General Specifications

Model FOR
Orifice Plate With Ring

GS 06E01C01-00E

Model FOR Orifice Plate with Ring is a differential-pressure type primary device used to produce a fluid flow restriction in a pipeline. The differential pressure across the orifice plate is proportional to the square of the fluid velocity. The differential pressure is applied to the integral pressure taps through ring slits in the corner formed by the ring wall and the orifice plate. Model FOR orifices are used in small and medium pipe size applications and in low pressure service.

■ STANDARD SPECIFICATIONS

Orifice Bore Type:

Concentric Sharp Edge Orifices.
Concentric Quadrant Edge Orifices. (see Note1)

Standard Conformance:

Concentric Sharp Edge Orifices: JIS Z 8762-2: 2007 (ISO 5167-2: 2003).
Concentric Quadrant Edge Orifices: Royal Dutch Shell Laboratory Report 1312M.

Pressure Taps: Corner taps

Nominal Pipe Sizes:

Concentric Sharp Edge Orifices:
15 to 500 mm (1/2 to 20 inch)
Concentric Quadrant Edge Orifices:
15 to 200 mm (1/2 to 8 inch)

Materials:

Ring ; S25C, SUS 304, SUS 316 or SUS 316L stainless steel, Monel, Hastelloy C, Hastelloy B.
Orifice Plate;
SUS 304, SUS 316 or SUS 316L stainless steel Monel, Hastelloy C, Hastelloy B.
Tab Handle;
SUS 304 stainless steel
Titanium for Orifice plate material code TN
Pressure Tap Nipples and connection;
See Table 1

Table 1

Ring material	Material of pipe nipple for tap
S25C	1/2 inch STPG 370 Sch80 150 mm R (PT) 1/2 male
SUS304	1/2 inch SUS304 TP Sch80 150 mm R (PT) 1/2 male
SUS316	1/2 inch SUS316 TP Sch80 150 mm R(PT) 1/2 male

Gaskets: (see Table 2)

Used between plate and rings. Thickness 1.5 mm.
Tombo No. 1993 (Material: Nonasbestos Joint Sheet)
Valqua No. 7020 (Material: Valuqualon Sheet)
Valqua No. N7030 (Material: Fluorocarbon Jacketed Sheet) .

Flange Rating:

JIS 5, 10, 16 and 20 K
ANSI Class 150
JPI Class 150

Note 1: Minimum Concentric quadrant edged orifice diameter 4.5 mm.
Minimum Concentric quadrant edge radius 0.5 mm.

Table 2

Gasket No.	The range of application		Applications
	Heat resistance	Pressure tightness	
Tombo No.1993	-100 to 180°C	See right	water and oil of 2.94 MPa or less Saturated steam and Boiling water of 0.98 MPa or less
Valqua No.N7030	150°C or less	1.47 MPa or less	Nitric acid, Sulfuric acid, Hydrochloric acid, Hydrofluoric acid and Ammonia
Valqua No.7020	-200 to 200°C	See right	Chemotherapeutants and Gasseals of 2.94 MPa or less. Can not be used for high concentration alkalis and Hydrofluoric acid. Steam of 1.96 MPa or less.

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■ OPTIONS

Degrease cleaning Treatment:

Orifice plate and rings cleaned with acetone.
Use SUS 304 or SUS 316 stainless steel as ring material.
Optional code: **/S**

Drain Hole or Vent Hole:

Limited to 25.4 mm or over of orifice bore size.
With Drain Hole for Gas or Steam.
Optional codes:**/D**
With Vent Hole for Liquid.
Optional codes: **/G**

Tap Connection:

1/2 NPT male screw. Optional codes: **/TN**
15mm (1/2 inch) soket welding. Optional codes: **/TS**
15mm (1/2 inch) butt welding. Optional codes:**/TB**
15mm (1/2 inch) with flange. Optional codes: **/TF**

Material Certificate:

Reproduced material certificate for Orifice Plate, Ring and Tap Connection.
Optional codes: **/M01**
Reproduced material certificate for Orifice Plate, Ring and Tap Connection with flange.
Optional codes: **/M02**

■ ORDERING INSTRUCTIONS

When ordering or giving quotations, Specify;

1. Model, Suffix codes and Optional codes.
2. Orifice specification sheet.

■ RELATED DEVICES

Model FGC Flanges. . .Refer to GS 06E01F01-00E

■ MODEL AND SUFFIX CODES

Model	Suffix Codes	Description
FOR	.....	Model FOR Orifice Plate with Ring
Nominal Pipe Size □	.....	Size in mm; □ mm
Orifice Bore Type	-E	Concentric sharp edge orifice
	-Q	Concentric quadrant edge orifice (Less than Size 200mm only)
	H	With tab handle
	N	Without tab handle
	C	Corner taps
Ring Material	-CS	S25C
	-27	SUS 304
	-32	SUS 316
	-33	SUS 316L (See Note2)
	-MN	Monel (Size Note2)
	-HC	Hastelloy C (See Note2)
	-HB	Hastelloy B (See Note2)
Orifice Plate Material	27	SUS 304 stainless steel
	32	SUS 316 stainless steel
	33	SUS 316L (See Note2,3)
	MN	Monel (See Note2,3)
	HC	Hastelloy C (See Note2,3)
	HB	Hastelloy B (See Note2,3)
	TN	Titanium (See Note2,3)
Flange Rating	-05K	JIS 5 K
	-10K	JIS 10 K
	-16K	JIS 16 K
	-20K	JIS 20 K
	-150	ANSI Class 150
	-151	JPI Class 150
Gasket Material	-1993	Tombo No.1993
	-7020	Valqua No.7020
	-N703	Valqua No.N7030
Optional Codes		/□

Note 2: Less than Size 400mm only.
Note 3: Only for Concentric edge orifice.

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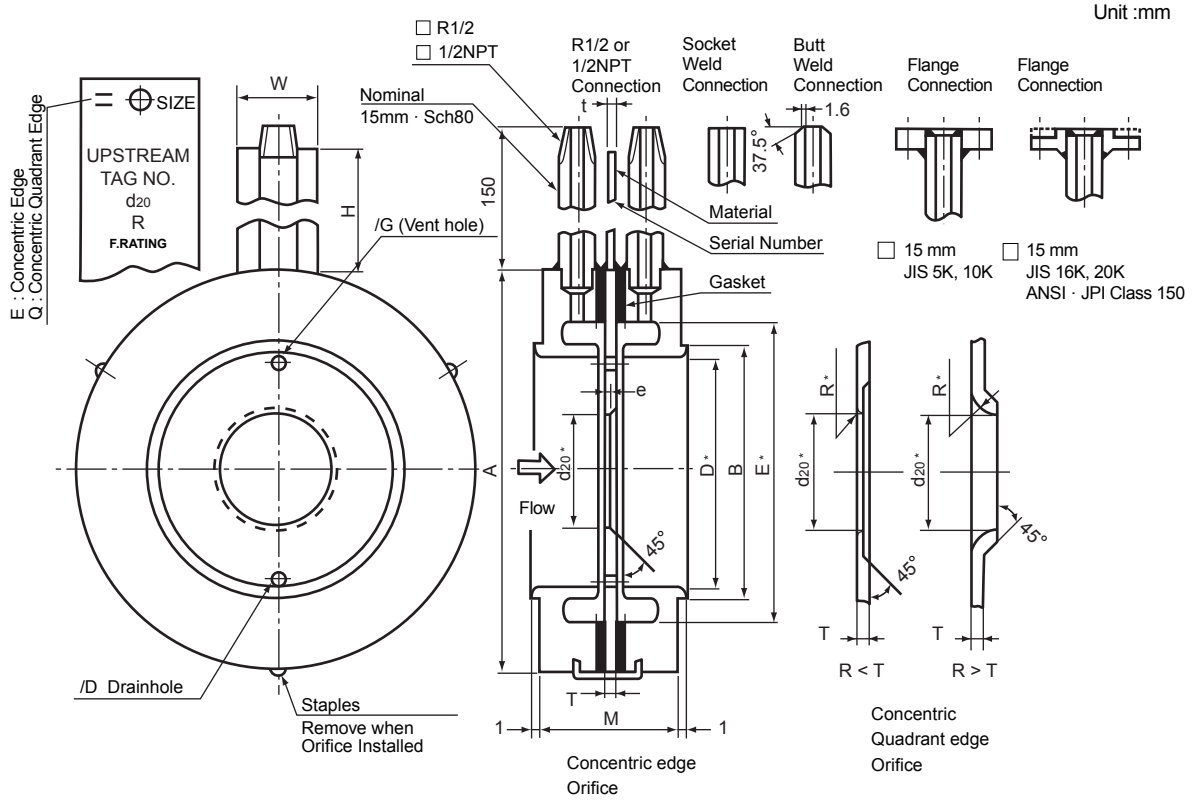
■ EXTERNAL DIMENSIONS (Nominal Pipe Size below 400 mm)

Unit :mm



* d_{20} : Orifice Diameter AT 20°C
R : Radius of Quadrant edge Orifice
D : Inside diameter of Rings.
E : Inside diameter of Gaskets
} Refer to Orifice Calculation Sheet.

Unit : mm
(appox. inch)

NOMINAL PIPE SIZE mm (inc)	OUTSIDE DIA. OF PLATE & RING A				DIAMETER GASKET OF STAY B	THICKNESS OF EDGE e	DIAMETER OF HOLE /G /D	FACE TO FACE M	THICK NESS OF PLATE T	Tab Handle		
	JIS 5K	JIS 10K	JIS 16K, 20K	ANSI JPI Class150						WIDE W	HIGHT H	THICK NESS t
15 (1/2)	—	58 (2.3)	58 (2.3)	—	21 (0.8)	0.2 ~ 0.3 (0.008 to 0.012)	—	75 (3.0)	2 (0.1)	25 (1)	95 (3.7)	2 (0.1)
20 (3/4)	—	63 (2.5)	63 (2.5)	—	27 (1.1)	0.2 ~ 0.4 (0.008 to 0.016)	—	75 (3.0)	2 (0.1)	25 (1)	95 (3.7)	2 (0.1)
25 (1)	65 (2.6)	74 (2.9)	74 (2.9)	66.7 (2.6)	33 (1.3)	0.2 ~ 0.4 (0.008 to 0.016)	—	75 (3.0)	2 (0.1)	25 (1)	95 (3.7)	2 (0.1)
40 (1 1/2)	83 (3.3)	89 (3.5)	89 (3.5)	85.7 (3.4)	48 (1.9)	0.3 ~ 0.5 (0.012 to 0.02)	1.6 (0.06)	75 (3.0)	2 (0.1)	25 (1)	95 (3.7)	2 (0.1)
50 (2)	93 (3.7)	104 (4.1)	104 (4.1)	104.8 (4.1)	60 (2.4)	0.5 ~ 0.8 (0.02 to 0.03)	1.6 (0.06)	75 (3.0)	2 (0.1)	25 (1)	95 (3.7)	2 (0.1)
65 (2 1/2)	118 (4.6)	124 (4.9)	124 (4.9)	123.8 (4.9)	73 (2.9)	0.5 ~ 0.8 (0.02 to 0.03)	1.6 (0.06)	75 (3.0)	3 (0.1)	32 (1.3)	95 (3.7)	2 (0.1)
80 (3)	129 (5.1)	134 (5.3)	140 (5.5)	136.5 (5.4)	88 (3.5)	0.5 ~ 0.8 (0.02 to 0.03)	1.6 (0.06)	75 (3.0)	3 (0.1)	32 (1.3)	95 (3.7)	2 (0.1)
100 (4)	149 (5.9)	159 (5.9)	165 (6.5)	174.6 (6.9)	114 (4.5)	0.8 ~ 1.2 (0.03 to 0.05)	1.6 (0.06)	75 (3.0)	3 (0.1)	38 (1.5)	105 (4.1)	2 (0.1)
125 (5)	184 (7.2)	190 (7.5)	203 (8.0)	196.9 (7.8)	140 (5.5)	0.8 ~ 1.2 (0.03 to 0.05)	1.6 (0.06)	75 (3.0)	3 (0.1)	38 (1.5)	105 (4.1)	2 (0.1)
150 (6)	214 (8.4)	220 (8.7)	238 (9.4)	222.3 (8.7)	165 (6.5)	0.8 ~ 1.2 (0.03 to 0.05)	1.6 (0.06)	75 (3.0)	3 (0.1)	38 (1.5)	105 (4.1)	2 (0.1)
200 (8)	260 (10.2)	270 (10.6)	283 (11.1)	279.4 (11.0)	216 (8.5)	1.5 ~ 2.0 (0.06 to 0.08)	1.6 (0.06)	76 (3.0)	4 (0.2)	38 (1.5)	105 (4.1)	2 (0.1)
250 (10)	325 (12.8)	333 (13.1)	356 (14.0)	339.7 (13.4)	268 (10.6)	e = T	2.0 (0.08)	76 (3.0)	4 (0.2)	44 (1.7)	120 (4.7)	3 (0.1)
300 (12)	370 (14.6)	378 (14.9)	406 (16.0)	409.6 (16.1)	318 (12.5)	e = T	2.5 (0.1)	76 (3.0)	4 (0.2)	44 (1.7)	120 (4.7)	3 (0.1)
350 (14)	413 (16.3)	423 (16.7)	450 (17.7)	450.9 (17.8)	355 (14.0)	e = T	2.5 (0.1)	80 (3.2)	4 (0.2)	44 (1.7)	120 (4.7)	3 (0.1)
400 (16)	473 (18.6)	486 (19.1)	510 (20.1)	514.4 (20.2)	406 (16.0)	e = T	3.0 (0.12)	80 (3.0)	4 (0.2)	44 (1.7)	120 (4.7)	3 (0.1)

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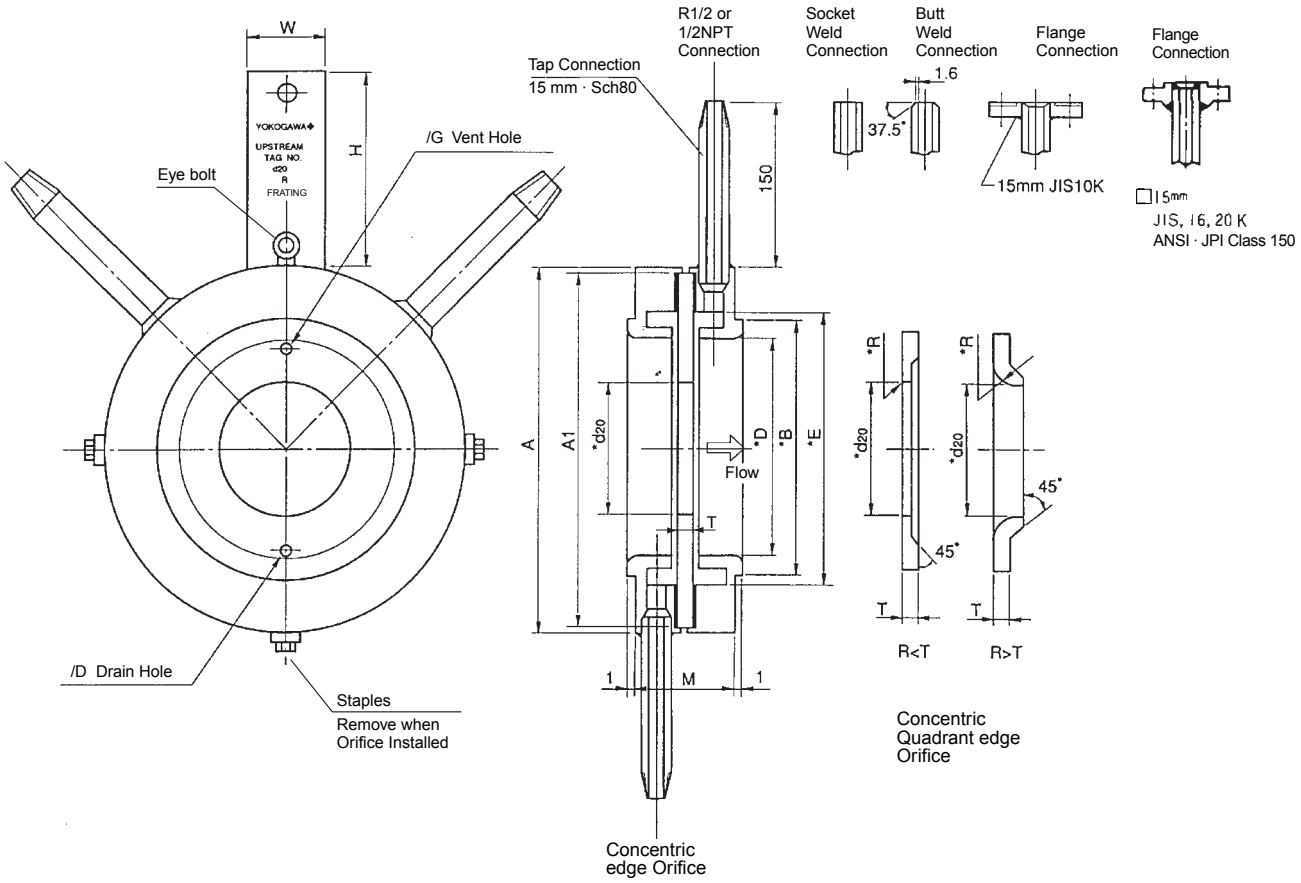
(Nominal Pipe Size above 450 mm)

Unit: mm



*d_{20} : Orifice Diameter AT 20°C
R : Radius of Quadrant Edge Orifice
D : Inside Diameter of Rings
E : Inside Diameter of Gaskets
} Refer to Orifice Calculation Sheet

Unit : mm
(appox. inch)

NOMINAL PIPE SIZE mm (inc)	OUTSIDE DIA. OF RING A				OUTSIDE DIA. OF PLATE A1				DIAMETER GASKET OF STAY B	THICK-NESS OF EDGE e	DIAMETER OF HOLE /G	FACE TO FACE M	THICK NESS OF PLATE T	Tab Handle		
	JIS 5K	JIS 10K	JIS 16K, 20K	ANSI JPI Class150	JIS 5K	JIS 10K	JIS 16K, 20K	ANSI JPI Class150						WIDE W	HIGHT H	THICK NESS t
450 (18)	533 (21.0)	541 (21.3)	575 (22.6)	549.3 (21.6)	527 (20.7)	535 (21.1)	569 (22.4)	543 (21.4)	458 (18.0)	e = T	3 (0.1)	102 (4.0)	6 (0.2)	44 (1.7)	160 (6.3)	2 (0.1)
500 (20)	583 (23.0)	596 (23.5)	630 (24.8)	606.4 (23.8)	577 (22.7)	590 (23.2)	624 (24.6)	600 (23.6)	512 (20.2)	e = T	4 (0.2)	102 (4.0)	6 (0.2)	44 (1.7)	160 (6.3)	2 (0.1)

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