

Annexure A

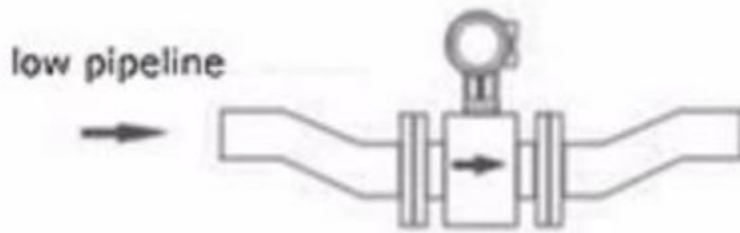
Pump lab specification

Lines

- 3 x pipe lines 250mm, 400mm and 700mm.
- 2400 kPa working pressure.

Each line should be designed to be secured to the floor in a manner to prevent very high vibration during the test.

Each line should be correctly designed to accommodate a flow meter in the correct position lower than the pipe line with air vent valves at the highest point.



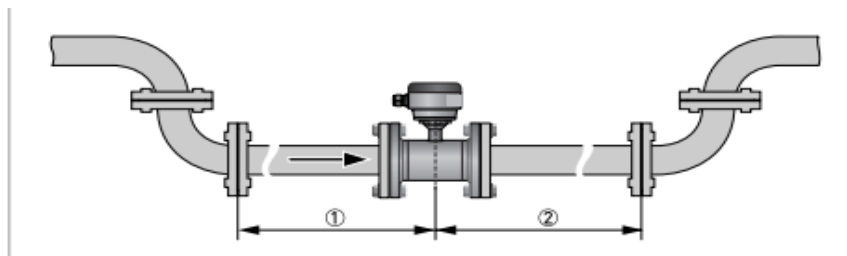
Valves

- 3 x Control valves 300mm, 400mm and 700mm.
- 10 000 kPa working pressure.
- 4-20 mA communication.
- Valves should have a Manual override to operate by hand wheel if necessary.

Flow meters

- 3 x flow meters 300 m, 400mm and 700mm.
- 4-20 mA communication.

Each flow meter should stay submerged in water and therefore be designed that the meter is lower than the pipeline with a straight length before the meter of at least 3 x diameters of the meter size and at least 1 x diameter after the meter. This can be more should you choose so, as long as it is not less than the required.



Minimal inlet and outlet

- ① Inlet: ≥ 3 DN
- ② Outlet: ≥ 1 DN

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Pressure pieces

- 10 000 kPa working pressure.
- 1m length.
- Pressure tapings for instruments as per ISO 9906.

The pressure pieces will be used on the 300mm valve, meaning the top of every pipe should fit to the new 300mm valve and the bottom flange need to fit the table below to fit to the individual pumps.

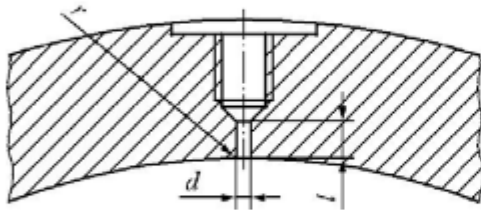
Pump	Flange standard	DN (mm)	O.D. (mm)	Number of holes	Hole Size (mm)
MSJ / SJ					
GSB 150	EN1092-1	DN150	355	12	33
GSB 200	EN1092-1	DN250	515	12	42
GSB 250	EN1092-1	DN250	515	12	42
GHP 53-29 / SRB 53-29	EN1092-1	DN250	515	12	42
GHP 58-29 / SRB 58-29	EN1092-1	DN250	515	12	42
GHP 50-25 / SRB 50-25	EN1092-1	DN200	430	12	36

4 Pressure tapings should be fitted to each pressure pieces not closer than 2 x Diameter of the pipe size for the connection of a pressure gauge.

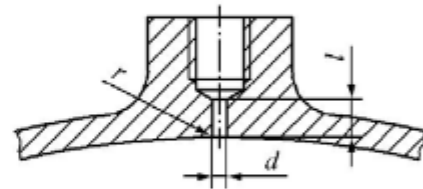
This should be done in accordance with the requirements of ISO 9906 2012

ISO 9906:2012(E)

A.4.3 Pressure tapings



$$l \geq 2,5 d$$

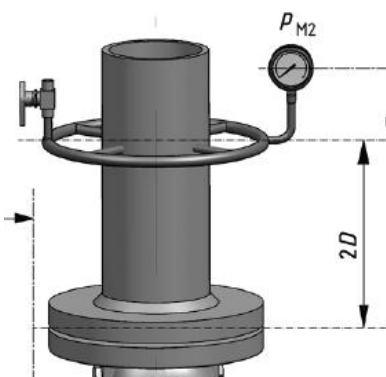


$$r \leq d/10$$

where $d = 3$ to 6 mm or $1/10$ pipe diameter, whichever value is the smaller

a) Thick wall

b) Thin wall

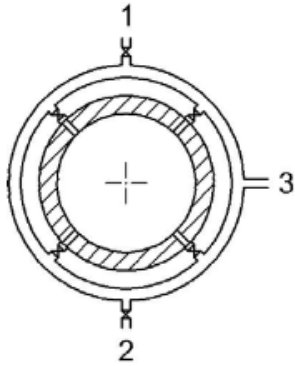


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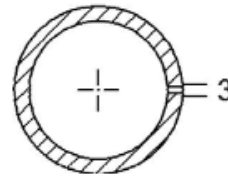
Figure A.4— Requirements for static pressure tapings

For grade 1 tests, four static pressure tapings shall be provided symmetrically disposed around the circumference of each measuring section, as shown in Figure A.5 a).

For grades 2 and 3 tests, it is normally sufficient to provide not more than one static pressure tapping at each measuring section, but if flow can be affected by a swirl or an asymmetry two or more may be necessary [see Figure A.5 b)].



a) Grade 1 — Four pressure tapings connected by a ring manifold



b) Grades 2 and 3 — One pressure tapping (or two in opposite position)

Key

- 1 vent
- 2 drain
- 3 connecting pipe to the pressure measuring instrument