

Restriction Orifice Type

Model : SOP-40, 41, 42

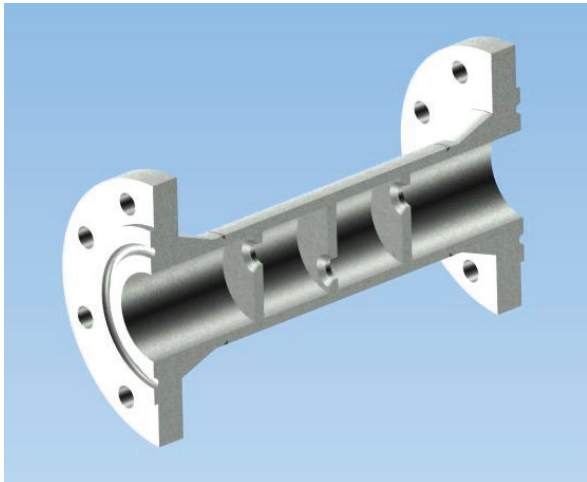


SeoJin Instech Co., Ltd.

www.seojin.biz

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.

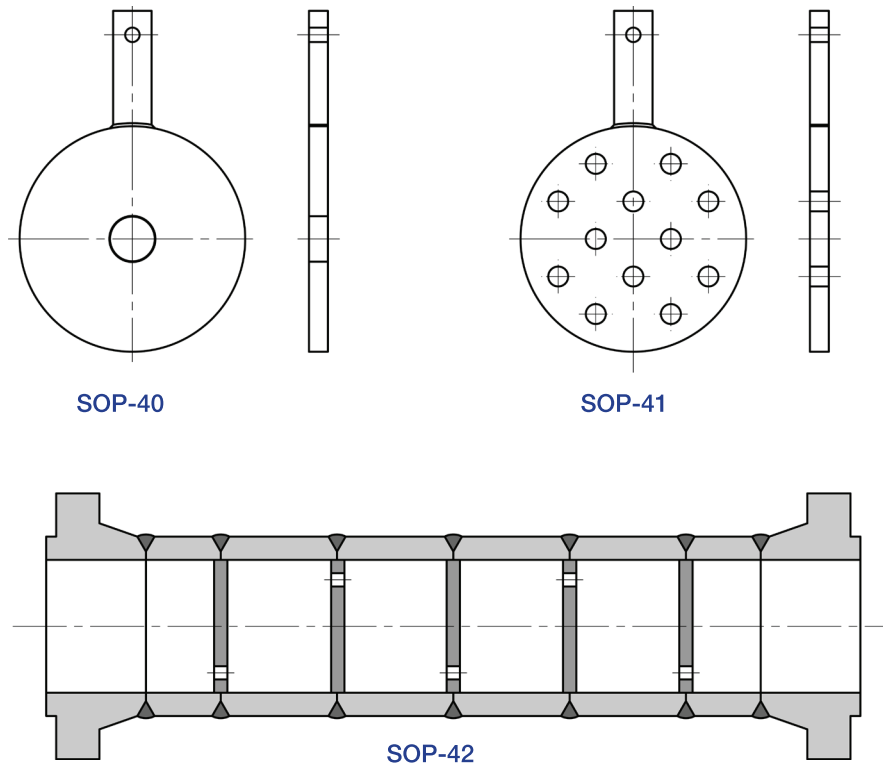
Where very HIGH PRESSURE DROPS in liquid flows are required MULTISTAGE RESTRICTION ORIFICES ASSEMBLIES may be required to achieve the desired pressure drop while preventing problem such as CAVITATION, FLASHING and high NOISE and VIBRATION levels.

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 cavitation 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.

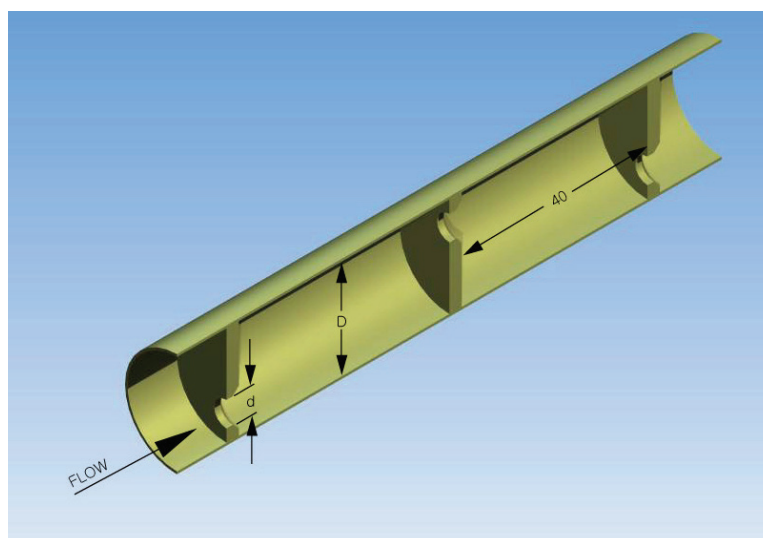
CHOKED FLOW IN GASES is also known as critical flow-occurs when an excessive amount of pressure drop is attempted across a single orifice plate. When the downstream pressure is less than 52.8% of the upstream pressure, the flow through the orifice will become sonic, at which point no further increase 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 choked flow occurring.

Model

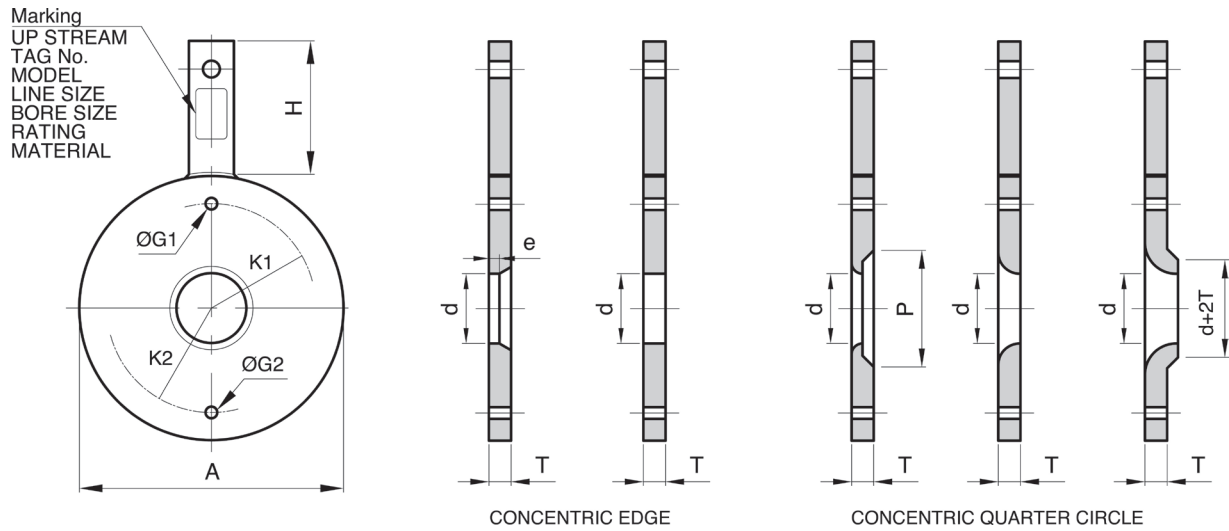


A **multi-plate restriction assembly** reduces the flowing pressure in stages as a means of reducing noise pollution or improving the durability of the restriction element. Flow is kept subsonic and noncavitating at each stage by adding stages.

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.



Orifice Plate Type



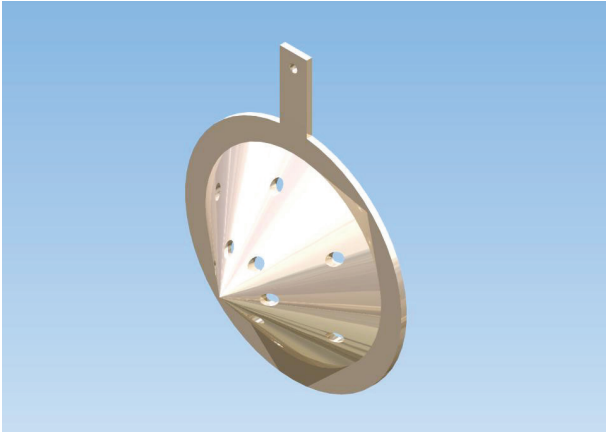
* d.K1, K2, G1, G2 : Refer to Specification Sheet

UNIT: mm

Normal Dia	PLATE O.D.A						Plate Thk' T	Edge e	Tap Handle	
	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

SOP-43

Restriction Orifice Type



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.

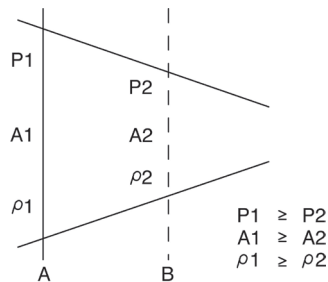
Principle

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 (Q_v) has a proportional relation of $Q_v = K \sqrt{\Delta p}$ 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 (Q_v).

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.

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



C_d : 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
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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 = 40A (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