

Displacement/timing measurement in the common rail injector

Diesel engines of the latest generation no longer have a diesel injection pump to supply fuel, but instead utilize the common rail principle. In order to optimize injector configuration for the respective engine model it is necessary to know the exact timing/displacement behavior of the needle valve. This information is delivered by an eddy current sensor built into the injector.

Because of the physical limitations (i.e. practically no installation space), a sensor with very small dimensions is required. The solution here is the miniature version of the EU05 eddy current sensor for commercial vehicle injectors and the ES05 sensor for passenger car injectors.

Reasons for selecting the system

- Non-contact measurement, as displacement transformation inevitable
- High temperature resistance
- Temperature-compensated measurement
- High system speed, as the injection process is in the micron to millisecond range
- Resistant to electromagnetic fields (solenoid valve)
- Resistant to fuels



Measurement system requirements

- Measuring range: 500 μm
- Resolution: 1 μm
- Bandwidth: 100 kHz

Environmental conditions

- Temperature: 100 °C
- Medium: fuel
- Interference field: Electromagnetic field

System requirements

DT3301(01)	Controller
SCD3/8	Power cable
SCA3/5	Signal cable
EC3/2	Cable extension
EA3200	Adaption board
EU05(65)	Sensor; alternative EU05(93)

