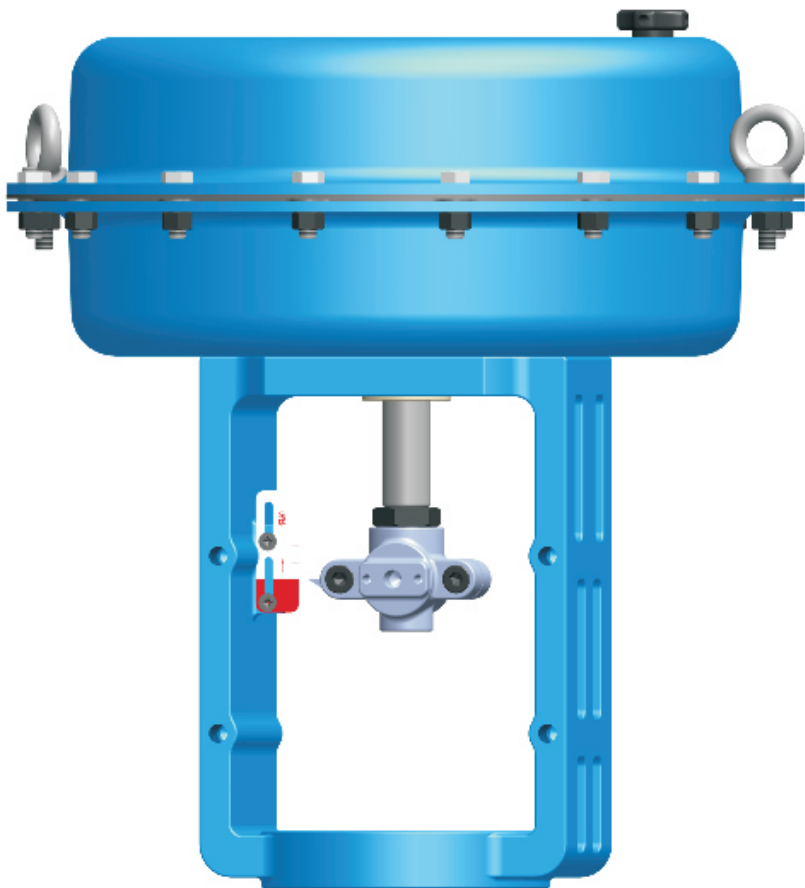


# PNEUMATIC DIAPHRAGM ACTUATOR



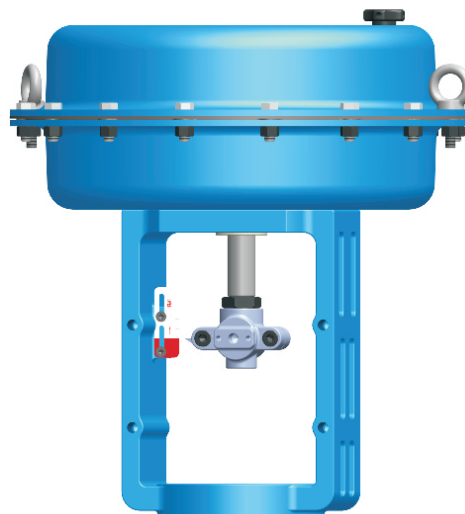
SERIES  
**ZH**

# DIAPHRAGM ACTUATOR

## Model ZH\_

### OVERVIEW

The model ZH\_ series is a pneumatic actuator of multi-spring type structure. It accepts the pneumatic output of positioners or other control equipments, converts the pneumatic force into a mechanical force with the diaphragm, and let the diaphragm force balanced with the spring force, there by setting the valve position. The model ZH\_, which employ multiple springs and a high air supply pressure, are much more compact and light as compared with conventional actuators.



### FEATURES

- Low overall height

Design of leg posts and diaphragm casing allows for maximum strength with minimum overall height.

- Long service lift

Diaphragm casing are rugged, thick-walled, internally coated steel construction providing stability and corrosion protection.

- High trust capability

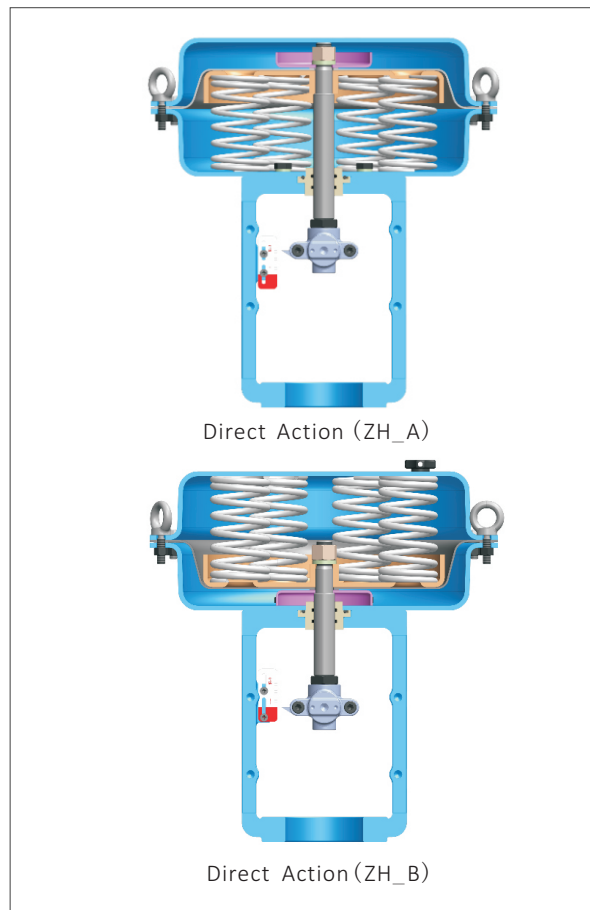
Molded and reinforced diaphragm permits higher pressure to provide maximum thrust for a given diaphragm size.

- High dynamic stability and frequency response

Shallow casing means reduced volume, thereby minimizing response time.

- Reduced hysteresis

Multi-spring design provides diaphragm stability and improves operational repeatability.



**STANDARD SPECIFICATION**

<b>Type</b>		Single Acting(Multi-spring)				
<b>Action</b>		Reverse action(RA), Direct action(DA)				
<b>Actuator Model</b>		ZH_22	ZH_23	ZH_34	ZH_45	ZH_56
<b>Effective Diaphragm Area(cm2)</b>		350	350	560	900	1400
<b>Max.Stroke(mm)</b>		16	25	40	60	100
<b>Materials</b>	<b>Case</b>	CS(Press)				
	<b>Diaphragm</b>	EPDM*				
	<b>Shaft(Output rod)</b>	SS410(H.Cr plated)				
	<b>Yoke</b>	A216 WCB				
<b>Air Supply Pressure kPa (kgf/cm2 G)</b>		140(1.4), 240(2.4) , 320(3.2)				
<b>Spring Range kPa (kgf/cm2 G)</b>		20 to 100(0.2 to 1.0), 40 to 200 (0.4 to 2.0), 80 to 240 (0.8 to 2.4)				
<b>Air connection</b>		3/8G internal thread				
<b>Ambient Temperature</b>		Standard type ..... - 10~ + 70 °C High temperature service (option) ..... 0~ + 100°C Low temperature service (option) ..... - 40~ + 40°C				
<b>Painting</b>		RAL5017(Powder Coating)*				
<b>Additional Options</b>	<b>Mechanisms</b>	Top-mounted H/W, Top worm-mounted H/W, Side mounted H/W.				
	<b>Accessories</b>	E/P <u>Positioner</u> , P/P <u>Positioner</u> , Air set, Limit S/W, Solenoid valve, Booster relay, Speed controller, Lock-up valve, etc.				

[Notes] (1) \*: Manufactured and attached as according to customer's order.

(2) For the optional items, refer to the specification sheets and installation drawings of respective accessories.

(3) Top worm-mounted H/W option is only available for actuator model ZH\_56.

**ACTION AND MODEL**

<b>Action</b>	<b>Actuators Model</b>				
<b>Direct</b>	ZHA22	ZHA23	ZHA34	ZHA45	ZHA56
<b>Reverse</b>	ZHB22	ZHB23	ZHB34	ZHB45	ZHB56

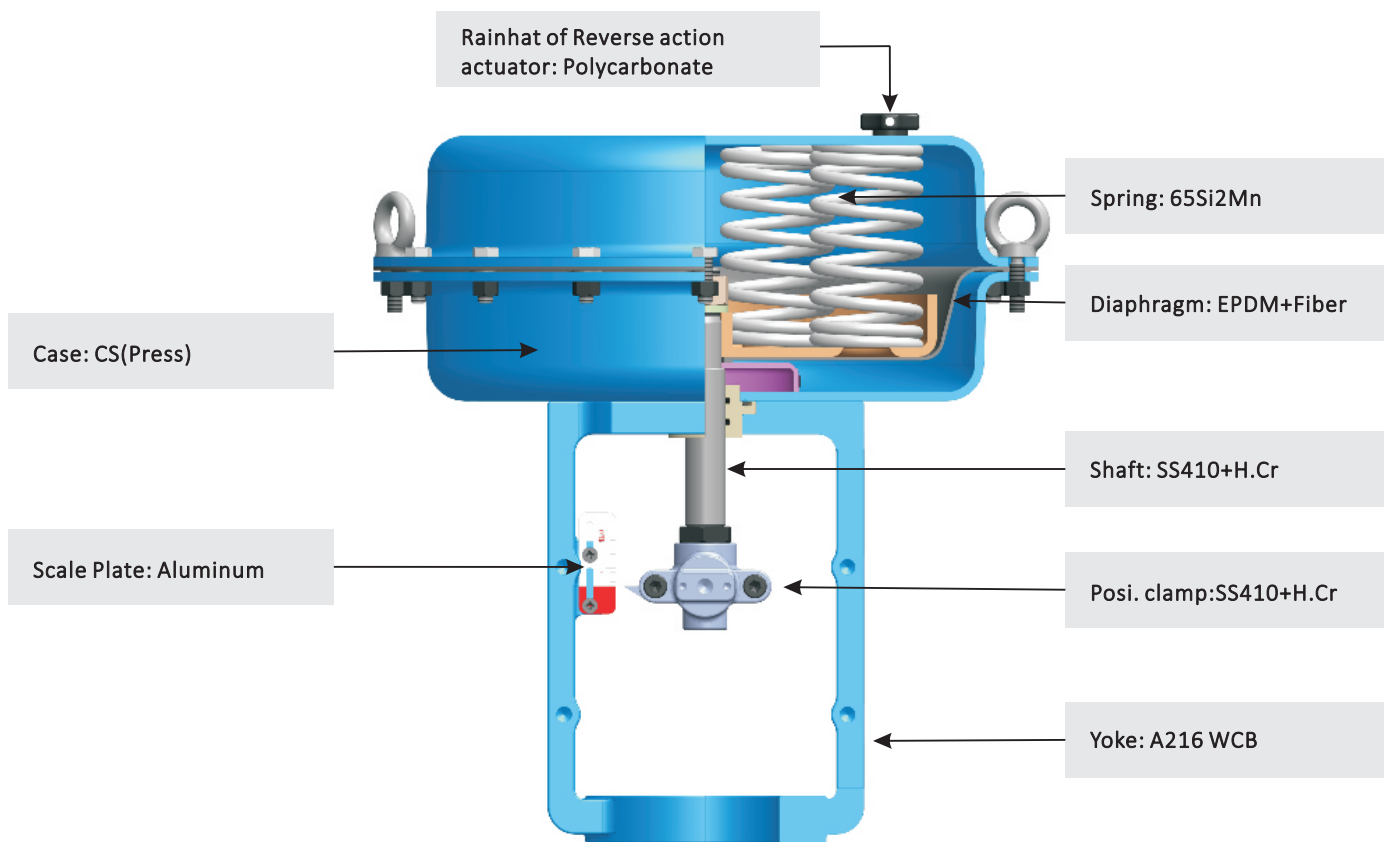
1) Direct action

As the air pressure fed to the top chamber of the diaphragm case increases, the actuator stem moves downward.

2) Reverse action

As the air pressure fed to the bottom chamber of the diaphragm case increases, the actuator stem moves upward.

**ACTUATOR STRUCTURE**



**PERFORMANCE**

**1. Hysteresis error**

Spring range	With positioner	Without positioner
20 to 100 kPa (0.2 to 1.0 kgf/cm <sup>2</sup> )	Less than 0.8% F.S.	Less than 5% F.S.
40 to 200 kPa (0.4 to 2.0 kgf/cm <sup>2</sup> )	Less than 1% F.S.	Less than 5% F.S.
80 to 240 kPa (0.8 to 2.4 kgf/cm <sup>2</sup> )	Less than 1% F.S.	Less than 5% F.S.

**2. Linearity**

Spring range	With positioner	Without positioner
20 to 100 kPa (0.2 to 1.0 kgf/cm <sup>2</sup> )	Less than 1% F.S.	Less than 5% F.S.
40 to 200 kPa (0.4 to 2.0 kgf/cm <sup>2</sup> )	Less than 1% F.S.	Less than 5% F.S.
80 to 240 kPa (0.8 to 2.4 kgf/cm <sup>2</sup> )	Less than 1.5% F.S.	Less than 5% F.S.

Note) Without positioner, the performance may vary according to the combination with valve body and kind of packing.

**3. Air consumption**

3-1 Max, stroke

[Unit: N.L]

Air Supply (Kgf/cm2)	Actuator Model				
	ZH_22	ZH_23	ZH_34	ZH_45	ZH_56
1.4	1.4	2.2	5.5	13.3	34.5
2.4	2.0	3.1	7.8	18.8	48.7
3.2	2.4	3.8	9.8	23.2	60.2

**4. Output force**

4-1 Reverse action(RA)

[Unit: KN]

Off Balance (Kgf/cm2)	Spring Range (Kgf/cm2)	Air Supply (Kgf/cm2)	Actuator Model				
			ZHB22	ZHB23	ZH B34	ZHB45	ZH B56
0.2	0.2~1.0	1.4	0.7	0.7	1.12	1.8	2.8
0.4	0.4~2.0	2.4	1.4	1.4	2.24	3.6	5.6
0.8	0.8~2.4	3.2	2.8	2.8	4.48	7.2	11.2

4-2 Direct action(DA)

[Unit: KN]

Off Balance (Kgf/cm2)	Spring Range (Kgf/cm2)	Air Supply (Kgf/cm2)	Actuator Model				
			ZHA22	ZHA23	ZHA34	ZHA45	ZHA56
0.2	0.2~1.0	1.4	1.4	1.4	2.24	3.6	5.6
0.4	0.4~2.0	2.4	1.4	1.4	2.24	3.6	5.6
0.4	0.4~2.0	3.2	4.2	4.2	6.72	10.8	16.8
0.8	0.8~2.4	3.2	2.8	2.8	4.48	7.2	11.2

**5. Actuator Weight**

[Unit: Kg]

Off Balance (Kgf/cm2)		Actuator Model				
		ZH_22	ZH_23	ZH_34	ZH_45	ZH_56
Without Manual H/W		11.5	13.5	22.5	45.5	110
With Manual H/W	Top	15.5	18	30.5	55	135
	Side	18	20	35.5	62.5	/

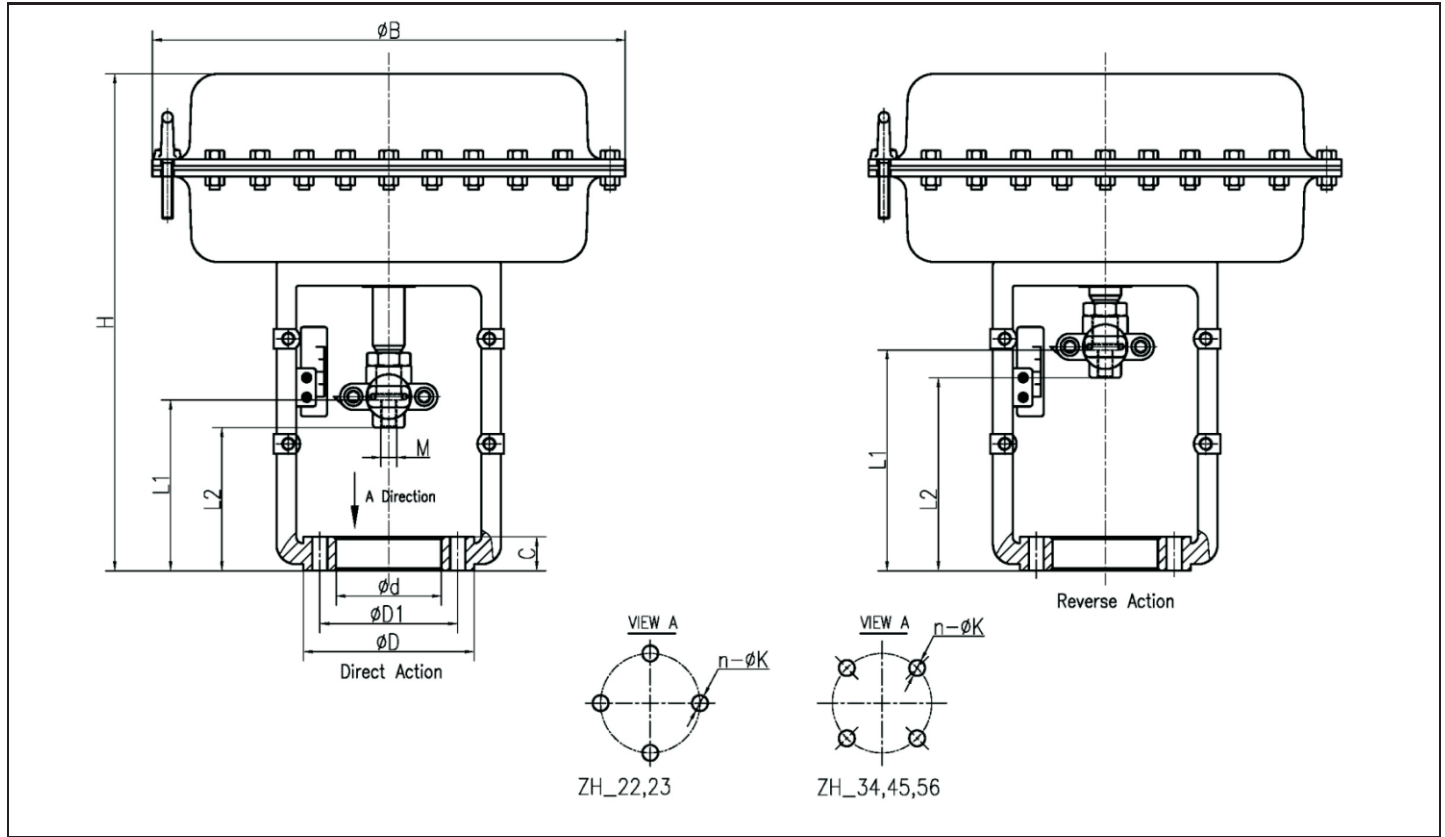
**Ordering Information**

When ordering, please specify:

- 1)Model Number: ZH\_2 to 6
- 2)Spring range
- 3)Stroke
- 4)Optional accessories

**DIMENSIONS**

Diaphragm Actuator(Without H/W Type)

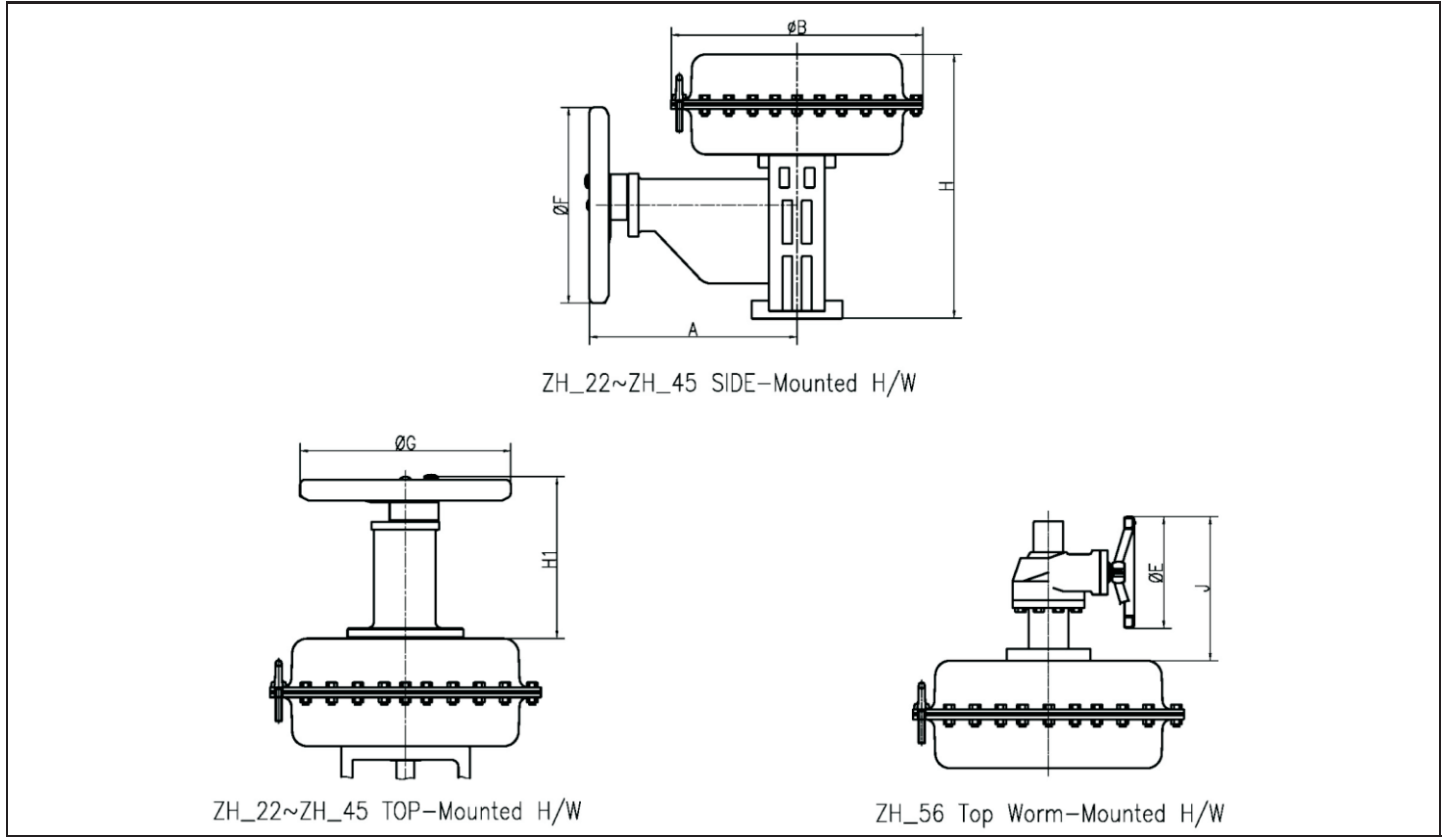


[Unit: mm]

Model No.	Stroke	L1	L2	H	$\Phi B$	$\Phi D$	$\Phi D1$	$\Phi d$	$n - \Phi K$	C	M
ZHA22	16	111	96	286	290	100	80	60	4- $\Phi 10$	20	M10
ZHB22		95	80								
ZHA23	25	120	103	300	290	100	80	60	4- $\Phi 10$	20	M10
ZHB23		95	78								
ZHA34	40	170	145	390	365	135	105	80	4- $\Phi 12$	26	M12*1.25
ZHB34		130	105								
ZHA45	60	200	175	524	475	152	118	95	4- $\Phi 14$	31	M16*1.5
ZHB45		140	115								
ZHA56	100	275	245	728	590	175	130	100	4- $\Phi 18$	37	M20*1.5
ZHB56		175	145								

**DIMENSIONS**

Diaphragm Actuator(Without H/W Type)



[Unit: mm]

Model No.	Stroke	H1	H	Φ B	Φ F	A	Φ G	Φ E	J
ZHA22	16	170	286	290	220	195	220	/	/
ZHB22		182							
ZHA23	25	170	300	290	220	260	220	/	/
ZHB23		182							
ZHA34	40	197	390	365	280	286	280	/	/
ZHB34		215							
ZHA45	60	227	524	475	240	360	340	/	/
ZHB45		270							
ZHA56	100	/	728	590	/	/	/	280	385
ZHB56		/							500



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