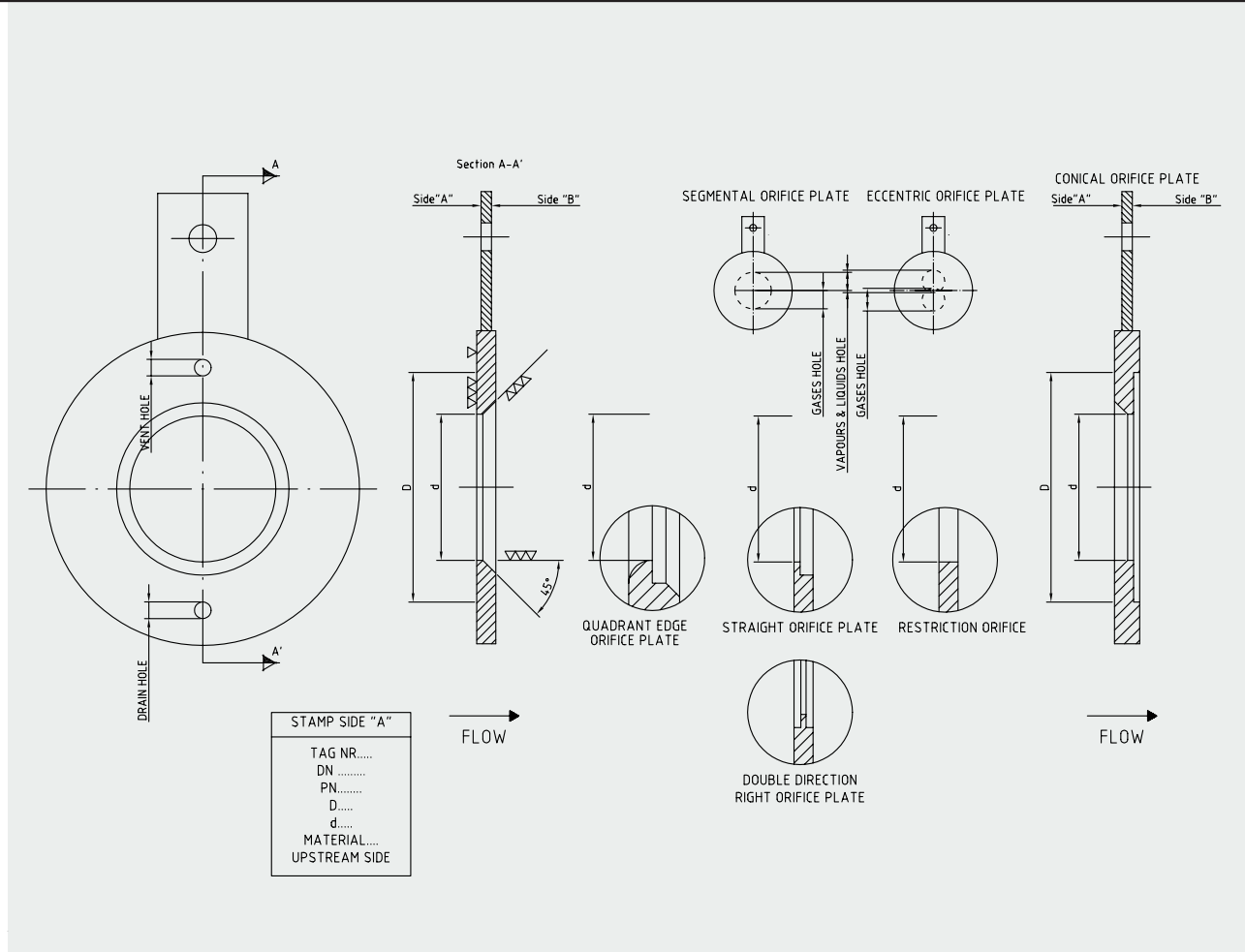


FLOW MEASUREMENT

5 PRIMARY ELEMENTS

- 5.1 ORIFICE PLATE & RESTRICTION ORIFICE
- 5.2 CERAMIC PRIMARY DIFFERENTIAL PRESSURE DEVICES
- 5.3 SPECTACLE BLINDS
- 5.4 FLANGES ASSEMBLY WITH ORIFICE PLATE OR RESTRICTION ORIFICE
- 5.5 METER RUN
- 5.6 DIAPHRAGM WITH ANNULAR CHAMBERS
- 5.7 DIAPHRAGM WITH INCORPORATED TAPS
- 5.8 AVERAGING PITOT TUBE
- 5.9 VENTURI TUBE
- 5.10 ISA 1932 NOZZLE
- 5.11 ASME NOZZLE
- 5.12 FLOW ACCESORIES

ORIFICE PLATE & RESTRICTION ORIFICE

**CHARACTERISTICS - ORIFICE PLATE**

Calibrated insertion diaphragm (concentric orifice) with identification tag for mounting between flanges with smooth waterproof surfaces.

The upper face of the entrance orifice plate is square edged while lower face is in angle.

CHARACTERISTICS - RESTRICTION ORIFICE

Calibrated insertion diaphragm (concentric orifice) with identification tag for mounting between flanges with smooth waterproof surfaces.

The upper face of the entrance orifice plate is square edged;

Suitable to reduce pressure or flow in pipes.

APPLICATIONS

- Gases, vapours, corrosive and non corrosive fluids.

SPECIFICATIONS

- Material:
AISI-304, AISI-316, AISI-318, AISI-321, Alloy 400, Alloy 625 Alloy 825, Alloy C-276, Titanium, PTFE, etc...
- Maximum process temperature: depending on material properties and use.
- Plate thickness: depends on inside Diameter and ΔP (differential pressure).
- Calculations:
BS EN ISO 5167-1, 2003, ASME, API, R W MILLER, L W SPINK.

CERAMIC PRIMARY DIFFERENTIAL PRESSURE DEVICES

Advanced Ceramic Technology is a recent term that refers to a wide range of materials, which are generally obtained from partition of inorganic raw material –metal oxides-, and selected with a high grade of purity. These materials are submitted to shaping techniques of the powder metallurgy with a following very high temperature sintering process that leads to dense components, which high technical performances offer a wide range of applications.

Thanks to their **excellent properties**, the **Advanced Ceramic Technology** can be used in the making of primary flow elements – with APLITEX as a pioneer. At the present time, they are a key element in processes that require:

- Extreme solidity.
- Stability at high temperatures.
- High resistance to corrosion.
- High resistance to chemical attacks.
- High resistance to vacuum.
- Long life.

Among the primary flow elements that APLITEX makes, the following items are also designed and made with ceramic material:

- ORIFICE PLATE & RESTRICTION ORIFICE
- SPECTACLE BLINDS
- FLANGES WITH ORIFICE PLATE OR RESTRICTION ORIFICE*
- METER RUN*
- DIAPHRAGM WITH ANNULAR CHAMBERS*
- ISA 1932 NOZZLE
- ASME NOZZLE

To guarantee the actual optimal use of these materials, it is necessary to work case by case and find a "ceramic solution" for each. This requires cooperation between the specialist of the final application, the user, and the maker of the ceramic component, APLITEX.

**NOTE: Calibrated insertion diaphragm in ceramic material, rest of assembly depending on specifications*



SPECTACLE BLINDS

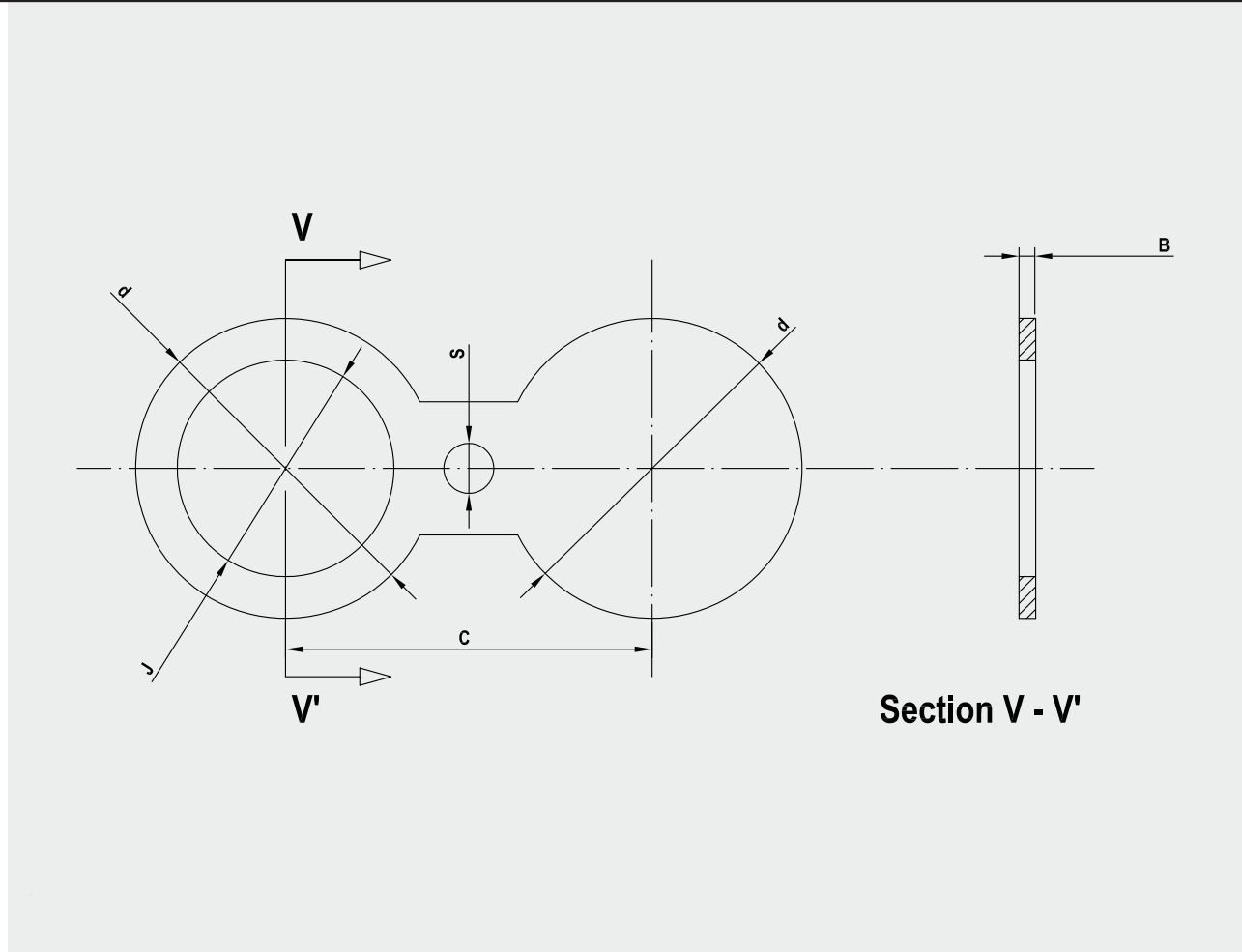
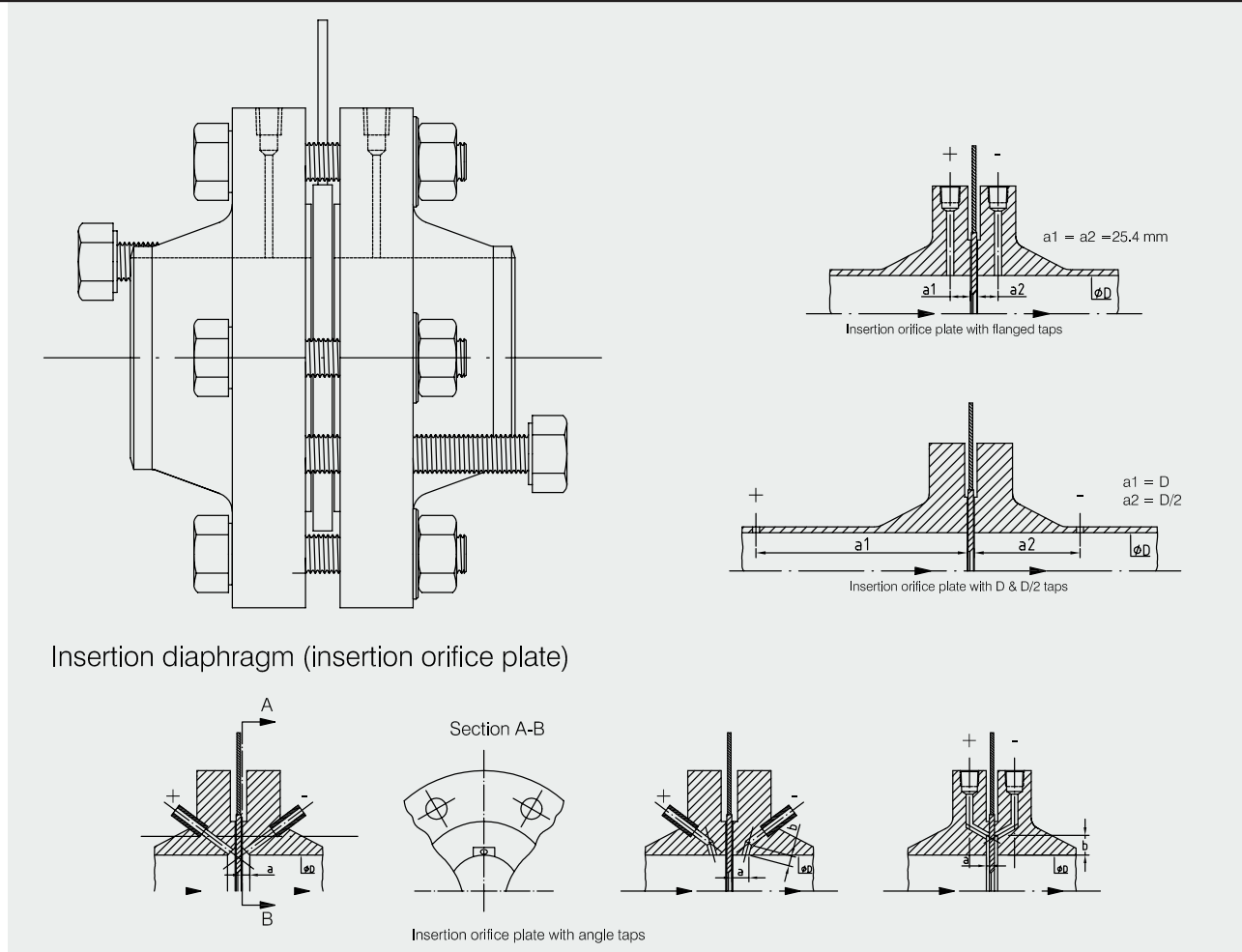
**CHARACTERISTICS**

Figure with "8" shape, blinded in one side to stop the flow and opened in the other to allow it.

SPECIFICATIONS

- Maximum process pressure: Limited to the flange rating
- Range of Pipeline (Standard):
Nominal Diameter: DIN or ASA
Rating: DIN or ASA
- Thickness: According to Norm
- Materials: Carbon steel, AISI-316, AISI-304, AISI-321, AISI-318, Alloy 400, Alloy 625, Alloy 825, Alloy C-276, Titanium, PTFE, etc...

FLANGES ASSEMBLY WITH O. PLATE OR RESTRICTION O.



CHARACTERISTICS

Calibrated insertion diaphragm (concentric orifice) with identification tag for mounting between flanges with smooth waterproof surfaces.

The upper face of the entrance orifice plate is square edged.

The pressure measurement taps are on flange or pipe. Diaphragm with flanges assembly designed to be welded to pipe.

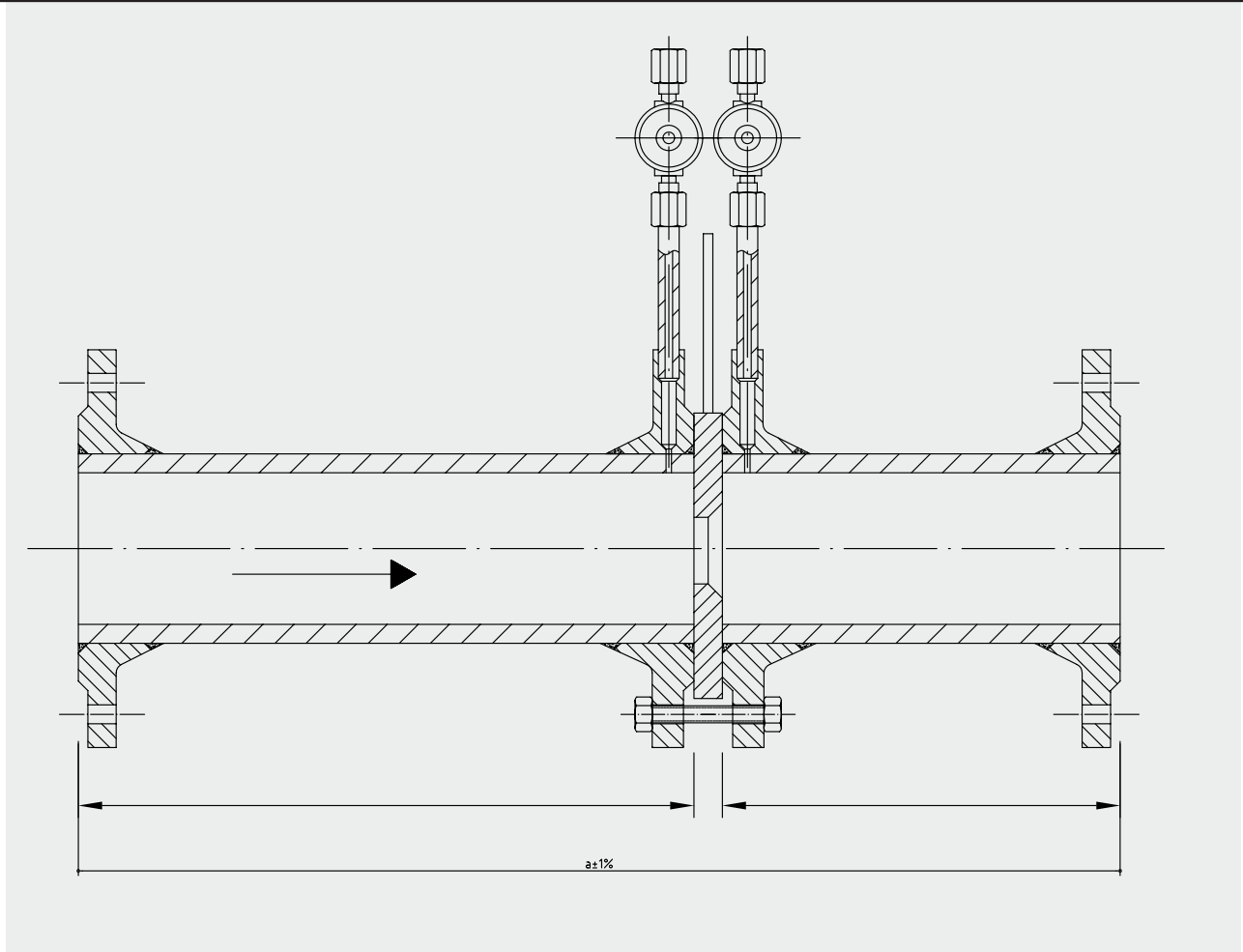
APPLICATIONS

- Gases, vapours, corrosive and non corrosive fluids.

SPECIFICATIONS

- Maximum working pressure: Limited to the flange rating.
- Maximum working temperature: Depends on material and application.
- Range of Pipeline:
 - Nominal Diameter: DIN or ASA
 - Rating: DIN or ASA
- Pressure taps: BSP, NPT, METRIC, etc...
- Flange standard: DIN or ASA.
- Flange and accessories material: Depends on pipe.
- Diaphragm material: See 5.1 ORIFICE PLATE & RESTRICTION ORIFICE.
- Calculations: BS EN ISO 51 67-1, 2003, ASME, API, R W MILLER, L W SPINK.

METER RUN



CHARACTERISTICS

Calibrated insertion diaphragm (concentric orifice) with identification tag for mounting between flanges with smooth waterproof surfaces.

The upper face of the entrance orifice plate is square edged.

The pressure measurement taps are on flange or pipe. Diaphragm with flanges assembly designed to be welded to pipe or mounted between flanges.

Suitable to lower dimensions to DN50 (2") and to offer a bigger precision in the measurement.

Sections of straight pipeline in both sides of the orifice plate are designed according to DIN19205 standard.

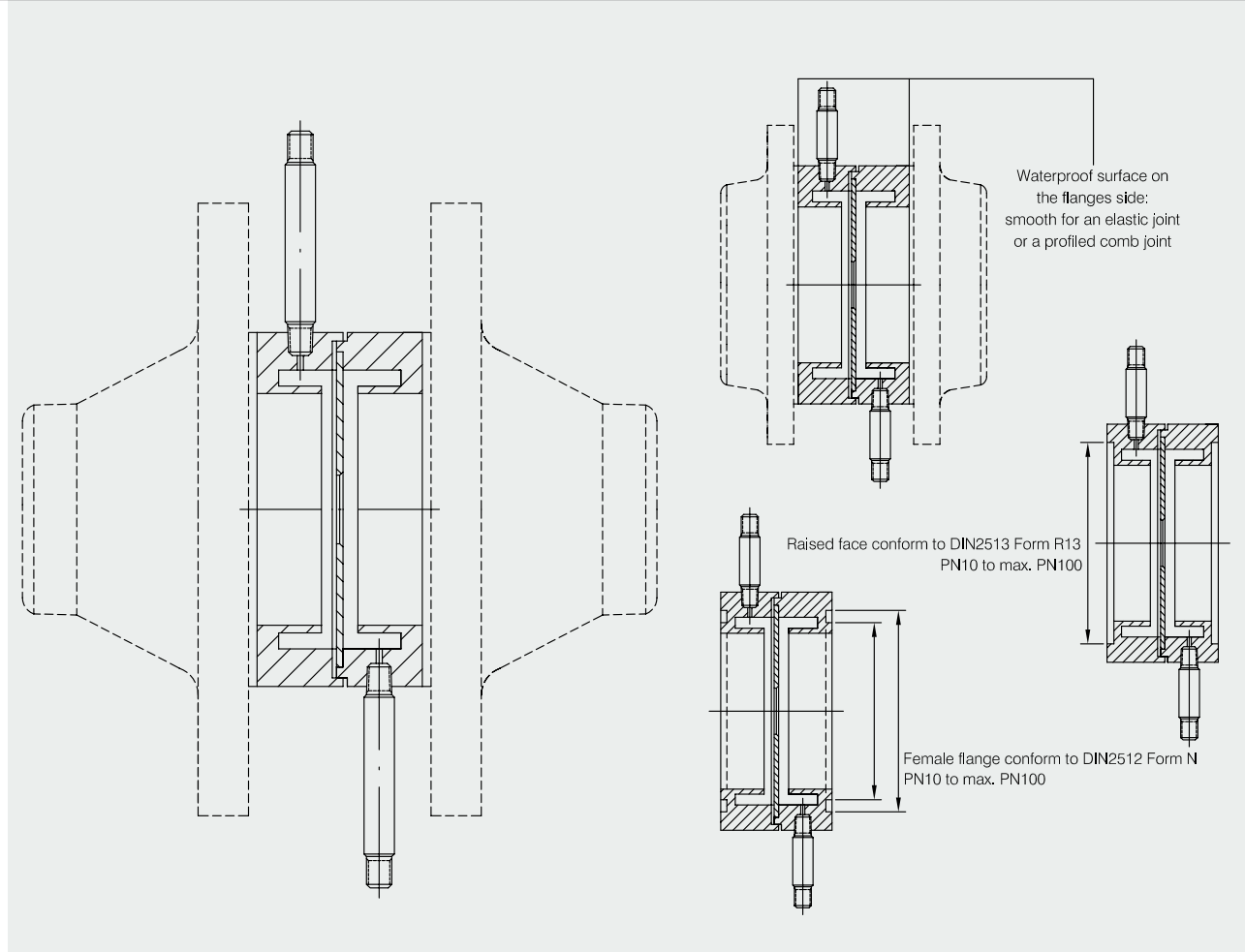
APPLICATIONS

- Gases, vapours, corrosive and non corrosive fluids.

SPECIFICATIONS

- Maximum working pressure: Limited to the flange rating.
- Maximum working temperature: Depends on material and application.
- Range of Pipeline:
Nominal Diameter: DIN or ASA
Rating: DIN or ASA
- Pressure taps: BSP, NPT, METRIC, etc...
- Flange standard: DIN or ASA.
- Pipe material: Depends on pipe.
- Flange and accessories material: Depends on pipe.
- Diaphragm material: See 5.1 ORIFICE PLATE & RESTRICTION ORIFICE.
- Calculations: BS EN ISO 5167-1, 2003, ASME, API, R W MILLER, L W SPINK.

ANNULAR CHAMBERS



CHARACTERISTICS

Calibrated and interchangeable insertion diaphragm (concentric orifice) with identification tag for mounting between flanges with smooth waterproof surfaces.

The upper face of the entrance orifice plate is square edged.

The pressure measurement taps are incorporated.

Assembly designed to be mounted between flanges.

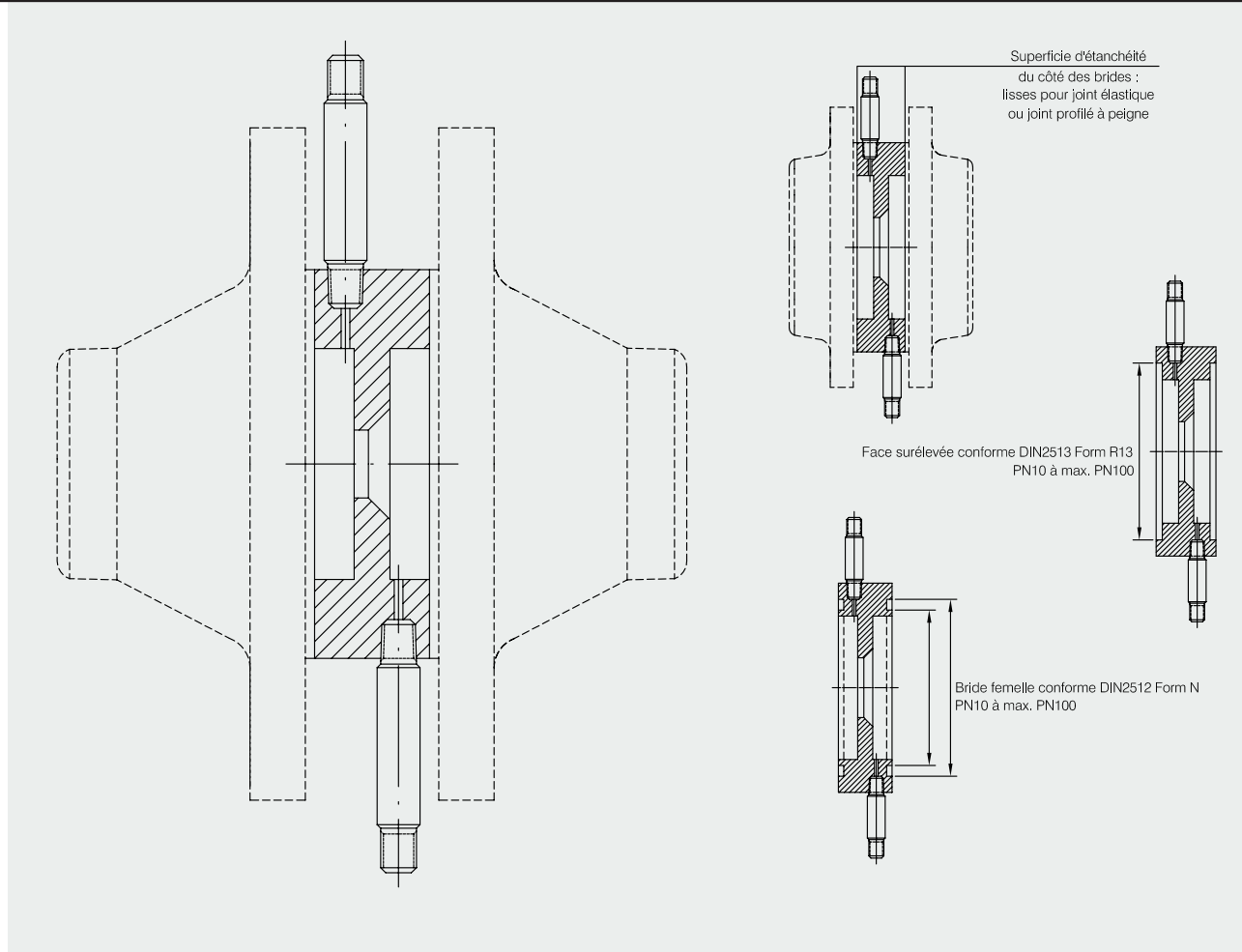
APPLICATIONS

- Gases, vapours, corrosive and non corrosive fluids.

SPECIFICATIONS

- Maximum working pressure: Limited to the flange rating.
- Maximum working temperature: Depends on material and application.
- Range of Pipeline:
Nominal Diameter: DIN or ASA
Rating: DIN or ASA
- Pressure taps: BSP, NPT, METRIC, etc...
- Assembly thickness: Depends on design.
- Material: AISI-316, AISI-304, AISI-321, AISI-318, Alloy 400, Alloy 625, Alloy 825, Alloy C-276, Titanium, PTFE, etc...
- Calculations: BS EN ISO 5167-1, 2003, ASME, API, R W MILLER, L W SPINK.

INCORPORATED TAPS



CHARACTERISTICS

Calibrated insertion diaphragm (concentric orifice) with identification tag for mounting between flanges with smooth waterproof surfaces.

The upper face of the entrance orifice plate is square edged.

The pressure measurement taps are incorporated. Assembly designed to be mounted between flanges.

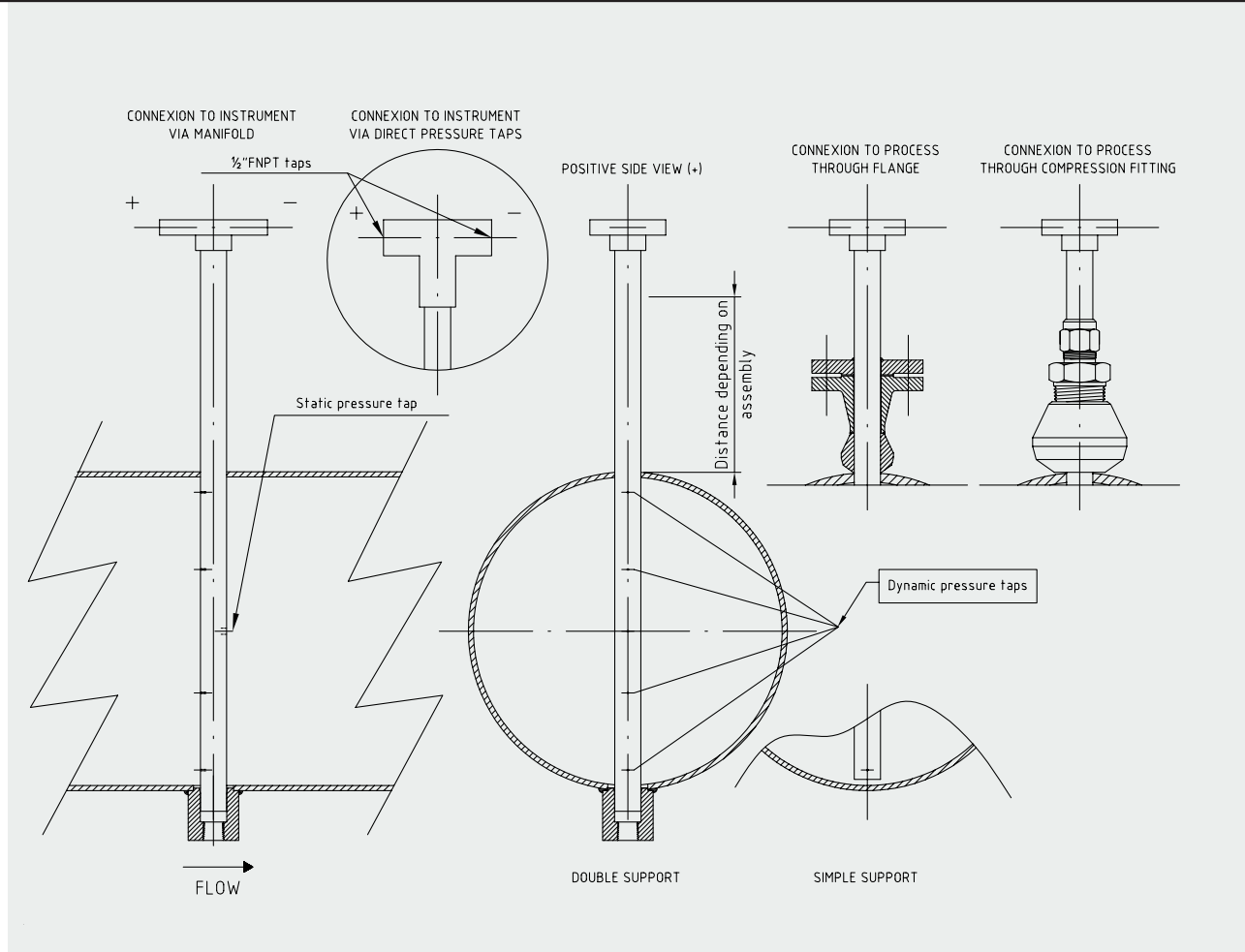
APPLICATIONS

- Gases, vapours, corrosive and non corrosive fluids.

SPECIFICATIONS

- Maximum working pressure: Limited to the flange rating.
- Maximum working temperature: Depends on material and application.
- Range of Pipeline:
 - Nominal Diameter: DIN or ASA
 - Rating: DIN or ASA
- Pressure taps: BSP, NPT, METRIC, etc...
- Assembly thickness: Depends on design.
- Material: AISI-316, AISI-304, AISI-321, AISI-318, Alloy 400, Alloy 625, Alloy 825, Alloy C-276, Titanium, PTFE, etc...
- Calculations: BS EN ISO 5167-1, 2003, ASME, API, R W MILLER, L W SPINK.

AVERAGING PITOT TUBE



CHARACTERISTICS

Unlike pressure differential flow meters that measure a relationship between flow and static pressure difference, the Pitot tube links flow with the difference between dynamic pressure (static pressure plus "velocity head") and the static pressure.

Permanent pressure loss caused by the device is very low, which is an advantage despite its limitations in terms of the quality of fluids of which the flow rate is to be measured.

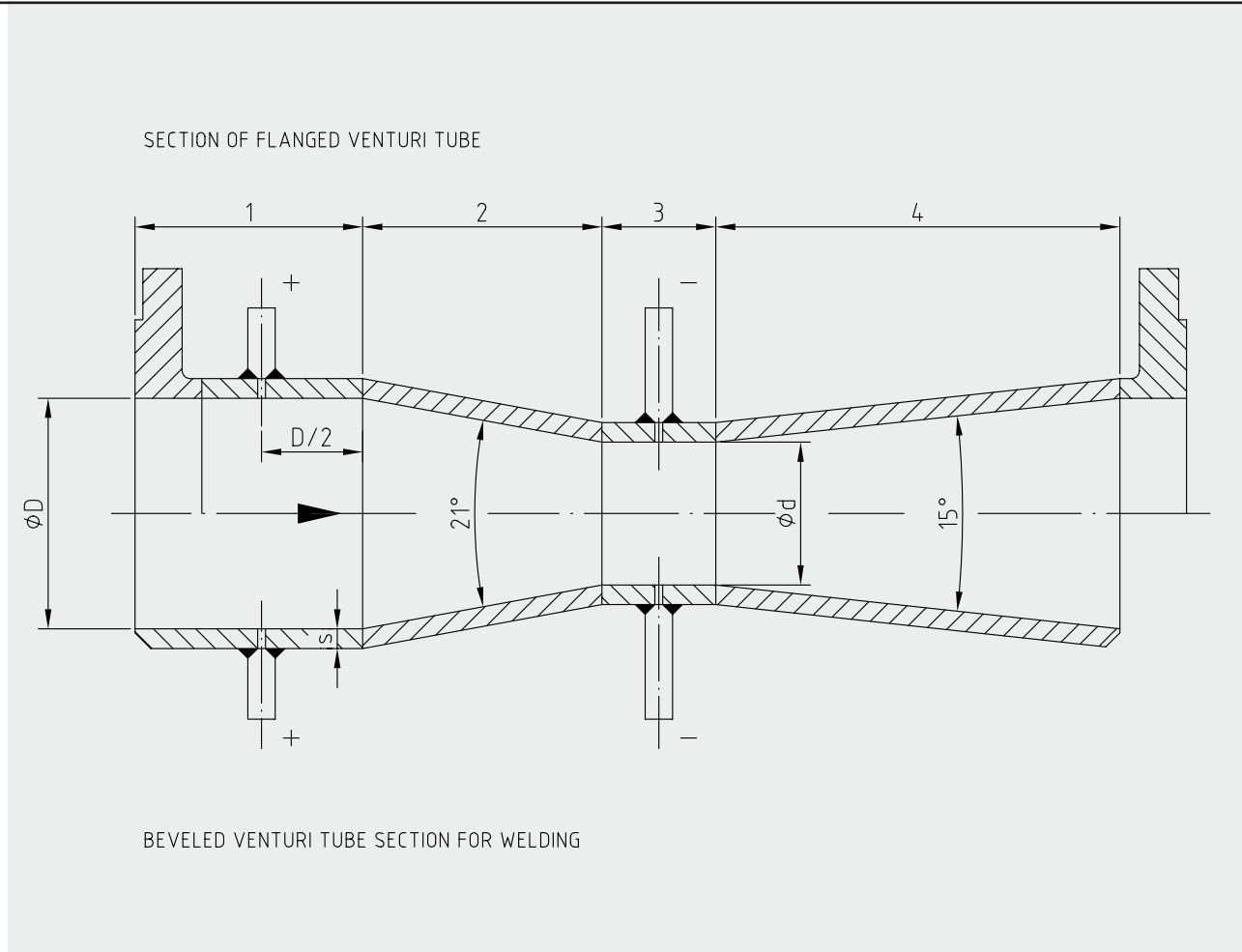
APPLICATIONS

- Where pressure loss in the system is not acceptable.
- Measurement of flow rates when there is a high level of air and water

SPECIFICATIONS

- Material:
 - AISI 304, AISI 316, AISI 318, AISI 321, Alloy 400, Alloy 625 Alloy 825, Alloy C-276, Titanium, PTFE, etc...
- Models:
 - Simple support
 - Double support
- Connexion to instrument
 - Direct pressure tap
 - Manifold
- Calculations:
 - Iso 3966-1977, ASME, API, R W MILLER, L W SPINK

VENTURI TUBE



CHARACTERISTICS

Classic Venturi Tube for welding to pipe or mounting between flanges. Execution conform to DIN or ASA. Construction from welded sheet or forged bar. Consisting of a short cylindrical section, a convergent section (the inlet cone), a throat and a divergent section (the outlet cone).

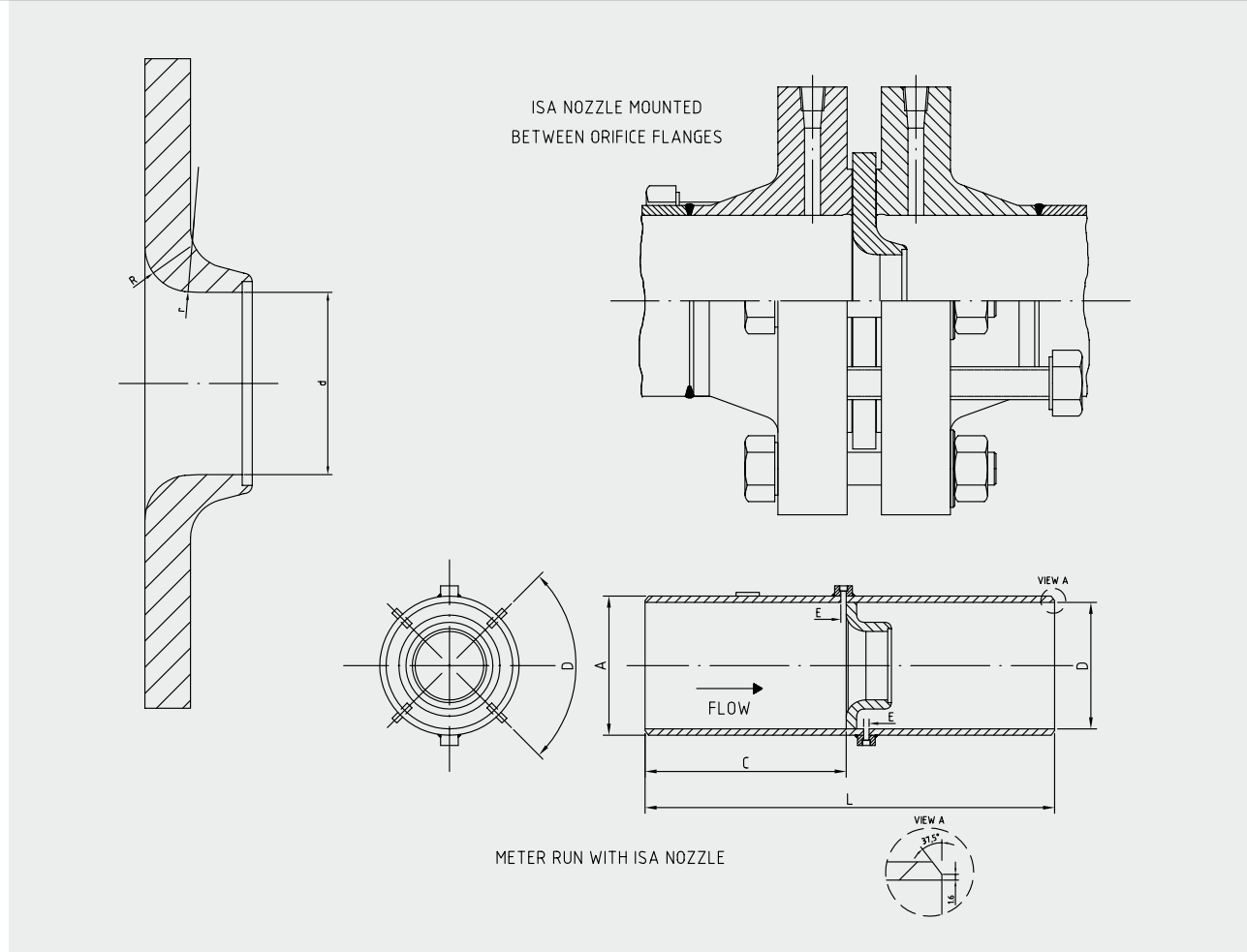
APPLICATIONS

- Gases at low pressure, liquids where pressure loss has to be kept to a minimum, or liquids with solids in suspension.
- Also available for low pressure differential.

SPECIFICATIONS

- Maximum working pressure: Limited to flange rating.
- Maximum working temperature: Depends on material and application .
- Material: Carbon steel, AISI-316, etc...
- Pressure taps: BSP, NPT, METRIC, etc...
- Thickness: According to pipe.
- Calculations: BS EN ISO 5167-1, 2003, ASME, API, R W MILLER, L W SPINK.

ISA 1932 NOZZLE



CHARACTERISTICS

Situated in the pipeline with two positions for taps, one upstream and the other in the centre of the narrowest part of the cross section. Allows flow rates 60% higher than the Orifice Plate in identical conditions. The permanent pressure loss it produces is inferior to that of the Plate but superior to that of the Venturi.

LIMITS OF USE

$50 \text{ mm} \leq D \leq 500 \text{ mm}$
 $0,3 \leq \beta \leq 0,8$

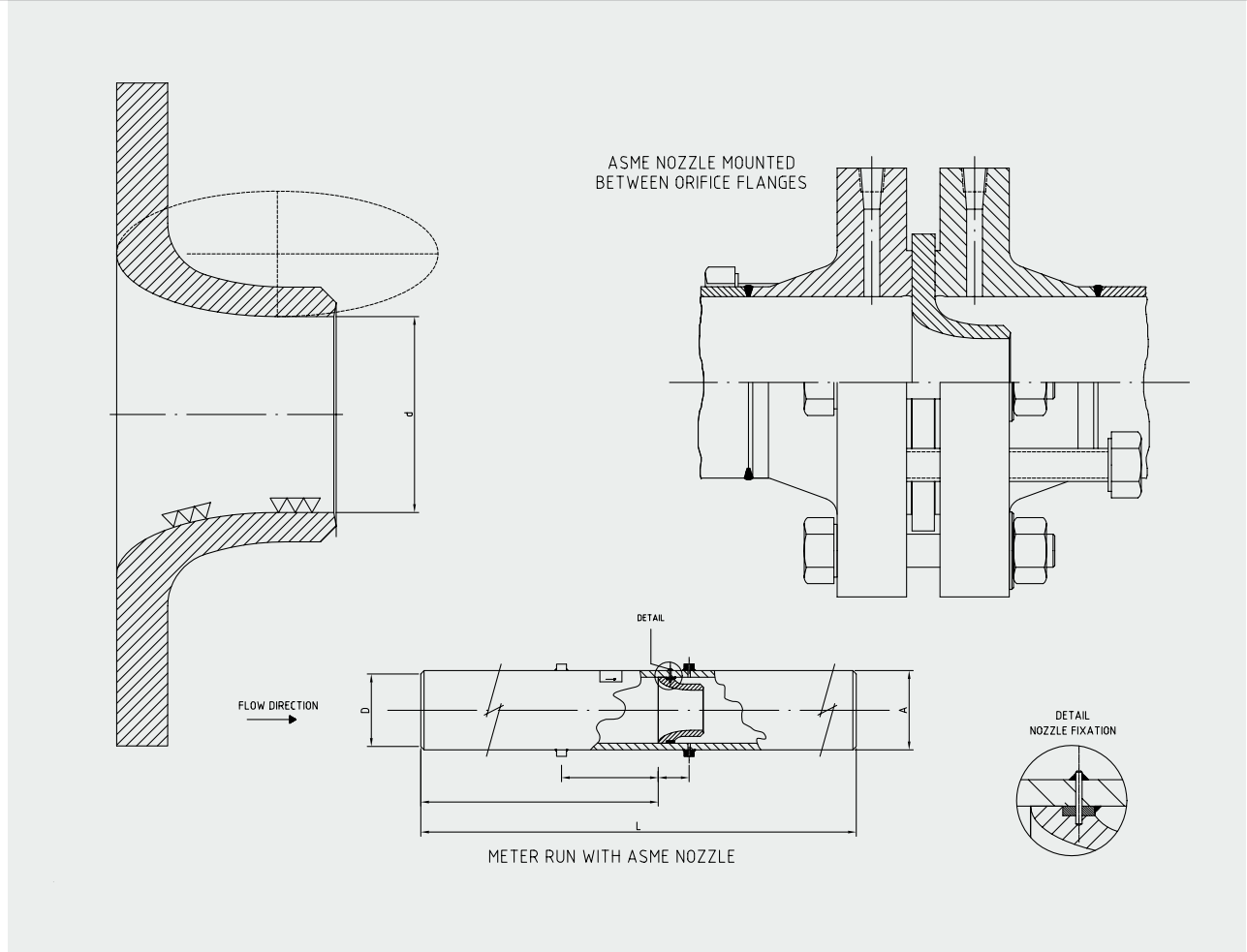
APPLICATIONS

- Gases, vapours, corrosive and non corrosive fluids that carry small quantities of solids.

SPECIFICATIONS

- Maximum working pressure: Limited to flange rating.
- Maximum working temperature: Depends on material and application .
- Material:
 AISI-316, AISI-304, AISI-321, AISI-318, Alloy 400, Alloy 625, Alloy 825, Alloy C-276, Titanium, PTFE, etc...
- Calculations:
 BS EN ISO 5167-1, 2003, ASME, API, R W MILLER, L W SPINK.

ASME NOZZLE



CHARACTERISTICS

Situated in the pipeline with two positions for taps, one upstream and the other in the centre of the narrowest part of the cross section. Allows flow rates 60% higher than the Orifice Plate in identical conditions. The permanent pressure loss it produces is inferior to that of the Plate but superior to that of the Venturi.

LIMITS OF USE

$50 \text{ mm} \leq D \leq 500 \text{ mm}$
 $0,3 \leq \beta \leq 0,8$

APPLICATIONS

- Gases, vapours, corrosive and non corrosive fluids that carry small quantities of solids.

SPECIFICATIONS

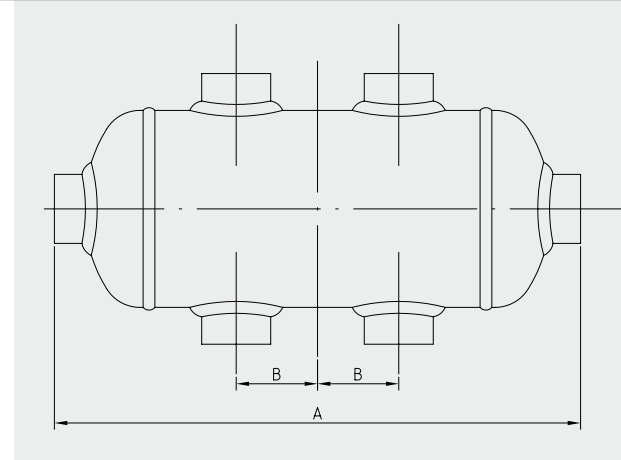
- Maximum working pressure: Limited to flange rating.
- Maximum working temperature: Depends on material and application .
- Material:
 AISI-316, AISI-304, AISI-321, AISI-318, Alloy 400, Alloy 625, Alloy 825, Alloy C-276, Titanium, PTFE, etc...
- Calculations:
 BS EN ISO 5167-1, 2003, ASME, API, R W MILLER, L W SPINK.

FLOW ACCESSORIES

5.12.1 CONDENSING AND SEAL POTS

SPECIFICATIONS

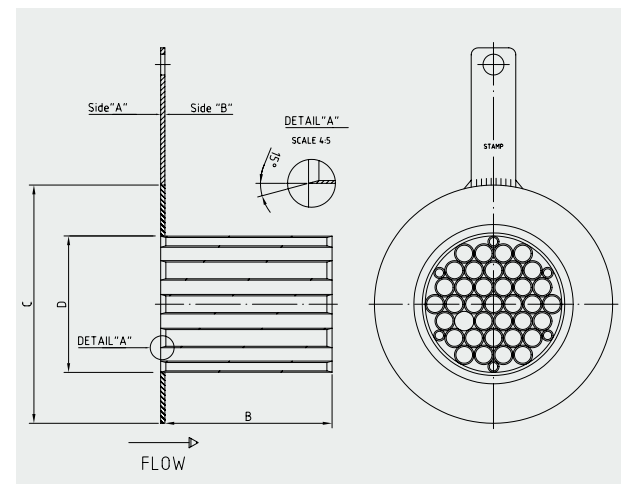
- Maximum working pressure: Depends on design.
- Maximum working temperature: Depends on the material and application.
- Range of Pipeline:
Nominal Diameter: DIN or ASA.
Rating: DIN or ASA.
- Pressure taps: BSP, NPT, METRIC, WELDOLET, THREADOLET, etc...
- Material: AISI-316, Carbon Steel, AISI-304; AISI-321, ASTM A335 GR P11, ASTM A335 GR P22, etc...
- CONFORM TO PED 97/23/EC standard (if required)



5.12.2 FLOW STRAIGHTNERS

SPECIFICATIONS

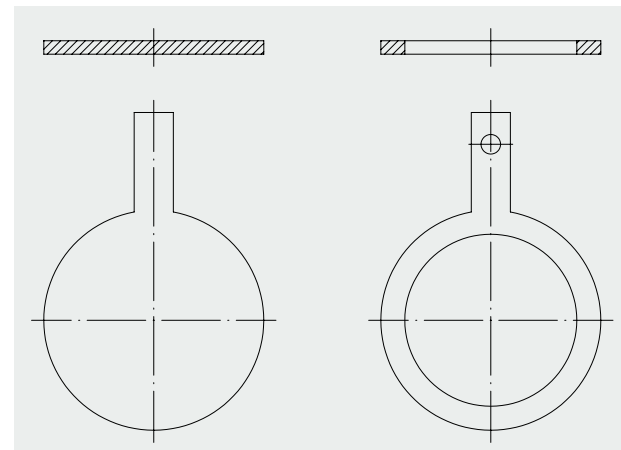
- Maximum working pressure: Depends on design.
- Maximum working temperature: Depends on the material and application.
- Range of Pipeline:
Nominal Diameter: DIN or ASA.
Rating: DIN or ASA.
- Material: AISI-316, Carbon Steel, AISI-304; AISI-321, ASTM A335 GR P11, ASTM A335 GR P22, etc...
- Calculations: BS EN ISO 5167-1, 2003.



5.12.3 RING SPACERS

SPECIFICATIONS

- Maximum working pressure: Depends on design.
- Maximum working temperature: Depends on the material and application.
- Range of Pipeline:
Nominal Diameter: DIN or ASA.
Rating: DIN or ASA
- Pressure taps: BSP, NPT, METRIC, etc...
- Material: AISI-316, Carbon Steel, AISI-304; AISI-321, ASTM A335 GR P11, ASTM A335 GR P22, etc...



5.12.4 MORE ACCESSORIES

To installation and spare parts, we offer:

- PRESSURE TRANSMITTERS
- 2, 3 & 5 PORTS OR VALVES MANIFOLD
- LIRAS FOR PRESSURE GAUGES
- FILTERS
- MANOMETRIC VALVES (NEEDLE, CONICAL TEFLON SEAT, ETC...)
- JOINTS (KLINGERIT, SPIROMETALLICS, EPDM, VITON, ETC...)
- COUPLINGS, SCREWS, ETC...