

Pressure and temperature measuring instruments for the  
**Shipbuilding Industry**



# WIKA – Part of your business



Alexander Wiegand, Chairman and CEO

In the course of the last five decades the name WIKA has become a symbol for sophisticated solutions in the field of pressure and temperature measurement. Our ever increasing ability is the basis for the implementation of innovative technologies in the form of reliable products and efficient system solutions.

Our top ranking in the world market today owes itself to the consistent devotion to ensure first class quality backed by more than 3,700 employees in the WIKA group of companies. Right from the outset more than 500 experienced distribution employees ensure that our customers are competently advised and individually serviced throughout the world.

The development and high-tech production in our own modern production facilities is the best guarantee for our flexibility. More than 200 engineers and technicians are searching continually to provide solutions for innovative products, improved materials and profitable production methods on behalf of WIKA. Not only due to close co-operation with recognised universities and institutions, but also direct contact with end-users, solutions for specific applications are developed and found.

More than 30 million quality products are delivered year in, year out, in more than 100 countries – worldwide some 300 million WIKA measuring instruments are in use.

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## This catalogue



The applications for pressure and temperature measuring instruments start on a yacht and go on to aircraft carriers. They stretch from the pressure gauge on the espresso machine, to diesel exhaust temperature measurement, to the regulation of the anchor chain stress on the hydraulic winches. And each application places particular demands on the instrument. Smallest nominal sizes, accuracy classes, vibration resistance, overpressure safety, salt water resistance etc. are only some of the criteria the instruments have to meet.

For all these pressure and temperature measuring devices and their accessories WIKA is the competent contact and

supplier. This catalogue gives you an overview of application-specific solutions with respect to the measurement of pressure and temperature in the shipbuilding segment. In order to assist you in making the right choice, several application examples are given for each instrument. The products presented here only show an excerpt from our range of products. Apart from the described products for shipbuilding applications, we offer a comprehensive standard range for the measurement of pressure and temperature, which is included in our full catalogue.

Special solutions geared to the individual requirements of your process will be developed in co-operation with you.

**Talk to us.**

## Our measuring instruments meet all the demands.

In view of the extreme mechanical and thermal stress that the instruments are exposed to and the aggressiveness of the surrounding media the quality demands are versatile.

In the following paragraphs the material requirements are explained in more detail:

### Cases

Choosing the right material for the case means taking care of parameters such as pressure, temperature and field conditions.

As explained above, those instruments that are in use on deck have to be resistant to sea water, but also below deck one can never exclude that a process medium can come in contact with the case (splash etc.).

For these rough surroundings WIKA offers cases made of stainless steel (usually 1.4301), steel (some versions galvanised), solid brass and grey cast iron. For other applications in less rough conditions WIKA instruments with aluminium or plastic case can be used.



### Metallic parts exposed to the medium

The main decider in this case is the characteristics of the medium measured that comes in contact with the pressure element and the pressure connection. For gaseous, liquid, aggressive and low-viscosity media that are not solids entrained WIKA uses stainless steel (e.g. pressure elements 1.4571 or 316L), for non-aggressive media a copper-zinc-alloy (brass) can be used.

For the stem of the thermometer similar conditions are valid, except that the viscosity and crystal formation of the media are less decisive. For the design and construction of thermowells, please look up the separate chapter "thermowells".

### Liquid filling

Many of the instruments made by WIKA can be filled with various liquids. This filling extenuates the movement of the measuring system and the pointer, so that an easier reading of the values can be reached. Pulsation, vibration and shock cannot affect the filled instrument as much as the dry version, and therefore the filling greatly contributes to a long service life of the instruments.

Glycerine 99.7% is used as standard. Other filling media used by WIKA are, for example, glycerine-water mixtures, silicon oils of different viscosities or inert filling liquids. Of course, customer specific media can be used for filling as well.



### Sealing material

The process medium, which is in direct contact to the sealing material, pressure and temperature are decisive factors for the selection of the appropriate sealing material for O-rings and also for separating diaphragms. Especially formulated elastomer compounds are mostly used. As standard WIKA offers the materials NBR (acrylonitrile-butadiene rubber), PTFE (polytetrafluoroethylene), FPM (fluorinated-propylene rubber) or EPDM (ethylene propylene-diene rubber). As an option in some cases FFPM (perfluorinated-propylene rubber) or CR (chloroprene rubber) are possibilities as well.

## We offer high-tech products for all types of ships.

Electrical systems for monitoring and control gain an ever increasing share in the shipbuilding industry. The growing complexity and size of the ships have a great influence on this development.

### Electric alarm contacts

(Data sheet AE 08.01)

Electric alarm contacts - mounted to mechanical pressure and temperature measuring instruments - make or break an electric control circuit depending on the position of the instrument's pointer. Thus they can be used for different control applications such as activation of screening processes in water treatment, switching pumps on and off etc.

WIKA delivers three different electric alarm contacts:

#### Sliding contacts:

To be used especially in temperature measurement instrumentation where the bimetal measuring systems have only minor actuating power or if there are operating conditions without vibrations. This type of contact is not suitable for liquid filled instruments.

#### Magnetic snap-action contacts:

This is the universal type of contacts to provide reliable service also with liquid filled instruments.

#### Inductive alarm sensors:

WIKA inductive contacts are certified for use in hazardous areas of Zone 1 and Zone 2. Power supply must be made by means of a power source certified intrinsically safe. They are also recommended for critical non-hazardous applications where an utmost of failsafe heavy duty operation is required. Due to the resin padded electronics they are fully suitable in corrosive atmosphere.



WIKA offers electric alarm contacts for gauges with 100 and 160 mm diameter and edgewise panel mounted gauges with the following dimensions: 96 x 96, 144 x 144 and 144 x 72. The number of contact sets can vary from one to three, the points of actuation are adjustable over the full extension of the scale graduation.

### Transmitters

(Data sheet AE 08.02)

WIKA pressure measuring instruments with built-in electric alarm contacts combine the advantages of local analogue indication with the demands for electrical signal transmission for modern measured value registration. This system allows large distances (remote reading) between measuring point and indicating instrument, and besides the signal can be used for a variety of electrical and electronic monitoring purposes.

WIKA supplies transmitters in two different versions:

**Model 891.34**, which generates the standard industrial output signals 4 ... 20 mA, 2-wire, and 0 ... 20 mA, 3-wire, via an integrated amplifier.

**Model 892.34**, for use in hazardous areas, with EC type test certificate and standard industrial output signal 4 ... 20 mA.

### Electric output signals

Depending on the version, WIKA measuring instruments provide different electric output signals, e.g. 4 ... 20mA, 0 ... 20mA, 0 ... 5 V, 0 ... 10 V. Zero and span can be adjusted.

Other output signals are available on request.

## Bus systems

The multifaceted applications of instruments with bus-capable systems can also be found in the shipbuilding industry:

Integrated bus-networks, bus-interfaces in automation systems, monitoring of aggregates or also single measuring values, e.g. in engine test benches, gas tanks etc., just to name some of them.

Compared to previously used systems bus-capable systems have various advantages, such as by far less wiring effort, higher accuracy due to the digital system, lower commissioning costs etc. But one of the main facts is that such a system offers greater safety in operation and facilitated service via remote transmission of measured data.

This way all aggregates on a ship can be controlled from only one place, while having documented the operating data and recorded and transmitted the notices of malfunction at the same time.

WIKA offers instrument models that, due to the use of standardised protocols, guarantee a trouble-free integration into the particular plant. WIKA provides pressure transmitters with PROFIBUS-DP, PROFIBUS-PA, HART, CAN or CANopen interface as well as temperature transmitters with PROFIBUS-PA and HART. On request WIKA can also provide all hardware (e.g. cables, plugs, repeaters, bus cards etc.) and software (e.g. drivers, visualisation and configuration software) that is necessary to build up a bus-network.

**With this range we present ourselves as a competent partner who can deliver complete systems from consulting to technologies – all from one source.**



## A suitable solution for all applications.

The connection of pressure and temperature measuring instruments to the process can be carried out directly or, depending on the media used, via diaphragm seals (please see extra chapter for details) or thermowells. In addition further mounting devices are available for the adjustment of the connection to the individual process requirements, e.g.:

- Surface mounting flange (back), mounted by means of three screws for wall mounting
- Panel mounting flange (front), mounted by means of three fixing screws, suitable for installation in switchboards, control boards
- Panel mounting narrow bezel and rear clamp, suitable for installation in switchboards, control boards
- Mounting clamp for wall and/or pipeline mounting

These options are available in several versions, depending on the model of the instrument, e.g. steel, brass, chrome-plated, polished, galvanised etc. But they cannot be combined arbitrarily. For details please see the price lists or the WIKA product configurator "Intelli Choice" on the WIKA CD-Rom.



The process connection for thermometers usually is a thermowell. This has the advantage that you can remove the instrument (for replacement or test/calibration) without having to vent, interrupt the plant or stop the process. In addition a thermowell prevents the thermometer from damage, which can be caused by high process pressures and flow rate, corrosive or abrasive media.

When choosing a suitable thermowell, parameters such as pressure, temperature, process medium, flow rate, density and viscosity have to be taken into account.

Moreover one has to make sure that the material chosen is suitable for the medium and that the given insertion dimensions (length and diameter) and the required process connection (screw-in, weld-in, flange) or thermometer connection (male/female thread) are taken into account. The thermowell material chosen has a considerable influence on the service life of the instrument. Corrosion or mechanical damage have to be excluded.

WIKA therefore offers a wide variety of materials, among others brass, steel, stainless steel or special materials such as Titanium, Hastelloy, Inconel or Monel etc. In addition coatings, for example of PFA, E-CTFE, Stellite or Tantalum, can be realised.

We deliver thermowells for all applications, solid machined or fabricated, with different threads and drill holes.

- Per DIN 43 772 in forms 5 (per old norm: BD), 6 (BE), 8 (CD) or 9 (CE), thermowells with welding neck in form 4 (per old norm D, replacement for BS and CS) or thermowells with flange.
- Of course those for our own thermometer as per WIKA-norm or per international standards.
- Customer specific thermowells can be calculated, constructed, manufactured and delivered in-house.

For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de) under "download" or request them directly from us. An additional process connection possibility is the use of capillary tubes. They are used for pressure gauges and thermometers alike to bridge greater distances between measuring and read point or to provide better protection for the measuring instrument against strong vibrations, high temperatures etc.

## WIKA measuring instruments are subject to thorough tests.



The requirements that are placed on measuring instruments in the shipbuilding industry are extremely high: Shock, vibration, humidity, salt water, impact, heat, low temperatures, dust and electromagnetic radiation – just to name some of them. The tests stipulated by classification societies are recognised and accepted worldwide.

WIKA instruments are type-tested according to these regulations. They are durable and work reliably in the aggregates installed on ships.

Supporting certificates according to different standards are available on request, depending on the instrument version, e.g. PTB (Physikalisch-Technische Bundesanstalt), CSA (Canadian Standards Association), BAM (Bundesamt für Materialforschung und Prüfung), Gosstandard Russia, TÜV (Technischer Überwachungsverein) etc.

For thermowells test certificates such as 3.1B can be requested as well.

## We rely on a tried and tested technology.

WIKA looks back on more than 50 years experience on the pressure measurement sector. The know-how gained in this time is reflected by the range of products offered. Indicating instruments for gauge, absolute and differential pressure with bourdon tube, diaphragm or capsule pressure element have been tested millions of times over. The pressure elements are made of copper alloys, alloyed steels or for particular applications of special materials. These instruments cover pressure ranges from 0 ... 2.5 mbar up to 0 ... 4,000 bar and accuracies of up to 0.1%. They can be equipped with mechanical, electrical and electronic accessories and combined with a variety of diaphragm seal solutions.

The following instruments are from our standard range and are especially suited for applications in the shipbuilding industry. But as all WIKA products can be used for many different tasks, there may also be other applications than those listed in the appropriate field.



### Pressure gauge model 131.11

For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us.

(Data sheet PM 01.05)

Application	HP- /LP-gauge
Nominal size	40, 50, 63
Scale ranges	NS 40 mm: -1 ... 1.6 to -1 ... 600 bar; NS 50 mm: -1 ... 1 to -1 ... 600 bar; NS 63 mm: -1 ... 1 to 1 ... 1,000 bar
Accuracy class	2.5
Operating temperature	ambient: -40 ... +60 °C, medium: +100 °C maximum
Material	case, pressure connection, pressure element and movement stainless steel; window polycarbonate



- American Bureau of Shipping
- Det Norske Veritas
- Germanischer Lloyd
- Lloyds Register of Shipping
- Nippon Kaiji Kyokai
- Registro Italiano Navale

### Pressure gauge model 111.12



For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us.

(Data sheet PM 01.09)

Application	on analysis instruments and for other pressure measurements with low mechanical stress
Nominal size	40, 50, 63, 80, 100
Scale ranges	-1 ... 0.6 to -1 ... 400 bar
Accuracy class	2.5
Operating temperature	ambient: -40 ... +60 °C, medium: +60 °C maximum
Material	case black plastic, nominal size 100 black steel; pressure connection, pressure element and movement copper alloy; window plastic
Options	black finish steel case, knife edge pointer, accuracy class 1.6

Also available with radial connection, model 111.10 (Data sheet PM 01.01). With this version also in nominal size 160 (case steel).

### Pressure gauge model 212.20



For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us.

(Data sheet PM 02.01)

Application	HP- /LP-gauge
Nominal size	100, 160
Scale ranges	-1 ... 0.6 to -1 ... 1,000 bar, NS 160 mm up to 1,600 bar max.
Accuracy class	1.0
Operating temperature	ambient: -40 ... +60 °C, medium: +80 °C maximum
Material	case and pressure element ≥ 100 bar stainless steel; pressure connection, pressure element < 100 bar and movement copper alloy; window instrument glass
Degree of protection	IP 54
Options	liquid filling, higher medium temperature, alarm contacts



**Pressure gauge model 214.11**

For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us.

(Data sheets PM 02.07 and PM 02.08)

Application	HP- /LP-gauge for panel mounting
Nominal size	48 x 24, 72 x 36, 72 x 72, 96 x 96
Scale ranges	-1 ... 0.6 to -1 ... 40 bar, NS 72 x 72 up to 400 bar, NS 96 x 96 up to 1,000 bar,
Accuracy class	1.6
Operating temperature	ambient: -20 ... +60 °C medium: +60 °C maximum
Material	case size 48 x 24 and 72 x 36, pressure connection up to 600 bar, pressure element and movement copper alloy; Case NS 72 x 72 and 96 x 96 and pressure connection from 600 bar steel; window instrument glass
Options	alarm contacts, pressure system stainless steel (model 234.11)



**Pressure gauge model 213.40**

For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us.

(Data sheet PM 02.06)

Application	HP- /LP-gauge, e.g. cooling water pressure
Nominal size	63, 100
Scale ranges	-1 ... 0.6 to -1 ... 1,000 bar
Accuracy class	NS 63 mm: 1.6 NS 100 mm: 1.0
Operating temperature	ambient: -20 ... +60 °C medium: +60 °C maximum
Material	case solid brass; pressure connection, pressure element and movement copper alloy; window acrylic glass
Degree of protection	IP 65
Liquid filling	glycerine 99.5%



**Pressure gauge model 213.53**

For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us.

(Data sheet PM 02.12)

Application	HP- /LP-gauge, e.g. pumping pressure
Nominal size	50, 63, 80, 100
Scale ranges	NS 50: -1 ... 1 to -1 ... 600 bar; from NS 63: -1 ... 0.6 to -1 ... 1,000 bar
Accuracy class	up to NS 63: 1.6, from NS 80 mm: 1.0
Operating temperature	ambient: -20 ... +60 °C medium: +60 °C maximum
Material	case stainless steel with pressure relief (transportation, adjustment, operation); pressure connection, pressure element and movement copper alloy; window plastic
Degree of protection	IP 65
Liquid filling	glycerine 99.7%
Options	NS 50, 63: pressure element and movement stainless steel; NS 63, 100: Internal pressure compensation; NS 100 zero point adjustable at front; higher medium temperature to 100 °C



**Pressure gauge model 232.30**

For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us.

(Data sheet PM 02.04)

Application	Safety pressure gauge class S3 per EN 837, HP- /LP-gauge, e.g. inlet/outlet pressure on aggregates
Nominal size	63, 100, 160 mm
Scale ranges	NS 63 -1 ... 1 to -1 ... 1,000 bar; NS 100: -1 ... 0.6 to -1 ... 1,000 bar; NS 160: -1 ... 0.6 to -1 ... 1,600 bar
Accuracy class	NS 63: 1.6, ≥ NS 100: 1.0
Operating temperature:	ambient: -40 ... +60 °C medium: +200 °C maximum
Material	case, pressure connection, pressure element and movement stainless steel; case with solid baffle wall and blow-out back; window laminated safety glass
Degree of protection	IP 65
Options	alarm contacts



**Pressure gauge model 232.50**

For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us.

(Data sheet PM 02.02)

Please refer to model 232.30 with the following modifications:  
case without solid baffle wall and blow-out back



**Pressure gauge model 233.30**

For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us.

(Data sheet PM 02.05)

Please refer to model 232.30 with the following modifications:

Operating temperature	ambient: -20 ... +60 °C medium: +100 °C maximum
Liquid filling	glycerine 99.7%
Options	IP 66, NS 63: class 1.0



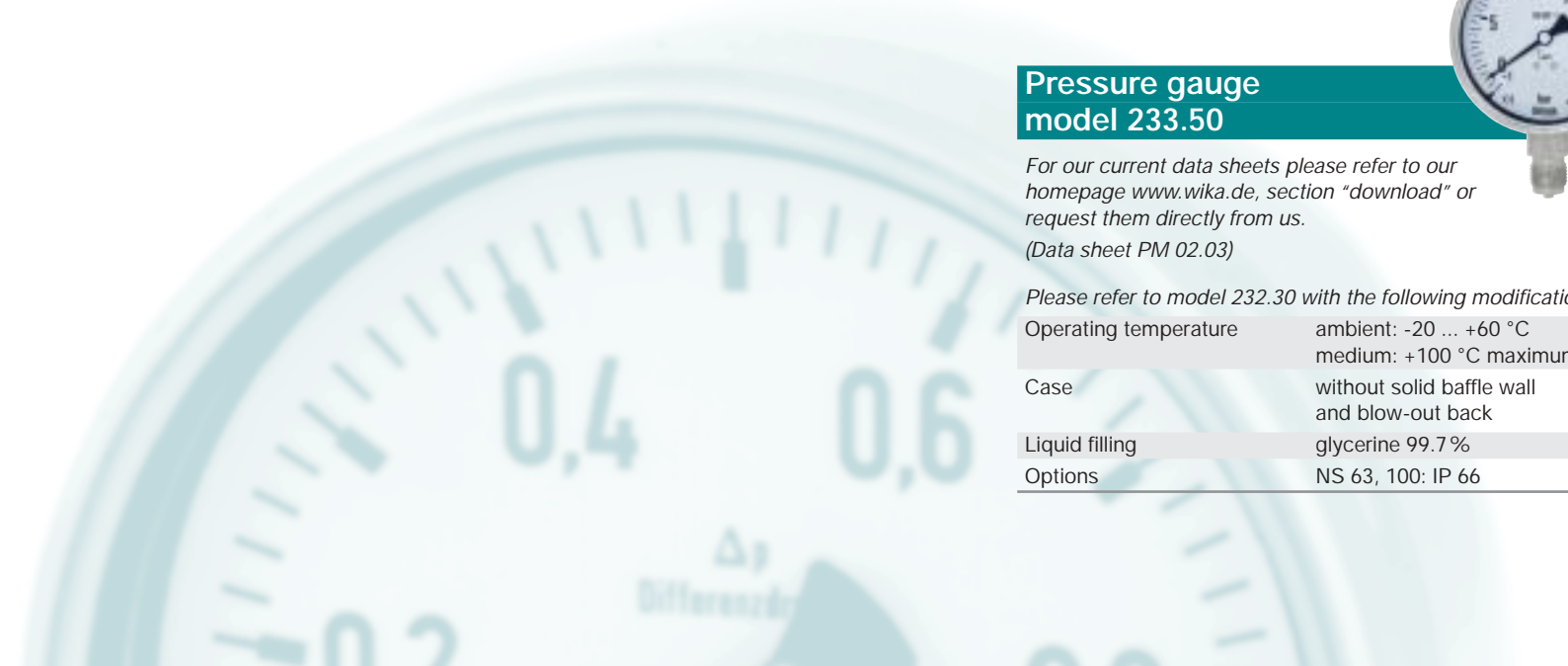
**Pressure gauge model 233.50**

For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us.

(Data sheet PM 02.03)

Please refer to model 232.30 with the following modifications:

Operating temperature	ambient: -20 ... +60 °C medium: +100 °C maximum
Case	without solid baffle wall and blow-out back
Liquid filling	glycerine 99.7%
Options	NS 63, 100: IP 66





**Pressure gauge model 312.20**

For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us.  
(Data sheet PM 03.01)

Application	testing and calibration
Nominal size	160
Scale ranges	-1 ... 0.6 to -1 ... 600 bar
Accuracy class	0.6
Operating temperature	ambient: -40 ... +60 °C medium: +60 °C maximum
Material	case and pressure element > 100 bar stainless steel; pressure connection, pressure element to 100 bar and movement copper alloy; window instrument glass
Degree of protection	IP 54
Options	higher medium temperature, alarm contacts, transmitter, liquid filling



**Pressure gauge model 332.30**

For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us.  
(Data sheet PM 03.05)

Application	testing and calibration
Nominal size	160
Scale ranges	-1 ... 0.6 to -1 ... 1,600 bar
Accuracy class	0.6
Operating temperature	ambient: -40 ... +60 °C medium: +200 °C maximum
Material	case, pressure connection, pressure element up to 1,000 bar and movement stainless steel; pressure element > 1,000 bar Ni-Fe-alloy; window laminated safety glass
Degree of protection	IP 54
Options	alarm contacts, liquid filling (model 333.30)



**Pressure gauge model 611.10**

For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us.  
(Data sheet PM 06.01)

Application	mbar-gauge, e.g. for analysis instruments at low pressures
Nominal size	50, 63
Scale ranges	-1 ... 25 to -1 ... 600 mbar NS 50 only from -1 ... 60 mbar
Accuracy class	1.6
Operating temperature	ambient: -20 ... +60 °C medium: +100 °C maximum
Material	case steel; pressure connection, pressure element and movement copper alloy; sealing ring NBR (Buna rubber); window acrylic glass
Degree of protection	IP 32
Options	pressure element stainless steel, high overpressure and vacuum safety



**Differential pressure gauge model 732.51 / 733.51**

For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us.  
(Data sheet PM 07.05)

Application	level measurement in pressure tanks, monitoring of pumping pressure, pressure drop in charge air cooler
Nominal size	100, 160
Scale ranges	-1 ... 16 mbar to 0 ... 25 bar, and all corresponding negative / positive scale ranges
Accuracy class	1.6
Operating temperature	ambient: -20 ... +60 °C medium: +100 °C maximum
Material	wetted parts, movement and case stainless steel and NiCrCo-alloy; window laminated safety glass
Degree of protection	IP 54
Options	liquid filling glycerine 99.7% (model 733.51), transmitter, alarm contacts (for maximum level control of the liquid column), lateral connection, medium temperature > 100 °C, medium temperature < -20 °C pressure equalising valve, IP 65

**Differential pressure gauge model 702.01.100**



For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us.  
(Data sheet PM 07.15)

Application	Filter monitoring, flowmeter, pump monitoring
Nominal size	100; working pressure gauge NS 23
Scale ranges	differential pressure 0 ... 0.25 to 0 ... 25 bar; working pressure 0 ... 25 bar
Accuracy class	differential pressure 2.5 working pressure 4
Operating temperature	ambient: -10 ... +70 °C medium: +90 °C maximum
Material	case and measuring medium chamber GDAISI 12 (Cu) 3.2982; pressure element for differential pressure stainless steel, for working pressure copper alloy; movement copper alloy; sealing rings NBR or FPM; window acrylic glass
Degree of protection	IP 54
Options	degree of protection IP 65, class 1.6 for differential pressure gauge scale ranges from 0 ... 1 bar, integrated pressure equalising valve

**Differential pressure gauge model 702.02.100 / 702.03.100**



For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us.  
(Data sheets PM 07.16 and PM 07.19)

Please refer to model 702.01.100 with the following modifications:

Application	combination differential pressure gauge and pressure switch, monitoring of oil flow in heat transfer oil plants as per DIN 32 727, also with component approval to ensure flow protection and safeguard flow in steam boilers as per VdTUV Code of Practice flow 100, filter monitoring and pump control in bilge water de-oiling systems
Electrical contact	one or two micro switch contacts, with setting range from 10% – 100% of span, for an increased rupturing capacity, wiring with cable gland M16 x 1.5
Options	wiring with terminal box, cable gland M20 x1.5, measuring medium chamber of stainless steel

**Differential pressure switch model 851.02.100**



For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us.  
(Data sheet PM 07.17)

Please refer to model 702.02.100 with the following modifications:

Application	pressure switch, for example for monitoring of oil pump, no indication of measured pressure, for example for oil pump and filter monitoring as well as pump control in bilge water de-oiling systems
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**Differential pressure transmitter model 891.34.2189**



For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us.  
(Data sheet PM 07.18)

Please refer to model 702.01.100 with the following modifications:

Application	differential pressure transmitter, as an option with LCD-Display, no indication of working pressure, filter monitoring, pump monitoring and control in drinking water treatment systems
Operating temperature	ambient: -10 ... +50 °C medium: +80 °C maximum
Degree of protection	IP 54
Output signal:	4 ... 20 mA or 0 ... 20 mA

# Many years of experience sets the stage for new solutions.



Right from the start WIKA has actively promoted the trend towards electronic pressure measurement. The know-how gained for mechanical pressure instruments in more than 50 years served as the basis of a wide variety of innovative sensors and transmitters for electronic pressure measurement.

WIKA offers a complete range of electronic pressure measuring instruments: pressure sensors, pressure switches, pressure transmitters, and transmitters with Turn down (UniTrans) for the measuring of gauge, absolute and differential pressure. Our pressure gauges are available in the measuring ranges 0 ... 0.6 mbar to 0 ... 8,000 bar. These instruments come supplied with standardised current or voltage output signals, interfaces and protocols for various types of field buses. Whether ceramic thick film, metal thin film or piezo-resistive, WIKA is the only manufacturer worldwide that produces the full range of essential sensor technologies in-house possible today. Whether SMD automatic insertion machines, CNC automatic machining centres, welding robots, laser welding, sputterers, thermotransfer printing or thin film production – we exploit all possibilities to achieve above average results.

Whether standard instrument or customer specific version – we are ready to meet every application with the optimum solution. The following instruments are from our standard range and are especially suited for applications in the shipbuilding industry. But as all WIKA products can be used for many different tasks, there may also be other applications than those listed in the appropriate field.

## Pressure transmitter model ECO-1

For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us.

(Data sheet PE 81.14 and PE 81.18)

Application	HP- /LP-transmitter, oil pressure, cooling water pressure, intake air pressure
Pressure ranges	0 ... 1 to 0 ... 1,000 bar
Accuracy class	1% of span (0.5% BFS)
Operating temperature	ambient: -30 ... +80 °C medium: -40 ... +100 °C
Material	wetted parts and case stainless steel
Output signals	4 ... 20 mA, 2-wire; 1 ... 5 V, 3-wire; 1 ... 6 V, 3-wire; 0 ... 10 V, 3-wire
Degree of protection	IP 65 (IP 67 with flying leads)



## Pressure transmitter model S-10

For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us.

(Data sheet PE 81.01 and PE 81.17)

Application	HP- /LP-transmitter, regulation of anchor chain stress, oil pressure, cooling water pressure
Pressure ranges	-1 ... 1 to -1 ... 4,000 bar
Accuracy class	0.5% of span, (0.25% BFS)
Operating temperature	ambient: -20 ... +80 °C medium: -30 ... +100 °C
Material	wetted parts and case stainless steel
Output signals	4 ... 20 mA, 2-wire; 0 ... 20 mA 2-wire; 0 ... 5 V, 3-wire; 0 ... 10 V, 3-wire
Degree of protection	IP 65 to IP 68
Option	Ex-approved version (model IS-10, Data sheet PE 81.22), higher medium temperature



## Pressure transmitter model MH-1

For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us.

(Data sheet PE 81.21)

Application	(mobile-)hydraulic systems
Pressure ranges	0 ... 60 to 0 ... 600 bar
Accuracy class	1% of span, (0.5% BFS)
Operating temperature	ambient: -30 ... +85 °C medium: -40 ... +125 °C
Material	wetted parts and case stainless steel
Output signals	4 ... 20 mA, 2-wire; 1 ... 5 V, 3-wire
Degree of protection	IP 65 to IP 69K (depending on electrical connection)



## Pressure transmitter model D-10-7/D-10-9

For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us.

(Data sheets PE 81.30 and PE 81.31)

Application	precision measurement at engine test benches, e.g. fuel pressure, oil pressure, cooling medium pressure
Pressure ranges	0 ... 250 mbar to 0 ... 1,000 bar
Accuracy class	0.25% temperature drift included, optional: 0.1%
Operating temperature	ambient: -20 ... +80 °C medium: -20 ... +80 °C
Material	Case and wetted parts stainless steel
Output signals	Profibus DP protocol (model D-10-7), CANopen protocol (model D-10-9)
Degree of protection	IP 65



## Differential pressure transmitter model 891.34.1998

For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us.

(Data sheet PE 81.70)

Application	level measurement in pressure tanks, part of a diagnostic system to compare different pressures against each other, pressure drop in charge air cooler
Pressure ranges	0 ... 6 mbar to 0 ... 25 bar
Gauge head diameter (mm)	140 (mbar pressure range), 78 (pressure range ≥ 100 mbar)
Max. static pressure	< 100 mbar-ranges: 2.5 bar (optional 10 bar), ≥ 100 mbar-ranges 25 bar (optional 40 bar)
Output signal	4 ... 20 mA, 0 ... 20 mA
Linearity of span	1.2%
Operating temperature	ambient: -20 ... +60 °C medium: -25 ... +100 °C
Material	wetted parts and case stainless steel and NiCrCo-alloy
Degree of protection	IP 65
Options	linearity of span 0.8%, explosion protection

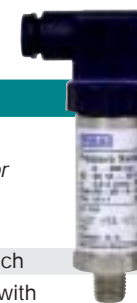


## Pressure switch model PS-20

For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us.

(Data sheet PE 81.28)

Application	oil pressure switch
Special feature	1 or 2 switches with respectively 2 variably configurable switching points
Pressure ranges	-1 ... 0.25 to -1 ... 1,000 bar
Accuracy adjustment of switching points	1% of span, (0.5% BFS)
Operating temperature	ambient: -20 ... +80 °C medium: -30 ... +100 °C
Material	wetted parts and case stainless steel
Degree of protection	IP 65 to IP 68
Options	programming module, higher medium temperature





**Pressure switch model 875.09**

For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us.

(Data sheet PE 81.35)

Application	HP- /LP-switch
Pressure ranges	-1 ... 1 to 0 ... 600 bar
Switching points	1 or 2 switching outputs, make or break
Repeatability	≤1% of span
Operating temperature	ambient: -20 ... +80 °C medium: -20 ... +80 °C
Material	wetted parts brass (version from 60 bar stainless steel 1.4571); case brass (version from 60 bar aluminium gold-anodised); top plastic
Degree of protection	IP 65 (IP 67 with flying leads)

**Level probe model LS-10, LH-10 and IL-10**

For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us.

(Data sheets PE 81.09 and PE 81.23)

Application	level measurement, floating dredge
Pressure ranges	0 ... 100 mbar to 0 ... 25 bar
Accuracy class	0.5% of span, 0.25% (model LH-10)
Operating temperature	medium: -10 ... +50 °C
Material	case, pressure connection and diaphragm stainless steel; protection cap PA (stainless steel with model IL-10); cable PUR
Output signals	4 ... 20 mA, 2-wire
Degree of protection	IP 68 to 100 m resp. to 300 m (models LH-10 and IL-10) immersion depth
Options	higher medium temperature with Teflon-cable model LH-10, Ex-approved version (model IL-10), other output signals (only model LH-10)



A variety of products with one feature in common:  
**Reliability.**

Temperature is an indicator of the thermal condition of a homogenous material or body. It expresses the energy of motion that is contained in the molecules of the material. Transmission of temperature from one body to another, e.g. process medium and thermometric sensor, requires close physical contact between both bodies to achieve thermal equilibrium. Conventional temperature measurement is based on the property of certain materials to alter their physical shape or volume proportional to the temperature applied.

The most commonly used principles at WIKA are as follows: Glass thermometers with liquid expansion, bimetal or gas actuated thermometers with temperature ranges from -200 °C to +700 °C. Based on these measuring methods, WIKA offers a comprehensive range of thermometers, which covers applications of various trades ranging from heating systems to the offshore-industry.

The following instruments are from our standard range and are especially suited for applications in the shipbuilding industry. But as all WIKA products can be used for many different tasks, there may also be other applications than those listed in the appropriate field.

**Machine glass thermometer model 32**

For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us.

(Data sheet TM 32.02)

Application	temperature compressor stage in- and outlets
Measuring principle	liquid expansion
Nominal size	110 x 30, 150 x 36 and 200 x 36
Location of stem	straight, 90° angle and 135° angle
Scale ranges	-60 ... +40 °C to 0 ... 200 °C
Limit of error	DIN 16 195
Pressure rating of stem	max. 6 bar
Material	case aluminium; thermometer glass insert prismatic capillary

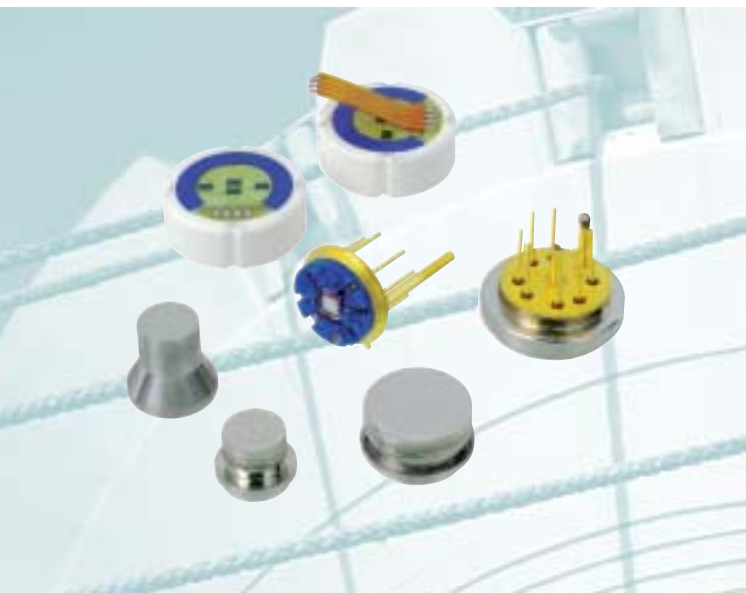


**Bimetal thermometer model 54**

For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us.

(Data sheet TM 54.01)

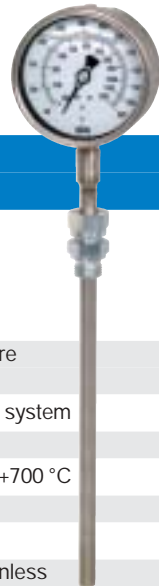
Application	oil temperature, cooling water temperature
Temperature element	coiled bimetal
Nominal size	63, 80, 100
Scale ranges	-70 ... +30 °C to 0 ... 500 °C
Accuracy class	1
Pressure rating of stem	max. 25 bar
Material	case and stem stainless steel; Connection partly Al-casting (with radial bottom connection); window instrument glass
Degree of protection	IP 56
Options	liquid filling to max. 250 °C, window of laminated safety glass



### Gas actuated thermometer model 73

For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us.  
(Data sheet in preparation)

Application	exhaust temperature measurement
Temperature element	inert gas expansion system
Nominal size	100
Scale ranges	0 ... +500 °C to 0 ... +700 °C
Accuracy class	1
Pressure rating of stem	max. 25 bar
Material	case and stem stainless steel; window laminated glass; liquid filling silicon oil
Degree of protection	IP 56



### Combi-thermometer model 73

For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us.  
(Data sheet in preparation)

Please refer to model 73 with the following modifications:

Application	for dual mechanical and electrical temperature measurement. With thermocouple type K (class 2), fitted from the back of the neck tube
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## Precision instruments provide precise measurements.

For electrical temperature measurement WIKA develops and manufactures resistance thermometers and thermocouples. Resistance thermometers are equipped with sensor elements on the basis of metallic conductors which change their electrical resistance dependent on temperature. They are suitable for applications between -200 °C and +600 °C (dependent on instrument model, sensor element and materials coming into contact with the medium). Thermocouples are temperature sensors that directly supply a voltage dependent on the temperature without additional power supply due to their thermo-electric properties. They are suitable for applications between -100 °C and +1,800 °C (dependent on instrument model, type of thermocouple and materials coming into contact with the medium).

In our range of products you will find instrument models with flying leads as well as versions with connection head. Connection to electronic evaluation systems (controller, display, recorder, etc.) is possible. A temperature transmitter can be installed in the connection head. Transmitters convert the temperature dependent change in resistance or in voltage of the a.m. instruments into a load independent current standard signal. The measured value input is converted into a linear output signal. In this case the 4 ... 20 mA signal is the most frequently used one. Sensor errors and the measured value can be signalled at the same time through a current loop. WIKA offers a comprehensive program of high-end digital or analogue temperature transmitters. You as our customer can choose between both, instruments with 4 ... 20 mA output signal as well as HART- and PROFIBUS-PA interface.

Our program is completed by a range of digital temperature indicators and controllers.

The following instruments are from our standard range and are especially suited for applications in the shipbuilding industry. But as all WIKA products can be used for many different tasks, there may also be other applications than those listed in the appropriate field.

### Thermocouple model TC191

For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us.  
(Data sheet TE 69.01)

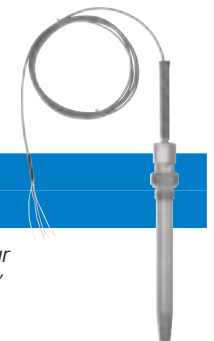
Application	exhaust gas temperature, for diesel engines and turbines
Application range	depending on sensor up to +850 °C
Sensor	thermocouple (simplex or duplex) type J or L up to +600 °C, thermocouple (simplex or duplex) type K up to +850 °C
Limiting deviation of the sensor	class 2 according to DIN EN 60 584
Operating ambient temperature	+200 °C max.
Material	thermowell stainless steel 1.4571; cable silicon glass fibre with galvanised steel net
Options	straight or angled design, field case as connecting box, thermocouple type L (non standard)



### Resistance thermometer model TR192

For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us.  
(Data sheet TE 69.05)

Application	exhaust gas temperature, for diesel engines and turbines
Application range	up to +600 °C
Sensor	1x Pt100 4-wire
Limiting deviation of the sensor	class B according to DIN EN 60 751
Operating temperature	+200 °C
Material	thermowell stainless steel 1.4571; cable Teflon-glass fibre with galvanised steel net
Option	field case as connecting box





**Thermocouple model TC192**

For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us.  
(Data sheet TE 69.05)

Please refer to model TR192 with the following modifications:

Sensor	Thermocouple (simplex or duplex) type J up to +600 °C or type K up to +850 °C
Limiting deviation of the sensor	class 2 according to DIN EN 60 584
Cable	glass fibre with galvanised steel net
Option	thermocouple type L (non standard)



**Resistance thermometer model TR197**

For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us.  
(Data sheet TE 69.15)

Application	hand held for temperature measurement in stored goods
Application range	-40 °C ... +70 °C
Sensor	1x Pt100, 2x Pt100; 2-, 3- or 4-wire, 1x Pt500 2-wire, 1x Pt1000 2-wire
Limiting deviation of the sensor	class A, B according to DIN EN 60 751; 1/3 DIN B at 0 °C
Material	sensor stainless steel 1.4571; cable neoprene sheathed
Degree of protection	IP 67
Option	field case as connecting box



**Resistance thermometer model TR291 / TR292**

For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us.  
(Data sheet TE 69.20)

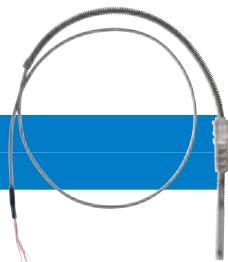
Application	temperature measurement in pipelines and at aggregates, e.g. air, steam, gas
Application range	depending on type of sensor -250 °C up to +600 °C
Sensor	1x Pt100, 2x Pt100, 1x Pt500 and 1x Pt1000; 2-, 3- or 4-wire; measuring insert replaceable
Limiting deviation of the sensor	class A or B according to DIN EN 60 751
Material	thermowell stainless steel 1.4571
Options	fixed measuring insert (model TR292), Elwika connector in lieu of connection head



**Resistance thermometer model TR293**

For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us.  
(Data sheet TE 69.25)

Application	exhaust gas temperature, for engines and turbines
Application range	up to +600 °C
Sensor	1x Pt100 2-wire
Limiting deviation of the sensor	class B according to DIN EN 60 751
Operating temperature	ambient: up to +200 °C
Material	thermowell stainless steel 1.4571



**Resistance thermometer model TR195**

For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us.  
(Data sheet TE 69.10)

Application	temperatures at moving parts such as bearings, arbors
Application range	-50 °C ... +200 °C
Sensor	1x Pt100, 2x Pt100, 1x Pt500 and 1x Pt1000; 2-, 3- or 4-wire
Limiting deviation of the sensor	class A or B according to DIN EN 60 751
Material	sensor stainless steel 1.4571; cable Teflon with shielding foil of aluminium
Degree of protection	IP 67
Option	field case as connecting box



**Resistance thermometer model TR221 / TR223**

For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us.  
(Data sheet TE 60.18, TR223 with integrated transmitter)

Application	several temperature measurements
Application range	-50 °C ... +250 °C
Sensor	1x Pt100 2-wire, 1x Pt100 3-wire (only for TR221)
Limiting deviation of the sensor	class B according to DIN EN 60 751
Operating temperature	ambient: max. 125 °C at connector, for model TR223 -40 °C ... +85 °C for transmitter
Transmitter	measuring range -50 °C ... 150 °C, output signal 4 ... 20 mA 2-wire
Material	process connection and thermowell stainless steel 1.4571
Degree of protection	IP 65
Options	quick connection plug

**Thermocouple model TC293**

For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us.  
(Data sheet TE 69.25)

Please refer to model TR293 with the following modifications:

Sensor	Thermocouple (simplex or duplex) type J up to +600 °C or type K up to +850 °C
Limiting deviation of the sensor	class 2 according to DIN EN 60 584
Option	thermocouple type L (non standard)





**Resistance thermometer model TR791**

For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us. (Data sheet TE 69.30)

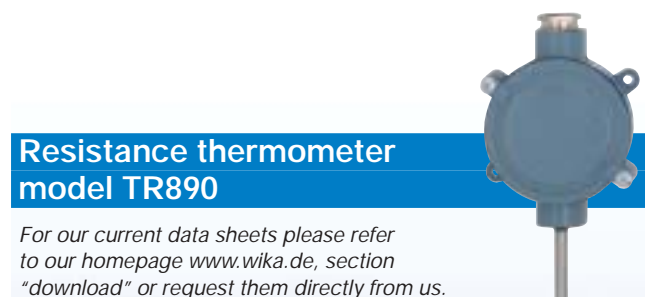
Application	stern tube
Application range	up to +600 °C
Sensor	1x Pt100 2-, 3- or 4-wire 2x Pt100 2-wire
Limiting deviation of the sensor	class A or B according to DIN EN 60 751
Material	sheathing stainless steel 1.4571; cable Teflon with shielding foil of aluminium
Degree of protection	IP 67
Option	field case as connecting box

**Thermocouple model TC791**

For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us. (Data sheet TE 69.30)

Please refer to model TR791 with the following modifications:

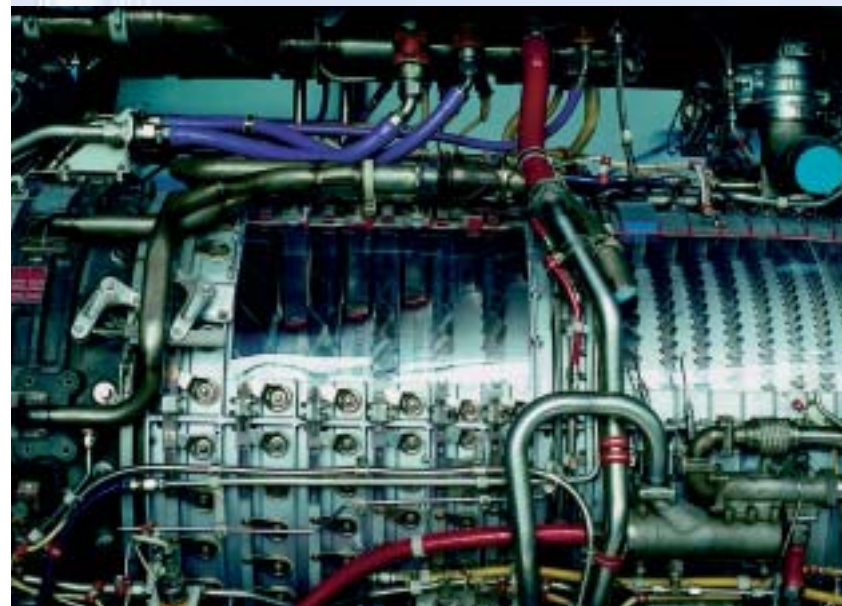
Sensor	Thermocouple (simplex or duplex) type J up to +800 °C, type K up to +1,200 °C
Limiting deviation of the sensor	class 2 according to DIN EN 60 584
Material	PVC cable
Option	thermocouple type L (non standard)



**Resistance thermometer model TR890**

For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us. (Data sheet TE 69.35)

Application	inside and outside temperatures
Application range	-40 °C ... +80 °C
Sensor	1x Pt100, 2x Pt100, 1x Pt500 and 1x Pt1000; 2-, 3- or 4-wire (4-wire only for 1x Pt 100)
Limiting deviation of the sensor	class A or B according to DIN EN 60 751
Material	sensor stainless steel 1.4571
Degree of protection	IP 67



**Temperature transmitter model T12 – T42**

For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us. (Data sheets TE 12.01 to TE 42.01)



WIKA temperature transmitters are available as head or rail mounted versions with analogue or digital outputs.

The customer can choose between fixed and configurable (via solder bridges, potentiometer and PC ) measuring ranges. The output signals 4 ... 20 mA 2-wire, also with HART-Protocol and field bus protocol PROFIBUS-PA, are available.



## Our products work vigorously even under extreme conditions.

Our know-how on the subject of diaphragm seal systems is appreciated and recognised internationally. In combination with diaphragm seals, which are available in many different designs and special materials, pressure gauges, pressure transducers, pressure transmitters and pressure switches can be used even under extreme conditions.

Thanks to the diaphragm seals the measuring instruments are suited to extreme temperatures as well as aggressive, corrosive, heterogeneous, abrasive, highly viscous or toxic media. A diaphragm made of an appropriate material separates the pressure medium from the pressure instrument, and a suitable liquid for the respective application hydraulically transmits the pressure to the instrument's sensing element. Due to highly sophisticated technologies, and our know-how on the subject of diaphragm seal systems, it is possible to realise almost any design and combination of materials. Pressure ranges from approx. 10 mbar to 1,600 bar can be handled. WIKA offers diaphragm seals, which are mounted to existing screw connections, and a special version, the in-line design. Diaphragm in-line seals are ideal for use with flowing process media, as they are completely integrated in the process line.

The following instruments are from our standard range and are especially suited for applications in the shipbuilding industry. But as all WIKA products can be used for many different tasks, there may be other applications than those listed in the appropriate field.



### Diaphragm seal model 990.10

For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us. (Data sheet CS 99.01)

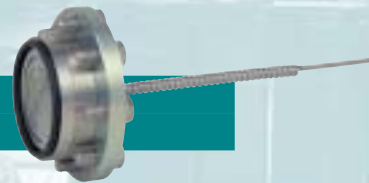
Application	to combine with bourdon tube pressure gauges, suitable for corrosive, contaminated, hot or viscous pressure media
Design	upper and lower housing threaded with internal diaphragm with diaphragm bed
Pressure rating	PN 25 ... 250
Suitable pressure ranges	0 ... 0.6 bar to 0 ... 250 bar
Material	upper housing, lower housing and diaphragm stainless steel; washer FPM; fastening parts galvanised steel
Options	other materials for all a.m. parts



### Diaphragm seal model 990.15

For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us. (Data sheet CS 99.14)

Application	specifically for connection with mounting flange or saddle flange, to combine with bourdon tube pressure gauges, suitable for corrosive, contaminated, hot or viscous pressure media
Design	body with sealing face and integral diaphragm to be sandwiched between flanges
Pressure rating	PN 100 or 250 bar
Suitable pressure ranges	0 ... 0.6 bar to 0 ... 250 bar
Material	body, diaphragm and hexagonal bolts stainless steel; sealing ring FPM; retainer flange steel
Options	other materials for all a.m. parts



### Diaphragm seal model 990.27

For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), "download" or request them directly from us.

(Data sheet CS 99.04)

Application	to combine with pressure gauges and transmitters for applications that place high requirements on the measuring instruments, suitable for corrosive, contaminated, hot or viscous pressure media
Design	DN ≤ 25/1" open flange with internal diaphragm with contoured diaphragm bed, DN ≥ 40/1½" body with sealing face and flush diaphragm with contoured diaphragm bed
Pressure rating	DN 15 ... 125 mm or DN ½ to 4 inch
Suitable pressure ranges	25 mbar and higher, depending on diaphragm size and process conditions with transmitter
Material	body, diaphragm, capillary extension, protective sheathing and instrument connection stainless steel
Options	other materials for body, diaphragm, capillary extension and protective sheathing



A great number of other diaphragm seals in different designs are available from our standard range.

# We devote our attention to even the smallest detail.

Besides pressure and temperature measuring instruments WIKA also offers the suitable range of accessories:



## Digital indicator model DI 20

For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us. (Data sheet TE 88.06)

Application	for displaying and monitoring the measured values of electrical thermometers or transmitters with standard signals
Multi-function input	thermocouple, resistance thermometer, current and voltage signals
Dimensions	96 x 48 mm
Display	4-digit display
Options	with up to three alarm outputs, retransmission output, serial communication, transmitter supply



## Attachable indicator model A-AI-1 and A-IAI-1

For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us. (Data sheet PE 82.11)

Application	attachable display for pressure transmitters and resistance thermometers with 4 ... 20 mA output and L-plug according to DIN 43 650
Dimensions	50 x 50 (display only)
Display	4-digit display
Degree of protection	IP 65



## Digital indicator model DI 35

For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us. (Data sheet in preparation)

Please refer to model DI 20 with the following modifications:

Display	5-digit display
Options	Up to four alarm outputs



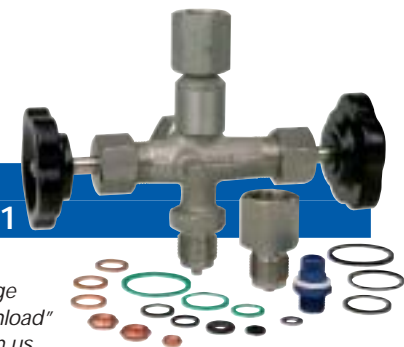
## Power supply units models A-VA-1, A-IVA-1, A-VB-1 and KFD2-STC4-Ex1



For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us. (Data sheet PE 82.06, GERMAN only)

Application power supply units	models A-VA-1 and A-VB-1 for power supply of up to ten transmitters
Application galvanic separator	model A-IVA-1 for separating electric circuits between intrinsically safe Ex-approved transmitters and non intrinsically safe digital displays, e.g. tank monitoring
Application Ex-feed separators	model KFD2-STC4-Ex1 for power supply of Ex-approved transmitters

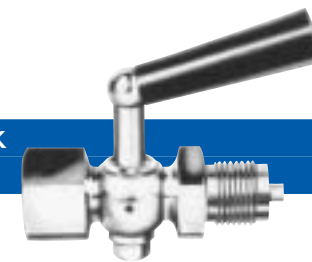
## Pressure gauge valve model 910.11



For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us. (Data sheet AM 09.02)

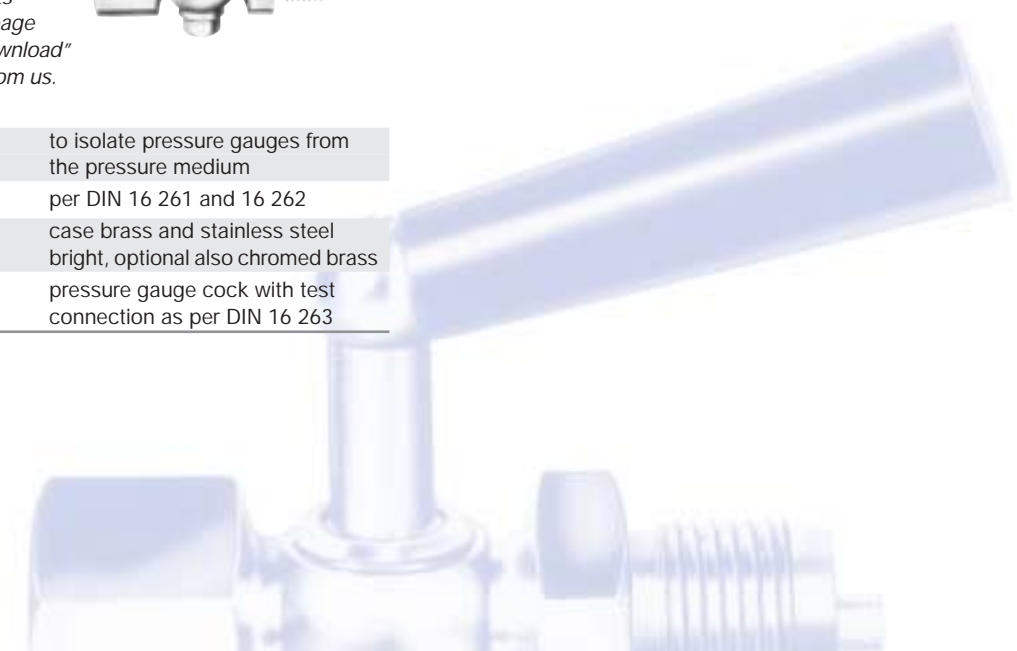
Application	isolation and throttle unit for pressure gauges, suitable for fluids, gases and steam
Design	plain valves per DIN 16 270, plain valves with test connection per DIN 16 271, valves with blocking test connection per DIN 16 272
Material	body brass for nominal pressure up to 250 bar, temperature range -10 ... +120 °C; carbon steel for nominal pressure up to 400 bar, temperature range -10 ... +120 °C; stainless steel for nominal pressure up to 400 bar, temperature range -20 ... +200 °C
Pressure connection	G 1/2 per EN 837-1/7.3, test connection M 20 x 1.5
Options	degreased for oxygen use, test certificate 3.1 B, pressure connection M 20 x 1.5 or 1/2 NPT

## Pressure gauge cock model 910.10



For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us. (Data sheet AM 09.01)

Application	to isolate pressure gauges from the pressure medium
Designs	per DIN 16 261 and 16 262
Material	case brass and stainless steel bright, optional also chromed brass
Options	pressure gauge cock with test connection as per DIN 16 263



### Pressure gauge snubber model 910.12



For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us. (Data sheet AM 09.03)

Application	to suppress the effect of pressure pulses and pressure peaks
Pressure connection	G 1/2 x G 1/2 B per EN 837-1/7.3
Material	body brass, spindle 1.4104, sealing Buna rubber for nominal pressure up to 250 bar, temperature range -10 ... +120 °C; body steel, spindle 1.4104, sealing Buna rubber for nominal pressure up to 400 bar, temperature range -10 ... +120 °C; body and spindle stainless steel 1.4571, sealing Viton for nominal pressure up to 400 bar, temperature range -10 ... +120 °C.
Options	degreased for oxygen use, inspection certificate per DIN 50 049/EN 10 204, pressure connection G 1/2, G 3/8, M 20 x 1.5, 1/2 NPT, 1/4 NPT

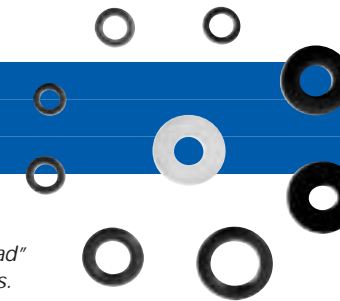
### Pressure gauge adapter model 910.14



For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us. (Data sheet AM 09.05)

Application	for the installation of pressure gauges, pressure gauge valves, snubbers and other pressure gauge accessories
Design features:	male-female, female-female, male-male, self-sealing nipple, LH-RH union, union nut with nipple, compression fitting with ferrule, flange with lens-type sealing ring, weld-on adapter
Materials	brass, steel, stainless steel
Options	chromed brass, threaded other than G

### Pressure gauge sealing washer model 910.17



For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us. (Data sheet AM 09.08)

Application	for reliable sealing of pressure gauges, valves and other fittings
Versions	Form 1 to fit spigot-type pressure gauge connectors as form B to EN 837-1, Form 2 self-centring in the bore hole, intended for pressure gauges not featuring a spigot or sealing shoulder
Materials	copper, nickel, asbestos free Novapress 300, aluminium, steel, stainless steel 1.4571, PTFE



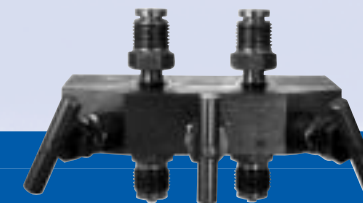
### Surface mounting bracket model 910.16



For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us. (Data sheet AM 09.07)

Application	to provide a means of surface mounting for pressure gauges and other indicating instruments, to fit the bracket normally requires an adapter, also available are brackets that will hold a pressure gauge directly.
Designs	surface mounting (as per DIN 16 281, form H); surface, pipe of structurals mounting (as per DIN 16 281, form A)
Materials	form H aluminium casting or stainless steel; form A tempered steel casting; direct fitting surface mounting bracket steel

### Pressure equalising valve model 910.25



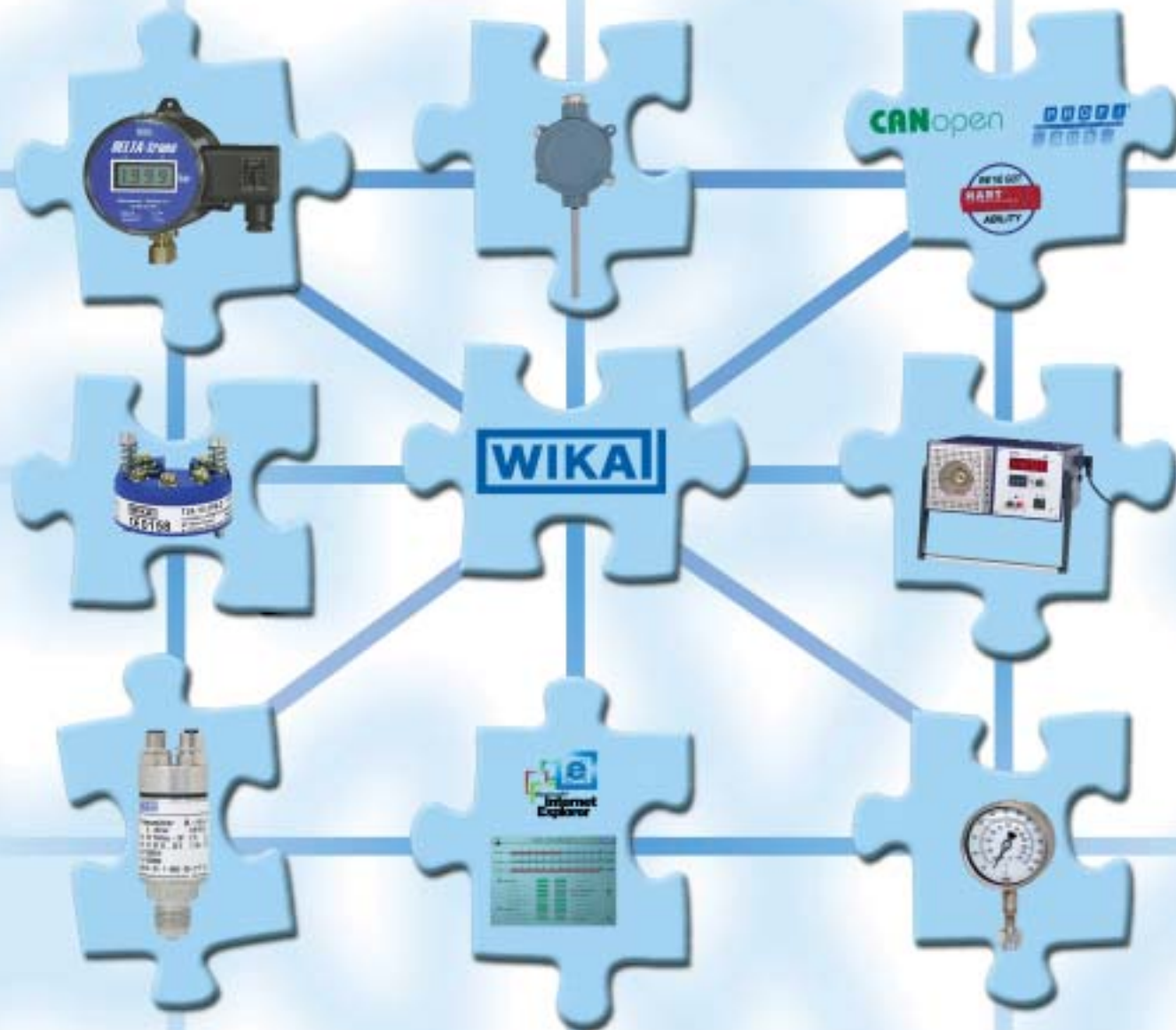
For our current data sheets please refer to our homepage [www.wika.de](http://www.wika.de), section "download" or request them directly from us. (Data sheet AM 09.11)

Application	to fit differential pressure gauges and transmitters, suitable for liquid and gaseous pressure media, pressure ratings of PN 40, 100 and 400 are available
Designs	one-way valve manifolds, three-way valve manifolds, five-way valve manifolds
Materials	case copper alloy (PN40) or stainless steel (PN 100 and 400); spindle and valve cone stainless steel; gland packing NBR (PN 40) or PTFE (PN 100 und 400)

## Special requirement requests are a standard at WIKA.

The products presented here only show an excerpt from our range of products. In co-operation with you we want to develop process solutions that are customised and precisely designed for your exact requirements. Seen in this way we look upon ourselves not only as a supplier of measuring instruments, but as the competent contact for all questions and problems regarding pressure and temperature measurement.

There are more than 40 development engineers available in Klingenberg alone to service and fulfil your project and tasks. They are supported by a team of well trained product managers and field staff. We thus ensure that you as our customer are competently advised and served on site. Be it new measurement applications above or below water, above or below deck – we are ready to offer you the solution. **Talk to us.**



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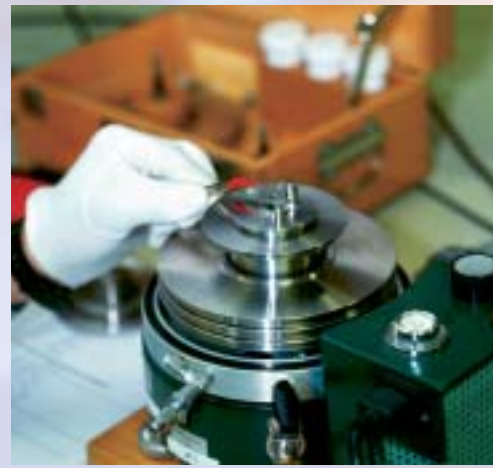
# A clever move



Product quality, safety in operation and efficiency are in direct line with an exact and reliable collection of process data.

WIKA is the reliable partner for all calibrating and service tasks for pressure and temperature instruments.

WIKA's calibrating and service centre has been accredited per DIN EN ISO/IEC 17025 and has been a member of the German calibration service (DKD) since 1982.



### ■ Calibrating on the highest level

In the DKD-laboratory your equipment is checked against its measuring characteristics. We are working according to national and international regulations and norms, e.g. DKD-R 6-1 (calibration of pressure measuring instruments) or EA-4/17 (calibration of pressure balances). The documentation is done via an internationally recognised DKD calibration certificate.



### ■ DKD laboratories for pressure, temperature and mass

For calibrating pressure and temperature measuring instruments we use most modern techniques in our new laboratories. For bourdon tube pressure gauges and pressure transmitters, for controllers and piston manometers, for contact thermometers and temperature dry well calibrators – you can always profit from our extensive long term experience. Especially for calibrating the mass circulation of piston manometers we hold an accreditation for mass as a measured variable.



### ■ To us service is more than just a word

In case one of your instruments does not fulfil the requirements right from the start, we can remedy deficiencies (pressure and temperature) in our service department immediately. As an independent service provider we offer this service for instruments of all makes.



### ■ On-site service

You do not want to send your instruments off site to someone else? In this case we offer our on-site service. WIKA owns two fully air-conditioned calibrating and service vehicles, by which we can carry out DKD calibrations and repair on-site. Moreover we hold an approval for on-site calibration in your plant, which is especially recommended for complex precision measurement.



### ■ Consulting/training

If you plan an enlargement of your instrument pool, we can produce our experience for choosing the right solution. Together with a team of testing and calibration experts customised solutions and also a ready to use plug and play system are developed. Of course the installation on-site as well as training of the personnel is included.



Our calibration training is individually designed for your requirements. Focus can be put on both, theory and practice of calibrating techniques. In addition topics concerning service, e.g. adjustment can be chosen.

# Conversion table on commonly used pressure units

## SI units – Engineering units (based on the metre)

		SI units						Engineering units					
to		bar	mbar	µbar	Pa	kPa	MPa	mmHg	mmWS	mWS	kp/mm <sup>2</sup>	kp/cm <sup>2</sup>	atm
SI units	from 1 bar	1	10 <sup>3</sup>	10 <sup>6</sup>	10 <sup>5</sup>	100	0,1	750.064	10,1972	10,1972	10,1972	1,01972	0,986923
	1 mbar	10 <sup>-3</sup>	1	10 <sup>3</sup>	100	0,1	0,1	750,064	10,1972	10,1972	10,1972	1,01972	0,986923
	1 µbar	10 <sup>-6</sup>	10 <sup>-3</sup>	1	0,1	0,1	0,1	750,064	10,1972	10,1972	10,1972	1,01972	0,986923
	1 Pa	10 <sup>-5</sup>	0,01	10	1	10 <sup>-3</sup>	10 <sup>-6</sup>	7,50064	101,972	101,972	101,972	10,1972	9,86923
	1 kPa	0,01	10	10	10 <sup>3</sup>	1	10 <sup>-3</sup>	7,50064	101,972	101,972	10,1972	10,1972	9,86923
	1 MPa	10	10	10	10 <sup>6</sup>	10 <sup>3</sup>	1	7,50064	101,972	101,972	101,972	10,1972	9,86923
	1 mmHg	1,33322	1,33322	1,33322	133,322	133,322	133,322	1	13,5951	13,5951	13,5951	1,35951	1,31579
Engineering units	1 mmWS	98,0665	98,0665	98,0665	9,80665	9,80665	9,80665	73,5561	1	10 <sup>-3</sup>	10 <sup>-6</sup>	0,1	96,7841
	1 mWS	98,0665	98,0665	98,0665	9,80665	9,80665	9,80665	73,5561	10 <sup>3</sup>	1	10 <sup>-3</sup>	0,1	96,7841
	1 kp/mm <sup>2</sup>	98,0665	98,0665	98,0665	9,80665	9,80665	9,80665	73,5561	10 <sup>6</sup>	10 <sup>3</sup>	1	100	96,7841
	1 kp/cm <sup>2</sup>	0,980665	0,980665	0,980665	98,0665	98,0665	98,0665	735,561	10	10	0,01	1	0,967841
	1 atm	1,01325	1,01325	1,01325	101,325	101,325	101,325	760	10,3323	10,3323	10,3323	1,03323	1
	1 Pa	10 <sup>-5</sup>	0,01	10	1	10 <sup>-3</sup>	10 <sup>-6</sup>	7,50064	101,972	101,972	101,972	10,1972	9,86923

Corresponding pressure units: 1 Pa = 1 N/m<sup>2</sup> 1 hPa = 1 mbar 1 mmHg = 1 Torr 1 kp/cm<sup>2</sup> = 1 at (atü)

**Notes:**  
The table refers to DIN 1301 Part 1 (1993) and Part 3 (1979). In accordance with the Execution Ordinance to the law on units in metrology (Federal German Units Ordinance) from 13th December 1985 only the following units are admissible for pressures: ■ pascal (Pa) ■ bar (bar) ■ millimetre of mercury (mmHg), but only for blood pressure and the pressure of other physical liquids in medicine.

Valid for these units in accordance with Federal German Unit Ordinance are the definitions and conversion factors per DIN 1301. Listed in Part 1 of this standard: ■ pascal as derived SI unit with special name and with special unit symbol ■ bar as generally applicable unit outside the SI ■ millimetre of mercury as unit outside the SI with limited area of application.

Part 3 of this standard defines amongst other things conversion factors for the following units: ■ conventional millimetre of mercury (mmHg) ■ conventional metre of water (mWS) ■ torr (Torr) ■ technical atmosphere (at) ■ standard atmosphere (atm).

## SI units – Engineering units (based on the foot)

		SI units						Engineering units			
to		bar	mbar	µbar	Pa	kPa	MPa	psi	ft H <sub>2</sub> O	in. H <sub>2</sub> O	in. Hg
SI units	from 1 bar	1	10 <sup>3</sup>	10 <sup>6</sup>	10 <sup>5</sup>	100	0,1	14,50377	33,4553	401,463	29,52998
	1 mbar	10 <sup>-3</sup>	1	10 <sup>3</sup>	100	0,1	0,1	14,50377	33,4553	401,463	29,52998
	1 µbar	10 <sup>-6</sup>	10 <sup>-3</sup>	1	0,1	0,1	0,1	14,50377	33,4553	401,643	29,52998
	1 Pa	10 <sup>-5</sup>	0,01	10	1	10 <sup>-3</sup>	10 <sup>-6</sup>	0,1450377	0,334553	4,01463	0,2952998
	1 kPa	0,01	10	10	10 <sup>3</sup>	1	10 <sup>-3</sup>	0,1450377	0,334553	4,01463	0,2952998
	1 MPa	10	10	10	10 <sup>6</sup>	10 <sup>3</sup>	1	0,1450377	0,334553	4,01463	0,2952998
	1 psi	68,94757	68,94757	68,94757	6,894757	6,894757	6,894757	1	2,30666	27,6799	2,036020
Engineering units	1 ft H <sub>2</sub> O	29,8907	29,8907	29,8907	2,98907	2,98907	2,98907	433,5275	1	12	0,8826709
	1 in. H <sub>2</sub> O	2,49089	2,49089	2,49089	0,249089	0,249089	0,249089	36,12729	83,3333	1	73,55591
	1 in. Hg	33,86389	33,86389	33,86389	3,386389	3,386389	3,386389	0,4911542	1,132925	13,59510	1
	1 Pa	10 <sup>-5</sup>	0,01	10	1	10 <sup>-3</sup>	10 <sup>-6</sup>	0,1450377	0,334553	4,01463	0,2952998

Corresponding pressure units: 1 Pa = 1 N/m<sup>2</sup> 1 psi = 1 lbf/in.<sup>2</sup> 1 mmHg = 1 torr 1 kgf/cm<sup>2</sup> = 1 at

**Notes:**  
The table refers to ISO 31-1:1992 and ISO 31-3:1992. For lengths ISO 31-1 defines conversion factors for units no longer to be used: ■ inch (in) ■ foot (ft). For pressures ISO 31-3 defines conversion factors for units no longer to be used: ■ pound-force per square inch (lbf/in.<sup>2</sup>) ■ conventional millimetre of water (mmH<sub>2</sub>O) ■ conventional millimetre of mercury (mmHg) ■ torr (Torr) ■ technical atmosphere (at) ■ standard atmosphere (atm).

# Conversion factors for temperature

## Temperature scales

°C: degree Celsius, °F: degree Fahrenheit, K: Kelvin

	°C	°Réaumur	°F	K	°Rankine
Boiling point of water (at 1 atm = 101325 Pa)	100	80	212	373.15	671.67
Freezing point of water (at 1 atm = 101325 Pa)	0	0	32	273.15	491.67
Interval freezing point/boiling point of water	100	80	180	100	180
Triple point of water (equilibrium solid-liquid-gaseous)	0.01	0.008	32.02	273.16	491.69

### Conversion formula

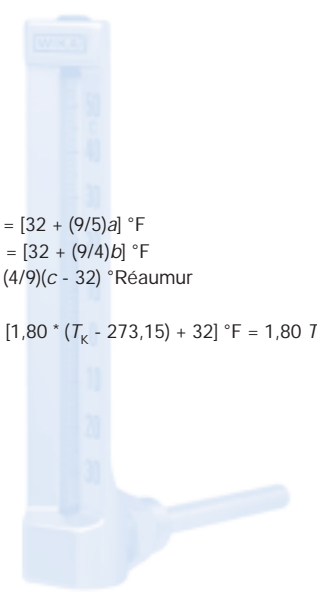
$$a \text{ } ^\circ\text{C} = (4/5)a \text{ } ^\circ\text{Réaumur} = [32 + (9/5)a] \text{ } ^\circ\text{F}$$

$$b \text{ } ^\circ\text{Réaumur} = (5/4)b \text{ } ^\circ\text{C} = [32 + (9/4)b] \text{ } ^\circ\text{F}$$

$$c \text{ } ^\circ\text{F} = (5/9)(c - 32) \text{ } ^\circ\text{C} = (4/9)(c - 32) \text{ } ^\circ\text{Réaumur}$$

$$t \text{ } ^\circ\text{C} = (t + 273,15) \text{ K}$$

$$T_K \text{ K} = (T_K - 273,15) \text{ } ^\circ\text{C} = [1,80 * (T_K - 273,15) + 32] \text{ } ^\circ\text{F} = 1,80 T_K \text{ } ^\circ\text{Rankine}$$



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