

Orifice Carrier Assemblies

- Design to BS EN ISO 5167
- Range of Carrier Types
 - Single Ring, Corner Tappings
 - Double Ring, Flange Tappings
 - Double Ring, Corner Tappings
 - Double Ring, Annular Chambers
- Wide range of materials
- Proven technology
- Suitable for 1" lines and above
- Orifice sizing on request

General Description

The orifice plate is the most common differential pressure flow primary element. It is based on proven technology, has no moving parts and is suitable for high temperature and pressure applications. Orifice plates are recommended for clean liquids, gases and low velocity steam flows.

For more details of orifice plates, please refer to Product Data Sheet FM-OP/TABA.

Flow measurement using orifice plates requires the accurate location of upstream and downstream pressure tappings. Various types of orifice carrier assemblies are available from Thermocouple Instruments Ltd, to suit a wide range of applications.

Orifice flange assemblies in accordance with ANSI B16.36 are also available. Refer to Product Data Sheet FM-CR/FLGA for further details.

Pressure Connections

The style of the pressure tappings may be as follows:-

- (a) **Flange Tappings** - located 25.4 mm upstream and 25.4 mm downstream from the corresponding face of the orifice plate.
- (b) **Corner Tappings** - single tappings located flush with the upstream and downstream faces of the orifice plates.
- (c) **Annular Chambers** - slots located flush with the upstream and downstream faces of the orifice plate.

Flange tappings are recommended for general applications. Corner tappings or annular chambers are particularly recommended for use in small lines (less than 50 mm diameter) and when the orifice plate is either of quarter circle, conical entrance or eccentric in design.

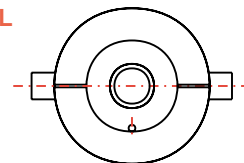


Orifice Carrier and Integral Plate
shown with optional isolation valves

Pressure Tapping Orientation

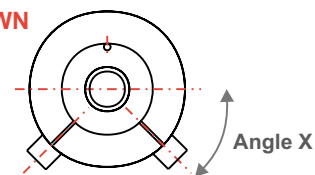
For vapours, and dirty or condensable gases in a horizontal line, the tappings should be located at the side of the pipe, with no more than a $\pm 45^\circ$ orientation from the horizontal.

HORIZONTAL



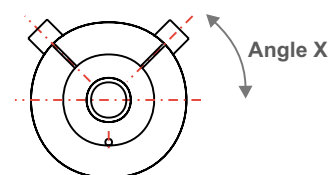
For liquid flows in a horizontal pipe the tappings should be in the lower half of the pipe, with no more than a $\pm 45^\circ$ orientation from the horizontal.

INCLINED DOWN



For horizontal clean gas flows, the tappings should be in the upper half of the pipe, with no more than a $\pm 45^\circ$ orientation from the vertical.

INCLINED UP



For vertical pipe installations, the pressure taps can be at any radial position around the pipe circumference.

Double Ring Orifice Carriers

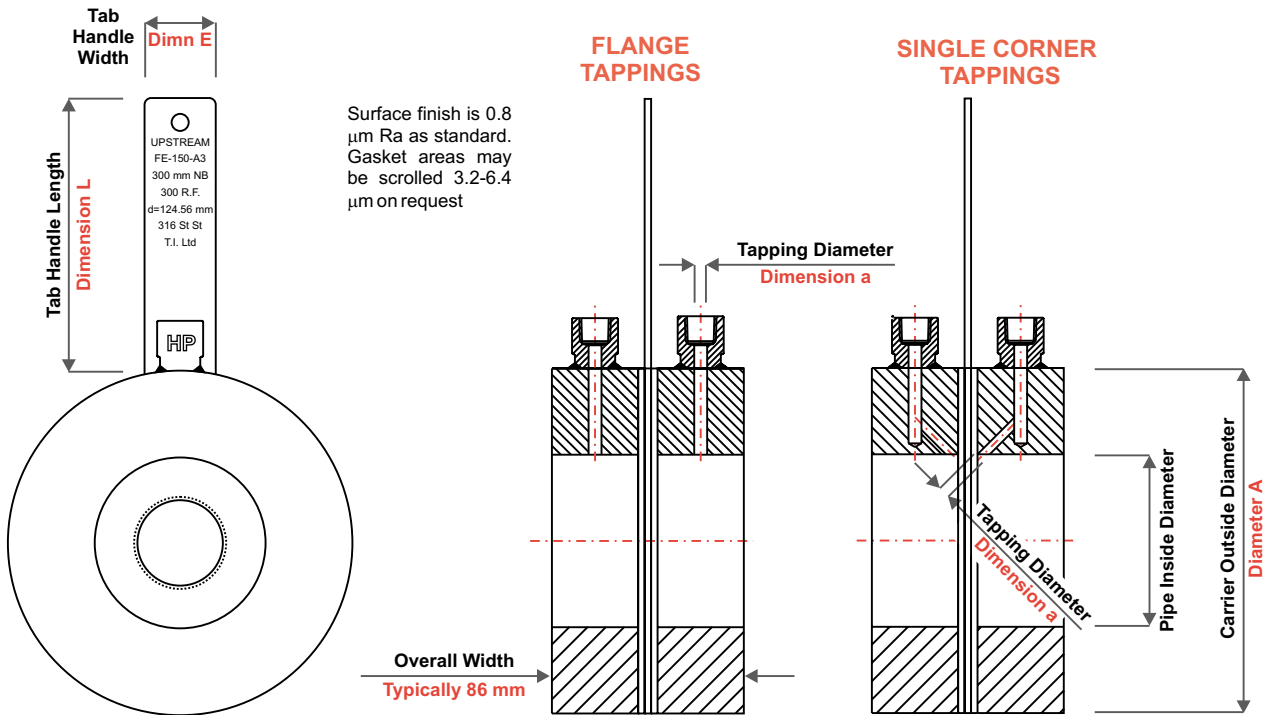
Double ring orifice carrier are designed to be mounted between standard pipe flanges. Versions are available to suit all common flange standards, including ANSI B16.5.

Double ring orifice carriers may be provided with flange tapplings, single corner tapplings or annular chambers.

Thermocouple Instruments Ltd's double ring orifice carriers use a standard tab handled

plate, which allows for easy replacement of the plate if it is damaged, or changes in process data necessitate a change of orifice bore.

Standard material of construction is 316L Stainless Steel, but a wide range of alternative common and exotic materials are available. Gaskets are provided - 1.5 mm thick non asbestos type, unless requested otherwise.



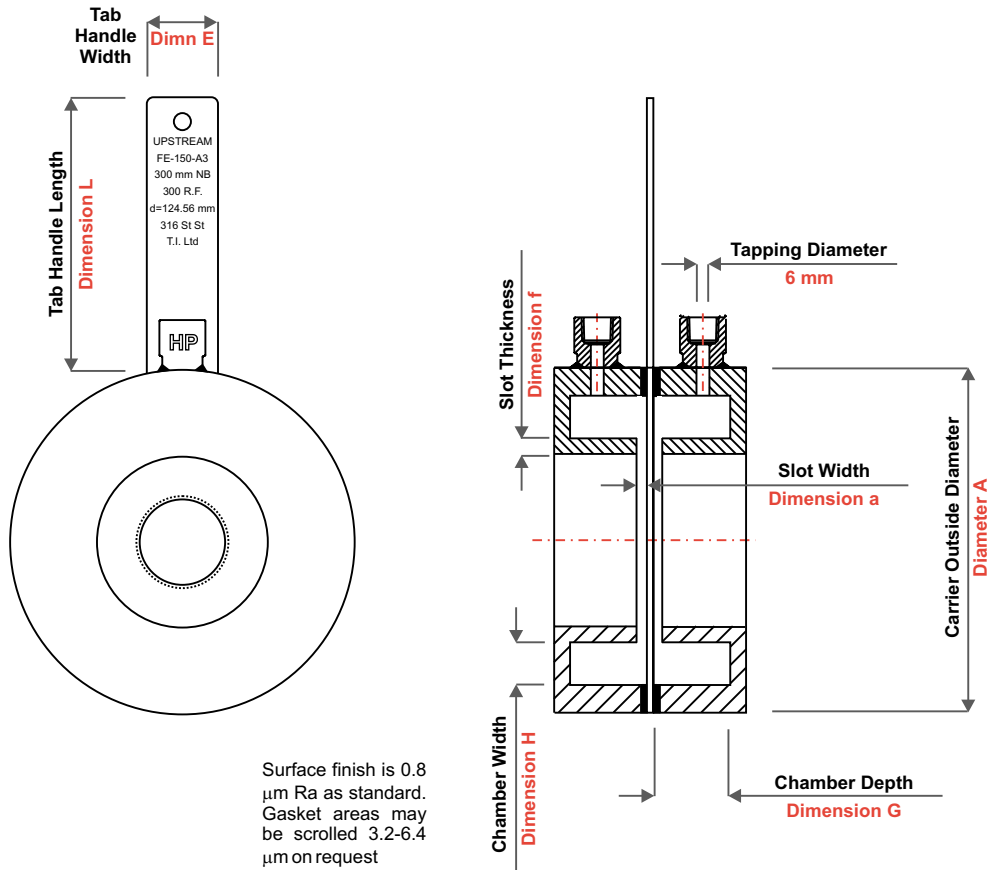
LINE SIZE		150 LB			300 LB			600 LB			900 LB			1500 LB			Pressure Tapping Diameter a	
mm	IN	A	L	E	A	L	E	A	L	E	A	L	E	A	L	E	Flange	Corner
25	1"	66.7	125	32	73	125	32	73	125	32	79.4	125	32	79.4	125	32	3	1
30	1 1/4"	76.2			82.6			82.6			88.9			88.9				
40	1 1/2"	85.7			95.3			95.3			98.4			98.4			5	
50	2"	104.8			111.1		28	111.1		28	142.9	150		142.9	150		6	
65	2 1/2"	123.8			130.2		32	130.2		32	165.1			165.1				1.25
80	3"	136.5			149.2			149.2			168.3			174.6				1.5
100	4"	174.6	150		181	150		193.7	150		206.4			209.6				2
125	5"	196.9			215.9			241.3			247.7			254				2.5
150	6"	222.3			250.8			266.7			288.9			282.6				3
200	8"	279.4			308			320.7			358.8	175		352.4	175			4
250	10"	339.7			362			400			435			435			10	5
300	12"	409.6			422.3			457.2			498.5			520.7				6
350	14"	450.9			485.8			492.1			520.7			577.9				7
400	16"	514.4			539.8			565.2			574.7	200		641.4	200			8
450	18"	546.1	175		593.7	175		609.6	175		635			701.7				9
500	20"	603.3			650.9			679.5			695.3			752.5				10

Double ring orifice carriers to suit PN rated flanges, and other flange standards, are also available

Annular Chamber Orifice Carriers

Annular chamber type orifice carriers are a special form of corner tapplings. The annular slot break through to the pipe over the entire perimeter.

The table below shows typical dimensions for some common sizes. Versions to suit other flange sizes and ratings are available on request.



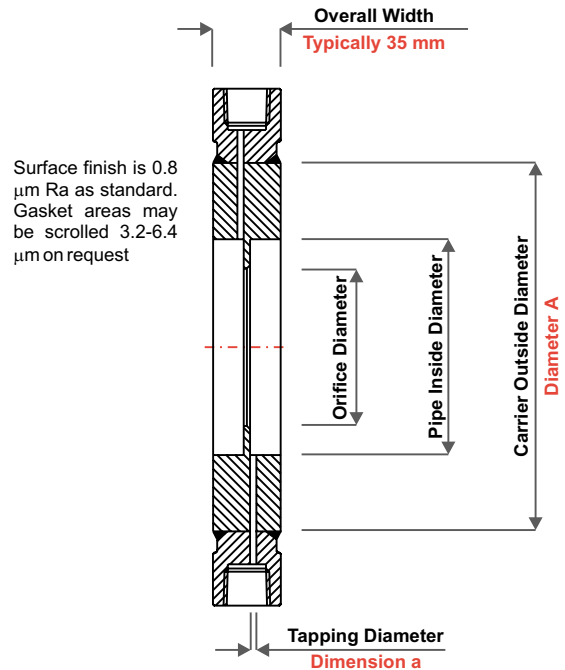
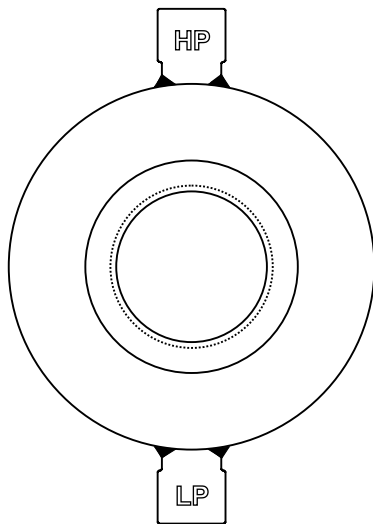
Nominal Size		150 LB			300 LB			600 LB			Dimns	
		OD	Chamber		OD	Chamber		OD	Chamber		a	f
mm	IN	A	G	H	A	G	H	A	G	H		
25	1"	66.7	10	12	73	10	12	73	10	12	1	2
30	1 1/4"	76.2	10	12	82.6	10	12	82.6	10	12	1	2
40	1 1/2"	85.7	12	12	95.3	12	12	95.3	12	12	1	2
50	2"	104.8	12	12	111.1	12	12	111.1	12	12	1	2
65	2 1/2"	123.8	15	12	130.2	15	12	130.2	15	12	1	2
80	3"	136.5	18	12	149.2	18	12	149.2	18	12	1.5	3
100	4"	174.6	20	20	181	20	20	193.7	20	20	1.5	3
125	5"	196.9	25	20	215.9	25	20	241.3	25	20	1.5	3
150	6"	222.3	26	20	250.8	26	20	266.7	26	20	1.75	3.5
200	8"	279.4	33	23	308	28	30	320.7	28	30	2.25	4.5

Single Ring Orifice Carriers

The single ring orifice carrier is a simple, compact orifice carrier, which may be machined in one piece, or be provided with a screwed on plate. This carrier occupies the minimum of space between the pipeline flanges.

Standard material of construction is 316L Stainless Steel.

Due to its small thickness, the single ring orifice carrier is often a cost effective solution, and may be manufactured in a wide range of exotic materials including Hastelloy®, Monel®, Duplex Stainless Steel, Inconel® and Incoloy®



Nominal Line Size		150 LB		300 LB		600 LB		900 LB		1500 LB		2500 LB		Tapping Diameter
mm	IN	A	X	A	X	A	X	A	X	A	X	A	X	a
25	1"	66.7	-	73	-	73	-	79.4	-	79.4	-	85.7	-	1
30	1 1/4"	76.2	-	82.6	-	82.6	-	88.9	-	88.9	-	104.8	-	1
40	1 1/2"	85.7	-	95.3	-	95.3	-	98.4	-	98.4	-	117.5	-	1
50	2"	104.8	-	111.1	45	111.1	45	142.9	45	142.9	45	146	45	1
65	2 1/2"	123.8	-	130.2	45	130.2	45	165.1	45	165.1	45	168.3	45	1.25
80	3"	136.5	-	149.2	45	149.2	45	168.3	45	174.6	45	196.9	45	1.5
100	4"	174.6	45	181	45	193.7	45	206.4	45	209.6	45	235	45	2
125	5"	196.9	45	215.9	45	241.3	45	247.7	45	254	45	279.4	45	2.5
150	6"	222.3	45	250.8	30	266.7	30	288.9	30	282.6	30	317.5	45	3
200	8"	279.4	45	308	30	320.7	30	358.8	30	352.4	30	387.4	30	4
250	10"	339.7	30	362	45	400	45	435	45	435	30	476.3	30	5
300	12"	409.6	30	422.3	45	457.2	36	498.5	36	520.7	45	549.3	30	6
350	14"	450.9	30	485.8	36	492.1	36	520.7	36	577.9	45	-	-	7
400	16"	514.4	45	539.8	36	565.2	36	574.7	36	641.4	45	-	-	8
450	18"	546.1	45	593.7	30	609.6	36	635	36	701.7	45	-	-	9
500	20"	603.3	36	650.9	30	679.5	30	695.3	36	752.5	45	-	-	10

Single orifice carriers to suit PN rated flanges, and other flange standards, are also available

Thermocouple Instruments Limited

Pentwyn, Cardiff, CF23 7XJ, UK
 Tel: (+44) 029 20734121 Fax: (+44) 029 20734040
 Internet: <http://www.thermocouple.co.uk>
 E-mail: thermocouple@thermocouple.co.uk

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