

Measurement of the tilt angle on tilting trains

Through the application of tilting trains existing track can be traveled at higher speeds and consequently used more efficiently. Displacement sensors fitted to the front end of the vehicle determine the required degree of tilt of the coach body when taking bends in order to compensate for the "arising sideward acceleration". This data is passed to the control units in the following coaches which then tilt the coach bodies appropriately. When taking a bend, the coach body on the vehicle is then tilted towards the inside of the bend with the aid of hydraulic cylinders. The degree of tilt is acquired by a MICRO-EPSILON strokeSENSOR. Consequently, the passenger experiences no or only very little lateral acceleration without the forces between the wheel rims and the track being increased. As a result, traveling by train is more comfortable. The journey time is shortened due to the higher possible speeds in bends.

Measurement system requirements

- Measuring range: 330 mm
- Accuracy: 1% FSO
- Resolution: 0.05 % FSO
- Frequency response (-3dB) 150 Hz

Ambient conditions

- Temperature: -40°C to +85°C
- Medium: Hydraulic oil
- Pressure: Up to $150 * 10^5$ Pa

Measurement system structure

Series EDS Long-stroke sensor
EDS-330-F(150)-SRB-I

Reasons for the system selection

- Measurement system integrated into cylinder.
- Non-contacting eddy current principle.
- Specific temperature compensation.
- Sensor flange acts as cylinder base.

