USER MANUAL

825

Black Globe Temperature Sensor

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1. Safety instructions

This system is designed according to the state-of-the-art accepted safety regulations. However, please note the following rules:

- Before putting into operation please read all respective manuals!
- Please observe all internal and state-specific guidelines and/or rules for the prevention of accidents. If necessary ask your responsible safety representative.
- Use the system only as described in the manual.
- Always have the manual at hand at the installation site.
- Use the system within the specified operating condition. Eliminate influences, which might impair the safety.
- Prevent the ingress of unwanted liquids into the devices.

2. Warranty

Please note the loss of warranty and non-liability by unauthorized manipulation of the system. You need a written permission of the LAMBRECHT meteo GmbH for changes of system components. These activities must be operated by a qualified technician.

The warranty does not cover:

1. Mechanical damages caused by external impacts (e.g. icefall, rockfall, vandalism).
2. Impacts or damages caused by over-voltages or electromagnetic fields which are beyond the standards and specifications in the technical data.
3. Damages caused by improper handling, e.g. by wrong tools, incorrect installation, incorrect electrical installation (e.g. false polarity) etc.
4. Damages which are caused by using the device beyond the specified operation conditions.

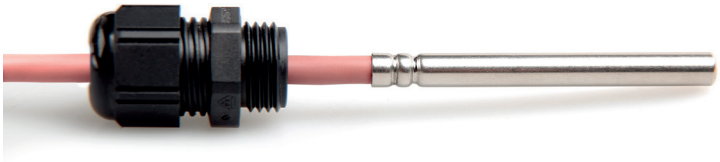
3. General information

3.1. Black globe temperature

The black globe temperature combines the effects of temperature, radiant heat, and wind into a single measurement value to assess environmental heat stress. This user manual explains the basic functions of the system and provides instructions for installation, electrical connection, and maintenance.

3.2. Function of the black globe temperature sensor

The black globe temperature sensor with PT100 is a highly precise resistance temperature detector housed in a shaft made of stainless steel..



The PT100 sensor is connected to the measurement processing unit via a 4-wire configuration, enabling accurate temperature measurement. These precise measurements are crucial for calculating the Wet-bulb Globe Temperature (WBGT) index, which considers not only air temperature but also radiant heat and wind effects, all of which are captured by the black globe.

3.3. Black globe design

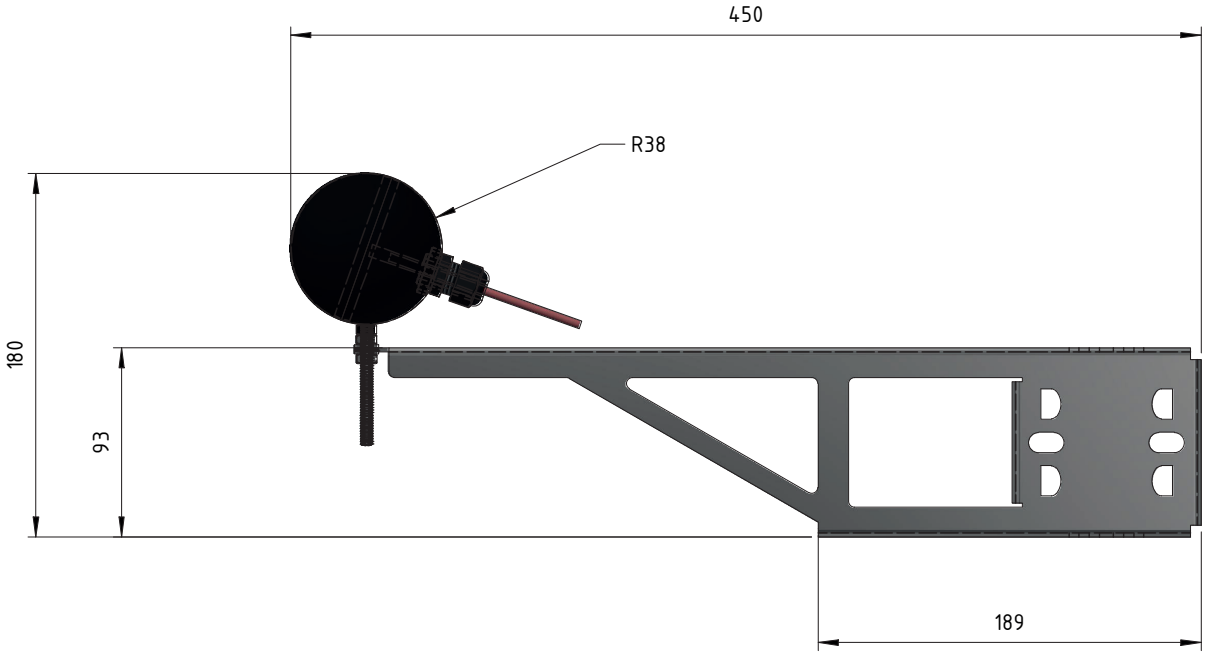
The black globe measures radiant temperature and plays a crucial role in assessing environmental heat stress. The PT100 sensor is centrally positioned inside the globe and measures its internal temperature. With a diameter of 7.5 cm, the black globe is suitable for use in various environments. Its special surface treatment, which ensures high radiation absorption due to its black color, enables precise measurements of thermal load.

4. Mounting the sensor and the black globe

The following steps are required for installing the sensor together with the black globe:

- **Installation of the black globe:** The black globe should be installed at a suitable location that is free from shadows cast by other objects or environmental conditions.
- **Sensor connection:** The PT100 sensor is fixed centrally within the globe. Ensure that the sensor is properly mounted to guarantee accurate temperature measurement.
- **Wiring:** The cable of the PT100 sensor is connected to the data acquisition system, using a 4-wire configuration to ensure measurement accuracy.
- **Mounting on the wall or mast:** Attach the mounting arm for securing the sensor to the wall or mast (see also the following drawings).

DIMENSIONS OF THE SENSOR WITH MOUNTING ARM



5. Electrical connection

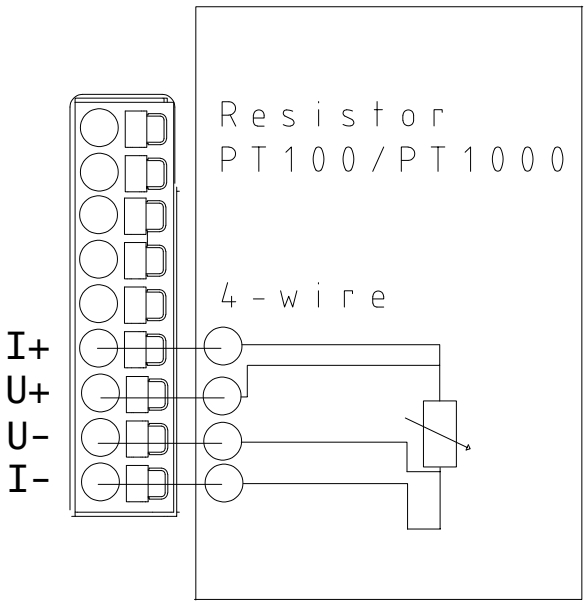
The PT100 sensor is equipped with a permanently attached 4-wire cable used for connection to a measurement processing unit. The connection is made via a 4-wire configuration to ensure accurate measurement.

The wiring of the sensor is as follows:

Wire	Color	Function
1	White	Signal
2	White	Signal
3	Red	Power supply
4	Red	Power supply

The sensor can be connected to a data logger using this cable.

CONNECTION EXAMPLE TO A SER[LOG] PLUS DATA LOGGER



PIN-Litzenfarben PT 100 PIN wire colors PT 100	
I+	rot/red
U+	rot/red
U-	weiß/white
I-	weiß/white

6. Setup and maintenance

6.1. Setup

The sensor is ready for operation immediately after being connected to the measuring device.

Ensure that all connections are properly made and that the measurement data processing software correctly interprets the inputs from the PT100 sensor.

6.2. Maintenance

The maintenance effort for the sensor is minimal. To verify the sensor's functionality, its reading can be compared with that of a precision thermometer. Please note that the PT100 temperature sensor must be removed from the black globe for this purpose. Hold the sensor and the thermometer side by side and wait until the readings have stabilized sufficiently for an accurate comparison. Simply holding a thermometer next to the black globe will result in inaccurate measurements and should be avoided.

Alternatively, you can send the sensor to us for calibration.

We recommend regularly inspecting the sensor for possible damage or contamination.

7. Disposal

LAMBRECHT meteo GmbH is listed and registered at the Stiftung Elektro-Altgeräte Register ear under:

WEEE-Reg.-Nr. DE 45445814

In the category of monitoring and control instruments, device type: "Monitoring and control instruments for exclusively commercial use".

Within the EU

The device has to be disposed according to the European Directives 2002/96/EC and 2003/108/EC (Waste Electrical and Electronic Equipment). Do not dispose the old device in the household waste! For an environmentally friendly recycling and disposal of your old device, contact a certified disposal company for electronic waste.

Outside the EU

Please follow the regulations in your country regarding the appropriate disposal of waste electronic equipment.

8. Technical data

BLACK GLOBE SENSOR 825	
Id-No.	00.08250.000000 (incl. mounting arm ID 33.08250.020001 and accessory)
Measuring element	PT100, 1/3 DIN (DIN 60751)
Measuring range	-40...+120 °C
Operating temperature	-60...+150 °C
Measuring accuracy	±0.1 °C at 0 °C
Protection class	IP67
Cable	4-wire, shielded
Cable length	5 m
Shaft length	105 mm
Shaft diameter	8 mm
Globe diameter	75 mm
Globe material	Copper; finished with matte black lacquer
Weight	Black Globe Temperature Sensor: 0.4 kg Mounting arm: 0.4 kg
INCLUDED IN THE SCOPE OF DELIVERY	
Id-No. 33.08250.020001	Mounting arm: stainless steel V4A; for mast diameters up to 120 mm; incl. U-bolt M10 A4, DIN 3570, inside Ø 52 mm / outside Ø 72 mm

*) Accuracy ±(0.1 °C + 0.0017 × |t|)
(t = Temperature in °C)

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