FLOW NOZZLE
MODEL : F600 SERIES

WISE®

DESCRIPTION

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 grate 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 and downstream sides.

SPECIFICATION

NOZZLE MOUNTING TYPES -
Flange Type
Weld-in Type
Holding Ring Type

FLOW CALCULATION STANDARDS -
1. LONG-Radius flow nozzle.
   JIS Z8762, ISO5167, ASME
2. ISA 1932, flow nozzle
   ISO 5167, JIS Z8762

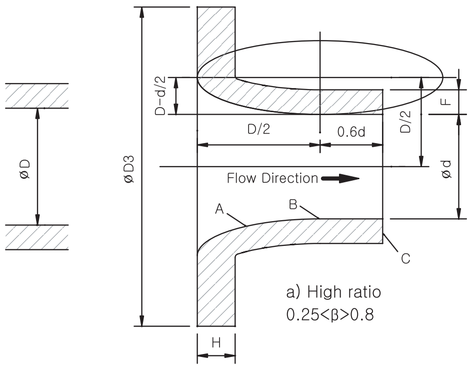
PRESSURE TAPS -
1D and 1/2D Tap, Throat Tap

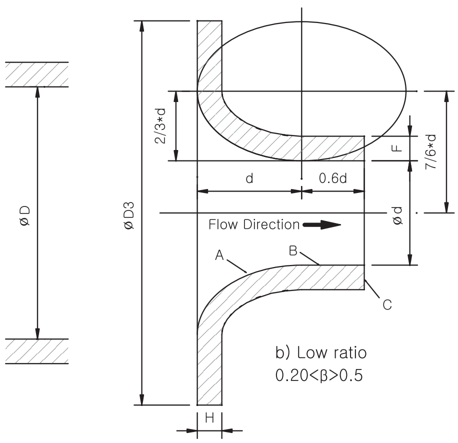
NOMINAL PIPE SIZE AVAILABLE -
100mm to 500mm(4 to 20 inches)

ß LIMIT -
$0.25 < \beta < 0.8$
(low-beta) long-radius nozzle $0.2 \leq \beta \leq 0.5$
(high-beta) long-radius nozzle $0.25 \leq \beta \leq 0.8$
ß : Ratio of throat to pipe diameter=d/D0
(d: Throat diameter)

NOZZLE THICKNESSES -
Maker Standards

MATERIAL -
A182-F11, F22
A182-F304, 304SS
A182-F316, 316SS





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ORDERING INFORMATION

FLOW NOZZLE
F600

ELEMENT TYPE
W : Weld in
H : Holding Ring
F : Flanged

LINE SIZE

JIS (mm)	ANSI (inch)	DIN (mm)	JIS (mm)	ANSI (inch)	DIN (mm)
J015 : 15A	A001 : 1/2B	D015 : 15A	J250 : 250A	A012 : 10B	D250 : 250A
J020 : 20A	A002 : 3/4B	D020 : 20A	J300 : 300A	A013 : 12B	D300 : 300A
J025 : 25A	A003 : 1B	D025 : 25A	J350 : 350A	A014 : 14B	D350 : 350A
J040 : 40A	A004 1 1/2B	D040 : 40A	J400 : 400A	A015 : 16B	D400 : 400A
J050 : 50A	A005 : 2B	D050 : 50A	J450 : 450A	A016 : 18B	D450 : 450A
J065 : 65A	A006 2 1/2B	D065 : 65A	J500 : 500A	A017 : 20B	D500 : 500A
J080 : 80A	A007 : 3B	D080 : 80A	J600 : 600A	A018 : 24B	D600 : 600A
J100 : 100A	A008 : 5B	D100 : 100A	J700 : 700A	A019 : 28B	D700 : 700A
J125 : 125A	A009 : 5B	D125 : 125A	J800 : 800A	A020 : 32B	D800 : 800A
J150 : 150A	A010 : 6B	D150 : 150A	J000 : 1000A	A021 : 40B	D000 : 1000A
J200 : 200A	A011 : 8B	D200 : 200A	XXXX : OHTER		

TAP TYPE
R : Radius Tap T : Throat Tap

END CON'N
F : Flanged W : Weld On

NOZZLE MATERIAL
4 : A182 F304
5 : A182 F316
Z : Other

PIPE MATERIAL
CS : A106 Gr.B
A1 : A335 P11
A2 : A335 P22
XX : Other

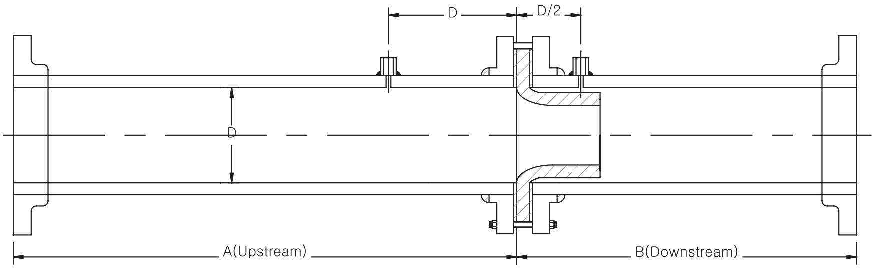
HOLDING RING MATERIAL
H4 : A182 F304
H5 : A182 F316
ZZ : Other

BOSS SIZE
2S : 1/2" S.W
3S : 3/4" S.W
OH : Other

OPTION
I : Inspection Pot
N : None
O : Other

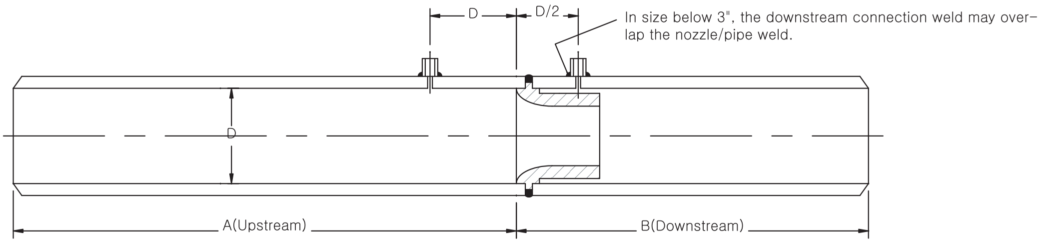
F600	W	A014	R	W	5	CS	ZZ	3S	N

FLANGED TYPE FLOW NOZZLE



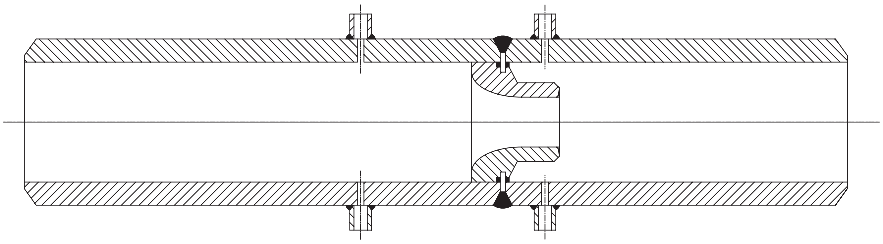
- FLANGE TYPE -

WELD-IN TYPE FLOW NOZZLE



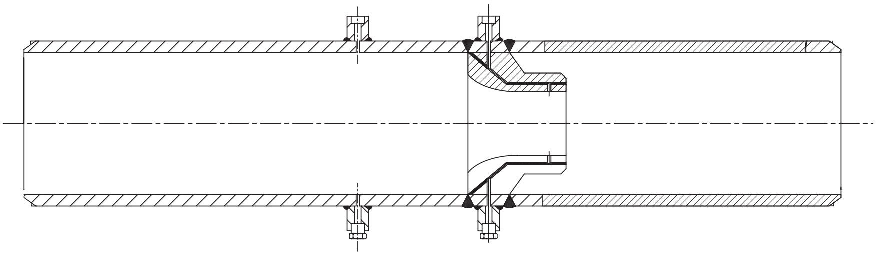
- WELD IN TYPE -

HOLDING RING TYPE FLOW NOZZLE



- HOLDING RING TYPE -

THROAT TAP TYPE FLOW NOZZLE



- THROAT TAP TYPE -

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DIFFERENTIAL PRESSURE AND PRESSURE LOSS

When a throttle element is interposed in a closed passage of fluid in piping, a difference is produced between the pressures upstream and downstream the throttle element as illustrated in Fig.1. This difference(h=p1-p2) is called differential pressure. The fluid passing through the section 2 gradually regains its pressure as it flows downstream, but the downstream pressure cannot be recovered up to the upstream pressure, part of the pressure being lost. This loss is called a pressure loss (permanent pressure loss = p1-p2) The extent of this pressure loss depends on the type of throttle elements and their open area ratio, as shown in Fig.2 The relation between the flow rate and the differential pressure if given by:

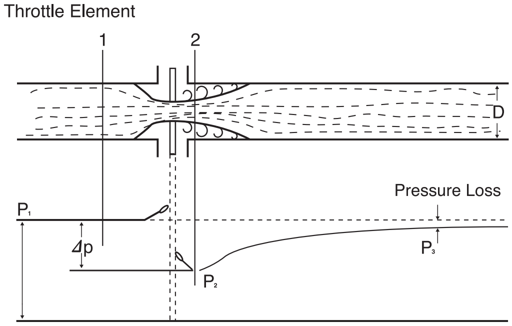

Fig.1

$$Q = C\sqrt{\varDelta P/\rho f}$$

$$Q = C\sqrt{\rho f * \varDelta P/\rho n}$$

$$W = C\sqrt{\varDelta P * \rho n}$$

Q(m^3/h) : Volume Rate of Flow at Density Operating conditions

Qn(Nm^3/h) : Volume Rate of Flow at Density Bass conditions

W(Kg/h) : Weight Rate of Flow

ρ(Kg/Nm3) : Density in Operating Conditions

ρn(Kg/Nm3) : Density in Base Conditions

C : Constant Coefficient

From the above, the relation between the flow rate and the differential pressure where the density is constant but the flow rate is variable is as listed in table 1. In other words, the flow rate is obtainable by measuring the differential pressure. When the density is variable(when the pressure and temperature are variable), the true flow rate can be given by compensating the variate of the density by the above equation(this however, is not applicable when the density varies to a greet extent.).

Table 1 : Relation between Flow Rate and Differential Pressure

Flow Rate %	100	90	80	70	60	50	40	30	20	10	0
Differential Pressure	100	81	64	49	36	25	16	9	4	1	0

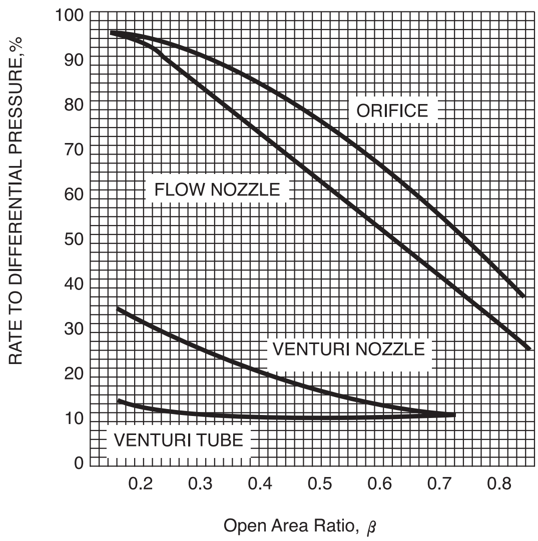

Fig.2

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