Küppers Elektromechanik GmbH
Flow Meters
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HM 3/1,5 R
Operating Instructions

Preparation

Please purge your pipe system before installing the HM to prevent contamination (fibrous in particular) from entering the flow meter. Also ensure the filter supplied with the HM is used.

Sources of Interference

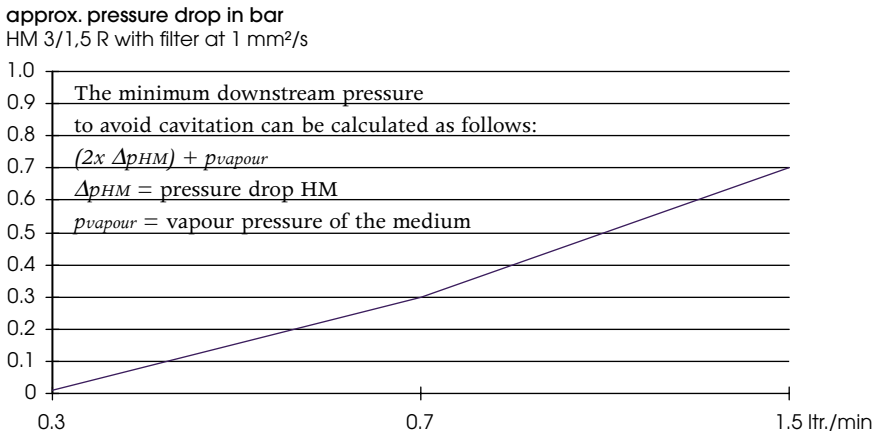
· **Turbulence and other Flow Disturbances**
close to the meter will falsify measuring results. Under extreme conditions they might also damage the HM. Laminar flow rectifiers (2.5 x turbine's nominal diameter long) fitted on both sides of the meter will eleminate problems.

· **Magnetic Fields and Similar Sources of Interference**
close to the meter might affect the pickups.

· **Vibrating Pipes**
can have a resonance effect on the pickups. You may prevent this by fitting anti-vibration joints or flexible pipes.

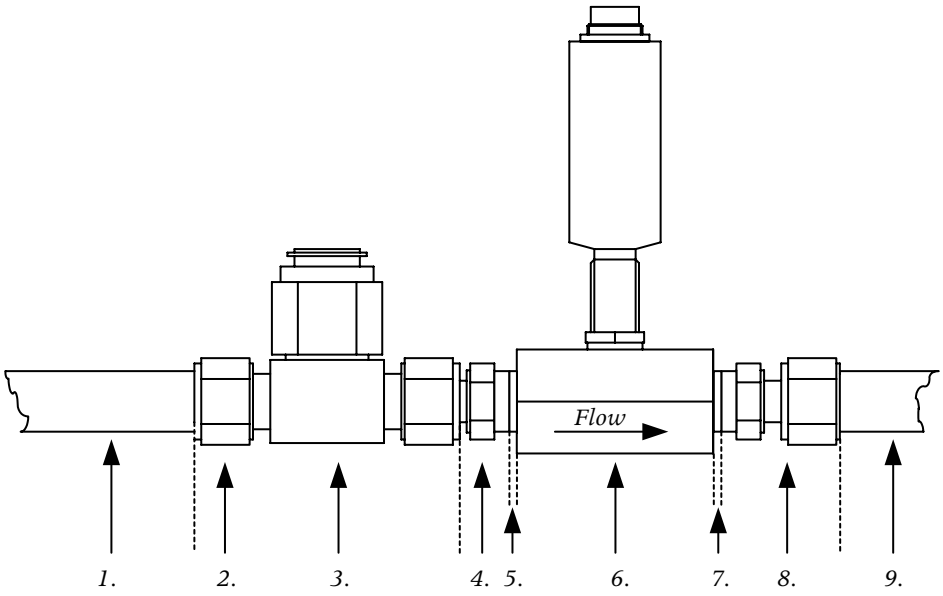
· **Gas Bubbles in the System**
Please ensure that pipes are filled with liquid. Bubbles, air pockets or gas will falsify your measuring results. The HM dectects the total volume passing through regardless of whether it is completely liquid or containing gas.

· **Pressure drop and Cavitation** (especially with measuring liquefied gases)



Installation

use filter, mounting position may either be vertical or horizontal.



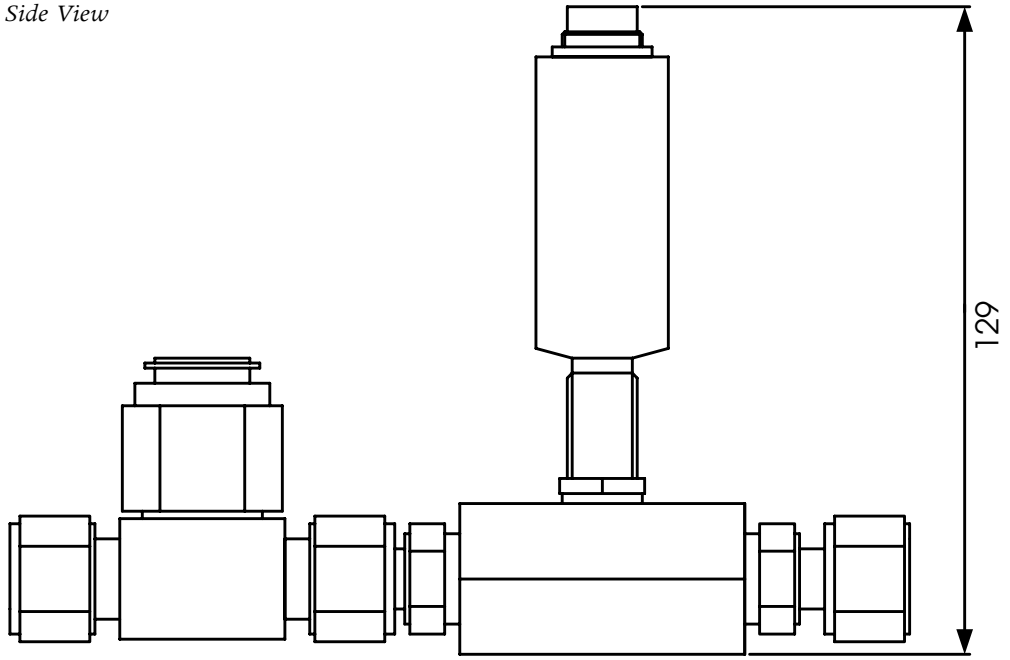
1. *Inlet section*
   Tube 12 mm recommended length 30 mm
2. *Swagelok fitting*
   For tube 12 mm
3. *Tube filter (SS-12-TF-MM-LE)*
   Incl. 140 micron filter element (SS-8F-K4-140)
4. *Swagelok tube adaptor (SS-12-MO-1-4RS)*
   G 1/4'' - 12 mm
5. *Aluminium washer*
   internal dia = 6 mm, external dia = 10.5 mm, strength = 1.5 mm
6. *HM 3/1,5 R*
   Turbine flow meter
7. *Aluminium washer*
   as above
8. *Swagelok tube fitting (SS-12-MO-1-4RP)*
   12 mm - G 1/4''
9. *Outlet section*
   Tube 12 mm, recommended length 15 mm

Maintenance

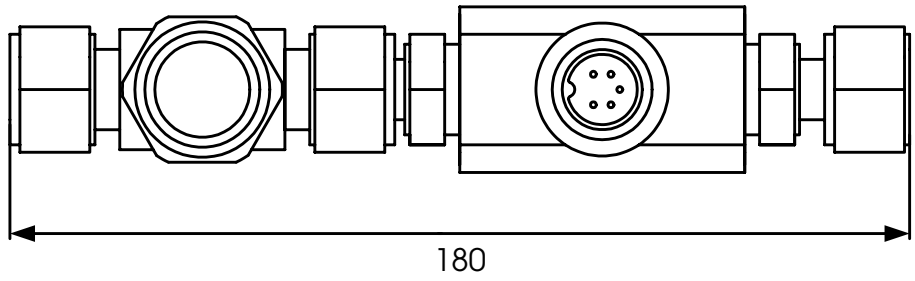
Adhering to these instructions, the HM is free of maintenance. Calibration values should be checked after approx. 8,000 hours of permanent operation.

Dimensional Drawings (mm)

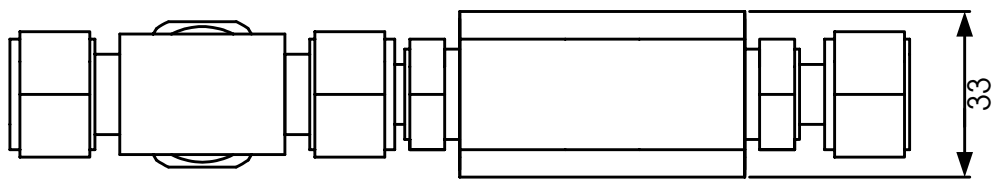
Side View



Top View



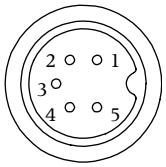
Bottom View

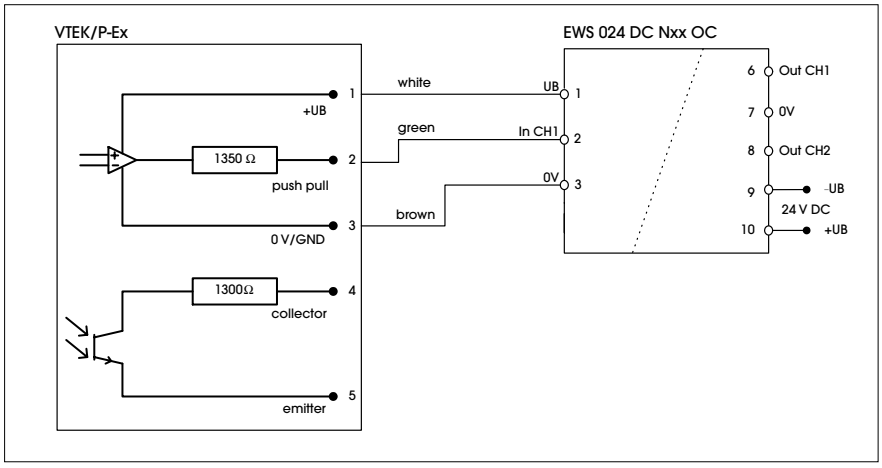


Electrical Connection

pin connection VTEK/P-Ex

1	=	+UB	4	=	OC signal (collector)
2	=	Signal Push Pull	5	=	OC signal (emitter)
3	=	0 V			





Evaluation

Turbine flow meters are mediate volume transmitters similar to a Woltmann's Sail Wheel. The volume passing through the tube is measured by the mean velocity of the streaming fluid. Flow rectifiers ensure a laminar flow in the axial direction of the wheel.
A light-weight turbinewheel carried concentrically in the tube body is rotated by the fluid. The RPM of the turbi newheel is directly proportional to the mean flow velocity within the tube diameter and corresponds to the volume flow over a wide range.We calibrate our flow meters to determine their K-Factors. Among others, our calibration records include these specifications:

- max. measuring error referring to the instantaneous flow rate
- max./min. frequency with corresponding flow values
- K-Factors for different flow rates
- average K-Factor valid for the entire flow range

The average K-Factor is used to evaluate varying flow rates.

Please adjust your evaluation equipment considering the above specifications.
The following equation applies:

$$Q = \frac{F \times 60}{K}$$

Q = flow rate, litres per minute
K = K-Factor of the turbine flow meter (pulses per litre)
F = generated pulse frequency in Hz