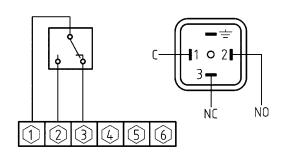
Version: Reed contact, single, changeover contact (SPDT)

Max. switching voltage: AC/DC 30 V
Max. switch rating: AC 3 VA – DC 3 W
Max. current: AC/DC 300 mA
Switching hysteresis: AC/DC 300 wA
Approx. 5 %

Adjustment range: 20–80 % of full scale value

Electrical connection: ISO 4400 connector (DIN 43650-A)

Wiring diagram



Magnetic piston pressure gauges/magnetic diaphragm pressure gauges for differential pressure

DG: M, PG: 3

Туре	MAG 80 Dif, D 312	MAG 100 Dif, D 312	MAG 80 Dif, RK1.W, D 312	MAG 100 Dif, RK1.W, D 312	MAG 115 Dif, D 311	MAG 115 Dif, RK1.W, D 311		
Version								
Housing Ø	80	100	80	100	115	115		
Housing		Stainles	s steel 304 with rub	ber sealing ring at t	he front			
Measuring element			See dat	ta sheet				
Accuracy		±3 % of f	ull scale value (at in	creasing differential	pressure)			
Connection		2 x G1/4 fen	nale thread		2 x 1/8 NPT fo	emale thread		
Max. static pressure		100	bar		2.4	bar		
Contact type			Reed, single, changeover contact*	Reed, single, changeover contact*		Reed, single, changeover contact*		
Electrical connection			Connector and junction box as per ISO 4400 (DIN 43650-A)	Connector and junction box as per ISO 4400 (DIN 43650-A)		Connector and junction box as per ISO 4400 (DIN 43650-A)		
Range	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.		
Price €								
0/2.5 mbar					88002311	88013311		
0/4 mbar					88003311	88014311		
0/6 mbar					88004311	88015311		
0/10 mbar					88005311	88016311		
0/16 mbar					88006311	88017311		
0/25 mbar					88007311	88018311		
0/40 mbar					88008311	88019311		
0/60 mbar					88009311	88020311		
0/100 mbar					88010311	88021311		
0/160 mbar								
Price €								
0/0.25 bar	88002312	88013312	88022312	88033312				
0/0.4 bar	88003312	88014312	88023312	88034312				
0/0.6 bar	88004312	88015312	88024312	88035312				
0/1 bar	88005312	88016312	88025312	88036312				
0/1.6 bar	88006312	88017312	88026312	88037312				
0/2.5 bar	88007312	88018312	88027312	88038312				
0/4 bar	88008312	88019312	88028312	88039312				
0/6 bar	88009312	88020312	88029312	88040312				
0/10 bar			88030312	88041312				

^{*} Please specify required switching point!

Blue part no. = in-stock items



Please enquire for prices for magnetic piston pressure gauges.



Extra charges for magnetic piston pressure gauges/ Magnetic diaphragm pressure gauges

DG: M

Туре	MAG 80 Dif, D 312	MAG 100 Dif, D 312	MAG 115 Dif, D 311
Version			
	Price €	Price €	Price €
Maximum static pressure PN 250			
Maximum static pressure PN 400			
Centre back connection (electrical contacts not possible)			
Bottom connection			
Connection 1/4 NPT female thread			
Connection G1/4B male thread (adapter)			
Connection G½B male thread (adapter)			
Connection ½ NPT male thread (adapter)			
Piston seal FKM (Viton)			
3-hole fixing, panel mounting bezel (can only be factory-fitted)			
Window acrylic glass			
Window Instrument glass, hardened			
Glycerine filling			
Plus connection right (pointer moves from right to left)			
Max. pointer			
Red reference pointer, adjustable			
Filter in plus connection			
Double Reed contact, changeover contact RK2.W (extra charge relates to basic device with single Reed contact, changeover contact RK1.W!)			
Red / green colour strip			
Customer logo			

Blue part no. = in-stock items

Accessories

DG: M

Туре		MAG 80 Dif, D 312	MAG 100 Dif, D 312	MAG 115 Dif, D 311
	PG	Price € Part no.	Price € Part no.	Price € Part no.
Aluminium mounting plate and fixing clamp for wall mounting or 2" pipe mounting	3	38001	38001	38304
Plastic mounting plate for wall mounting	1	38305	38305	

Blue part no. = in-stock items

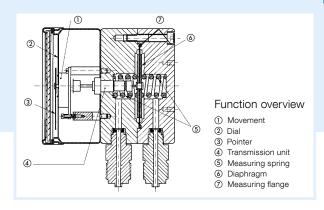


Standard spring-diaphragm pressure gauges for differential pressure - overload protected



- Direct indication of the differential pressure
- High overload protection
- Zero correction
- With integrated pressure damping





Application For differential pressure measurement at low differential pressure and high static pressure. For non-corrosive gaseous and liquid media which are not highly viscous. Particularly suitable for monitoring filters, pumps and pipe systems.

Technical Type specifications

MF 100 Dif D401

Nominal size

100

Function

The pressures act on two pressure chambers separated by an elastic diaphragm. If there are different pressures in the chambers, the diaphragm is axially displaced against a compression spring. This is transmitted to the movement by means of a rod. The differential pressure is directly indicated by a pointer. The diaphragm is held by a metallic support which results in an overpressure safety of up to 25 bar at both sides.

Accuracy class (EN 837-3/6)

Ranges (EN 837-3/5)

0/250 mbar to 0/6 bar

Maximum static pressure

25 bar

Overpressure safety

Up to 25 bar at both sides

Operating temperature range

Medium: +60 °C Ambient: -20 °C +60 °C

Temperature performance

Indication error when the temperature of the measuring system deviates from the normal temperature of 20 °C:

rising temperature approx. ±0.5 %/10 K falling temperature approx. ±0.5 %/10 K of full scale value

Degree of protection

IP 54 (EN 60529)

Standard version Connection

Brass nickel-plated, bottom; parallel in line 2 x G1/2B - spanner size SW 22 (EN 837-3/7.3) with locked damping screw, inside diameter 0.5 mm

Measuring element

Compression spring Stainless steel 301

Diaphragm

FKM (Viton)

Measuring flange

Aluminium eloxed

Movement

Brass

Aluminium, white Dial marking black

Pointer

Aluminium, black

Housing

Stainless steel 304

Bayonet type bezel

Stainless steel 304

Window

Laminated safety glass



Options

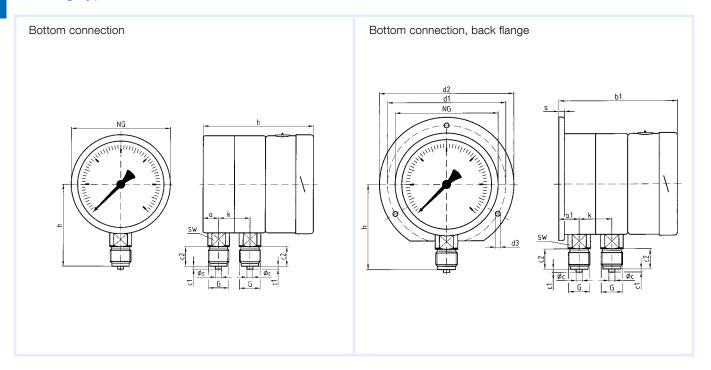
- Glycerine filling (type D 8)
- Back flange

- Special scales
- Other process connections



Standard spring-diaphragm pressure gauges for differential pressure type D 4 - NG 100

Housing types and dimensions



Nominal size (NG)	а	a1	b	b1	Øc	C1	C 2	dı*	d2	d 3*	G	h	k	S	SW
100	16	19.5	112.5	116	6	3	20	116	132	4.8	G½B	84	32	5.5	22

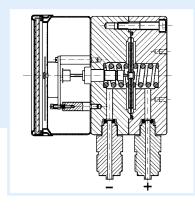
^{*} Dimensions as per DIN 16064.

Spring-diaphragm pressure gauges for chemical applications for differential pressure - overload protected



- Direct indication of the differential pressure
- High overload protection
- Compact design
- High resistance to chemicals
- Electrical contacts optional





Application For differential pressure measurement at low differential pressure and high static pressure. For corrosive gaseous and liquid media which are not highly viscous, also for use in corrosive environments. Particularly suitable for monitoring filters, pumps and pipe systems.

Technical Types specifications

MFW 100 Ch Dif D402 MF 100 Ch Dif D402

Nominal size

100

Function

The pressures act on two pressure chambers separated by an elastic diaphragm. If there are different pressures in the chambers, the diaphragm is axially displaced against a compression spring. This is transmitted to the movement by means of a rod. The differential pressure is directly indicated by a pointer. The diaphragm is held by a metallic support which results in an overpressure safety of up to 25 bar at both sides.

Accuracy class (EN 837-3/6)

2.5

Ranges (EN 837-3/5)

MF 100: 0/250 mbar to 0/6 bar

MFW 100: 0/250 mbar to 0/25 bar

Maximum static pressure

25 bar

Overpressure safety

Up to 25 bar at both sides

Operating temperature range

Medium: -20 °C Ambient: +60 °C

Temperature performance

Indication error when the temperature of the measuring system deviates from the normal temperature of 20 °C:

rising temperature approx. ±0.5 %/10 K falling temperature approx. ±0.5 %/10 K of full scale value

Degree of protection

IP 54 (EN 60529)

Standard version

Connection

Stainless steel 316 Ti/316 L, MF 100 = bottom parallel

in line/MFW 100 = parallel next to each other 2 x G1/2B - SW22 (EN 837-3/7.3) with locked damping screw, inside diameter 0,5 mm

Measuring element

Compression spring stainless steel 301

Diaphragm

FKM (Viton)

Measuring flange

Stainless steel 316Ti/316L

Movement

Stainless steel

Dial

Aluminium, white Dial marking black

Pointer

Aluminium, black

Housing

Stainless steel 304

Bayonet type bezel

Stainless steel 304

Window

Laminated safety glass

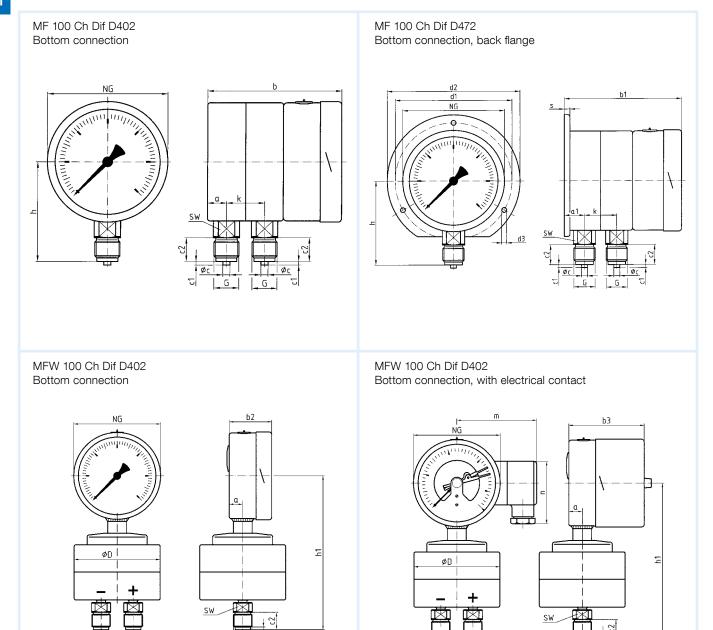


- **Options**
- Back flange (MF 100)
- Special scales

- Other process connections
- Electrical contacts (MFW 100)

Spring-diaphragm pressure gauges for chemical applications for differential pressure Type D 4 - NG 100

Housing types and dimensions



Nominal size (NG)	а	a1	b	b1	b ₂	bз	Øc	C1	C 2	d1*	d2	d 3*	ØD	G	h	h1	k	k1	m
100	16	19	84	87.5	49	87	6	3	20	116	132	4.8	99	G½B	86	177	32	37	92
Nominal size (NG)	n	s	S1	S 2	SW														
100	72	2	5.5	3	22														

^{*} Dimensions as per DIN 16064.

Spring diaphragm pressure gauges for differential pressure

DG: M, PG: 3

Туре	MF 100 Dif, D401	MF 100 Ch Dif, D402	MFW 100 Ch Dif, D402	MFW 100 Ch Dif, MK1 D402	MFW 100 Ch Dif, IK1 D402
Version	<u>[+]-[-</u>	<u></u> ‡H <u>-</u> J			
Housing Ø	100	100	100	100	100
Housing		Stainless steel	304, bayonet bezel sta	inless steel 304	
Measuring element			See data sheet		
Accuracy class	2.5	2.5	2.5	2.5	2.5
Connection	2 x G1/2B	2 x G1/2B	2 x G1/2B	2 x G1/2B	2 x G1/2B
Max. static pressure	25 bar	25 bar	25 bar	25 bar	25 bar
Range	Part no.	Part no.	Part no.	Part no.	Part no.
Price €					
0/40 mbar					
0/60 mbar					
0/100 mbar					
0/160 mbar					
0/250 mbar	88086401	88086402	88106402	88126402	88146402
0/400 mbar	88087401	88087402	88107402	88127402	88147402
0/600 mbar	88088401	88088402	88108402	88128402	88148402
			I		
Price €					
0/1 bar	88089401	88089402	88109402	88129402	88149402
0/1.6 bar	88090401	88090402	88110402	88130402	88150402
0/2.5 bar	88091401	88091402	88111402	88131402	88151402
0/4 bar	88092401	88092402	88112402	88132402	88152402
Price €					
0/6 bar	88093401	88093402	88113402	88133402	88153402
0/10 bar			88114402	88134402	88154402
0/16 bar			88115402	88135402	88155402
0/25 bar			88116402	88136402	88156402
Extra charges	Price €	Price €	Price €	Price €	Price €
Max. static pressure PN 100					
Glycerine filling					
Silicone oil filling					
Wall mounting	Back	flange		ece for instrument brac ge 160 for instrument b	
Pipe mounting (2")					

Blue part no. = in-stock items



Accessories for panel mounting and wall mounting

DG: M

Type	Housing diameter (mm)		50	62	90	100	160
Туре	Housing diameter (mm)		50 Price €	63 Price €	80 Price €	100 Price €	160 Price €
	Description	PG	Part no.	Part no.	Part no.	Part no.	Part no.
	3-hole fixing, panel mounting bezel Stainless steel 304, for retrofitting (with mounting aid) to RF 50, 63, 100 centre back D7/D9 (stainless steel housing with crimped bezel), flat version	3	38014*	38015**		38017*	
	3-hole fixing, panel mounting bezel Stainless steel 304, for retrofitting (front side) to RF 63 centre back or bottom D6/D7/D9 (plastic or stainless steel hous- ing with crimped bezel)	3		38019**			
	3-hole fixing, panel mounting bezel Plastic, black, for retrofitting to RF 63 back D611 (plastic housing with crimped bezel)	1		38003			
	3-hole fixing, panel mounting bezel (bayonet type) Stainless steel 304, for factory-fitting to RF 100, 160 D4/D8 KP 63, 100, 160 D4 (stainless steel housing with bayonet bezel)	3		38054*		38056*	38057*
	Clamp fixing Stainless steel 304, bare metal surface, with 2 screws M4 and knurled knob as mounting aid for retrofitting to RF 50, 63 D611 (plastic housing) RF 50, 80, 63 D711 (stainless steel housing)	3	38033	38034	38042		
	Back flange Plastic, black, for retrofitting to RF 63 bottom D601 (plastic housing with crimped bezel)	1		38018			
	Back flange Stainless steel 304, for factory-fitting to RF 63, 80, 100, 160 D3/D4/D7/D8/D9 KP 63, 80, 100, 160 D3/D4 (stainless steel housing)			38048**	38049**	38050**	38051**
0 0	Back flange Stainless steel 304, for retrofitting to RF 63, D7/D9 (stainless steel housing with crimped bezel)			38343**			

Blue part no. = in-stock items



^{*} Polished
** Vibratory-finished

Shut-off cocks and valves for pressure gauges



Shut-off cocks for pressure gauges

Application Shut-off element between pipe and pressure gauge. Stop cocks with test port allow you to connect both pressure gauges and testers to the pipe. Suitable for liquids, gases and vapour.

Technical Version specifications DIN 16261 to 16263

(or based on DIN)

Operating temperature range

Medium: -10/+50 °C

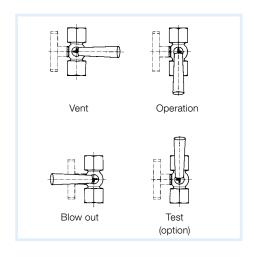
Connection and nominal pressure

See price list.

Housing and tap

Brass bare metal surface or stainless steel bare metal surface. The tap contains two holes which are arranged in the shape of a T. The function depends on the tap position:

- 1. Vent pressure gauge
- 2. Apply pressure to pressure gauge
- 3. Blow out measuring line
- 4. Apply pressure to tester





Shut-off valves for pressure gauges

Shut-off or reducing element between pipe and pressure gauge. Stop valves with test port allow you to connect both pressure gauges and testers to the measuring line. Suitable for liquids, gases and vapour.

Version

DIN 16270 without test port

DIN 16271 with test port, male M 20×1.5 DIN 16272 with test port which can

be closed separately, male, see 16271 Type A female/female x male connection Type B loose female coupling x male connection and shaft for instrument bracket

Operating temperature range

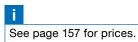
Brass -10/+120 °C Steel 1.0460 -10/+120 °C Stainless steel 316 Ti -20/+200 °C

Connection and nominal pressure

See price list.

Materials

Parts	Brass	Steel	Stainless steel
Housing	Brass	1.0460	316 Ti
Valve spindle	Brass	430 F	316 Ti
Valve cone	Brass	430 F	316 Ti
Packing	PTFE	PTFE	PTFE
Сар	Brass	Steel	Stainless steel
Union nut	Brass	Steel	Stainless steel
Female/female connection	Brass	Steel	Stainless steel
Loose female coupling	Brass	Steel	Stainless steel
Vent screw	316 Ti	316 Ti	316 Ti
Wheel	Plastic	Plastic	Plastic





Overpressure safety device, Pressure gauge push-button stop cock

Overpressure safety device

Application Adjustable overpressure safety device used to protect the system against peak pressures exceeding the range of the pressure gauge. At measuring points which are subject to great pressure variations, you can install different pressure gauges with different ranges in order to precisely measure even the lower pressures. The overpressure safety devices are adjusted according to the maximum permissible pressure ratings of the various pressure gauges installed.

Technical specifications

Function

When the set pressure is reached, a piston valve shuts off the port to the pressure gauge. After the pressure has dropped to a value of approx. 25 % below the closing pressure, the valve opens again.

Operating temperature range

Max. 80 °C

Overpressure safety

Brass: 600 bar Stainless steel: 1000 bar

Max. vacuum range up to -1 bar, no adjustment function

G½ female/female connection x male connection

Materials overpressure safety device

Parts	Brass	Stainless steel
Housing	Brass	316 Ti
Piston	316 Ti	316 Ti
Female/female connection	Steel	303
Diaphragm	FKM	FKM
O ring	FKM	FKM

Pressure gauge push-button stop cock

Application Shut-off element between measuring line and pressure gauge. Normally, the push-button stop cock is closed. In this state, there is no pressure applied to the pressure gauge. Push the button to apply pressure to the pressure gauge and to display the operating pressure. Suitable for gases as per DVGW G260 and SVGW.

Technical Test specifications

DVGW- and SVGW-tested, with EC Type Examination Certificate, product ID number CE-0085AQ0985

Operating temperature range

Medium: 0/70 °C -20/+60 °C Ambient:

Connection

2 x female thread Rp ½, EN 10226 Rp 1/4 EN 10226 1/2 NPT (without test) 1/4 NPT (without test)

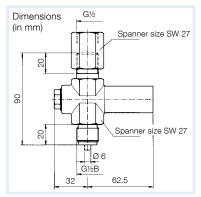
Nominal pressure

5 bar (MOP 5)

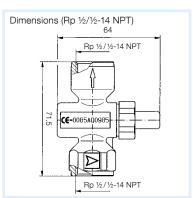
Housing

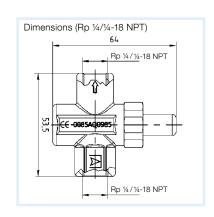
Brass, nickel-plated















DG: H

Pressure gauge shut-off cock female x female											
	Connection	Nominal pressure	Material	PG	Part no.	Price €					
	G1/4	PN 6	Brass	2	63001						
	G¾	PN 16	Brass	2	63002						
	G1/2	PN 16	Brass	2	63003						
With round test flange 40 x 5	G1/2	PN 16	Brass	2	63004						
With test flange 60 x 25 x 10	G1/2	PN 16	Brass	2	63005						
With sealing gland	G1/2	PN 16	Brass	2	63006						

Pressure gauge shut-off cock female x male											
	Connection	Nominal pressure	Material	PG	Part no.	Price €					
(G¼	PN 6	Brass	2	63011						
	G¾	PN 16	Brass	2	63012						
	G½	PN 16	Brass	2	63013						
With round test flange 40 x 5	G½	PN 16	Brass	2	63009						
With test flange 60 x 25 x 10	G½	PN 16	Brass	2	63010						

Pressure gauge shut-off cock female/female x male											
4==	Connection	Nominal pressure	Material	PG	Part no.	Price €					
	G1⁄4	PN 6	Brass	2	63014						
	G1/2	PN 16	Brass	2	63027						
	G1/2	PN 16	1.4571	3	63090						
With test flange 60 x 25 x 10	G1/2	PN 16	Brass	2	63028						
With test flange 60 x 25 x 10	G1/2	PN 16	1.4571	3	63091						
With male test connection M20 x 1.5	G1/2	PN 16	Brass	2	63015						
With male test connection M20 x 1.5	G1/2	PN 16	1.4571	3	63016						

Pressure gauge shut-off cock loose female x female										
	Connection	Nominal pressure	Material	PG	Part no.	Price €				
	G½	PN 16	Brass	2	63017					
With test flange 60 x 25 x 10	G½	PN 16	Brass	2	63018					

Pressure gauge shut-off cock loose female x male									
	Connection	Nominal pressure	Material	PG	Part no.	Price €			
	G½	PN 16	Brass	2	63107				
With test flange 60 x 25 x 10	G½	PN 16	Brass	2	63024				

Pressure gauge shut-off valve DIN 16270 Type A – female/female x male connection Type B – loose female coupling x male connection and shaft for instrument bracket										
Type A	Type B	Connection	Nominal	Material	PG	Type A	Price €	Type B	Price €	
	- Form		pressure			Part no.		Part no.		
	1000 to 1000 t	G1/4	PN 125	Brass	2	63094				
		G½	PN 250	Brass	2	63092		63046		
		G1⁄2	PN 400	Steel	3	63040		63047		
4		G1⁄2	PN 400	1.4571	3	63093		63048		
Test connection male	e M20 x 1.5	G½	PN 250	Brass	2	63041		63049		
DIN 16271		G½	PN 400	Steel	3	63042		63108		
		G½	PN 400	1.4571	3	63044		63109		
Extra charge oil-free	and grease-free*					63045	On request	63110	On request	
Extra charge DVGW-	tested						On request		On request	

*Only for brass and stainless steel.



DG: H

Pressure gauge dual stop valve DIN 16272 with male test connection M 20 x 1.5 Type A – female/female x male connection Type B – loose female coupling x male connection and shaft for instrument bracket											
Type A	Type B	Connection	Nominal	Material	PG	Type A	Price €	Type B	Price €		
rtin.	rth 🗓			pressure			Part no.		Part no.		
R - H - A	R A	G1/2	PN 250	Brass	2	63111		63115			
		G1/2	PN 400	Steel	3	63112		63116			
G½ PN 400 1.4571 3 63113 63117											
Extra charge o	il-free and greas	e-free (only for	brass and sta	inless steel)	-	63114	On request	63118	On request		

Pressure gauge push-butto	Pressure gauge push-button stop cock female x female – DVGW- and SVGW-tested/CE-0085AQ0985											
	Connection	Nominal pressure	Material	PG	Part no.	Price €						
	Rp ½, EN 10226	MOP 5	Brass, nickel-plated	2	63031							
	Rp ¼, EN 10226	MOP 5	Brass, nickel-plated	2	63191							
	1/4-18 NPT*	MOP 5	Brass, nickel-plated	2	63193							
	½-14 NPT*	MOP 5	Brass, nickel-plated	2	63235							

^{*} Without DVGW and SVGW approval.

Damping device (pressure surge protection) female x male – adjustable											
	Connection	Nominal pressure	Material	PG	Part no.	Price €					
	G½	PN 400	Brass	2	63074						
	G½	PN 400	Steel	3	63075						
	G½	PN 400	316 Ti	3	63076						

Overpressure safety device	Overpressure safety device G½ female/female connection x male – adjustable, vacuum-tight												
	Adjustment range in bar	Material	PG	Part no.	Price €	Material	PG	Part no.	Price €				
	0.4-2.5	Brass	2	63131		316 Ti	3	63139					
	2-6	Brass	2	63132		316 Ti	3	63140					
f \	5-25	Brass	2	63133		316 Ti	3	63141					
U	20-60	Brass	2	63134		316 Ti	3	63142					
	50-250	Brass	2	63135		316 Ti	3	63143					
	240-400	Brass	2	63136		316 Ti	3	63144					
Extra charge oil-free and grease-free			-	63137	On request		-	63145	On request				
Extra charge DVGW-tested			-	63138	On request		-	63146	On request				

			· ·										
Siphon DIN 16282 – outlet female/female connection G½													
		Type	Inlet	Material	Nominal pressure	PG	Part no.	Price €					
U shape	Φ	A*	G½B	Steel	PN 100	3	63147						
		В	Without thread, welded end 20 x 2.6 mm	Steel	PN 100	3	63148						
	Ψ	A*	G½B	316 Ti	PN 100	3	63149						
Circular shape	Ф	C*	G½B	Steel	PN 100	3	63150						
		D	Without thread, welded end 20 x 2.6 mm	Steel	PN 100	3	63151						
		C*	G½B	316 Ti	PN 100	3	63152						

^{*} Types A and C are no longer provided for in the new DIN edition.

Siphon – standa	Siphon – standard – inlet G½											
U shape	Circular shape	Type	Outlet	Material	Nominal pressure	PG	Part no.	Price €				
Ф	Ф	U	G½B	Steel	PN 25	3	63085					
		U	Female/female connection G1/2B	Steel	PN 25	3	63153					
		Circular	G½B	Steel	PN 25	3	63081					
	B	Circular	Female/female connection G1/2B	Steel	PN 25	3	63154					



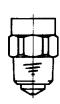
DG: H

	Female connection	Male connection	Material	PG	Part no.	Price €
	G¹/ ₈	G1⁄4	Brass	2	63050	
	G1/4	G1//s	Brass	2	63052	
	G1/4	G%	Brass	2	63053	
	G1/4	G½	Brass	2	63054	
	G¼	G½	316 Ti	3	63051	
	G ³ / ₈	G¼	Brass	2	63056	
	G ³ / ₈	G½	Brass	2	63057	
	G½	G1/4	Brass	2	63058	
	G1⁄2	G¾	Brass	2	63059	
	G½	G%	316 Ti	3	63062	
	G½	M 20 x 1.5	Brass	2	63155	
	M 20 x 1.5	G½	Brass	2	63156	
	G1/4	G1/4	Brass	2	63159	O roquo
	Female connection G1/4	Female connection G1/8	Material Brass	PG 2	Part no. 63158	Price € On reque
		G/4	Diass			
\/		01/		_		
	G½	G1/4	Brass	2	63160	On reque
		G1/4 G1/2	Brass Brass	_		On reque
	G½			2	63160	
	G½ G½	G1/2	Brass	2 2	63160 63161	
	G½ G½ Male connection	G½ Male connection	Brass Material	2 2 PG	63160 63161 Part no.	
	G½ G½ Male connection G½	G½ Male connection G½	Brass Material Brass	2 2 2 PG 2	63160 63161 Part no. 63164	
	G½ G½ Male connection G½ G½	G½ Male connection G½	Brass Material Brass	2 2 2 PG 2	63160 63161 Part no. 63164	
ion nipple – self-sealing	G½ G½ Male connection G½ G½	G½ Male connection G½ G½	Material Brass 316 Ti	2 2 2 PG 2 3	63160 63161 Part no. 63164 63165	On reque
tion nipple – self-sealing	G½ G½ Male connection G½ G½	G½ Male connection G½	Brass Material Brass	2 2 2 PG 2	63160 63161 Part no. 63164	



Female connection	Male connection	Material	PG	Part no.	Price €
G¹/ ₈	G¼	Brass	2	63067	
G¼	G%	Brass	2	63068	
G¼	G½	Brass	2	63069	
G3/8	G½	Brass	2	63065	

Mounting valve with self-sealing coating – automatically closes when the pressure gauge is replaced



Female connection	Male connection	Material	PG	Part no.	Price €
G1⁄4	G1⁄4	Brass	2	77907	
G1⁄4	G%	Brass	2	77908	
G3/ ₈	G%	Brass	2	77917	
G1⁄4	G½	Brass	2	77914	
G3/ ₀	G½	Brass	2	77918	

Blue part no. = in-stock items



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on nut + nipple DIN 16284						
	Female connection	Male connection	Material	PG	Part no.	Price €
	G1/4	6 mm	Brass	2	63072	
	G½	12 mm	Brass	2	63084	
	G1/2	12 mm	316 Ti	3	63070	
nale/female connection DI	IN 16283					
	Female connection	Female connection	Material	PG	Part no.	Price •
	G1/4 left	G¼	Brass	2	63101	
	G1/4 left	G¼	Steel	3	63102	
	G1/4 left	G¼	316 Ti	3	63103	
	G½ left	G1/2	Brass	2	63104	
	G½ left	G1/2	Steel	3	63105	
	G½ left	G1/2	316 Ti	3	63106	
rument bracket DIN 1628	t turne U					
rument bracket bin 1626	Female connection	Protrusion	Material	PG	Part no.	Price •
	26 mm	60 mm	Aluminium	3	63077	
	26 mm	100 mm	Aluminium	3	63078	
(/)	26 mm	100 mm	316 Ti	3	63080	
oter DIN 16281						
pter DIN 10201	Female connection	Male connection	Material	PG	Part no.	Price :
	G½	G½	Brass	2	63095	
	G½	G½	Steel	3	63097	
	G1/2	G½	316 Ti	3	63096	
ls	Type	For thread	Material	PG	Part no.	Price 4
	Profile seal for	G½				11106
	inner centering	M 12 x 1.5	Copper	2	39205	
	Profile seal for inner centering	G½ M 20 x 1.5	Copper	2	39206	
	Flat gasket DIN 16258	G1⁄4 M 12 x 1.5	Copper	2	39209	
+++	Flat gasket DIN 16258	G½ M 20 x 1.5	Copper	2	39210	
	Flat gasket DIN 16258	G½ M 20 x 1.5	316 Ti	3	39211	
٦	Flat gasket DIN 16258	G½ M 20 x 1.5	PTFE	1	39212	
tective caps	Nominal size*	Colour*	Matarial	PG	Dart no	Price
	Nominal size*	Blue	Material Rubber	1 1	Part no. 63029	Price 1
	63	Red	Rubber	1	63100	
records / II	UU	1 1 0 U	IUDDEI	1 1	00100	

63

100

Black

Black

Rubber

Rubber

1

1

63019

63030



 $^{^{\}ast}$ Other nominal sizes and colours on request.

CATALOGUE DOMESTIC TECHNOLOGY

Pressure gauges for building technology



Bourdon tube pressure gauges for heating/plumbing applications

- With self-sealing connection thread for fast mounting
- Special versions: pressure gauge for heating installations and hydrometers

Nominal sizes

50 - 63 - 80 - 100

Accuracy class 2.5



Page 297



Combined thermometer/ pressure gauges / thermo-hydrometers

- Pressure and temperature measurement with at a single measuring point
- With self-sealing connection thread for fast mounting.
- With mounting valve for easy replacement without downtime

Nominal sizes

63 – 80

Accuracy class



Page 337

Bourdon tube pressure gauges with capillary tube



- For burners, boilers, hot water tanks and refrigerating/air conditioning systems
- Corrosion-resistant, highly impact-resistant plastic housing
- With copper or plastic capillary
- Great variety of housing versions and connection types available

Nominal sizes 26, 37, 40 – 52 – 45 x 45

Accuracy class



Page 302

for pump test set For checking the pressure and suction capacity at oil burner pumps

With or without glycerine filling

Pressure gauges

Nominal size 50

Accuracy class



Page 90



CL 1.6

This and many other products can be found in the catalogues DOMESTIC TECHNOLOGY and PORTABLE MEASURING INSTRUMENTS.







2

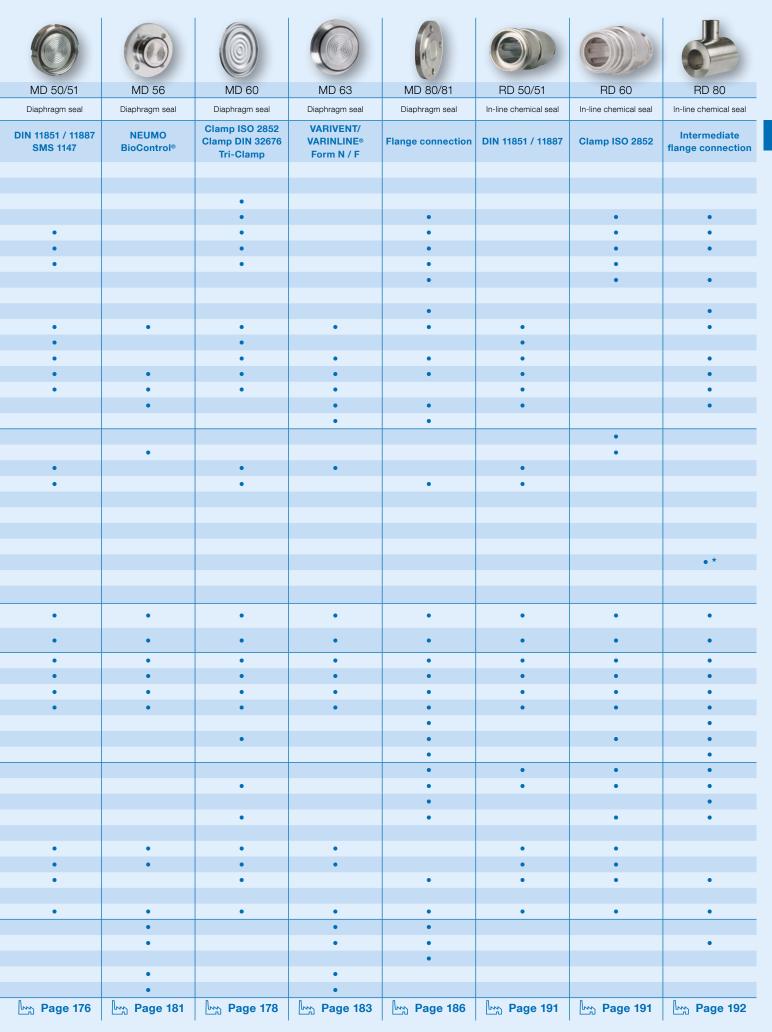
CHAPTER 2

Chemical seals: Diaphragm seals, in-line chemical seals and piston type chemical seals

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Chemical seals at a glance

						ago	
		MD 11	KD 21	MD 21	MD 22	MD 30	MD 40
Design		Diaphragm seal	Piston type diaphragm seal	Diaphragm seal	Diaphragm seal	Diaphragm seal	Diaphragm seal
Connection type		Connection thread	Connection thread	Connection thread	Connection thread	Connection thread	Paper flange
1/4"	_	•			•		
1/2"	tio	•	•	•	•	•	
3/4"	nec		•	•			
1"	Ö		•	•			
1½"	SS		•	•			
2"	Ses		•	•			
2½"	oro						
3"	-5						
3½"	ete						
4"	E L						
DN 25	dia						
DN 32	nal						
DN 40	Nominal diameter / process connection						DN 48
DN 50	ž						
DN 65							
DN 80							
DN 100						1	
PN 10		•					
PN 16							
PN 25	<u>0</u>					•	
PN 40	ting				•		•
PN 65	Pressure ratings						
PN 80	are					_	
PN 100 PN 160	SSE					•	
PN 250	P				•	•	
PN 600			•	•	•	•	
PN 1000			•				
	-			•			
With cooling element > 100 °C With capillary tube > 100 °C	Application area			•	•	•	•
	Ą						•
Paraffin oil (FDA)			•	•	•	•	•
Neobee (FDA)	je			•	•	•	•
Glycerine	<u>ib</u>	•		•	•	•	•
Glycerine / water Silicone oil	Filling liquid			•	•	•	•
Halocarbon				•	•	•	•
High-temperature oil				•			
Measurement of water and waste water		•	•	•	•	•	•
Measurement of oils		•	•			•	
Measurement of heavy fuel oil	SE						
Measurement of chemicals	ıre.				•	•	
Measurement of pulp materials	<i>□</i>		•	-	-	_	•
Measurement of food	Application areas						
Measurement of pharmaceuticals	<u>i</u>						
Measurement of suspensions	dd		•	•	•	•	•
Measurement of abrasive suspensions	4		•				
Measurement of crystallising media				•		•	•
Special materials			•	•	•	•	•
Coatings	SL			•		•	•
Other designs	tio		•			•	•
Mating flanges	Options						•
Seals							•
Coalo							



Chemical seals



Application Chemical seals are process connections with a separating diaphragm which separate the measuring system and the medium to be measured.

Chemical seals expand the application ranges of pressure gauges, pressure switches and pressure transducers.

Description Chemical seals are used e.g. in the following situations:

- The medium must not come into contact with the measuring element, for example, because the medium is polluted, highly viscous, crystallises or hardens.
- The medium is corrosive and the special materials which are sufficiently corrosion-resistant cannot be used for elastic measuring elements.
- The ambient temperature at the measuring point or the temperature of the medium are extremely high.
- For hygienic reasons, there must be no dead space.
- The site conditions do not allow for direct installation of a pressure gauge.





Chemical seals



Principle of operation Chemical seals are used in conjunction with Bourdon tube pressure gauges, pressure transducers or pressure switches. They are either mounted directly to the measuring instrument or connected via a cooling element or a capillary tube. The separating element - a diaphragm or a pipe – is the main component of a chemical seal. The diaphragm seal is the most commonly used chemical seal. A chemical seal is always a sealed system; the space between the separating element and the measuring device (e.g. Bourdon tube) is evacuated and then filled with a pressure transmission liquid. The medium to be measured is in contact with the separating element and causes it to bend. The element must have a displacement capacity which is sufficient to move the measuring element. The deflection must always take place in the elastic area of the separating element. This is determined by the diameter, the material and the shape.



performance

Temperature The system is filled at room temperature. Different temperatures will change the volume of the filling liquid. This would have a negative impact on the accuracy. If you specify the operating temperatures, we can counteract this effect by selecting the most suitable filling liquid.

If the temperature exceeds 100 °C, the gauge and the chemical seal at the measuring point should be separated by means of a capillary tube or the system should be equipped with a cooling element.

Response time

Using a chemical seal will generally result in a delayed response of the pressure gauge. This effect may be used for additional damping.

Pressure transmission liquid

The pressure transmission liquid must be selected according to the minimum and maximum operating temperatures. In addition, the pressure transmission liquid and the medium must be compatible as it is possible that they will come into contact if the separating element is damaged.

Diaphragm seals MD 11 plastic version







Robust plastic version

- Suitable for many chemicals
- Perfect solution for waste water
- Different materials available







Application For mounting to Bourdon tube pressure gauges or pressure switches. Specially for polluted waste water, fertilisers, corrosive media.

specifications PVC, PP or PVDF

Technical Process connection

female thread G½ or G¼

Diaphragm

EPDM, TFM-coated, internal

Instrument connection

Female thread G½ or G¼ PP GF 30

Pressure transmission liquid

Glycerine (FM 03)

Nominal pressure

PN 10

Operating temperature range

PVC 0/60 °C -10/+80 °C PP PVDF -20/+100 °C

Instrument connection 90 Process connection Ø84,5

Dimensions (mm)

Options • Other process connections

DG: M, PG: 1

MD 11 plastic version												
Chemical seal body	Process connection	Instrument connection	(in	Minimur bar) at n	m range ominal s	Part no.	Price €					
			63	100	160	DMU						
PVC	G¼	G1⁄4	1.6	1.6	1.6		33970					
PVC	G1/2	G½	1.6	1.6	1.6		33971					
PP	G1⁄4	G1⁄4	1.6	1.6	1.6		33972					
PP	G½	G½	1.6	1.6	1.6		33973					
PVDF	G1/4	G1/4	1.6	1.6	1.6		33974					
PVDF	G½	G½	1.6	1.6	1.6		33975					



Diaphragm seals MD 21/22 compact version





Type MD 21

Application For mounting to Bourdon tube pressure gauges, pressure transducers or pressure switches. For corrosive, hot and polluted media at high pressures. Specially suitable for mechanical engineering and chemical industry applications.

specifications

Technical Process connection

Stainless steel 316 Ti/316 L G1/2B to G2B, DIN 3852 type A Fixed male thread

Diaphragm

Stainless steel 316 Ti/316 L, welded flush to upper body, no dead space

Instrument connection

Welded connection

Pressure transmission liquid

Paraffin oil (FM 09), FDA-listed

Pressure ranges

See price list section

Nominal pressure

PN 600 to PN 1000

- **Options** Adapter for instrument connection G¼B/G½B
 - Cooling element (> 100 °C)
 - Capillary tube
 - Other threads
 - Other materials
 - Other filling liquids

Type MD 22

For mounting to Bourdon tube pressure gauges, pressure transducers or pressure switches. For corrosive, hot and polluted media at medium pressures. Specially suitable for mechanical engineering and chemical industry applications.

Process connection

Stainless steel 316 L G1/2B, fixed male thread

Upper body and lower body

Stainless steel 316 L

Diaphragm

Stainless steel 316 Ti/316 L Internal, welded

Instrument connection

Welded connection

Pressure transmission liquid

Paraffin oil (FM 09), FDA-listed

Pressure ranges

See price list section

Nominal pressure

PN 40 to PN 250

- Adapter for instrument connection G¼B/G½B
- Cooling element (> 100 °C)
- Capillary tube
- Other threads
- Other materials
- Other filling liquids

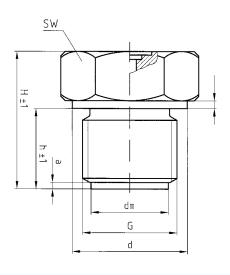


169

Diaphragm seals MD 21/22

Types and dimensions (mm)

Type MD 21



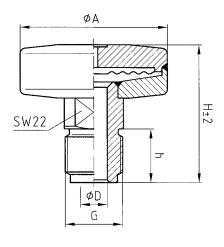
Pipe thread as per DIN 3852 type A or ISO 228-1

G	d	dm	h	Н	а	b	SW
G½B	26	17.2	17	33.5	3	3	27
G¾B	32	23.5	19	34	3	3	32
G1B	39	28	21	36	3	3	41
G1½B	55	40	25	48	3	3	55
G2B	68	50	27	56	3	3.5	70

Pipe thread as per ANSI/ASME B1.20.1

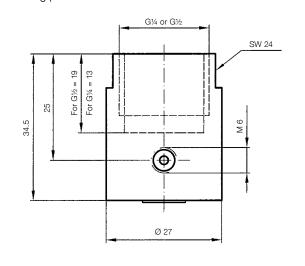
G	d	dm	h	Н	а	b	SW
1"NPT	-	23.5	24	36	-	-	41
11/2"NPT	-	35	25	45	-	-	55
2"NPT	-	48	26	50	-	-	70

Type MD 22

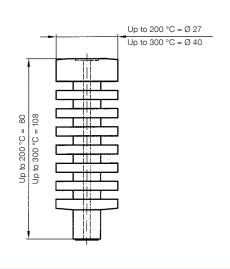


PN	G	ØA	ØD	h	Н
40	G¼B	55	6	13	44.5
40	G¾B	55	6	16	47.5
40	G1/2B	55	10	20	51.5
40	1/4"NPT	55	6	15	46.5
40	½"NPT	55	10	20	51.5
250	G¼B	40	6	13	44.5
250	G¾B	40	6	16	47.5
250	G1/2B	40	10	20	51.5
250	1/4"NPT	40	6	15	46.5
250	½"NPT	40	10	20	51.5

Adapter for instrument connection $G1\!\!\!/\!\!\!/ G1\!\!\!/\!\!\!/ 2$ with filling port

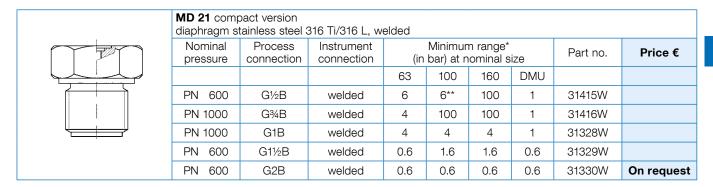


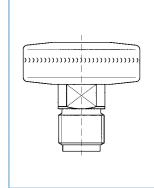
Cooling element, can be welded at both ends



Diaphragm seals MD 21/22

DG: M, PG: 3





	MD 22 compact version diaphragm stainless steel 316 Ti/316 L, internal, welded												
Nominal pressure	Process connection	Instrument connection	(in	Minimur bar) at n	m range* Iominal s	Part no.	Price €						
			63	100	160	DMU							
PN 40	G¼B	welded	0.6	0.6	0.6	0.6	31997W						
PN 40	G½B	welded	0.6	0.6	0.6	0.6	31998W						
PN 40	½-14 NPT	welded	0.6	0.6	0.6	0.6	31999W						
PN 250	G¼B	welded	4	4	4	4	32000W						
PN 250	G½B	welded	4	4	4	32001W							
PN 250	½-14 NPT	welded	4	4	4	4	32002W						

^{*} Valid for standard pressure transmission liquid with direct mounting (without capillary tube) and a room temperature and a temperature of the medium of 20 °C.

Blue part no. = in-stock items



See page 194 for extra charges for options, mounting and accessories.



^{**} Version in bayonet bezel housing (cl 1.0) 6–40 bar, in crimped bezel housing (cl 1.6) 6–600 bar.

Piston type chemical seals KD 21



- Piston instead of diaphragm: For extremely rough conditions with abrasive media
- For pressures from 10 bar to 600 bar
- Robust and reliable pressure measurement
- Shock- and vibration-resistant







Application For mounting to Bourdon tube pressure gauges, pressure transducers or pressure switches. For corrosive, polluted and abrasive suspensions at high pressures. Specially for pressure measurements in waste water, drilling water, sludge, concrete, plaster and minerals.

specifications Stainless steel 316 L

Technical Process connection

Thread G1/2B to G2B, 1/2-14 NPT to 2-111/2 NPT

Seal

FKM (Viton)

Pressure connection

Stainless steel 316 L Flush

Instrument connection

Welded connection

Pressure transmission liquid

Paraffin oil (FM 09), FDA-listed

Pressure ranges

0/10 bar to 0/600 bar

- **Options** Adapter for instrument connection G¼/G½
 - Capillary tube
 - Flange connections EN, ASME, JIS
 - Other process connections
 - Other materials
 - Other filling liquids, except for Neobee M20 (FM

Nominal pressure

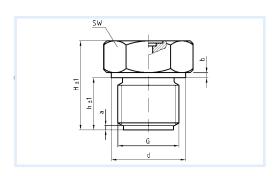
PN 600

Accuracy

With pressure gauge cl. 2.5 With pressure transducer 1.0 % FSO

Can be mounted to

- Bourdon tube pressure gauges NG 50, 63, 80, 100, 160 and RF 130 PG
- Pressure transducer DMU
- Pressure switch DS



DG: M, PG: 3

Nominal pressure	Process connection	d	h	Н	а	b	SW	Instrument connection	Minimum range* (in bar) at nominal size			Part no.	Price €	
									63	100	160	DMU		
PN 600	G1/2B	26	17	33.5	3	3	27	welded	10	16	16	10	31420W	
PN 600	G¾B	32	19	34	3	3	32	welded	10	16	16	10	31421W	
PN 600	G1B	39	21	36	3	3	41	welded	10	16	16	10	31422W	
PN 600	G1½B	55	25	48	3	3	55	welded	10	16	16	10	31423W	On request
PN 600	G2B	68	27	56	3	3.5	70	welded	10	16	16	10	31424W	On request
PN 600	½-14 NPT	-	20	33.5	-	-	27	welded	10	16	16	10	31425W	
PN 600	34-14 NPT	-	-	-	-	-	-	welded	10	16	16	10	31426W	
PN 600	1-11½ NPT	-	24	36	-	-	41	welded	10	16	16	10	31427W	On request
PN 600	1½-11½ NPT	-	25	45	-	-	55	welded	10	16	16	10	31428W	On request
PN 600	2-11½ NPT	-	26	50	-	-	70	welded	10	16	16	10	31429W	On request

^{*} Valid for standard pressure transmission liquid with direct mounting (without capillary tube) and a room temperature and a temperature of the medium of 20 °C.



Diaphragm seals MD 30 standard version with threaded connection



- Can be disassembled and cleaned
- Applications up to 250 bar
- Welded diaphragm
- Many process connections available







Application For mounting to Bourdon tube pressure gauges, pressure transducers or pressure switches. For corrosive, viscous, polluted or hot media.

specifications Stainless steel 316 L

Technical Process connection/lower body

G1/2B or 1/2 NPT

Diaphragm

Stainless steel 316 L

Seal

FKM (Viton)

Instrument connection/upper body

Stainless steel 316 L Welded connection

Retaining flanges

Stainless steel 316 L

Spacer ring

Stainless steel 316 L (for PN 100)

Screws and nuts

Stainless steel 304

Pressure transmission liquid

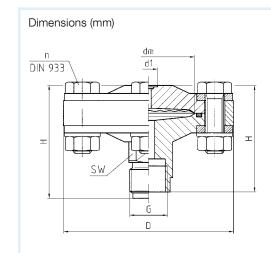
Paraffin oil (FM 09), FDA-listed

Pressure ranges

See price list section

Nominal pressure

PN 25 to PN 250



G	d1	PN	dm	D	Н	n	SW
G1/2	10	25	36	95	60	4xM10	22
G½B	10	25	36	95	63	4xM10	22
½-14NPT	10	25	36	95	63	4xM10	22
G½	10	100	36	95	60	4xM10	22
G½B	10	100	36	95	63	4xM10	22
½-14NPT	10	100	36	95	63	4xM10	22
G½	10	250	56	95	56	8xM10	22
G½B	10	250	56	95	79	8xM10	22
½-14NPT	10	250	56	95	76	8xM10	22

Options Process connection/lower body

- Special materials/coatings
- Other connection threads

Diaphragm

Special materials/coatings

Other materials

Instrument connection/upper body

- Adapter for instrument connection G¼B/G½B
- Cooling element (> 100 °C)
- Capillary tube

Screws/nuts/spacer ring

Other materials

Miscellaneous

Other filling liquids





Diaphragm seals MD 40 for the paper and pulp industries



- Special flange connection for the pulp and paper industries
- Compact design
- Can be welded directly to the pressure gauge
- Various tubus lengths available







Application For mounting to Bourdon tube pressure gauges, pressure transducers or pressure switches. For corrosive, highly viscous, polluted or hardening media. Typical application areas:

- Paper industry
- Pulp industry
- Lacquer industry

specifications

Technical Process connection/tubus

Stainless steel 316 L, DN 48 Loose retaining flange Stainless steel 304

Diaphragm

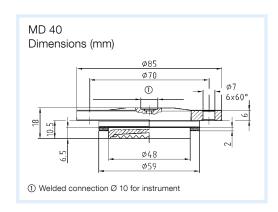
Stainless steel 316 L

Seal

NBR (Perbunan)

Instrument connection

Stainless steel 316 L Welded connection



Pressure transmission liquid

Paraffin oil (FM 09), FDA-listed

Pressure ranges

See price list section

Nominal pressure

PN 40

Scope of delivery

- Diaphragm seal
- Screws M 6 x 20 (galvanised steel)
- Seal (NBR) 59 x 48 x 2 mm

Options Process connection/tubus

- Extended tubus 18 mm (also suitable for O ring seal)
- Special materials
- Silicone-free version

Diaphragm

Special materials

Instrument connection

- Adapter for instrument connection G¼B/G½B
- Cooling element (> 100 °C)
- Capillary tube

Other

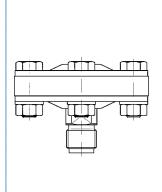
Other filling liquids



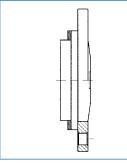


Diaphragm seals MD 30/40

DG: M, PG: 3



MD 30 standa	ard version							
Nominal pressure	Process connection		Minimur bar) at n			Part no.	Price €	
		63 100 160 DMU						
PN 25	Stainless steel 316 L, G½B	0.6	0.6	0.6	0.6	31417W		
PN 100	Stainless steel 316 L, G½B	313						
PN 250	Stainless steel 316 L, G½B	0.6	0.6	31332W				
Extra charge	es							
Process conn	ection G1/2B, PFA-coated							
Process connection ½-14 NPT								
Process connection ½-14 NPT, PFA-coated								
Process conn	Process connection G½ female thread							



Spare parts/accessories							
Direct connection	31347W						
	Part no.	Price €					
Instrument connection stainless steel 316 L, welded connection Process connection stainless steel 316 L, DN 48, PN 40 (including seal and screws) Retaining flange stainless steel 304, ranges 0/1.6 to 0/40 bar*							
MD 40 version for the paper and pulp industries							

Valid for standard pressure transmission liquid with direct mounting (without capillary tube and a room temperature and a temperature of the medium of 20 °C.
 ** Without spacer ring.

6 screws M6 x 20

Spare seal, Perbunan 59 x 48 x 2

Blue part no. = in-stock items

31418

31419

Diaphragm seals MD 50/51 for screwed pipe connections (food)







- All materials FDA-listed
- Suitable for SIP/CIP
- No dead space
- Various standards available







Application Diaphragm seals MD 50/51 with food law compliant screwed pipe connection for hygienic process separation of pressure measuring and control units in pipes or tanks. For mounting to Bourdon tube pressure gauges, pressure transducers and pressure switches. For installation in hygienic processes without dead spaces.

- Food and beverages industry
- Dairies
- Beverage machines
- Breweries

Description All materials used are FDA-listed. The chemical seal and the measuring instrument are welded together, resulting in an inseparable single, shock- and vibration-resistant unit that does not require additional external protection. The chemical seals are available with various nominal diameters; due to their compact design, they are suitable for a wide range of applications.

Technical Type specifications MD 50 and 51

Process connections

MD 50: DIN 11851/11887 DN 25 to DN 65 MD 51: SMS 1147 1" to 21/2"

Material

Stainless steel 316 L, FDA-listed

Surface roughness

Ra ≤ 0.8 µm

Pressure transmission liquid

Paraffin oil (FM 09), FDA-listed

Pressure ranges

0.6 bar to 40 bar

Can be mounted to

- Bourdon tube pressure gauges NG 50, 63, 80, 100, 160
- Pressure transducers (DMU)
- Pressure switches (DS)

- Options Other designs (Südmo, Guth)
 - Other materials
 - Electropolished
 - Cooling element
 - Capillary
 - Other pressure transmission liquids
 - Accessories such as union nuts and seals
 - Other process connections:

MD 52-1: DIN 11864-1 GS or ÜM, design A/B, DN 25/80, H3

DIN 11853-1 GS or ÜM, DN 25/80, H3

MD 52-2: DIN 11864-2 NF or BF, design A/B, DN 25/80, H3

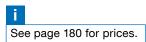
DIN 11853-2 NF or BF, DN 25/80, H3

MD 52-3 DIN 11864-3 NKS or BKS, design A/B, DN 25/80, H3

DIN 11853-3 NKS or BKS, DN 25/80, H3

MD 53: APV-RJT 1" to 3" MD 54: IDF 1" to 3"

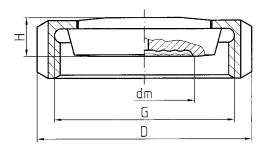
MD 55: APV-ISS 1" to 3"



Diaphragm seals MD 50/51

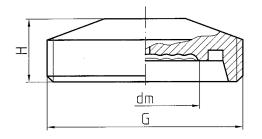
Types and dimensions (mm)

Tapered socket DIN 11851 type D/DIN 11887 type B with grooved union nut DIN 11851 type F



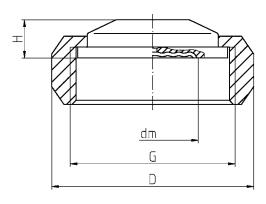
Type	DN	PN	dm	G	D	Н
	25	40	23.5	Rd52x1/6	63	14
	32	40	28	Rd58x1/6	70	14
MD 50, DIN 11851	40	40	36	Rd65x1/6	78	14
5	50	25	48	Rd78x1/6	92	15
	65	25	48	Rd95x1/6	112	16

Threaded socket DIN 11851 type C/DIN 11887 type A



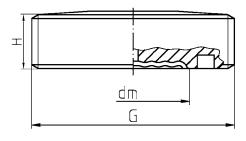
Туре	DN	PN	dm	G	Н
	25	40	23.5	Rd52x1/6	21
	32	40	28	Rd58x1/6	21
MD 50, DIN 11851	40	40	36	Rd65x1/6	21
Dire 11001	50	25	48	Rd78x1/6	21
	65	25	-	Rd95x1/6	-

Socket and union nut SMS 1147



Туре	DN	PN	dm	G	D	Н
MD 51,	1½"	40	36	Rd60x1/6	74	14
SMS stand-	2"	40	48	Rd70x1/6	84	14
ard	2½"	25	48	Rd85x1/6	100	14

Threaded socket SMS 1147



Туре	DN	PN	dm	G	Н
MD 51,	11/2"	40	36	Rd60x1/6	17
SMS stand-	2"	40	48	Rd70x1/6	17
ard	2½"	25	48	Rd85x1/6	17

Diaphragm seals MD 60 for hygienic processes









- 3-A-certified in conjunction with Bourdon tube pressure gauge RF 63/100 and chemical seal DMU 02 Vario
- All materials FDA-listed
- Suitable for SIP/CIP
- NovAseptic®-compatible (1" to 2½")







Application For mounting to Bourdon tube pressure gauges, pressure transducers or pressure switches. For viscous, perishable or hot media. Typical application areas:

- Food and beverages industry
- Beverages industry
- Pharmaceutical industry
- Biotechnology

Description All materials used are FDA-listed. The chemical seal and the measuring instrument are welded together, resulting in an inseparable single, shock- and vibration-resistant unit that does not require additional external protection. The chemical seals are available with various nominal diameters; due to their compact design, they are suitable for a wide range of applications.

Technical Type specifications MD 60: Clamp ISO 2852

Process connection

Stainless steel 316 L Clamp 3/4" to 21/2"

Diaphragm

Stainless steel 316 L, welded to upper body, no dead space

Surface roughness

Ra ≤ 0.8 µm

Instrument connection

Welded connection

Pressure transmission liquid

Paraffin oil (FM 09), FDA-listed

Pressure ranges

See price list section

Nominal pressure

PN 25 to 40

Test

3-A-certified:

Nominal diameter 1"- 21/2" for RF 63/100 (crimped bezel and bayonet bezel versions) Nominal diameter 1"-21/2" for DMU 02 Vario

- Options Adapter for instrument connection G1/4B/G1/2B
 - Special materials/coatings
 - Electropolished
 - Cooling element (> 100 °C)
 - Capillary tube
 - Other filling liquids
 - Accessories (retainer ring, seal, socket)

■ Other process connections:

MD 61: Clamp DIN 32676

MD 62: Tri-Clamp



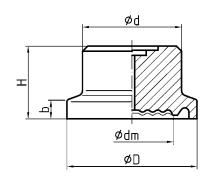
NovAseptic® is a registered trademark of Millipore AB.

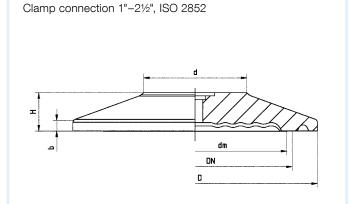
See page 180 for prices.

Diaphragm seals MD 60

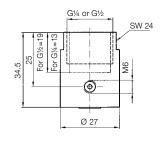
Types and dimensions (mm)

Clamp connection 3/4" ISO 2852

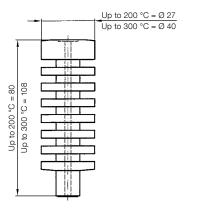




Adapter for instrument connection $G1\!\!\!/4\,B/G1\!\!\!/2B$ with filling port



Cooling element, can be welded at both ends



Type	DN	PN	D	dm	d	Н	b
MD 60	3/4"	40	25	25 17.2		14	3.6
	1"	40	50.5	25.5/28	27	10	2.85
MD 60 NovAseptic®	1½"	40	50.5	36	27	10	2.85
design	2"	40	64	48	27	10	2.85
	2½"	25	77.5	48	38.2	10	2.85

Diaphragm seals MD 50/51/60

DG: M, PG: 3

	MD 50 for hygie	enic processes, g	grooved u	nion nut	DIN 1185	1 (female)							
	Nominal diameter DN	Nominal pressure PN	(ir		m range* nominal si	ze	Part no.	Price €					
			63	100	160	DMU							
	25	40	4	4	4	1	31300W						
	32	40	0.6	1.6	1.6	1	31301W						
	40	40	0.6	0.6	0.6	1	31302W						
	50	25	0.6	0.6	0.6	0.6	31303W						
	65	25	0.6	0.6	0.6	0.6	31304W						
	MD 50 for hygie	enic processes, t	hreaded	socket DI	N 11851	(male)							
	Nominal diameter DN	Nominal pressure PN	(ir	Minimur bar) at r	m range* nominal si	ze	Part no.	Price €					
			63	100	160	DMU							
	25	40	4	4	4	1	31306W						
	32	40	0.6	1.6	1.6	1	31307W						
	40	40	0.6	0.6	0.6	1	31308W						
	50	25	0.6	0.6	0.6	0.6	31309W						
	65	25	0.6	0.6	0.6	0.6	31310W	On request					
	MD 51 for hygienic processes, grooved union nut SMS 1147 (female) Nominal Nominal Minimum range* Part no. Data 6												
	Nominal diameter DN	Nominal pressure PN	(ir		m range* nominal si	ze	Part no.	Price €					
			63	100	160	DMU							
	1½"	40	0.6	0.6	0.6	1	31314W						
	2"	40	0.6	0.6	0.6	0.6	31315W						
	21/2"	25	0.6	0.6	0.6	0.6	31316W	On request					
	MD 51 for hygie	enic processes, t	hreaded	socket SN	MS 1147 (male)							
	Nominal diameter DN	Nominal pressure PN	(ir		n range* nominal si	Part no.	Price €						
			63	100	160	DMU							
	11/2"	40	0.6	0.6	0.6	1	31320W						
	2"	40	0.6	0.6	0.6	0.6	31321W						
		onnection ISO 28	852										
	Nominal diameter DN	Nominal pressure PN	(ir		m range* nominal si	ze	Part no.	Price €					
	G.G.T.IOTO. 211	procedic i i i	63	100	160	DMU							
7//>	3/4"	40	6			1.6	31913W**						
	1"	40				1.6	31914W***						
'	1"	40	4	4		1.6	31912W						
	11/2"	40	0.6	0.6	1.6	1	31324W						
	2"	40	0.6	0.6	0.6	0.6	31325W						
	2½"	25	0.6	0.6	0.6	0.6	31326W						

Valid for standard filling liquid with direct mounting (without capillary tube) at a room temperature and temperature of the medium of 20 °C.

Blue part no. = in-stock items



See page 194 for extra charges for options, mounting and accessories.



^{**} Not available with 3-A-approval.
*** DMU 02 Vario only.

Diaphragm seals MD 56 NEUMO BioControl®



Diaphragm





- Defined installation and press-fitting with metal stop
- EHEDG-certified
- Medium cannot get behind the seal
- Suitable for SIP/CIP







Application Flange type diaphragm seal MD 56 for sterile process separation of pressure measuring and control units in pipes or tanks. For mounting to Bourdon tube pressure gauges, pressure transducers and pressure switches. For installation in sterile processes without dead spaces. Typical application areas:

- Sterile applications in process engineering
- Pharmaceutical industry
- Biotechnology
- Food and beverages industry
- Beverage machines
- Dairies
- Breweries

Description All materials used are FDA-listed. Defined installation as per EHEDG hygienic design recommendations; EHEDG-certified. The chemical seal and the measuring instrument are welded together, resulting in an inseparable single, shock- and vibration-resistant unit without external edges that might collect dirt. The chemical seals are available with nominal diameters 25, 50, 65, 80; due to their compact design, they are suitable for a wide range of applications.

Technical Type specifications

MD 56

Process connection

NEUMO BioControl® D25, D50, D65, D80

Material

Stainless steel 316 L, seal EPDM (USP CLASS VI classified; FDA-listed)

Surface roughness

 $Ra \le 0.8 \, \mu m$

- **Options** Other materials
 - Electropolished
 - Cooling element
 - Capillary
 - Other filling liquids
 - Accessories such as housing, block flange and seals

Pressure transmission liquid

Paraffin oil (FM 09), FDA-listed

Pressure ranges

0.6 bar to 16 bar

Test

EHEDG-certified type EL-CLASS I

Can be mounted to

- Bourdon tube pressure gauges NG 50, 63, 80, 100, 160
- Pressure transducers (DMU)
- Pressure switches (DS)



BioControl® is a registered trademark of NEUMO GmbH & Co.KG.

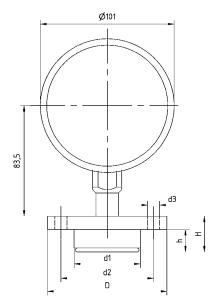
See page 182 for prices.

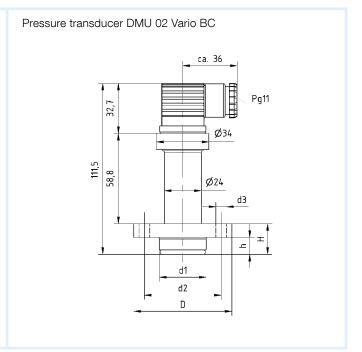


Diaphragm seals MD 56

Types and dimensions (mm)

Pressure gauge NG 100 with MD 56 $\,$





DG: M, PG: 3

Туре	Minimum range* (in bar) at nominal size				D	d1	d2	d3	Н	h	Part no.	Price €
	63	100	160	DMU								
MD 56 BioControl® D25	4	4	4	1	64	30.4	50	4 x Ø 7	20	11	31410W	
MD 56 BioControl® D50	0.6	0.6	1.6	1	90	49.9	70	4 x Ø 9	27	17	31411W	
MD 56 BioControl® D65	0.6	0.6	0.6	0.6	120	67.9	95	4 x Ø 11	27	17	31412W	
MD 56 BioControl® D80	0.6	0.6	0.6	0.6	140	87.4	115	4 x Ø 11	37	25	31413W	

Diaphragm

Diaphragm seals MD 63 for VARINLINE® housing







- Defined installation and press-fitting with metal stop
- EHEDG-certified
- Medium cannot get behind the seal
- Suitable for SIP/CIP







Application Diaphragm seal MD 63 for sterile process separation of pressure measuring and control units in pipes or tanks. For mounting to Bourdon tube pressure gauges, pressure transducers and pressure switches. For installation in sterile processes without dead spaces. Typical application areas:

- Sterile applications in process engineering
- Pharmaceutical industry
- Biotechnology
- Food and beverages industry
- Beverage machines
- Dairies
- Breweries

Description All materials used are FDA-listed and comply with the EHEDG hygienic design recommendations and are EHEDG-certified. The chemical seal and the measuring instrument are welded together, resulting in an inseparable single, shock- and vibration-resistant unit without external edges that might collect dirt. The chemical seal is available for type F and type N; due to its compact design, it is suitable for a wide range of applications.

Technical Type specifications

MD 63

Process connection

For VARINLINE®/VARIVENT® In-line-housing Type F for housing DN 25 and 1" (nominal installation diameter 50 mm) Type N for housing DN 40-125 and $1\frac{1}{2}$ "-6" (nominal installation diameter 68 mm)

Material

Stainless steel 316 L, seal EPDM (USP CLASS VI classified, FDA-listed)

Surface roughness

 $Ra \le 0.8 \mu m$

- Options Other materials
 - Electropolished
 - Cooling element, electropolished (> 100 °C)
 - Capillary tube
 - Other filling liquids
 - Accessories (brackets, housings and seals)

Pressure transmission liquid

Paraffin oil (FM 09), FDA-listed

Pressure ranges

0.6 bar to 25 bar

Test

EHEDG-certified type EL-CLASS I

Can be mounted to

- Bourdon tube pressure gauges NG 50, 63, 80, 100, 160
- Pressure transducers (DMU)
- Pressure switches (DS)



VARINLINE® and VARIVENT® are registered trademarks of GEA Tuchenhagen GmbH.

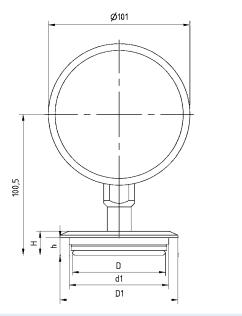
See page 184 for prices.

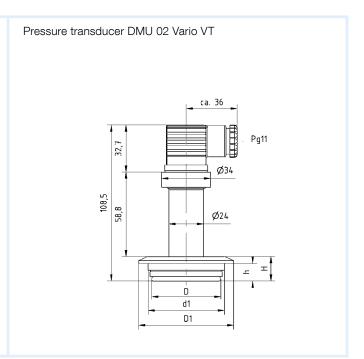


Diaphragm seals MD 63

Types and dimensions (mm)

Pressure gauge NG 100 with MD 63





DG: M, PG: 3

Туре	Minimum range* (in bar) at nominal size			D	D1	d1	Н	h	DN VARILINE	Part no.	Price €	
	63	100	160	DMU								
MD 63 VARIVENT® type F	4	4		1	50	66	53	17	12.3	DN 25; 1"	31340W	
MD 63 VARIVENT® type N	0.6	0.6	0.6	0.6	68	84	71	17	12.3	DN 40-125; 1½"-6"	31341W	

Chemical seals MD 70 for homogenising machines



- For high pressures
- Ideal for high dynamic loads
- Compact and robust design
- Easy integration into existing systems





Application For mounting to Bourdon tube pressure gauges and pressure transducers. For highly viscous media at high pressures. Specially for homogenising machines.

specifications Stainless steel 316 L

Technical Process connection

Loose retaining flange, Stainless steel

Diaphragm

Stainless steel 316 L Welded to upper body, no dead space

Instrument connection

Stainless steel 316 L Welded connection

Pressure transmission liquid

Paraffin oil (FM 09), FDA-listed

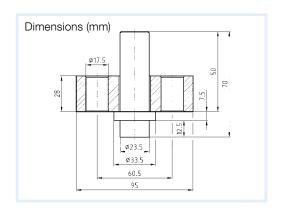
Pressure ranges

See price list section

Nominal pressure

PN 600

Options • Other filling liquids



DG: M

MD 70 version for homogenising machines											
Instrument connection stainless steel 316 L	PG	Part no.	Price €								
Process connection stainless steel 316 L, DN 23.9, PN 600 Ranges 0/100 to 0/600 bar*	3	31352W									
Price reduction without retaining flange	-	Net									

^{*}Valid for standard pressure transmission liquid with direct mounting (without capillary tube) Blue part no. = in-stock items and a room temperature and a temperature of the medium of 20 °C.



Diaphragm seals MD 80 Flange version



- Flush, welded diaphragm
- For DIN and ASME flange connections
- Numerous special materials and coatings (option)
- With bottom instrument connection as cell design (option)







Application For mounting to Bourdon tube pressure gauges, pressure transducers or pressure switches. For corrosive, highly viscous, polluted, crystallising or hot media. Typical application areas:

- Chemical Industry
- Petrochemistry
- Refineries
- Power plant engineering

Technical Type specifications MD 80

Process connection

Stainless steel 316 L, Flange connection as per EN 1092-1 type B 1 DN 25 to 100 or ASME B 16.5 (Raised Face) DN 1" to 4"

Diaphragm

Stainless steel 316 L

Instrument connection

Welded connection

Pressure transmission liquid

Paraffin oil (FM 09), FDA-listed

Pressure ranges

See price list section

Nominal pressure

PN 40

Class 150 to 300

Options

Process connection

- Special materials/coatings
- Other sealing surfaces
- Cell design

Diaphragm

- Special materials: Hastelloy, Monel, Nickel, Inconel, Incoloy, Platinum, Titanium, Tantalum, Zirconium,other Chrome-nickel-steel Alloys
- Coatings/linings:

PFA (up to 250 °C), ECTFE (up to 150 °C) PTFE (up to 150 °C, up to 100 bar) Silver (up to 150 °C), gold (up to 200 °C)

Miscellaneous

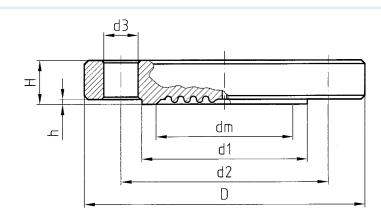
- Higher nominal pressures
- Cell design
- Adapter for instrument connection G1/4B/G1/2B
- Cooling element (> 100 °C)
- Capillary tube (back or bottom)
- Other filling liquids
- Customer-specific flanges
- Other nominal diameters



See page 189 for prices.

Diaphragm seals MD 80

Types and dimensions (mm)



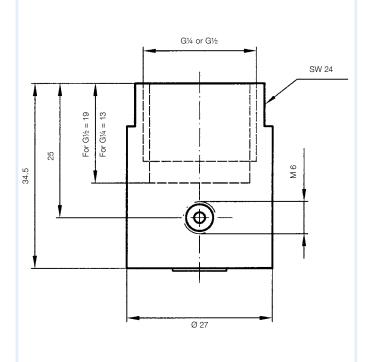
Flange connection as per EN 1092-1 type B 1

DN	PN	D	d1	d2	d3	Н	h	dm
25	40	115	68	85	4x14	18	2	28
40	40	150	88	110	4x18	18	2	48
50	40	165	102	125	4x18	18	2	48
80	40	200	138	160	8x18	24	2	48
100	40	235	162	190	8x22	24	2	48

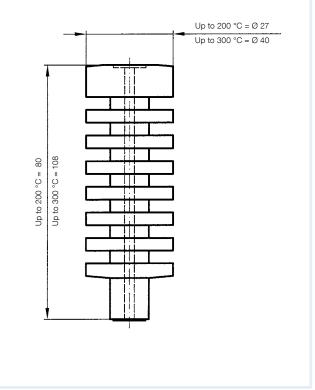
Flange connection as per ASME B 16.5 (Raised Face)

DN	CL	D	d1	d2	d3	Н	h	dm
1"	150	108	50.8	79.4	4x15.9	14.3	1.6	28
'	300	123.9	50.8	88.9	4x19.1	17.5	1.6	28
1½"	150	127	73.2	98.6	4x15.9	17.5	1.6	36
172	300	155.6	73.2	114.3	4x22.4	22.4	1.6	36
2"	150	152.4	92.1	120.7	4x19.1	19.1	1.6	48
2	300	165.1	92.1	127	8x19.1	25.4	1.6	48
3"	150	190.5	127	152.4	4x19.1	23.9	1.6	48
3	300	209.6	127	168.3	8x22.4	31.8	1.6	48
4"	150	228.6	157.2	190.5	8x19.1	23.9	1.6	48
4	300	254	157.2	200.1	8x22.3	31.7	1.6	48

Adapter for instrument connection $G1\!\!\!/\!\!\!/ G1\!\!\!/\!\!\!/ 2$ with filling port



Cooling element, can be welded at both ends



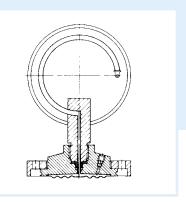
Diaphragm seals MD 81 Tubus flange version



- For tanks with thick walls
- For higher block flanges and increased insulation
- Connection as per DIN or ASME
- Tubus length can be adapted as required







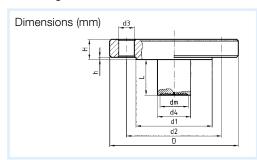
Application For mounting to Bourdon tube pressure gauges, pressure transducers or pressure switches. For corrosive, highly viscous, polluted, crystallising or hot media. Ideal for insulated or thick-walled tanks. Specially designed for use in the chemical and petrochemical industries, in refineries or power plant engineering.

specifications Stainless steel 316 L,

Technical Process connection

Flange connection as per EN 1092-1 type B 1 DN 50 to 100 or

ASME (Raised Face) B 16.5 DN 1" to 3" Tubus lengths 50, 100, 150 mm



Diaphragm/sealing surface

Stainless steel 316 L, welded

Instrument connection

Stainless steel 316 L, welded connection

Pressure transmission liquid

Paraffin oil (FM 09), FDA-listed

Pressure ranges

See price list section

Nominal pressure

PN 40

Class 150

Flange connection as per EN 1092-1 type B 1

DN	PN	D	d1	d2	dз	d4	Н	h	L
50	40	165	102	125	4x18	48	20	3	Ó
80	40	200	138	160	8x18	76	24	3), 15, 6
100	40	235	162	190	8x22	94	24	3	\mathcal{D}

Flange connection as per ASME B 16.5

DN	CL	D	d1	d2	d 3	d4	Н	h	L
1"	150	108	51	79.5	4x16	25	14.5	1.5	ó
2"	150	152	92	121	4x19	48	19	1.5	5,4 150
3"	150	190	127	152	4x19	76	24	1.5	20

Options Process connection

- Other tubus lengths
- Special materials/coatings
- Other sealing surfaces

Diaphragm

Special materials: Hastelloy, Monel, Nickel, Inconel, Incoloy, Platinum, Titanium, Tantalum, Zirconium, other Chrome-nickel-steel Alloys

Coatings/linings: PFA (up to 250 °C), ECTFE (up to 150 °C) ■ PTFE (up to 150 °C, up to 100 bar), silver (up to 150 °C), gold (up to 200 °C)

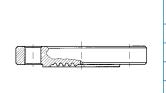
Miscellaneous

- Adapter for instrument connection G¼B/G½B
- Capillary tube (back or bottom)
- Cooling element (> 100 °C)
- Other filling liquids
- Customer-specific flanges
- Other nominal diameters

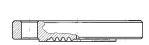


Diaphragm seals MD 80/81

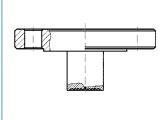
DG: M



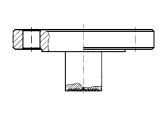
MD 80 flange	MD 80 flange version, flange connection as per EN 1092-1 type B 1										
Nominal diameter DN	Nominal pressure PN	Minimum range* (in bar) at nominal size					Part no.	Price €			
		63	100	160	DMU						
25	40	4	4	4	0.6	3	31333W				
40	40	4	4	4	0.6	3	31336W				
50	40	0.6	0.6	0.6	0.6	3	31339W				
80	40	0.6	0.6	0.6	0.6	3	31385W				
100	40	0.6	0.6	0.6	0.6	3	31388W				



MD 80 flange	version, flange	connecti	on as per	ASME B	16.5 (Ra	ised Fa	sed Face)			
Nominal diameter DN	Nominal pressure CL		Minimum range*				Part no.	Price €		
		63	100	160	DMU					
1"	150	4	4	4	1	3	31393W			
1"	300	4	4	4	1	3	31394W			
44/11	150	4	4	4	1	3	31396W			
1½"	300	4	4	4	1	3	31397W			
2"	150	0.6	0.6	0.6	0.6	3	31399W			
2	300	0.6	0.6	0.6	0.6	3	31400W			
3"	150	0.6	0.6	0.6	0.6	3	31402W			
3	300	0.6	0.6	0.6	0.6	3	31403W			
4"	150	0.6	0.6	0.6	0.6	3	31405W			
4"	300	0.6	0.6	0.6	0.6	3	31406W			



	MD 81 tubus flange version, tubus length 50 mm, flange connection as per EN 1092-1 type B 1								
Nominal Nominal Minimum range* PG Par diameter DN pressure PN (in bar) at nominal size							Part no.	Price €	
			63	100	160	DMU			
	50	40	1	2.5		1	3	31917W	
	80	40	0.6	0.6	1	1	3	31921W	
	100	40	0.6	0.6	1	1	3	31924W	



	MD 81 tubus flange version, tubus length 50 mm, flange connection as per ASME B 16.5 (Raised Face)									
Nominal diameter DN	Nominal pressure CL		Minimur bar) at n			PG	Part no.	Price €		
		63	100	160	DMU					
1"	150	4	4		1	3	31938W			
2"	150	1	2.5		1	3	31929W			
3"	150	0.6	0.6	1	1	3	31931W			

Extra charges €							
	Nominal diameter DN						
Tubus length	50/2"	80/3"	100				
100 mm							
150 mm							

^{*} Valid for standard pressure transmission liquid with direct mounting (without capillary tube) and a room temperature and a temperature of the medium of 20 °C.

Blue part no. = in-stock items



See pages 190/194 for extra charges for options, mounting and accessories.



Extra charges for diaphragm seals MD 80/81

DG: M

Turns of applications assufaces		MD 80	MD 81
Type of sealing surface		Extra charges €	Extra charges €
Groove, type D EN 1092-1 (for stai	nless steel)		On request
Tongue, type C EN 1092-1 (for sta	inless steel)		On request
Groove, type RJF (Ring Joint Facir	ngs) ASME B 16.5		On request
Capillary connection			
Capillary connection centre back		On request	On request
Capillary connection bottom		On request	On request
Special materials for wetted parts*	Nominal diameter		
Hastelloy C276	DN 25		On request
	DN 40		On request
DN 50			On request
DN 80			On request
DN 100			On request
Tantalum DN 25			On request
	DN 40		On request
	DN 50		On request
	DN 80		On request
	DN 100		On request
Monel 400, nickel, Inconel, platinum, titanium		On request	On request
Coatings*	,		
PFA (up to 250 °C continuous	DN 25		On request
temperature)	DN 40		On request
	DN 50		On request
	DN 80		On request
	DN 100		On request
ECTFE (up to 150 °C)	DN 25		On request
	DN 40		On request
	DN 50		On request
	DN 80		On request
	DN 100		On request
PTFE, silver, gold	All nominal diameters	On request	On request

 $^{^{\}star}$ Please enquire for special materials for groove or tongue versions.



In-line chemical seals RD 50/51/60 for hygienic processes





- For dairy fitting DIN 11851 and clamp connection ISO 2852
- No T piece required in pipe
- Easy, fast installation in pipe







Application For mounting to Bourdon tube pressure gauges, pressure transducers or pressure switches. For flowing, corrosive and highly viscous media; designed for direct installation in pipes. Typical application areas:

- Biochemical applications
- Food and beverages industry
- Beverages industry
- Pharmaceutical industry

specifications RD 50: DIN 11851, 316 L,

Technical Process connection

male thread DN 15 to DN 80, RD 51: SMS 1147 1" to 3" RD 60: Clamp ISO 2852, 316 L 1" to 3"

Diaphragm

Stainless steel 316 L, no dead space, welded to body

Instrument connection

Stainless steel 316 L Welded connection

Pressure transmission liquid

Paraffin oil (FM 09), FDA-listed

In-line

Pressure ranges

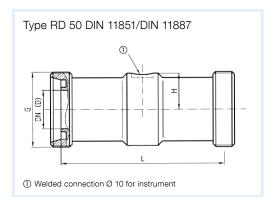
See price list section

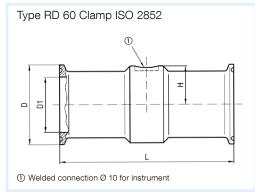
Nominal pressure

See dimensions table

Options

- Cooling element (> 100 °C)
- Capillary tube





DN	PN	G	L	D	Н
15	40	Rd34x1/8"	240	16	20
25	40	Rd52x1/6"	110	26	24
32	40	Rd58x1/6"	110	32	29
40	40	Rd65x1/6"	110	38	31.5
50	25	Rd78x1/6"	110	50	37
65	25	Rd95x1/6"	110	66	45
80	25	Rd110x1/4"	60	81	51.5

DN	PN	D	D1	L	Н
1"	16	50.5	22.2	110	24
1½"	16	50.5	34.8	110	31.5
2"	16	64	47.8	110	37
2½"	16	77.5	60.3	110	45
3"	10	91	72.9	60	51.5



In-line chemical seals RD 80 intermediate flange version

- Easy intermediate flange installation in the pipe
- Various nominal sizes
- Various nominal pressures
- Special materials (option)







For mounting to Bourdon tube pressure gauges, pressure transducers or pressure switches. For flowing, corrosive and highly viscous media, for direct installation in pipes.

specifications Stainless steel 316 L,

Technical Process connection

for flanges as per EN 1092-1 Type B 2, DN 25 to DN 100 or ASME B 16.5, 1" to 4"

Diaphragm

Stainless steel 316 L, welded to body, no dead space

Instrument connection

Stainless steel 316 L Female thread G1/2

Pressure transmission liquid

Paraffin oil (FM 09)

Pressure ranges

See price list section

Nominal pressure

PN 4 to 400 Class 150 to 6000

Options • Coatings

- Cooling element (> 100 °C)
- Capillary tube
- Other filling liquids

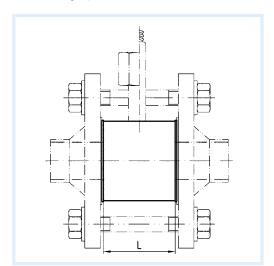
Dimensions (mm)

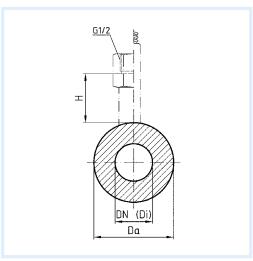
Flange connection as per EN 1092-1 type B 2

DN	Tue	PN	Da	L	Н
25	28.5	4-400	68	100	29
40	43.1	4-400	88	100	29
50	54.5	4-400	100	100	29
65	70.3	4-400	120	100	29
80	82.5	4-400	138	60	29

Flange connection as per ASME B 16.5

DN	Tue	CL	Da	L	Н
1"	28.5	150–6,000	50	100	29
1½"	43.1	150-6,000	73.2	100	29
2"	54.5	150–6,000	91.9	100	29
3"	82.5	150–6,000	127	60	29
4"	107.1	150–6,000	157.2	60	29



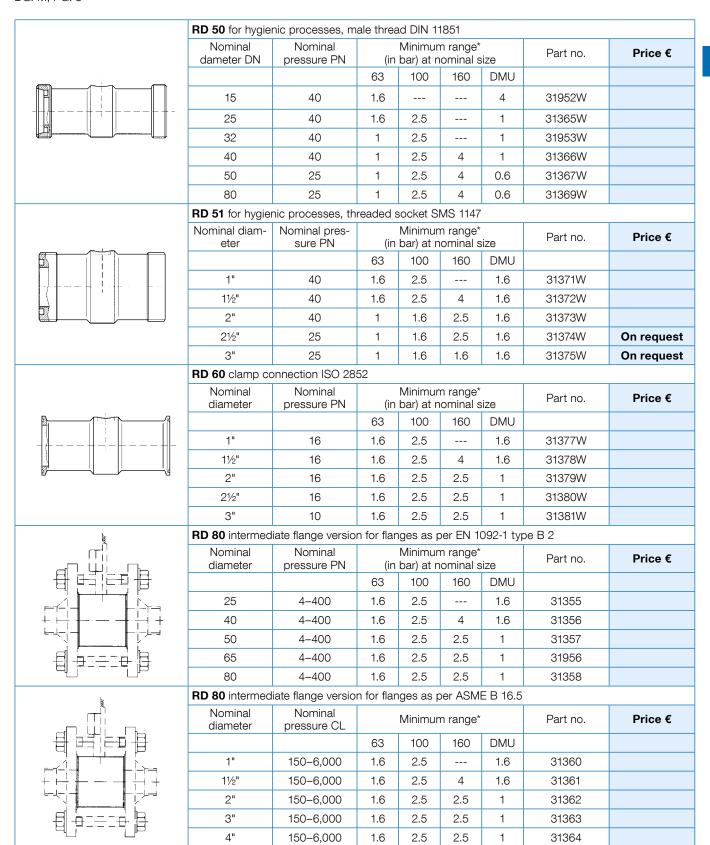






In-line chemical seals RD 50/51/60/80

DG: M, PG: 3



 $^{^{\}star}$ Valid for standard pressure transmission liquid with direct mounting (without capillary tube) and a room temperature and a temperature of the medium of 20 $^{\circ}\text{C}.$

Blue part no. = in-stock items



See page 194 for extra charges for options, mounting and accessories.



Chemical seals - fitting prices and accessories

DG: M

The fitting price includes fitting of the pressure gauge or pressure transducer to the chemical seal, filling of the system with transmission liquid, closing and securing the screw connections and calibration of the system at room temperature (20 °C). The final price consists of the price for the pressure gauge, the price for the chemical seal, the fitting price and the price for options and/or accessories, if applicable.

0.110, 0.1 0.0	eessories, ii applicable.	Length of		Fitting	to ^	EBISO.		Eitting	n to	AERISO	
Fitting p	rices € ¹)	capillary tube		Bourdon tube			uge 2)	Fitting to AFRISO pressure transducer 2)			2)
Direct m			PG	Part no.		Price €		Part no.		Pri	се€
,	C it is advisable to use a ement or a capillary tube)		-	32007				32016			
Fitting w	rith capillary tube	1 m	3	32008				32017			
	tube stainless steel, or welded to chemical seal,	2 m	3	32009				32018			
with benc	protection and connec-	3 m	3	32010				32019			
tion piece	for instrument bracket	4 m	3	32011				32020			
		5 m	3	32012				32021			
		6 m	3	32013				32022			
		8 m	3	32014				32023			
		10 m	3	32015				32052			
		Other			(n reque	est			On re	equest
Extra ch	arges	1 2	PG			- 4-1	Pric	e€			,
	tection hose	Per metre	3								
Calibratio other than	n of the filled system at oper n +20 °C (between +20 and	rating temperatures +100 °C), with dial	3								
other thar	n of the filled system at oper n +20 °C (between > 100 an marking t _A = x °C		3								
	ssure transmission liquids	Application area / operating temperature range 3)	3								
FM 01	Silicone oil	-20/+200 °C	3								
FM 02	Silicone oil	-90/+100 °C	3								
FM 03	Glycerine	0/230 °C	3								
FM 04	Glycerine/water	-10/+120 °C	3								
FM 05	Almond oil	-10/+250 °C	3								
FM 06	High-temperature oil	-10/+300 °C	3								
FM 07	High-temperature oil	-10/+400 °C	3								
FM 08	Halocarbon 4) (for oxygen or chlorine)	-40/+175 °C	3								
FM 09	Paraffin oil (FDA-compliant)	-20/+220 °C	-				Stand	dard			
FM 10	Neobee® M20 (FDA-compliant)	-20/+200 °C	3								
Accesso	ries			Version	PG	Part no.	Price €	Version	PG	Part no.	Price *
Adapter for instrument connection with thread and filling port, for welding to chemical seal		(a)		Instrument connection G¼ female	3	32003		Instrument connection G½ female	3	32004	
Cooling e both ends factory-fit	lement, can be welded at s (only suitable for ting)			Up to T _{max} medium 200 °C (Ø 27)	3	32005		Up to T _{max} medium 300 °C (Ø 40)	3	32006	
Cooling element, screw connection at both ends G½ female x male				Up to T _{max} medium 200 °C (Ø 27)	3	31420		Up to T _{max} medium 300 °C (Ø 40)	3	31421	

¹⁾ For differential pressure measuring instruments = twice the fitting price.

Blue part no. = in-stock items



²⁾ Please enquire for other makes or measuring instruments.

³⁾ Only at positive overpressure.

⁴⁾ Up to a maximum of 160 bar.





Pressure transducers with SIL assessment



Pressure transducers OEM version



Pressure transducers for process engineering



HydroFox® for level measurement

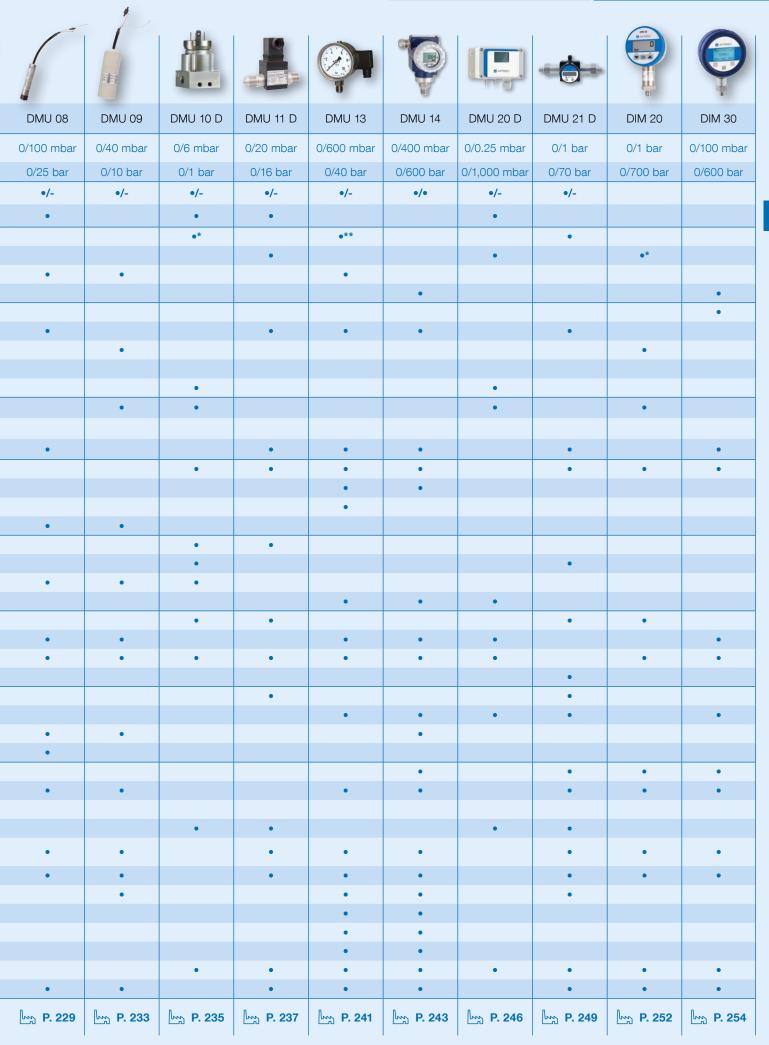
CHAPTER 3

Electronic pressure measuring instruments: pressure transducers, digital pressure gauges, pressure switches

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		DMU 600/20	DMU 01	DMU 02	DMU 02 Vario	DMU 03	DMU 04	DMU 05 P	DMU 07
Smallest measuring range		0/4 bar	0/1 bar	0/600 mbar	0/1 bar	0/100 mbar	0/100 mbar	0/100 mbar	0/40 mbar
Largest measuring range		0/40 bar	0/400 bar	0/2,000 bar	0/1000 bar	0/600 bar	0/400 bar	0/600 bar	0/20 bar
4–20 mA / HART	ont	•/-	•/-	•/-	•/-	•/-	•/-	•/-	•/-
0–10 V	Output	•	•	•		•	•	•	•
≤ ± 1% FSO		•							
≤ ± 0.5% FSO	racy		•	•					
≤ ± 0.35% FSO	Accuracy				•	•	•		•
≤ ± 0.1% FSO								•	
Stainless steel				•	•				
Stainless steel, FKM	parts					•	•	•	
Stainless steel, ceramic (AL2O3), FKM	Wetted parts		•						•
Stainless steel, silicon, glass, silicone	Wet	•							
Aluminium, silicon, glass, silicone, PUR									
No pressure transmission liquid	lre sion	•	•	•					•
Paraffin oil, FDA	Pressure transmission				•		•		
Silicone oil	trar					•		•	
0 " " "			•	•	•	•	•	•	•
Hygienic connections	ss co				•		•		
Flanges	Process con- nection				•				
Capitierelible preses									
ISO 4400 connector	-uo	•	•	•	•	•	•	•	•
M12 x 1	cal c	•	•	•	•	•	•		•
Fixed cable connection	Electrical con- nection	•	•	•		•	•		•
ŭ									•
Temperature of the medium ≥ 100 °C	area		•	•	•	•	•	•	•
Temperature of the medium > 100 °C	Application area	•							
Temperature of the medium > -25 °C	pplic	•	•				•	•	•
Temperature of the medium ≥ -25 °C	Ā			•	•	•			•
Measuring range spread	on				•				
Indication of measured values ATEX certificate	Evaluation			•					
SIL assessment	EV8		***				•		•
Negative pressure (vacuum)		•	•	•	•	•	•	•	
Relative pressure measurement		•	•	•	•	•	•	•	•
Absolute pressure measurement		•	•		-	•	•	•	
Differential pressure measurement									
Measurement of water / waste water	eas	•	•	•	•	•	•	•	•
Measurement of oils	Application areas	•	•	•	•	•	•	•	•
Measurement of chemicals	licatio			•	•				
Measurement of food	App				•		•		
Measurement of pharmaceuticals					•		•		
Measurement of crystallising media					•		•		•
Measurement of gases		•	•	•	•	•	•	•	•
Measurement of liquids		•	•	•	•	•	•	•	•
* Depends on measuring range. ** Accuracy of mechanical local display. *** Depends on version.		P. 202	P. 204	P. 208	P. 210	P. 217	P. 221	P. 223	P. 227



Pressure transducers

Application Pressure transducers are used for electronic pressure measurement in many industrial and building applications. Various measuring principles, output signals, materials, pressure transmission liquids and process connections allow pressure transducers to be used in almost any application. Pressure transducer versions are available for abrasive, pure, highly viscous, viscous or crystallising media as well as special models for hygienic processes.

Typical applications • Pneumatic/hydraulic

- areas Gas industry
 - Process engineering
 - Pharmaceutical and biotechnology application
 - Chemical industry and petrochemical industry
 - Medical technology
 - Laboratory applications
 - Food applications
 - Water treatment
 - Waste water applications
 - Mechanical and plant engineering
 - Automation
 - Filter monitoring
 - Heating, refrigeration, air conditioning
 - Automotive industry



Connection technology with numerous versions, diffusion-tight and extremely robust: pressure transducer DMU 02 Vario

Description Pressure transducers convert physical pressure into an electrical signal proportional to the pressure. Different pressure transducer versions are available which use a variety of measuring principles serving as the basis for sensing the pressure.

Measuring principle and measuring cell



An isolation layer made of non-conductive silicon oxide is coated to the stainless steel diaphragm (a high-precision part calculated in view of the force path) on the side facing away from the pressure; after that, polysilicon is deposited. Semiconductor resistors are etched from this layer; a gold layer provides contacts. When pressure is applied and causes a deflection, the resistance changes. As compared to conventional strain gauges (conductors), polysilicon semiconductor sensors have a higher output signal. Since the measuring cell is made of stainless steel, it can be directly welded to the process connection. This helps to prevent leaks caused by fatigue of the sealing material. These robust measuring cells are insensitive to shock and vibration and have a high resistance to overloads. They are used for pressure measurements from 600 mbar up to several thousand bar.



Pressure transducers with polysilicon stainless steel measuring cells:

DMU 02, 02 Vario

Benefits

- Robust measuring cell
- High resistance to chemicals
- No seal
- No internal transmission liquid
- High output signal
- High long-term stability
- Shock- and vibration-resistant





Measuring principle and measuring cell



Piezo-resistive silicon measuring cells

The function principle of piezo-resistive silicon measuring cells is based on a silicon chip with measuring resistors in the diaphragm. When pressure is applied and causes a deflection, the resistance changes.

As opposed to open measuring cells which can only be used with certain, non-corrosive media, the silicon chips of encapsulated measuring cells are contained in a gas-evacuated protective housing filled with transmission liquid; this housing is closed with an elastic diaphragm at the pressure side. If the diaphragm is deflected as a result of the application of pressure, the transmission liquid is displaced towards the sensor.

Silicon measuring cells are highly sensitive and have a high output signal. This allows for measurements at very low pressures and provides for high chemical resistance.

Pressure transducers with encapsulated silicon stainless steel measuring cells: DMU 03, 04, 05, 08, 11, 12, 14

Pressure transducers with open silicon measuring cells:

DMU 10 D, 600/20

Benefits

- High resistance to chemicals
- High output signal
- Very small measuring ranges possible
- High accuracy



Measuring principle and measuring cell





Aluminium oxide (Al_2O_3) that is resistant to almost all chemicals is used for ceramic measuring cells. Piezo-resistive thick-film measuring cells consist of a base and a diaphragm made of aluminium oxide ceramic. During the production process, measuring resistors are burnt into the side of the diaphragm facing away from the medium; they change when pressure is applied to the diaphragm and causes a deflection. Ceramic thick-film measuring cells are used for medium pressure from 1 bar to up to 400 bar.

Capacitance ceramic measuring cells use a ceramic base and a ceramic diaphragm which are gold-coated on the side facing away from the pressure. The gold coating forms the electrode pair of a capacitor; they are positioned at a distance of just a few µm away from each other. Pressure causes a deflection of the diaphragm and the capacitance changes. Capacitance ceramic measuring cells are used for low pressures from 100 mbar to up to 60 bar; they have a high overload resistance.

Both measuring cell types are mounted to the process connection via elastomer seals. The use of ceramic measuring cells is only limited by the chemical resistance of the seals. Different pressure loads and pressure measuring ranges can be obtained by varying the thickness of the diaphragm.

Pressure transducers with piezo-resistive thick-film ceramic measuring cells: DMU 01K, 01, 01 VM and DIM 20, DMU 13

Pressure transducers with capacitance ceramic measuring cells: $\mathsf{DMU}\ \mathsf{07},\ \mathsf{09}$

Benefits

- Robust measuring cell
- High resistance to chemicals
- Abrasion-resistant
- No internal transmission liquid
- No chemical seal required





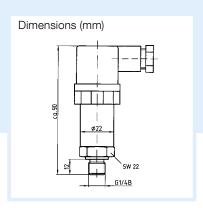
Pressure transducers DMU 600/20 Compact version

- Special OEM unit
- Compact design
- Superior price/performance ratio due to automated large-scale production
- High pressure resistance
- Without transmission liquid









Application Electronic pressure measurement for media such as air, chemical gases (humidity: 0 to 85 % rH, not condensing), water, oil, petrol. Not suitable for media which react with glass, silicon, stainless steel 304 or silicone glue.

Description

Pressure transducers convert physical pressure into an electrical signal proportional to the pressure. DMU 600/20 is equipped with a piezo-resistive silicon measuring cell.

specifications

Technical Measuring accuracy

Deviation from the characteristic curve according to IEC 60770 - limit point calibration (non-linearity, hysteresis, repeatability): <±1 % FSO

Measuring ranges

Relative pressure: 0/4 bar to 0/40 bar

Overpressure safety

At least 2 x FS

(burst pressure at least 2 x FS)

Operating temperature range

Medium: -25/+85 °C -25/+85 °C Ambient: -40/+85 °C Storage:

Temperature error band

In compensated range -10/+70 °C < 0.2 % FSO/10 K

Dynamic characteristics

Response time < 1 ms

Process connection

G1/4B, DIN 3852 type E

Options • Other measuring ranges

- Other process connections
- Other electrical connections
- Fixed cable connection
- Other output signals e.g. 0-10 V, 1-5 V
- Absolute pressure version

Materials

Stainless steel 304 Housing: Pressure connection: Stainless steel 304 Diaphragm: Silicon, glass Seal: Silicone

Supply voltage

DC 9-32 V

Output signal

4-20 mA, 2-wire

Load

 $4-20 \text{ mA} \leq \frac{U_B - U_{Bmin}}{2}$ 0.02 A

Current input

4-20 mA < 25 mA

Electrical protection

Short circuit proof and protected against reverse polarity

Electrical connection/degree of protection

Connector and junction box as per ISO 4400 (DIN 43650-A), IP 65

CE conformity (EMC)

EMC Directive 2014/30/EU

DG: H. PG: 4

Da. 11, 1 a. +				
Measuring range		ity	Part no.	Price €
0/4 bar	50	-	33005	
0/6 bar	50	-	33006	
0/10 bar	50	-	33007	
0/16 bar	50	-	33008	
0/25 bar	50	-	33009	
0/40 bar	50	-	33010	

Minimum order quantity 50 pieces Blue part no. = in-stock items



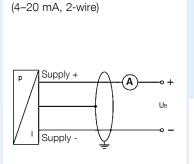
Pressure transducers DMU 01K Compact version

- Special OEM unit
- Proven ceramic technology
- No mechanical ageing of the measuring cell
- Superior price/performance ratio due to automated large-scale production
- Compact design
- Without transmission liquid









Wiring diagram

Application

For electronic pressure measurement in industrial or HVAC applications (such as hydraulic, pneumatic, automation, heating or air conditioning).

Description

Pressure transducers convert physical pressure into an electrical signal proportional to the pressure. DMU 01K is equipped with a piezo-resistive thick-film ceramic measuring cell.

specifications

Technical Measuring accuracy

Deviation from the characteristic curve according to IEC 60770 - limit point calibration (non-linearity, hysteresis, repeatability): < ±1 % FSO

Measuring ranges

Relative pressure: 0/1.6 to 0/250 bar

Overpressure safety

At least 2 x FS

except for 250 bar: Overload max. 400 bar (burst pressure at least 3 x FS)

Operating temperature range

Medium: -25/+125 °C Ambient: -25/+85 °C -40/+85 °C Storage:

Temperature error band

In compensated range

 $-25/+85 \text{ °C} \le 0.5 \text{ % FSO/10 K (typ.)}$

Dynamic characteristics

Response time: 2-wire: ≤ 10 ms 3-wire: ≤ 3 ms

Process connection

G1/4B, DIN 3852 type E

Material

Housing: Stainless steel 304 Pressure connection: Stainless steel 304 Diaphragm: Ceramic (Al₂O₃ 96 %)

Seal: FKM (Viton)

- **Options** Fixed cable connection
 - Other output signals
 - Other connection threads
 - Output signal 0-10 V, 3-wire

Supply voltage

2-wire DC 8-32 V

Output signal

4-20 mA, 2-wire

Load

2-wire: $R_{\text{max}} = \left[\left(U_{\text{B}} - U_{\text{Bmin}} \right) / \ 0.02 \ A \right] \, \Omega$

Current input

4-20 mA < 25 mA

Electrical protection

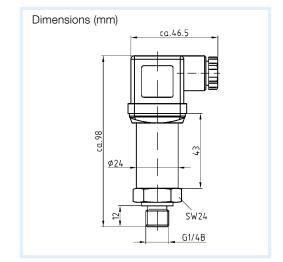
Short circuit proof and protected against reverse

Electrical connection/degree of protection

Connector and junction box as per ISO 4400 (DIN 43650-A), IP 65

CE conformity (EMC)

EMC Directive 2014/30/EU







Pressure transducers DMU 01 Standard version



- Proven ceramic technology
- No mechanical ageing of the measuring cell
- No transmission liquid
- Versions for relative pressure and absolute pressure
- Small temperature error









Application For electronic pressure measurement in industrial applications (such as hydraulic and pneumatic applications as well as mechanical and plant engineering).

Description

Pressure transducers convert physical pressure into an electrical signal proportional to the pressure. DMU 01 is equipped with a piezo-resistive thick-film ceramic measuring cell.

specifications

Technical Measuring accuracy

Deviation from the characteristic curve according to IEC 60770 - limit point calibration (non-linearity, hysteresis, repeatability): < ±0.5 % FSO (measuring range -1/0 bar $< \pm 1 \%$ FSO)

Measuring ranges

Relative pressure: -1/0 to 0/400 bar Absolute pressure: 0/1 to 0/400 bar

Overpressure safety

At least 2 x FS, except for: ■ 250 bar: Overload 400 bar ■ 400 bar: 650 bar (burst pressure at least 3 x FS, except 400 bar: burst pressure = 1,000 bar)

Operating temperature range

Medium: -25/+125 °C Ambient: -25/+85 °C Storage: -40/+85 °C

Temperature error band

In compensated range -25/+85 °C $\leq \pm 0.3$ % FSO/10 K

Dynamic characteristics

Response time 2-wire ≤ 10 ms ≤ 3 ms 3-wire

Process connection

G1/2B (EN 837-1/7.3) or G1/2B DIN 3852 type E with flush diaphragm (DMU 01 VM up to max. 0/25 bar, enquire for absolute pressure ranges)

- **Options** Fixed cable connection
 - Other output signals
 - Other connection threads
 - SIL 2 (IEC 61508/61511) 2-wire, for DMU 01 VM



Materials

Housing: Stainless steel 304 Pressure connection: Stainless steel 304 Diaphragm: Ceramic (Al₂O₃ 96 %) FKM (Viton) Seal:

Supply voltage

2-wire DC 8-32 V 3-wire DC 14-30 V

Output signal

4-20 mA, 2-wire 0-10 V, 3-wire

Load

2-wire: $R_{\text{max}} = [(U_{\text{B}} - U_{\text{Bmin}}) / 0.02 \text{ A}] \Omega$ 3-wire: $R_{min} = 10 \text{ k}\Omega$

Current input

4-20 mA < 25 mA 0-10 V < 7 mA

Electrical protection

Short circuit proof and protected against reverse polarity

Electrical connection/degree of protection

Connector and junction box as per ISO 4400 (DIN 43650-A, EN 175301-803), IP 65)

CE conformity (EMC)

EMC Directive 2014/30/EU

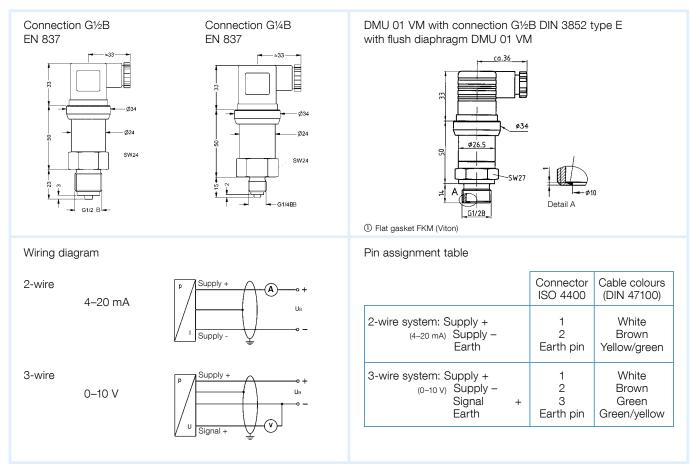




Mechanical engineering

Pressure transducers DMU 01

Dimensions (mm) and electrical connections



The units are shipped with a detailed connection diagram.

Pressure transducers DMU 01

DG: H, PG: 4

Туре	DMU 01 K	DMU 01	DMU 01 VM
Version			
Measuring principle	Piezo-resistiv	ve thick-film ceramic	measuring cell.
Measuring accuracy (IEC 60770)	1 % FSO	0.5 % FSO (-1/0 bar 1 % FSO)	0.5 % FSO
Wetted parts	Cera	mic/stainless steel 30)4/FKM
Connection	G¼B DIN 3852 type E	G½B EN 837	G½ DIN 3852 type E with flush diaphragm
Supply voltage	DC 8-32 V	DC 8-32 V	DC 8-32 V
Output	4–20 mA	4–20 mA	4–20 mA
System	2-wire	2-wire	2-wire
Electrical connection	Connector and jun	ction box as per ISO	4400 (DIN 43650-A)
Measuring range	Part no.	Part no.	Part no.
Price €			
-1/0 bar		31114	31619
-1/+1.5 bar	31608	31616	31620
-1/+3 bar	31609	31617	31621
-1/+5 bar	31610	31618	31622
Price €			
0/1 bar		31115	31623
0/1.6 bar	31511	31116	31624
0/2.5 bar	31512	31117	31625
0/4 bar	31513	31118	31626
0/6 bar	31514	31119	31627
0/10 bar	31515	31120	31628
0/16 bar	31516	31121	31629
0/25 bar	31517	31122	31630
0/40 bar	31518	31123	
0/60 bar	31611	31124	
0/100 bar	31612	31125	
Price €			
0/160 bar	31613	31126	
0/200 bar		31878	
0/250 bar	31614	31127	
0/400 bar		31128	
0/600 bar			

^{*} Delivery only in packing units of 10 pieces per measuring range.

Blue part no. = in-stock items

Extra charges for pressure transducers DMU 01

Mechanical engineering

DG: H

Туре	DMU 01	DMU 01 VM
Version		
	Price €	Price €
Connection G½B DIN 3852 type E	Frice €	Standard
Connection G¼B EN 837 type E		
Connection 1/4-18 NPT		
Connection ½-14 NPT		
Other connections	On request	On request
Suitable for oxygen (≤ 25 bar)		
Fixed cable connection 2 metres		
Cable extension per metre		
Output 0-10 V, 3-wire		
Other output signals	On request	On request
Absolute pressure (measuring ranges according to data sheet)		
SIL 2 (4-20 mA only)		



Pressure transducers DMU 02 Industrial version



- Extremely resistant to shock, pulsation and vibration
- High overload safety
- Dynamic pressure resistance at high load changes
- Wetted area without seals due to welding
- No transmission liquid







Application For electronic pressure measurement in industrial applications, e.g. hydraulic, pneumatic, gas industry, refrigeration, automation, medical, as well as general mechanical and plant engineering applications.

Description

Pressure transducers convert physical pressure into an electrical signal proportional to the pressure. DMU 02 is equipped with a piezo-resistive polysilicon thin-film measuring cell.

Technical Measuring accuracy

specifications Deviation from the characteristic curve according to IEC 60770 - limit point calibration (non-linearity, hysteresis, repeatability): <±0.5 % FSO

Measuring ranges

Relative pressure: -1/0 to -1/+24 bar 0/0.6 to 0/2000 bar

Overpressure safety

≤ 250 bar at least 2 x FS (burst pressure at least 3 x FS) ≤ 250 bar at least 1.5 x FS (burst pressure at least 2 x FS) ≥ 1,000 bar at least 1.2 x FS (burst pressure at least 1.5 x FS)

Operating temperature range

-40/+125 °C Medium: -40/+105 °C Ambient: Storage: -40/+125 °C

Temperature error band

In compensated range -20/+85 °C ≤ 0.15 % FSO/10 K

Dynamic characteristics

Response time < 1 ms

Process connection

G1/2B (EN 837-1/7.3)

- **Options** Other connection threads
 - Fixed cable connection
 - Other connectors
 - Other output signals
 - Cleaned for oxygen
 - EX version (II 1G Ex ia IIB T4) (Ex)

Material

Stainless steel 304 Housing: Pressure connection: Stainless steel 630 Without Seal:

Supply voltage

DC 9-32 V

EX version: DC 20-27 V

Output signal

4-20 mA, 2-wire 0-10 V, 3-wire

Load

 $4-20 \text{ mA} \leq \frac{U_B - U_{Bmin}}{}$ 0.02 A

At least 100 Ohm with EX version 0-10 V > 5 kOhm

Current input

4-20 mA < 25 mA 0-10 V < 20 mA

Electrical protection

Short circuit proof and protected against reverse polarity

Electrical connection/degree of protection

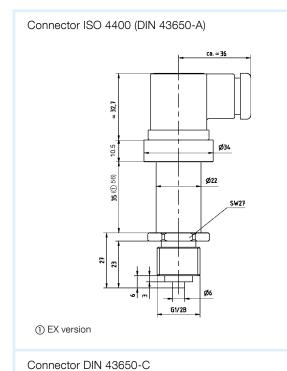
Connector and junction box as per ISO 4400 (DIN 43650-A), IP 65

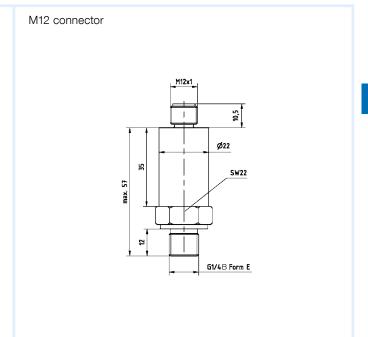
CE conformity (EMC)

EMC Directive 2014/30/EU

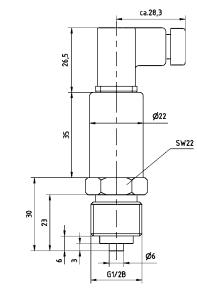
Pressure transducers DMU 02

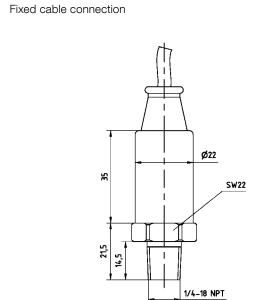
Dimensions (mm) and electrical connections





Process engineering





Pin assignment table	Electrical connections					
	ISO 4400 (DIN 43650-A, EN 175301-803)	M 12 x 1 (4-pin) EN 61076-2-101	Cable outlet			
2-wire system: Supply +	1	1	Red			
Supply –	2	3	Black			
Earth	Earth contact	_	_			
3-wire system: Supply +	1	1	Red			
Supply -	2	3	Black			
Signal	3	4	White			
Earth	Earth pin	_	_			

The units are shipped with a detailed connection diagram.



Pressure transducers DMU 02 Vario (programmable)



- Connection technology with numerous versions
- Extremely resistant to shock, pulsation and vibration
- Best dynamic pressure resistance at high load changes
- Measuring cell welded without seals
- Without transmission liquid
- Turn Down 1:4
- Zero calibration via magnet







Application For electronic pressure measurement in mechanical and plant engineering applications, gas applications and medical technology. Particularly suitable for pure media.

Description Pressure transducers convert physical pressure into an electrical signal proportional to the pressure. DMU 02 Vario is equipped with a piezo-resistive polysilicon thin-film measuring cell. All standard electrical connection types are available. The measuring ranges can be changed via optional parameterisation hardware and software. The zero point can be corrected from the outside via a permanent magnet after voltage has been supplied and within a given time window.

Technical Measuring accuracy

specifications Deviation from the characteristic curve according to IEC 60770 limit point calibration (non-linearity, hysteresis, repeatability): <±0.3 % FSO

Measuring ranges

Relative pressure: -1/0 to -1/+24 bar 0/1 bar to 0/1,000 bar

Overpressure safety

≤ 250 bar at least 2 x FS (burst pressure at least 3 x FS) > 250 bar at least 1.5 x FS (burst pressure at least 2 x FS) 1000 bar at least 1.2 x FS (burst pressure at least 1.5 x FS)

Operating temperature range

Medium: -40/+125 °C -40/+105 °C Ambient: -40/+125 °C Storage:

Temperature error band

In compensated range -10/+80 °C < 0.15 % FSO/10 K

Dynamic characteristics

Response time < 4 ms (without flush diaphragm)

- **Options** Other process connections
 - Other electrical connections
 - Field housing (stainless steel)
 - Cleaned for oxygen
 - Other output signals

Process connection

G1/2B (EN 837-1/7.3)

Material

Housing: Stainless steel 304 Pressure connection: Stainless steel 630/

316 Ti/316 L

Seal: Without

Supply voltage

DC 9-32 V

Output signal

4-20 mA, 2-wire

 $4-20 \text{ mA} < \frac{U_B - U_{Bmin}}{\cdot}$ 0.02 A

0-10 V > 5 kOhm

Current input

< 25 mA

Electrical protection

Short circuit proof and protected against reverse polarity

Electrical connection/degree of protection

Connector and junction box as per ISO 4400 (DIN 43650-A), IP 65

CE conformity (EMC)

EMC Directive 2014/30/EU

- Fitting of chemical seal
- Customer-specific setting (damping, unit)
- Programmable hardware and software
- Other operating temperature ranges



See page 212 for dimensions. See page 213 for prices.



Pressure transducers DMU 02 Vario (flush)



- Ideal for hygienic processes
- Connection technology with numerous versions
- Extremely resistant to shock, pulsation and vibration
- Best dynamic pressure resistance at high load changes
- Zero calibration via magnet









Application For electronic pressure measurement in mechanical and plant engineering applications, gas applications, medical technology. With flush diaphragm, the pressure transducers are also suitable for use with viscous, highly viscous or crystallising media.

Description

Pressure transducers convert physical pressure into an electrical signal proportional to the pressure. DMU 02 Vario is equipped with a piezo-resistive polysilicon thin-film measuring cell. DMU 02 Vario is available in a virtually unlimited number of versions. All standard and customer-specific connections can be connected to the electronic precision measuring system. All standard electrical connection types are available. The zero point can be corrected from the outside via a permanent magnet after voltage has been supplied and within a given time window.

Technical specifications

Measuring accuracy

Deviation from the characteristic curve according to IEC 60770 limit point calibration (non-linearity, hysteresis, repeatability): <±0.3 % FSO

Measuring ranges

Relative pressure: -1/0 to -1/+24 bar 0/1 bar to 0/600 bar

Overpressure safety

≤ 250 bar at least 2 x FS (burst pressure at least 3 x FS) > 250 bar at least 1.5 x FS (burst pressure at least 2 x FS)

Operating temperature range

Medium: -10/+125 °C Ambient: -10/+105 °C -10/+125 °C Storage:

Temperature error band

In compensated range 0/70 °C < 1.5 % FSO/10 K

Dynamic characteristics

Response time < 20 ms

Process connection

G1/2B DIN 3852 A with O ring (FBO); Clamp (CP); dairy fitting (MR); Varivent (VT); NEUMO BioControl (BC); Flange connection (FT)

Material

Housing: Stainless steel 304 Pressure connection: Stainless steel 316 L Seal: Without

Diaphragm: Stainless steel 316 L

Pressure transmission liquid Multi-grade oil, FDA-compliant

Supply voltage DC 9-32 V

Output signal

4-20 mA, 2-wire

Load $4-20 \text{ mA} < \frac{U_B - U_{Bmin}}{2}$ 0.02 A

Current input

< 25 mA

Electrical protection

Short circuit proof and protected against reverse polarity

Electrical connection/degree of protection

Connector and junction box as per ISO 4400 (DIN 43650-A), IP 65

CE conformity (EMC)

EMC Directive 2014/30/EU



See page 212 for dimensions. See page 213 for prices.

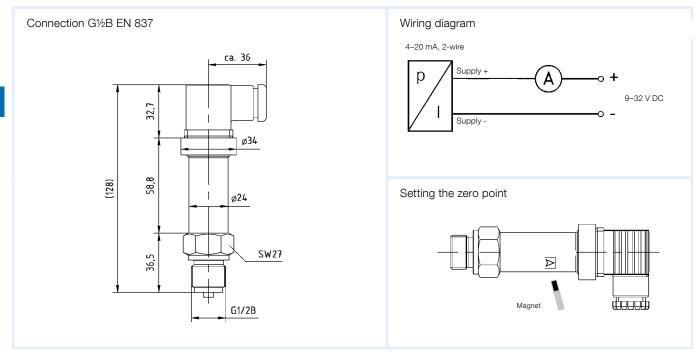
- Options Other process connections
 - Other electrical connections
 - Field housing (stainless steel)
 - Filling for oxygen

- Other output signals
- Customer-specific setting (damping, unit)

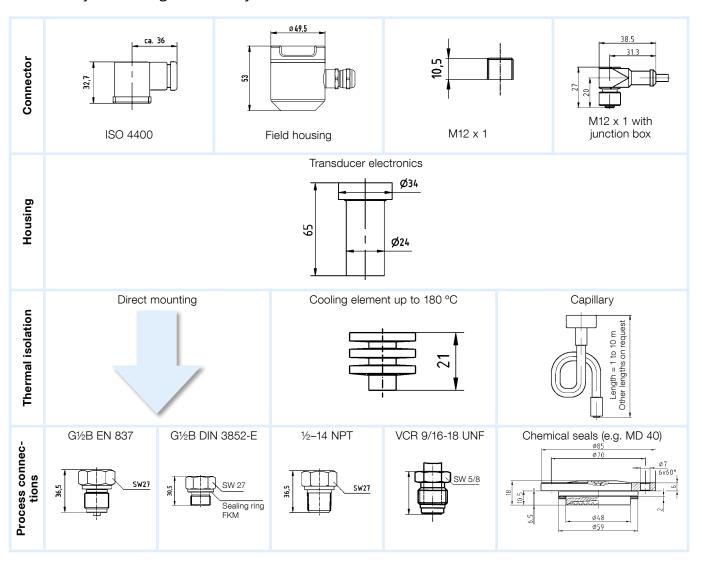


Pressure transducers DMU 02 Vario

Dimensions (mm) and electrical connections



Modular system for great variety of versions



Pressure transducers DMU 02/DMU 02 Vario

DG: H, PG: 4

Туре	DMU 02	DMU 02 HD High pressure	DMU 02 Vario Programmable*	DMU 02 Vario FBO flush with O ring	DMU 02 Vario CP Clamp		
Version				<u> </u>			
VOLGIGIT				2.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	\rightleftharpoons		
Measuring principle		Piezo-resistive poly	silicon stainless steel	ess steel measuring cell (thin-film)			
Measuring accuracy (IEC 60770)	0.5 % FSO	0.5 % FSO		0.3 % FSO			
Wetted parts	Stainless steel 630	Stainless steel 630	Stainless steel 630/316 L	Stainless steel 316 L/ FKM	Stainless steel 316 L		
Connection	G1/2B EN 837	M18 x 1.5 male	G1/2B EN 837	G1/2B DIN 3852-A	ISO 2852 1"		
Supply voltage			DC 9-32 V				
Output			4-20 mA				
System			2-wire				
Electrical connection		Connector and ju	unction box as per ISC	O 4400 (DIN 43650-A)			
Offset error compensation			Subsequent zero	calibration via magnet	from the outside		
Measuring range	Part no.	Part no.	Part no.	Part no.	Part no.		
Price €							
-1/0 bar	32801		32833	32863	32892		
-1/+1.5 bar	32802		32834	32864	32893		
-1/+3 bar	32803		32835*	32865	32894		
-1/+5 bar	32804		32836	32866	32895		
-1/+9 bar	32805		32837*	32867	32896		
-1/+24 bar	32806		32838*	32868	32897		
Price €							
0/600 mbar	32807		32841				
Price €							
0/1 bar	32808		32842*	32872	32901		
0/1.6 bar	32809		32843	32873	32902		
0/2.5 bar	32810		32844*	32874	32903		
0/4 bar	32811		32845	32875	32904		
0/6 bar	32812		32846	32876	32905		
0/10 bar	32813		32847*	32877	32906		
0/16 bar	32814		32848	32878	32907		
0/25 bar	32815		32849	32879	32908		
0/40 bar	32816		32850*	32880	32909		
0/40 bar 0/60 bar	32817		32851	32881	32909		
0/100 bar	32818		32852	32882			
Price €	02010		02002	02002			
0/160 bar	32819		32853*	32883			
0/160 bar 0/250 bar	32820		32854	32884			
0/250 bar 0/400 bar							
	32821		32855	32885			
0/600 bar	32822		32856	32886			
0/1,000 bar	32823		32857*				
0/1,600 bar		32829					
0/2,000 bar		32830					

^{*} Programmable turn down 1:4 via optional programming tool (no asterisk = fixed measuring range)

Blue part no. = in-stock items



See pages 215/216 for extra charges.



Pressure transducers DMU 02 Vario

DG: H, PG: 4

Туре	DMU 02 Vario CP Clamp	DMU 02 Vario MR Dairy fitting	DMU 02 Vario VT VARIVENT®	DMU 02 Vario BC NEUMO BioControl®	DMU 02 Vario FL Flange
Version					
	<u> </u>		7	1	
Measuring principle		Piezo-resistive polysili	con stainless steel m	easuring cell (thin-film))
Measuring accuracy (IEC 60770)			0.3 % FSO		
Wetted parts	Stainless steel 316 L	Stainless steel 316 L	Stainless steel 316 L	Stainless steel 316 L	Stainless steel 316 L
Connection	ISO 2852 1½"	DIN 11851 DN 25	VARIVENT® F (DN 25 and 1")	NEUMO BioControl® DN 25	EN 1092-1 type B1 DN 25 PN 40
Supply voltage			DC 9-32 V		
Output			4-20 mA		
System			2-wire		
Electrical connection		Connector and june	ction box as per ISO	4400 (DIN 43650-A)	
Offset error compensation		Subsequent zero	calibration via magne	t from the outside	
Measuring range	Part no.	Part no.	Part no.	Part no.	Part no.
Price €					
-1/0 bar	33080	32915	32938	32960	32981
-1/+1.5 bar	33081	32916	32939	32961	32982
-1/+3 bar	33082	32917	32940	32962	32983
-1/+5 bar	33083	32918	32941	32963	32984
-1/+9 bar	33084	32919	32942	32964	32985
-1/+24 bar	33085	32920	32943	32965	32986
Price €					
0/1 bar	33089	32924	32947	32969	32990
0/1.6 bar	33090	32925	32948	32970	32991
0/2.5 bar	33091	32926	32949	32971	32992
0/4 bar	33092	32927	32950	32972	32993
0/6 bar	33093	32928	32951	32973	32994
0/10 bar	33094	32929	32952	32974	32995
0/16 bar	33095	32930	32953	32975	32996
0/25 bar	33096	32931	32954		32997
0/40 bar	33097	32932			32998
0/60 bar					On request
0/100 bar					On request
0/160 bar					On request
0/250 bar					On request

Blue part no. = in-stock items



See pages 215/216 for extra charges.



Extra charges for DMU 02/DMU 02 Vario

Process engineering

DG: H, PG: 4

Туре	DMU 02	DMU 02 HD High pressure	DMU 02 Vario Programm- able	DMU 02 Vario FBO flush with O ring	DMU 02 Vario CP Clamp
Version				The state of the s	
	<u></u>		<u></u>		<u></u>
	Price €	Price €	Price €	Price €	Price €
EX protection II 1G Ex ia IIC T4					
Connection G1/4B EN 837					
Connection G½B DIN 3852 type E	No extra charge		No extra charge		
Connection G1/4B DIN 3852 type E					
Connection G½B DIN 3852 type A	On request		On request		
Connection G1/4B DIN 3852 type A	On request		On request		
Connection 1/4-18 NPT					
Connection ½-14 NPT					
High pressure connection M20 x 1.5 female		No extra charge			
Connection G½B (flush DIN 3852-A)				No extra charge	
Connection G1B (flush DIN 3852 A)				No extra charge	
Connection G1B (flush with O ring DIN 3852 A)				On request	
Connection clamp ISO 2852 2"					
Connection clamp ISO 2852 21/2"					
Other connections and designs (chemical seals)			See chapter 2		
Other materials			On request		
Coatings			On request		
Surface roughness ≤ 0.4 µm for diaphragm					
Weld-in socket G½" for DMU 02 Vario FBO					
High temperature version up to 180 °C					
Capillary tube with spiral hose			See page 190	See page 190	See page 190
Cleaned for oxygen					
Socket DIN 43650-C	No extra charge	No extra charge			
Field housing (stainless steel)					
Circular connector M12x1, 4-pin, A-coded DIN-EN 61076-2-101		On request			
Fixed cable connection 2 metres					
Cable extension per metre					
Right angle socket M12 x 1.5 with 2 m PUR cable, shielded					
Right angle socket M12 x 1.5 with 5 m PUR cable, shielded					
Output 0-20 mA, 3-wire					
Output 0-10 V, 3-wire					
CANopen 2.0A	On request	On request			
Ratiometric 0.5–4.5 V @ 5 VDC					
Other output signals	On request	On request	On request	On request	On request
Calibration report (for measuring accuracy up to 0.3 % FSO)					
Programming hardware and software for DMU 02 Vario					



Extra charges for DMU 02/DMU 02 Vario

DG: H, PG: 4

Туре	DMU 02 Vario MR Dairy fitting	DMU 02 Vario VT VARIVENT®	DMU 02 Vario BC NEUMO BioControl®	DMU 02 Vario FL Flange
Version				
	Price €	Price €	Price €	Price €
Connection DIN 11851 DN 32 / PN 40				
Connection DIN 11851 DN 40 / PN 40*				
Connection DIN 11851 DN 50 / PN 25*				
Connection DIN 11851 DN 65 / PN 25				
Connection DIN 11851 DN 80 / PN 25				
Connection VARIVENT® type N DN 40-125 and 1½"-6"				
NEUMO BioControl® DN 50				
NEUMO BioControl® DN 65				
NEUMO BioControl® DN 80				
Connection EN 1092-1 type B1 DN 40 PN 40				
Connection EN 1092-1 type B1 DN 50 PN 40				
Connection EN 1092-1 type B1 DN 80 PN 40				
Connection EN 1092-1 type B1 DN 100 PN 40				
Connection ASME B 16.5 DN 1" class 150				
Connection ASME B 16.5 DN 11/2" class 150				
Connection ASME B 16.5 DN 2" class 150				
Connection ASME B 16.5 DN 3" class 150				
Connection ASME B 16.5 DN 4" class 150				
Other connections and designs				On request
Other materials	On request	On request	On request	On request
Coatings	On request	On request	On request	On request
Surface roughness ≤ 0.4 µm for diaphragm				
High temperature version up to 180 °C				
Capillary tube with spiral hose	See page 194.	P. 194	P. 194	P. 194
Cleaned for oxygen				
Field housing (stainless steel)				
Circular connector M12 x 1, 4-pin, A-coded EN 61076-2-101				
Other output signals	On request	On request	On request	On request
5-point calibration report (for measuring accuracy up to 0.3 % FSO)				

^{*} See extra charges DMU 04 for sep. union nut.

Blue part no. = in-stock items



Process engineering

Pressure transducers DMU 03 Industrial version



- For low pressure ranges
- Versions for relative pressure and absolute pressure
- Excellent long-term stability
- ATEX version (optional)
- Option SIL 2









Application For electronic pressure measurement in mechanical and plant engineering as well as process engineering applications. With flush diaphragm, the pressure transducers are also suitable for use with viscous, highly viscous media.

Description

Pressure transducers convert physical pressure into an electrical signal proportional to the pressure. DMU 03 is equipped with an oil-filled piezo-resistive silicon measuring cell. DMU 03 has safety integrity level SIL 2 (IEC 61508/61511).

Technical specifications

Measuring accuracy

Deviation from the characteristic curve according to IEC 60770 - limit point calibration (non-linearity, hysteresis, repeatability): < ± 0.35 % FSO (measuring ranges 0/100 mbar to $0/400 \text{ mbar} \le \pm 0.5 \% \text{ FSO}$

Long-term stability

≤ ±0.1 % FSO/year at reference conditions

Measuring ranges

Relative pressure: 0/100 mbar to 0/600 bar Absolute pressure: 0/400 mbar to 0/600 bar HP version: 0/1,000 bar to 0/2,200 bar

Overpressure safety

At least 3 x FS, except for

- 40 bar: Overload = 105 bar
- > 400 bar: Overload = at least 1.5 Burst pressure at least 5 x FS, except for
- 25 bar: Burst pressure = 120 bar
- 400 bar: Burst pressure = 1,250 bar
- > 600 bar: Burst pressure = at least 3 x FS

Operating temperature range

Medium: -40/+125 °C Ambient: -40/+85 °C

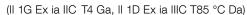
-20/+60 °C In EX zone 0: EX zone 1 and higher: -20/+70 °C

-40/+100 °C Storage:

Temperature error band

- $P_N < 0.4 \text{ bar} \le \pm 1 \% \text{ FSO}$ in compensated range 0/70 °C
- $P_N \ge 0.4$ bar to 40 bar $\le \pm 0.75$ % FSO in compensated range -20/+85 °C
- $P_N \ge 60$ bar to 600 bar $\le \pm 0.75$ % FSO in compensated range 0/70 °C

Options • EX version (Ex)



- Other process connections
- Other electrical connections
- Field housing (stainless steel 303)

Dynamic characteristics

Response time 2-wire ≤ 10 ms

3-wire ≤ 3 ms

Process connection

G1/2B (EN 837-1/7.3) / DIN 3852-E with flush diaphragm (0/100 mbar to 0/40 bar)

Materials

Stainless steel 316 L Housina: Pressure connection: Stainless steel 316 L Diaphragm: Stainless steel 316 L Seal: FKM (Viton)

Pressure transmission liquid

Silicone oil

Output signal/supply voltage

4-20 mA, 2-wire DC 8-32 V ATEX version DC 10-28 V 0-20 mA, 3-wire DC 14-30 V 0-10 V, 3-wire DC 14-30 V

Load

 $4-20 \text{ mA: } R_{max} = [(U_B - U_{Bmin}) / 0.02 \text{ A}] \Omega$

 $0-20 \text{ mA} \leq 500 \Omega$ $0-10 \text{ V} > 10 \text{ k}\Omega$

Current input

4-20 mA < 25 mA 0-20 mA < 25 mA 0-10 V < 7 mA

Electrical protection

Short circuit proof and protected against reverse polarity

Electrical connection/degree of protection

Connector and junction box as per ISO 4400 (DIN 43650-A), IP 65

CE conformity (EMC)

EMC Directive 2014/30/EU

- Other seal materials
- Higher accuracy and overpressure safety
- Fitting of chemical seal
- SIL 2 (IEC 61508/61511) 2-wire

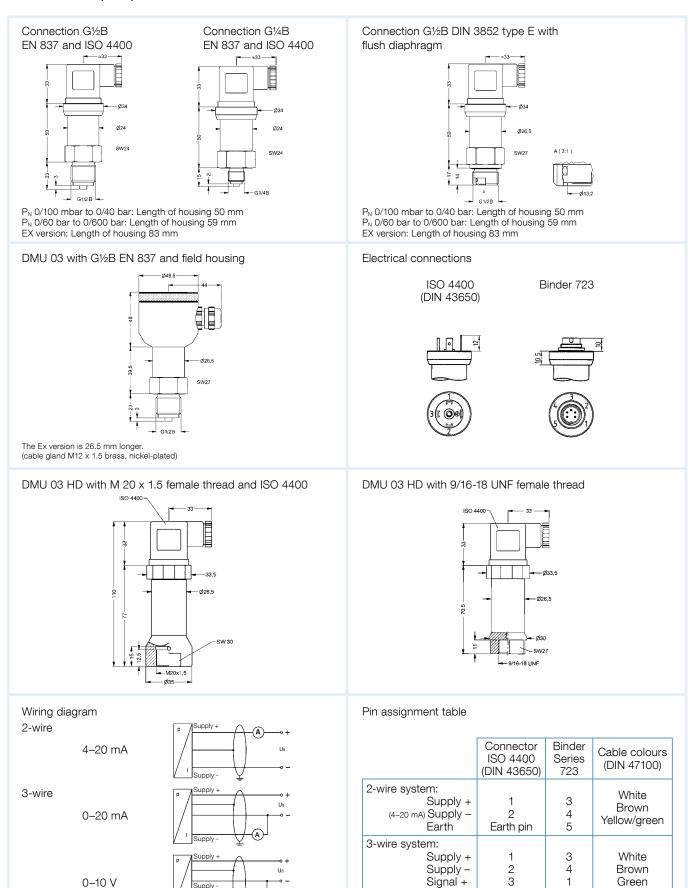




See page 219 for prices.

Pressure transducers DMU 03

Dimensions (mm) and electrical connections



The units are shipped with a detailed connection diagram.



Yellow/green

Earth pin

5

Earth

Pressure transducers DMU 03

DG: H, PG: 4

Туре	DMU 03	DMU 03 VM	DMU 03 HD
Version			
Measuring principle	Piezo-resistive stainles	ss steel measuring cell	Thin film sensor
Measuring accuracy (IEC 60770)	0.35 % FSO (≤ 0.4 bar 0.5 % FSO)	0.35 % FSO (≤ 0.4 bar 0.5 % FSO)	0.35 % FSO
Wetted parts	Stainless	steel 316 L	Stainless steel 630
Connection	G½B EN 837	G½B DIN 3852 type E with flush diaphragm Diaphragm	M 20 x 1.5 female thread
Supply voltage	DC 8-32 V	DC 8-32 V	DC 12-36 V
Output	4–20 mA	4–20 mA	4–20 mA
System	2-wire	2-wire	2-wire
Electrical connection	Connector	and junction box as pe (DIN 43650-A)	r ISO 4400
Measuring range	Part no.	Part no.	Part no.
Price €			
-1/0 bar	31634		
-1/+1.5 bar	31635		
-1/+3 bar	31636		
-1/+5 bar	31637		
Price €			
0/40 mbar	32024		
0/60 mbar	32025		
0/100 mbar	31638	31643	
0/160 mbar	31639	31644	
0/250 mbar	31145	31165	
0/400 mbar	31146	31166	
0/600 mbar	31147	31167	
Price €			
0/1 bar	31148	31168	
0/1.6 bar	31149	31169	
0/2.5 bar	31150	31170	
0/4 bar	31151	31171	
0/6 bar	31152	31172	
0/10 bar	31153	31173	
0/16 bar	31154	31174	
0/25 bar	31155	31175	
0/40 bar	31156	32026	
0/60 bar	31157		
0/100 bar	31158		
Price €			
0/160 bar	31159		
0/250 bar	31160		
0/400 bar	31161		
0/600 bar	31162		
0/1,000 bar			33402
0/1,600 bar			33403

Blue part no. = in-stock items



Extra charges for pressure transducers DMU 03

DG: H

Туре	DMU 03	DMU 03 VM	DMU 03 HD	
Version				
	Price €	Price €	Price €	
EX protection II 1G Ex ia IIC T4				
Connection G1/4B DIN 3852 type E				
Connection G½B DIN 3852 type E	No extra charge	Standard		
Connection G1/4B EN 837 type E				
Connection 1/4-18 NPT				
Connection ½-14 NPT				
Other connections	On request	On request	No extra charge	
Connection 9/16 UNF female thread				
Field housing (stainless steel 303)				
Binder connector 723				
Fixed cable connection 2 metres				
Cable extension per metre				
Output 0-20 mA, 3-wire				
Output 0-10 V, 3-wire				
Other output signals	On request	On request	On request	
Absolute pressure (measuring ranges according to data sheet)				
Measuring accuracy 0.25 % FSO				
5-point measurement report (for measuring accuracy up to 0.25 % FSO)				
Fitting of chemical seal	All measuring ranges, minimum range depends on design of chemical seal			
SIL 2 (4-20 mA only)				







Pressure transducers DMU 04 industrial version



- DMU 04 CP/MR for hygienic processes
- Small temperature error
- Options: ATEX, field housing or high temperature version (up to 300 °C) and SIL 2









Application For applications requiring hygienic process connections, materials or processing, especially food technology, pharmaceutical and biotechnology applications.

Description

Pressure transducers convert physical pressure into an electrical signal proportional to the pressure. DMU 04 is equipped with an oil-filled piezo-resistive silicon measuring cell. DMU 04 has safety integrity level SIL 2 (IEC 61508/61511).

specifications

Technical Measuring accuracy

Deviation from the characteristic curve according to IEC 60770 - limit point calibration (non-linearity, hysteresis, repeatability): < ± 0.35 % FSO (measuring ranges ≤ 0/400 mbar and > 40 bar $< \pm 0.5 \% FSO)$

Measuring ranges

Relative pressure: -1/0 bar, 0/100 mbar to 0/40 bar Absolute pressure: 0/400 mbar to 0/400 bar

Overpressure safety At least 3 x FS, except for

(burst pressure at least 5 x FS), except for

■ 25 bar: Burst pressure = 120 bar

■ 40 bar: Overload = 105 bar

Operating temperature range

Medium: -10/+125 °C

Short-term (60 min) up to 150 °C

Ambient: -40/+85 °C

> In EX zone 0: -20/+60 °C EX zone 1 and higher: -20/+70 °C

-40/+100 °C Storage:

Temperature error band

In compensated range $-20/+85 \, ^{\circ}\text{C} \le \pm \ 0.75 \, \% \, \text{FSO/10 K}$ $(0-50 \text{ °C} < 0.40 \text{ bar} \le \pm 1.5 \% \text{ FSO/10 K})$

Dynamic characteristics

Response time 2-wire ≤ 10 ms 3-wire ≤ 3 ms

Process connections

G1/2B DIN 3852 with flush diaphragm, G1B DIN 3852 with flush diaphragm Clamp 1"/11/2"/2" ISO 2852, Conical dairy fitting DIN 11851 DN 25/40/50 (without union nut)

Materials

Stainless steel 316 L Housing: Pressure connection: Stainless steel 316 L Diaphragm: Stainless steel 316 L

Pressure transmission liquid

Food oil (FDA-compliant)

Output signal/supply voltage

4-20 mA, 2-wire DC 8-32 V EX version DC 10-28 V 0-20 mA, 3-wire DC 14-30 V DC 14-30 V 0-10 V, 2-wire

 $4-20 \text{ mA: } R_{max} = [(U_B - U_{Bmin}) / 0.02 \text{ A}] \Omega$ $0-20 \text{ mA} \le 500 \Omega$

 $0-10 \text{ V} > 10 \text{ k}\Omega$

Current input

4-20 mA < 25 mA 0-20 mA < 25 mA0-10 V < 7 mA

Electrical protection

Short circuit proof and protected against reverse polarity

Electrical connection/degree of protection

Connector and junction box as per ISO 4400 (DIN 43650-A), IP 65

CE conformity (EMC)

EMC Directive 2014/30/EU

- High temperature version up to 300 °C
- Higher accuracy
- Union nut DN 25/40/50
- SIL 2 (IEC 61508/61511) 2-wire





- Options EX version (Ex)
 - (II 1G Ex ia IIC T4 Ga, II 1D Ex ia IIIC T85 °C Da)
 - Other process connections
 - Other electrical connections
 - Field housing (stainless steel 303)

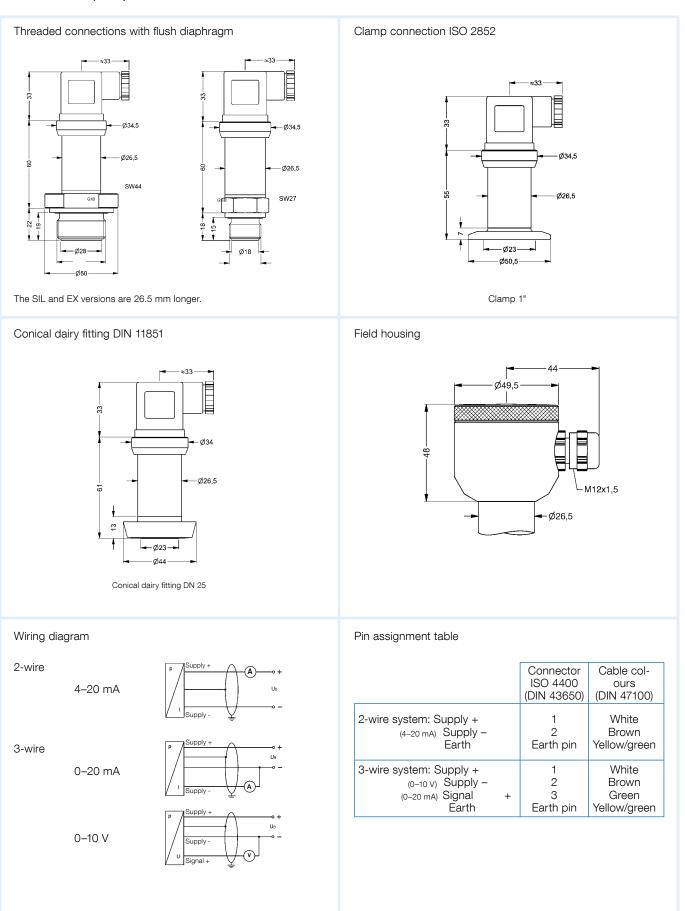


AFRISO



Pressure transducers DMU 04

Dimensions (mm) and electrical connections



The units are shipped with a detailed connection diagram.



Pressure transducers DMU 05 P precision version

- Precision version with outstanding measurement performance
- For applications requiring superior measuring accuracy and long-term stability
- Options: ATEX version or RS 232 interface







Application For electronic pressure measurement in applications requiring high measuring accuracy and long-term stability, such as process engineering, water treatment, laboratory applications as well as measurements of gas consumption and heat energy.

Description

Pressure transducers convert physical pressure into an electrical signal proportional to the pressure. DMU 05 P is equipped with an oil-filled piezo-resistive silicon measuring cell. The intelligent DMU 05 pressure transducers are equipped with digital amplifier electronics (microprocessor and 16 bit A/D converter). DMU 05 P actively compensates for sensor-specific deviations (non-linearity and temperature error), allowing for superior measuring characteristics. DMU 05 can also be supplied with an optional digital RS 232 interface for setting offset, range and damping.

specifications

Technical Measuring accuracy

Deviation from the characteristic curve according to IEC 60770 - limit point calibration (non-linearity, hysteresis, repeatability): < ± 0.1 % FSO

Long-term stability

≤ +0.1 % FSO/year

Measuring ranges

Relative pressure: 0/400 mbar to 0/600 bar Absolute pressure: 0/400 mbar to 0/600 bar

Overpressure safety

At least 2 x FS, 600 bar at least 1.5 x FS (burst pressure at least 5 x FS, ≥ 400 bar at least 2 x FS)

Operating temperature range

-25/+125 °C Medium: -25/+85 °C Ambient: In EX zone 0: -20/+60 °C EX zone 1 and higher: -20/+70 °C

-40/+100 °C Storage:

Temperature error band

In compensated range -20/+80 °C ≤ 0.02 % FSO/10 K

Dynamic characteristics

Response time < 5 ms

Process connection

 $\mbox{G}\slash{\mbox{2}\slash}\mbox{B}$ (EN 837-1/7.3) or $\mbox{G}\slash{\mbox{2}\slash}\mbox{DIN}$ 3852 type E with flush diaphragm (0/400 mbar to 0/40 bar)

Materials

Stainless steel 316 L Housing: Pressure connection: Stainless steel 316 L Diaphragm: Stainless steel 316 L FKM (Viton) Seal:

Pressure transmission liquid

Silicone oil

Output signal/ supply voltage 4-20 mA DC 12-36 V

2-wire

EX version DC 14-28 V

Load

 $4-20 \text{ mA: } R_{\text{max}} = [(U_{\text{B}} - U_{\text{Bmin}}) / 0.02 \text{ A}] \Omega$

Current input

4-20 mA < 25 mA

Electrical protection

Short circuit proof and protected against reverse

Electrical connection/degree of protection

Connector and junction box as per ISO 4400 (DIN 43650-A), IP 65

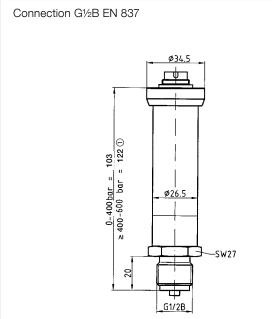
CE conformity (EMC)

EMC Directive 2014/30/EU

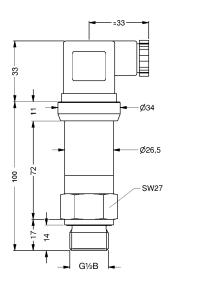
- See page 225 for prices.
- **Options** RS 232 interface in conjunction with Binder connector 723, 7-pin (interface and software required)
 - EX version (
 - (II 1G Ex ia IIC T4 Ga, II 1D Ex ia IIIC T85 °C Da)
- Other process connections
- Other electrical connections
- Other seal materials

Pressure transducers DMU 05 P

Dimensions (mm) and electrical connections

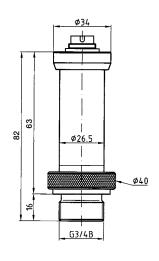


Connection G½B DIN 3852 type E with flush diaphragm



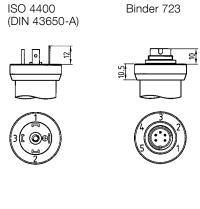
① EX version 161 mm

G¾B DIN 3852 type E Screw-in version for level measurement



Electrical connections / cable outlet

ISO 4400



Pin assignment table		Electrical connections				
		ISO 4400 (DIN 43650)	Binder 723 (5-pin)	Binder 723 (7-pin)	Cable outlet	
2-wire syster	n: Supply + Supply – Earth	1 2 Earth contact	3 4 5	3 1 2	White Brown Yellow/green	
RS 232 ¹⁾ :	RxD TxD CTS GND	-	-	4 5 6 7	-	

¹⁾ Software, interface and cable must be ordered separately. The units are shipped with a detailed connection diagram.

Pressure transducers DMU 04/DMU 05 P

Process engineering

DG: H, PG: 4

Туре	DMU 04	DMU 04	DMU 04 CP	DMU 04 MR	DMU 05 P	DMU 05 P VM
Version						
Measuring principle		Pi	ezo-resistive stainl	ess steel measuring o	cell	
Measuring accuracy (IEC 60770)	0.35 % FSO (< 0.4 bar 0.5 % FSO > 40 bar 0.5 % FSO)	0.35 % FSO (< 0.4 bar 0.5 % FSO > 40 bar 0.5 % FSO)	0.35 % FSO (< 0.4 bar 0.5 % FSO)	0.35 % FSO (< 0.4 bar 0.5 % FSO)	0.1 % FSO	0.1 % FSO
Wetted parts	Stainless ste	el 316 L/FKM	Stainless	s steel 316 L	Stainless ste	el 316 L/FKM
Connection	G1/2B DIN 3852-E with flush diaphragm	G1B DIN 3852-E with flush diaphragm	Clamp 1" ISO 2852	Conical dairy fitting DIN 11851 DN 25 (without union nut)	G½B EN 837	G½B DIN 3852 with flush diaphragm
Supply voltage	DC 8-32 V	DC 8-32 V	DC 8-32 V	DC 8-32 V	DC 12-36 V	DC 12-36 V
Output	4–20 mA	4–20 mA	4–20 mA	4–20 mA	4–20 mA	4–20 mA
System	2-wire	2-wire	2-wire	2-wire	2-wire	2-wire
Electrical connection		Connector	r and junction box	as per ISO 4400 (DIN	l 43650-A)	
Measuring range	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €						
-1/0 bar		31663	31686	31719	31742	
-1/+1.5 bar	31647	31664	31687	31720	31743	
-1/+3 bar	31648	31665	31688	31721	31744	
-1/+5 bar	31649	31666	31689	31722	31745	
Price €						
0/100 mbar		33021			33026	33027
0/160 mbar		33022			31747	31771
0/250 mbar	33016	31669	33023	33025	31748	31772
0/400 mbar	33017	31670	33024	31726	31749	31773
0/600 mbar	33018	31671	31694	31727	31750	31774
Price €	222/2	2.25	2122	0.1=00	2.==.	0
0/1 bar	33019	31672	31695	31728	31751	31775
0/1.6 bar	33020	31673	31696	31729	31752	31776
0/2.5 bar	31651	31674	31697	31730	31753	31777
0/4 bar	31652	31675	31698	31731	31754	31778
0/6 bar	31653	31676	31699	31732	31755	31779
0/10 bar	31654	31677	31710	31733	31756	31780
0/16 bar	31655	31678	31711	31734	31757	31781
0/25 bar Price €	31656	31679		31735	31758	31782
	31657	21600		01706	01750	22000
0/40 bar 0/60 bar	31658	31680 31681		31736	31759 31760	33028
0/100 bar	31659 31660	31682			31761	
0/160 bar 0/250 bar	31661	31683 31684			31762 31763	
	31662	31685				
0/400 bar					31764	
0/600 bar					31765	

Blue part no. = in-stock items



Extra charges for DMU 04/DMU 05 P

DG: H, PG: 4

Туре	DMU 04	DMU 04	DMU 04 CP	DMU 04 MR	DMU 05 P	DMU 05P VM			
Version									
	Price €	Price €	Price €	Price €	Price €	Price €			
EX protection II 1G Ex ia IIC T4									
Clamp 11/2" ISO 2852			No extra charge						
Clamp 2" ISO 2852									
Conical dairy fitting DIN 11851 DN 40									
Conical dairy fitting DIN 11851 DN 50									
Sep. union nut DIN 11851 DN 25									
Sep. union nut DIN 11851 DN 40									
Sep. union nut DIN 11851 DN 50									
G1B with conical seal									
Other process connections	On request	On request	On request	On request	On request	On request			
High temperature version up to +300 °C									
Field housing (stainless steel 303)									
Binder connector 723, 5-pin									
Fixed cable connection 2 metres									
Cable extension per metre									
Output 0-20 mA, 3-wire									
Output 0-10 V, 3-wire									
Other output signals	On request	On request	On request	On request	On request	On request			
Absolute pressure (measuring ranges according to data sheet)									
Measuring accuracy 0.25 % FSO									
5-point measurement report (for measuring accuracy up to 0.25 % FSO)									
RS 232 interface*									
Programming interface and software					On request	On request			
SIL 2 (4–20 mA only)									

 $^{^{\}ast}$ Only in conjunction with Binder connector 723





Pressure transducers HydroFox® DMU 07 for level measurement



- Flush diaphragm
- Without transmission liquid
- Mechanically insensitive ceramic sensor
- Small temperature error
- High overpressure safety









Application For continuous electronic level measurement of liquids and for pressure measurement of liquids and gases in plant engineering.

Description

Pressure transducers convert physical pressure into an electrical signal proportional to the pressure. HydroFox® DMU 07 uses a capacitance ceramic measuring cell.

specifications

Technical Measuring accuracy

Deviation from the characteristic curve according to IEC 60770 - limit point calibration (non-linearity, hysteresis, repeatability): <±0.35 % FSO

Measuring ranges

Relative pressure: 0/40 mbar to 0/20 bar

Overpressure safety

≤ 400 mbar at least 5 x FS

> 400 mbar at least 3 x FS

≥ 16 bar at least 2 x FS

Operating temperature range

Medium: -40/+125 °C Ambient: -40/+85 °C -40/+100 °C Storage:

Temperature error band

In compensated range -20/+80 °C ≤ 0.1 % FSO/10 K

Dynamic characteristics

Response time ≤ 200 ms

Process connection

G11/2B flush diaphragm

Options • Pressure connection made of PVDF

- Other seal materials
- Field housing (stainless steel 303)
- Higher accuracy
- Other output signals

Materials

Stainless steel 316 L Housing: Pressure connection: Stainless steel 316 L Diaphragm: Ceramic (Al₂O₃ 96 %) Seal: FKM (Viton)

Output signal/supply voltage

4–20 mA DC 9-32 V 2-wire

Load

4-20 mA: $R_{max} = [(U_B - U_{Bmin}) / 0.02 A] \Omega$

0-10 V $R_{min} = 10 k\Omega$

Current input

4-20 mA < 21 mA

Electrical protection

Short circuit proof and protected against reverse polarity

Electrical connection/degree of protection

Connector and junction box as per ISO 4400 (DIN 43650-A), IP 65

CE conformity (EMC)

EMC Directive 2014/30/EU



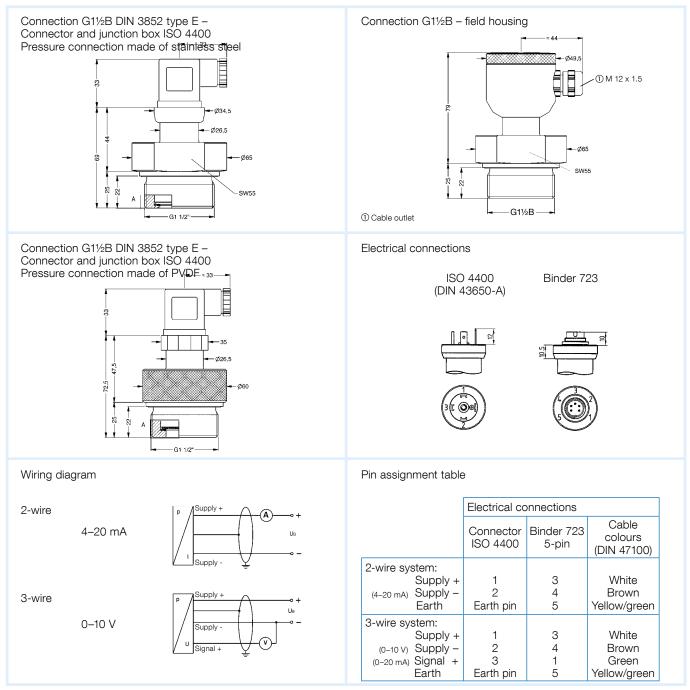
See chapter 5 for the complete "Level Measurement" range.

See page 239 for prices.



Pressure transducers HydroFox® DMU 07

Dimensions (mm) and electrical connections



The units are shipped with a detailed connection diagram.



Pressure transducers HydroFox® DMU 08 - level probe

- Compact and robust stainless steel design
- Integrated overvoltage protection
- Special calibration for all standard pressure units possible
- Optional ATEX version









Application For electronic, continuous level measurement, e.g. in wells, drilling holes, water, containers or in waste water systems. Suitable for groundwater, waste water (with optional FEP cable), diesel fuel and fuel oil.

Description

Pressure transducers HydroFox® DMU 08 convert physical pressure into an electrical signal proportional to the pressure. HydroFox® DMU 08 uses a piezo-resistive silicon measuring cell.

specifications

Technical Measuring accuracy

Deviation from the characteristic curve according to IEC 60770 - limit point calibration (non-linearity, hysteresis.

repeatability): <±0.35 % FSO (measuring ranges 0/100 mbar to $0/400 \text{ mbar} < \pm 0.5 \% \text{ FSO}$

Measuring ranges

Relative pressure: 0/100 mbar to 0/25 bar

Overpressure safety

See page 232.

Operating temperature range

Medium: -10/+70 °C Ambient: -10/+70 °C Storage: -25/+70 °C For EX version -20/+60 °C at Patm 0.8 to 1.1 bar

Temperature error band

In compensated range $0/70 \, ^{\circ}\text{C} \le 400 \, \text{mbar} \le \pm \, 1 \, \% \, \text{FSO}/10 \, \text{K}$ \geq 400 mbar \leq ± 0.75 % FSO/10 K

Dynamic characteristics

Response time ≤ 10 ms

Materials

Housina: Stainless steel 316 L Stainless steel 316 L Diaphragm:

Seals: FKM (Viton)

Options • EX version

(II 1G Ex ia IIC T4 Ga, II 1D Ex ia IIIC T85 °C Da)

■ Measuring accuracy 0.1 % FSO



Pressure transmission liquid

Silicone oil

Supply voltage

DC 8-32 V

DC 10-28 V EX version

Output signal

4-20 mA, 2-wire

4-20 mA: $R_{max} = [(U_B - U_{Bmin}) / 0.02 A] \Omega$

Current input

4-20 mA < 25 mA

Electrical protection

Short circuit proof and protected against reverse polarity

Electrical connection (degree of protection)

PUR cable (IP 68)

With integrated breather tube for reference to the ambient atmospheric pressure

CE conformity (EMC)

EMC Directive 2014/30/EU

Accessories (options)

- Screw connector kit
- Junction box
- Anchor clamp
- Extended weight
- FEP cable
- SIL 2 (IEC 61508/61511)





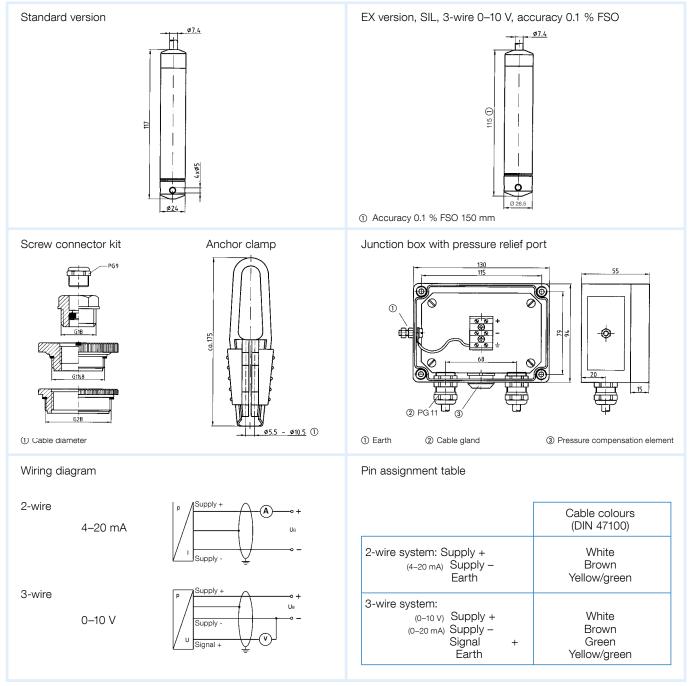
See chapter 5 for the complete "Level Measurement" range.

See page 239 for prices.



Pressure transducers HydroFox® DMU 08

Dimensions (mm) and electrical connections



The units are shipped with a detailed connection diagram.

Overpressure safety DMU 08

Measuring range	100 mbar	160 mbar	200 mbar	250 mbar	300 mbar	400 mbar	600 mbar	1 bar	1.6 bar	2 bar	2.5 bar	4 bar	6 bar	10 bar	16 bar	20 bar	25 bar
Overload	5 x	6 x	4 x	4 x	4 x	5 x	8 x	5 x	6 x	4 x	4 x	5 x	6 x	4 x	5 x	3 x	3 x
Burst pressure	15 x	9 x	6 x	6 x	6 x	7 x	12 x	7 x	9 x	6 x	6 x	6 x	8 x	5 x	7 x	4 x	4 x



Pressure transducers HydroFox® DMU 08 T - level probe

- With integrated temperature measurement
- Compact and robust stainless steel design
- Integrated overvoltage protection
- Special calibration for all standard pressure units possible







Application For electronic, continuous level and temperature measurement, e.g. in wells, drilling holes and for monitoring of rain overflow facilities, rivers and waters, for drinking water treatment in tanks or waste water systems. Suitable for groundwater, drinking water, waste water (with optional FEP cable), diesel fuel and fuel oil.

Description Pressure transducers HydroFox® DMU 08 T convert physical pressure and temperature into two independent, electrical signals. HydroFox® DMU 08 T uses a piezo-resistive silicon measuring cell; the temperature is measured by means of an integrated Pt 100 sensor.

Technical specifications

Measuring accuracy

Deviation from the characteristic curve according to IEC 60770 - limit point calibration (non-linearity, hysteresis, repeatability): <±0.35 % FSO (measuring ranges 0/100 mbar to $0/400 \text{ mbar} < \pm 0.5 \% \text{ FSO}$

Measuring ranges

Relative pressure: 0/100 mbar to 0/25 bar

Temperature (please specify when ordering):

1.) 0...30 °C (designation: 0030) 2.) 0...50 °C (designation: 0050) 3.) 0...70 °C (designation: 0070)

Overpressure safety

See page 232.

Operating temperature range

Medium: -10/+70 °C Ambient: -10/+70 °C -25/+70 °C Storage:

Temperature error band

In compensated range $0/70 \, ^{\circ}\text{C} < 400 \, \text{mbar} \le \pm \, 1 \, \% \, \text{FSO}/10 \, \text{K}$ \geq 400 mbar \leq ± 0.75 % FSO/10 K

Dynamic characteristics

Response time ≤ 10 ms for output signal pressure

Materials

Housing: Stainless steel 316 L Diaphragm: Stainless steel 316 L FKM (Viton) Seals:

Pressure transmission liquid

Silicone oil

Supply voltage

DC 10-30 V Pressure: Temperature: DC 10-30 V

Output signals

Pressure: 4-20 mA, 2-wire Temperature: 4-20 mA, 2-wire

 $4-20 \text{ mA: } R_{\text{max}} = [(U_{\text{B}} - U_{\text{Bmin}}) / 0.02 \text{ A}] \Omega$

Current input

4-20 mA < 25 mA

Electrical protection

Short circuit proof and protected against reverse polarity

Electrical connection (degree of protection)

PUR cable (IP 68)

With integrated breather tube for reference to the ambient atmospheric pressure

CE conformity (EMC)

EMC Directive 2014/30/EU

Accessories (options)

- Screw connector kit
- Junction box
- Anchor clamp
- Extended weight



See chapter 5 for the complete "Level Measurement" range.

See page 239 for prices.

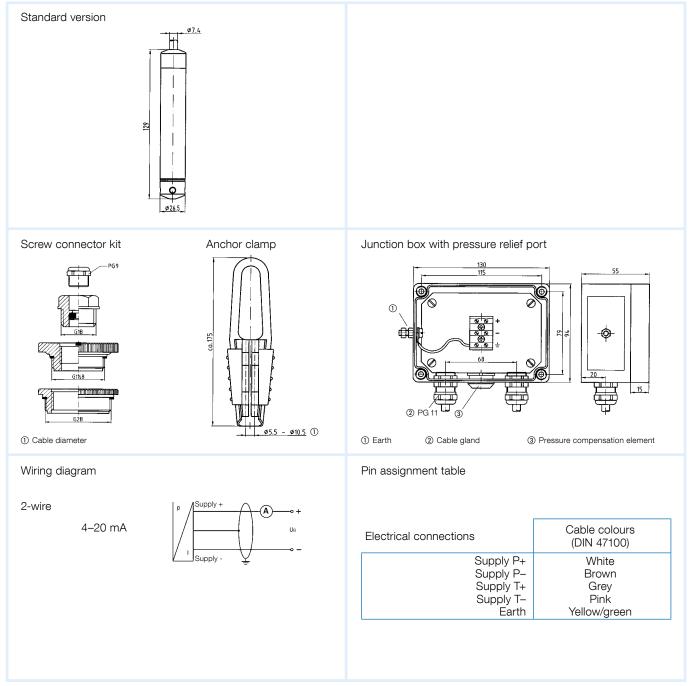


- FEP cable
- Other measuring ranges on request



Pressure transducers HydroFox® DMU 08 T

Dimensions (mm) and electrical connections



The units are shipped with a detailed connection diagram.

Overpressure safety DMU 08 T

Measuring range	100 mbar	160 mbar	200 mbar	250 mbar	300 mbar	400 mbar	600 mbar	1 bar	1.6 bar	2 bar	2.5 bar	4 bar	6 bar	10 bar	16 bar	20 bar	25 bar
Overload	5 x	6 x	4 x	4 x	4 x	5 x	8 x	5 x	6 x	4 x	4 x	5 x	6 x	4 x	5 x	3 x	3 x
Burst pressure	15 x	9 x	6 x	6 x	6 x	7 x	12 x	7 x	9 x	6 x	6 x	6 x	8 x	5 x	7 x	4 x	4 x



Pressure transducers HydroFox® DMU 09 Level probe - for chemical applications



- Robust ceramic diaphragm without transmission liquid
- Highly resistant FEP cable
- Special calibration for all standard pressure units possible









Application For electronic, continuous level measurement in extremely corrosive liquids, e.g. chemicals or waste water from landfill sites.

Description Pressure transducers HydroFox® convert physical pressure into an electrical signal proportional to the pressure. HydroFox® DMU 09 uses a capacitance ceramic measuring cell.

specifications

Technical Measuring accuracy

Deviation from the characteristic curve according to IEC 60770 - limit point calibration (non-linearity, hysteresis, repeatability): <±0.35 % FSO

Measuring ranges

Relative pressure: 0/40 mbar to 0/10 bar

Overpressure safety

≤ 400 mbar at least 5 x FS > 400 mbar at least 3 x FS

Operating temperature range

Medium: -25/70 °C -25/70 °C Ambient: Storage: -25/70 °C

Temperature error band

In compensated range $0/70 \, ^{\circ}\text{C} \le \pm \ 0.1 \, \% \, \text{FSO/10 K}$

Dynamic characteristics

Response time < 200 ms

Materials

Housing:

Diaphragm: Ultra-pure ceramic (Al₂O₃ 99.9 %)

Seals: FKM (Viton)

Output signal/supply voltage

4-20 mA DC 9-32 V 2-wire

Load

 $4-20 \text{ mA: } R_{\text{max}} = [(U_{\text{B}} - U_{\text{Bmin}}) / 0.02 \text{ A}] \Omega$

Current input

4-20 mA < 21 mA

Electrical protection

Short circuit proof and protected against reverse polarity

Electrical connection/degree of protection

FEP cable (IP 68)

With integrated breather tube for reference to the ambient atmospheric pressure

CE conformity (EMC)

EMC Directive 2014/30/EU

Accessories (options)

- Screw connector kit
- Junction box
- Anchor clamp

- **Options** Housing PVDF
 - Cable protection conduits
 - FFKM seals



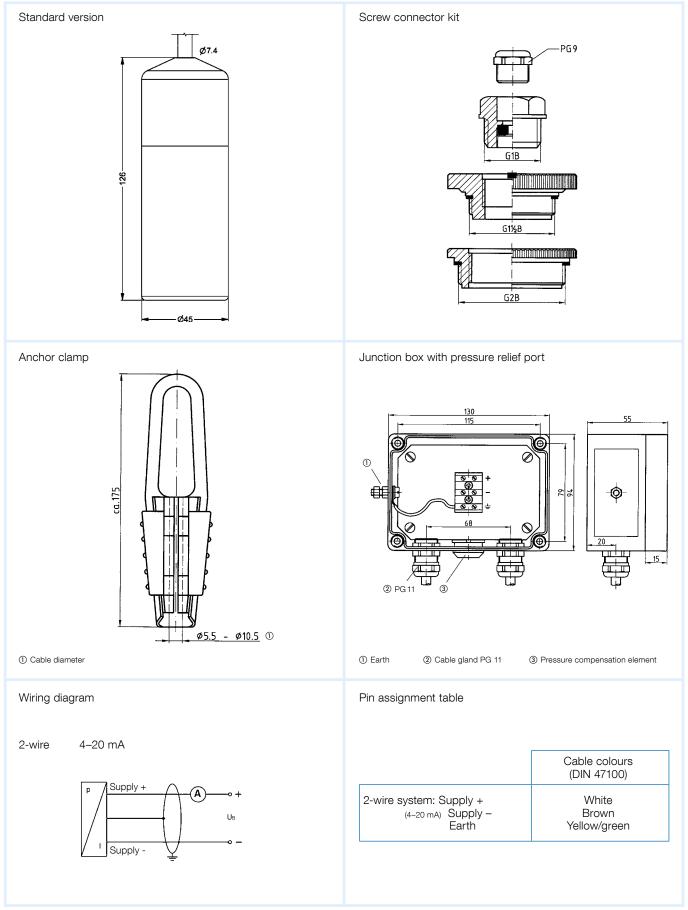
See chapter 5 for the complete "Level Measurement" range.

See page 239 for prices.

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Pressure transducers HydroFox® DMU 09

Dimensions (mm) and electrical connections



The units are shipped with a detailed connection diagram.



Pressure transducers DeltaFox® DMU 10 D Version for differential pressure measurement

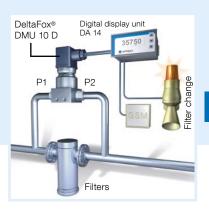


- Compact design
- Robust aluminium housing
- High long-term stability
- High overpressure safety
- Long service life









Application For electronic differential pressure measurement at very low differential pressure. For non-corrosive gaseous media. Particularly suitable for monitoring filters and fans in air and air conditioning applica-

Description The DeltaFox® DMU 10 D pressure transducers feature piezo-resistive silicon measuring cells. When pressure is applied, the pressure difference between the positive side and the negative side is converted into a current or voltage signal which is proportional to the differential pressure.

Technical Measuring accuracy

specifications Deviation from the characteristic curve as per IEC 60770 - limit point calibration (non-linearity, hysteresis, repeatability): < ±0.35 % FSO > 0/160 mbar: 0/40-0/160 mbar: $\leq \pm 1 \% \text{ FSO}$ < 0/40 mbar: ≤ ±2 % FSO

Long-term stability

≤ +0.2 % FSO/year

Measuring ranges

Differential pressure measuring range	Overload
0/6 mbar to 0/10 mbar	100 mbar
0/25 mbar	200 mbar
0/40 mbar to 0/60 mbar	350 mbar
0/100 mbar to 0/400 mbar	1000 mbar
0/600 mbar to 0/1000 mbar	3000 mbar

Operating temperature range

Medium: -25/+125 °C -25/+85 °C Ambient: Storage: -40/+100 °C

Temperature error band

Differential pressure measuring range	In compensated range 0/60 °C
≤ 0/10 mbar	≤ ±2 % FSO/10 K
≤ 0/25 mbar	≤ ±1.5 % FSO/10 K
≤ 0/250 mbar	≤ ±1 % FSO/10 K
> 0/250 mbar	≤ ±0.5 % FSO/10 K

Dynamic characteristics

Response time < 5 ms

Process connection

2 x G1/8B female thread

Materials

Housing: Aluminium,

silver-coloured, anodised

Process connection: Aluminium

Silicon, glass, RTV, Sensor:

Ceramic (Al₂O₃), nickel

Seal: PUR glued

Output signal / supply voltage

4-20 mA, 2-wire DC 8-32 V DC 14-30 V 0-20 mA, 3-wire DC 14-30 V 0-10 V, 3-wire

 $4-20 \text{ mA: } R_{max} = [(U_B - U_{Bmin}) / 0.02 \text{ A}] \Omega$ 0–20 mA < 500 Ω

 $0-10 \text{ V} > 10 \text{ k}\Omega$

Current input

0/4-20 mA max. 25 mA 0-10 V max. 7 mA

Electrical protection

Short circuit proof and protected against reverse polarity

Electrical connection/degree of protection

Connector and junction box as per ISO 4400 (DIN 43650-A), IP 65

CE conformity (EMC)

EMC Directive 2014/30/EU

Options

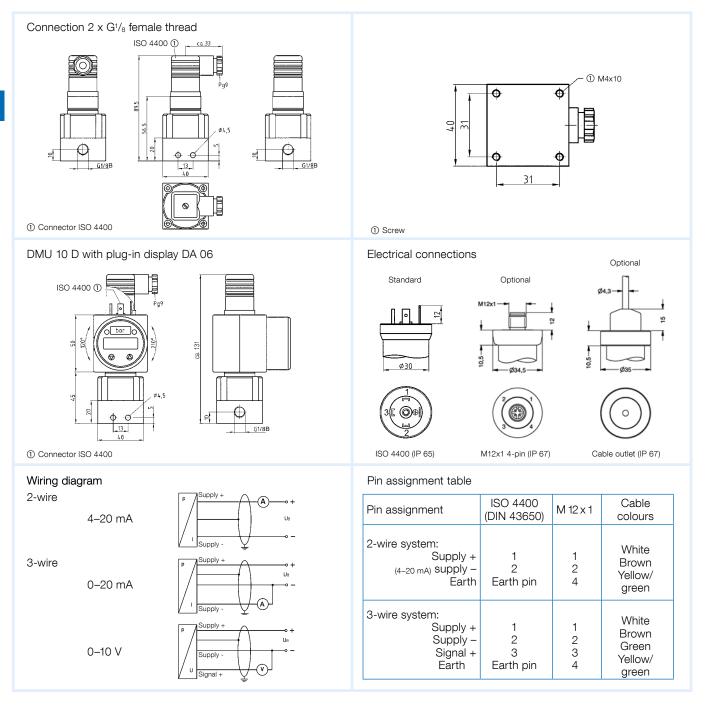
- Other process connections
- Other electrical connections
- Digital plug-in display DA 06





Pressure transducers DeltaFox® DMU 10 D

Dimensions (mm) and electrical connections



Pressure transducers DeltaFox® DMU 11 D Version for differential pressure measurement



- Compact design
- High overload safety
- Mechanically robust and reliable, suitable for applications involving dynamic pressure changes as well as shock and vibration









For electronic differential pressure measurement in industrial applications. For corrosive gaseous and liquid media which are not highly viscous and do not crystallise.

Description

The DeltaFox® DMU 11 D pressure transducers feature two oil-immersed piezo-resistive stainless steel measuring cells. When pressure is applied, the pressure difference between the positive side and the negative side is converted into a current or voltage signal which is proportional to the differential pressure.

specifications

Technical Measuring accuracy

Deviation from characteristic curve as per IEC 60770 - limit point calibration, non-linearity, hysteresis, reproducible):

 \leq ± 0.5 % FSO (differential pressure range with turn down from 1:1 to 1:5)

≤ ± 1 % FSO (differential pressure range with turn down from 1:5 to 1:10)

Measuring ranges/overload safety

Nominal pressure (bar)	Differential pres- sure measuring range (bar)	Max. static pressure at one end (bar)					
0.2	0/0.02 to 0/0.2	0.5					
0.4	0/0.04 to 0/0.4	1					
1.0	0/0.1 to 0/1.0	3					
2.5	0/0.25 to 0/2.5	6					
6.0	0/0.6 to 0/6.0	20					
16	0/1.6 to 0/16	60					

Operating temperature range

Medium: -25/+125 °C Ambient: -25/+85 °C -40/+100 °C Storage:

Temperature error band

In compensated range 0/70 °C ≤ 1.5 % FSO/10 K In compensated range

0/50 °C at nominal pressure 0.4 bar ≤ 2 % FSO/10 K

In compensated range

0/50 °C at nominal pressure 0.2 bar ≤ 2.5 % FSO/10 K

Dynamic characteristics

Response time < 5 ms

- **Options** Other process connections
 - Other electrical connections
 - Other seal materials
 - Other output signals
 - Fitting of chemical seal

Process connection

2 x G1/2B (837-1/7.3)

Materials

Housina: Aluminium, black, anodised Pressure connection: Stainless steel 316 L Diaphragm: Stainless steel 316 L

Seal: FKM (Viton)

Output signal/supply voltage

4-20 mA, 2-wire DC 12-36 V 0-10 V, 3-wire DC 14-36 V

Load

 $4-20 \text{ mA:} R_{\text{max}} = [(U_{\text{B}} - U_{\text{Bmin}}) / 0.02 \text{ A}] \Omega$ $0-10 \text{ V} > 10 \text{ k}\Omega$

Current input

4-20 mA < 25 mA 0-10 V < 7 mA

Electrical protection

Short circuit proof and protected against reverse polarity

Electrical connection/degree of protection

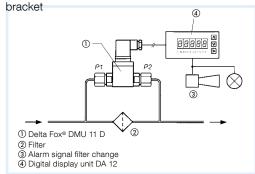
Connector and junction box as per ISO 4400 (DIN 43650-A), IP 65

CE conformity (EMC)

EMC Directive 2014/30/EU

Scope of delivery

Pressure measuring instrument with mounting **(4)**



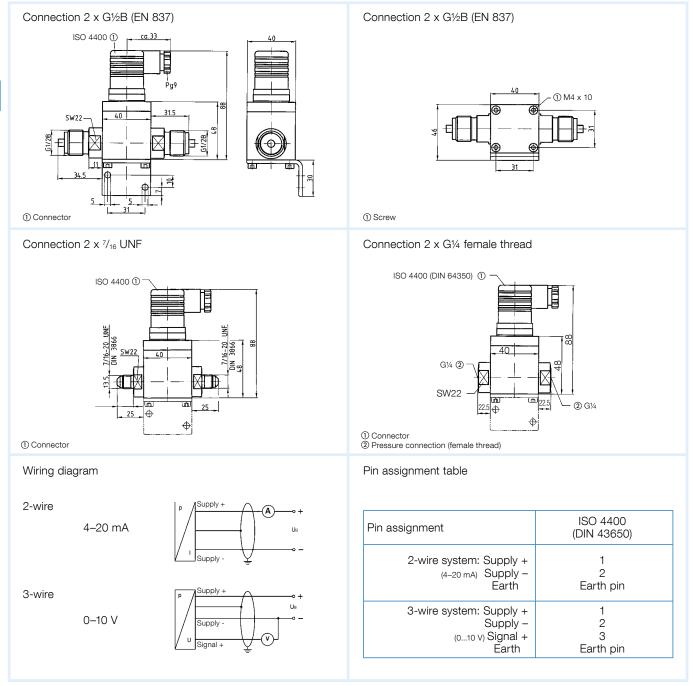




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Pressure transducers DeltaFox® DMU 11 D

Dimensions (mm) and electrical connections



The units are shipped with a detailed connection diagram.



Pressure transducers DMU 07 - DMU 11 D

DG: H, PG: 4

Туре	DMU 07	DMU 07 FG	DMU 08	DMU 08 T**	DMU 09	DMU 10 D	DMU 11 D*
Version							
Measuring principle	Capacitano measur		Piezo-resistive stainless steel measuring cell	Piezo-resistive stainless steel measuring cell	Piezo-resistive ceramic measuring cell	Piezo-resistive silicon measuring cell	Piezo-resistive stainless steel measuring cell
Measuring accuracy (IEC 60770)	0.35 % FSO	0.35 % FSO	0.35 % FSO (≤ 0.4 bar 0.5 % FSO)	0.35 % FSO (≤ 0.4 bar 0.5 % FSO)	0.35 % FSO	> 160 mbar = 0.35 % FSO 40-160 mbar = 1 % FSO < 40 mbar = 2 % FSO	0.5 % FSO (with ref. to nominal pressure)
Wetted parts	Ceramic/FKM Stainless steel 316 L	Ceramic/FKM Stainless steel 316 L	Stainless steel/ FKM 316 L	Stainless steel/ FKM 316 L	PP/ceramic/ FKM	Aluminium/silicon/glass RTV/ceramic, nickel/PUR (glued)	Stainless steel/ FKM 316 Ti
Connection	G1½B with flush diaphragm	G1½B with flush diaphragm				2 x G¹/ ₈ B female thread	2 x G½B EN 837
Supply voltage	DC 9-32 V	DC 9-32 V	DC 8-32 V	DC 10-30 V	DC 9-32 V	DC 8-32 V	DC 12-36 V
Output	4–20 mA	4–20 mA	4–20 mA	4–20 mA	4–20 mA	4–20 mA	4–20 mA
System	2-wire	2-wire	2-wire	2-wire	2-wire	2-wire	2-wire
Electrical connection	Connector ISO 4400 (43650-A)	Field housing M12 x 1.5	5 m PUR cable	5 m PUR cable	5 m FEP cable	Connector (4365	
Measuring range	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €							
0/6 mbar						31861	
0/10 mbar						31862	
0/25 mbar						31863	
0/40 mbar	31789	31821			31767	31864	31830
0/60 mbar	31790	31805			31768	31865	31831
0/100 mbar	31791	31547	31555	31555T0070	31571	31866	31813
0/160 mbar	31792	31806	31556	31556T0070	31572	31867	31814
0/200 mbar	31793	31548	31557	31557T0070	31573		
0/250 mbar	31794	31807	31558	31558T0070	31574	31868	31815
0/300 mbar			31519	31519T0070	31812		
0/400 mbar	31795	31549	31559	31559T0070	31575	31869	31832
0/600 mbar	31796	31808	31560	31560T0070	31576	31870	31833
0/1 bar	31797	31550	31561***	31561T0070	31577	31871	31816
0/1.6 bar	31798	31809	31562	31562T0070	31578		31834
0/2 bar	31799	31551	31563	31563T0070	31579		
0/2.5 bar			31564	31564T0070	31580		31817
0/4 bar	31800	31552	31565	31565T0070	31581		31835
0/6 bar	31801	31810	31566	31566T0070	31582		31818
0/10 bar	31802	31553	31567	31567T0070	31583		31836
0/16 bar			31568	31568T0070			31837
0/20 bar			31569	31569T0070			
0/25 bar			31570	31570T0070			
0 -001			0.57.0	3.3.313313			

^{*} Please specify required nominal pressure/maximum static pressure when ordering. Standard temperature range: 0–70 °C Replace the designation of the part number, if necessary ** 0–30 °C, designation: 0030 / 0–50 °C, designation: 0050 / 0–70 °C, designation: 0070 *** Electrical connection 15 m PUR cable, price €



See page 240 for extra charges for and accessories.



Blue part no. = in-stock items

Extra charges/accessories for DMU 07 - DMU 11 D

DG: H, PG: 4

Туре	DMU 07	DMU 07 FG	DMU 08	DMU 08 T	DMU 09	DMU 10 D	DMU 11 D
Version							
			I				
	Price €	Price €	Price €	Price €	Price €	Price €	Price €
EX protection II 1G EEx ia IIC T4							
2 x G1/4 female thread							
2 x hose connection 6 mm							On request
2 x ⁷ / ₁₆ UNF							
Other connections	On request	On request				On request	On request
Cable connection per metre PUR cable							
Cable connection per metre FEP cable							
				,			
Binder connector							
Fixed cable connection 2 metres							
Cable extension per metre							
Output 0-20 mA, 3-wire							
Output 0-10 V, 3-wire							
Other output signals	On request	On request	On request		On request	On request	On request
Measuring accuracy 0.25 % FSO							
5-point calibration report (for measuring accuracy up to 0.25 % FSO)							
SIL 2 (4–20 mA only)							

Accessories for DMU 08/ DMU 09

DG: H	PG	Part no.	Price €
Screw connector kit G2" - 1½" - 1"	1	52125	
Screw connector kit stainless steel G1"	3	31822	
Junction box with pressure relief port (IP 65)	1	31824	
Anchor clamp	3	31825	

Blue part no. = in-stock items





Pressure transducers DMU 13 with local display





- Robust stainless steel housing (safety housing)
- High-precision measurements with integrated transducer
- Mechanical, power-independent local display





Application For pressure measurements with a power-independent local display in combination with an electrical output signal.

Description

The DMU 13 pressure transducers consist of a mechanical Bourdon tube measuring element and a piezo-resistive stainless steel measuring cell. The Bourdon tube measuring element is used to provide an easy-to-read analogue local display. The display is power-independent. Due to the integrated pressure transducer, high-precision measurement in parallel is possible. A standardised current output is available for signal transmission and recording of measured data. The robust stainless steel housing has a solid baffle wall and blow out (safety housing).

specifications

Technical Nominal size

Measuring accuracy

Pressure gauge: class 1.0 (EN 837-1/6) Transducer: Deviation from the characteristic curve according to IEC 60770 - limit point calibration (non-linearity, hysteresis, repeatability): $< \pm 0.5 \%$ FSO

Measuring ranges

Relative pressure: 0/0.6 to 0/40 bar

Application area

Static load: full scale value Dynamic load:

0.9 x full scale value

Short term: 1.3 x full scale value

Operating temperature range

Medium: -20/+100 °C -20/+60 °C Ambient: Storage: -40/+70 °C

transducer

Additional data Output signal/supply voltage

4-20 mA DC 12-36 V 2-wire

Load

 $4-20 \text{ mA} \leq \frac{U_B - U_{Bmin}}{\cdot}$ 0.02 A

Current input

4-20 mA < 25 mA

Housing (safety housing)

Housing with solid baffle wall and blow-out

Window

Laminated safety glass

Degree of protection

IP 54 (EN 60529)

Process connection

G½B – spanner size SW 22, bottom (EN 837-1/7.3)

Materials

Stainless steel 304 Housina: Pressure connection: Stainless steel 316 L Diaphragm: Stainless steel 316 L FKM (Viton) Seal:

Pressure transmission liquid

Silicone oil

Electrical connection

Junction box

Long-term stability

≤ ±0.2 % FSO/year

Temperature error band

In compensated range 0-70 °C ≤ 1 % FSO/10 K



See page 245 for prices.

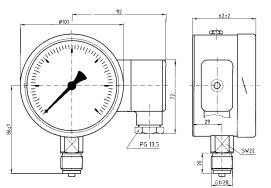
- **Options** Housing filling (paraffin oil)
 - Electrical contacts
 - Other process connections
 - Fitting of chemical seal



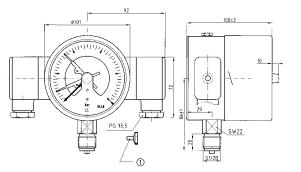
Pressure transducers DMU 13

Dimensions (mm) and electrical connections

Bottom connection



Bottom connection, with electrical contact



① Removable key, delivered loose with the unit.

Pin assignment table for pressure measuring cell (right junction box)

Supply +	1
Supply -	2
Earth	Earth pin

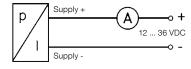
Pin assignment table for electrical contact (left junction box). Example: Magnetic spring contact MK2.12

Normally open contact	1
Normally closed contact	2
Supply	4



Wiring diagram

2-wire, 4-20 mA





Process engineering

Pressure transducers DMU 14 DG/FG Ex Intelligent precision version







- Version DMU 14 FG Ex with ATEX approval for zone 0
- Ideal for process engineering
- High accuracy of ±0.1 %
- Either die cast housing (DG) or field housing (FG)
- Turn down 1:10
- Local display



Application The intelligent pressure transducer DMU 14 DG EX with die cast aluminium housing provides very high accuracy and a turn down function for measuring range selection and is an ideal solution for process engineering applications. The version DMU 14 FG EX with a stainless steel field housing is perfectly suitable for applications in the pharmaceutical and food industries. The devices come with HART® communication.

Description

Pressure transducers convert physical pressure into an electrical signal proportional to the pressure. DMU 14 DG/FG EX is equipped with an oil-filled piezo-resistive silicon measuring cell.

Technical Measuring accuracy

specifications Deviation from the characteristic curve according to IEC 60770 - limit point calibration (non-linearity, hysteresis, repeatability) ≤ ± 0.1 % FSO

 \leq ± 0.2 % FSO with turn down > 1:5

Long-term stability

 \leq ± 0.1 % x FSO/year at reference conditions

Display

LC display, 5-digit 7-segment main display Character height 8 mm, indication range ± 9,999

8-digit 14-segment additional display

Character height 5 mm 52-segment bar chart Accuracy: 0.1 %, ±1 digit

Measuring ranges

Relative pressure: 0/0.4 to 0/600 bar Absolute pressure possible from 0/1 bar Vacuum ranges -1/+1; -1/+2; -1/+4 and -1/+10 bar

Overpressure safety

Up to 0/20 bar, at least 4 x FS 0/40 to 0/400 bar, at least 2 x FS 0/600 bar: Overload = 1,000 bar

Operating temperature range

Medium: -30/+125°C

Short-term (60 min) up to +150 °C

Ambient: -20/+70 °C

in EX zone 0 at p_{atm} 0.8 to 1.1 bar

-20/+60°C

without display -40/+80 °C

Storage: -30/+80°C

Temperature error

 \leq ± 0.2 % FSO x turn down in compensated range -20/+85 °C

Dynamic characteristics

100 ms (without consideration of electronic damping)

Process connection

G1/2B (EN 837-1/7.3)

Materials

Housing DG: Aluminium die cast,

powder-coated

Stainless steel 316 L Housing FG: Pressure connection: Stainless steel 316 L Diaphragm: Stainless steel 316 L

Seal: FKM

Pressure transmission liquid

Silicone oil

(Option food oil - temp. of the medium -10/+125 °C)

Adjustable parameters

Electronic damping: 0/100 sOffset: 0/90 % Turn down (of span): 1:10

Output signal/supply voltage

4-20 mA, 2-wire DC 12-28 V with EX version/HART communication

4-20 mA: $R_{max} = [(U_B-U_{Bmin})/0.02] \Omega$ HART® communication $R_{min} = 250 \Omega$

Current input

Max. 25 mA

Electrical protection

Short circuit proof and protected against

reverse polarity

Electrical connection

Cable gland M20 x 1.5

Degree of protection

IP 67 (EN 60529)

Pressure transducers DMU 14 DG/FG Ex Intelligent precision version





Technical CE conformity

specifications EMC Directive 2014/30/EU Pressure Equipment Directive 2014/68/EU (module A)

EX approval

IBExU15ATEX1059 X

DMU 14 FG Ex:

(Ex) | 1G Ex ia | C T4 Ga

😢 II 1D Ex ia III C T85 °C Da

DMU 14 DG Ex

(Ex) | 2G Ex ia | C T4 Gb

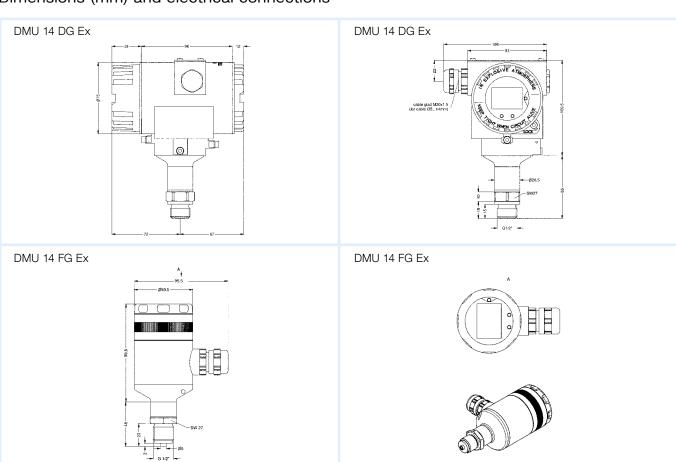
und

(Ex) | 1D Ex ia | | C T85 ° C Da

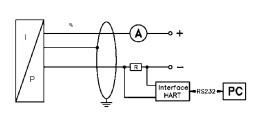
Options

- Other process connections
- High temperature version up to 300 °C

Dimensions (mm) and electrical connections







Pin	assignment	table
-----	------------	-------

Electrical connections	Aluminium die cast housing:	Stainless steel field housing:			
	Connection terminals	Connection terminals			
	(terminal cross section 2.5 mm²)	(terminal cross section 1.5 mm²)			
Supply + Supply - Test	IN + IN - Test	IN + IN - -			
Shield	<u></u>	<u></u>			



Pressure transducers DMU 13 - DMU 14

Process engineering

DG: H, PG: 4

Туре	DMU 13	DMU 14 FG Ex	DMU 14 DG E
Version			
			<u> </u>
Housing Ø	100	60	75
Housing	Stainless steel	Stainless steel	Aluminium
Measuring accuracy	0.5 % FSO Pressure gauge: class 1.0	0.1 % FSO	0.1 % FSO
Wetted parts	Stainless steel 316 Ti/316 L	Stainless steel 316 L/FKM	Stainless stee 316 L/FKM
Connection	G½B	G½B	G½B
Supply voltage	DC 12-36 V	DC 12-28 V	DC 12-28 V
Output	4–20 mA	4–20 mA	4–20 mA
Measuring range	Part no.	Part no.	Part no.
Price €			
0/400 mbar		31977	31987
Price €			
-1/0 bar			
0/0.6 bar			
0/1 bar	31077	31978	31988
Price €			
0/1.6 bar / 0/2 bar*	31078	31979	31989
0/2.5 bar	31079		
0/4 bar	31080	31980	31990
0/6 bar	31081		
0/10 bar	31082		
0/16 bar	31083		
0/25 bar / 0/20 bar*	31084	31981	31991
0/40 bar	31085	31982	31992
Price €	01000	01302	01002
0/60 bar			
0/100 bar		31983	31993
0/160 bar			
0/250 bar / 0/200 bar*		31984	31994
0/400 bar		31985	31995
0/400 bar		31986	31996
Price €		31900	31990
0/700 bar			
Extra charges (without PG)	Price €	Price €	Price €
Housing filling	File	FIICE C	FIICE
Without display – reduced price			
Clamp connection 1" or 1½", PN = 16			
Clamp connection 2", P _{max} = 16 bar			
Dairy fitting DIN 11851 DN 25, PN = 40 Dairy fitting DIN 11851 DN 40, PN = 40			
Dairy fitting DIN 11851 DN 50, PN = 25			
High-temperature version +300 °C			
Measuring range -1/xx bar			
Pressure transmission liquid food oil Absolute pressure (measuring ranges according to data sheet)			

^{*} Applies to DMU 14 DG/FG Ex only.

Blue part no. = in-stock items



Pressure transducers DeltaFox® DMU 20 D Version for differential pressure measurement





- Multiple-range transmitter with up to 3 switchable measuring ranges
- Easy parameterisation via 2-line LC display
- Min./Max. value indication
- Ideal for clean room and filter monitoring



Application The differential pressure transducer DMU 20 D can be used with all dry, gaseous, non-corrosive media. The device detects even smallest differential pressures and is particularly suitable for heating, air conditioning and ventilation applications. Clean rooms and filter monitoring are other application

Description The devices are equipped with silicon sensors. When pressure is applied, the pressure difference between the positive side and the negative side is converted into a current and voltage signal which is proportional to the differential pressure.

> The 2-line LC display shows the measured value as well as the unit and optionally the status of the switching outputs. The customer can parameterise up to three measuring ranges.

Technical Display specifications 2-line LC display

Visible area: 32.5 x 22.5 mm 5-digit 7-segment main display (character height 8 mm, ±9,999) 8-digit 14-segment additional display (height 5 mm, 52-segment bar chart) Accuracy: 0.1 % ±1 digit Switchable pressure units: mbar, bar, Pa, hPa, kPa, psi, Atm, torr, mmHG

Supply voltage

DC 11-32 V / 2-wire DC 19-32 V / 3-wire

0(4)-20 mA, 3-wire, $R_{max} = 330 \Omega$ 4–20 mA, 2-wire, $R_{max} = [(U_B-U_{Bmin})/0.02 \text{ A}] \Omega$ 0–10 V, R_{min} 10 $k\Omega$

Output

0(4) - 20 mA / 3-wire 0 - 10(5) V / 3-wire

Housing

Plastic (ABS)

(H x W x D) 68.5 x 115 x 50 mm

Ceramic, silicone, epoxy, RTV

Process/pressure connection

Brass, nickel-plated Hose olive Ø 6.6 x 11 mm, for flexible hoses with Ø 6 mm

Wetted parts

Pressure connection, PVC/silicone hose, sensor

Measuring accuracy

Deviation from the characteristic curve according to IEC 60770 - limit point calibration (non-linearity, hysteresis, repeatability)

≤± 0.5 % FSO BFSL

(measuring ranges < 6 mbar = ≤± 1 % FSO BFSL) Long-term stability ≤± 0.2 % FSO / year (measuring ranges < 6 mbar = $\leq \pm 0.5$ % FSO/year) Mounting position: Vertical

Measuring ranges/overload safety

Nominal pressure PN diff.	Switchable	Max. static pressure
0.25 mbar		100 mbar*
0.4 mbar		100 mbar*
0.6 mbar		100 mbar*
1.6 mbar	1.0 mbar	200 mbar
4 mbar	2.5 mbar	200 mbar
10 mbar	6 mbar	200 mbar
40 mbar	25 mbar	345 mbar
250 mbar	60/160 mbar	1,000 mbar
1,000 mbar	400/600 mbar	3,000 mbar

Operating temperature range:

0 / +50°C Medium: 0 / +50 °C Ambient: Storage: -10 / +70°C

Electrical connection

Cable gland M 16 x 1.5

Electrical protection

Protected against short circuit and reverse polarity

Degree of protection

IP 54 (EN 60529)

CE conformity

EMC Directive: 2014/30/EU

Options

- Other process connections
- Other output signals

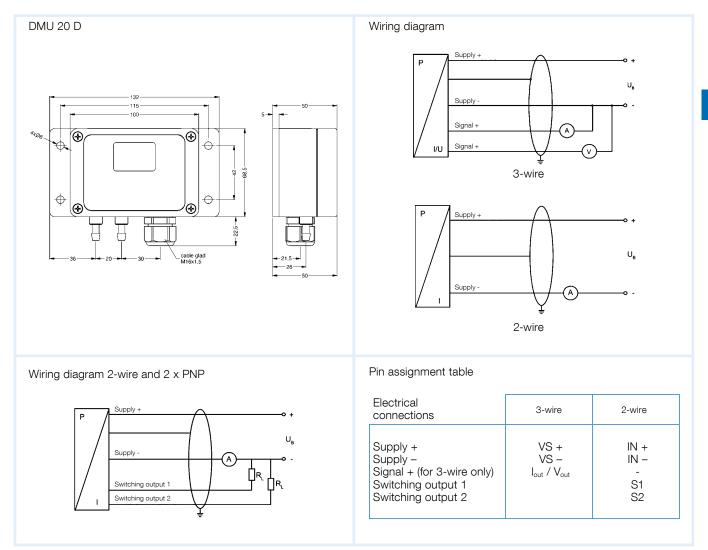


Pressure transducers DeltaFox® DMU 20 D Version for differential pressure measurement

Process engineering



Dimensions (mm) and electrical connections





Ordering data

Pressure transducers DeltaFox® DMU 20 D Version for differential pressure measurement

DG: H, PG: 4 Price € 1 Pressure transducer DMU 20 D DMU 20 D 33409 2 Pressure type Differential pressure Relative pressure 3 Output Analogue output 0 (4)-20 mA and 0-10 (5) V / 3-wire 02 Analogue output 4–20 mA / 2-wire and 2 x PNP open collector switching output Analogue output 4-20 mA / 2-wire 4 Measuring range in mbar **050** 0/0.25* On request **051** 0/0.4* On request 052 0/0.6* On request **053** 0/1.6 **054** 0/4 **002** 0/10 005 0/40 009 0/250 **012** 0/1,000 *Available approx. as of 07/2017 5 Process connection 1 Hose olive Ø 6.6 x 11 mm, for flexible hoses with inner diameter 6 mm Hose olive Ø 4.4 x 10 mm, for flexible hoses with inner diameter 4 mm **Ordering code** Example: 0/10 mbar, 33409 D 01 002 1 Connection Ø 6.6 x 11 mm

Pressure transducers DeltaFox® DMU 21 D Version for differential pressure measurement





- LED display and open collector switching output
- Turn down up to a maximum of 1:10 through customer

Process engineering

- Min./Max. value storage
- Housing can be rotated by 330° and pressure connections by 300°





Application For electronic differential pressure measurement which requires a local display in addition to the analogue output, for example for monitoring filters and fans. The differential pressure transducer can be used with all liquid and gaseous, corrosive media which are not highly viscous and which do not crystallize.

Description The DeltaFox® DMU 21 D pressure transducers feature two oil-immersed piezo-resistive stainless steel measuring cells and a 4-digit, red LED display. When pressure is applied, the pressure difference between the positive pressure side and the negative pressure side is converted into a current signal which is proportional to the differential pressure. A menu and two keys allow for displaying the measured values and for configuring the individual parameters.

Technical Display specifications

(character height 7 mm) Range -1,999 / +9,999 Accuracy: 0.1 %, ±1 digit Digital damping: 0.3 / 30 s (programmable) Display housing can be rotated by 330°

4-digit red 7-segment LED display

Adjustments

Turn down 1:10

Reference point for switching and analogue output selectable on + connection, - connection or differential pressure

Supply voltage

DC 24 V ±10 %

Load

500 Ω

Analogue output

4 - 20 mA / 3-wire

Switching output

1 open collector (PNP), max. 125 mA Status indication via LED On/off delay 0 to 100 s Switching accuracy ≤± 0.5 % FSO

Material

Housing: Plastic (PA 6.6, polycarbonate) Diaphragm: Stainless steel 316 L Pressure connection: Stainless steel 316 L Seal: FKM

Wetted parts

Diaphragm, pressure connection, seal

Measuring ranges

0/1 bar to 0/70 bar

Measuring accuracy

Deviation from the characteristic curve according to IEC 60770 - limit point calibration (non-linearity, hysteresis, repeatability) ≤ ± 1 % FSO BFSL

Application area

The maximum pressure in the system (maximum static pressure, one end) must not exceed the full scale value (FS).

Operating temperature range

Medium: -40 / +125 °C Ambient: -25 / +85 °C -40 / +85 °C Storage:

Process connection

G½ (DIN 3852)

Both pressure connections rotatable by 300°

Electrical connection

Connector M 12 x 1, 5-pin

Electrical protection

Short circuit proof and protected against reverse polarity

Degree of protection

IP 65 (EN 60529)

CE conformity

EMC Directive: 2014/30/EU

Scope of delivery

DMU 21 D, mounting bracket and 2 screws

Options

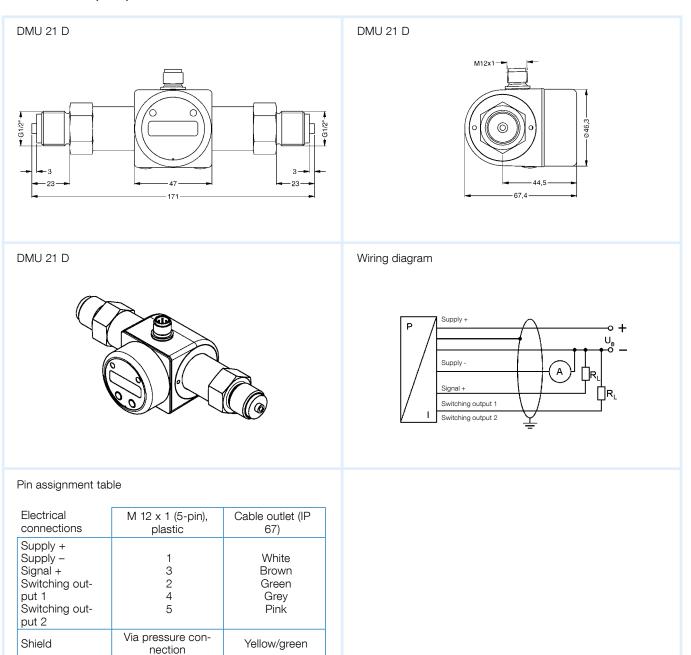
- Other process connections
- 2 x PNP open collector switching outputs
- Fixed cable connection with 2 metres PVC cable



Pressure transducers DeltaFox® DMU 21 D Version for differential pressure measurement



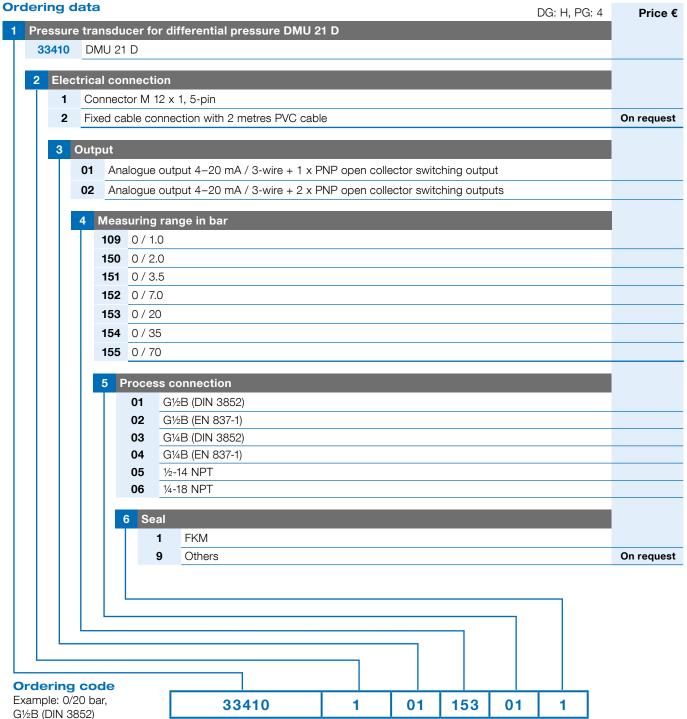
Dimensions (mm) and electrical connections



Pressure transducers DeltaFox® DMU 21 D Version for differential pressure measurement

Process engineering







A AFRISO

Universal digital pressure gauges DIM 20 service instrument

- High flexibility due to selectable units
- Min./max. value memory
- Intuitive operation via menus
- Display can be rotated by 330°
- Zero and full scale can be calibrated

For high-precision electronic pressure measurement with local digital display, for applications such as hydraulics, pneumatics, mechanical and plant engineering.

Description Compact microprocessor-controlled pressure gauge with thick-film ceramic measuring cell. The signal received from the pressure sensor is processed by the microprocessor, converted into the desired unit and displayed. Each device is shipped with its own measurement log.

Technical Functions specifications

Selection of units, min./max. memory, zero and full scale calibration, adjustable auto-off function, adjustable decimal point, battery status indication

Displayed values

Selectable pressure unit:

bar/mbar/psi/inHg/mmHg/cmHg/kPa/MPa/mWC

Display

Multi-line LC display

4.5 digit, numeric, for displaying the measured value (character height 9.5 mm) - line 1

6-digit, alphanumeric, for displaying additional information (character height 6.8 mm) and additional symbols - line 2

Display can be rotated by 330°

Measuring accuracy

±0.25 % FSO BFSL

Deviation from the characteristic curve according to IEC 60770 - limit point calibration (non-linearity, hysteresis, repeatability)

Measuring ranges

Relative pressure: -1/0 bar, 0/2.5 bar to 0/700 bar

Overpressure safety

At least 1.5 x FS

Burst pressure

Measuring rate 5/s

Process connection

G1/4B (EN 837-1/7.3), bottom

Materials

PA6, glass-loaded Housing: Pressure connection: Stainless steel 304 Ceramic (Al₂O₃ 96 %) Diaphragm:

Seal:

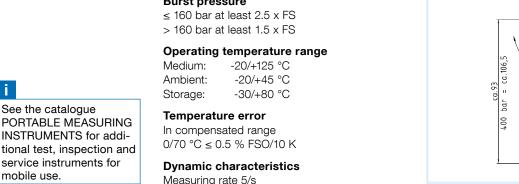
Degree of protection

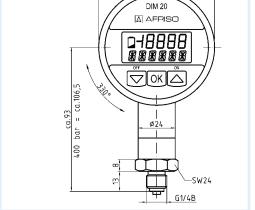
Dimensions (mm)

IP 51 (EN 60529)

Supply voltage

1 x lithium battery 3.6 V (included), battery life depends on usage (max. 5 years)





Ø75



Quality assurance

Digital pressure gauge DIM 20

DG: H, PG: 4

Туре	DIM 20		
Version	9668 1.1.1		
Housing Ø	75		
Housing	Plastic		
Measuring accuracy	0.25 % FSO BFSL		
Wetted parts	Stainless steel 304 ceramic/FKM		
Connection	G¼B		
Supply voltage	DC 3.6 V		
Output			
Measuring range	Part no.		
Price €			
0/400 mbar			
Price €	00500		
-1/0 bar	32500		
0/0.6 bar			
0/1 bar			
Price €			
0/1.6 bar			
0/2.5 bar	32503		
0/4 bar			
0/6 bar	32505		
0/10 bar	32506		
0/16 bar			
0/25 bar	32508		
0/40 bar Price €	32509		
0/60 bar			
0/100 bar	32511		
0/160 bar	32512		
0/250 bar	32513		
0/400 bar	32514		
0/600 bar			
Price €			
0/700 bar	32516		
Extra charges (without PG)	Spare battery PG: 4		
	Part no. 68309		
	Price €		
	Connection 1/4-18NPT		
	Price €		

 $^{^{\}star}$ Extra charge; please append N2 to the part no. when ordering. Blue part no. = in-stock items



Precision digital pressure gauge **DIM 30**



- Suitable for on-site calibration or pressure transducers
- Graphical LC display
- Data logger function

A AFRISO

Application For mobile electronic pressure measurement with high demands in terms of accuracy and long-term stability in process engineering as well as mechanical and plant engineering applications. Suitable for monitoring pressure and temperature behaviour as well as on-site calibration of pressure transducers.

Description The battery-operated digital pressure gauge DIM 30 consists of two devices – the digital display with a graphical LC display and a pressure transducer with a piezo-resistive stainless steel sensor. The pressure transducer can be replaced without tools and without calibration for other measurement tasks. The integrated data logger can record pressure and temperature values linearly and cyclically. These measured values can be analysed with the enclosed PC evaluation software.

Technical Display specifications

Backlit graphical LC display, visible area 55 x 46 mm Indication of measured values max. 7 digits

Temperature indication, time, 100-segment bar chart potential input value, languages German/

Duration and intensity of backlight adjustable Switchable pressure units: bar, mbar, hPa, kPa, MPa, psi, inHg, cmHg, mmHg, inH2O, mmH2O, mH₂O, kg/cm²

Temperature indication: Measuring ranges -10 / +50 °C Resolution 0.1 °C Accuracy ±2 K

Data logger

Stores pressure values and sensor temperature (sec., min., hour, daily at an adjusted time) max. 8,500 values

Adjustable measurement interval

Zero adjustment

From the front via keypad

Supply voltage

3 x 1.5 V, battery AA (LR6) Battery service life Standard mode: > 2000 h, Standby mode: At least 5 years

Current input

Without backlight: Approx. 1.3 mA With backlight: Approx. 16 mA (depends on adjusted intensity) In standby mode: Approx. 1.2 µA

Stainless steel 304, Ø 100 mm

Diaphragm

Stainless steel 316 L

Seal

Without (weld version only for process connections as per EN 837) FKM for all other process connections

Wetted parts:

Pressure connection, diaphragm, seal

Measuring accuracy:

Deviation from the characteristic curve according to IEC 60770 - limit point calibration (non-linearity, hysteresis, repeatability) ≤± 0.05 % BFSL

(measuring ranges <0.4 bar = $\leq \pm$ 0.125 % BFSL) Long-term stability ≤± 0.1 % FSO / year

Mounting position:

Any

Measuring ranges:

0 / 100 mbar to 0 / 600 bar PN ≥1 bar, vacuum-tight without limitation

Overload safety:

At least 3 x FS, except 40 bar, overload = 105 bar 400 bar, overload = 1.000 bar 600 bar, overload = 1,000 bar

Burst pressure

At least 5 x FS, except 400 and 600 bar, burst pressure = 1,250 bar

DG: H, PG: 4

Accessories	Part no.	Price €
Service case with foam inlay, no content	33406	
Protective cap, rubber, blue NG 100	33407	
Manual calibration pump	33408	

Blue part no. = in-stock items



Precision digital pressure gauge DIM 30



specifications Medium:

Technical Operating temperature range

-10 / +55°C Ambient: -10 / +55°C Storage: -20 / +70°C

Process connection

G½B, (EN 837-1/7.3)

Degree of protection

IP 67 (EN 60529)

CE conformity

EMC Directive 2014/30/EU

Pressure Equipment Directive 2014/68/EU (module A)

* Applies to devices with a maximum permissible overpressure of >200 bar only

Scope of delivery

- DIM 30
- Batteries

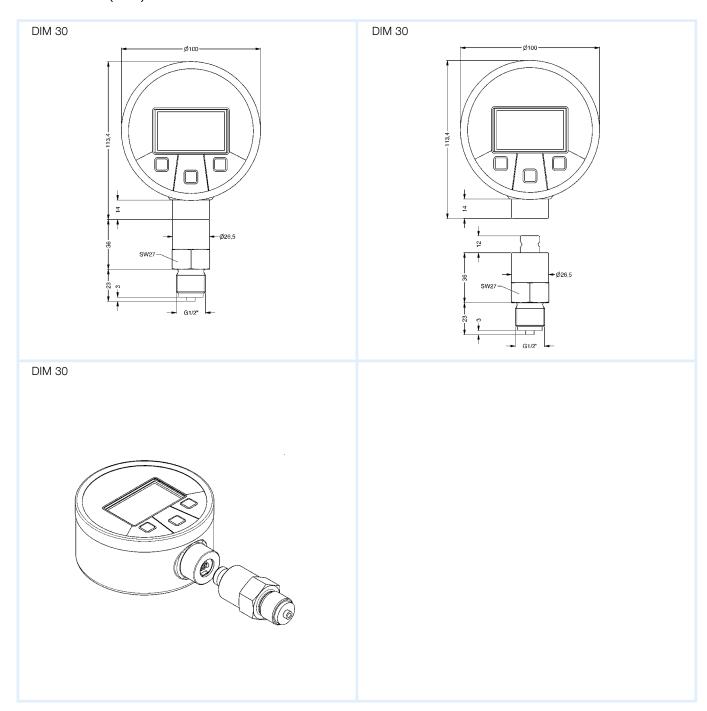
Quality assurance

- PC connection cable
- Evaluation software on CD-ROM

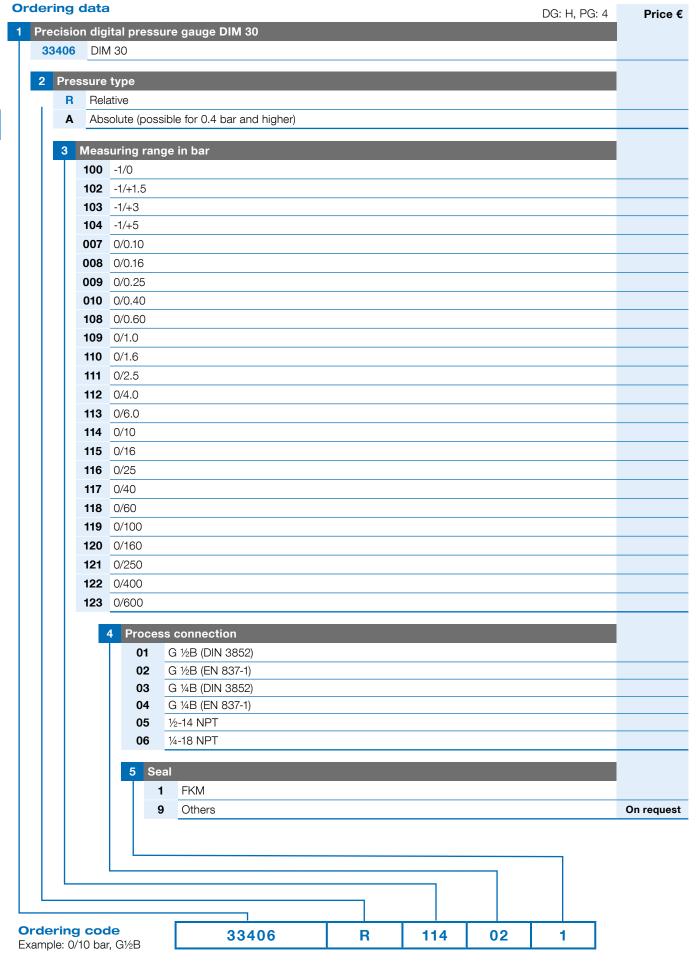
Options

Other process connections

Dimensions (mm) and electrical connections

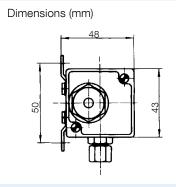


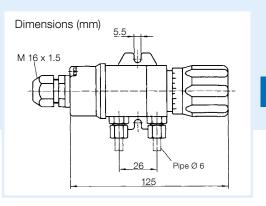
Precision digital pressure gauge DIM 30



Differential pressure switches DS 01







Application Suitable for all practically neutral media such as process water, heating water, neutral gases, oils. Suitable for two-point control by means of a continuously adjustable switching point (between 10 and 100% of pressure range).

Description

A robust diaphragm type movement is the basis for this unit. It is suitable for overpressure, vacuum and differential pressure measurements. The unit uses the same principle of operation for all three measuring applications. The pressure or the differential pressure applies a force to one side of the diaphragm. This force displaces the diaphragm system and moves the measurement range spring. A switching pin mounted to the diaphragm actuates an electrical switching element. The switching point is adjusted by means of a knurled knob according to the scale.

Technical specifications

Pressure ranges

0/0.6 to 0/4 bar

Maximum static pressure

16 bar, device is overpressure-proof up to 16 bar and vacuum-proof

Operating temperature range

Medium: $T_{max} = +80 \, ^{\circ}C$ Ambient: $T_{max} = +80 \, ^{\circ}C$

Connection

2 x G1/8 female thread

Pressure chamber

Brass

Diaphragm

NBR (Perbunan)

Mounting

Bracket for wall-mounting

Electrical connection

Cable gland M 16 x 1.5

Switching point

10-100 % of pressure range, fully adjustable

Contact

Microswitch, normally closed contact (normally closed contact available without extra charge)

Hysteresis

Approx. 2 %

Maximum rating

U ... AC 250 V, I ... 3 A, P ... 500 VA

DG: H, PG: 4

	_		
Pressure range	Part no.	Price €	
0/0.6 bar	88103		
0/1 bar	88104		
0/1.6 bar	88105		
0/2.5 bar	88107		
0/4 bar	88106		
Extra charges – options			
Diaphragm FKM (Viton)	88125		
Fixed cable 2.5 m	88126		
2 x compression fitting for 6 mm pipe, steel	88120		
2 x compression fitting for 6 mm pipe, brass	88108		
2 x compression fitting for 8 mm pipe, brass	88114		

Blue part no. = in-stock items



Electronic pressure switch EDS 10





4-digit LED display

- Display can be rotated and tilted to any position
- 2 PNP switching outputs
- Accuracy ≤±0.35 % at 400 mbar and higher
- Possible measuring ranges from 100 mbar to 600 bar





Application Main application areas comprise monitoring of gaseous or liquid media in plant and mechanical engineering. The pressure switch lends itself to pneumatic or hydraulic systems requiring high switching accuracy. The display can be rotated and tilted to practically any position so that the device can be used under adverse mounting conditions.

Description The device uses a piezo-resistive stainless steel measuring cell. The 4-digit LED display of the pressure switch EDS 10 can be rotated by 330° and tilted by 300°. The switching points (switching hysteresis) can be set with two keys via the menu. The status of the switching outputs is indicated by an LED each. At a nominal pressure of ≥1, the pressure switch is vacuum-tight without limitations.

Technical Display

specifications 4-digit, 7-segment, LED display, red (-1,999 ... +9,999, visible area 22.5 x 10.5 mm) 4 LEDs for switchable pressure units (bar, mbar, psi, MPa) Status indication switching output Switching output 1: green LED Switching output 2: yellow LED

Supply voltage

DC 18 - 30 V

Current input

< 40 mA

Switching outputs

2 x PNP (SIO mode), max. 200 mA Delay time: 0 to 50 s Repeatability: ≤± 0.1% FSO Switching cycles: >100 x 108 Switching frequency: max. 200 Hz

Material

Housing: Plastic (PA 6.6)

> Highly impact-resistant and corrosion-resistant Stainless steel 316 L

Diaphragm: Seal: FKM (Viton), wetted part Pressure connection:Stainless steel 316 L

Measuring accuracy

Deviation from characteristic curve as per IEC 60770

Limit point calibration (non-linearity, hysteresis, repeatability)

≤± 0.35 % FSO

(measuring ranges \leq 0.4 bar = \leq ± 0.5 % FSO) Long-term stability ≤± 0.3 % FSO / year

Measuring ranges

Relative pressure: 0 / 100 mbar to 0 / 600 bar Vacuum-tight without limitations at nominal pressure ≥ 1 bar Absolute pressure: 0 / 400 mbar to 0 / 600 bar

Overpressure safety

At least 2 x FS, except 0 / 600 bar, overload = 1000 bar Burst pressure at least 3 x FS

Operating temperature range

-40 / +125 °C Medium: -40 / +85 °C Ambient: -40 / +100 °C Storage:

Process connection

G ½ (DIN 3852)

Electrical connection

Connector M 12 x 1 (4-pin), metal

Degree of protection

IP 67 (EN 60529)

CE conformity

EMC Directive: 2014/30/EU

Pressure Equipment Directive: 2014/68/EU

(module A)*

* Applies to devices with a maximum permissible overpressure of > 200 bar only

Options

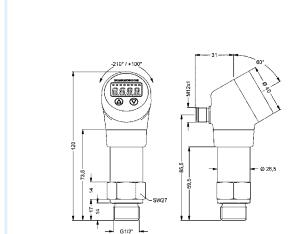
- Other process connections
- Seal material (EPDM)
- Other switching and analogue outputs

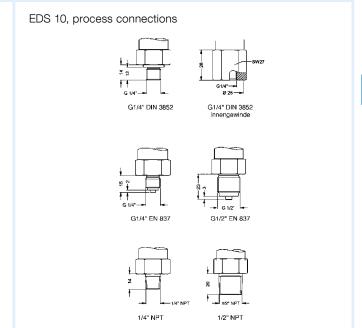


Electronic pressure switch EDS 10



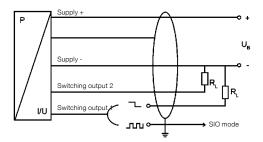
Dimensions (mm) and electrical connections



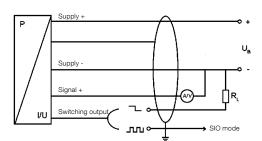


Wiring diagram 3-wire system (SIO with switching output)

EDS 10



Wiring diagram 3-wire system (SIO with analogue output)



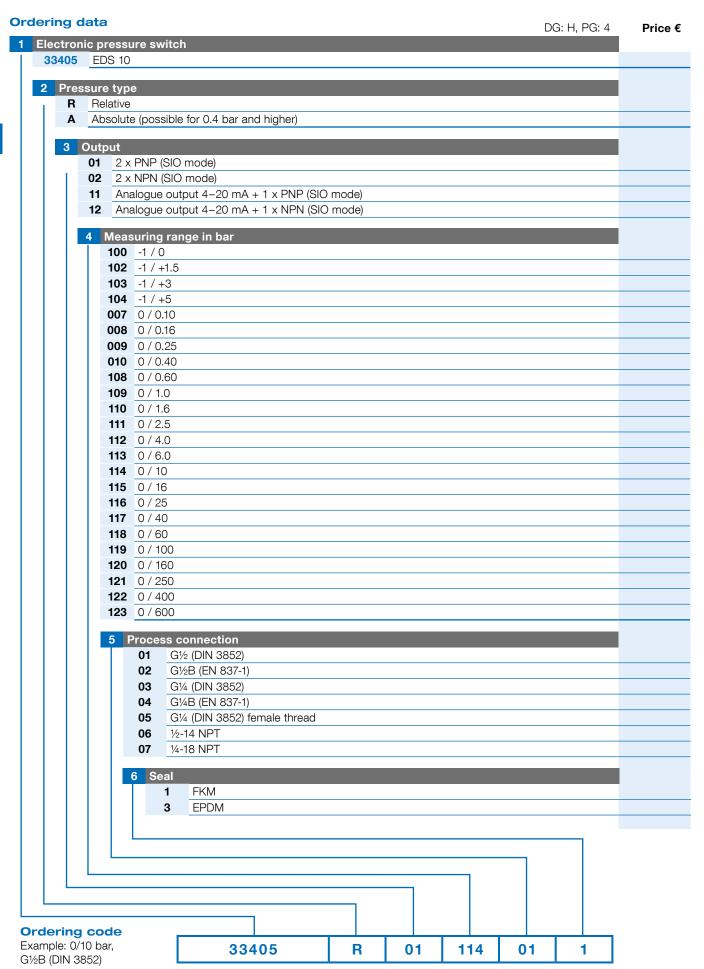
Pin assignment table

Electrical connections	M 12 x 1 (4-pin)	M 12 x 1	
	Metal	(4-pin) metal	
	(without ana-	(with ana-	
	logue output)	logue output)	
Supply +			
Supply –	1	1	
Signal +	3	3	
	-	2	
Communication/switching out-	4	4	
put 1	2	_	
Switching output 2	_		
01:11	Pressure	Pressure	
Shield	connection	connection	



Electronic pressure switch EDS 10









Bimetal thermometers for chemical applications



Resistance thermometers



Bimetal thermometers for industrial applications



Gas filled thermometers

CHAPTER 4

Temperature measuring instruments and controllers

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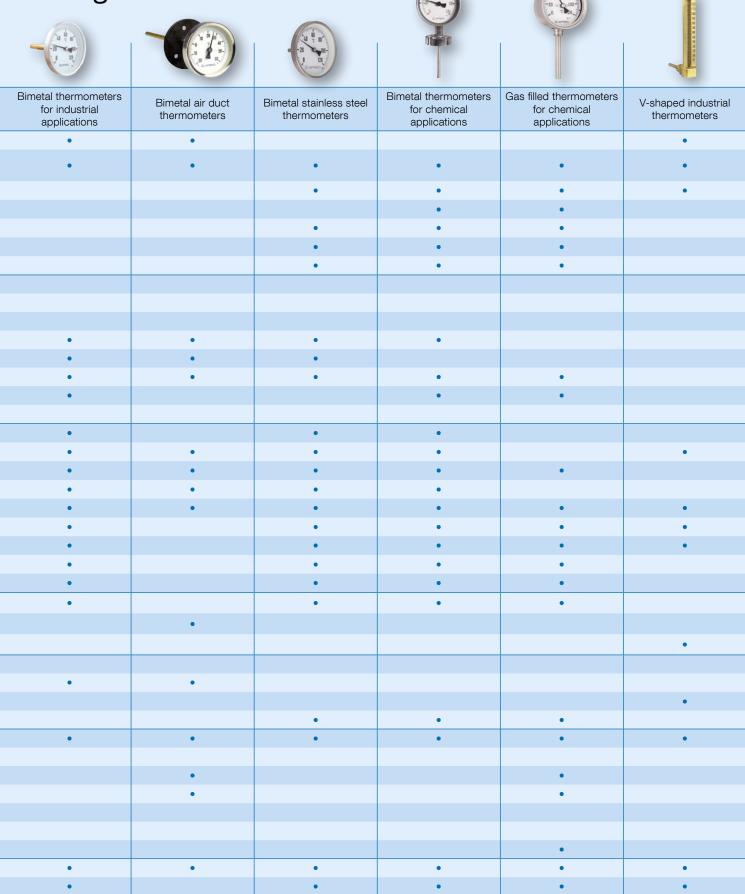
Mechanical temperature measuring instruments at

		10 to 00 to 100	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	T A PRINCE		
		Thermometers with capillary	Bimetal thermometers	Bimetal standard thermometers	Surface mount thermometers	Flue gas thermometers
Heating, plumbing		•	•	•	•	•
Mechanical and plant engineering	Application areas					
Process engineering	u G					
Chemical applications	ätič					
Food industry	pije					
Hygienic processes	Ap					
Corrosive media						
NG 40		•	•			
NG 50			•	•		
NG 52		•				
NG 63			•	•	•	
NG 80			•	•	•	•
NG 100			•	•		
NG 160				•		
Profile housing		•				
-40/+40 °C		•				
-30/+50 °C						
-20/+60 °C			•	•		
-20/+40 °C	v				•	
0/60 °C	Ranges		•	•	•	
0/120 °C	Ra	•	•	•	•	
0/160 °C				•		
0/200 °C						
≥ 0/300 °C						•
Class 1 (EN 13190)	>					
	Accuracy		•	•	•	•
Class 2 (EN 13190)	SG		•	•	•	•
DIN 16195	⋖					
Plastic	<u>o</u>	•	•		•	
Sheet steel galvanised	Housing			•	•	•
Aluminium, eloxed	운					
Stainless steel 304						
Stem			•	•		•
Plug-on	<u>_</u>		•			
Mounting flange	Connection					
Flange	une					
Fastening spring/clip	ပိ				•	
Magnetic holder					•	
Capillary tube		•				
Other ranges	Ø	•		•	•	
Other connection designs	Options	•				
Glycerine filling	o					
Electrical contacts		DS -	DA -	p> -	P ♠ –	n ·
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Technical specifications, application areas and suitability depend on the product version. See catalogue data sheet and/or operating instructions for options and details.

a glance

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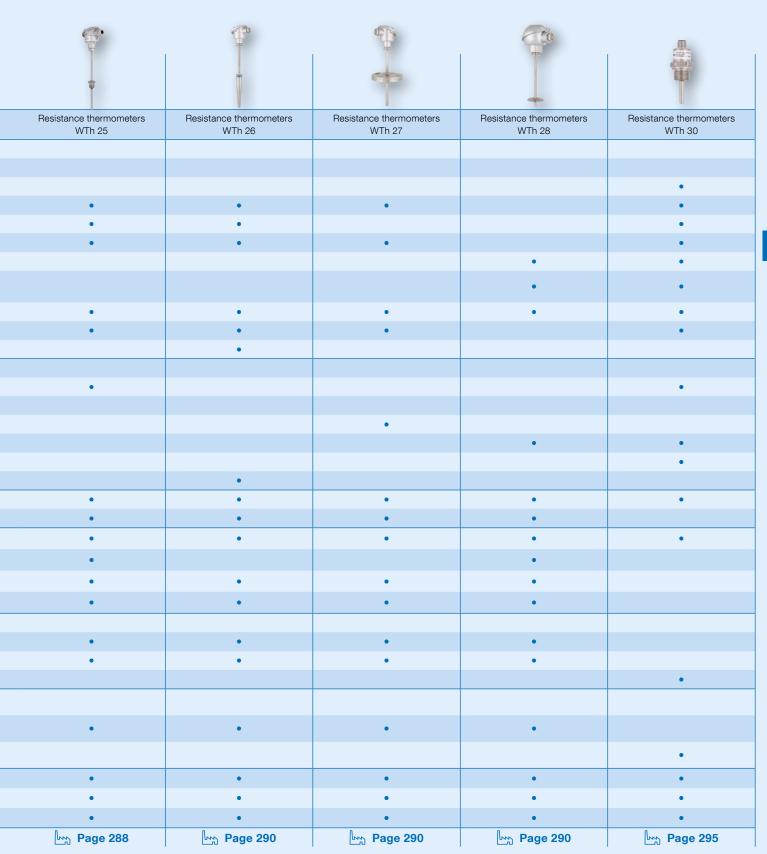
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Electronic temperature measuring instruments at a glance

	0				
	Resistance thermometer WTh 20	Resistance thermometer WTh 21	Resistance thermometer WTh 22	Resistance thermometer WTh 23	Resistance thermometer WTh 24
Heating, plumbing	•	•	•	•	
Air conditioning/ventilation		•	•	•	
Pipeline engineering			•	•	
Mechanical and plant engineering				•	•
Appliance engineering					•
Chemical / process engineering 5					•
Pharmaceutical / biotechnology					
Mechanical and plant engineering Appliance engineering Chemical / process engineering Pharmaceutical / biotechnology Food industry / hygienic processes					
Corrosive media					•
High temperatures					
High pressure loads					
Cable probe	•				
Fixed thread				•	•
Screwed pipe connection					
Flange connection Clamp connection					
Clarify Connection					
Varivent connection					
Weld-in thermometer					
Pt 100, class A Pt 100, class B				•	•
	•	•	•	•	•
100 mm			•	•	•
125 mm					
160 mm			•		•
100 mm 125 mm 160 mm ≥ 250 mm			•		•
Housing plastic		•	•		
Housing aluminium Wetted parts 316 Ti				•	•
Wetted parts 316 Ti	•	•	•	•	•
Wetted parts 316 L					
Cable (wire ferrules)	•				
Cable (wire ferrules) Cable gland Connector		•	•	•	•
Connector					
Other designs	•	•		•	
Other designs Other process connections Transmitter installation			•	•	
Transmitter installation		•	•		•
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Technical specifications, application areas and suitability depend on the product version. See catalogue data sheet and/or operating instructions for options and details.



Bimetal thermometers for industrial applications Bimetal air duct thermometers





Bimetal thermometers for industrial applications

specifications

Technical Mechanical engineering, plant engineering, pipelines, boilers, heating technology

Type

D2

Nominal size

63 - 80 - 100 - 160

Measuring element

Bimetal helix

Accuracy class

1 (EN 13190)

Ranges °C

-20/+60, 0/60, 0/120, 0/160

Application area (EN 13190)

Continuous load: measuring range Short-term: range

Operating pressure at thermowell

Max. 6 bar

Degree of protection

IP 41 (EN 60529)

Standard version

Stem brass, Ø 9 mm Thermowell G½B, brass, removable

Mounting position

NG 63 - 80 - 100 - 160 centre back NG 63 - 80 - 100 - 160 bottom

Dial

Aluminium, white, Dial marking black

Pointer

Aluminium, black

Housing

Sheet steel galvanised

Push on bezel

Sheet steel nickel-plated

Window

Instrument glass

See page 270 for prices.

- **Options** Other connection types
 - Other ranges
 - Other stem lengths

Bimetal air duct thermometers

Air conditioning, ventilation

Type

D2

Nominal size

63 - 80 - 100

Measuring element

Bimetal helix

Accuracy class

2 (EN 13190)

Ranges °C

-30/+50, -20/+60, -20/+40, 0/60

Application area

Full scale value

Degree of protection

IP 41 (EN 60529)

Stem brass, Ø 9 mm, mounting flange, plastic Ø 60 mm, or back flange, steel

Mounting position

NG 63 - 80 - 100 centre back

Dial

Aluminium, white, Dial marking black

Pointer

Plastic, black

Housing

Sheet steel galvanised

Push on bezel

Sheet steel nickel-plated

Window

Version LKF: Plastic

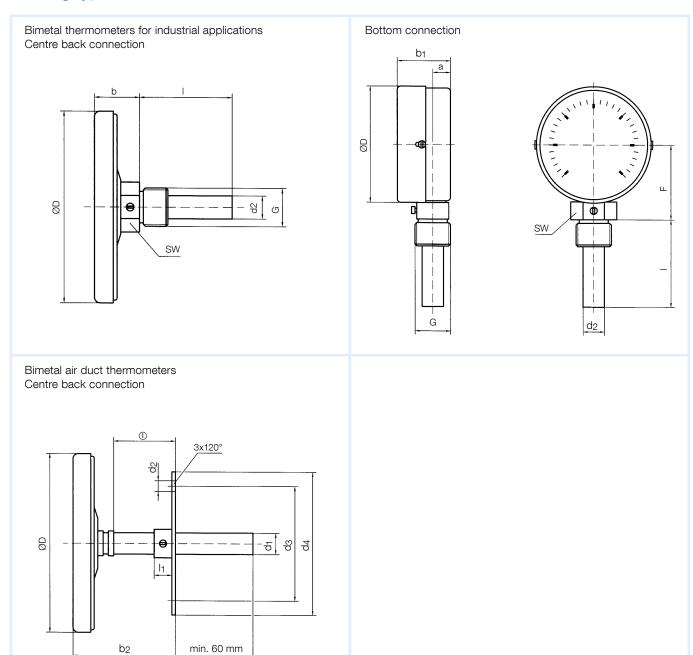
Version LKB: Instrument glass

- Other ranges
- Other stem lengths
- Accuracy class 1
- Steel flange Ø 40/80 mm



Bimetal thermometers for industrial applications/ Bimetal air duct thermometers

Housing types and dimensions (mm)



Dimensions (mm)

① Adjustable

Nominal size (NG)	а	b	b1	b2	D	d1	d ₂	dз	d4	F	G	I	l1	SW
63	10	24	34		63	9	12	51	60	43.5	G½B	40	10	22
80	10	24	36	able	80	9	12	51	60	52	G½B	63	10	22
100	10	26	36	usta	100	9	12	51	60	62	G½B	100	10	22
160	-	32	37	Adj	160	-	-	-	-	92	G½B	150	-	22



Bimetal thermometers for industrial applications

DG: H, PG: 2

Туре	BiTh 63 I D211	BiTh 80 I D211	BiTh 100 I D211	BiTh 160 I D211							
Version											
Housing Ø	63	80	100	160							
Housing	Sheet stee	el galvanised, push on bezel	nickel-plated, instrument gl	ass window							
Stem		Brass, Ø 9 mm									
Connection		Thermowell G½B, brass, Ø 12 mm outside, removable									
Accuracy class		Class 1 as p	I								
Range	-20/+60 °C	-20/+60 °C	-20/+60 °C	-20/+60 °C							
Stem length	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.							
40 mm	65106211	65206211	65306211	65406211							
63 mm	65107211	65207211	65307211	65407211							
100 mm	65108211	65208211	65308211	65408211							
150 mm	65109211	65209211	65309211	65409211							
Range	0/60 °C	0/60 °C	0/60 °C	0/60 °C							
Stem length	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.							
40 mm	65131211	65231211	65331211	65431211							
63 mm	65132211	65232211	65332211	65432211							
100 mm	65133211	65233211	65333211	65433211							
150 mm	65134211	65234211	65334211	65434211							
Range	0/120 °C	0/120 °C	0/120 °C	0/120 °C							
Stem length	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.							
40 mm	65146211	65246211	65346211	65446211							
63 mm	65147211	65247211	65347211	65447211							
100 mm	65148211	65248211	65348211	65448211							
150 mm	65149211	65249211	65349211	65449211							
Range	0/160 °C	0/160 °C	0/160 °C	0/160 °C							
Stem length	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.							
40 mm	-0 mm 65151211 65251211		65351211	65451211							
63 mm	65152211	65252211	65352211	65452211							
100 mm	65153211	65253211	65353211	65453211							
150 mm	65154211	65254211	65354211	65454211							

Minimum order quantity for non-stock items = 10 pieces

Blue part no. = in-stock items



See page 283 for options/extra charges.



Bimetal thermometers for industrial applications

DG: H, PG: 2

Туре	BiTh 63 I D201	BiTh 80 I D201	BiTh 100 I D201	BiTh 160 I D201							
Version											
Housing Ø	63	80	100	160							
Housing	Sheet stee	galvanised, push on bezel	· · · · ·	lass window							
Stem		Brass, Ø 9 mm									
Connection		Thermowell G½B, brass, Ø		9							
Accuracy class		·	per EN 13190								
Range	-20/+60 °C	-20/+60 °C	-20/+60 °C	-20/+60 °C							
Stem length	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.							
40 mm	65106201	65206201	65306201	65406201							
63 mm	65107201	65207201	65307201	65407201							
100 mm	65108201	65208201	65308201	65408201							
150 mm	65109201	65209201	65309201	65409201							
Range	0/60 °C	0/60 °C	0/60 °C	0/60 °C							
Stem length	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.							
40 mm	65131201	65231201	65331201	65431201							
63 mm	65132201	65232201	65332201	65432201							
100 mm	65133201	65233201	65333201	65433201							
150 mm	65134201	65234201	65334201	65434201							
Range	0/120 °C	0/120 °C	0/120 °C	0/120 °C							
Stem length	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.							
40 mm	65146201	65246201	65346201	65446201							
63 mm	65147201	65247201	65347201	65447201							
100 mm	65148201	65248201	65348201	65448201							
150 mm	65149201	65249201	65349201	65449201							
Range	0/160 °C	0/160 °C	0/160 °C	0/160 °C							
Stem length	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.							
40 mm	65151201	65251201	65351201	65451201							
63 mm	65152201	65252201	65352201	65452201							
100 mm	65153201	65253201	65353201	65453201							
150 mm	65154201	65254201	65354201	65454201							

Blue part no. = in-stock items



See page 283 for options/extra charges.



Bimetal air duct thermometers

DG: H, PG: 2

Туре	BiTh 63 LKF D211	BiTh 80 LKF D211	BiTh 100 LKF D211	BiTh 63 LKB D271	BiTh 80 LKB D271	BiTh 100 LKB D271
Version						
Housing Ø	63	80	100	63	80	100
Housing		el galvanised, push I-plated, plastic wii		nickel	el, galvanised, pusl -plated, with back t trument glass winc	flange,
Stem			Brass, (Ø 9 mm		
Connection	Flai	nge, plastic, Ø 60 r	mm		plain	
Accuracy class			Class 2 as p	er EN 13190		
Range	-30/+50 °C	-30/+50 °C	-30/+50 °C	-30/+50 °C	-30/+50 °C	-30/+50 °C
Stem length	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.
100 mm	65613211	65713211	65813211	65613271	65713271	65813271
150 mm	65614211	65714211	65814211	65614271	65714271	65814271
200 mm	65615211	65715211	65815211	65615271	65715271	65815271
Range	-20/+60 °C	-20/+60 °C	-20/+60 °C	-20/+60 °C	-20/+60 °C	-20/+60 °C
Stem length	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.
100 mm	65608211	65708211	65808211	65608271	65708271	65808271
150 mm	65609211	65709211	65809211	65609271	65709271	65809271
200 mm	65610211	65710211	65810211	65610271	65710271	65810271
Range	-20/+40 °C	-20/+40 °C	-20/+40 °C	-20/+40 °C	-20/+40 °C	-20/+40 °C
Stem length	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.
100 mm	65623211	65723211	65823211	65623271	65723271	65823271
150 mm	65624211	65724211	65824211	65624271	65724271	65824271
200 mm	65625211	65725211	65825211	65625271	65725271	65825271
Range	0/60 °C	0/60 °C	0/60 °C	0/60 °C	0/60 °C	0/60 °C
Stem length	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.
100 mm	65633211	65733211	65833211	65633271	65733271	65833271
150 mm	65634211	65734211	65834211	65634271	65734271	65834271
200 mm	65635211	65735211	65835211	65635271	65735271	65835271

Minimum order quantity for non-stock items = 10 pieces

Blue part no. = in-stock items



See page 283 for options/extra charges.



Bimetal stainless steel thermometers/ Bimetal thermometers for chemical applications





Bimetal stainless steel thermometers

Application

For corrosive media. Suitable for a great variety of industrial applications.

Technical Type: D3 specifications

Nominal size: 63 - 80 - 100 Measuring element: Bimetal helix

Accuracy class: 1 (EN 13190)

Ranges °C

-20/+60, 0/60, 0/120, 0/160

Application area (EN 13190)

Continuous load: measuring range Short-term: range

Operating pressure at thermowell

Max. 6 bar

Degree of protection: IP 43 (EN 60529)

Standard version

Connection

Stem stainless steel 316 L, Ø 8 mm, plain

Adapter ring

Plastic, for thermowells with connection collar Ø 14, 18 mm (only for axial mounting position up to max. 120 °C)

Mounting position

NG 63 - 80 - 100 centre back NG 63 - 100 bottom

Aluminium, white - Dial marking black

Pointer: Aluminium, black

Housing and push on bezel: Stainless steel 304

Window: Instrument glass

Options

- Thermowell G½B, stainless steel 316 Ti/316 L
- Other connection designs
- Other ranges
- Other stem lengths

Bimetal thermometers for chemical applications

For corrosive media. Meets exacting measuring demands, e.g. in process engineering as well as chemical and food industry applications.

Type: D4

Industrial/chemical applications

Nominal size: 63 - 100 - 160 Measuring element: Bimetal helix Accuracy class: 1 (EN 13190)

Ranges °C

-20/+60, 0/60, 0/120, 0/160

Application area

Continuous: Full scale value Short-term: 1.1 x full scale value

Operating pressure at thermowell

Max. 6 bar

Degree of protection: IP 65 (EN 60529)

Connection

Stem stainless steel 316 Ti, Ø 8 mm, plain, closed

Mounting position

NG 63 - 100 - 160 centre back NG 63 - 100 - 160 bottom

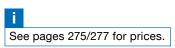
Aluminium, white Dial marking black

Pointer: Aluminium, black Housing: Stainless steel 304

Bayonet type bezel: Stainless steel 304

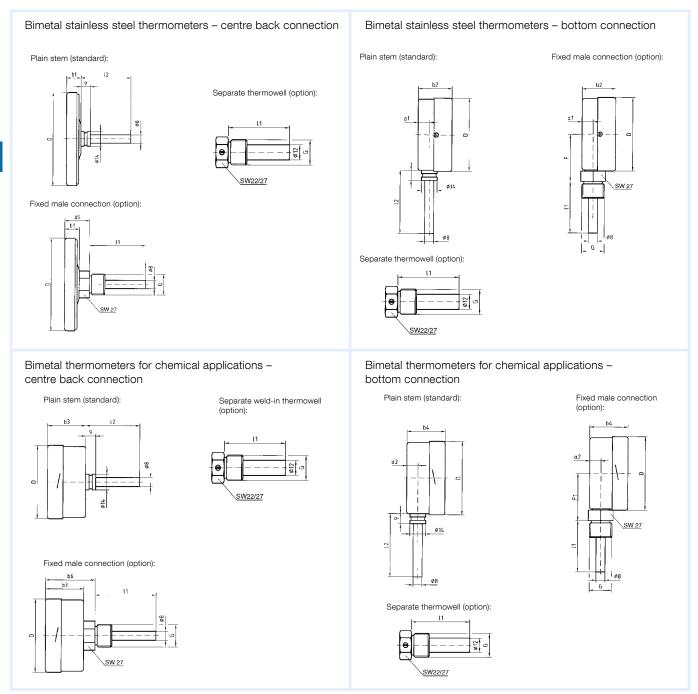
Window: Instrument glass

- Thermowell G½B, stainless steel 316 Ti/316 L
- Grooved nut connection as per DIN 11851
- Other connection designs
- Other ranges
- Other stem lengths
- Laminated safety glass window
- Glycerine filling
- Every angle version
- 3-hole fixing, panel mounting bezel
- Back flange
- Special materials



Bimetal stainless steel thermometers/ Bimetal thermometers for chemical applications

Housing types and dimensions (mm)



Dimensions (mm)

Nominal size (NG)	D	a1	a 2	b1	b2	bз	b4	b 5	b6	F	F1	G	l1	l 2
63	63	10	15.5	15	34	32	45	27	62	46.5	58.5	G½B	40	49
80	80	-	-	15	-	-	-	28	-	-	-	G½B	63 100	67 104
100	100	10	17.5	17	36	27.5	49.5	29	57.5	65	77.5	G½B	150	154
160	160	10	15.5	18	-	34	48	32	64	95	107.5	G1/2B	200	204



Bimetal stainless steel thermometers

DG: H, PG: 3

Туре	BiTh 63 E D312	BiTh 80 E D312	BiTh 100 E D312	BiTh 63 E D302	BiTh 100 E D302
Version					
Housing Ø	63	80	100	63	100
Housing		Stainless steel 304 with	n push on bezel 304, ins	strument glass window	,
Stem		Sta	ainless steel 316, Ø 8 m	ım	
Connection		Plair	n stem (without thermov	vell)	
Accuracy class		(Class 1 as per EN 13190)	
Range	-20/+60 °C				
For thermowell with stem length L1	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.
63 mm	66107312	66207312	66307312	66107302	66307302
100 mm	66108312	66208312	66308312	66108302	66308302
150 mm	66109312	66209312	66309312	66109302	66309302
200 mm	66110312	66210312	66310312	66110302	66310302
Range	0/60 °C				
For thermowell with stem length L1	Price € Part no.				
63 mm	66132312	66232312	66332312	66132302	66332302
100 mm	66133312	66233312	66333312	66133302	66333302
150 mm	66134312	66234312	66334312	66134302	66334302
200 mm	66135312	66235312	66335312	66135302	66335302
Range	0/120 °C				
For thermowell with stem length L1	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.
40 mm	66146312	66246312	66346312		
63 mm	66147312	66247312	66347312	66147302	66347302
100 mm	66148312	66248312	66348312	66148302	66348302
150 mm	66149312	66249312	66349312	66149302	66349302
200 mm	66150312	66250312	66350312	66150302	66350302
Range	0/160 °C				
For thermowell with stem length L1	Price € Part no.				
63 mm	66152312	66252312	66352312	66152302	66352302
100 mm	66153312	66253312	66353312	66153302	66353302
150 mm	66154312	66254312	66354312	66154302	66354302
200 mm	66155312	66255312	66355312	66155302	66355302

Minimum order quantity for non-stock items = 10 pieces



^{*} See page 283 for other connection types, options/extra charges.



Bimetal stainless steel thermometers with fixed connection thread

DG: H, PG: 3

Туре	BiTh 63 E D312	BiTh 80 E D312	BiTh 100 E D312					
Version								
Housing Ø	63	80	100					
Housing		Stainless steel 304 with push on bezel 304, instrument glass window						
Stem	Si	tainless steel 316, Ø 8 m	m					
Connection	Fix	ed male connection, G½	B**					
Accuracy class		Class 1 as per EN 13190)					
Range	0/60 °C	0/60 °C	0/60 °C					
Stem length L1*	Price € Part no.	Price € Part no.	Price € Part no.					
63 mm	66132312AFG4D8	66232312AFG4D8	66332312AFG4D8					
100 mm	66133312AFG4D8	66233312AFG4D8	66333312AFG4D8					
150 mm	66134312AFG4D8	66234312AFG4D8	66334312AFG4D8					
200 mm	66135312AFG4D8	66235312AFG4D8	66335312AFG4D8					
Range	0/120 °C	0/120 °C	0/120 °C					
Stem length L1*	Price € Part no.	Price € Part no.	Price € Part no.					
63 mm	66147312AFG4D8	66247312AFG4D8	66347312AFG4D8					
100 mm	66148312AFG4D8	66248312AFG4D8	66348312AFG4D8					
150 mm	66149312AFG4D8	66249312AFG4D8	66349312AFG4D8					
200 mm	66150312AFG4D8	66250312AFG4D8	66350312AFG4D8					
Range	0/200 °C	0/200 °C	0/200 °C					
Stem length L1*	Price € Part no.	Price € Part no.	Price € Part no.					
63 mm	66157312AFG4D8	66257312AFG4D8	66357312AFG4D8					
100 mm	66158312AFG4D8	66258312AFG4D8	66359312AFG4D8					
150 mm	66159312AFG4D8	66259312AFG4D8	66359312AFG4D8					
200 mm	66160312AFG4D8	66260312AFG4D8	66360312AFG4D8					

Minimum order quantity for non-stock items = 10 pieces

^{*} Maximum stem length = 300 mm ** ½-14 NPT available at no extra charge

Bimetal thermometers for chemical applications

Industrial/chemical applications

DG: H, PG: 3

Туре	BiTh 63 Ch D412	BiTh 100 Ch D412	BiTh 160 Ch D412	BiTh 63 Ch D402	BiTh 100 Ch D402	BiTh 160 Ch D402		
Version								
Housing Ø	63	100	160	63	100	160		
Housing		Stainless ste	el 304 with bayonet	bezel, instrument	glass window			
Stem			Stainless steel	l 316, Ø 8 mm				
Connection			Plain stem (with	out thermowell)*				
Accuracy class		Class 1 as per EN 13190						
Range	-20/+60 °C							
For thermowell with stem length L1	Price € Part no.							
63 mm	66607412	66807412	66907412	66607402	66807402	66907402		
100 mm	66608412	66808412	66908412	66608402	66808402	66908402		
150 mm	66609412	66809412	66909412	66609402	66809402	66909402		
200 mm	66610412	66810412	66910412	66610402	66810402	66910402		
Range	0/60 °C							
For thermowell with stem length L1	Price € Part no.							
63 mm	66632412	66832412	66932412	66632402	66832402	66932402		
100 mm	66633412	66833412	66933412	66633402	66833402	66933402		
150 mm	66634412	66834412	66934412	66634402	66834402	66934402		
200 mm	66635412	66835412	66935412	66635402	66835402	66935402		
Range	0/120 °C							
For thermowell with stem length L1	Price € Part no.							
63 mm	66647412	66847412	66947412	66647402	66847402	66947402		
100 mm	66648412	66848412	66948412	66648402	66848402	66948402		
150 mm	66649412	66849412	66949412	66649402	66849402	66949402		
200 mm	66650412	66850412	66950412	66650402	66850402	66950402		
Range	0/160 °C							
For thermowell with stem length L1	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.		
63 mm	66652412	66852412	66952412	66652402	66852402	66952402		
100 mm	66653412	66853412	66953412	66653402	66853402	66953402		
150 mm	66654412	66854412	66954412	66654402	66854402	66954402		
200 mm	66655412	66855412	66955412	66655402	66855402	66955402		



^{*} See page 283 for other connection types, options/extra charges.



Gas filled thermometers for chemical applications



- For chemical, process engineering and food industry applications
- High measuring accuracy
- Fast response





Application For corrosive media. Meets the most exacting measuring demands, e.g. in process engineering as well as chemical and food industry applications.

Technical Type specifications D4

Nominal size

100 - 160

Measuring principle

Pressurised gas filling

Accuracy class

1 (EN 13190)

Ranges °C

-20/+60, 0/60, 0/120, 0/160, 0/200, 0/300, 0/400, 0/500

Application area

Continuous: Full scale value Short-term: 1.1 x full scale value

Operating pressure at thermowell

Max. 10 bar (up to 300 °C)

Degree of protection

IP 65 (EN 60529)

Standard version Connection

Stem stainless steel 321, 100 x 10 mm, plain

Mounting position

Centre back or bottom or with joint

Dial

Aluminium, white Dial marking black

Aluminium, black

Pointer

- **Options** Every angle version
 - Grooved nut connection as per DIN 11851
 - Other connection designs
 - Other nominal sizes
 - Other ranges
 - Special scales

Zero correction

At side of housing

Movement

Brass

Housing

Stainless steel 304

Bayonet type bezel

Stainless steel 304

Window

Instrument glass

- Glycerine filling (type D8)
- 3-hole fixing, panel mounting bezel
- Back flange
- Capillary (stainless steel 321)
- Special materials
- Electrical contacts

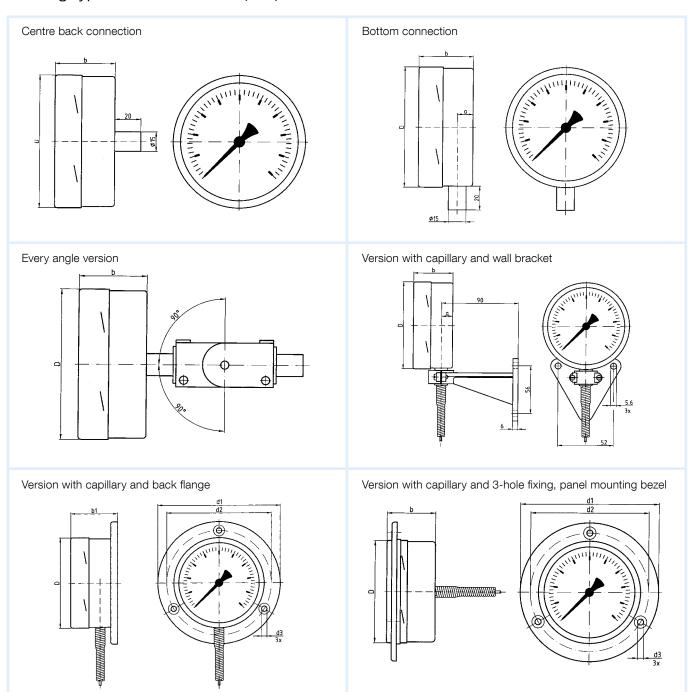




Gas filled thermometers for chemical applications

Type D4 - NG 100 / 160

Housing types and dimensions (mm)



Dimensions (mm)

Nominal size	а	b	b1	ØD	Ø d1	Ø d2	Ø d3
100	13	45	51	101	132	116	5.5
160	13	45	51	161	196	178	6
250	13	55	57	252	285	270	6



Gas filled thermometers for chemical applications

DG: H, PG: 3

Туре	FTh 100 Ch D412	FTh 160 Ch D412	FTh 100 Ch D402	FTh 160 Ch D402	FTh 100 Ch D482	FTh 160 Ch D482				
Version										
Housing Ø	100	160	100	160	100	160				
Housing		t bezel, instrument	glass window							
Stem			Stainless steel 321, 100 x 10 mm							
Connection			Plain stem (with	nout thermowell)						
Filling			Pressurise	d gas filling						
Accuracy class			Class 1 as p	er EN 13190	1					
		1	1	1		gle version				
Range	-20/+60 °C	-20/+60 °C	-20/+60 °C	-20/+60 °C	-20/+60 °C	-20/+60 °C				
	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.				
	64341412	64343412	64341402	64343402	64341482	64343482				
Range	0/60 °C	0/60 °C	0/60 °C	0/60 °C	0/60 °C	0/60 °C				
	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.				
	64361412	64363412	64361402	64363402	64361482	64363482				
Range	0/120 °C	0/120 °C	0/120 °C	0/120 °C	0/120 °C	0/120 °C				
	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.				
	64373412	64375412	64373402	64375402	64373482	64375482				
Range	0/160 °C	0/160 °C	0/160 °C	0/160 °C	0/160 °C	0/160 °C				
	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.				
	64377412	64379412	64377402	64379402	64377482	64379482				
Range	0/200 °C	0/200 °C	0/200 °C	0/200 °C	0/200 °C	0/200 °C				
	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.				
	64381412	64383412	64381402	64383402	64381482	64383482				
Range	0/300 °C	0/300 °C	0/300 °C	0/300 °C	0/300 °C	0/300 °C				
J	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.				
	64389412	64391412	64389402	64391402	64389482	64391482				
Range	0/400 °C	0/400 °C	0/400 °C	0/400 °C	0/400 °C	0/400 °C				
-	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.				
	64397412	64399412	64397402	64399402	64397482	64399482				
Range	0/500 °C	0/500 °C	0/500 °C	0/500 °C	0/500 °C	0/500 °C				
	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.				
	64401412	64403412	64401402	64403402	64401482	64403482 art no. = in-stock items				



* See page 283 for other connection types, options/extra charges.



Gas filled thermometers for chemical applications

DG: H, PG: 3

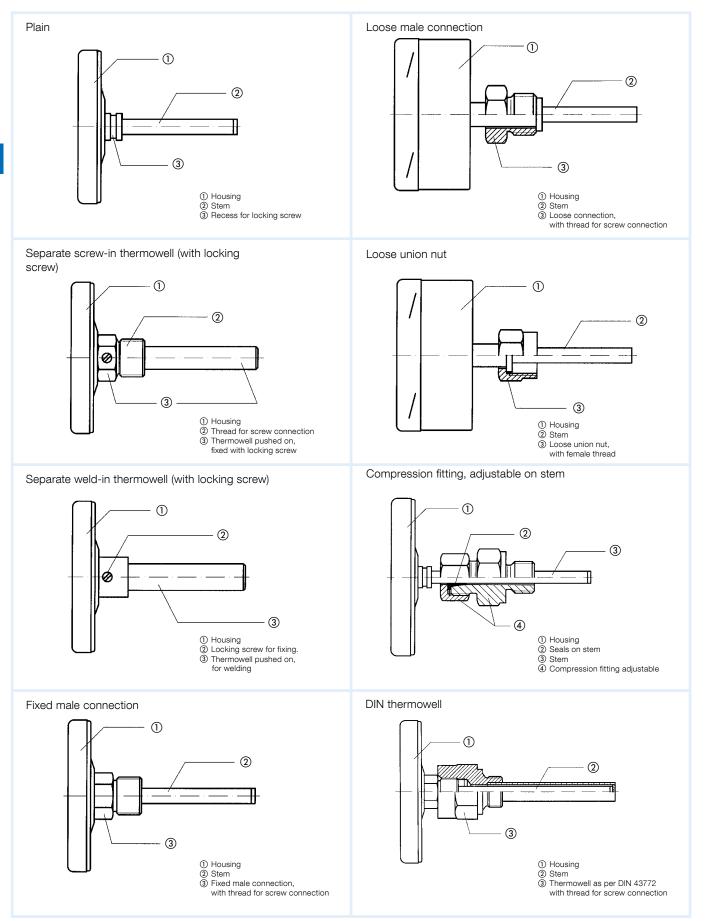
Туре	FTh 100 Ch D442	FTh 160 Ch D442	FTh 100 Ch D472	FTh 160 Ch D472	FTh 100 Ch D432	FTh 160 Ch D432
Version						
Housing Ø	100	160	100	160	100	160
Housing		Stainless ste	el 304 with bayone	t bezel, instrument	glass window	
Stem			Stainless steel 3	321, 100 x 10 mm		
Connection			Plain stem (with	nout thermowell)		
Filling			Pressurise	d gas filling		
Capillary			Stainless stee	el 321, 1 metre		
Mounting	Wall b	racket	Back	flange		el mounting bezel, 04
Accuracy class			Class 1 as p	oer EN 13190		
Range	-20/+60 °C					
	Price € Part no.					
	64341442	64343442	64341472	64343472	64341432	64343432
Range	0/60 °C					
	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.
	64361442	64363442	64361472	64363472	64361432	64363432
Range	0/120 °C					
	Price € Part no.					
	64373442	64375442	64373472	64375472	64373432	64375432
Range	0/160 °C					
	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.
	64377442	64379442	64377472	64379472	64377432	64379432
Range	0/200 °C					
	Price € Part no.	Price Part no.€	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.
	64381442	64383442	64381472	64383472	64381432	64383432
Range	0/300 °C					
	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.
	64389442	64391442	64389472	64391472	64389432	64391432
Range	0/400 °C					
	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.
	64397442	64399442	64397472	64399472	64397432	64399432
Range	0/500 °C					
	Price € Part no.					
	64401442	64403442	64401472	64403472	64401432	64403432



^{*} See page 283 for other connection types, options/extra charges.



Connection types for bimetal and gas filled thermometers (industrial, stainless steel and chemical versions)



Extra charges - connection types for bimetal and gas filled thermometers (industrial, stainless steel and chemical versions)

DG: H

Туре			Bimetal thermometer	'S	Gas filled thermometers
Material		Brass	Steel	Stainless steel 316 ss	Stainless steel
PG		2	3	3	3
	Stem length mm	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.
Separate screw-in thermowell (with locking screw),	45	64506	64511	64501	
G½B for stem up to Ø 8 mm for BiTh Ø 10 mm for FTh	63	64507	64512	64502	
Ø 10 min lor Fm	100	64508	64513	64503	64463
	150	64509	64514	64504	
	200	64510	64515	64505	
	250	64722		64660	
	300	64723		64721	
Separate weld-in thermowell (with locking screw)	63		64517	64521	
for stem up to Ø 8 mm for BiTh Ø 10 mm for FTh	100		64450	64453	64435
	150		64518	64522	
	200		64519	64523	
Stem extension per 100 mm ¹⁾		64524		64526	64527
Thermowell extension per 100 mm		64528		64530	64531
Fixed male connection G1/4B				On request 64534	
Fixed male connection G1/2B				64454	64460
Loose male connection G1/4B				64541	
Loose male connection G½B				64544	64545
Loose union nut G½, female				64455	On request 64461
Loose union nut G¾, female				64553	On request 64554
Compression fitting adjustable G½B				On request 64556	64557
Compression fitting adjustable G¾B				On request 64558	64559
Capillary per metre Stainless steel					64464
Stem Ø 6 mm 2)		On request			



¹⁾ Only applies to standard lengths 200/250/300 mm – extra charge for special lengths: € 2) Only for centre back connection, limited measuring ranges (0–120° C, 0–300° C, 0–500° C).

Extra charges for bimetal thermometers and gas filled thermometers (industrial, stainless steel, chemical application versions)

DG: H

	Bin	netal thermomet	ters	Gas filled th	ermometers
Housing diameter (mm)	< 100	100	160	100	160
	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.
Red mark on dial	64465	64470	64478	64487	64492
1 reference pointer red, external rotary knob adjustment (window = plastic) T _{max} 160 °C only for instruments without filling	64467	64471		On request 64488	On request 64493
Maximum pointer, external rotary knob adjustment (Window: BiTh 63, 100 = instrument glass; BiTh 160 = plastic; FTh 100, 160 = plastic) T _{max} 160 °C, only for gauges without filling and gauges with bayonet bezel housing	64468	64473	64481	64489	64494
Glycerine filling (only for instruments with bayonet bezel housing)		64475	64483	64490	64495
Silicone oil filling (only for instruments with bayonet bezel housing)		64476	64484	64491	64496
Other ranges for bimetal thermometers (extra charge as compared to version 0/120 °C)	Minimum stem length centre back (in mm)*	Minimum stem length bottom (in mm)*	Price €		
-20/+40 °C	63	100		-	
-20/+60 °C	63	63		-	
-30/+50 °C	63	63		-	
-40/+40 °C	63	63		-	
-40/+60 °C	63	63		-	
0/60 °C	63	100		-	
0/80 °C	63	63		-	
0/100 °C	63	63		-	
0/200 °C	63	63	On request	-	
0/250 °C	100	100	On request	-	
0/300 °C	75	63	On request	-	
0/400 °C	75	75	On request	-	
0/500 °C	63	63	On request	-	
0/600 °C	75	175	On request	-	

 $^{^{\}star}$ For version with separate thermowell.

Blue part no. = in-stock items

Electrical contacts (only for gas filled thermometers)

DG: H, PG: 3

Design			Magnetic spring contact		Inductive contact	
Code			MK 1	MK 2	IK 1	IK 2
Number of contacts			1	2	1	2
Switching function: 1 = closes, 2 = opens (pointer moves clockwise)			1 2	11, 12 21, 22	1 2	11, 12 21, 22
The extra charges thermo	indicated includ					
Version	Nominal size	Housing	Price €	Price €	Price €	Price €
Gas filled thermometers	100	No filling				
for chemical applica- tions		With filling				
liono	160	No filling				
	160	With filling				

Ĺ

See page 397 for contact protection relays and isolating switching amplifiers.



Thermowells according to DIN 43772

DG: H

Туре		Design 5			Design 6			Design 4	
	<u>Sw27</u>	N 2	도 <u></u>	<u>SW27</u>	N S	<u>'</u>		ØF2 N 27 H 32	3
	10	ØF1		U1	ØF2	- 0	, .	50 ⊆ ∈ ∈ − − − − − − − − − − − − − − − − −	
	d1 d2 E	N D1 F1	K1 H1 H2	d1 d2 E	N D1 F2	K1 H1 H2	dı d2 F	N F3 H1	H ₂
Dimensions (mm)	10 8 G½B 11 10 G½B	G½ 26 12 G½ 26 13	14 19 15 14 19 15	10 8 G½B 11 10 G½B	G½ 26 17 G½ 26 17	14 19 15 14 19 15	9 8 26 11 10 26	G½ 15 19 G½ 17 19	15 15
				d2 = probe	diameter of in	strument			
Connection			Process con					mometer G½ f	
Version	W	elded, screw-i		Bar	stock, screw-		Sin	gle part, weld-	
Material		Brass	Stainless steel 316 Ti		Steel	Stainless steel 316 Ti		Steel	Stainless steel 316 Ti
Pmax*		25 bar	40 bar		160 bar	150 bar		160 bar	150 bar
Tmax*		160 °C	400 °C		300 °C	400 °C		300 °C	400 °C
PG		2	3		3	3		3	3
	l anastlas	Price €	For Price €	r stem diamete	· ·	n Price €	1	Price €	Price €
	Lengths mm	Price € Part no.	Price € Part no.	Lengths mm	Price € Part no.	Price € Part no.	Lengths mm	Price € Part no.	Price € Part no.
	L 110 U1 82 G 105	64670	64674	L 110 U1 82 G 105	64678	64682	L 110 U1 82 G 105	64686	64690
	L 170 U1 142 G 165	64671	64675	L 170 U1 142 G 165	64679	64683	L 170 U1 142 G 165	64687	64691
	L 210 U1 182 G 205	64672	64676	L 210 U1 182 G 205	64680	64684	L 210 U1 182 G 205	64688	64692
	L 260 U1 232 G 255	64673	64677	L 260 U1 232 G 255	64681	64685	L 260 U1 232 G 255	64689	64693
				stem diameter					
	Lengths mm	Price € Part no.	Price € Part no.	Lengths mm	Price € Part no.	Price € Part no.	Lengths mm	Price € Part no.	Price € Part no.
	L 110 U1 82 G 105	64694	64698	L 110 U1 82 G 105	64702	64706	L 110 U1 82 G 105	64710	64714
	L 170 U1 142 G 165	64695	64699	L 170 U1 142 G 165	64703	64707	L 170 U1 142 G 165	64711	64715
	L 210 U1 182 G 205	64696	64700	L 210 U1 182 G 205	64704	64708	L 210 U1 182 G 205	64712	64716
	L 260 U1 232 G 255	64697	64701	L 260 U1 232 G 255	64705	64709	L 260 U1 232 G 255	64713	64717

^{*} Applies to static load (load always depends on medium, pressure and temperature of medium, flow rate, installation length and material of thermowell). The stem length of the thermometer is calculated as follows (for fixed male connection, G½B): L = minus 10 mm.



Industrial thermometers



- Extremely robust due to full metal housing
- Vibration-resistant glass thermometers
- Stem: Stainless steel version possible
- Excellent readability due to blue thermometer filling



Application Heating, industry, mechanical engineering.

Technical Nominal size

specifications 110 x 30 - 150 x 36 - 200 x 36

Upper part

Aluminium, V-shaped, polished, anodised brass-coloured. Numbers of the measuring range on the right scale side below the anodised layer, printed, black. Adjustable with the help of a brass nut (spanner size SW 22) so it can be read from any view.

Glass insert (capillary)

Prismatic capillary, completely made of glass, Ø 6 mm. Graduation marks of the capillary burnt in, black, completely resistant. Main graduation marks corresponding to the numbers printed on the housing are especially bold and easy to read.

Thermometer filling

Standard version: Blue liquid indicating from -60 with the help to +200 °C.

Stem

Brass, Ø 10 mm, with fixed thread G½B. Stainless steel version on request.

Accuracy

DIN 16195

Ranges °C

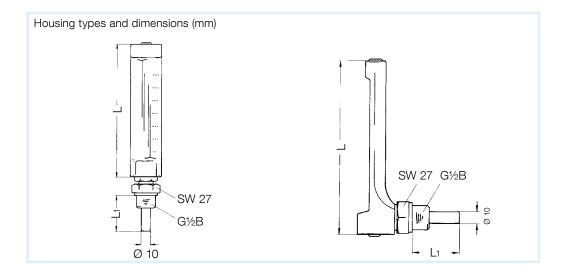
-30/+50, 0/60, 0/100, 0/120, 0/160

Mounting position

Straight Angled 90° Angled 135°

Stem lengths (mm)

40, 63, 100, 160



- **Options** Other ranges
 - Other stem lengths
 - Other stem materials
 - Other connection threads
 - Upper part anodised aluminium-coloured
 - Upper part made of plastic
 - Thermowells

Туре	L	Lı
VMTh 110	110	40
VMTh 150	150	63 100
VMTh 200	200	160



Industrial thermometers

DG: H, PG: 2

Туре	VMTh 110	VMTh 110	VMTh 150	VMTh 150	VMTh 200	VMTh 200
		I		Ī	F	N
Version				li li		
					Î	
Nominal size	110 x 30	110 x 30	150 x 36	150 x 36	200 x 36	200 x 36
DIN	16181	16182	16185	16186	16189	16190
Mounting position	Straight	Angled 90° 1)	Straight	Angled 90° 1)	Straight	Angled 90° 1)
Housing Stem				sed brass-coloured 7 10 mm		
Connection		Var		in socket G½B, bras	20 2)	
Accuracy		VOI		III 300Ket 072B, bras	55 ^{-/}	
Range	-30/+50 °C	-30/+50 °C	-30/+50 °C	-30/+50 °C	-30/+50 °C	-30/+50 °C
Stem length	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.
40 mm	64101	64120	64136	64150		
63 mm	64102	64121	64137	64151	64165	64181
100 mm	64103	64122	64138	64152	64166	64182
160 mm	64104	64123	64139	64153	64167	64183
Range	0/60 °C	0/60 °C	0/60 °C	0/60 °C	0/60 °C	0/60 °C
Stem length	Price € Part no.	Price €	Price €	Price € Part no.	Price €	Price €
40 mm	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
63 mm	64106	64124	64140	64154		
00	64107	64125	64141	64155	64169	64185
100 mm	64108	64126	64142	64156	64170	64186
160 mm	6.4100	0.4107	0.41.40	0.4157	0.4171	64107
Range	64109 0/100 °C	64127 0/100 °C	64143 0/100 °C	64157 0/100 °C	64171 0/100 °C	64187 0/100 °C
Stem length	Price €	Price €	Price €	Price €	Price €	Price €
_	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
40 mm			64330	64335		
63 mm			64331	64336		
100 mm			64332	64337		
160 mm			64333	64338		
Range	0/120 °C	0/120 °C	0/120 °C	0/120 °C	0/120 °C	0/120 °C
Stem length	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.
40 mm	64111	64128	64100	64110		
63 mm	64112	64129	64105	64115	64173	64189
100 mm	64113	64130	64144	64158	64174	64190
160 mm	64114	64131	64145	64159	64175	64191
Range	0/160 °C	0/160 °C	0/160 °C	0/160 °C	0/160 °C	0/160 °C
Stem length	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.
40 mm	64116	64132	64146	64160		
63 mm	64117	64133	64147	64161	64177	64193
100 mm	64118	64134	64148	64162	64178	64194
160 mm	64119	64135	64149	64163	64179	64195

¹⁾ Version with mounting position 135° on request. ²⁾ Extra charge for stainless steel srew-insocket: 30.90 €. Minimum order quantity for non-stock items = 10 pieces



Resistance thermometers WTh 23/24/25







WTh 23

Description Version

Compact screw-in resistance thermometer specially for heating, ventilation and air conditioning applications

Technical Sensor specifications

1 x Pt 100 2-, 3- or 4-wire Class B, IEC 751

Measuring insert

Not replaceable

Thermowell

Ø 6 mm, stainless steel 316 Ti

Process connection

G1/4B stainless steel 316 Ti

Installation length

100 mm

Connection head (degree of protection)

Type J, aluminium die cast (IP 54)

Measuring range

-35/+180 °C

- Options Sensor class A
 - Sensor Pt 1000
 - Transmitter installation
 - Other thermowell diameters
 - Thermowell with bend, measuring tip with spring
 - Neck
 - Other process connections
 - Other installation lengths

WTh 24

Version

Screw-in resistance thermometer for medium pressure and flow loads, specially for mechanical engineering and plant engineering

Sensor

1 x Pt 100 2-, 3- or 4-wire Class B, IEC 751

Measuring insert

Replaceable

Thermowell

As per DIN 43772 Ø 9 x 1 mm, stainless steel 316 Ti

Ø 9 x 1 mm, 25 mm long Stainless steel 316 Ti

Process connection

G1/2B stainless steel 316 Ti

Installation lengths

100, 160, 250 mm

Connection head (degree of protection)

Type B as per DIN 43729 Aluminium die cast (IP 54)

Measuring range

-35/+180 °C

- Sensor class A
- Sensor Pt 1000
- Transmitter installation (standard: 0/100 °C = 4-20 mA)
- Other installation lengths

WTh 25

Version

Screw-in resistance thermometer for medium pressure and flow loads at higher temperatures

Sensor

1 x Pt 100 2-, 3- or 4-wire Class B. IEC 751

Measuring insert

Replaceable, Ø 6 mm

Thermowell

As per DIN 43772

Ø 9 x 1 mm, stainless steel 316 Ti

Ø 9 x 1 mm, 120 mm long Stainless steel 316 Ti

Process connection

G1/2B stainless steel 316 Ti

Installation lengths

100, 125, 160, 250, 400 mm

Connection head (degree of protection)

Type B as per DIN 43729 Aluminium die cast (IP 54)

Measuring range

-35/+400 °C

- Sensor class A
- Sensor Pt 1000
- Reduced measuring tip (6 mm)
- Transmitter installation
- Other thermowell materials, process connections, installation lengths



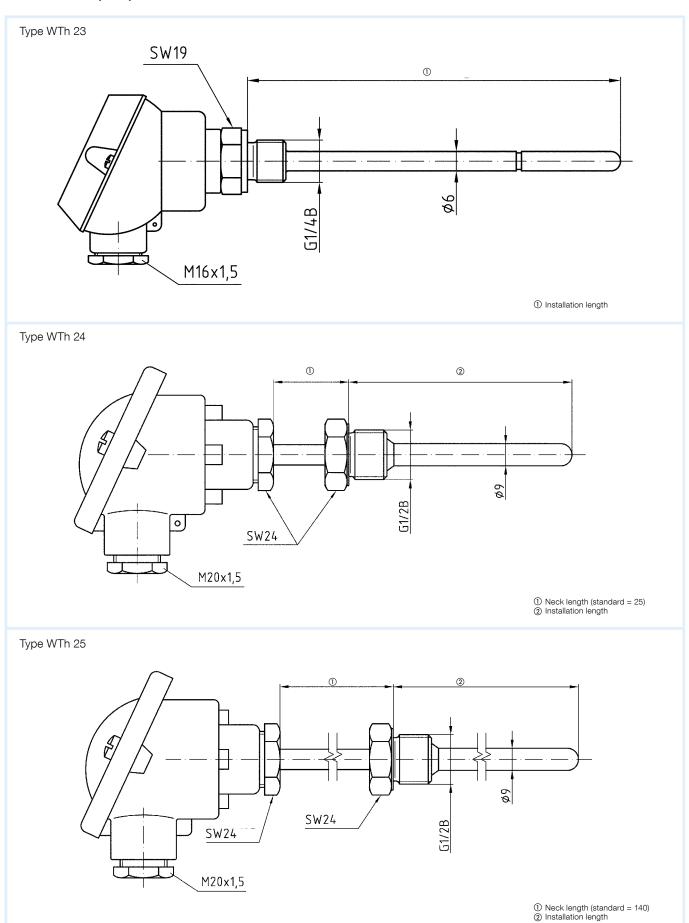
See page 292 for wiring diagram.

See the catalogue DOMESTIC TECHNOLOGY for versions as injectiontype and outdoor resistance thermometers for use in air ducts.



Resistance thermometers WTh 23/24/25

Dimensions (mm)



Resistance thermometers WTh 26/27/28







WTh 26

Technical Version specifications Weld-in resistance

thermometer for high pressure and flow loads

Sensor

1 x Pt 100 2-, 3- or 4-wire Class B, IEC 751

Measuring insert

Replaceable, Ø 6 mm

Thermowell

As per DIN 43772-4 Stainless steel 316 Ti

Neck

Ø 11 x 2 mm, 140 mm long Stainless steel 316 Ti

Installation lengths (L1/L3) 65/110, 65/140, 65/200,

125/200, 125/260

Connection head (degree of protection)

Type B as per DIN 43729 Aluminium die cast (IP 54)

Measuring range

-35/+550 °C

WTh 27

Version

Flanged resistance thermometer for medium pressure and flow loads

Sensor

1 x Pt 100 2-, 3- or 4-wire Class B, IEC 751

Measuring insert

Replaceable, Ø 6 mm

Flanged thermowell

Several parts, Ø 11 x 2 mm Flange connection as per EN 1092-1 type B 1, DN 25, PN 40 Stainless steel 316 Ti

Neck

Ø 11 x 2 mm, 120 mm long Stainless steel 316 Ti

Installation lengths 100, 160, 250, 400 mm

Connection head (degree of protection)

Type B as per DIN 43729 Aluminium die cast (IP 54)

Measuring range

-35/+400 °C

WTh 28

Version

Resistance thermometer for hygienic processes, e.g. food, beverages, pharmaceutical, biotechnology applications

Sensor

1 x Pt 100 2-, 3- or 4-wire Class B. IEC 751

Measuring insert

Replaceable, Ø 6 mm

Thermowell

Ø9 x 1 mm, stainless steel 316 Ti

Neck

Ø 9 x 1 mm, 140 mm long Stainless steel 316 Ti

Process connection

Either clamp, screw connection DIN 11851, weld-in ball, weld-in socket

Installation length

100, 125, 160, 250, 400 mm

Connection head (degree of protection)

Type B, type BUZ Aluminium die cast (IP 54)

Measuring range

-35/+300 °C

Options Sensor class A

- Without thermowell (thread M 18 x 1.5 or M 14 x 1.5)
- Transmitter installation
- Other thermowell materials, process connections, installation lengths, connection heads
- Sensor class A
- Reduced measuring tip (6 mm)
- Transmitter installation
- Other thermowell materials, process connections, installation lengths, connection heads
- Sensor class A
- Reduced measuring tip (6 mm)
- Other thermowell materials
- Other process connections
- Other installation lengths
- Transmitter installation
- Field housing



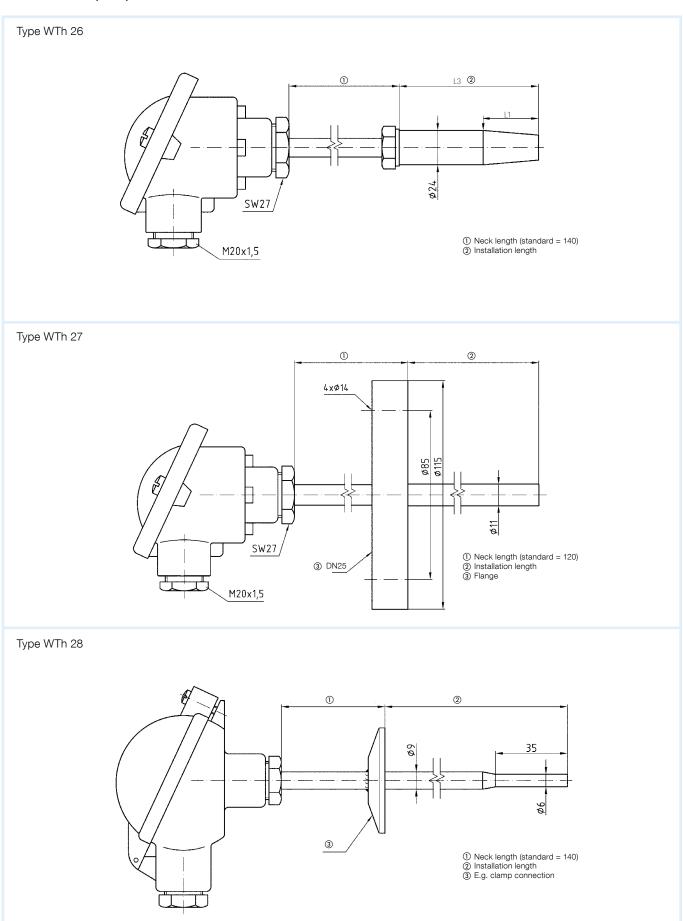
See page 292 for wiring diagram.

See the catalogue DOMESTIC TECHNOLOGY for versions as injectiontype and outdoor resistance thermometers for use in air ducts.



Resistance thermometers WTh 26/27/28

Dimensions (mm)



Electrical connection assignment for resistance thermometers WTh

Ceramic base in connection head, type J (WTh 23) 1 x three-wire 1 x two-wire 1 x four-wire Ceramic base in connection head, type B (WTh 24 to WTh 28) 1 x two-wire 1 x three-wire 1 x four-wire PCB in connection head, made of polyamide (WTh 21 and WTh 22) 1 x two-wire 1 x three-wire 1 x four-wire Cable probe (WTh 20) 1 x two-wire 1 x three-wire 1 x four-wire Red White Red Red White Red Red White White Transducer Controller Display Recorder Controller Display Recorder unit unit Three-wire transducer Power supply unit Power supply Two-wire DC 7.5 ... 30 V transducer DC 15 ... 30 V 4 ... 20 mA

0 ... 10 V

Resistance thermometers

DG: H, PG: 4

Туре	WTh 23	WTh 24	WTh 25	
Version				
Sensor	1 x Pt 100 3-wire, class B	1 x Pt 100 3-wire, class B	1 x Pt 100 3-wire, class B	
Thermowell/probe diameter Material	6 mm Stainless steel 316 Ti	9 mm Stainless steel 316 Ti	9 mm Stainless steel 316 Ti	
Neck		25 mm	120 mm	
Process connection	G¼B Stainless steel 316 Ti	G½B Stainless steel 316 Ti	G½B Stainless steel 316 Ti	
Connection head/ Electr. connection	Type J/cable gland	DIN 43729, type B Cable gland	DIN 43729, type B Cable gland	
Measuring range fixed (moving)	-35/+180 °C	-35/+180 °C	-35/+400 °C	
Installation length	Price € Part no.	Price € Part no.	Price € Part no.	
65 mm				
100 mm		32210	32240	
125 mm			32241	
160 mm	32226	32211	32242	
250 mm	32227	32212	32243	
400 mm	32228		32244	
Extra charges (without PG)	Price €	Price €	Price €	
Per additional 100 mm installation length				
Transmitter installation* DC 7.5–30 V/4–20 mA				
1 x Pt 100 4-wire				
2 x Pt 100 2-wire				
Sensor class A				
Reduced measuring tip (Ø 6 mm) for 1 x Pt 100				
Connection head design BBK				

^{*} Applies to standard measuring ranges (-50/+50, 0/50, 0/100, 0/120, 0/150, 0/200, 0/300 °C),



extra charge in all other cases €

** Applies up to 1,000 mm, one-time extra charge for installation length greater than 1,000 mm: €

Resistance thermometers

DG: H, PG: 4

Туре	WTh 26	WTh 27	WTh 28	
Version				
Sensor	1 x Pt 100 3-wire, class B	1 x Pt 100 3-wire, class B	1 x Pt 100 3-wire, class B	
Thermowell/probe Diameter Material	Weld-in thermowell as per DIN 43772 Stainless steel 316 Ti	11 mm Stainless steel 316 Ti	9 mm Stainless steel 316 Ti	
Neck	140 mm	120 mm	140 mm	
Process connection	Weld-in thermowell as per DIN 43772*	Flange EN 1091-1 Type B1 DN 25/PN 40	Clamp 1"	
Connection head/ Electr. connection	DIN 43729, type B Cable gland	DIN 43729, type B Cable gland	Type B, type BUZ Cable gland	
Measuring range	-35/+550 °C	-35/+400 °C	-35/+200 °C	
Installation length	Price € Part no.	Price € Part no.	Price € Part no.	
65 mm	32250			
100 mm	32251	32260	32230	
125 mm			32231	
160 mm	32253	32261	32232	
250 mm	32254	32262	32233	
400 mm		32263	32234	
F	D: C	D: 6	D: C	
Extra charges (without PG)	Price €	Price €	Price €	
Per additional 100 mm installation length ***				
Transmitter installation* DC 7.5-30 V/4-20 mA				
1 x Pt 100 4-wire				
2 x Pt 100 2-wire				
Sensor class A				
Reduced measuring tip (Ø 6 mm) for 1 x Pt 100				
Clamp 1½'"			On request	
DIN 11851, DN 40			On request	
Hygienic, DN 40			On request	
Weld-in ball			On request	
Weld-in socket			On request	



^{*} Enquire for thermowells made of other materials.

** Applies to standard measuring ranges (-50/+50, 0/50, 0/100, 0/120, 0/150, 0/200, 0/300, 0/400, 0/500 °C), extra charge in all other cases €

***Applies up to 1,000 mm, one-time extra charge for installation length greater than 1,000 mm €

Resistance thermometer WTh 30 for hygienic processes



- Hygienic design as per EHEDG recommendations
- Compact design
- High accuracy
- Short response time
- Various process connections
- Transducer can be integrated



Application For temperature measurement in tanks, pipelines and applications requiring hygienic process connections, materials and processing. Specially suitable for food, pharmaceutical and biotechnology applications due to the compact design and the high accuracy.

Description WTh 30 consists of a robust stainless steel housing with various process connections and a Pt 100 measuring insert which is directly integrated in a thermowell. The change in resistance depending on the measured temperature is directly available as a signal or can be detected by a transducer and converted into a 4-20 mA output signal. The instrument will be offered, as standard, with a compact M12 plug connection.

specifications

Technical Measuring range

-50/+200 °C

Response time

As per to EN 60751, test in flowing water (without transducer) T 90 = 5.5 s

Sensor

1 x Pt 100, 4-wire Class A, IEC 751

Thermowell

Stainless steel 316, Ø 6 mm

Installation lengths

30, 35, 50, 100, 150, 200 mm

Housing

Stainless steel, Ø 18 mm

Degree of protection

IP 67 (EN 60529)

Electrical connections

M 12 connection, connector housing stainless steel

Process connections

Stainless steel 316 L, one of the following: G1/2B; G½B conical, metal seal; grooved union nut DIN 11851; Clamp DIN 32676; Clamp ISO 2852; Tri-Clamp VARIVENT® type N

Surface roughness

 $Ra < 0.8 \mu m$ Welding seam < 1.6 µm

Operating pressure

Max. 16 bar

(VARIVENT® type N max. 10 bar)

Transducer (option)

Technical Version

specifications Transducer directly integrated in the plug housing, with encapsulated electronics.

Measuring ranges

0/100° C (standard) 0/150 °C -50/+100° C

Supply voltage

DC 8.5-36 V

Output signal

4-20 mA, 2-wire

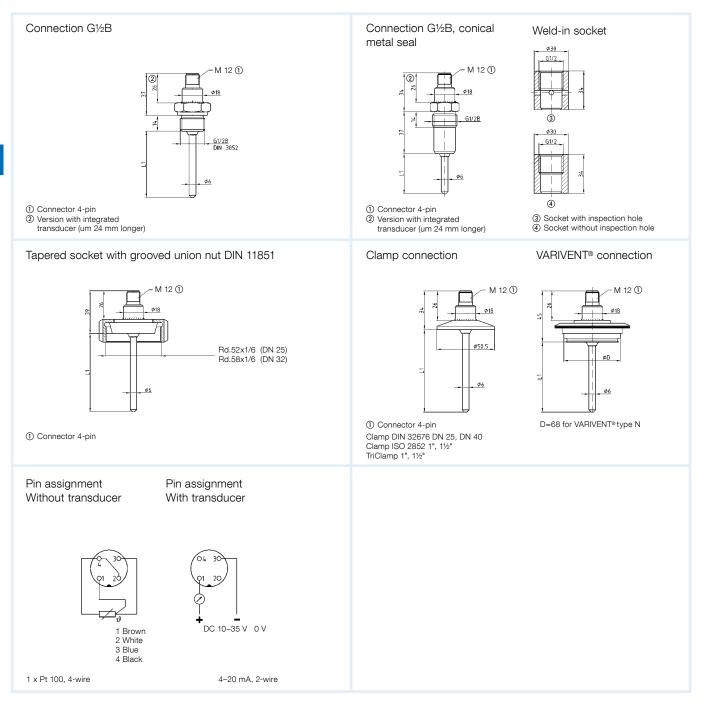
- Options Integrated transducer
 - Other process connections
 - Electropolishing

- Replaceable measuring insert
- Other installation lengths
- Weld-in sockets



Resistance thermometers WTh 30

Electrical connections and dimensions (mm)



Resistance thermometers WTh 30

DG: H, PG: 4

Туре	WTh 30	WTh 30 DK	WTh 30 MR	WTh 30 CP	WTh 30 VT
Version					
Sensor	1 x Pt 100 4-wire, class A	1 x Pt 100 4-wire, class A	1 x Pt 100 4-wire, class A	1 x Pt 100 4-wire, class A	1 x Pt 100 4-wire, class A
Thermowell/probe Diameter Material	6 mm Stainless steel 316 L	6 mm Stainless steel 316 L	6 mm Stainless steel 316 L	6 mm Stainless steel 316 L	6 mm Stainless steel 316 L
Process connection	G½B	G½B, conical, metal seal	Grooved union nut DIN 11851 DN 25/PN 40	Clamp ISO 2852 DN 25	VARIVENT® Type N
Electrical connection	M 12 connector	M 12 connector	M 12 connector	M 12 connector	M 12 connector
Measuring range	-50/+200 °C	-50/+200 °C	-50/+200 °C	-50/+200 °C	-50/+200 °C
Installation length L1	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.
30 mm	32302	32310	32318	32326	32334
35 mm	32303	32311	32319	32327	32335
50 mm	32304	32312	32320	32328	32336
100 mm	32305	32313	32321	32329	32337
150 mm	32306	32314	32322	32330	32338
200 mm	32307	32315	32323	32331	32339
Extra charges (with- out PG)	Price €	Price €	Price €	Price €	Price €
Installed transducer 4–20 mA*					
Process connection					
DIN 11851 DN 32					
ISO Clamp DN 38				No extra charge	
DIN Clamp DN 25				No extra charge	
DIN Clamp DN 40				No extra charge	
Tri-Clamp 1"				No extra charge	
Tri-Clamp 1½"				No extra charge	
Accessories				Part no.	Price €
Weld-in socket for G½B	conical, metal seal, wit		32340		
Weld-in socket for G½B		· · · · · · · · · · · · · · · · · · ·		32341	
Connector with cable, 5					
Confidence with cable, o	11101100				

^{*} Please specify desired measuring range: 0/100 °C (standard), 0/150 °C, -50/+100 °C (corresponding to 4–20 mA each).



CATALOGUE DOMESTIC TECHNOLOGY

Temperature measuring instruments and controllers for building technology



Bimetal thermometers with thermowells

- For heating/plumbing
- 🛂 Plastic or brass thermowell
- Corrosion-resistant plastic housing

Nominal sizes

50 - 63 - 80 - 100

Ranges

0/60, -20/+60, 0/60, 0/120 °C



Page 340



Bimetal standard thermometers

- For heating/plumbing
- Sheet steel housing, galvanised

Nominal sizes

34 - 50 - 63 - 80 - 100 - 160

Ranges

-20/+60, 0/60, 0/120, 0/160 °C



Page 343



Thermometers with capillary tube

- For burners, boilers, hot water tanks and refrigerating/air conditioning systems
- Corrosion-resistant, highly impact-resistant plastic housing
- With copper or plastic capillary
- Great variety of housing versions and connection types available

Nominal sizes

37 - 40 - 52 45 x 45, 58 x 25, 25 x 58, 62 x 11

Range

0/120 °C





Combined thermometer/ pressure gauges / thermo-hydrometers

- Pressure and temperature measurement with at a single measuring point
- With self-sealing connection thread for fast mounting
- Mounting valve for easy replacement without downtime



63 - 80

Accuracy class





Surface mount thermometers

- For heating/plumbing
- Fastening by means of magnet, spring or universal clamp
- Either plastic or sheet steel housing, galvanised

Nominal sizes

63 - 80

Ranges 0/60, 0/120 °C



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Flue gas thermometers and flue gas temperature controllers

- For burner control for gas and oil burners
- Connection via stainless steel stem

Nominal size

80

Ranges

0/300, 0/350, 0/500 °C



Page 343



Pressure measuring instrument S4600 ST

- Measurement of pressure, vacuum and differential pressure
- Barometric pressure sensor and temperature compensation for highly accurate measured value
- Option data logger (data in XML format)
- Measurement logs as QR codes for smartphones, tablets or management software



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Resistance thermometers WTh 20-22

- Version as plug-in type resistance thermometer, also for use in air ducts, and as indoor and outdoor resistance thermometer for wall mounting
- Pt 100-Sensor
- Many option:
 E.g. transmitter installation,
 sensor class A, etc.



From page 373

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This and many other products can be found in the catalogues DOMESTIC TECHNOLOGY and PORTABLE MEASURING INSTRUMENTS.





HydroFox®



CHAPTER 5

Level indicators, level controllers, overfill prevention systems

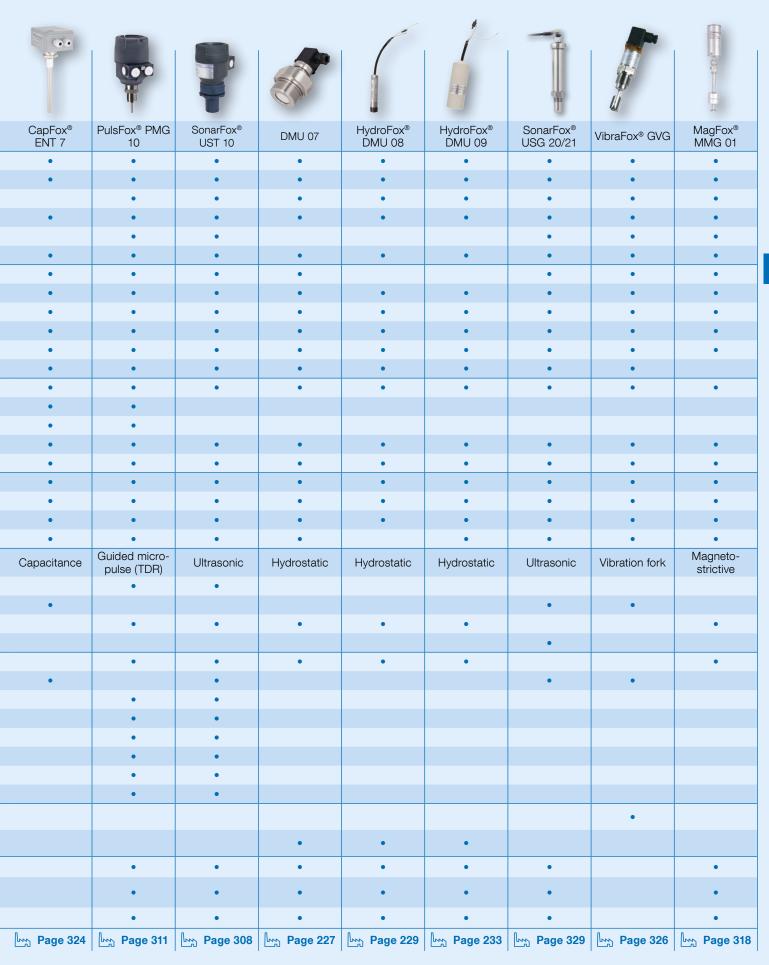
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Level indicators at a glance

			Sherry Sh	M AFFECO O.O.O.	TentControl 323	Business designed from the second sec	
	MT-Profil R	Unitop	DTA 10	DIT 10	TankControl	CoFox® ELT	CapFox® EFT 7
Indoor tanks	•	•	•	•	•	•	•
Outdoor tanks		•	•	•	•	•	•
Electrically isolating tanks	•	•	•	•	•	•	•
Electrically isolating tanks Electrically conductive tanks	•	•	•	•	•	•	•
Pressurised tanks						•	
Unpressurised tanks	•	•	•	•	•	•	•
< 1,000 mm	•	•	•	•		•	•
Up to 2,000 mm	•	•	•	•	•	•	•
Up to 2,500 mm	•	•	•	•	•	•	•
Up to 2,000 mm Up to 2,500 mm Up to 2,900 mm Up to 3,000 mm		•	•	•	•	•	•
Up to 3,000 mm		•	•	•	•	•	•
> 3,000 mm			•	•	•		•
Liquid media	•	•	•	•	•	•	•
Solid media Solid media (bulk solids) Powdery media Electrically isolating media							
Powdery media							
Electrically isolating media	•	•	•	•	•		•
Electrically conductive media	•	•	•	•	•	•	
Fuel oil/diesel fuel (EN 590)	•	•	•	•	•		•
Fuel oil/diesel fuel (EN 590) Biofuel/biodiesel (EN 14214) Water AdBlue®	•	•	•	•	•		•
Water	•	•	•	•	•	•	
AdBlue [®]		•				•	
Measuring principle	Mechanical	Pneumatic	Pneumatic	Hydrostatic	Hydrostatic	Conductive	Capacitance
Local display		•		•	•	•	
Local display Limit level			•		•	•	
Continuous measurement		•	•	•	•		•
Non-invasive measurement							
Analogue output (4–20 mA, 0–10 V)							•
Rinary output (relay, PNP)					•	•	
% liquid level		•	•				
% liquid level % volume Liquid level in cm Liquid level in mm		•		•	•		
Liquid level in cm	•		•		•		
Liquid level in mm				•	•		
Litres		•	•	•	•		
m³				•	•		
Approval for construction products							
Approval for construction products ATEX							
Display unit DA 10/12/14 ≝							•
Display unit DA 10/12/14 Display and control unit VarioFox® 12/14 Transducer MELL							•
Transducer MFU							•
* Depends on version.	☼ Page 7	🏠 Page 9	☼ Page 12	☼ Page 13	Page 14	Page 319	Page 307

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Technical specifications, application areas and suitability depend on the product version. See catalogue data sheet and/or operating instructions for options and details.



Selection table level indicators for process engineering

					7		(g - 504 - 1) - €
		State	Relative Dielectric Constant (ɛr)	PulsFox PMG 10®	SonarFox® UST 10	HydroFox® DMU 07/08/09	MagFox® MMG 01
ulture	Fertilizer (watered solution)	Liquid	Conductive	0	0	0	0
Agriculture	Manure	Liquid	Conductive	•	•	0	-
ials	Calcium carbonate aqueous solution	Liquid	Conductive	0	•	0	0
ater	Cement	Fixed	1.5–10	•	_	_	_
m uo	Ground, stone, sand, gravel	Fixed	2.5-5.0	0	_	_	_
ructi	Powdered lime (CaO)	Fixed	1.6–2.2	•	_	_	_
Construction materials	Slacked lime (lime hydrate) / lime milk (Ca(OH) ₂)	Liquid	Conductive	0	•	-	-
	Ammonia (NH₃)	Liquid	17–25	0	-	0	-
	Ammonium hydroxide (NH ₄ OH)	Liquid	Conductive	•	0	0	-
	Ammonium chloride (NH ₄ Cl) aqueous solution	Liquid	Conductive	0	0	0	-
	Boric acid (H ₃ BO ₃) aqueous solution	Liquid	Conductive	0	0	0	_
	Carbon tetrachloride (CCI ₄)	Liquid	2.3	0	0	-	-
	Ether, diethyl-ether $(CH_3CH_2)_2O$	Liquid	3.1–4.4	0	0	0	-
	Formaldehyde (HCHO) in $\rm H_2O$, formalin	Liquid	23	•	0	-	-
	Fluorosilicic acid ((H ₂ SiF ₆)in H ₂ O)	Liquid	Conductive	0	0	0	-
	Glycerol (glycerine, glycerin) (HOCH ₂ CH(OH) CH ₂ OH)	Liquid	42.5–47	•	•	•	•
	Ethylene glycol ($[CH_2OH]_2$)	Liquid	37–41.2	•	•	•	•
	Hydrochloric acid (HCl)	Liquid	Conductive	0	0	0	-
	Ferric chloride ((FeCl ₃) in H ₂ O)	Liquid	Conductive	0	0	0	-
>	Formic acid (HCO ₂ H)	Liquid	Conductive	0	0	0	-
ustry	Phosphoric acid (H ₃ PO ₄)	Liquid	Conductive	0	0	_	_
Pu	Sodium chloride ((NaCl) in H ₂ O)	Liquid	Conductive	0	0	0	-
ical	Sodium carbonate, soda (Na ₂ CO ₃)	Fixed	5.3-8.4	0	_	0	-
Chemical Indu	Sodium hydroxide, caustic soda ((NaOH) in $\rm H_2O$)	Liquid	Conductive	0	0	-	-
O	Sodium bicarbonate, baking soda (NaHCO ₃)	Fixed	5.7	0	-	_	-
	Sodium hypochlorite ((NaOCI) in $\rm H_2O$), bleach	Liquid	Conductive	0	0	-	-
	Potassium permanganate ((KMnO $_4$) in H $_2$ 0)	Liquid	Conductive	0	0	0	-
	Potassium hydroxide ((KOH) in H ₂ O)	Liquid	Conductive	0	0	0	-
	Sodium hydroxide ((NaOH) in H ₂ O)	Liquid	Conductive	0	0	0	-
	Sodium bisulfite ((NaHSO ₃) in H ₂ O)	Liquid	Conductive	0	•	0	-
	Sulphuric acid (H ₂ SO ₄), low concentrated	Liquid	84	0	0	-	-
	Sulphuric acid (H ₂ SO ₄), low concentrated	Liquid	Conductive	0	0	-	-
	Chloroform (CHCl ₃)	Liquid	3.7–5.5	•	0	-	-
	Trichloroethane (CH ₃ CCI ₃)	Liquid	7.2	0	-	-	-
	Acetic acid (CH ₃ COOH), vinegar	Liquid	Conductive	•	0	-	-
	Painting and varnish agents diluted with water (non-explosive)	Liquid	Conductive	•	•	-	0
0	Not suitable Limited suitability Suitable			Page 311	Page 308	227	Page 318

by medium

					T		ъО
		State	Relative Dielectric Constant (ɛr)	PulsFox PMG 10®	SonarFox® UST 10	HydroFox® DMU 07/08/09	MagFox [®] MMG 01
	Beer	Liquid	Conductive	0	0	•	•
	Citric acid ((C ₆ H ₈ O7) in H ₂ O)	Liquid	Conductive	0	0	0	0
	Coconut oil	Liquid	2.9	•	•	0	0
	Palm oil	Liquid	1.75	•	•	0	-
	Animal fat	Liquid	2.7	•	•	0	_
	Lumpy fruit or vegetable	Fixed	Conductive	0	_	_	_
age	Cream, yoghurt	Liquid	Conductive	0	0	-	_
ver	Milk	Liquid	Conductive	•	0	0	_
pe Pe	Sugar syrup	Liquid	Conductive		0	_	_
anc	Margarine	Liquid	2.8-3.2		0	_	_
Food and beverage	Confectionery coating pastes, honey, jam, marmalade, liquid chocolate	Liquid	2.4; 23; ∞; 3	0	•	-	-
	Edible oil	Liquid	3.9	•	•	0	_
	Fruit juice	Liquid	Conductive	•	•	0	_
	Potato (whole)	Fixed	Conductive	0	_	_	_
	Sodium chloride (NaCl), table salt, rock-salt	Liquid	3.3	0	-	-	0
	Wine	Liquid	Conductive	•	•	0	0
v	Fuel oil	Liquid	2.1	0	•	•	_
ant	Heated pakura (mazout)	Liquid	2.2	•	0	_	_
교	Hot water in high pressure vessels	Liquid	Conductive	0	-	0	0
Power Plants	Water in condensing vessels	Liquid	80	0	0	0	•
<u> </u>	Water level in supply water pool	Liquid	Conductive	•	•	•	-
	Crude oil	Liquid	1.7–2.2	0	•	0	•
	Shale oil	Liquid	2.1	•	0	0	•
il Industry	Grease (lubricant)	Liquid	3.15	0	0	0	0
Ĕ	Diesel oil	Liquid	2–2.5	0	0	•	-
Ö	Lubricant oil	Liquid	2–2.5	0	0	•	0
	Transformer oil	Liquid	2–2.5	0	0	•	•
Paper Mill	Paper pulp	Liquid	Conductive	-	0	0	-
ے تھا	Water	Liquid	Conductive	•	•	•	•
	Granulated plastic	Fixed	1.1–2.8	0	-	_	_
Plastic Industry	Polyvinyl chloride (PVC)	Fixed	3.4	•	-	-	-
ngu	Polyethylene pellet	Fixed	1.5–1.8	-	-	-	-
ţi.	Polystyrene	Fixed	2.2-2.6	-	-	_	-
las	Plastic powder	Fixed	1.3–1.8	0	-	-	-
ш.	Silicone oil	Liquid	2.7	0	•	•	•
	Drinking water in reservoirs	Liquid	Conductive	•	•	•	0
	Thermal water in cooling reservoirs	Liquid	Conductive	0	0	•	•
/ ater	Travelling bar screen control with diff. measurements	Liquid	Conductive	-	•	-	-
Water / waste water	Water level in rivers for flood control	Liquid	Conductive	-	0	•	0
Wa	Water level in well	Liquid	Conductive	-	0	•	0
>	Seawater	Liquid	Conductive	0	•	•	-
	Rainwater reservoir	Liquid	Conductive	•	•	•	•
	Waste water in reservoirs or channels	Liquid	Conductive	0	•	•	0
	suitable ited suitability able			Page 311	Page 308	Page 227	Page 318

Hydrostatic level indicator HydroFox® **DMU 08**



- Special calibration for all standard pressure units possible
- Version with PUR or FEP cable
- ATEX version (optional)









Application For electronic, continuous level measurement, e.g. in wells, drilling holes, water, containers or in waste water systems. Suitable for groundwater, drinking water, waste water (with optional FEP cable), diesel fuel, fuel oil; also for use in flood hazard areas.

Description Pressure transducers HydroFox® DMU 08 convert physical pressure into an electrical signal proportional to the pressure. HydroFox® DMU 08 uses a piezo-resistive silicon measuring cell.

Technical Measuring accuracy

specifications Deviation from the characteristic curve according to IEC 60770 - limit point calibration (non-linearity, hysteresis, repeatability): \leq ± 0.35 % FSO (measuring ranges 0/100 mbar to $0/400 \text{ mbar} < \pm 0.5 \% \text{ FSO}$

Measuring ranges

Relative pressure: 0/100 mbar to 0/25 bar

Operating temperature range

Medium: -10/+70 °C Ambient: -10/+70 °C -25/+70 °C Storage:

Temperature error band

In compensated range 0/70 °C ≤ ±1 % FSO/10 K

Dynamic characteristics

Response time ≤ 10 ms

Materials

Housing: Stainless steel 316 L Diaphragm: Stainless steel 316 L

FKM (Viton)

Pressure transmission liquid

Silicone oil

Supply voltage

DC 8-32 V

Output signal

4-20 mA, 2-wire

4-20 mA: $R_{max} = [(U_B - U_{Bmin})/0.02 \text{ A}] \Omega$

Current input

4-20 mA < 25 mA

Electrical protection

Short circuit proof and protected against reverse polarity

Electrical connection (degree of protection)

PUR cable, 5 m (IP 68)

With integrated breather tube for reference to the ambient atmospheric pressure

Accessories (options)

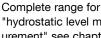
- Screw connector kit
- Junction box
- Anchor clamp

Options

- Screw connector kit
- Junction box
- Anchor clamp
- Extended weight
- ATEX version (see chapter 3)

DG: H	PG	Part no.	Price €			
DMU 08 with 5 m PUR ca	ble					
Measuring range						
0/100 mbar	4	31555				
0/160 mbar	4	31556				
0/200 mbar	4	31557				
0/250 mbar	4	31558				
0/300 mbar	4	31519				
0/400 mbar	4	31559				
Screw connector kit plastic, G2 x 1½ x 1	1	52125				
Junction box with pressure relief port	1	31824				
Diversity of the standard factors						

Blue part no. = in-stock items



"hydrostatic level measurement" see chapter 3: DMU 07 - DMU 09.



Capacitance level indicator CapFox® EFT 7



- For non-conductive media such as fuel oil and diesel fuel
- Band electrode can be shortened on site as required
- Rod probe for tank heights exceeding 200 mm
- Band electrode 6,000 mm (optional)







Application

Capacitance level indicator for continuous measurement level in tanks and containers for non-conductive media, especially fuel oil and diesel fuel.

Description The capacitance level indicator CapFox® EFT 7 detects the change in electrical capacitance caused by the change in level. The device is available with either a flexible band electrode or a rigid probe. Please specify the length of the rigid probe when ordering. Zero and full scale can be adjusted via an internal potentiometer. The output signals are proportional to the liquid level.

Technical Measuring range

specifications 0/200 mm to 0/3,000 mm, depending on selected probe

Measuring accuracy

±2 % FS

Linearity: $< 2 \% C 200 pF < \Delta C < 275 pF$ Temperature deviation: 0.1 %/1K

Operating temperature range

Ambient: -20/+50 °C

Process pressure

Atmospheric

Process connection

Aluminium

Flexible band electrode G1B

Rod probe G11/2B

Flexible band electrode

3,000 mm long flexible electrode band cable (can be shortened to 1,150 mm) with plastic probe

Rigid rod probe

Electrode stainless steel 316 Ti Concentric shielding tube, steel Required probe length must be specified with order Minimum length 200 mm Maximum length 1,500 mm

Supply voltage

AC 230 V, DC 24 V, AC 24 V

Power input

AC 3 VA/DC 2 W

Output signals (load)

4-20 mA (max. 500 Ohm) 0-10 V (min. 10 kOhm)

Capacitance range

0-300 pF

Housing

Impact-resistant plastic (ABS) W x H x D 104 x 65 x 144 mm

Degree of protection

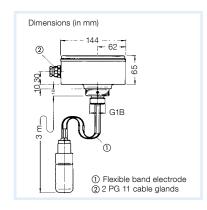
IP 65 (EN 60529)

Electrical connections

2 x cable gland PG 11

Options

- Flexible band electrode 6,000 mm
- Other lengths



DG: H, PG: 4	Part no.	Price €
CapFox® EFT 7 with flexible band electrode 3 m	52107	
CapFox® EFT 7 with rod probe, please specify length!	52108	

Blue part no. = in-stock items



Ultrasonic transmitter SonarFox® UST 10

- Non-contact level measurement of liquid and solid media
- Maintenance-free, not subject to wear and tear
- Integrated flow calculation with 32-point linearisation
- Optional switching relay for level contact or flow function







Application For continuous, non-contact level measurement of media with a variety of consistencies and surface characteristics. Ideal for level measurement of liquids and bulk solids.

Description The SonarFox® UST 10 level indicator uses the physical properties of ultrasonic waves to determine the level. An ultrasonic wave is emitted which is reflected by objects in the cone. The time up to the reception of the reflected echo is a measure of the distance. Since the mounting position is defined, it is possible to calculate the filling level of the medium. Type, density and temperature of the medium have no effect on the measurement - the only prerequisite is a reflecting surface. Acoustically diffuse surfaces such as foam or uneven surfaces of bulk solids are not suitable or should be tested with regard to the application. Installations or stirrers below a plane surface of the medium do not affect the meas-

Probe selection

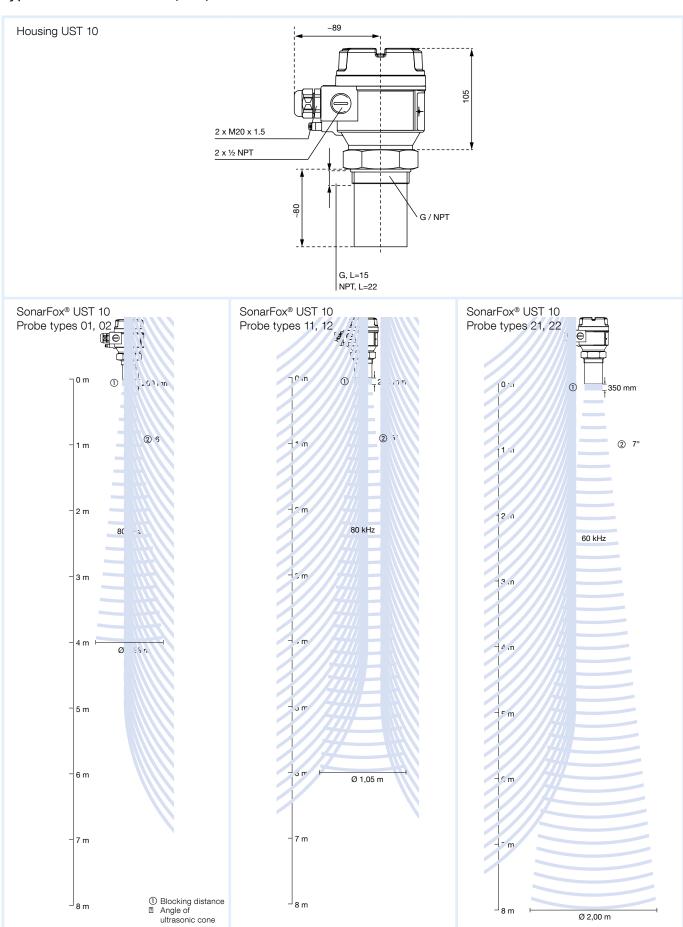
Probe type	01, 02	11, 12	21, 22
Measuring range	0.2 – 4 m	0.25 – 6 m	0.35 – 8 m
Low tanks < 1,000 mm	+	-	-
Tanks between 1,000 mm and 6,000 mm	0	+	-
High tanks > 6,000 mm	-	-	+
Liquids	+	+	+
Solids	+	+	+
High-viscosity or adhesive media	+	+	+
Low-viscosity media	+	+	+
Corrosive media	+	+	+
Conductive media	+	+	+
Non-conductive media	+	+	+
Foam on the medium	-	-	-

- Not suitable
- O Limited suitability
- Suitable



Ultrasonic transmitter SonarFox® UST 10

Types and dimensions (mm)



Ultrasonic transmitter SonarFox® UST 10

Technical specifications

Measuring range

Max. 8,000 mm

Measuring accuracy

0.25 %

Operating temperature range

Ambient: -25/+70 °C Medium: -30/+90 °C

Process pressure

0.5/3 bar

Supply voltage

4-20 mA, 2-wire (12-36 V)

Power input

48-720 mW

Damping

Adjustable 6, 10 or 30 s

Electrical connection

2 x cable gland

Option

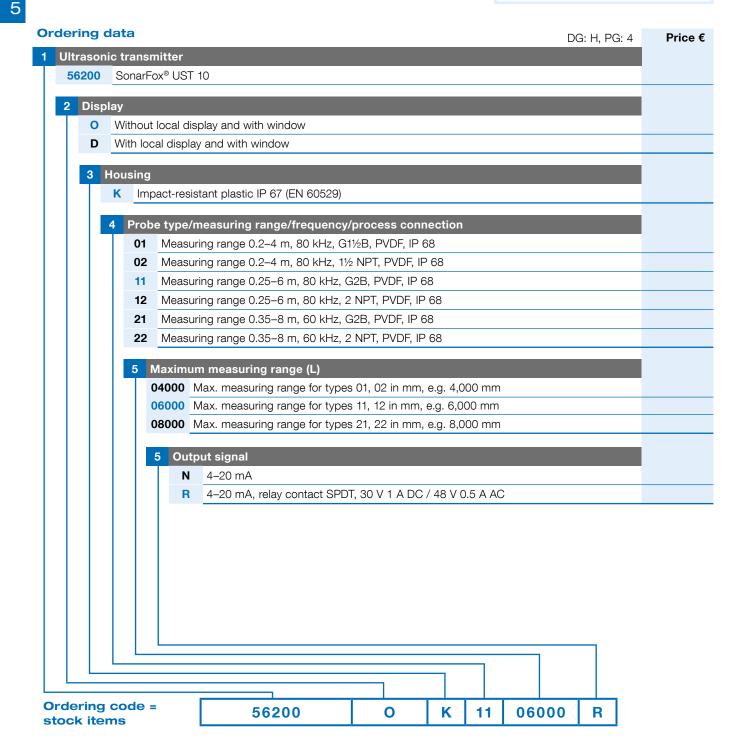
Local display/programming display
 PD 10 UST



display **PD 10 UST**

Part no. **56210** DG: H, PG: 4

74.90 €



Guided micropulse level indicators PulsFox® PMG 10

- Level measurement independent of dielectric constant or changes in pressure, temperature or density
- Reliable, accurate measurement even with foam, vapour, dust or turbulent surfaces of the medium
- Robust housing for rough ambient conditions
- Maintenance-free, not subject to wear and tear







For continuous level measurement in containers, tanks or silos. Suitable for liquid, powdery, granular, electrically conductive or non-conductive media. Ideal for changing media. Also suitable for pressurised or vacuum tanks.

Description

PulsFox® PMG 10 level indicators operate on the basis of the guided micropulse principle (TDR, time domain reflectometry). A micropulse is emitted along a probe. The micropulse is surrounded by an electromagnetic field. Reflections of the pulses from objects and surfaces serve as the basis of distance measurement. The pulse's propagation time is directly proportional to the distance between the probe and the surface of the medium. The reflectance of materials depends on the dielectric constant er. Changes of the medium (e.g. vapour, dust or a turbulent surface) do not affect the measuring accuracy of this measuring principle. No recalibration is required when a different medium is used. Even if properties such as pressure, temperature and density change, the system operates with high reliability and precision. PulsFox® PMG 10 has no moving parts and is therefore maintenance-free and not sub-

Application examples ■ Cement silo

- Liquid bitumen
- Containers for construction materials such as mortar, plaster, gypsum
- Silos for additional fuels such as meat and bone meal or dried sewage sludge
- Tanks for liquefied gas such as LPG, LNG
- Tanks facilities for ethanol fuel
- Tank facilities for hydrochloric acid
- Storage of intermediate products, chemical industry

- Supply tanks for hydraulic oil
- Condensation tanks for liquids
- Water separators located prior to vacuum
- Small and medium size tanks for raw and finished products in refineries
- Level measurement in facilities for leachate treatment
- Supply water tanks of turbines
- Level measurement in bodies of water



Guided micropulse level indicators PulsFox® PMG 10

Probe selection

	probe MS	mono probe MF	probe DF	Coax probe KX
Low tanks ≤ 1,000 mm	0	-	-	+
Tanks > 1,000 mm / ≤ 3,000 mm	+	+	+	+
Tanks > 3,000 mm / ≤ 6,000 mm	-	+	+	0
High tanks > 6,000 mm	-	+	+	-
Liquids	+	+	+	+
Solids	+	+	+	-
High-viscosity or adhesive media	+	o	-	-
Low-viscosity media	+	+	+	+
Disturbing installations/small distances	-	-	+	+
Conductive foam on the medium	+	+	-	-

Rigid mono

- Not suitable
- Limited suitability
- Suitable

specifications MS:

Technical Measuring range

≤ 3,000 mm MF, DF: ≤ 24,000 mm KX: ≤ 6,000 mm

Dielectric constant (Er) of medium

MS, MF: ≥ 2.1 DF: ≥ 1.8 KX: ≥ 1.4

Operating temperature range

-30/+200 °C Medium: -30/+90 °C Flange: (High temperature: -30/+200 °C) -30/ +60 °C Ambient: (with display: -20/+60 °C)

Process pressure

PN 16 or PN 25 MF, DF, KX: PN 16

Process connection

See technical specifications of the individual versions

Supply voltage

4-20 mA, 2-wire (18-35 V)

Output signal

4-20 mA/HART, 2-wire

Housing

Aluminium die cast

Flexible

Elevible dual

Degree of protection

IP 65 (EN 60529)

Electrical connection

2 x cable gland

Option

- Local display/programming display PD 10 PMG
- Other process connections
- FEP/PFA/PP coatings



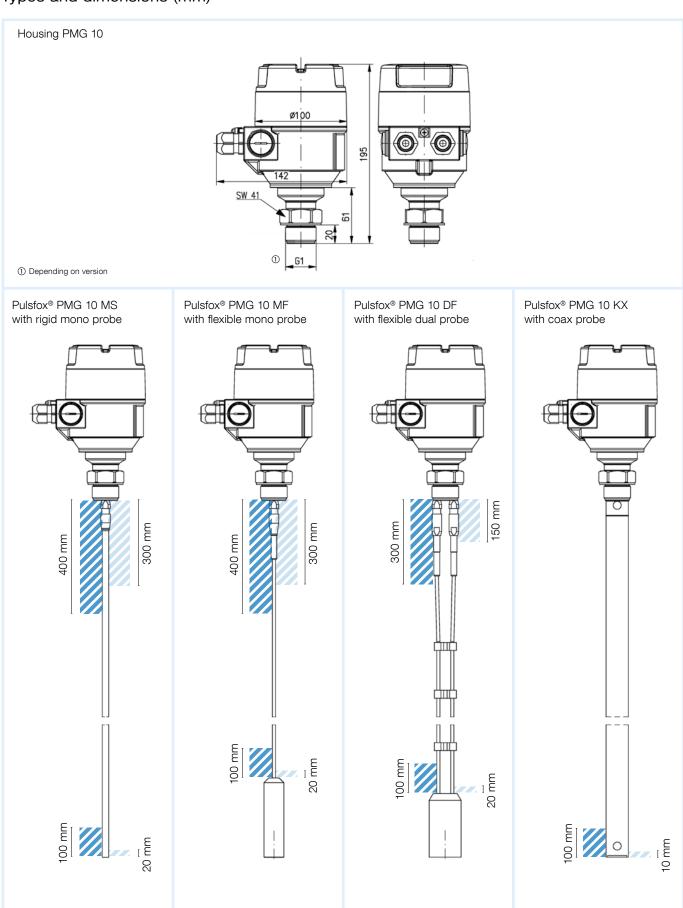


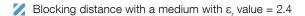
See pages 314-317 for prices.



Guided micropulse level indicators PulsFox® PMG 10

Types and dimensions (mm)





Blocking distance with a medium with εr value = 80



Guided micropulse level indicator with rigid mono probe PulsFox® PMG 10 MS

- Also for high-viscosity or adhesive media
- Conductive foam does not influence the measurements

Technical specifications

Measuring range

Max. 3,000 mm

Dielectric constant (Er) of medium

 ≥ 2.1

Measuring accuracy

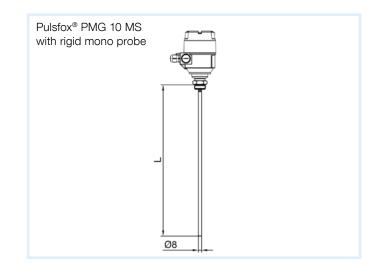
Better than ±5 mm in the case of liquids, ±20 mm in the case of powder/solids

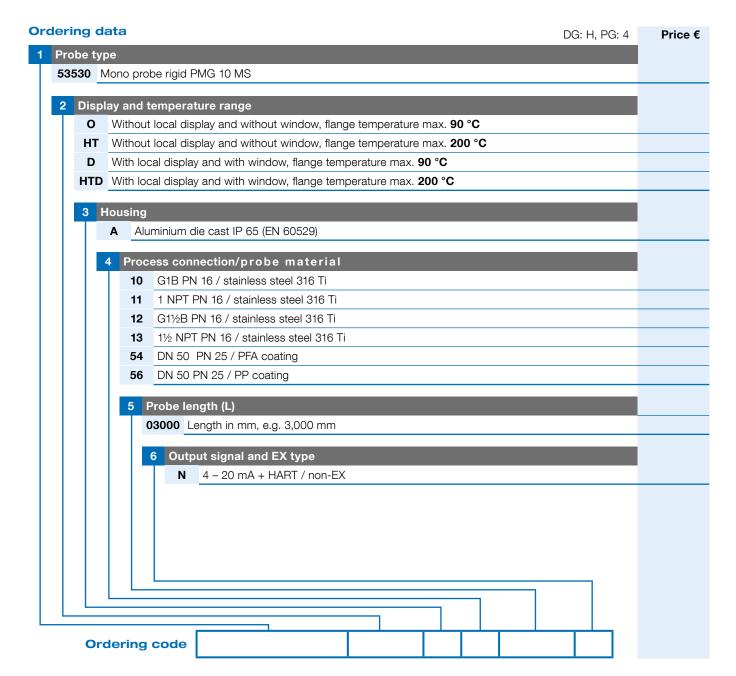
Probe material

Stainless steel 316 Ti

Wetted parts

Stainless steel 316 Ti, PTFE, FKM





Guided micropulse level indicator with flexible mono probe PulsFox® PMG 10 MF

- Also suitable for high tanks (> 6 m)
- Conductive foam does not influence the measurements
- Optional FEP coating for corrosive media

Technical specifications

Measuring range

Max. 24,000 mm

Dielectric constant (Er) of medium

> 21

Measuring accuracy

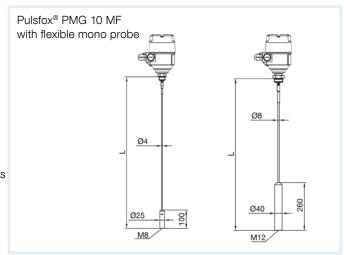
Better than: ±0.05% of probe length (min. ±5 mm) in the case of liquids ±0.2% of probe length (min. ±20 mm) in the case of powder/solids

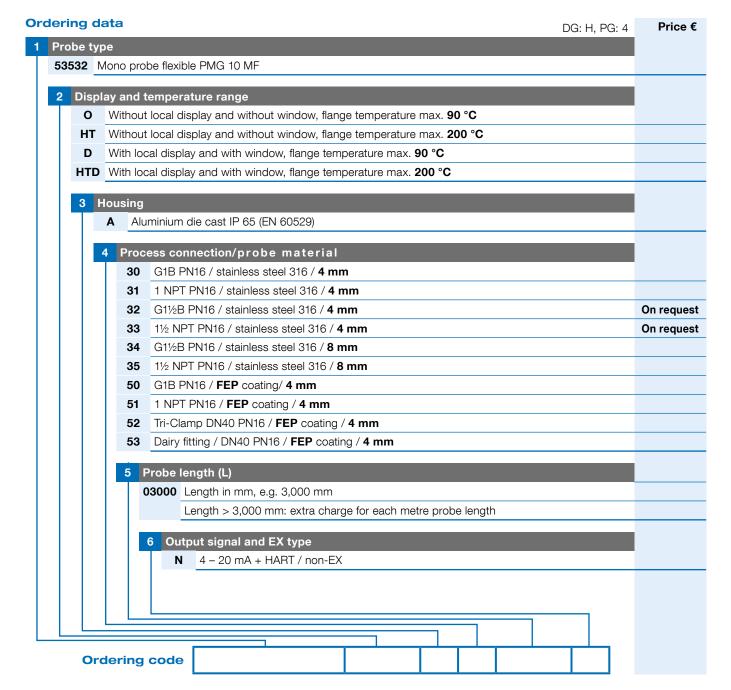
Probe material

Stainless steel 316

Wetted parts

Stainless steel 316 Ti, PTFE, FKM







Guided micropulse level indicator with flexible dual PulsFox® PMG 10 DF

- Small minimum distances
- Also suitable for high tanks (> 6 m)
- Only for non-adhesive media

Technical specifications

Measuring range

Max. 24,000 mm

Dielectric constant (Er) of medium

≥ 1.8

Measuring accuracy

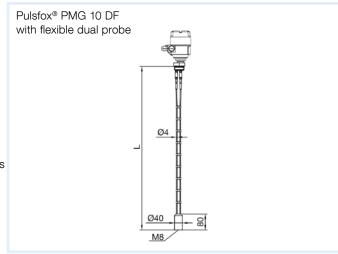
Better than: $\pm 0.05\%$ of probe length (min. ± 5 mm) in the case of liquids $\pm 0.2\%$ of probe length (min. ± 20 mm) in the case of powder/solids

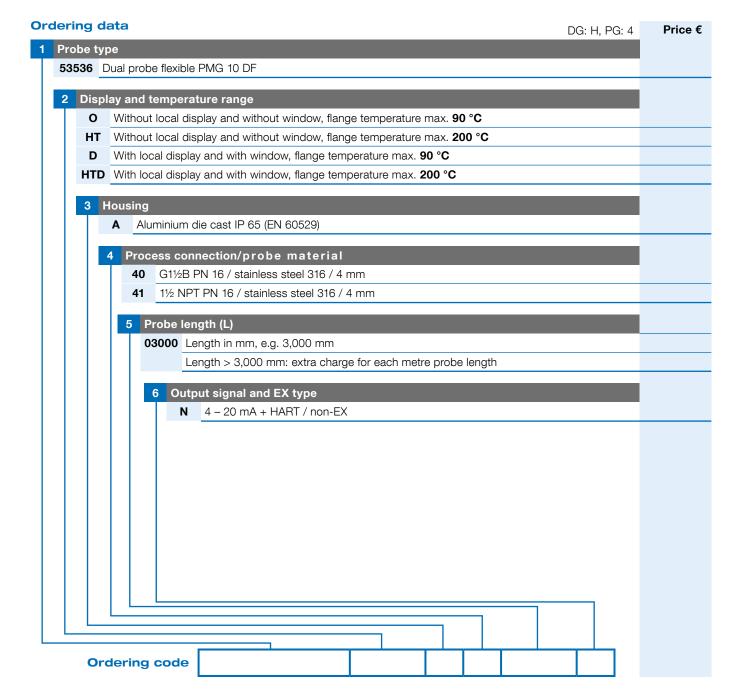
Probe material

Stainless steel 316

Wetted parts

Stainless steel 316, PTFE, FKM





Guided micropulse level indicator with rigid coax probe PulsFox® PMG 10 KX

- Also suitable for low tanks (< 1 m)
- No minimum distances
- Not for adhesive media

Technical specifications

Measuring range

Max. 6,000 mm

Dielectric constant (Er) of medium

> 1.4

Measuring accuracy

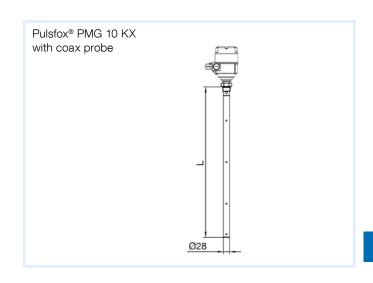
Better than: $\pm 0.05\%$ of probe length (min. ± 5 mm) in the case of liquids

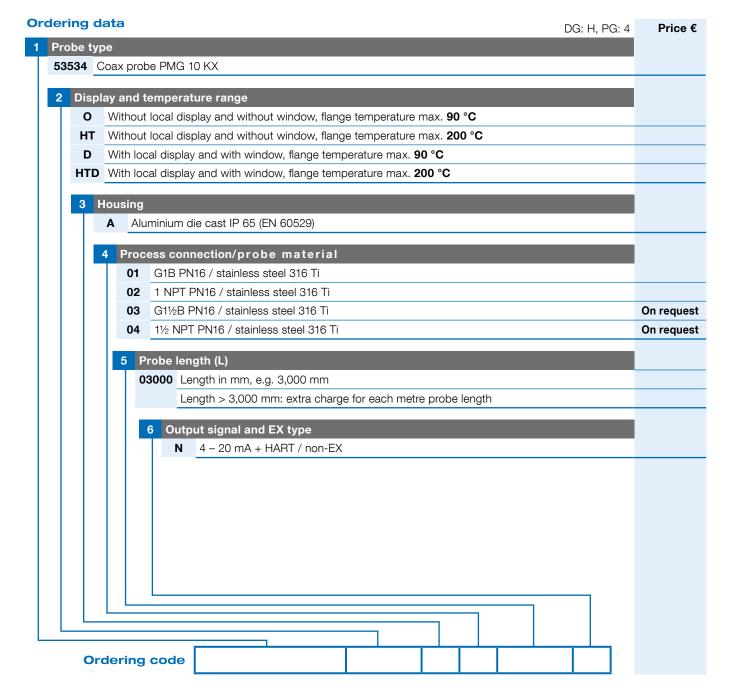
Probe material

Stainless steel 316 Ti

Wetted parts

Stainless steel 316 Ti, PTFE, FKM





Magnetostrictive level indicator MagFox® MMG 01

- High measuring accuracy ±0.5 mm
- Freely adjustable measuring range over the entire probe length
- HART protocol (option)
- Shock- and vibration-resistant (option)







Application

For continuous high-precision measurement of levels in tanks and containers with liquid levels of 100 mm to 6,000 mm. Suitable for liquid, not highly viscous media which do not adhere to the probe.

Description MagFox® MMG 01 operates on the basis of the magnetostrictive principle. A wire consisting of magnetostrictive material is integrated in the probe tube. The microcontroller-based sensor electronics emit current pulses through the wire which generate a circular magnetic field. The float of the probe contains a magnet which magnetises the wire at the float's position. A torsion wave is generated at the point of overlay of the two magnetic fields; this wave passes back to the probe head. The propagation time is detected and evaluated by the electronics.

specifications

Technical Measuring range

0/100 mm to 0/6,000 mm

Measuring accuracy

 $\pm 0.5 \, \text{mm}$

Operating temperature range

-40/+125 °C Medium: Ambient: -40/+85 °C

Process pressure

Max. 16 bar

Process connection

Stainless steel 316 Ti, compression fitting G1/2, height-adjustable

Probe

Stainless steel 316 Ti, Ø 12 mm, probe length 1,000 mm (min. length 100 mm/max. length 6,000 mm)

For density of medium ≥ 0.70 g/cm³ and < 0.60 g/cm³ stainless steel 316 Ti, PN 16, cylindrical 43 x 43 mm (Ø x H)

Supply voltage

DC 8-30 V

Output signal

4-20 mA, 2-wire

Housing

Robust field housing with screw cover Stainless steel 303, Ø 50

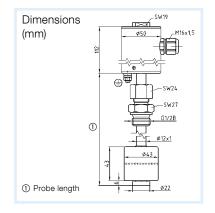
Degree of protection: IP 68 (EN 60529)

Electrical connections

Cable gland M16 x 1.5

Options

- Vibration-resistant version
- Other process connections
- Other process pressures
- Other probe materials
- Other floats
- Higher operating temperature range
- Flexible probe
- Interface layer measurement via HART protocol



DG: H, PG: 4	Part no.	Price €
MMG 01 100-1,000 mm please specify probe length!	53510	
Extra charges		
Probe extension per 100 mm		
Process connection R1½, brass		
Operating temperature range (medium) -40/+250 °C		
4-20 mA/HART®		

Blue part no. = in-stock items



Conductivity level switch CoFox® FLT 8



- For conductive media such as water, waste water, emulsions and many more
- Min. or max. fail-safe mode adjustable
- Two voltage-free relay outputs
- Low response threshold







Application Suitable for use with electrically conductive liquids whose level is to be limited or controlled. The liquids such as water, emulsions or waste water must neither foam excessively nor be viscous or adhesive (bridging). CoFox® ELT 8 can be operated with one probe as a level switch or with two probes for controlling pumps, vales, etc (start/stop). Can also be used as a water alarm unit, for example in control stations or IT rooms, in conjunction with floor water probe BWS 10-1.

Description

Level switch in wall mounting housing with visual alarm and operation indicator. CoFox® ELT 8 is designed for continuous operation and operates on the basis of conductivity. If a probe electrode is in contact with the liquid, this closes a circuit to the tank wall or to a second electrode via the liquid. The relay outputs switch. The sensitivity is adjustable. 2 voltage-free relay contacts are provided for switching functions.

Switching functions

Level switch: The relay can be set to either energise or de-energise when the probe rod comes into contact with or loses contact with the liquid. The switching point must be adjusted according to the conductivity of the liquid.

Level control for filling: A minimum of 2 probe rods are required. Set the internal switch to "Max" (H). The relay energises when the min. probe loses contact with the liquid. Relay de-energises when the max. probe comes into contact with the liquid.

Level control for emptying: A minimum of 2 probe rods are required. Set the internal switch to "Min" (L). The relay energises when the max. and min. probes have contact with the liquid. The relay de-energises when the min. probe loses contact with the liquid.

Technical specifications

Response threshold

2.5 kOhm - 60 kOhm fully adjustable

Operating temperature range

Ambient: -10/+60 °C

Supply voltage

AC 230 V or DC 24 V

Power input

4 VA (AC 230 V) 2 VA (DC 24 V)

Probe circuit

Max. AC 3 V

Switching outputs

Relay contact: 2 voltage-free changeover contacts Contact rating: AC 250 V, 2 A

Visual indication

Green I FD: Mains operation Red LED: Alarm condition

Fail-safe mode

Integrated selector for min. or max. fail-safe mode (low/high)

Housing

Wall mounting housing with plug-in base made of impact-resistant plastic (ABS) W x H x D: 53 x 113 x 108 mm Degree of protection: IP 30 (EN 60529)

Scope of delivery

Level switch without probe

Version	DG	PG	Part no.	Price €
ELT 8 AC 230 V	Н	4	53503	
ELT 8 DC 24 V	Н	4	53503A	
Accessories				
Additional alarm unit ZAG 01	Н	4	40633	
Combined warning light and horn	G	4	61020	
Cable extension fitting KVA	G	1	40041	

Blue part no. = in-stock items



See page 322 for probes for level switches.



Conductivity alarm unit CoFox® ELT 500/4



- For conductive media such as water, waste water, emulsions and many more
- With visual alarm and Reset button
- Relay contact for connection of additional alarm equipment
- Up to 4 zones can be monitored





Application Suitable for use with electrically conductive liquids which do not foam excessively, are not viscous and not adhesive (bridging), e.g. water, emulsions or waste water. Ideal for generating alarms in large installations and facilities. Several zones (also large areas) can be monitored simultaneously with electrodes (probes) at various points.

Description Wall mounting housing with visual alarm, operation indicator and Reset button. The CoFox ELT® 500/4 level controller operates on the basis of conductivity. The electrodes connected to the control unit monitor the status at several points. When one or several electrodes are bridged, the red LED belonging to the corresponding electrode circuit is switched on. For fast and precise location of the leak, a label is provided for each LED. A common voltage-free relay contact can be used to control separate alarm devices (e.g. alarm light or horn). The function is only activated by electrode signals which are longer than 1 second in duration. The alarm is saved and cannot be reset for the duration of the signal. The alarm condition must cleared before the alarm can be reset by means of the Reset button on the

CoFox® ELT 500/4 can be cascaded for large area monitoring from a centralised location.

Technical specifications

Probe connections

4 probes

Zone monitoring

4 input circuits

Response threshold

50 kOhm

Operating temperature range

Ambient: -10/+50 °C

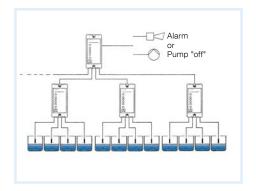
Supply voltage

AC 230 V

Power input

Probe circuit

Max. AC 3 V



Switching output

Relay contact: 1 voltage-free changeover

contact

AC 250 V, 2 A Contact rating:

Visual indication

Green LED: Mains operation 4 red LEDs: Alarm condition

Wall mounting housing with plug-in base made of impact-resistant plastic (ABS) W x H x D 53 x 113 x 108 mm

Degree of protection

IP 30 (EN 60529)

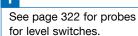
Scope of delivery

Level switch without probe

Version	DG	PG	Part no.	Price €
ELT 500/4 AC 230 V	Н	4	53505	
Accessories				
Additional alarm unit ZAG 01	Н	4	40633	
Combined warn- ing light and horn	G	4	61020	
Cable extension fitting KVA	G	1	40041	

Blue part no. = in-stock items





Conductivity level switch CoFox® ELT 680



- Specially designed for applications in the food industry
- Detection of interface layers between liquids with different levels of conductivity (product, foam)
- Adjustable delay helps to avoid unwanted switching
- Contact resistance does not influence measurement





Suitable for use with electrically conductive media, predominantly liquids, e.g. milk, wine, fruit juices, waste water or lyes. Also suitable for foaming or adhesive media, e.g. beer or yoghurt.

Description The CoFox ELT® 680 level switch operates on the basis of conductivity. A delay can be set to avoid undesired switching as a result of surface turbulence. The sensitivity and adjustment range of the device have been designed in such a way as to keep contact resistance from impairing the reliability of the unit (e.g. caused by foam on the electrode insulator (in breweries, dairies and ice-cream plants). Furthermore, the unit is capable of interface layer detection between liquids having different levels of conductivity (e.g. water and milk) in pipes and tanks.

Switching functions

The unit can be operated either with one electrode as a single-point controller or with two electrodes as a dependent dual-point controller.

Technical specifications

Adjustment range

Variable adjustment

HR: 1 kOhm to 100 kOhm LR: 50 Ohm to 2,000 Ohm

Operating temperature range

Ambient: -10/+60 °C

Supply voltage

AC 230 V or DC 24 V

Power input

2.5 W

Probe circuit

Max. AC 3 V

Switching output

Relay contact: 1 voltage-free changeover contact

Contact rating: AC 250 V, 750 VA DC 12 V, 1 A

Visual indication

Green LED

Delay

Adjustable from 0 to 20 s

Fail-safe mode

Integrated selector for min. or max. fail-safe mode (low/high)

Housing

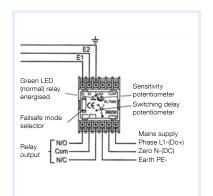
DIN rail housing made of impact-resistant plastic (ABS)

W x H x D 73 x 55 x 112 mm

Degree of protection: IP 40 (EN 60529)

Scope of delivery

Level switch without probe



DG: H, PG: 4	Part no.	Price €
ELT 680 DC 24 V	53682	
ELT 680 AC 230 V	53681	
Accessories		
Additional alarm unit ZAG 01	40633	

Blue part no. = in-stock items

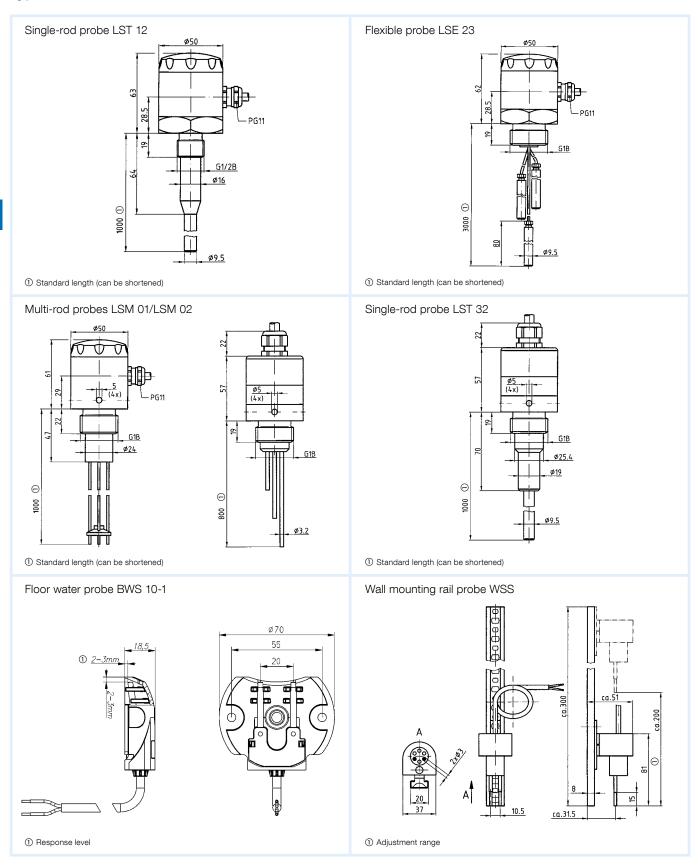


See page 322 for probes for level switches.



Probes for conductivity level switches, suitable for CoFox® ELT 8, ELT 500/4, ELT 680

Types and dimensions (mm)





Many other probe versions are available. Please enquire.



Probes for conductivity level switches, suitable for CoFox® ELT 8, ELT 500/4, ELT 680

DG: H, PG: 4

Туре	Single-rod probe LST 12	Flexible probe LSE 23	Triple-rod probe LSM 01	Quadruple- rod probe LSM 01	Dual-rod probe LSM 02	Triple-rod probe LSM 02	Single-rod probe LST 32	
Version								
Type number	6921 21 1000	6622 27 1030	6272 14 1230	6272 14 1240	6812 24 002P	6812 24 003P	6812 21 000P	
Suitable for			CoFox® ELT 8 / CoFox® ELT 680			l .		
Price €								
Part no.	55312	55323	55034	55021	55041	55044	55332	
Probe head		1						
Material	Aluminium, screw cover ABS	Aluminium, screw cover ABS	PVC, screw cover ABS	PVC, screw cover ABS	Stainless steel 316 Ti	Stainless steel 316 Ti	Stainless steel 316 Ti	
Electrical Connection	PG 11	PG 11	PG 11	PG 11	2 m fixed cable	2 m fixed cable	2 m fixed cable	
Degree of protection	IP 66	IP 65	IP 65	IP 65	IP 66	IP 66	IP 66	
Process connection	G½B	G1B	G1B	G1B	G1B	G1B	G1B	
Electrodes								
Number	1	3	3	4	2	3	1	
Material	316 Ti	316 Ti	316 Ti	316 Ti	316 Ti	316 Ti	316 Ti	
Insulator	PTFE	PTFE	Epoxy resin	Epoxy resin	PTFE	PTFE	PTFE	
Diameter	9.5 mm	9.5 mm	3.2 mm	3.2 mm	3.2 mm	3.2 mm	9.5 mm	
Length	1,000 mm	3,000 mm	1,000 mm	1,000 mm	800 mm	800 mm	1,000 mm	
Application ar	ea							
Process pressure	0/3 bar	0/2 bar	0/3 bar	0/3 bar	0/10 bar	0/10 bar	-1/+20 bar	
Temperature of medium	-20/+150 °C	2 bar: 0/50 °C 1 bar: 0/100 °C	0/50 °C	0/50 °C	-20/+120 °C	-20/+120 °C	-20/+220 °C	
Wall mounting	rail probe WSS							
Application Price 6		Height-adjustable wall mounting probe, suitable for CoFox® ELT 500/4 / CoFox® ELT 8 / CoFox® ELT 680						
	Price €							
	Part no.	Part no.		55050				
Temp		ature of the medium	0/50 °C					
Adjustment range		Approx. 200 mm						
Electrical connection Permanently insta		ntly installed cab	le, 150 cm					
Floor water pr	obe BWS 10-1							
App			Suitable for CoFox® ELT 500/4 / CoFox® ELT 8 / CoFox® ELT 680					
	Price €							
	Part no. Response level		55112					
701	Temperature of the medium		Approx. 2–3 mm 0/50 °C					
	Probe diameter							
1		Probe diameter Material		70 mm				
		Electrical connection		Plastic, orange				
Electrical connection		Permanently installed cable, 200 cm						

Blue part no. = in-stock items

Select according to the operating conditions. Special customised probes are available in addition to the standard probes listed. Please enquire.



Compact capacitance level switch CapFox® ENT 7

- For powdered and finely grained bulk solids or liquids
- Suitable for rough application conditions
- Switching output for signalling the limit level
- Optional high-temperature version (HT)







For detecting levels of powdered and finely grained bulk solids or of liquids. Especially suitable for use in silos, hoppers, tanks and containers.

Description The compact capacitance level switch CapFox® ENT 7, the control unit and the probe form a unit. It detects the change in electrical capacitance caused by the change in level. The device can be supplied with a flexible probe or a rod probe. The rod probe can be mounted in any mounting position. The response sensitivity is adjustable. CapFox® ENT 7 features a voltage-free relay contact which switches when the limit value is reached. The contact can be used to control external equipment such as flaps or sliders, pumps, visual or audible alarms (e.g. alarm lamp or horn) or to transmit the signal to a PLC. Minimum or maximum fail-safe modes can be selected as required.

specifications 0-200 pF

Technical Capacitance range

Operating temperature range

Medium: -20/+80 °C Ambient HT: -20/+220 °C Ambient: -20/+60 °C

Process pressure

Atmospheric pressure

Process connection

G11/2B

Rod probe

Stainless steel 316 Ti, partially PP-insulated, probe length 300 mm (min. length 300 mm max. length 1,000 mm) or fully PTFE-insulated, probe length 300 mm

Flexible probe

Stainless steel 316 Ti, fully PP-insulated Probe length 3,000 mm (min. length 1,000 mm - max. length 6,000 mm)

Supply voltage

AC 230 V or DC 24 V (option)

Power input

5 VA

Switching output

Relay contact: 1 voltage-free changeover contact Contact rating: AC 250 V, 4 A (resistive load)

Fail-safe mode

Integrated selector for high level alarm or low level alarm

Housing

Impact-resistant plastic (ABS) W x H x D 104 x 65 x 144 mm

Degree of protection

IP 65 (EN 60529)

Electrical connections

2 x cable gland PG 11

Options

- Supply voltage DC 24 V
- Other probe lengths
- Other probe designs

DG: H, PG: 4	Part no.	Price €
ENT 7, 300 mm partially PP-insulated	52701	
Extra charge probe extension per 100 mm		
ENT 7, 300 mm fully PTFE-insulated	52707	
ENT 7, 3 m flexible probe	52708	
Extra charge probe extension per m		
ENT 7 HT High temperature version up to max. 220 °C (300 mm active probe length)	52709	

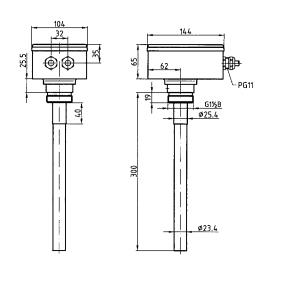
Blue part no. = in-stock items



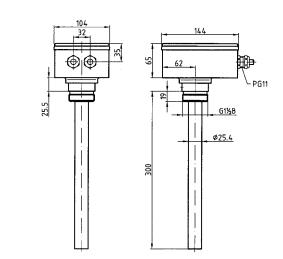
Capacitance level switch CapFox® ENT 7

Types and dimensions (mm)

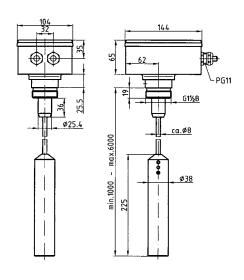
CapFox® ENT 7 with rod probe, partially PP-insulated



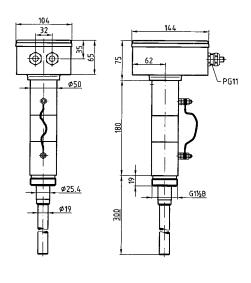
CapFox® ENT 7 with rod probe, fully PTFE-insulated



CapFox® ENT 7 with flexible probe



CapFox® ENT 7 HT with high-temperature barrier





Many other probe versions are available. Please enquire.



Vibration level switch for liquids VibraFox® GVG

- Compact design
- WHG approval
- Maintenance-free
- High resistance to chemicals
- Various process connections
- Commissioning without calibration



Application Suitable for detecting limit levels in liquids with a maximum dynamic viscosity of 10,000 mPa ● s and a minimum density of 0.7 kg/dm³. Specially useful in applications in which float switches cannot be used due to liquid flow, turbulence or product adherence. Ideally suitable as an overflow alarm or for dry-run protection. Due to the WHG approval, VibraFox® can be used as part of an approved overfill prevention system.

Description

The vibration fork of VibraFox® is excited to its resonance frequency. When the fork comes into contact with the medium, there is a change in frequency which is detected by the electronics and converted into a switching signal. The unique evaluation electronics enable the application of the system even under adverse conditions, e.g. in vibrating tanks or with turbulent liquid surfaces.

Technical Density of medium

specifications 0.7 kg/dm³ ... 2.5 kg/dm³

Dynamic viscosity of the medium

0.1 ... 10,000 mPa • s

Flow rate

Max. 6 m/s (at a viscosity of 10,000 mPa • s)

Operating temperature range

Medium: -40/+100 °C Medium HT version: -40/+150 °C -40/+70 °C Ambient:

Process pressure

-1/+64 bar

Process connection

G34A or G1A (PN 64)

Vibration fork

Stainless steel 316 L

Supply voltage

AC/DC 20-253 V (2-wire) Load current min. 10 mA max. 250 mA or DC 10-55 V (3-wire) Load current max. 250 mA

Power input

2-wire: Depending on external load

3-wire: Max. 0.6 W

Output

2-wire AC/DC or 3-wire transistor (PNP) DC

Switching delay

After immersion: $0.5 \, s$ After removal: 0.5 s

Switching point

Installation from top: Installation from bottom: 34 mm (in water at 25 °C)

Switching hysteresis

Vertical installation: Approx. 2 mm Horizontal installation:2 mm (in water at 25 °C)

Visual indication

Bi-colour LED green/red

Function test

With test magnet (included)

Housing

Stainless steel 316 L, cover PEI

Electrical connection

Connector and junction box as per ISO 4400 (DIN 43650-A) IP 65 or M 12 x 1 (IP 67)

Approval for construction products

DIBt: Z-65.11-412

- **Options** Other process connections (e.g. NPT, Clamp, dairy fitting)
 - Surface roughness Ra < 0.8 µm
 - Other electrical connections

Coupling relay (only for DC version)

■ Extended operating temperature range -40/+150 °C (medium)

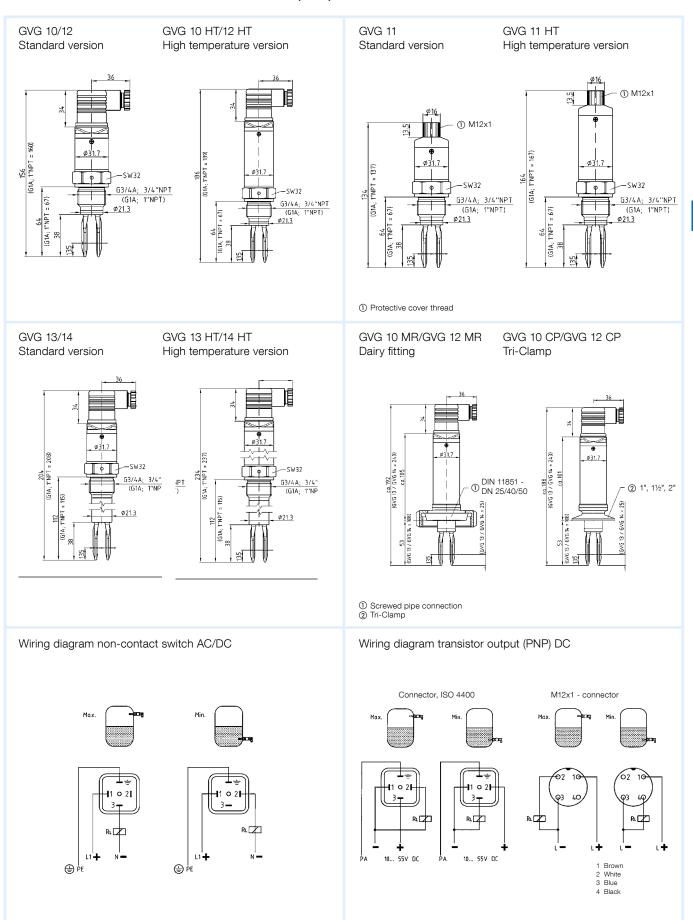


See page 328 for prices.



Vibration level switch for liquids VibraFox® GVG

Electrical connections and dimensions (mm)



Vibration level switch for liquids VibraFox® GVG

DG: H, PG: 4

Туре	GVG 10	GVG 11	GVG 12	GVG 13	GVG 14
Version					
Process connection	G¾A	G¾A	G¾A	G¾A	G¾A
Price €					
Part no.	56164	56166	56168	56170	56172
Installation length	64 mm	64 mm	64 mm	112 mm	112 mm
Process connection	G1A	G1A	G1A	G1A	G1A
Price €					
Part no.	56165	56167	56169	56171	56173
Installation length	67 mm	67 mm	67 mm	115 mm	115 mm
Supply voltage	AC/DC 20-253 V	DC 10-55 V	DC 10-55 V	AC/DC 20-253 V	DC 10-55 V
Output	Non-contact switch	Transistor output PNP	Transistor output PNP	Non-contact switch	Transistor output PNP
Electrical connection	Connector and junction box as per ISO 4400 (DIN 43650-A)	M 12 x 1	Connector and junction box as per ISO 4400 (DIN 43650-A)	Connector and junction box as per ISO 4400 (DIN 43650-A)	Connector and junction box as per ISO 4400 (DIN 43650-A)
Extra charges	Price €	Price €	Price €	Price €	Price €
Extended operating temperature range (medium) -40 °C/+150 °C					
Process connection*					
34" NPT	Without extra charge	Without extra charge	Without extra charge	Without extra charge	Without extra charge
1" NPT					
Tri-Clamp 1", PN 16, Ra \leq 0.8 μ m, -40/+150 °C**					
Tri-Clamp 2", PN 16, Ra \leq 0.8 μ m, -40/+150 °C**					
Dairy fitting DIN 11851 DN 25, PN 40, Ra \leq 0.8 μ m, -40/+150 °C**					
Dairy fitting DIN 11851, DN 40, PN 40, Ra \leq 0.8 μ m, -40/+150 °C**					
Dairy fitting DIN 11851, DN 40, PN 40, Ra \leq 0.8 μ m, -40/+150 °C** Dairy fitting DIN 11851, DN 50, PN 25, Ra \leq 0.8 μ m, -40/+150 °C**					
DN 40, PN 40, Ra ≤ 0.8 μm, -40/+150 °C** Dairy fitting DIN 11851,				Part no.	Price €
DN 40, PN 40, Ra ≤ 0.8 µm, -40/+150 °C** Dairy fitting DIN 11851, DN 50, PN 25, Ra ≤ 0.8 µm, -40/+150 °C**	put: 1 x voltage-	free changeover	contact	Part no. 53700	Price €

Blue part no. = in-stock items



^{*} Extra charge as compared to version with process connection G¾ male.

** Extra charges already include extended operating temperature range -40 °C/+150 °C.







Advantages - your benefits

- Piggable pipes: limit switch without interfering contours
- Effective cleaning cycles in hygienic processes: Suitable for CIP and SIP
- Extremely short response time of 0.02 seconds
- Easy conversion of existing measuring points via modular process connections
- Suitable for many applications: Independent of the conductivity of the liquid
- Process reliability: Versions with additional status output for continuous function monitoring



Function principle The SonarFox® USG series level switches use the physical properties of ultrasonic waves to determine the limit level. An ultrasonic wave is emitted which creates a characteristic "signature" when it passes through materials. This signature indicates whether the ultrasonic waves have passed through air or liquid. Type, density and temperature of the medium have no effect on the measurement. Installations in the tank or the pipe do not affect the measurement.

> SonarFox® USG operates independently of density and temperature and can be used for all liquids with a maximum dynamic viscosity of 10,000 mPa • s.

Overview of SonarFox® USG versions – installation situation



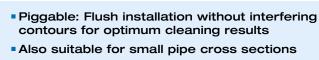






Ultrasonic level switch SonarFox® USG 20





- Modular process connection concept for application diversity
- No wearing parts





Application

Ideal for applications in which vibration level switches cannot be used due to the interfering contour "vibration fork" (pipe cross section, cleaning method) and float switches cannot be used because of flow, turbulence or formation of deposits. Particularly suited for small pipe diameters or as an overflow alarm or for dry-run protection. Due to flush installation, the device is ideal for hygienic processes, cleaning methods using pigging and efficient CIP and SIP cycles.

Description

The level switch SonarFox® USG 20 is flush with the inside wall of the tank or the pipe. Compared to vibration level switches, USG 20 is piggable so that it can also be used as a measuring point in systems with CIP or SIP.

USG 20 is connected via a threaded connection $G\frac{1}{2}$. The modular adapter concept allows for adaptation to the measuring point via the screwed connection and a great variety of process connections (such as $G\frac{3}{4}$, G1, C1, C1) ri-Clamp, dairy fitting or C10 variety or a weld-in socket. Compatible mechanical and electrical connections enable easy retrofitting and replacement of vibration forks.

specifications

Technical Density of medium

Independent of density

Dynamic viscosity of the medium

Max. 10,000 mPa • s

Operating temperature range

Wetted parts

can be cleaned up to 150 °C (60 min)

Medium: -20/+100 °C Ambient: -20/+60 °C

Process pressure

10 bar

Process connection

G½

See accessories table for available adapters

Housing

Stainless steel 304 (1.4301)

Process connection: stainless steel 316 L (1.4435)

Sensor surface: PEEK

Supply voltage

DC 12-28 V

Power input

< 1 W

Output

ISO 4400 active DC (max. 1 A) (active if "Wetted/Dry", selectable via connection) M 12 x 1, 4-pin

1 x wetted active DC (max. 1 A) 1 x dry active DC (max. 1 A)

M 12 x 1, 8-pin

2 x voltage-free changeover contact

(max. 0.5 A/30 V)

Switching delay

After transition "Dry > Liquid": 0.02 s After transition "Liquid > Dry": 0.02 s

Switching point

At 50 % wetted

Switching hysteresis

Approx. 2 mm

Maximum switching frequency 1 Hz

Function test

With test magnet for simulation of the switching signal

Electrical connection

Connector and junction box as per ISO 4400 (DIN 43650-A) IP 65 or M 12 x 1 (IP 67) 4-pin/8-pin

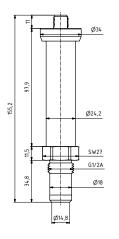


Ultrasonic level switch SonarFox® USG 20



Housing types and dimensions (mm)

USG 20-1/-2

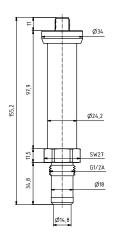


Wiring diagram USG 20-1, USG 21-1



- ① +24 V ② Active if "Dry" ③ GND
- Active if "Wetted"

USG 20-1/-2, USG 21-1/-2



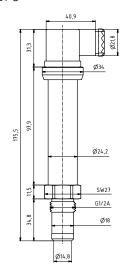
Wiring diagram USG 20-2



- ① Output "Dry" ② COM "Dry/Wetted" ③ Output "Wetted" ④ +24 V

- (5) Output self-test "OK" (6) COM self-test (7) Output self-test "Error" (8) GND

USG 20-3, USG 21-3



Wiring diagram USG 20-3



- ① GND ② Active if "Dry" ③ +24 V

- ① GND ② +24 V ③ Active if "Wetted"



Ultrasonic level switch SonarFox® USG 21





- Measurement through plastic tank walls
- Less sealing points
- Easy retrofitting in existing systems
- Also suitable for tanks with corrosive or ultra-pure media
- No wearing parts



Application For non-contact level detection through plastic pipe walls or plastic tank walls. SonarFox® USG 21 is ideal for applications involving highly corrosive liquids. Retrofitting is possible even while the system is filled, the process does not have to be interrupted. Optimal for applications in the chemical industry.

Description The level switch SonarFox® USG 21 measures the medium through a plastic pipe or tank wall. USG 21 is mounted with a threaded connection G1/2 and pressed to the wall with the help of coupling grease or a coupling pad; there is no gap. The ultrasonic sensor is factory-adjusted to a specific wall thickness range (for example, 3 - 4 cm). A test magnet is used to start automatic dry calibration which adjusts the system to the tank.

> As an alternative to using a mounting holder via a weld socket, could be used as well a clamping system.

Technical Density of medium

specifications Independent of density

Dynamic viscosity of the medium

Max. 10,000 mPa • s

Operating temperature range

-20/+100 °C Medium: -20/+60 °C Ambient:

Process pressure

Unlimited, only depends on the tank

Process connection

G1/2 for mounting of press connection

Housing

Stainless steel 304 (1.4301)

Process connection: stainless steel 316 L (1.4435)

Sensor surface: PEEK

Supply voltage

DC 12-28 V

Power input

< 1 W

Output

ISO 4400 active DC (max. 1 A) (active if "Wetted/Dry", selectable via connection) M 12 x 1 4-pin

1 x wetted active DC (max. 1 A) 1 x dry active DC (max. 1 A)

M 12 x 1 8-pin

2 x voltage-free changeover contact

(max. 0.5 A/30 V)

Switching delay

After transition "Dry > Liquid": 0.02 s After transition "Liquid > Dry": 0.02 s

Switching point

At 50 % wetted

Switching hysteresis

Approx. 2 mm

Maximum switching frequency 1 Hz

Function test

With test magnet for simulation of the switching signal

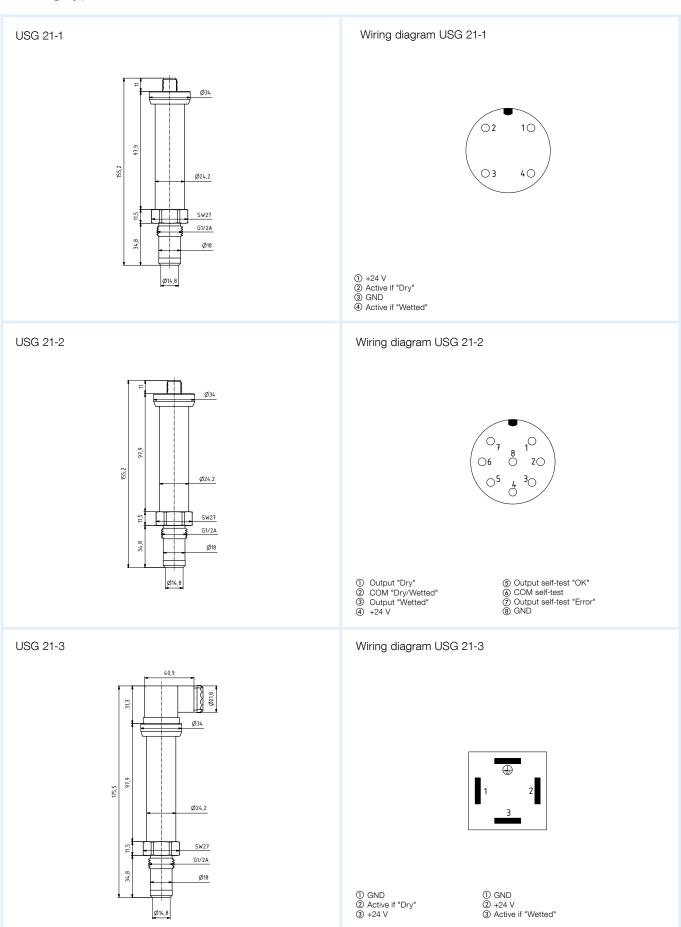
Electrical connection

Connector and junction box as per ISO 4400 (DIN 43650-A) IP 65 or M 12 x 1 (IP 67) 4-pin/8-pin

Ultrasonic level switch SonarFox® USG 21



Housing types and dimensions (mm)



Ultrasonic level switch SonarFox® USG 22





- Measurement through metal tank walls
- Less sealing points
- Easy retrofitting in existing systems
- Also suitable for tanks with ultra-pure media
- No wearing parts



Application For non-contact level detection through metal pipe walls or metal tank walls. SonarFox® USG 22 is ideal for applications involving highly ultra-pure liquids. Retrofitting is possible even while the system is filled, the process does not have to be interrupted. Optimal for applications in the pharmaceutical and food industries.

Description The level switch SonarFox® USG 22 measures the medium through a metal pipe or tank wall. USG 22 is mounted with a threaded connection G½ and pressed to the wall with the help of coupling grease or a coupling pad; there is no gap. A test magnet is used to start automatic dry calibration which adjusts the system to the tank.

> As an alternative to using a mounting holder via a weld socket, could be used as well to use a clamping system.

specifications Independent of density

Technical Density of medium

Dynamic viscosity of the medium

Max. 10,000 mPa • s

Operating temperature range

-20/+100 °C Medium: Ambient: -20/+60 °C

Process pressure

Unlimited, only depends on the tank

Process connection

G½ for mounting of press connection

Housing

Stainless steel 304 (1.4301)

Process connection: stainless steel 316 L (1.4435)

Sensor surface: PEEK

Supply voltage

DC 12-28 V

Power input

Output

ISO 4400 active DC (max. 1 A) (active if "Wetted/Dry", selectable via connection)

M 12 x 1 4-pin

1 x wetted active DC (max. 1 A) 1 x dry active DC (max. 1 A)

M 12 x 1 8-pin

2 x voltage-free changeover contact

(max. 0.5 A/30 V)

Switching delay

After transition "Dry > Liquid": 0.02 s After transition "Liquid > Dry": 0.02 s

Switching point

At 50 % wetted

Switching hysteresis

Approx. 2 mm

Maximum switching frequency 1 Hz

Function test

With test magnet for simulation of the switching signal

Electrical connection

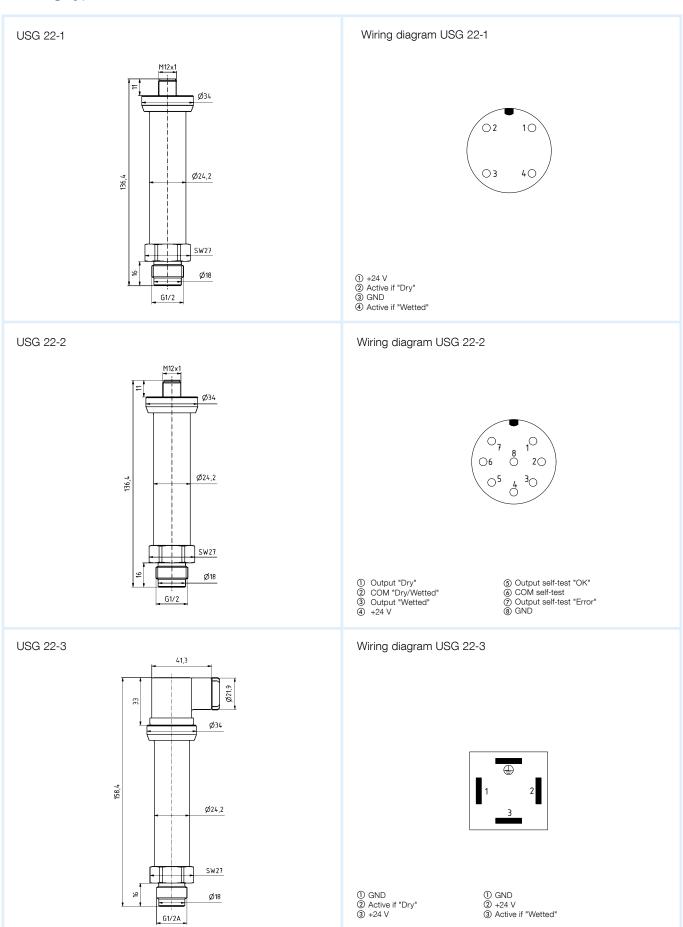
Connector and junction box as per ISO 4400 (DIN 43650-A) IP 65 or M 12 x 1 (IP 67) 4-pin/8-pin



Ultrasonic level switch SonarFox® USG 22



Housing types and dimensions (mm)



Ultrasonic level switch SonarFox® USG 20



DG: H, PG: 4

Туре	USG 20-1	USG 20-2	USG 20-3	
Version				
Process connection	G½	G½	G½	
Supply voltage	DC 12-28 V	DC 12-28 V	DC 12-28 V	
Output	1 x "Wetted" active DC (max. 1 A) 1 x "Dry" active DC (max. 1 A)	2 x changeover contact changeover contact (max. 0.5 A/30 V)	ISO 4400 active DC (max. 1 A) (active if "Wetted/Dry", selectable via connection)	
Electrical connection	M 12 x 1, 4-pin	M 12 x 1, 8-pin	Connector and junction box as per ISO 4400	
Price €				
Part no.	56180	56181	56182	
Accessories		Part no.	Price €	
Process adapter USG 20 G½ to .				
G¾, stainless steel 316 L (1.4404))	56190		
G1, stainless steel 316 L (1.4404)		56191		
Weld-in socket, stainless steel 31	6 L (1.4404)	56192		
Tri-Clamp 1", stainless steel 316 L	_ (1.4404)	56193		
Tri-Clamp 2", stainless steel 316 L	_ (1.4404)	56194		
VARIVENT®, stainless steel 316 L	(1.4404)	56196	On request	
Dairy fitting as per DIN 11851, sta nominal diameter DN 25	inless steel 316 L (1.4404),	56197		
Dairy fitting as per DIN 11851, sta nominal diameter DN 40	inless steel 316 L (1.4404),	56198		
Dairy fitting as per DIN 11851, sta nominal diameter DN 50	inless steel 316 L (1.4404),	56199		
Other process adapters			On request	

Blue part no. = in-stock items



Ultrasonic level switch SonarFox® USG 21/22



DG: H, PG: 4

Туре	USG 21-1	USG 21-2	USG 21-3	
Version				
Process connection	G½	G½	G½	
Supply voltage	DC 12-28 V	DC 12-28 V	DC 12-28 V	
Output	1 x "Wetted" active DC (max. 1 A) 1 x "Dry" active DC (max. 1 A)	2 x changeover contact changeover contact (max. 0.5 A/30 V)	ISO 4400 active DC (max. 1 A) (active if "Wetted/Dry", selectable via connection)	
Electrical connection	M 12 x 1, 4-pin	M 12 x 1, 8-pin	Connector and junction box as per ISO 4400	
Price €				
Part no.	56184	56185	56186	
Accessories		Part no.	Price €	
Weld socket for mounting USG 21, plastic		56187	On request	

Туре	USG 22-1	USG 22-2	USG 22-3	
Version				
Process connection	G½	G½	G½	
Supply voltage	DC 12-28 V	DC 12-28 V	DC 12-28 V	
Output	1 x "Wetted" active DC (max. 1 A) 1 x "Dry" active DC (max. 1 A)	2 x changeover contact changeover contact (max. 0.5 A/30 V)	ISO 4400 active DC (max. 1 A) (active if "Wetted/Dry", selectable via connection)	
Electrical connection	M 12 x 1, 4-pin	M 12 x 1, 8-pin	Connector and junction box as per ISO 4400	
Price €				
Part no.	56201	56202	56203	
Accessories		Part no.	Price €	
Weld socket for mounting USG 22, stainless steel		56204	On request	



CATALOGUE DOMESTIC TECHNOLOGY

Level indicators and level controllers for domestic technology



TankControl 10

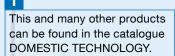




- Hydrostatic level indicator for fuel oil, diesel fuel, biodiesel and water
- Indication in litres, %, m3 and mm level
- 🛂 Graphical indication of consumption and remaining range
- 🛂 Visual and audible alarms, test and Acknowledge buttons and 2 relays
- High measuring accuracy due to electronic sensor

Nominal sizes 0/400 mbar

Measuring accuracy ±1.5 % FS





Overfill prevention system UFS 01

- 🛂 2 relay outputs for additional alarm equipment, EMS, etc.
- 🛂 Fail-safe, self-monitoring system to avoid overfilling
- Suitable for a wide range of water-polluting liquids.





Level controller RG 210

- Compact control unit for fuel oil, diesel fuel, emulsions, water and non-corrosive media
- Universal application due to selectable function: level switch (1 probe), level control for filling (2 probes) or level control for emptying (2 probes)



Page 42

From page 27



🛂 For a wide array of media

- Versions with metallised sleeve: Permanent operation even with biofuel/biodiesel
- Versions for indoor and outdoor tanks
- Special versions for hazardous areas/potentially explosive atmospheres (zone 0)





Alarm units for oil, petrol and grease separators



Probes for separator alarm units



Gas alarm units and systems

CHAPTER 6

WATCHDOG-LINE alarm units and gas alarm systems

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ACCESSORIES	
Test gas unit PGK 10 mounting frame, seal kit. DIN rail clin354	

WATCHDOG-LINE alarm units at a glance

Alarm unit	Probe	Media	Application	Catalogue page
Water alarm unit WWG	Wall mounting rail probe WSS or Floor water probe BWS 10-1	 Water Conductive water mixtures Electrically con- ductive liquids Emulsions 	Single-channel Suitable for water, but also for electrically conductive liquids, emulsions and conductive water mixtures. EnOcean®-ready	Page 77
Oil/water alarm unit ÖWU	Wall mounting rail combination probe	■ Oil + water	Single-channel ÖWU distinguishes oil alarms and water alarms and indicates the appro- priate alarm condition. EnOcean®-ready	Page 74
Oil/water alarm unit ÖWWG 3	PTC thermistor probe	■ Electrically conductive and non-conductive liquids	Single-channel ÖWWG 3 generates alarms in the event of accumulations of liquids caused by tank leaks, backflow, flood- ing, etc. EnOcean®-ready Approval for construction products: DIBt: Z-65.40-339, CE	Page 71
Oil-on-water detector ÖAWD ÖAWD	Floating probe SWS	■ Oil on water	1 channel ÖAWD monitors standing water and calmly flowing bodies of water / water surfaces for pollution by oil.	Page 75
Oil/water alarm unit OM 5*	Photoelectric probe	■ Oil ■ Water	5 channel For collection facilities below oil consuming equipment, pipe and cable ducts, pumps and control stations and tanks. Approval for construction products: DIBt: Z-65.40-214, CE	Page 73
Digital tank contents indicator DTA 10	Pneumatic measuring line	 Fuel oil Diesel fuel Water Non-corrosive media (density 0.5 to 1.5 g/cm³) 	1 channel For manual level measurement and signalling of a minimum level during measurements – battery-operated	Page 12
Level indicator TankControl 10	Submersible probe or Magnetic foat switch	Fuel oil EL, LDiesel fuelBiodieselWater	Single-channel/dual-channel For continuous level measurement and alarms in the event of minimum or maximum levels, level differences, backwater and level control.	Page 14
Level switches Minimelder / Maximelder	Magnetic float switch	■ Water ■ Fuel oil EL, L, M ■ Oil/water mix- tures ■ Neutral liquids	1 channel Suitable to signal minimum or maximum levels in tanks containing liquids. EnOcean®-ready	Page 18

^{*} Use as leak detection system class III as per EN 13160-1/-4

Alarm unit	Probe	Media	Application	Catalogue page
Backup controller RENA	Level probe	■ Rainwater	1 channel Controls backup supply of mains water if the rainwater level is low.	Page 288
Water valve WaterControl 01	Water Sensor con Water Sensor BWS Water Sensor eco Battery-less	■ Water ■ Rainwater	Multi-channel For manually or remotely controlled closing and opening of a water pipe in the case of a leak. Teach-in of up to 40 sensors EnOcean®-inside	Page 98
Overfill prevention system UFS 01 (WHG)	Level probe UFS 01	■ Water-polluting liquids (flash point > 55 °C)	1 channel Signals when the maximum level in stationary tanks is reached. Approval for construction products: DIBt: Z-65.11-193	Page 38
Leak detector LAG as per German WHG and BetrSichV	Leak detection fluid container with probe	Water-polluting liquids	1 channel Leak detector for double-walled tanks with liquid in the interstitial space. Approval for construction products: CE marking as per EC Construction Products Regulation 305/2011, EN 13160-1, -3	Page 49
Boiler water low level alarm WMS	Probe WMS	■ Water in boiler	1 channel Monitors the water level in the boiler and interrupts the power supply to the burner if the level is below the mini- mum value. Mark of conformity: TÜV HWB 14-345 and 14-348	Seite 157
Gas detector GM 2.1	Gas sensor GS 4.1	■ Explosive gases ■ Vapours	Dual-channel Suitable for monitoring rooms, buildings and public	Page 81
Alarm unit for low gas level	Pressure gauge with electrical contacts	■ Gases	1 channel Alarm unit for low gas level for monitoring the pressure in gas-filled containers.	Page 118
Alarm units WGA for separators	WGA-ES8 (ultrasound, only for WGA 01 D) WGA-ES8 (ultrasound, only for WGA 01 D) PTC thermistor probe WGA-R6	■ Oil ■ Petrol ■ Grease ■ (Sludge, sand)	Devices with 1 channel / 2 channels / 3 channels Monitor, for example, the layer thickness and the maximum level of separated liquid in oil, petrol and grease separators.	Page 344

Alarm unit for separators **WGA 01**





- For oil and petrol separators
- Layer thickness/overflow alarm



Application Oil and petrol pose a great hazard to groundwater and waste water. WGA 01 monitors the thickness of the layer of separated liquid in oil and petrol separators and generates an alarm signal when it is time to drain the separator. In addition, the maximum level in the separator can be detected. This avoids overfilling that may be caused by clogged outlets or other circumstances. The unit keeps harmful substances from reaching the sewage water system.

Description WGA 01 consists of a control unit, a capacitance probe (WGA-ES4) for monitoring the thickness of the oil or petrol layer and an optional additional PTC thermistor probe (WGA-R6) for detecting the maximum level (overflow alarm). The control unit is equipped with 2 relay outputs, visual and audible alarms as well as Test and Acknowledge buttons. The WGA-ES4 probe is mounted at least 150 mm below the constant level of the separator. As soon as the oil or petrol layer reaches the critical level, the device generates an alarm signal. By installing the optional WGA-R6 probe above the constant level, you can also monitor the maximum level. The control unit monitors the probes for short circuits or line interrup-

specifications

Technical Operating temperature range

Medium: -20/+40 °C Ambient: 0/40 °C

Probe WGA-ES4

Function principle: capacitance Length 220 mm, Ø 25 mm Cable length 5 m

Probe WGA-R6 (option)

Function principle: PTC thermistor Length 100 mm, Ø 22 mm Cable length 5 m

Connection probe - control unit

Max. 200 m

Supply voltage

AC 230 V

Power input

Approx. 4 VA

Switching outputs

Relay contacts: voltage-free changeover contacts

(cannot be acknowledged) 1 x for layer thickness 1 x for overfilling (overflow)

Contact rating: AC 250 V/5 A/ 100 VA

Visual indication

1 green LED layer thickness (operation) 1 green LED overflow (operation) 1 red LED layer thickness (alarm) 1 rote LED overflow (alarm)

Audible alarm

Integrated piezo buzzer, can be acknowledged

Function test

By means of Test button

Housing

Wall mounting housing made of impact-resistant plastic (polycarbonate) W x H x D: 175 x 125 x 75 mm

Degree of protection

IP 65 (EN 60529)

ATEX approvals

Control unit:

Ex II (1) G [Ex ia Ga] IIB

Scope of delivery

Control unit, probe WGA-ES4 Cable extension fitting, mounting accessories

Options

Probe WGA-R6

DG: H, PG: 4	Part no.	Price €
WGA 01 incl. probe WGA-ES4 (layer thick- ness)	53410	
Additional probe WGA-R6 (overflow)	53419	
Spare probe WGA-ES4	53418	

Blue part no. = in-stock items



probe cable lengths.



Alarm unit for separators **WGA 01 D**





- For oil and petrol separators
- Up to 3 probes for layer thickness alarm, overflow alarm, sand - sludge alarm
- With LC display



Application Oil and petrol pose a great hazard to groundwater and waste water. WGA 01 D monitors the thickness of the layer of separated liquid in oil and petrol separators and generates an alarm signal when it is time to drain the separator. In addition, the maximum level in the separator can be detected. This avoids overfilling that may be caused by clogged outlets or other circumstances. The unit keeps harmful substances from reaching the sewage water system. It is also possible to signal impermissible sand or sludge accumulations.

For separators

Description WGA 01 D consists of a control unit with LC display and a capacitance probe (WGA-ES4) to monitor the layer thickness of oil or petrol layers. The PTC thermistor probe WGA-R6 for monitoring the maximum level (overflow alarm) and/or the ultrasonic sludge probe WGA-ES8 for monitoring impermissible sand or sludge layer can also be connected. The control unit is equipped with 2 relay outputs, visual and audible alarms as well as Test and Acknowledge buttons. The WGA-ES4 probe is mounted at least 150 mm below the constant level of the separator. As soon as the oil, petrol or grease layer reaches the critical level, the device generates an alarm signal. By installing the optional WGA-R6 probe above the constant level, you can also monitor the maximum level. The control unit monitors the probes for short circuits or line interruptions. The device automatically detects the connected probes during commissioning.

Technical specifications

Operating temperature range

Medium: 0/40 °C 0/40 °C Ambient:

Probe WGA-ES4

Function principle: capacitance Length 220 mm, Ø 25 mm Cable length 5 m

Probe WGA-R6 (option)

Function principle: PTC thermistor Length 100 mm, Ø 22 mm Cable length 5 m

Probe WGA-ES8 (option)

Function principle: ultrasound H x W x D: 85 x 160 x 32 mm Cable length 5 m

Connection probe - control unit

Max. 200 m

Supply voltage

AC 230 V

Power input

Approx. 4 VA

Switching outputs

Relay contacts: 2 x voltage-free changeover

contacts

Contact rating: AC 250 V/5 A/ 100 VA

Visual indication

LC display, 3 lines

Audible alarm

Integrated piezo buzzer, can be acknowledged

Housing

Wall mounting housing made of impact-resistant plastic (polycarbonate) W x H x D: 175 x 125 x 75 mm

Degree of protection

IP 65 (EN 60529)

ATEX approvals

Control unit: Ex II (1) G [Ex ia GA] II A

Scope of delivery

Control unit, probe WGA-ES4

Options

Probe WGA-R6 Probe WGA-ES8

DG: H, PG: 4	Part no.	Price €
WGA 01 D incl. probe WGA-ES4 (layer thickness)		
WGA 01 D without probe 53409		
Additional probe WGA-R6 (overflow)	53419	
Spare probe WGA-ES4	53418	
Additional probe WGA-ES8 (Sand – sludge)	53399	

Alarm unit for separators WGA 02/WGA 03





- For oil, petrol and grease separators
- Layer thickness/overflow alarm
- With ATEX approval for zone 0



Application Oil, grease and petrol pose a great danger to groundwater and waste water. WGA 02 monitors the thickness of the layer of separated liquid in oil, petrol and grease separators and generates an alarm signal when it is time to drain the separator.

> WGA 03 can also detect the maximum level in the separator. This avoids overfilling that may be caused by clogged outlets or other circumstances. The unit keeps harmful substances from reaching the sewage water system.

Description WGA 02 consists of a control unit and a conductivity probe (WGA-SD 03) for monitoring the oil or grease layer. The control unit is equipped with 2 relay outputs, visual and audible alarms as well as Test and Acknowledge buttons. The WGA-SD 03 probe is mounted below the constant level of the separator. As soon as the oil, petrol or grease layer reaches the critical level, the device generates an

> WGA 03 is equipped with an additional capacitance probe (WGA-AS). It is mounted above the constant level. An alarm is triggered when the maximum level is reached.

The control unit monitors the probes for short circuits or line interruptions.

specifications

Technical Operating temperature range

Medium: 0/60 °C Ambient: -25/+50 °C

Probe WGA-SD 03 (layer thickness)

Function principle: conductivity Length 216 mm, Ø 25 mm Cable length 5 m, PVC, oil-resistant

Connection probe - control unit

Max. 300 m

Supply voltage

AC 230 V

Power input

Approx. 2 VA

Switching outputs

Relay contact:

2 voltage-free changeover contacts

(1 can be acknowledged)

Contact rating: AC 250 V/5 A/100 VA

Visual indication

1 green LED operation 1 red LEDs alarm 1 red LEDs error

Audible alarm

Integrated piezo buzzer, can be acknowledged

Housing

Wall mounting housing made of impact-resistant plastic (polycarbonate) W x H x D: 175 x 125 x 75 mm Degree of protection IP 65 (EN 60529)

ATEX approvals

Control unit: Ex II (1) G [Ex ia] IIC Probe WGA-SD 03: Ex II 1 G Ex ia IIA T5 Ga

Scope of delivery

Control unit, probe WGA-SD 03, junction box, mounting material

Additional specifications WGA 03

Probe WGA-AS (overflow)

Function principle: capacitance Length 81 mm, Ø 82 mm Cable length 5 m, PVC, oil-resistant

Power input

Approx. 4 VA

Visual indication

1 green LED operation LEDs alarm 2 red LEDs error 2 red

ATEX approvals

Probe WGA-AS: Ex II 1 G Ex ia IIA T5 Ga

Scope of delivery

Like WGA 02, but with additional WGA-AS probe

DG: H, PG: 4	Part no.	Price €
WGA 02 incl. probe WGA-SD 03	53540	
WGA 03 incl. probes WGA-SD, WGA-AS	53541	
Spare probe WGA-SD 03	53542	
Spare probe WGA-AS	53415	



Alarm unit for separators WGA 04/WGA 05





- For oil, petrol and grease separators
- Sand sludge alarm/layer thickness alarm
- With ATEX approval for zone 0



Application WGA 04 monitors oil, petrol and grease separators for accumulations of sand and sludge and generates an alarm signal when it is time to clean the separator. WGA 05 additionally monitors the thickness of the layer of separated liquid and generates an alarm signal when it is time to drain the separator.

Description WGA 04 consists of a control unit and an ultrasonic probe (WGA-SN 01). The probe generates an alarm signal when it detects solid matter between the two probe tips. The control unit is equipped with 2 relay outputs, visual and audible alarms as well as Test and Acknowledge buttons.

> WGA 05 is additionally equipped with a conductivity probe (WGA-SD 03) for monitoring the layer of oil, petrol or grease. The WGA-SD 03 probe is mounted below the constant level of the separator. As soon as the oil, petrol or grease layer reaches the critical level, the device generates an alarm signal. The control unit monitors the probes for short circuits or line interruptions.

Technical specifications

Operating temperature range

Medium: 0/60 °C -25/+50 °C Ambient:

Probe WGA-SN 01 (sand)

Function principle: ultrasound Length 142 mm, width 79 mm, depth 21 mm Cable length 5 m, PVC, oil-resistant

Connection probe - control unit

Max. 300 m

Supply voltage

AC 230 V

Power input

Approx. 2 VA

Switching outputs

Relay contact:

2 voltage-free changeover contacts (1 can be acknowledged)

Contact rating: AC 250 V/5 A/100 VA

Visual indication

1 green LED operation 1 red LEDs alarm 1 red LEDs error

Audible alarm

Integrated piezo buzzer, can be acknowledged

Function test

By means of Test button

Housing

Wall mounting housing made of impact-resistant plastic (polycarbonate) W x H x D: 175 x 125 x 75 mm Degree of protection IP 65 (EN 60529)

ATEX approvals

For separators

Control unit: Ex II (1) G [Ex ia] II C Probe WGA-SN 01: Ex II 1 G Ex ia II B T5 Ga

Scope of delivery

Control unit, probe WGA-SN 01, junction box, mounting material

Additional specifications WGA 05

Probe WGA-SD (layer thickness)

Function principle: conductivity Length 216 mm, Ø 25 mm

Power input

Approx. 4 VA

Visual indication

1 green LED operation 2 red LEDs alarm LEDs error 2 red

ATEX approvals

Probe WGA-SD 03: Ex II 1 G Ex ia IIA T5 Ga

Scope of delivery

Like WGA 04, but with additional probe WGA-SD 03

DG: H, PG: 4	Part no.	Price €
WGA 04 incl. probe WGA-SN 01	53412	
WGA 05 incl. probes WGA-SN 01, WGA-SD 03	53543	
Spare probe WGA-SN 01	53416A	
Spare probe WGA-SD 03	53542	



Alarm unit for separators WGA 06







Application

Together with the WGA-ÖW probe, WGA 06 monitors pump and control shafts in separator systems for oil accumulations and generates an alarm signal before pollutants can reach the sewage system. It is also possible to connect the WGA-AS probe. This way, the maximum levels in separators or retention tanks can be detected. This avoids overfilling that may be caused by clogged outlets or other circumstances. The unit keeps harmful substances from reaching the sewage water system.

Description

WGA 06 consists of a control unit and a capacitance probe (WGA-ÖW or WGA-AS). The control unit is equipped with 2 relay outputs, visual and audible alarms as well as Test and Acknowledge buttons. Either the floating probe WGA-ÖW or the fixed probe WGA-AS can be connected. WGA-ÖW floats on the surface of the water in the shaft and generates an alarm signal when an oil, grease or petrol layer of at least 15 mm has built up. WGA-AS is mounted above the constant level of the separator or the retention tank. An alarm is triggered when the maximum level is reached. The control unit monitors the probes for short circuits or line interruptions.

Technical specifications

Technical Operating temperature range

Medium: 0/60 °C Ambient: -25/+50 °C

Floating probe WGA-ÖW (oil-on-water)

Function principle: capacitance 3 PVC floating balls Height 120 mm, Ø 370 mm Cable length 5 m, PVC, oil-resistant

Probe WGA-AS (overflow)

Function principle: capacitance Length 81 mm, Ø 82 mm Cable length 5 m, PVC, oil-resistant

Connection probe - control unit

Up to 300 m (depends on line resistance)

Supply voltage

AC 230 V

Power input

Approx. 2 VA

Switching outputs

Relay contact: 2 voltage-free changeover contacts

(1 can be acknowledged)

Contact rating: AC 250 V/5 A/100 VA

Visual indication

1 green LED operation 1 red LED alarm 1 red LED error

Audible alarm

Integrated piezo buzzer, can be acknowledged

Function test

By means of Test button

Housing

Wall mounting housing made of impact-resistant plastic (polycarbonate) W x H x D: 175 x 125 x 75 mm Degree of protection IP 65 (EN 60529)

ATEX approvals

Control unit: Ex II (1) G [Ex ia] II C Probes: WGA-ÖW: Ex II 1G Ex ia IIA T5 Ga WGA-AS: Ex II 1 G Ex ia IIA T5 Ga

Scope of delivery

Control unit: without probes Probe: with junction box, without mounting material

DG: H, PG: 4	Part no.	Price €
WGA 06 without probes	53414	
Floating probe WGA-ÖW (oil-on-water)	53417	
Probe WGA-AS (overflow)	53415	



Gas alarm units GW-S 2.1 / GW-S 4.1 in wall mounting housing



- For connection of two or four gas sensors (measuring points)
- Digital display for concentration, programming and calibration data
- Alarms: memory mode or volatile mode (1-2)
- Self-monitoring for line interruption, short circuit and power outage
- Data logger (data logger)

Application For continuous monitoring for flammable or toxic gases as well as oxygen in ambient air. Ideal for industrial and building technology applications. Not suitable for use in hazardous areas (EX areas).

Description

Freely programmable gas alarm unit in a compact wall mounting housing for the connection of up to four gas sensors. The control unit can monitor various types of gases. GW-S can be operated in single-stage or dual-stage mode. Limit values can be set as required.

Four integrated relays can be assigned as required (1 relay is used for general alarm and 1 relay for the audible alarm signal (horn)). The other relays are available for control outputs.

The gas alarm system features a display with alternating indication of measured values and three operating levels:

- 1. Measurement level: Displays measured values, faults, alarms
- 2. Parameter level: Displays measuring ranges, limit values, alarm groups
- 3. Service level: Displays limit values, performs function checks of the relays, parameterisation (such as alarm group and limit value settings)

GW-S alternately displays the concentration of the gas in the ambient air. If a sensor exceeds alarm level 1 or alarm level 2, the visual alarm and the alarm relay are activated. When the concentration falls below the alarm level, the alarm is cleared. It is also possible to program GW-S in such a way that alarm level 2 remains stored until a manual reset. The activation of the relay for the horn can also be programmed for each alarm level. Stop mode allows for permanent indication of the concentration at a given measuring point. GW-S is self-monitoring (line interruption, short circuit and power outage) and signals faults via LED and fault relay. In addition, the display shows an "E". The alarm function can be tested without test gas.

Version GW-S 2.1 for connection of up to two gas sensors. Version GW-S 4.1 for connection of up to four gas sensors.

Technical specifications

Sensor inputs

4-20 mA

GW-S 2.1: 2 gas sensors can be connected GW-S 4.1: 4 gas sensors can be connected Digital interface: RS 232 for configuration

Alarm thresholds

Max. 2, adjustable, memory mode or volatile mode

Switching outputs

4 voltage-free relay contacts AC 250 V, 1A

Keypad for alarm and horn reset, edit, menu selection, confirmation

Indication

Digital display for: concentration value, menu LEDs for:

- Alarm and fault for each measuring point
- Operational, horn and indicated measuring point

Supply voltage: AC 230 V

Power input: Max. 20 VA

Operating temperature range

Ambient: -10/+40 °C

Housing

Wall mounting housing

 $W \times H \times D$: 240 x 120 x 190 mm

Weight: 1.3 kg

Degree of protection IP 54 (EN 60529)

Connectable sensors

Series 400, 500, 600, 700 and 800

Option

■ Data logger

DG: H, PG: 4	Part no.	Price €
GW-S 2.1	61146	
GW-S 4.1	61145	
Version with data logger		On request

Blue part no. = in-stock items



Suitable gas sensors (series 400-800) see pages 351-353.



Gas alarm system GW-SK 6.1 in DIN rail housing



- For connection of up to six gas sensors (measuring points)
- Digital display for concentration, programming and calibration data
- Alarms: memory mode or volatile mode (1-4)
- Self-monitoring for line interruption, short circuit and power outage
- Data logger (data logger)

Application For continuous monitoring for flammable or toxic gases as well as oxygen in ambient air. Ideal for industrial and building technology applications. Not suitable for use in hazardous areas (EX areas).

Description Freely programmable gas alarm system in a compact DIN rail housing for the connection of up to six gas sensors. The control unit can monitor various types of gases. GW-SK can be operated in single-stage or dual-stage mode. Limit values can be set as required. 6 integrated relays can be assigned as required (1 relay is used for general alarm and 1 relay for the audible alarm signal (horn)). The other relays are available for control outputs.

Among others, the following combinations are possible:

- 1 alarm threshold, 6 sensors, 4 alarm groups
- 2 alarm thresholds, 6 sensors, 2 alarm groups
- 3 alarm thresholds, 6 sensors, 1 alarm group

The gas alarm system features a display with alternating indication of measured values and three oper-

- 1. Measurement level: Displays measured values, faults, alarms
- 2. Parameter level: Displays measuring ranges, limit values, alarm groups
- 3. Service level: Displays limit values, performs function checks of the relays, parameterisation (such as alarm group and limit value settings)

GW-SK 6.1 alternately displays the concentration at each measuring point. If a sensor exceeds alarm level 1 or alarm level 2, the visual alarm and the alarm relay are activated. When the concentration falls below the alarm level, the alarm is cleared. It is also possible to program GW-SK 6.1 in such a way that alarm level 2 remains stored until a manual reset. The activation of the relay for the horn can also be programmed for each alarm level. Stop mode allows for permanent indication of the concentration at a given measuring point. GW-S 6.1 is self-monitoring (line interruption, short circuit and power outage) and signals faults via LED and fault relay. In addition, the display shows an "E". The alarm function can be tested without test gas.

specifications

Technical Sensor inputs

4-20 mA

Up to six gas sensors can be connected RS 232 interface for configuration

Alarm thresholds

Max. 4, adjustable, memory or volatile mode

Switching outputs

6 voltage-free relay contacts

Controls

Keypad for alarm and horn reset, edit, menu selection, Enter

Indication

Digital display for concentration values, menu

- Alarm and fault for each measuring point
- Operational, horn and indicated measuring point

Supply voltage: 24 V DC, \pm 5 %

Power input: 24 V max. 30 W, without measuring system approx. 3 W

Electrical connections

35-pin screw terminals

Operating temperature range

Ambient: -10/+40 °C

Housing

DIN rail housing (DIN 43880) Can be clipped onto 35 mm DIN rails W x H x D: 105 x 71 x 90 mm Weight: 650 g

Degree of Protection IP 30 (EN 60529)

Option

Serial interface, data logger, emergency power system

DG: H; PG: 4	Part no.	Price €
GW-SK 6.1	61163	
Options		
Power supply unit NTE 24 SK for AC 230 V operation	69114	
Emergency power supply NSV, 24 V operation	69115	On request
Data logger		On request

Blue part no. = in-stock items



Suitable gas sensors

see pages 351-353.

(series 400-800)

Gas sensors for GW-S 2.1/GW-S 4.1/GW-SK 6.1





Description For the detection of flammable, explosive, toxic gases or oxygen. Can also be used in dusty and dirty environments. For connection to the gas alarm units GW-S, GW-S4 and GW-SK. Aluminium wall mounting design. Connection cable (shielded) 3 x 1.5 mm² Cu+ protective conductor, signal and return conductor (max. 100 Ohm line resistance).

GS 400 ST

Technical specifications

Measuring range

0-100 % LEL

(measurement signal is only linear in the range of 0-50 % LEL)

Measuring principle

Semiconductor (HL) (service life approx. 5 years)

Supply voltage

DC 18-28 V

Ambient temperature

-10/+40 °C

Humidity

40/50 % rH

Housing

W x H x D: 90 x 85 x 65 mm Weight: approx. 0.4 kg

Degree of protection: IP 40 (EN 60529)

Output

4-20 mA

GS 500 ST

Measuring range

0/99 % LEL

Measuring principle

Heat tone (WT) (service life approx. 3 years)

Supply voltage

DC 18-28 V

Ambient temperature:

-20/+40 °C

Humidity

15/95 % rH

Atmospheric pressure

900/1100 hPa

Housing

W x H x D: 90 x 85 x 65 mm Weight: Approx. 0.4 kg

Degree of protection: IP 40 (EN 60529)

Output: 4-20 mA

Option: RS 232 interface

DG: H, PG: 4	•	it i	Part no.	Price €
Gas sensor GS 400 ST (HL) methane	1	1	69145	
Gas sensor GS 400 ST (HL) propane	1	1	69143	
Gas sensor GS 400 ST (HL) butane	1	1	69144	
Gas sensor GS 400 ST (HL) LPG	1	1	69147	
Gas sensor GS 400 ST (HL) R134	1	1	69148	
Gas sensor GS 500 ST (WT) methane	1	1	69109	
Gas sensor GS 500 ST (WT) propane	1	1	69120	
Gas sensor GS 500 ST (WT) butane	1	1	69124	
Gas sensor GS 500 ST (WT) LPG	1	1	69130	
Gas sensor GS 500 ST (WT) H ₂	1	1	69137	
Gas sensor GS 500 ST (WT) ethanol	1	1	69138	
Gas sensor GS 500 ST (WT) n-heptane	1	1	69139	

Gas sensors for GW-S 2.1/GW-S 4.1/GW-SK 6.1







Description For monitoring the oxygen concentration and toxic gases. Can also be used in dusty and dirty environments. For connection to the gas alarm units GW-S 2.1/GW-S 4.1/GW-SK 6.1. Aluminium version for wall mounting housing. Connection cable (shielded) 3 x 1.5 mm² Cu+ protective conductor, signal and return conductor (max. 100 Ohm line resistance).

GS 600 ST

specifications 0/21 % O2 by volume

Technical Measuring ranges

Measuring principle

Electro-chemical (EC), service life 1-2 years

Supply voltage

DC 18-28 V

Ambient temperature

10/40 °C

Humidity

15/50% rH

Atmospheric pressure

900/1100 hPa

Housing

W x H x D: 90 x 85 x 65 mm Weight: Approx. 0.4 kg Degree of protection: IP 40 (EN 60529)

Output

4-20 mA

Options RS 232 interface

GS 700 ST

Measuring ranges

GS 700 ST-CO₂: 0/5 % by volume GS 700 ST-CO, LG: 0/3000 ppm

Measuring principle

Infrared (IR)

Supply voltage

DC 18-28 V

Ambient temperature

-10/+40 °C

Humidity

Max. 95 % rH

Atmospheric pressure

900/1100 hPa

Housing

W x H x D: 90 x 85 x 65 mm Weight: Approx. 0.4 kg Degree of protection: IP 30 (EN 60529)

Output

4-20 mA

RS 232 interface

GS 800 ST

Measuring ranges 0.1/25 % O₂ by volume

Measuring principle

Zirconium dioxide (Zr)

Supply voltage

DC 18-28 V

Ambient temperature

-10/+50 °C

Humidity

Max. 95 % rH

Atmospheric pressure

900/1100 hPa

Housing

W x H x D: 90 x 85 x 65 mm Weight: Approx. 0.4 kg Degree of protection: IP 40 (EN 60529)

Output

4-20 mA

RS 232 interface

PG: 4	DG	•	Ty.	Part no.	Price €
Gas sensor GS 600 ST (EC) CO (0-300 ppm)	Н	1	-	61180	
Gas sensor GS 600 ST (EC) O ₂ (0.1–25 % by volume)	Н	1	-	61179	
Gas sensor GS 600 ST (EC) H ₂ S (0-50/100 ppm)	Н	1	-	61121	
Gas sensor GS 600 ST (EC) NH ₃ (0–100 ppm)	Н	1	-	61122	
Gas sensor GS 600 ST (EC) NO ₂ (0-50 ppm)	Н	1	-	61123	
Gas sensor GS 600 ST (EC) CI ₂ (0-10 ppm)	Н	1	-	61124	
Gas sensor GS 600 ST (EC) SO ₂ (0–100 ppm)	Н	1	-	61126	
Gas sensor GS 700 ST (IR) CO ₂ (0-5% % by volume)	Н	1	-	69112	
Gas sensor GS 700 ST (IR) CO ₂ -LG (3000 ppm)	Н	1	-	69104	
Gas sensor GS 800 ST (Zr) O ₂	Н	1	-	69113	
Adjustment adjustment /programming costs for the alarm thresholds for standard gases (methane, propane/butane, O ₂ , CO, CO ₂ , hydrogen) per sensor	-	1	-	61177	
Adjustment adjustment/programming costs for the alarm thresholds for special gases per sensor	-	1	-	61183	



Gas measuring system MF420-Ex-2.1 with ATEX approval for zones 1 and 2





For monitoring of combustible gases and vapours or carbon monoxide

For gas monitoring

- On site calibration by one person (without opening the housing), indication of measured value and system info
- Measuring principle: Heat tone principle (WT) or electro-chemical principle (EC)
- Suitable for control units GW-S 2.1, GW-S4.1 and GW-SK 6.1





For the detection and monitoring of flammable, explosive, toxic gases or oxygen. Can also be used in dusty and dirty environments. Can be used as standalone measuring system or in conjunction with the gas alarm systems GW-S 2.1, GW-S4.1 und GW-SK 6.1 as a complete gas alarm facility for hazardous areas. Approved for operation in potentially explosive atmospheres/EX areas zone 1 and zone 2.

Description Gas sensor with digital display in compact wall mounting housing. Diverse gases can be monitored (see ordering table). Connection cable (shielded) 3 x 1.5 mm² Cu+ protective conductor, signal and return conductor (max. 100 Ohm line resistance). Thanks to the local display, it is possible to immediately read current measured values, perform calibration and set limit values. The concentration is output via the 4-20 mA interface for further processing.

specifications

Technical Measuring range

Version WT: 0/100 % LEL Version EC: 0/300 ppm

Measuring principle

Version WT: Heat tone, catalytic sensor (pellistor)

Version EC: Electro-chemical sensor (Service life approx. 3 years)

Supply voltage

DC 18-30 V

Current input

Approx. 105 mA at 24 V

Operating temperature range

Ambient: -40/+60 °C, temperature class T4 -40/+50 °C, temperature class T6

Humidity

10/95 % r. H. non-condensing

Atmospheric pressure

700/1300 hPa

Housing

Wall mounting housing made of aluminium alloy/ stainless steel

Ø x H: 84 x 78 mm

Weight: 1.1 kg

Degree of protection: IP 65 (EN 60529)

Output signal

4-20 mA

ATEX approvals

Ex II 2G Ex de IIC T6/T4 Gb

Options

• RS 232 interface at control unit

Gas measuring system MF420-Ex-2.1 (P) methane Gas measuring system MF420-Ex-2.1-C ₃ H ₈ (WT) propane H 1 1 69 Gas measuring system MF420-Ex-2.1-C ₄ H ₁₀ (WT) n-butane H 1 1 696 Gas measuring system MF420-Ex-2.1-C ₃ H ₈ / C ₄ H ₁₀ (WT) LPG for monitoring Liquefied Petroleum Gas Gas measuring system MF420-Ex-2.1-H ₂ (WT) for monitoring hydrogen H 1 1 696 Gas measuring system MF420-Ex-2.1-C ₇ H ₁₆ (WT) n-heptane H 1 1 696 Gas measuring system MF420-Ex-2.1-C ₉ H ₁₀ (WT) xylene H 1 1 696 Gas measuring system MF420-Ex-2.1-C ₂ H ₆₀ (WT) ethanol H 1 1 696 Gas measuring system MF420-Ex-2.1-C ₃ H ₈₀ (WT) i-propanol H 1 1 696 Gas measuring system MF420-Ex-2.1-C ₂ H ₂ (WT) acetylene H 1 1 696 Gas measuring system MF420-Ex-2.1-C ₂ H ₂ (WT) acetylene H 1 1 696 Adjustment (adjustment/programming costs alarm thresholds and alarm relays)						
Gas measuring system MF420-Ex-2.1-C ₃ H ₈ (WT) propane Gas measuring system MF420-Ex-2.1-C ₄ H ₁₀ (WT) n-butane H 1 1 690 Gas measuring system MF420-Ex-2.1-C ₃ H ₈ /C ₄ H ₁₀ (WT) LPG for monitoring Liquefied Petroleum Gas Gas measuring system MF420-Ex-2.1-H ₂ (WT) for monitoring hydrogen H 1 1 690 Gas measuring system MF420-Ex-2.1-C ₇ H ₁₆ (WT) n-heptane H 1 1 690 Gas measuring system MF420-Ex-2.1-C ₇ H ₁₆ (WT) n-heptane H 1 1 690 Gas measuring system MF420-Ex-2.1-C ₉ H ₁₀ (WT) xylene H 1 1 690 Gas measuring system MF420-Ex-2.1-C ₂ H ₆₀ (WT) ethanol H 1 1 690 Gas measuring system MF420-Ex-2.1-C ₂ H ₆₀ (WT) i-propanol H 1 1 690 Gas measuring system MF420-Ex-2.1-C ₂ H ₂ (WT) acetylene H 1 1 690 Gas measuring system MF420-Ex-2.1-C ₂ H ₂ (WT) acetylene H 1 1 690 Gas measuring system MF420-Ex-2.1-C ₂ H ₂ (WT) acetylene H 1 1 690 Gas measuring system MF420-Ex-2.1-C ₂ H ₂ (WT) acetylene H 1 1 690 Gas measuring system MF420-Ex-2.1-C ₂ H ₂ (WT) acetylene H 1 1 690 Gas measuring system MF420-Ex-2.1-C ₂ H ₂ (WT) acetylene H 1 1 690 Gas measuring system MF420-Ex-2.1-C ₂ H ₂ (WT) acetylene H 1 1 690	no. Price €	Part no.	ty		DG	PG: 4
Gas measuring system MF420-Ex-2.1-C ₄ H ₁₀ (WT) n-butane Gas measuring system MF420-Ex-2.1-C ₃ H ₈ / C ₄ H ₁₀ (WT) LPG for monitoring Liquefied Petroleum Gas Gas measuring system MF420-Ex-2.1-H ₂ (WT) for monitoring hydrogen H 1 690 Gas measuring system MF420-Ex-2.1-C ₇ H ₁₆ (WT) n-heptane H 1 1 690 Gas measuring system MF420-Ex-2.1-C ₉ H ₁₀ (WT) xylene H 1 1 690 Gas measuring system MF420-Ex-2.1-C ₂ H ₆₀ (WT) ethanol H 1 1 690 Gas measuring system MF420-Ex-2.1-C ₃ H ₈₀ (WT) i-propanol H 1 1 690 Gas measuring system MF420-Ex-2.1-C ₂ H ₂ (WT) acetylene H 1 1 690 Gas measuring system MF420-Ex-2.1-C ₂ H ₂ (WT) acetylene H 1 1 690 Gas measuring system MF420-Ex-2.1-C ₂ H ₂ (WT) acetylene H 1 1 690 Gas measuring system MF420-Ex-2.1-C ₂ H ₂ (WT) acetylene H 1 1 690 Gas measuring system MF420-Ex-2.1-C ₂ H ₂ (WT) acetylene H 1 1 690 Gas measuring system MF420-Ex-2.1-C ₂ H ₂ (WT) acetylene H 1 1 690 Gas measuring system MF420-Ex-2.1-C ₂ H ₂ (WT) acetylene H 1 1 690 Gas measuring system MF420-Ex-2.1-C ₂ H ₂ (WT) acetylene	1	69111	1	1	Н	Gas measuring system MF420-Ex-2.1 (P) methane
Gas measuring system MF420-Ex-2.1-C ₃ H ₈ /C ₄ H ₁₀ (WT) LPG for monitoring Liquefied Petroleum Gas Gas measuring system MF420-Ex-2.1-H ₂ (WT) for monitoring hydrogen H 1 1 690 Gas measuring system MF420-Ex-2.1-C ₇ H ₁₆ (WT) n-heptane H 1 1 690 Gas measuring system MF420-Ex-2.1-C ₉ H ₁₀ (WT) xylene H 1 1 690 Gas measuring system MF420-Ex-2.1-C ₂ H ₆₀ (WT) ethanol H 1 1 690 Gas measuring system MF420-Ex-2.1-C ₃ H ₈₀ (WT) i-propanol H 1 1 690 Gas measuring system MF420-Ex-2.1-C ₂ H ₂ (WT) acetylene H 1 1 690 Gas measuring system MF420-Ex-2.1-C ₂ H ₂ (WT) acetylene H 1 1 690 Gas measuring system MF420-Ex-2.1-C ₂ H ₂ (WT) acetylene H 1 1 690 Gas measuring system MF420-Ex-2.1-C ₂ H ₂ (WT) acetylene H 1 1 690 Gas measuring system MF420-Ex-2.1-C ₂ H ₂ (WT) acetylene H 1 1 690 Gas measuring system MF420-Ex-2.1-C ₂ H ₂ (WT) acetylene)4	69004	1	1	Н	Gas measuring system MF420-Ex-2.1-C ₃ H ₈ (WT) propane
Gas measuring system MF420-Ex-2.1-C ₇ H ₁₆ (WT) for monitoring hydrogen H 1 1 690 Gas measuring system MF420-Ex-2.1-C ₇ H ₁₆ (WT) n-heptane H 1 1 690 Gas measuring system MF420-Ex-2.1-C ₉ H ₁₀ (WT) xylene H 1 1 690 Gas measuring system MF420-Ex-2.1-C ₂ H ₆₀ (WT) ethanol H 1 1 690 Gas measuring system MF420-Ex-2.1-C ₃ H ₈₀ (WT) i-propanol H 1 1 690 Gas measuring system MF420-Ex-2.1-C ₂ H ₂ (WT) acetylene H 1 1 690 Gas measuring system MF420-Ex-2.1-C ₂ H ₂ (WT) acetylene H 1 1 690 Gas measuring system MF420-Ex-2.1 (EC) for monitoring carbon monoxide (CO) Adjustment (adjustment/programming costs alarm thresholds and alarm relays))7	69007	1	1	Н	Gas measuring system MF420-Ex-2.1-C ₄ H ₁₀ (WT) n-butane
Gas measuring system MF420-Ex-2.1-C ₇ H ₁₆ (WT) n-heptane Gas measuring system MF420-Ex-2.1-C ₉ H ₁₀ (WT) xylene H 1 1 690 Gas measuring system MF420-Ex-2.1-C ₂ H ₆₀ (WT) ethanol H 1 1 690 Gas measuring system MF420-Ex-2.1-C ₃ H ₈₀ (WT) i-propanol H 1 1 690 Gas measuring system MF420-Ex-2.1-C ₂ H ₂ (WT) acetylene H 1 1 690 Gas measuring system MF420-Ex-2.1 (EC) for monitoring carbon monoxide (CO) Adjustment (adjustment/programming costs alarm thresholds and alarm relays))9	69009	1	1	Н	Gas measuring system MF420-Ex-2.1-C ₃ H ₈ / C ₄ H ₁₀ (WT) LPG for monitoring Liquefied Petroleum Gas
Gas measuring system MF420-Ex-2.1-C ₉ H ₁₀ (WT) xylene Gas measuring system MF420-Ex-2.1-C ₂ H ₆₀ (WT) ethanol H 1 1 690 Gas measuring system MF420-Ex-2.1-C ₃ H ₈₀ (WT) i-propanol H 1 1 690 Gas measuring system MF420-Ex-2.1-C ₂ H ₂ (WT) acetylene H 1 1 690 Gas measuring system MF420-Ex-2.1 (EC) for monitoring carbon monoxide (CO) Adjustment (adjustment/programming costs alarm thresholds and alarm relays)	0	69010	1	1	Н	Gas measuring system MF420-Ex-2.1-H ₂ (WT) for monitoring hydrogen
Gas measuring system MF420-Ex-2.1-C ₂ H ₆₀ (WT) ethanol H 1 1 690 Gas measuring system MF420-Ex-2.1-C ₃ H ₈₀ (WT) i-propanol H 1 1 690 Gas measuring system MF420-Ex-2.1-C ₂ H ₂ (WT) acetylene H 1 1 690 Gas measuring system MF420-Ex-2.1 (EC) for monitoring carbon monoxide (CO) H 1 1 690 Adjustment (adjustment/programming costs alarm thresholds and alarm relays)	3	69013	1	1	Н	Gas measuring system MF420-Ex-2.1-C ₇ H ₁₆ (WT) n-heptane
Gas measuring system MF420-Ex-2.1-C ₃ H ₈₀ (WT) i-propanol H 1 1 690 Gas measuring system MF420-Ex-2.1-C ₂ H ₂ (WT) acetylene H 1 1 690 Gas measuring system MF420-Ex-2.1 (EC) for monitoring carbon monoxide (CO) H 1 1 690 Adjustment (adjustment/programming costs alarm thresholds and alarm relays)	4	69014	1	1	Н	Gas measuring system MF420-Ex-2.1-C ₉ H ₁₀ (WT) xylene
Gas measuring system MF420-Ex-2.1-C ₂ H ₂ (WT) acetylene H 1 1 690 Gas measuring system MF420-Ex-2.1 (EC) for monitoring carbon monoxide (CO) Adjustment (adjustment/programming costs alarm thresholds and alarm relays)	34	69034	1	1	Н	Gas measuring system MF420-Ex-2.1-C ₂ H ₆₀ (WT) ethanol
Gas measuring system MF420-Ex-2.1 (EC) for monitoring carbon monoxide (CO) H 1 1 690 Adjustment (adjustment/programming costs alarm thresholds and alarm relays)	35	69035	1	1	Н	Gas measuring system MF420-Ex-2.1-C ₃ H ₈₀ (WT) i-propanol
Adjustment (adjustment/programming costs alarm thresholds and alarm relays)	36	69036	1	1	Н	Gas measuring system MF420-Ex-2.1-C ₂ H ₂ (WT) acetylene
	37	69037	1	1	Н	Gas measuring system MF420-Ex-2.1 (EC) for monitoring carbon monoxide (CO)
For standard gases (methane, propane/butane, O ₂ , CO, CO ₂ , hydrogen) per sensor - 1 1 61						Adjustment (adjustment/programming costs alarm thresholds and alarm relays)
	7	61177	1	1	-	For standard gases (methane, propane/butane, O_2 , CO, CO_2 , hydrogen) per sensor
For special gases per sensor - 1 1 61	3	61183	1	1	-	For special gases per sensor

Blue part no. = in-stock items

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Accessories for gas alarm units/gas sensors

Test gas unit PGK 10

Application For checking, servicing and repairing gas alarm systems.

Description Plastic case with test gas cap and withdrawal unit (valve, flow meter with stainless steel float for gas flow regulation from 0.5-1.5 I/min and test gas tube). Can accommodate 1 to 2 test gas cylinders.

> Calibration gas not included in scope of delivery; please order separately.



Mounting frame

Description

Suitable for all wall mounting housings of the WATCHDOG-LINE series (alarm units). For fast integration in control cabinets.

Dimensions housing

W x H x D 100 x 188 x 65 mm

Sealing kit (IP 54)

Description

Sealing kit for rough application conditions. Suitable for all wall mounting housings of the WATCHDOG-LINE series (alarm units). The sealing kit is easy to mount between the housing cover and base. This increases the degree of protection of the alarm unit to IP 54.

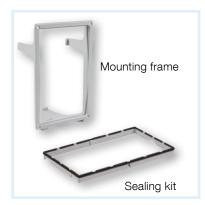
Dimensions housing

W x H x D: 100 x 188 x 65 mm

DIN rail clip

Description

DIN rail clip for fast and easy mounting of WATCHDOG-LINE alarm units in the control cabinet or for side-by-side mounting of several units on the wall. The clip is mounted by means of screws so that the alarm unit can be clipped onto standard DIN rails.





PG: 4	PG	DG		it	Part no.	Price €
Test gas unit PGK 10 (without gas cylinder)	1	Е	1	-	61100	
Withdrawal unit MiniFlo Brass valve and Perspex flow meter with stainless steel float for gas flow control from 0.5 to 1.5 l/min, test gas hose	3	Е	1	-	69050	
Calibration gas methane 20 % LEL, non-recyclable cylinder containing 12 l	2	Е	1	-	69060	
Calibration gas methane 40 % LEL, non-recyclable cylinder containing 12 l	2	Е	1	-	69061	
Calibration gas propane 20 % LEL, non-recyclable cylinder containing 12 l	2	Е	1	-	69062	
Calibration gas propane 40 % LEL, non-recyclable cylinder containing 12 l	2	Е	1	-	69063	
Calibration gas carbon monoxide (300 ppm), non-recyclable cylinder containing 12 l	2	Е	1	-	69064	
Synthetic air for zero point calibration, non-recyclable cylinder containing 12 l	2	Е	1	-	69065	
Mounting frame	1	G	1	-	43521	
Sealing kit (IP 54)	1	G	1	-	43416	
DIN rail clip	1	G	1	-	43100	
Enquire for other calibration gases and concentrations				Blue	part no - ir	-etack itame

Enquire for other calibration gases and concentrations.

Blue part no. = in-stock items



Upon request, we design and build complete gas alarm systems for you and service them at regular intervals.



Alarm units for fast detection of levels, accumulations of liquids, leakage, gases or smoke



In the building technology sector, there are many risks which should be monitored to avoid annoyance to home owners, janitors, property managers or maintenance personnel and to avert extensive damage. WATCHDOG-LINE alarm units report undesirable events, danger and emergency conditions early so that immediate measures can be taken.

The WATCHDOG-LINE devices excel with easy and intuitive operation. A large variety of probes and sensors enable fast detection of liquid levels, leakage and accumulations of liquids, gases or smoke. Integrated visual and audible alarms provide the appropriate signals in hazard conditions. For remote signalling and easy

integration into smart home systems, the are ready for the installation of an EnOcean® wireless module. This way, the persons in charge can be notified of an alarm condition - whether or not they have a mobile device. Residential buildings, factories and facilities are protected and monitored.

From standard wall mounting to integration into control cabinets using mounting frames – AFRISO-LINE alarm units are easy and quick to install. With very little effort, the devices can also be retrofitted with seal kits for use in rough dirty and wet environments (IP 54).







WATCHDOG-LINE alarm units



- Audible and visual alarms for maximum safety
- Additional signalling devices (ZAG 01, horn, warning light) can be connected
- Ready-to-connect device for easy installation and commissioning
- High reliability and long service life







areas

- Typical application Collection facilities below oil and water consuming equipment
 - Drip pans below storage tanks, burners or motors in buildings or outdoors
 - Containers, barrels and tanks/ double-walled tanks
 - Sewage tanks
 - Cisterns and water storage tanks
 - Drinking water installations
 - Oil depots, boiler rooms and rooms with mains water connection
 - Heating systems
 - Cable and pipe ducts

- Detectable media Water, waste water, groundwater
 - Heating circuit water
 - Cooling water
 - Rainwater
 - Fuel oil EL, L, M
 - Diesel fuels or low-viscosity lubricating oils class A III
 - Motor oils, gearbox oils and hydraulic oils
 - Vegetable oils and transformer oils

- Canal shafts, manholes and inspection ducts
- Cellars, kitchens, laundry rooms
- Warehouses and storage areas
- Machinery rooms
- Museums, archives, office buildings
- Lift shafts
- High-tech equipment rooms and server rooms
- Pumping stations and control rooms
- Catchment and overflow basins
- Flood risk areas
- Oil, petrol and grease separators
- Protective pipes and pipelines
- Beverages
- Antifreeze agents and fertilisers
- Emulsions
- Sludge, sand
- Oil, petrol and grease layers
- Conductive water mixtures and liquids
- Gases, vapours, smoke
- Many other liquids with a flash point of > 55 °C.









Emission measurement

Oxygen analysers



Stationary gas analysis



Gas treatment systems and gas coolers

CHAPTER 7

Stationary gas analysers

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Stationary gas analysis – information on gas concentration measurement



Typical applications:

- Emission measurement
- Combustion processes
- Large combustion systems
- Turbo generator monitoring
- Industrial gas filling
- Incineration

- Crematoria
- Biological systems
- Tunnel monitoring
- Cooling plants
- Fruit and vegetable storage houses
- Purity measurements

Task

The objective of gas concentration measurement is to measure a component of a gas mixture continuously, selectively and quantitatively and to transform the results into electrical, standardised signals. These signals can be processed for logging, control, calculation or analysis purposes. Each gas component is measured on the basis of different chemical/physical or physical measuring principles.

Such measuring principles include:

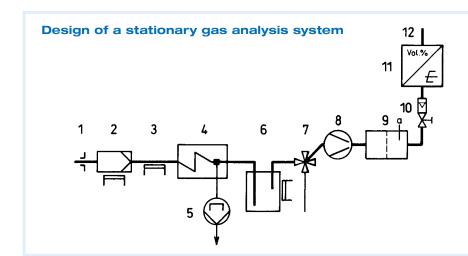
- Absorption of infrared radiation for measuring heteroatomic gases
- Paramagnetism for measuring oxygen concentrations
- Ion conductivity of solid electrolytes and liquid electrolytes

The selectivity of the component to be measured is a key factor in finding a suitable measuring system. Selectivity refers to the specific technical detectability of a certain component in the gas to be measured without it being influenced by other gases.

Application

The analysis of gas mixtures with continuously operating measuring systems is a part of industrial measuring technology. By using continuously operating gas analysers it is possible to recognise tendencies, monitor, control and/or evaluate processes. The technical analysis of gas emissions is prescribed by numerous environmental acts in many countries. For example, in Germany, legislation and directives such as TA-Luft and BlmSchG stipulate that certain systems must be equipped with emission measuring facilities. AFRISO supplies tested and approved analysers, turnkey analysis systems and/or auxiliary equipment (such as gas sampling probes, filters, coolers) for such applications; these units make continuous analysis of gas components possible





- 1. Sampling point
- 2. Gas sampling probe
- 3. Heated gas line
- 4. Cooler
- 5. Condensate separation
- 6. Filter
- 7. Changeover valve
- 8. Gas pump
- 9. Flow monitoring
- 10. Flow measurement
- 11. Analyser
- 12. Gas outlet

Design features

Due to the varied nature of measuring tasks and gas components, it is imperative to consider the operating conditions and ambient conditions in addition to the selection of the measuring principle and the measuring range. Therefore, the operating conditions (such as pressure, temperature, humidity, dirt/pollution) and the ambient conditions (such as ambient temperature, corrosive environments, shocks, dust concentration) play a key role in the design of a measuring system.

Gas treatment

The accuracy and the reliability of a gas analysis system are determined by the selection of the gas sampling and gas treatment systems. In most cases, the gas sampled for analysis cannot be directly processed by the gas analyser. The performance of the analyser can be adversely affected by high dust concentrations or high humidity, high dew points, excessively high or low pressures, excessively high temperatures as well as other detrimental components.

Therefore, the design of the gas analysis system is a crucial factor determining the viability of the analysis values generated by the analyser. The most important conditions for minimum maintenance and trouble-free operation are the sampling point as well as suitable accessories and their proper arrangement.

Precise and efficient gas analysis therefore requires a targeted design of the entire gas treatment system. Take advantage of AFRISO's many years of experience and competence as a supplier of complete analysis systems for solutions to your measuring problems. AFRISO supplies gas analysis systems:

- 1. Individual system components
- 2. Completely mounted on panel, wired and with all hoses connected
- 3. Completely mounted, wired, with all hoses connected, already installed in measuring cabinets
- 4. As a complete measuring station in a container or built onto a vehicle.

Application example: Emission measurement in biomass combustion plants

Measuring cabinet with two lines for emission measurement in a log wood combustion system for heat and power generation. Pertinent legislation such as the 13th German Federal Immission Act requires continuous monitoring of CO, O2 and dust limit values. Monitoring of an existing oil fuelled plant was also integrated into the system. Data is acquired, calculated and visualised once a second.

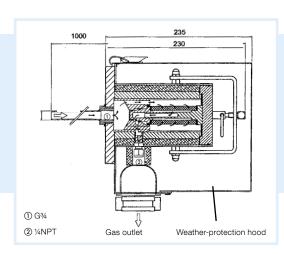


Custom-built systems to your specifications – please enquire.





Stationary gas sampling probe SP 210



- Low dead volume, short response time
- Simple filter replacement
- Easy cleaning of filter chamber and sampling pipe
- Self-controlling electrical heating system with undertemperature alarm contact
- Modular design for optimum adaptation to process requirements

Application

For stationary, continuous sampling of gases and filtration of particulate matter at the sampling point. Part of the required maintenance of a complete analysis system can thus be focused on the first component in the chain of components; mixtures of particulate matter and coarse dust are filtered to a high degree.

Description

Stationary gas sampling probe with external, electrically heated ceramic filter; with mounting flange and G¾ female thread for sampling pipe or pre-filter. A deep-bed ceramic filter element with a large surface is located in a housing with a low dead volume outside of the sampling space. The filter element is easy to replace; no tools are required and the heated pipe does not need to be dismantled. Heating of the complete filter housing including the mounting flange ensures reliable operation without dew point problems in external areas. The unit is heated to +180 °C by means of self-controlling heating elements. Therefore, heating controllers or thermostats are not required. A thermo switch monitors the sampling probe for undertemperature. Version SP 210-HP with weather protection hood for outdoor applications.

Technical specifications

Technical Operating temperature range

Ambient: -20/+80 °C Medium: Max. 1,300 °C

Sampling pressure: 0.4/2 bar absolute

Dust admission: Max. 1 g/m³ **Filter space volume:** 100 ml

Filter element

Type F-2K, filter fineness 2 µm, ceramic

Probe heating

+180 °C, self/controlling Alarm contact: < 160 °C

Switch rating: AC 250 V / DC 30 V, 3 A (AC/DC)

Connection gas outlet

Swagelok pipe connector Ø 6 x 1 mm

Supply voltage

AC 110-240 V, 50/60 Hz

Power input

Starting phase: 400 VA Operation: 70 VA Fuse: 6 A

Mounting flange

DN 65 PN 6, type B as per EN 1092

Stainless steel 316 Ti

Wetted parts

Stainless steel 316 Ti, FPM, ceramic

Housing

W x H x D: 170 x 220 x 230 mm Weight: 6.5 kg (SP 210-H) 8.5 kg (SP 210-H/W)

Degree of protection

SP 210-H: IP 54 (EN 60529) SP 210-H/W: IP 55 (EN 60529)

PG: 4		it.	Part no.	Price €
Gas sampling probe SP 210-H, heated	1	1	68935	
Gas sampling probe SP 210-H/W, heated	1	1	68936	
Accessories				
Steel sampling pipe SP 210 stainless steel Length 1 m (max. 600 °C)	1	1	68940	
Sampling pipe SP 210 titanium Length 1 m, for corrosive gases (max. 400 °C)	1	1	68941	
Sampling pipe SP 210 Kanthal (max. 1300 °C)	1	1	68942	
Pre-filter VFS-2 for dust admission 2–16 g/m ³	1	1	68945	On request
Pre-filter VFS-10 for dust admission >10 g/m ³	1	1	68946	On request
Filter element F-2K ceramic 2 μm	1	1	68950	

Blue part no. = in-stock items



Please enquire for other gas sampling probes and heated gas sampling lines.



Heated analysis and frost protection lines series HL



- Reliable analysis due to heating up to max. 200 °C
- Excellent insulation, low energy consumption, low heat loss
- Robust, resistant, suitable for thermal load
- Ready-to-connect with wire ferrules
- Outer jacket with high chemical resistance and UV protection

Application Electrically heated gas lines are used in gas analysis systems to transport gas samples from the sampling point to the gas treatment system and to keep the temperature from falling below the dew point. A temperature controller maintains a constant temperature.

> Self-controlling heated gas lines are used as frost protection lines in gas analysis systems. They do not require a separate controller.

Description

Electrically heated analysis lines are made to customer specifications in different versions. The analysis line consists of several layers. The outer material is a corrugated polyamide hose with a thermal insulation layer at the inside (thermal fleece). The inside of the analysis line consists of a PTFE hose to transport the gas to be measured, a heating cable and a metal jacket to protect against damage. The PTFE is replaceable and available in various diameters (DN 4 / DN 6). The heated analysis lines feature end pieces (silicone cap), a Pt 100 sensor (with the exception of the frost protection line) and a 2 m connection line with wire ferrules.

specifications

Technical Heating capacity, specific

Analysis line: 100 W/m at T = 10 °C Frost protection line: 30 W/m at T = 10 °C

Sensor

Analysis line: Pt 100, 2-wire

Operating temperature

 T_{max} 200 °C Analysis line: Frost protection line: T_{max} 45 °C

Supply voltage

AC 230 V, 50 Hz

Accessories • Wall bushing

- Insulation sleeves
- Connector
- Temperature controller with solid state relay

Electrical connection

Connection line 2 m with wire ferrule

Material

Carrier: PTFE Jacket: PA 12

Dimensions

Carrier: Inside Ø 4 mm / outside Ø 6 mm (DN 4) or

inside Ø 6 mm / outside Ø 8 mm (DN 6)

Jacket: Outside Ø approx. 43 mm



Heated analysis and frost protection lines series HL

PG: 4	Part no.	Base price €	Part no.	Price per metre €
Analysis line HL 4 heated, DN 4 with Pt 100 sensor, connection caps and connection cable	61500		61501	
Analysis line HL 6 heated, DN 6 with Pt 100 sensor, connection caps and connection cable	61502		61503	
Analysis line HLA 4 heated, DN 4 with Pt 100 sensor, connection caps, connection cable and replaceable inner line	61504		61505	
Analysis line HLA 6 heated, DN 6 with Pt 100 sensor, connection caps, connection cable and replaceable inner line	61506		61507	
Analysis line HLE 4 heated, DN 4 with Pt 100 sensor, connection caps and connection cable and stainless steel jacket	61510		61511	
Analysis line HLE 6 heated, DN 6 with Pt 100 sensor, connection caps and connection cable and stainless steel jacket	61512		61513	
Analysis line HLAE 4 heated, DN 4 with replaceable inner line with Pt 100 sensor, connection caps, connection cable, replaceable inner line and stainless steel jacket	61514		61515	
Analysis line HLAE 6 heated, DN 6 with replaceable inner line with Pt 100 sensor, connection caps, connection cable, replaceable inner line and stainless steel jacket	61516		61517	
Analysis HLFR 4 heated, DN 4, self-controlling, can be shortened at any interval (1 m)	61520		61521	
Analysis HLFR 6 heated, DN 6, self-controlling, can be shortened at any interval (1 m)	61522		61523	
Accessories				
Insulating sleeve HL-M	61525		-	-

Please enquire for other heated analysis lines (e.g. EX versions, frost protection lines.

Blue part no. = in-stock items

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Heated analysis line and frost protection line are delivered ready to be connected. Please order the base price plus the desired meter price with separate part number to allow the lines to be made to your exact requirements.



Temperature controller ZPR



- On-off controller
- Ideal for heated gas sampling lines and gas sampling probes
- Version for DIN rail mounting or front panel mounting
- With relay output or analogue output



Application Electronic on-off controllers for monitoring and controlling electrically heated gas sampling lines or gas sampling probes.

The electronic on-off temperature controllers are available in **Description** the following versions:

- DIN rail mounting
- Front panel mounting

The series ZPR temperature controllers control and monitor the temperature in gas lines. They are optionally available with analogue output.

	ZPR DR100	ZPR 32	ZPR 16	ZPR 16A
Outputs	2 x relay 1 x logic (0/5V)	1 x relay 1 x logic (0/5V)	2 x relay 1 x logic (0/14V)	2 x relay 1 x logic (0/14V) 1 x analogue 4–20 mA
Supply voltage	AC 110-240 V	AC 110-240 V	AC 110-240 V	AC 110-240 V
Dimensions (W x H x D)	22.5 x 109 x 125 mm	48 x 24 x 100 mm	48 x 48 x 91 mm	48 x 48 x 91 mm
Weight	200 g	75 g	125 g	125 g
Mounting	DIN rail	Front plate	Front plate	Front plate

PG: 4	Part no.	Price €
Temperature controller ZPR DR100	61530	
Temperature controller ZPR 32	61531	
Temperature controller ZPR 16	61532	
Temperature controller ZPR 16A with analogue output	61533	

Enquire for controllers in wall mounting housings.

Blue p	art no.	= in-stock items
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Universal filter AF-U



- Optimum filtration of particulate matter
- With or without liquid alarm sensors
- Easy, fast wall mounting
- Bypass function



Application For filtration of solid matter.

Description Unheated universal filter for optimum filtration performance and removal of extremely small particles with filter elements with high filter fineness. Versions with or without conductivity based liquid alarm sensors. The sensor can detect the breakthrough of liquids (e.g. if a gas dryer is used upstream of the unit). If condensate water breaks through, the stream flow effect directs the drops to the sensor. The control unit of the liquid alarm sensor has a relay output that can be used to activate a pump or a solenoid valve or to signal an alarm. If condensate breaks through, the filter housing acts as a buffer space so that the liquid cannot immediately reach other components. The universal filter can be equipped with various filter inserts (ceramic, glass fibre, PTFE, stainless steel). These inserts are available with different filter fineness ratings to cover all possible applications.

> The liquid alarm sensor detects and signals moisture, e.g. is the upstream gas dryer is defective. The liquid alarm sensor operates on the basis of the measuring principle of electric conductivity.

Technical Operating temperature range

specifications Medium filter: max. 100 °C Universal filters Ambient control unit: -5/+55 °C

Gas connections

2 x G1/4 female thread Inlet: Side Outlet: Side

Gas pressure

Max. 1 bar

Filter insert

Teflon (PTFE), glass fibres or ceramic

Filter surface

70 cm²

Condensate outlet

GL 25

Material

PTFE Filter head: Filter body: Duran glass

Weight: Approx. 0.31 kg (filter)

Approx. 0.35 kg (control unit)

Technical Switching output specifications **Control unit**

Relay contact: 1 voltage-free changeover contact

Contact rating

AC 250 V, 750 VA DC 12 V, 1 A

Sensor cable length

1.5 m

Supply voltage

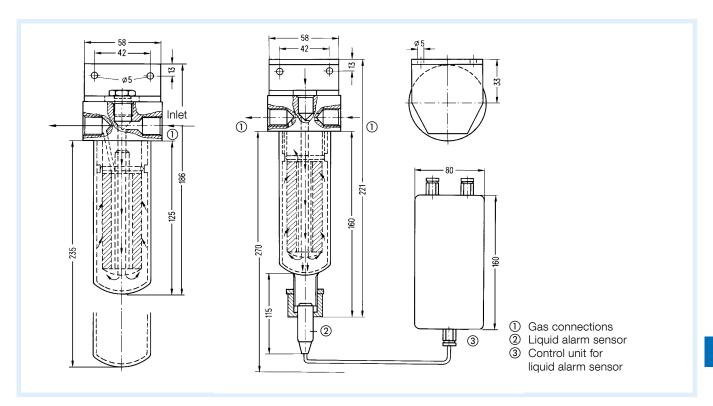
AC 230 V or AC 115 V

Power input

2 VA



Universal filter AF-U



PG: 4	Part no.	Price €
Universal filter AF-U 75 with Teflon insert, filter fineness 2 µm	61605	
Universal filter AF-UK 75 with Teflon insert and condensate drain, filter fineness 2 µm	61610	
Accessories		
Liquid alarm sensor FAS with evaluation electronics	68965	
Filter insert FE-T 2-75 Teflon, filter fineness 2 μm	61750	
Filter insert FE-T 20-75 Teflon, filter fineness 20 μm	61751	
Filter insert FE-K 2-75 ceramic, filter fineness 2 μm	61755	
Filter insert FE-K 20-75 ceramic, filter fineness 20 μm	61756	
Filter insert FE-G 01-75 glass fibre, filter fineness 0.1 μm	61745	
Screw connection VGL 25 with hose connection	68970	
Spare parts		
Filter head FK	61700	
Filter glass FG 75 for filter insert 75 mm	61710	
Filter glass FG-K 75 with condensate outlet for filter insert 75 mm	61720	

Please enquire for further filters (e.g. stainless steel filters or heated filters) and filter inserts.



Absorption filter AF-A, humidifier bottle AF-B



Absorption filter

Application For removing corrosive components (e.g. SO₃) by means of sacrificial materials. The measured components are usually not influenced by the sacrificial materials.

Description

The absorption filter is a filter with various absorption materials which remove corrosive gases such as SO₃, NO₂, HF and HCl.

Humidifier bottle

For humidification of the calibration gas.

The humidifier bottle provides for identical physical properties of measured gas and calibration gas. The calibration gas is guided through the humidifier bottle in which a an inlet filter ensures that the gas bubbles so that it can absorb water.

specifications

Technical Operating temperature range

Medium: Max. 100 °C

Material

Filter head: PTFE Filter body: Duran glass

Sacrificial materials

- Copper granulate
- Steel wool
- Zinc

Gas inlet

G1/4 female thread

Gas pressure

Max. 1 bar

Gas outlet

GL 25 with hose connection Ø 4/6 mm (inner/outer)

Operating temperature range

Medium: Max. 100 °C

Material

Filter head: PTFE Filter body: Duran glass Inlet filter: Duran glass

Gas inlet/gas outlet

G1/4 female thread

Gas pressure

Max. 1 bar

PG: 4	Part no.	Price €
Absorption filter AF-A with set of sacrificial materials	61625	
Set of sacrificial materials AF-AO	61626	
Humidifier bottle AF-B 75 with inlet filter	61630	
Humidifier bottle AF-B 150 with inlet filter	61631	
Inlet filter AF-BE	61632	

Blue part no. = in-stock items



Please enquire for additional sacrificial materials!



Adsorption filter AF-AD

- Condition of the filter material visible from the outside
- Easy to fill with different adsorption agents

Application For removing, adsorbing unwanted components

Description The adsorption filter can be filled with different adsorption agents (e.g. activated carbon) to remove unwanted components..

specifications Medium: -20 °C to +80 °C

Technical Operating temperature range

Material

Filter head: PTFE Empty cartridge: PVC Filter body: Duran glass Viton®

Adsorption agent

- Activated carbon
- Silica gel
- Soda lime
- Purafil II

Gas inlet/gas outlet

G1/4 female thread

Gas pressure

Max. 1 bar at 20 °C

PG: 4	Part no.	Price €
Adsorption filter AF-AD	61633	
Empty cartridge	61634	
Adsorption agent for AF-AD	61635	On request



Room air inlet filter AF-R, acid filter AF-S



Room air inlet filter AF-R

Application For filtration of the ambient air.

Description The room air inlet filter filters the ambient air and removes the dust in the gas to be measured up to

a grain size of approx. 2 µm.

Technical specifications

Technical Operating temperature range

Medium: Max. 100 °C

Material

Filter insert: Glass fibre Filter head: PTFE

Length filter insert

75 mm

Gas outlet

G1/4 female thread

Filter surface

70 cm²

Filter fineness

2 µm



Acid filter AF-S

For removing aerosols.

With the coalescing filter insert, the acid filter removes highly corrosive aerosols from the gas flow.

Operating temperature range

Ambient: -20/+140 °C Medium: Max. 140 °C

Material

Filter insert: Glass fibre Filter head: PTFE Filter body: Duran glass

Gas inlet/gas outlet

G1/4 female thread

Gas pressure

Max. 0.5 bar

Condensate outlet

GL 14 with hose connection Ø 4/6 mm (inner/outer)

Filter surface

70 cm²

PG: 4	Part no.	Price €
Room air inlet filter AF-R	61600	
Filter insert FE-G 02-75 glass fibre 0.2 µm, 75 mm	61754	
Acid filter AF-S with condensate drain	61615	
Coalescent filter insert FE-S	61651	



Water trap AF-W, flame arrestor FS 75





Water trap AF-W

Application Additional equipment to protect the analyser from condensate and aerosols.

Description The water trap is installed directly upstream of the analyser in order to keep condensate and aerosols from entering the analyser.

Technical specifications

Operating temperature range

Medium: Max. 90 °C

Material

Filter element: PTFE Housing: Polypropylene

Filter fineness

 $< 0.1 \ \mu m$

Filter surface

20 cm²

Gas inlet/gas outlet

Compression fitting Ø 4 x 1 mm

Filling volume

Approx. 5 ml

Gas pressure

Max. 2 bar

Flame arrester FS 75

The detonation flame arrestor helps to avoid transmission of flames in the case of deflagration and stable detonation of explosible vapour, gas or gas-air mixtures of explosion groups IIA, IIB1, IIB2

Extinguishes a starting flame by a small capillary . The metal surface rapidly cools down the flame.

Operating temperature range

Medium: Max. 60 °C

Maximum experimental safety gap

 $> 0.65 \; mm$

Length

75 mm

Material

Housing: V4A Metal strips: V2A O-Ring: Viton®

Gas pressure

Max. 1.30 bar

Gas inlet/gas outlet

G1/4 female thread

Weight

340 g

i	
PΙ	ease enquire for
otł	ner versions of
the	e flame arrester.

PG: 4	Part no.	Price €
Water trap AF-W	61640	
Flame arrester FS 75	61780	

Solenoid valve MV Condensate collector KS





Solenoid valve MV

Application The 2/2-way or 3/2-way solenoid valve controls switchover from test gas to measured gas or allows for gas switchover to several gas sampling points. It is also possible to implement bypass arrangements.

Description

- **Benefits** Pivoted armature valve with manual emergency operation.
 - Direct action with separating diaphragm
 - Use with corrosive media

specifications Medium:

Technical Operating temperature range

-20/+60 °C Max. 55 °C Ambient:

Material

Housing and seat materials: PP, PVDF Seal material: NBR

Electrical connection

Pin connector as per DIN EN 175301-803 type A for socket type 2508

Degree of protection

IP 65

Mounting position

Any

Gas inlet/gas outlet

G1/4 female thread

Supply voltage

AC 230 V, 50 Hz

Condensate collector KS

Used to buffer major amounts of condensate.

The 10 I condensate collector is used if automatic condensate removal is not possible or desired. It can be equipped with a float switch and the appropriate electronics.

- Highly corrosion-resistant
- Level alarm possible via floating probe

Material

Plastic PE

Dimensions

H x Ø: 460 x 200 mm

Table of Contents

10 litres

Weight

500 g

Cap

Screw cap Ø 7 cm

Connections

Condensate: Compression fitting Ø 4 x 1 mm Venting: Compression fitting Ø 4 x 1 mm

Please enquire for other versions and high temperature version.

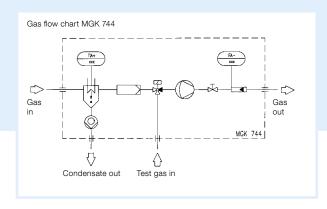
PG: 4	Part no.	Price €
Solenoid valve MV-2, 2/2-way	61810	
Solenoid valve MV-3, 3/2-way	61811	
Condensate collector KS	61798	
Condensate collector KS-A with liquid level sensor	61799	



Gas treatment system MGK 744



- Compact design ½ 19" rack housing
- Can be used as a portable or stationary gas treatment system



Application For gas analysis systems which withdraw a gas sample for the analysis process. Especially for longterm or continuous measurements and measurements involving pollution and/or condensate. Decisive for precise and reproducible measurement results.

Description

Compact, portable and stationary gas treatment system in $\frac{1}{2}$ 19" rack housing with permanently installed Peltier gas cooler which cools down the gas to be measured to a temperature of 5 °C, irrespective of the sampling temperature or the ambient temperature. With hose pump for automatic condensate removal, gas pump, extra fine particle filter and flow meter with needle valve. The gas treatment system is equipped with a status unit for detecting the operating state of the cooler as well as an additional master switch for the gas pump.

- Gas cooling: To 5 °C with Peltier gas cooler
- Gas filtration: Fine particulate filter
- Gas flow: Flow setting by means of rotameter and needle valve
- Gas transport: Gas pump
- Condensate transport: Condensate removal by means of hose pump

Technical specifications

Operating temperature range

Ambient: 5/40 °C Storage: -15/+55 °C

Gas outlet dew point:

5°C

Gas inlet conditions

Dew point: Max. 40 °C Gas temperature: Max. 80 °C at 50 l/h and 20 °C ambient temperature

Gas throughput and filtration

- 60 l/h at 200 mbar
- Fine particulate filter with glass fibre filter 2 µm

Indication

Gas cooler state via front LEDs

- Temperature ok
- Cooling active
- Problem

Gas inlet/gas outlet

Compression fitting Ø 4 x 1 mm

Wetted parts

Duran glass, PA, PC, Viton®

Supply voltage

AC 230 V/50 Hz, 60 VA

Housing

1/2 19" housing 3 U

W x H x D: 213 x 128 x 255 mm

Approx. 3.5 kg Weight:

Degree of protection: IP 20 (EN 60529)

PG: 4	Part no.	Price €
Gas treatment system MGK 744	69640	
Options		
Extra charge for 3/2 way solenoid distribution valve	69641	
Extra charge for desktop/ portable housing	69642	



NO_x converter C 100/C 200



- Converter to convert NO₂ to NO by means of catalyser cartridge
- Indirect nitrogen oxide measurement via NO analyser
- NOX measurement possible as total of NO and NO₂
- Catalyser temperature adjustable via temperature controller
- Available with and without bypass
- Converter cartridge with long service life

Application For determining the total of NO and NO₂ in combustion processes.

Description The NO_x converter C 100 converts the NO₂ contained in the measured gas into NO (catalytic principle). This way, the total nitrogen oxides (NO and NO₂) can be determined using NO-selective NDIR analysers. For this purpose, the gas passes a catalyser cartridge. Version C 200 features a bypass that can be used for e.g. test purposes.

specifications

Technical Operating temperature range

Medium: 350 °C (standard catalyser)

Ambient: 0/40°C Storage: -10/+50°C

Gas inlet conditions

Temperature: Max. 80 °C Pressure: Max. 2 bar

Gas throughput Gas flow: 60 NI/h

Conversion rate NO₂ to NO

Effectiveness >96 % with new catalyser

Gas inlet/gas outlet

1/4 NPT female thread

Supply voltage

AC 230 V, 50 Hz

Housing

19" rack housing 3 U

W x H x D: 440 x 135 x 260 mm Weight: Approx. 6.0 kg Degree of protection: IP 20

PG: 4	Part no.	Price €
NO _x converter C 100	61825	
NO _x converter C 200 with bypass	61826	



Gas purifier GR 120 E



- Generates constant, high-quality zero air.
- Principle of operation: catalytic oxidation
- Activated carbon filter as output filter for optimum zero air processing
- Easy catalyser replacement via the front panel

Application Gas purifiers supply devices and systems with synthetic air. They are used in stationary measuring systems or laboratories for the supply of gas chromatographs, and in analysis systems as test and operating air.

Description

From ambient air available via an oil-free compressor or from a central air supply system, the gas purifier GR 120 E generates zero air of a consistently high quality from which all hydrocarbons - including methane(CH4) - have been removed. The device operates on the basis of the principle of catalytic oxidation where all hydrocarbons and carbon monoxide are turned into water carbon dioxide.

The inlet filter element is a fine filter with a fineness of 0.3 µm. The outlet filter element is an activated carbon filter as outlet filter for optimum zero air processing.

specifications

Technical Operating temperature range

Ambient: 5/40 °C Storage: 0/50 °C

Gas inlet conditions

Compressed air: 0.2 / 8 bar, oil-free and dry

Dew point: < -10 °C

Output concentration

<0.1 ppm, measured as methane

Gas inlet/gas outlet

G1/8 female thread

Supply voltage

AC 230 V, 50 Hz

Housing

19" rack housing 3 U

W x H x D: 440 x 187 x 365 mm Weight: Approx. 11.0 kg Degree of protection: IP 20

PG: 4	Part no.	Price €
Gas purifier GR 120 E	61815	



Zero air generator NLG 100



- For flame ionisation detectors and infrared gas analysers
- Principle of operation: catalytic oxidation
- THC residual concentration < 100 ppb

Application Zero air generator for supply of flame ionisation detectors with zero air and as calibration gas for zero calibration of infrared gas analysers.

Description The NLG 100 zero air generators generate pure, hydrocarbon-free zero air from normal, dry compressed air. Catalytic oxidation at the Pt/Pd catalyser converts at approx. 400 °C all hydrocarbons including ca. (CH₄) – into carbon dioxide (CO₂) and water (H₂O). The generated air has a constant quality better than that of synthetic air from gas cylinders (with reference to organic compounds). With normal compressed air (3/8.5 bar, oil-free and dry, dew point < -10 °C), a THC residual concentration < 100 ppb is reached (measured as methane).

The zero air generator is shipped tested and ready for operation.

specifications Ambient:

Technical Operating temperature range

5/40 °C Storage: 0/50 °C

Gas inlet conditions

Compressed air: 3/8.5 bar, oil-free and dry

Dew point: < -10 °C

Output concentration

< 0.1 ppm, measured as methane

Gas inlet/gas outlet

G1/4 female thread

Supply voltage

AC 230 V, 50 Hz

Housing

Wall mounting housing

W x H x D: 400 x 200 x 130 mm

Weight: Approx. 3.0 kg Degree of protection: IP 20

PG: 4	Part no.	Price €
Zero air generator NLG 100	61830	



Gas pump WISA



- Reliable transport of the gas from the sampling point to the analyser
- Principle of operation: vibrating armature
- Adjustable pumping capacity

Application The gas pump transports the gas from the sampling point to the analyser.

Description The pump is a vibrating armature pump which transports the gas by means of a membrane and valves. The pumping capacity can be adjusted by means of a slide.

specifications 5.5 l/min

Technical Pumping capacity

Final vacuum

420 mbar abs.

Motor

Voltage: AC 230 V, 50 Hz Nominal power: 8 VA

Gas inlet/gas outlet

Hose connection piece 8 mm

Dimensions

W x H x D 194 x 100 x 102 mm

Weight

1.2 kg

Housing

Aluminium

PG: 4	Part no.	Price €
Gas pump WISA	61800	



Gas cooler MGK 741



- Virtually maintenance-free no moving parts
- Temperature monitoring
- Low dead volume for short analysis
- Resistant to shocks and vibrations
- Small dimensions and low weight



Application For dew point reduction of humid gases to help avoid condensation in the analyser. A stable gas outlet dew point avoids water vapour cross sensitivity and volumetric errors.

Description

Peltier gas cooler, low maintenance and self-monitoring. MGK 741 provides optimum cooling of the gas, reduces the wash-out effect to a minimum and separates the condensate. The condensate is automatically discharged by means of an integrated hose pump. The heat exchanger consists of Duran glass and is arranged in a heat-insulated cooling block. The heat is dissipated by means of a fan and cooling fins. LEDs are used to indicate the operating state. High and low temperature alarms are available as general alarms via a relay contact (voltage-free changeover contact). The compact and space-saving design enables easy integration in stationary gas treatment systems.

specifications

Technical Operating temperature range

Ambient: 5/40 °C -15/+55 °C Storage:

Heat exchanger

Single-stage Duran glass reverse unit

Gas inlet conditions

Dew point: Max. 40 °C

Gas temperature: Max. 120 °C at 50 l/h

Ambient temperature: 20 °C

Status alarm

Voltage-free changeover contact AC 120 V, 0.5 A DC 24 V, 1 A

Mounting

Wall mounting

Gas inlet/gas outlet

Compression fitting 4 x 1 mm

Wetted parts

Duran glass, PVDF, Viton®, stainless steel

Supply voltage

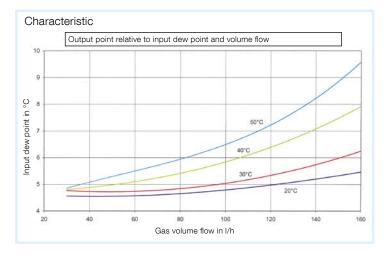
AC 230 V, 50 Hz

Housing

W x H x D: 230 x 230 x 95 mm

Weight: Approx. 3.5 kg

Degree of protection: IP 20 (EN 60529)



PG: 4 Part no. Price € Gas cooler MGK 741 with hose pump 69510

Blue part no. = in-stock items



Please enquire for other gas coolers such as compressor type gas coolers.

Infrared gas analysers



- Extremely small measuring ranges
- Selective measurement of up to four gas components
- Tested components for measurements as per German TA-Luft and 13./17. BlmSchV

- **Application** Room air monitoring (CO, CO₂, difluorodichloromethane)
 - Monitoring of activated carbon filters (CO, CO₂)
 - Monitoring of inertisation (CO₂, O₂)
 - Monitoring of biological processes (CO₂, O₂)
- Measurement of landfill gases (CH₄, CO₂)
- Monitoring of cold stores (O₂, difluorodichloromethane)
- Optimisation of boilers (CO, O₂)

Description This NDIR unit provides continuous operation and can selectively measure and display the concentrations of up to four different gas components. The NDIR (non-dispersive infrared absorption) measuring principle is based on the absorption of infrared radiation by heteronuclear molecule gases with several atoms. Optimum sensitivity and high selectivity with regard to other components in the measurement gas are achieved by means of opto-pneumatic radiation receivers. An optional electro-chemical sensor makes it possible to additionally measure the O_2 concentration. Measuring range for O_2 up to 25 % by volume. The conventional method with test gas can be used for calibration. If the optional calibration unit is used, test gas cylinders are not required.

Technical specifications

Operating temperature range

Ambient 5/40 °C

Supply voltage

AC 230 V

Gas throughput

20 / 100 l/h

Analogue output

4-20 mA

Interface

RS 232

Display

4-digit lit LCD

Setup time

15 s

Heat-up time

30 min

Gas inlet/gas outlet

Compression fitting Ø 4 x 1 mm

Housing

19" rack housing 4 U Weight: Approx. 10 kg

Approval

for measurement as per German TA-Luft and 13./17. BlmSchV for the following components:

- 0 to 250 mg CO
- 0 to 500 mg SO₂
- 0 to 400 mg NO
- 0 to 10/25 O₂ % by volume

We are continuously extending the product range of measured components and combinations. An AFRISO expert will be pleased to answer any questions you have concerning your applica-

PG: 4	Part no.	Price €
Infrared gas analyser CO	69966	
Infrared gas analyser CO₂	69967	
Infrared gas analyser NO	69968	
Infrared gas analyser SO₂	69969	
Infrared gas analyser CO, CO ₂	69971	
Infrared gas analyser CO, NO	69972	
Infrared gas analyser CO, SO₂	69973	
Infrared gas analyser NO, SO₂	69974	
Infrared gas analyser NO, CO ₂	69975	
Infrared gas analyser NO, CO, SO ₂	69976	
Extra charges (option)		
O ₂ measurement 0-25 % by volume	69977	
Wall mounting housing WAG IR-A	69970	On request
Pneumatic unit (pump and flow monitoring)	69983	
	Blue part n	o. = in-stock items

Oxygen measuring system Oxystem 250



- In situ measurement directly in the gas duct
- Compact design
- No gas treatment required



Application For monitoring combustion and production processes as well as storage facilities and storage containers which require the oxygen concentration to be measured and/or controlled.

Description Compact electronic oxygen measuring probe for stationary installation. Consisting of a 100 mm long zirconium dioxide measuring probe with an adjustable screw fitting and control electronics. Inline oxygen measurement without gas treatment. A reliable

> dynamic O₂ probe based on ZrO₂ is used to acquire the measured values. The probe is calibrated in atmospheric air. No reference gases are required. Due to the compact dimensions, the probe can be easily installed in the flue gas pipe. The probe provides fast and precise measurement results. Oxystem 250 is suitable for flue gas temperatures of up to 300 °C.

specifications 0/21 % O₂ by volume

Technical Measuring range

Measuring accuracy

±0.1 % O₂ by volume

Operating temperature range

Medium: Max. 300 °C Ambient: 0/50 °C

Sensor operating temperature

700 °C

Screw fitting

Ø 30 mm, L = 100 mm, G1, V2A

Display

2 line LCD

Display of O₂ value and lambda

Supply voltage

Power supply unit: AC 230 V/12 V, 10 VA

Heat-up time

5 minutes

Output

0-10 V on request 4-20 mA, can be switched over

Housing

Impact-resistant plastic (ABS) W x H x D: 250 x 185 x 125 mm Weight 2 kg

Degree of protection IP 40 (EN 60529)

PG: 4	Part no.	Price €
Oxygen measuring system Oxystem 250 with control unit, power supply unit, probe	61840	
Spare parts		
Oxygen probe GSO 250 K	61841	
Power supply unit NTE 12	61842	
Control unit AWE 250	61843	



Oxygen analyser Oxystem 600



- In situ measurement directly in the gas duct
- Short response time
- Relay output for connection of external equipment
- Easy operation



Application For monitoring and controlling combustion processes in power plants and other heating systems. Suitable for continuous operation, even under rough ambient conditions.

Description

The analyser consists of two components, the probe and the control unit. The probe is directly immersed into the gas to be measured (in situ). The probe tip should be approximately in the centre of the chimney. The control unit is equipped with a cable (5 m) with a connector which is plugged directly into the probe. The sensor of the gas probe is based on the principle of solid electrolytes (zirconium dioxide). The free oxygen ion movement begins at temperatures of more than 500 °C (solid electrolyte potentiometric method). The sensor is heated. The oxygen concentration is calculated from the cell voltage and the temperature according to Nernst's law. The display shows the current oxygen concentration in percent by volume (0/21 % O₂) and the temperature of the measuring cell. 3 relay outputs (2 x limit value, 1 x alarm) as well as 1 analogue output are available. The system can be set to automatic calibration.

specifications

Technical Measuring range

1-21 % by volume O₂

Operating temperature range

Medium: 150/680 °C Ambient: -15/+80 °C (probe) 5/50 °C (control unit) -15/+50 °C (power supply unit)

Reference gas throughput

0.5/10 l/h

Gas velocity

Max. 10 m/s

Supply voltage

AC 42 V (probe)

AC 110-230 V, 50-60 Hz V (control unit)

Power input

160 VA (probe) 20 VA (control unit)

Analogue output

0-20 mA or 4-20 mA

(selectable)

Switching outputs

Relay contacts: 3 voltage-free changeover contacts Contact rating: 0.5 A

Display

4 line LCD

Display of temperature, oxygen concentration % by volume. Measuring range can be selected as required between 21 % by volume and 1 % by volume O2 via the software.

Operation via keypad and menus.

Housing

W x H x D: 310 x 270 x 220 mm

Weight: 4.5 kg Dimensions probe

(Ø x L): 51 x (250/400/800/1,300/1,800) mm

Dimensions power supply unit W x H x D: 260 x 180 x 130 mm

Weight: 7.5 kg

Degree of protection

Control unit: IP 55 (EN 60529) Probe: IP 55 (EN 60529)

PG: 4	Part no.	Price €
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Oxygen probe GSO 600 F 250 mm	69447	
Oxygen probe GSO 600 F 400 mm	69448	
Oxygen probe GSO 600 F 800 mm	69449	
Oxygen probe GSO 600 F 1,300 mm	69450	
Oxygen probe GSO 600 F 1,800 mm	69451	
Control unit AWE 600	69453	
2 relays for limit values for Oxystem	69454	
Wall duct for Oxystem	69455	
Power supply unit NTE 12 HT at T > 45 °C for Oxystem 600	69457	



Oxygen analyser Oxystem 1800 High temperature version



- In situ measurement directly in the gas duct
- Short response time
- No gas treatment required
- Easy operation



Application For monitoring combustion processes and controlling the furnace atmosphere at high temperatures, e.g. in industrial furnaces used in the ceramics or aluminium industry. Measurement directly in the gas with short response times.

Description The sensor of the probe is based on the principle of solid electrolytes (zirconium dioxide). The free oxygen ion movement begins at temperatures of more than 500 °C (solid electrolyte potentiometric method). The probe is heated by the gas atmosphere, it does not have its own heating. The oxygen concentration is calculated from the cell voltage and the temperature according to Nernst's law. The analyser consists of two components, the probe and the control unit. The probe is mounted horizontally or suspended vertically (at temperatures of more than 1,200 °C). The control unit and the probe are connected by means of a two-wire shielded cable and a shielded temperature compensation line, type S (Pt/PtRh10). The maximum length is 20 m. The display shows the current oxygen concentration in % or ppm and the temperature of the measuring cell. The ranges automatically switch from % by volume to ppm and to e xx % O₂ by volume.

specifications Medium:

Technical Operating temperature range

700/1,450 °C Ambient: 5/45 °C (control units) -15/+70 °C (probe)

Reference gas throughput

Not required, in special cases 0.5 to 5 l/h

Supply voltage

AC 42 V (probe)

AC 110-230 V, 50-60 Hz (control unit)

Power input

160 VA (probe) 20 VA (control unit)

Analogue output

0-20 mA or 4-20 mA (selectable)

Switching outputs

Relay contacts: 3voltage-free changeover contacts

Contact rating: 0.5 A

Display

4 line LCD

Display of temperature, oxygen concentration % by volume. Measuring range can be selected as required between 21 % by volume and 0.1 ppm O₂ via the software.

Operation via keypad and menus.

Housing

310 x 225 x 200 mm $W \times H \times D$:

Weight: 2.5 kg

Dimensions probe

(Ø x L): 25 x 600 mm, other lengths on request

Degree of protection

Control unit: IP 55 (EN 60529) Probe: IP 55 (EN 60529)

PG: 4	Part no.	Price €
Oxygen probe GSO 1800 E 600 mm	69562	
Probe extension 400 mm for GSO 1800 E	69563	
Control unit AWE 1800	69564	
2 relays for limit values for Oxystem	69454	
Wall duct for Oxystem	69455	
Temperature compensation line for Oxystem 1800	69565	
Measuring line, 2 wires for Oxystem 1800	69566	



Oxygen trace analyser Oxystem S



- Oxygen analyser with largest range possible
- Completely self-monitoring
- Maintenance-free
- Fully automatic operation

Application Monitors inert gas atmospheres for absence of oxygen in order to avoid oxidation. Measurement of residual oxygen concentration in the production of noble gases and nitrogen.

Oxygen measurement without cooling (hot measurement); the system can directly process gas with temperatures of up to 350 °C.

Description The analyser is designed as a 19" rack housing 3 U, 84 HP. All components are integrated in a single housing. The electronic system is operated via keypad and display. The ranges % by volume, ppm and e xx % by volume O2 are fully automatically switched over on the display. The menu item "Error status" provides more detailed information on the self-monitoring functions. All status and alarm messages are indicated at the front plate (display with blinking exclamation marks) and output via a voltage-free contact. The sensor is based on the principle of solid electrolytes (zirconium dioxide). The free oxygen ion movement begins at temperatures of more than 500 °C (solid electrolyte potentiometric method). The sensor is heated. The oxygen concentration is calculated from the cell voltage and the temperature according to Nernst's law.

Technical specifications

Operating temperature range

Medium: 5/100 °C Ambient: 5/45 °C

Display

Four-line, alphanumerical LC display (temperature, oxygen concentration % by vol./ppm). Measuring range can be selected as required between 100 % by volume and 0.1 ppm O_2 via the software. Operation via keypad and menus.

Reference gas throughput

Gas throughput 5-10 l/h

Gas inlet/gas outlet

Swagelok pipe connector Ø 6 x 1 mm Compression fitting Ø 4 x 1 mm

Supply voltage

AC 230 V, 50-60 Hz

Power input

40 VA

Analogue output

0-20 mA or 4-20 mA (selectable)

Switching outputs

Relay contacts: 3 voltage-free changeover contacts

Contact rating: 0.5 A

Housing

19" rack housing, 3 U

W x H x D: 470 x 134 x 315 mm

Weight: 10 kg

Degree of protection

IP 10 (EN 60529)

PG: 4	Part no.	Price €
Oxygen trace analyser Oxystem S	69551	
Flow meter DFM OX-S with needle valve	69552	
Gas pump MGP OX-S, installed	69553	
2 relays for limit values for Oxystem	69454	
Screw connection 6 mm Swagelok	69554	



Oxygen analyser Oxystem P paramagnetic



- Proven measuring principle for maximum reliability
- Highly resistant to corrosive gases
- Self-monitoring
- Low maintenance

Application For continuous determination of the oxygen concentration in gas mixtures or process gases, e.g. in corrosive process gases in the chemical industry.

Description The analyser consists of a thermostat-controlled sensor and a control unit in a 19" rack housing, 4 U. The sensor uses the paramagnetism of oxygen and operates on the basis of the thermomagnetic principle. Oxystem is to be operated in conjunction with a gas treatment system. After a heat-up time of 3 hours and horizontal alignment, the analyser is ready for measurements. The analyser is equipped with two contacts for limit values and one contact for system alarms.

Technical specifications

Measuring range

Standard: 0/100 % O₂ by volume 0/21 % O₂ by volume,

selectable via the software

Measuring accuracy

± 1.5 % of full scale value

Display

4 line LCD

Display of oxygen concentration % by volume

Operating temperature range

Medium: 5/40 °C 5/45 °C Ambient:

Supply voltage

AC 230 V 50/60 Hz; 100 VA

Ready for measurement

Heat-up time: 3 hours

Gas throughput

30/60 l/h

Gas inlet/gas outlet

Swagelok pipe connector Ø 6 x 1 mm Compression fitting Ø 4 x 1 mm

Analogue output

0-20 mA or 4-20 mA (selectable)

Limit values

2 limit values selectable 1 contact for alarms

Housing

19" rack housing, 4 U

178 x 470 x 315 mm $W \times H \times D$:

Weight: 18 kg

Degree of protection

IP 20 (EN 60529)

PG: 4	Part no.	Price €
Oxygen analyser Oxystem P	69545	
Options		
Corrosion-resistant version VA/Viton®	69541	
Gas pump MGP OX-P, installed	69542	
Measuring range < 5 % O₂ by volume	69543	
Wall mounting housing WAG OX-P	69544	



Gas analysis system BIOLYZER for discontinuous measurement



- For discontinuous measurement
- Ideal for biogas plants
- Monitors up to four gas components
- Compact wall mounting housing system ready for installation

Application For discontinuous analysis and regular process monitoring of biogenous process gases such as biogas, sewage gas and landfill gas. All important gas types such as methane, hydrogen sulphide, oxygen and carbon dioxide can be monitored.

Description Gas measuring system for discontinuous, selective measurement and indication of up to four different gas components (CH₄, H₂S, O₂ and CO₂). CH₄ and CO₂ are detected by means of infrared technology, O2 and H2S by means of electrochemical sensors. All components are integrated in a robust wall mounting housing. BIOLYZER features LED displays, status indicators for each measurement channel as well as a lit LC display. The memory has a history function, the values can be displayed. With freely adjustable alarm thresholds and binary outputs for: active, error, calibration, alarm. The gas treatment system with all important components (gas cooler with hose pump, fine filter, aerosol filter, rotameter with needle valve, anti-detonation device) is integrated in a robust, air-flushed wall mounting housing. BIOLYZER is delivered complete with wiring, hoses, calibration and ready to be mounted.

> BIOLYZER LT is suitable for simple routine checks. Version without gas cooler and load limitation for hydrogen sulphide measurements. Therefore, the standard measuring range is 0 to 1,000 ppm H₂S.

specifications

Technical Gas types/measuring ranges

CH₄ 0/100 % by vol., IR double beam CO₂ 0/100 % by vol., IR double beam 0/25 % by vol., electrochemical H_2S 0/5,000 ppm, electrochemical Measuring intervals can be programmed for the individual gases. Manual measurement is possible at all times.

Indication

4-digit LED: Status indicators for each channel 4 line LCD: Data memory can be read via

RS 232

Communication

RS 232, analogue output for each gas type, output 4-20 mA, linearised, data memory

Operating temperature range

Ambient: 10/40 °C

Supply voltage

230 V / 50 Hz

Optional: 115 V / 60 Hz Power input: Max. 85 VA

Dimensions

 $W \times H \times D$: Approx. 300 x 400 x 185 mm

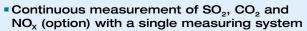
Degree of protection

IP 54 (EN 60529)

PG: 4	Part no.	Price €
Gas analyser BIOLYZER for CH ₄ , H ₂ S, O ₂ , CO ₂	69643	
Gas analyser BIOLYZER for CH ₄ , H ₂ S, O ₂	69644	
Gas analyser BIOLYZER for CH ₄ , H ₂ S	69645	
Gas analyser BIOLYZER LT for CH ₄ , H ₂ S, O ₂ , CO ₂	69646	
Gas analyser BIOLYZER LT for CH ₄ , H ₂ S, O ₂	69647	
Gas analyser BIOLYZER LT for CH ₄ , H ₂ S	69648	
Options (extra charges)		
Profibus DP for BIOLYZER	69637	
Sampling point selector MSU	69636	
Continuous measure- ment BIOLYZER	61850	
Blu	e part no.	= in-stock items



Measuring system MEA 3000 / 3300 for exhaust gas cleaning systems (scrubbers)



- Proven NDIR technology for reliable and accurate measurements
- Low-maintenance due to internal calibration and innovative filter technology
- Worldwide service
- Confirmation of Compliance as per MEPC.184(59)



The complete system for continuous maritime emission measurement as per MARPOL regulations

Application On January 1, 2015, new limit values for SO2 and NOX went into effect to reduce air pollution caused by ships. The International Maritime Organization (IMO) has specified these new limit values in MARPOL Annex VI. If a vessel uses an exhaust gas cleaning system - a so-called scrubber - for compliance with the limit values, this system must be continuously monitored by means of an emission measurement system.

> MEA 3000 / 3300 measures the SO_2 and CO_2 limit values upstream or downstream of the scrubber and transfers them to the vessel's main control system. Compliance or non-compliance with the specified limit values can be proven and documented this way. The measured ratio of SO2 and CO2 can be used to control the scrubber. Optionally, the measuring system can also measure and document the NO_x values and other components.

Description The MEA 3000 / 3300 measuring system for continuous emission monitoring (CEMS) from AFRISO is based on proven NDIR measurement technology. This measurement technology allows for reliable measuring and monitoring of the limit values for SO₂, CO₂ and NO_x (optional) specified by the IMO. The accurate complete system allows for simultaneous monitoring of multiple measuring points and different measured values. The system's space-saving and robust design make it easy to install or retrofit on site. Due to the innovative filter technology, a practical calibration system and a self-cleaning probe, the system requires very little maintenance.

specifications

Technical Measuring range

Exhaust gas temperature: 0/500 °C SO₂: 0/250 to 0/500 ppm CO₂: 0/20 % by volume Enquire for other gases

Measuring principle

NDIR measuring technology (non-dispersive infrared) Extractive measurement (cold/dry)

Operating temperature range

Operation: 5/35 °C, with fan

5/45 °C, with air conditioning system

2/60 °C Storage:

Supply voltage

AC 100-240 V (+/- 15 %) 50-60 Hz (+/- 3 HZ)

Power input

Approx. 1,200 VA without heated line Additionally 100 W/m for the heated line

Analogue output

2 x 4-20 mA

Switching outputs

4 voltage-free contacts for status signals

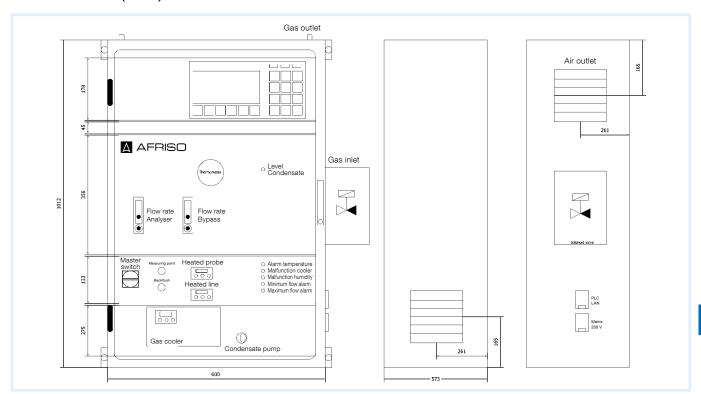
Robust, metal analyser control cabinet W x D x H: Approx. 750 x 640 x 1,100 mm Weight: Approx. 110 kg

Degree of protection: IP 54 (EN 60529)



Measuring system MEA 3000 / 3300 for exhaust gas cleaning systems (scrubbers)

Dimensions (mm)





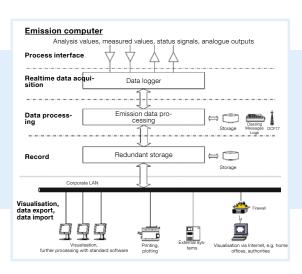




	Part no.	Price €
Measuring system MEA 3000, CO ₂ and SO ₂ measurement downstream of scrubber	61090	On request
Measuring system MEA 3300, CO ₂ measurement upstream and SO ₂ measurement downstream of scrubber/CO ₂ measurement and SO ₂ measurement downstream of scrubber for 2 lines	61091	On request
Air conditioning system, 500 W	50000	On request
Gas sampling probe AFE 3000, with 2 2/2-way valves for automatic backflushing	61093	On request



Emission computer



- Process data acquisition system with data logger for emission measurement
- Real-time data processing (cycles of one second)
- Redundant storage of data for compliance with official requirements
- Design, installation, commissioning and service from a single supplier

Application

Continuous monitoring, acquisition and visualisation of emission values according to the pertinent legislation and standards such as the German TA Luft, 13th / 17th / 27th / 30th German Federal Immission Act, harmonised practice concerning emission computers (German Department of the Environment BMU August 2, 2004) and EN 14181.

Description

Modular process data acquisition system. All data (e.g. scaling) is acquired, calculated and visualised in cycles of one second. This is considerably faster than the legal minimum requirement of 5 seconds. There are practically no restrictions in terms of the number of channels for analogue and digital acquisition. The software is Java-based so that it can run on different hardware platforms and under various operating systems. Due to the redundant storage of data, it is not necessary to run an additional recorder and to automatically generate hard copies (e.g. classification logs or messages), as stipulated by the authorities.

The data logger records data in real time. It processes analogue and digital input signals as well as analogue and digital output signals. The measuring accuracy can be set to either 12 or 16 bits. The number of measurement channels is practically unlimited. If a single data logger is not sufficient for the task at hand, additional data loggers can be cascaded as required.



The emission computer performs the following main tasks:

- Storage of values recorded in single-second cycles
- Calculation of derived values in single-second cycles
- Computation and storage of scaled values and classification data
- Generation of messages
- Generation of digital and analogue output data
- Clock synchronisation according to DCF77 or GPS

The data is processed on a separate computer. The values measured by the data logger are stored every second. These values are scaled to obtain integral values which, in turn, serve as the basis for classifications according to the various legal requirements.





Application examples: gas analysis systems and components for gas treatment

















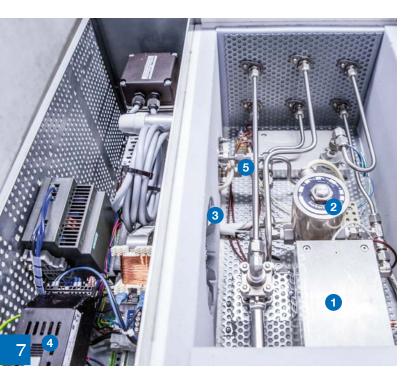








Application examples: Heated zone







Typical components in a heated zone:

- Heated filter
- 4 Temperature controller
- 2 Solenoid valve, heated
- 5 Gas pump, heated
- 3 Fan

Heated gas treatment system

Application: Heated gas treatment systems are used in higher and constant operating temperatures are required (e.g. to keep the temperature from falling below the dew point). Heated gas treatment systems are available as 19" rack housing systems, portable systems and wall mounting systems. Various components such as filters, solenoid valves, flow monitoring units, pumps, etc. can be installed to meet specific application requirements.

Application examples: Sampling point switching

Sampling point selectors are used in gas analysis systems to measure the gas from different sampling points with a single analyser. Depending on the specific application requirements, different numbers of sampling points can be measured via a single unit. They are available as heated and unheated versions.

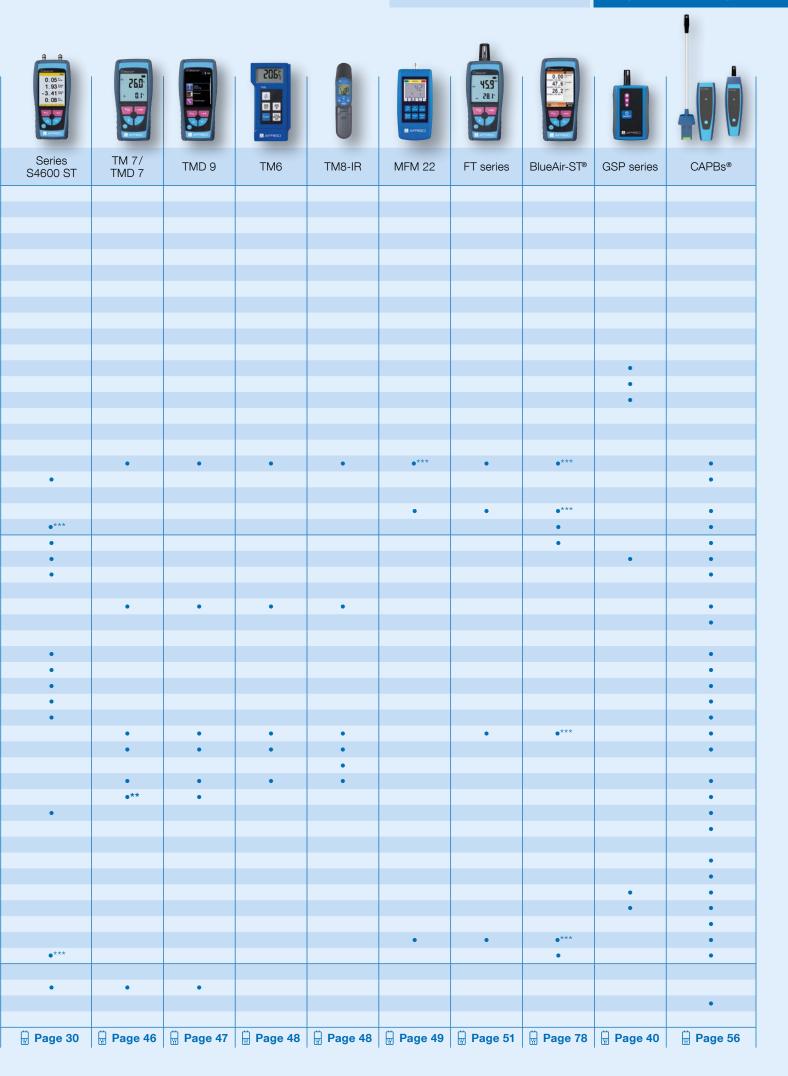






The BlueLine measuring instrument series at a glance

This and many other products can be found in the catalogue PORTABLE MEASURING INSTRUMENTS		0	0.		- 13 Y. Un t
	BLUELYZER ST	EUROLYZER STx	MULTILYZER STe	Dust measuring instrument STM 225	Series S2600
O_2	•	•	•	51 <u>-</u>	
CO (up to 4,000 ppm)			•		
CO (up to 6,000 ppm)	•				
CO (up to 10,000 ppm)		•			
CO ₂ (calculated)	•	•	•		
NO		•***	•***		
NO_2	(0		•***		
NO _x	<u>ne</u>	•***	•***		
CO (20,000 ppm)	a va		•***		
SO_2	nred		•***		
Particulate matter	Parameters/measured values			•	
Methane	m/s				
Propane (liquefied gas)	ter				
Butane	ame				
Lambda	Para	•	•		
Eta efficiency / eta coefficient	•	•	•		
Flue gas loss qA	•	•	•		
Temperature	•	•	•		
Pressure	•	•	•		•
Dew point	•	•	•		
Humidity in %					
Volume flow		•***	•***		
Measurements of filters, ventilation systems, ducts					•
Measurements of production facilities, tanks, gas pipes					•
Burner adjustment/servicing (gas, oil, solid fuel systems)	•	•	•	•	•
CO ambient measurement	•	•	•		
Servicing of water heaters	•	•	•		
Servicing of CHP systems		•	•		
Flue gas measurement	•	•	•		
Pressure measurement	•	•	•		•
Measurement of inlet pressure, flow pressure, static pressure, nozzle pressure		•	•		•
Pressure / vacuum measurement	•	•	•		•
Differential pressure measurement	Typical applications areas	•	•		•
Vacuum measurement	s ar				•
Temperature measurement (flue gas, air, external wall)		•	•		
Temperature measurement (water)	ical				
Temperature measurement (moving objects)	dd				
Surface temperature measurement	<u> </u>	•	•		
Differential temperature measurement	ojd •	•	•		
Draft / chimney draft measurement	•	•	•		•
Ventilation loss measurement					
Flue gas loss measurement	•	•	•		
Heating system check					
4 Pa test					
Gas leak detection					
Gas concentration measurement					
Flow rate measurement (water)					
Moisture measurement (material / moisture / climatic conditions in rooms / mould)					
Air velocity		•***	•***		
RImSohV	10	•	•		
EN 50379-2	val	•	•		•
EN 15378	Approvals				
KÜO	Ă	•			





35750 AFRISO





CHAPTER 8

Signalling devices/display units/signal processing, monitoring and communication systems

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Signal isolation/signal amplification







TV 22 GL

Description The TV 22 GL isolation amplifier is used for galvanic isolation and amplification of DC current signals (mA). Input and output are galvanically isolated with a high degree of isolation. The integrated high-efficiency electronic power supply unit helps to avoid overheating and allows for high output loads.

> The extremely narrow design results in a high packing factor.

TV 200 GS

The TV 200 GS isolation amplifier is used for galvanic isolation, conversion and amplification of standard output signals (V/mA). Input and output are galvanically isolated with a high degree of isolation. The integrated high-efficiency electronic power supply unit helps to avoid overheating and allows for high output loads. Offset and gain can be set by means of two potentiometers on the front.

STV 22 GL

The STV 22 GL supply isolation amplifier is used for galvanic isolation and amplification of DC current signals (mA). The connected transducer is directly supplied by means of a galvanically isolated and limited supply voltage. Input and output are galvanically isolated with a high degree of isolation. The integrated high-efficiency electronic power supply unit helps to avoid overheating and allows for high output loads.

Technical specifications

Housing

DIN rail housing W x H x D 18 x 78 x 103 mm

Supply voltage

AC/DC 20-253 V

0-20 mA or 4-20 mA

Output

0-20 mA or 4-20 mA 1:1 to input signal

Output load

Max. 400 Ohm

Housing

DIN rail housing W x H x D 23 x 78 x 103 mm

Supply voltage

AC/DC 20-253 V

Part no. 53704: 4-20 mA Part no. 53705: 0-10 V

Output

Part no. 53704: 0-10 V Part no. 53705: 4-20 mA

Output load

Max. 500 Ohm current output Min. 1 kOhm voltage output

Housing

DIN rail housing W x H x D: 18 x 78 x 103 mm

Supply voltage

DC 20-253 V AC 50-253 V

Sensor supply

DC 24 V open circuit voltage DC 17 V at 20 mA

0-20 mA or 4-20 mA

Output

0-20 mA or 4-20 mA 1:1 to input signal

Output load

Max. 400 Ohm

DG: H, PG: 4	Part no.	Price €
Isolation amplifier TV 22 GL	53701	
Isolation amplifier TW 41 GM (isolator without power supply)	53702	
Isolation amplifier TWH 41 GM (HART-enabled)	53703	
Isolation amplifier TV 200 GS* (input 4–20 mA/output 0–10 V)	53704	
Isolation amplifier TV 200 GS* (input 0–10 V/output 4–20 mA)	53705	
Supply isolation amplifier STV 22 GL	53706	

^{*} Other signals on request.



Trip amplifiers, Zener barriers





MK 330 GS

Description The MK 330 GS trip amplifier compares the measurement signal at the input with the values set by means of the coding switches (0-99 %). If the measurement signal exceeds or falls below the set value, the corresponding output relay responds according to the selected function (relay energises or de-energises). The SMK 330 GS trip amplifier with supply also supplies the connected transducer.

Technical Housing specifications

DIN rail housing W x H x D 23 x 78 x 103 mm

Supply voltage

DC 20-253 V AC 50-253 V

Inlet

0-10 V or (0)4-20 mA

Input resistance

50 Ohm/U 400 kOhm

2 relay changeover contacts 250 V, 2 A, 100 VA Function 2 max, 2 min or 1 max/min

Z 787

Isolation/amplification

The Zener barrier limits the amount of energy transferred from the non-hazardous area to the hazardous area. It is used for evaluation of up to 2 signals from the hazardous area. No separate supply voltage required.

Housing

DIN rail housing W x H x D: 12.5 x 115 x 110 mm

Supply voltage

Max. 28 V DC

Fuse rating

50 mA

Connection

2-channel DC version Positive polarity

Current circuits (max. data)

28 V Uo 93 mA I_0 650 mW P_0

Nominal resistance

300 Ohm

Operating temperature range

-20/+60 °C

EC Type Examination Certificate

BAS 01 ATEX 7005 Ex II (1) GD [Ex ia] II C [Ex ia Da] III C

DG: H, PG: 4	Part no.	Price €
Trip amplifier MK 330 GS	53708	
Trip amplifier with power supply SMK 330 GS	53709	
Zener barrier Z 787	31296	

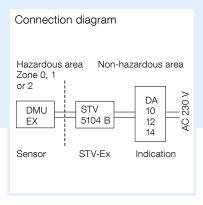


EX supply isolation amplifier STV 5104 B





- Single- or dual-channel version
- 2-wire supply
- > 18 V at 20 mA
- 20 programmable measuring ranges
- Universal AC or DC supply



Description STV 5104 B is used to supply, galvanically isolate and amplify 2-wire and 3-wire transducers in hazardous areas. Input and output are galvanically isolated with a high degree of isolation.

Technical Housing specifications

DIN rail housing

W x H x D 23.5 x 109 x 130 mm

Degree of protection

IP 20 (EN 60529)

Supply voltage

AC 21.6-253 V DC 19.2-300 V

Power input

≤ 3 W

Sensor supply

DC 18-28 V

(> 18 V at 20 mA)

Inlet

0(4)-20 mA

0-10 V

Output

0(4)-20 mA (galv. isolated)

0-10 V

1:1 with ref to input value

Accuracy

≤ 0.1 % FS

Temperature coefficient

≤ 0.01 % FS/°C

Response time

< 25 ms

Operating temperature range

Ambient: -20/+60 °C

Calibration temperature

20-28 °C

EX data

 $\leq 250 \text{ V}$ U_{m} Uo 28 V DC 93 mA DC I_0 P_0 $\leq 0.65 \text{ W}$ ≤ 3 mH C_0 $\leq 0.08 \, \mu F$

EX approvals

DEMKO 99 ATEX 126013 applied to zone 0, 1 or 2 or 20, 21 or 22

Compliance

EMC: 2014/30/EU

Low Voltage

Directive: 2014/35/EU ATEX: 2014/34/EU PELV/SELV: IEC 364-4-41 and EN 60 742

UL 913, UL 508 DNV Marine: Vers. f. Certific. No. 2.4

DG: H, PG: 4	Part no.	Price €
EX supply isolation amplifier STV 5104 B, 1 channel	53720	
EX supply isolation amplifier STV 5104 B, 2 channels	53721	

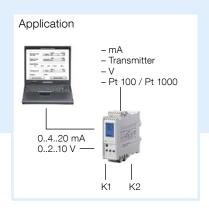


Isolation/amplification

Multifunctional transducer MFU 12/14



- Universal input (current, voltage, resistance)
- Integrated supply voltage for 2/3-wire transmitter
- 2 analogue outputs
- 2 or 4 additional contact outputs
- Programming interface
- Universal power supply unit



Description The digital multi-purpose transducers are freely programmable digital transducers with two analogue outputs and up to 4 relays. Current up to 20 mA (also bipolar), voltage up to 10 V (also bipolar) or a three-wire technology potentiometer are possible input signals. In addition, a supply for 2-wire or 3-wire transmitters is integrated. The inputs are galvanically isolated from the voltage and the outputs. The two analogue outputs can be used simultaneously.

Technical Display specifications

Multi-line LCD, 42 x 64 pixels, multi-colour backlight, backlight can be switched off

Range

0 to 9999 digits (start and end value freely configurable), free scaling unit, 3 languages (English, French, German)

Accuracy

± 0.2 % of maximum value

Resolution

Inputs 13 bits, outputs 10 bits

Inputs

Current:

Max. -20.4/+20.4 mA, adjustable as required Voltage:

Max. -10.2/+10.2 V, adjustable as required Potentiometer:

0.1/100 kOhm, adjustable as required Transmitter supply 19.5 ... 24.5 V DC

Analogue output 1 (current)

Max. 0/4-20.4 mA; adjustable as required Galvanically isolated from input

Analogue output 2 (voltage)

Max. 0/2-10.2 V; adjustable as required Galvanically isolated from input

Switching outputs

Up to 4 voltage-free changeover contacts Configurable as required, max. AC 250 V Selectable functions energising/de-energising, hysteresis, window or trend function selectable delays for energising/de-energising

Linearisation

Via 24 free x/y on characteristic curve Characteristic curve mode table, cylinder, sphere

Additional functions

- Alarm message in the case of missing or defective sensor
- Zoom function, spreading, inverted mode, trend indication, teach functions
- Automatic or manual simulation mode
- Locking of parameters / editing lock
- Programming interface

Supply voltage

DC 20-253 V AC 50-253 V

Housing

DIN rail housing W x H x D: 33 x 110 x 128 mm Screw terminals can be pulled off

Accessories (options)

■ Programming software MFU 03-S (Win XP, Vista, 7) with interface cable and USB adapter

■ Device with identical functions, but for temperature inputs (Pt 100, Pt 1000, Ni 1000 and thermocouples)

DG: H, PG: 4	Part no.	Price €
Transducer MFU 12, 2 voltage-free changeover contacts	53722	
Transducer MFU 14, 4 voltage-free changeover contacts	53723	
Software MFU 03-S, with interface cable and USB adapter	53724	



Digital plug-in display DA 06



- Easy and fast mounting via plug-in system
- Indication scalable as required
- Housing and display can be rotated at any angle
- Open collector switching output / PNP







Application Cost-effective digital display unit with local indication for all transducers with 4–20 mA output and ISO 4400 (DIN 43650-A) connector. Easy and fast mounting via plug-in system. Optional EX protection (zones 0/1) and connector M 12 x 1, 5-pin.

Description DA 06 is mounted between the plug and the junction box and is immediately ready for operation. As the unit is supplied via the 4-20 mA loop, it does not require a separate power supply. The unit is programmed by means of two keys at the front. The following parameters can be set: scaling, decimal point, dampening, switching point and delay. In addition, the unit features a memory for min. and max. values.

> The settings are not lost in case of a power outage. Out of range values can be displayed as messages (both ends of the range). The integrated diagnostics system continuously monitors all functions of the display. The housing can be turned by 300°, the display by 330°.

Technical specifications

9,999 digit (start and end values scalable as required)

Display

4-digit, 7 mm high, red LED display Display housing can be turned by 330°

Accuracy

0.1 % ±1 digit

Adjustable parameters

Scaling, decimal point, dampening, switching point, delay

Min./max. value memory

The highest and lowest values reached during operation can be displayed.

Housing

Plastic PA 6.6/polycarbonate W x H x D: 47 x 47 x 68 mm Housing can be turned by 300°

Options • EX protection II 2G Ex ia IIC T4 Gb (Ex)



- Electrical connection M 12 x 1, 5-pin
- 3-wire 0-10 V

Degree of protection

IP 65 (EN 60529)

Operating temperature range

Ambient/

Electronics: -25/+85 °C -40/+85 °C Storage: For EX version:-25/+70 °C

Electrical connection

Adapter for connector as per ISO 4400 (DIN 43650-A)

Input signal/output signal

4-20 mA, 2-wire

Switching output

1 open collector (PNP), max. 125 mA (with EX protection max. 70 mA, 4.7 mH) On/off delay: 0 to 100 s

CE conformity (EMC)

EMC Directive 2014/30/EU

DG: H, PG: 4	Part no.	Price €
DA 06	31278	
DA 06-Ex	31279	
DA 06 – M 12 x 1	33223	
DA 06-Ex - M 12 x 1	33222	



Digital

display unit

Signalling

DMU 07

Digital display units DA 10/12/14



- Grey display with excellent readability
- Text-based user interface
- Linearisation for volume indication (24 points)
- Scalable units, displayed as bar chart
- Integrated supply voltage for transducer







Application Universal application for displaying measured values (DA 10), optionally with additional relay outputs (DA 12/14) for electronic transducers.



Digital display unit in plastic housing for control panel mounting. With grey display and automatic off function for the backlight. The universal measurement input can be configured as a current input or a voltage input. Standard bearing charts for cylindrical horizontal tanks and spherical tanks are pre-programmed, additional units can be selected or set up. The units are scalable and shown as bar charts. Limit values can be displayed via a window and a trend function (rising/falling). With display message (flashing error text) if values are exceeded, parameter backup for restoring previous configurations and potentiometer for test purposes.

Technical Display specifications

5-digit graphical LC display, backlit (white), textbased user interface, user interface language selectable (German/English/French/Italian), selectable units, custom units can be defined

Measuring range

± 99,999 digits (start and end values scalable as required)

Linearity

± 0.1 % of measuring range

Decimal point position can be set as required

Response time

< 0.2 s

Operating temperature range

Ambient: 0/50 °C

Supply voltage

AC 50-253 V /DC 20-253 V 2.5 W / AC 4.4 V

Sensor supply

Integrated, galvanically isolated supply voltage for transducer: DC 21 V/20 mA

Sensor input

All analogue standard signals, e.g. 4-20 mA, 0-20 mA, 0-1 V, 0-10 V as well as potentiometer

Analogue output

0/4-20 mA, galvanically isolated

Housing

Standard rack mounting housing W x H x D: 96 x 48 x 135 mm

Panel cut out

W x H: 92 x 45 mm

Degree of protection (front)

IP 65 (EN 60529)

Electrical connection

Plug-in screw terminals (1.5 mm²)

Linearisation

Customer-specific linearisation with a max. of 24 points for the indication of volume (e.g. litres) in non-linear tanks. Bearing charts for cylindrical horizontal tanks and spherical tanks are pre-programmed.

Min./max. value memory

The highest and lowest values reached during operation can be displayed.

Additional functions DA 12 / 14

Analogue output 2

0-10 V, galvanically isolated

Switching outputs

Relay contacts: 2 x (DA 12) / 4 x (DA 14) voltage-free changeover contacts (adjustable switching hysteresis) Contact rating: AC 250 V, 2A, 100 VA

DG: H, PG: 4	Part no.	Price €
DA 10	31281	
DA 12	31282	
DA 14	31283	
Accessories (PG: 3)		
Wall mounting housing WAG 01 for one DA*	31287	
WAG 02 for two DA*	31288	
WAG 03 for three DA*	31289	
WAG 04 for four DA*	31290	

^{*} Price includes mounting if DA and WAG are ordered together.



Data logger with display **DL 10**



- Transmitter supply for 4 independent channels
- Freely adjustable scaling and maximum pointer function
- Linearisation via 24 x/y points
- Freely adjustable storing cycles
- Adjustable trigger thresholds for starting the storing function
- Wide range power supply





Application Universal application for displaying and saving up to 4 independent analogue input signals with freely selectable scaling and units; with comprehensive data logger function to memory card and integrated supply for 2-wire and 3-wire transmitters.

Description Digital display unit with integrated data logger in plastic housing for control panel mounting. DL 10 is used for visualising four independently parameterisable analogue signals; it features a data logger function for all channels and provides an integrated supply for 2-wire and 3-wire transmitters. Each channel has a current/voltage input and can be scaled as required. There are several types of indication. For example, the measured value can be displayed as a virtual analogue bar. The measured values can be acquired per channel in adjustable storing cycles and saved to an SD memory card. In addition, it is possible to adjust trigger thresholds to start the storing function (one channel can also trigger another channel). An integrated, electronic wide range power supply unit allows for operation in a supply range from DC 20-253 V or AC 50-253 V.

Technical Display

specifications 5-digit graphical LC display, backlit (white), text-based user interface, user interface language selectable (German/English/French), units selectable from list, custom units can be defined

Measuring range

± 99,999 digits (start and end values scalable as required)

Linearity

± 0.2 % of measuring range

Resolution

10 bits

Response time

< 0.2 s; additional damping can be activated

Operating temperature range

Ambient: 0/50 °C

Supply voltage

AC 50-253 V / DC 20-253 V Approx. 7 VA / 5 W

Input resistance

Current: Approx. 120 Ohm Voltage: Approx. 100 kOhm

Sensor supply

Approx. DC 20 V idle and approx. DC 17 V at 20 mA Limited to 25 mA/channel

Sensor input

0-20 mA, 4-20 mA, 0-10 V Analogue:

Digital counter: Max. 30 V, max. 2 Hz

17-20 V Sensor supply:

Housing

Standard rack mounting housing W x H x D: 96 x 48 x 135 mm

Panel cut out

W x H: 92 x 45 mm

Degree of protection

Front and terminal area IP 20 (EN 60529)

Electrical connection

Plug-in screw terminals (1.5 mm2)

Linearisation

Customer-specific linearisation with a max. of 24 points for the indication of volume (e.g. litres) in non-linear tanks for each channel. Bearing charts for cylindrical horizontal tanks and spherical tanks are pre-programmed.

Interfaces

AD-UART

Data memory

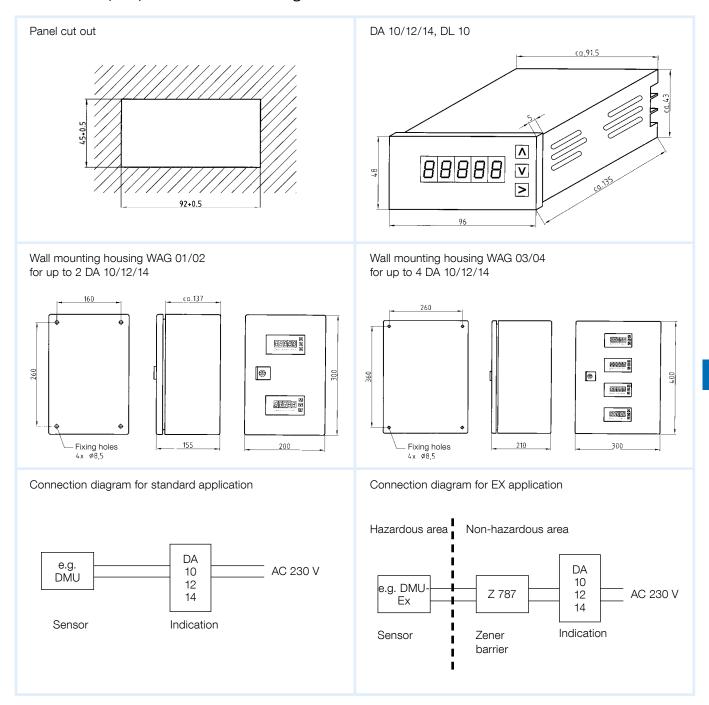
SD-/MM card (max. 2 GB), formatting: FAT, FAT 16 fastest saving cycle 1 second.

DG: H, PG: 4	Part no.	Price €
Data logger with display DL 10-4 SV, 4 channels	31256	
SD memory card 1 GB, industrial version	31257	



Digital display units DA 10/12/14 Data logger with display DL 10

Dimensions (mm) and connection diagrams





Signalling devices





Warning light with rotating reflector

Application For humid rooms and for outdoor installation.

Yellow warning light with rotating reflector. Robust **Description** design with Al base. Maintenance-free, suitable

for continuous use.

specifications AC 230 V

Technical Supply voltage

Degree of protection IP 54 (EN 60529)

Weight 1.8 kg

Mounting position

Vertical

Horn KH 1

Horn with continuous tone for use in dry rooms.

Sound pressure

90 dB (A), distance 1 m

Supply voltage

AC 230 V

Degree of protection

IP 43 (EN 60529)

Weight

0.18 kg

Mounting position

Funnel down

DG: G, PG: 4			Part no.	Price €
Warning light with rotating reflector	1	-	61015	
Horn KH 1	1	-	61011	



Signalling devices



Combined warning light and horn

Description Combination warning light and horn, can be controlled separately.

specifications 90 dB (A), distance 1 m

Technical Sound pressure

Supply voltage AC 230 V

Power input

10 VA

Degree of protection

IP 43 (EN 60529)

Weight

0.19 kg

Horn HPW 2

Horn with continuous tone for use in humid rooms and for outdoor installation.

Sound pressure

108 dB (A), distance 1 m

Supply voltage

AC 230 V

Power input

22 VA

Degree of protection

IP 55 (EN 60529)

Weight

1 kg

DG: G, PG: 4		II -	Part no.	Price €
Combined warning light and horn	1	-	61020	
Horn HPW 2	1	-	61012	

Blue part no. = in-stock items

405



Additional alarm unit ZAG 01



- Audible and visual alarms for maximum safety
- Can be connected to all WATCHDOG-LINE alarm units
- With 2 voltage-free changeover contacts (at output side)
- Ready-to-connect device for easy installation and commissioning



Application For indication and transfer of alarm signals from WATCHDOG-LINE alarm units, AFRISO leak detectors or any other switching equipment. Suitable for triggering additional visual and audible alarms in buildings, e.g. in the case of underground tank facilities or in rooms which are far away from the dangerous location. Can be connected directly to the output of the alarm unit.

Description The additional alarm unit in a wall mounting housing signals alarm conditions in conjunction with an alarm unit or a leak detector. ZAG 01 is connected to the voltage-free contact of the alarm unit. A 230 V alarm input is also available. The audible alarm can be muted with the acknowledge button. The visual alarm is cleared once the leak has been fixed or the cause of the event removed. The test button allows you to perform a function check.

> The voltage-free relay contacts allow for a connection of additional external signalling equipment (such as horns), event reporting systems EMS, building control systems or similar equipment. ZAG 01 is suitable for panel mounting with a mounting frame. A sealing kit (IP 54) is available for rough application conditions.

Technical specifications

Operating temperature range

Ambient/storage: -10/+60 °C

Supply voltage

AC 230 V

Nominal power

3 VA

Alarm input

Input 1: DC 12 V Input 2: AC 230 V

Switching outputs

Relay contact 1:

voltage-free changeover contact, can be acknowledged

Relay contact 2:

voltage-free changeover contact, cannot be

acknowledged

Contact rating: AC 250 V, 2 A

Alarm sound

Min. 70 dB (A)

Housing

Wall mounting housing made of impact-resistant plastic (ABS) W x H x D 100 x 188 x 65 mm

Degree of protection

IP 40 (EN 60529)

See the catalogue DOMESTIC TECHNOLOGY for additional WATCHDOG-LINE alarm units for the detection of level, liquids, leaks or gases.

DG: H	PG	DG	Part no.	Price €
Additional alarm unit ZAG 01	4	Н	40633	
Mounting frame	1	G	43521	
Sealing kit (IP 54)	1	G	43416	



AFRISO event reporting systems EMS

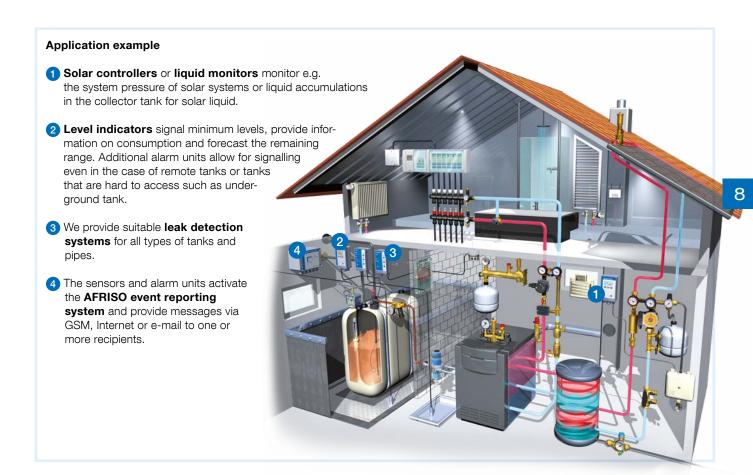


AFRISO event reporting systems EMS allow for remote monitoring of buildings or plants in domestic and industrial applications. Sensors and WATCHDOG-LINE alarm units monitor all the functions of the system and the security of the building around the clock. Alarms are reported to one or several recipients via GSM, Internet or E-mail. It is possible to send a general alarm message

or to report different types of alarms to different recipients. We provide a comprehensive range of devices generating the appropriate signals. Depending on the system configuration, the AFRISO event reporting systems allow for full remote control of complete residential installations and technical facilities as well as integration into building control systems.

Monitoring functions:

- Events such as leaks, heating system failure
- Events such as smoke, fire, gas or flooding
- Levels in tanks and containers
- Leaks in tanks or pipes
- Measured values such as temperature, level, pressure



Features of EMS event reporting systems

1. Event reporting

The system calls via GSM and reports the events.

2. Remote control

The event reporting system EMS can be called. You can send commands to control heating systems, ventilation, air conditioning systems, etc.

3. Data logging

Event reporting systems log data at configurable intervals.

4. Remote data polling

You can access the event reporting system via GSM or Internet and receive current and stored data.

5. Remote programming

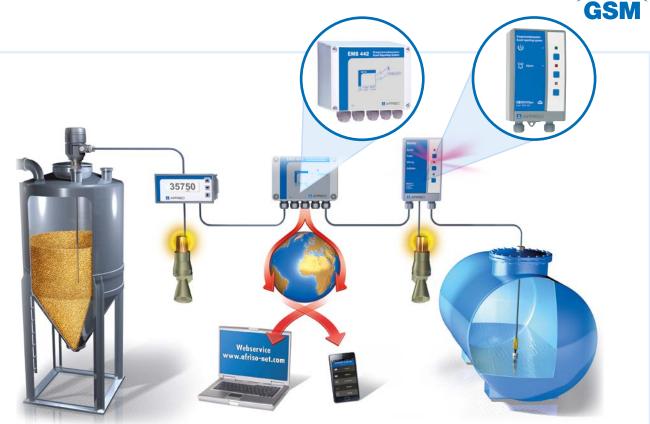
You can program various parameters via GSM. For example, it is possible to remotely change the telephone number to which the system is to report the events.

6. Integrated security system

- A PIN ensures that unauthorised persons cannot access the event reporting system
- If the number to be called by the system is busy, the system redials automatically
- If the number is still busy after several attempts, the system calls another number specified
- All program settings, voice messages and alarms not yet processed are saved in the case of power outage; the system resumes processing when power is restored.



AFRISO event reporting systems EMS



Event reporting systems EMS 220/EMS 442

- Suitable for domestic and industrial applications
- 2 analogue, 2 digital inputs (EMS 220)
- 4 analogue, 4 digital inputs (EMS 442)
- Event reporting via text message or to the AFRISO Net server

In connection with the AFRISO Net web service, data can also be visualised, logged, managed and transferred via e-mail.

WATCHDOG-LINE alarm units with event reporting system EMS 220

WATCHDOG-LINE alarm units for monitoring industrial buildings such as stockrooms, machine rooms, depots for hazardous substances, etc.

In conjunction with the EMS event reporting system, the WATCHDOG-LINE alarm units signal events such as low level messages, error messages, level information, malfunctions and accidents via text messages, all around the globe, 24/7.





Event reporting system EMS 220





- For building technology
- 2 analogue and 2 digital inputs
- Event reporting directly to the mobile phone
- Data recording, visualisation and management with AFRISO Net web service



Application

Suitable for a large range of domestic and industrial remote monitoring applications. Up to two analogue measured values and two digital limit values can be monitored with a single unit. In connection with the AFRISO Net web service, data can also be visualised, logged and managed.

Typical application areas:

- Monitoring and management of fuel oil tanks
- Monitoring of heating and service rooms
- Monitoring of ducts, drip pans or pipes
- Signal forwarding of danger and status messages

EMS 220 can e.g. be combined with the following AFRISO signal transducers:

- Level indicators
- Level switches
- Leak detectors
- Gas and smoke detectors

Description EMS 220 has 2 analogue and 2 digital inputs. EMS 220 sends alarm signals or results of continuous measurements to the mobile phone of the user or to the AFRISO Net server for documentation and further distribution. From the server, messages can be sent via Internet, text message or e-mail. The owner/operator can request information on the system status or change parameters via mobile phone at any time. Measuring intervals, limit values and data transmission intervals can be adjusted as required.

specifications Ambient:

Technical Operating temperature range

-20/+50 °C

Supply voltage

AC 230 V

Sensor supply

DC 24 V, max. 25 mA

Alarm inputs

- 2 analogue input 4-20 mA, active or passive
- 2 digital inputs, for voltage-free assignment

Data transmission

GSM text messages with integrated GSM modem /900/1800 MHz

Measuring intervals/ data transmission intervals

Adjustable as required

Parameterisation/configuration

Via mobile phone

Housing

Wall mounting housing made of impact-resistant plastic (ABS) W x H x D 100 x 188 x 65 mm

Degree of protection

IP 40 (EN 60529)

Electrical connections

Cable glands

The AFRISO Net web service is a cost-effective way of requesting data online anywhere and at any time. See page 411 for a detailed description.

DG: H, PG: 4	Part no.	Price €
EMS 220	90220	
Setup on AFRISO Net server (one-time fee)	90013	
Monthly base fee per SIM card	90014	

Blue part no. = in-stock items



Event reporting system EMS 442



- For industrial remote monitoring tasks
- 4 analogue and 4 digital inputs
- Event reporting directly to the mobile phone
- Data recording, visualisation and management with AFRISO Net web service



Application The event reporting system EMS 442 is ideal for a wide range of industrial remote monitoring tasks. Up to 4 analogue measured values and 4 digital limit values can be monitored with a single unit. In connection with the AFRISO Net web service, data can also be visualised, logged and managed.

Typical application areas:

- Monitoring and management of tank farms, oil storage facilities, silos, food tanks and facilities for storing chemicals
- Level measurement in wells, drilling holes, rivers, lakes, etc.
- Monitoring of ducts, pump stations, waste water systems, separators
- Monitoring of production processes
- Monitoring of technical facilities such as heating systems, air conditioning systems, refrigeration systems, lifts, etc.

Description EMS 442 has 4 analogue and 4 digital inputs as well as 2 switching outputs (relay outputs) for connection of additional alarm equipment on site. EMS 442 sends alarm signals or results of continuous measurements to the mobile phone of the user or to the AFRISO Net server for documentation and further distribution. From the server, messages can be sent via Internet, text message or e-mail. The owner/operator can request information on the system status via mobile phone at any time. Measuring intervals, limit values and data transmission intervals can be adjusted as required.

specifications

Technical Operating temperature range

Ambient: -20/+50 °C

Supply voltage

AC 230 V

Sensor supply

4 x DC 24 V, max. 25 mA

Alarm inputs

- 4 analogue inputs 4–20 mA, active or passive
- 4 digital inputs, for voltage-free assignment

Switching outputs

Relay contacts: 2 voltage-free changeover contacts Contact rating: AC 250 V, 5 A/500 VA

DC 24 V, 5 A/100 VA

Data transmission

GSM text messages with integrated GSM modem /900/1800 MHz

Measuring intervals/ data transmission intervals

Adjustable as required

Parameterisation/configuration

Via mobile phone

Housing

Wall mounting housing made of impact-resistant plastic (polycarbonate) W x H x D 175 x 125 x 75 mm

Degree of protection

IP 65 (EN 60529)

Electrical connections

5 x cable gland M 16

The AFRISO Net web service is a cost-effective way of requesting data online anywhere and at any time. See page 411 for a detailed description.

DG: H, PG: 4	Part no.	Price €
EMS 442	90442	
Setup on AFRISO Net server (one-time fee)	90013	
Monthly base fee per SIM card	90014	

Blue part no. = in-stock items



AFRISO Net web service



- Internet-based remote monitoring system
- Continuous monitoring and logging, 24/7
- Automatic connection monitoring, alarm if connection is lost
- No separate application programs required
- Alarms can be transmitted via text message or e-mail

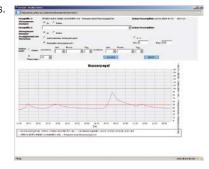
www.afriso-net.com

Application The user can view measurements and alarms of the EMS 220/442 event reporting systems at any time and from anywhere on the globe, e.g. via Web browser, mobile phone and e-mail. The AFRISO Net server collects the data and archives it in a database. This measurement data can be visualised and documented. Reports and trend charts for selectable periods can be created automatically.

Typical applications areas

Visualisation of level, pressure, temperature, flow measurements. Alarm messages such as maximum levels/overfill, minimum levels/low alarms, oil and grease separator alarms.

- Level Inventory: industrial level inventory
- Fuel: level measurement and control (alarm messages) at petrol stations
- PumpControl: remote monitoring of pump facilities and waterworks
- WasteControl: logistics for waste disposal
- TransControl: access monitoring



Description

AFRISO Net is self-monitoring, i.e. it features automatic connection monitoring and generates an alarm if a connection is lost. Individual device identification authenticates the sender and the data. AFRISO Net can forward alarms as text messages and e-mails; an alarm can be sent to several recipients at the same time or chained.

The device settings are completely managed via the AFRISO Net server. Access to specific data can be limited for each user; the passwords are managed securely. Unauthorised access is blocked by a firewall. Daily backups and automatic storage of the measured results (up to five years) round off the security concept of the AFRISO Net web service.

specifications EMS 220, EMS 442

Technical Compatible event reporting systems

Data transmission

- Encrypted connection between server and browser
- Text messages
- E-mails
- ERP systems, e.g. SAP/R3

Data transmission protocols

GSM, text messages SMS, GPRS, TCP/IP

Web browser

Internet Explorer, Firefox

User interface languages

German, English, Finnish, Swedish, Danish

DG: H	Part no.	Price €
Setup on AFRISO Net server (one-time fee)	90013	
Monthly base fee per SIM card	90014	

Blue part no. = in-stock items







CHAPTER 9

Appendix - Technical Information

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Courses and Training

Professional and practical. With our courses, workshops and seminars, you benefit from our many years of in-depth experience in the field of measuring and control technology. Our entire offering responds to current issues and standards as well as customer requirements. Of course, it is also possible to arrange for individual in-house courses and seminars to be provided at your site.







AFRISO training programme

Tank protection and leak protection lining

Two-day seminar on the installation of leak protection linings and leak detectors (theory and practice).

Hydraulic Balancing

One-day seminar on hydraulic balancing with the VarioQ valve program with measuring function.

Heating system check

One-day seminar on the inspection and evaluation of heating systems.

Gas check

One-day seminar on checking gas installations.

Testing of drinking water pipes

One-day seminar on testing drinking water installations and drainage lines. Legal foundations.

Visit us at www.afriso.de/training for our full training programme and additional information.

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We will be glad to answer your questions concerning our seminars. Please get in touch with us.

E-mail: training@afriso.de Phone: +49 7135 102-222



Our Service - Your Benefit

Flexible, cost-aware, on schedule, solution-orientated and fast - the AFRISO team always provides the decisive added value.





Information and presentation

Whether telephone support or on site: Our consultants speak your language – we provide you with personal and individual consulting worldwide. And if you have an in-house event for your customers, we will be glad to participate.

After sales service

Whether commissioning, professional maintenance, calibration or function checks – a network of service centres and our specialists in the plant support you in getting the maximum out of your AFRISO product. For safe processes, precise measurement results, compliance with legal requirements and a long service life.

Repair service

In the case of a malfunction, send us your instrument along with a short description of the problem. We will repair it within five workdays.

Rental service

You cannot afford to do without your instrument? No problem, our on-site service ensures that you remain on duty. We will have your instrument picked up and send you a rental instrument. For a low rental fee. Ask for availability of this service in your country.



Our service and repair department will be glad to answer your questions. Please get in touch with us. Phone: +49 7135 102-211



AFRISO information material – brochures and flyers

Discover new opportunities and sales potential with AFRISO quality products. We offer a large variety of information materials and media for wholesalers, points of sale, associations, HVAC companies and tank protection companies. You can order these media from us free of charge – even large numbers of copies. All printed materials allow you to add your company stamp to the back page.

Flyers, brochures and product overviews

Flyers, brochures, and product overviews provide information on individual products or complete product ranges for various application areas.



Product literature for end consumers

Product literature for end users is a great medium for fairs, exhibition rooms, mail campaigns and other activities. They present the benefits and applications of AFRISO products for building technology and tank protection in private households in a concise, easy-to-understand way.



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All information material can be downloaded from www.afriso.com. If you want to order printed material for free, simply specify the number of copies required in your e-mail to marketing@afriso.de.



Downloads

Visit www.afriso.com for comprehensive product information and details, technical specifications, terms and conditions, valuable downloads and the latest news.

Operating instructions

In addition to product descriptions, the operating instructions include detailed technical data, mounting, installation and safety information as well as information on approvals for all AFRISO products.



Forms

Checklists with indication of application conditions and planned use of AFRISO products allow us to quickly process your enquiries or returns.



Software

Due to continuous improvements and to changes in legislation and directives, we provide software updates for electronic measuring instruments on an ongoing basis. The updates and the appropriate instructions can be downloaded from our website for free.



Certificates

A number of manufacturer certificates and declarations as well as numerous specific approvals, certificates and compliance tests attest to the outstanding quality and performance of AFRISO products.





2D/3D CAD files for machine and plant design

The fast track to reliable instrumentation in process engineering



Designing machines and plants confronts process instrumentation engineers and technicians with the same challenge over and over again: rummaging though manufacturers' data sheets to find the data needed for a solid design takes a lot of time and effort. In many cases, required information is missing; if STEP models are available, the degree of detail is frequently insufficient. Uncertainty as to the up-to-dateness of the data makes things even worse. The enormous effort that has to go into research and the time spent waiting for the information ordered put a strain on tight schedules and slow down the entire design process.





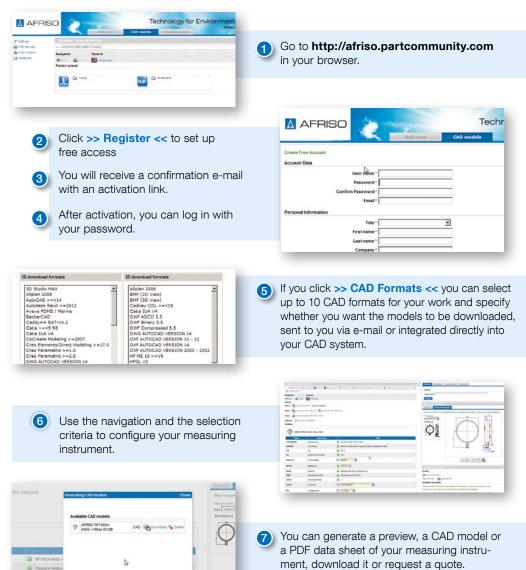
CAD product catalogue for maximum design reliability

With the new CADENAS CAD format, AFRISO offers designers, engineers and purchasers countless possibilities to simplify and optimise planning and purchasing processes. 2D/3D models of pressure gauges, pressure transducers, level indicators, thermometers and accessories can be downloaded or obtained via e-mail in all CAD formats available on the market via the online portal http://afriso.partcommunity.com. 24/7, without a delay and in high quality.

All this requires very little effort. Register, select your own CAD system and the desired CAD formats – and you are ready to go. Finding products could not be easier: the required parts are selected by means of planning-relevant parameters and a product assistant or via a tree view. It is also possible to directly create combinations of variants, e.g. with the process connection required for the application. A 3D preview which can be generated online allows you to verify that you have compiled the correct model.

The "quasi-configured" model does not only contain the geometry data for checking the connection and fit – all other technical specifications including the ordering code are available and can be directly integrated into the design and the bill of materials. This way, purchasing as well has exact specifications which can serve as the basis of quotations.

Cut down your engineering effort - this is how it works:



Certificates and approvals

At AFRISO, quality is systematically planned and, at every stage of product development and production, managed and monitored. A wide variety of approvals and certificates attests to this. Stringent testing by national and international approval bodies ensures maximum reliability.











ZERTIFIKAT

Die Benannte Stelle nach Druckgeräterichtlinie - Zertifizierungsstelle für Qualitätssicherungssysteme -Der TÜV SÜD Industrie Service GmbH

bescheinigt, dass das Unternehmen

AFRISO-EURO-INDEX GMBH

Lindenstraße 20 74363 Güglingen, Deutschland

für den Geltungsbereich

Wassermangelsicherungen und Wasserstandsbegrenzer als Ausrüstungsteile mit Sicherheitsfunktion nach EG-Baumusterprüfungen (gemäß Anlage)

ein Qualitätssicherungssystem nach der Druckgeräterichtlinie 97/23/EG Anhang III, Modul D

eingeführt hat und anwendet.

Durch ein Audit, Bericht -Nr.: Q-IS-DDB-MAN-PED-394-556-15, wurde der Nachweis erbracht, dass die betreffenden Anforderungen erfüllt sind. Hirweis: Einstutung der Fluide gemäß Artikel 13 der Richtlinie 2014/68/EU

Der Hersteller ist berechtigt, die im Rahmen des Geltungsbereiches dieses Qualitätssicherungssystems hergestellten Druckgeräte bei der Kennzeichnung mit unserer Kenn-Nummer wie dargestellt zu versehen:

C€ 0036

Zertifikat - Nr. DGR-0036-QS-805-15 gültig bis 14. November 2018 unter der Vorausselzung von bestande

Mannheim, 23. September 2015

TÜV SÜD Industrie Service GmbH Westendstraße 199 80686 München Germany

CERTIFICAT

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CERTIFICATE



TÜV®

TÜV SÜD Industrie Service GmbH | DGR-QS-Zertifizierungsstelle - Germany



Zertifikat

Die Qualitätsgemeinschaft Geruchsgesperrte Heizöltanks e.V. verleiht der Fima

AFRISO-EURO-INDEX GmbH D-74363 Güglingen

für folgende 7 Produkte:

- Automatische Heizölentlüfter Flow-Verbindung mit einem PA Schlauch
 Heizölfilter, Zweistrangfilter Z 500
 Grenzwertgeber GWG 12/K
 Membran-Antiheberventile MAV

- Automatische Heizölentlüfter FloCo-TOP in Ver-bindung mit einem PA Schlauch 4 x 1 mm
 Mechanische Füllstandmessgeräte MT-Profil R
 Entnahmegarnituren Euroflex

das Recht die Marke PROOFED BARRIER® zu führen

Die Verleihung erfolgt auf Grund des positiven Berichtes des Qualitätsausschusses vom 16.04.2007 unter Zugrundelegung des Erstprüfungsberichtes des Fraunhofer Institutes für Verfahrenstechnik und Verpackung ivv, 85334 Freising vom 05.03.2007. Die Firma AFRISO-EURO-INDEX GmbH unterwirft sich der laufenden Überwachung durch das Fraunhofer Institut iv vund den Regeln der Qualitätsgemeinschaft Geruchsgeperrte Heizöltanks e.V. (QgH e.V.) sowie der Markensatzung der QgH e.V. in der jeweils geltenden Fassung.

Würzburg, den 16.04.2007

Wahen Wolfgang Dehoust

Vorsitzender der Qualitätsgemeinschaft Geruchsgesperrte Heizöltanks e.V.



DET NORSKE VERITAS

TYPE APPROVAL CERTIFICATE

CERTIFICATE NO. A-13016

This is to certify that the Pressure Indicator

with type designation(s)
RF__, Series D4__, D7__, D8__ and D9__

Afriso-Euro-Index GmbH Amorbach, Germany

is found to comply with on of Ships, High Speed & Light Craft and Det Norske Veritas' Offshore Standards







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Mr.	80		9	3		
BE 63 D		4				
	160			5		

Approval conditions

AFRISO EURO-INDE	X, Manual for Pressure and Temperature: 2007/2008
	Vibration Test Report, dated 96-10-01
	Dry Heat Test Report, dated 96-10-01
Test Reports	Damp Heat Test, dated 96-10-01
	Cold Test Report, dated 96-10-01
	Salt Mist Test Report, dated 96-10-01
Survey Reports	DNV SHL: AFRISO, dated 96-06-18
	DNV SHL: 6-0996, dated 96-10-11
	Retention Survey Report, TAC no.: A-10961, dated 2012-11-14
Datasheet	Bourdon tube pressure gauge D7 & D9, MX-2610N_20121115_070229
Material declaration	Afriso Euro-Index Material Declaration ASBESTOS, dated 2012-12-27

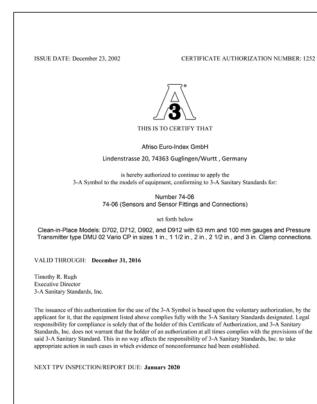
alterations are made to the product deagn or choice or systems, stonware versions, components are not all the control of the survey are:

Ensure that type approved documentation is available
Inspection of factory samples, selected at random from the production line (where practicable)
Preview of production and inspection routines, including test records from product sample tests and control routines
Ensuring that systems, software versions, components and/or materials used comply with type approved documents referenced system, software component and materials appellications.
Review of possible changes in design of systems, software versions, components, materials and/or performance, an sure that such changes in other affect the type approved given
Ensuring traceability between manufacturer's product type marking and the type approval certificate

ntion survey is to be performed at least every second year and at renewal of this certificate

END OF CERTIFICATE













Information on the flange standard EN 1092 / international comparison of grades

Conversion to EN 1092

The new flange standard EN 1092-1 for all flange types has been in effect since June 2002. Currently, the old standards are still in use. However, this will change since the old standards are no longer maintained and updated. New standards will exclusively refer to EN 1092.

AFRISO flanges

AFRISO usually ships type B1 flanges as per EN 1092. This flange type differs from the former type C flanges as per DIN 2630 only in terms of the surface quality of the sealing surface. Flanges according to the old standard are available upon request.

		(OLD DIN 25/26.	.)		EW 092-1)
Flanges	Sealing surface	Туре	Standard	R _z (µm)	Туре	R _z (µm)
Flat		A B	DIN 2573 DIN 2576	- 40 - 160	А	12.5 – 50
Raised face		C D E	DIN 2630 to DIN 2638	40 – 160 40 16	B1 * B2 **	12.5 – 50 3.2 – 12.5
Tongue		F	DIN 2512		С	3.2 – 12.5
Groove		N	DIN 2312		D	
Spigot		V 13	DIN 2513		E	12.5 – 50
Recess		R 13	DII V 2010		F	12.0 – 00
Spigot		V 14	DIN 2514 for		Н	3.2 – 12.5
Recess		R 14	O rings		G	0.2 - 12.0

^{*} Typically PN 2.5 to PN 40

Stainless steel - international comparison of grades

Material no.	DIN	AISI	
1.4301	X 5 CrNi 18 10	304	
1.4305	x 8 CrNiS 18-9	303	-
1.4310	x 12 CrNi 177 / x 10 CrNi 188	301	DIN: Deutsches Institut für Normung
1.4401	X 5 CrNiMo 17 123	316	institut für Normung
1.4404	X 2 CrNiMo 17 132	316 L	AISI: American Iron
1.4435	X 2 CrNiMo 18 143	316 L	Steel Institute
1.4462	X 2 CrNiMoN 22 53	318 L	
1.4542	X 5 CrNiCuNb 16-4	630	
1.4571	X 6 CrNiMoTi 17 122	316 Ti	
1.4541	X 6 CrNiTi 18-10	321	



^{**} Typically PN 63 and PN 100

Conversion table for standard pressure units

10		Ра кРа	МРа	kp/mm²	kp/cm²		BH H H	mWC	mmWC	psi	O ҈ ₩	H.
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0.00249089 2.49089 249.089 0.249089			0.006894757	0.0070307	0.070307	0.068046	51.715217	0.70307	703.07	1	27.68	2.03529
	2.49089	089 0.249089	0.000249089	0.0000254	0.00254	0.002458317	1.86832	0.0254	25.4	0.03613	-	0.07356
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Information on the Pressure Equipment Directive (PED) 2014/68/EU Pressure Equipment Directive (PED)

The European Pressure Equipment Directive (PED) came into force on May 30, 2002. The following paragraphs provide some information on the Directive itself and on our activities within the framework of this Directive.

- AFRISO-EURO-INDEX GmbH pressure gauges with a full scale value of > 0.5 bar are subject to the Pressure Equipment Directive and meet the appropriate requirements.
- Since the future application conditions of most pressure gauges are normally not completely known at the time of manufacture, we always manufacture our products in accordance with the most stringent criteria (gases of group 1).
- This way, our pressure gauges with a full scale value of 200 bar receive a CE mark according to the conformity assessment procedure.
- Pressure gauges with a connection flange of > DN 25 receive a CE mark with a full scale range of 0.5 bar and greater.
- The CE mark is attached to the outside of the housing (type designation plate).
- A declaration of conformity is provided on request.
- Detailed operating instructions and the appropriate data sheets are available at www.afriso.com. They can also be sent to you on request.
- Pressure gauges with a full scale value of less than 0.5 bar and loose chemical seals do not fall under the PED and must not carry a CE mark.
- Pressure gauges with a full scale value of between 0.5 bar and 200 bar fall under "Good Engineering Practice" and must not carry a CE mark (section 4, paragraph 3).
- We are not authorised to CE mark pressure gauges without a company name or a company logo.
- Pressure gauges which are used as a part of a safety system installed to protect against exceeding permissible limit values (equipment parts with a safety function) are treated separately.
- Our pressure gauges comply with the European Standard EN 837-1 and EN 837-3 and are manufactured and tested according to the appropriate requirements.

Selection criteria/safety considerations for pressure gauges as per EN 837-2

Medium				Liq	uid			
Housing		Withou	ut filling			With	filling	
Nominal size	40/50/	/63/80	100/16	60/250	40/50	/63/80	100/16	60/250
Range bar	≤ 25	> 25	≤ 25	> 25	≤ 25	> 25	≤ 25	> 25
Code for minimum safety version	0	0	0	0	S1	S1	S1	S1
AFRISO type designation	All	All	All	All	D6/D7/D8	D6/D7/D8	D7/D8	D7/D8

Medium		Gas	or steam (att	ention: not ap	olicable to oxy	/gen + acetyle	ene*)	
Housing		Withou	ut filling			With	filling	
Nominal size	40/50/	/63/80	100/16	60/250	40/50/63/80		100/16	60/250
Range bar	≤ 25	> 25	≤ 25	> 25	≤ 25	> 25	≤ 25	> 25
Code for minimum safety version	0	S2	S1	S3	S1	S2	S1	S3
AFRISO type designation	All	"A"	D4/D9	RF 100/160 Si D4x2	D6/D7/D8	"B"	D6/D7/D8	RF 100/160 Si D8x2

Explanations of key:

"A" RF 63 Ch D 9x2, RF 63 Si D 4x2, RF 50/63 ST, RF 50/63 GT,

RF 63 MK/IK D 3x2

"B" RF 63 D 7x2, RF 63 Si D 8x2

- O Pressure gauges without blow-out
- S1 Pressure gauges with blow-out
- S2 Safety pressure gauges without solid baffle wall
- S3 Safety pressure gauges with solid baffle wall (for higher safety level)

Note 1:

Pressure gauges for oxygen and acetylene must meet the requirements for safety pressure gauges (NS 40 - 80 S2, NS 63/100/160 S3).

Note 2:

Pressure gauges with glycerine filling must not be used for oxygen or other oxidation process fluids. High-concentration fluorine liquids and chlorinated liquids (for example, halocarbon) can be used for such applications.

Note 3

This table contains the standard safety version with the corresponding keys. Users must take into consideration any information they have concerning their special requirements and may also use safety pressure gauges at pressures below than 25 bar.



Silicone-filled pressure measuring instruments may not be used in production facilities for paint and lacquer and in paint shop environments.



^{*} See page 428 for pressure gauges for oxygen or acetylene.

Selection criteria/safety considerations for pressure gauges as per EN 837-2

Pressure gauges for oxygen and acetylene

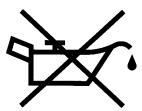
Only safety pressure gauges (S2 and S3) may be used.

All materials for wetted parts (parts coming into contact with oxygen or acetylene) must comply with EN 29539.

Pressure gauges for oxygen

The Bourdon tube and other wetted parts must be free from oil and grease. Only lubricants suitable for oxygen at maximum operating pressure may be used.

The dial must bear the word "oxygen" in English and the international symbol for "free from oil and grease" (symbol 0248 according to ISO 7000 with the "oil prohibited" symbol):



Oxygen and acetylene

	NG 40 - 80 S 2/S 3	NG 100 - 250 S 3
Version	RF 50 ST RF 50 GT RF 63 ST RF 63 GT RF 63 MK/IK D 3x2 RF 63 Si D 4x2	RF 100 Si D 4x2 RF 160 Si D 4x2



Dials for pressure gauges - graduation

Housing diameters (NG) 40, 50, 63, 72x72 - accuracy classes 1.6 and 2.5

Ranges	Graduation	Ranges	Graduation	Ranges	Graduation	Example
-						\
0 1 bar	0.05 bar	0 10 mbar	0.5 mbar	-60 +40 mbar	5 mbar	0, 06
-1 0 bar	0.05 bar	-4 +6 mbar	0.5 mbar	-100 0 mbar	5 mbar	0,4 0,6
0 10 bar	0.5 bar	-6 +4 mbar	0.5 mbar	0 1000 mbar	50 mbar	-0,2 0,8-
-1 +9 bar	0.5 bar	10 0 mbar	0.5 mbar	-400+600 mbar	50 mbar	
0 100 bar	5 bar	0 100 mbar	5 mbar	-600+400 mbar	50 mbar	0 1,0
0 1000 bar	50 bar	-40+60 mbar	5 mbar	-1000 0 mbar	50 mbar	Dar Cl.1,6 \\
Ranges	Graduation	Ranges	Graduation	Ranges	Graduation	Example
						0,5
0 1.6 bar	0.05 bar	0 16 mbar	0.5 mbar	0 160 mbar	5 mbar	0,5
-1 +0.6 bar	0.05 bar	-6 +10 mbar	0.5 mbar	-60 +100 mbar	5 mbar	
0 16 bar	0.5 bar	-10 +6 mbar	0.5 mbar	-100 +60 mbar	5 mbar	
-1 +15 bar	0.5 bar	-16 0 mbar	0.5 mbar	-160 0 mbar	5 mbar	1,5 0 1,6 bar CL1,6
0 160 bar	5 bar					bar CL.1.6
Danasa	Graduation	Dannes	Graduation	Dannes	Graduation	Fyemule
Ranges	Graduation	Ranges	Graduation	Ranges	Graduation	Example
0 0 5 hav	01 504	0 05 mb av	1	0.050 mls au	10	1,0 1,5
0 2.5 bar -1 +1.5 bar	0.1 bar 0.1 bar	0 25 mbar -10 +15 mbar	1 mbar 1 mbar	0 250 mbar -100+150 mbar	10 mbar 10 mbar	
	0.1 bar 1 bar	-10 +10 mbar	1 mbar	-150+100 mbar	10 mbar	-0,5 2,0 -
	10 bar	-25 0 mbar	1 mbar	-250 0 mbar	10 mbar	· 0 25 -
0 250 bar	10 bai	-25 U IIIDai	i ilibai	-250 U Mbar	10 mbar	0 2,5 bar Cl16
						U.I.6 ▼ MAFRISO
				<u> </u>		
Ranges	Graduation	Ranges	Graduation	Ranges	Graduation	Example
3.1		3 3 3		3 3 1		\ \ \ \ \ \ \ .
						2 /
0 4 bar	0.2 bar	0 40 mbar	2 mbar	0 400 mbar	20 mbar	
-1 +3 bar		-15+25 mbar		-150+250 mbar	20 mbar	
0 40 bar	2 bar	-25 +15 mbar	2 mbar	-250+150 mbar	20 mbar	
0 400 bar	20 bar	-40 0 mbar	2 mbar	-400 0 mbar	20 mbar	
						bar CL.1.6
						(AAFRISO
Ranges	Graduation	Ranges	Graduation	Ranges	Graduation	Example
						N11111
0 0.6 bar	0.02 bar	0 60 mbar	2 mbar	0 600 mbar	20 mbar	3
-0.6 0 bar	0.02 bar	-20+40 mbar	2 mbar	-200+400 mbar	20 mbar	
0 6 bar	0.2 bar	-40+20 mbar	2 mbar	-400+200 mbar	20 mbar	1 5
-1 +5 bar	0.2 bar	-60 0 mbar	2 mbar	-600 0 mbar	20 mbar	
0 60 bar	2 bar					0 6
0 600 bar	20 bar					bar CL.1.6
						שואי חסט



Dials for pressure gauges - graduation

Housing diameters (NG) 80, 100, 160, 96x96, 144x144 - accuracy classes 1.0 and 1.6

Ranges	Graduation	Ranges	Graduation	Ranges	Graduation	Evampla
Hanyes	ai auuatioii	Hanyes	ai auuatioii	Hanges	ai auuatioii	0,4 0,6 1,0 bar
0 1 bar	0.02 bar	0 10 mbar	0.2 mbar	-60 +40 mbar	2 mbar	
	0.02 bar 0.02 bar	-4 +6 mbar	0.2 mbar	-100 +40 mbar	2 mbar	S 0,4 0,6 %
	0.02 bar	-4 +0 mbar	0.2 mbar	0 1000 mbar	20 mbar	=n2 na=
	0.2 bar 0.2 bar	-6 +4 mbar -10 0 mbar	0.2 mbar	-400 +600 mbar	20 mbar	= 0,2 0,0=
					20 mbar	= 0 ° 10 =
0 100 bar	2 bar 20 bar	0 100 mbar	2 mbar	-600 +400 mbar	20 mbar	bar I,U
0 1000 bar	20 bar	-40+60 mbar	2 mbar	-1000 0 mbar	20 mbar	AFRISO (I.1.8
_		_		_		_
Ranges	Graduation	Ranges	Graduation	Ranges	Graduation	Example
	0.05.1		0.5	0 400 1		N111//
0 1.6 bar	0.05 bar	0 16 mbar	0.5 mbar	0 160 mbar	5 mbar	1,0 %
-1 +0.6 bar	0.05 bar	-6 +10 mbar	0.5 mbar	-60 +100 mbar	5 mbar	5 0,5 1,0 5
0 16 bar	0.5 bar	-10 +6 mbar	0.5 mbar	-100 +60 mbar	5 mbar	= =
-1 +15 bar	0.5 bar	-16 0 mbar	0.5 mbar	-160 0 mbar	5 mbar	= a c 1.5.=
0 160 bar	5 bar					0 bar 1,6
0 1600 bar	50 bar					AFRISO ^{U.1.0}
_	a	_		_		_
Ranges	Graduation	Ranges	Graduation	Ranges	Graduation	1,0 1,5 2,0 5 bar 0,100
						WILLIAM
0 051	0.051	0 05 1	0.5	0 050 1		》1,0 1,5 ~
0 2.5 bar	0.05 bar	0 25 mbar	0.5 mbar	0 250 mbar	5 mbar	
-1 +1.5 bar	0.05 bar	-10 +15 mbar	0.5 mbar	-100 +150 mbar	5 mbar	=0,5 2,0=
0 25 bar	0.5 bar	-15 +10 mbar	0.5 mbar	-150 +100 mbar	5 mbar	
0 250 bar	5 bar	-25 0 mbar	0.5 mbar	-250 0 mbar	5 mbar	7,0 2,5
						AFRISO (1.1.0
Ranges	Graduation	Ranges	Graduation	Ranges	Graduation	Example
						NIIIIIIII
0 4 bar	0.1 bar	0 4.0 mbar	0.1 mbar	-25 +15 mbar	1 mbar	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
-1 +3 bar	0.1 bar	-1.5 +2.5 mbar	0.1 mbar	-40 0 mbar	1 mbar	<u>-1</u> 2-
0 40 bar	1 bar	-2.5 +1.5 mbar	0.1 mbar	0 400 mbar	10 mbar	_ '
0 400 bar	10 bar	-4 0 mbar	0.1 mbar	-150 +250 mbar	10 mbar	<u> </u>
		0 40 mbar	1 mbar	-250 +150 mbar	10 mbar	3 = 1 = 1 = 1 = 1 = 1 = 1 = 1 = 1 = 1 =
		-15+25 mbar	1 mbar	-400 0 mbar	10 mbar	bar
						∆AFRISO ^{©1.1,0}
Ranges	Graduation	Ranges	Graduation	Ranges	Graduation	Example
Ranges	Graduation	Ranges	Graduation	Ranges	Graduation	Example
Ranges 0 0.6 bar	Graduation 0.01 bar	Ranges 0 6 mbar	Graduation 0.1 mbar	Ranges -40 +20 mbar	Graduation 1 mbar	Example 0.3
_		_		-	Graduation 1 mbar 1 mbar	Example 0,3 0,4
0 0.6 bar	0.01 bar	0 6 mbar	0.1 mbar	-40 +20 mbar	Graduation 1 mbar 1 mbar 1 mbar 10 mbar	Example 0,3 0,4
0 0.6 bar -0.6 0 bar 0 6 bar	0.01 bar 0.01 bar	0 6 mbar -2 +4 mbar -4 +2 mbar	0.1 mbar 0.1 mbar 0.1 mbar	-40 +20 mbar -60 0 mbar 0 600 mbar	1 mbar 1 mbar 10 mbar 10 mbar	Example 0,3 0,2 0,5 0,5
0 0.6 bar -0.6 0 bar 0 6 bar -1 +5 bar	0.01 bar 0.01 bar 0.1 bar 0.1 bar	0 6 mbar -2 +4 mbar -4 +2 mbar -6 0 mbar	0.1 mbar 0.1 mbar 0.1 mbar 0.1 mbar	-40 +20 mbar -60 0 mbar 0 600 mbar -200+400 mbar	1 mbar 1 mbar 10 mbar 10 mbar 10 mbar	Example 0,3 0,1 0,5 0,6
0 0.6 bar -0.6 0 bar 0 6 bar -1 +5 bar	0.01 bar 0.01 bar 0.1 bar 0.1 bar	0 6 mbar -2 +4 mbar -4 +2 mbar -6 0 mbar	0.1 mbar 0.1 mbar 0.1 mbar 0.1 mbar	-40 +20 mbar -60 0 mbar 0 600 mbar	1 mbar 1 mbar 10 mbar 10 mbar 10 mbar 10 mbar	0,3 0,4 0,5 0,6 bar

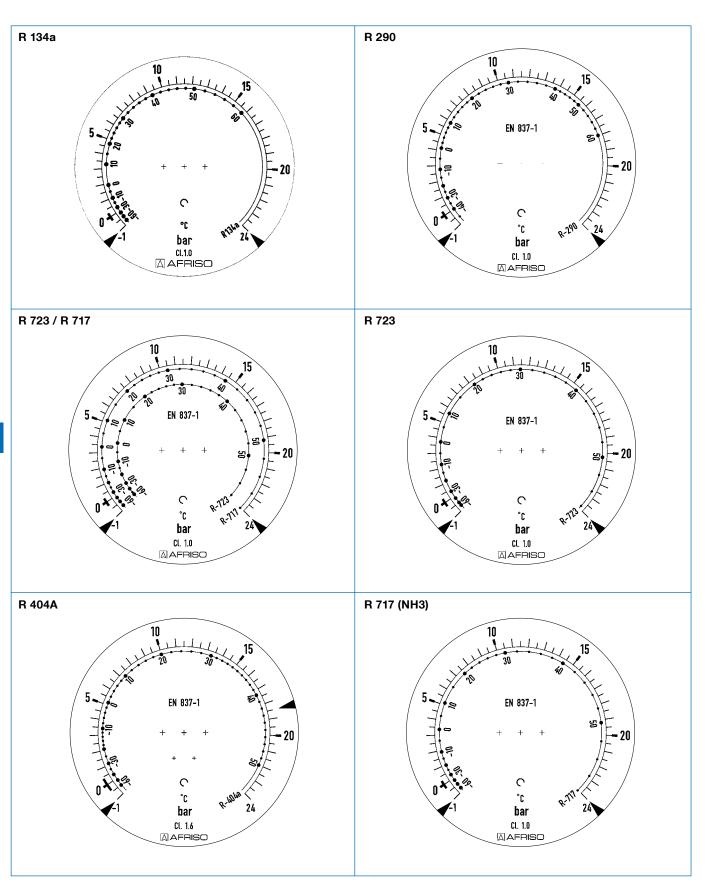


Dials for pressure gauges - graduation

Housing diameter (NG) 160, 250 - accuracy class 0.6 - DIN 16123

Ranges	Graduation	Ranges	Graduation	Ranges	Graduation	Example
0 1 bar -1 0 bar 0 10 bar -1 +9 bar 0 100 bar	0.005 bar 0.005 bar 0.05 bar 0.05 bar 0.5 bar	0 10 mbar -4 +6 mbar -6 +4 mbar -10 0 mbar 0100 mbar -40+60 mbar	0.05 mbar 0.05 mbar 0.05 mbar 0.05 mbar 0.5 mbar 0.5 mbar	-60 +40 mbar -100 0 mbar 0 1000 mbar -400 +600 mbar -600 +400 mbar -1000 0 mbar	0.5 mbar 0.5 mbar 5 mbar 5 mbar 5 mbar 5 mbar 5 mbar	0,5 0,5 0,5 0,5 0,5 0,5 0,5 0,5 0,5 0,5
Ranges	Graduation	Ranges	Graduation	Ranges	Graduation	Example
0 1.6 bar -1 +0.6 bar 0 16 bar -1 +15 bar 0 160 bar	0.01 bar 0.01 bar 0.1 bar 0.1 bar 1 bar	0 16 mbar -6 +10 mbar -10 +6 mbar -16 0 mbar	0.1 mbar 0.1 mbar 0.1 mbar 0.1 mbar	0 160 mbar -60 +100 mbar -100 +60 mbar -160 0 mbar	1 mbar 1 mbar 1 mbar 1 mbar	0.5 0.7 0.8 0.9 1.0 1.1 1.2 1.2 1.2 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3
Danges	Graduation	Danges	Graduation	Danges	Graduation	Evennle
Ranges	Graduation	Ranges	Graduation	Ranges	Graduation	Example
0 2.5 bar -1 +1.5 bar 0 25 bar 0 250 bar	0.02 bar 0.02 bar 0.2 bar 2 bar	0 25 mbar -10 +15 mbar -15 +10 mbar -25 0 mbar	0.2 mbar 0.2 mbar 0.2 mbar 0.2 mbar	0 250 mbar -100 +150 mbar -150 +100 mbar -250 0 mbar	2 mbar 2 mbar 2 mbar 2 mbar	1,0 1,5 C s 25/2 2,0 High High High High High High High High
Ranges	Graduation	Ranges	Graduation	Ranges	Graduation	Example
0 4 bar -1 +3 bar 0 40 bar 0 400 bar	0.02 bar 0.02 bar 0.2 bar 2 bar	0 40 mbar -15 +25 mbar -25 +15 mbar -40 0 mbar	0.2 mbar 0.2 mbar 0.2 mbar 0.2 mbar	0 400 mbar -150 +250 mbar -250 +150 mbar -400 0 mbar	2 mbar 2 mbar 2 mbar 2 mbar	1.5 2.5 1.0 6 bs 2017 3.0 and and an analysis of the second of the seco
Ranges	Graduation	Ranges	Graduation	Ranges	Graduation	Example
0 0.6 bar -0.6 0 bar 0 6 bar -1 +5 bar 0 60 bar 0 600 bar	0.005 bar 0.005 bar 0.05 bar 0.05 bar 0.5 bar 5 bar	0 6 mbar -2 +4 mbar -4 +2 mbar -6 0 mbar 0 60 mbar -20+40 mbar	0.05 mbar 0.05 mbar 0.05 mbar 0.05 mbar 0.5 mbar 0.5 mbar	-40 +20 mbar -60 0 mbar 0 600 mbar -200 +400 mbar -400 +200 mbar -600 0 mbar	0.5 mbar 0.5 mbar 5 mbar 5 mbar 5 mbar 5 mbar	0,25 0,30 0,35 0,40 0,40 0,45 0,55 0,50 0,60 0,55 0,55 0,55 0,55 0,5

Temperature scales for refrigerant dew point temperature Examples range -1/+24 bar



Standard colours for temperature scales: R 717 = red



Checklist for enquiries - level measurement

Company:	Project/enquiry:			
Quantity				
Requirements			-	
Preferred measuring principle	Level detection: PTC thermistor Conductivity Vibration Rotary paddle Capacitance Ultrasonic		☐ Mechan ☐ Pneuma ☐ Capacit ☐ Hydrost ☐ Ultrason	itic ance atic iic micropulse (TDR)
Required outputs	☐ 4-20 mA ☐ Limit level conta	□ 0-10 V acts, no.	□ HART □ Other:	□ RS 232
Required accuracy				
Medium to be measured				
Viscosity/density/granule size				
Dielectric constant (ϵ_r)				
Surface	☐ Calm ☐ Turbulent		Yes, No	Thickness: Water content:
Surface Changing media				
	□ Turbulent	□ No		
Changing media	☐ Turbulent ☐ Yes	□ No	No EX zone	
Changing media EX protection	☐ Turbulent ☐ Yes ☐ No	□ No	No EX zone (WHG)	
Changing media EX protection Approved overfill prevention system required	☐ Turbulent ☐ Yes ☐ No ☐ No	□ No □ Yes, I	No EX zone (WHG)	
Changing media EX protection Approved overfill prevention system required Temperatures	☐ Turbulent ☐ Yes ☐ No ☐ No	□ No □ Yes, I	No EX zone (WHG)	
Changing media EX protection Approved overfill prevention system required Temperatures Tank height / diameter	☐ Turbulent ☐ Yes ☐ No ☐ No ☐ T _{max} medium: ☐ Cylindrical ☐ Vertical	□ No □ Yes, E □ Yes, (T _{max} am	EX zone	
Changing media EX protection Approved overfill prevention system required Temperatures Tank height / diameter Tank shape	☐ Turbulent ☐ Yes ☐ No ☐ No ☐ T _{max} medium: ☐ Cylindrical ☐ Vertical	□ No □ Yes, € □ Yes, (T _{max} am □ Rectangular □ Horizontal	EX zone	Water content:
Changing media EX protection Approved overfill prevention system required Temperatures Tank height / diameter Tank shape Is the tank pressurised?	☐ Turbulent ☐ Yes ☐ No ☐ No ☐ T _{max} medium: ☐ Cylindrical ☐ Vertical ☐ Not pressurised	□ No □ Yes, E □ Yes, (T _{max} am □ Rectangular □ Horizontal □ Yes, max. pres	EX zone	Water content:
Changing media EX protection Approved overfill prevention system required Temperatures Tank height / diameter Tank shape Is the tank pressurised? Is the tank under vacuum?	☐ Turbulent ☐ Yes ☐ No ☐ No ☐ T _{max} medium: ☐ Cylindrical ☐ Vertical ☐ Not pressurised ☐ No ☐ G1B	□ No □ Yes, € □ Yes, (T _{max} am □ Rectangular □ Horizontal □ Yes, max. pres	EX zone	Water content:
Changing media EX protection Approved overfill prevention system required Temperatures Tank height / diameter Tank shape Is the tank pressurised? Is the tank under vacuum? Required process connection	☐ Turbulent ☐ Yes ☐ No ☐ No ☐ T _{max} medium: ☐ Cylindrical ☐ Vertical ☐ Not pressurised ☐ No ☐ G1B ☐ Other:	□ No □ Yes, 8 □ Yes, (T _{max} am □ Rectangular □ Horizontal □ Yes, max. pres □ Yes, max. vacu	EX zone	water content: bar I Flange: ther:
Changing media EX protection Approved overfill prevention system required Temperatures Tank height / diameter Tank shape Is the tank pressurised? Is the tank under vacuum? Required process connection Mounting type	☐ Turbulent ☐ Yes ☐ No ☐ No ☐ No ☐ T _{max} medium: ☐ Cylindrical ☐ Vertical ☐ Not pressurised ☐ No ☐ G1B ☐ Other: ☐ Top mounting	□ No □ Yes, € □ Yes, (T _{max} am □ Rectangular □ Horizontal □ Yes, max. pres □ Yes, max. vacu □ G11½B □ Side mounting	EX zone	water content: bar I Flange: ther:



Checklist for enquiries - thermometers

Company:	Project/enquiry:
Quantity	
Application	
Medium to be measured	
Version	☐ Bimetal thermometer ☐ Gas filled thermometer
Housing diameter	□34 □50 □63 □80 □100 □160 □250
Range	
Connection position	☐ Bottom ☐ Back ☐ Every angle version
Connection type	□ Plain □ Loose male connection □ Sep. screw-in thermowell □ Loose union nut □ Sep. weld-in thermowell □ Compression fitting, adjustable □ DIN/EN thermowell □ Fixed male connection Neck □ No □ Yesmm
Connection thread	□ G □ NPT □ BSPT □ For welding □ ¼ □ ⅓ □ ½ □ ¾ □ Other:
Stem length	
Mounting for capillary type	☐ Wall bracket ☐ Back flange ☐ 3-hole fixing, panel mounting bezel
Capillary length	
Housing	☐ Plastic ☐ Sheet steel ☐ Stainless steel with push on bezel ☐ Stainless steel with bayonet bezel
Filling	☐ No filling ☐ Glycerine ☐ Silicone oil ☐ Other:
Stem material	☐ Brass ☐ Stainless steel ☐ Other:
Thermowell material	☐ Brass ☐ Steel ☐ Stainless steel ☐ Other:
Dial	☐ Single scale as per EN ☐ Dual scale: ☐ Special scale: Customer logo ☐ Yes ☐ No Manufacturer logo ☐ Yes ☐ No
Accuracy class	Class □ 1 □ 2 as per EN 13190
Electrical contacts (only for gas filled thermometers)	□ No □ Magnetic spring contact □ Inductive contact □ Single □ Dual switching function:
Other	



Checklist for enquiries - resistance thermometers

Company:	Project/enquiry:
Quantity	
Application	
Medium to be measured	
Temperatures	T _{max} medium: T _{max} ambient:
Pressure loads	Static: Dynamic: from to
Measuring range	
Sensor	☐ 1 x ☐ 2 x ☐ Pt 100 ☐ Other: ☐ Class B ☐ Class A as per IEC 751 ☐ 2-wire ☐ 3-wire ☐ 4-wire
Neck	□ No □ Yes, lengthmm □ Material stainless steel 316 Ti □ Other material:
Installation length	mm
Process connection	☐ Fixed male connection ☐ Union nut ☐ Compression fitting ☐ ☐ NPT ☐ M ☐ Other: ☐ ¼ ☐ ½ ☐ 18x1.5 ☐ 14x1.5 ☐ Other: ☐ Mounting flange ☐ Ø 41 mm ☐ Ø 80 mm, adjustable ☐ Clamp DN ☐ DIN 11851 DN ☐ Hygienic DN ☐ Other:
Thermowell	☐ Weld-in thermowell as per DIN: ☐ Flanged thermowell, blind flange DN 25, PN 40 ☐ Other:
Material for process connection or thermowell	☐ Stainless steel 316 Ti ☐ Other:
Reduced measuring tip	□ No □ Yes □ 6 mm □ 4 mm
Required connection head or electrical connection	
Transmitter installation	□ No □ Yes, output signal □ 4-20 mA □ 0-10 V □ Measuring range of transmitter:
Other	



Checklist for enquiries - pressure gauges

Company:	Project/enquiry:
Quantity	
Application	
Medium to be measured	
Temperatures	$ \begin{array}{cccc} T_{\text{max}} & \text{medium:} & T_{\text{max}} & \text{ambient:} \\ T_{\text{min}} & \text{medium:} & T_{\text{min}} & \text{ambient:} \end{array} $
Pressure loads	Static: Dynamic: from to
Measuring system	☐ Bourdon tube ☐ Capsule element ☐ Diaphragm ☐ Magnetic piston ☐ Other: ☐ Spring diaphragm
Housing diameter	□ 26 □ 40 □ 50 □ 63 □ 80 □ 100 □ 160 □ 250 mm" □ 4½"
Range	
Connection position	☐ Bottom ☐ Back ☐ Radial ato'clock
Connection thread	☐ G ☐ NPT ☐ BSPT ☐ 1/8 ☐ 1/4 ☐ 3/8 ☐ 1/2 ☐ Other:
Mounting type	☐ Direct ☐ Clamp fixing ☐ Back flange ☐ 3-hole fixing, panel mounting bezel
Housing	☐ Plastic ☐ Sheet steel, black ☐ Sheet steel with clip-in window ☐ Stainless steel with bayonet bezel
Housing with blow-out	☐ Yes ☐ No ☐ Safety version S3
Filling	☐ Without ☐ Glycerine ☐ Silicone oil ☐ Other:
Window	☐ Plastic ☐ Instrument-grade glass ☐ Laminated safety glass Must be resistant to solvents ☐ Yes ☐ No Must be resistant to:
Wetted parts	☐ Brass ☐ Steel ☐ Stainless steel 316Ti/316 L ☐ Monel ☐ Other:
Special coatings (diaphragm)	□ PTFE □ Other:
Measuring system helium-tested	☐ Yes qpv= 10 ⁻⁶ ☐ No
Dial	☐ Single scale as per EN ☐ Dual scale: ☐ Special scale: Customer logo ☐ Yes ☐ No Manufacturer logo ☐ Yes ☐ No
Accuracy class	□ 0.25 □ 0.6 □ 1.0 □ 1.6 □ 2.5
Electrical contacts	□ No □ Magnetic spring contact □ Inductive contact □ Reed contact □ Electronic contact □ 1 x □ 2 x □ 3 x □ 4 x Switching function:
Other	

Checklist for enquiries - chemical seals

Company:	Project/enquiry:		
Quantity			
Application			
Medium to be measured			
Material for wetted parts			
Temperatures	T _{max} medium: T _{min} medium:	T _{max} ambient: T _{min} ambient:	
Pressure loads	Static:	Dynamic: from to	
Vacuum	☐ Yes ☐ No		
Special requirements			
	T	1	
Information on the pressure gauge	☐ Pressure gauge	☐ Pressure transducer	
Housing diameter	□ 63 □ 100 □ 16	50	
Range/measuring range			
Connection position	☐ Bottom ☐ Ba	ack	
See checklists "Pressure gauges" and "Pressure transducers" for additional specifications.			
	1		
Details on the chemical seal	☐ Diaphragm seal☐ In-line chemical seal☐	☐ Piston type chemical seal☐ Tongue type chemical seal	
l			
Process connection (thread type and size / nominal diameter and nominal pressure)			
nal diameter and nominal pressure)			
nal diameter and nominal pressure) Material			
nal diameter and nominal pressure) Material			
nal diameter and nominal pressure) Material Other	□ Yes □ No)	
nal diameter and nominal pressure) Material Other Fitting of pressure gauge to chemical seal	☐ Yes ☐ No		
nal diameter and nominal pressure) Material Other Fitting of pressure gauge to chemical seal Direct mounting Cooling element between pressure gauge		o m es □ No en pressure gauge and	
nal diameter and nominal pressure) Material Other Fitting of pressure gauge to chemical seal Direct mounting Cooling element between pressure gauge and chemical seal	☐ Yes ☐ No Capillary length Protective hose ☐ Ye Height difference between	o m es □ No en pressure gauge and	
nal diameter and nominal pressure) Material Other Fitting of pressure gauge to chemical seal Direct mounting Cooling element between pressure gauge and chemical seal Fitting with capillary tube	☐ Yes ☐ No Capillary length_ Protective hose ☐ Ye Height difference between chemical sealcr	m ss	
nal diameter and nominal pressure) Material Other Fitting of pressure gauge to chemical seal Direct mounting Cooling element between pressure gauge and chemical seal Fitting with capillary tube Calibration temperature	☐ Yes ☐ No Capillary length_ Protective hose ☐ Ye Height difference between chemical sealcr	m ss	
nal diameter and nominal pressure) Material Other Fitting of pressure gauge to chemical seal Direct mounting Cooling element between pressure gauge and chemical seal Fitting with capillary tube Calibration temperature Preferred filling liquid	☐ Yes ☐ No Capillary length_ Protective hose ☐ Ye Height difference between chemical sealcr	m ss	
nal diameter and nominal pressure) Material Other Fitting of pressure gauge to chemical seal Direct mounting Cooling element between pressure gauge and chemical seal Fitting with capillary tube Calibration temperature Preferred filling liquid	☐ Yes ☐ No Capillary length_ Protective hose ☐ Ye Height difference between chemical sealcr	m ss	
nal diameter and nominal pressure) Material Other Fitting of pressure gauge to chemical seal Direct mounting Cooling element between pressure gauge and chemical seal Fitting with capillary tube Calibration temperature Preferred filling liquid	☐ Yes ☐ No Capillary length_ Protective hose ☐ Ye Height difference between chemical sealcr	m ss	



Checklist for enquiries - pressure transducers

Company:	Project/enquiry:					
Quantity						
Application						
Medium to be measured						
Material for wetted parts						
Temperatures	T _{max} medium:		T _{max} ambi	ent:		
Pressure loads	Static:		Dynamic:	from	to	
Measuring principle	☐ Piezo-resistive☐ Capacitance c				meas □ Piezo-	resistive stainless steel uring cell resistive thin film uring cell
Measuring range						
Pressure type	☐ Relative pressi	ure	☐ Absolut	e pressur	re	☐ Differential pressure
Connection type/connection thread	☐ Standard ☐ G ☐ 1/8 ☐ Chemical seal Clamp connection Dairy fitting DIN	□ NPT □ 1/4 fitted:		☐ Other: ☐ ½		☐ Flush ☐ Other:
Housing	☐ Standard ☐ Field housing v	☐ Field	housing I	□ Subme		obe
Electrical connection	☐ Connector ISC☐ PUR cable☐ Plug connecto		☐ FEP cal		able	metres
Output signal	□ 4–20 mA	□ 0–20		□ 0–10 V		☐ Other:
Measuring accuracy	□ 0.1 □ 0.2	:5 [□ 0.35	□ 0.5		□ 1.0 % FSO
EX protection	□ No □ Yes	s, for zone:				
Accessories	☐ Digital display ☐ Digital plug-in ☐ Integrated disp ☐ Supply isolatio	display olay			□ With _	ut switching output switching outputs on amplifier
Other						



Checklist for enquiries - event reporting systems

Company:	Project/enquiry:				
Quantity					
Application					
Parameters to be monitored	□ Level □ Limit level □ Continuous □ Liquid □ Solid	□ Leak □ Tank leaks □ Pipe leaks □ Other:	☐ Hazards ☐ Gas ☐ Smoke ☐ Fire ☐ Water ☐ Low water ☐ Process temperature ☐ Room temperature ☐ Doors ☐ Windows ☐ Burglary		
	☐ Other parameters:				
Supply voltage	□ Battery □ N	Mains			
Data transmission	☐ GSM ☐ Telephone net				
Required alarm inputs	☐ Digital Number: ☐ Analogue Number :_				
Required alarms		Call ☐ Internet //isual ☐ Audible puts:	/E-mail □ Other:		
Remote data polling	☐ Not required ☐ Required – desired par				
Remote programming	☐ Not required ☐ Required – desired par	ameters:			
Safety function	☐ Not required ☐ Required – desired par	ameters:			
Data logging	☐ Not required ☐ Required – desired par	ameters:			
Data management and visualisation via Webservice (www.afriso-net.com)	☐ Not required ☐ Required – desired par	ameters:			
Other					



Checklist for enquiries - gas analysis

Company:	Project/enquiry:			
Quantity				
Application				
Type of gas to be measured (designation)	☐ Flue gas ☐ Inert gas	☐ Exhaust gas ☐ Process gas	☐ Natural	
Fuel type (for flue gas measurement)	☐ Gas	☐ Oil	□ Coal	□ Waste
Composition of gas to be measured	Concentration range	(physical unit)*		red component**
				_
Measuring point	*mg/m³, ppm, Vol. % Continuous measu	rement Isurement (selectable)		**Please check
Dew point of gas to be measured	Discontinuous mee	°C		
Separation of water possible?	☐ No ☐ Yes, gas cooler alre ☐ Yes, please offer ga	eady available		
Desired temperature in gas paths	☐ Not heated ☐ Frost protection ☐ High temperature v			
Pressure of gas at sampling point	☐ Minimum ☐ Mean ☐ Maximum	mbar mbar		
Temperature of gas at sampling point	☐ Minimum ☐ Mean ☐ Maximum			
Sampling point	☐ Outdoor ☐ Indoor ☐ Ex zone at samplin	g point, , Zone:	Groun	y.
Ambient temperature at installation site	☐ Minimum ☐ Mean ☐ Maximum	°C °C	, Group	, <u> </u>
Installation site	☐ Outdoor ☐ Indoor ☐ Ex zone at samplin Class:	g point, , Zone:	, Group);
Pollution of gas to be measured, e.g. tar fog, coal dust, fly ash, metal dust, etc.		_ mg/m³ _ mg/m³		



Checklist for enquiries - gas analysis

(cont.)

	I	
Corrosive gas components (please indicate com-		_ % by volume/ppm
ponent and concentrations)		_% by volume/ppm
		_ % by volume/ppm
Length of gas line between sampling point and		_ /o by volume/ppm
	☐ Not heated m	
gas analyser	☐ Heated m	
Number of measuring points	□1 □2 □3	
Output signals	□ 4–20 mA □ 0–10 V	
	□ 2–10 V □ 0–20 mA	
	☐ Interface:	
Automatic calibration		
Trationalio campration	☐ Yes _	
	□No	
Type of measuring system	☐ Portable	
	□ Mobile	
	Cabinet:	
	☐ Wall mounting	
	☐ 19" rack mounting	
	☐ Sheet steel	
	☐ Glass-fibre reinforced plastic	
	Mounting frame/Field device:	
	□ Cabinet	
	☐ Accessible container	
	☐ Wall mounting	
	□ wan mounting	
Measuring system	Emission measuring system ☐ No	
	T - 1	
	☐ Yes:	
	☐ TA-Luft	
	☐ 13. BlmSchV ☐ 17. BlmSchV	
	☐ 27. BlmSchV ☐ 30. BlmSchV	
	☐ Operational measurement	
	Process measurement:	
	☐ Yes:	
	☐ Chemical/petrochemical industry	
	☐ Other, specify industry:	
	U Other, specify industry.	
Other/system sketch		
,		



General Terms of Delivery

of AFRISO-EURO-INDEX GmbH · Lindenstraße 20 · 74363 Güglingen

§ 1 Validity

- (1) All our deliveries, services and offers are exclusively made on the basis of the General Terms of Delivery. These General Terms of Delivery are part of all contracts with our contract partners (hereinafter referred to as "customers") we conclude pertaining to the deliveries or services provided by us.
- (2) General terms and conditions of the customer shall only become part of the contract if we expressly consent to their validity in writing. This consent requirement shall apply in any and all cases, even if, for example, we carry out deliveries to the customer without expressly rejecting the customer's general terms and conditions even though we are aware of such terms and conditions.
- (3) Our General Terms of Delivery shall only apply if the customer is a business person (§ 14 BGB, German Civil Code), a legal person of public law or a public-law fund.
- (4) The General Terms of Delivery shall apply in particular to contracts covering the sale and/or delivery of movable goods ("goods"), regardless of whether we manufacture the goods ourselves or purchase them from suppliers (§§ 433, 651 BGB, German Civil Code). Unless otherwise agreed, the General Terms of Sale in the version valid at the time of the customer's order shall be deemed to be an outline agreement for future contracts of the same kind; we shall not be obliged to state their validity for each and every individual case.
- (5) Individual agreements with the customer (including supplementary agreements, amendments and modifications) which have been made in individual cases shall always take precedence over these General Terms of Delivery. The contents of such agreements shall be subject to a written contract and/or our written confirmation, subject to proof of the contrary.
- (6) Material declarations and notifications which are to submitted to us by the customer after conclusion of contract (e.g, deadlines, notification of defects, declaration of withdrawal or reduction) must be made in writing to be effective.
- (7) Any reference to the validity of statutory provisions is only for the purpose of clarification. Even without such a clarification, therefore, the statutory provisions shall apply if and to the extent that they have not been modified or expressly excluded in these General Terms of Delivery.

§ 2 Offer and conclusion of contract

- (1) All our offers are free and non-binding, unless they are expressly marked as binding or contain a certain acceptance period. We shall have the right to accept orders within a period of fourteen days after receipt.
- (2) The legal relationship between us and the customer shall be governed solely by the written purchase agreement, including these General Terms of Delivery. The written purchase agreement contains all agreements between the parties with regard to the contract. Any communication by us not made in writing prior to the conclusion of this contract is legally non-binding; any agreements of the contract parties not made in writing shall be replaced by the written contract, unless it is expressly stated that they shall be binding.
- (3) Amendments and modifications to the agreements, including these General Terms of Delivery, must be made in writing in order to be effective. With the exception of managers or authorized signatories, our employees are not entitled to make any differing verbal agreements. Transmission via telecommunication systems, in particular via fax or via e-mail, shall be deemed to be a sufficient instrument in writing, provided that the copy of the signed declaration is transmitted.
- (4) Any information or representation whatsoever on our part with regard to the delivery or service (such as, but not limited to weights, dimensions, performance values, loads, tolerances and technical data) shall be deemed to be approximate, unless the usability for the purpose provided by the contract requires accurate conformity. Such information or representations do

- not constitute guaranteed characteristics, but descriptions or markings of the delivery or service. Any standard deviations and deviations which are made according to statutory provisions or which represent technical improvements, as well as the replacement of components by equivalent parts, are permissible if they do not impair the usability for the purpose intended by the contract.
- (5) We reserve the right to property or copyright to all offers and cost estimates submitted by us as well as to all drawings, illustrations, calculations, brochures, catalogues, models, tools and other documents and equipment provided to the customer. The customer shall not be permitted to disclose these objects, as such or in content, to third parties, to make them known, to use them himself or through third parties or to reproduce them. At our request, he shall be obliged to completely return such objects to us and to destroy any copies produced if they are no longer required by him in the normal course of business or if negotiations do not lead to the conclusion of a contract. Storage of data provided electronically for the purpose of standard data backup shall be the only exception to this.

§ 3 Prices and payment

- (1) The prices apply to the scope of services and delivery specified in the order confirmations. Additional or special services will be charged separately. The prices are in EURO ex works plus packaging, the applicable value added tax, and, for export deliveries, customs duties as well as fees and other public charges.
- (2) If the agreed prices are based on our list prices and if the delivery is to be effected more than four months after conclusion of the contract, our list prices valid at the time of delivery shall apply (minus any percentage discount or fixed discount that may have been agreed).
- (3) Invoices shall be payable within 30 days from the invoice date without any deduction, unless otherwise agreed in writing. The date of unconditional credit on our business account shall be decisive for payment in due time. Payment by check shall be excluded, unless agreed separately, as the case may be. If the customer does not pay by the due date, an interest of 5 % per year shall be due on the amounts payable; we shall be entitled to claim higher interest and further damages.
- (4) Any set-off with counterclaims of the customer or retention of payments due to such claims shall only be permissible if and to the extent that such counterclaims are undisputed or asserted by a court.
- (5) We shall be entitled to deliver or provide outstanding deliveries or services after prepayment or provision of security if, after the conclusion of the contract, we become aware of circumstances which substantially reduce the creditworthiness of the customer and which jeopardise the payment of our outstanding claims arising from the contract against the customer (including claims from other individual contracts pursuant to the same outline agreement).

§ 4 Delivery and delivery period

- (1) Deliveries are made ex works.
- (2) Time limits and deadlines for deliveries and services mentioned by us are only approximate, unless a fixed deadline or a fixed date has been explicitly assured or agreed. If shipping has been agreed, delivery periods and delivery dates refer to the date of transfer to the forwarding agent, freight carrier or to any other third party in charge of shipping.
- (3) Without prejudice to our rights arising from default of the customer, we shall be entitled to demand from the customer an extension of delivery and performance periods or a postponement of delivery and performance dates for the period during which the customer does not meet his obligations pursuant to the contract.



- (4) We shall not be liable for impossibility of delivery or for delays in delivery, if such impossibility or delay is caused by force majeure or other events unforeseeable at the time of the conclusion of the contract which are beyond our control or for which we cannot be held responsible or which we have not caused (e.g. disruptions of operations of any kind, difficulties in procuring materials or energy, transport delays, strikes, lawful lockouts, lack of labour, energy or raw materials, difficulties in procuring necessary regulatory approvals, governmental measures, or incorrect or delayed supply by suppliers. Insofar as such events make the delivery or service substantially more difficult or impossible and the hindrance is not only of temporary duration, we are entitled to withdraw from the contract. In the case of hindrances of a temporary nature, the delivery or performance periods shall be extended or the delivery or performance dates shall be postponed by the period of the hindrance plus a reasonable start-up period. If, as a result of the delay, the customer cannot reasonably be expected to accept the delivery or service, the customer shall be entitled to withdraw from the contract, which is to be performed immediately by an instrument in writing.
- (5) We shall be entitled to deliver and provide partial deliveries and partial services only:
 - if the partial delivery is reasonable for the customer and sufficient consideration is given to his legitimate interests,
 - if the delivery of the remaining ordered goods is assured and
 - if, as a result, the customer does not incur any substantial additional costs or additional efforts (unless we are willing to pay for such costs).
- (6) If we are in default with a delivery or service or if a delivery or service is impossible for any reason whatsoever, our liability for compensation shall be limited pursuant to provision § 8 of these general Terms of Delivery.

§ 5 Place of performance, shipping, packaging, passage of risk, acceptance

- (1) The place of performance for all obligations resulting from the contract shall be the registered office of our company in Güglingen, unless other agreements have been made. If the installation is part of the contract, the place of performance shall be the place at which the installation is to be performed.
- (2) The type of shipping and packaging are subject to our discretion. The cost of shipping and packaging shall be borne by the customer. If the customer requires drop shipping delivery, we shall charge a processing fee of EUR 10.00 for each delivery.
- (3) In cases of small orders with a net purchase value of less than EUR 100.00, we will charge a processing fee of EUR 15.00 in addition to shipping and packaging.
- (4) The passage of risk to the customer shall be the point in time of the transfer of the good to be delivered (the beginning of the loading process being decisive) to the forwarding agent, freight carrier or to any other third party in charge of shipping. This shall also apply in the case of partial deliveries or if we have undertaken other obligations (e.g. shipping or installation). If the shipment or the transfer is delayed for a reason caused by the customer, the transfer of risk shall be the day on which the good to be delivered is ready for shipment and we have notified the customer to this effect.
- (5) Storage costs incurred by us after transfer of risk shall be borne by the customer. If we store the goods to be delivered, the storage costs amount to 0.25% of the invoice amount of the delivered goods per completed week. We reserve the right to assert and prove further or lower storage costs.
- (6) We shall provide for transportation insurance of the consignment.
- (7) If acceptance has to take place, the purchase item shall be deemed accepted if:
 - the delivery and, provided we also have to perform installation, the installation are completed,
 - we have communicated this to the customer with reference to the deemed acceptance in accordance with this provision § 5 (7) and have prompted the customer to accept the delivery,
 - 12 business days have passed since the delivery or installation, or the customer has begun to use the purchased item (e.g. a delivered plant has been put into operation) and, in

- this case, six workdays have passed since delivery or installation, and
- within this period, the customer has refused acceptance for any reason other than for a defect of which the customer has notified us and which substantially impedes or make impossible the use of the purchased item.

§ 6 Warranty, material defects, acceptance of the disposal obligation by the customer

- (1) The warranty period shall be one year from the date of delivery or, if acceptance is required, from the date of acceptance. This period shall not apply to claims for damages on the part of the customer resulting from injury to life, body or health or from wilful or grossly negligent breach of duty by us or our vicarious agents, which are subject to the limitation periods according to the statutory provisions.
- The goods delivered must be carefully inspected immediately after delivery to the customer or to the third party designated by the customer. With regard to obvious defects or other defects which would have been recognizable in the case of an immediate, careful examination, they shall be deemed to be accepted by the customer if we do not receive written notification of defects within seven workdays after delivery. With regard to other defects, the delivery items shall be deemed to have been accepted by the customer if the notice of defect does not reach us within seven workdays after the date of detection of the defect; if the defect was already recognizable by the customer at an earlier point in time in normal use, this earlier point in time shall be decisive for the beginning of the complaint period. Upon request by us, a rejected delivery item must be returned to us free of freight charges. In the case of a justified complaint, we shall reimburse the costs of the least expensive type of shipping; this shall not apply if the costs increase because the delivery item is located at a place other than the place of the intended use.
- 3) In the case of material defects of the goods delivered, we shall first be obliged and entitled to rectify or replace the goods within a reasonable time. In case of failure, i.e. impossibility, unreasonableness, refusal or unreasonable delay of the improvement or replacement delivery, the customer shall be entitled to withdraw from the contract or to reasonably reduce the purchase price.
- (4) Insignificant or typical variations in colour, dimensions, weight and quality shall not be considered to be defects of the delivery items
- (5) If a defect is the result of fault on our part, the customer shall be entitled to claim damages under the conditions stipulated in provision § 8 hereto.
- (6) In the case of defects of components of other manufacturers, which we cannot remedy for license or actual reasons, we will, at our discretion, assert our warranty claims against the manufacturers and suppliers on behalf of the customer or assign them to the customer. In the case of such defects, there shall only be warranty claims against us subject to the other conditions and according to the provisions of these General Terms of Delivery and only if the aforementioned claims against the manufacturer and suppliers could not be enforced or if such enforcement is futile, for example, due to insolvency. During the duration of the legal dispute, the period of limitation of the customer's warranty claims against us shall be suspended.
- (7) The warranty shall be void if the customer modifies the delivery item without our consent or has it modified by a third party and such modification renders the rectification of the defect impossible or unreasonable. In any such case, the customer shall bear the additional costs arising from such modification for rectification of the defect.
- (8) If, in individual cases, a delivery of used items is agreed with the customer, such delivery shall be performed under exclusion of any warranty for material defects.
- (9) The customer shall be obliged to dispose of the delivered goods when they are no longer used at his own cost and in full compliance with all pertinent regulations. The customer shall indemnify us from the obligations pursuant to § 10, section 2 of the German Electronic Equipment Act (obligation of manufacturers to take back their products) and from any claims of third parties related to this.



The customer shall contractually oblige any other commercial third party to which the customer transfers the delivered goods to dispose of such goods according to the pertinent regulations when such goods are no longer used. Our claim to the above transfer of obligation/indemnification through the customer shall be extended by a period of limitation of two years after the final termination of the usage of the delivery item. The two-year period of suspension of the limitation shall not begin until we receive a written notice from the customer stating that he has ceased to use the device.

§ 7 Infringement of property laws

- (1) Pursuant to this provision § 7, we shall ensure that the delivery item is free from industrial property rights or third-party copyrights. Each contract partner shall immediately notify the other contract partner in writing if claims with regard to the infringement of such rights are asserted against him.
- (2) In the event that the delivery item infringes an industrial property right or copyright of a third party, we shall, at our discretion and at our expense, alter or replace the delivery item in such a way that no rights of third parties are infringed, but the delivery item continues to fulfil the contractually agreed functions; or we shall enter into a license agreement in order to obtain the right to use the delivery item for the customer. If we should not be able to succeed within a reasonable period, the customer shall be entitled to withdraw from the contract or to reasonably reduce the purchase price. Any claims for damages of the customer are subject to the restrictions of provision § 8 of these General Terms of Delivery.
- (3) In the case of infringements of laws by products of other manufacturers delivered by us, we shall, at our discretion, assert our claims against the manufacturers and suppliers on behalf of the customer or assign such claims to the customer. In these cases, there shall only be claims against us subject to the provisions of this provision § 7 and only if the aforementioned claims against the manufacturer and suppliers could not be enforced or if such enforcement is futile, for example, due to insolvency.
- (4) If an order is to be filled (designs, etc.) according to customer specifications, drafts or instructions, the customer shall be fully responsible for obtaining all rights of commercial exploitation of the property rights that may be contained in his specifications, drafts or instructions. If the execution of an order according to specifications, etc. of the customer violates third-party property rights or labelling obligation, the customer shall undertake to indemnify us from any resulting claims for compensation, compensation for expenses and / or reimbursement of third parties.

§ 8 Liability for damages in case of fault

- (1) Our liability for damages, irrespective of the legal grounds, in particular from impossibility, delay, defective or incorrect delivery, breach of contract, breach of obligations in the case of contractual negotiations and tort, shall be limited subject to the provisions of this provision § 8.
- (2) We shall not be liable in the case of simple negligence on the part of our organs, legal representatives, employees or other vicarious agents, to the extent that this is not a violation of contractual obligations. Essential with regard to the contract are the obligation to deliver and/or install the delivery item in good time, its freedom from deficiencies in law and its freedom from defects which impair its functionality or usability more than insignificantly, as well as advisory, protection and custodial obligations which allow the customer to use the delivery item as per contract, or which serve the protection of the health or life of the customer's personnel or the protection of his property against substantial damage.
- (3) To the extent that we are liable for damages pursuant to provision § 8 (2) hereto, such liability shall be limited to damages which we have foreseen at the time of conclusion of the contract as a possible consequence of an infringement of the contract or which we should have foreseen applying due diligence. Indirect damages and consequential damages which are the result of defects of the delivery item shall only be subject to damages o the extent that such damage is typically to be expected when the delivery item is used as intended.

- (4) In the case of liability for simple negligence, our obligation to indemnify for damage to property and consequential financial loss shall be limited to the amount covered by our liability insurance and standard in our industry, even in the case of a breach of essential contractual obligations. Upon request, we will gladly provide the customer with a corresponding insurance confirmation stating the amount covered by the liability insurance carrier.
- (5) The above exclusions and limitations of liability shall apply to the same extent on behalf of our organs, legal representatives, employees and other vicarious agents.
- (6) If we provide technical information or consultancy services and such information or services are not a part of the scope of services agreed upon by contract and owed by us, this shall be free of charge and without any liability whatsoever.
- (7) The limitations of this provision § 8 shall not apply to our liability for intentional conduct, for guaranteed characteristics, for injury to life, body or health or pursuant to the German Product Liability Act (Produkthaftungsgesetz).

§ 9 Retention of title

- (1) We retain the title to the sold goods until we have received full payment of all our present and future receivables arising from the purchase contract and from an ongoing business relationship (secured claims).
- (2) Prior to full payment of the secured claims, the goods subject to retention of title shall neither be pledged to third parties nor transferred to third parties for security. The customer shall notify us in writing immediately if an application for the opening of insolvency proceedings is filed or if third parties attempt to seize the goods under retention of title (e.g. by means of distraint or attachment).
- (3) In the case of a breach of contract by the customer, in particular in the event of non-payment of the purchase price due, we shall be entitled to withdraw from the contract pursuant to the statutory provisions and to reclaim the goods as a result of retention of title and withdrawal. If the customer does not pay the purchase price due, we shall only be entitled to assert these rights if we have previously set the customer a reasonable deadline for payment without success, or if such a deadline is not required pursuant to the statutory provisions.
- (4) The customer shall be entitled to resell and/or process the goods under retention of title in the ordinary course of business, subject to revocation pursuant to (c) below. In this case, the following provisions shall apply in addition.
 - (a) The retention of title shall cover the full value of the products resulting from processing, mixing or combining our products; we shall be deemed the manufacturer. If, in the case of processing, mixing or combining with goods of third parties, their rights of ownership remain, we shall acquire co-ownership to the ratio of the invoice amounts of the processed, mixed or combined goods. The same provisions that apply to the goods delivered under retention of title shall apply to the resulting new product. (b) The customer shall assign to us, as a security, the claims arising against third parties from the resale of the goods or of the product in whole or to the amount of our possible co-ownership pursuant to the preceding paragraph. We accept the assignment. The obligations of the customer pursuant to provision § 9 (2) hereto shall also apply in respect of the assigned claims.
 - (c) The customer shall remain entitled to collect the claim in addition to us. We undertake not to collect the claim as long as the customer meets his payment obligations, as long as the customer performs and as long as we do not assert the retention of title by exercising a right pursuant to provision § 9 (3) hereto. If any of the above conditions are not met, we shall be entitled to request the customer to notify us of the assigned claims and the corresponding debtors and provide us with any information and the appropriate documents necessary for us to collect such claims, and to notify the debtors (third parties) of such assignment. In this case, we shall also be entitled to revoke the customer's authorization to resell and process the goods subject to retention of title.
 - (d) If the liquidable value of the securities exceeds our claims by more than 10 %, we shall, at the customer's request, release securities at our discretion.



§ 10 Final clause

- (1) If the customer is a merchant, a legal person under public law or a public-law fund or if the customer has no general court of jurisdiction in the Federal Republic of Germany, the place of jurisdiction for all disputes arising from the business relationship between us and the customer shall be our registered office in Güglingen or the registered office of the customer. However, in such cases, Güglingen shall be the exclusive place of jurisdiction for actions against us. This provision does not affect statutory provisions regarding exclusive places of jurisdiction.
- (2) The relations between us and our customers are subject exclusively to the laws of the Federal Republic of Germany. The United Nations Convention on Contracts for the International Sale of Goods (CISG) of April 11, 1980 shall not apply.
- (3) If and to the extent that the contract or these General Terms of Delivery contain gaps in the provisions, those statutory provisions shall be deemed to have been agreed upon which the contract parties would have agreed upon in view of the economic objectives of the contract and the purpose of these General Terms of Delivery if they had been aware of the gaps. Note

The customer shall be deemed to have been notified that we store data relating to the contractual relationship pursuant to § 28 Bundesdatenschutzgesetz (German Federal Data Protection Act) for the purpose of processing such data and that we retain the right to disclose such data to third parties (e.g. insurance companies) if and to the extent such disclosure is required to perform the contract.

November 2016

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