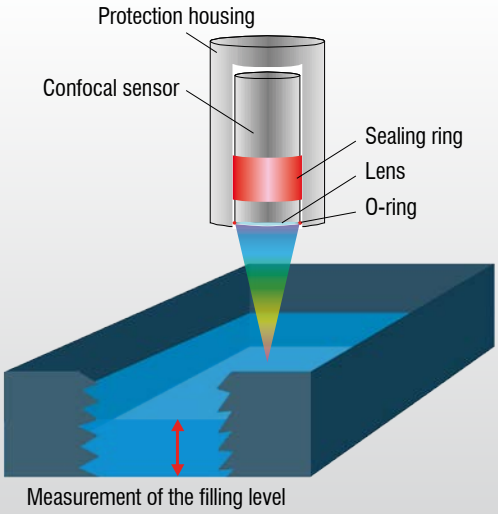
A151

Confocal sensors
confocalDT



Liquid level measurement during capacitor production

During the production process, capacitor elements must be dipped in a defined manner into a bath of liquid (solvent). To ensure constantly high quality it is crucial that the capacitor elements are dipped exactly according to the specifications. Therefore, it is of the utmost importance that the liquid level is maintained at a very accurately defined height.

For this measurement task, conventional laser triangulation sensors required a complicated system setup and their complex adjustment incurred costs. The wave motion of the liquid that occurred interrupted the measurement signal which could not then be used for further evaluation.

To compensate for these shortcomings, a confocalDT system from Micro-Epsilon is used. This system - including an IFC2421 controller, an IFS2405-28 sensor and a fiber optic cable - measures on the directly reflecting surface of the solvent.

The explosive vapors are kept away from the sensor since it is inserted into a protection housing with a sealing ring and an O-ring seals the optical system. In addition, the conduit is continuously heated externally to prevent condensation on the lenses.

This measurement arrangement ensures that due to an exactly defined dipping depth the individual components correspond to the defined quality criteria such as for example the durability or short circuit conditions.

Requirements for the measurement system

- Measuring range: 24 mm
- Required accuracy: 50 µm
- Achieved accuracy: 10 µm
- Measurement on reflecting surfaces
- Material: solvent, reflecting

Ambient conditions

- Area subject to explosion hazards due to solvent vapors

System design

- Controller: IFC2421
- Sensor: IFS2405-28
- Sensor cable: C2401-10, 10 m

Advantages

- Non-contact measurement
- Highly accurate against directly reflecting target
- Easy and precise sensor mounting