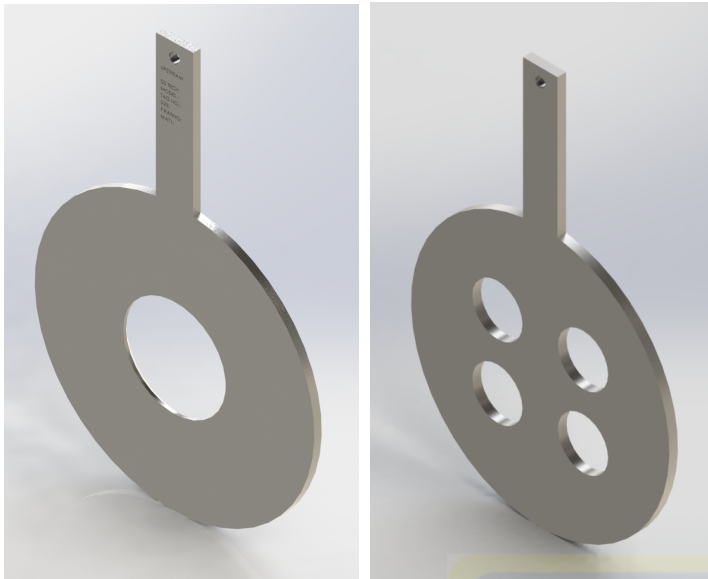


ORIFICE PLATE & FLANGE



MODEL : DHIF-O200 SERIES

DAEHAN & DS INSTRUMENT CO.,LTD



SPECIFICATIONS

ORIFICE BORE TYPE

- Concentric Square Edged Type
- Eccentric Type
- Segmental Type
- Quadrant Type
- Multi Hole Type

Tap Type

- Flange Taps
- Radius Tasp(Vena Contracta Taps)

FLOW CALCULATION STANDARDS

- ISO 5167-2, ASME MFC 14M and 3M

FLANGE RATING

- JIS 10, 16, 20, 30, 40 and 63K
- ANSI class 150, 300, 600,900,1500,2500#

NOMINAL PIPE SIZES AVAILABLE

- 15mm ~ 2,400 mm(1/2"~96")

MATERIAL

- Carbon steel
- Stainless Steel (304SS,316SS,321SS,321H)
- Low Alloy (A335-P5,P9,P11,P12,P22,P91)

ACCURACY

- Typically $\pm 0.5 \sim 0.75\%$ un-Calibrated
 $\pm 0.5\%$ Calibrated.

MARKINGS

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

MODEL :DHIF-O210

DESCRIPTION

Orifice plates are most commonly used primary elements for flow measurement in pipelines based on the principle of measurement of "differential pressure"created when an obstruction is placed in the fluid flow, due to increase in fluid velocity.

Orifice plates cover a wide range of applications of fluid and operating conditions. They give an acceptable level of uncertainties at lowest cost and long life without regular maintenance.

We manufacture orifice plates, restriction orifice plates, with or without carrier ring, meter run assemblies,integral orifice plates to suit customer's requirements.

We have fully equipped integrated designing, manufacturing and testing facilities which are among the best in country. Over the years we have manufactured and supplied orifice plate assemblies to many prestigious projects in the domestic as well as international market.

PRINCIPLES OF THE METHOD OF MEASUREMENT AND COMPUTATION

The principle of the method of measurement is based on the installation of an orifice plate into a pipeline in which a fluid is running full. The presence of the orifice plate causes a static pressure difference between the upstream and downstream sides of the plate.

The mass flowrate, q_m , can be determined using Equation:

$$q_m = \frac{C}{\sqrt{1-\beta^4}} \varepsilon \frac{\pi}{4} d^2 \sqrt{2\Delta P \rho_1}$$

* ISO 5167-2:2003(E.)

ORIFICE PLATE & FLANGE



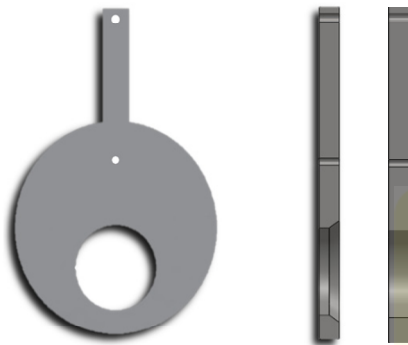
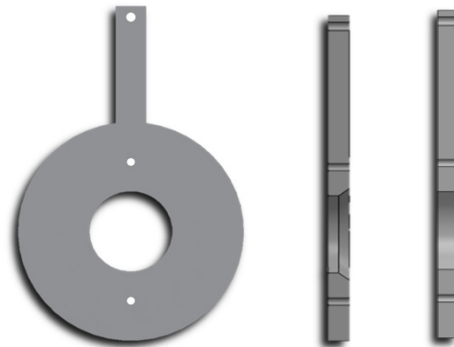
MODEL : DHIF-O200 SERIES

DAEHAN & DS INSTRUMENT CO.,LTD

ORIFICE BORE TYPE

▶ CONCENTRIC SQUARE EDGED

These are most commonly used for flow measurement. This has special features such as simple structures, high accuracy, and ease of installation & replacement. The orifice plate are correctly finished to the dimensions, surface roughness, and flatness to the applicable standard. These plate are recommended for clean liquids, gases & steam flow, when the Reynolds number ranges from 10000 to 10^7



▶ ECCENTRIC

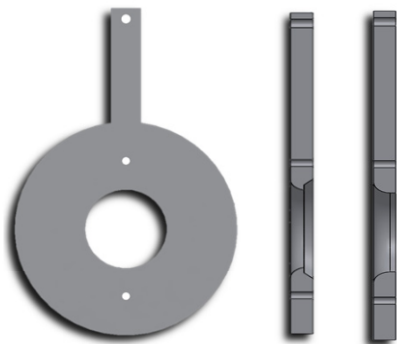
Eccentrically bored plates are plates with the Orifice off center, or eccentric, as opposed to concentric. The bore of the eccentric Orifice normally is inscribed in a circle with is 98% of the pipe diameter, so that solids or slurries may passthrough, Eccentric Orifice plates are used in many industries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



▶ SEGMENTAL

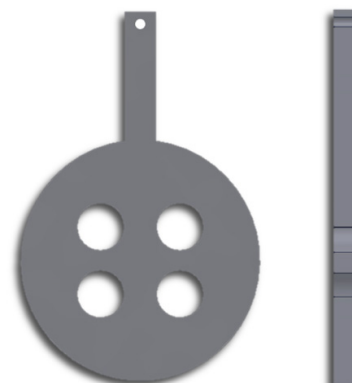
Segmental bore Orifice plates are provided for measurements where solides are entrained in a gas or liquid flow stream. The circular portion of the bore is inscribed within a circle which is normally 98% of the pipe diameter.

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 conditionina. paper.and petrochemical.



▶ QUADRANT DEGE

The inlet edge of the bore of this orifice plate is rounded with a radius of a quarter circle. The quadrant-edged orifice is recommended for measurement fo flows with Reynolds Number between 2000 to 10000



▶ MULTI HOLE TYPE

The flow to condition itself as it is forced through the multi holes thereby removing the requirement for a flow conditioner.

Because of this phenomenon, Conditioning Orifice Plates provide superior performance in short straight pipe run and tight fit applications.

ORIFICE PLATE & FLANGE



MODEL : DHIF-O200 SERIES

DAEHAN & DS INSTRUMENT CO.,LTD

REQUIRED STRAIGHT LENGTHS BETWEEN ORIFICE PLATES AND FITTINGS

Diameter	Upstream(inlet) side of orifice plate												Down-stream
	Single 90bend Two 90bends in any plane	Two 90bends in the same plane :	Two 90bends in the same plane	Two 90 bends in perpendicular planes	Two 90 bends in perpendicular planes	Single 90 tee with or without an extension on mitre 90 bend	single 45 bend two 45bends in the same plane	concentric reducer 2d to D over a length of 1.5D to 3D	Concentric expander 0.5D to D over a length of D to 2D	Full bore ball valve or gate valve fully open	Abrupt symmetrical reduction	Thermometer pocket or well of diameter	
Diameter ratio (β)	2	3	4	5	6	7	8	9	10	11	12	13	14
-	Ae(Bf)	Ae(Bf)	Ae(Bf)	Ae(Bf)	Ae(Bf)	Ae(Bf)	Ae(Bf)	Ae(Bf)	Ae(Bf)	Ae(Bf)	Ae(Bf)	Ae(Bf)	Ae(Bf)
0.2	6(3)	10(10)	10(10)	19(18)	34(17)	3(3)	7(7)	5(5)	6(6)	12(6)	30(15)	5(3)	4(2)
0.4	16(3)	10(10)	10(10)	44(18)	50(25)	9(9)	30(9)	5(5)	12(8)	12(6)	30(15)	5(3)	6(3)
0.5	22(9)	18(10)	22(10)	44(18)	75(34)	19(18)	30(18)	8(5)	20(9)	12(6)	30(15)	5(3)	6(3)
0.6	42(13)	30(18)	42(18)	44(18)	65(25)	29(18)	30(18)	9(5)	26(11)	14(7)	30(15)	5(3)	7(4)
0.67	44(20)	44(18)	44(20)	44(20)	60(18)	36(18)	44(18)	12(6)	28(14)	18(9)	30(15)	5(3)	7(4)
0.75	44(20)	44(18)	44(22)	44(20)	75(18)	44(18)	44(18)	13(8)	36(18)	24(12)	30(15)	5(3)	8(4)

NOTE 1 The minimum straight lengths required are the lengths between various fitting located upstream or downstream of the orifice and the orifice plate itself. Straight lengths shall be measured from the downstream end to the curved portion to the nearest(or only) bend or of the tee or the downstream end of the curved or conical portion of the reducer or the expander.

NOTE 2 Most of the bends on which the lengths in this table are based had a radius of curvature equal to 1.5D.

a This is not a good upstream installation; a flow conditioner should be used where possible.

b The installation of thermometer pockets or wells will not alter the required minimum upstream straight lengths for the other fittings.

c A thermometer pocket or well of diameter between 0.03D and 0.13D may be installed provided that the values in Columns A and B are

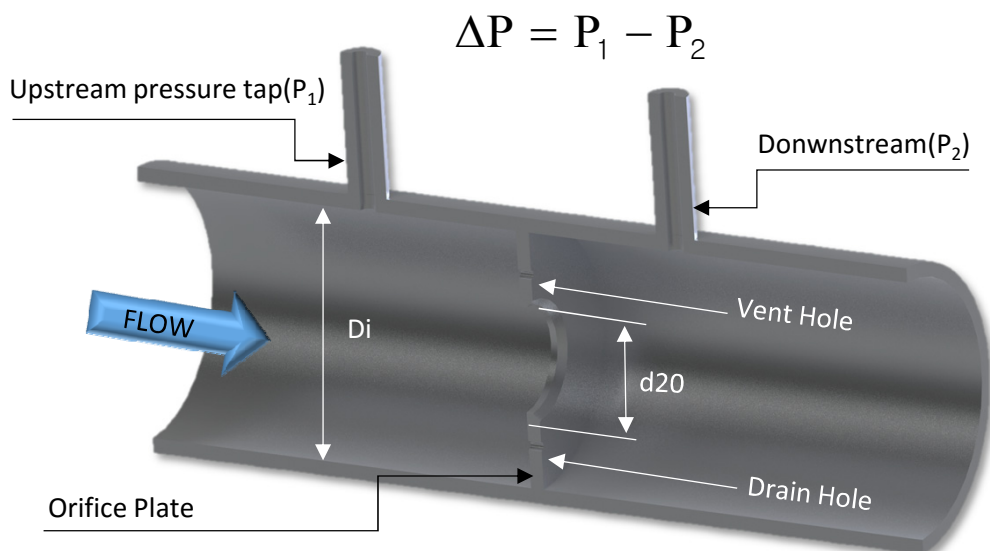
increased to 20 and 10 respectively. Such an installation is not, however, recommended.

d Column A for each fitting gives lengths corresponding to "Zero additional uncertainty" values.

e Column B for each fitting gives lengths corresponding to "0.5% additional uncertainty" values.

f The straight length in Column A gives zero additional uncertainty; data are not available for shorter straight lengths which could be used to give the required straight lengths for Column B.

PRINCIPLES OF THE ORIFICE

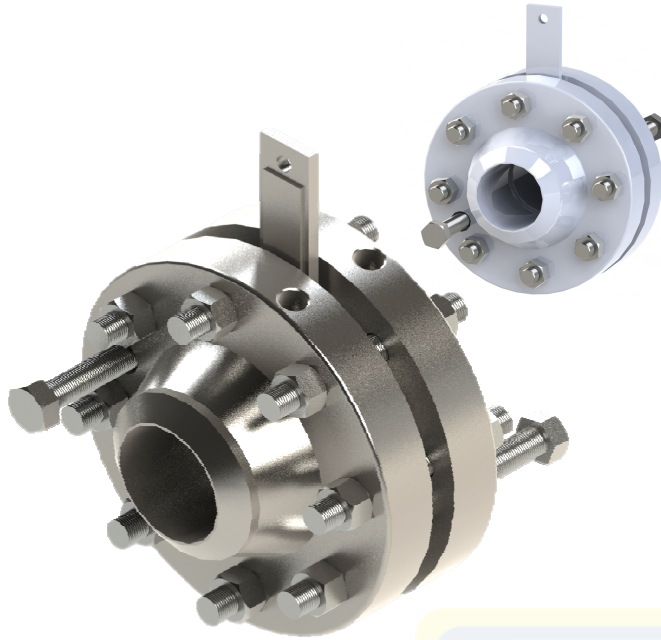


ORIFICE PLATE & FLANGE



MODEL : DHIF-O200 SERIES

DAEHAN & DS INSTRUMENT CO.,LTD



MODEL : DHIF-O220

SPECIFICATIONS

ORIFICE PLATE

ORIFICE BORE TYPE

- Concentric Square Edged Type
- Eccentric Type
- Segmental Type
- Quadrant Type

FLOW CALCULATION STANDARDS

- ISO 5167-2, ASME MFC 14M and 3M

FLANGE RATING

- JIS 10, 16, 20, 30, 40 and 63K
- ANSI class 150, 300, 600,900,1500,2500#

NOMINAL PIPE SIZES AVAILABLE

- 15mm ~ 3200 mm(1/2"~128")

MATERIAL

- Carbon steel
- Stainless Steel (304SS,316SS,321SS,321H)
- Low Alloy (A335-P5,P9,P11,P12,P22,P91)

ACCURACY

- Typically $\pm 0.5 \sim 0.75\%$ un-Calibrated
 $\pm 0.5\%$ Calibrated.

ORIFICE FLANGE ASSEMBLY

ORIFICE FLANGE TYPE

- Weld Neck Type
- Socket Weld Type
- Slip On Type
- Ring Joint Type

GASKET

- Spiral Wound Gaskets
- Material : Metal Gasket,Non Asbestos,Graphite.

PIPING CONNECTION METHOD

- ANSI 150#: Insertion Welding Type (Slip-on Type)
- ANSI 300,600#: Butt Welding Type (Welding Neck Type)
- ANSI 900,1500,2500#: Butt Welding Type (Ring Joint Type)

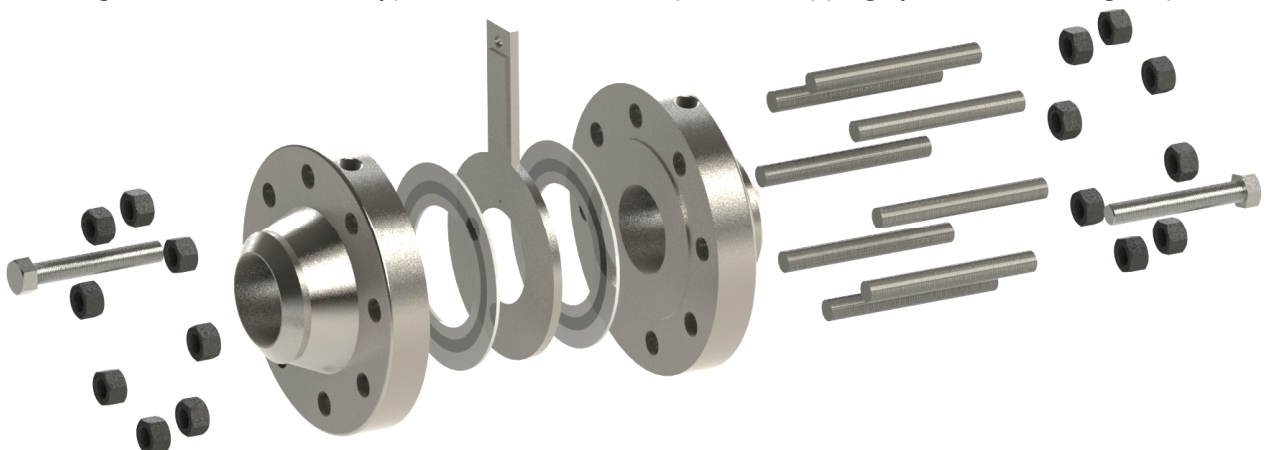
Bolt & Nuts

- Stud bolts: A193-B7,A193-B8,A193-B8M
- Nuts : A194-2H,A194-8,A194-8M

DESCRIPTION

Orifice flange assembly is used in conjunction with orifice plate for flow measurement of smaller or medium size pipes at lower or medium pressure ranges.

The flange connection is a RF type and the differential pressure tapping system is the flange taps



ORIFICE PLATE & FLANGE



MODEL : DHIF-O200 SERIES

DAEHAN & DS INSTRUMENT CO.,LTD

ORDERING INFORMATION

Main order	CODE	DESCRIPTION
1.Base Model	DHIF-O200 SERIES	Base Model
2.Type	O210	Orifice Plate
	O220	Orifice Plate & Flange
3.Bore Type	C	Concentric Type
	E	Eccentric Type
	S	Segmental Type
	Q	Quadrant Type
	MH	Multi Hole Type
4. Line Size	□□□ A	Pipe Size (mm)
5. Plate/Flange Material	A	316SS(316LSS)
	B	304SS(304LSS)
	C	Carbon steel
	O	Option
6. Flange Rating	015	ANSI/ASME 150LB
	030	ANSI/ASME 300LB
	060	ANSI/ASME 600LB
	090	ANSI/ASME 900LB
	150	ANSI/ASME 1500LB
	250	ANSI/ASME 2500LB
	000	Option
7. Tap Type & Size	A	NPT 1/2"
	B	SW 1/2"
	C	NPT 3/4"
	D	SW 3/4"
8. Taps Q'ty	1	1 Pair
	2	2 Pair
	3	3 Pair
	4	4 Pair
9. Valve	V	Valve Include
	E	Valve Exclude
10. Option	OP	Option

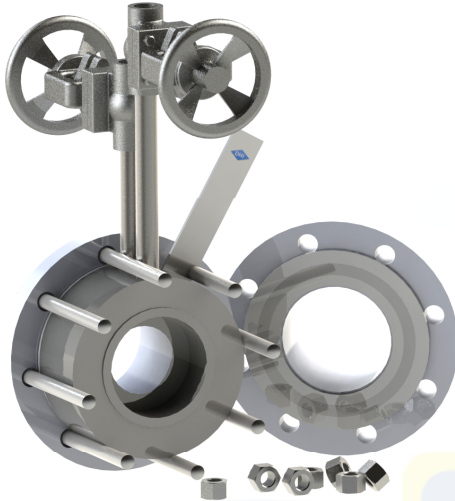
RING TYPE ORIFICE



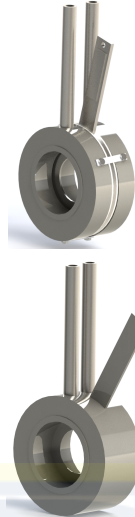
MODEL : DHIF-O200 SERIES

DAEHAN & DS INSTRUMENT CO.,LTD

SPECIFICATIONS



MODEL : DHIF-O232



PRESSURE TAPS

- Corner Taps

Type

- Separated Type
- Integral Bolck Type

FLOW CALCULATION STANDARDS

- ISO 5167-2, ASME MFC 14M and 3M

FLANGE RATING

- JIS 10, 16, 20, 30, 40 and 63K
- ANSI class 150, 300, 600,900,1500,2500#

NOMINAL PIPE SIZES AVAILABLE

- 15mm ~ 600 mm(1/2"~24")

MATERIAL

- Carbon steel
- Stainless Steel (304SS,316SS,321SS,321H)
- Low Alloy (A335-P5,P9,P11,P12,P22,P91)

ACCURACY

- Typically $\pm 0.5 \sim 0.75\%$ un-Calibrated
- $\pm 0.5\%$ Calibrated.

FLANGE TYPE

- Weld Neck Type
- Socket Weld Type
- Slip On Type
- Ring Joint Type

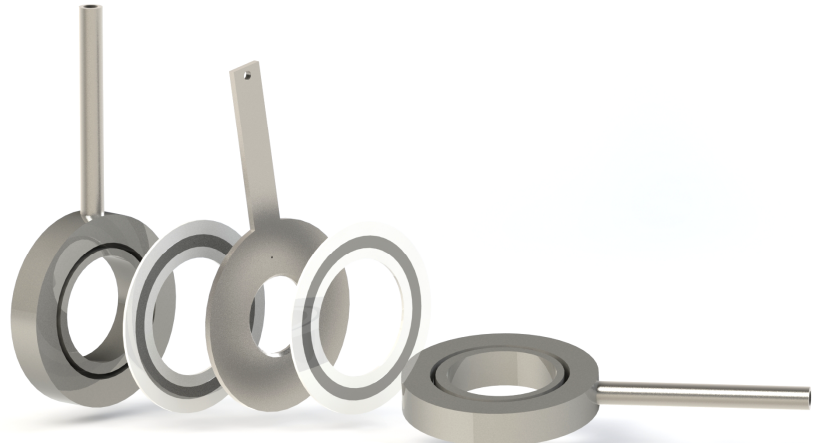
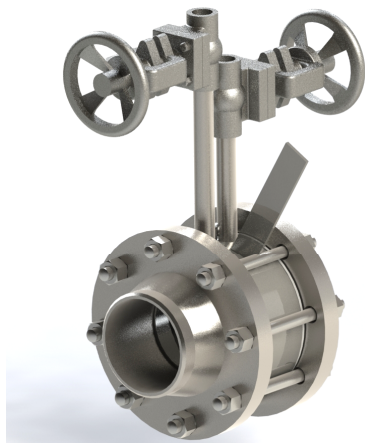
PIPING CONNECTION METHOD

- ANSI 150#: Insertion Welding Type (Slip-on Type)
- ANSI 300,600#: Butt Welding Type (Welding Neck Type)
- ANSI 900,1500,2500#: Butt Welding Type (Ring Joint Type)

DESCRIPTION

Orifice ring assemblies are used for flow measurement of smaller or medium sized pipes at lower pressure. Each assembly consists of one orifice plate and two orifice rings at lower pressure. Each assembly two orifice rings. Differential pressure is taken out in a corner tap system.

Orifice block, which are of a unit-construction type and provide higher pressure ratings than the orifice ring assemblies, also are available.



RING TYPE ORIFICE



MODEL : DHIF-O200 SERIES

DAEHAN & DS INSTRUMENT CO.,LTD

ORDERING INFORMATION

Main order	CODE	DESCRIPTION
1.Base Model	DHIF-O200 SERIES	Base Model
2.Type	O231	Separated Ring Type
	O232	Integral Block Ring Type
3.Bore Type	C	Concentric Type
	E	Eccentric Type
	S	Segmental Type
	Q	Quadrant Type
	MH	Multi Hole Type
4. Line Size	□□□ A	Pipe Size (mm)
5. Plate/Ring Material	A	316SS(316LSS)
	B	304SS(304LSS)
	C	Carbon steel
	O	Option
6. Flange Rating	015	ANSI/ASME 150LB
	030	ANSI/ASME 300LB
	060	ANSI/ASME 600LB
	090	ANSI/ASME 900LB
	150	ANSI/ASME 1500LB
	250	ANSI/ASME 2500LB
	000	Option
7. Tap Type & Size	A	NPT 1/2"
	B	SW 1/2"
	C	NPT 3/4"
	D	SW 3/4"
8. Taps Q'ty	1	1 Pair
	2	2 Pair
	3	3 Pair
	4	4 Pair
9. Valve	V	Valve Include
	E	Valve Exclude
10. Option	OP	Option

INTEGRAL ORIFICE



MODEL : DHIF-O200 SERIES

DAEHAN & DS INSTRUMENT CO.,LTD



SPECIFICATIONS

PRESSURE TAPS

- Corner Taps

Type

- Union Type
- Integral Bolck Type

FLOW CALCULATION STANDARDS

- ISO 5167-2, ASME MFC 14M Honed Orifice

FLANGE RATING

- JIS 10, 16, 20, 30, 40 and 63K
- ANSI class 150, 300, 600,900,1500,2500#

NOMINAL PIPE SIZES AVAILABLE

- 15mm ~ 600 mm(1/2"~24") : Block Type
- 15mm ~ 40 mm(1/2"~1/2") : Union Type

MATERIAL

- Carbon steel
- Stainless Steel (304SS,316SS,321SS,321H)
- Low Alloy (A335-P5,P9,P11,P12,P22,P91)

ACCURACY

- Typically $\pm 0.5 \sim 0.75\%$ un-Calibrated
- $\pm 0.5\%$ Calibrated.

MODEL :DHIF-O242

FLANGE ASSEMBLY

FLANGE TYPE

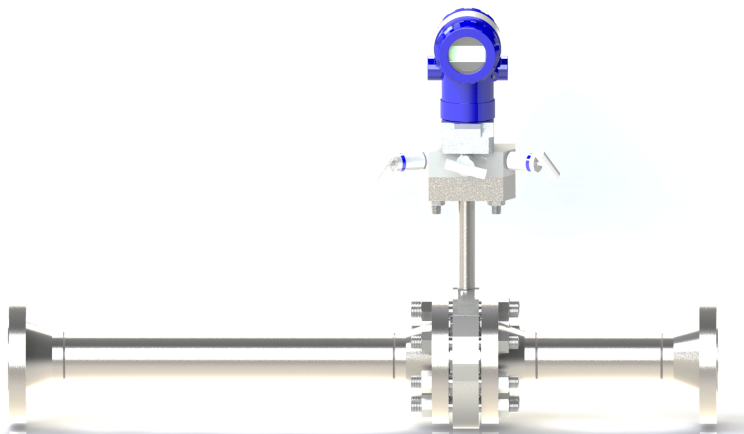
- Weld Neck Type
- Socket Weld Type
- Slip On Type
- Ring Joint Type

PIPING CONNECTION METHOD

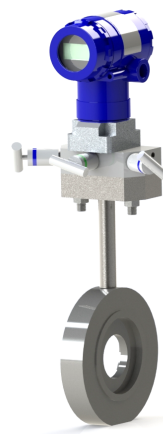
- ANSI 150#: Insertion Welding Type (Slip-on Type)
- ANSI 300,600#: Butt Welding Type (Welding Neck Type)
- ANSI 900,1500,2500#: Butt Welding Type (Ring Joint Type)

DESCRIPTION

Integral orifice primary element utilizes a self centering orifice plate design to eliminate installation error. Enables highly accurate flow measurement in small line sizes. Available with a variety of process connections.



BLOCK METER RUN INCLUDED TYPE (DHIF-O242)



BLOCK TYPE (DHIF-O241)



UNION TYPE (DHIF-O243)

INTEGRAL ORIFICE



MODEL : DHIF-O200 SERIES

DAEHAN & DS INSTRUMENT CO.,LTD

ORDERING INFORMATION

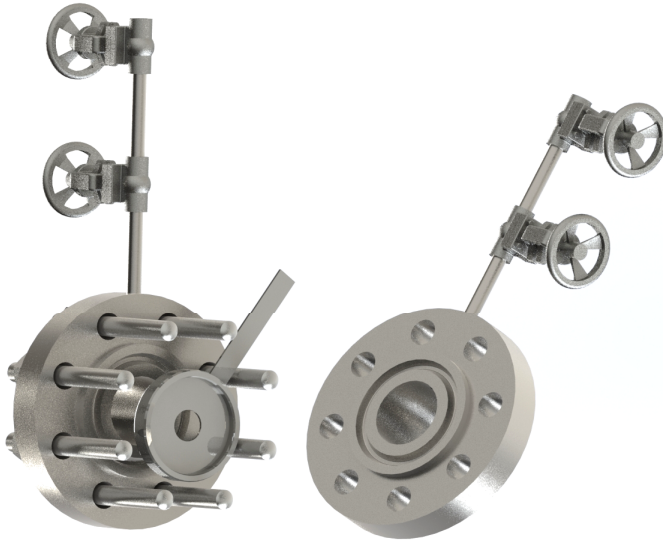
Main order	CODE	DESCRIPTION
1.Base Model	DHIF-O200 SERIES	Base Model
2.Type	O241	Block Type Meter run excluded
	O242	Block Type Meter run Included
	O243	Union Type
3.Bore Type	C	Concentric Type
	E	Eccentric Type
	S	Segmental Type
	Q	Quadrant Type
	MH	Multi Hole Type
4. Line Size	□□□ A	Pipe Size (mm)
5. Plate/Flange/Pipe Material	A	316SS(316LSS)
	B	304SS(304LSS)
	C	Carbon steel
	O	Option
6. Flange Rating	015	ANSI/ASME 150LB
	030	ANSI/ASME 300LB
	060	ANSI/ASME 600LB
	090	ANSI/ASME 900LB
	150	ANSI/ASME 1500LB
	250	ANSI/ASME 2500LB
	000	Option
7. Tap Type & Size	A	NPT 1/2"
	B	SW 1/2"
	C	NPT 3/4"
	D	SW 3/4"
8. Taps Q'ty	1	1 Pair
	2	2 Pair
	3	3 Pair
	4	4 Pair
9. Option	OP	Option

HIGH PRESSURE ORIFICE



MODEL : DHIF-O200 SERIES

DAEHAN & DS INSTRUMENT CO.,LTD



SPECIFICATIONS

PRESSURE TAPS

- Flange Type

Type

- Oval Type
- Octagonal Type

FLOW CALCULATION STANDARDS

- ISO 5167-2, ASME MFC 14M and 3M
- AGA-3

FLANGE RATING

- JIS 10, 16, 20, 30, 40 and 63K
- ANSI class 150, 300, 600,900,1500,2500#

NOMINAL PIPE SIZES AVAILABLE

- 15mm ~ 600 mm(1/2"~24") : Block Type
- 15mm ~ 40 mm(1/2"~1/2") : Union Type

MODEL :DHIF-O252

MATERIAL

- Carbon steel
- Stainless Steel (304SS,316SS,321SS,321H)
- Low Alloy (A335-P5,P9,P11,P12,P22,P91)

ACCURACY

- Typically $\pm 0.5 \sim 0.75\%$ un-Calibrated
- $\pm 0.5\%$ Calibrated.

FLANGE TYPE

- Weld Neck Type
- Ring Joint Type

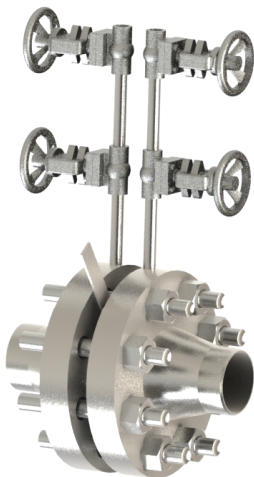
PIPING CONNECTION METHOD

- ANSI 300,600,900,1500,2500#

DESCRIPTION

A holding 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 holding 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 is normally the flange tap type.



HIGH PRESSURE ORIFICE



MODEL : DHIF-O200 SERIES

DAEHAN & DS INSTRUMENT CO.,LTD

ORDERING INFORMATION

Main order	CODE		DESCRIPTION
1.Base Model	DHIF-O200 SERIES		Base Model
2.Type	O251		Plate Only
	O252		Orifice Plate & Flange
3.Bore Type	C		Concentric Type
	E		Eccentric Type
	S		Segmental Type
	Q		Quadrant Type
	MH		Multi Hole Type
4. Line Size	□□□ A		Pipe Size (mm)
5. Plate/Flange Material	A		316SS(316LSS)
	B		304SS(304LSS)
	C		Carbon steel
	O		Option
6. Flange Rating	030		ANSI/ASME 300LB RTJ
	060		ANSI/ASME 600LB RTJ
	090		ANSI/ASME 900LB RTJ
	150		ANSI/ASME 1500LB RTJ
	250		ANSI/ASME 2500LB RTJ
	000		Option
7. Tap Type & Size	A		NPT 1/2"
	B		SW 1/2"
	C		NPT 3/4"
	D		SW 3/4"
8. Taps Q'ty	1		1 Pair
	2		2 Pair
	3		3 Pair
	4		4 Pair
9. Valve	V		Valve Include
	E		Valve Exclude
10. Valve Q'ty	1		1 Pair
	2		2 Pair
11. Option	OP		Option

HIGH ACCURACY ORIFICE



MODEL : DHIF-O200 SERIES

DAEHAN & DS INSTRUMENT CO.,LTD



MODEL :DHIF-O261

SPECIFICATIONS

PRESSURE TAPS

- Flange Taps

ACCURACY

- Typically $\pm 0.25\%$ Calibrated

CONNECTION

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

FLOW CALCULATION STANDARDS

- ISO 5167-2, ASME MFC 14M and 3M

FLOW STRAIGHTENER TYPE

- 19TUBE BUNDLE
- ZANKER
- Etoile

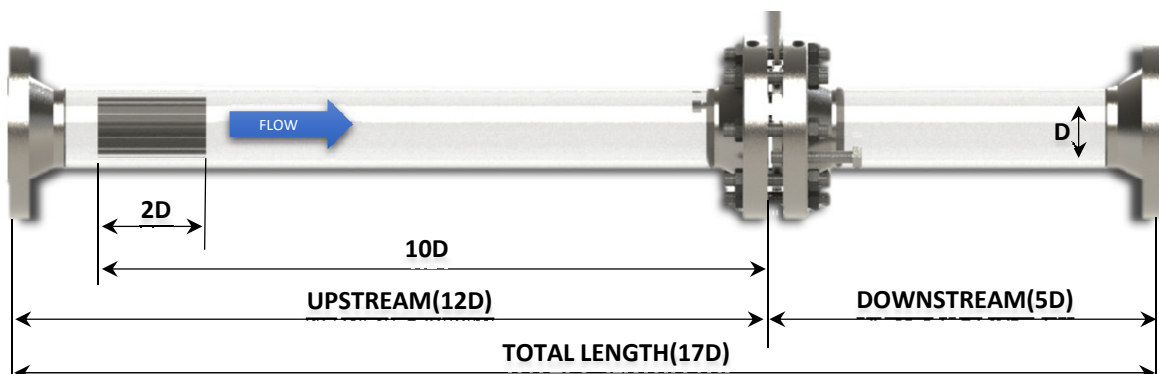
COMPOSITION

- Orifice Plate
- Orifice Flange
- Flow Straightener(Conditioner)
- Meter run Pipe
- Bolt & Nuts
- Gasket

DESCRIPTION

These flange & meter run tube, flow conditioner include high accuracy orifice assembly.

For applications demanding a high accuracy flow measurement from the flow element, the upstream and downstream pipe section must be attached to a so-called meter run assembly, such as the orifice assembly.



HIGH ACCURACY ORIFICE



MODEL : DHIF-O200 SERIES

DAEHAN & DS INSTRUMENT CO.,LTD

ORDERING INFORMATION

Main order	CODE	DESCRIPTION
1.Base Model	DHIF-O200 SERIES	Base Model
2.Type	O261	Flow straightener Included
	O262	Flow straightener Excluded
3.Bore Type	C	Concentric Type
	E	Eccentric Type
	S	Segmental Type
	Q	Quadrant Type
	MH	Multi Hole Type
4. Line Size	□□□ A	Pipe Size (mm)
5. Plate/Flange/Pipe/Straightener Material	A	316SS(316LSS)
	B	304SS(304LSS)
	C	Carbon steel
	O	Option
6. Flange Rating	015	ANSI/ASME 150LB
	030	ANSI/ASME 300LB
	060	ANSI/ASME 600LB
	090	ANSI/ASME 900LB
	150	ANSI/ASME 1500LB
	250	ANSI/ASME 2500LB
	000	Option
7. Tap Type & Size	A	NPT 1/2"
	B	SW 1/2"
	C	NPT 3/4"
	D	SW 3/4"
8. Taps Q'ty	1	1 Pair
	2	2 Pair
	3	3 Pair
	4	4 Pair
9. Flow Straightener	T	Tube Bundle
	E	Etoile
	Z	Zanker
	O	Option
10. DP Transmitter & 3Way Manifold valve	T	Include
	E	Exclude
11. Option	OP	Option