

# ORIFICE PLATE & FLANGE

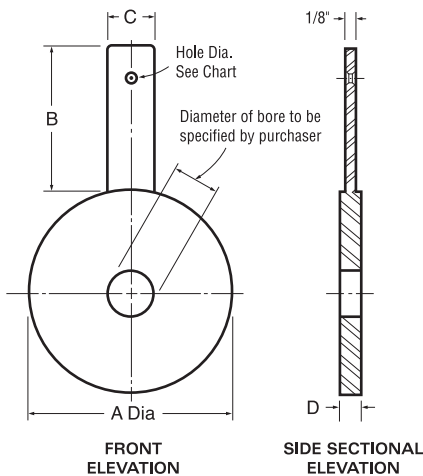


## ■ Orifice

Tapping of differential pressure is done by this vener contractor tap Orifice. Since Orifice plate can be installed directly to flange of pipe, flow measurement by this Orifice plate can be performed more economically than by orifice plates with rings, and it is generally suited for large diameter pipes. As for large diameter pipes of 500mm or greater, these Orifice plates are used to measure the average value of pressure by making some differential pressure tapping holes around the pipe and connecting thereto a loop form pressure equalizing pipe.



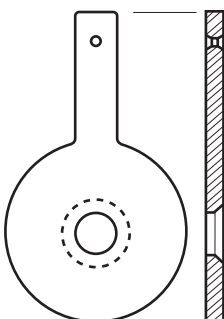
## 1. Orifice Plates (Model : DHOP)



DAEHAN Paddle-Type Orifice Plates are used with Orifice Flange Unions. All outer diameters of the plates are machined, providing a uniform circular disc. This results in a high degree of concentricity of the Orifice bore and the plate outer diameter. Next, handles are carefully welded on. The plates are then sanded in special machines to a prescribed finish. Bank plates and plates with popular bore size are stocked continuously. Each plate is stamped on its handle with line size, flange rating, Orifice bore and plate material. DAEHAN maintains a stock in Type 304 and 316 Stainless Steel in standard thickness. Other size and materials are available on request.

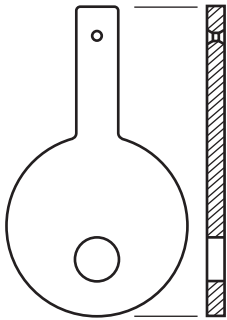
### Diameters of holes in paddle Plate Handles are as flows:

Plate Size	Hole Diameter
1/2" thru 2"	1/4"
1 1/2" thru 12"	3/8"
14" thru 24"	1/2"
26" and larger	3/4"



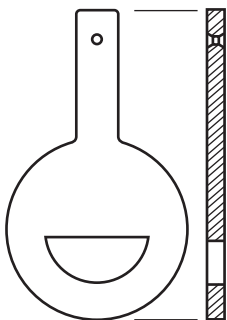
### 1) Concentric Edge

The bore and bevel is the standard of limiting the plate edge thickness. The bevel is machined on a 45 angle to the desired edge thickness. Unless otherwise specified, plates will be bevelled to 1/50 of the line I.D. or 1/8 of the Orifice bore, minimum governing.



## 2) Eccentric

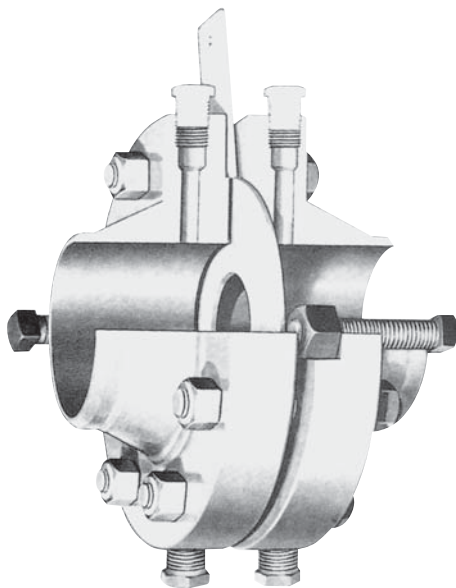
Eccentrically bored plates are plates with the Orifice off center, or eccentric, as opposed to concentric. The bore of the eccentric Orifice normally is inscribed in a circle with is 98% of the pipe diameter, so that solids or slurries may pass through, Eccentric Orifice plates are used in many industries including heavy and light chemicals, steel, paper, atomic and petrochemicals.



## 3) Segmental

Segmentally bore Orifice plates are provided for measurements where solids are entrained in a gas or liquid flow stream. The circular portion of the bore is inscribed within a circle which is normally 98% of the pipe diameter. The segmental opening may be placed either at the top or bottom of the pipe. Industries using these bores include sewage treatment, steel, chemical, water conditioning, paper, and petrochemical.

## 2. Orifice Flanges (Model : DHOF-W)

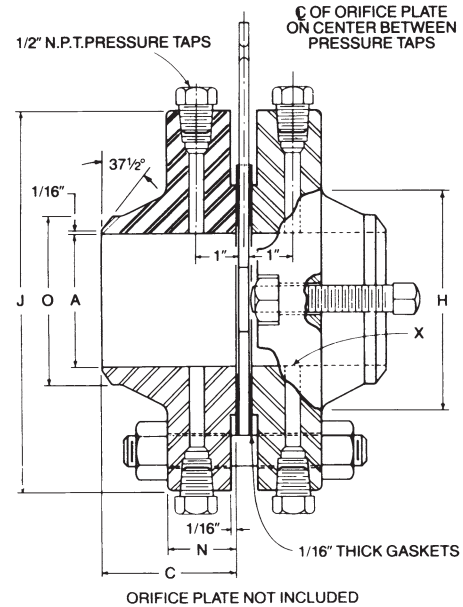
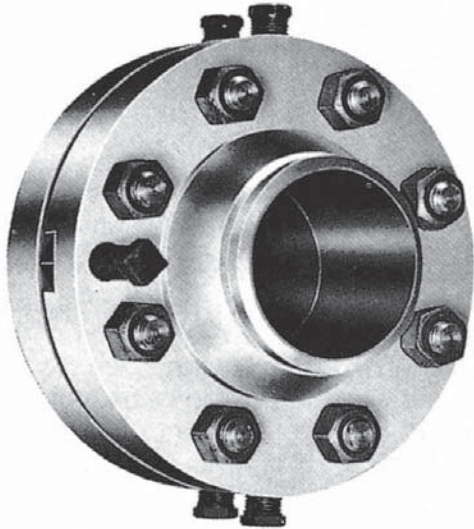


How DAEHAN Orifice Flanges Provide Better Measurement Orifice flanges one of the most economical means of measuring flow, and DAEHAN Orifice Flanges are specially manufactured to be the most accurate. Automatic machine tools enable DAEHAN to meet the most stringent tolerances and recommendations for flanges, with careful attention given to tap location, bore smoothness, bolt and flange facings. DAEHAN Orifice Flanges are made of forged steel, A.S.T.M. A-105. Other materials are available on special order and extended delivery.

# ORIFICE PLATE & FLANGE



## Orifice Plate & Flange Assembly



## SPECIFICATIONS

### ORIFICE PLATE

#### ORIFICE BORE TYPE

- Concentric Square Edge Type
- Eccentric Type
- Segmental Type
- Quadrant Edge Type

#### FLOW CALCULATION STANDARDS

- ISO5167, JIS Z 8762, ASME, KS A 0612

#### FLANGE RATING

- ANSI 150, 300, KS, JIS 10K 20K, AWWA.

#### MATERIAL

- 304SS, 304L SS, 316SS, 316L SS, Monel,
- Hastelloy, Inconel, Cu-Ni, PTFE, Glass
- Ni, Cr, Mo Alloy Steel(A182 F11 to 91)

### ORIFICE FLANGE

#### ORIFICE FLANGE TYPE

- Weld Neck Type
- Socket Weld Type
- Slip On Type

#### NOMINAL DIAMETERS

- 25mm(1inch) to 3000mm(120inch)

#### TAPS TYPE

- Flange Taps Type
- Corner Taps Type
- D-D/2 Taps Type

#### MATERIAL

- A105, A182 F304, A182 F316, A182F11, A182 F22, A182 F51, A350 LF2, etc

# ORIFICE PLATE & FLANGE



MODELS	SUFFIX CODES		DESCRIPTION
Orifice Plate & Flange Assembly	DHOP -----		Plate Only
	DHOF-W -----		Flange Assembly (Bolt, Nut, Gasket Include)
Tap Type	D -----		D-D/2 Taps
	F -----		Flange Taps
	C -----		Corner Taps
Nominal Pipe Size	<input type="text"/> <input type="text"/> <input type="text"/> -----		Pipe size in inch or mm
Material : Plate/Flange	CS -----		Carbon Steel
	4S -----		304SS
	4L -----		304L SS
	6S -----		316SS
	6L -----		316L SS
	11 -----		A182 F11
	12 -----		A182 F12
	51 -----		A182 F51
	91 -----		A182 F91
	OP -----		Option
Mounting Connection	015 -----		ASME(ANSI) Class 150 LB
	030 -----		ASME(ANSI) Class 300 LB
	010 -----		KS(JIS) Class 10K
	020 -----		KS(JIS) Class 20K
	000 -----		Option
Diff' Taps	1 -----		NPT 1/2
	2 -----		NPT 3/4
	3 -----		SW 1/2
	4 -----		SW 3/4
Meter Run	N -----		None
	Y -----		Include
Option			/ <input type="text"/> <input type="text"/> <input type="text"/>

# RING TYPE ORIFICE



## MODEL : DHOF-RING



### ■ DESCRIPTIONS

Orifice Ring Assemblies are used for flow measurement of smaller or medium sized pipes 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 Assembled, also are available. Differential pressures are taken out in a corner tap system.

### ■ SPECIFICATIONS

#### ORIFICE BORE TYPE :

- Concentric Square Edged Orifices
- Quadrant Edged Orifices.
- Minimum quadrant edged orifice diameter 4.5mm
- Minimum quadrant edged radius 0.5mm

#### FLOW CALCULATION STANDARDS :

- ISO5167, JIS Z 8762, ASME, KS A 0612

#### FLANGE RATING

- JIS5, 10, 20, 30kg/cm<sup>2</sup> ANSI 150#, 300#

#### MATERIALS

- Ring and Pressure Tap Nipple : C.S, 304SS, 316SS
- Plate : 304SS, 316SS, 316L, Monel, other
- Tab Handle : 304SS, 316SS

#### TAP CONNECTION

- PT 1/2 or 1/2 NPT male,
- Socket weld, butt weld or flange.(Flange rating to be the same as the of the process pipeline)

#### GASKET:

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

# RING TYPE ORIFICE



MODELS	SUFFIX CODES	DESCRIPTION
Ring Type Orifice	DHOF-RING -----	Coner Taps Plate & Ring
Flange	F -----	Flange Include
	N -----	Flange Exclude
Nominal Pipe Size	□□□ -----	Pipe size in inch or mm
Material : Plate/Flange	CS -----	Carbon Steel
	4S -----	304SS
	4L -----	304L SS
	6S -----	316SS
	6L -----	316L SS
	11 -----	A182 F11
	12 -----	A182 F12
	51 -----	A182 F51
	91 -----	A182 F91
	OP -----	Option
Mounting Connection	015 -----	ASME(ANSI) Class 150 LB
	030 -----	ASME(ANSI) Class 300 LB
	010 -----	KS(JIS) Class 10K
	020 -----	KS(JIS) Class 20K
	000 -----	Option
Diff' Taps	1 -----	NPT 1/2
	2 -----	NPT 3/4
	3 -----	SW 1/2
	4 -----	SW 3/4
	0 -----	Option
Taps Valve	B -----	Ball Valve
	G -----	Glove Valve
	N -----	None
	O -----	Option
Option		/□□□

# HIGH PRESSURE ORIFICE



MODEL : DHOF-RTJ□

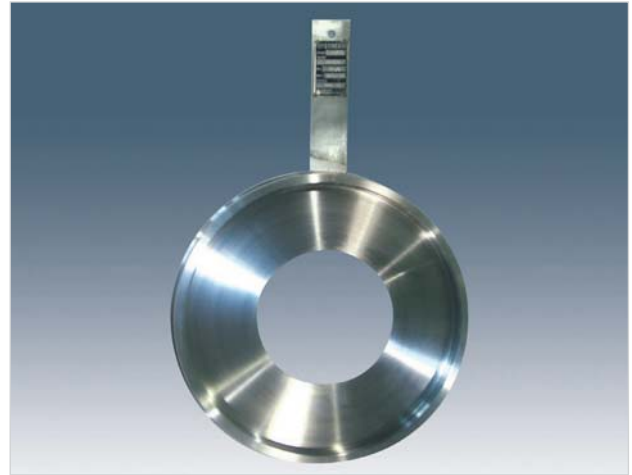
## DESCRIPTION

These flanges include both the welding neck type used with orifice plates or orifice plates with rings. They are available in the following types

Model DHOF-RTJ□

Used with Model DHOF-RTJ□ orifice with holding ring for flange taps. Available only in welding neck type.

Flange faces are ring-joint types



## SPECIFICATIONS

- Welding neck. Type DHOF-RTJF are only available with welding neck style.

### NOMINAL PIPE SIZE

- 1-1/2B to 24B(40A to 600A)

### FLOW CALCULATION STANDARDS

- ISO5167, JIS Z 8762, ASME, KS A 0612

### FLANGE RATING

- ANSI 600, 900, 1500, 2500LB RTJ Oval Type or Octagonal Type

### MATERIAL

- Carbon Steel  
- 304SS, 304L SS, 316SS, 316L SS  
- Ni, Cr, Mo Alloy Steel(A182 F11 to 91)

- Two per flange. Provided in Model DHOF-RTJF the flange tap location specified in ISO5167O

### CONNECTIONS

- 1, For threading directly to flange 1/2NPT F, 3/4NPT F, 1/2 S.W, 3/4 S.W  
- 2, For connecting with nipple 1/2NPT M, 3/4NPT M, socket weld, butt weld or flange

### BOLTS & NUTS

- 1,Bolt Type & Material : Stud & A193 Gr B7  
- 2,Nut Type & Material : Hex \* A194 2H

# HIGH PRESSURE ORIFICE



## MODEL : DHOF-RTJ□

MODEL	SUFFIX CODES		DESCRIPTION
DHOF-RTJ□	P -----		Plate Only
	F -----		Flange Include
Nominal Pipe Size	□□□ -----		Pipe size in inch or mm
Material	CS -----		Carbon Steel
	4S -----		304SS
	4L -----		304L SS
	6S -----		316SS
	6L -----		316L SS
	11 -----		A182 F11
	12 -----		A182 F12
	51 -----		A182 F51
	91 -----		A182 F91
	OP -----		Option
Mounting Connection	060 -----		ANSI Class 600 LB
	090 -----		ANSI Class 900 LB
	150 -----		ANSI Class 1500 LB
	250 -----		ANSI Class 2500 LB
	000 -----		Option
Diff' Taps	1 -----		NPT 1/2
	2 -----		NPT 3/4
	3 -----		SW 1/2
	4 -----		SW 3/4
Option		/□□□	



# HIGH ACCURACY ORIFICE



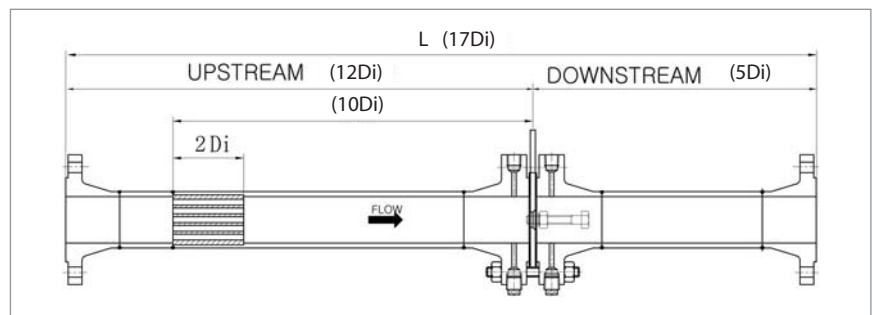
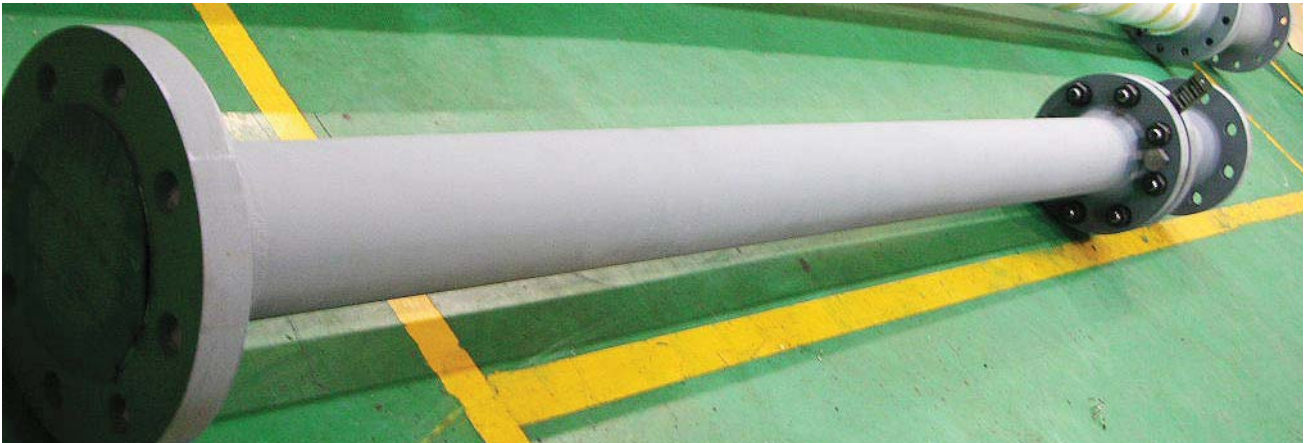
MODEL : DHOF-H □

## DESCRIPTION

These flanges & meter run tube, flow straightener Include high accuracy Orifice Assembly  
They are available in the following types

Model : DHOF-H □

Used with Model DHOF-H □ orifice plate with weld neck flange, meter run tube, flow straightener, etc



## SPECIFICATIONS

Meter run tube type  
DHOF-H □ are only Assembly

### Accuracy

- 1B to 20B(40A to 500A) : 0.25%
- 22B to 32B(550A to 800A) : 0.3%

### Nominal pipe size

- 1B to 32B(25A to 800A)

### Flange Rating

- ASME(ANSI) 300#, 600#, 900#
- Standard : ASME B 16.36

### Flow Calculation standard

- ISO5167-2003
- ASME PTC
- AGA3
- JIS Z 8762
- KS A 0612

### Flange Material

- Carbon steel
- 304(L)SS, 316(L)SS
- Ni, Cr, Mo Alloy steel(A182 F11 to 91)

### Plate Material

- 304(L)SS, 316(L)SS
- Ni, Cr, Mo Alloy steel(A182 F11 to 91)
- Inconel, Hastelloy, Monel etc

### Meter run tube

- A106
- 304(L)SS, 316(L)SS
- Ni, Cr, Mo Alloy steel(A335 F11 to 91)

### Connection

- 1. For threading directly to flange 1/2NPTF 3/4NPTF, 1/2SW, 3/4SW
- 2. For connecting with nipple 1/2NPTM, 3/4NPTM, socket weld, butt weld or flange

# HIGH ACCURACY ORIFICE

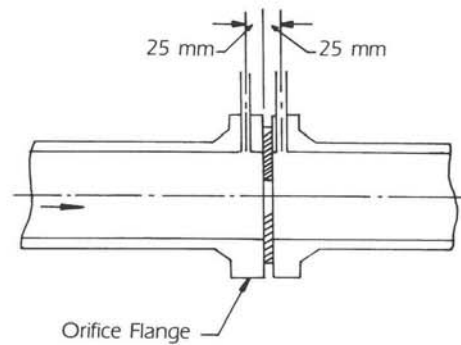


## MODEL : DHOF-H□

MODEL	SUFFIX CODES	DESCRIPTION
DHOF-H□ Nominal Pipe Size	□□□ -----	Pipe size in inch or mm
Flange Rating	30 -----	300#
	60 -----	600#
	90 -----	900#
	O1 -----	Option
Plate Material	4(L)S -----	304(L)SS
	6(L)S -----	316(L)SS
	I6 -----	Inconel 600
	HS -----	Hastelloy-C 276
	O2 -----	Option
Flange Material	CS -----	Carbon Steel
	4S -----	304(L)SS
	6S -----	316(L)SS
	11 -----	A182 F11
	12 -----	A182 F12
	22 -----	A182 F22
	51 -----	A182 F51
	91 -----	A182 F91
	O3 -----	Option
Meter run tube Material	CS -----	Carbon Steel
	4S -----	304(L)SS
	6S -----	316(L)SS
	11 -----	A335 P11
	12 -----	A335 P12
	22 -----	A335 P22
	51 -----	A335 P51
	91 -----	A335 P91
	O4 -----	Option
Diff' Pressure Taps	0 -----	MFR STD
	1 -----	NPT 1/2
	2 -----	NPT 3/4
	3 -----	SW 1/2
	4 -----	SW 3/4
	O5 -----	Option
Flow Straightener	T -----	Tube Bundle
	E -----	Etoile
	A -----	AMCA
	K -----	K-Lab
	N -----	NEL
	O6 -----	Option
Transmitte	O -----	One Body
	S -----	Separation Type
	O7 -----	Option
Output	A -----	4 ~ 20mA
	V -----	1 ~ 5V
	R -----	etc
Option	/□□□	

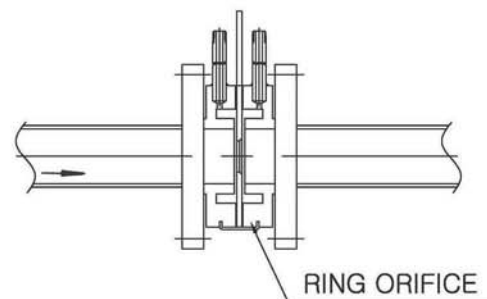
## 1) FLANGE TAP

Both upstream and downstream are located at a distance of 25mm from the Orifice plate.  
This method is applicable to smaller pipes.



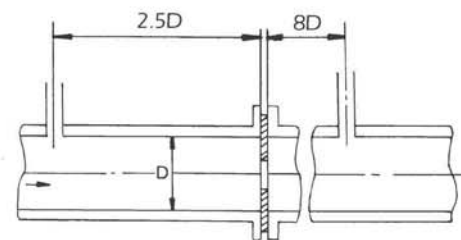
## 2) CONER TAP

Tapping for differential pressure is made at immediately up stream and downstream positions of the orifice. This system is used primarily for small pipes. (Smaller 2")



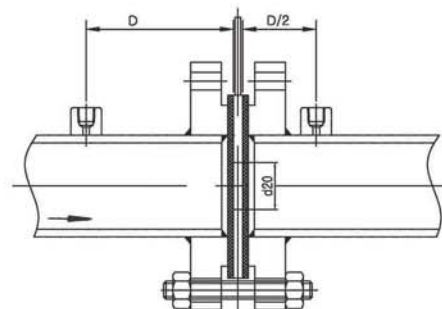
## 3) PIPE TAP

The differential pressure is small.  
This Tapping system is not very popular.



## 4) D-D/2 TAP

The tap for the upstream side is located at a distance of approximately the pipe diameter and that for the downstream is located in a position of the half of pipe diameter.

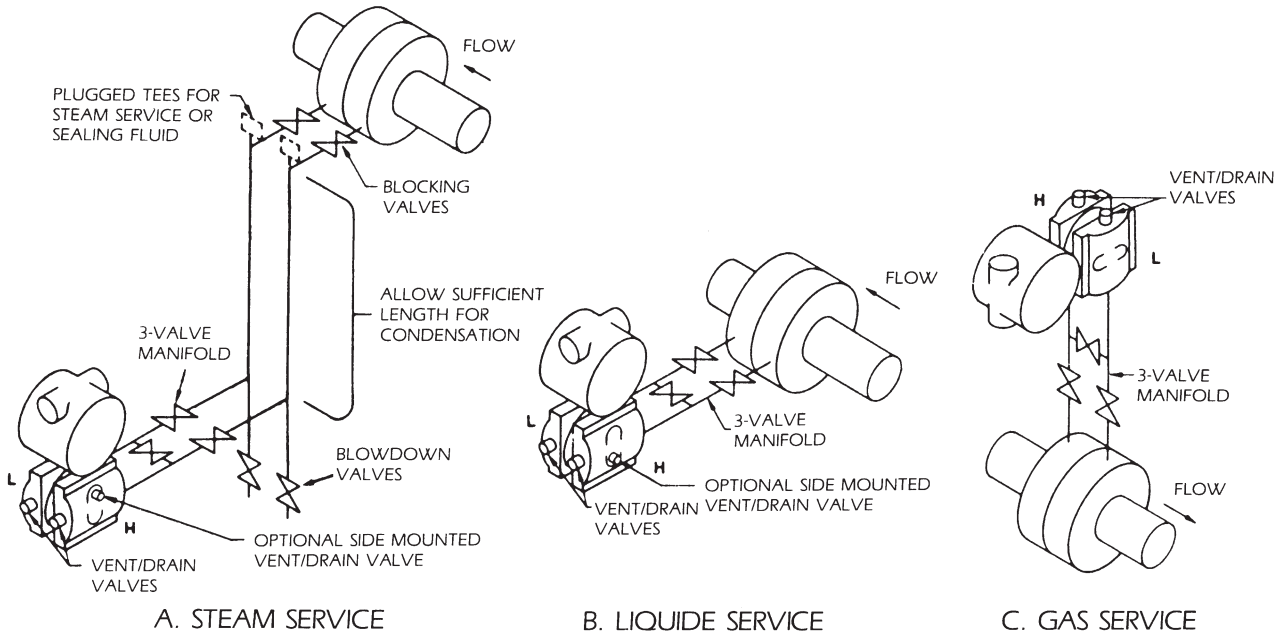


# ORIFICE TYPE

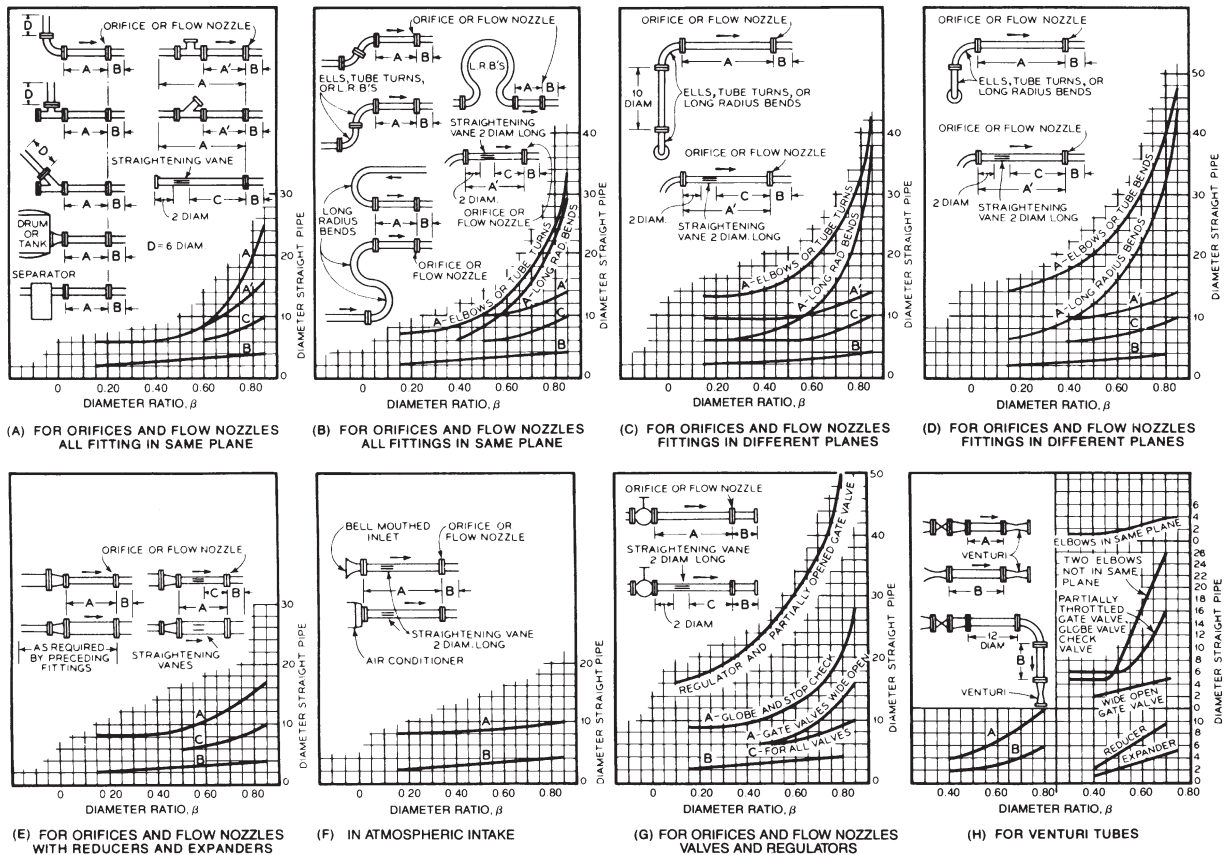
## (INSTALLATION & PIPING REQUIREMENTS)



INNOBIZ  
2003-F240



## Piping Requirements for Orifices, Flow Nozzles and Venturi Tubes



# RESTRICTION ORIFICE



## MODEL : DHRO-SH/MH/MS



Single Hole



Multi Hole

### ■ DESCRIPTIONS

The restriction orifices are used for reducing fluid pressure and are designed somewhat different 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 welded multi orifices (a multistage orifice) which are used for high-pressure high-temperature fluids.

The bore edge of the restriction orifices can be surface-hardened with stellite welding or by nitriding.

### ■ SPECIFICATIONS

#### MOUNTING

- Flange, Union, Butt Weld etc

#### NOMINAL PIPE SIZE

- 1/2B to 24B(15A to 600A)

#### FLOW CALCULATION STANDARDS

- ISO5167, JIS Z 8762, ASME, KS A 0612

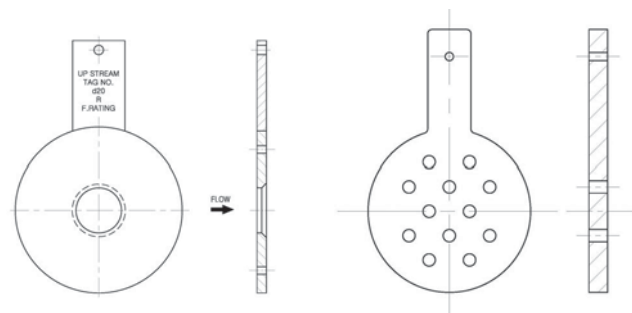
#### FLANGE RATING

- ANSI 150, 300, 600, 900, 1500, 2500LB RTJ

Oval Type or Octagonal Type

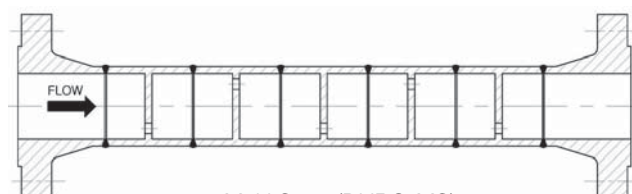
#### MATERIAL

- Carbon Steel
- 304SS, 304L SS, 316SS, 316L SS
- Ni, Cr, Mo Alloy Steel(A182 F11 to 91)
- Monel, Hastelloy, Inconel etc



Single Hole(DHRO-SH)

Multi Hole(DHRO-MH)



Multi Stage(DHRO-MS)

# RESTRICTION ORIFICE



MODELS	SUFFIX CODES		DESCRIPTION
Restriction Orifice	DHRO-SH -----		Single Hole
	DHRO-MH -----		Multi Hole
	DHRO-MS -----		Multi Stage
Type	F -----		Flange Include
	N -----		Flange Exclude
Nominal Pipe Size	□□□ -----		Pipe size in inch or mm
Material : Plate/Flange	CS -----		Carbon Steel
	4S -----		304SS
	4L -----		304L SS
	6S -----		316SS
	6L -----		316L SS
	11 -----		A182 F11
	22 -----		A182 F22
	51 -----		A182 F51
	91 -----		A182 F91
	I 5 -----		Inconel 625
	M0 -----		Monel 400
	HC -----		Hastelloy-C276
OP -----		Option	
Mounting Connection	015 -----		ASME(ANSI) Class 150 LB
	030 -----		ASME(ANSI) Class 300 LB
	060 -----		ASME(ANSI) Class 600 LB
	090 -----		ASME(ANSI) Class 900 LB
	150 -----		ASME(ANSI) Class 1500 LB
	250 -----		ASME(ANSI) Class 2500 LB
	000 -----		Option
Option		/□□□	

# INTEGRAL ORIFICE



## DESCRIPTION

### Integral Orifice the One-Piece DP Flow Meter

#### Integral Orifice is an orifice-based flow meter with a difference

- Its advanced design greatly simplifies installation and commissioning

#### Integral Orifice is a stand-alone, orifice-based flow meter that incorporates all the following features:

- Integral 3-valve manifold
- Integral connections between the carrier tappings and manifold
- DP transmitter, factory-mounted onto the manifold and pre-configured for the application
- Fully leak-tested and configured

## DISTINCTIVE

### Integral Orifice is an orifice-based flow meter with a difference

- Combines primary element with DP Transmitter in a single flow meter assembly

### One-piece flowmeter, pressure tested as an assembly

- Improved reliability with no leaks to trace and rectify
- Integral multivariable transmitter and RTD for INTEGRAL reading of mass (liquids and steam) and corrected volume (gas) flow rates in a single unit

### Integral impulse connections

- No impulse piping installation required
- Provides repeatable DP connection across installation locations

### Reduced cost of installation

- Only one piece to install
- Eliminates need to supply and connect separate manifold

### Easy to specify

- Single ordering code covers complete flowmeter
- Only two orifice ratios simple specification process



# INTEGRAL ORIFICE



## ■ Model : DHIO-FM



The integral orifice is a flow element capable of being close coupled with differential pressure transmitters to make a complete flow meter. It provides easy-to-install, low-cost measurement of the small flows found frequently in plant metering operations and research projects. It can be ordered with internal NPT threads or flanged pipe runs, welded both upstream and downstream of the flow restriction.

The orifice assembly may be directly mounted to the transmitter or remote using optional adapter kit 155S711.

## ■ Model : DHIO-BN



Integral Orifice Block Type—a compact flow meter, providing measurement integrally in mass units for liquids and steam. Gas flow is measured integrally in reduced volume units.

## ■ Model : DHIO-BY



## ■ SPECIFICATIONS

### Fluids

- Liquids, gases and saturated steam

### Materials

- Orifice assembly, stem and manifold : 316L  
Orifice Body : 304 SS, 304L SS, 316 SS, 316L SS

### Process Connections

- Wafer body to fit between the following flange drillings:  
- ASME B16.5 (ANSI) Class 150, 300, 600, 900, 1500#

### Line Sizes

- 15A, 25A, 40A, 50A, 80A, 100A, 150A, 200A  
(1/2", 1 in., 1 1/2 in., 2 in., 3 in., 4 in., 6 in., 8 in.)

### Temperature limited

- Process : -40 to 121 °C (-4 to 250 °F)  
- Ambient : -40 to 70 °C (-4 to 158 °F)



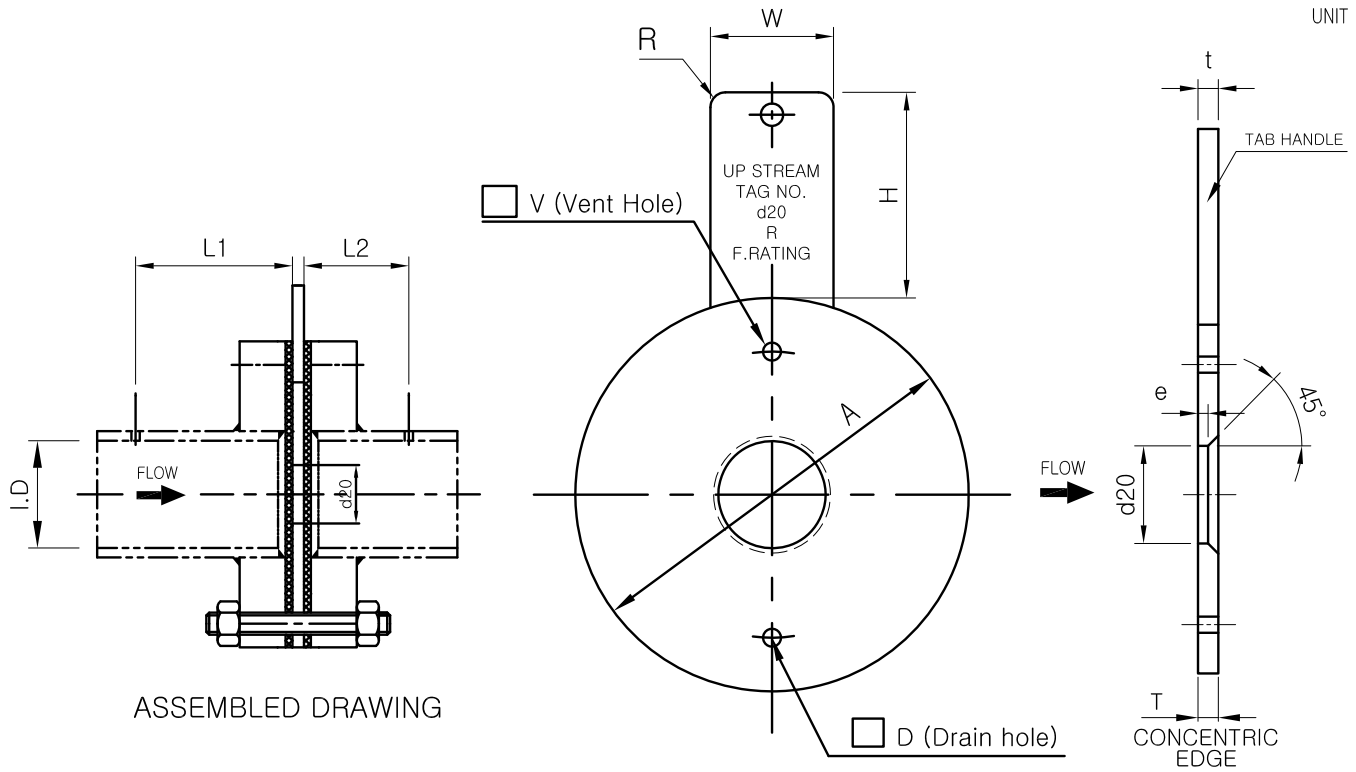
# INTEGRAL ORIFICE



MODEL	SUFFIX CODES	DESCRIPTION
DHIO-□□	FM -----	Flange & Meter Run Included
	BN -----	Block Type Meter Run Excluded
	BY -----	Block Type Meter Run Included
Nominal Pipe Size	□□□ -----	Pipe size in inch or mm
Material Plate or Block / Meter Run	CS -----	Carbon Steel
	4S -----	304SS
	4L -----	304L SS
	6S -----	316SS
	6L -----	316L SS
	OP -----	Option
Mounting Connection	015 -----	ASME(ANSI) Class 150 LB
	030 -----	ASME(ANSI) Class 300 LB
	060 -----	ASME(ANSI) Class 600 LB
	090 -----	ASME(ANSI) Class 900 LB
	150 -----	ASME(ANSI) Class 1500 LB
	000 -----	Option
Indicator	V -----	Volumetric
	M -----	Mass
OutPut	A -----	4~20mA
	V -----	1~5V
Option		/□□□

# ORIFICE PLATES FOR PN10 FLANGE

UNIT : mm



NO.	SIZE	TAG NO	d20	V or D	I.D	L1	L2	Q'TY	REMARK
1	1800A	FE-001	1206.38	-	1790	1790±179	895±89	1	

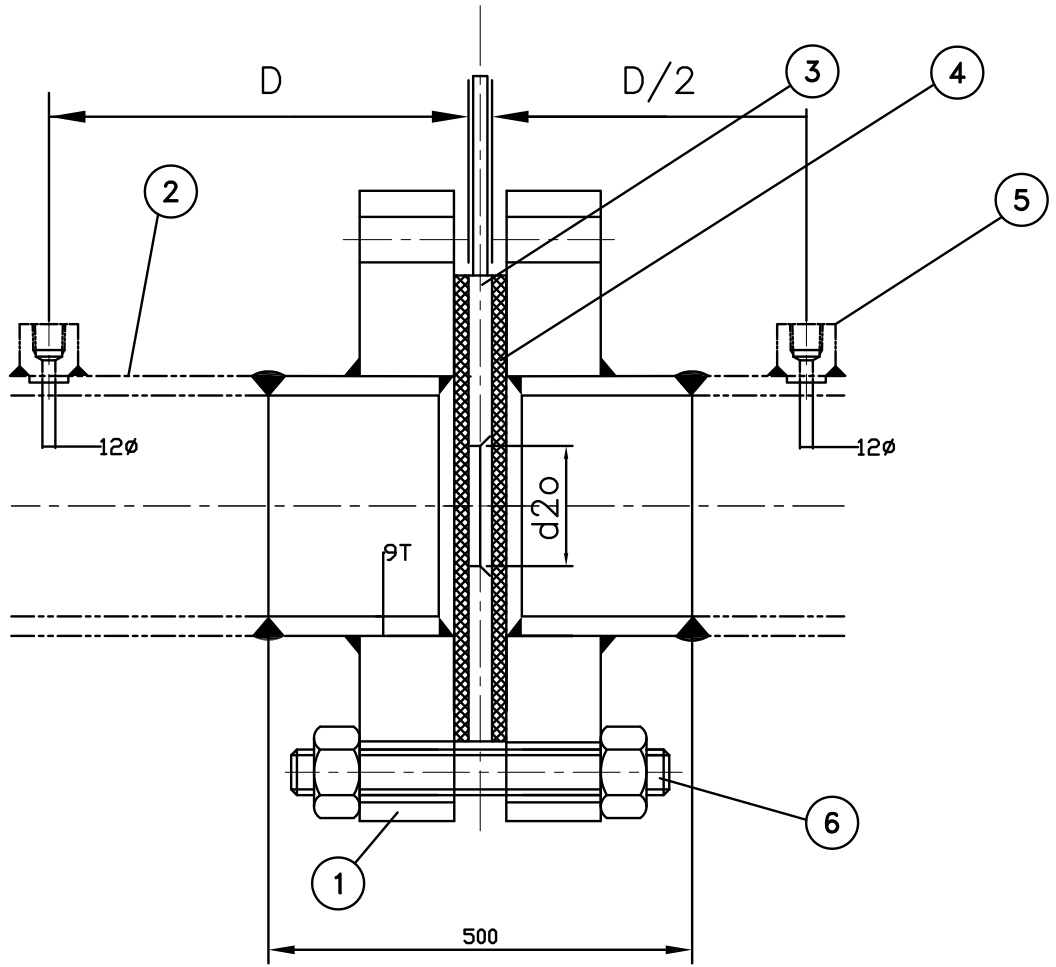
NOMINAL PIPE SIZE	OUTSIDE DIAMETER OF PLATE A	THICKNESS OF EDGE	DIAMETER OF HOLE (V or D)	THICKNESS OF PLATE T	TAB HANDLE		
					WIDTH W	HEIGHT H	THICKNESS t
72	1972	5~12	-	15	60	190	10

PROJECT NAME							광양 2교로 송풍				
TITLE							ORIFICE PLATE				
DRAWN	CHECKED	REVIEWED	APPROVED	SCALE	REV. No						
Oh Tae Ho	Jeong Su Hae	Gopi Jagan	Park Il Hwan	N/S	△						
DATE : 15. 09. 07			MODEL			DRAWING NO		MATERIAL			
SHEET : 01 OF 02			DHOFF-W-D-1800-6S/CS-PN10-1-N			ANSI-150#.dwg		Plate:316SS Flange:A105			



DAEHAN INSTRUMENT CO.,LTD.

# PN10 FLANGE



&d20: Refor to calculation sheet

6	BOLT & NUT	A193 B7	44	M45 X 300L	STUD
5	BOSS	A105	2	PT 1/2	USER SCOPE
4	GASKET		2	DN1800	MAX 350 °C
3	PLATE	SUS316	1	DN1800	
2	PIPE	C/S		DN1800	USER SCOPE
1	FLANGE	A105	2	PN 10 DN1800	
NO.	PARTS NAME	MATERIAL	Q'TY	STANDARD	REMARK

SIZE	FLANGE O.D	BOLT CIRCLE DIAM.	D	D/2
72B (1800A)	2115	2020	1790±179	895±89

PROJECT NAME		광양 2고로 송풍			
TITLE		ORIFICE ASSEMBLY			
DRAWN	CHECKED	REVIEWED	APPROVED	SCALE	REV. No
Oh Tae Ho	Jeong Su Hae	Gopi Jagan	Park Il Hwan	N/S	1
DATE : 15. 09. 17	MODEL		DRAWING NO	MATERIAL	
SHEET : 02 OF 02	DHOF-W-D-1800-6S/CS-PN10-1-N		ANSI-150#.dwg	Plate:316SS Flange:A105	

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