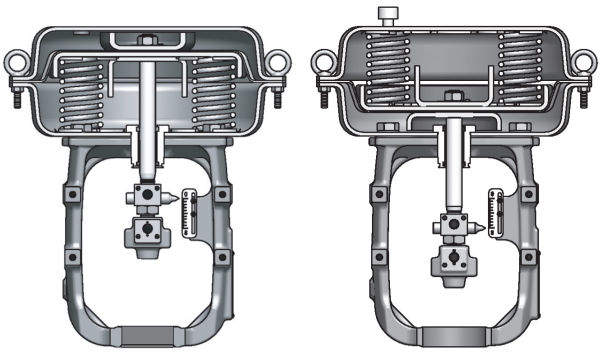
Multi-Spring Type Diaphragm Motors

Model HA_ _

OVERVIEW

The model HA_ _ motor 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 HA_ _, which employ multiple springs and a high air supply pressure, are much more compact and light as compared with conventional actuators.



SPECIFICATIONS

Type

Spring type piston cylinder

Action and Motor model

Action	Motors model		
Direct	HA2D	HA3D	HA4D
Reverse	HA2R	HA3R	HA4R

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.

Material

Item	Material
Diaphragm case	Steel
Diaphragm	Cloth embedded ethylene propylene rubber
Actuator stem	Stainless steel
Yoke	Cast steel (Option: carbon steel)

Spring range

20 to 98 kPa {0.2 to 1.0 kgf/cm^2}
80 to 240 kPa {0.8 to 2.4 kgf/cm^2}

Supply pressure

140 to 390 kPa {1.4 to 4.0 kgf/cm^2}

Air connection

Rc 1/4 or 1/4NPT internal thread

Ambient temperature

-30 to 70°C

Optional accessories

Positioner*, Air filter regulator, hand wheel*, limit switch, solenoid valve, motion transmitter, booster relay, lock-up valve, and others.

Note) 1) For the optional items, refer to the specification sheets and installation drawing of respective accessories.

2) Accessories with the asterisk mark (*) are selected from the following types depending on the actuators to be combined.

Actuator	Positioner		Hand wheel	
	P/P	I/P	Top	Side
HA2_ to HA4_	HTP_-_ _	AVP20_ AVP30_ AVP70_	Mounted	Mounted

Performance

Output

Varies depending on utilized spring range and air supply pressue.

Accuracy

Table 1. Hysteresis error and linearity

Item \ Spring range			20 to 98kPa {0.2 to 1.0 kgf/cm²}	80 to 240kPa {0.8 to 2.4 kgf/cm²}
Hysteresis error	Without positioner		3	-
	With positioner		1	1
Linearity	Without positioner		±5	-
	With positioner	HTP_-_ _	±1	±1
		AVP_ _ _	±1	±1

Note) When no positioner is provided, performance varies by the type pf packing used.

Dimensions and weight

Refer to Figure 1 to 3 and Table 2 to 4.

Finish

Blue (Munsell 10B5/10), or silver, or other specified colors.

DIMENSIONS

Table 2. Dimensions and weight

Model No.	Stroke (mm)	Dimensions (mm) L	H	ϕd	t	K	ϕB	B	Nominal diaphragm area (cm²)	Maximum diaphragm chamber capacity (cm³)	Weight (kg)
HA2D HA2R	14.3	121	334	56	22	M9 × 1	267	281	310	1100	15
		103									
	25.0	122									
		95									
	38.0	142	354	65	26	M12 × 1.25				1500	16
		102									
HA3D HA3R	25.0	144	407	65	26	M12 × 1.25	350	363	550	2800	31
		113									
	38.0	144									
		102									
	55.0	196	459	80	30	M15 × 1.5				3400	32
		139									
HA4D HA4R	38.0	214	612	90	35	M18 × 1.5	470	520	950	10000	68
		172									
	50.0	226									
		172									
	75.0	251									
		172									

Note) 1) Dimension L is as with air pressure 0 kPa (kgf/cm²).

2) The model numbers and L dimensions are listed with those of the direct action in the top row and those of the reverse action in the bottom row.

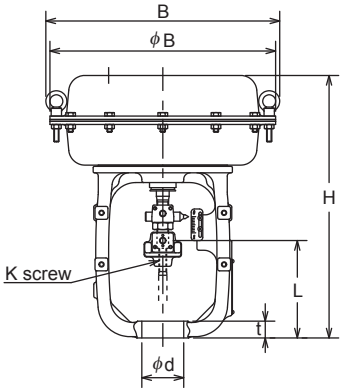


Figure 1. Dimensions

Table 3. Dimensions and weight with side-mounted hand wheel

Model No.	Stroke (mm)	Dimensions (mm)						Max. operating force required at hand wheel (N[kgf])	Weight (kg)
		A	ϕB	B	C	ϕD	H		
HA2D HA2R	14.3	289	267	281	37	280 (200)	334	140 [14] (190) ([19])	25
	25.0								
	38.0				57		354		26
HA3D HA3R	25.0	347	350	363	46	355	407	280 [29]	49
	38.0								
	50.0				98		459		50
HA4D HA4R	38.0	476	470	520	114	570	612	450 [46.0]	120
	50.0								
	75.0								

Note) 1) Dimension B is as shown in Figure 1.

2) Figures in parenthesis in ". D dimensions" and "maximum operating force required at hand wheel" colomns show for general bonnet of HLS single seated-control valve, when No.3 or No.4 disignated to SS2-8113-0200 is selected for pipe installation position. If valve and pipe sizes are for mounting with reducer, seslect pipe installation position of No.1, No.2, or top-hand wheel.

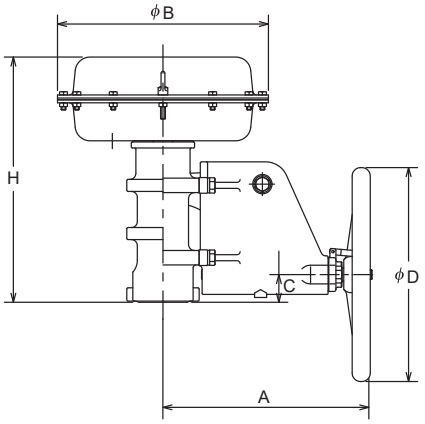


Figure 2. Dimensions with side-mounted hand wheel

Table 4. Dimensions and weight with top-mounted hand wheel

Model No.	Stroke (mm)	Dimensions (mm)				Max. operating force required at hand wheel (N[kgf])	Weight (kg)
		ϕB	B	ϕD	H		
HA2D HA2R	14.3	267	281	200	D:575 R:558	140 [14]	23
	25.0						
	38.0				D:595 R:591		24
HA3D HA3R	25.0	350	363	355	D:694 R:682	250 [26]	46
	38.0						
	50.0				98		47
HA4D HA4R	38.0	470	520	570	1010	400 [41]	110
	50.0						
	75.0						

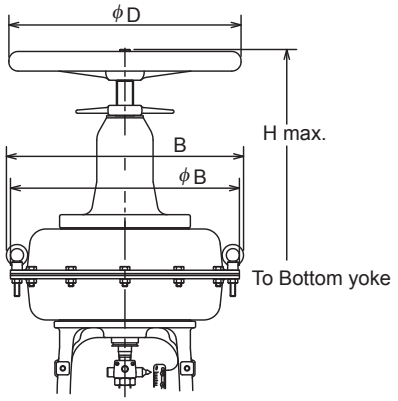
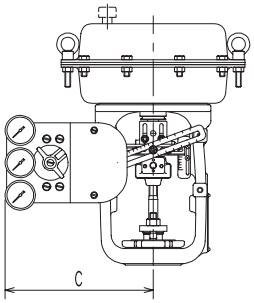
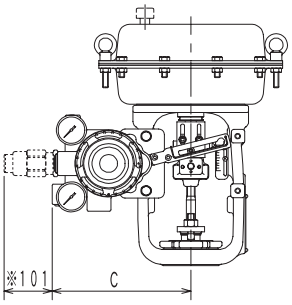


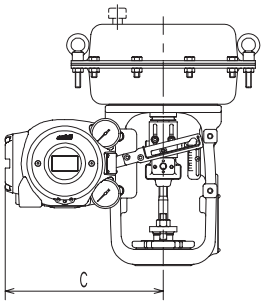
Figure 3. Dimensions with top-mounted hand wheel



With HTP_ -_ _ positioner



With AVP30_ positioner



With AVP70_ positioner

Figure 4. Dimensios of actuator with positioner

Table 5. Dimension of actuator with positioner

Model	P/P positioner	I/P positioner			
	HTP_-_ _	AVP30_ (AFR* mounted on the positioner)	AVP30_ (AFR* with bracket for separated mount)	AVP70_ (AFR* mounted on the positioner)	AVP70_(AFR* with bracket for separated mount)
HA2_	215	293	202	307	230
HA3_	245	323	232	337	260
HA4_	265	358	267	372	295

Note) This dimensions are refference value.
**AFR: Air Filter Regulator*

Ordering Information

When ordering, please specify;

1) Model Number: HA2 to 4
2) Spring range
3) Stroke
4) Optional accessories

Please read “Terms and Conditions” from the following URL before ordering and use.
https://www.azbil.com/products/factory/order.html

Specifications are subject to change without notice.

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