Operating instructions

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

EN

CE Ex
II 2G c TX X
II 2D c TX X

Model R5502

Model S5413

WIKA
Part of your business

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WIKA® ist eine geschützte Marke in verschiedenen Ländern.

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

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Declarations of conformity can be found online at www.wika.com.

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1. General information

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- The bimetal thermometers described in the 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. Working safely requires that all safety instructions and work instructions are 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 any time.
- Skilled personnel must have carefully read and understood the operating instructions, prior to beginning any work.
- The manufacturers 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.
- Further information:
  - Internet address: www.wika.de / www.wika.com
  - Relevant data sheet: TM 53.01, TM 54.01, TM 55.01

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1. General information

Explanation of symbols

WARNING!
... 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.

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

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

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2. Safety

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WARNING!
Before installation, 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 equipment.

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.

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2. Safety

2.2 Personnel qualification

WARNING!
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.

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 of independently recognising potential hazards.

2.3 Additional safety instructions for instruments per ATEX

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

WARNING!
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!

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

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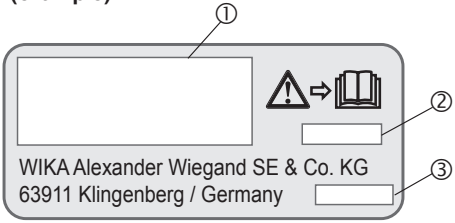
WARNING!
Observe the information given in the applicable type examination certificate and the relevant country-specific regulations for installation and use in potentially explosive atmospheres (e.g. IEC 60079-14, NEC, CEC). Non-observance can result in serious injury and/or damage to the equipment.

For additional important safety instructions for insturments with ATEX approval see chapter 2.3 “Additional safety instructions for instruments per ATEX”.

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

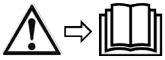
2.5 Labelling, safety marks

Product label (example)



① Model
② Year of manufacture
③ Serial number

Ex marking
II 2G c TX X
II 2D c TX X



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

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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			
■ Model A5x	Back mount (axial)		
■ Model R5x	-	Lower mount (radial)	
■ Model S5x	Back mount, housing can rotate and swivel		
Permissible ambient temperature	-20 ... +60 °C max.		-50 ... +60 °C
Working pressure			
■ Continuous load (1 year)	Measuring range (EN 13190)		
■ Short term (max. 24 h)	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.

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

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Through the high protection class of the thermometer (IP65) and its liquid damping, operation under vibration conditions is possible.

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4.2 Scope of delivery

Cross-check scope of delivery with delivery note.

5. Special conditions for use (X conditions)

1) **Design temperatures**
Ambient temperature: -20 … +60 °C

Medium temperature: max. +600 °C
(instruments with liquid filling: max. +250 °C)

Observe the surface temperature for ATEX application:
The permissible medium temperature does not only depend on the instrument design, but also on the ignition temperature of the surrounding gases, vapours or dust. Take both aspects into account.

2) **Maximum surface temperature**
For instruments with liquid filling, make sure that the medium temperature is lower than 250 °C.

The surface temperature mainly depends on the medium temperature. For prevention, consider the maximum medium temperature as maximum surface temperature.

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5. Special conditions for use (X conditions)

Instruments for use in hazardous gas/air, vapour/air and mist/air atmospheres:

Temperature class (gas application)	Maximum permissible surface temperature (for the end application)
T6	+65 °C
T5	+80 °C
T4	+105 °C
T3	+160 °C
T2	+240 °C
T1	+250 °C (+360 °C) [1]

1) only for instruments without liquid filling

Hazardous dust atmosphere

For dusts, the procedure specified in ISO/IEC 80079-20-2 for determining the ignition temperature has to be applied. The ignition temperature is determined separately for dust clouds and dust layers, respectively. For dust layers, the ignition temperature depends on the dust layer thickness per EN/IEC 60079-14.

Ignition temperature of dust	Maximum permissible medium temperature (in the measuring system)
Dust cloud T_{cloud}	< 2/3 T_{cloud}
Dust layer T_{layer}	< T_{layer} – 75 K – (reduction depending on the layer thickness)

The permissible maximum medium temperature must not exceed the lowest determined value, even in case of a malfunction.

3) Mount the instrument in such a way that, taking into consideration the influence of convection and heat radiation, no deviation above or below the permissible ambient and medium temperatures can occur.

4) The end user must ensure that the measuring instrument is connected to the equipotential bonding of the end-use application via the process connection. The sealings used at the process connection must be electrically conductive.

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5. Special conditions for use (X conditions)

5) Avoid handling of materials that react dangerously with the materials used for the instrument, and substances liable to spontaneous combustion.

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6) Avoidance of vibration

Requirements for the installation point

If the line to the instrument is not adequately stable, an instrument holder should be used for fastening. If vibrations cannot be avoided by means of suitable installation, use instruments with liquid filling. Protect the instruments against coarse dirt and wide fluctuations in ambient temperature.

Permissible vibration load at the installation site

Always install the instruments in locations free from vibration. If necessary, it is possible to isolate the instrument from the mounting point, e.g. by installing a flexible connection line between the measuring point and the instrument and mounting the instrument on a suitable bracket. If this is not possible, do not exceed the following limits:

Frequency range < 150 Hz

Acceleration < 0.5 g

7) 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 probe and the inner wall of the thermowell. The working temperature of the thermal compound is -40 ... +200 °C.

8) Clean the thermometer with a moist cloth. Ensure that due to the cleaning no electrostatic charge will be generated.

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6. Transport, packaging and storage

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.

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WARNING!
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 casing, 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.

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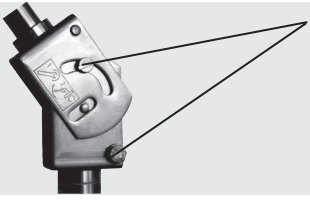

loosening

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

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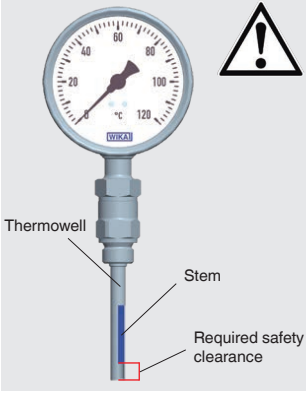
3. Position the indicator as required, tighten the hexagon bolts and slotted screws, and finally tighten the lock nut or union nut firmly.



CAUTION!
When using thermowells, please ensure 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.
(Formula for the calculation of the insertion length l_1 see the respective thermowell's data sheet)

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8. Maintenance and cleaning

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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.

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 dismounted 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

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

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9. Dismounting, return and disposal

9.1 Dismounting

WARNING!
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 Returns

WARNING!
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 package.

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.

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EU-Konformitätserklärung
EU Declaration of Conformity

Dokument Nr.:
Document No.: 11603046.02

Wir erklären in alleiniger Verantwortung, dass die mit CE gekennzeichneten Produkte
We declare under our sole responsibility that the CE marked products

Typenbezeichnung:
Type Designation:

Model 53:
A5300 + option ATEX / A5301+ option ATEX / S5300 + option ATEX / S5301 + option ATEX
Model 54:
A5400 + option ATEX / A5401 + option ATEX / A5402 + option ATEX / A5403 + option ATEX /
R5440 + option ATEX / R5441 + option ATEX / R5442 + option ATEX / R5443 + option ATEX / S5410 + option ATEX / S5411 + option ATEX / S5412 + option ATEX / S5413+ option ATEX
Model 55:
A5525 + option ATEX / A5500 + option ATEX / A5501 + option ATEX / R5526 + option ATEX / R5502 + option ATEX / R5503 + option ATEX / S5550 + option ATEX / S5551+ option ATEX

Beschreibung: **Bimetall-Thermometer**
Description: ***Bimetal thermometer***

gemäß gültigem Datenblatt: TM53.01
according to the valid data sheet: TM54.01
TM55.01

die grundlegenden Schutzanforderungen der folgenden Richtlinien erfüllen:
comply with the essential protection requirements of the directives:

Harmonisierte Normen:
Harmonized standards:

2014/34/EU	Explosionsschutz (ATEX) (1)	EN 1127-1 :2011
2014/34/EU	*Explosion protection (ATEX)* (1)	EN 13463-1:2009
		EN 13463-5:2011

Ex II 2 GD c TX X

alternativ
alternative

Ex II 2 G c TX X

Ex II 2 D c TX X

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Conformity assessment procedure "Internal Control of Production". The Documentation is deposited at notified body TÜV NORD CERT GmbH, Essen (no. 0044), reference number 8000550764.

Unterzeichnet für und im Namen von / *Signed for and on behalf of*

WIKA Alexander Wiegand SE & Co. KG

Klingenberg, 2016-09-29

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