Datasheet

FLOW MEASUREMENT

CORNER TAPS FLOWMETER (o/o)

KEY DATA

- Complete set with orifice plate between annular chambers or monoblock (orifice carrier) version
- Orifice design according to ISO5167-1 & ISO5167-2, ASME.MFC.3M or ISO/TR 15377 standards
- Recommended for gas, liquid or steam
- Accuracy : from 0,5% of the max flowrate
- Repeatability of measurement : 0,1%

Monobloc (orifice carrier) version

BENEFITS

- Easy to install between single flanges
- Pressure taps integrated in the monoblock or in the annular chambers
- Cost-effective measurement system : low installation cost and maintenance-free
- Very long life-time product, no drift over time
- Standardized principle : reliability and accuracy of measurement, no need of calibration
- Different types of orifices available depending on the applications

Deltafluid
MEASURING UP TO YOUR EXPECTATIONS

The corner pressure taps flowmeters with annular chambers are widely used as 0/0 flowmeters. The monoblock 0/0 version exists as well.

STANDARDS

- ISO 5167-1 & ISO 5167-2
- ASME.MFC.3M
- ISO/TR 15377
- Pressure Equipment Directive PED 2014/68/UE

TECHNICAL CHARACTERISTICS

- Fluid temperature (1): cryogenic to +800°C
- Fluid type : gas, steam, monophasic liquid
- Measuring element : simple plate mounted between annular chambers or monoblock (orifice carrier) version - see on page 3
- Plate materials (2) : carbon steel, stainless steel, monel, hastelloy, inconel, duplex, super duplex, titanium, tantalum, PVC, PTFE...
- Orifice types : sharp-edge, conical entrance, quarter circle, eccentric, segmental, conditioning
- Face types : RF, RTJ, large male/female face, tongue/groove face
- Flange materials : carbon steel (ASTM A105, A350LF2 or other to be specified), stainless steel, monel, hastelloy, duplex, super-duplex...

» The flange material can be different from the annular chambers or the monoblock material «

- Flange types : according to ASME B16.5, B16.47, MSS SP-44, API6B or NF EN 1092-1, NF EN 1759-1 standards
- Gasket types : flat gasket (spiral wound, graphite, PTFE) or RTJ (soft iron, inox, monel...)
- Maximum operating pressure : limited by the flange rating
- Accuracy : from 0,5% of the max flowrate

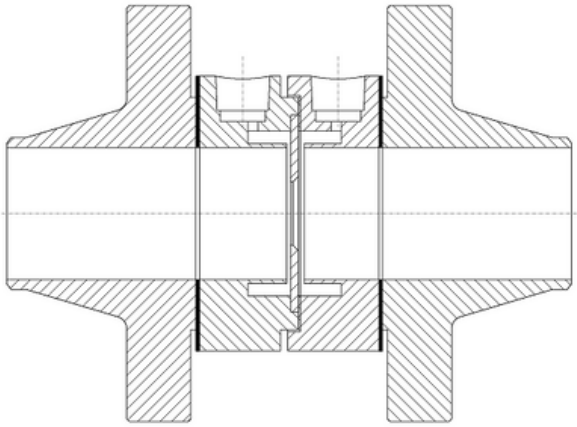
(1) No temperature restriction with remote-mounted transmitter, otherwise +125°C max

(2) For an agressive fluid, applying a specific coating on the edge can increase the product lifetime

PRESSURE TAPS TYPES

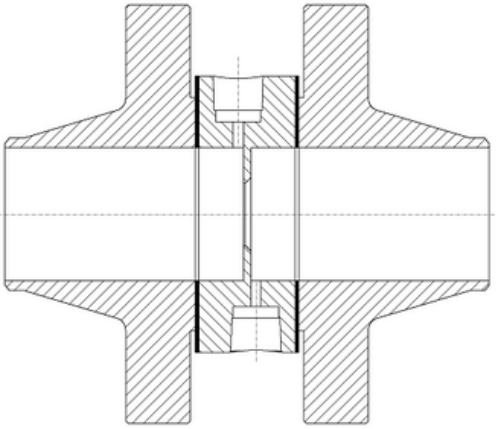
➤ The measurement is executed at the edge of the plate (orifice) upstream and downstream

- corner taps (or 0/0) with annular chambers



- Mounting between simple flanges
- Plate / annular chambers materials can be different
- Averaged upstream and downstream pressure for a better accuracy

- corner taps (or 0/0) monoblock version

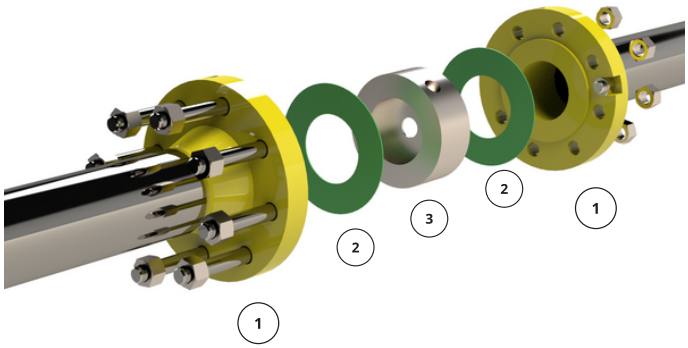


- Measuring element machined from a single block, seamless therefore very resistant
- Pressure taps directly machined in the monoblock
- Easy installation : monoblock to be mounted between simple flanges or to be welded to the pipe

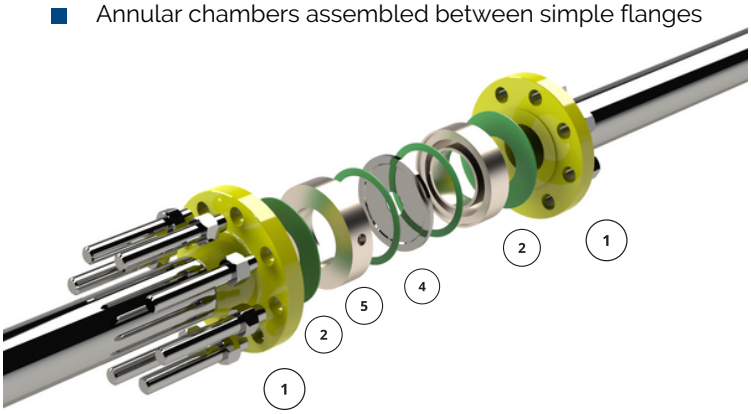
- illustrations with a RF assembly - the same types of pressure taps also exist in RTJ-M and RTJ-F (

ASSEMBLY

- Monoblock assembled between simple flanges



- Annular chambers assembled between simple flanges

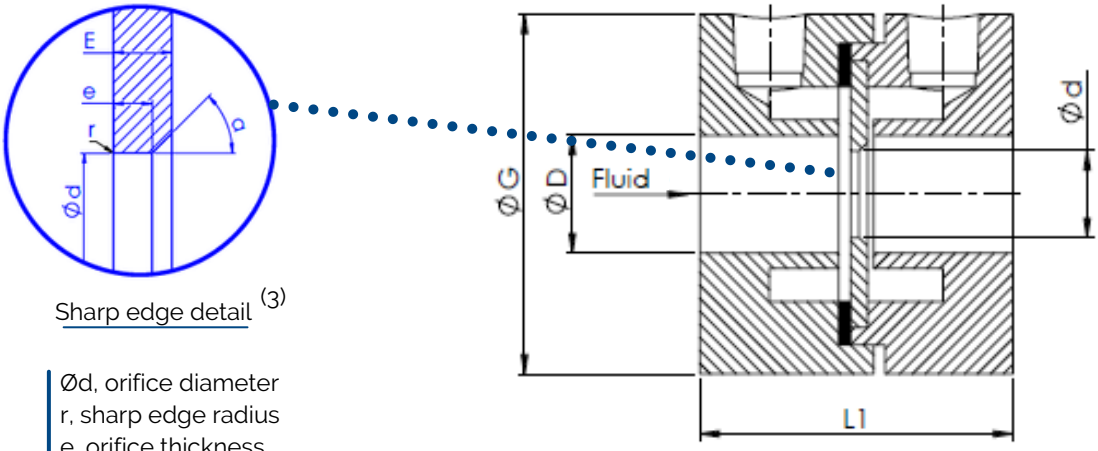


(1) WN flanges (yellow) (2) Gaskets (green) (3) 0/0 monoblock (4) Orifice plate (5) Annular chambers (2 parts)

- For all types of assembly, see the corresponding IOM notice "User guide - Installation, operation and maintenance manual"

DIMENSIONS

0/0 flowmeter with annular chambers drawing



Sharp edge detail (3)

Ød, orifice diameter
r, sharp edge radius
e, orifice thickness
E, plate thickness
α, angle of the downstream bevel
ØD, inside pipe diameter

Dimensional information (values in mm)

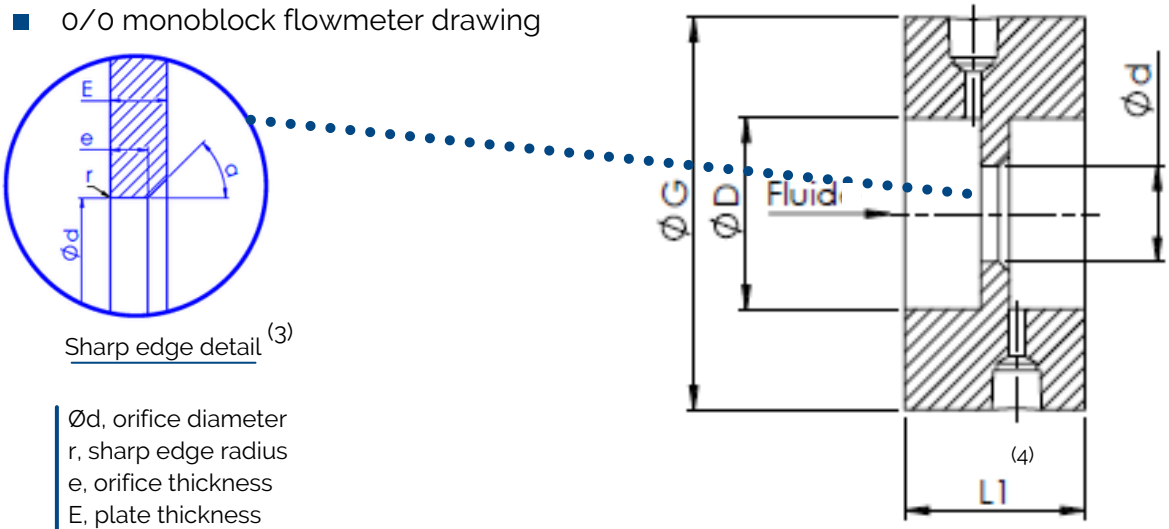
					ØG, annular chamber outside diameter in mm					
DN	DN	E (mm)	e (mm)	L1 (mm)	150# RF PN20 RF	300# RF PN50 RF	600# RF PN100 RF	900# RF PN150 RF	1500# RF PN250 RF	2500# RF PN420 RF
1''	25	3	0,4	76	65	71	71	77	77	84
1'' 1/2	40	3	0,6	76	84	93	93	96	96	115
2''	50	3	0,8	76	103	109	109	141	141	144
2''1/2	65	3	1	76	122	128	128	163	163	166
3''	80	3	1,2	76	135	147	147	166	173	195
4''	100	3	1,5	76	173	179	192	204	208	233
6''	150	3	2	76	220	249	265	267	281	315
8''	200	6	3	79	277	306	319	357	350	385
10''	250	6	3	79	338	360	398	433	433	474
12''	300	6	3	79	408	420	455	496	519	547

Beyond 12'', contact us

(3) for detailed characteristics of sharp-edge orifice plate, see corresponding datasheet

DIMENSIONS

0/0 monoblock flowmeter drawing



Sharp edge detail (3)

Ød, orifice diameter
r, sharp edge radius
e, orifice thickness
E, plate thickness
α, angle of the downstream bevel
ØD, inside pipe diameter

Dimensional information (values in mm)

					ØG, monoblock outside diameter in mm					
DN	DN	E (mm)	e (mm)	L1(4) (mm)	150# RF PN20 RF	300# RF PN50 RF	600# RF PN100 RF	900# RF PN150 RF	1500# RF PN250 RF	2500# RF PN420 RF
1''	25	3	0,4	20/38	65	71	71	77	77	84
1'' 1/2	40	3	0,6	20/38	84	93	93	96	96	115
2''	50	3	0,8	20/38	103	109	109	141	141	144
2''1/2	65	3	1	20/38	122	128	128	163	163	166
3''	80	3	1,2	20/38	135	147	147	166	173	195
4''	100	3	1,5	20/38	173	179	192	204	208	233
6''	150	3	2	20/38	220	249	265	267	281	315
8''	200	6	3	20/38	277	306	319	357	350	385
10''	250	6	3	20/38	338	360	398	433	433	474
12''	300	6	3	20/38	408	420	455	496	519	547

Beyond 12'', contact us

(3) for detailed characteristics of sharp-edge orifice plate, see corresponding datasheet

(4) the standard thickness of the 0/0 monoblock is either 38 mm or 20 mm, see options on page 8; other values available on request

STRAIGHT LENGTHS

- Required straight lengths between **conditioning orifice plate** (or orifices in the monoblock) and fittings - 2D upstream / 2D downstream
- Required straight lengths between single hole orifice plate (or single orifice in the monoblock) and fittings - without flow conditioner

Values expressed as multiple of pipe internal diameter, D

	UPSTREAM SIDE OF ORIFICE PLATE													Downstream side of orifice plate	
d/D	Single 90° bend or two 90° bends in any plane S>30S		Two 90° bends in the same plane 30D≥S≥10D		Two 90° bends in the same plane 10D≥S		Two 90° bends in perpendicular planes 30D≥S≥5D		Two 90° bends in perpendicular planes 5D>S		Single 90° tee with or without extension		Single 45° bend or two 45° bends in the same plane S≥22D		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 symmetric reduction		Thermometer pocket or well of diameter ≤ 0,03D		Fittings (columns 2 to 11) and densitometer pocket	
1	2		3		4		5		6		7		8		9		10		11		12		13			
<0,2	6	3	10		10		19	18	34	17	3		7		5		6		12	6	30	15	5	3	4	2
0,40	16	3	10		10		44	18	50	25	9	3	30	9	5		12	8	12	6	30	15	5	3	6	3
0,50	22	9	18	10	22	10	44	18	75	34	19	9	30	18	8	5	20	9	12	6	30	15	5	3	6	3
0,60	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	3,5
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	3,5
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

Nota :
The minimum straight lengths required are the lengths between various fittings located upstream or downstream of the orifice plate and the orifice plate itself.
Straight lengths shall be measured from the downstream end of the curved / conical portion of the nearest bend or tee or reducer or expander to the upstream face of the orifice plate.
In the columns, left values give lengths corresponding to zero additional uncertainty (see ISO 5167-1 standard)
Right values give lengths corresponding to 0,5% additional uncertainty (see ISO 5167-1 standard). Empty cells when no available data.
S is the distance between two fittings..

ACCESSORIES

For flow measurement, we offer a full range of accessories for assembly with corner taps flowmeter.

- Transmitter

Differential pressure transmitter, multivariable transmitter

- Manifold

2-way / 3-way / 5-way manifold with or without direct mounting

- Condensation pot

- Valve

- Siphon

- Fittings

- Flow straightener or conditioner

ADDITIONAL INFORMATION

All information on the mounting of orifice plates and monoblocks (and their accessories) such as :

- pressure taps orientation
- mounting of the differential pressure transmitter
- flange tightening

can be found on the IOM notice "User guide - Installation, operation and maintenance manual".

ITEM CODES

- 0/0 monobloc corner taps flowmeter : DM-ND-NP-Face type-Material-Thickness

DM	ND	NP	Face type	Material	Thickness (6)
Nominal diameter - ASME	1/2'' to 24''	150# to 2500#	RF RTJ SEM (5) SEF (5) DEM (5) DEF (5)	304L 316L Others	E20 E38
OR					
Nominal diameter - ISO	DN15 to 600	PN2,5 to 400			

- 0/0 annular chamber corner taps flowmeter : DCA-ND-NP-Face type-Material

DCA	ND	NP	Face type	Material
Nominal diameter - ASME	1/2'' to 24''	150# to 2500#	RF RTJ SEM (5) SEF (5) DEM (5) DEF (5)	304L 316L Others
OR				
Nominal diameter - ISO	DN15 to 600	PN2,5 to 400		

(5) Specify large or small male/female face (SEM/SEF) if flanges according to ASME B16-5 standard.

(6) standard thickness 20 and 38 mm - other values available on request

- Examples corner taps flowmeter codes :

  - DM-2-300-RF-316-E20
  - DCA-3-600-RTJ-316

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MEASURING UP TO YOUR EXPECTATIONS

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