Differential Pressure
Flow Element (Orifice Type)

Model : SOP-10, 20, 30

SeoJin Instech Co., Ltd.

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SOP-10
Orifice Plate

Introduction

Orifice plates are widely used for measurement as they provide the simplest and the most economical means of flow detection. Orifice plates are available in the concentric type that the round opening (bore) of the orifice plate is positioned concentrically with the center of the pipe and the opening edge (bore edge) is available either in the concentric square edge type (sharp. Square edge type) or in the quadrant edge type (round edge type). Orifice plates are also available in the eccentric type that the opening of the orifice is shifted from the center of the pipe. They also are available in the segmental type that the opening is a circular segmental segment and the orifice is comparable to a partially opened gate valve

Specifications

ORIFICE BORE TYPE
Concentric Square Edged Orifice
Quadrant Edged Orifice
Eccentric Orifice
Segmental Orifice

FLOW CALCULATION STANDARDS
ISO 5167
AGA report #3
ASME MFC-3M (R.W Miller)
L.K.Spink
JIS Z 8762

FLANGE RATINGS
JIS 10, 20, 30 etc.
ANSI Class 150, 300, 600, 900 etc.

PRESSURE TAPS
Flange taps
Corner taps
Vena contract taps
1D and 1/2D (Radius) taps
Pipe taps

PLATE THICKNESS
3, 6, 9, 12mm

TAB HANDLE
Welded to orifice plate

PLATE MATERIAL
Standard : 304LSS, 316LSS
Non-standard : Monel, etc.

DRAIN AND VENT HOLE
Per ASME recommendations
Not drilled for orifice bores smaller than 25.4mm

MARKINGS
Upstream side of tab handle stamped
"UPSTREAM"and with bore type and size, line size, tag number, and flange rating.

SPECIAL MARKINGS
Special marking may be furnished to meet special requirement

Applications

Concentric Orifice Plate
This type is generally the type most commonly used.
Simple- structured with high precision, this orifice plate can be easily mounted and dismounted.
In strict conformance with applicable standards, it is precisely finished to have required shape, size, surface roughness and flatness.
For differential pressure measurement, it is combined with flange taps, corner taps or D-D/2 taps.

Quarter-Circle Orifice Plate
The inlet edge of the quadrant edge orifice is rounded and usually the radius of the rounding is equal to the plate thickness.
This orifice plate is principally used for measuring flow rates of low Reynolds Numbers.
Flange taps or corner taps are used.
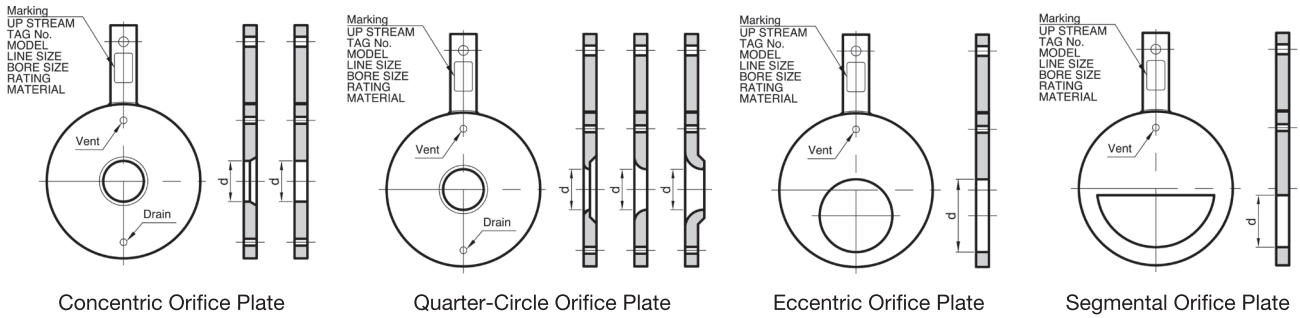
Eccentric Orifice Plate

For liquids containing solid particles that are liable to settle, or for vapors liable to deposit water condensate, this orifice plate is installed with its eccentric bore bottom flush with the bore bottom of the piping, so that the sedimentation of such inclusions is avoided. Likewise, for gases or vapors, it may be installed with its eccentric bore top flush with the bore top of the piping to avoid the stay of gas or vapor in its vicinity.

Flange taps or vena contracta taps are used with.
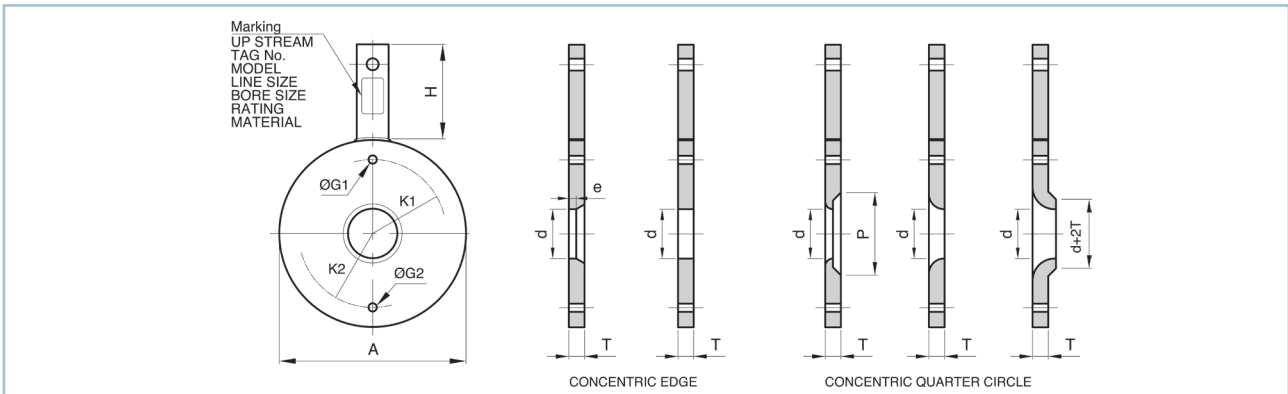
Segmental Orifice Plate

Segmental orifice plate are provided for measurements where solid are entrained in liquid flow stream.

Segmental bore may be placed either at the top or bottom of the pipe.

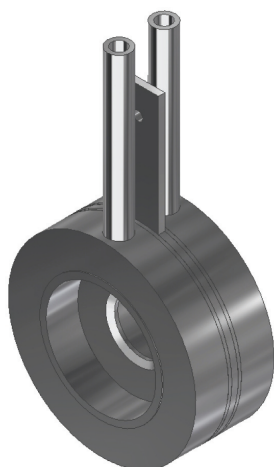Flange taps or vena contracta taps are employed to take out fluid pressures.

Concentric Orifice Plate   Quarter-Circle Orifice Plate   Eccentric Orifice Plate   Segmental Orifice Plate

Dimensions

CONCENTRIC EDGE   CONCENTRIC QUARTER CIRCLE

* d.K1, K2, G1, G2 : Refer to Specification Sheet

UNIT: mm

Norminal Dia	PLATE O.D.A						Plate Thk' T	Edge e	Tap Handdle	
	150#	300#	600#	900#	1500#	2500#			W	H
1/2 B	47.8	53.8	53.8	63.6	63.6	69.9	3.0	-	25	90
3/4 B	57.8	66.7	66.7	69.9	69.9	76.3	3.0	-	25	90
1 B	66.8	73.0	73.0	79.4	79.4	85.8	3.0	0.5	25	90
1-1/2 B	85.8	95.3	95.3	98.6	98.6	117.5	3.0	0.5	25	90
2 B	104.6	111.1	111.1	12.8	142.8	146.1	3.0	0.5	25	90
2-1/2 B	123.6	130.4	130.4	165.1	165.1	168.3	3.0	0.5	25	90
3 B	136.6	149.1	149.1	168.3	174.6	196.9	3.0	1.0	25	90
4 B	174.6	183.2	193.7	206.4	209.6	235.0	3.0	1.0	38	110
5 B	197.0	216.0	241.5	247.7	260.4	279.5	3.0	1.5	38	110
6 B	222.5	250.7	266.7	288.9	282.6	317.5	3.0	1.5	38	110
8 B	279.5	308.0	320.7	358.8	352.4	387.4	3.0	1.5	38	110
10 B	339.8	361.9	400.1	435.0	435.0	476.5	6.0	-	44	120
12 B	409.8	422.3	457.3	498.5	520.7	549.5	6.0	-	44	120
14 B	450.6	485.8	492.2	520.0	577.9	-	6.0	-	44	120
16 B	514.1	539.8	565.2	574.7	641.4	-	6.0	-	44	120
18 B	549.4	597.0	612.8	637.9	704.9	-	9.0	-	50	130
20 B	606.4	654.1	682.6	698.5	755.7	-	9.0	-	50	130
22 B	660.5	704.9	733.5	-	-	-	9.0	-	50	130
24 B	717.8	774.7	790.6	838.2	901.7	-	9.0	-	50	130

Orifice Plate

SOP-20
Orifice Plate with Ring

Introduction

Orifice Ring Assemblies are used for flow measurement of smaller or medium sized pipe at lower pressures.

Each assembly consists of one orifice plate and two orifice rings.

Differential pressures are taken out in a corner tap system.

Orifice Blocks, which are of a unit-construction type and provide higher pressure ratings than the Orifice Ring Assemblies, also are available.

Specifications

ORIFICE BORE TYPE
Concentric Square Edged Orifice
Quadrant Edged Orifice
Minimum quadrant edged orifice diameter 4.5mm
Minimum quadrant edged radius 0.5mm

FLOW CALCULATION STANDARDS
ISO 5167
JIS Z8762
AGA3, 8
General Application
L.K Spink

FLANGE RATINGS
JIS 5, 10, 20 etc.
ANSI (or JPI) 150, 300 etc.
(Note: ANSI and JPI ring dimensions are identical)

PRESSURE TAPS
Corner taps

PLATE THICKNESSES
3, 6, 9, 12mm

TAP HANDLE
Welded to orifice plate

PRESSURE TAP NIPPLES
15mm (1/2 inch) Sch 40, 80
Length : 150mm
Tap Connections : PT 1/2 or NPT male,
Socket weld, Butt weld or Flange. (Flange rating to be the same as the of the process pipeline)

DRAIN AND VENT HOLE
Per ASME recommendations
Not drilled for orifice bores smaller than 25.4mm

SPECIAL MARKINGS
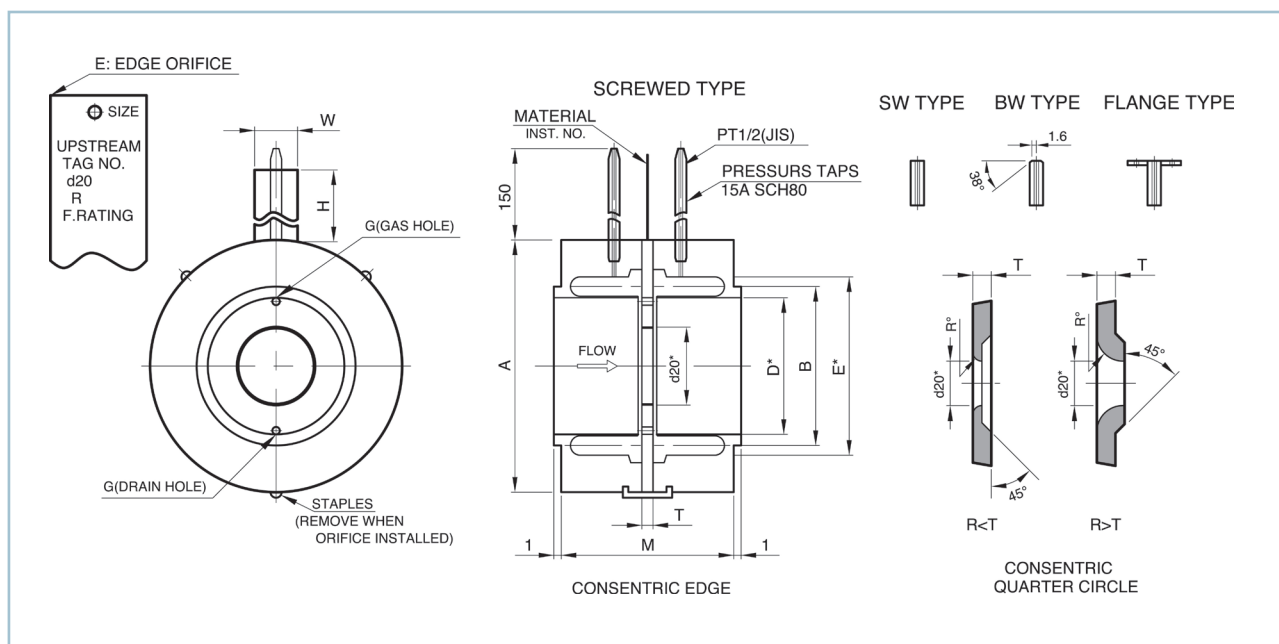Special marking may be furnished to meet special requirements

MATERIALS
Ring and Pressure Tap Nipple : 304LSS, 316LSS
Plate : 304LSS, 316LSS, Monel, etc.
Tab Handle : 304LSS, 316LSS, etc..

GASKET
Material : Non-Asbestos, Teflon
Thickness : 1.5mm, 2.0mm, 3.0mm

Dimensions

* d20 : ORIFICE DIA.AT 20℃ : REFER TO ORIFICE CALCULATED SHEET
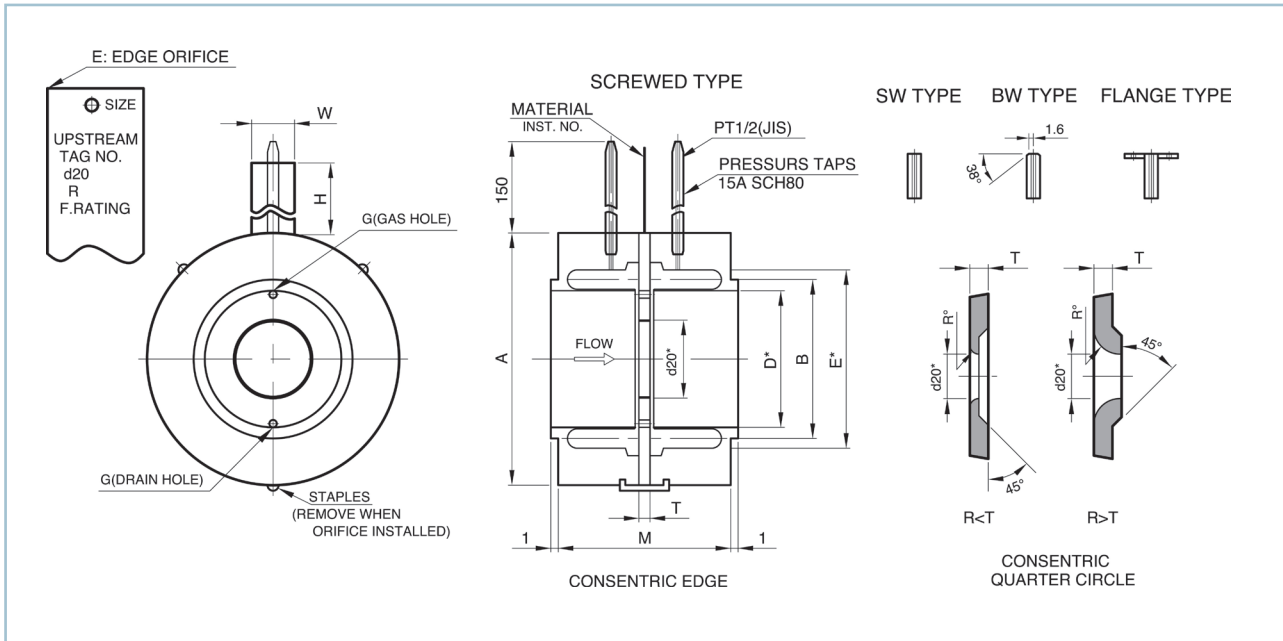
D : INSIDE DIA OF RING

E : INSIDE DIA OF GASKET

▶Ring Orifices for JIS 10K Flange

Norminal Pipe Size	Outside Diam of Rings and Plate A	Diam of Gasket and Stay B	Thickness of Edge e	Diam of Hole B	Face to Face M	Thickness of Plate T	Width of Plate W	Hight of Tab Handle H	Thickness of Tab Handle T
15 A	58	21	0.2-0.3	-	75	2	25	95	2
20 A	63	27	0.2-0.4	-	75	2	25	95	2
25 A	74	33	0.2-0.4	-	75	2	25	95	2
32 A	84	42	0.3-0.5	1.6	75	2	25	95	2
40 A	89	48	0.3-0.5	1.6	75	2	25	95	2
50 A	104	60	0.5-0.8	1.6	75	2	25	95	2
65 A	124	73	0.5-0.8	1.6	75	2	32	95	2
80 A	134	88	0.5-0.8	1.6	75	3	32	95	2
90 A	144	101	0.5-0.8	1.6	75	3	32	95	2
100 A	159	114	0.8-1.2	1.6	75	3	38	105	2
125 A	190	141	0.8-1.2	1.6	75	3	38	105	2
150 A	220	168	0.8-1.2	1.6	75	3	38	105	2
175 A	245	196	1.5-2.0	1.6	76	4	38	105	2
200 A	270	219	1.5-2.0	1.6	76	4	38	105	2
225 A	290	246	1.5-2.0	1.6	76	4	38	105	2
250 A	333	273	e=T	2.0	76	4	44	120	3
300 A	378	323	e=T	2.5	76	4	44	120	3

Dimensions

* d20 : ORIFICE DIA.AT 20℃ : REFER TO ORIFICE CALCULATED SHEET

D : INSIDE DIA OF RING

E : INSIDE DIA OF GASKET

▶**Ring Orifices for ANSI #150 Flange**

UNIT: mm

Norminal Pipe Size	Outside Diam of RIngs and Plate A	Diam of Gasket and Stay B	Thickness of Edge e	Diam of Hole B	Face to Face M	Thickness of Plate T	Width of Plate W	Hight of Tab Handle H	Thickness of Tab Handle T
1/2 B	-	-	-	-	-	-	-	-	-
3/4 B	-	-	-	-	-	-	-	-	-
1 B	66.7	33	0.2-0.4	-	75	2	25	95	2
1-1/4 B	76.2	42	0.3-0.5	1.6	75	2	25	95	2
1-1/2 B	85.7	48	0.3-0.5	1.6	75	2	25	95	2
2 B	104.8	60	0.5-0.8	1.6	75	2	25	95	2
1-1/2 B	123.8	73	0.5-0.8	1.6	75	2	32	95	2
3 B	136.5	88	0.5-0.8	1.6	75	3	32	95	2
3-1/2 B	161.9	101	0.5-0.8	1.6	75	3	32	95	2
4 B	174.6	114	0.8-1.2	1.6	75	3	38	105	2
5 B	196.9	141	0.8-1.2	1.6	75	3	38	105	2
6 B	222.3	168	0.8-1.2	1.6	75	3	38	105	2
8 B	279.4	219	1.5-2.0	1.6	76	4	38	105	2
10 B	339.7	273	e=T	2.0	76	4	44	120	3
12 B	409.6	323	e=T	2.5	76	4	44	120	3

SOP-30, 31
Holding Ring Type

Introduction

The Holder Ring Assembly is a combination of a holder ring and an orifice plate designed for ring-type-joint(RTJ) flanges of ANSI or JPI Specifications.

The holder ring has a function of holding the orifice plate and also a function as a gasket to prevent leakage of the process fluid.

This metallic sealing system is applicable to a fluid of high temperature and high pressure.

The pressure tapping system normally is of the flange tap type.

Specifications

ORIFICE BORE TYPE
Concentric Square Edged Orifice
Quadrant Edged Orifice

FLOW CALCULATION STANDARDS
ISO 5167
AGA 3,8
General Application
L.K.Spink
ASME-MFC-3M
JIS Z 8762

FLANGE RATINGS
ANSI Class 300, 600, 900 etc.
Ring type joint(RTJ)

PRESSURE TAPS
Flange taps

PLATE THICKNESSES
3, 6, 9, 12mm

RING TYPE
Oval
Octagonal

DRAIN AND VENT HOLE
Per ASME recommendations
Not drilled for orifice bores smaller than 25.4mm

MARKINGS
Upstream side of tab handle stamped with "UPSTREAM" and with bore type and size, Tag number, quadrant edge radius and flange rating.

SPECIAL MARKINGS
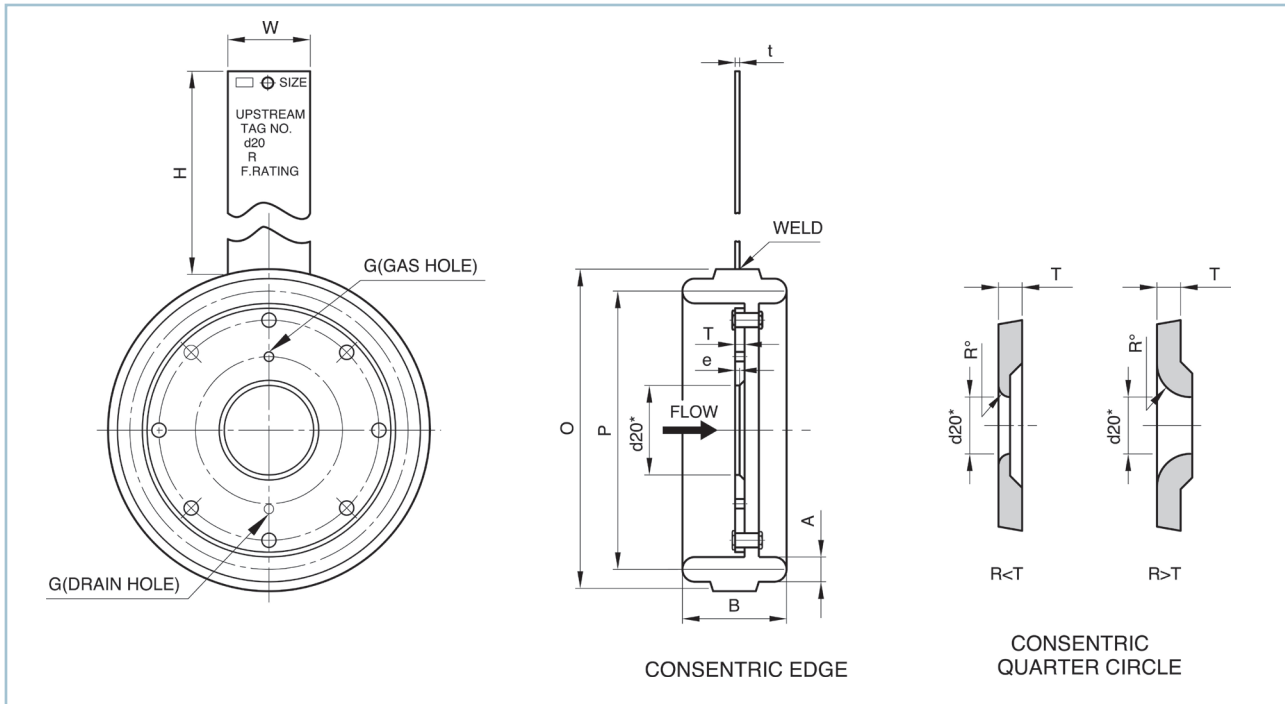Special marking may be furnished to meet Specific requirement

MATERIALS
Standard : 304LSS, 316LSS
Non-standard : Monel, etc.

NOMINAL PIPE SIZES AVAILABLE

Orifice Bore Type	Inch	DN (mm)
Concentric Square Edge	1-1/2″ ~ 14″	40 ~ 350
Quadrant Edge	1-1/2 ″ ~ 6″	40 ~150

Dimensions
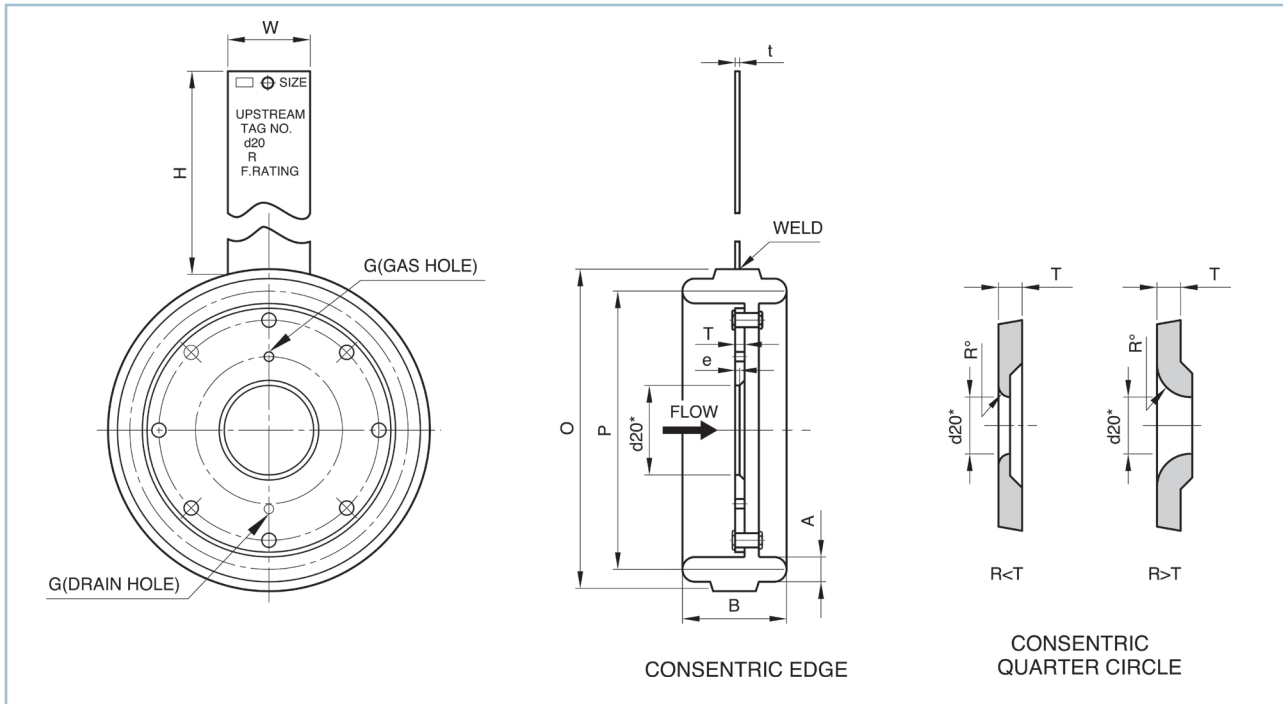

CONSENTRIC EDGE

CONSENTRIC
QUARTER CIRCLE

▶**For ANSI 1500(Oval type, octagonal type)**

UNIT: mm

Norminal Pipe Size	Holding Ring				Thickness of Edge e	Dianm of Hole G	Thickness of Plate T	Tap Handle		
	Outside Diam O	Pitch Diam P	Width A	Hight B				Width A	Hight B	Thickness t
1-1/2 B	82	68.26	7.94	25.0	0.3~0.5	1.6	2	25	110	2
2 B	112	95.25	11.11	29.0	0.5~0.8	1.6	2	25	110	2
2-1/2 B	125	107.95	11.11	30.0	0.5~0.8	1.6	3	32	120	2
3 B	154	139.53	11.11	30.0	0.5~0.8	1.6	3	32	120	2
4 B	179	161.93	11.11	30.0	0.8~1.2	1.6	3	38	125	2
5 B	211	193.68	11.11	30.0	0.8~1.2	1.6	3	38	150	2
6 B	230	211.14	12.70	31.6	0.8~1.2	1.6	3	38	150	2
8 B	292	269.88	15.88	34.9	1.5~2.0	1.1	4	38	150	2
10 B	346	323.85	15.88	34.9	e=T	2.0	4	44	190	3
12 B	409	381.00	22.22	40.5	e=T	2.5	4	44	190	3
14 B	451	419.10	25.40	44.4	e=T	2.5	4	44	220	3

Dimensions

CONSENTRIC EDGE

CONSENTRIC QUARTER CIRCLE

▶ **For ANSI 2500(Oval type, octagonal type)**

UNIT: mm

Norminal Pipe Size	Holding Ring				Thickness of Edge e	Dianm of Hole G	Thickness of Plate T	Tap Handle		
	Outside Diam O	Pitch Diam P	Width A	Hight B				Width A	Hight B	Thickness t
1/2 B	50.9	42.9	8.0	24	0.2~0.4	-	4	25	110	4
3/4 B	58.8	50.8	8.0	24	0.2~0.4	-	4	25	110	4
1 B	68.3	60.3	8.0	28	0.3~0.5	1.6	4	25	130	4
1-1/4 B	83.3	72.2	11.1	28	0.3~0.5	1.6	4	25	130	4
1-1/2 B	93.7	82.6	11.1	30	0.3~0.5	1.6	4	25	130	4
2 B	112.7	101.6	11.1	32	0.5~0.8	1.6	6	25	140	4
2-1/2 B	123.8	111.1	12.7	34	0.5~0.8	1.6	6	32	140	6
3 B	139.7	127.0	12.7	34	0.5~0.8	1.6	6	32	150	6
4 B	173.1	157.2	15.9	34	0.8~1.2	1.6	6	38	150	6
5 B	209.6	190.5	19.1	34	0.8~1.2	1.6	6	38	170	6
6 B	247.7	228.6	19.1	36	0.8~1.2	1.6	6	38	170	6
8 B	301.6	279.4	22.2	40	1.5~2.0	2.0	8	44	200	8
10 B	371.5	342.9	28.6	46	2.0~3.0	2.5	8	44	220	8
12 B	438.2	406.4	31.8	48	2.0~3.0	2.5	8	44	230	8

Holding Ring Type

Ordering Information

■ ORIFICE PLATE & RING ASSEMBLY

SOP -	10	A	1	A	1	A	1

DRAIN / VENT
1 = None
2 = Drain

RING MATERIAL
A = None
B = 304LSS
C = 316LSS
D = etc.

PLATE MATERIAL
1 = 304LSS
2 = 316LSS
3 = etc.

FLANGE RATING
A = JIS 10K
B = JIS 20K
C = JIS 30K
D = ANSI #150
E = ANSI #300
F = ANSI #600
G = ANSI #900
H = etc.

BORE TYPE
1 = Concentric Edge
2 = Quadrant Edge
3 = Eccentric
4 = Segmental

LINE SIZE
A = 15A (1/2″)
B = 20A(3/4″)
C = 25A (1″)
D = 32A (1-1/2″)
E = 50A (2″)
F = 65A (2-1/2″)
G = 80A (3″)
H = 100A (4″)
I = 125A(5″)
J = 150A (6″)
K = 200A (8″)
L = etc.

TYPE(BASE MODEL)
10 = Orifice Plate
20 = Orifice Plate with Ring
30 = Holding Ring type Orifice (Oval type)
31 = Holding Ring type Orifice (Octagonal type)

■ When placing an order, selected ordering number should be indicated on the purchase order sheet.
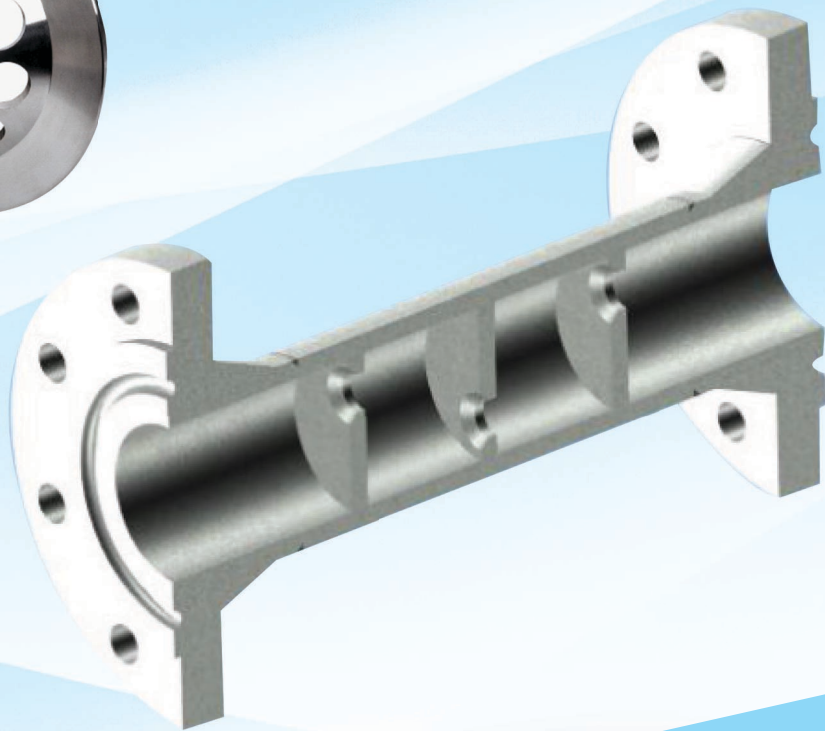
Restriction Orifice Type

Model : SOP-40, 41, 42, 43

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SOP-40, 41, 42
Restriction Orifice Type
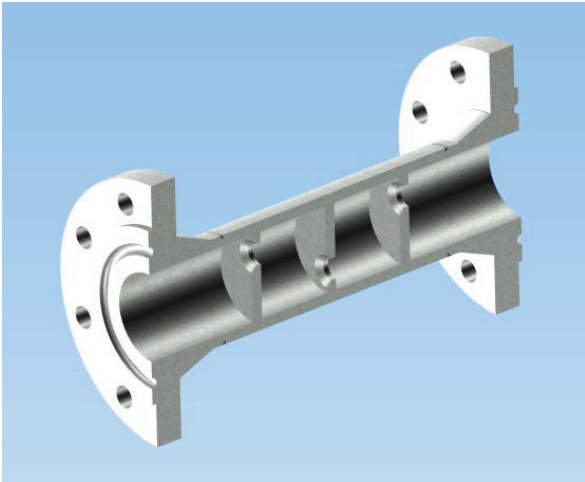
Introduction

The restriction orifices are used for reducing fluid pressure and are designed somewhat different from the orifice plates that are used for measuring flow rates.

There are some types of restriction orifices, including a single plate with a single hole, a single perforated plate (having diffused holes), and a set of several welded orifices (a multistage orifice) for high pressure, high temperature fluids.

Prevents

Cavitation and Flashing in Liquid Flows
Choked flow in gases.
Excessive Noise /Vibration

Restriction orifice plates have traditionally been used to reduce pressures in GAS AND LIQUID FLOWS by forcing the flow through a restricted bore. The precise pressure drop is produced by accurately calculating the orifice bore, having taken into account all the relevant process and flow conditions.

Where very HIGH PRESSURE DROPS in liquid flows are required MULTISTAGE RESTRICTION ORIFICES ASSEMBLIES may be required to achieve the desired pressure drop while preventing problem such as CAVITATION, FLASHING and high NOISE and VIBRATION levels.

CAVITATION is a potentially damaging, erosive condition which occurs when the internal pressure of the liquid passing through the orifice falls below its vapour pressure and vapour bubbles form. Further downstream from the orifice the pressure recovers sufficiently to collapse the bubbles with extreme violence. Cavitation calculations are performed during the design stage of a Multistage Restriction Orifice Plate calculate cavitaion factors at each stage in the orifice assembly.

FLASHING is a similar phenomenon to cavitation except that the process pressure never recovers sufficiently to collapse the gas bubbles resulting in two phase flow-liquid and gas-downstream of the orifice. Erosion of pipe work and valves and other instrumentation can occur due to the impact of liquid droplets carried at high speed in the vapour flow.
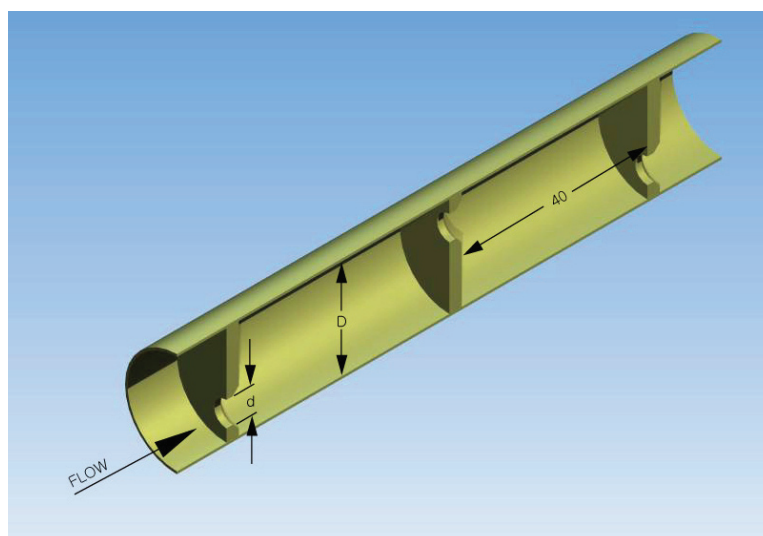
CHOKED FLOW IN GASES is also known as critical flow-occurs when an excessive amount of pressure drop is attempted across a single orifice plate. When the downstream pressure is less that 52.8% of the upstream pressure, the flow through the orifice will become sonic, at which point no further increase in flow can be achieved by either increasing the upstream pressure or lowering the downstream pressure. A Multistage Restriction Orifice enables to reduce the pressure as it goes through each plate to prevent chocked flow occuring.
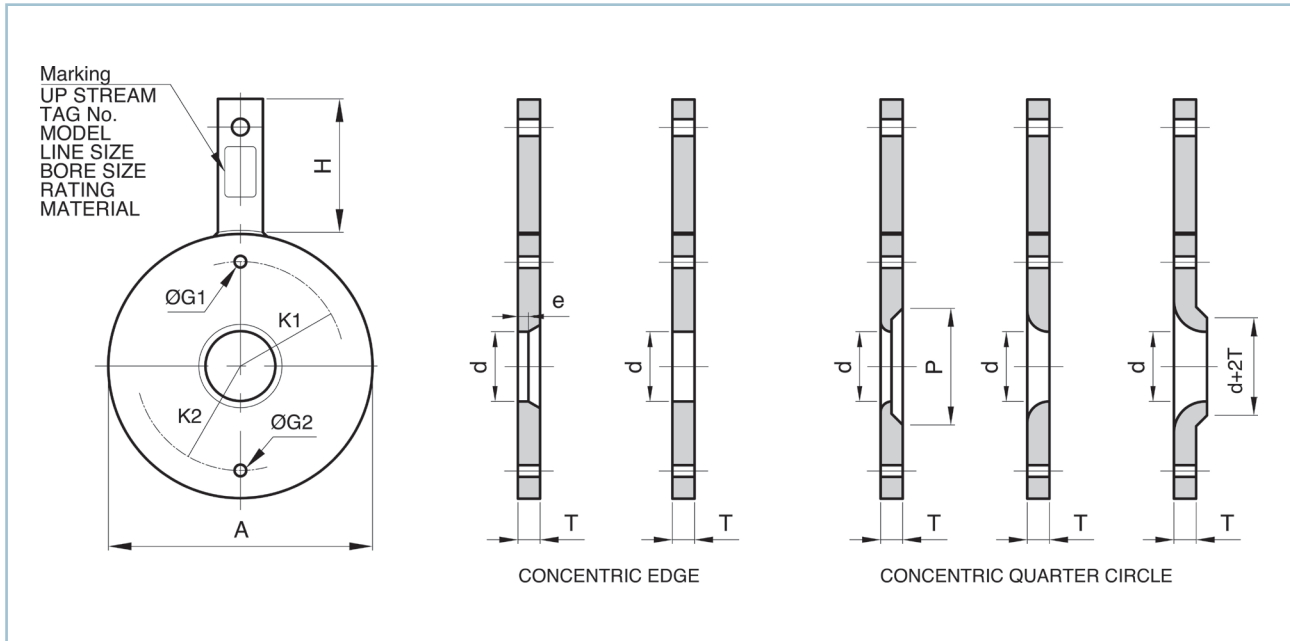
SOP-40

SOP-41

SOP-42
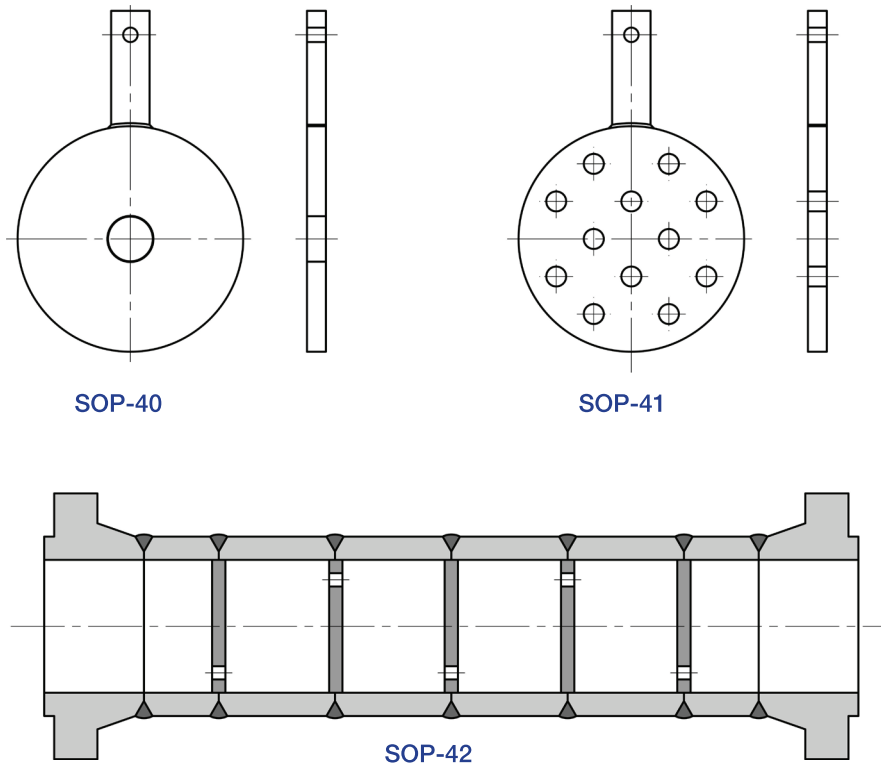
A multi-plate restriction assembly reducese the flowing pressure in stages as a means of reducing noise pollution or improving the durability of the restriction element. Flow is kept subsonic and noncavitating at each stage by adding stages.

Each assembly is custom-engineered by Seojin for specific operating parameters. Most assemblies are welded with non-removable plates. These assemblies are commonly used in blowdown applications in which gases are vented to atmospheric pressure with minimal emitted sound.

Restriction Orifice Type
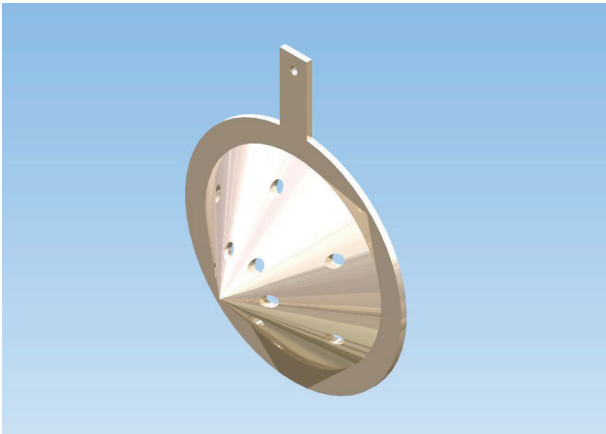
Orifice Plate Type

Marking
UP STREAM
TAG No.
MODEL
LINE SIZE
BORE SIZE
RATING
MATERIAL

CONCENTRIC EDGE   CONCENTRIC QUARTER CIRCLE

* d.K1, K2, G1, G2 : Refer to Specification Sheet

UNIT: mm

Norminal Dia	PLATE O.D.A						Plate Thk¹ T	Edge e	Tap Handdle	
	150#	300#	600#	900#	1500#	2500#			W	H
1/2 B	47.8	53.8	53.8	63.6	63.6	69.9	3.0	-	25	90
3/4 B	57.8	66.7	66.7	69.9	69.9	76.3	3.0	-	25	90
1 B	66.8	73.0	73.0	79.4	79.4	85.8	3.0	0.5	25	90
1-1/2 B	85.8	95.3	95.3	98.6	98.6	117.5	3.0	0.5	25	90
2 B	104.6	111.1	111.1	12.8	142.8	146.1	3.0	0.5	25	90
2-1/2 B	123.6	130.4	130.4	165.1	165.1	168.3	3.0	0.5	25	90
3 B	136.6	149.1	149.1	168.3	174.6	196.9	3.0	1.0	25	90
4 B	174.6	183.2	193.7	206.4	209.6	235.0	3.0	1.0	38	110
5 B	197.0	216.0	241.5	247.7	260.4	279.5	3.0	1.5	38	110
6 B	222.5	250.7	266.7	288.9	282.6	317.5	3.0	1.5	38	110
8 B	279.5	308.0	320.7	358.8	352.4	387.4	3.0	1.5	38	110
10 B	339.8	361.9	400.1	435.0	435.0	476.5	6.0	-	44	120
12 B	409.8	422.3	457.3	498.5	520.7	549.5	6.0	-	44	120
14 B	450.6	485.8	492.2	520.0	577.9	-	6.0	-	44	120
16 B	514.1	539.8	565.2	574.7	641.4	-	6.0	-	44	120
18 B	549.4	597.0	612.8	637.9	704.9	-	9.0	-	50	130
20 B	606.4	654.1	682.6	698.5	755.7	-	9.0	-	50	130
22 B	660.5	704.9	733.5	-	-	-	9.0	-	50	130
24 B	717.8	774.7	790.6	838.2	901.7	-	9.0	-	50	130

Introduction

The Conical Type (Restriction Orifice) is a device that performs as a reducing valve which decrease the pressure of fluid in the piping system, is used in almost all the fluid like liquid, gas, steam etc.

When high-pressure fluids are reduced to lowpressure, it creates cavitation and this may result in damaging facilities by noise and vibration of the pipe.

The conical type orifice allows for the reduction of pressure by controlling the process condition to avoid cavitation.

Principle

The conical type orifice creates an increase in velocity by reducing the flow s diameter. According to Bernoulli s principle, this increase in velocity is accompanied by a corresponding decrease in pressure.

This pressure differential (Δp) and (Qv) has a proportional relation of $Qv=K^{\Delta p}$ In a regular flow volume, this pressure differential can be measured regularly. It is the same principle with the difference pressure flow meter and volume (Qv).

If you want to decrease pressure p in a flux, you should determine the bore size of the orifice according to a formula like one above.

$$Q_v = c\,d \cdot A_2 \cdot E \cdot \varepsilon \cdot \sqrt{\frac{2\Delta p}{\rho}}$$

P1
P2
A1
A2
$\rho 2$
$\rho 1$

A   B

$P1 \geq P2$
$A1 \geq A2$
$\rho 1 \geq \rho 2$
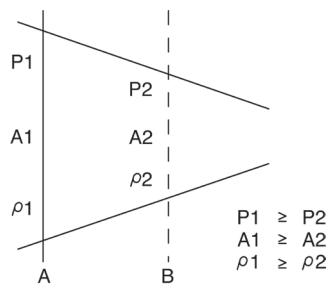
Cd	: Coefficient of Approaching Velocity
A_2	: Reduced Area
E	: Coefficient of Approaching Speed
ε	: Coefficient of Expansion
ρ	: Density of Fluid
Δp	: Pressure Loss

If you want to decrease pressure p in a flux, you should determine the bore size of the orifice according to a formula like one above.

Ordering Information

■ RESTRICTION ORIFICE TYPE

SOP -	40	A	1	A	1	A

PIPE MATERIAL
A = NONE
B = A106 Gr.B
C = 304LSS
D = 316LSS
E = etc.

MATERIAL
1 = 304LSS
2 = 316LSS
3 = etc.

FLANGE RATING
A = JIS 10K
B = JIS 20K
C = JIS 30K
D = ANSI #150
E = ANSI #300
F = ANSI #600
G = ANSI #900
H = etc.

1 = Concentric Edge

LINE SIZE
A = 15A (1/2″)
B = 20A (3/4″)
C = 25A (1″)
D = 32A (1-1/2″)
E = 50A (2″)
F = 65A (2-1/2″)
G = 80A (3″)
H = 100A (4″)
I = 125A (5″)
J = 150A (6″)
K = 200A (8″)

TYPE(BASE MODEL)
40 = Restriction Orifice (Single Hole)
41 = Restriction Orifice (Multi Hole)
42 = Restriction Orifice (Multi Stage)
43 = Restriction Orifice (Conical Type)

■ When placing an order, selected ordering number should be indicated on the purchase order sheet.
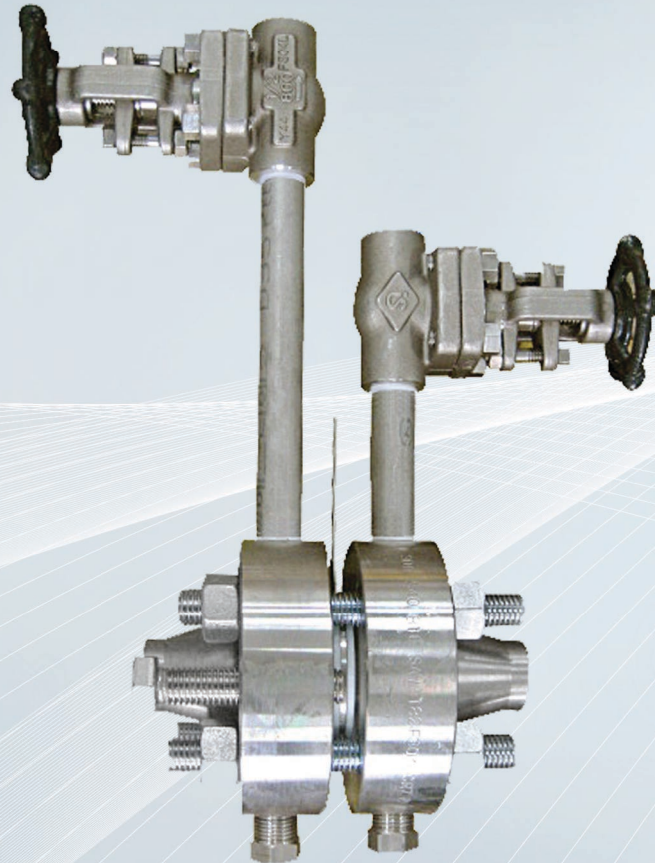
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■ Specifications subject to change without notice

Orifice Flange Assembly

Model : SOP-50

SeoJin Instech Co., Ltd.

www.seojin.biz

SOP-50
Orifice Flange Assembly

Introduction

Orifice Flange Assemblies are used in conjunction with Orifice Plates for flow measurement of smaller or medium size pipes at lower or medium pressure ranges.
The flange connection is of an RF type and the differential pressure tapping system is with flange taps.

Specifications

FLANGE TYPE
Welding neck
Slip-on
Socket-weld
Ring-joint welding neck

NOMINAL DIAMETERS
25mm(1 inch) to 500mm(20 inches)

FLANGE MATERIAL
A105, A182-F304, A182-F316, A182-F11,
A182-F22, A350-LF2

FLANGE RATINGS
JIS 10, 20, 30 etc.
ANSI(or JPI) 150, 300, 600 etc.

MATERIALS OF BOLTS AND NUTS
Stud bolts : A193-B7, A193-B8, A193-8M
Nuts : A194-2H, A194-8,A194-8M

GASKET
Thickness : 1.5mm, 4.5mm
Material : Non-Asbestos sheet gasket,
            Spiral wound gaskets

PIPING CONNECTION METHOD
ANSI 150# : Insertion welding type (Slip-on-type)
ANSI 300#,600# : Butt welding type (Welding neck)
ANSI 600# : Butt welding neck (Ring-joint WN)

DIFFERENTIAL PRESSURE PIPING CONNECTION
Select refering to the model number construction table

Part Drawing

Dimensions

TC1: Flange   TC2: Welding   TC3: Thread
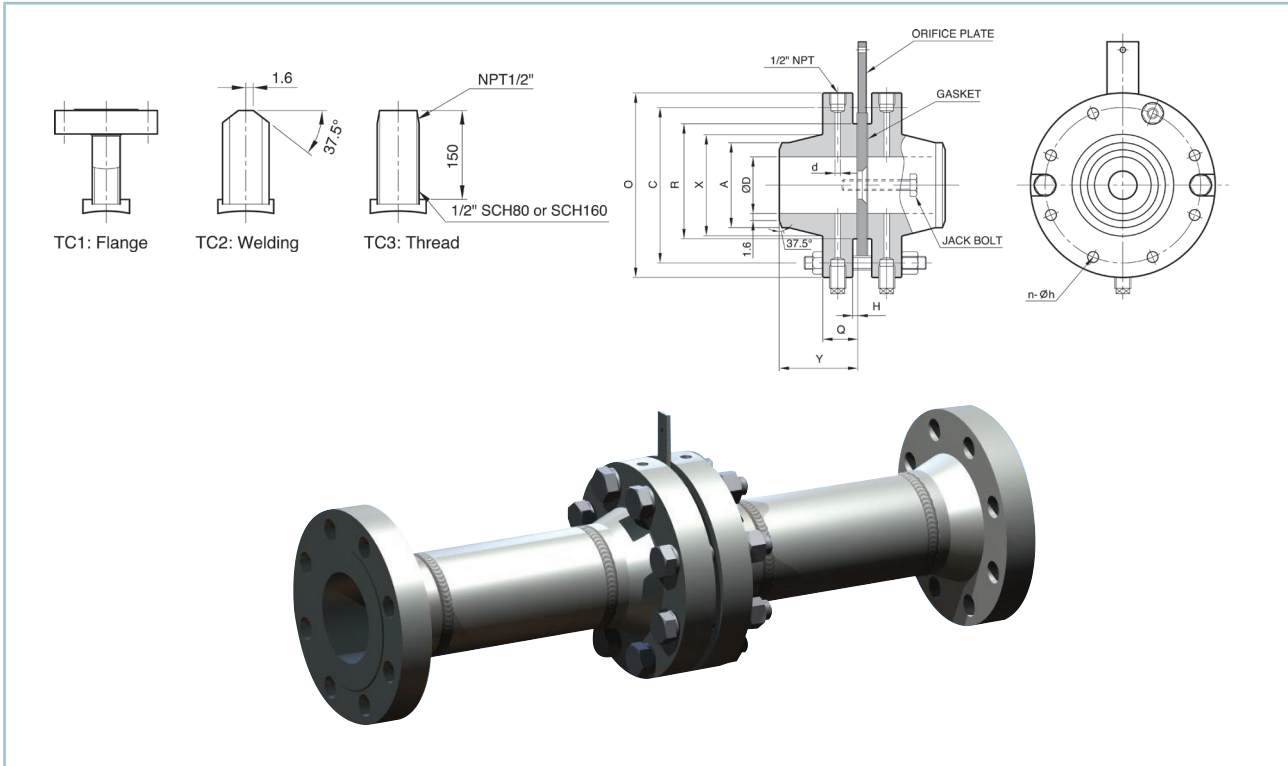
▶For JIS 10K Flanges

UNIT: mm

Norminal Pipe Size	Diam of Flange	Thicknes of Flange	D of Hub of Wedge	Diam of Hub	Length Through Hub	Diam of Raised face	Height of Raised face	Diam of Tab Holes	Diam of Bolts Circle	Number of bolt	Bolt Size
	o	Q	A	X	Y	f	E	d	c		
25 A	125	38.1	34.0	50	80	70	1	4	70	4	M16
32 A	135	38.1	42.7	60	80	80	2	4	100	4	M16
40 A	140	38.1	48.6	66	83	85	2	4	105	4	M16
50 A	155	38.1	60.5	80	83	100	2	4	120	4	M16
66 A	175	38.1	76.3	98	86	120	2	4	140	4	M16
80 A	185	38.1	89.1	112	86	130	2	6	150	8	M16
90 A	195	38.1	101.6	122	86	140	2	6	160	8	M16
100 A	210	38.1	114.3	132	90	155	2	6	175	8	M16
125 A	250	38.1	139.8	160	95	185	2	8	210	8	M20
150 A	280	38.1	165.2	190	100	215	2	8	240	8	M20
200 A	330	38.1	216.3	238	110	265	2	12	290	12	M20
225 A	350	38.1	241.8	264	110	285	2	12	310	12	M20
300 A	445	38.1	318.5	346	120	370	3	12	400	16	M22
350 A	490	38.1	355.6	386	130	415	3	12	445	16	M22
400 A	560	38.1	406.4	442	130	475	3	12	510	16	M24

Orifice Flange Assembly

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Ordering Information

■ ORIFICE PLATE & FLANGE ASSEMBLY

SOP -	50	A	1	A	1	A	1	A

GASKETS MATERIAL
A = Non Asbestos 1.5t
B = Teflon 1.5t
C = Spiral Wound
D = etc.

BOLT / NUT MATERIAL
1 = B7 / 2H
2 = B8 / 8
3 = etc.

PLATE MATERIAL
A = 304LSS
B = 316LSS
C = etc.

FLANGE MATERIAL
1 = Carbon Steel
2 = 304LSS
3 = 316 SS
4 = etc

FLANGE RATING
A = JIS 10K
B = JIS 20K
C = JIS 30K
D = ANSI #150
E = ANSI #300
F = ANSI #600
G = ANSI #900
H = etc.

TAP NIPPLE
1 = None
2 = NPT 1/2
3 = etc.

LINE SIZE
A = 15A (1/2″)
B = 20A (3/4″)
C = 25A (1″)
D = 32A (1-1/2″)
E = 50A (2″)
F = 65A (2-1/2″)
G = 80A (3″)
H = 100A (4″)
I = 125A (5″)
J = 150A (6″)
K = 200A (8″)
L = etc.

TYPE(BASE MODEL)
50 = Orifice Flange Assembly (Welding Neck Type)
51 = Orifice Flange Assembly (Socket-Welding Type)
52 = Orifice Flange Assembly (Slip-On Type)
53 = Orifice Flange Assembly (RTJ Type)

■ When placing an order, selected ordering number should be indicated on the purchase order sheet.

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