

TECHNICAL INFORMATION

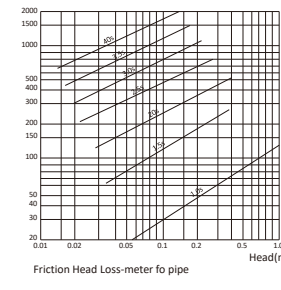
Optimum Flow Rate and Pipe Size Selection

Ø Sanitary Pipe Size Selection and Optimum Flow Rate

The optimum size pipe for a process pipeline depends on the relationship between the following factors:

- Pump capacity
- Pipe pressure loss
 - In sanitary piping, the cleanability of the pipeline serves as another important factor. The following are typical requirements for implementing sufficient cleanability:
- The flow velocity must be 0.6m/sec or higher (to prevent retention of air in the upper portion of the pipe interior).
- The flow rate must be such that turbulent flow is formed.

Table 1 shows recommended flow rate ranges and other data useful for size selection.



Pipe Run-Length of Fittings(m)

	90°EL	TEE	TEE	TEE
1"	0.5	1.1	1.3	0.4
1 1/2"	0.5	2.3	2.0	0.4
2"	1.0	2.6	2.6	0.6
2 1/2"	1.5	3.8	3.8	0.8
3"	2.0	4.0	4.5	1.2
4"	1.5	6.0	6.0	1.2

Micro-inch Finish

TYPE	mu	um
36	142	3.61
60	87	2.21
80	71	1.80
120	52	1.32
180	30	0.76
240	15	0.38
320	12	0.31

Nominal Pipe size	Sanitary Pipe Volume per meter (L/m)	Recommended flow rate range for process pipeline (L/h)	Flow rate at pressure (L/h)			Flow rate at pressure loss (0.008kgf/cm ² per meter (L/h))
			Velocity 0.6m/sec	Velocity 1.0m/sec	Velocity 1.5m/sec	
1.0s	0.415	800*2200	896	1490	2241	1500
1.5s	1.00	3600*6000	2160	3600	5400	6000
2s	1.80	6000*13000	3877	6460	9693	12900
1	2.78	13000*24000	6007	10000	15017	24000
3s	4.11	24000*38000	8869	14800	22172	38700
1	5.69	38000*60000	12286	20500	30715	60000
4s	7.48	60000*88000	16161	26900	40403	88200
1	9.21	88000*120000	19920	33200	49800	120000

Ratings: A=High suitability B=Normal suitability C=Limited suitability D=Unsuitable -=>Not recommended	ISO Designation of Abbreviation (G27 flexible rubber symbol)	NBR Nitrile rubber	E Ethylene Propylene rubber	Q Silicon rubber	Viton Fluorinated rubber	PTEF/Polytetrafluoroethylene P PFA Perfluoropolymer P
Product or Process:						
Abrasive products		D	D	D	D	A
Dairy products (milk, cream)		B	A	A	-	A
Dairy products (sour milk products)		B	A	A	-	A
Brewery products (beer, hops, etc.)		B	A	C	C	A
Wine and yeast		B	A	A	C	A
Animal and vegetable fats	100°C	B	D	B	A	A
Water and water solutions	<-70°C	B	A	B	B	A
Hot water and steam	<-130°C	D	A	C	-	A
Concentrated fruit juices and essential oils	<-100°C	D	D	D	B	A
Non-oxidation acids	<-80°C	D	B	D	C	A
Oxidation acids	<-80°C	-	B	D	C	A
Weak concentrate of lye	<-100°C	C	A	C	C	A
Strong concentrate of lye	<-100°C	D	B	D	D	A
Mineral oils	<-100°C	B	-	-	A	A
Aliphatic carburetted hydrogen (hexane)		B	D	D	A	A
Aromatic carburetted hydrogen (benzene)		D	D	D	B	A
Alcohols		C	B	A	A	A
Ester and ketones		D	D	D	A	A
Ether		D	D	B	A	A
Methylene chloride		D	D	B	A	A
Ozone and atmospheric conditions		C	A	A	A	A



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SI Unit Conversion Table

	Pa	kPa	MPa	bar	kgf/cm ²	atm	mmH ₂ O	mmHg Torr
Pressure	1	1*10 ⁻³	1*10 ⁻⁶	1*10 ⁻⁵	1.01972*10 ⁻⁵	9.86923*10 ⁻⁶	1.01972*10 ⁻¹	7.50062*10 ⁻³
	1*10 ³	1	1*10 ⁻³	1*10 ⁻²	1.01972*10 ⁻²	9.86923*10 ⁻³	1.01972*10 ²	7.50062
	1*10 ⁶	1*10 ³	1	1*10 ¹	1.01972*10 ¹	9.86923	1.01972*10 ⁵	7.50062*10 ³
	1*10 ⁹	1*10 ⁶	1*10 ³	1	1.01972	9.86923*10 ⁻¹	1.01972*10 ⁴	7.50062*10 ⁶
	9.80665*10 ⁴	9.80665*10 ¹	9.80665*10 ⁻²	9.80665*10 ⁻¹	1	9.67841*10 ⁻¹	1*10 ⁴	7.35559*10 ²
	1.01325*10 ⁵	1.01325*10 ²	1.01325*10 ⁻¹	1.01325	1.03323	1	1.03323*10 ⁴	7.60000*10 ²
	9.80665	9.80665*10 ⁻¹	9.80665*10 ⁻⁶	9.80665*10 ⁻⁵	1*10 ⁻⁴	9.67841*10 ⁻⁵	1	7.35559*10 ⁻²
	1.33322*10 ²	1.33322*10 ⁻¹	1.33322*10 ⁻⁴	1.33322*10 ⁻³	1.35951*10 ⁻³	1.31579*10 ⁻³	1.35951*10	1

PS.)1Pa=1N/m²

	N	dyn	kgf
Force	1	1*10 ⁵	1.01972*10 ⁻¹
	1*10 ⁵	1	1.01972*10 ⁻⁶
	9.80665	9.80665*10 ¹	1

	Pa.s	cP	P
Viscosity	1	1*10 ³	1*10
	1*10 ⁻³	1	1*10 ⁻²
	1*10 ⁻¹	1*10 ²	1

PS.)1P=1dyn.s/cm²=1g/cm.s, 1Pa.s=1N.S/m², 1cP=1mPa.s

	Pa or N/m ²	MPa or N/mm ²	kgf/mm ²	kgf/cm ²
Kinematic Viscosity	1	1*10 ⁻⁶	1.01972*10 ⁻⁷	1.01972*10 ⁻⁵
	1*10 ⁶	1	1.01972*10 ⁻¹	1.01972*10
	9.80665*10 ⁴	9.80665	1	1*10 ²
	9.80665*10 ⁸	9.80665*10 ²	1*10 ²	1

PS.)1Pa=1N/m², 1MPa=1N/mm²

	m ² /s	cSt	St
Kinematic	1	1*10 ⁶	1*10 ⁴
	1*10 ⁶	1	1*10 ⁻²
	1*10 ⁻⁴	1*10 ²	1

PS.)1St=1cm²/s, 1cSt=1mm²/s

	W/(m · K)	kcal/(h · m · °C)
thermal conductivity	1	8.6000*10 ⁻¹
	1.16279	1

PS.)1cal=4.186 05J

	W/(m · K)	kcal/(h · m · °C)	PS	kcal/h
power	1	1.01972*10 ⁻¹	1.35962*10 ⁻³	8.6000*10 ⁻¹
	9.80665	1	1.33333*10 ⁻²	8.43371
	7.355*10 ²	7.5*10	1	6.32529*10 ²
	1.16279	1.18572*10 ⁻¹	1.58095*10 ⁻³	1

PS.)1W=1J/S

1PS=0.735kW

1cal=4.186 05J

	W/(m ² · K)	kcal/(h · m ² · °C)
coefficient on heat transfer	1	8.6000*10 ⁻¹
	1.16279	1

PS.)1cal=4.186 05J

	J/(kg · K)	kcal/(h · m ² · °C)
specific heat	1	2.38889*10 ⁻⁴
	4.18605*10 ³	1

PS.)1cal=4.186 05J

	J	kW · h	kgf · m	kcal/h
work,energy	1	2.77778*10 ⁻⁷	1.01972*10 ⁻¹	2.38889*10 ⁻⁴
	3.600*10 ⁶	1	3.67098*10 ⁵	8.6000*10 ²
	9.80665	2.72407*10 ⁻⁶	1	2.34270*10 ⁻³
	4.18605*10 ³	1.16279*10 ⁻³	4.26858*10 ²	1

PS.)1J=1W · 1J=1N · m

1cal=4.186 05J



TECHNICAL INFORMATION

SERVICE PRESSURE RATINGS (PSI)

SIZE	1/2"	A37 DN10	1 DN25	2" DN50	1 DN65	3" DN80	4" DN100	DN115	DN125	6" DN150	8" DN200	10" DN250	12" DN300
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Product	1/2"	A37 DN10	1 DN25	2" DN50	1 DN65	3" DN80	4" DN100	DN115	DN125	6" DN150	8" DN200	10" DN250	12" DN300
13MHH-Heavy Duty Single Pin Clamp													
70F/21°C	1500		500	150	400	350	200			200	180		
250F/121°C	1200		250	250	200	150	125			125	100		

Product	1/2"	A37 DN10	1 DN25	2" DN50	1 DN65	3" DN80	4" DN100	DN115	DN125	6" DN150	8" DN200	10" DN250	12" DN300
13MHM-Heavy Duty Double Pin Clamp													
70F/21°C	1500	1200	500	150	400	350	200			150	100		
250F/121°C	1200	900	250	250	200	150	125			75	50		

Product	1/2"	A37 DN10	1 DN25	2" DN50	1 DN65	3" DN80	4" DN100	DN115	DN125	6" DN150	8" DN200	10" DN250	12" DN300
13MHP-High Pressure Clamp With Screw Bolt Brass Nut													
70F/21°C	2000		1500	1000	1000	1000	1000			300		200	200
250F/121°C	1500		1200	800	800	800	800			200		100	100

Product	1/2"	A37 DN10	1 DN25	2" DN50	1 DN65	3" DN80	4" DN100	DN115	DN125	6" DN150	8" DN200	10" DN250	12" DN300
13MHHS-3 Segments Clamp													
70F/21°C			600	550	450	350	350						
250F/121°C			300	275	225	175	150						

Product	1/2"	A37 DN10	1 DN25	2" DN50	1 DN65	3" DN80	4" DN100	DN115	DN125	6" DN150	8" DN200	10" DN250	12" DN300
13CS-Double Pin With Link Clamp													
70F/21°C	1500	1200	500	450	400	350	300	250	250	200	200	100	100
250F/121°C	1200	900	300	250	200	150	120	100	100	75	50	30	20

1 psi=0.07kg/cm²
1 psi=6.895kPa
1 bar=14.503psi

13IS & 13IU SERVICE PRESSURE RATING

SIZE	SERVICE PRESSURE RATING AT 70°F*	
1"~1 1/2"	700PSI	250PSI
2"	450PSI	250PSI
2 1/2"	450PSI	200PSI
3"	350PSI	150PSI
4"	200PSI	125PSI
6"	150PSI	100PSI

*Wing nuts tightened to 25 inch lbs of torque.



PNEUMATIC DIVERT VALVE



F

T

L

Y

T/T

Operating Instructions

1. The CSE pneumatic valve can be assembled with different types of flow designs , (as drawing A) to get variable flow control.
2. You can choose SMS, DIN, IDF, RJT, 3A, Ferrule....., Welding; Clamp; Unions.....connect end.
3. Material:
 - 3-1. All products being used with fluid are made of stainless steel AISI 316/316L(1.4401/1.4571).
 - 3-2. The other parts in AISI 304 (1.4301).
 - 3-3. The valve stem is sealed by a FDA EPDM/Silicone/Viton seat and according international standard for use on food or pharmaceutical.
4. Operating air pressure: 5bar-8bar compressed air.
5. Control methods:
 - a. Designed to control different types of various flow, as type L; T; F...etc.
 - b. Choose appropriate dimensions of end, as 2".....clamp or welding.
 - c. Choose appropriate control ways (manual or pneumatic):
 - c-1. Manual control valve are equipped with a rapid pitch screw for protection against unscrewing.
 - c-2. Choose air/spring(simple effect); or air/air (double effect) for pneumatic control.
 - c-3. You can use CSE automatic control box to get signal transfer and complete individual valve control.
 - c-3-1. Signal transfer:
 - a. with 10-30VDC proximity switch contact:1 or 2pcs (PNP OR NPN)
 - b. Or 3A 125VAC,30VDC micro switch contact: 2pcs c-
 - c-3-2. Complete individual valve control:
 - 3-2. Complete individual valve control:
 - Choose (a) or (b) +DC24 3.0W electric valve:1pc & air manifold (for complete control box).

OPERATING MANUAL

Compression Valve Ranges:

1. Pneumatic valve can be equipped with different types of flow design,(as drawing A)
2. Can choose SMS, DIN, IDF, RJT, 3A, Ferrule....., Welding; Clamp; Unions.....connect end.
3. Material:
 - 3-1. All products being used with fluid are made of stainless steel AISI 316/316L(1.4401/1.4571).
 - 3-2. The other parts in AISI 304 (1.4301).
 - 3-3. The valve stem is sealed by a special PTFE/EPDM/Silicon/Viton seat and according to international standard to use in food or pharmaceutical applications.
4. Operating air pressure: 5bar-9bar compressed air.
5. Control methods:
 - a. Designed different type to control various flow, as type F; T; L...etc.
 - b. Choose appropriate dimensions of end, as 2".....clamp or welding.
 - c. Choose appropriate control method (manual or pneumatic):
 - c-1. Manual control valves are equipped with a rapid pitch screw to prevent unscrewing.
 - c-2. Or choose air/spring(simple effect); or air/air (double effect) for pneumatic control.
 - c-3. Can use CSE automatic control box to get signal transfer and complete individual valve control.
 - c-3-1. Signal transfer:
 - a. with 10-30VDC proximity switch contact:1 or 2pcs (PNP OR NPN).
 - b. Or 3A 125VAC,30VDC micro switch contact: 2pcs c-
 - c-3-2. Complete individual valve control:
 - 3-2. Complete individual valve control:
 - Choose (a) or (b) +DC24 3.0W electric valve:1pc & air manifold (for complete control box).



OPERATING MANUAL

Sanitary Butterfly Valve:

Instructions:

1. The butterfly valves are designed for an abundance of low torque applications. They can be easily actuated.
2. Make sure the valve is set in correct position on or off
3. The screws on the body must be locked.
4. Check to see if the valve is in the correct ON or OFF position.
5. Check the valve handle to be sure it's tight and secure.
6. Be sure to keep the valve surface clean.
7. Disassemble the valve for cleaning inner parts and surface from all screws and gasket.
8. Loose screws or bolts will not allow the valve to operate properly.
9. Make sure to check gasket (depends on type of operation) or to replace with a new gasket on schedule to avoid leaking.

Notice:

A. CLEANING:

The butterfly valve can only be cleaned in manual position.

B. ASSEMBLY ON THE PIPE LINE:

a. Weld end:

1. Please disassemble the weld flanges for welding to avoid damage to the gasket.
2. Please clean all inner surface prior to re-assembly.
3. Please make sure to tighten all screws and bolts.
4. Turn the valve to the on and off positions several times to ensure smooth operation.

b. Clamp end & Screw end:

1. Please re-check the correct size clamp (ferrule) or thread on valve.
2. Please re-check correct clamp (ferrule) / thread on the piece that is going to be connected.
3. Need to tighten up valve with connecting piece or clamp-ring.

C. ASSEMBLY OF A DIFFERENT HANDLE:

1. Please check the dimension of disk to assemble the correct handle
2. Please check handle on-off in correct position after assembling the valve

D. WORK TEMPERATURE & PRESSURE:

1. Work pressure for valve: -0.9bar~10bar on water temperature 20°C
2. Work temperature(water):-50°C~210°C depending on it's rubber seat:

Silicon: -50°C~210°C, EPDM: -40°C~110°C, Viton: -10°C~210°C

Torque for full open/close(SIZE)	1"	1 1/2"	2"	2 1/2"	3"	4"
H/M	<13	<13	<16	<18	<23	<34

Special note of CSE Butterfly valve:

Body: SS304, 316, 316L Material made from precision CNC milling machined

Body connection can be changed and lower torque is available (Standards: BS, SMS, DIN, 3A, Weld and Male end, Clamp end.....ect.

Disk: Out from full machined & high level polished, the surface is less than Ra 0.6µm

Disk assembling with the handle or actuator is square 9.5mm or 8 × 12mm or

12 × 12mm, Connection part is meeting USA and Europe requirement

(Electric polished and PTFE coating can be requested)

Handle : Ask sales associate for the 3 different type of handles we offer



OPERATING MANUAL

Range of Diaphragm-Type Valve:

Diaphragm valve Aspect design:

1. Control mode: Manual Type & Pneumatic Type
2. Connection Type: Clamp & Weld
3. Body Material: 316L, Forged, Or Casting
4. Connection: INCH :1/2"~2", DIN/ISO: DN10-DN50 other sizes available upon request.
5. Work temp: Assembling Diaphragm: EPDM (-40°~150°C), PTFE/EPDM(-10°~150°C)
6. Work pressure: MAX 10 Bar
7. Surface: Standard: OD/ID mirror polished. ID Ra<0.5µm OD-Sand Blasted or E/P ID-Polish to Ra<0.5µm(SF1) or E/P Finished Ra,0.38µm(SF4) can be requested.
8. Clean model: CIP & Manual.

Notice:

1. Make sure the valve is in the correct position on or off.
2. Opening for cleaning in manual & CIP, Note: DO NOT loosen seal /bolts.
3. All bolts must be tightened for good operation.
4. Be sure when checking the seal to change the seal when product leakage is detected.

Range of Check valve:

1. Make sure the valve is in correct flow position.
2. Be sure the valve surface is clean.
3. Open to clean inner valve; do not loose all of gasket and spring.
4. Please tighten up the valve clamp when the valve is used on pipe line.
5. Be sure to check the stem gasket or change gasket on schedule to avoid leaking.

OPEN PRESSURE:

Valve Size	1/2"	3/4"	1"	1 1/2"	2"	2 1/2"	3"	4"
Pressure(PSI)	0.5	0.5	3.0	1.6	0.6	1.3	0.8	0.9

Special note for check valves:

- Body & Stem & Disk: 304,316,316L.Full Precision Machined.
- Angle Design For Precision Open and Closed.
- And Can be Use On level/vertical, and Sticky Liquid.
- Spring: Stainless Steel Material Sanitary Both End Design.
- O-ring & Seal Ring: EPDM,SILICON and Viton Material.
PTFE Can be Required (Need Min Q,ty)
- Complete Valve: Open By 0.45bar.Max Work 10bar.
- Design Can be Use On Food, Pharmaceutical and I.C Industry.
- Valve connector end: 3A,BS,SMS,DIN Weld end, Male end, Clamp End.
- Middle flange: Can be choice clamp design or 4 screw bolt flange design.

