

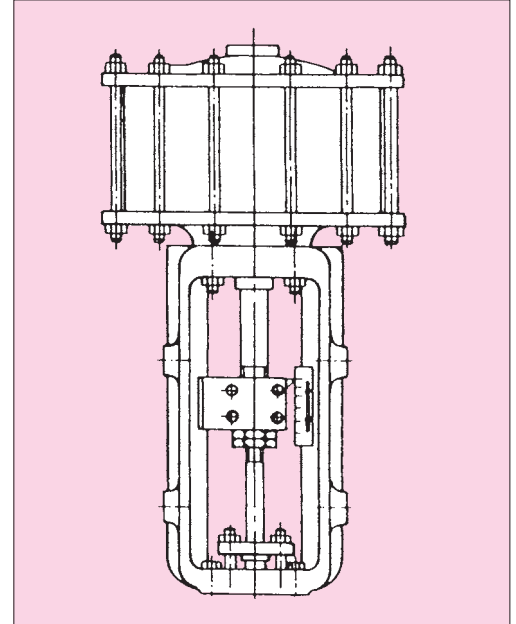
**MOTOYAMA****General Specifications****Model 1500****DOUBLE-ACTION CYLINDER TYPE ACTUATOR****Features**

Double-action cylinder type actuators have no spring, whereas diaphragm actuators do have springs. They provide high thrust because of their greater range of supply pressure, and also provide a long stroke.

Cylinder type actuators, having features not provided by diaphragm actuators, are suitable for applications where compactness or a higher thrust than those of diaphragm actuator required. On the other hand, double-action cylinder type actuators require positioners when used for throttling control of valves.

Should supply pressure failure occur, the piston does not hold its position; therefore, an emergency device is required to move the control valve to the open or closed position.

No. 1500 actuators, which are springless and produce high thrust, are available in eleven sizes. Actuators with manual handwheels are also available.

**1. SPECIFICATIONS**

<b>Type</b>	Model 1500 Air Operated Double Action Cylinder Type Actuator										
<b>Action</b>	Direct action, Reverse action										
<b>Actuator Sizes</b>	200C	250C	300C	350C	400C	400XC	490C	540C	540XC	700C	700XC
<b>Max. Stroke (mm)</b>	65, 150, 250, 350, 450, 550										
<b>Effective Piston Area (cm<sup>2</sup>)</b>	282	440	635	865	1130	2260	1690	2170	4300	3650	7250
<b>Supply Air Press. kPa (kgf/cm<sup>2</sup>G)</b>	400(4.0), 500(5.0), 600(6.0), 700(7.0), 800(8.0), 900(9.0)										
<b>Max. Supply Air Press. kPa (kgf/cm<sup>2</sup>G)</b>	700 (7.0) <sup>(5)</sup>							900 (9.0)			
<b>Air Connection</b>	Rc 1/2						Rc3/4	Rc 1			
<b>Ambient Temperature</b>	-30°C~+70°C (※-50°C~-30°C,+70°C~+100°C)										
<b>Dimensions, Mass</b>	See page 2										
<b>Painting Color</b>	Silver										
※ <b>Options</b>	<b>Additional Mechanisms</b>	Side-mounted handwheel, Travel stop									
	<b>Accessories</b>	Limit switch, Solenoid valve, Pressure regulator with filter, Pneumatic Relay, Booster Relay, Positioner, Emergency device									

**[Notes]** (1) ※ :Options are available on request.

(2) "X" means tandem type double-action cylinder.

(3) Stroke is Max. value. Stroke is adjusted according to length of the stopper.

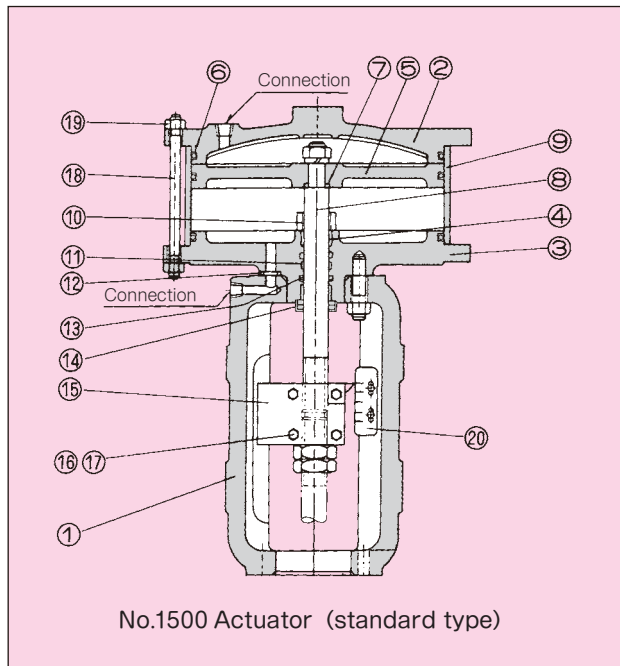
(4) If air connection "NPT" is specified, the bushing is available.

(5) On size 400XC actuator, Max. supply Air pressure 700kPa (7.0kgf/cm<sup>2</sup>G) is applicable for the Actuator Stroke 250mm and smaller. For bigger Stroke actuator, Max. supply Air pressure is limited by 600kPa (6.0kgf/cm<sup>2</sup>G).

## 2. CONSTRUCTION

No. 1500 Double Action Cylinder Type Actuator is available in eleven (11) sizes, and all of them have simple & durable structures.

The following figure represents the standard structure.



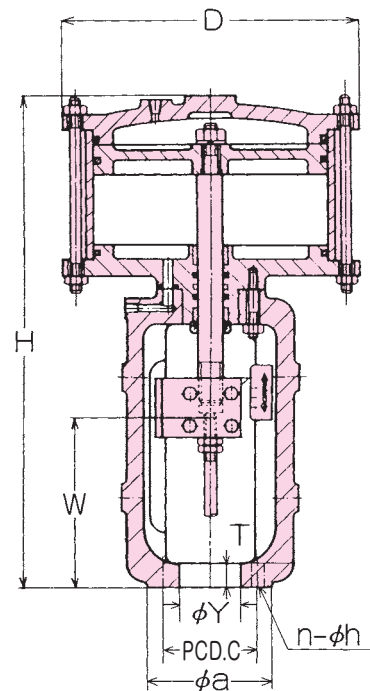
Mark	Part Name	Mark	Part Name
1	Yoke	11	Grease
2	Cylinder cover	12	O-ring
3	Cylinder bottom	13	O-ring
4	Guide bushing	14	Oil seal
5	Piston	15	Coupling
6	O-ring	16	Bolt
7	O-ring	17	Nut
8	Piston rod	18	Bolt
9	Cylinder	19	Nut
10	Stopper	20	Stroke scale

## 3. MAIN DIMENSIONS AND MASSES

### 1 Standard Dimensions

Unit : mm

Actuator Size	φD	H						W						Mount. Dimension									
		Stroke (mm)												Y	C	a	T	n-φh					
		65	150	250	350	450	550	65	150	250	350	450	550										
200	265	704	889	1089	1294	1494	1694											L ≤ 350			6-φ23		
250	325	719	904	1104	1309	1509	1709											120	160	200		43	
300	375	732	917	1117	1322	1522	1722											350 < L ≤ 550					
350	440	752	937	1137	1342	1542	1742	250	350	450	550	650	750							160	200	260	60
400	490	755	940	1140	1345	1545	1745																
400X		970	1240	1540	1840	2140	2440																
490	595	745	945	1145	1345	1545	1745																
540	680	1289	1464	1674	1864	2064	2264																
540X		1531	1751	2076	2371	2691	2915																
700		1305	1480	1690	1880	2080	2280																
700X	840	1572	1792	2117	2412	2732	2965	425	515	615	715	815	915	200	300	370	100				4-φ33		

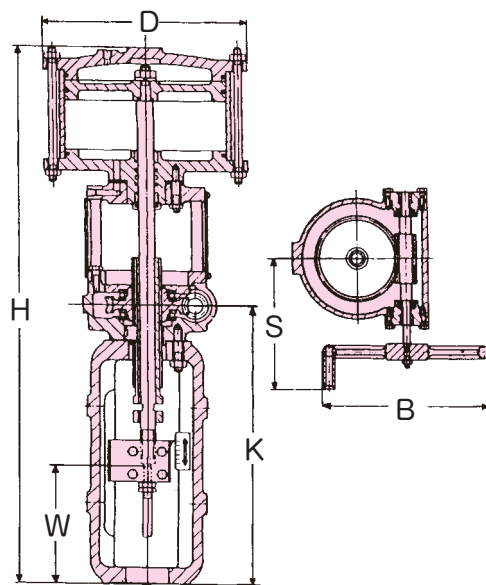


[Note] "L" dimension means Actuator Stroke.

## 2 Dimensions with Side-mounted Handwheel

Unit : mm

Actuator Size	H						K						B	S		
	Stroke (mm)															
	65	150	250	350	450	550	65	150	250	350	450	550				
200	999	1269	1569	1874	2174	2474										
250	1114	1284	1584	1889	2189	2489										
300	1027	1297	1597	1902	2202	2502										
350	1047	1317	1617	1922	2222	2522	565	665	765	870	965	1065	400	300		
400	1050	1320	1620	1925	2225	2525										
400X	1265	1620	2020	2420	2820	3220							635	400		
490	1055	1325	1625	1925	2230	2530										
540	2120	2385	2685	2985	3285	3585										
540X	2362	2672	3087	3492	3912	4236										
700	2136	2401	2701	3001	3301	3534	1125	1215	1315	1415	1515	1615	620	510		
700X	2403	2713	3128	3533	3953	4286										



## 3 Masses

Unit : kg

Actuator Size	Standard						with Side-mounted handwheel					
	Stroke (mm)						Stroke (mm)					
	65	150	250	350	450	550	65	150	250	350	450	550
200	100	120	145	165	210	225	190	215	240	265	310	330
250	120	145	170	195	240	255	210	235	265	295	340	360
300	135	160	185	215	260	280	225	250	280	315	360	380
350	180	210	235	270	315	335	270	300	330	365	415	440
400	230	260	290	325	375	400	320	350	385	425	475	505
400X	335	380	425	475	540	580	435	480	530	580	650	695
490	390	430	470	515	575	610	490	530	575	620	685	725
540	945	985	1040	1080	1130	1170	1220	1290	1370	1440	1520	1600
540X	1270	1330	1400	1470	1540	1610	1540	1650	1730	1830	1940	2040
700	1320	1370	1420	1470	1530	1580	1590	1670	1750	1840	1920	2010
700X	1820	1900	1980	2070	2150	2240	2100	2200	2310	2430	2550	2670

## 4. EMERGENCY UNIT

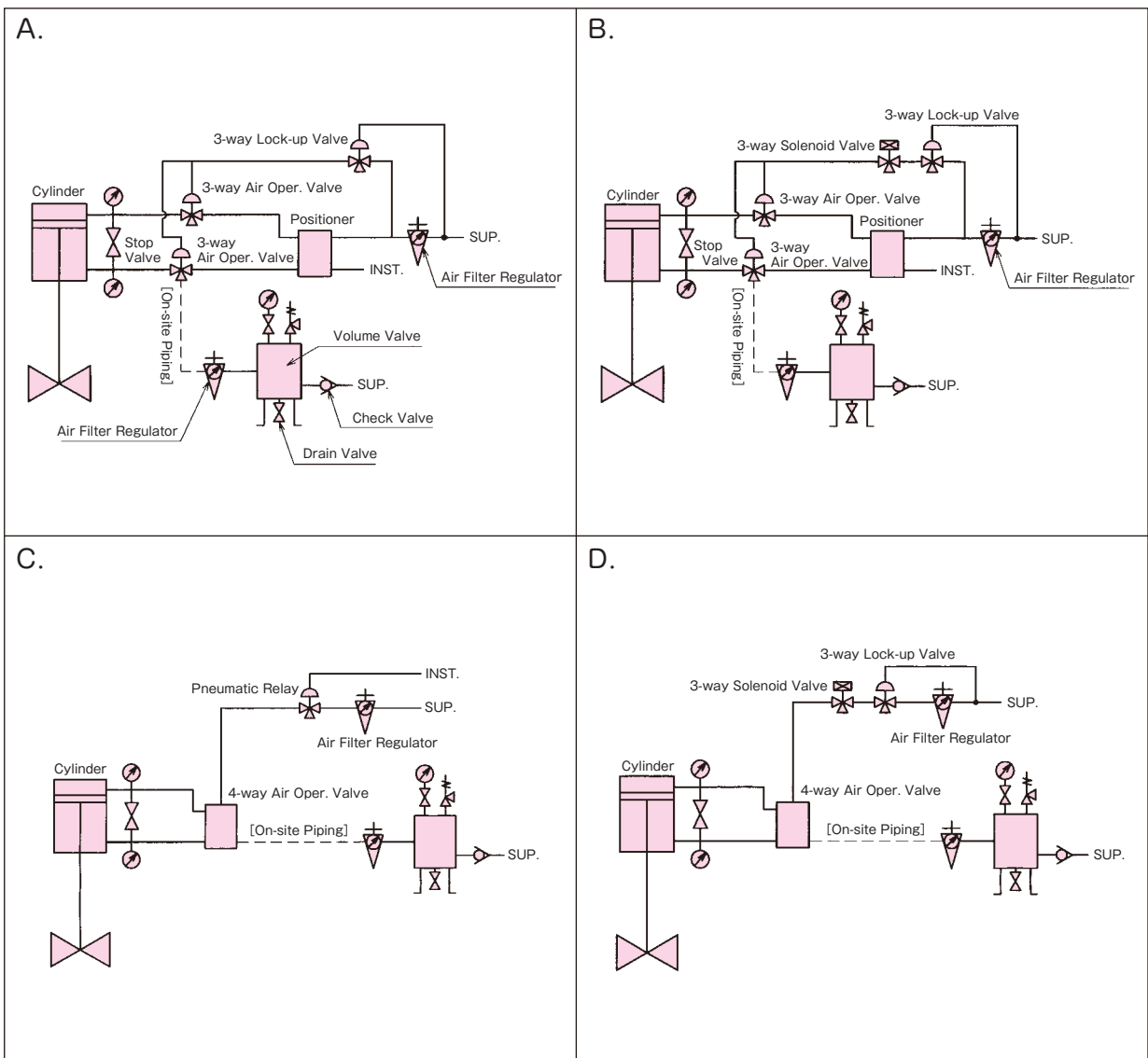
On Cylinder Actuator, Emergency Unit is required to move the valve disc or plug to the safety position, full-open or full-close, when emergency such like supply air failure or electric power failure happen.

Typical example of Emergency Unit is shown below.

### 1 Type of Emergency Unit

Type	Valve Operation	Valve Position at Emergency	Failure Case
A	Throttling	Full-Open or Full-Close	Supply Air Failure
B	Throttling	Full-Open or Full-Close	Supply Air or Electric Power Failure
C	On-Off	Full-Open or Full-Close	Supply Air Failure
D	On-Off	Full-Open or Full-Close	Supply Air or Electric Power Failure

### 2 Sketch of Emergency Unit Type A, B, C & D



## 5. ACCESSORIES

### 1 Positioners

Pneumatic-Pneumatic Positioner Model IP 300		Electric-Pneumatic Positioner Model IP 600	
Supply Air Press.	Max.700kPa (7.1kgf/cm <sup>2</sup> G)	Supply Air Press.	Max.700kPa (7.1kgf/cm <sup>2</sup> G)
Input Press.	20 ~ 100kPa (0.2~1.0kgf/cm <sup>2</sup> G)	Input Press.	40 ~ 20mA (235Ω)
Atmospheric Temp. & Fluid temp.	-5°C ~ + 60°C	Atmospheric Temp. & Fluid temp.	-10°C ~ + 60°C
Air Consumption	20ℓ/min (NOR.) {SUP.500kPa (5.0kgf/cm <sup>2</sup> G)}	Air Consumption	15ℓ/min (NOR.) {SUP.500kPa (5.0kgf/cm <sup>2</sup> G)}
Air Connection	Rc1/4 (※NPT 1/4)	Air Connection	Rc1/4 (※NPT 1/4)
Mass	2.2kg	Mass	3kg

※Option

### 2 Conditioning Unit

Air Filter Regulator ARU3AMS-04	
Max. Working Pressure	1.0MPa (10.2kgf/cm <sup>2</sup> G)
Max. Atmospheric Temperature	60°C
Output Pressure	0.05 ~ 0.7MPa (0.051~7.14kgf/cm <sup>2</sup> G)
Filtering Accuracy	5μm
Connection	Rc1/2 (※NPT 1/2)
Material	Die-cast Aluminum
Mass.	0.8kg

[Note] ※Option

### 3 Pneumatic Relays

Model No.	AR2031	AR2031-H	AR2005
Application	for Low Pressure	for High Pressure	with Manual Reset Lever
Rated Pressure	0.97MPa (9.9kgf/cm <sup>2</sup> G)		0.68MPa (7kgf/cm <sup>2</sup> G)
Connection	Rc1/2 (※NPT)		
Max. Operating press.	0.97MPa (9.9kgf/cm <sup>2</sup> G)		0.68MPa (7kgf/cm <sup>2</sup> G)
Press.Setting Ranges kPa (kgf/cm <sup>2</sup> G)	40~80 (0.4~0.8) 80~140 (0.8~1.4) 140~200 (1.4~2.0)	200~350 (2.0~3.5) 350~700 (3.5~7.0)	40~80 (0.4~0.8) 80~140 (0.8~1.4) 140~200 (1.4~2.0)

[Note] ※Option



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