

Mechanical Temperature Measuring Instruments



WIKAI

 Part of your business

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Fully automatic production of standard pressure gauges



The modern high-bay warehouse ensures efficient logistics

Ability to meet any Challenge

Our knowledge for your success

In the course of the last six 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 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 5,600 employees in the WIKA group of companies. Right from the outset more than 500 experienced distribution employees alone ensure that our customers are competently advised and individually serviced throughout the world.

Certified quality

The WIKA quality assurance management system has been certified in accordance with ISO 9001:2001 since 1994. The quality and safety standards of our company meet the standard systems of several countries.

Made by WIKA

The development and high-tech production in our owned modern production facilities (Germany, Brazil, China, India, Canada, Poland, Switzerland, South Africa and U.S.A.) is the best warranty for our flexibility.

Whether SMD automatic insertion machines, CNC automatic machining centres, welding robots, laser welding, sputters, thermotransfer printing or thin film production - we exploit all possibilities to achieve above-average results.

And the end result: More than 43 million quality products are delivered year in, year out, in more than 100 countries. This means some 350 million WIKA measuring instruments in use all over the globe.



DKD accredited calibration laboratories for pressure, temperature and mass

WIKA Product lines

The WIKA programme covers the following product lines for various fields of application.

Electronic Pressure Measuring Instruments

WIKA offers a complete range of electronic pressure measuring instruments: pressure sensors, pressure switches and pressure transmitters for the measurement of gauge, absolute and differential pressure. Our pressure measuring instruments are available in the measuring ranges 0...0.6 mbar to 0...15,000 bar. These instruments come supplied with standardised current or voltage output signals (also intrinsically safe or with flameproof enclosure according to ATEX), interfaces and protocols for various Models 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 today's leading sensor technologies.

Mechatronic Pressure Measuring Instruments

As a result of the almost unlimited options for different combinations of mechanical and electrical connections, an extraordinary range of instrument variants is possible. For these gauges various digital and analogue output signals are also available.

Within our measuring instruments we use latest sensors, tested in automotive applications millions of times over. They work without any kind of mechanical contact, consequently wear-resistant, and there's absolutely no retroaction to the mechanics.

Mechanical Pressure Measuring Instruments

Indicating instruments for gauge, absolute and differential pressure with bourdon tube, diaphragm or capsule pressure element have been tested millions of times over. These instruments cover pressure ranges from 0...2.5 mbar to 0...7,000 bar and accuracies of up to 0.1 %.

Diaphragm Seals

WIKA diaphragm seals are appreciated and recognised internationally for the adaption of pressure gauges, pressure transducers, pressure transmitters etc., to extremely difficult measuring operations.

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.

Electrical Temperature Measuring Instruments

Our range of products includes thermocouples, resistance thermometers (also with local display), temperature switches as well as analogue and digital temperature transmitters for all industrial applications, covering temperature ranges from -200 to +1,800 °C.

Mechatronic Temperature Measuring Instruments

As a result of the integration of switching contacts and output signals into our mechanical temperature measuring instruments, we can offer a wide variety of combined instruments. With switching contacts the pointer position triggers a change-over. Electrical output signals are realised via an additional, independent sensor circuit (resistance thermometer or thermocouple).

Mechanical Temperature Measuring Instruments

Our mechanical temperature measuring instruments work on the bimetal, expansion or gas actuation principle and cover temperature ranges from -200 °C to +700 °C.

Thermowells

A large variety of thermowells are available for the thermometers, so that they can even be used under extreme process conditions. They can also be ordered in special materials, e.g. Hastelloy or titanium, with tantalum covers or E-CTFE/PFA coatings. As an engineering service we offer thermowell calculations in accordance with ASME PTC 19.3 or Dittrich/Klotter.

Calibration Technology

WIKA offers a wide range of calibration instruments for the measurement parameters pressure and temperature. In addition, as WIKA service, any kind of electronic and mechanical pressure and temperature measuring instruments (even from other manufacturers) are calibrated at our DKD calibration laboratories.

All product lines product reviews are available and may be ordered by telefax request.

Bimetal Thermometers

Model 46

**Bimetal Thermometers,
Domestic and industrial heating**



- Nominal size: 50, 63, 80, 100
- Pressure rating max. in bar of thermowell/stem: 6
- Wetted parts: Cu-alloy
- Data sheet: TM 46.02

Model 48

**Bimetal Thermometers,
Air conditioning**



- Nominal size: 63, 80, 100, 160
- Wetted parts: Cu-alloy
- Data sheet: TM 48.01

Model 50

**Bimetal Thermometers,
Standard series**



- Nominal size: 63, 80, 100, 160
- Pressure rating max. in bar of thermowell/stem: 6
- Wetted parts: Cu-alloy
- Data sheet: TM 50.03

Model 52

**Bimetal Thermometers,
Industrial series, axial**



- Nominal size: 25, 33, 40, 50, 63, 80, 100, 160
- Pressure rating max. in bar of thermowell/stem: 25
- Wetted parts: Stainless steel
- Data sheet: TM 52.01

Model 52

**Bimetal Thermometers,
Industrial series, radial**



- Nominal size: 63, 80, 100, 160
- Pressure rating max. in bar of thermowell/stem: 25
- Wetted parts: Stainless steel
- Data sheet: TM 52.01

Model 53

**Bimetal Thermometers,
Process Industry Series**



- Nominal size: 3", 5"
- Pressure rating max. in bar of thermowell/stem: 25
- Wetted parts: Stainless steel
- Data sheet: TM 53.01



Model 53

Bimetal Thermometers, Process Industry Series



- Case: adjustable stem and dial
- Nominal size: 3", 5"
- Wetted parts: Stainless steel
- Optional: Liquid damping up to max. 250 °C (at the stem)
- Data sheet: TM 53.01

Model 54

Bimetal Thermometers, Heavy duty series



- Nominal size: 63, 80, 100, 160
- Wetted parts: Stainless steel
- Optional: Liquid damping up to max. 250 °C (at the stem)
- Data sheet: TM 54.01

Model 54

Bimetal Thermometers, Heavy duty series



- Case: adjustable stem and dial
- Nominal size: 63, 80, 100, 160
- Wetted parts: Stainless steel
- Optional: Liquid damping up to max. 250 °C (at the stem)
- Data sheet: TM 54.01

Model 55

Bimetal Thermometers, Process industry series



- Nominal size: 63, 100, 160
- Wetted parts: Stainless steel
- Data sheet: TM 55.01

Model 55

Bimetal Thermometers, Process industry series



- Case: adjustable stem and dial
- Nominal size: 100, 160
- Wetted parts: Stainless steel
- Data sheet: TM 55.01

Gas actuated Thermometers

Model 73

Gas actuated Thermometers, Stainless steel series



- Nominal size: 100, 160
- Wetted parts: Stainless steel
- Optional: - Liquid damping (case)
 - Versions with hygienic process connections
 - Thermometers for industrial heating
- Data sheet: TM 73.01

Model 73

Gas actuated Thermometers, Stainless steel series Case adjustable stem and dial



- Nominal size: 100, 160
- Wetted parts: Stainless steel
- Optional: Liquid damping (case)
- Data sheet: TM 73.01

Model 73

Gas actuated Thermometers, Stainless steel series, Distant reading with capillary



- Nominal size: 100, 160
- Wetted parts: Stainless steel
- Optional: - Various mounting provisions
 - Liquid damping (case)
 - Thermometers for industrial heating
- Data sheet: TM 73.01

Model 73

Gas actuated Thermometers, Stainless steel series, Panel mounting with capillary



- Nominal size: 144 x 144
- Wetted parts: Stainless steel
- Data sheet: TM 73.01

Model 73

Gas actuated Thermometers, Stainless steel series with surface-mounted concat bulb



- Nominal size: 100, 160
- Wetted parts: Stainless steel
- Optional: - Various mounting provisions
 - Liquid damping (case)
- Data sheet: TM 73.01

Model 74

Gas actuated Thermometers, Stainless steel series for sterile process technology



- Nominal size: 100
- Wetted parts: Stainless steel 1.4435
- Optional: - Liquid damping (case)
 - Wetted parts electropolished
 - Alarm contacts
- Data sheet: TM 74.01

Model 75

Gas actuated Thermometers, Stainless steel series for diesel engines



- Nominal size: 100
- Wetted parts: Stainless steel
- Optional: - highest rigidity
 - highly vibration resistant
 - diesel engines
- Data sheet: TM 75.01

Expansion Thermometers

Model 70

Expansion Thermometers, Stainless steel case



- Nominal size: 63, 100, 160
- Wetted parts: Stainless steel
- Optional: - Liquid damping (case)
 - Accuracy class 1
 - with Micro switch

Data sheet: TM 81.01

Model IFC

Expansion Thermometers, Standard series



- Nominal size: 60, 80, 100
- Wetted parts: Cu-alloy
- Optional: - Case square
 - other case materials
 - with Micro switch

Data sheet: TM 80.01

Special Products/ Special types of connections

Model 32, V-Form

Machine Glass Thermometers



- Nominal size: 110, 150, 200
- Wetted parts: Cu-alloy
- Optional: - Dual scale °F/°C
 - other types of connections

Data sheet: TM 32.02

Compression fitting design of connection 4



- suitable for thermometers with plain stem (design of connection 1)
- Material: Stainless steel
- Operating condition max. 600 °C

Union nut with fitting design of connection 5



- suitable for thermometers with union nut (design of connection 3)
- Material: Stainless steel
- Operating condition max. 600 °C

Extension neck



- Material: Stainless steel
- Operating condition max. 600 °C

Thermowells

TW10

Flanged Thermowell (Solid Machined)



- Thermowell Style: Tapered, straight or stepped
- Flange Size: ASME 1 to 4 inch (DIN/EN DN 25 to DN 100)
- Pressure Rating: ASME up to 2500 psig (DIN/EN up to PN 100)
- Data sheet: TW 95.10, TW 95.11, TW 95.12

TW15

Threaded Thermowell (Solid Machined)



- Thermowell Style: Tapered, straight or stepped
- Head Design: Hexagon, Round with hexagon, or Round with wrench flats
- Process Thread: 1/2 NPT, 3/4 NPT or 1 NPT
- Data sheet: TW 05.15

TW20

Socket Weld Thermowell (Solid Machined)



- Thermowell Style: Tapered, straight or stepped
- Welding Diameter: 1.050 inch, 1.315 inch or 1.900 inch (26.7 mm, 33.4 mm or 48.3 mm)
- Pressure Rating: 3000 or 6000 psi
- Data sheet: TW 95.20

TW22

Fabricated Thermowell with Sterile Connection



- Aseptic connection: DIN 11851, DIN 32676, Tri-clamp or VARIVENT
- Material: Stainless steel 1.4435

TW25

Weld-In Thermowell (Solid Machined)



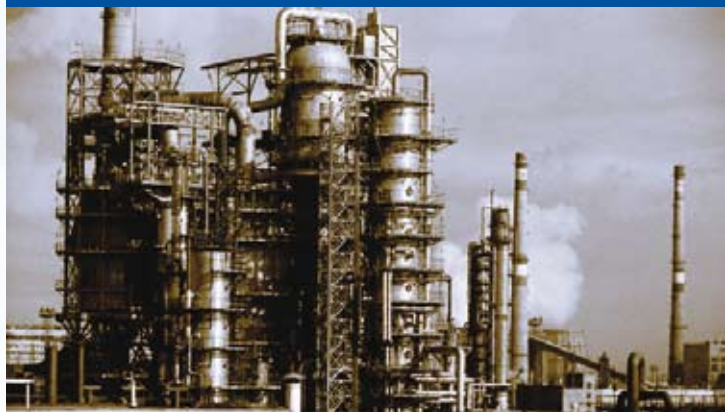
- Thermowell Style: Tapered, straight or stepped
- Head Diameter: Up to 2 inch (50.8 mm)
- Data sheet: TW 95.25

TW30

Vanstone Thermowell (Solid Machined)



- Thermowell Style: Tapered, straight or stepped
- Flange Size: ASME 1, 1-1/2 or 2 inch
- Pressure Rating: ASME up to 2500 psig
- Data sheet: TW 95.30



TW35

Threaded / Weld-In Thermowell (Fabricated, DIN Style)



- Thermowell Style: Form 2, 2G, 3 or 3G
- Pipe Material: Stainless steel 1.4571
- Instrument Connection: M24 x 1.5 running nut
- Data sheet: TW 95.35

TW40

Flanged Thermowell (Fabricated, DIN Style)



- Thermowell Style: Form 2F or 3F
- Flange Size: DIN/EN DN 25 to DN 50 (ASME 1 to 2 inch)
- Pressure Rating: DIN/EN up to PN 100 (ASME up to 1500 psig)
- Data sheet: TW 95.40

TW45

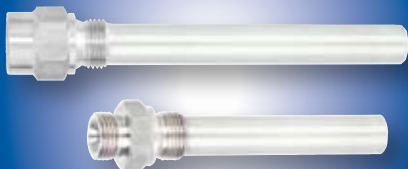
Threaded Thermowell (Fabricated, DIN Style)



- Thermowell Style: Form 5 or 8
- Material: Stainless steel 1.4571 or Cu-alloy
- Data sheet: TW 95.45

TW50

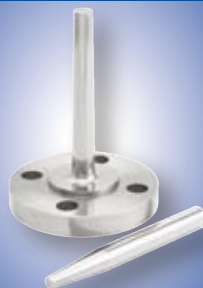
Threaded Thermowell (Solid Machined, DIN Style)



- Thermowell Style: Form 6, 7 or 9
- Data sheet: TW 95.50

TW55

Flanged / Weld-In Thermowell (Solid Machined, DIN Style)



- Thermowell Style: Form 4 or 4F
- Flange Size: DIN/EN DN 25 to DN 50 (ASME 1 to 2 inch)
- DIN/EN up to PN 100 (ASME up to 2500 psig)
- Data sheet: TW 95.55

TW60

Sanitary Thermowell (Solid Machined)



- Thermowell Style: Tapered, straight or stepped
- Sterile Connection: Tri-clamp or bevel seat
- Connection Size: 1 to 3 inch

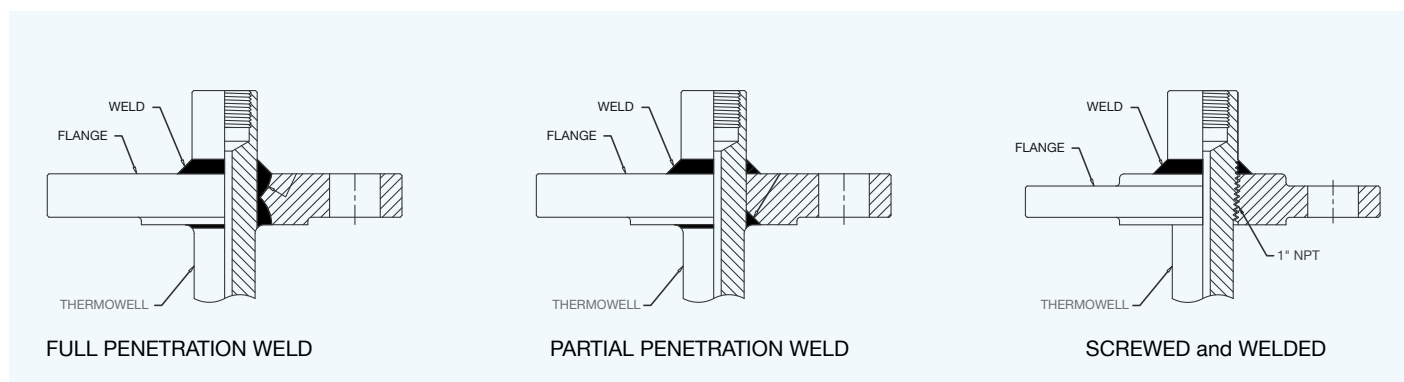
Thermowells

WIKA thermowells are available in both fabricated and machined bar stock versions. Styles offered include flanged, threaded, weld-in, vanstone and sanitary designs. Material selection and product customization is available in order to provide optimum sensor protection and accurate measurement.

Flanged style thermowells can be constructed using full penetration, partial penetration, or screwed and welded options. A full penetration weld ensures a fully welded surface between the two parts and is generally the

strongest joint. A partial penetration weld, on the other hand, consists of a partially welded interface with filler metal being laid on the surface of the two metals. The thermowell in screwed and welded design is made by a threaded 1" NPT thermowell screwed into a threaded hub flange and a seal weld on one or both sides.

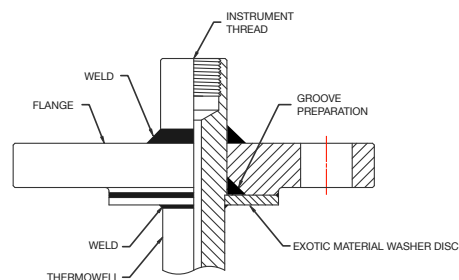
Welding Options



Washer Disc Option

A washer disc option is available for flanged thermowells. In this configuration the washer material is matched to the thermowell stem material. The washer is then machined to the identical dimension as the flange raised face diameter. It is then welded with a partial penetration weld completely around the outside diameter of the raised face diameter of the flange and also on the inside diameter of the washer disc to the thermowell stem. The weld on the inside diameter is then machined to the specified radius and the washer disc surface is grooved to the appropriate face finish.

This option is available and is utilized when process conditions warrant an exotic alloy to withstand corrosive or aggressive conditions. The high priced washer and stem material is subjected to the process condition whereas the flange that is external from the process can be of a lesser grade of material. A 316/316L stainless steel grade is used for this purpose. The price comparison in supplying the washer disc with an exotic alloy material and the flange with a standard stainless steel grade is often more cost effective than supplying the whole thermowell of an exotic alloy.



Note: Consideration must be given to the price differential between alloys when contemplating this option. Process compatibility must also be considered as there is an unvented void between the flange and the washer disc that could be detrimental in certain processes.



Non-Destructive Testing / Evaluation

Non-Destructive Testing (NDT) and Non-Destructive Evaluation (NDE).

A number of different tests are employed by WIKA to detect imperfections or defects within or on material surfaces.

- **Liquid Penetrant Inspection (LPI):** Used to locate surface defects on relatively smooth and nonporous materials. This testing method is commonly used on weldments ensuring a high quality weld surface. Modelical weld flaws that can be detected include cracks, porosity, overlap and laminations.
- **Radiography (RT) Gamma or X-Ray radiation:** Used extensively for weldments on pipe, fittings etc. It is based on the differential absorption of penetrating radiation to detect differences in density due to material composition, thickness and flaws. Defects are detected internally and can be Modelically in raw materials, castings, forgings, welded and brazed joints. Radiography is normally utilized on items that have critical application requirements. Irregularities or flaws that can be detected include: surface and internal cracks, voids, laminations, thicknesses, lack of fusion, lack of penetration, excessive penetration, porosity, inclusions, misassembly and misalignments.
- **Hydrostatic and Pneumatic Pressure or Vacuum Testing:** Used to detect a path where a liquid or gas can flow into thermowells, protection tubes, piping systems, vessels, pressure seals, mineral insulated cable and associated fittings or sleeves. The pressure or vacuum testing can be applied externally to the device or fitting when used in conjunction with a suitable pressure vessel and/or internally, for example in thermowells, piping and tubing bores. For hydrostatic pressure testing the medium is usually water with low chlorine content. Glycol can be used as an alternative when ambient temperatures are low. For pneumatic pressure testing dry air, helium, argon or nitrogen are commonly used. There are a variety of methods used to detect leakage in an assembly or system. They include visual (surface wetting), acoustic methods, pressure recording instruments measuring pressure loss, leak detecting fluid (soapy water), and gas detectors.
- **Ultrasonic Testing (UT):** Used as an independent test or in conjunction with radiography testing. It is a method in which beams of high frequency acoustic energy are introduced into a material. Any surface or subsurface discontinuities or flaws that are detected interrupt the beam at the point where the flaw is located and reflect a portion of the acoustic energy. The amount of reflected energy is dependent on the extent of the irregularity or flaw. The defects that can be detected are similar to those of radiography. Ultrasonic testing often replaces radiography when there is difficulty in positioning the radiographic film or where there are occasions or safety risks when the required distance from the radiation source cannot be maintained.
- **Positive Material Identification (PMI):** One method is X-Ray fluorescence spectroscopy (XRF). With this method the instrument analyzer has a low radioactive source. The basic principal is each material element has a different electron energy level and the instrument determines the required energy to remove them, for example to cause ionization. The analyzer has limitations in the amount of metal elements that it can detect. This method of verifying metal chemistry is fast, easy and effective when determining the accuracy of Mill Test Reports, material that has lost its identification or when there is a requirement for the verification of bulk materials.

An alternative system that is available for determining material chemistry is with optical emission spectrometry (OES). This method utilizes a laser beam or electric arc to excite the electrons in the sample which causes them to emit light. The wavelengths of the light emitted are related to the chemistry of the material under evaluation.

Thermowell Flange Finishes

The standard gasket surfaces of all Raised Face flanges are machined with a phonographic spiral serrated finish. This finish is machined using a 90 degree included angle "V" tool making the spiral groove typically to a depth of 0.015 inches (0.38mm).

Non standard flange finishes can be Concentric serrated with similar "V" tool as with the phonographic spiral making a concentric groove to a depth of 0.015 inches (0.38mm).

Another flange finish that is not often used is a smooth or plane finish produced by tools with cutting speeds and feeds that leave no definite tool marks.

The acceptable roughness range of the phonographic or concentric finishes on flange faces is 125 to 500 Roughness average (Ra) or Average arithmetic roughness height (AARH) in microinches or 6.2 to 12.5 micrometers. The standard to ASME/ANSI B16.5 is 125 to 250 (AARH /Ra).

Flange Facings		
Standard flange facing Raised Face to ASME B16.5		
	AARH (μinch)	Ra (μm)
Stock finish	125 to 250	3.2 to 6.3
Smooth finish	< 125	< 3.2
RTJ (inside groove)	< 63	< 1.6
Tongue/Groove	< 125	< 3.2
Standard flange facing to DIN 2527:		
	Ra (μm)	Rz (μm)
Form C	-	40 to 160
Form E	-	< 16
Standard flange facing to EN 1092-1:		
	Ra (μm)	Rz (μm)
Form B1	3.2 to 12.5	12.5 to 50
Form B2	0.8 to 3.2	3.2 to 12.5

Thermowell Design

A proprietary thermowell design spreadsheet is offered to assist users with the mechanical design of thermowells subjected to flow induced vibrations and stresses. Straight or tapered stem thermowells can be specified. As safety is always paramount, warnings are displayed when input or output is incorrect or beyond the typical range of data.

The spreadsheet includes a large selection of alloys or the user can input values for specific alloys not listed. A duplicate sheet feature is available when compiling multiple calculations together with summary feature additions.



Metallic Thermowell Materials

Designation	Nominal Composition	Maximum Temp.* (continuous service in Air)	Melting Range	Application Notes
304SS	18% Chromium 8% Nickel	900°C	1371°C-1454°C	Offers excellent resistance to many corrosive agents encountered in domestic and industrial use.
310SS	25% Chromium 20% Nickel	1148°C	1371°C-1454°C	Good resistance to oxidation at temperatures up to 1148°C. Good resistance to thermal fatigue and cyclic heating.
316SS	17% Chromium 12% Nickel 2-3% Molybdenum	898°C	1371°C-1454°C	Good resistance to a wider range of chemicals than 304SS. Withstands sulphurous acid compounds.
321SS	Similar to 304SS but Steel stabilized by Titanium addition	871°C	1371°C-1426°C	Not sensitive to inter-granular corrosion when heated within the carbide precipitation range of 482°C-815°C. Similar in corrosion resistance to 304SS.
347SS	Similar to 304SS but contains Tantalum and is Steel stabilized Niobium addition	871°C	1371°C-1426°C	Excellent equivalent to 304SS for 426°C-815°C range. Superior to 321SS where service is both corrosive and at an elevated temperature.
304LSS 316LSS	Similar to 304SS and 316SS but with reduced carbon	871°C	1371°C-1454°C	Low carbon versions of 304SS and 316SS (maximum of 0.03% carbon). Because of low carbon content the effects of carbide precipitation are reduced.
20-Cb-3	20% Chromium 34% Nickel 2.5% Molybdenum 3.5% Copper	954°C	1426°C	Superior grade with excellent resistance to corrosive conditions.
Inconel 600	76% Nickel 15.5% Chromium	1148°C	1354°C-1412°C	Excellent material for severely corrosive environments. Resistant to oxidation at temperatures up to 1175°C.
Inconel 601	60.5% Nickel 23.0% Chromium 1.5% Aluminium	1148°C	1301°C-1367°C	Similar to Inconel 600 however higher Chromium content gives superior resistance to oxidizing, carburizing and Sulphur containing environments.
Incoloy 800	32.5% Nickel 46% Iron 21% Chromium	1093°C	1357°C-1385°C	Resistant to oxidation and carburization at elevated temperatures. It resists stress - corrosion cracking, Sulphur attack, internal oxidation, scaling and corrosion in a wide variety of industrial atmospheres.
Monel 400	66% Nickel 31% Copper	537°C	1343°C	Highly resistant to corrosion by chlorinated solvents, glass etching agents, Sulfuric and many other acids, and practically all alkalis generally free from stress-corrosion cracking. Good resistant to salt water corrosion.
Hastelloy B-2	61% Nickel 28% Molybdenum	1204°C	1260°C-1354°C	Good corrosion resistance to Hydrochloric, Sulfuric, Phosphoric, and Acetic acids. Excellent corrosion resistance to Hydrogen-Chloride gas.
Hastelloy C-276	54% Nickel 16% Molybdenum 15.5% Chromium 4% Tungsten	1204°C	1260°C-1354°C	Good corrosion resistance to many chemical environments, including Ferric and Cupric Chlorides, contaminated mineral acids, wet Chlorine gas. Oxidation resistance to 990°C.
Hastelloy X	47% Nickel 9% Molybdenum 22% Chromium 0.5% Tungsten	1204°C	1260°C-1354°C	Good high temperature strength and resistance to oxidation to 1204°C. Also good for reducing conditions.

* The maximum temperature for continuous service in air may not fulfill all the requirements of the ASME code. Please consult a WIKA technical representative for clarification.

Mechanical temperature measuring instruments

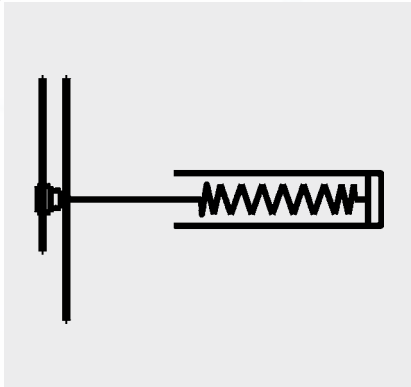
Temperature is an indicator of the thermal condition of a homogenous material or body. It expresses the energy of motion that is contained in the molecules of the material. Transmission of temperature from one body to another, e.g. process medium and thermometric sensor, requires close physical contact 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 in the WIKA production are highlighted below

Bimetal thermometers

Principle

The temperature is measured by means of a bimetal system inside the temperature sensor. The bimetal is made from two metal strips, permanently joined together, each metal having a different thermal expansion coefficient. This causes the strip to deflect in proportion to the temperature variation. The actual bimetal system consists of a bimetal strip that is either

- helically or
- spirally



wound, depending on the size of the sensor and the temperature range to be measured. Any temperature variation causes the bimetal to rotate an attached spindle. This rotation is indicated by a pointer on a dial scale.

WIKA bimetal thermometers are available for temperature ranges from $-70\text{ }^{\circ}\text{C}$ to $+600\text{ }^{\circ}\text{C}$ with accuracies complying with Class 1 and 2 of EN 13 190.

Expansion thermometers

Principle

The temperature is measured by a liquid-filled measuring system consisting of a temperature probe, a capillary and a bourdon tube. These three components form a sealed system. Any temperature variation causes a change in the

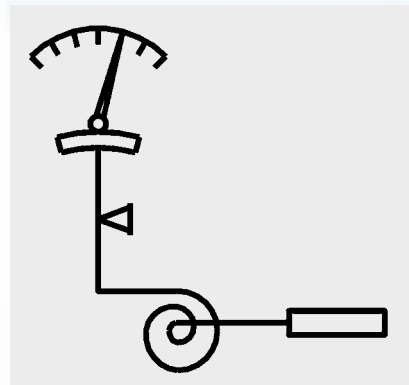
internal pressure of this system. As a result of this pressure change the shaft and pointer connected to the tube rotate and the temperature value is indicated on the scale.

With capillary lengths available between 500 mm and 10,000 mm, it is also possible to measure temperatures at remote measuring points. WIKA expansion thermometers are available for temperature ranges from $-40\text{ }^{\circ}\text{C}$ to $+400\text{ }^{\circ}\text{C}$ with accuracies complying with Class 1 and 2 of EN 13 190.

Gas actuated thermometer with or without capillary

Principle

Gas actuated thermometers consist of a stem, a capillary and a case containing the bourdon tube element. These components are connected to form a single system. The complete measuring system is filled with an inert gas under pressure. Any temperature variation causes a change in the internal pressure of the stem, leading to a deflection of the bourdon tube. A mechanical linkage (movement) transmits this deflection to the pointer. Variations in the ambient



temperature acting on the case are compensated for by a bimetal element mounted between the movement and the bourdon tube. WIKA gas actuated thermometers are available for temperature ranges from $-80\text{ }^{\circ}\text{C}$ to $+700\text{ }^{\circ}\text{C}$ with an accuracy complying with Class 1 of EN 13 190.

Further products for the temperature measurement

Temperature Transmitters



Fittings



Electrical Thermometers



Panel Meters & Controllers



Hand Held Indicators



Temperature Calibrators



Infrared Pyrometers



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