

External & Internal Black Bulb Temperature Sensors



Features:

- Wide range of sensing element types
- Black bulb to measure radiant heat

Benefit:

- Greater comfort

Technical Overview

The TT-535 and TT-915 range of black bulb temperature sensors are used for radiant heat in outdoor and indoor spaces. Black bulb temperature sensors are used to calculate comfort temperature which is specified as the average of the conductive and the radiant temperature. Units contain either a high quality thermistor, Nickel or Platinum sensing element.

The -CVO active output option combines 4 pre-set ranges and selectable output mode, customised output range scaling enabling a choice of outputs and ranges on one unit.

Specification:

Output types:

Passive	Resistive
Active (selectable)	Current 4-20mA or Voltage 0-10Vdc

Accuracy:

Thermistor	±0.2°C 0 to 70°C (32 to 158°F)
PT100a	±0.2°C @ 25°C (77°F)
PT1000a	±0.2°C @ 25°C (77°F)
NI1000	±0.4°C @ 0°C (32°F)
-CVO	±0.4°C @ 25°C (77°F)

Housing:

Material	ABS (flame retardant)
Dimensions	
TT-535	55 x 90mm dia. (2.17 x 3.54")
TT-915	85 x 85 x 23mm (3.35 x 3.35 x 0.91")

Black bulb:

Material	Anodised aluminium
Dimensions	17.5 x 37mm dia. (0.69 x 1.46")

Protection:

TT-535	IP30
TT-915	IP65

Ambient range:

TT-535	-10 to +90°C (14 to 194°F)
TT-915	-10 to +60°C (14 to 140°F)

Weights:

TT-535	160g (0.35lb)
TT-915	120g (0.26lb)

Country of origin

UK

Comfort temperature measurement is best achieved by taking into account the radiant effect of surfaces within the controlled space. The comfort temperature is specified as the average of the conductive temperature and the radiant temperature.

$$T_{\text{comfort}} = \frac{T_{\text{radiant}} + T_{\text{conductive}}}{2}$$



The TT-xxx-CVO products referred to in this data sheet meet the requirements of EU Directive 2004/108/E

Part Codes:

TT-535 External Black Bulb Sensor

TT-915 Internal Black Bulb Sensor

Sensing Element (add type to above code)

Passive output:

-A	(10K3A1) Trend, Cylon, Distech
-B	(10K4A1) Andover, Delta Controls
-C	(20K6A1) Honeywell
-D	(PT100a) Serck
-E	(PT1000a) Cylon
-F	(NI1000a) Sauter
-G	(Ni1000a/TCR(LAN1)) Siemens
-H	(SAT1) Satchwell
-K	(STA1) Landis & Staefa
-L	(TAC1) TAC
-M	(2.2K3A1) Johnson Controls
-N	(3K3A1) Alerton
-P	(30K6A1) Drayton
-Q	(50K6A1) Ambiflex
-S	(SAT2) Satchwell
-T	(SAT3) Satchwell
-W	(SIE1) Siebe
-Y	(STA2) Landis & Staefa
-Z	(10K NTC) Carel

Active output:

-CVO	4-20mA/0-10Vdc selectable output
-CVO-C	4-20mA/0-10Vdc selectable output with custom temp. scaling

Interface Option (add type to above code)

-SP	1-11kΩ set point (only available TT-915 only)
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Installation:

TT-535

1. It is recommended that the unit be mounted with the cable entry at the bottom.
2. If the cable is fed from above then into the cable gland at the bottom, it is recommended that a rain loop be placed in the cable before entry into the sensor.
3. Remove the front cover by twisting the lid and separating from the main body.
4. Using the base of the housing as a template mark the hole centres. Drill two pilot holes at 85mm centres in the surface to which the sensor is to be mounted.
5. Fix the sensor to the wall using appropriate screws.
6. The housing is designed to make it easy for an electrical screwdriver to be used if desired.
7. Feed the cable through the waterproof gland and terminate at the terminal block. Leaving some slack inside the housing, tighten the cable gland onto the cable to ensure water tightness.
8. Replace the lid after the electrical connections have been made.

TT-915

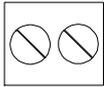
1. Undo the tamperproof screw at the bottom of the housing and gently pull the front panel from the base.
2. Using the base as a template mark the hole centres and fix to the wall with suitable screws. Alternatively the base plate can be mounted on to a conduit box or a standard recessed back box.
3. Feed cable through the 22mm knockout in the base of the housing and terminate the cores at the terminal block as required. Leaving some slack inside the unit.
4. Replace the housing to the base plate.
5. Re-fit the tamperproof screw through the lug at the bottom of the base plate.

Connections:

All connections to BEMS controllers, data recorders etc. should be made using screened cable. Normally, the screen should be earthed at one end only (usually the controller end) to avoid earth hum loops which can create noise. Low voltage signal and supply cables should be routed separately from high voltage or mains cabling. Separate conduit or cable trays should be used. Where possible, the controller's earth should be connected to a FUNCTIONAL EARTH, rather than the mains safety earth. This will provide better immunity to high frequency noise. Most modern buildings have a separate earth for this purpose.

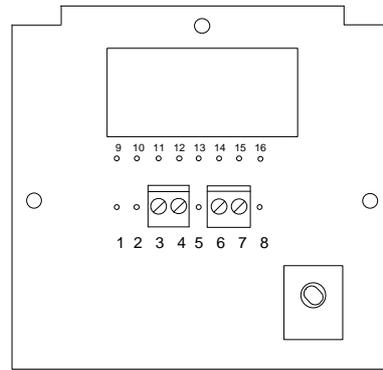
Connections (continued):

Passive output:



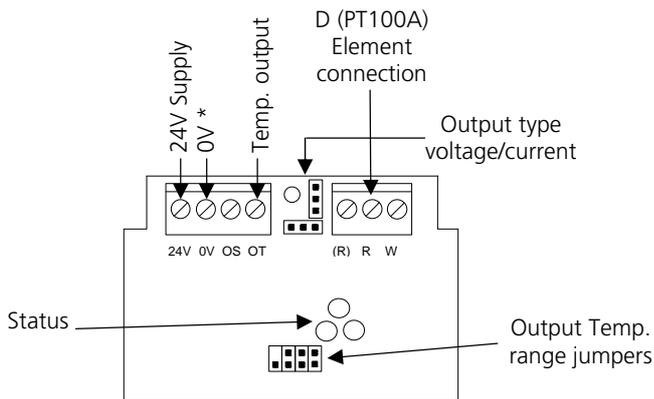
Connections are made via the 2-way terminal block. Connections for thermistor, platinum and nickel sensing elements are polarity independent.

Passive output with 1-11kΩ set point:



3 & 4 Temperature
 6 & 7 Set point

Active output:



* Not required with 4-20mA output

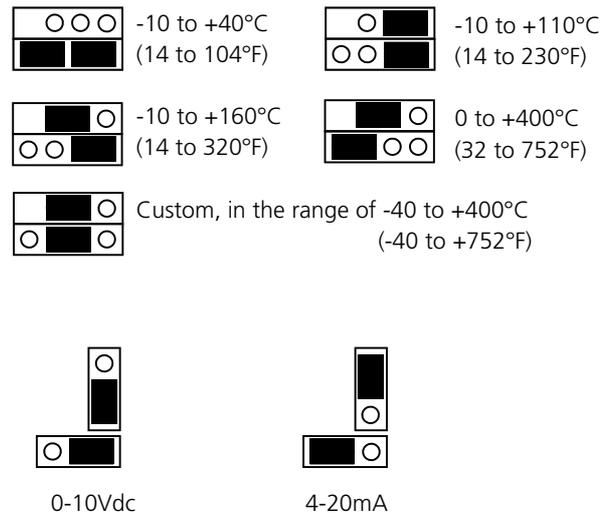
Notes:

Voltage output Nominal voltage 24Vac/dc.

Current output If using in current output mode, the sensor must only be used with a 24Vdc supply. The sensor may be damaged if supplied with AC.

The selectable output temperature ranges are dependent on sensor type, ambient and application.

For full connection and specification please refer to the TT-CVO data sheet.



Whilst every effort has been made to ensure the accuracy of this specification, Sontay cannot accept responsibility for damage, injury, loss or expense from errors or omissions. In the interest of technical improvement, this specification may be altered without notice.

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