

MOTOYAMA

General Specifications

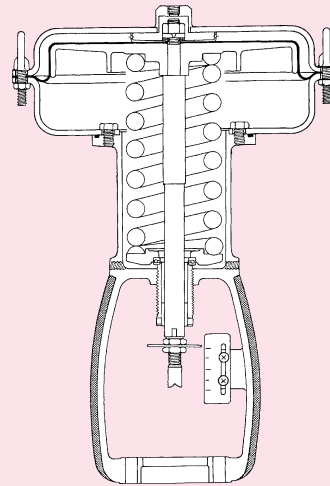
Model 2800

SINGLE-SPRING TYPE DIAPHRAGM ACTUATORS

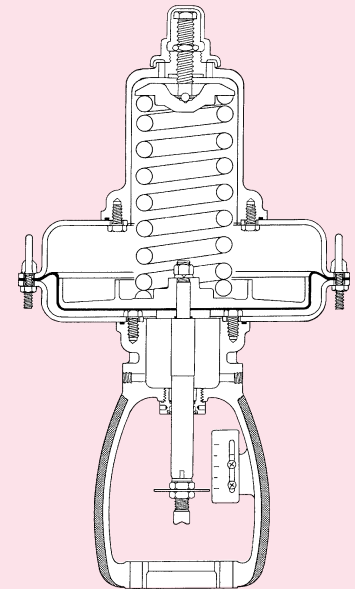
Model 2800 diaphragm actuators provide the operation to control the valve travel balancing between the force on the diaphragm by the signal air pressure, and the spring force.

The Model 2800 diaphragm actuators are designed for large output thrust applying single-spring type, to be installed on large size valve bodies.

Direct Action (DA)
(Air-to stem down)



Reverse Action (RA)
(Air-to stem up)



1. SPECIFICATIONS

Type	Model 2800 Pneumatic single-acting spring diaphragm actuator					
Action	Direct action (DA), Reverse action (RA)					
Actuator Sizes	500S	500L	650S	650L	650XS	650XL
Max Stroke (mm)	65	100	65	130	65	130
Output Thrust N (kgf) [at off-balance 80kPaG (0.8kgf/cm ² G)]	9490 (968)		16470 (1680)		32950 (3360)	
Hysteresis Error	With positioner	Max. 1 % F.S. ⁽²⁾				
	Without positioner	Max. 4 % F.S. ⁽²⁾				
Linearity	With positioner	Max. ± 1 % F.S. ⁽²⁾				
	Without positioner	Max. ± 5 % F.S. ⁽²⁾				
Materials	Diaphragm	Cloth reinforced chloroprene rubber (※ Ethylene propylene rubber)				
	Yoke	FC200 (※ SCPH2)				
Supply Air Pressure kPaG (kgf/cm²G)	120 (1.2), 240 (2.4), 280 (2.8), (120 only for 500 S / L)					
Spring Range kPaG (kgf/cm²G)	20 ~ 100(0.2 ~ 1.0), 40 ~ 200(0.4 ~ 2.0), 60 ~ 220(0.6 ~ 2.2), 80 ~ 240(0.8 ~ 2.4), 100 ~ 220 (1.0 ~ 2.2) [(20 ~ 100 only for 500 S/L)]					
Air Connection	Rc 1/4 (500S, 500L), Rc 3/8 (650S, 650L, 650XS, 650XL), ※ NPT					
Ambient Temperature	- 30 °C ~ + 70 °C (※ - 50 °C ~ - 30 °C, + 70 °C ~ + 100 °C)					
Dimensions, Masses	See page 2 Table 1.					
Painting Color	Silver					
Options*	Additional Mechanisms	Top-mounted handwheel, Side-mounted handwheel, Travel stop, Oil dash pot				
	Accessories	Pneumatic positioner (IP300), Electro-pneumatic positioner (EA91A, EA90A, EA10S), Air filter regulator (MR2000), Limit switch, Solenoid valve, Booster relay, Speed controller, Lock up valve				

[Note] (1) ※ is available as option.

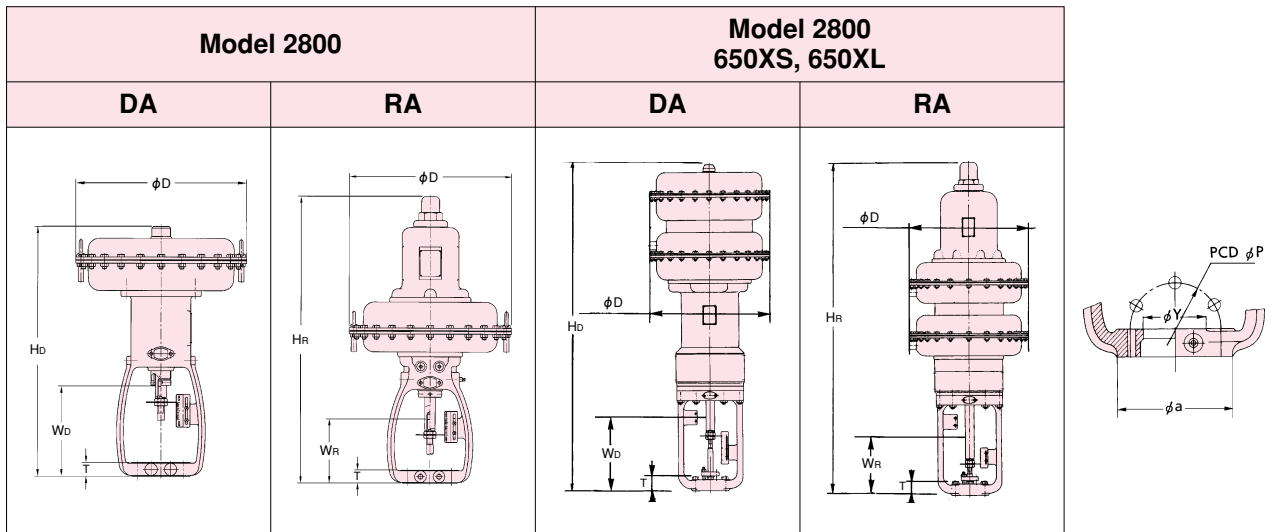
(2) Without positioner, the performance may vary in combination with valve type and gland packing.

(3) Material designation is represented by new JIS (SI Unit). Please consent in advance that approval drawings and other documents may represent with old material designation.

Table 1. Dimensions and Weight

Unit : mm

Actuator Size		500S	500L	650S	650L	650XS	650XL	
Effective Diaphragm Area (cm ²)		1210		2100		4200		
Max. Diaphragm Chamber Volume (cm ³)	DA	10100	13500	16400	27600	16400	27600	
	RA	11500	16200	17800	29100	17800	29100	
External Dimensions (mm)	Outside Dia. of Diaphragm Casing ϕD	500		650				
	Height	DA ; H _D	734	820	1030	1133	1509	1744
		RA ; H _R	885	955	1270	1425	1803	2038
	Stem Length	DA ; W _D	265		273	309	308	370
		RA ; W _R	200	165	207	179	243	240
	Threads of valve stem		W 3/4 ¹⁰ threads		W 7/8 ⁹ threads		M30 × 2.0	
	Yoke Insertion Dia. ϕY		100		120			
	Yoke Thickness T		40		43		60	
	Yoke Mounted Thread Hole PCD ϕP		135		160			
	No. and Dia. of Yoke Mounted Thread Hole		6- ϕ 19		6- ϕ 23			
Yoke Spud Dia ϕa		170		200				
Approximate Weight (kg)	DA	85	102	270	275	365	395	
	RA	100	120	295	300	395	425	

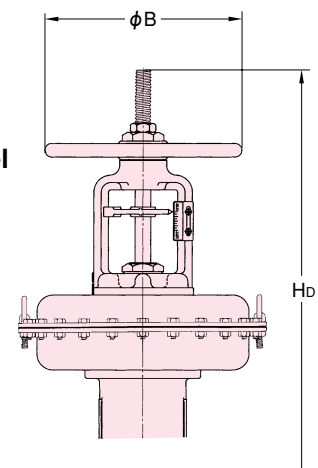


2. ADDITIONAL MECHANISMS

1 Top-mounted Handwheels (only for 500S, 500L DA)

Table 2. Dimensions and Weights for unit with Top-mounted Handwheel

Actuator Size	500 S	500 L
Handwheel Dia. ϕB	400	
Max. Height H _D	1159	1245
Max. Stroke	65	100
Turns for Max. Stroke	12.8	19.7
Approximate Weight (kg)	110	130



Unit : mm

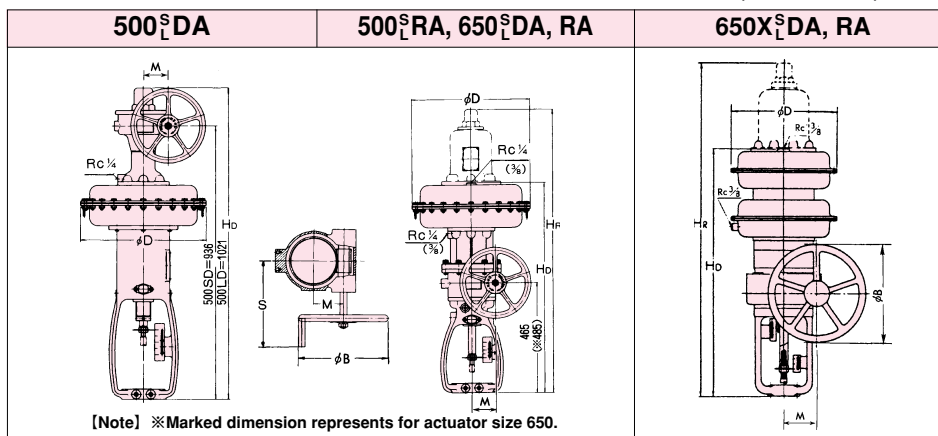
2 Side-mounted Handwheels

Table 3. Dimensions and Weight for unit with Side-mounted Handwheel

Unit : mm

Actuator Size	500S	500L	650S	650L	650XS	650XL	
Handwheel Dia ϕ B	300		400		500		
Handwheel Projection S	285		300		330		
Height	DA ; H _D	1113	1198	1140	1243	1722	1957
	RA ; H _R	1180	1250	1380	1535	2016	2251
Center-to-center distance M	100		115		204		
Max. Stroke	65	100	65	130	65	130	
Turns for Max. Stroke	177.5	273	92.2	184.4	148	297	
Approximate Weight (kg)	130(150)	150(175)	315(330)	320(350)	415(440)	450(485)	

[Note] Dimensions in parenthesis represent for Reverse Action (RA).



3 Travel Stops

Travel stops are used to limit the valve travel to certain position for application purpose.

< Example >

Actuator size 500 S, direct action, push-down close, to limit full open

500S -DU-O

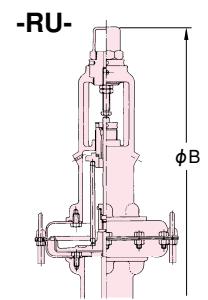
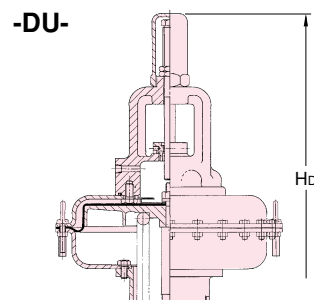
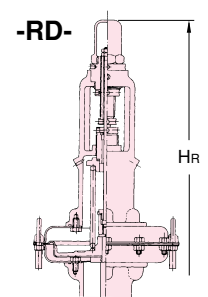
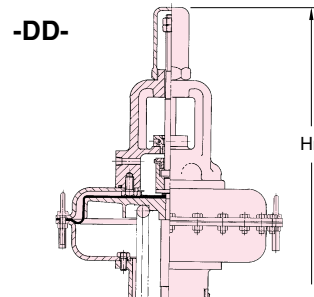
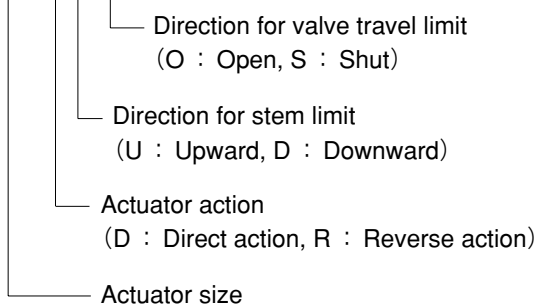


Table 4. Heights of Travel Stop and Classification

Unit : mm

Actuator Action	Direction for Stem Limit	Symbol	Direction for Valve Travel Limit	Application	Height	Actuator Size			
						500S	500L	650S	650L
Direct Action (DA)	Downward-D	-DD	Shut-S	Limit for full shut of push-down close valve	H _D	1031	1152	1443	1546
			Open-O	Limit for full shut of push-down open valve					
	Upward-U	-DU	Shut-S	Limit for full shut of push-down open valve					
			Open-O	Limit for full shut of push-down close valve					
Reverse Action (RA)	Downward-D	-RD	Shut-S	Limit for full shut of push-down close valve	H _R	1164	—	—	—
	Upward-U	-RU	Open-O	Limit for full shut of push-down close valve		1095	—	—	—

[Note] The stroke range of travel stop may be limited by conditions in service.

4 Oil Dash Pots (Dampers)

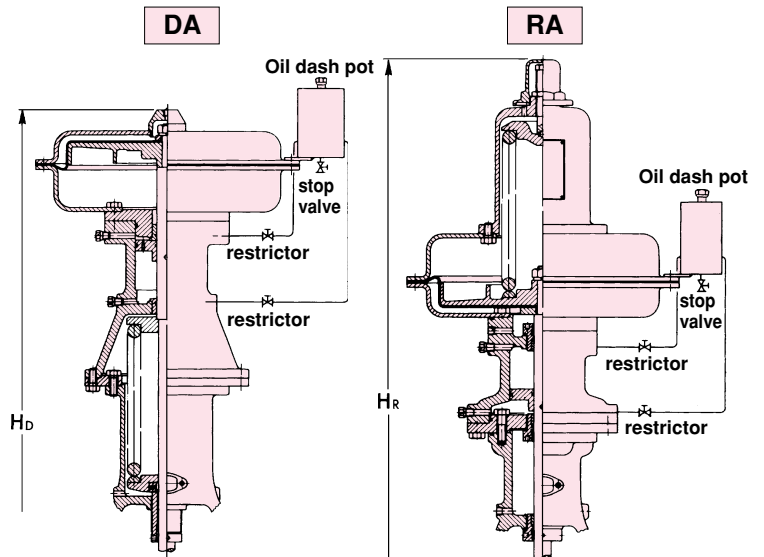
Please inquire to use the oil dash pot under the following conditions.

- For single seated valve,
fluid flows in direction to close the valve plug.
- For double seated valve,
 - (1) inlet pressure is high, and fluctuation of differential pressure is large.
 - (2) Velocity of fluid is high.

Table 5. Dimensions for Oil Dash Pot

Unit : mm

Actuator Size	500S	500L	650S	650L	
Height (mm)	DA ; H _D	1065	1220	1540	1645
	RA ; H _R	1105	1300	1560	1715



3. POSITIONER MOUNTING DIMENSIONS

1 Pneumatic Positioner IP300

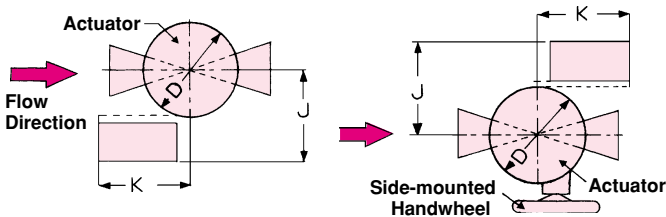


Table 6. Mounting Dimensions for IP300

Unit : mm

Actuator Size	500 S		500 L		650 S		650 L	
	DA	RA	DA	RA	DA	RA	DA	RA
Actuator outside Dia. ϕD	500				650			
J	170				240			
K	270				270			

2 Electro-pneumatic Positioner EA91A, EA90A

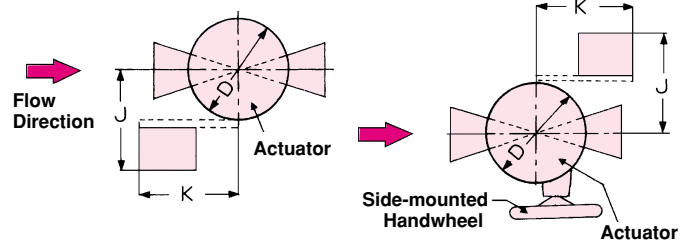


Table 7. Mounting Dimensions for EA91A, EA90A

Unit : mm

Actuator Size	500 ^S _L	650 ^S _L
Actuator outside Dia. ϕD	500	650
J	225	300
K	245	

[Note] The mounting dimensions for other positioner may be different from the above mentioned.



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