

**TOMOE**<sup>®</sup>

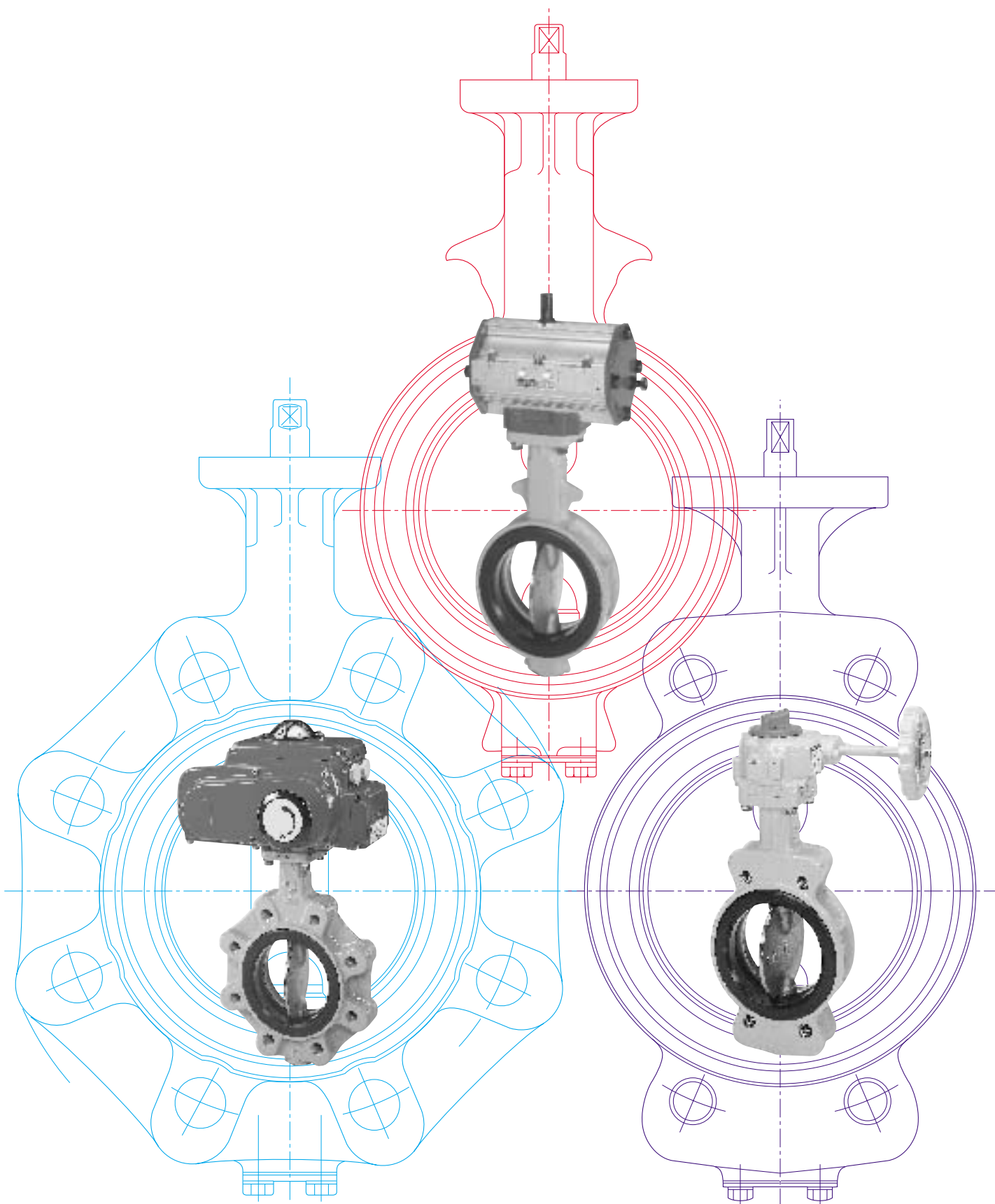
RUBBER SEATED BUTTERFLY VALVE 700G SERIES

Wafer

Full Lugged

Semi Lugged

**700G/704G/705G**



TOMOE VALVE CO.,LTD.

Wafer Full Lugged Semi Lugged  
**700G/704G/705G**



Discs and seats come in various materials to meet a wide range of needs. The ultimate general purpose valve with excellent cost performance.

- Valve nominal size 40 to 600mm
- Max. working pressure 0.98Mpa <sup>※4</sup>
- Working temperature range  
 NBR: -10 to 80°C  
 EPDM: -20 to 120°C

**General Description**

Simple handling, durability, and long life are the most basic terms on which valves can be improved. TOMOE has now developed the 700Gseries, a superior pressure-proof general purpose valve, to improve cost performance and meet your various needs with its wide range of features. The 700Gseries is designed to satisfy many international flange standards, which can be used worldwide.

**Structure**

The body can be available with various designs such as wafer, semi-lugged and full-lugged in various materials such as, ductile Iron and carbon steel etc. The disc is also available with high-grade stainless steel, type 316, dacro coated or nylon coated carbon steel, aluminum bronze and PPS. The patented cosine-curve structure is adopted for the seat ring. The 700G series is superior to conventional models in all respects.

**Standard Specifications**

Model		700G (Wafer)			704G (Full Lugged)		705G (Semi Lugged)		
Valve nominal size		40 to 300mm	350 to 500mm	600mm	50 to 300mm	350 to 600mm	50 to 300mm	350 to 600mm	
Applicable flange standard		JIS 5K-10K, ANSI 125Lb-150Lb DIN PN10,PN16 BS 4504 NP10, NP16, BS 10 'E'	JIS 5K-10K,	JIS 5K, ANSI 125Lb-150Lb DIN PN10, BS 4504 NP10, (exclude JIS 10K)	JIS 5K-10K, ANSI 125Lb-150Lb BS 4504 NP10-NP16, DIN PN10, PN16	JIS 5K-10K, ANSI 125Lb-150Lb, DIN PN10, PN16, BS 4504 NP10, NP16 BS10 'E'	JIS 5K-10K, ANSI 125Lb-150Lb, DIN PN10, BS 4504 NP10, NP16 BS10 'E'	JIS 5K-10K, ANSI 125Lb-150Lb, DIN PN10, BS 4504 NP10, NP16 BS10 'E'	
Face-to-face dimensions		API 609 / ISO 5752 (20 series)							
Max. working pressure		0.98Mpa							
Body shell test (Hydraulic)		1.47Mpa							
Seat leak test (Pneumatic)		1.08Mpa <sup>※4</sup>							
Working temperature range <sup>※1,※2</sup>		NBR: -10 to 80°C, EPDM: -20 to 120°C							
Standard materials	Body <sup>※3</sup>	Ductile iron, JIS FCD450	Cast iron, JIS FC 250	Ductile iron, JIS FCD450,		Ductile iron, JIS FCD 450	Cast iron, JIS FC250 Ductile iron, JIS FCD450		
	Disc	316 Stainless steel, JIS SCS14	304 Stainless steel, JIS SCS13 316 Stainless steel, JIS SCS14	316 Stainless steel, JIS SCS14 or SUS F316	304 Stainless steel, JIS SCS 13 316 Stainless steel, JIS SCS14	316 Stainless steel, JIS SCS 14 or JIS SUS F 316	304 Stainless steel, JIS SCS 13 316 Stainless steel, JIS SCS 14		
		PPS (50 to 200mm) Aluminum Bronze JIS ALBC <sub>2</sub> (50 to 600mm)	Aluminum Bronze JIS ALBC <sub>2</sub>	PPS (50 to 200mm) Aluminum Bronze JIS ALBC <sub>2</sub> (50 to 600mm)	Aluminum Bronze JIS ALBC <sub>2</sub>	PPS (50 to 200mm) Aluminum Bronze JIS ALBC <sub>2</sub> (50 to 600mm)	Aluminum Bronze JIS ALBC <sub>2</sub>	Aluminum Bronze JIS ALBC <sub>2</sub>	
		Carbon steel, JIS SF490A with Dacro coating (65 to 300mm)	Ductile iron, JIS FCD 450 with hard chrome plating	Carbon steel, JIS SF 490A (65 to 300mm)	Ductile iron, JIS FCD 450 with hard chrome plating	Carbon steel, JIS SF490A with Nylon coating <sup>※5</sup>	Carbon steel, JIS SF 490A with Dacrocoating (65 to 300mm)	Carbon steel, JIS SF490A with Nylon coating <sup>※5</sup>	Ductile iron, JIS FCD450 with hard chrome plating
	Carbon steel, JIS SF490A with Nylon coating <sup>※5</sup>	Carbon steel, JIS SF490A with Nylon coating <sup>※5</sup>		Carbon steel, JIS SF490A with Nylon coating <sup>※5</sup>		Carbon steel, JIS SF490A with Nylon coating <sup>※5</sup>	Carbon steel, JIS SF490A with Nylon coating <sup>※5</sup>	Carbon steel, JIS SF490A with Nylon coating <sup>※5</sup>	Ductile iron, JIS FCD450 with hard chrome plating
	Stem	SUS420J2 / SUS 392 J1							
Seat ring	NBR, EPDM <sup>※6</sup>								
Actuators	Lock lever	40 to 200mm	-	50 to 200mm	-	50 to 200mm	-	-	
	Worm gear	40 to 300mm	350 to 600 mm	50 to 300mm	350 to 600mm	50 to 300mm	350 to 600mm	350 to 600mm	
	Center handle	40 to 300mm	-	50 to 300mm	-	50 to 300mm	-	-	
	Pneumatic cylinder	40 to 300mm	350 to 600 mm	50 to 300mm	350 to 600mm	50 to 300mm	350 to 600mm	350 to 600mm	
	Motorized	40 to 300mm	350 to 600 mm	50 to 300mm	350 to 600mm	50 to 300mm	350 to 600mm	350 to 600mm	
Coating	Epoxy primer finish (Munsell N7)								

※1. Working temperature range varies depending on combination of disc materials and seating, so please consult us whenever using valves.  
 ※2. Please consult us when using NBR and EPDM seating continuously above 60°C. and 100°C. respectively.  
 ※3. Cast steel body or stainless steel body is also available.  
 ※4. 16bar finish is also available subject to working condition.  
 ※5. Nylon coated disc is available from 40 to 300mm. Max. working temperature of Nylon coated Disc is 60°C. Dacro coating is a surface treatment which is superior to electric zinc coating.  
 DACROTEED is a registered trademark of Diamond sharnock corporation and is registered throughout the world.  
 ※6. Heat resistant EPDM, FPM, SEP, CR, White+NBR seat are also available.



700G

704G

705G

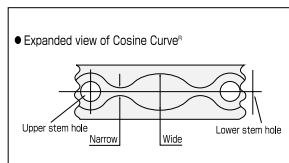
## Features

### Satisfies ISO standards for face-to-face dimensions

Valve face-to-face dimensions conform to standard ISO5752 (20 series).

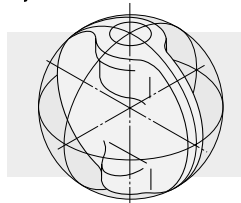
### Patented Cosine Curve seat ring

The Cosine Curve seat ring reduces valve operating torque substantially and allows the torque to be adjusted according to the working pressure.



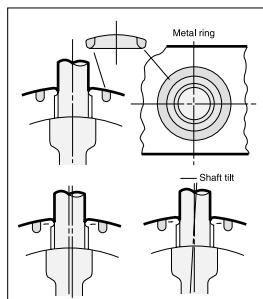
### Much longer life with spherical design

Similar to a spherical body rotating inside a spherical area, the operation of the disc is smooth and unhindered. Torque is reduced and the valve life is lengthened by 300%.



### Self-aligning stem seal through backup ring.

The stem seal is the primary and secondary seal system. The backup ring functions as the self-aligning stem seal.



### Select from various disc materials to meet your specific needs

As one of standard disc materials, PPS (50 to 200mm) has been added to meet the current trend of lined pipes. PPS (polyphenylene sulfide with stainless steel core) is a kind of plastic material suitable for corrosive fluids (subject to the performance of rubber seats).

### Two aligning methods (350 to 600mm)

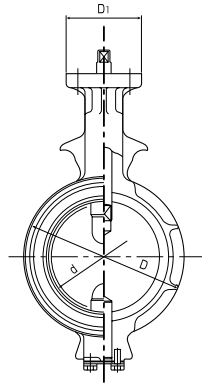
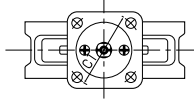
Two valve models are available: the casted hole type (700G) and the tapped hole type and drilled hole type (705G), which accommodates all the applicable flange standards.

### Long bonnet

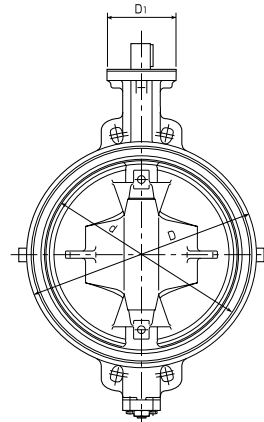
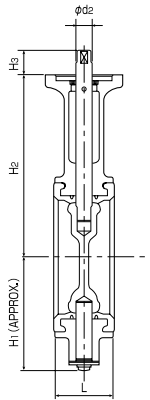
The long neck shape allows insulation of up to 50mm after the valve is installed.

Fig 701G : Nylon coated body, is also available(50 to 300mm)  
Please contact us for more detailed information.

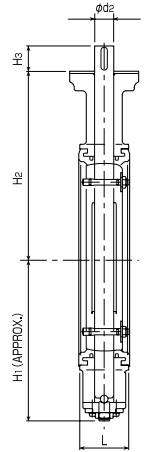
**700G**  
(Wafer)



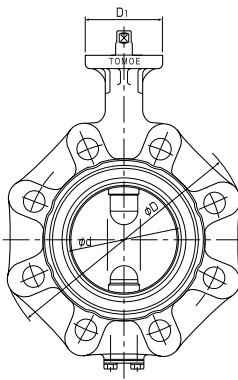
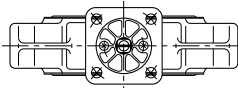
40 to 300mm



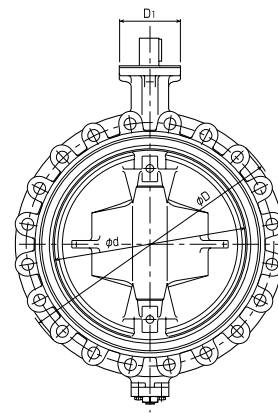
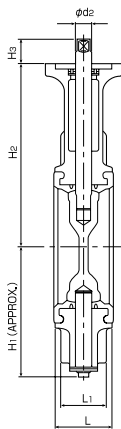
350 to 600mm



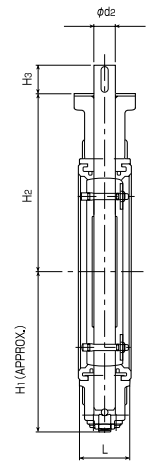
**704G**  
(Full-Lugged)



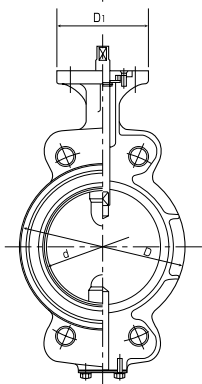
50 to 300mm



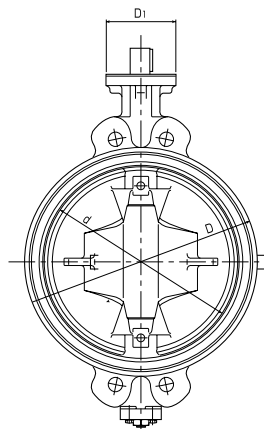
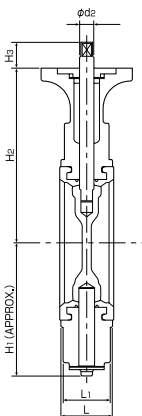
350 to 600mm



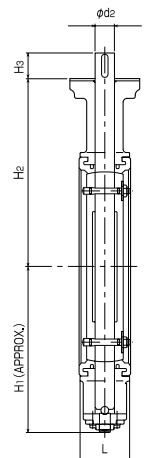
**705G**  
(Semi-Lugged)



50 to 300mm



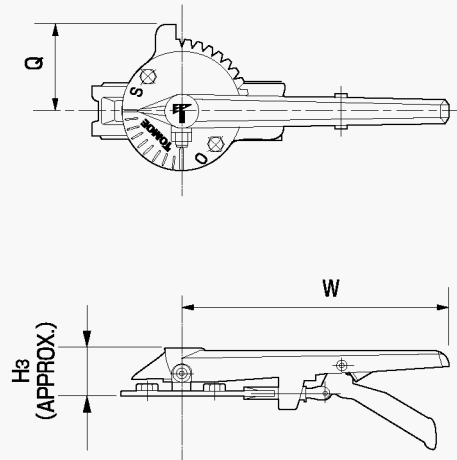
350 to 600mm



Dimension list

Nominal size		Dimension (mm)								Approx. weight (kg)
mm	inch	d	D	D <sub>1</sub>	L	φd <sub>2</sub>	H <sub>1</sub>	H <sub>2</sub>	H <sub>3</sub>	
40	1½	45	80	70	35	10	61	132	21.5	1.5
50	2	56	90		43		68	138		1.8
65	2½	69	115		46		79	151		2.5
80	3	84	126		52	12	86	156	22.5	2.6
100	4	104	146			14	103	167	3.4	
125	5	130	181	102	56	16	118	191	27.5	5.4
150	6	153.5	211		18	135	202	7.0		
200	8	199	256		60	22	177	227	30	10.4
250	10	253	322	140	68	28	215	280	35	18
300	12	302	367		78	32	253	312	25	
350	14	337	410				276	348	48	42
400	16	394	469		102	40	338	383	54	64
450	18	441	525	114	46	368	413	65	87	
500	20	492	580							127

Lock lever type 700G-1G



Dimension list

Nominal size		Dimension (mm)								Approx. weight (kg)
mm	inch	d	D	D <sub>1</sub>	L	φd <sub>2</sub>	H <sub>1</sub>	H <sub>2</sub>	H <sub>3</sub>	
50	2	56	90	70	43	10	85	138	21.5	2.5
65	2½	69	115		46		94	151		3.5
80	3	84	126		52		12	109		156
80	3	84	190			14	117	167	4.8	
100	4	104	223		102	56	16	143	191	27.5
125	5	130	250	18		164	202	8.8		
150	6	153.5	276	60		22	176	227	30	16.3
200	8	199	334	125	68	28	215	280	35	27
300	12	302	402		78	32	253	312	39	
350	14	337	472				276	348	48	66
400	16	394	533		140	102	40	338	383	54
450	18	441	579	114		46	368	413	65	128
500	20	492	634							
600	24	584	696	165	154	55	458	528	79	275
600	24	584	795							269

In Case JIS10K : \*  
In Case JIS10K or DIN PN10 : \*

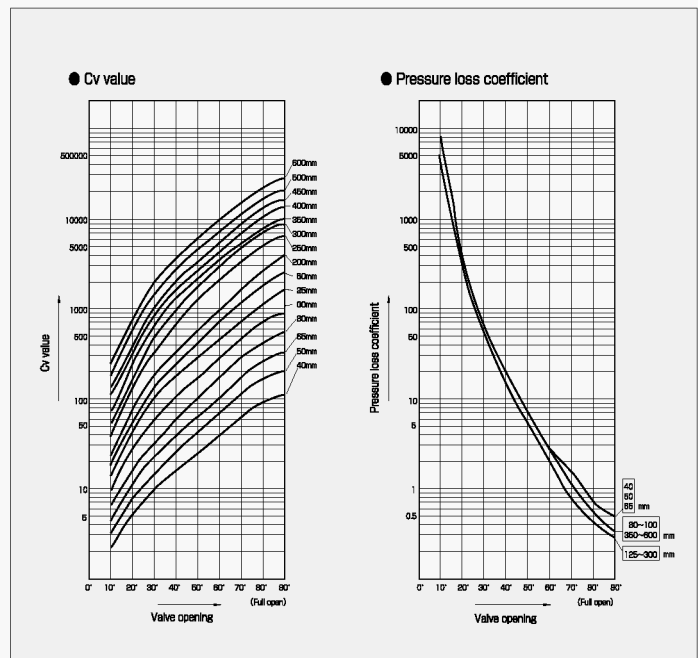
Dimension list

Nominal size		Dimension (mm)								Approx. weight (kg)
mm	inch	d	D	D <sub>1</sub>	L	φd <sub>2</sub>	H <sub>1</sub>	H <sub>2</sub>	H <sub>3</sub>	
50	2	56	90	70	43	10	85	138	21.5	2.5
65	2½	69	115		46		94	151		3.5
80	3	84	126		52		12	109		156
100	4	104	146			14	117	167	22.5	5.0
125	5	130	181		102	56	16	143	191	27.5
150	6	153.5	211	18		164	202	11.0		
200	8	199	256	60		22	186	227	30	15.0
250	10	253	322	125	68	28	215	280	35	24
300	12	302	367		78	32	253	312	31	
350	14	337	410				276	348	48	47
400	16	394	469		140	102	40	338	383	54
450	18	441	525	114		46	368	413	65	96
500	20	492	580							
600	24	584	682	165	154	55	458	528	79	191

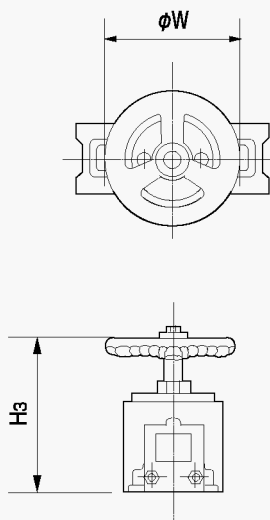
Dimension list

Nominal size		Dimension (mm)			Approx. weight (kg)
mm	inch	H <sub>3</sub>	Q	W	
40	1½	39	75	220	1.1
50	2				1.1
65	2½				1.1
80	3				1.1
100	4				1.1
125	5	43	87.5	300	1.7
150	6	42	102.5	350	1.7
200	8				2.2

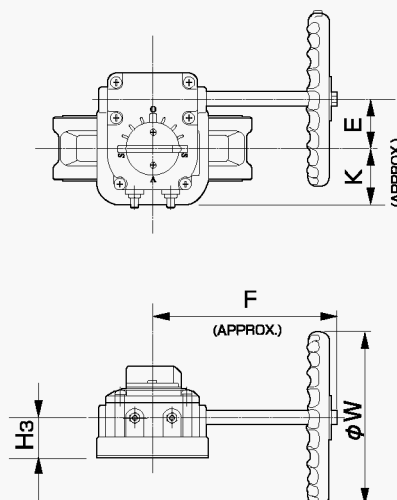
Cv value/pressure loss coefficient



Center handle type 700G-2G



Worm gear type 700G-2U



Dimension list

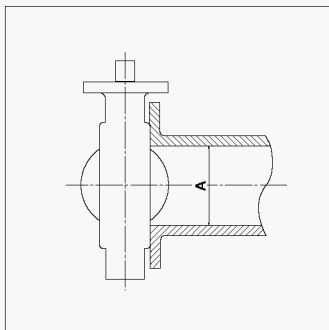
Nominal size		Dimension (mm)		Approx. weight (kg)
mm	inch	H <sub>3</sub>	φW	
40	1½	136	100	2.9
50	2			2.9
65	2½			2.9
80	3			2.9
100	4			2.9
125	5	133	100	3.8
150	6			3.8
200	8	151	200	7.1
250	10			7.1
300	12			7.1

Dimension list

Nominal size		Dimension (mm)					Approx. weight (kg)
mm	inch	H <sub>3</sub>	E	K	F	φW	
40	1½	29.5	36	46	160	100	2.3
50	2						2.3
65	2½						2.3
80	3						2.3
100	4						2.3
125	5	34.5	44	53	173.5	160	4.2
150	6						4.2
200	8	41.5	67	75	198	200	7.6
250	10						7.6
300	12						13.4
350	14	48	87.5	90	222.5	280	15.6
400	16						18.3
450	18						18.3
500	20	61	113	140	352	400	18.3
600	24						33.2

Minimum internal diameters of piping

Nominal size		Minimum internal diameters of piping A (mm)
mm	inch	
40	1½	25
50	2	34
65	2½	51
80	3	70
100	4	91
125	5	118
150	6	144
200	8	194
250	10	246
300	12	294
350	14	330
400	16	381
450	18	427
500	20	477
600	24	569



■ Piping bolts and nuts sizes for 700G

Nominal size		JIS 5K		JIS 10K		ANSI 125Lb/150Lb	
mm	inch	Long bolts and nuts	Hexagon bolts	Long bolts and nuts	Hexagon bolts	Long bolts and nuts	Hexagon bolts
40	1½	—	4-M12x 75x30	—	4-M16x 90x38	4-U1/2x110x30-13	—
50	2	—	4-M12x 90x30	—	4-M16x105x40	4-U5/8x145x45-16	—
65	2½	—	4-M12x 90x30	—	4-M16x105x40	4-U5/8x155x50-16	—
80	3	—	4-M16x105x40	—	8-M16x110x40	4-U5/8x155x50-16	—
100	4	—	8-M16x110x40	—	8-M16x110x40	8-U5/8x165x50-16	—
125	5	—	8-M16x110x40	—	8-M20x120x50	8-U3/4x175x55-19	—
150	6	—	8-M16x120x40	—	8-M20x130x50	8-U3/4x175x55-19	—
200	8	—	8-M20x130x50	—	12-M20x135x50	8-U3/4x175x55-19	—
250	10	—	12-M20x135x50	—	12-M22x150x60	12-U7/8x215x55-22	—
300	12	—	12-M20x150x50	—	16-M22x160x60	12-U7/8x215x55-22	—
350	14	12 (8) -M22x185x45	(8) -M22x60x50	16 (12) -M22x185x45	(8) -M22x 60x50	12 (8) -U1 x225	(8) -U1 x70x57
400	16	16 (12) -M22x205x45	(8) -M22x60x50	16 (12) -M24x220x50	(8) -M24x 70x50	16 (12) -U1 x255	(8) -U1 x75x57
450	18	16 (12) -M22x225x45	(8) -M22x60x50	20 (16) -M24x230x50	(8) -M24x 70x50	16 (12) -U1 1/8x280	(8) -U1 1/8x85x63
500	20	20 (16) -M22x230x45	(8) -M22x60x50	20 (16) -M24x245x50	(8) -M24x 70x50	20 (16) -U1 1/8x295	(8) -U1 1/8x85x63
600	24	20 (16) -M24x275x50	(8) -M24x70x54	20 -M30x290x60	8 -M30x 75x60	20 (16) -U1 1/4x340	(8) -U1 1/4x95x70

■ Piping bolts and nuts sizes for 704G

Nominal size		JIS 5K	JIS 10K	ANSI 125Lb/150Lb	DIN PN10, BS 4504 NP10
mm	inch	Hexagon bolts	Hexagon bolts	Hexagon bolts	Hexagon bolts
50	2	8-M12x30x28	8-M16x35x33	8-U 5/8x35x30	8-M16x35x33
65	2½	8-M12x35x33	8-M16x35x33	8-U 5/8x35x30	8-M16x35x33
80	3	8-M16x35x33	16-M16x35x33	8-U 5/8x40x30	16-M16x40x38
100	4	16-M16x40x38	16-M16x40x38	16-U 5/8x45x38	16-M16x40x38
125	5	16-M16x40x38	16-M20x45x41	16-U 3/4x50x44	16-M16x40x38
150	6	16-M16x40x38	16-M20x45x41	16-U 3/4x50x44	16-M20x45x41
200	8	16-M20x45x41	24-M20x50x46	16-U 3/4x55x44	16-M20x50x46
250	10	24-M20x50x46	24-M20x50x46	24-U 7/8x60x50	24-M20x55x50
300	12	24-M20x55x51	32-M22x55x51	24-U 7/8x60x50	24-M20x55x50
350	14	24-M22x60x50	32-M22x60x50	24-U1 x70x57	32-M20x60x46
400	16	32-M22x60x50	32-M24x70x50	32-U1 x75x57	32-M24x70x50
450	18	32-M22x60x50	40-M24x70x50	32-U1 1/8x85x63	40-M24x70x50
500	20	40-M22x60x50	40-M24x70x50	40-U1 1/8x85x63	40-M24x70x50
600	24	40-M24x70x50	48-M30x75x60	40-U1 1/4x95x70	48-M27x80x60

■ Piping bolts and nuts sizes for 705G (For tapped Holes)

Nominal size		JIS 5K		JIS 10K		ANSI 125Lb/150Lb		BS 4504 NP10/DIN PN10		
mm	inch	Hexagon bolts and nuts	Hexagon bolts	Hexagon bolts and nuts	Hexagon bolts	Long bolts and nuts	Hexagon bolts	Tapped		Drilled
								Long bolts and nuts	Hexagon bolts	Long bolts and nuts
50	2	—	8-M12x30x28	—	8-M16x35x32	—	8-U 5/8x35x30	—	8-M16x35x30	4-M16x125x30
65	2½	—	8-M12x35x33	—	8-M16x35x32	—	8-U 5/8x35x30	—	8-M16x35x30	4-M16x125x30
80	3	—	8-M16x35x33	4-M16x110x40	8-M16x35x32	—	8-U 5/8x40x30	—	8-M16x40x35	8-M16x130x30
100	4	4-M16x110x40	8-M16x40x38	4-M16x110x40	8-M16x40x38	4-U5/8x165x 50	8-U 5/8x45x38	—	8-M16x40x35	8-M16x140x35
125	5	4-M16x110x40	8-M16x40x38	4-M20x120x50	8-M20x45x41	4-U3/4x175x 55	8-U 3/4x50x44	4-M16x140x35	8-M16x40x35	8-M16x140x35
150	6	4-M16x120x40	8-M16x40x38	4-M20x130x50	8-M20x45x41	4-U3/4x175x 55	8-U 3/4x50x44	4-M20x155x40	8-M20x45x37	8-M20x155x40
200	8	4-M20x130x50	8-M20x45x41	8-M20x135x50	8-M20x50x46	4-U3/4x175x 55	8-U 7/8x55x44	4-M20x160x40	8-M20x50x42	8-M20x160x40
250	10	8-M20x135x50	8-M20x50x46	8-M22x150x60	8-M22x55x50	8-U7/8x215x 55	8-U 7/8x60x50	8-M20x175x40	8-M20x55x50	12-M20x175x40
300	12	8-M20x150x50	8-M20x55x51	12-M22x160x45	8-M22x60x55	8-U7/8x215x 55	8-U 7/8x60x50	8-M20x185x40	8-M20x55x50	12-M20x185x40
350	14	8-M22x185x45	8-M22x60x50	12-M22x185x45	8-M22x60x50	8-U1 x225	8-U1 x70x57	12-M20x200x45	8-M20x65x46	16-M20x200x45
400	16	12-M22x205x45	8-M22x60x50	12-M24x220x50	8-M24x70x50	12-U1 x255	8-U1 x75x57	12-M24x230x50	8-M24x70x54	16-M24x230x50
450	18	12-M22x225x45	8-M22x60x50	16-M24x230x50	8-M24x70x50	12-U1 1/8x280	8-U1 1/8x85x63	16-M24x245x50	8-M24x70x54	20-M24x245x50
500	20	16-M22x230x45	8-M22x60x50	16-M24x245x50	8-M24x70x50	16-U1 1/8x295	8-U1 1/8x85x63	16-M24x265x50	8-M24x70x54	20-M24x265x50
600	24	16-M24x275x50	8-M24x70x54	20-M30x290x56	8-M30x75x60	16-U1 1/4x340	8-U1 1/4x95x70	16-M27x320x50	8-M27x80x60	20-M27x320x50

- (Remarks) 1. Hexagon bolts should be used with hexagon (thin) nuts.  
 2. The values in parenthesis are the number of bolts when the bolts holes are tapped.  
 3. Unify screw (1 inch or above nominal size): 8 threads/inch.

[Ex.]

16 - M24 x 100 x 54

Quantity Screw Bolts length Effective screw length

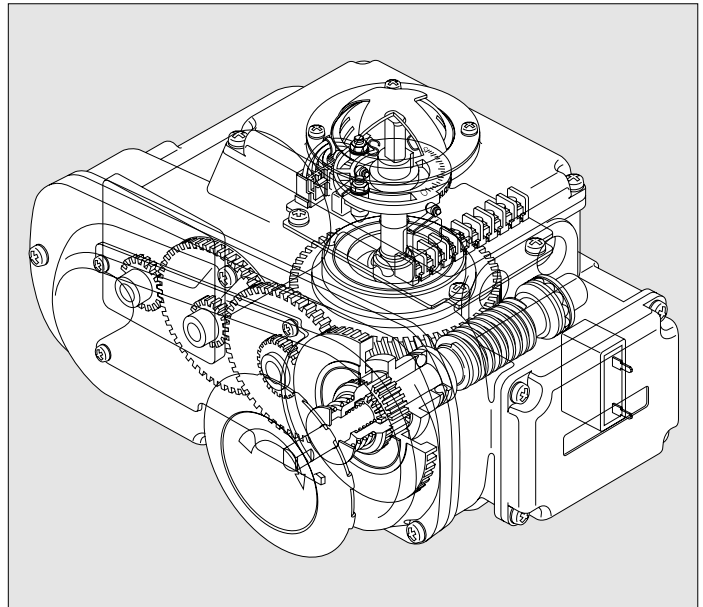
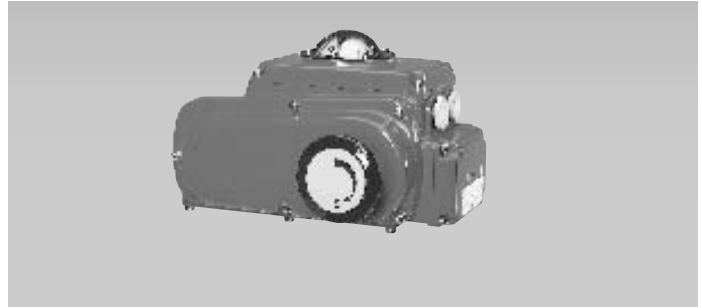


## New ELMY® small size motorized actuator (4I)

With the success and superior characteristics of the ELMY butterfly valve actuator, the **New ELMY®** was developed as its successor. With a replaceable control circuit board, tough metal gears, a new limit cam mechanism, a new clutch mechanism, and an improved watertight design, the **New ELMY®** is more superior than ever before.

Item Type	Type1	Type2	Type2.5	Type3
Output torque	98 N·m (10kgf·m)	196 N·m (20kgf·m)	333 N·m (34kgf·m)	981 N·m (100kgf·m)
Power source (V)	AC 100, 120, 200, 220, 240 50/60Hz			
Motor capacity (W)	20	30		90
Travel time (50/60Hz) (sec)	25/20 *2 (180/150)		37/30 *2 (260/210)	55/50 *2 (500/440)
Weight (kg)	6.4	11.2	12.8	23.2
Mounting Flange (ISO 5211)	F07	F10		F10, 12, 14
Rating (min)	30			
Insulation	Class E			
Type of motor and its protective device	Reversible motor built-in thermal protector			
Space heater	Supplied under the standard specifications			
Position limit switch	One each at the open and close positions, Extra position limit switches(under no voltage)			
Torque limit switch	None			
Mechanical limit stop	End of travel positioning bolt built-in			
Conduit connections	G 1/2 (PF 1/2) at two locations			
Enclosure	JIS C 0920 (IP 65), Class 5, dust & water-jet proof type			
Handwheel	Round wheel, automatic return clutch			
Options	1 Potentiometer 135Ω, 500Ω 2 Intermediate limit switch (no voltage) 3 Servounit <sup>※1</sup> (AC 4-20mA, DC1-5V, 0-10V) 4 Speed Controller Unit.			

※1. There is no space heater with servounit.  
※2. With speed controller unit.



Purpose/construction	Circuit diagram	Construction drawing
<p><b>Standard</b></p> <p><b>With extra position limit switches (non-voltage)</b></p> <p>● <b>Purpose</b> To send non-voltage full-open and full-closed signals by switching on and off.</p>		

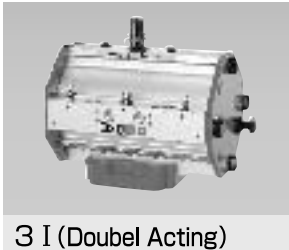
## Electric motorized actuator (4L)

Type	LTKD-01	LTKD-05
Output torque	245.2N·m	833.6N·m
Rotation speed	10.3/12.3 to 67.5/81	10/12 to 67.5/81
Power supply	AC400/440V 50/60Hz 3φ AC200/220V 50/60Hz 3φ	
Motor capacity	0.2kw, 0.4kw	0.75kw
Rated time	15min.	
Insulation class	Type E (B·F·H as option)	



## Small size pneumatic actuator

Even with a built-in bypass unit and speed controller, the actuator size is reduced greatly. A new linkage mechanism is also designed for the torque conversion to provide high actuator performance and stability. We offer a total system that provides ultimate performance, with a design which is compact, lightweight and has high output torque.

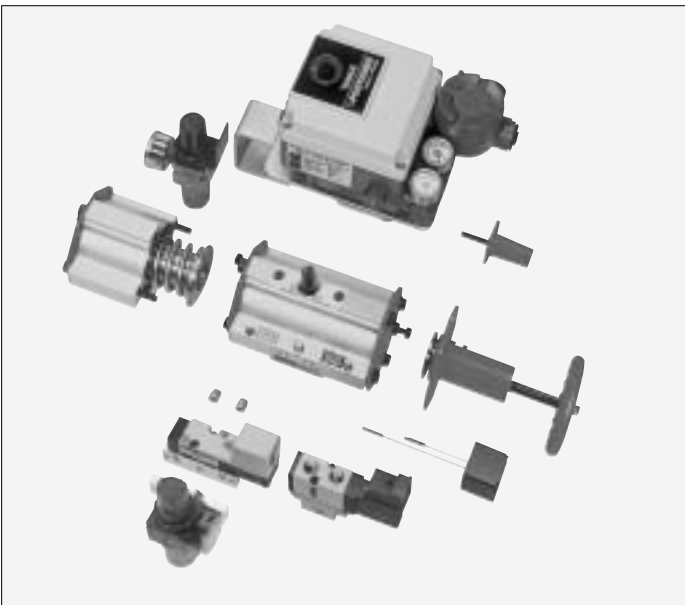


3 I (Double Acting)

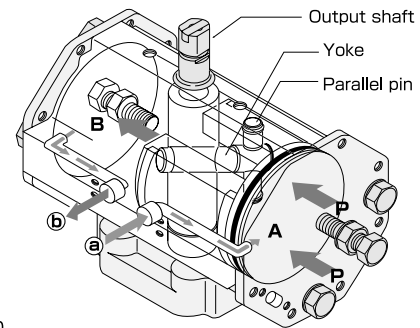
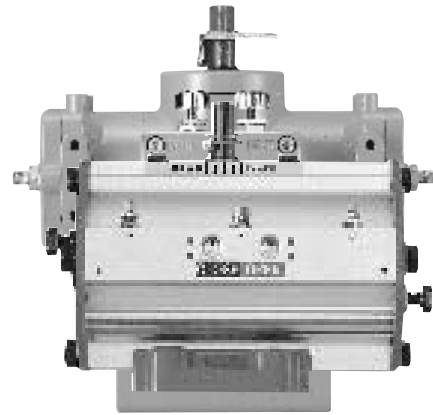


3Q/3R (Spring Return)

Air supply pressure	0.39 to 0.69Mpa
Operational fluid	Dry air
Pressure shell test	0.98Mpa
Rotating speed range	5-15 sec.
Rotating angle	-5° to +95°
Working temperature range	0 to 80°C



### ■ Comparison with previous model



PATENTED

### ■ Mechanism (double-action)

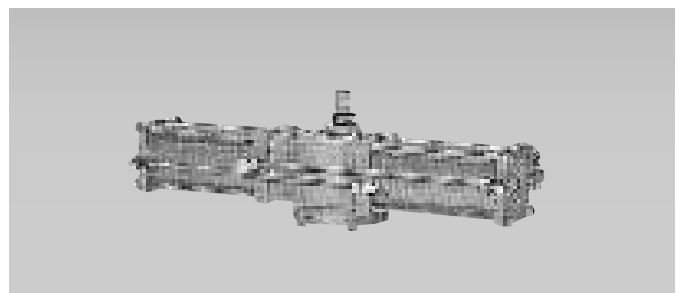
- ① The torque generation and rotation mechanism occur at the center of the cylinder. A new linkage system is employed to transmit the torque with a high output.
- ② Teflon bearings are used for lower friction and increased durability.
- ③ Adjusting screw is provided to adjust the open and close positions independently.
- ④ A bypass valve and speed controller are built into the body and the direct mounting of auxiliary devices is possible.

### ■ Operation principle (double-action)

- ① Supply air enters at intake port ③ and passes through air passages in the cylinder to compartment (A). In compartment (A), the pressure (P) is applied to the right surface of the piston and it pushes the piston to the left.
- ② The piston is equipped with a parallel pin that is connected to a yoke. As the piston moves, the pin moves, moving the yoke and rotating the output shaft.
- ③ The remaining air in the compartment (B) will travel through the air passages, pass through the speed controller, and be exhausted from port ④.
- ④ If air enters port ④, the result is vice versa.

## Pneumatic actuator (3A)

Air supply pressure	0.39 to 0.69Mpa
Operational fluid	Dry air
Body shell test	0.98Mpa
Rotating angle	90°
Rotating speed range	5 to 15 sec.
Working temperature range	0 to 80°C



### Storage conditions

- To protect the seat rings, do not unpack valves until you are ready to install them. If a valve remains unpacked for a long period of time, dust or other particles may enter the valve and cause seat leakage.
- For temporary storage before installing or for long-term storage, keep valves in the vinyl bag in which they came and store them indoors in a cool, well-ventilated location (temperature of -10 to 60°C and humidity of 70% or less). Keep the valve away from dusty locations and take care in protecting the valve and actuator from bearing excessive weights.

### Installing valves

- Valves can be installed in any orientation, to allow for the easiest possible operation of the valve. However, be careful of the orientation of the stem when your pipe layout is one of those covered on page 119.

### Piping instructions

- Verify the materials of the seat ring and disc of the valve before installation.
- When installing a butterfly valve directly to a check valve or pump, install an extension or spacer to prevent the disc of the butterfly valve from contacting the check valve or pump.
- Install the valve only after completing all welding operations around the valve to prevent damage caused by the solder and other welding materials.
- After welding is performed on a flange, wait until it has sufficiently cooled before installing the valve. Never perform welding on a flange with the valve installed.
- In the surrounding piping, make sure that no welding remains, pipe wastes, scaling, or dust remain in the pipe. Clean the inside of the pipes if necessary prior to installation.
- Before blowing air to remove any foreign matter in the piping, install an extension tube with face-to-face dimensions equal to that of the valve in place of the valve. Do not blow air with the valve installed in the pipe, for this may damage the seat ring.
- Clean the mating surface of the flange with compressed air before installation. Remove rust or foreign particles with a cleaning alcohol or neutral detergent.
- With a zinc plated flange, attention must be paid to avoid flange leakage due to an uneven surface of the flange.
- Make sure that there is no warpage in the flange, misalignment, or damage to the mating surface of the flange.
- Be sure to properly align the valve and mounting flanges.
- Install the jack bolts taking care not to damage the seat ring of the valve and adjust the face-to-face dimensions. The face-to-face dimensions should be such that the piping must be spread open 3 to 5mm to allow the valve to be inserted. (A jack bolt is available on request.)
- If possible, avoid mounting the actuator with it facing downward. Especially for valve sizes of 350mm or larger, where the lower portion of the valve stem bears thrust loads, never install the actuator facing downward.
- After centering the pipes, insert bolts at the proper locations so that the bottom of the valve can rest upon them to prevent the valve from falling through.

- Before tightening the installation bolts, make sure that the disc of the valve does not contact any portion of the flange when it is fully opened.
- Tighten the installation bolts to a torque of no more than 60Nm
- The installation bolts should be tightened evenly and in the proper sequence. Tighten one bolt a small amount, and then proceed to another bolt that is located on the other side. Proceed tightening each bolt a little at a time by crisscrossing across the flange to insure well-balanced tightening.
- On the completion of the installation, fully open and close the valve to once again make sure that the disc does not touch the piping or gasket.

### Operational instructions

- Prior to operation, clean the outside of the piping with compressed air, and the inside of the piping with running water.
- If the valve is to be used at an opening angle of 30° or under for flow constriction, consult us in advance.

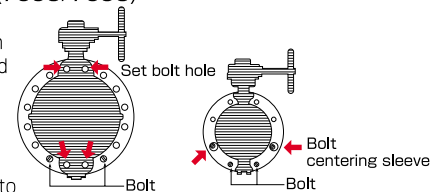
### Others

- After installation, open and close the valve once every two weeks if the valve is not used for a long period of time, and open and close the valve a few times before starting actual operation.
- For pressure tests of the piping (where pressures exceed the rated pressure), always keep the valve fully open. Never fully close the valve or use it as a blind flange.
- If the actuator is a manual gear, pneumatic cylinder, electric motor, or diaphragm, or other similar type, and the ambient temperature is extremely high, it may be necessary to change the O-rings and other rubber components using special materials or change the motor or solenoids to those with higher insulation levels, so be sure to consult us in advance.
- Always operated lock lever, worm gear, or center handle type actuators by hand. Never use an extension bar on the lever or a wheel key on the gear handle, for they might damage the handle or lever. Unlike gate valves or globe valves, tightening with a high torque is unnecessary.
- Do not loosen the installation bolts or other bolted components before relieving the system pressure.

### Installation instructions (700G/705G)

- Insert bolts to support the upper rib of the valve when 3/4 of the valve is inserted between the flanges.
- To center the piping for JIS 10K flanges, insert centering sleeves on the bolts and install the bolts to support the valve at the bottom and prevent it from falling through (only for 100, 125, and 150mm sizes).

\*Use the provided centering sleeves to facilitate the operation.



◎ The specifications are subject to change without notice. Please consult us for the latest specifications.

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