

NOZZLES AND VENTURI NOZZLES

Nozzles and venturi nozzles are the primary flow elements which are used for the measurement of high velocity flow, such as high-pressure steam, non-viscous and erosive media. It can also be used for the measurement of other fluids such as water, air or other gases. The design of the nozzles and venturi nozzles are based on Bernoulli's equation and consists of a convergent section with a rounded profile and a cylindrical throat. Due to its rigidity the nozzle is dimensionally more stable at higher temperature and flow rates.



SPECIAL FEATURES

- ◆ Suitable for liquid, gas and steam flow measurement
- ◆ Proven technology and robust design
- ◆ Calibration may be performed, if required
- ◆ Flow nozzle design based on ISO5167, ASME.MFC.3M and ISA1932 industry standards
- ◆ Accurate, repeatable and reliable
- ◆ Accurate flow metering of high velocity steam and gas.
- ◆ Optimum solution for measuring the flow of steam
- ◆ Flow nozzles are accurate devices for measuring the flow of high velocity, non-viscous fluids and particularly suitable for erosive fluids where the sharp edge of an orifice plate could quickly deteriorate
- ◆ Accuracy typically $\pm 3\%$ un-calibrated, $\pm 1\%$ calibrated
- ◆ Extended working life

TYPES

- ◆ ISA 1932 nozzle
- ◆ Long radius high beta
- ◆ Long radius low beta
- ◆ Venturi nozzle-truncated
- ◆ Venturi nozzle -non truncated

APPLICATIONS

- ◆ Oil and gas industry
- ◆ Steam process and high velocity process for erosive fluids
- ◆ Power generation
- ◆ Water treatment and distribution
- ◆ Gas processing and transmission
- ◆ Chemical and petrochemical Industries
- ◆ Food and beverages
- ◆ All sorts of flow measurements in liquid, gas or steam applications of various industries

TECHNICAL SPECIFICATION

Design Standards:

ISO 5167-3, ASME MFC-3M, ASME PTC-6, ASME PTC-19.5 and ISA1932 Industry Standards

Line Size:

DN50 (1") to DN1000(40"), Larger lines sizes available on request

Pressure Rating:

Ranging from ANSI 150# to 2500#

Flow Nozzle Material:

Carbon Steel, Low Temperature Carbon Steel, Stainless Steel, Chrome Moly Steel, Duplex, Super Duplex, 6 Mo, Aluminum (Further materials are available on request)

Flange Material:

SA105 / SA182F11 / SA182F22 / SA182 F91

Mounting Style:

Flanged / Butt weld / Insert type

Types of Tappings:

Flanged / NPT / Socket Weld / Thread O'let / Socket O'let, further types are available on request

Markings:

Marked with the line size, bore size and material of construction.

β Ratio:

0.2 to 0.8 (Nozzle Type Dependant)

Design Specifications:

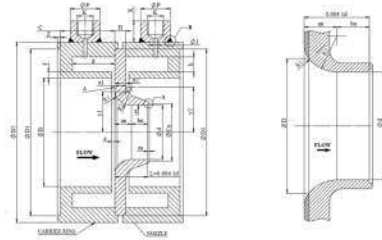
ISA 1932:

Sizes: DN 50mm - 500mm

Design standard: per ISO 5167

Beta (d/D): $0.3 \leq \beta \leq 0.8$

Reynolds number: $10^4 \leq Re \leq 10^7$



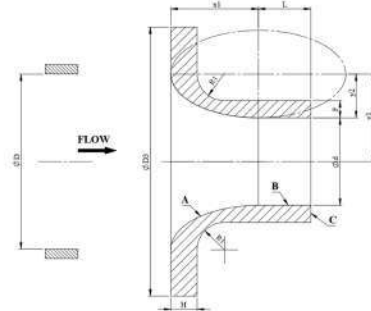
Long Radius High Beta:

Sizes: DN 50mm - 630mm

Design standard: per ISO 5167

Beta (d/D): $0.25 \leq \beta \leq 0.8$

Reynolds number: $10^4 \leq Re \leq 10^7$



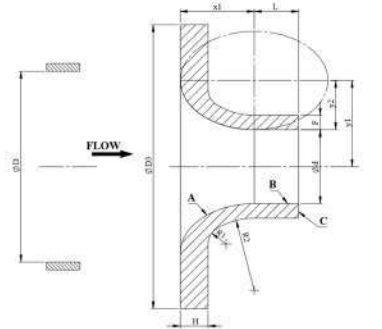
Long Radius Low Beta:

Sizes: DN 50mm - 630mm

Design standard: per ISO 5167

Beta (d/D): $0.2 \leq \beta \leq 0.5$

Reynolds number: $10^4 \leq Re \leq 10^7$



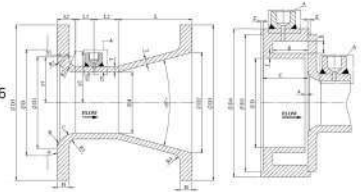
Venturi Nozzle-Truncated:

Sizes: DN 65mm - 500mm

Design standard: per ISO 5167

Beta (d/D): $0.316 \leq \beta \leq 0.775$

Reynolds number: $1.5 \times 10^5 \leq Re \leq 2 \times 10^6$



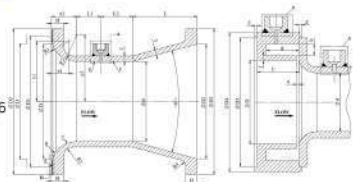
Venturi Nozzle-Non Truncated:

Sizes: DN 65mm - 500mm


Design standard: per ISO 5167

Beta (d/D): $0.316 \leq \beta \leq 0.775$

Reynolds number: $1.5 \times 10^5 \leq Re \leq 2 \times 10^6$



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