

## Accessories

# for DIGISTANT<sup>®</sup>, RESISTOMAT<sup>®</sup>, Simulators, Industrial Applications

### Pt100 Temperature Sensor DIN EN 60751



- High precision
- Various designs for different uses
- Temperature range - 200 °C to + 600 °C
- DAkkS calibration possible
- 4 wire technology

#### Application

Platinum resistance thermometers allow problem-free temperature measurements with a high level of precision and reliability. Platinum is especially suitable for meeting even the highest measuring technology requirements due to its stability and exceptional reproducibility. Various sensor designs allow an optimum adaptation to the measuring point. The lab sensor models 42441, 42442 are suitable for precision measurements in liquids and baths. Model 42943 is perfect for its use as a reference thermometer.

The needle sensor model 42905 and surface sensor model 42930-0 are very small temperature sensors.

#### Description

Tolerance classes A, AA, B and C have been defined to ensure replaceability of the platinum resistance thermometers. The permissible deviations are specified by the following numerical equations according to DIN EN 60751.

Class	Tolerance (°C)
AA	$0.10 + 0.0017 \cdot t$
A	$0.15 + 0.002 \cdot t$
B	$0.30 + 0.005 \cdot t$
C	$0.60 + 0.01 \cdot t$

“t” represents the temperature here. Increased customer requirements have resulted in limited tolerance classes. The tolerance 1/10 DIN is a tolerance limited by 10 times with reference to the tolerance of class B and also only applies to a limited temperature range.

Our Pt100 sensors have the tolerance classes B, A and better.

With the exception of the laboratory sensors, all Pt 100 resistance thermometers in the 42000 series are equipped with 2 m connection cables including plugs. The laboratory sensors are equipped with 6-pin LEMO connectors. Connection cables are required for connection to various devices. (see lower part of the back)

## Technical Data

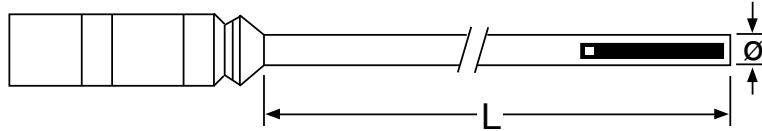
### Ambient and Immersion Sensor

#### Standard laboratory sensor

Made from stainless steel with 6-pin LEMO connection RC 2306 (max. connection temperature 100 °C).

#### Precision laboratory sensor

Made from stainless steel with 6-pin LEMO connection RC 2306 (max. connection temperature 100 °C).



\* Tolerance: 42520 class A, 42510 class B, 42510 1/6 DIN B to 0 °C

\* Temperature range: 42510 - 50 °C ... 500 °C  
42520 - 50 °C ... 600 °C

\* Application: The smooth cylinder design is suitable for immersion and ambient temperature measurement.

\* Tolerance: class A 1/5 DIN B (range 0° C ... 120 °C)

\* Temperature range: - 50 °C ... 400 °C

\* Application: The smooth cylinder design is suitable for immersion and ambient temperature measurement.

Dimensions (ø x L in mm)	Response Time 90 % in Water	Model
6 x 250	approx. 20 sec.	<b>42510</b>
4 x 300	approx. 8 sec.	<b>42520</b>

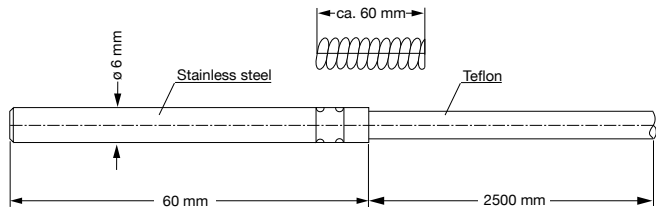
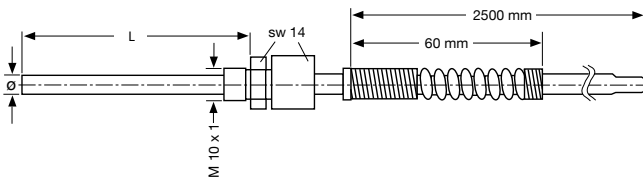
Dimensions (ø x L in mm)	Response Time 90 % in Water	Model
6 x 250	approx. 20 sec.	<b>42441</b>
6 x 300	approx. 20 sec.	<b>42442</b>

#### Temperature sensor for industrial applications:

Made from stainless steel with 2 m of attached Teflon cable including bend protection, tin-plated wire ends, changeable length with M 10 x 1 compression fitting.

#### Temperature sensor of ohmmeters:

Made from stainless steel, with 2.5 m attached Teflon cable including kink protection approx. 60 mm.



\* Tolerance: class A

\* Temperature range: - 100 °C ... 400 °C

\* Application: Suitable as a screw-in sensor (up to 8 bar) and for measurements in fluids and at ambient temperature.

Especially suitable for devices with soldered or clamped connections.

\* Tolerance: class B

\* Temperature range: - 50 C ... 200 °C

\* Application: Suitable for measurement in fluids and ambient temperatures.

Special application: Measuring temperature for resistance measurement with temperature compensation.

Dimensions (ø x L in mm)	Response Time 90 % in Water	Model
6 x 300	approx. 20 sec.	<b>4192</b>
6 x 200	approx. 20 sec.	<b>4192-V200</b>
6 x 100	approx. 20 sec.	<b>4192-V100</b>

Dimensions (ø x L in mm)	Connections	Model
6 x 60	6 pol. LEMO plug	<b>2392-V001</b>
<b>Application: Especially suitable for RESISTOMAT® 2304, 2316, 2329</b>		
6 x 60	with open ends	<b>2392-V002</b>
<b>Application: Laboratory tank, operation submerged in water</b>		

## Technical Data

### High-Precision Laboratory Sensor

#### High precision laboratory sensor:

Made from stainless with 6-pin connector type RC 2306 (max. connection temperature 100 °C)



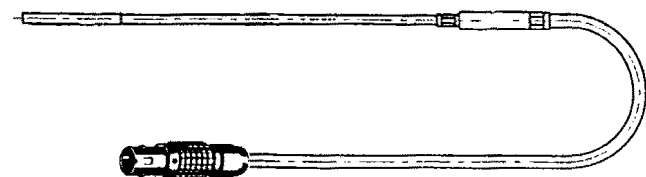
- \* Tolerance: 1/10 DIN B  
(range 0 °C ... 120 °C)
- \* Temperature range: - 100 °C ... + 400 °C
- \* Application:  
Especially suitable as a reference thermometer in liquid baths.

Dimension ( $\varnothing$ x L in mm)	Response Time 90 % in Water	Model
4 x 300	approx. 8 sec.	<b>42943</b>

### Needle Sensor

#### Laboratory sensor:

Made from stainless with 6-pin LEMO connector size 1B and with 2 m cable.



- \* Tolerance: class A
- \* Temperature range: - 50 °C ... 500 °C
- \* Application:  
The needle-like design is suitable for measurements in soft materials.

Warranty: 3 months

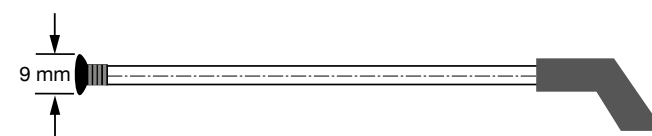
Dimension ( $\varnothing$ x L in mm)	Response Time 90 % in Water	Model
1.6 x 300	approx. 6 sec.	<b>42905</b>

Because of its small diameter of 1.6 mm the needle sensor is fragile. Bending at a value of just  $r = 400$  would break the element. For this reason a warranty of only 3 months is provided.

### Surface Sensor

#### Surface temperature sensor with handle :

With 1.5 m cable and 6-pin LEMO connector 1B.



- \* Tolerance: 1/3 DIN B,  $\pm 0.1$  °C (Ro)
- \* Temperature range: - 50 °C ... + 220 °C
- \* Application:  
The design of the sensor makes it particularly suitable for measuring surface temperatures.

Sensor Length	Diameter	Model
160 mm without handle	Contact area 9 mm	<b>42930</b>

## Connection Cable (for sensors with LEMO coupling RC 2306)

Model	Version	Diameter	Connections	Connections to Following Models	Length
4281-0	4-wire,	4 mm	LEMO size 2S (connector) and LEMO size 1B (connector)	Model 4420	2 m
4282-0	Teflon coating			Model 4423, Model 2304	4 m
4283-0	4-wire,	4 mm	LEMO size 2S and open ends	Series 9206	8 m
4286	Teflon coating				2 m

## Adapter Cables (for sensors with cable and LEMO connector size 1 B)

Model	Version	Diameter	Connections	Connections to Following Models	Length
4286-0	4-wire, Teflon coating	4 mm	Coupling 1B and open ends	Series 9206	0.2 m

All sensors with LEMO connectors size 1B can be connected directly to models 4420, 4423 und 2304.

## DAkKS Calibration Certificate

The platinum resistance thermometer can be supplied with DAkKS calibration certificate. Calibration is performed by comparison with standard platinum resistance thermometers at the following test points:

$$0\text{ }^{\circ}\text{C}, T_{X}, T_{Y}, \text{ and } T_{Z}$$

Please specify the temperature points that you require.

Order code: 42DKD-F

Delivery time: Sensor delivery time plus approx. 3 weeks

Measuring Range	PTB-Accredited Measurement Uncertainties
- 80 °C ... 0 °C	0.02 K
> 0 °C ... 100 °C	0.01 K
> 100 °C ... 400 °C	0.03 K
> 400 °C ... 500 °C	0.05 K
> 500 °C ... 660 °C	von 0.2 K

## Manufacturer Calibration

Temperature Range [° C]	Measuring Code	Note
- 30 ... + 500	Comparative measurement	We recommend a minimum of 2 calibration points. Note: It is only possible to calibrate the entire measurement chain.

## Notes and Tips

The Pt100 temperature sensors consist of a platinum resistance wire, which is usually embedded in a ceramic body and surrounded by a stainless steel pipe for protection. Bending, vibration or shock can damage the element.

Therefore you should treat the sensors with care as any other high-quality instruments.

- \* **Warranty exclusion: We shall not held liable for natural wear or weakening of properties due to changes in the material.**
- \* **Always store the sensors in a protective sleeve!**

### Sensor with connection cable:

- \* **Never pull the sensors connection cable! Tensile load irreparable damage to the sensor element.**