



INDICATING SYSTEMS

AVL OT-SENSOR 428

When performing thermodynamic calculations on pressure curves measured in internal combustion engines, the exact determination of TDC position is of great importance (e.g. IMEP measurement). Due to the not ideally rigid construction of the engine, the static determination of TDC can lead to uncertainties at calculation.

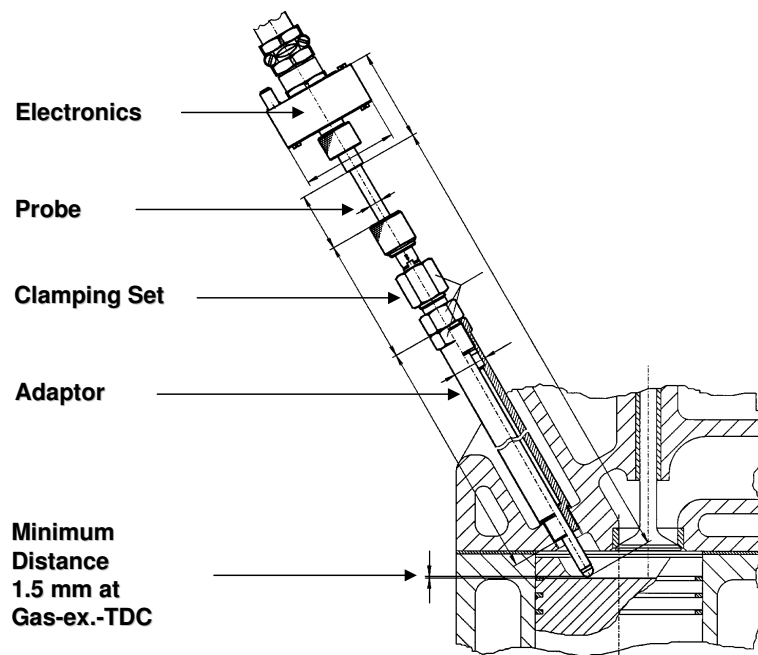


Abbildung 1: Aufbau und Montage des OT-Sensors 428

The capacitive TDC Sensor 428 is a precise measuring instrument for dynamic determination of the TDC of motored or non fired cylinders of internal combustion engines.

A specially developed electronic circuit delivers an analogue signal, whose maximum value corresponds to the engine's TDC position. The AVL Indicating Systems are able to process this signal in connection with an angle encoder directly. The necessary power is supplied by means of AVL's angle encoder.

The "Horizontal-Cut-Principle" is used for calculation procedure, see figure 2.

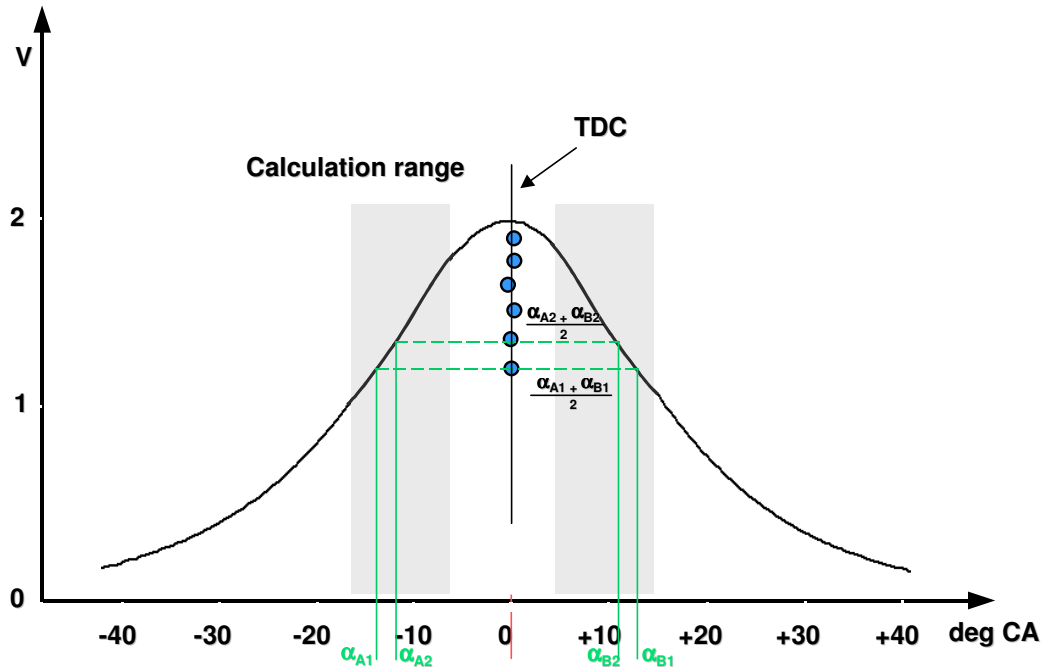


Figure 2: Horizontal-Cut-Principle



Your Benefits at a Glance

- Dynamic determination of the angular TDC position under motored or non-fired operating conditions better than +/- 0.1 deg. CA
- AVL Indicating Software IndiCom recognizes the compression TDC and calculates the TDC symmetry angle.
- Simple installation of the sensor via the pressure sensor bore, spark bore plug or injector bore.
- Comparison of the TDC-sensor and the cylinder pressure signals (engine thermodynamic loss angle, see figures 3 and 4)

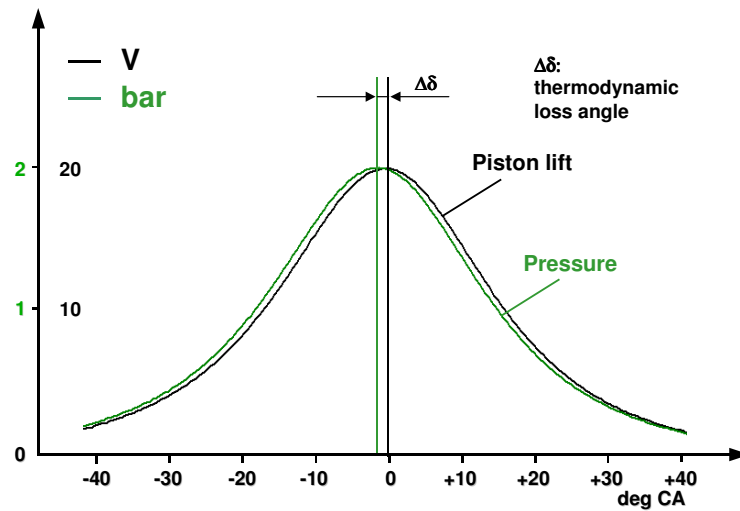


Figure 3: Pressure and Piston Lift Curve

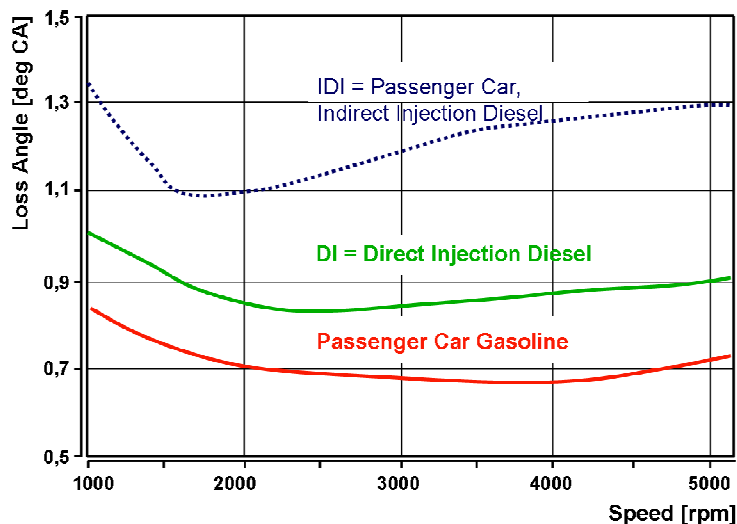


Figure 4: Thermodynamic Loss Angle

**Technical Data**

Operating Temperature Range:

- Sensor Probe: 0 °C... 250 °C (Cycle average)
- Sensor Electronic 0 °C ... 80 °C

- Speed Range: 0 rpm ... 6000 rpm (non-fired)
- Power Supply: AVL angle encoder
- Analogue Output Signal: $\pm 10V$

Weight:

- TDC-Sensor 428: 780g
- Installation Adapter: approx. 120g

The TDC-Sensor is installed in the cylinder head via currently available bores (i.e. injector, spark plug or pressure transducer bores) using suitable adapters. Due to the many varied injector, spark plug and engine types in use, it is not possible for AVL to supply adapter for all applications. Therefore these adapters will normally be manufactured by the user according to the dimension of the engine in question. For installation in AVL pressure

Further information you will find at www.avl.com