ORIFICE Flow Element

Orifice Plate, Orifice Flange, Meter-Run, Restriction Orifice

FLOW MEASURMENT

Low Cost and Simple Construction

Ease of Installation

Low Maintenance

Suitable for Most Gases and Liquids



ACA

Catalogue

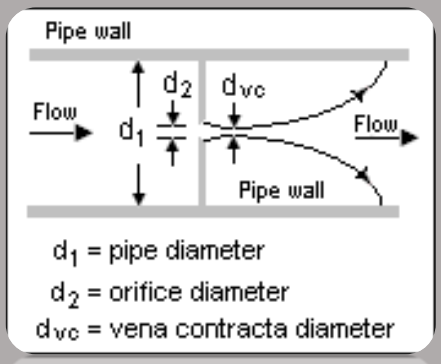
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INTRODUCTION

Performance

An orifice plate with a precisely machined hole (the orifice) is placed in the pipeline. The orifice creates a pressure drop as the fluid flows through it. The differential pressure transmitter measures the pressure difference between the two taps. This ΔP is directly proportional to the flow rate. Using the known orifice dimensions and fluid properties, the flow rate can be calculated using the Bernoulli equation



Industries

Can be used in all industrial sectors, for example:

- Chemical
- Pharmaceutical
- Oil and Gas
- Power plants
- Water and Wastewater
- Petrochemical
- Food and Drinks
- Iron, Steel and Metals
- Pulp and Paper

Application

Orifice meters are extensively employed for measuring flow rates of wide variety of fluids.

Oil and Gas Industry

Water Treatment Plants

Chemical Processing

Power Generation

Steam Boilers

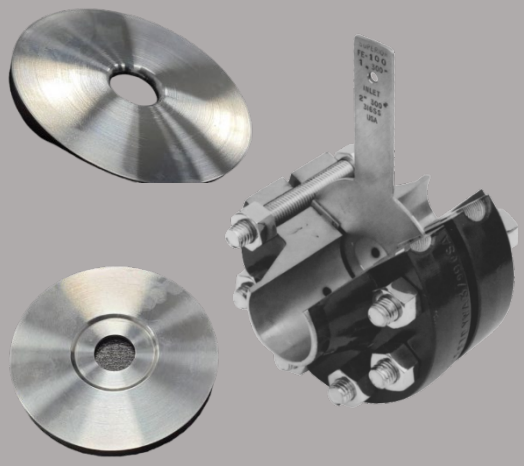
Petrochemicals and Refineries



PRODUCT RANGE

Metering flow element

An orifice meter measures the flow rate of liquid, gas, or steam using the differential pressure measurement principle. ACA Co. can design and fabricate various type of orifice plates such as RTJ, sharp edge, quadrant, conical , ... based on application.



Restriction orifice plate – Multi hole/Stage

A restriction orifice (RO) is a flow control instrument designed to provide a controlled or restricted flow within a pipeline.
They are also employed when a significant pressure drop is needed.
ROs can be single-stage or multiple-stage (in series) depending on the application



Multi-stage Orifice

The Multi-Stage Restriction Orifice is an advanced flow control solution designed to achieve precise pressure drop management in fluid systems while minimizing noise and cavitation. Engineered for high-pressure applications, this device consists of multiple orifice plates arranged in series to gradually reduce pressure, ensuring a smooth and controlled flow transition. Ideal for industries such as oil & gas, petrochemicals, and power generation, our multi-stage restriction orifices are manufactured from high-quality materials like stainless steel and carbon steel to withstand extreme operating conditions. Customizable to specific process requirements, they enhance system efficiency, reliability, and longevity, making them a cost-effective solution for demanding flow regulation challenges.



PRODUCT RANGE

Custody transfer meter-run Orifice

In the context of natural gas, custody transfer often involves orifice meters.
An orifice meter run is a complete assembly designed for custody transfer applications.
Here's what it entails:
Honed Surface: The internal surface of the piping within the orifice meter run is honed or machined to be glass-smooth. This ensures minimal friction and consistent flow behavior.
One-Piece Assembly: The orifice meter run is a single-piece manufacturer piping assembly that holds the orifice plate.
Certification: ACA Co. has been known as qualified custody transfer orifice run manufacturer by IRAN Supervision on Petroleum Export and Domestic Transactions (SPEDT)







PRODUCT RANGE

PVC Orifice plate

PVC (polyvinyl chloride) orifice plates are made of a durable plastic material, which makes them suitable for a wide range of corrosive and non-corrosive fluids. Here are some common applications where you can use PVC orifice:
Water Treatment: PVC orifices are often used in water treatment facilities to measure the flow of chemicals, such as chlorine or sodium hypochlorite, into the water supply for disinfection.
Chemical Processing: They can be used in chemical plants to monitor the flow of various chemicals and solvents.



Compact (Integrated) orifice meter

compact orifice meters provide accurate flow measurements, making them valuable tools across industries for managing fluid flow and ensuring precise control.
These meters are designed for direct transmitter mounting and ease of installation.

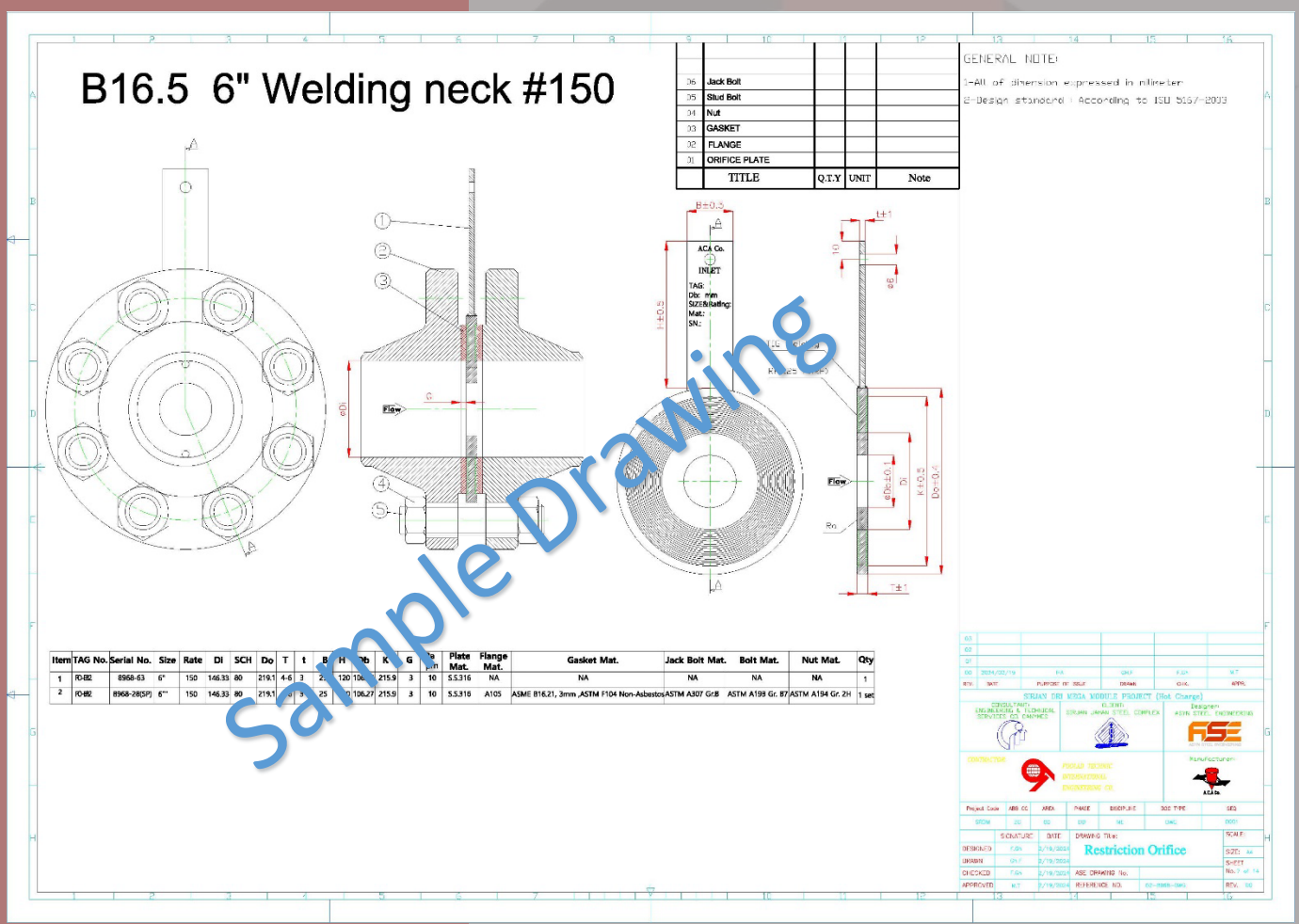


Technical details

Orifice flange assembly, Integral orifice assembly, Orifice plate with carrier ring, Orifice plate assembly with RTJ holder, Orifice plate, Restriction orifice	Product range
Weld neck, Slip on,SW, RTJ,etc according to request	Flange types
ASTM A105, ASTM A182 F304/L, ASTM A182 F316/L, etc according to request	Flange material
AISI SS316 ,SS304, SS304L, SS316, SS316L, PVC, Other materials on request	Plate material
ASTM A193 Gr. B7/A194 Gr. 2H as standard, Other materials on request	Stud bolts and nuts material
Spiral Wound, Flat NON-Metal, Graphite, PTFE, Other materials on request	Gasket material

*For sour services wetted parts material will be considered as NACE MR0175.

Dimensions drawing sample



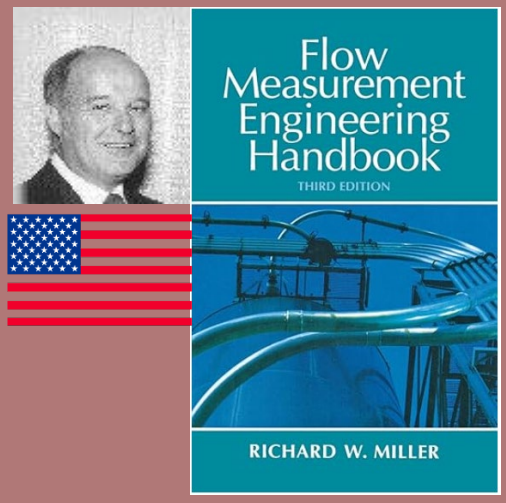
Technical details

Reference standards

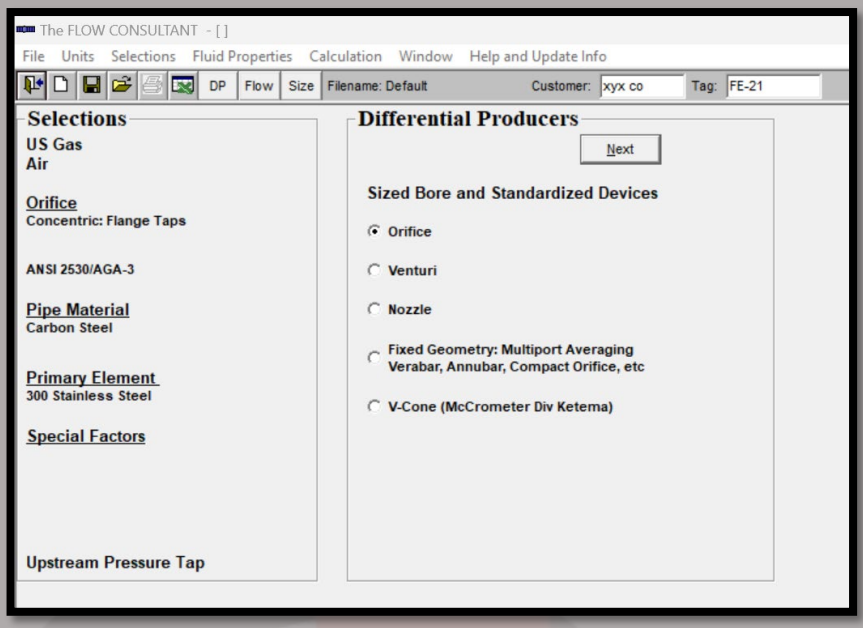
- **ISO 5167** – Measurement of fluid flow by means of pressure differential devices (covers orifice plates, nozzles, and Venturi tubes).
- **ISO 15377** – Measurement of fluid flow by means of orifice plates with concentric, quadrant, and conical inlet designs.
- **ASME B16.36** – Pipe flanges and flanged fittings (for flange-mounted orifice plates).
- **ASME B16.47** – Large-diameter steel flanges (for orifice assemblies in large pipelines).
- **ASME MFC-3M** – Measurement of fluid flow in pipes using orifice, nozzle, and Venturi meters.
- **ASME MFC-14M** – Measurement of single-phase fluid flow using small bore precision orifices.
- **API 14.3 (AGA Report No. 3)** – Measurement of gas by orifice meters.
- **ASTM A240 / A105 / A182** – Material specifications for stainless steel and carbon steel used in orifice manufacturing.
- **NACE MR0175 / ISO 15156** – Material requirements for sour service applications in oil & gas.
- **RW Miller Handbook** – It covers the design, selection, installation, and performance of various flow measurement devices, including orifice plates, Venturi tubes, nozzles, and restriction orifices.

Technical details

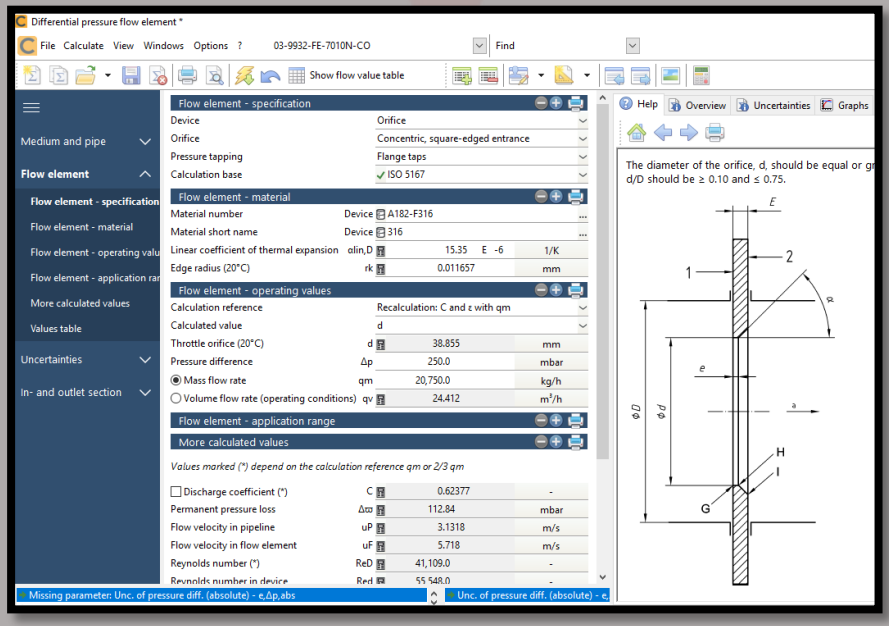
Reference Software



Flow Consultant



Conval by F.I.R.S.T

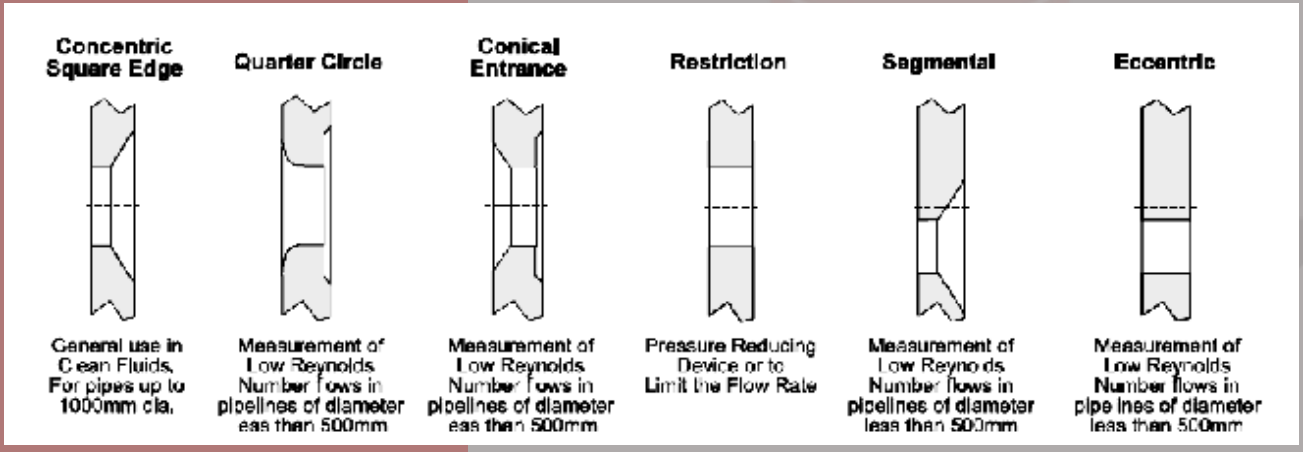


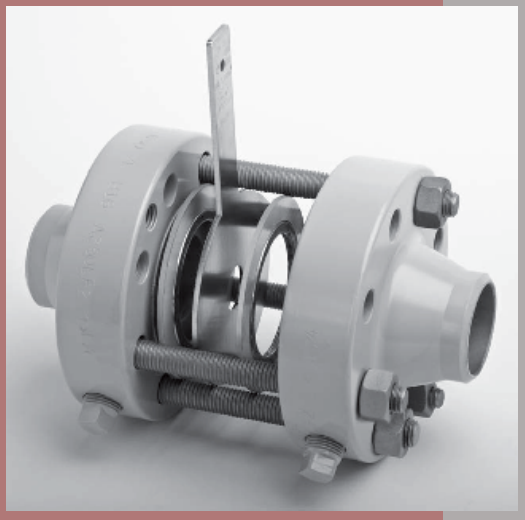
Technical details

Bolts and tightening torques

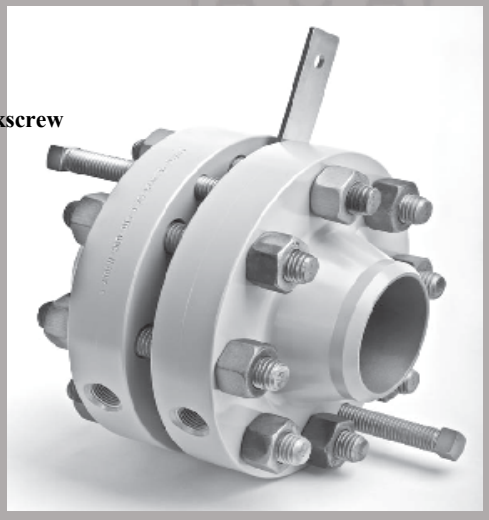
Normal sizes as per ASME B 16.5	Bolts		Tightening torques
	Quantity x size		SI [Nm]
	150 lbs	300 lbs	
½“ 150 lbs / 300 lbs	4 x ½“	4 x ½“	5.2
1“ 150 lbs / 300 lbs	4 x ½“	4 x 5/8“	10
2“ 150 lbs / 300 lbs	4 x 5/8“	8 x 5/8“	41
3“ 150 lbs / 300 lbs	4 x 5/8“	8 x 3/4“	70
4“ 150 lbs / 300 lbs	8 x 5/8“	8 x 3/4“	50
6“ 150 lbs / 300 lbs	8 x 3/4“	12 x 3/4“	45

Plate edge types





jackscrew



Order Codes

Model		
1	ACA10-	Orifice
Pipe size		
2	6-	1/4" ~ 48"
Pipe Sch		
3	A-	10
	B-	20
	C-	40
	D-	STD
	E-	80
	F-	120
	G-	160
	H-	Other
Orifice type		
4	T-	Typical orifice - ISO 5167
	M-	Meter run orifice - MFC 14M
	R1-	Single stage restriction orifice
	R2-	multi stage restriction orifice
	W-	Wafer Type
Plate type		
5	0-	Concentric square edge
	1-	Concentric restriction
	2-	Concentric square edge restriction
	3-	Eccentric restriction
	4-	Quarter circle
	5-	Integrated/Octagonal RTJ
	6-	Separated/Octagonal RTJ
	7-	Integrated/Oval RTJ
	8-	Separated/Oval RTJ
Plate tab handle		
6	W-	Welded
	I-	Integrated
	NA-	Not required
Pressure Rating		
7	#150-	#150 ~ #2500
	PN6-	PN6 ~ PN250
Plate Material		
8	S6-	S.S.316
	S6L-	S.S.316L
	PV	PVC
	SP-	Other
Plate Thickness		
9	t3-	3 mm
	t8-	6-8 mm
	t10	8-10 mm
	t14	10-14 mm
	t18	14-18 mm
	t22	18 - 22 mm
	t30	22 - 30 mm
	SP-	Special medium
Flange type		
10	A-	WN RF
	B-	Slip on
	C-	Socket weld
	0-	Not required

Order Codes

Face type		
11	RF-	RF
	TJ-	RTJ
	0-	Not required
Flange standard		
12	0-	ASME B16.36
	1-	ASME B16.5
	2-	ASME B16.47A
	3-	ASME B16.47B
	4-	Other
	N-	Not required
Flange material		
13	1-	ASTM A105
	S4-	S.S.304
	S4L-	S.S.304L
	S6-	S.S.316
	S6L-	S.S.316L
	SP-	Special medium
Gasket material		
14	K-	Klingerit
	SC4-	Spiral Wound,C.S./Graphite/SS304 - ASME 16.20 B16.5
	SC6-	Spiral Wound,C.S./Graphite/SS316 - ASME 16.20 B16.5
	S44-	Spiral Wound,SS304./Graphite/SS304 - ASME 16.20 B16.5
	S66-	Spiral Wound,SS316./Graphite/SS316 - ASME 16.20 B16.5
	Vi-	Viton
	PT-	PTFE
Vent/Drain hole		
15	V-	Vent
	D-	Drain
	B-	Vent & Drain
	N-	NA
Tapping		
16	Y-	Flange tap, 1/2" NPTF, 2 per flange
	C-	Corner tap
	N-	NA
Stud Bolts & nuts material		
17	0-	A193 B7 / A194 2H
	1-	S.S.304
	2-	S.S.316
	SP-	Special medium
	N-	Not required
DP Transmitter		
18	5-	50 mbar
	10-	100 mbar
	15-	150 mbar
	25-	250 mbar
	30-	300 mbar
	50-	500 mbar
	SP-	Other
Manifold		
19	0-	No
	1-	3 way S.S.316
	2-	5 way S.S.316
Material certificate		
20	0-	No
	1-	Yes

Order Codes

Model		
1	ACA10RU-	MeterOrifice
Pipe size		
2	6-	1/4" ~ 48"
Inlet & Outlet Pipe Sch		
3	A-	10
	B-	20
	C-	40
	D-	STD
	E-	80
	F-	120
	G-	160
	H-	Other
Inlet & Outlet Pipe Material		
4	CA-	A106
	S4-	S.S.304
	S4L-	S.S.304L
	S6-	S.S.316
	S6L-	S.S.316L
	H-	Other
Orifice type		
5	T-	Typical orifice - ISO 5167
	M-	Meter run orifice - MFC 14M
	R1-	Single stage restriction orifice
	R2-	multi stage restriction orifice
	W-	Wafer Type
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Plate tab handle		
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Pressure Rating		
8	#150-	#150 ~ #2500
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Plate Thickness		
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Order Codes

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	B-	Slip on
	C-	Socket weld
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Orifice Face type		
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	1-	ASME B16.5
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	N-	Not required
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	S4L-	S.S.304L
	S6-	S.S.316
	S6L-	S.S.316L
	SP-	Special medium
Inlet & Outlet Flange type		
15	A-	WN RF
	B-	Slip on
	C-	Socket weld
	0-	Not required
Inlet & Outlet Face type		
16	RF-	RF
	TJ-	RTJ
	0-	Not required
Inlet & Outlet Flange standard		
17	0-	ASME B16.36
	1-	ASME B16.5
	2-	ASME B16.47A
	3-	ASME B16.47B
	4-	Other
	N-	Not required
Inlet & Outlet Flange material		
18	1-	ASTM A105
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	S6-	S.S.316
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	Vi-	Viton
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	D-	Drain
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	N-	NA
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	50-	500 mbar
	SP-	Other
Manifold		
24	0-	No
	1-	3 way S.S.316
	2-	5 way S.S.316
Material certificate		
25	0-	No
	1-	Yes

Contact Us

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