Precision Deflection Measurement in Fire Resistance Testing

Industries: Process
Application type: Monitoring

Description

Laser Distance Sensors are used to test the deflections of objects during fire resistance testing. In these tests, components such as doors, windows, and walls are heated to high temperatures that simulate a fire situation. The intense heat causes the tested object to expand, bend, or deform, and it is essential to accurately measure these deflections to evaluate the fire resistance of the material. On the side opposite the heat source, a Dimetix Laser Distance Sensor continuously measures the distance to a target on the object, capturing even the smallest movements in real time.

The **Dimetix Laser Distance Sensor model DAN-10-150** is mounted at a fixed position, usually above or across from the object, and is designed to provide high-speed, high-precision measurements without coming into contact with the test specimen. This non-contact approach ensures that the sensor does not influence the test results, and its fast response time of **100 Hz** allows for immediate detection of any changes in the object's geometry. The accuracy of these measurements is critical; even millimeter-level deflections can be significant when assessing the performance of fire-rated components.

By providing continuous and reliable data on how an object behaves under extreme thermal conditions, Laser Distance Sensors help engineers and safety experts determine whether the material meets the required fire resistance standards. The precise deflection data, often combined with temperature and radiation measurements, forms a comprehensive picture of the material's performance. This information is invaluable for improving fireproof designs and ensuring that construction materials and assemblies can withstand the stresses imposed during a fire.

In summary, the use of Laser Distance Sensors in fire resistance testing offers a robust, non-contact solution that delivers accurate and fast measurements of deflections. This capability is crucial for verifying the fireproof qualities of various building components, thereby contributing to enhanced safety and more reliable building performance under extreme conditions.

Customer Benefits:

- **Precise real-time measurement** of even the smallest deflections with an **accuracy of ±1 mm**
- **Non-contact measurement**, ensuring **no influence on the test object**

Dimetix Sensors – the solution for applications with high precision requirements

Thanks to the clearly arranged product portfolio the evaluation of a suitable Dimetix Laser Distance Sensor is simple and uncomplicated.

Dimetix sensors offer numerous features, which are integrated in each and every device as standard, including, among others, various interfaces like SSI, RS-422/485, RS-232 and 2 digital outputs.
Optionally, the Industrial Ethernet interfaces PROFINET, EtherNET/IP and EtherCAT are also available. Furthermore, all devices are IP65-protected and impress with a weight of less than 500 grams!

Particularly noteworthy, however, is the accurate measurement of 1 millimeter over distances of up to 500 meters, even under the most extreme conditions. This is possible with the sensors of the types DPE, DEN and DEH.

No less interesting are sensors of types DAE, DAN and DBN. Preferably, they can be used for projects which do not require a range over 500 meters or are cost-sensitive.

	DPE-10-500	**DPE-30-500**	**DEN-10-500**	**DEH-30-500**
PARTNUMBER	500630	500636	500637	500638
SPECIFICATION				
Typical accuracy $\cong \pm 2\sigma$	± 1 mm	± 3 mm	± 1 mm	± 3 mm
Mensurierung range on natural surfaces	0.05…~100 m	0.05…~100 m	0.05…~100 m	0.05…~100 m
Measuring range on reflective foil	~0.5…500 m	~0.5…500 m	~0.5…500 m	~0.5…500 m
Max. measuring rate	250 Hz	250 Hz	100 Hz	100 Hz
Operating temperature	-40…+60°C	-40…+60°C	-10…+50°C	-10… +60°C

	DAE-10-050	**DAN-10-150**	**DAN-30-150**	**DBN-50-050**
PARTNUMBER	500633	500632	500634	500635
SPECIFICATION				
Typical accuracy $\cong \pm 2\sigma$	± 1 mm	± 1 mm	± 3 mm	± 5 mm
Mensurierung range on natural surfaces	0.05…~50 m	0.05…~100 m	0.05…~100 m	0.05…~50m
Measuring range on reflective foil	~40…50 m	~40…150 m	~40…150 m	
Max. measuring rate	100 Hz	100 Hz	100 Hz	10 Hz
Operating temperature	-40…+60°C	-10…+50°C	-10…+50°C	-10…+50°C