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1. Information on This Operating Instruction

- The manual is aimed at specialists and semi-skilled personnel.
- Please read the instructions carefully before carrying out any operation and keep the specified order.
- Thoroughly read and understand the information in chapter 2 "Safety Instructions".

If you have any problems or questions, please contact your supplier or contact us directly at:



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Operating Instructions

Resistance Thermometers TPt... and Thermocouples TTe...

1.1 Pictographs Used

In this manual, pictographs are used as hazard warnings.

Particular information, instructions and restrictions designed for the prevention of personal or substantial property damage:



WARNING! Is used to warn you against an imminent danger that may result in personal injury or death.

IMPORTANT! Is used to warn you against a possibly hazardous situation that may result in personal, property or environmental damage.

CAUTION! Is used to draw your attention to important recommendations to be observed. Disregarding them may result in property damage.



DANGER! Indicates a potentially hazardous situation, which may result from hot surfaces. Disregarding the safety instructions may result in severe burns.



DANGER OF EXPLOSION! Indicates a potentially hazardous situation, which may result from existing explosive gases and dusts. Disregarding the safety instructions may result in explosions.



The following symbol highlights **actions** you have to conduct or **instructions** that have to be strictly observed.

1.2 Exclusion of Liability

We accept no liability for any damage or malfunction resulting from incorrect installation, inappropriate use of the device or failure to follow the instructions in this manual.

2. Safety Instructions



IMPORTANT! Disregarding the respective regulations may result in severe personal injuries and / or property damage.

Please read this operating instruction thoroughly before installing the device.

Disregarding the containing warnings, especially the safety instructions, may result in danger for people, the environment, and the device and the system it is connected to.

The instrument corresponds with the state of engineering at the time of printing. This concerns the accuracy, the operating mode and the safe operation of the device.

In order to guarantee that the device operates safely, the operator must act competently and be conscious of safety issues.

The ARMANO Messtechnik GmbH provides support for the use of its products either personally or via relevant literature. The customer verifies that our product is fit for purpose based on our technical information. The customer performs customer and application specific tests to ensure that the product is suitable for the intended use. With this verification, all hazards and risks are transferred to our customers. Our warranty expires in case of inappropriate use.

Qualified personnel:

- The personnel that is charged for the installation, operation and maintenance of the instrument must hold a relevant qualification. This can be based on training or relevant tuition. The personnel must be aware of this manual and have access to it at all times.
- The electrical connection shall be carried out by a fully qualified electrician only.

General safety instructions:

- In all work, the existing national regulations for accident prevention and safety at the workplace must be complied with. Any internal regulations of the operator must also be complied with, even if these are not mentioned in this manual.
- During operation, the mounting parts can become very hot.



DANGER! Risk of burns!

Operating Instructions

Resistance Thermometers TPt... and Thermocouples TTe...

- Please ensure that the process is unpressurised before installing or removing the mounting part. Otherwise, there is a risk that hot, corrosive, toxic or explosive substances leak.



IMPORTANT! Risk of burns, chemical burns, poisoning or explosion!

- Never install a version for mounting into thermowells without a thermowell into a process, which is pressurised or by other means critical. These versions do not seal the process!
- Degree of protection according to DIN EN 60529: Ensure that the ambient conditions at the installation location do not exceed the requirements of the specified degree of protection (⇒ chapter 4 "Technical Data").
- Use the instrument in its perfect technical condition only. Damaged or defective instruments need to be checked immediately and replaced if necessary.
- Only use appropriate tools for mounting, connecting and dismantling the instrument.
- Nameplates or other information on the device shall neither be removed nor obliterated, since otherwise any warranty and manufacturer responsibility expires.
- In order to ensure measurement accuracy and durability of the instrument and to avoid damage, the limit values indicated in the technical data have to be observed.
- In case of visible damage or malfunctions, the instrument must be put out of operation immediately.



Special safety instructions:

Warnings, which are specifically relevant to individual operating procedures or activities, are to be found at the beginning of the relevant sections of this operating instruction.

- The medium temperature has to be within the specifications of the device.
- Ensure that construction type and materials of the device are resistant regarding application conditions and medium.
- Minimise external mechanical influences, such as oscillations, vibrations and shocks, by an appropriate installation.
- Reduce the influence of vapour, abrasive / aggressive media, dust and soot or others by selecting a suitable installation location.
- Avoid direct sunlight and immediate vicinity to hot objects as far as possible.
- Avoid strong electromagnetic fields.
- Modifications or other technical changes of the instrument by the customer are not permitted. Otherwise, you will lose your warranty. Use thermowells for easy installation and removal.

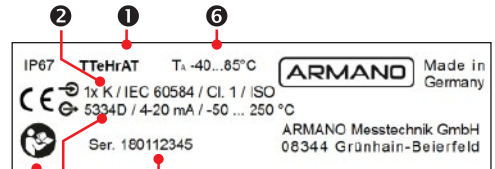
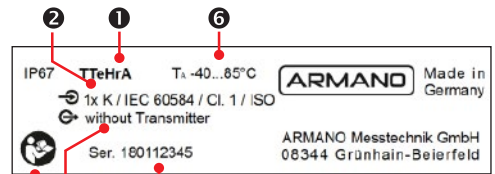
3. Device Description

The present document describes the standard version. For the application in environments with increased safety requirements (e.g. potentially explosive areas), special devices might be necessary. Our resistance thermometers and thermocouples are used for standard industrial temperature measurement.

They are generally manufactured in accordance with the standards DIN EN 60751, DIN EN 61515 and DIN EN 60584.

Further information on the instruments can be found in the data sheets 85xx and 86xx.

Nameplate:



- 1 Model
- 2 Characteristics input side for thermocouples: number x measuring element / product standard / accuracy class / hot junction (ISO = insulated; GND = hot junction welded to sheath)
Characteristics input side for resistance thermometers: number x measuring element / product standard / accuracy class / connection method (2-, 3- or 4-wire connection)
- 3 Symbol "Please regard manual"
- 4 Characteristics output signal for transmitters: transmitter model / signal range / temperature range
For instruments without transmitter the annotation "without Transmitter"
- 5 Serial number (the first four digits represent the year of manufacture, followed by the week of manufacture)
- 6 Ambient temperature range

Operating Instructions

Resistance Thermometers TPt... and Thermocouples TTe...

3.1 Scope of Application

The manual is valid for the products listed below. Information, which is not given in this manual, can be found in the respective product data sheets if necessary.

Resistance thermometers

Model	Data sheet	Model	Data sheet
TPtMiA	8510	TPtMi	8560
TPtHoA	8520	TPtMfSt	8550
TPtHrA	8521	TPtMfA	8551
TPtHoSrA	8530	TPtRG	8581
TPtSrA	8531	TPtRA	8580
TPtMiAo	8561		

Thermocouples

Model	Data sheet	Model	Data sheet
TTeMiA	8610	TTeMiAo	8661
TTeHoA	8620	TTeMi	8660
TTeHrA	8621	TTeO	8670
TTeHoSrA	8630	TTeMA	8650
TTeSrA	8631	TTeKA	8651



IMPORTANT! For explosion-protected resistance thermometers and thermocouples, our operating instruction B08-505 is valid as well.

Explosion-protected resistance thermometers

Model	Data sheet	Model	Data sheet
TPtHrXiA	8526	TPtSrXdA	8535
TPtSrXiA	8536	TPtMiXiAo	8566
TPtHrXdA	8525	TPtPAXd	8590

Explosion-protected thermocouples

Model	Data sheet	Model	Data sheet
TTeHrXiA	8626	TTeSrXdA	8635
TTeSrXiA	8636	TTeMiXiAo	8666
TTeHrXdA	8625	TTePAXd	8690

3.2 Intended Use

Our resistance thermometers / thermocouples are suitable for the temperature measurement in liquids or gases. Applications that are not explicitly listed as according to regulations, are improper to intended purpose!

The operational safety of the device supplied is only guaranteed by intended use. The specified limit values (⇒ chapter 4 "Technical Data") must not be exceeded.

3.3 Configuration and Function

Resistance thermometers consist of a temperature sensor (also referred to as stem, immersion tube, sensor probe etc.), which is composed of a closed tubular body, with a measuring resistor appropriately embedded in its tip.

The temperature-dependent change in resistance of the platinum is used as measuring effect and can be metrologically processed as a resistance signal. Depending on the construction type and the used measuring element, temperatures of -200 °C up to $+800\text{ °C}$ (-328 °F to $+1472\text{ °F}$) can be measured with resistance thermometers.

Thermocouples consist of a temperature sensor, which is composed of a closed tubular body, with appropriately embedded metallic wires made of various alloys according to DIN EN 60584, which are welded to one another at their ends. The thermoelectric effect, which results from the different material combinations, can be metrologically processed as a temperature-dependent voltage. Depending on the construction type and the used material combination, temperatures of -200 °C up to $+1600\text{ °C}$ (-328 °F up to $+2912\text{ °F}$) can be measured with thermocouples.

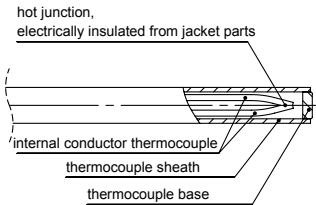
Operating Instructions

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As standard, thermocouples are executed in an insulated design. The response time can be improved by welding the hot junction (the joint, where the thermocouple wires are welded) with the wall of the temperature sensor. Thus, the thermocouple is generally grounded, which has to be considered when selecting process-

ing devices. The electrical connection is located on the cold side of resistance thermometer and thermocouple. Depending on the construction type, it consists of a terminal block, fitted in a housing (connection head), of a plug connector or of a connection cable.

hot junction insulated (ungrounded)



hot junction connected (grounded)

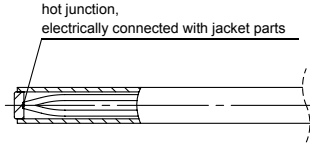


Figure 1: design of the hot junction for thermocouples

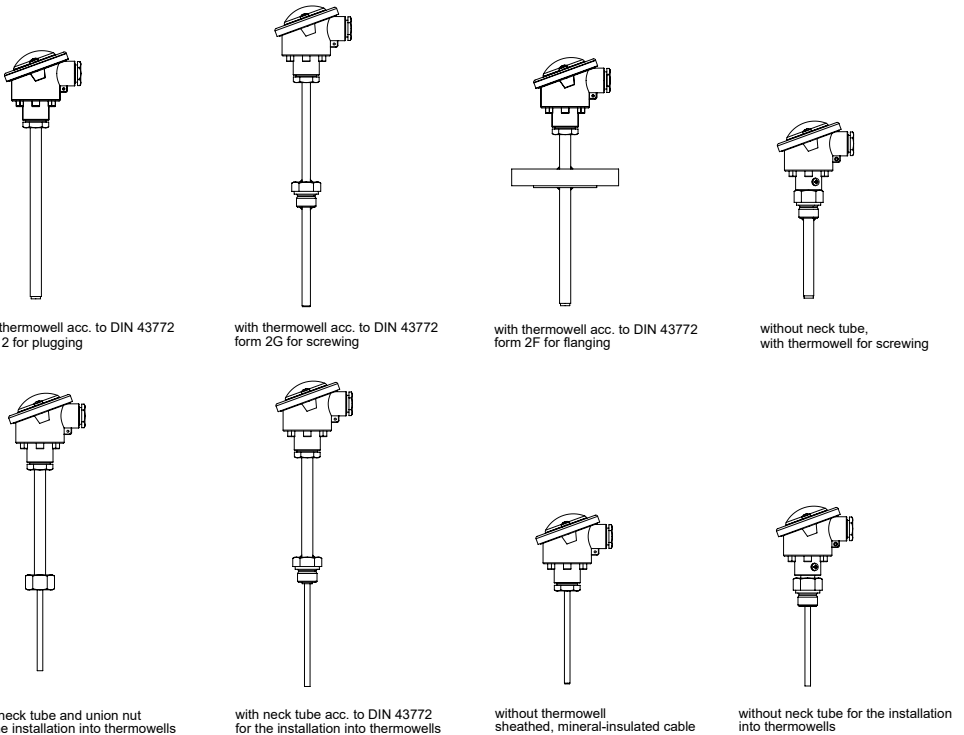


Figure 2: construction types, each depicted with connection head B

Operating Instructions

Resistance Thermometers TPt... and Thermocouples TTe...

4. Technical Data



Our product range resistance thermometers and thermocouples comprises various construction types and versions. For detailed technical data, please refer to the data sheet of the respective product.

An overview of the models and their respective data sheet can be found in chapter 3.1 "Scope of Application" of this operating instruction.

Common technical data

In the following, you will find an overview of common technical data and standards. These might deviate when specified in the corresponding data sheet or in the customer-specific working drawing.

Accuracy class of thermocouples	class 1 acc. to DIN EN 60584
Tolerance value ¹⁾ J, K, N for type J in the range -40 °C to +750 °C for type K and N in the range -40 °C to +1000 °C	+1.5 °C or 0.004 · t
Tolerance value ¹⁾ S in the entire operating temperature range	+1.0 °C or (1+(t-1100)·0.003) °C
Accuracy class of resistance thermometers	class AA, A or B acc. to DIN EN 60751
Characteristic curves of thermocouples	acc. to DIN EN 60584
Characteristic curves of resistance thermometers	acc. to DIN EN 60751
Design of measuring inserts for connection heads	acc. to DIN 43735
Design of high temperature thermocouples	acc. to DIN EN 50446

Accuracy classes and temperature ranges for resistance thermometers

Class	Scope of application °C		Tolerance value ²⁾ °C
	wire-wound resistor	thin film resistor	
AA	-50 / +250	0 – 150	±(0.1+0.0017· t)
A	-100 / +450	-30 / +300	±(0.15+0.002· t)
B	-196 / +600	-50 / +500	±(0.3+0.005· t)
C	-196 / +600	-50 / +600	±(0.6+0.01· t)

¹⁾ whichever value is higher

²⁾ |t| = value of temperature in °C without consideration of the algebraic sign

5. Installation

Prior to mounting, please check the following aspects:

- Are the goods undamaged and complete?
- Do the goods match the shipping documents?
- Is the instrument suitable for the case of application?
- Is the process temperature within the measuring range?
- Does the process connection comply with the requirements?

5.1 Mechanical Connection

The mechanical connection of the devices is carried out according to the general technical rules for the selected connection type.



When screwing in the devices, do not exert any force on the connection head, plug connector, etc., but only on the designated elements of the connection type (e.g. wrench flats of thread connections).

For sealing the process or the thermowell installed with cylindrical screw fittings (e.g. G½), gaskets made of appropriate material must be used. Conical screw fittings (e.g. ½" NPT) seal in the thread due to their cone-shaped geometry – if necessary by using additional appropriate sealants, e.g. PTFE tape (Please observe the operating temperature!).

Sealing material has to be replaced after being dismounted.

5.2 Installation Conditions

The installation situation may have a significant influence on the accuracy of the temperature sensor. A reasonable compromise between demands on measuring accuracy and mechanical strength should always be found.

The mass of the instrument mounting part should be kept to a minimum in order to avoid installation errors. However, thermometer thermowells are highly-stressed components, which, due to the lateral inflow at high temperatures and pressures, not only undergo a bending moment, but are also subjected to vibration. If these are within the range of the natural frequency of the thermowell, it can easily result in an overload. This can be prevented beforehand by carrying out a thermowell calculation.

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Temperature sensors should be optimally installed in a way that the medium flows against the tip of the thermowell to achieve a better thermal transfer (⇒ figure 1). Otherwise, an adverse dead flow zone could be created on the tip of the thermowell.

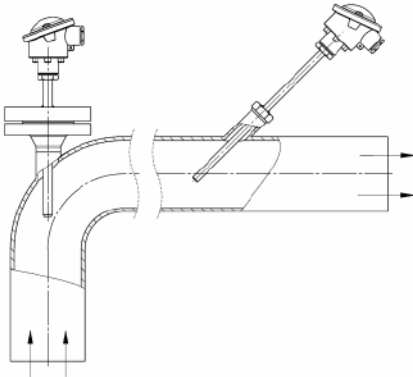


Figure 1: position of installation and flow direction

Furthermore, the installation length should be regarded. Install the temperature sensor in a way that at least 5 times the diameter of the stem is completely immersed in the medium. Measuring errors do occur if the stem is not fully immersed in the medium.

A 1:5 ratio between sensor diameter and installation length results in an installation error of 1 % (e.g. $d1=\varnothing9, U1=45$) (⇒ figure 2).

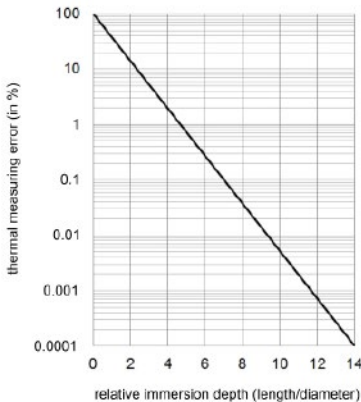


Figure 2: installation error depending on the immersion depth

Please regard the temperature distribution of the medium at the installation location of the instrument. Avoid measurements too close to walls of large vessels or in dead spaces of pipes if this does not correspond to the actual measurement task. When using thermowells, the thermal contact resistance between outside wall of the stem and inner wall of the thermowell can be reduced by means of a thermal contact agent.

Avoid the installation in pipe sections with flow turbulences. If possible, maintain an installation clearance of 10 times the pipe diameter from pipe bends, valves, gate valves, tapers or others.

5.3 Heat Dissipation from the Process

The values for the operating temperature range, indicated in the data sheets, are based on the temperature resistance of the temperature sensor. The maximum permissible temperatures of the other instrument components are indicated as maximum permissible ambient temperatures. The user has to ensure that those values are not exceeded, also in regard to the heat dissipation from the process.

For the electrical thermometers, this is usually achieved by extending the neck tube or, e.g. for sheathed thermocouples or resistance thermometers, by a sufficiently large distance between cable sleeve and process connection.

5.4 Alignment of the Connection Head

TPtHrA, TPtSrA, TPtRA, TPtHrXiA, TPtSrXdA, TPtSrXiA, TPtHrXdA, TPtHoA, TPtHoSrA, TTeHrA, TTeSrA, TTeRA, TTeHrXiA, TTeSrXdA, TTeSrXiA, TTeHrXdA, TTeO:

Loosen the M24 screw fitting directly beneath the connection head with a wrench, align the head and firmly tighten the screw fitting.

TPtHoA, TPtHoSrA, TTeHoA, TTeHoSrA, TTeMA, TTeKA:

Loosen the lateral retaining screws on the lower part of the connection head with a screwdriver, align the head and tighten the retaining screws.

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Resistance Thermometers TPt... and Thermocouples TTe...

TPtPAXd, TTePAXd:

Loosen the left / right threaded bushing in the middle of the neck tube with a spanner. Align the housing and tighten the bushing.

TPtMfA, TPtMiA, TTeMiA:

These models cannot be aligned at the connection head. Align the mounting parts before fastening the process connection (e.g. compression fitting, stop flange).

5.5 Straight Thermocouples According to DIN EN 50446 (High-temperature Thermocouples)

Depending on diameter, nominal length and construction type, an additional support has to be provided on site when installed horizontally.

Especially for temperatures above 1000 °C and nominal lengths ≥ 710 mm, the deflection of the thermowells, induced by their own weight when mounted horizontally, has to be taken into consideration.

Ceramic thermowells are very sensitive to mechanical tensions, induced by rapid, high temperature changes. We therefore recommend to preheat them before inserting them into the process.

The following insertion speeds should not be exceeded when inserting thermocouples with ceramic thermowell:

Thermowell diameter (mm)	Insertion speed (cm/min)
10	100
15	50
≥ 24	1

6. Electrical Connection



The temperature sensor must only be installed by qualified personnel. Qualified personnel are those persons, who are acquainted with mounting and commissioning of temperature sensors and who have qualifications such as: trained electrician or electrically instructed person.

During installation, make sure to maintain the required IP degree of protection and regard the integrity of cables and live parts.

Please ensure that

- all fittings were fastened with the required tightening torque.
- the applied sealing inserts in the screwed cable glands match the used cable diameters.
- the core cross-sections match the terminals.

6.1 Colour Coding of Thermocouples

Cables, connecting terminals and plug connectors are colour-coded according to DIN EN 60584-3.

Table: colour coding according to DIN EN 60584-3

Thermocouple	Positive pole	Negative pole
K (NiCr-Ni)	green	white
J (Fe-CuNi)	black	white
N (NiCrSi-NiSi)	pink	white
E (NiCr-CuNi)	violet	white
T (Cu-CuNi)	brown	white
S (Pt10Rh-Pt)	orange	white
R (Pt13Rh-Pt)	orange	white
B (Pt30Rh-Pt6Rh)	grey	white

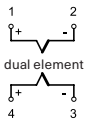
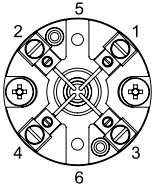
The general code colour of the thermocouples (e.g. for plug connectors or cable sheathing) is equal to the colour of the positive pole.

Operating Instructions

Resistance Thermometers TPt... and Thermocouples TTe...

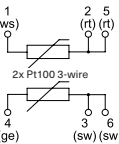
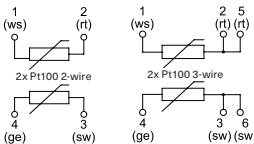
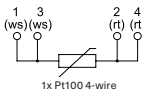
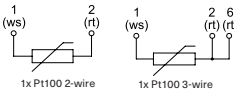
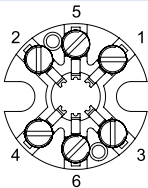
6.2 Sensors with Connection Head and Ceramic Terminal Block

Thermocouples with connection head:
Applies to TTeHrA, TTeSrA, TTeHoSrA, TTeHoA, TTeMiA, TTeMiAo, TTeHrXiA, TTeSrXiA, TTeHrXdA, TTeSrXdA, TTeMiXiAo

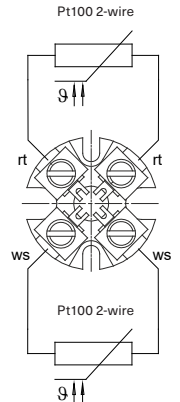
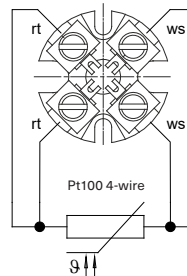
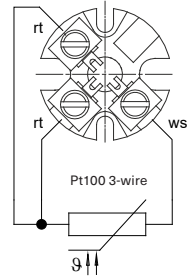
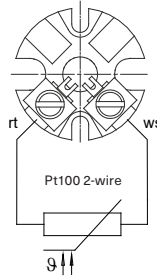


Next to the terminal numbers, the terminals are colour-coded. The colours are selected according to DIN EN 60584-3 (⇒ chapter 6.1).

Resistance thermometers with connection head:
Applies to TPtHrA, TPtSrA, TPtHoSrA, TPtHoA, TPtMiA, TPtMiAo, TPtHrXiA, TPtSrXiA, TPtHrXdA, TPtSrXdA, TPtMiXiAo



Resistance thermometers with connection head in miniature construction:
Applies to TPtMfA



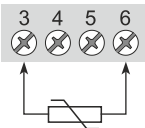
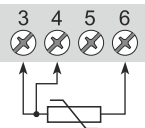
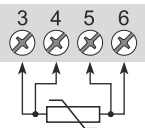
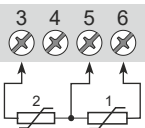
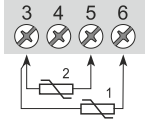
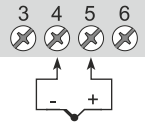
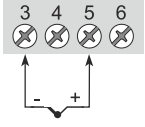
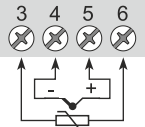
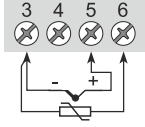
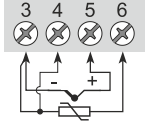
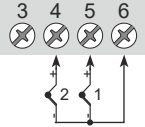
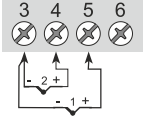
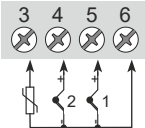
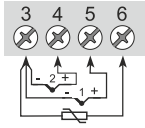
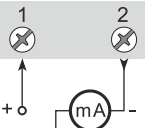
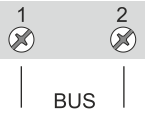
6.3 Sensors with Connection Head and Fitted Transmitter

The following transmitter types are installed as standard:

	Input	Output	Galvanic isolation	Accuracy
TT5331	universal	4...20 mA	yes	< 0.05 % FS
TT5333	Pt100, 3-wire	4...20 mA	no	< 0.1 % FS
TT5334	thermo-couple	4...20 mA	yes	< 0.05 %
TT5337	universal	4...20 mA, HART	yes	< 0.05 %
TT5350	universal	Profibus Fieldbus	yes	< 0.05 %
TT7501	universal	4...20 mA, HART	yes	< 0.05 %

Operating Instructions Resistance Thermometers TPt... and Thermocouples TTe...

For the wiring diagram of other transmitters, please refer to the respective data sheets.

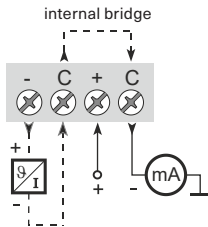
Wiring	RTD 2-wire	RTD 3-wire	RTD 4-wire	2 x RTD, 2-wire
diagram				
applies to	TT5331 TT5337 TT5350 TT7501	TT5331 TT5333 TT5337 TT5350 TT7501	TT5331 TT5337 TT5350 TT7501	TT5337 TT7501
Wiring	2 x RTD, 2-wire	TC, int. CJC	TC, int. CJC	TC, ext. CJC
diagram				
applies to	TT5350	TT5331 TT5334 TT5337 TT7501	TT5350	TT5331 TT5337 TT7501
Wiring	TC, ext. CJC	TC, ext. CJC, 3-wire	2 x TC, int. CJC	2 x TC, int. CJC
diagram				
applies to	TT5350	TT5350	TT5337 TT7501	TT5350
Wiring	2 x TC, ext CJC	2 x TC, ext CJC	Output	Output bus
diagram				
applies to	TT5337 TT7501	TT5350	TT5331 TT5333 TT5334 TT5337 TT7501	TT5350

Operating Instructions

Resistance Thermometers TPt... and Thermocouples TTe...

Sensors with connection head BUZ-H-W with integrated digital display:
Applies to TPtMiA, TPtHrA, TPtSrA, TTeMiA, TTeHrA, TTeSrA

The connection of the current loop to the fitted transmitter is already prewired (wires displayed with dashed lines in the wiring diagram below). Do not – as otherwise usual – connect the current loop to the transmitter, but to the digital display fitted in the lid, according to the following diagram:



The screw terminals are pluggable, so that you can carry out the wiring conveniently outside the lid.

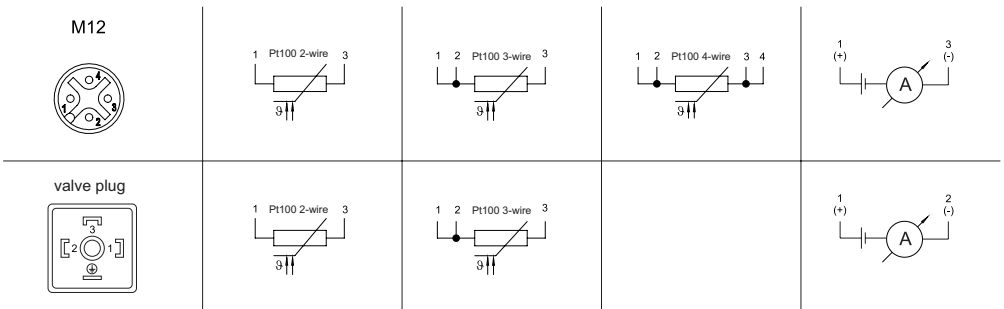
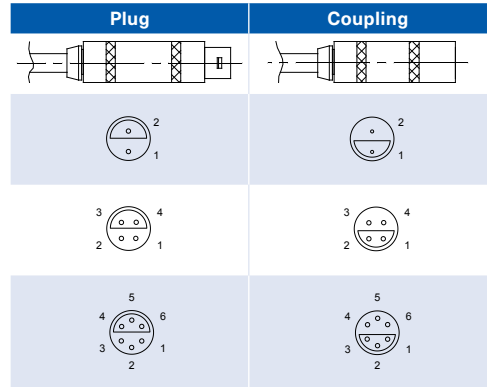
6.4 Resistance Thermometers Compact Design

Applies to TPtMfSt

The sensors are equipped with either an M12 plug connector according to DIN EN 61076-2-101 or a valve plug according to DIN EN 175301. The plug connectors are wired according to the following diagram:

6.5 Sensors with Lemosa Plug Connectors

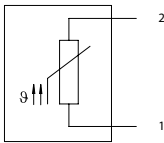
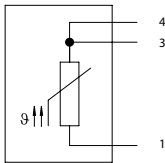
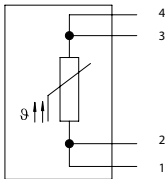
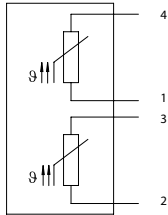
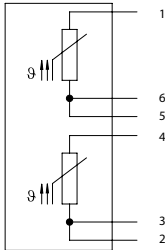
Pin assignment of Lemosa plug connectors:
 (front view)



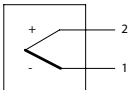
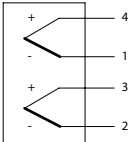
Operating Instructions

Resistance Thermometers TPt... and Thermocouples TTe...

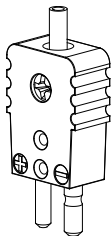
Pin assignment for resistance thermometers:

2-wire connection	3-wire connection	4-wire connection
		
2 x 2-wire connection	2 x 3-wire connection	
		

Pin assignment for thermocouples:

Single thermocouple	Dual thermocouple
	

6.6 Thermocouples with Plug Connectors Free of Thermoelectric Voltage According to DIN 50212



The polarity of the thermocouple is indicated on the plug connector. The colour of the housing corresponds to the colour coding according to DIN EN 60584-3 (⇒ chapter 6.1).

Operating Instructions

Resistance Thermometers TPt... and Thermocouples TTe...

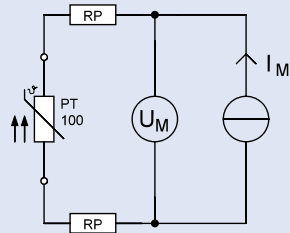
6.7 Colour Coding of Resistance Thermometers with Connection Cable

	Colours ¹⁾ according to DIN EN 60751		Colours ¹⁾ according to DIN 47100	
	single RTD	dual RTD	single RTD	dual RTD
2-wire connection				
3-wire connection				
4-wire connection				

6.8 Connection Methods of Resistance Thermometers

2-wire connection

The 2-wire connection does not compensate the parasitic lead resistance (RP). Some (older) measuring instruments offer the possibility of performing a line balancing. However, this method does not compensate the temperature drift of the connection cable. The standard IEC 60751 prohibits the operation of all measuring resistors with an accuracy class better than B for the 2-wire connection. However, the use of a 2-wire connection can be legitimate when using measuring resistors with a high nominal value (e.g. Pt1000, Pt5000).



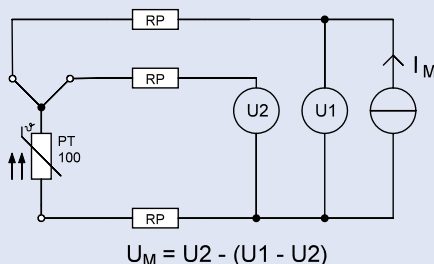
¹⁾ colour codes according to DIN IEC 60757

Operating Instructions

Resistance Thermometers TPt... and Thermocouples TTe...

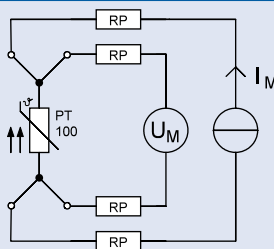
3-wire connection

The 3-wire connection compensates the parasitic lead resistances (RP) as well as their temperature drift with an accuracy sufficient for most applications. The prerequisite for the faultless operation of a 3-wire connection is that all three leads have the same resistance RP (e.g. three cores of one connection cable).



4-wire connection

The 4-wire connection compensates the parasitic lead resistances (RP) as well as their temperature drift, even if the leads have different resistances (RP). The prerequisite for the faultless operation of a 4-wire connection is that the voltage U_M is measured with high impedance. We recommend the application of the 4-wire connection from accuracy class A.



7. Maintenance / Cleaning, Storage and Transport



CAUTION! Material damage and loss of warranty!

Any modifications or interventions in the device, made by the customer, might damage important parts or components. Such intervention leads to the loss of any warranty and manufacturer's responsibility!

→ Never modify the device or perform any repairs yourself.

Maintenance:

- Our resistance thermometers / thermocouples are maintenance-free.
- To assure the accuracy of measurement, we recommend to recalibrate the resistance thermometers biennially and the thermocouples annually. This can be carried out by the manufacturer or by qualified personnel.

Cleaning:

- Clean the device with suitable agents. Only use cleaning agents and cleaning tools that do not corrode or damage the components of the device (this especially applies to the nameplate).
- Devices that are cleaned with high pressure-, water- or steam jets require the degree of protection IP69K.



IMPORTANT! Improper transport may destroy the device and cause considerable personal and property damage.

Please inspect the transport packaging and the delivered items immediately upon their receipt to determine their integrity, completeness and conformity with the delivery documents.

The permissible ambient conditions for storage and transport can be found in the data sheet of the respective product.

Operating Instructions

Resistance Thermometers TPt... and Thermocouples TTe...

Storage:

- If possible, store the instrument in its original packaging.
- If possible, remove the packaging not until installation of the device.
- Store the instruments in a dry place, not exposed to direct sunlight.
- The storage temperature of the instruments should not fall below or exceed the permissible temperature limitations, specified in the data sheets.

Transport:

- Please use a suitable packaging for the transport (if possible, the original packaging) with adequate padding material.
- Do not throw the instruments even when packed.
- Protect the packed instruments from moisture.
- Provide relevant transportation instructions on the packaging.

Replacement of the measuring insert:



IMPORTANT! Irrespective of the mechanical possibility of replacement, there are various factors, which makes such replacement of the measuring insert temporarily or permanently unwarranted. During the replacement, the IP degree of protection indicated on the device is no longer maintained. Please consult the person responsible in your company if the measuring insert may be replaced.

For the following models, the measuring insert can be replaced by the customer:

All models with the code letter "A" in the model code, except the following models:

TPtMiA, TPtMiAo, TPtMiXiAo, TPtMfA, TTeMiA, TTeMiAo, TTeMiXiAo, TTeMA, TTeKA

For the replacement of the measuring insert, please proceed as follows:

Open the lid of the connection head and loosen both spring-loaded M4 screws. Then you can remove the measuring insert. Reinsert a suitable replacement measuring insert and tighten both spring-loaded screws.

Any arising repairs may only be executed by the manufacturer. For possibly necessary repair or maintenance work, please contact your supplier or our factory.

8. Dismounting and Disposal



WARNING! Risk of injury!

Never remove the device from a system in operation.
Make sure that the system is switched off professionally.



Before dismounting:

Check before dismounting, whether the system

- is switched off,
- is in a safe and currentless state,
- is unpressurised and cooled down.

Disposal:

In compliance with the directives 2011/65/EU (RoHS) and 2012/19/EU (WEEE), the device must be disposed of separately as electrical and electronic waste. Please regard legal regulations of the country of distribution.



NO DOMESTIC WASTE!

The instrument comprises various materials. It shall not be disposed of together with domestic waste.

→ Bring the device to your local recycling plant

or

→ send the device back to your supplier or to the ARMANO Messtechnik GmbH.

9. CE Conformity



The CE marking of the instruments certifies the conformity with prevailing EU directives for placing products on the market within the European Union. The following directives apply:

ATEX directive 2014/34/EU¹⁾

EMC directive 2014/30/EU²⁾

Low-voltage directive 2014/35/EU²⁾

The corresponding declaration of conformity is enclosed or available upon request.

¹⁾ only for explosion-protected instruments ⇒ operating instruction B08-505

²⁾ only for instruments with respective fitted transmitters or digital displays

10. Declaration of Manufacturer

Herstellererklärung

Declaration of Manufacturer

Für die nachfolgend bezeichneten Erzeugnisse

We hereby declare for the following named goods

WIDERSTANDSTHERMOMETER
Typen TPt...

RESISTANCE THERMOMETERS
Models TPt...

und

and

THERMOELEMENTE
Typen TTe...

THERMOCOUPLES
Models TTe...

gemäß der Übersicht 8000E

according to model overview 8000E

wird hiermit bestätigt, dass sie, wenn zutreffend, den folgenden Normen entsprechen:

that they comply with the following standards, if applicable:

DIN EN 60751:2009-05
DIN EN 61515:2017-03
DIN EN 60584-1:2014-07
DIN EN 60584-3:2008-08
DIN 43735:2011-06

Gemäß den Bestimmungen der Richtlinie

According to the regulations of the directive

2014/68/EU (Druckgeräterichtlinie)

2014/68/EU (Pressure Equipment Directive)

fallen diese Thermometer nicht unter diese Richtlinie und werden weder einem Konformitätsbewertungsverfahren unterzogen noch mit einer CE-Kennzeichnung versehen.

these thermometers are not subject to this directive and neither do undergo a conformity assessment procedure nor do they bear the CE mark.

Die Geräte werden nach geltender guter Ingenieurpraxis ausgelegt und gefertigt.

The instruments are designed and manufactured according to sound engineering practice.

Diese Erklärung wird verantwortlich für den Hersteller:

This declaration is issued under the sole responsibility of the manufacturer:

ARMANO Messtechnik GmbH

abgegeben durch / by
Grünhain-Beierfeld, 2018-09-21

Bernd Vetter
Geschäftsführender Gesellschafter / Managing Director

ARMANO

ARMANO Messtechnik GmbH

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mail@armano-wesel.com