ILK Dresden

Institut für Luft- und Kältetechnik
Gemeinnützige Gesellschaft mbH

■ Measuring System for
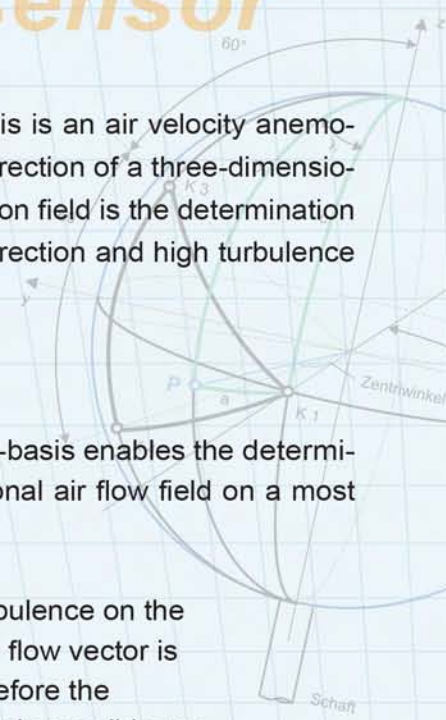Determination of
Three-Dimensional
Air Flow Conditions

3D Air Velocity Measurement

3D - Air flow sensor

Anemometer

The thermal air flow sensor on flow-through-basis is an air velocity anemometer for determination of the amount and the direction of a three-dimensional air flow in a gaseous fluid. The main application field is the determination of very low air velocities with changeable flow direction and high turbulence rates.

Application

The new thermal flow sensor on flow-through-basis enables the determination of the air flow vector in a three-dimensional air flow field on a most simple way and with very high accuracy.

If there are turbulent air flows the effect of turbulence on the measuring result is considered. The actual flow vector is recorded in a large time resolution. Therefore the determination of an unsteady flow vector is possible too.

No special knowledge for the realization of the measuring tasks is required from the user. The measuring system is simple to handle and mechanically very robust.

The determination of flow vector is carried out online. By this way the demand for one measurement is limited on minimum.

Behaviour
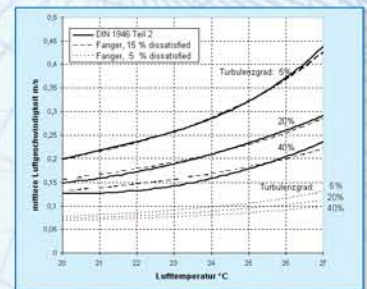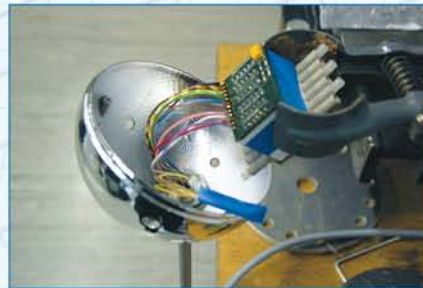
Advantages

Thermal

- large measuring range: 0.01..10 m/s
- measurement of very low flow velocities is possible
- measurement of unsteady air flows
- determination and consideration of turbulence rate
- real time measurement with 0.1 s time resolution for air flow velocity and direction
- no sensor adjustment for the determination of flow direction is needed
- no special knowledge for the realization of measuring tasks is needed
- calibration for several velocity ranges
- a lot of possibilities for supervision and control functions

fluid	Luft
flow velocity (measuring ranges)	0..0,5 0..1, 0..2, 0..5, 0..10m/s
flow direction	3D room
measuring accuracy	1..5%, depending on measuring range
turbulence rate	determination from 0%
turbulence rate correction	consideration of turbulence effect
frequency limit	140 Hz
update interval	10 ms
data version	analog/digital

software with individual adaption to specific requirements	determination of thermal behaviour recording of three-dimensional flow fields supervision, controlling
further measuring points	e.g. temperature, humidity, radiation, air pressure
sensor positioning	laser pointer
options	transport box, tripod, laptop, printer, data logger, controlling components

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