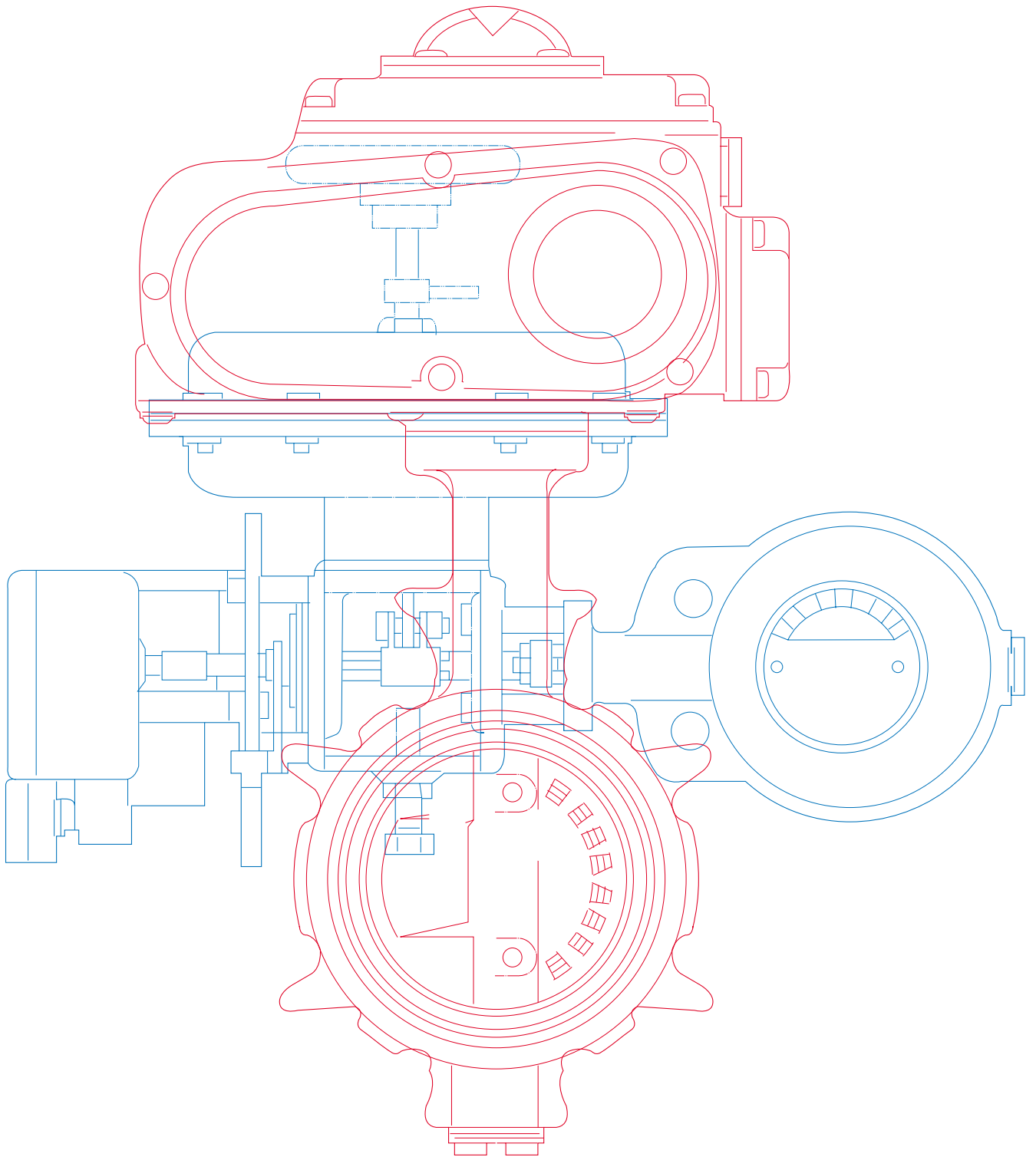


**TOMOE**<sup>®</sup>

Rotary Control Valve

**507V/508V**



**TOMOE VALVE CO.,LTD.**

**With multiple applications in airconditioning systems, pulp&paper mills, steel mills, chemical plants, food processing, and many other process industries, the Rotary control valve, 507V/508V is in constant support for you and your fluid control applications at all times.**

## **Model 507V** of The Rotary Control Valve, Applicable for High Temperature Fluid of up to 400°C

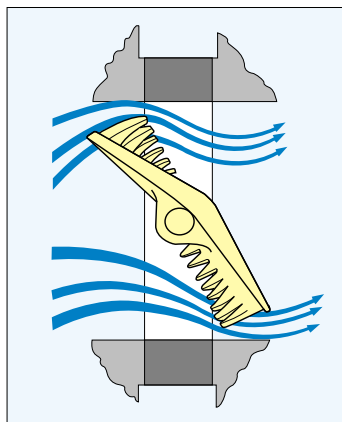
### **General**

The Model 507V is the high temperature version of our rotary control valve. In designing it for exclusive use in the regulation of fluids, we have pursued every angle of the control requirements and developed a state-of-the-art product: with high rangeability, reduced dynamic torque, low noise level, anti-cavitation, and other excellent features. This model covers a wide temperature range in the fluid control of airconditioning systems, pulp and paper mills, chemical plants, steel mills and food processing equipment.

### **Structure**

The high performance characteristics of this model in fluid control originates from its unique design with the teeth and gull-wing shaped disc that touches the seat at a certain angle.

The teeth are arranged on the circumference of the disc towards either direction of flow. The "touch-at-an-angle" disc assists the reduction of seating and unseating torque and facilitates smooth control of the valve.



### **Features**

#### **(1) FLEXIBLE CONTROL OVER A WIDE RANGE**

The 507V allows complete control over the full range from the open to the closed position. The valve can also handle high temperatures of up to 400°C such as steam lines. These features enable the rotary valve to response quickly and flexibly to any changes within the operating parameters of the process lines. The 507V, therefore, is the optimum valve for any control systems processing multiple products where the operating conditions change from time to time in accordance with process requirements.

#### **(2) COST-EFFECTIVE ROTARY CONTROL VALVE**

In spite of its compact size and lightweight, the 507V has a large valve capacity that minimizes the energy loss of fluid at the fully open position.

This compact design reduces the required size of actuator, installation space, piping supports, minimizes vibration of control systems and increases its operating life.

These features provide benefits in reduction of the total operating cost for your plant.

## Control Valve, 507V/508V Series

### General

With guide-vane-like teeth around the disc edge, and the disc touching the seat at a certain angle, this product is compact, lightweight and highly cost-effective high performance rotary control valve having outstanding control characteristics.

The valve displays steady control over a wide range with higher rangeability, better cavitation resistance, lower dynamic torque, lower noise level, and better leakage rate than any other rotary control valves.

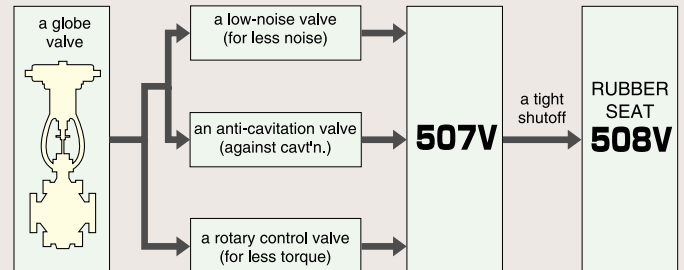
Two models, 507V and 508V, are available for a range of severe applications. The 507V is the optimum type for fluid control of high pressure, high temperature system. The 508V is characterized by its rubber seat ring and eliminates the need for any additional stop valve because of its complete sealing capability.

### Fundamental Structure

This product has two basic design features that are responsible for the outstanding performance of the valve. One is the teeth around the disc, the other is the gull-wing-like design of the disc. The teeth on the circumference of the disc break up the fluid energy

acting on it with a resultant reduction of pressure recovery. Unlike conventional flat discs, the gull-wing-like disc of the product touches the seat at a certain angle for reduced seating/unseating torque. Resulting in a steady control of the valve.

### A Recent Trend of Control Valves Towards a Rotary Type.



# Model 508V of The Rotary Control Valve, Tight Shutoff With A High Grade Rubber Seat Ring.

### General

With a special designed rubber seat ring, the Model 508V ensures tight shut-off, and eliminates the need for any additional stop valve required by conventional control valves. The face-to-face dimension meets both the JIS and ISO standards and is applicable for various industrial fields including airconditioning systems.

### Structure

#### TIGHT SHUTOFF WITH A RUBBER SEAT RING

Except for the rubber seat ring, the 508V have the same design principle as the 507V, excellent controllability is achieved by having the innovative teethed disc seating at a certain angle.

The 508V has a reinforced core rubber seat ring allowing it to be used for high pressure service up to 16 kgf/cm<sup>2</sup> with complete tight shutoff.



### Features

#### (1) RUBBER SEAT RING WITH A "CONTROL COSINE CURVE" SILHOUETTE

Taking into consideration the cosine curve silhouette rubber seat ring, incorporated in our models 700G, 702Z, etc. we developed a new type of seat ring for exclusive use in the 508V.

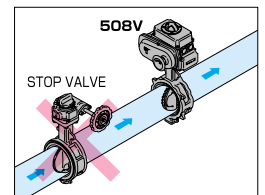
The 508V has a reinforced core rubber seat ring incorporated with a "control cosine curve" profile for sizes between 50 mm and 200mm. This seat ring design ensures a tight shut-off up to a working pressure of 16 kgf/cm<sup>2</sup>.

The 508V in sizes between 250 mm and 350 mm has a similar seat ring design and profile. The seat ring is backed up by a metal core precisely formed and encapsulated inside the rubber. This design enables the control valve to function under severe conditions of high velocity, a large differential pressure or a high vacuum. (The maximum allowable shutoff pressure is 10 kgf/cm<sup>2</sup>).



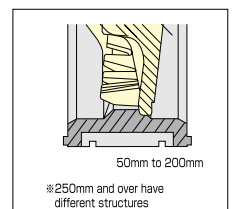
#### (2) NO ADDITIONAL STOP VALVE, LESS INSTALLATION SPACE, AND LESS COST

Because of its reliable sealing effect against a high differential pressure, the 508V does not require any additional stop valve. You save on installation space and cost. You benefit from the excellent cost effective features of our rotary control valve.



#### (3) SATISFIES BOTH JIS AND ISO STANDARDS FOR EXTENDED APPLICATIONS

The 508V is available in different flange specifications. In addition, its face-to-face dimension meets both the JIS and ISO requirements. Thus, this model is applicable for various industrial applications worldwide.

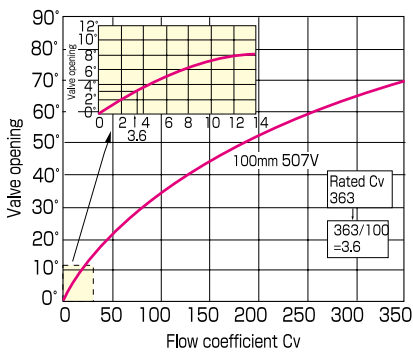


# Multiple merits for multiple applications.

## Merits in Controllability

### High Rangeability

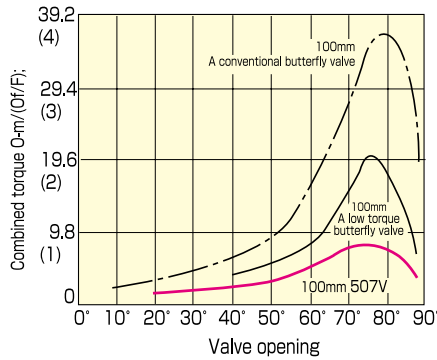
- \*The wide range of controllability permits flexible adjustment to any changes in the process conditions of production lines. This merit is especially beneficial to multifold productions.
- \*A conventional "split range control" with twin valves is no longer required. One product is enough to cover the whole range.



With its nearly "equal percent" flow characteristics and its very low leakage rate, the product offers an extremely high rangeability of 100:1.

### Low Dynamic Torque

- \*The steady performance ensures more precise control.
- \*The compact actuator saves space and energy.

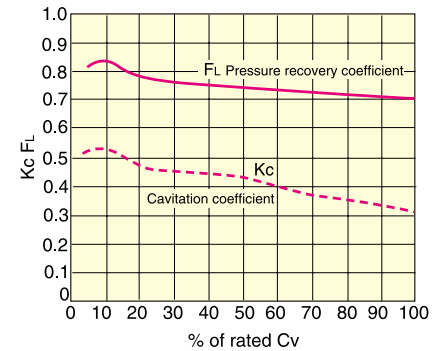


The above graph shows a comparison of the product with other typical valves. The patented disc has remarkably reduced the dynamic torque.

## Merits in Reliability

### Excellent Cavitation Resistance

- \*The outstanding cavitation resistance increases the operational life of the valve and pipeline and improves the reliability of the system.
- \*This model is applicable to a more severe requirement than ever.

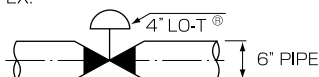


A high coefficient of initial cavitation, (Kc) and a high pressure recovery coefficient, (FL) inhibit the occurrence of cavitation.

## Cv Value

SIZE			OPENING ANGLE						
mm	inch		10°	20°	30°	40°	50°	60°	70°
50	2	Cv	3	11	22	38	53	69	85
		CvFp	3	11	22	37	50	63	74
80	3	Cv	14	33	58	88	120	140	176
		CvFp	14	33	58	86	115	133	162
100	4	Cv	17	43	80	127	190	275	363
		CvFp	17	43	80	125	183	255	320
150	6	Cv	55	120	210	320	450	630	825
		CvFp	55	120	208	313	432	583	727
200	8	Cv	70	175	330	550	860	1265	1595
		CvFp	70	174	328	539	820	1147	1376
250	10	Cv	96	280	455	760	1230	1800	2515
		CvFp	96	279	452	748	1181	1657	2164
300	12	Cv	150	410	740	1240	1900	2700	3610
		CvFp	150	409	735	1215	1815	2470	3109
350	14	Cv	180	480	900	1500	2200	3300	4440
		CvFp	180	479	895	1476	2127	3068	3918
400	16	Cv	200	550	1100	1900	3000	4400	5650
		CvFp	200	549	1094	1872	2892	4079	5014

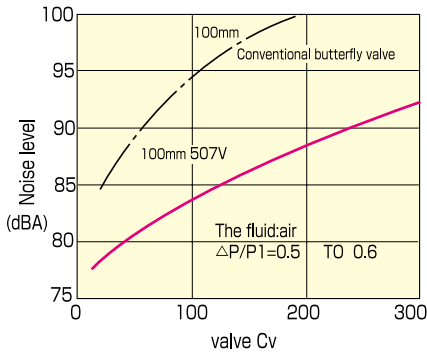
(REMARKS)  
CvFp: PIPE SIZE = 1.5 × VALVE SIZE  
EX:



## Merits for Environmental Considerations

### Low Noise Level

- \*Provides better work environment.
- \*Especially on air and gas applications, this product has a lower noise level by 5 to 10dBA and meets and exceeds noise regulations



The teeth on the disc cut the flow into fine jet streams. This is the most effective device for lowering of noise level when the valve is half open.

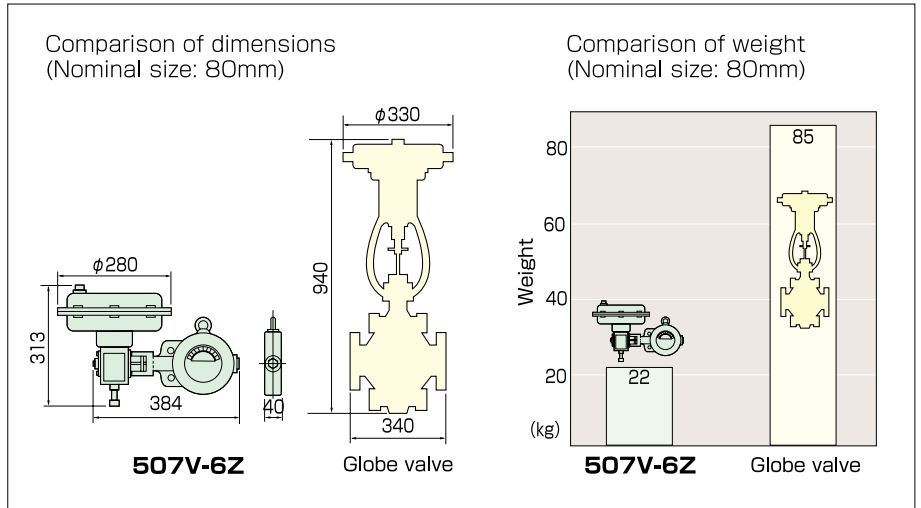
## Merits from the Economic Viewpoint

### The Larger Capacity of the Valve

- \*reduces loss of energy at the fully wide open position.
- \*allows one to two sizes of valve reduction in comparison with a conventional valve.

### The Compact and Lightweight Design

- \*permits compact piping arrangement.
- \*allows the use of a portable remote controller unit.
- \*eliminates vibration problems of the piping system, and improve its operational life.



### The Simple Design

- \*permits easy control of spare parts.
- \*facilitates easy maintenance.
- \*has a reduced number of parts and improved reliability.

## Pressure Recovery Factor (FL), Coefficient of incipient Cavitation (Kc)

OPENING ANGLE	10°	20°	30°	40°	50°	60°	70°
PRESSURE RECOVERY FACTOR (FL)	0.85	0.80	0.78	0.76	0.73	0.71	0.70
COEFFICIENT OF INCIPIENT CAVITATION (Kc)	0.55	0.50	0.47	0.45	0.40	0.37	0.32

# Model 507V

## Standard Specifications of the Body

Valve Size		50 to 400mm		
Pressure Rating		50 to 200mm : ANSI CLASS 300Lbs. 250 to 400mm : ANSI CLASS 150Lbs.		
Actuator Mounting		Non-flange joint		
Flange Accomodation		JIS 10k, JIS 16k, JIS 20k ANSI CLASS 150Lbs., ANSI CLASS 300Lbs., DIN PN 10, 16, 25 Please contact us when 250mm/16k and over.		
Service Temperature *	Cast Steel	-10°C to +400°C Following materials are used for 200°C or higher temperature carbon for bearings Grafoil® for packings		
	Stainless Steel	-50°C to +400°C Following materials are used for 200°C or higher temperature carbon for bearings Grafoil® for packings		
Rangeability		100:1		
Valve Opening		Max 70°		
Flow Characteristics		Equal Percent		
Leakage Rate**		ANSI / FCI 70-2 CLASS II		
Stuffing Box		Studs and nuts tightening		
Standard Materials	Body	1 50 to 200mm	Forged Steel SF490A	2 Forged Stainless Steel SUSF316
		250 to 400mm	Cast Steel SCPH2	Stainless Steel SCS14
	Disc***	50 to 150mm	Cast Steel SCPH2	Stainless Steel SCS14
		200 to 400mm	Ductile Iron FCD450	Stainless Steel SCS14
	Stem		Stainless Steel SUS630(SUS316)****	
	Bearings		Reinforced Teflon®	Reinforced Teflon®
	Packings		Teflon® Asbestos	Teflon® Asbestos
	Gland Flange		Stainless Steel	Stainless Steel

\*Please consult us if the application is in the range of 400°C to 600°C.

Grafoil® is a product of Union Carbide Inc.

\*\*The disc is gull wing shaped and touches on the metal seat at an angle. This design minimizes leakage to a level less than 0.5% of the rated Cv, which is equal to or lower than the leakage permitted on a double-seat globe control valve.

\*\*\*The disc is electroless plated with nickel.

\*\*\*\*Please consult us if SUS316 stem are required.

Note: teflon® is a brand name of fluoroplastics produced by Mitsui Du Pont Fluorochemicals and Du Pont Corporation.

## Cv Value

SIZE	mm	50	80	100	150	200	250	300	350	400
	inch	2	3	4	6	8	10	12	14	16
%of Max. Cv		0.38	0.33	0.25	0.25	0.22	0.22	0.21	0.20	0.18

# Model 508V

[Tight Shutoff With Rubber Seating]

## Standard Specifications

Valve Size		50·80·100·150·200mm	250·300·350mm
Face-to-face Dimension		ISO 5752 Wafer Short(except 350 mm which is "Medium") JIS B2032(Series 46)(except 350 mm which is of Series 47)	
Flange Accomodation		JIS 5K, 10K, 16K, 20K ANSI 150Lbs ISO(BS, DIN) PN10, PN16 BS10 "E", "F"	JIS 10K, 16K ANSI 150Lbs ISO(BS, DIN) PN10, PN16 BS10 "E", "F"
Service Temperature		-20 to 120°C	
Max. Working Press.		16 kgf/cm <sup>2</sup> (Tight Shutoff)	10 kgf/cm <sup>2</sup> (Tight Shutoff)
Body. Test Press.		32 kgf/cm <sup>2</sup>	20 kgf/cm <sup>2</sup>
Seat Leak Test Press.		18 kgf/cm <sup>2</sup>	12 kgf/cm <sup>2</sup>
Flow Characteristics		nearly equal percent	
Rangeability		100:1	
Service Temperature *	Body	FCD450(No Fluid Exposure)	
	Disc	SCS14	SCS13 or FCD450(electroless plated)
	Stem	SUS420J2(No Fluid Exposure)	
	Seat Ring	EPDM(core-reinforced)	

<REMARK> SF490A:Forged Steel equivalent to A105. SCPH2:Cast Steel equivalent to WCB. FCD450:Ductile Cast Iron equivalent to A395.

SCS13,14:Stainless Steel Casting equivalent to CF8/CF8M. SUS420J2:Stainless Steel

# Our High Performance Designs meet to all requirements for enhancement of process lines, such as automation, manpower-reduction, multiple production process and systems.

## An Electronic Approach (with a micro computer) MICOM NEL/507V-4I

The actuator has a built-in micro computer which allows easy field adjustment of the flow.

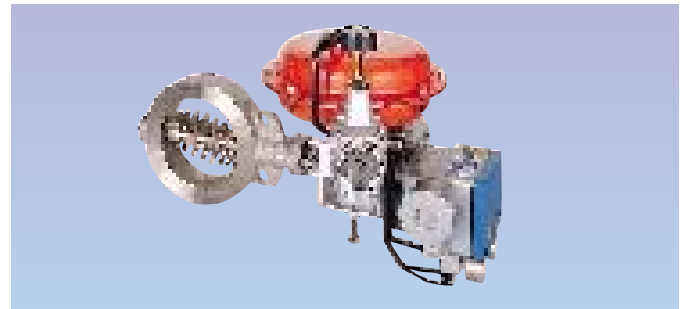
- \*With the use of a remote controller, the built-in micro computer allows simple, easy and instant adjustment of flow characteristic of the valve, zero/span, and other varied parameters at site.
- \*A high precision control of up to 1/250 of a degree permits accurate positioning.
- \*Electronic control of the motor assures maintenance-free service with high reliability.
- \*This compact and multi-function device with built-in micro computer, offers you the most up-to-date technology



## A Pneumatic Approach SPRING DIAPHRAGM/507V-6Z

A compact and lightweight spring diaphragm features in our design.

- This is a rotary control valve with a compact and lightweight multispring diaphragm actuator.
- \*A "floating stem" mechanism permits smooth action to convert the actuator's thrust into a rotation torque.
- \*A link mechanism with no backlash assures accurate and smooth operation.



### Standard Specifications of Actuator

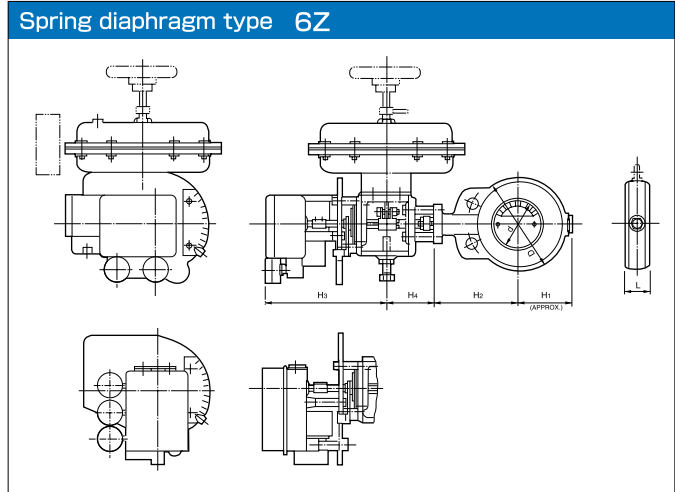
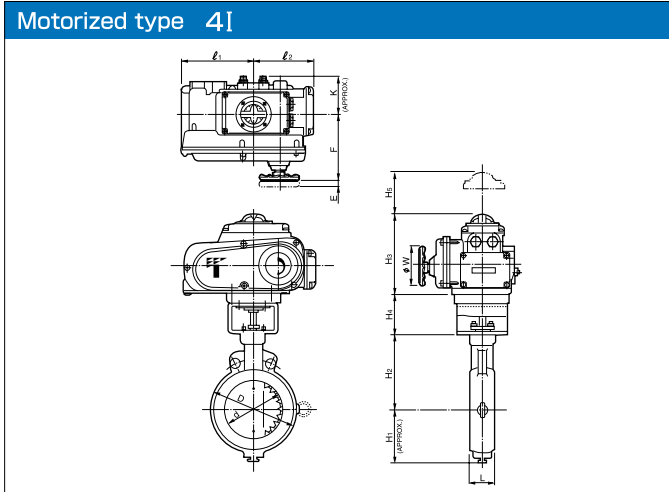
Type	MICOM-NEL	
Input Signal	4 to 20mA DC(input resistance 250Ω) or 1 to 5V DC	
No-Voltage Contact Input	"a" contacts for open/close contact signals	
Power Supply	AC, 100V/200V ±10%, 50/60Hz, 1φ	
Rotation Range	0 to 70°	
Frequency of Service	50%ED or less	
Frequency of Inching	60times/min or less	
Control Compartment	all semi-conductors, hybrid IC, completely resin-molded	
Control Functions	Correction of valve flow characteristics <ul style="list-style-type: none"> <li>*adjustment of Cv linear characteristics (built-in programs)</li> <li>*adjustment of flow linear characteristics (programmed with the remote controller)</li> <li>*linear characteristics of valve openings</li> </ul>	
	Mode of Valve Operations	either direct or reverse operation
	Mode for Operation with input Signal off	either stop, wide open, or full close(3.0mA ±10% or less)
	Output Signal	4~20mA, DC(load resistance of less than 300Ω)
	Zero/span Adjustment	(by means of the built-in switch or the remote controller) *Range of Valve Opening: 0° to 70° *An adjustable range of input/output signal is as follows <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>■ Adjustable Range of Input Signal</p> </div> <div style="text-align: center;"> <p>■ Adjustable Range of Output Signal</p> </div> </div>

### Standard Specifications of Actuator

	Model 280	Model 400
Construction	Floating system type	
Diaphragm area (cm <sup>2</sup> )	348	725
Max. supply pressure MPa (kgf/cm <sup>2</sup> G)	0.20 (2.0)	0.27 (2.8)
Spring range MPa (kgf/cm <sup>2</sup> G)	0.02~0.10 (0.2~1.0) 0.14MPa (SUP.1.4) 0.04~0.15 (0.4~1.5) 0.20MPa (SUP.2.0)	0.06~0.19 (0.6~1.9) 0.27MPa (SUP.2.8)
Max. stroke (mm)	39.6	58.3
Approx. weight (kg)	10.7 (including bracket)	57.1 (including bracket)

<REMARK> The Manual handle (top handle) is available as optional.

# 507V



## Dimension list

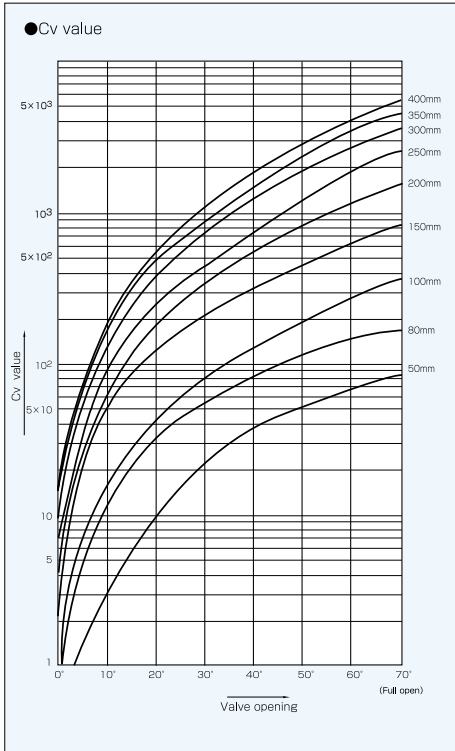
Nominal size		Dimension (mm)														Motor type	Approx. weight (kg)	
mm	inch	d	D	L	H <sub>1</sub>	H <sub>2</sub>	H <sub>3</sub>	H <sub>4</sub>	H <sub>5</sub>	l <sub>1</sub>	l <sub>2</sub>	E	F	K	φW			
50	2	49	92		63	108											Type1	18.3
80	3	73	127	40	86	126	167	95		138	114	12	126	65	70		Type1	19.3
100	4	97	155		98	149											Type1	20.3
150	6	146	216	52	129	187	201	75		167	143	14	154	85	100		Type2	24
200	8	194	265	62	184	208			100								Type2	34
250	10	241	324		196	278											Type2	60
300	12	289	370	89	230	331											Type3	70
350	14	318	415		256	316	233	115		223	165	23	246	136	200		Type3	86
400	16	364	470	108	296	338											Type3	100

- The H<sub>3</sub> dimension is different when the servo unit is connected.
- For the New MICOM ELMY, the dimension H<sub>3</sub> is different.

## Dimension list

Nominal size		Dimension (mm)										Diaphragm type	Approx. weight (kg)				
mm	inch	d	D	L	H <sub>1</sub>	H <sub>2</sub>	H <sub>3</sub>	H <sub>4</sub>	H <sub>5</sub>	H <sub>6</sub>							
50	2	49	92		63	108											20
80	3	73	127	40	86	126											22
100	4	97	155		98	149	214	93									23
150	6	146	216	52	129	187											30
200	8	194	265	62	184	208											39
250	10	241	324		196	278											90
300	12	289	370	89	230	331											100
350	14	318	415		256	316	253	127									115
400	16	364	470	108	296	338											130

## Cv value/Fl value/Kc value



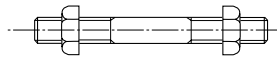
## Piping bolts sizes

Nominal size		JIS 10K	JIS 20K	ANSI 125/150Lb	ANSI 300Lb
mm	inch	Long bolts		Long bolts	
50	2	4-M16×125×30	8-M16×125×30	4-U 5/8×130×35	8-U 5/8×140×40
80	3	8-M16×130×30	8-M20×145×35	4-U 5/8×140×40	8-U 3/4×160×50
100	4	8-M16×130×30	8-M20×150×40	8-U 5/8×140×40	8-U 3/4×165×45
150	6	8-M20×160×40	12-M22×175×50	8-U 3/4×165×45	12-U 3/4×185×55
200	8	12-M20×165×40	12-M22×185×45	8-U 3/4×180×50	12-U 7/8×210×65
250	10	12-M22×205×45	—	12-U 7/8×215×55	—
300	12	16-M22×205×45	—	12-U 7/8×220×55	—
350	14	16-M22×205×45	—	12-U 1 ×235×55	—
400	16	16-M24×235×50	—	16-U 1 ×255×65	—

Piping bolts sizes are described as follows : ※For spiral gaskets, use SNB7 bolts and S45C nuts. (Ex.)

Nominal size 150mm JISkg/cm<sup>2</sup> Long bolts  
 8 - M20 × 160 × 40

Quantity Screw diameter Bolts length Effective screw diameter

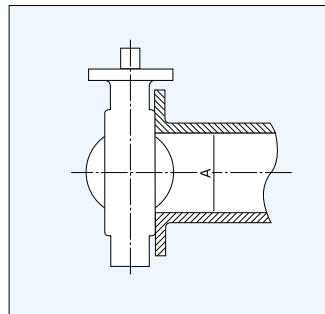


- (Remarks)
1. Hexagon bolts should be used with hexagon (thin) nuts.
  2. The length is based on 4.5mm packings.

■ In piping operations, use a gasket size that complies with flange standard.

## Minimum internal diameter of piping

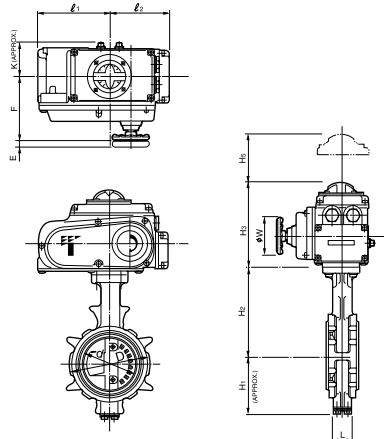
Nominal size		Minimum internal diameter of piping A (mm)
mm	inch	
50	2	36
80	3	71
100	4	98
150	6	148
200	8	199
250	10	241
300	12	293
350	14	321
400	16	367





# 508V

## Motorized type 4I

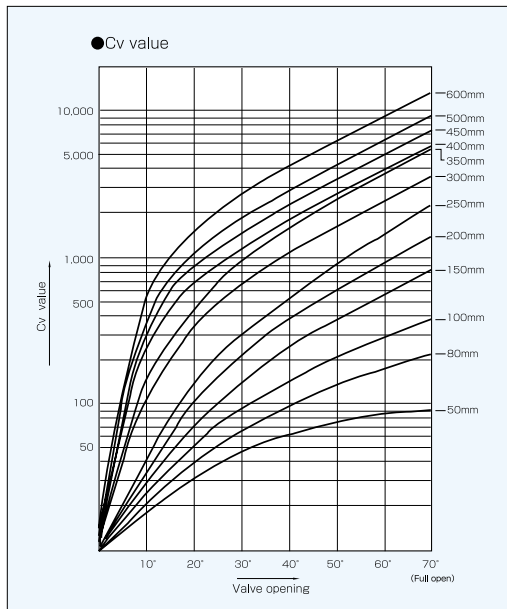


### Dimension list

Nominal size	Dimension (mm)													Motor type	Approx. weight (kg)		
	mm	inch	d	D	L	H <sub>1</sub>	H <sub>2</sub>	H <sub>3</sub>	H <sub>4</sub>	l <sub>1</sub>	l <sub>2</sub>	E	F			K	W
50	2	48	101	43	76	142										Type1	8.9
80	3	75	131	46	95	158	165		138	114	12	126	65	70		Type1	10.4
100	4	96	156	52	110	169										Type2	11.7
150	6	143	217	56	160	202	198	100	167	143	14	154	85	100		Type2	20
200	8	188	268	60	182	277										Type3	39
250	10	248	322	68	255	280	230		223	165	23	246	136	200		Type3	53
300	12	296	375	78	284	312										Type3	66

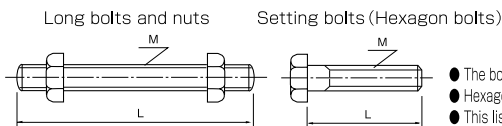
- The H<sub>3</sub> dimension is different when the servo unit is connected.
- For the New MICOM ELMY, the dimension H<sub>3</sub> is different.

### Cv value/FL value/Kc value



### Piping bolts and nuts sizes

Nominal size	JIS 5K			JIS 10K			JIS 16K, 20K				
	mm	inch	Quantity	M	L	Quantity	M	L	Quantity	M	L
Long bolt and nuts											
50	2	4	4	M12	105	4	M16	120	4	M16	120
80	3	4	4	M16	120	8	M16	120	8	M20	140
100	4	8	4	M16	130	8	M16	130	8	M20	150
150	6	8	8	M16	130	8	M20	150	12	M22	165
200	8	8	8	M20	150	12	M20	150	12	M22	170
250	10	-	-	-	-	12	M22	170	12	M24	190
300	12	-	-	-	-	16	M22	185	16	M24	200
350	14	-	-	-	-	16	M22	195	16	M30 (P3)	230
400	16	-	-	-	-	16	M24	220	-	-	-
450	18	-	-	-	-	20	M24	235	-	-	-
500	20	-	-	-	-	20	M24	250	-	-	-
600	24	-	-	-	-	20	M30	300	-	-	-
Setting bolt											
600	24	-	-	-	-	8	M30	65	-	-	-

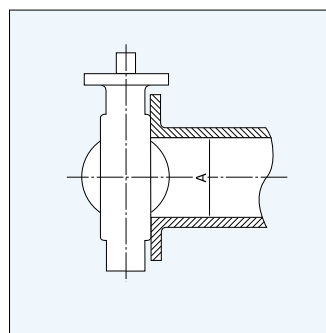


- The bolts length complies with JIS standard for steel flange thickness.
- Hexagon bolts should be used with hexagon (thin) nuts.
- This list is exclusively for the standard material SS400.

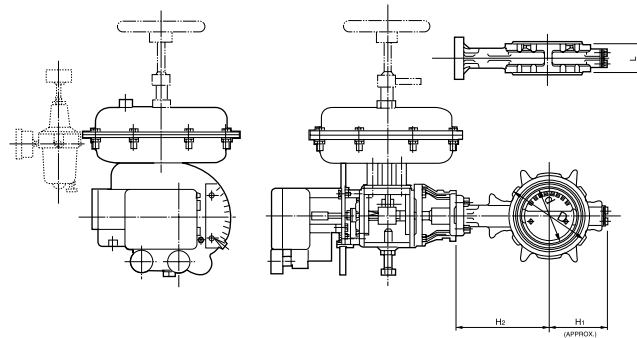
■ No piping gasket is required.

### Minimum internal diameter of piping

Nominal size		Minimum internal diameter of piping A (mm)
mm	inch	
50	2	34
80	3	70
100	4	91
150	6	144
200	8	194
250	10	246
300	12	294
350	14	327
400	16	387
450	18	434
500	20	484
600	24	581



## Spring diaphragm type 6X (air to open type), 6W (air to close type)



### Dimension list

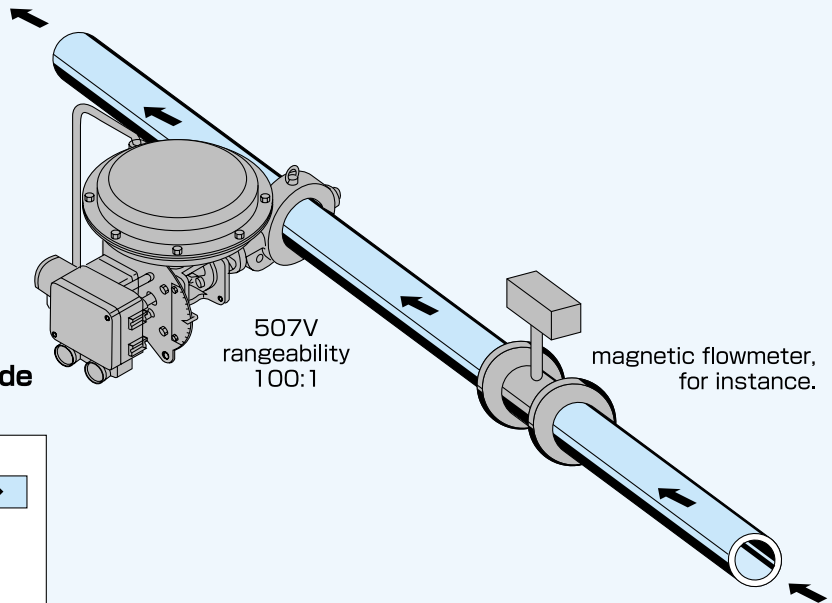
Nominal size	Dimension (mm)						Cylinder type	Approx. weight (kg)
	mm	inch	d	D	L	H <sub>1</sub>		
50	2	48	101	43	76	142	Type280	22
80	3	75	131	46	95	158		23
100	4	96	156	52	110	169		24
150	6	143	217	56	160	202	Type400	75
200	8	188	268	60	182	227		79

- Please consult us about 250 to 350mm.

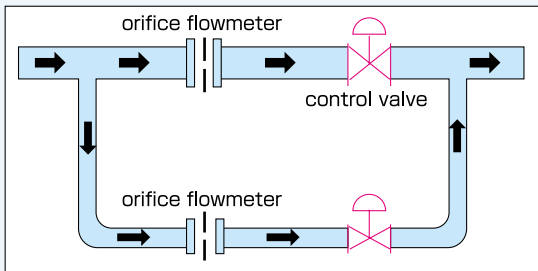
# APPLICATIONS

## Example of High Rangeability Control of Flow (an example using a diaphragm actuator)

This product is an optimum control valve for a high rangeability control of a system using a magnetic or volute flowmeter. The valve offers a high rangeability control of a process system.

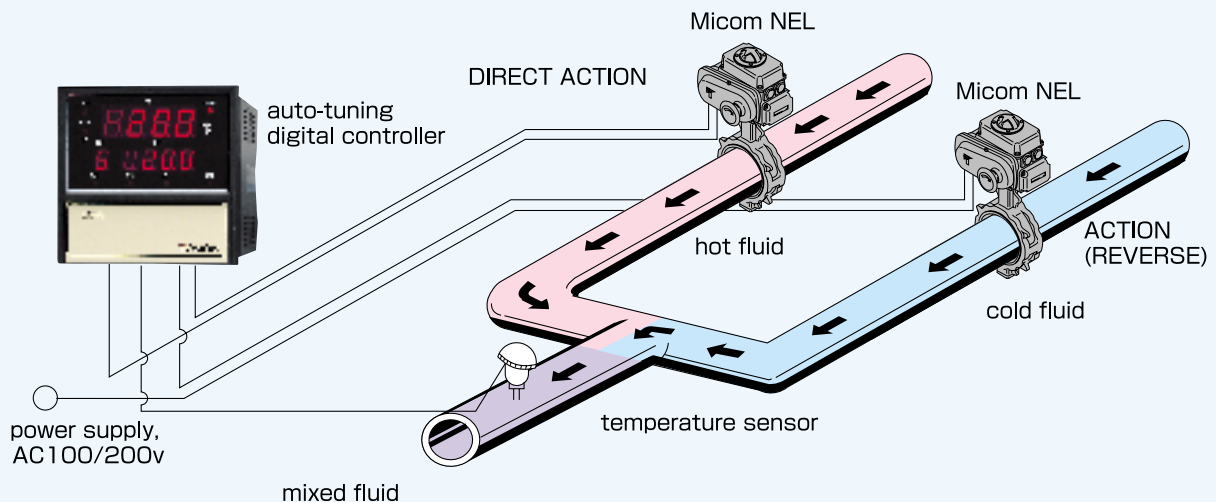


### ■ An example of a conventional mode of control using twin valves.



## Example of Electronic Temperature Control (an example using the MICOM NEL)

- \*This illustration is an electronic temperature control system consisting of control valves, a digital controller, and a temperature sensor.
- \*Unlike conventional pneumatic control systems, this system allows for easy temperature control of process lines with only a combination of three instruments.
- \*The digital controller features a PID control with a built-in microprocessor. The auto-tuning device allows for easy adjustment.



# Low Noise and Anti-Cavitation Package at Low Cost.

## A Resistance Plate

Cuts Your Noise / Cavitation Problem and Cuts Down Your Cost!



Using a combination of our compact/light weight rotary control valve and a resistance plate, we offer you an economic solution of noise and cavitation problems in your flow/pressure control systems.

The resistance plate is placed downstream from the control valve, and absorbs about 85% to 95% of the differential pressure providing tremendous reduction of noise by a pressure reduction device.

A single resistance plate is more cost effective and efficient, as compared with conventional "low noise/anti-cavitation valves".

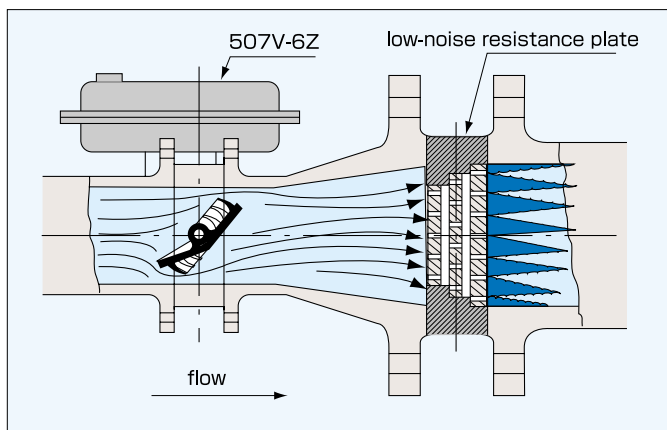
### A Typical Design

The resistance plate is available with one to four stages, depending on fluid and pressure drop ratio.

It is custom-made to suit specific condition such as flow, pressure, anti-noise specification, and other requirements.

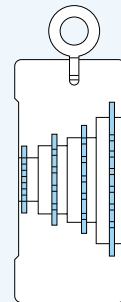
The standard design has a carbon or stainless steel body to suit an RF flange. Drain hole and water inlet for cleaning can be provided as optional.

### An Example of Installation



a two-stage resistance plate with a drain hole

a resistance plate with four expansion stages



### Examples of Specifications

Body Ends	Wafer
Pressure Rating	ANSI Class 150 to 600
Flow Direction	one way
Size	40 ~ 600mm
Flange Accomodation	JIS 10K·20K·30K·40K ANSI 150Lb·300Lb·600Lb
Standard Materials	Carbon Steel(S35C) Stainless Steel (SUS304, SUS316)
FL / Stage	0.8

### Typical Applications

- \*pump startup by-pass line
- \*downstream of regulator on reduction device in gas line
- \*downstream of steam pressure reduction valve
- \*vent or flare systems on gas lines

### Eamples of applications

Size	Class	Rated Cv	FL	Fluid	Flow rate	Temp(°C)	SG	P <sub>1</sub> (kg/cm <sup>2</sup> A)	ΔP(kg/kg/cm <sup>2</sup> )	Stages
1 1/2"	1,500	0.5	0.87	Water	3.0m <sup>3</sup> /H	A.T.	1.0	107	75	2
6"	900	12.5	0.91	HC gas	2.1×10 <sup>6</sup> m <sup>3</sup> /H	206	0.26	100	95	4
8"	300	177	-	blackish water	568m <sup>3</sup> /H	A.T.	0.98	42	14	2
8"	900	38	0.92	HC gas	6.4×10 <sup>6</sup> m <sup>3</sup> /H	206	0.26	100	95	4
12"	300	690	0.88	gas	10.6×10 <sup>6</sup> m <sup>3</sup> /H	A.T.	0.65	23	3.5	2
12"	300	690	-	gas	21.2×10 <sup>6</sup> m <sup>3</sup> /H	21	0.6	39	7	2
14"	150	1,125	0.84	crude oil	2,270m <sup>3</sup> /H	66	0.82	8	4	1
14"	600	515	0.91	crude oil	3,269m <sup>3</sup> /H	66	0.82	60	49	2
16"	300	484	-	saturated steam	147,294T/H	200	-	11	9	3

The resistnace plate can be used in combination with other products, including globe valves.....etc Please consult us for more information.

## Correct Installation Of Valve In View Of Drift

A rotary control valve, including butterfly valve, controls the flow by means of the rotation of its disc. Therefore, it is apt to be subjected to a direct effect of drift caused by an elbow, tee or the like, upstream of the valve. The drift may induce cavitation, noise, vibration, or other problems. In the worst case, this may cause an imbalance of torque on the valve and result in the loss of the actuator function.

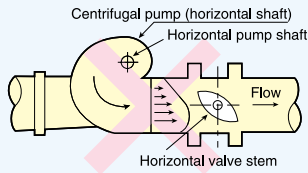
To avoid such problem, we would like to recommend that a straight portion

of a pipeline as long as 6D to 8D min. up-stream/downstream of the valve is best reducing for mitigating the effect of the drift.

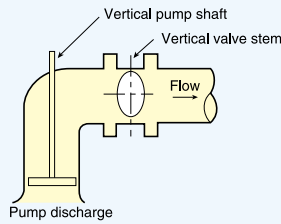
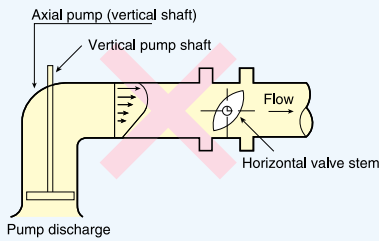
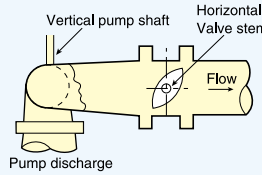
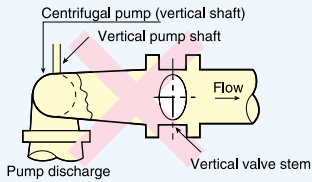
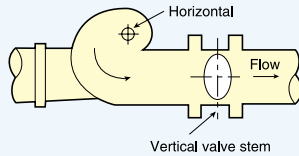
If sufficient length is not available between the valve and the elbow / tee or the like, the valve should be installed in such a manner as to minimize the effect of drift in accordance with the following sketches. The same consideration should be given to a pump or a manually operated valve up-stream/downstream of the rotary valve.

### (A) Installation of valve at a pump discharge.

(wrong direction of the valve stem)



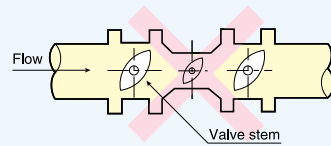
(correct direction of the valve stem)



### (B) A combination of a control valve and stop valves.

(wrong direction of the valve stem)

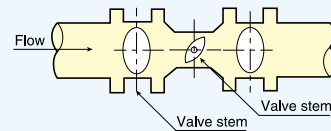
Incorrect installation orientation



All the valve stems have the same orientation.

(correct direction of the valve stem)

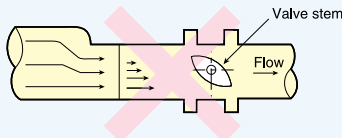
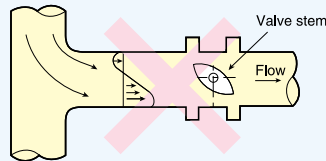
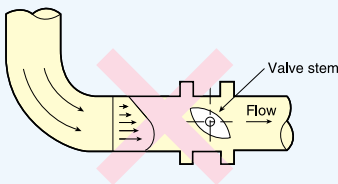
Correct installation orientation



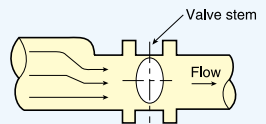
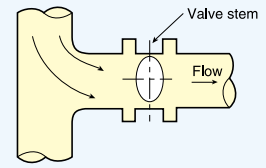
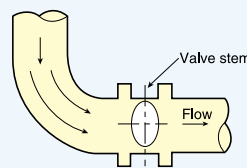
The orientation of the valve stems is alternating.

### An elbow, reducer, or tee immediately upstream of the valve.

(wrong direction of the valve stem)



(correct direction of the valve stem)



## TOMOE VALVE CO.,LTD.

<http://www.tomoe.co.jp/>

●Head Office & International Department  
11th Floor, Mitsui Bldg., 1-11-7Utsubo Hommachi, Nishi-ku, Osaka550-0004, Japan  
Telephone:81-6-6448-4320      Telefax:81-6-6448-4330

### Overseas Operations

**TOMOE VALVE LTD.**  
Estuary Road, Queensway Meadows Industrial Estate, Newport, Gwent NP9 OSP U.K.  
Telephone:44-1633-636800      Telefax:44-1633-636801

**TOMOE VALVE S.E.A.PTE.LTD**  
No. 7 International Business Park,  
#04-03, Transtech Building, Singapore 609919  
Telephone: 65-8895060      Telefax: 65-8995061

