Exhaust-gas treatment

Lambda sensor LSU 4.9

**PRODUCT BENEFITS**

- Supports compliance with current and future emissions limits as well as OBD (onboard diagnostics) guidelines
- Regulates air supply so that the air-fuel mixture is optimized for combustion
- High measurement accuracy and soot damage resistance
- Robust sensor element design thanks to pumped reference
- High temperature resistance allows for improved installation options

**Connector interface**

**Protective tube**

**Sealing ring**

**Wiring harness**
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TASK
The availability of precise, instant data from the exhaust system forms the basis for all functions – from mixture formation to exhaust-gas treatment. Minimizing pollutants in the raw exhaust gas calls for a mixture formation that takes place inside the engine. This process is governed by the engine control unit. The wideband lambda sensor LSU 4.9 for gasoline and diesel engines assists in the regulation process for minimizing raw emissions gas tolerances by precisely identifying the residual oxygen content in the exhaust, thus supporting compliance with current and future exhaust and OBD regulations. It can be used in all vehicle classes that use a 12-volt or 24-volt electrical system.

FUNCTION
At the heart of the lambda sensor is the planar sensor element, which is based on the operating principle of the Nernst sensor and features an integrated measurement cell and heater. This uses a zirconium dioxide membrane, a property of which is the ability to carry out electrolytic transfer of oxygen ions at high temperatures (approx. 650°C), which produces voltage. Owing to this property, zirconium-based oxygen sensors can determine the difference in the oxygen partial pressures (the difference in O₂ concentrations) between two different gases. With a lambda sensor, one side of the membrane is exposed to the exhaust-gas stream, while the other is exposed to an oxygen reference. Ambient air is often used as the reference in lambda sensors. Through an opening, the air is guided towards the sensor either directly or via a separate feed line, whereby there is a risk of reference air contamination from CO₂, CO, water, oil or fuel vapors. In contrast, the lambda sensor uses a pumped reference – the oxygen reference is created within the sensor itself. To do this, the membrane is used as a pump, and a virtually oxygen-free reference is created within the sealed space.

VARIANTS
The lambda sensor LSU 4.9 is available for diesel and gasoline engines. The LSU 4.9 TSP for gasoline engines also features thermo shock protection.

TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Specification</th>
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<tbody>
<tr>
<td>Lambda control range λ</td>
<td>0.65 to air</td>
</tr>
<tr>
<td>Max. exhaust-gas temperature</td>
<td>≤ 930 °C (sustained)</td>
</tr>
<tr>
<td>Peak temperature</td>
<td>≤ 1,030 °C</td>
</tr>
<tr>
<td>Type</td>
<td>Nernst sensor</td>
</tr>
<tr>
<td>Heater voltage requirement</td>
<td>11 V</td>
</tr>
<tr>
<td>Trimming resistor</td>
<td>inside connector casing</td>
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<tr>
<td>Emissions standards</td>
<td>Euro 5/V, Euro 6/VI (2013 model year)</td>
</tr>
</tbody>
</table>

4.2% system accuracy

reduced emissions due to improved signal accuracy