



Black Globe Temperature Sensor

(BG40 Series)

Features

- Microprocessor accuracy
- Frequency output
- Robust signal (up to 250m cable - no loss)
- Sensors fully interchangeable with no software adjustment
- Semi-conductor sensing element
- Waterproof, aluminium sheathed tip
- Robust housing
- Standard 6" Copper globe
- Integral mounting bracket
- Fully weatherproof
- Australian Made

Applications

- Livestock Heat Stress Monitoring - HLI, AHLU
- Human Heat Stress Monitoring - WBGT, TWL
- Scientific research

The BG40 Series Black Globe Temperature sensor is a high quality electronic sensor designed to measure radiant heat temperature.

The matt black copper globe responds to the heating effects of solar radiation, and radiant heat sources, as well as the cooling effects of precipitation and wind.

The effect of the copper globe is to measure temperature as felt by a body, as opposed to the temperature measured as the ambient air temperature.

This measurement is essential for calculating heat stress in many different industries.



Utilising a 6" diameter copper globe provides a large enough surface area to provide meaningful data. The 6" globe is the standard used by researchers to develop the calculations. It remains far more accurate than smaller globes.

Improved design for the temperature sensor using high stability components provides faster and more accurate temperature sensing.

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The temperature stability of the BG40 electronics allows temperature measurement accuracies of better than $\pm 0.2^{\circ}\text{C}$ over the entire measurement range.

The sensing element consists of a semiconductor integrated circuit that provides a linear output voltage proportional to the measured temperature.

The microprocessor reads the voltage and provides a very stable square-wave frequency proportional to the measured temperature.

The BG40 now also includes a sensor bracket to allow easy, robust fitment of the sensor tip into the globe, and the whole assembly to your chosen post. We recommend the sensor is installed between 1.5 and 2 metres above ground level.

If supplied as part of an Envirodata weather station, the mounting point is pre-fitted to the XA31 Cross arm, on top of the IS31 Mounting mast.

Specifications

Sensing Element:

- Semiconductor Integrated Circuit

Resolution:

- 0.025°C

Accuracy:

- $\pm 0.1^{\circ}\text{C}$ from 0°C to 60°C
- $\pm 0.2^{\circ}\text{C}$ from -20°C to 100°C

Drift:

- $< 0.05^{\circ}\text{C}$ per year

Calibration Accuracy:

- $< \pm 0.05^{\circ}\text{C}$ at 0°C and 25°C

Response time:

- < 2 minutes in air; 30 seconds in liquid

Calibration Method:

- Two point calibration in ice-water and warm water baths, using certified standard.

Reliability:

- Typically five (5) years operation before factory recalibration recommended.

Housing:

- Fully sealed grey ABS IP65

Operating Conditions:

- Temperature: -20°C to $+100^{\circ}\text{C}$
- Humidity: 0% to 100%

Weather Exposure:

- Constant water pressure should be avoided on the housing (do not submerge).
- The sensing tip is fully sealed.

Supply Voltage:

- 5.5 to 15 Volts DC

Current Drain:

- $< 2.5\text{mA}$ at 6V DC

Output:

- +5 Volt square wave frequency (pulse) proportional to the temperature.
- $-20^{\circ}\text{C} = 0\text{ Hz}$
- $+100^{\circ}\text{C} = 60\text{ Hz}$
- 100% linear progression
- Frequency = $^{\circ}\text{C}/2 + 10$

Cable Specification:

- Custom wound 3-core
- Shielded
- UV stabilised
- 2m Length
- Extension cables to 250m with no signal loss