OCTOGON

MANUAL

TEMB

SCREW-IN RESISTANCE TEMPERATURE SENSOR

Operating manual



Document	Version	Date	Applies to
Operating manual	V00x	10/2026	TEMB, Pt100, 4 ... 20 mA, display, limit contacts

This operating manual describes transport, safety, mounting, connection, operation, configuration, fault recovery and maintenance of the TEMB screw-in resistance temperature sensor.

Contents

1 General ... 2
1.1 Information ... 2
1.2 Signs, abbreviations ... 3
1.3 Device ... 3
2 Transport, packaging, storage ... 3
2.1 Transport ... 3
2.2 Packaging ... 3
2.3 Storage ... 3
3 Safety instructions ... 4
3.1 Intended use ... 4
3.2 Personnel qualification ... 4
3.3 Special hazards ... 4
4 Start-up, operation ... 5
4.1 Function ... 5
4.2 Before mounting ... 5
4.3 Product label (example) ... 5
4.4 Mounting ... 5
4.5 Electrical connection ... 6
4.6 Pin assignment ... 6
4.7 Connection example ... 6
4.8 Connection of switch outputs ... 6
4.9 Function test ... 7
4.10 Error detection / fault current ... 7
4.11 Adjusting the display unit ... 8
5 Configuration ... 9
5.1 System operating principles ... 9
5.2 Main menu ... 11
5.3 Basic menu (bASE) ... 11
5.4 Display menu (diSP) ... 12
5.5 Switch point menu (SP) ... 13
5.6 System menu (SYS) ... 15
5.7 Menu tree overview ... 16
6 Fault recovery ... 17
7 Maintenance, dismounting, return, cleaning, disposal ... 17
7.1 Maintenance ... 17
7.2 Dismounting ... 17
7.3 Return ... 17
7.4 Cleaning ... 18
7.5 Disposal ... 18
8 Technical data ... 19
9 Dimensions ... 20

1 General

1.1 Information

– These operation instructions contain important information on handling the resistance thermometer. Working safely requires that all safety instructions and work instructions are observed.

– Skilled personnel must have carefully read and understood the operating instructions prior to beginning any work.

– The operating instructions are part of the product and must be kept in the immediate vicinity of the resistance thermometer and readily accessible to skilled personnel at any time.

– Observe the relevant local accident prevention regulations and general safety regulations for the resistance thermometer's range of use.

– If the serial number on the product label becomes illegible (e.g. through mechanical damage), traceability can not be ensured.

– The temperature sensors described in this operating manual are carefully designed and manufactured using state-of-the-art technology. Every component undergoes strict quality inspection at all stages of manufacture.
– 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, unauthorised modifications to the resistance thermometer or assignment of insufficiently qualified skilled personnel.

1.2 Signs, abbreviations

Sign	Meaning
Warning	Non-compliance can cause injuries to persons and/or the demolition of the device. There can be a danger to life.
Attention	Non-compliance can cause a faulty device operation or lead to property damage.
Information	Non-compliance can have influence on device operation or cause unintentional device reactions.
Danger – electrical power	Non-compliance with the safety instructions represents a risk of serious or fatal injuries caused by electrical power.
Warning – hot surface	Possible dangerous situations caused by hot surfaces or liquids, which can lead to burns. Please avoid hot surfaces and liquids.
U+	Positive supply connection
U–	Negative supply connection
SP1	Switch point 1
SP2	Switch point 2

1.3 Device

Feature	Version
Design	screw-in resistance temperature sensor
Sensor	RTD Pt100, 4-wire, class A / B / AA (B1/3 DIN)
Output	4 ... 20 mA, 2-wire
Display	7 segment, 4 digits, 3 keys
Limit contacts	2x PNP or NPN
Manufacturer type	METS-WS

2 Transport, packaging, storage

2.1 Transport

Check the device for any damage that may have been caused during transportation. Report obvious damage at once.

2.2 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, return).

2.3 Storage

For longer term storage avoid the following influences:

– Direct sunlight or proximity to hot objects
– Mechanical vibration, mechanical shock (rough mounting)
– Soot, vapour, dust and corrosive gases

If possible store the device in its original package or an equivalent one.

3 Safety instructions

Warning Before installation, commissioning and operation ensure that the appropriate resistance thermometer has been selected in terms of measuring range, design, specific measuring conditions and appropriate wetted parts materials (corrosion).

Information More important safety instructions can be found in the individual chapters.

3.1 Intended use

The resistance thermometer TEMB is used for the measurement of temperatures from –50 … 200 °C in liquid and gaseous media. It can be used for pressures up to 25 bar.

The sensor 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 an inspection by the manufacturer.

When the instrument is transported from a cold into a warm environment, the formation of condensation may result in the instrument malfunctioning. Before putting it back into operation, wait for the instrument temperature and the room temperature to equalise.

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

3.2 Personnel qualification

Warning **Risk of injury if qualification is 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.

For installation and start-up of the temperature sensor the personnel has to be familiar with the relevant regulations and directives of the country and must have the required qualification. They must have knowledge on measurement and control technology, have to be acquainted with electric circuits, are capable of carrying out the work described and can independently recognise potential hazards. Depending on the operation conditions of the application they need to have the corresponding knowledge, e.g. of corrosive media.

3.3 Special hazards

Warning For hazardous media such as oxygen, acetylene, flammable or toxic gases or liquids, refrigeration plants, compressors, etc., in addition to all standard regulations, the appropriate existing codes or regulations must also be followed.

If you do not observe the appropriate regulation, serious injuries and/or damage can occur!

Warning A protection from electrostatic discharge (ESD) is required.

The proper use of grounded work surfaces and personal wrist straps is required when working with exposed circuitry (PCB, printed circuit boards), in order to prevent static discharge from damaging sensitive electronic components.

Danger – electrical power There is a danger of death caused by electric current. Upon contact with live parts, there is a direct danger of death.

Electrical instruments may only be installed and connected by skilled electrical personnel.

Operation using a defective power supply unit (e.g. short circuit from the mains voltage to the voltage output) can result in life-threatening voltages at the instrument.

Warning Rest media in dismounted devices can represent a danger to people, the environment and the facility. Please take sufficient security measures!

Do not use this instrument in safety or Emergency Stop devices. Incorrect use of the instrument can result in injury.

Should a failure occur, aggressive media with extremely high temperature and under high pressure or vacuum may be present at the instrument.

4 Start-up, operation

4.1 Function

The TEMB is fitted directly into the process via thread of the process connection. A change in resistance of the sensor element in the tip of the protecting tube is transformed into an electrical standard signal by a measuring amplifier. The signal changes proportional to the temperature and can be evaluated.

4.2 Before mounting

Information

- Check if a completely assembled temperature sensor is supplied.
- Inspect the temperature sensor for possible damage during transportation. Should there be any obvious damage, inform the transport company and supplier without delay.
- Keep the packaging, as it offers optimal protection during transportation.
- Ensure that the process connection thread and the connection contacts will not be damaged.

4.3 Product label (example)

Field	Meaning	Field	Meaning
OR...	Product code	Art.Nr.	Part number
Tmax	Range maximum	SN	Serial number
T	Temperature range	Date	Date of QC
U+	Supply/Loop +	OUT	Loop signal
U–	Supply/Loop –	SUP.	Range of voltage
SP	No. and kind of switch point		

4.4 Mounting

Tools: wrench (flats 27), screw driver

The resistance thermometers are designed for screw fitting directly into the process. The insertion length, along with the flow velocity and viscosity of the process media, may reduce the maximum loading on the protecting tube.

Installation on pipes:

- A: on elbows
- B: in small pipes, inclined
- C: perpendicular to flow direction

You have to provide for a sealing element which corresponds to the application. Exceptions may be instruments with self-sealing threads (e.g. NPT thread).

When mounting the instrument, ensure that the sealing faces of the instrument and the measuring point are clean and undamaged.

Screw in or unscrew the instrument only via the flats using a suitable tool and the prescribed torque. The appropriate torque depends on the dimension of the process connection and on the sealing element used (form/material). Do not use the case as working surface for screwing in or unscrewing the instrument.

When screwing the transmitter in, ensure that the threads are not jammed.

If necessary observe information about tapped holes and welding sockets.

4.5 Electrical connection

Attention Connect the instrument to earth via the process connection.

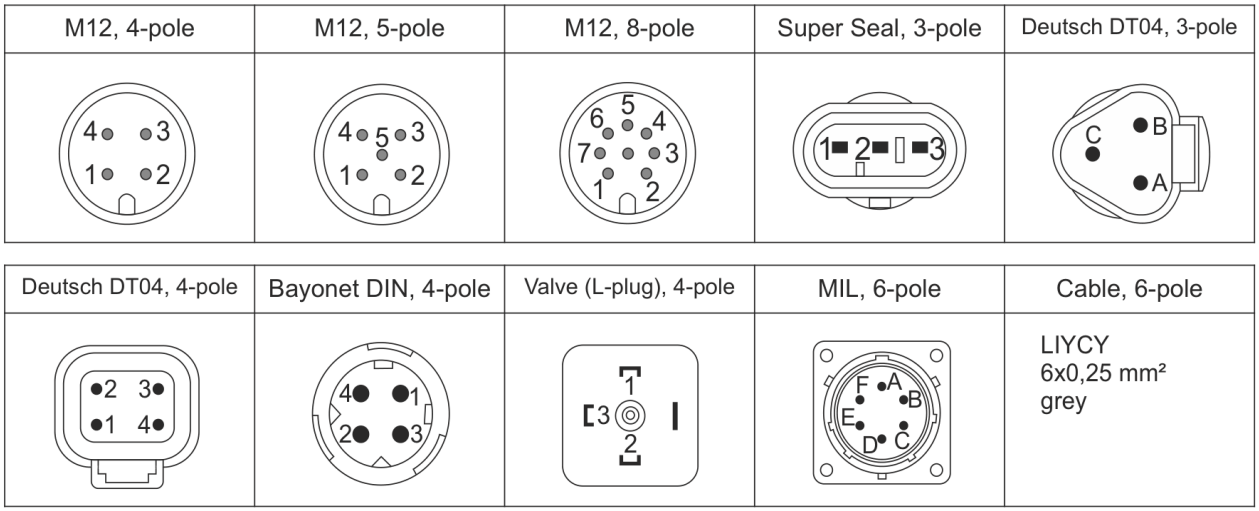
The ingress protection specified only applies while the temperature transmitter is connected with the female connectors that provide the corresponding ingress protection.

Ensure that the cable diameter you select fits to the cable gland of the connector. Ensure that the cable gland of the mounted connector is positioned correctly and that the sealings are available and undamaged. Tighten the threaded connection and check the correct position of the sealings to ensure ingress protection.

Make sure that the ends of cables with flying leads do not allow any ingress of moisture.

4.6 Pin assignment

Connection	Current loop 4 ... 20 mA U+	U–	Limit value contact Common	SP 1	SP 2
M12, 4-pole	1	3	2	4	
M12, 5-pole	1	3	5	4	2
M12, 8-pole	1	3	5	4	2
Super Seal, 3-pole	1	3			
Deutsch DT04, 3-pole	A	B			
Deutsch DT04, 4-pole	1	3	2	4	
Bayonet DIN, 4-pole	1	2	3	4	
Valve (L-plug), 4-pole	1	2	3	GND	
Cable, 6-pole	yellow	white	green	brown	grey
MIL, 6-pole	A	C	E	D	B



View: plug pins of male connector. Cable: LIYCY, 6 × 0.25 mm², grey.

4.7 Connection example

Two-wire connection via the current loop 4 ... 20 mA:

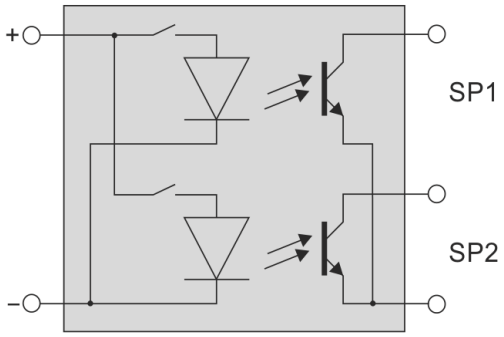
TEMB	Connection
1 (+)	to + of the supply
3 (–)	to + of the evaluation unit (e.g. SPS)
	– of the supply to – of the evaluation unit

4.8 Connection of switch outputs

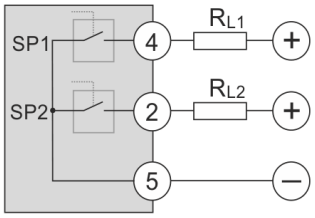
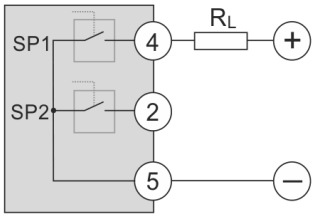
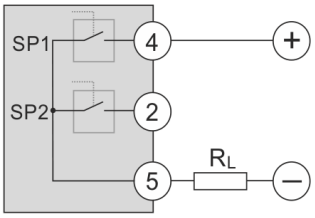
The switch outputs are potential-free. They are electrically isolated from the current loop (see figure "Isolated switch outputs").

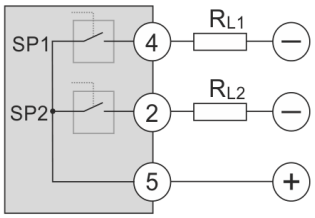
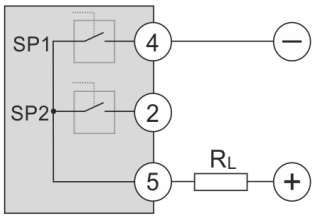
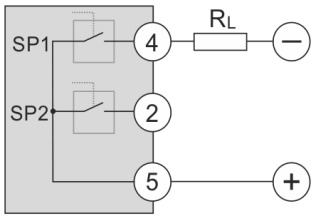
In case of using only one switch point it is possible to connect the load on both sides of the contact, e.g. NPN-style: load connected to high or low side (see below).

Use an appropriate recovery diode if you want to switch inductive loads.



Isolated switch outputs

Switch outputs with common on low side (NPN)		
Two outputs are used	One output is used, load on high side	One output is used, load on low side
		

Switch outputs with common on high side (PNP)		
Two outputs are used	One output is used, load on high side	One output is used, load on low side
		

4.9 Function test

Information The output signal must be proportional to the temperature. If not, this might point to a damage of the sensor. In that case refer to chapter Fault recovery (section 6).

Warning

- Open pressure connections only after the system is without pressure.
- Observe the environmental and working conditions outlined in chapter Technical data (section 8).
- When touching the transmitter, keep in mind that the surfaces of the instrument components might get hot.

4.10 Error detection / fault current

The device detects wire break and short circuit (sensor element <> measuring amplifier) as well as temperatures outside of the measuring range and indicates this with an error current in the current loop circuit.

The current output is proportional to the temperature from 3.8 to 20.5 mA. If the measured temperature would result in a current below 3.8 mA the current output is set to 3.6 mA (also for a wire short circuit). If the current would exceed 20.5 mA, the current output is set to 21 mA (also for wire break).

If the device is equipped with switching outputs, these will be disabled if an error is detected for more than 10 seconds. This ensures that the switches are in a safe state, comparable to the loss of voltage supply.

Measuring signal (% of range)	Output current
below –1.25 % or wire short circuit	3.6 mA (error current)
–1.25 %	3.8 mA
0 %	4.0 mA
100 %	20.0 mA
103.125 %	20.5 mA
above 103.125 % or wire break	21.0 mA (error current)

Output current and measured signal.

4.11 Adjusting the display unit

It is possible to turn the display unit approx. 300° to optimize the reading. To do so, hold the plastic body with one hand and turn the display unit with the other hand into the wanted position.

The turning angle is limited by an internal limit stop. Do not try to force the display beyond that point. It might be destroyed.

5 Configuration

Description of handling and configuration of the display device.

An overview of the menu tree is shown in section 5.7.

The 3 buttons on the display head operate by capacitive principle with no mechanical components: When pressing a button, there is no key drop. The buttons are reacting to the approach of a finger via sensing its electromagnetic field. Withdraw your finger at least 1 cm after pressing a button. This is useful for proper keypress detection.

The following description is for a device configuration using capacitive buttons. The configuration via software is described in a separate manual.

5.1 System operating principles

5.1.1 System feedback to operator

The LEDs for switching output are used to give operator feedback when buttons are pressed. This does not affect the switching outputs themselves. When no button is pressed the LEDs are showing the state of switching outputs.

Button	Feedback
Arrow button down (left)	Left LED is flashing
Arrow button up (right)	Right LED is flashing
Both arrow buttons simultaneously	Both LEDs are flashing
Center button	Both LEDs are flashing rapidly

Button feedback.

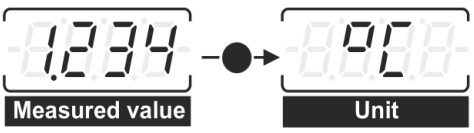
5.1.2 Display mode / measured value indication

After power up the device starts in display mode. The current measured value is displayed or is displayed alternately with the unit (see 5.4.1).

The displayed value is flashing when the measured value is greater than the maximal presentable value. This can be caused by a fixed decimal point (see 5.4.3).

As long as the center button is pressed the selected unit will be displayed.

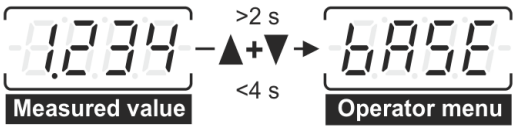
A single arrow button has no function in display mode.



Unit indication

5.1.3 Configuration mode activation

When pressing both arrow keys simultaneously for at least 2 s the configuration mode is entered. The first entry of the operator menu appears on the display (**bASE**). If both buttons are not released within 4 s the device switches back to display mode, showing the current measured value again.



Activating the configuration mode

5.1.4 Configuration mode / operator menu

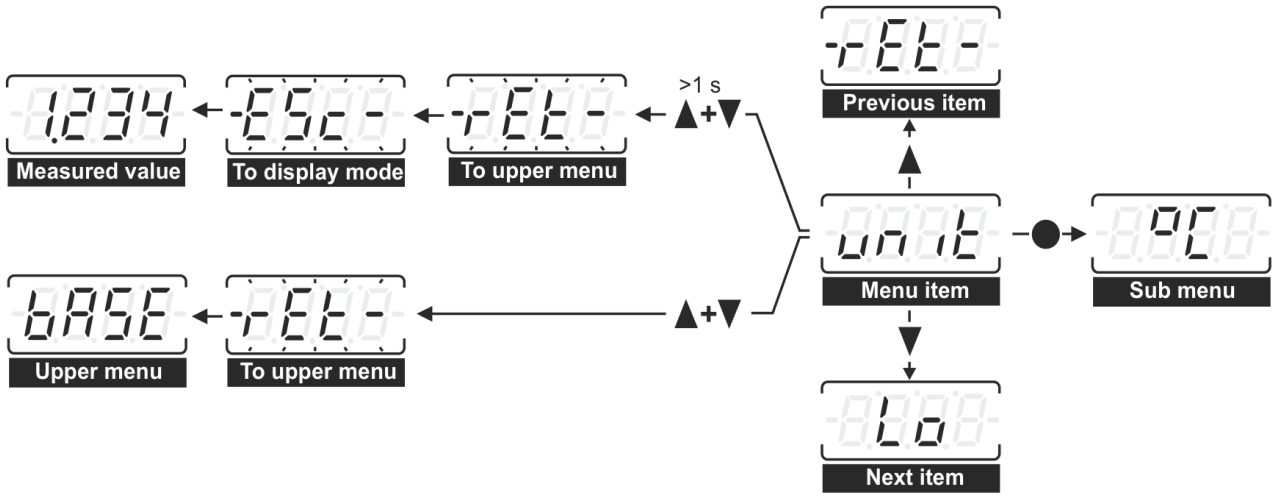
The configuration mode always starts with the first item of the main menu (**bASE**). Within the menu you navigate with the arrow buttons. The center button selects a menu item respectively enters a submenu. Menu items which just show a value (e.g. maximum pointer) can be exit to the next upper menu item with the center button.

Every menu has the item „**-ret-**“ (return) which allows you to go back to the next upper menu. In the main menu it goes back to the display mode.

At the end of a menu (typically „**-ret-**“) you return to the first menu item when pressing the down arrow button again. Similarly, you jump to the end of the menu when pressing the up arrow in the first menu item.

In each menu item it is possible to return to the next upper menu by pressing both arrow buttons simultaneously. The feedback is a flashing „**-ret-**“. When doing this for more than 1 s, the device returns to display mode with the feedback of a flashing „**-ESc-**“ (escape).

If no button is pressed for 5 minutes in the configuration mode, the device automatically switches back to the display mode.



Configuration mode: Example operator menu

5.1.5 Setting values

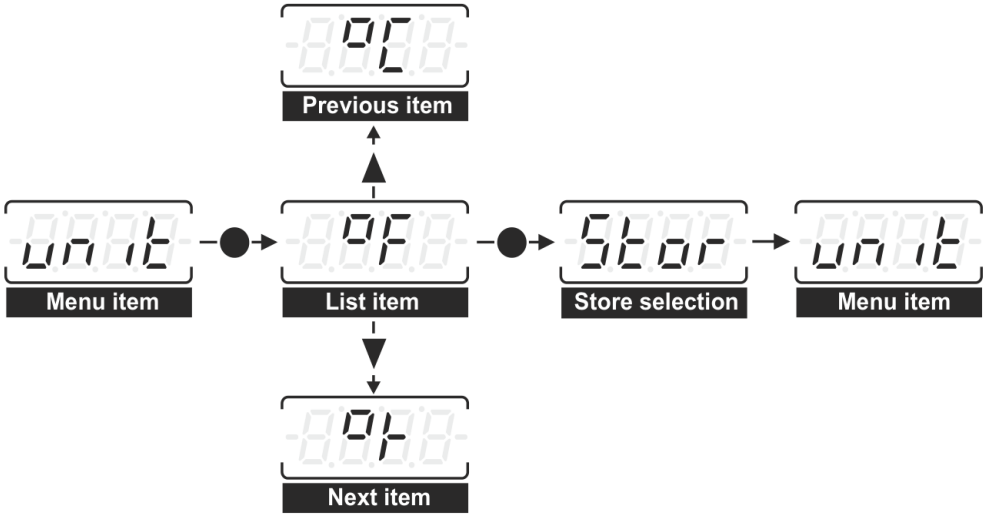
There are 2 types of values that can be altered:

- values which can be selected from a predefined parameter list
- numerical values

Selecting a value from a list

Parameter lists are used for example for the units. Within the list you navigate with the arrow buttons. With the center button a selected value is stored, confirmed with indicating „**Stor**“. After that the device is in the next upper menu.

The list can be left by pressing both arrow buttons simultaneously to the next upper menu without changing the present value.



Configuration mode: Example to select a value from a list

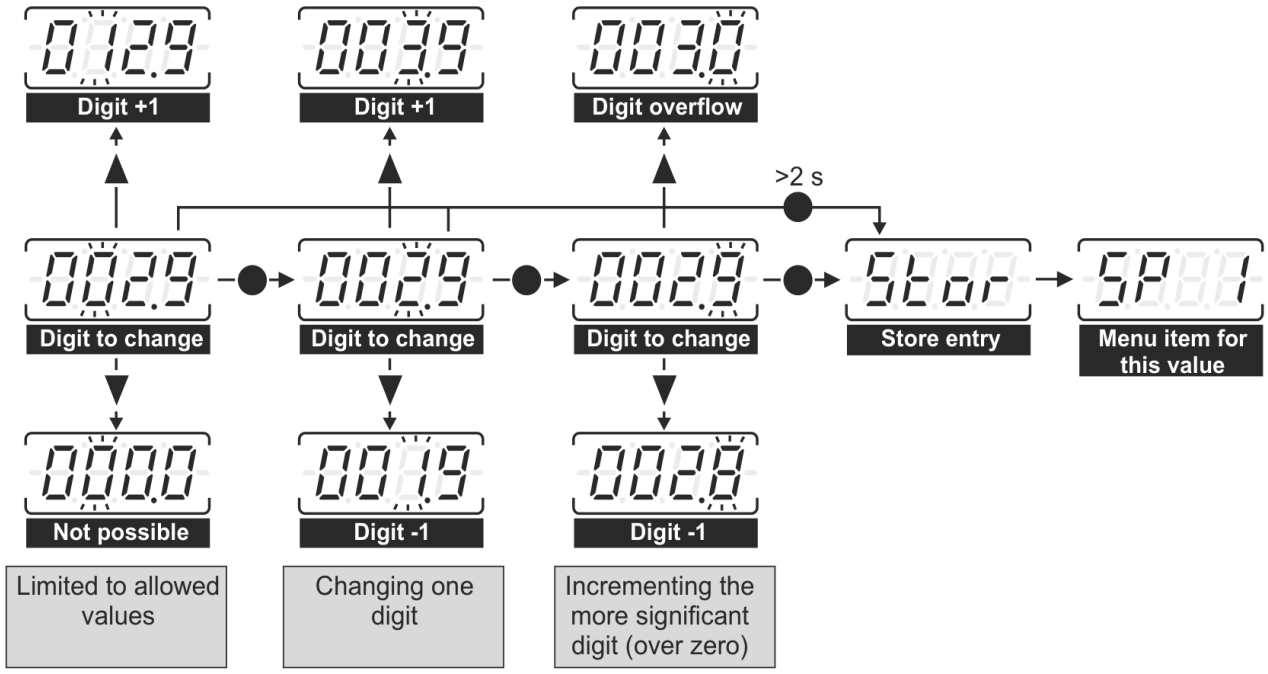
Setting a numerical value

Numerical values are entered digit by digit. The selected digit flashes and is incremented with the up arrow button and decremented with the down arrow button. The more significant digit will also be incremented or decremented when stepping over zero. If a change of the active digit would exceed the allowable value (e.g. the lower or upper range limit) the allowable value will be shown. With the opposite arrow button you can return to the previous value.

The selected digit is confirmed with the center button and proceed to the next digit. You can cancel the value entry at any time by pressing both arrow buttons simultaneously. The device will then switch back to the corresponding menu entry. The partially edited value will not be saved.

When the right-most digit is selected, the center button confirms the whole value. „**Stor**“ appears on the display to confirm that the value has been stored and the device switches back to the menu item for the value.

You can store a partially edited value at any digit position by holding the center button until „**Stor**“ appears on the display (approx. 2 s).



Button functions for entering numerical values (Example)

5.2 Main menu

The main menu has the following functions:

Display	Designation	Description
bASE	Basic functions	Setting of unit, lower and upper range value, minimum and maximum pointer
diSP	Display functions	All settings relating to the display
SP	Switch point settings	Configuration of the switching outputs (option)
SYS	System data	Reset to factory settings, loop test, Displaying of: hardware version, software version, serial number
-rEt-	Return	Return to display mode

5.3 Basic menu (bASE)

The basic menu has the following functions:

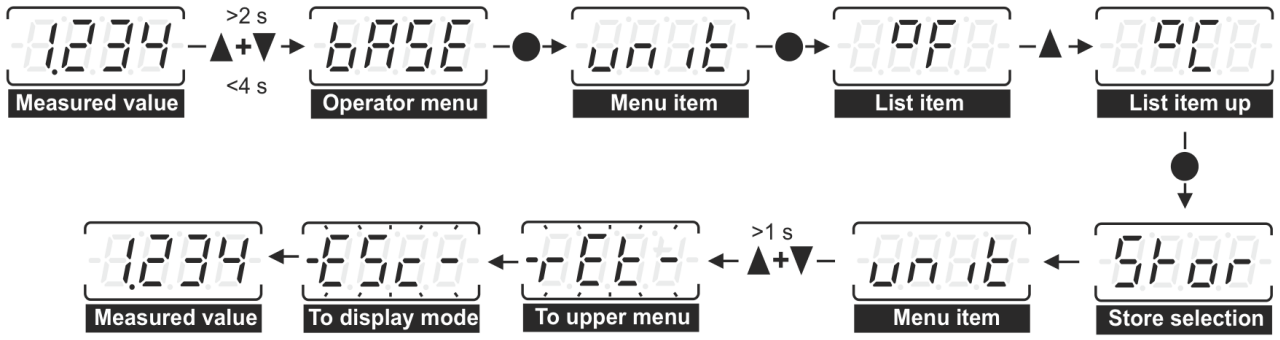
Display	Designation	Description
unit	Measuring unit	Setting the measuring unit (parameter list)
Lo	Trailing pointer minimum (low)	Display and/or delete the minimum trailing pointer
Hi	Trailing pointer maximum (high)	Display and/or delete the maximum trailing pointer
-rEt-	Return	Return to main menu

5.3.1 Setting the measuring unit (unit)

A selected unit applies to data entries (e.g. switch points) and to the display of numerical values (e.g. the trailing pointers). Possible are the following units:

Display	Unit	Display	Unit
°C	°C	**mA**	mA
°F	°F	**-rEt-**	Return to „unit“
°K	°K		
%	% of measuring range		

Example for the steps needed to change the unit from °F to °C:



Steps to change the unit

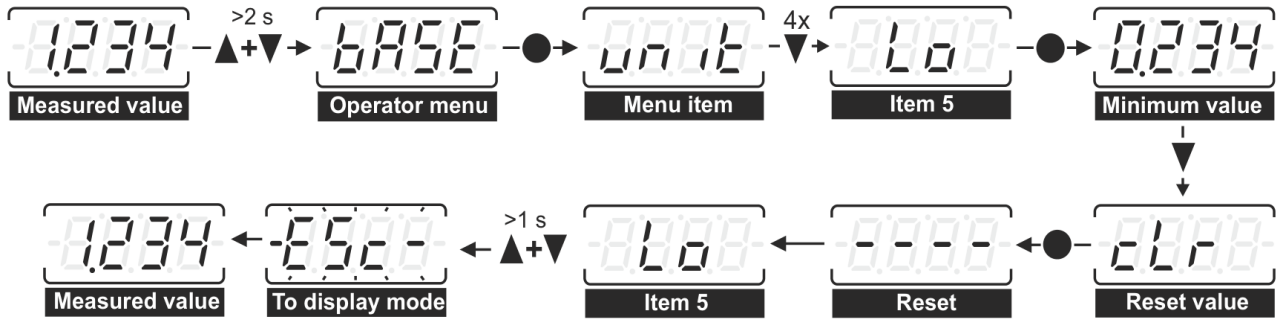
5.3.2 Trailing pointers (Lo / Hi)

The trailing pointers for minimum and maximum values can be displayed or reset. A reset is confirmed with „---“ on the display.

The trailing pointer shows „**Er.Lo**“ respectively „**Er.Hi**“ if the current output has been set to a fault current (see 4.10).

Display	Designation	Description
1234	Value of min/max pointer	Value of the min/max pointer in the selected measuring unit
cLr	Clear	Reset the stored pointer value
-rEt-	Return	Return to „Lo“ or „Hi“

The steps to reset the minimum pointer are shown below.



Steps to reset the minimum pointer

5.4 Display menu (diSP)

The display menu has the following functions:

Display	Designation	Description
td	Display period for measured value (time data)	Setting between 0.5 ... 99.9 s possible
tu	Display period for unit (time unit)	Setting between 0.0 ... 99.9 s possible
rot	Rotate 180°	Rotate screen by 180° when the device is mounted upside down
dEcP	Decimal places	Setting the decimal places (0 ... 3 fixed decimal places or automatic)
-rEt-	Return	Return to „diSP“

5.4.1 Display period for measured value/unit (td / tu)

The unit can be shown either by pressing the center button in display mode or alternately with the measured value. The display periods of measured value and unit can be configured independently of one another.

Setting the period for the unit to 0.0, only the measured value will be displayed.

5.4.2 Rotating the display by 180° (rot)

In case of mounting the device upside down, the 7-segment display and buttons can be rotated by 180° so that reading and operating are possible as usual.

Display	Designation	Description
0°	Standard (0°)	
180°	Upside down (180°)	Display rotated by 180° for upside down operation
-rEt-	Return	Return to „rot“

5.4.3 Decimal point setting (dEcP)

Possible is a fixed or an automatic positioning of the decimal point.

Display	Designation	Description
Auto	Automatic	The decimal point is set so that all digits are fully used
0000	No decimal place	
000.0	One decimal place	
00.00	Two decimal places	
0.000	Three decimal places	
-rEt-	Return	Return to „dEcP“

Please note that when the decimal point is fixed, the measured value may not be displayed if there are insufficient digits left of the decimal point. In this case the maximum number that can be shown on the display will appear, flashing, e.g. „**99.99**“, when two decimal places are set for a measured value of 110 °C.

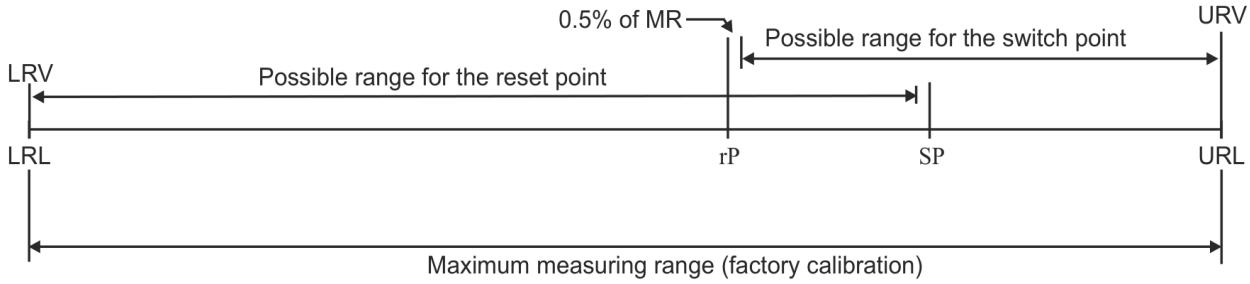
5.5 Switch point menu (SP)

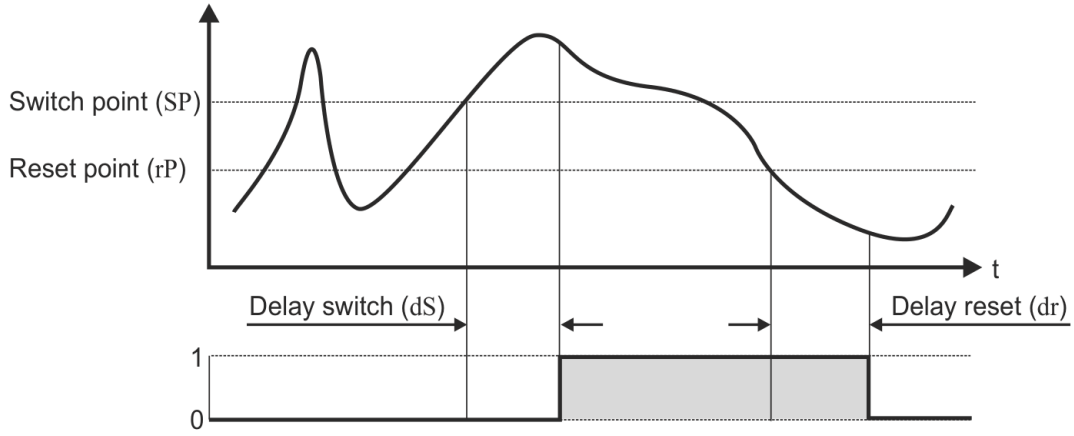
The menu has items for the settings of the two switch points. The output behaviour can be a hysteresis or a frame function where the menu items are different. The switching delays can be defined independently from the output function.

Display	Designation	Description
SP 1	Switch point	Switch point in the selected measuring unit
rP 1	Reset point	Reset point in the selected unit
dS 1	Delay switch	Output delay at switch point
dr 1	Delay reset	Output delay at reset point
out 1	Output function	Configuring the output behaviour (normally open, normally close, hysteresis / frame function)
LEd 1	LED switch point	Configuring the behaviour of the LED for switch point (electrically, logically)
	Menu items for switch point 2	
-rEt-	Return	Return to „SP“

The switch point (**SP**) must be between the upper range value (URV) and the reset point. The reset point (**rP**) must be between the lower range value (LRV) and the switch point. The minimum hysteresis (difference between switch point and reset point) is 0.5 % of the measuring range (MR).

It is possible to define a delay for the switch point as well as the reset point, e.g. to avoid that short temperature peaks trigger the switch.





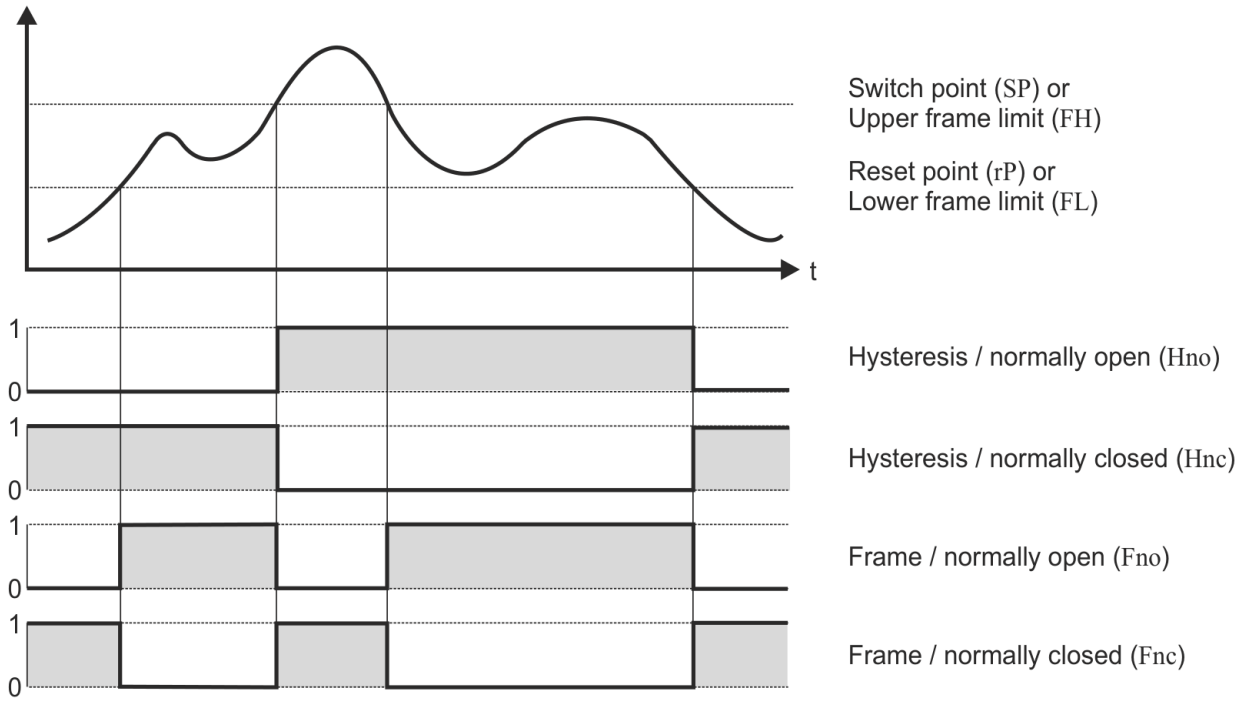
When the frame function is used, the menu items for switch point and reset point are replaced by the upper and lower frame limits. The minimum difference of the frame limits is 0.5 % of the measuring range (MR).

Display	Designation	Description
FH 1	Frame high	Upper frame limit in the selected measuring unit
FL 1	Frame low	Lower frame limit in the selected measuring unit
dS 1	Delay switch	Output delay when entering the frame
dr 1	Delay reset	Output delay when leaving the frame
out 1	Output function	Configuring the output behaviour (normally open, normally close, hysteresis / frame function)
LEd 1	LED switch point	Configuring the behaviour of the LED for switch point (electrically, logically)
	Menu items for switch point 2	
-rEt-	Return	Return to „SP“

5.5.1 Configuring the output function (out 1 / 2)

Possible are hysteresis or frame functions and the output as normally open or closed contacts.

Display	Designation	Description
Hno	Hysteresis, normally open	If the temperature is above the switch point the switch is closed. At the lower range limit the switch is open.
Hnc	Hysteresis, normally closed	If the temperature is above the switch point the switch is open. At the lower range limit the switch is closed.
Fno	Frame, normally open	Inside of the frame the switch is closed. At the lower range limit the switch is open.
Fnc	Frame, normally closed	Inside of the frame the switch is open. At the lower range limit the switch is closed.
-rEt-	Return	Return to „out 1“ or „out 2“



5.5.2 Configuring the behaviour of the LED switch point (LEd 1 / 2)

Possible is electrical or logical behaviour.

Display	Designation	Description
ELEc	Electrical behaviour	The LED is „ON“ when the switch point contact is closed
Logi	Logical behaviour	The LED is „ON“ when the switch point value is reached or within frame
-rEt-	Return	Return to „LEd 1“ or „LEd 2“

5.6 System menu (SYS)

The system menu has the following functions:

Display	Designation	Description
LooP	Loop test	Setting a fixed current in order to test the current loop
inFo	Information	Indicating of hardware and software version, serial number
rES	Reset	Reset to factory settings
-rEt-	Return	Return to „SYS“

5.6.1 Information (inFo)

The information menu has the following functions:

Display	Designation	Display	Designation
HW1	Hardware version 1 (HW1)	**SW2**	Software version 2 (SW2)
HW2	Hardware version 2 (HW2)	**Sn 1**	Serial number 1 (Sn 1)
SW1	Software version 1 (SW1)	**Sn 2**	Serial number 2 (Sn 2)
-rEt-	Return		Return to „inFo“

Due to the limited number of alphanumerical segments on the display the values for these items are split.

5.6.2 Reset to factory settings (rES)

It is possible to reset the device to the configuration as delivered with the menu item „Reset“ (**rES**). When entering the menu the entry points to „**rEt**“. To confirm the reset go to „**YES**“ with one of the arrow buttons and press the center button. After this final confirmation all parameters will be changed to the settings as delivered.

When confirming with the center button „**donE**“ appears on the display which confirms that the device has been reset to factory settings. Then the device switches back to the initial menu item („**rES**“).

Display	Designation	Description
-rEt-	Return	Return to „rES“
YES	Yes	Resetting the device to factory settings

5.7 Menu tree overview

Menu	Item	Function
bASE		**Menu with basic functions**
	unit	Setting the measuring unit (°C, °F, °K, %, mA)
	Lo	Display and/or delete the minimum trailing pointer
	Hi	Display and/or delete the maximum trailing pointer
diSP		**All settings relating to the display**
	td	Setting the display period for the measured value
	tu	Setting the display period for the unit
	rot	Display direction (0° = standard, 180° = turned)
	dEcP	Display the decimal places (0 ... 3 fixed decimal places or automatically)
SP		**Configuring the switching outputs (when available)**
	SP 1 / FH 1	Switch point or upper frame limit of switching output 1
	rP 1 / FL 1	Reset point or lower frame limit of switching output 1
	dS 1	Output delay at the switch point of switching output 1
	dr 1	Output delay at the reset point of switching output 1
	out 1	Output functions of switching output 1 (**Hno**, **Hnc**, **Fno**, **Fnc**)
	LEd 1	Behaviour LED switch point
		Menu items for switch point 2
SYS		**System functions**
	inFo	Versions of hardware and software, serial number
	rES	Reset to factory settings

6 Fault recovery

Warning

- Open process connections only after the system is without pressure.
- Open electrical connections only after system has achieved dead-voltage condition.
- Residual media in dismounted instruments can result in a risk to personnel, the environment and equipment.
- Remove the temperature sensor from service and mark it to prevent it from being used again accidentally, if it becomes damaged or unsafe for operation.

Failure	Possible cause	Procedure
No output signal	Cable break	Check connectors and cable
	Mechanical load too high or overtemperature	Replace the sensor with a suitable design
No/false output signal	Incorrectly wired	Follow pin assignment (s. product label / operating instructions)
Erroneous measurement values	Sensor drift caused by overtemperature	Replace the sensor with a suitable design
	Sensor drift caused by chemical attack	Replace the sensor with a suitable design
Erroneous measurement values (too low)	Entry of moisture into cable or plug	Replace the sensor with a suitable design
Erroneous measurement values and response time too long	Wrong mounting geometry, e.g. mounting depth too low or heat dissipation too high	The temperature-sensitive area of sensor must be inside the medium and surfaces must be isolated
	Deposits on the sensor	Remove deposits
Measurement signal “comes and goes”	Cable break in connecting cable or loose contact caused by mechanical overload	Replace the sensor with a suitable design, e.g. thicker conductor cross section
Corrosion	Composition of medium not as expected or modified or wrong material of protecting tube	Analyse medium and then select a more suitable material
Signal interference	Stray currents caused by electric fields or earth loops	Use of screened connecting cables, increase the distance to motors and power lines
	Earth circuits	Elimination of potentials, use of supply isolators or galvanically isolated measuring amplifiers

Note: In case of unjustified reclamation an additional charge is possible.

7 Maintenance, dismounting, return, cleaning, disposal

7.1 Maintenance

The TEMB screw-in temperature sensors require no maintenance and contain no components which could be repaired or replaced.

7.2 Dismounting

Warning Rest media in dismounted instruments can be hazardous to persons, the environment and the installation. Use sufficient safety measures!

Warning – hot surface There is a risk of burns. Let the instrument cool down sufficiently before dismounting. During dismounting there is a risk of dangerously hot pressure media escaping.

Only disconnect the resistance thermometer once the system has been depressurised.

7.3 Return

Warning Before the return of an instrument see chapter 7.4.

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

To avoid a damage, use for example antistatic plastic film, shock-absorbent material, a marking as highly sensitive measuring instrument.

7.4 Cleaning

Attention

- Before cleaning the instrument disconnect the electrical connection.
- Clean the instrument with a moist cloth.
- Electrical connections must not come into contact with moisture.
- Wash or clean the dismounted instrument before returning it in order to protect personnel and the environment from exposure to residual media.
- Rest media in dismounted instruments can be hazardous to persons, the environment and the installation. Use sufficient safety measures!

7.5 Disposal

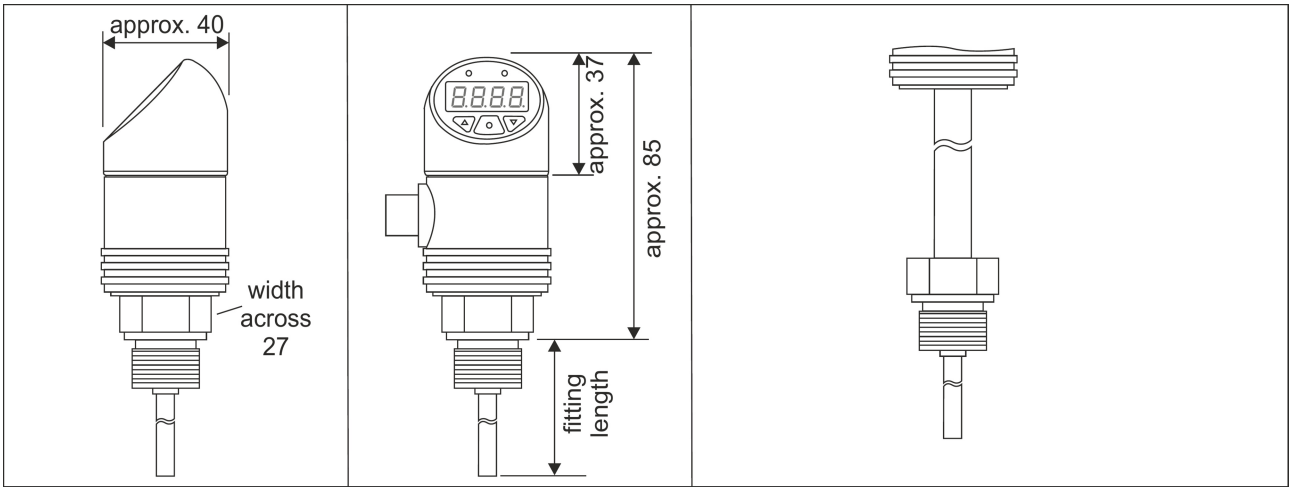
Information Dispose instrument components and packaging materials in accordance with the respective waste treatment and disposal regulations of the region or country to which the sensor is supplied.

8 Technical data

Item	Value
Input	
Sensor RTD Pt100	–50 ... 200 °C (minimum range: 50 °C), 4-wire (higher measurement range up to –50 ... +250 °C available on request)
Output	
Current signal	4 ... 20 mA, 2-wire
Current range	3.8 ... 20.5 mA
Signal on error	3.6 mA (sensor short circuit, underflow); 21 mA (sensor break, sensor open circuit, overflow)
Performance parameters	
Sensor RTD Pt100	Class A / Class B / Class AA (B1/3 DIN)
Measuring amplifier: accuracy	max. 0.1 % of measurement range + sensor error
Resolution	24 bit
Filter setting	5 ... 5000 ms
Configuration	keys on display / via software (TrComm)
Switch-on delay	5 ms
Indicator / limit values: resolution	–9999 ... 9999 digit
Error in measurement	±0.2 % of measurement range, ±1 digit
Temperature drift	100 ppm/K
Features, operation	according VDMA 24574-1 up to 24574-4
Programmable features	
Measuring amplifier	Measuring range start (LRV) / Measuring range end (URV) / Adjustment, simulation of output current / Filter function / Linear output signal / 2-point calibration
Display	Indication range / indication time / decimal point / units / zero point smoothing / programming lock / calibration points / TAG number
Limit contacts	limit value 1 and 2 / hysteresis 1 and 2 / delay times 1 and 2
Indication	
Display	7 segment, 8.5 mm, red, 4 digits, representation mirror-inverted 180° possible
Display head	rotatable approx. 330°
Memory	minimum / maximum values
Indication	measuring value – unit of measurement – control menu
Decimal point	automatically or manually, dependent on measuring range / unit
Representation	**xxxx** / **xxx.x** / **xx.xx** / **x.xxx**
Limit contacts	
Electronic contacts	2x PNP or NPN (30 VDC, 200 mA); option: 2x PNP or NPN (30 VDC, 1000 mA)
Indication	1 LED red for each limit value
Voltage across	< 1 V
Settings	with 3 keys (TouchM-Technology)
Setting range	switch point and hysteresis: any value within measuring range
Switching delay	0.0 ... 999.9 s
Failsafe function	adjustable
Galvanic isolation	switch outputs are separated from measuring amplifier
Supply	
Voltage	12 ... 35 VDC
Reverse voltage protection	available (no function, no damage)
Short-circuit resistance	Yes
Environmental conditions	
Temperature operating range	–40 ... +85 °C (Please note: Temperatures above +85 °C can destroy the electronics.)
Medium	–50 ... +250 °C
Storage	–40 ... +100 °C
Condensation	uncritical

Item	Value
Mechanics	
Dimensions	see section 9
Process connection	1/4″ / 3/8″ / 1/2″ / 3/4″ / 1″ / 1/4NPT / 3/8NPT / 1/2NPT
Extension	100 mm (option)
Electrical connection	see section 4.6
Material protecting tube	stainless steel 1.4571 (standard 6 × 0.5 mm)
Material extension	stainless steel 1.4571
Material process connection	stainless steel 1.4571
Material body	PBT GF30
Material display head	polycarbonate (makrolon)
Weight	approx. 150 g (70 mm, 1/2″, M12)
Fitting position	any
System pressure	PN 25
Device protection	
Protection class	at least IP65 (electronics)
PCB	potted

9 Dimensions



Dimensions in mm.