Flow Nozzle

Model : WZ 600 Series

DESCRIPTION

This is suitable for determining the flow rate of fluid flowing at high pressure and high temperature and is permit approximately 60% greater capacity than the orifice plate.

The principle of the method of measurement is based on the installation of a nozzle in to a pipeline in which a fluid is running full. The installation of the primary device causes a static pressure difference between the upstream side and the throat. The flow rate can be determined from the measured value of this pressure difference.
The flow nozzles, more costly than other orifice due to their structure, are suited for determining the flow rates of fluids flowing at high temperature and high pressure. Under the same measuring conditions, a flow nozzle has a higher mechanical strength, can permit the flow of more than 60 percent great volume of a fluid, and can measure the flow rates of fluids containing solid particles less disturbed, than an orifice having the same bore.
Thus, they are suited, in addition, for high speed flowing fluids. We can supply not only single flow nozzles, but also flow nozzles having welded short pipes on both their upstream[4D] and downstream[2D] sides.

Other types are available on request in full compliance with ISO-5167 [Including ISA 1932 Nozzle], Venturi Nozzle, ASME MFC-3M, ASME PTC-6 standards.

SPECIFICATION

■ Construction Type
- Weld In type
- Flanged type
- Holding Ring type
- Knock Pin type

■ Material
- Pipe :
  Carbon Steel : A53-B / A106-B, C etc.
  Low Alloy Steel : A335-P11 / P12 / P22 / P91
  Stainless Steel
- Element :
  A182-F11 / F12 / F22 / F91
  A182-F304 / F316 / F327

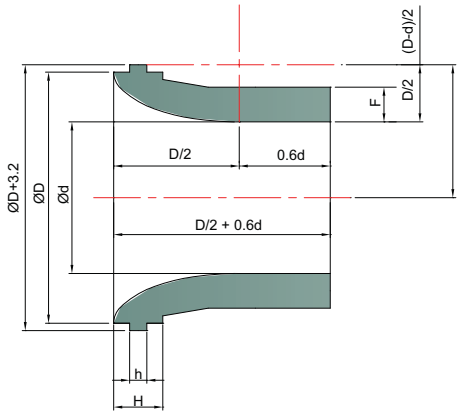
■ Flow Calculation Standards & Nozzle Type :
- ISO 5167 : Long radius Nozzle is
  High ratio : 0.25 ≤ ß ≤ 0.75
  Low ratio : 0.25 ≤ ß ≤ 0.5
  ISA 1932 Nozzle
  Venturi Nozzle

- ASME MFC 3M : Long radius Nozzle is
  High ratio : 0.25 ≤ ß ≤ 0.75
  Low ratio : 0.25 ≤ ß ≤ 0.5
  Low ratio with Throat Tap
  ASME PTC-6 Nozzle

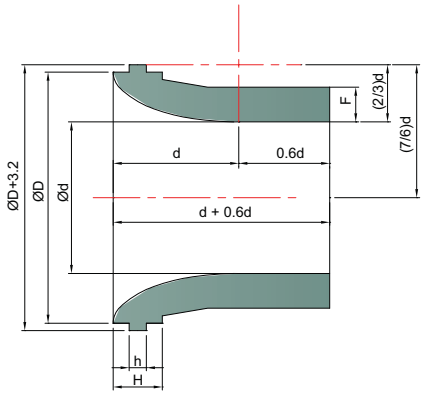
■ End Connection
- Butt welds type
- Flanged type

Design of ISO 5167 Nozzle

WEIZEN will offer all flow nozzle types as per ISO 5167 standard and there are two types of long radius nozzle, which are called.

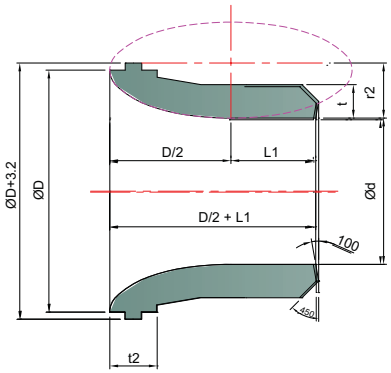


■ High Ratio 0.25 ≤ ß ≤ 0.75
d : Throat bore diameter- Gases
D : Pipe Inner diameter
3mm ≤ H ≤ 0.15D
3mm ≤ F

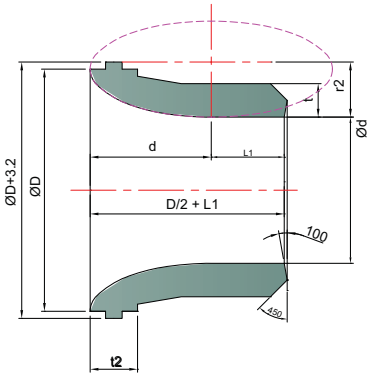


■ Low Ratio 0.25 ≤ ß ≤ 0.50
d : Throat bore diameter
D : Pipe Inner diameter
3mm ≤ H ≤ 0.15D
3mm ≤ F

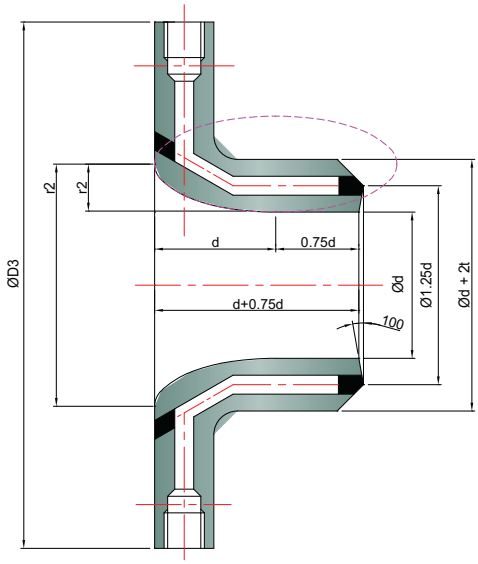
Design of ASME MFC-3M Nozzle



■ High Ratio Nozzle
0.5 ≤ ß ≤ 0.75
L1 ≤ 0.6d or ≤ D/3
r2 = (D-d)/2
2t ≤ D-(d+6mm)
3mm ≤ t2 ≤ 0.15D



■ Low Ratio Nozzle
0.25 ≤ ß ≤ 0.5
0.6d ≤ L1 ≤ 0.75d
r 0.63d ≤ r2 ≤ 0.67D
3mm ≤ t ≤ 12mm
3mm ≤ t2 ≤ 0.15D



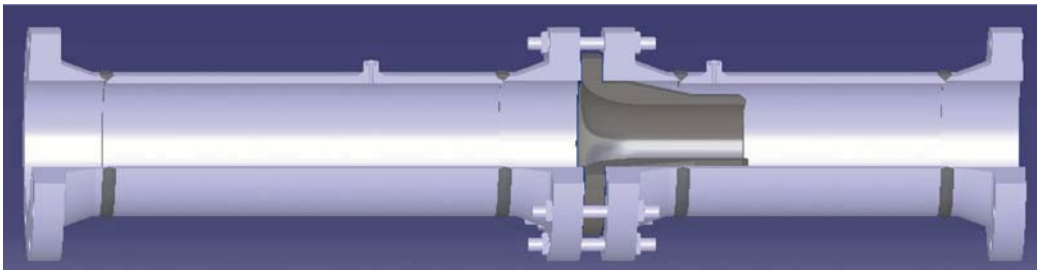
■ Low Ratio, with Throat tap
0.25 ≤ ß ≤ 0.5

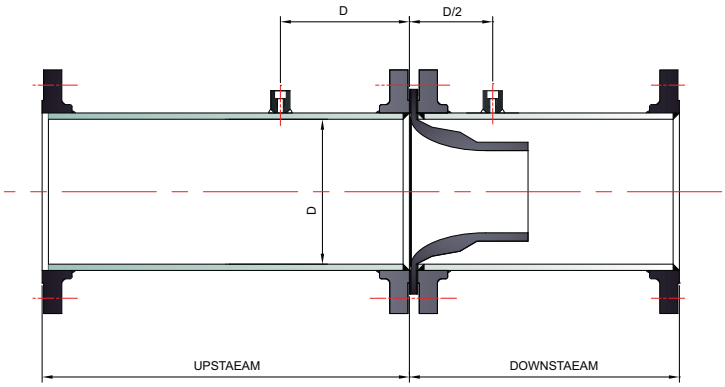
0.63d ≤ r2 ≤ 0.67D
t ≥ 0.25d
t2 ≥ 40mm

CONSTRUCTION TYPE

A. Flange Type Flow Nozzle

This is mounted to insert between piping flanges. Flow Nozzle is designed in accordance with ISO 5167 and ASME specification.

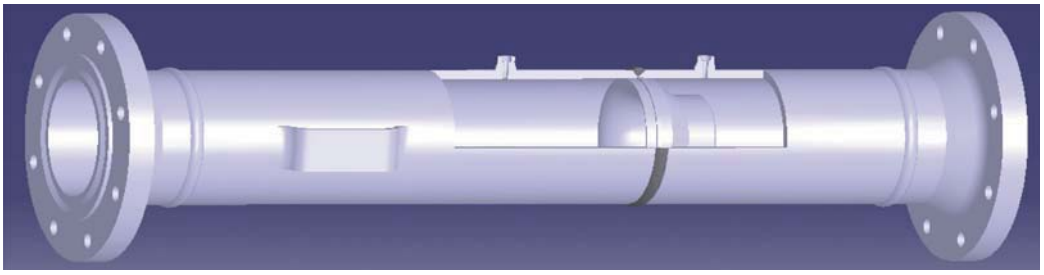


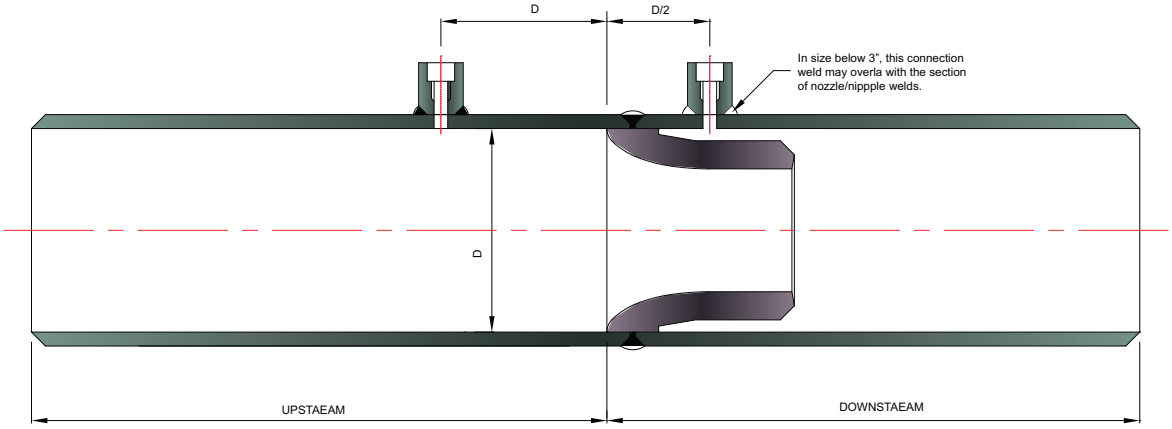


B. Weld-In Type Flow Nozzle

This type weld-in Flow Nozzle is used where flanges are not applicable such as high temperature and high pressure applications.

As **WEIZEN** standard, unless otherwise specified, **WEIZEN** will offer this type.

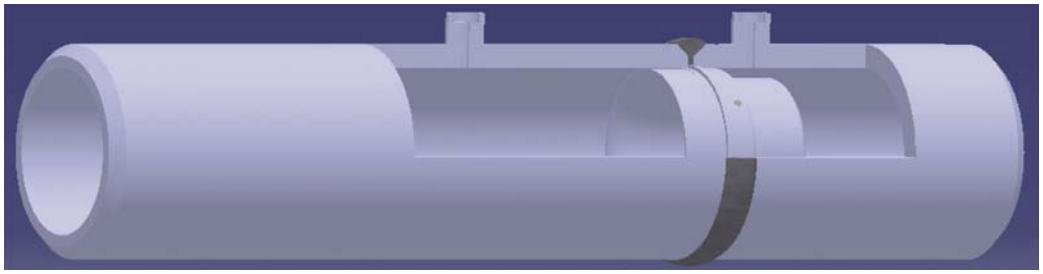


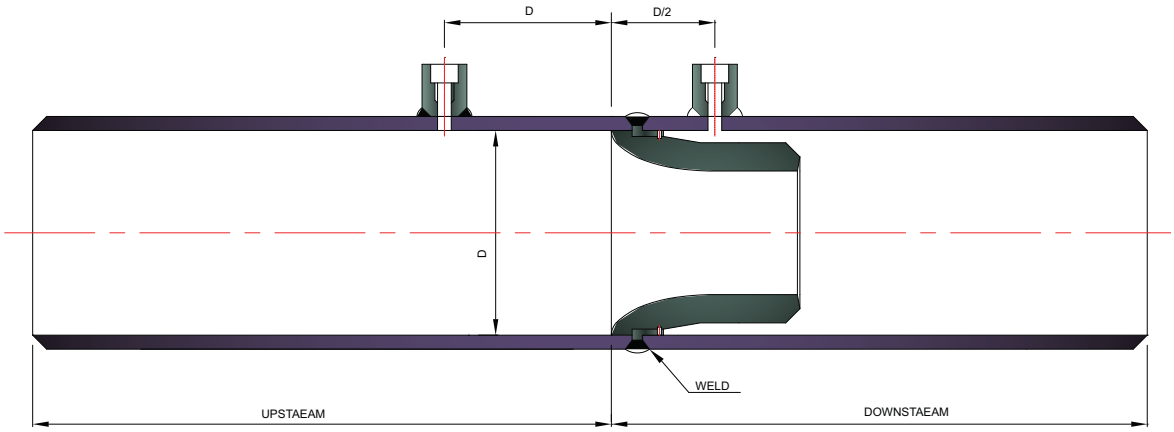


CONSTRUCTION TYPE

C. Holding Ring Type Flow Nozzle

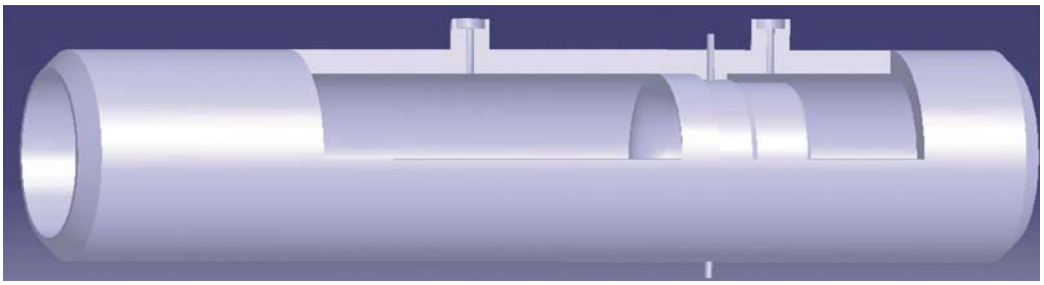
This type holding ring Flow Nozzle element the welding of dissimilar materials [for avoiding the welding operation between two kind of materials] because the ring, pins and pipe are of compatible materials.

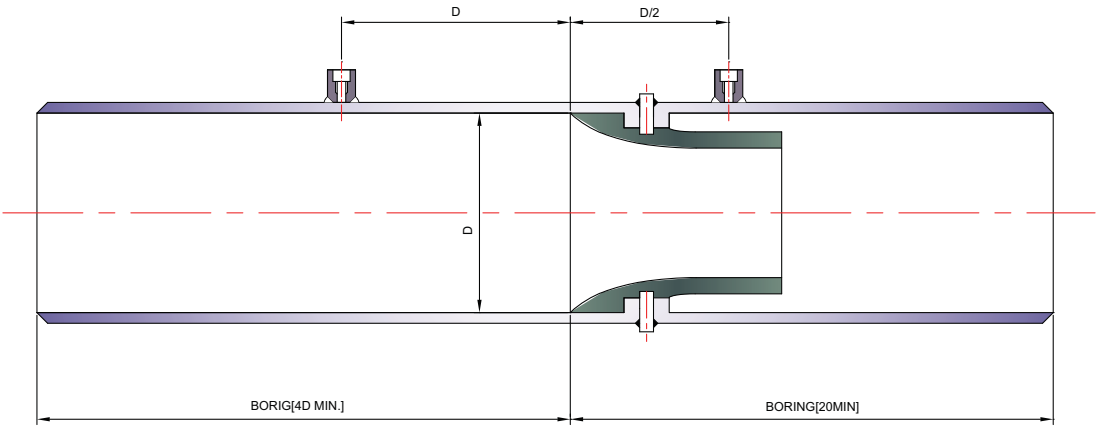




D. Knock-Pin Type Flow Nozzle

This Flow Nozzle type also avoid welding operation between dissimilar materials however, they have rather difficult to assembly the nozzle from piping. This type should basically be boring[Deep Hole] and horning operation due to its structure.

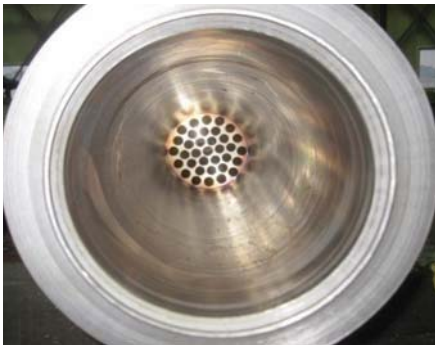


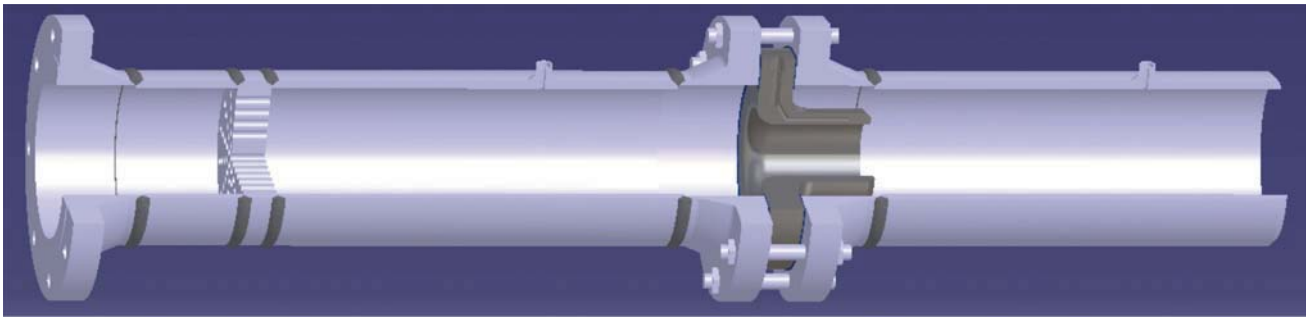


CONSTRUCTION TYPE

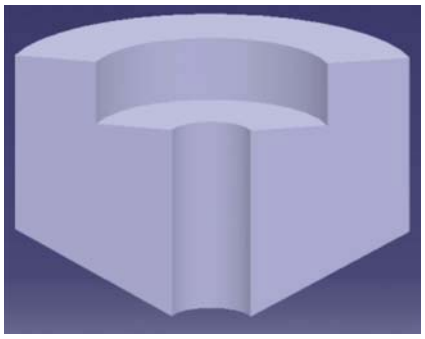
E. Low Ratio Throat Tap Type Flow Nozzle [ASME PTC-6 standard]

In the testing of steam turbines, high degree of accuracy is required. Extensive test work on ASME work on a ASME long radius nozzle with diametric throat taps has led to standardization on the ASME PTC-6 Flow Nozzle for these performance tests..

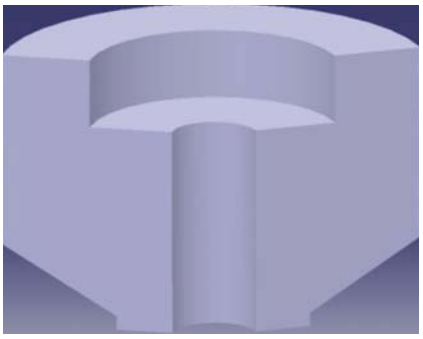




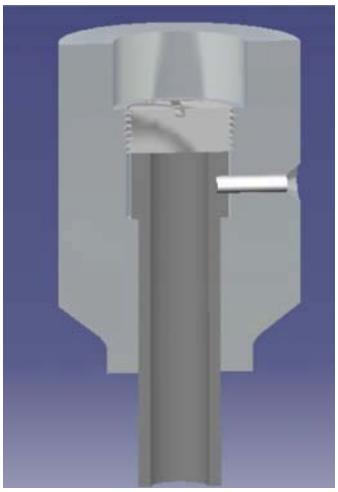
PRESSURE TAPPING



WZ 500MR End Connection
Flange[Welding Adaptor]



Up to 425˚C (800˚F)
[Welding Adaptor]



For temperature above 425˚C (800˚F)
[Thermal sleeve welding Adaptor Alloy Steel]

Nominal Pipe Diameter [D]	Recommended max. Diameters of Pressure Tap Holes
Under 2" (50A)	1/4" (6.35 mm)as (Vapor)
2" (50A) & 3" (80A)	Clean 1/4" (6.35 mm) and 3/8" (9.50 mm)
4" (100A) & 8" (200A)	3/8" (9.50 mm) and 1/2" (12.7 mm)
10" (250A) and Over	3/8" (9.50 mm) to 3/4" (19.0 mm)

Venturi Nozzle & ISA 1932 Nozzle

The profile of the Venturi Nozzle is axisymmetric. It consists of a convergent section, with a rounded profile, a cylindrical throat and a divergent section. The upstream face is identical with that of an ISA 1932 Nozzle.
The upstream pressure tappings shall be corner tappings [see below drawing]. The tappings may be located either in the pipe of its flanges or in carrier rings.
the throat pressure tappings shall be comprise at least four [4] single pressure tappings and PE will offer the piezometer ring [Annular Ring] on request only.