

## Contents

1. General information
2. Safety information
3. Description and use
4. Technical data
5. Installation
6. Operation
7. Maintenance and repairs
8. Removal from operation
9. Disposal

## 1. General information

Please read these instructions for use before setting up the device to operate.

Our bimetal dial thermometers for industrial temperature measurement are manufactured in compliance with the DIN EN 13190 standard.

More information on the equipment can be found in the data sheets 8101 and 8102.

Our bimetal dial thermometers are suited for measuring the temperature of liquids or gases.



**Applications which are not explicitly described as intended use are contrary to the intended use!**

ARMATURENBAU GmbH and MANOTHERM Beierfeld GmbH assume no liability for damages arising from improper use of the equipment or from disregard of the information contained in these instructions for use.

## 2. Safety information



**Comply with the applicable domestic safety regulations during installation, operational setup and use.**

The connection must be made only by qualified personnel. Disregard of the corresponding regulations can lead to severe bodily harm and/or property damage.

**Ensure that your bimetal dial thermometer is used without damage by taking the following precautions:**



- The maximum temperature of the medium to be measured must be within the display range of the thermometer.
- Check that the construction and materials of the thermometer are resistant to the conditions of use and the medium to be measured. Use thermowells!
- Thermometers without damping fluid in the case are intended for use in locations free of vibrations and impacts.

Conversions or other technical changes of the equipment by the customer are not permitted. Such actions void the warranty.

Thermowells are suitable for trouble-free installation and removal.

## 3. Description and use

Our bimetal dial thermometers have a case and stem made of stainless steel.

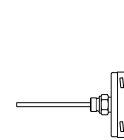
A bimetallic coil is used as a measurement system. As the temperature changes, the coil roll changes. This rotational movement is translated directly via an axle or via a deflection spring to the indicator.

This makes bimetal dial thermometers free of hysteresis.

They are also suited for measuring corrosive chemical or petrochemical materials.

## 4. Technical data

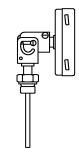
### Models



TBiCh...rm



TBiCh...



TBiCh...rmGel

The diagrams show the bayonet ring case.

To compensate for the influence of vibrations, bimetal thermometers of the same design are available with case filling model TBiChG.

Suitable thermowells are available for the individual stem types.

### Display range

The measuring of your thermometer is indicated by two triangles on the scale. Within these limits accuracy class 1 is guaranteed.

### Active Length of the stem

The active length determines the minimum length of the stem. It is based on the display range (temperature difference) and the stem diameter.

$\Delta T$ [K]	La [mm]	
	$\varnothing$ 6 mm	$\varnothing$ 8mm
60	70	60
80	60	40
ab 100	40	40

Further technical information can be found in our data sheets 8101 and 8102. These can be obtained from our Web site.

## 5. Installation

### Storage and transport

- Permitted storage temperature: -40 to +60 °C  
With glycerine filling of the case: -20 to +60 °C
- Bimetal thermometers must be protected from mechanical damage during transport and storage. They should be left in their original packaging until used.
- The packaging can be disposed of for paper recycling. In case of further transport or return, the equipment must be adequately protected from damage.

### Installation



Installation and setup for operation must be performed by trained personnel authorized by the operating company.

Before installation, check the following:

- Are the goods undamaged and complete?
- Do the goods match the delivery documentation?
- Is the device available suitable for the application?
- Is the process temperature within the measuring range?
- Does the process connection meet the requirements?

The mechanical connection of the thermometer is made according to the general technical guidelines for the selected connection type.



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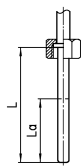
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When screwing in the thermometer, do not exert force via the case. Hold up turnable threaded nuts and union nuts at the stem.

For sealing to the process or thermowell with cylindrical threads, sealing rings made of suitable material are to be used. (The standard is aluminum or brass sealing rings) NPT couplings (tapered thread) seal in the thread using suitable sealing materials such as PTFE tape (take note of the process temperature!)

The dial and numbers are to be aligned vertically. For thermometers with the joint type ...rmGel, adjustment of the case for best readability is possible.

To facilitate exact reading, install the equipment at eye level if possible.



Install the thermometer stem so that the active part of the stem (see the table above for information on active length) is completely immersed in the medium to be measured.

Errors in measurement will occur if the active part of the stem is not completely surrounded by the medium to be measured.

Consider the temperature distribution of the medium at the place where the thermometer is installed. Avoid measuring too close to walls of large tanks or in dead spaces of piping if this is not the actual intent of measurement.

When using thermowells, the resistance to heat transfer between the outer wall of the stem and the interior wall of the thermowell can be reduced by using a thermal contact medium.



### Zone 0 installation:

The device is to be separated from zone 0 in a suitable manner. Therefore, when installing a bimetal thermometer for zone 0 - based on the

EN 50284 standard - this must be done with a thermowell with a wall thickness of at least 1 mm!

## **6. Operation**

Safe and reliable operation is ensured with proper installation.

Stand straight in front of the thermometer installed at eye level to read it, not at an angle or to the side. This will avoid reading errors.

The reading precision generally corresponds to the scale graduation.

### Ambient temperatures

The permitted ambient temperature indicates the limits within which the thermometer can be used without the risk of damaging it.

The accuracy class of the indication is maintained within the nominal usage range.

Outside the nominal usage range additional temperature errors will occur.

- Permissible ambient temperature: -40 to +60 °C  
with case filling glycerine -20 to +60 °C
- Nominal usage range: 23 ± 5 °C

### **Prevent personal injury and property damage:**



- **Comply with all relevant regulations when setting up and operating measurement points for materials which are dangerous, flammable, explosive or harmful to health.**

- The thermometers must not be used beyond the full scale value. Doing so can lead to the destruction of the equipment.

### Display correction

Every bimetal thermometer has the option to correct an indication error (4% of the temperature range).

Models TBiCh (bayonet ring)

- Loosen the bayonet ring by turning to the left and open the case

- Using a screwdriver, carefully turn the pointer on the indicator bushing until it is at the target value

- Close the case and tighten the bayonet ring by turning to the right

Models TBiChg (crimped-on ring)

There is an adjustment screw on the back side.

Use a no. 6 hexagon Allen key to turn the dial carefully until the pointer is at the target value.

Correct indication errors only if you can check the accuracy by means of comparative measurement. Instruments for comparison to use are calibrated glass thermometers or portable, calibrated digital thermometers.

## **7. Maintenance and repairs**

The equipment requires no maintenance. It contains no elements which you can replace or repair.

To ensure measurement accuracy, we recommend checking the equipment on a regular basis.

After about a year of operation, correction of the indication may be necessary due to aging.

Incidental repairs must be made only by the manufacturer.

If repair or maintenance is necessary, please contact your supplier or our factory. The equipment must be well packaged before sending it to our factory (see above).



Media residues on equipment which has been removed can pose a hazard to people, the environment and property. Take appropriate precautionary measures.

## **8. Removal from operation**

To take the equipment out of operation, please remove it completely from the area of use.

## **9. Disposal**



Please help to protect our environment and dispose of the materials used in accordance with the applicable regulations or recycle them.

Subject to technical changes without notice.

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