

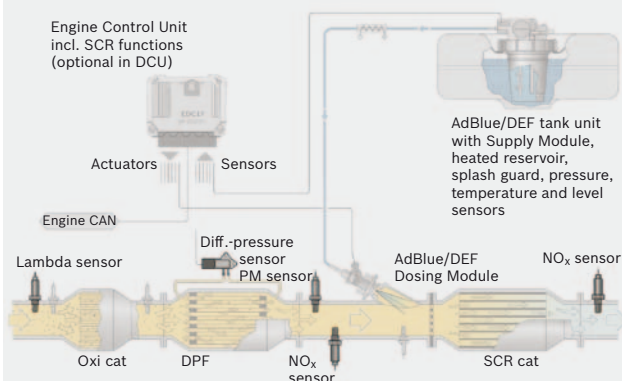
# Diesel Systems

## Sensors for exhaust-gas treatment systems



**BOSCH**  
Invented for life

### Sensors in the diesel exhaust system



### Customer benefits

- ▶ Clean and economical engine operation thanks to the provision of all required data
- ▶ High measuring precision
- ▶ Adherence to current and future emission standards and OBD regulations (On-Board Diagnosis)
- ▶ Emission targets: Euro 5, Euro 6, CARB ≥ MY2013

All functions from mixture formation to exhaust-gas treatment rely on precise, constantly updated data from the exhaust tract. This data is provided by sensors developed by Bosch specifically for this application.

The next stages of U.S. and EU emission legislation will stipulate the ability for comprehensive exhaust-gas treatment system diagnosis in order to ensure compliance with emission targets over the vehicle's lifetime.

Internal mixture formation, which is controlled by the EDC Electronic Diesel Control, is an important factor for reducing the pollutant content of the engine's raw emissions. The control for minimizing tolerances in raw emissions is supported by the lambda sensor with precise metering of the residual oxygen in the exhaust gas.

Bosch offers fuel-efficient solutions for the operation of closed particulate filters. As soon as the particulate filter (DPF) is fully loaded it has to be regenerated by burning the stored particulate matter. The solution is built upon software functions based on the evaluation of sensor signals. A differential pressure sensor is used to monitor DPF loading and functionality at the same time.

### Sensors for exhaust-gas treatment systems



- 1 NO<sub>x</sub> sensor
- 2 Particulate matter sensor
- 3 Lambda sensor LSU
- 4 Differential pressure sensor

Further restrictions in emissions legislation will require additional sensors, including the NO<sub>x</sub> sensor and the particulate matter sensor.

### Possible applications

Bosch exhaust sensors can be applied in every conceivable diesel system configuration for the fulfillment of ambitious emission targets.

**Customer benefits and techn. features NO<sub>x</sub> sensor**

- ▶ System competence in monitoring and controlling the SCR system by precise measurement of exhaust-gas NO<sub>x</sub> content
- ▶ Fast operational availability, good signal dynamics, continuous signal availability and high robustness in the exhaust stream
- ▶ Flexible application due to CAN interface

NO <sub>x</sub> measuring range	0 - 1,600 ppm
Measuring precision	± 10 ppm

**Customer benefits particulate matter sensor**

- ▶ Compliance with upcoming legal regulations on On-Board Diagnosis
- ▶ Monitoring of DPF ageing
- ▶ System competence in diagnosis function and sensor technology
- ▶ Flexible application due to CAN interface

**Customer benefits lambda sensor LSU**

- ▶ Reduction of engine emission scatter by up to 50%
- ▶ Robust design: Thermal shock and soot resistance, heating voltage reserve

**Benefits and features differential pressure sensor**

- ▶ Enables fuel-saving, demand controlled particulate filter regeneration

Pressure range	0 - 100 kPa (differential)
	0 - 125 kPa (relative)
Response time	< 1 ms

**Bosch: Automotive competence from a single source**



Comprehensive range of services and know-how



System and network competence



Innovator and technology leader



Warrantor for quality and dependability



Worldwide presence



Universal partner

**NO<sub>x</sub> sensor**

The NO<sub>x</sub> sensor supports control of the required urea dosing in SCR systems for NO<sub>x</sub> reduction and monitoring (OBD) of the SCR components. The ceramic sensor element works on the amperometric double chamber principle; it measures the NO<sub>x</sub> content in the exhaust gas. The sensor is available for passenger car and commercial vehicle applications.

**Particulate matter sensor**

The particulate matter sensor enables diagnosis of the particulate filter. It is integrated into the exhaust tract downstream of the filter. The sensor function is based on resistance measurements: Adsorbed soot particles form conductive paths between electrode combs on which an electric current is flowing. The sensor element is regenerated regularly by heating. The diagnostic software uses the measured current to evaluate DPF functionality. This sensor is available for passenger car and commercial vehicle applications.

**Lambda sensor for diesel engines**

The wide-band lambda sensor measures the residual oxygen content in the exhaust gas and helps to comply with strictest exhaust and OBD regulations. At the heart of the sensor is a planar sensor element with integrated measuring cell and heater. The measured data serves to adjust the optimal air-fuel mixture via the air-intake system. The latest-generation lambda sensor is specifically adapted to customer requirements regarding diesel engines.

**Differential pressure sensor**

The differential pressure sensor measures the exhaust pressure difference across the particulate filter using a piezo-resistive sensor element. The measured value can be used to calculate the loading stage of the filter. This is the precondition for demand-controlled, fuel-saving particulate filter regeneration.

**Robert Bosch GmbH**  
Diesel Systems

Postfach 30 02 20  
70442 Stuttgart  
Germany  
Fax: +49 711 811-45090  
diesel@bosch.com

[www.future-with-diesel.com](http://www.future-with-diesel.com)

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