höntzsch
flow measuring technology

User's Information TA10 Probes 12/99

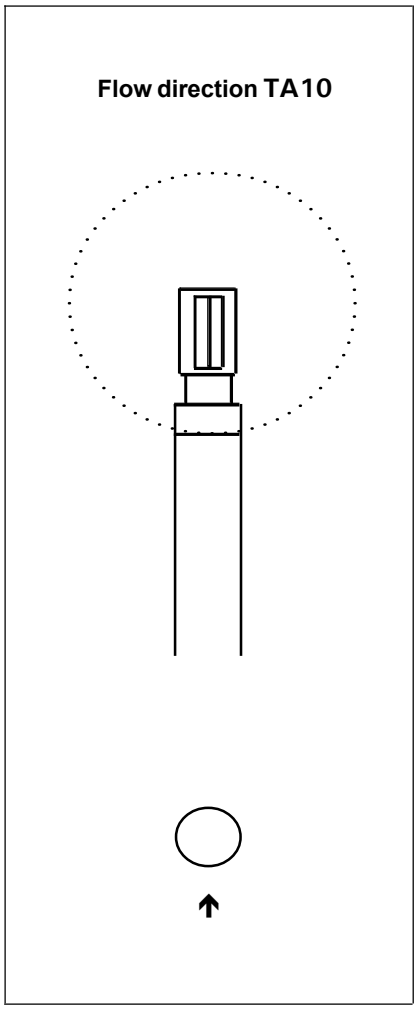
Supplementary to this User's Information we refer to the corresponding **Technical Data Sheet** with the specific data relating to your order and details of the Manual as well as to Data Sheets **Thermal Flow Sensors TA10.** The data in these documents supplements the following User's Information.

References to danger

- Probe in pressurized pipeline:
- insertion or retraction of probe in depressurized conditions only!
- In the case of probe guide pieces with probe attachment by TEFLON® clamping bush: increase the tension on the clamping bush from time to time (TEFLON runs causing the clamping fixture to lose initial gripping power)
- Probe with probe guide piece: after positioning a probe in the pipeline fix the probe tube!

Probe alignment

Thermal flow sensors TA are to be aligned in the direction of flow.



Probe fitting position

The probe fitting position of TA10 sensors can be chosen at random.

Fitting instructions

The probes should be so fitted that

- flow is according to the flow direction provided for: see 'direction indicator' on the connection housing.

Alignment estimated by sight does not interfere with the measurement. Rather more deviations from the nominal position can however affect the measurement.

- the probe mounting device does not affect the flow if possible.
- no drops hit the sensor.
- they are fitted vibration-free and not in the immediate vicinity of electromagnetic or thermal sources of interference. The T_{95} response time of the TA10 sensors of air velocities of around 5 Nm/s is approx. 1 s.

U234_TA10_B_e_081203

Input/output sections
When measuring in a measurement section of inside diameter Di it must be observed that optimal accuracy when converting the local velocity v_p to the average velocity v_m

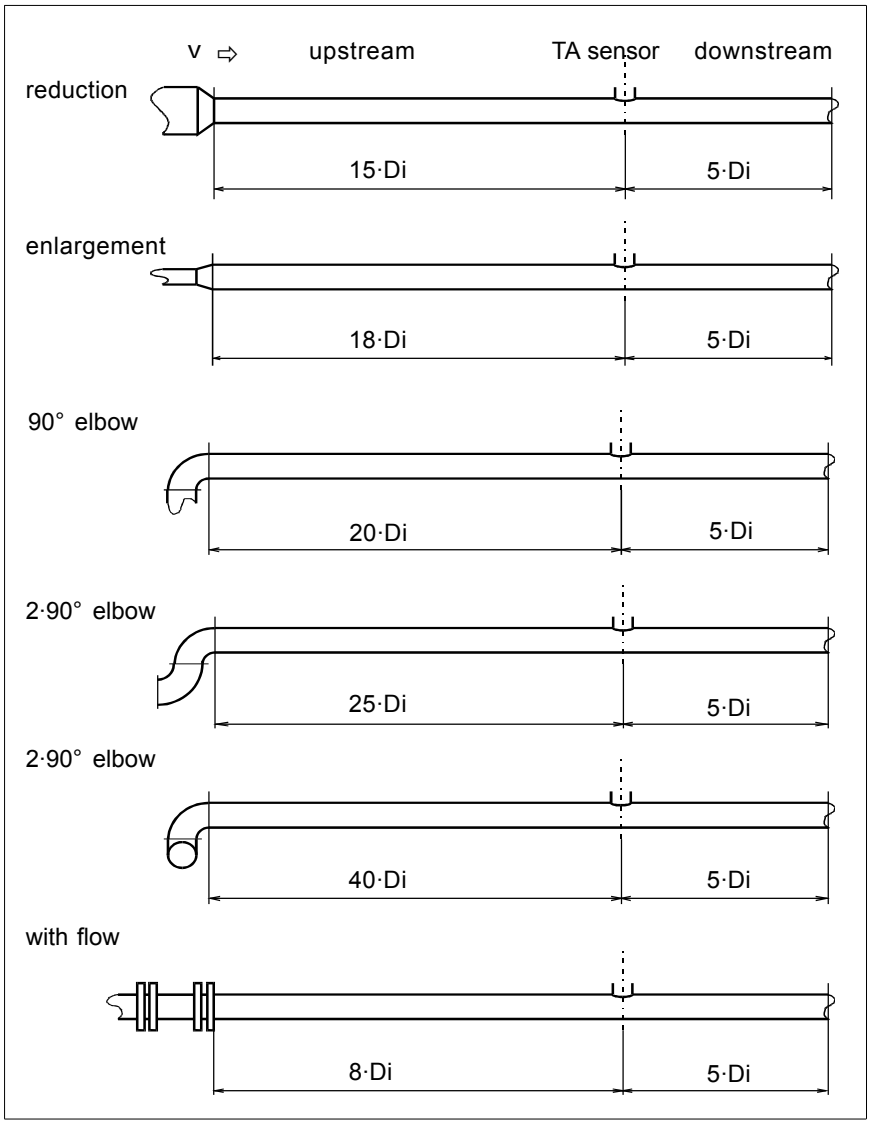
$$v_m = v_p \cdot PF$$

(PF, CF = Profile Factor, Coefficient) is only guaranteed when input/output sided irrotational flow

- prevails and moreover sufficient straight, unhindered input
- section as well as sufficient straight, unhindered output section is available.

The illustrations show the recommended minimum pipe length, given as a multiple of Di. The use of greater lengths is always advisable.

Should a suitably long, straight section line not be available then the measurement cross section is to be so placed that 2/3 of the straight pipe section are upstream and 1/3 downstream of the measurement cross section.



Standard designs of flow straighteners, see for example
DIN ISO 5167-1 'Measurement of fluid flow by means of pressure differential devices'

Greater measurement cross sections
To determine the average flow velocity v_m in greater measurement cross sections a preliminary examination is to be carried out to determine the flow profile/measurement cross section topography. As a result of this study an optimum measuring point is to be fixed and the associated coefficient for the conversion of the local velocity v_p to the average velocity v_m to be stipulated.

For further information see for example

- VDI/VDE 2640-3 'Measurement of gas flow... Velocity area method'
- Result report of the Hessian State Institute for the Environment, 'Environmental Planning, Protection of Labour and Environmental Protection Pamphlet 167': Überprüfung der Repräsentativität von Meßpunkten bei der Ermittlung der Emissionen luftfremder Stoffe unter Anwendung von Messquerschnittstopographien, MQT-Verfahren.
- Data Sheet TA 10 12/99, 'Coefficient / Profilfe factor'

Calibration number KKZ
The calibration number KKZ describes the course of a calibration curve. It is the basis for the linearization of a TA sensor characteristic.

The KKZ is individually determined for each sensor and is deposited at the appropriate evaluation unit U10a.

Cleaning the sensor
In applications where dirt can settle on the sensor, thermal flow sensors should be cleaned at regular intervals. Start by checking the necessity for cleaning at short intervals by visible inspection in order to establish an optimal cleaning interval.

Soiled measuring probes can be cleaned with an appropriate cleaning agent which does not leave residue when dry, e. g. alcohol or distilled water. Swing the sensor carefully in the cleaning agent. Avoid mechanical devices.

When choosing the cleaning agent pay attention to the compatibility with the sensor materials.

EMC information
for installation in facilities with interference emitting components:

- Spacial separation of lines emitting interference from measuring cables and evaluation units.
- When using frequency converters the influence of RF interference emittance must be taken into consideration from the outset and increased active and passive anti-interference measures must be taken: Decouple the mains input of the frequency converter by means of a spark filter against active interference emittances. In addition this increases the passive resistance to jamming of the facility.
- Special attention should be directed to the motor wire. The motor wire between converter and motor should be shielded, the shielding being on both sides.
- Metallic parts in the service cabinet - as for instance sub-rack with control electronics or mounting plates - very good large area and RF-like conductive connection.
- Relays, contactors, electro valves installed in the same circuit to be wired by means of spark arrester combinations or excess-voltage limiting components.
- Lay the shielding from analog signal lines only on one side - if possible at the evaluation unit - and of low impedance. Twist non-shielded lines: is effective against balanced interference to source terminals.
- For connections on connection cable points of separation use preferred shielded plug connector. When using terminals: place terminals in an RF-shielded housing and use EMC-correct cable lead-ins. Contact outer shielding of the connecting line to the cable lead-ins.
- All lines to be kept short! Loops in the line can destroy protective measures. Lay non-reserved wires in a cable on both sides on earthed wire potential. Lay cables and wires close to the reference potential, for instance side panels, mounting plates or steel girders.

höntzsch
flow measuring technology

Causes of trouble

no measured value:
- sensor not connected
- parting of connection cable or short in the connection cable

measured value too low:
- coefficient too low for the measuring position. See 'Greater Measurement Cross Sections': Flow profile other than expected, e.g. caused by subsequent structural alterations to the measurement section.
  Please note: the flow profile can change dependent on velocity when the input/output sections are too short.
- rotational flow with centric positioning of the sensor
- sensor not optimumly aligned to the flow.
- sensor soiled: results in reduced thermal coupling
- effective electromagnetic interferences
- burden at current output greater than permissible according to Technichal Data Sheet. Effect: correct output values in a lower part of the measuring range, no longer increasing output values in an upper part of the measuring range.
  setting of the scaling for the
- analog output not as expected measuring gas other than air

Measured value too high:
- coefficient too high for the measuring position. See 'Greater Measurement Cross Sections': Flow profile other than expected, e. g. caused by subsequent structural alterations to the measurement section. Please note: the flow profile can change dependent on velocity when the input/output sections are too short.
- effective electromagnetic interferences
- measuring gas other than air

Measured value fluctuates:
- time constant set at too low a value
- expected measured value fluctuation does not correspond to the real measured value fluctuation
- effective electromagnetic interferences

Maintenance
In applications where dirt can settle on the sensor, sensor should be cleaned at regular intervals! See 'Cleaning the sensor'

Corrective maintenance
to be carried out by Höntzsch GmbH. Please enclose a description of errors when returning faulty instruments. If the instruments have been used in hazardous materials please inform us of any safety precautions to be taken during corrective maintenance. We see it as a conscientious duty to our staff to request you to furnish us with this information.

Service
Please contact Höntzsch GmbH

U234_TA10_B_e_081203

Höntzsch GmbH
P.O. Box 1324 D-71303 Waiblingen
Gottlieb-Daimler-Straße 37
D-71334 Waiblingen (Hegnach)
Telephone 07151/1716-0
Facsimile 07151/58402
eMail info@hoentzsch.com
Internet www.hoentzsch.com