CONTROL VALVE STANDARD SPECIFICATION

CYLINDER ACTUATOR

LINEAR TYPE

YAC-Series

PROVAL

PROVAL Co., Ltd.

[E-3]

PNEUMATIC CYLINDER LINEAR ACTUATOR

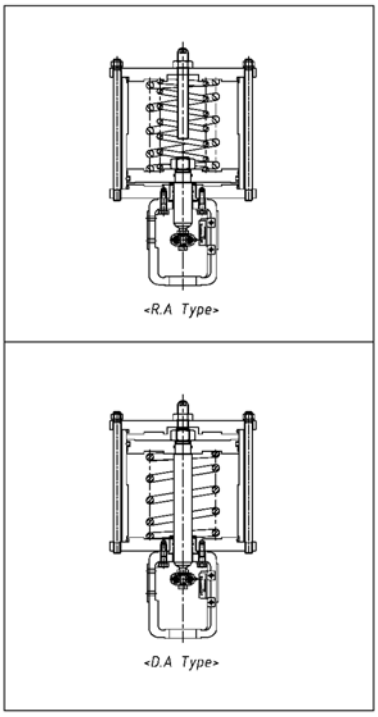
☞ GENERAL

The PROVAL Cylinder actuator designed for a wide range of globe valves. PROVAL Cylinder actuator uses in control or on/off services. Actuator's thrust capacity is much greater than similar size diaphragm type actuator because of air pressure as high as 700Kpa (7bar) being used.

PROVAL Cylinder actuator operates either as a single acting or double acting type. Positioner is usually mounted on yoke. Double acting type actuator has a two air connection. The cylinder actuators provide the operation to control the valve travel balancing between the force on the piston by the signal air pressure, and the spring force.

By combining positioner, the actuator brings about high accuracy of positioning.

☞ FEATURES



• High thrust capability

– Cylinder has higher thrust force than similar size diaphragm.

• Long service life

• Long stroke

– It is possible to apply long stroke up to 8 inch

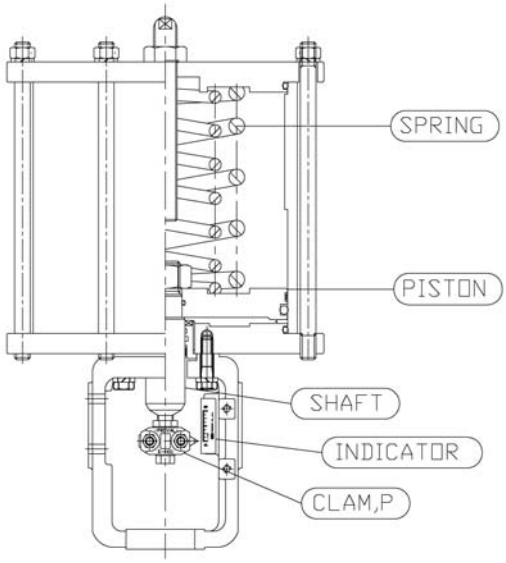
• Adjustable actuating force to suit different application.

☞ STANDARD SPECIFICATION

Type		Single acting							
Action		Reverse action (RA), Direct action (DA)							
Actuator Model		C-160S	C-200S	C-250S	C-300S	C-350S	C-400S	C-450S	C-500S
Effective Diaphragm Area (cm^2)		201	314	491	707	907	1194	1485	1847
Max. Stroke (mm)		20	50	50	100	100	150	150	200
Materials	Case	A283-C							
	Piston	A120 (H.Cr plated)							
	Shaft (output rod)	SUS304 (H.Cr plated)							
	Yoke	A216-WCB							
Supply Air Pressure kPa (kgf/cm^2G)		400 ~ 700 (4.0~7.0)							
Spring Range kPa (kgf/cm^2G)		100~200 (1.0~2.0), 150~250 (1.5~2.5), 200~300 (2.0~3.0), 250~350 (2.5~3.5)							
Air Connection		Rc 1/4				Rc 3/8"			
Ambient Temperature		-20°C ~ 80°C							
Additional Options	Mechanisms	Top-mounted H/W, Side worm-mounted H/W, Travel stopper.							
	Accessories	E/P Positioner, P/P Positioner, 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) Please consent in advance that approval drawing and other documents may represent with old material designation.
(3) For ambient temperature, denoted the extended temperature range as option.

☞ ACTUATOR STRUCTURE



• Actuator and valve actions

Selection of actuator actions determines valve actions (in response to input signals).

Air-fail-close: actuator where the valve opens as the input signal increases.

Air-fail-open: actuator where the valve closes as the input signal increases

With the Alpha plus, the valve closes as the plug lowers. The valve action depends, in turn, on whether an air-fail-close or air-fail-open actuator is chosen.

☞ PERFORMANCE

1. Hysteresis

Spring range	With Positioner	Without Positioner
1.0 ~ 2.0 kgf/cm²	Less than 1.5% of F.S.	Less than 5% of F.S.
1.5 ~ 2.5 kgf/cm²	Less than 1.5% of F.S.	Less than 5% of F.S.
2.0 ~ 3.0 kgf/cm²	Less than 1.5% of F.S.	Less than 5% of F.S.
2.5 ~ 3.5 kgf/cm²	Less than 1.5% of F.S.	Less than 5% of F.S.

2. Linearity

Spring range	With Positioner	Without Positioner
1.0 ~ 2.0 kgf/cm²	Less than 1.5% of F.S.	Less than 5% of F.S.
1.5 ~ 2.5 kgf/cm²	Less than 1.5% of F.S.	Less than 5% of F.S.
2.0 ~ 3.0 kgf/cm²	Less than 1.5% of F.S.	Less than 5% of F.S.
2.5 ~ 3.5 kgf/cm²	Less than 1.5% of F.S.	Less than 5% of F.S.

[Notes] Without positioner, the performance may vary according to the combination with valve body and kind of packing.

3. Air consumtion

-Max, stroke

[Unit: N. ℓ]

Air Supply (kgf/cm²G)	Actuator Model							
	C-160S	C-200S	C-250S	C-300S	C-350S	C-400S	C-450S	C-500S
4.0	2	7.9	12.3	35.4	48.2	94.4	119.5	196.8
5.0	2.4	9.4	14.8	42.5	57.8	113.3	143.4	236

4. Output force

4-1 Reverse action (RA)

[Unit: kgf]

Off Balance (kgf/cm²)	Spring Range (kgf/cm²)	Air Supply (kgf/cm²G)	Actuator Model							
			C-160S	C-200S	C-250S	C-300S	C-350S	C-400S	C-450S	C-500S
2.0	2.0 ~ 3.0	4.0	402	628	981	1413	1815	2388	2971	3693
2.5	2.5 ~ 3.5	5.0	502	785	1227	1766	2269	2985	3714	4616

4-2 Direct action (DA)

[Unit: kgf]

Off Balance (kgf/cm^2)	Spring Range (kgf/cm^2)	Air Supply (kgf/cm^2G)	Actuator Model							
			C-160S	C-200S	C-250S	C-300S	C-350S	C-400S	C-450S	C-500S
2.0	1.0 ~ 2.0	4.0	402	628	981	1413	1815	2388	2971	3693
2.5	1.5 ~ 2.5	5.0	502	785	1227	1766	2269	2985	3714	4616

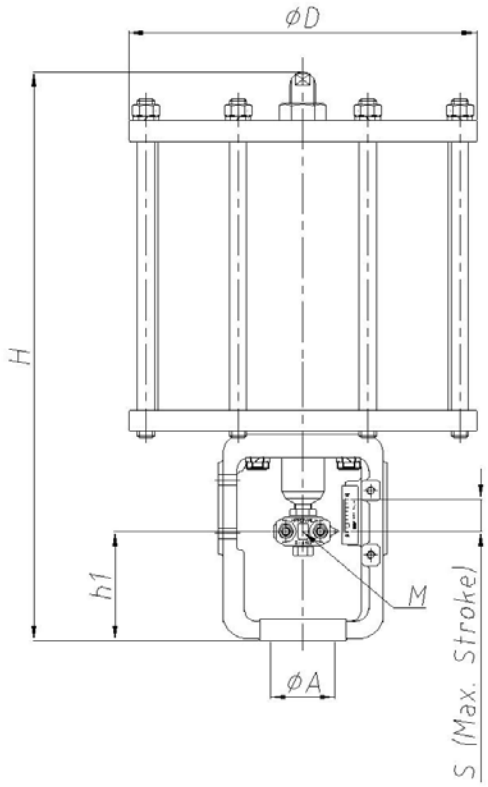
4-3 Double action

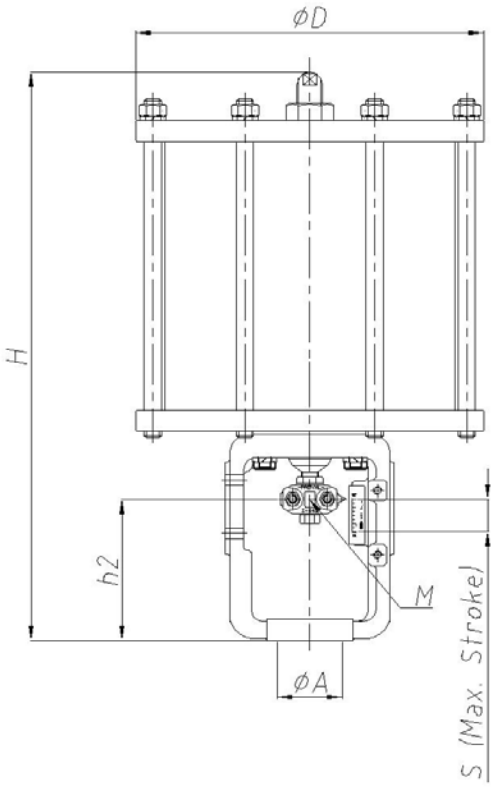
[Unit: kgf]

Off Balance (kgf/cm^2)	Air Supply (kgf/cm^2G)	Actuator Model							
		C-160S	C-200S	C-250S	C-300S	C-350S	C-400S	C-450S	C-500S
4.0	4.0	402	628	981	1413	1815	2388	2971	3693
5.0	5.0	502	785	1227	1766	2269	2985	3714	4616

DIMENSION DRAWING

CYLINDER TYPE ACTUATOR (No Handle Type)



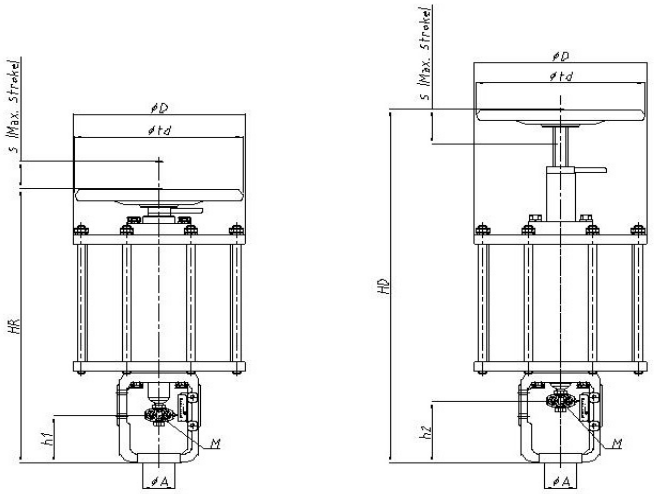


DIMENSIONS [Unit: mm]

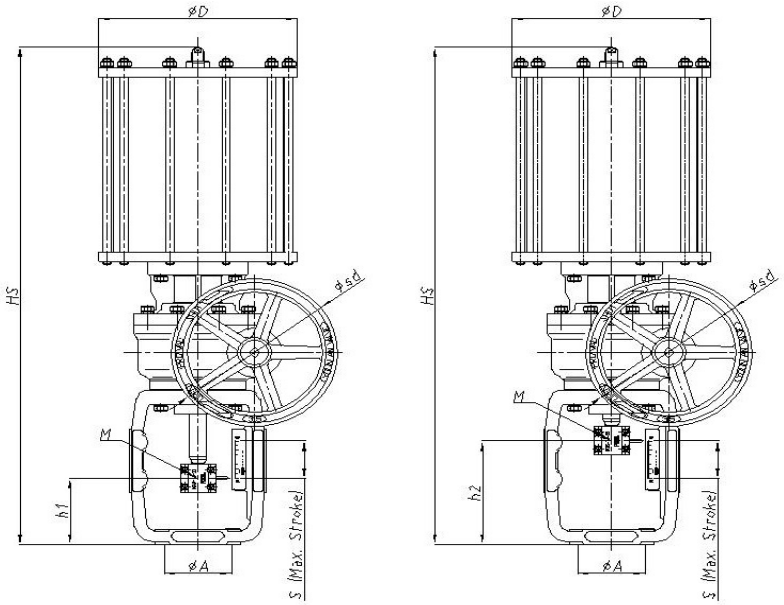
Model No.	H	h1	h2	ØD	ØA	S	M	Air Connection
C-160S	440	100	120	224	60.5	20	M16 x 2P	PT 1/4”
C-200S	530	100	140	274	60.5	40	M16 x 2P	PT 3/8”
C-250S	530	100	140	324	60.5	40	M16 x 2P	PT 3/8”
C-300S	790	150	240	374	100.5	90	M27 x 2P	PT 3/8”
C-350S	790	150	240	405	100.5	90	M27 x 2P	PT 1/2”
C-400S	790	150	240	460	100.5	90	M27 x 2P	PT 1/2”

DIMENSION DRAWING

CYLINDER TYPE ACTUATOR (Handle Type)



<C-160S/ C-200S / C-250S>



<C-300S/ C-350S / C-400S>

DIMENSIONS [Unit: mm]

Model No.	HR	HD	HS	h1	h2	ØD	Ød	Øsd	ØA	S	M	Air Connection
C-160S	490	565	-	100	120	224	200	-	60.5	20	M16 x 2P	PT 1/4”
C-200S	590	765	-	100	140	274	315	-	60.5	40	M16 x 2P	PT 3/8”
C-250S	590	765	-	100	140	324	315	-	60.5	40	M16 x 2P	PT 3/8”
C-300S	-	-	1070	150	240	374	-	315	100.5	90	M27 x 2P	PT 3/8”
C-350S	-	-	1070	150	240	405	-	315	100.5	90	M27 x 2P	PT 1/2”
C-400S	-	-	1070	150	240	460	-	315	100.5	90	M27 x 2P	PT 1/2”