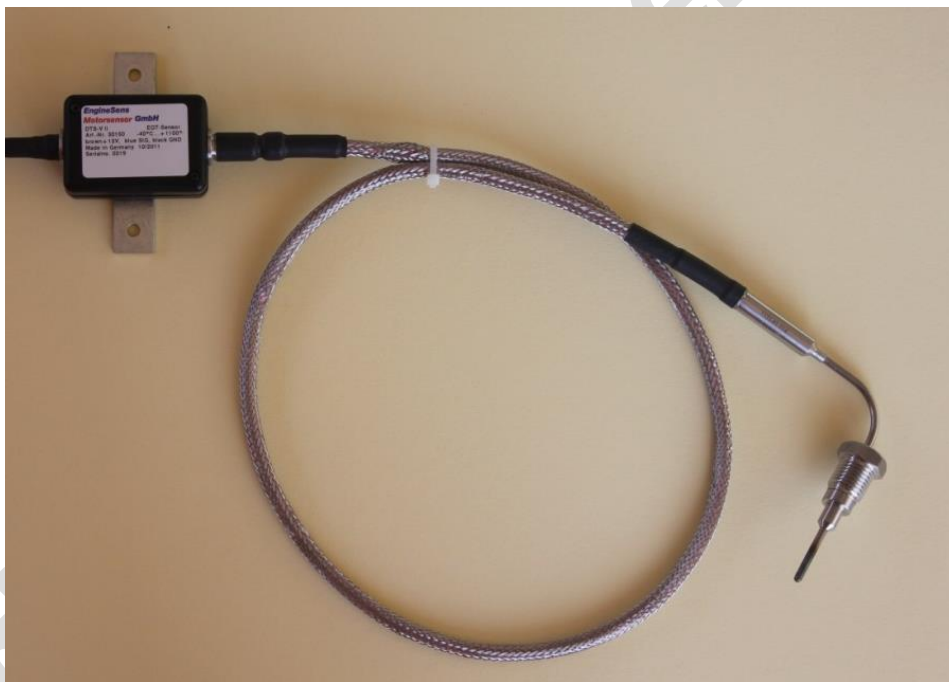


Installation Instructions for High-Temperature Probes EngineSens Motorsensor DTS-V III Part.-No. 30150



Content:

1. Mechanical installation
2. Electrical installation
3. Signal output
4. The transmitter
5. Signal processing

Status August 2014

1. Mechanical installation

The sensor tip should be placed in the middle of the hottest area in the exhaust manifold or in the exhaust line. Positioning the sensor tip facing upwards is acceptable. To fix it our welding socket SO-200 of stainless steel is recommended. A hole of diameter 12 mm has to be drilled to mount this socket. It might be shortened according to the required immersion length of the sensor tip. Before welding it is recommended to place the socket properly by using a small wooden stick (e.g. pencil). Do not weld in one run. First fix it with one welding point, than make another welding point opposite placed and then start welding all over the diameter. The thread has to be protected against damages during the welding process. The union nut should be fixed with a torque of about 40 Nm.

Next step is to fix the black transmitter box in the engine compartment. This needs a flat space of 80x90 mm. Depending on the vehicle it is required to mount an additional metal plate. (Not included in the delivery of the temperature probe). The flange of the black transmitter box is equipped with two holes for screws M6. The distance between both holes is 59 mm.

The metal mesh cable between sensor tip and black transmitter box must never been cut, shortened or extended.

2. Electrical installation

The high-temperature probe DTS is based on a thermocouple type N and a transmitter that amplifies the thermal voltage and integrates cold-junction compensation.

The supply voltage of the transmitter is battery voltage 12V DC at pin no. 3

Ground is on pin no. 2. The output signal comes from pin no. 3.

Please use the color scheme underneath:

Pin 1: output 0-5V DC	blue or white
Pin 2: ground	black
Pin 3: +12V DC supply voltage	brown or red

The black cable is specified for temperatures -40°C...+130°C. Thermal hot components like exhaust gas manifold, turbocharger, etc. should never be too close to the wire.

3. Signal output

The thermal voltage of the sensor tip is transmitted in a 0...5V voltage output. The dependency of temperature and voltage output is described by the formula following:

Up to an output voltage $< U_{out} = 2,327V$ (500°C) this formula is to be applied:

$$T = 10,14 \times (U_{out3} - 7 \times U_{out2} + 40 \times U_{out} - 18,2)$$

With an output voltage higher than $> U_{out} = 2,327V$ (500°C) the second formula has to be used:

$$T = 232,4 \times U_{out} - 39,86$$

The calculated measuring error is max. 10°C. A precise Temperature-Voltage-Table can be downloaded in the internet under http://www.enginesens.com/DTS-V_V-T-Table_since_September_2011.pdf.

In case of interruption, breakage of sensor tip and short-circuit ground-signal an output signal of 0 V will be generated. In case of short-circuit +12V-signal a signal $> 5 V$ will be measured. Avoid misconnections!

4. The transmitter

The black transmitter box is mounted in the engine compartment and is designed for these conditions. It resists heat up to 130°C, moisture and vibrations. All electronic components are fixed on a printed circuit board (PCB) with leadless solder. The plastic box is made out of PA-66. The supply voltage is provided by the vehicle's battery voltage 12 V DC at clamp 15 (ignition on). In order to fulfill all EMC requirements the electronics has been equipped with filters. All components are RoHS-compatible. The transmitter circuit is optimized for ambient temperatures of 85°C. Here the precision achieved is at an optimum. At higher and lower temperatures the characteristic curve shifts some degrees. At ambient temperatures of 125°C the column indicated 125°C is then valid. The table http://www.engesens.com/DTS-V_V-T-Table_since_September_2011.pdf is very precise and ensures an overall precision of 12 K at 1.100°C. For free programmable ECU we recommend to take the values in column 85°C or to measure the temperature profile in the compartment where the transmitter box is installed.

5. Signal processing

The output signal can be read and processed directly by some racing ECU's (e.g. by Trijekt). If you are processing in another manner please consider that most electric circuits only can process up to 5 V DC. In case of short-circuit the battery voltage might be conducted to the ECU. Then 12 V DC are on that clamp. In any case it is recommended to use a short-response fuse for that channel. EngineSens Motorsensor offers a display unit especially adapted for the DTS-V, supply voltage +12 V DC and simultaneously indicating the present gas temperature.

We offer the DTS-V III product line with many variants regarding different intrusion lengths, different mounting options, bending angles, etc. In case of any questions or information required contact us.

Always good success!

Your Team

EngineSens Motorsensor GmbH

Mannheimer Str. 44 b
D-68519 Viernheim
Tel. +49(0)6204/98 60 823
Fax +49(0)6204/98 60 825
www.engesens.com