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Flowmålingsprincipper for …..
Vand, varme mm

John Frederiksen, Teknologisk Institut

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INDHOLD

- Mekaniske målere
  - Vingehjul
  - Ringstempel mm
- Ultralydsmålere
  - In-line
  - Clamp-on
- Magnetisk Induktive målere
- Coriolis målere

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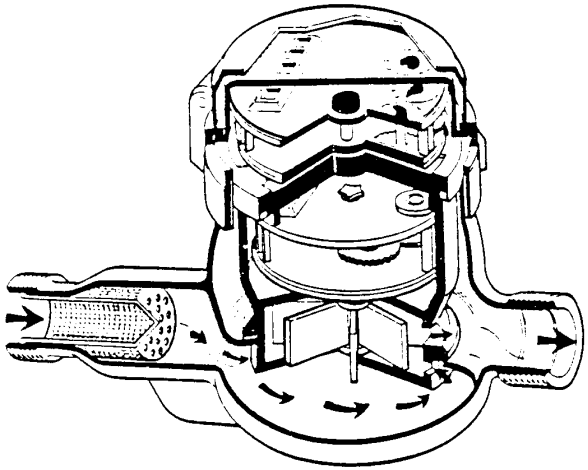
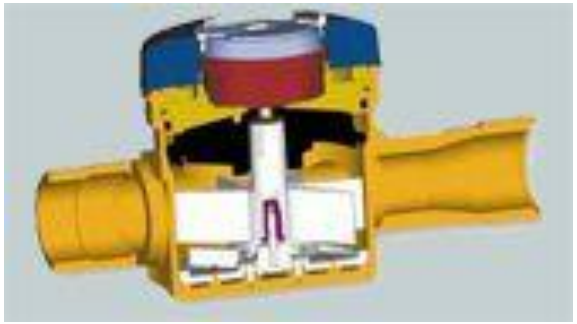
Vingehjulsmålere



Fler-strålet



Én-strålet

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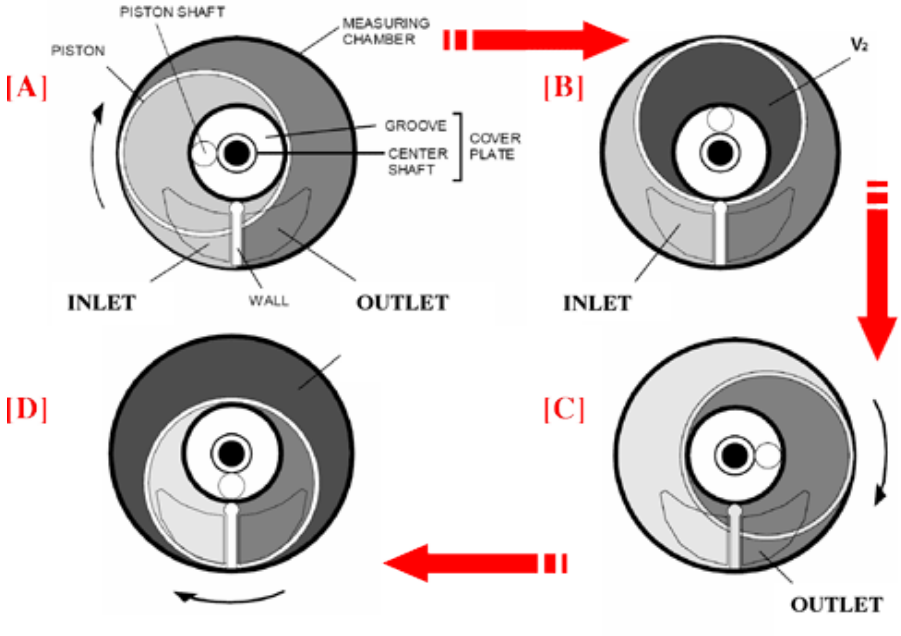
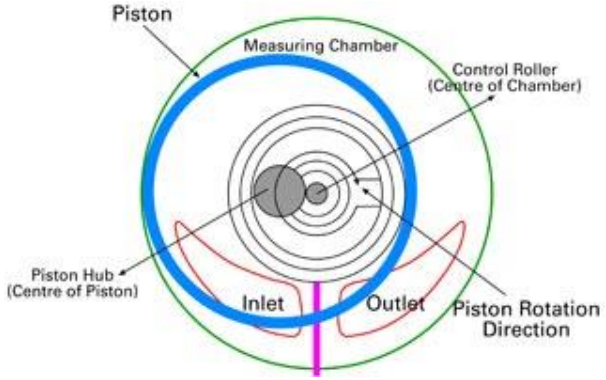
Ringstempelmåler





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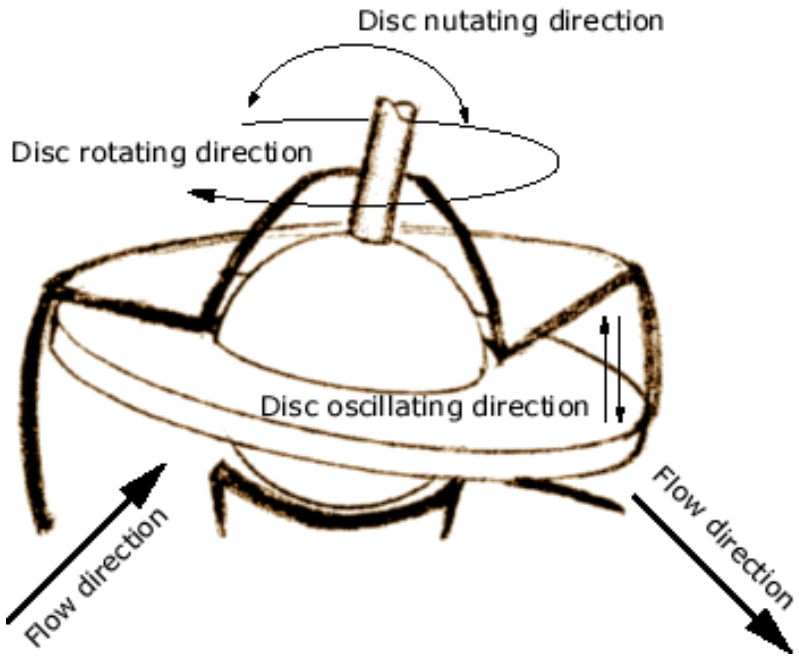
Hvirvelskivemåler



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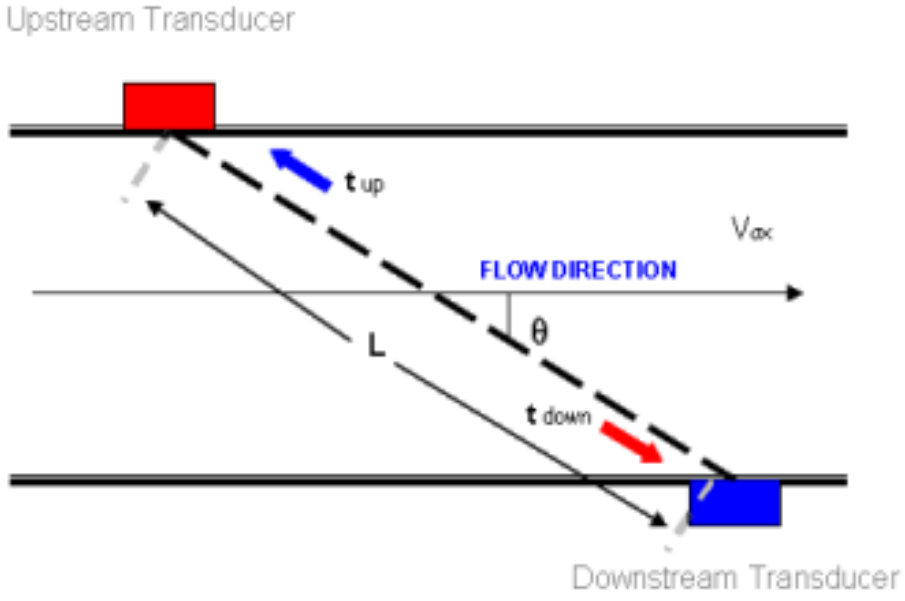
Ultralydsmålere



$$T_{AB} = \frac{L}{C + V\cos\alpha}$$

$$T_{BA} = \frac{L}{C - V\cos\alpha}$$

$$\frac{1}{T_{AB}} - \frac{1}{T_{BA}} = \frac{2V\cos\alpha}{L} = \frac{2VD}{L^2}$$

$$V = \frac{L^2}{2D}\left(\frac{1}{T_{AB}} - \frac{1}{T_{BA}}\right)$$

$$V = \frac{L^2}{2D}\left(\frac{\Delta T}{T_{AB} \times T_{BA}}\right)$$

Princip

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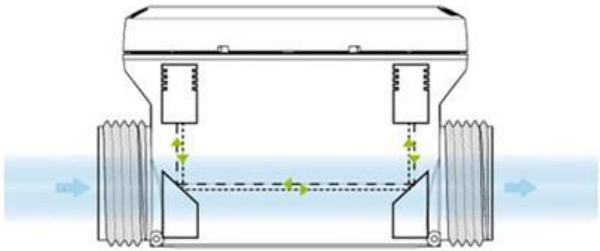
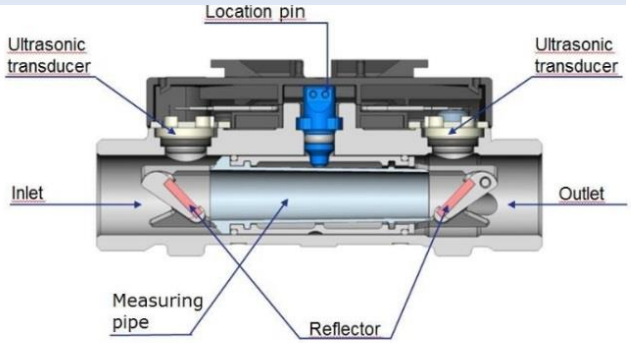
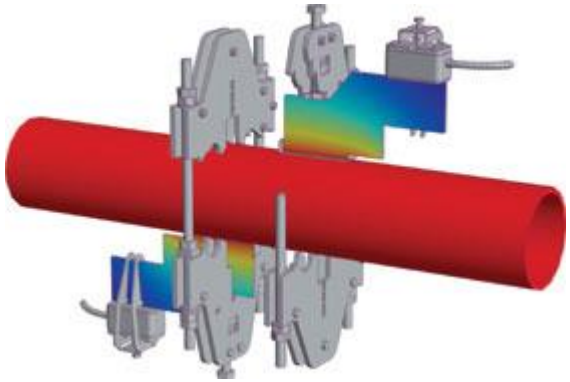
Ultralydsmålere in-line



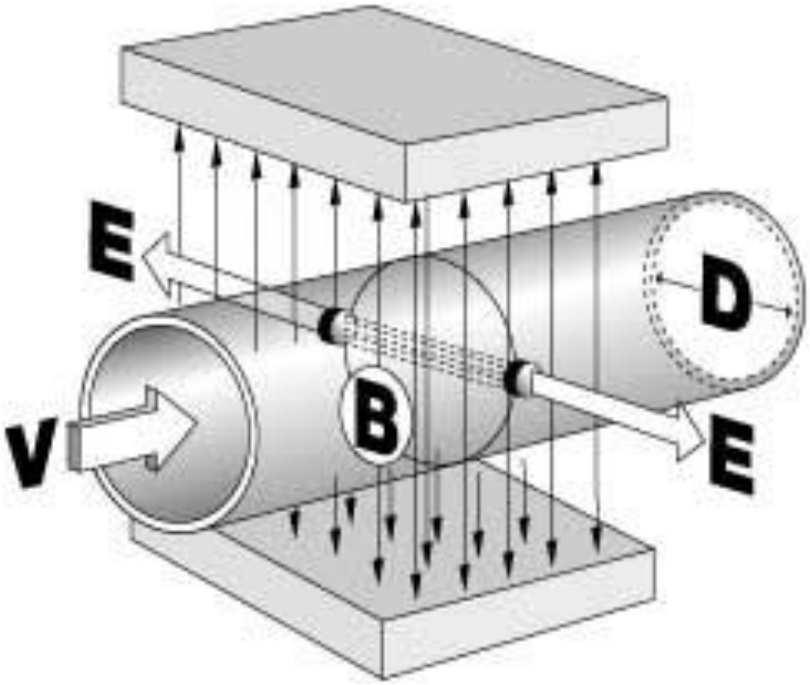
Ultralydsmåler udført med reflektorer

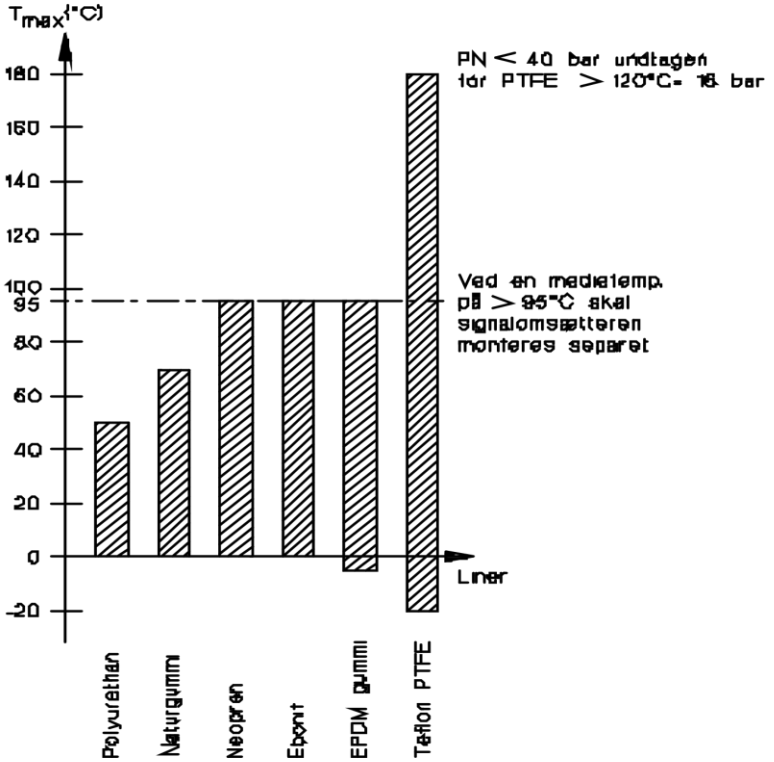


Ultralydsmålere Clamp-On



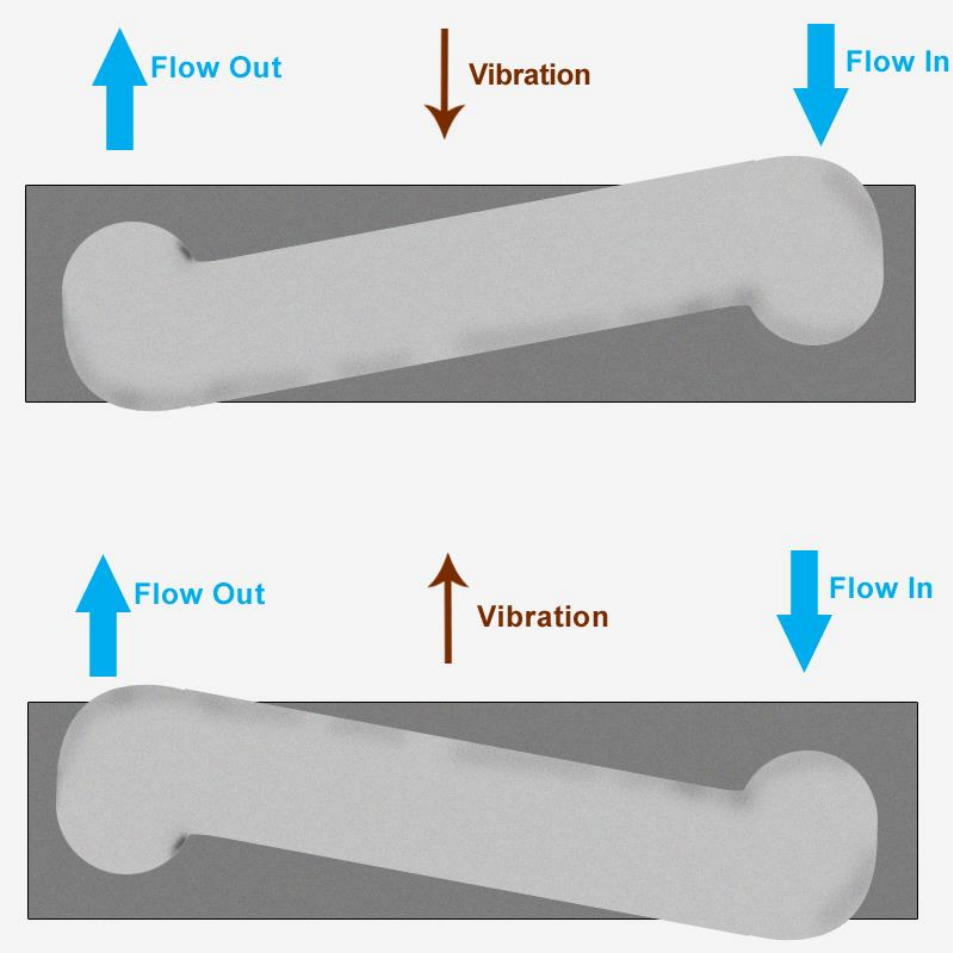
Magnetisk induktiv flowmåler





Magnetisk induktiv flowmåler

Coriolis masseflowmålere



http://www.youtube.com/watch?v=z44R6dRyZBg

Coriolis masseflowmålere

Installationsforhold

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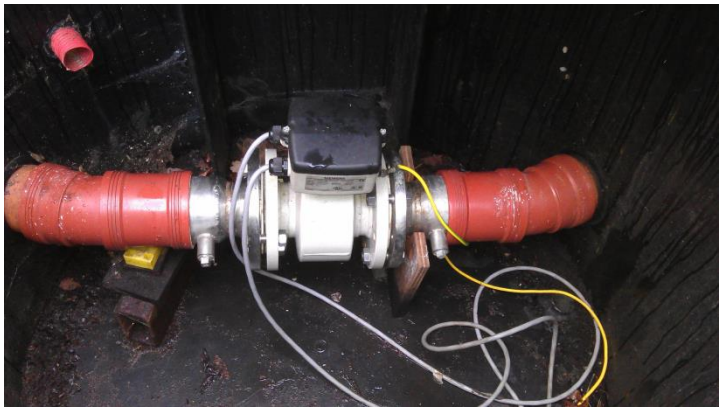
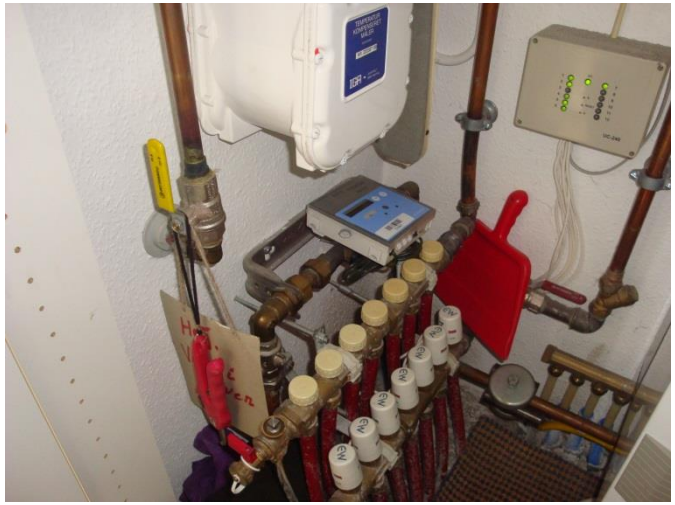
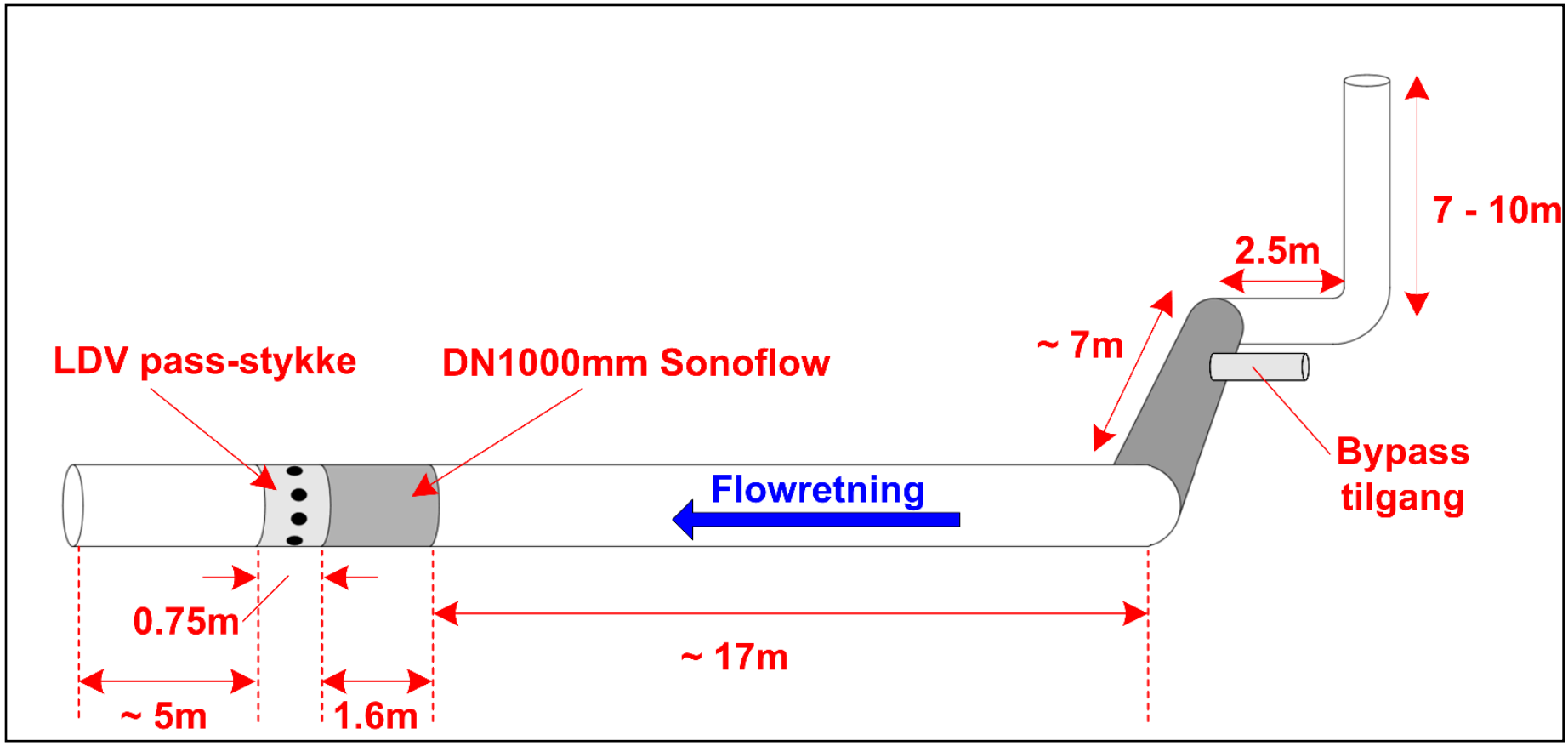


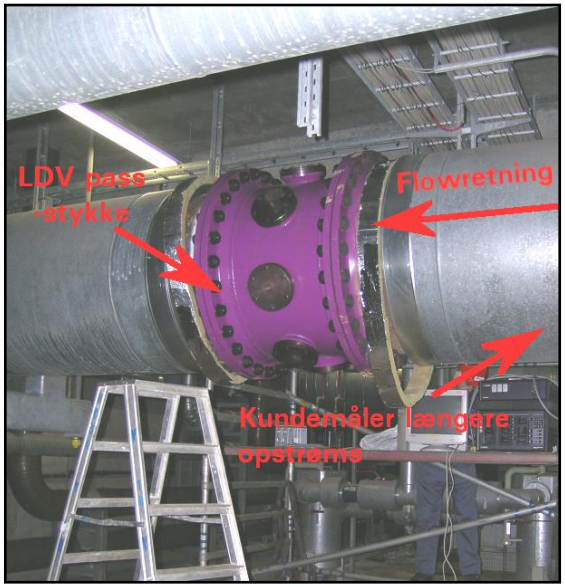
Installationsforhold

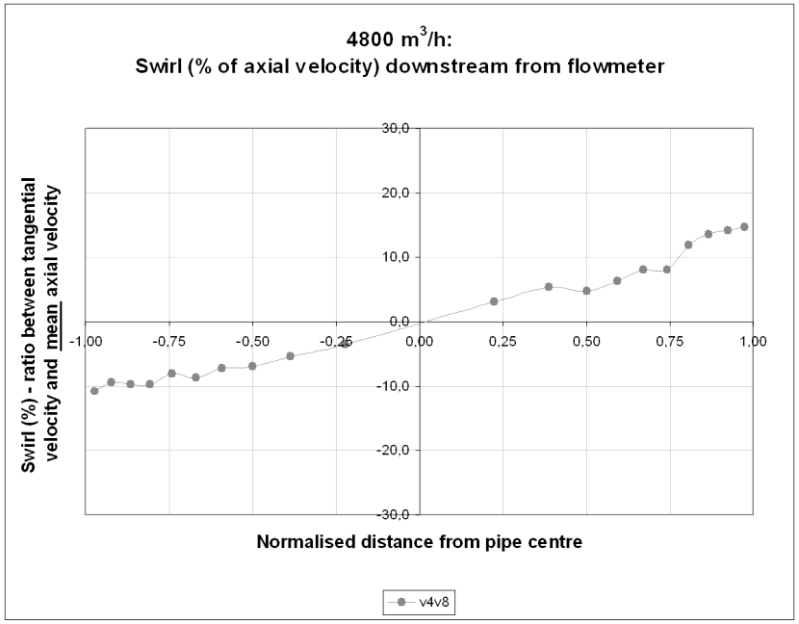


Installationsforhold



Installationsforhold





Swirl %

Aksiel flow
1,8 m/s

Tangentiel
0,35 m/s

Driftsforhold

Belægning indvendig i måler

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Tak for opmærksomheden
Spørgsmål?