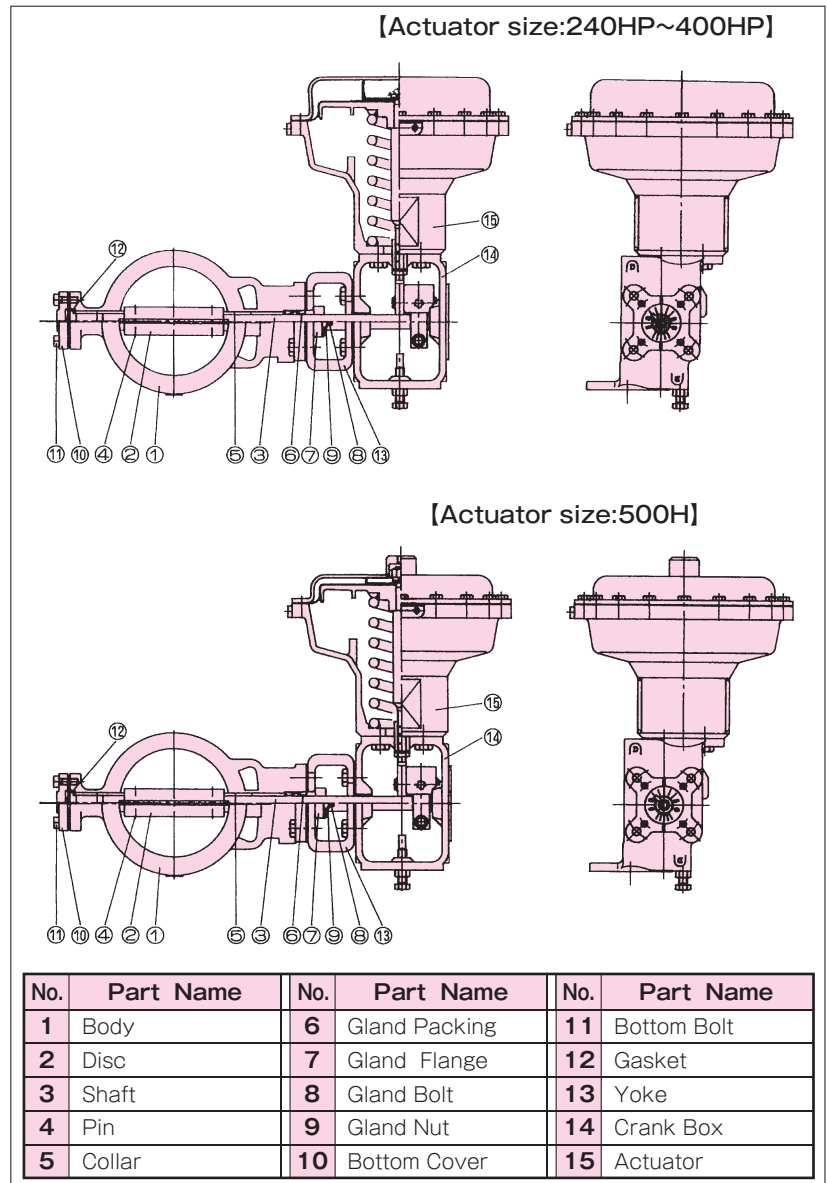


**MOTOYAMA****General Specifications****Model  
2911-1M****Wafer Type Butterfly Valves****Features**

- Downsizing actuators & good controllability with low driving torque.
- Simple structure offers high reliability of performance.
- Light weight & Compactness.
- Easy installation and maintenance.

2911  
-1M**1. Specifications**

<b>Valve Type</b>		Model 2911-1M Spring Return Diaphragm Actuator Operated Wafer Type Butterfly Valve	
<b>Valve Body</b>	<b>Body Type</b>	11-1M	
	<b>Valve Sizes</b>	80mm~600mm (3 inch~24 inch)	
	<b>Press. Rating</b>	JIS 10K (*Options : JIS2K, JIS5K) , ASME/JPI 150	
	<b>End Connections</b>	Wafer Type	
	<b>Materials</b>	<b>Body</b>	SOPH2, SCS13A, SCS14A, WCB, CF8, CF8M
		<b>Disc</b>	SCS14A
	<b>Bonnet Type</b>	Body Integrated Plain	
<b>Control Mode</b>	Throttling (60° Opening) , On-off (90° Opening)		

Actuator	Actuator Type	Model 2900 Spring Return Diaphragm Actuator		
	Actuator Size	240HP, 330HP, 400HP	500H	
	Supply Air Press.	280kPaG (2.8kgf/cm <sup>2</sup> G)		
	Spring Range	80~200kPaG (0.8~2.0kgf/cm <sup>2</sup> G)	60~220kPaG (0.6~2.2kgf/cm <sup>2</sup> G)	
	Rotating Angle	60° , 90°		
	Air Piping Conn.	Rc1/4		
	Ambient Temp.	-20°C~+70°C		
Valve Characteristics & Performance	Valve Action	Direct Action, Reverse Action		
	Applicable Press Range	SCPH2, SCS13A, SCS14A, WCB, CF8, CF8M: 0~1.89MPaG (19.3kgf/cm <sup>2</sup> G)		
	Applicable Temp. Range	-20°C~200°C (* Max. 350°C)		
	Allowable Differential Press.	See "Allowable Differential Press" Table (Page 4)		
	Flow Characteristics	Inherent Characteristic		
	Rated Cv Value	120~10200 (60° Opening) , 230~20200 (90° Opening)		
	Range-ability	15 : 1 (60° Opening)		
	Allowable Seat Leakage Ratio	See "Allowable Seat Leakage Rate" Table (Page 3)		
	Action Accuracy	Hysteresis Error (with Positioner)	2%F.S. Max.	
		Linearity (with Positioner)	±2%F.S. Max.	
Painting Color	Silver			
* Options	Construction; Mechanism ; Materials	End Connection: JIS2k·5k, Temp. Range: 201~350°C Mat'l of Outer Exposure Bolt & Nut: SUS, Handwheel(one-side), Adjustable Travel Stop(one-side)		
	Accessories	Electrio-Pneumatic Positioner, Pneumatic Positioner, Air Filter Regulator, Limit Swith, Solenoid Valve, Other Suitable Accessories		
	Others	High Press. Gas Safety Law Authorization, Oil-Free, Water-Free, Specified Painting Color.		

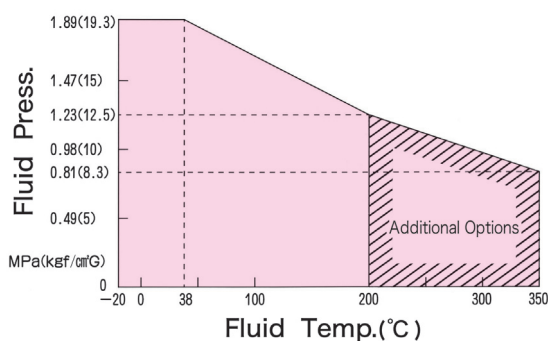
(Note) \*Manufactured and mounted as options according to customer's request.

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## 2. Pressure-Temperature Range and Main Material Classification

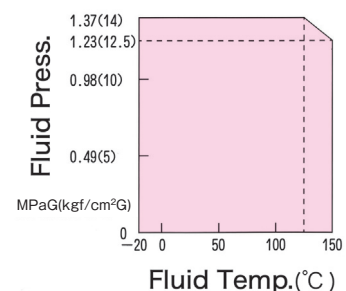
### Pressure-Temperature Range

Body : SCPH2, SCS13A, SCS14A, WCB, CF8, CF8M



Collar : BEAREE FL3030<sup>®</sup>

( as Option )



### Typical Combinations of Materials

Classification	Standard Materials			
Body	FC200 (ASTM A48 No.35)	SCPH2 (ASTM A216 WCB)	SCS13A (ASTM A351 CF-8)	SCS14A (ASTM A351 CF-8M)
Disc	SCS14A			
Collar	SUS316+CoCr Alloy, (BEARFE FL3030 <sup>®</sup> )			
Shaft	SUS316			
Pin	SUS316			

(Notes)

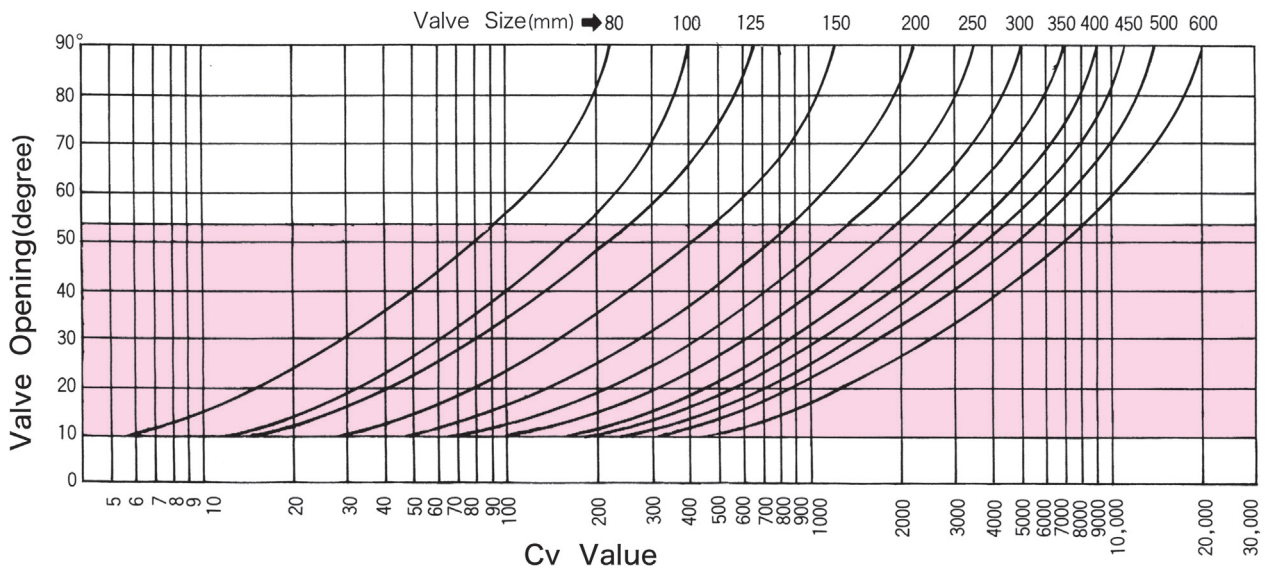
- (1) Left table is our standard material combinations. Other Material combinations are available as option.
- (2) Material codes used in this catalog are in accordance with JIS standard (SI unit). Material codes in accordance with old JIS standard may be used in some other documentations.
- (3) Collar BEAREE FL 3030<sup>®</sup> is as option.

### 3. Cv values and Flow Characteristics

#### Rated Cv Values

Size	(mm)	80	100	125	150	200	250	300	350	400	450	500	600
	(inch)	3	4	5	6	8	10	12	14	16	18	20	24
On-Off Control (90°)		230	390	650	1230	2200	3420	4920	6800	9000	11200	14000	20200
Throttling Control (60°)		120	230	330	620	1100	1710	2460	3500	4500	5600	7000	10200

#### Flow Characteristics



Shaded zone is appropriate range to control the flow.

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### 4. Allowable Seat Leakage Ratio

Unit : %

Size	(mm)	80	100	125	150	200	250	300	350	400	450	500	600
	(inch)	3	4	5	6	8	10	12	14	16	18	20	24
On-Off Control (90°)		2.0	1.5	1.5	1.0	1.0	1.0	0.9	0.9	0.7	0.7	0.7	0.7
Throttling Control (60°)		4.0	3.0	3.0	2.0	2.0	2.0	1.8	1.8	1.4	1.4	1.4	1.4

Note : Seat leakage ratio varies slightly according to the temperature of fluid. The above table is maximum leakage ratio at fully closed position and the temperature 200°C and lower, expressed in the percentage to the rated capacity of the Valve.

## 5. Allowable Differential Pressure

Valve Opening 60° :Throttling Control

90° :On-Off Control

Unit : kPa (kgf/cm<sup>2</sup>)

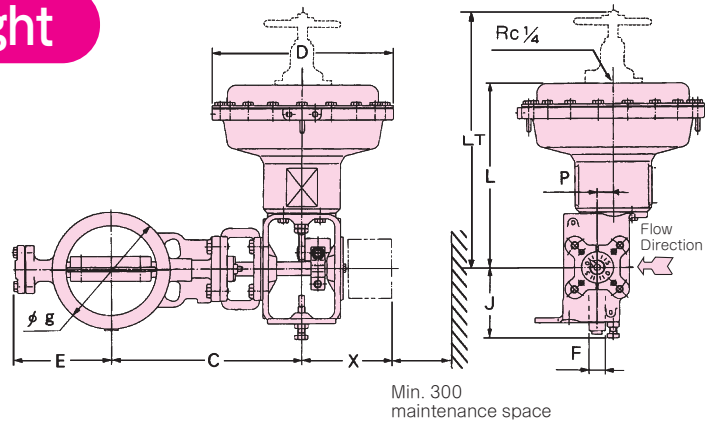
Actuator Size			240HP		330HP		400HP		500H		
Off-balance			80kPaG (0.8kgf/cm <sup>2</sup> G)						60kPaG (0.6kgf/cm <sup>2</sup> G)		
Valve Size (mm) (inch)	Opening Fluids		60°	90°	60°	90°	60°	90°	60°	90°	
			80	3	Gas	980(10.0)					
		CL									
		OP									
		Liq									
		CL									
		OP	686( 7.0)	186( 1.9)							
100	4	Gas	CL		823( 8.4)	--					
			OP	980(10.0)	813( 8.3)	--	980(10.0)				
		Liq	CL		823( 8.4)	980(10.0)					
			OP	441( 4.5)	86(0.88)	686( 7.0)	333( 3.4)				
125	5	Gas	CL	951( 9.7)	490( 5.0)	--					
			OP	980(10.0)	519( 5.3)	--	980(10.0)				
		Liq	CL	951( 9.7)	490( 5.0)	980(10.0)					
			OP	235( 2.4)	45(0.46)	686( 7.0)	176( 1.8)				
150	6	Gas	CL	657( 6.7)	343( 3.5)	980(10.0)					
			OP	921( 9.4)	353( 3.6)						
		Liq	CL	657( 6.7)	343( 3.5)						
			OP	137( 1.4)	26(0.27)	500( 5.1)	98( 1.0)				
200	8	Gas	CL		137( 1.4)		657( 6.7)	--	980(10.0)		
			OP	304( 3.1)	98( 1.0)	980(10.0)	490( 5.0)	--	853( 8.7)		
		Liq	CL		137( 1.4)		657( 6.7)	980(10.0)	980(10.0)		
			OP	50(0.52)	7(0.08)	196( 2.0)	40(0.41)	343( 3.5)	69(0.71)		
250	10	Gas	CL	156( 1.6)	74(0.76)	657( 6.7)	353( 3.6)		617( 6.3)		
			OP	186( 1.9)	65(0.67)	764( 7.8)	313( 3.2)	980(10.0)	539( 5.5)		
		Liq	CL	156( 1.6)	74(0.76)	657( 6.7)	353( 3.6)		617( 6.3)		
			OP	26(0.27)	3(0.04)	98( 1.0)	20(0.21)	176( 1.8)	36(0.37)		
300	12	Gas	CL	98( 1.0)	48(0.49)	421( 4.3)	225( 2.3)		392( 4.0)		
			OP	127( 1.3)	45(0.46)	529( 5.4)	215( 2.2)	666( 6.8)	372( 3.8)		
		Liq	CL	98( 1.0)	48(0.49)	421( 4.3)	225( 2.3)		392( 4.0)		
			OP	15(0.16)	1(0.02)	63(0.65)	11(0.12)	98( 1.0)	20(0.21)		
350	14	Gas	CL			294( 3.0)		500( 5.1)		627( 6.4)	
			OP			392( 4.0)	156( 1.6)	627( 6.4)	274( 2.8)	627( 6.4)	617( 6.3)
		Liq	CL			294( 3.0)		500( 5.1)		627( 6.4)	
			OP			40(0.41)	7(0.08)	68(0.70)	12(0.13)	147( 1.5)	30(0.31)
400	16	Gas	CL			225( 2.3)		382( 3.9)	215( 2.2)		480( 4.9)
			OP			294( 3.0)	117( 1.2)	500( 5.1)	205( 2.1)	509( 5.2)	470( 4.8)
		Liq	CL			225( 2.3)		382( 3.9)	215( 2.2)		480( 4.9)
			OP			27(0.28)	4(0.05)	46(0.47)	8(0.09)	98( 1.0)	19(0.20)
450	18	Gas	CL			166( 1.7)	92(0.94)	284( 2.9)			353( 3.6)
			OP			235( 2.4)	96(0.98)	392( 4.0)	156( 1.6)	460( 4.7)	372( 3.8)
		Liq	CL			166( 1.7)	92(0.94)	284( 2.9)			353( 3.6)
			OP			19(0.20)	2(0.03)	32(0.33)	5(0.06)	72(0.74)	13(0.14)
500	20	Gas	CL			107( 1.1)	58(0.60)	186( 1.9)	98( 1.0)		235( 2.4)
			OP			137( 1.4)	53(0.55)	235( 2.4)	97(0.99)	421( 4.3)	215( 2.2)
		Liq	CL			107( 1.1)	58(0.60)	186( 1.9)	98( 1.0)		235( 2.4)
			OP			12(0.13)	1(0.02)	22(0.23)	3(0.04)	50(0.52)	9( 0.1)
600	24	Gas	CL			73(0.75)	38(0.39)	117( 1.2)	68(0.70)	274( 2.8)	156( 1.6)
			OP			96(0.98)	37(0.38)	156( 1.6)	66(0.68)	313( 3.2)	147( 1.5)
		Liq	CL			73(0.75)	38(0.39)	117( 1.2)	68(0.70)	274( 2.8)	156( 1.6)
			OP			7(0.08)	0(0.01)	12(0.13)	1(0.02)	30(0.31)	5(0.06)

(Note) "CL" indicates max. shut-off pressure at fully Closed position and "OP" indicates allowable differential pressure at fully Opened position.

## 6. Main Dimensions & Weight

**(Notes)**

- (1) This figure indicates standard mounting orientation, D-1L On Page 7.
- (2) Chain-double-dashed line indicates mounting position of positioner.
- (3) Dotted line indicates Hand Wheel.



Unit : mm

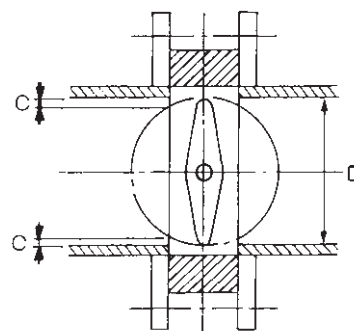
Valve-Size		g	Face-to Face F	Actuator Size	E	C	J	L	LT	D	X	P		Appr. Weight (kg)							
(mm)	(inch)											60° Opening	90° Opening								
80	3	130	42	240HP	135	245	115	275	480	240	230	30	18	21							
100	4	156	49		155	280								25							
125	5	187	52	240HP	165	290	130	445	690	330	240	52	30	27							
				330HP		340								46							
150	6	217	52	240HP	180	300	130	445	690	330	240	52	30	31							
				330HP		350								50							
200	8	* 267 270	56	240HP	220	385	130	445	690	330	240	52	30	46							
				330HP		395								65							
				400HP		420								100							
250	10	326	62	240HP	245	415	130	445	690	330	240	52	30	65							
				330HP		425								84							
				400HP		455								119							
300	12	* 372 381	70	240HP	* 280 300	455*	130	445	690	330	240	52	30	81							
				330HP		475								100							
				400HP		465*								135							
350	14	415	85	330HP	350	525	130	445	690	330	240	52	30	128							
				400HP		555								160	470	765	400	270	60	35	163
				500H										205	635	1090	500		104	60	239
400	16	475	90	330HP	385	560	130	445	690	330	240	52	30	152							
				400HP		585								160	470	765	400	270	60	35	187
				500H										205	635	1090	500		104	60	263
450	18	* 530 533	100	330HP	415	585	130	445	690	330	240	52	30	213							
				400HP		610								160	470	765	400	270	60	35	248
				500H										205	635	1090	500		104	60	324
500	20	585	110	330HP	445	610	130	445	690	330	240	52	30	253							
				400HP		640								160	470	765	400	270	60	35	288
				500H										205	635	1090	500		104	60	364
600	24	* 690 692 Note(2)	120	330HP	500	670	130	445	690	330	240	52	30	351							
				400HP		695								160	470	765	400	270	60	35	386
				500H										205	635	1090	500		104	60	462

- (Notes)** (1) Dimensions with \*mark, Upper dimension is for JIS 10K, and Lower dimension is for ASME/JPI 150.  
 (2) Size 600mm with JIS 10K, Body materials, SCPH2, SCS13A, SCS14A, WCB, CF8, CF8M "g" dimension is 692mm.  
 (3) Approximate Weight does not include Hand Wheel.

2911-1M

## 7. Caution on Piping

1. On Wafer Type Butterfly Valves, the disc enters inside to the piping when it is fully open, so use the pipes equal to or larger dimensions mentioned in the table below to prevent the disc from galling or sticking.
2. When smaller piping is required than Min. Diameter "D", please contact our Sales Office.
3. Radial clearance "C" is applied based on MSS-SP-67.



The minimum inside diameter of piping.

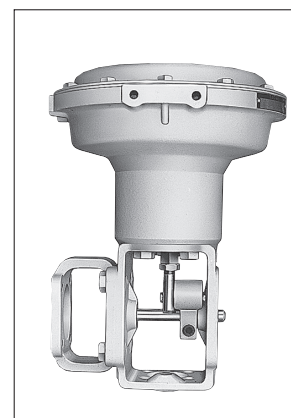
Unit : mm

Size		Minimum Diameter "D"	Radial clearance "C"	Recommended pipe schedule	
(mm)	(inch)			Sch. No. (I.D.)	Radial clearance "C"
80	3	73	3.0	#40 ( 78.1)	4.35
100	4	90		#40 (102.3)	7.92
125	5	117		#40 (126.6)	6.60
150	6	144		#40 (151.0)	5.32
200	8	195		#40 (199.9)	5.45
250	10	246		#40 (248.8)	4.76
300	12	294		#40 (297.9)	5.13

## 8. Actuator

### 1 Actuator Output

Actuator Model/Type		2900			
		Single Action Diaphragm			
Actuator Size		240HP	330HP	400HP	500H
Torque N-m (kgf-m)	60°	64 (6.5)	210 (21.4)	344 (35.1)	739 (75.4)
	90°	36 (3.7)	121 (12.3)	199 (20.3)	427 (43.5)
Spring Range kPaG (kgf/cm <sup>2</sup> G)		80~200 (0.8~2.0)			60~220 (0.6~2.2)
Off-balance kPaG (kgf/cm <sup>2</sup> G)		80 (0.8)			60 (0.6)
Supply Air Pressure kPaG (kgf/cm <sup>2</sup> G)		280 (2.8)			



## 2 Actuator Mounting Orientation

■ WAFER TYPE BUTTERFLY VALVE has a characteristic to be able to change the actuator position in one of the following orientation corresponding to the on-site conditions so that it can be installed easily in the limited piping spaces.

However, be sure to install the Actuator to be vertical in any orientation selected. Unless otherwise specified, valve will be shipped with our standard orientation D-1L or R-1L.

Note : Valve close according as disk is rotated at the view from actuator side.

	D-1L(Standard)	D-2L	D-3L	D-4L
Direct Action (DA)				
Reverse Action (RA)				

(Legends) → : Flow Direction

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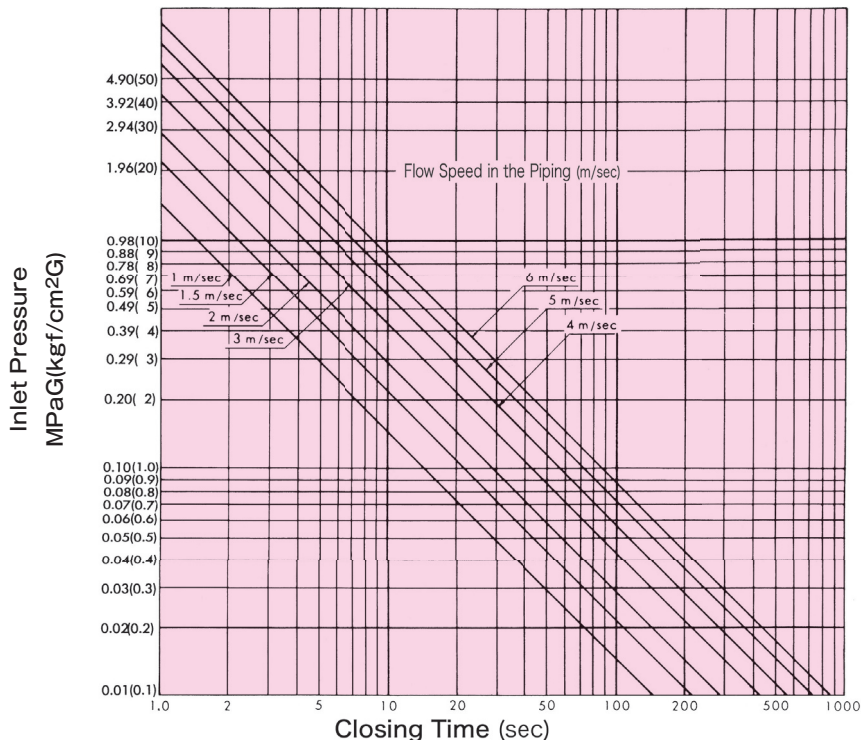
## 9. Reference Data

■ Closing time vs Inlet pressure & Velocity (For reference only)

In case of liquid service, valve closing time is limited by fluid velocity.

The below table shows the relation between the inlet pressure and fluid velocity with the minimum closing time.

Use this table for the process designing as for reference.





株式会社 **本山製作所**

# MOTOYAMA ENG. WORKS, LTD.

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## ●OVERSEAS NETWORK

China, Korea, Taiwan, Singapore, Indonesia, Malaysia, Saudi Arabia

◆当社は保証期間を原則として製品納入後 1 年としています。

◆The product will be warranted for one year after delivering this product in principle.

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