YAMATAKE **Specification**

CV 3000 Series Multismotor*
Multi-Spring Type Diaphragm Motors
Model HA

Introduction

The "Multismotor" is a pneumatic actuator of multi-spring type diaphragm structure. It accepts the pneumatic output of a control instrument (such as automatic controller or manual loader), 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 "Multismotor" actuators, which employ multiple springs and a high air supply pressure, are much more compact and light as compared with conventional actuators.

Standard specifications

Types :

Action	Model			
Direct	HA1D	HA2D	HA3D	HA4D
Reverse	HA1R	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 moves upward.

Major materials : Diaphragm case : SS41
Diaphragm : Fiber-reinforced ethylene propylene rubber
Actuator stem : SUS304 stainless steel
Yoke : FC20 (Optional : SCPH2)

Spring range : 0.2~1.0kgf/㎠ (20~98kPa) or 0.8~2.4kgf/㎠ (80~240kPa)

Air supply : 1.4~4.0kgf/㎠ (140~390kPa)

Air connections : Rc1/4 or 1/4 NPT internal thread

Ambient temperature : −30 ~ +70℃

Options :

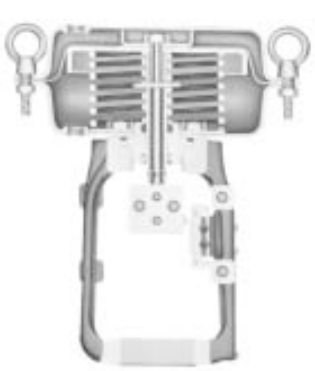
Positioner*, pressure regulator with filter, manual operating device*, limit switch, solenoid valve, motion transmitter, volume booster, air lock relay, and others.

Notes : 1) For the optional items, refer to the specification sheets and installation drawings of respective valves.
2) Positioner and handwheel types become the models of following table.

Actuator	Positioner		Manual handwheel	
	P/P	I/P	Top	Side
HA1	VPE	HEP	THM	—
HA2~4	HTP	HEP	THM	SHM

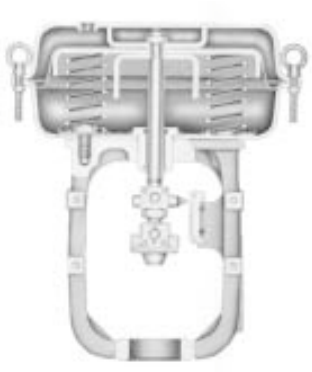
Performance

Output : Varies depending on utilized spring range and air supply pressure.

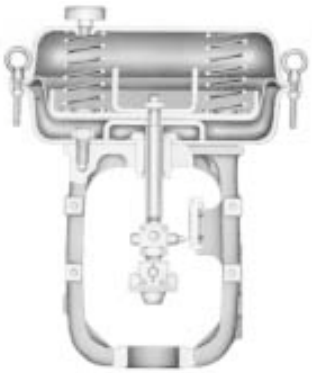


HA1D (Direct action)

HA1R (Reverse action)



HA2D~4D (Direct action)



HA2R~4R (Reverse action)

Accuracy :

Table 1. Hysteresis error and linearity (within %FS)

Item			Spring range 0.2~1.0kgf/㎠ (20~98kPa) HA1	0.2~1.0kgf/㎠ (20~98kPa) HA2~4	0.8~2.4kgf/㎠ (80~240kPa) HA1	0.8~2.4kgf/㎠ (80~240kPa) HA2~4
Hysteresis error	Without positioner		5	3	—	—
	With positioner		1	1	1	1
Linearity	Without positioner		±5	±5	—	—
	With positioner	VPE	±3	—	±3	—
		HTP	—	±1	—	±1
		HEP	±2	±1	±2	±1

Note) When no positioner is provided, performance may differ by the type of packing used.

Dimensions and weight : Refer to Figure 1 and Table 2.

Finish : Grayish green (Munsell 5B 4/1) or silver, or other specified color.

*Trademark

Table 2. Dimensions and weight

Table 2-1 Multismotors

Model Number	Stroke (mm)	Dimensions (mm) L	H	φd	t	K	φB	B	Nominal diaphragm area (cm²)	Maximum diaphragm chamber capacity (cm³)	Weight (kg)
HA1D HA1R	14.3	119	260	56	22	M9×1	218	230	160	850	8
		105									
	25.0	120									
		95									
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									
	50.0	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									

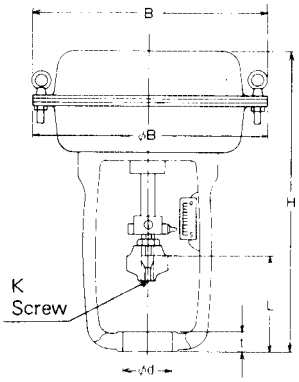


Fig. 1-1 Dimensions of Multismotor

Notes: 1) Dimension L is as with air pressure 0 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.

Table 2-2 Multismotor with side-mounted handwheel

Model Number	Stroke (mm)	Dimensions (mm) A	φB	B	C	φD	H	Max.operating force required at handwheel (kgf(N))	Weight (kg)
HA2D HA2R	14.3	289	267	281	37	280 (200)	334	14 (140)	25
	25.0							(19)	
	38.0				57		354	((190))	26
HA3D HA3R	25.0	347	350	363	46	355	407	29 (280)	49
	38.0								
	50.0				98		459		50
HA4D HA4R	38.0	476	470	520	114	570	612	46.0 (450)	120
	50.0								
	75.0								

Notes: 1) Dimensions B is as shown in Figure 1-1.
2) Figures in parenthesis in "φ D dimensions" and "maximum operating force required at handwheel" columns show for general bonnet of HLS single seated-control valve, when No.3 or No.4 designated to SS2-8113-0200 is selected for pipe installation position. If valve and pipe sizes are for mounting with reducer, select pipe installation position of No.1, No.2, or top-handwheel.

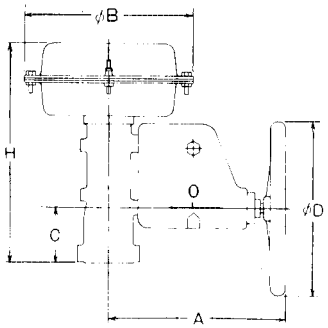


Fig. 1-2 Multismotor with side-mounted handwheel

Table2-3 Multismotor with top-mounted handwheel

Model Number	stroke (mm)	Dimensions (mm) φB	B	φD	H	Max.operating force required at handwheel (kgf(N))	Weight (kg)
HA1D HA1R	14.3	218	230	140	410	16 (160)	11
	25.0						
HA2D HA2R	14.3	267	281	200	D:575 R:558	14 (140)	23
	25.0						
	38.0				D:595 R:591		24
HA3D HA3R	25.0	350	363	355	D:694 R:682	26 (250)	46
	38.0						
	50.0				746		47
HA4D HA4R	38.0	470	520	570	1010	41 (400)	110
	50.0						
	75.0						

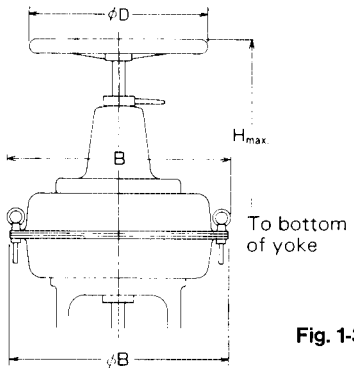


Fig. 1-3 Multismotor with top-mounted handwheel

Ordering Information

When ordering, please specify;

1) Model Number 2) Spring range 3) Stroke 4) Options

Specifications are subject to change without notice.

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