

Bimetal thermometer, models 53, 54, 55 (ATEX)

EN



Model R5502



Model S5413

WIKAL

Part of your business

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Prior to starting any work, read the operating instructions! Keep for later use!

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Certificates and approvals can be found at www.wika.com.

1. General information

1. General information

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- Bimetal thermometers described in these operating instructions have been designed and manufactured using state-of-the-art technology. All components are subject to stringent quality and environmental criteria during production. Our management systems are certified to ISO 9001 and ISO 14001.
- These operating instructions contain important information on handling the instrument. To ensure safe operation, all safety instructions and operating instructions must be observed.
- Observe the local accident prevention regulations and general safety regulations, in effect for the instrument's range of use.
- The operating instructions are part of the instrument and must be kept in the immediate vicinity of the instrument and readily accessible to skilled personnel at anytime.
- Skilled personnel must have carefully read and understood the operating instructions prior to beginning any work.
- The manufacturer's liability is void in the case of any damage caused by using the product contrary to its intended use, non-compliance with these operating instructions, assignment of insufficiently qualified skilled personnel or unauthorised modifications to the instrument.
- The general terms and conditions contained in the sales documentation shall apply.
- Subject to technical modifications.

07/2021 EN based on 03/2018 RU (based on 11583747.05 10/2017 EN)

1. General information

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■ Further information:

- Internet address: www.wika.de / www.wika.com
- Data sheet: TM 53.01, TM 54.01, TM 55.01

The instrument specifications indicated in the operational documentation, can only be maintained if the instrument is used in strict compliance with these operating instructions.

Explanation of symbols



CAUTION!

... indicates a potentially dangerous situation that can result in serious injury or death, if not avoided.



CAUTION!

... indicates a potentially dangerous situation that can result in light injuries or damage to equipment or the environment, if not avoided.



Information

... points out useful tips, recommendations and information for efficient and trouble-free operation.



CAUTION!

... indicates a potentially dangerous situation in the hazardous area that can result in serious injury or death, if not avoided.



CAUTION!

... indicates a potentially dangerous situation that can result in burns caused by hot surfaces or liquids, if not avoided.

2. Safety requirements

2. Safety requirements

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CAUTION!

Before installing, commissioning and operation, ensure that the appropriate bimetal thermometer has been selected in terms of measuring range, design and specific measuring conditions. The compatibility of the wetted parts of the process connection (thermowell, thermowell stem) with the medium must be tested. Non-observance can result in serious injury and/or damage to property.



Further important safety instructions can be found in the individual chapters of these operating instructions.

2.1 Intended use

These bimetal thermometers are used for measuring temperature in hazardous areas of industrial applications.

The instrument has been designed and built solely for the intended use described here, and may only be used accordingly.

The technical specifications contained in these operating instructions must be observed. Improper handling or operation of the instrument outside of its technical specifications requires the instrument to be taken out of service immediately and inspected by an authorised WIKA service engineer.

The manufacturer shall not be liable for claims of any type based on operation contrary to the intended use.

2. Safety requirements

2.2 Personnel qualification



CAUTION!

Risk of injury should qualification be insufficient!

Improper handling can result in considerable injury and damage to equipment!

- The activities described in these operating instructions may only be carried out by skilled personnel who have the qualifications described below.
- Keep unqualified personnel away from hazardous areas.

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Skilled personnel

Skilled personnel are understood to be personnel who, based on their technical training, knowledge of measurement and control technology and on their experience and knowledge of country-specific regulations, current standards and directives, are capable of carrying out the work described and independently recognising potential hazards.

2.3 Additional safety instructions for instruments per ATEX



CAUTION!

Non-observance of these instructions and their contents may result in the loss of explosion protection.



CAUTION!

It is imperative that the application conditions and safety requirements of the EC-type examination certificate are followed.

Temperature measuring instruments must be earthed via the process connection!

2. Safety requirements

Bimetal thermometers contain no internal heat source, and, when correctly installed and operated, cause no increase in temperature!

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2.4 Special hazards



CAUTION!

Observe the information given in the applicable type examination certificate and the relevant country-specific regulations for installation and use in potentially explosive atmospheres (e.g. IEC 60079-14, NEC, CEC). Non-observance can result in serious injury and/or damage to property.

For additional important safety instructions for instruments with ATEX approval, see chapter 2.3 "Additional safety instructions for instruments per ATEX".



CAUTION!

Residual media in the dismantled instruments can result in a risk to persons, equipment and the environment. Take sufficient precautionary measures.

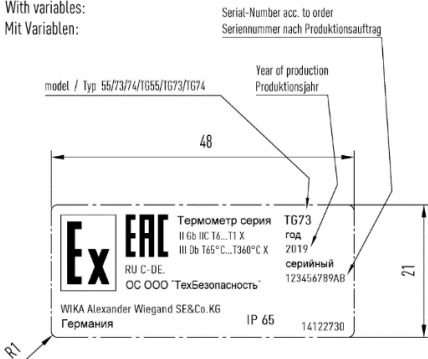
2. Safety requirements

2.5 Labelling, safety marks

Product label (example)

With variables:

Mit Variablen:



Before mounting and commissioning the instrument, ensure you read the operating instructions!



Do not fill the instruments with filling liquids subsequently.

List of critical failures

1. The integrity of the case is compromised.
2. The temperature measurement function is impaired.

Possible personnel errors

Installation and connection of the instrument not in accordance with these operating instructions, which may lead to malfunctions.

Method of elimination:

- dismount the instrument
- install and connect the instrument in accordance with these operating instructions.

Limit state parameters

1. The case starts to lose its integrity.
2. Increased response time.

3. Specifications / 4. Design and ...

3. Specifications

Specifications	Model 53	Model 54	Model 55
Measuring element	Bimetal coil		
Nominal size	3", 5"	63, 80, 100, 160	63, 100, 160
Instrument version <ul style="list-style-type: none">■ Model A5x■ Model R5x■ Model S5x	Back mount (axial) Lower mount (radial) Back mount, case can rotate and swivel		
Permissible ambient temperature	-20 ... +60 °C max.		-50 ... +60 °C
Working pressure <ul style="list-style-type: none">■ Continuous load(1 year)■ Short term (max. 24 h)	Measuring range (EN 13190) Scale range (EN 13190)		
Case, ring	Stainless steel 1.4301 (304)		
Stem, process connection	Stainless steel 1.4571 (316Ti)		
Ingress protection	IP65 per EN/IEC 60529 IP66, liquid-filled		

For further specifications see WIKA data sheet TM 53.01, TM 54.01 or TM 55.01 and order documentation.

4. Design and function

4.1 Description

The bimetal thermometers of this series are intended for installation in pipelines, vessels, plant and machinery.

5. Special conditions for use (X conditions)

Sheath and case are made of stainless steel. To allow fitting to the process, different installation lengths and process connections are available.

Through the high protection class of the thermometer IP and its liquid damping, operation under vibration conditions is possible.

4.2 Scope of delivery

Cross-check scope of delivery with delivery note.

5. Special conditions for use (X conditions)

- Thermometers (mechanics) contain no internal heat source, and, when correctly installed and operated, cause no increase in temperature. The temperature class and maximum surface temperature are determined by the instrument design and the ignition temperature of the surrounding explosive gas and/or dust environment (atmosphere) according to the manufacturer's technical documentation;
- Thermometers with model 831 electrical contacts must be connected to intrinsically safe circuits of duly certified products (safety barriers);
- Installation, operation, and maintenance of instruments are carried out in accordance with the manufacturer's instructions according to its technical documentation;
- Heat return flow from the process which exceeds the ignition temperature of the explosive gas and/or dust environment (atmosphere) surrounding the instrument case is not permitted and must be prevented through appropriate thermal insulation.

6. Transport, packaging and storage

6. Transport, packaging and storage

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6.1 Transport

Check instrument for any damage that may have been caused by transport. Obvious damage must be reported immediately.

6.2 Packaging

Do not remove packaging until just before mounting. Keep the packaging as it will provide optimum protection during transport (e.g. change in installation site, sending for repair).

6.3 Storage

Permissible conditions at the place of storage:

Storage temperature: -20 ... +60 °C

Avoid exposure to the following factors:

- Direct sunlight or proximity to hot objects
- Mechanical vibration, mechanical shock (putting it down hard)
- Soot, vapour, dust and corrosive gases

Store the instrument in its original packaging in a location that fulfils the conditions listed above. If the original packaging is not available, pack and store the thermometer as described below:

1. Wrap the thermometer in an antistatic plastic film.
2. Place the thermometer, along with shock-absorbent material, in the packaging.
3. If stored for a prolonged period of time (more than 30 days), place a bag, containing a desiccant, inside the packaging.



CAUTION!

Before storing the instrument (following operation), remove any residual media. This is of particular importance if the medium is hazardous to health, e.g. caustic, toxic, carcinogenic, radioactive, etc.




The use of liquid damping is always recommended for temperatures near the dew point (± 1 °C around 0 °C).

7. Commissioning, operation



The bimetal thermometer must be earthed via the process connection!

When screwing the instruments in, the force required to do this must not be applied through the case! but only through the spanner flats provided for this purpose and using a suitable tool.



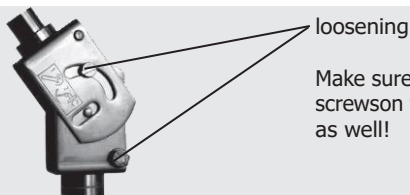
Installation with
open-ended spanner

When mounting a bimetal dial indicating thermometer that can be rotated and swivelled, the specific instructions must be followed. In order to set the indicator to the desired position, the following steps must be taken:

1. The lock nut or union nut must be loosened at the process connection.
2. The hexagon bolts and slotted screws at the swivel joint must be loosened.

7. Commissioning, operation

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Make sure to loosen the screw on the opposite side as well!

3. Position the indicator as required, tighten the hexagon bolts and slotted screws, and finally tighten the lock nut or union nut firmly.

When using thermowells, they must be filled with a thermal contact medium in order to reduce the heat transfer resistance between the outer wall of the sensor and the inner wall of the thermowell. The working temperature of the thermal compound is $-40 \dots +200 \text{ }^{\circ}\text{C}$.



CAUTION!

Do not fill hot thermowells. There is a risk of the oil spraying out!



CAUTION!

When using a thermowell, make sure that the stem does not touch the bottom of the thermowell since, due to the different expansion coefficients of the materials, the stem may become buckled at the bottom of the thermowell.

(For the formula for the calculation of the insertion length l_1 , see the respective thermowell's data sheet)

Thermo-
well

Stem

Required
safety

8. Maintenance and cleaning

8.1 Maintenance

These bimetal thermometers are maintenance-free! The indicator should be checked once or twice every year. For this the instrument must be disconnected from the process and checked using a temperature calibrator.

Repairs must only be carried out by the manufacturer or authorised organisations.

8.2 Cleaning



CAUTION!

- Clean the thermometer with a moist cloth.
- Wash or clean the thermometer before returning it, in order to protect personnel and the environment from exposure to residual media.
- Residual media in the dismantled instrument can result in a risk to personnel, the environment and equipment. Take sufficient precautionary measures.



For information on returning the instrument see chapter 9.2 "Returns".

9. Dismounting, return and disposal



CAUTION!

Residual media in the dismantled instrument can result in a risk to persons, the environment and equipment. Take sufficient precautionary measures.

9. Dismounting, return and disposal

9.1 Dismounting

EN



CAUTION!

Risk of burns!

Let the instrument cool down sufficiently before dismounting it! During dismounting there is a risk of dangerously hot pressure media escaping.

9.2 Return



CAUTION!

Absolutely observe when shipping the instrument: All instruments delivered to WIKA must be free from any kind of hazardous substances (acids, bases, solutions, etc.).

When returning the instrument, use the original packaging or a suitable transport packaging.

To avoid damage:

1. Wrap the instrument in an antistatic plastic film.
2. Place the instrument, along with shock-absorbent material, in the packaging. Place shock-absorbent material evenly on all sides of the transport packaging.
3. If possible, place a bag, containing a desiccant, inside the packaging.
4. Label the shipment as transport of a highly sensitive measuring instrument.



Information on returns can be found under the heading "Service" on our local website.

9.3 Disposal

Incorrect disposal can put the environment at risk. Dispose of instrument components and packaging materials in an environmentally compatible way and in accordance with the country-specific waste disposal regulations.

WIKA subsidiaries worldwide can be found online at www.wika.com.



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