



International Workshop on Water and Heat Meters

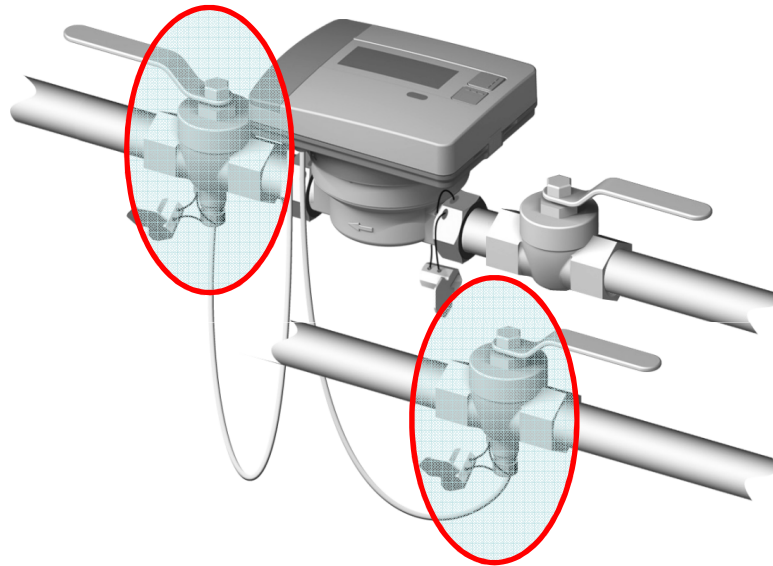
New results of current investigations and their influence on actual rules and standards

Special aspects of temperature sensor installation in cartridge-type heat meters

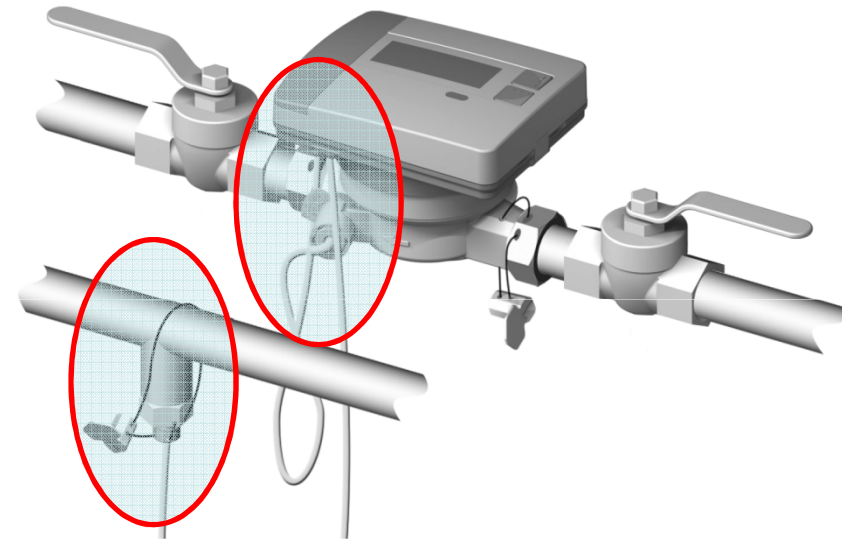
Requirements of the EN 1434 – and type approval

- **Symmetrical installation of both temperature probes**
 - Same installation fittings
 - Same installation situation of both temperature probes
 - direct
 - pocket
- **consequence:**
 - Installation- and flow- depending influences are compensable in the first approximation
 - Type tests must not check the additional parameters of influences
 - Fittings are not relevant for the the type approval
 - Lower effort

Symmetrical and asymmetrical installation



Symmetrical installation



Asymmetrical installation

The praxis

- **Definition of the asymmetrical installation of the temperature probes**
 - Flow- and return probe are installed in different ways
- **Advantage**
 - Lower effort (installation point is in the flow sensor)

Flow	Return
direct	cartridge/ tangential (direct)
pocket	Single-jet/ ultrasonic/ outlet(direct,pocket)

Metrological measurement

■ Examination of the influence

- Exact specification of installation situations
 - Pocket- variants (usually a few manufacturers - specific variants)
 - Metrological evaluation of asymmetric installation
 - Limiting of the parameters to include the asymmetrical error
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Which factors can be expected?

- Temperature

 - Flow

 - Construction design
 - Temperature probe

 - Installation points / fittings

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