

High Quality Actuator

# Sy-Pa

*No metal to metal touch.*

*Torque curve  $\neq$  valve torque.*

*Double piston ring-EPDM & teflon.*

*Paint:surface-hard anodized.*

*Perfect weather proof.*



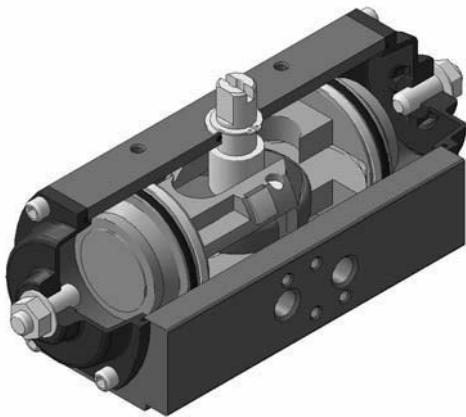
**Pneumatic Actuator  
Scotch-yoke Power actuator**

# INTRODUCTION

## Sy-Pa™ Cylinder actuator

The Sy-Pa rotary actuators are designed to operate rotating valves ;  
Ball valves, V-notch ball valves, Plug valves & Butterfly valves for control as well as on-off service.  
Small size, up to APD210 is Scotch-yoke mechanism which produces a torque curve that most closely  
match as the torque requirements of rotating valves.  
It produces great torque at the beginning & the end position of Ball valves and Butterfly valves.

### DOUBLE ACTING TYPE : MODEL APD50 ~ APD210



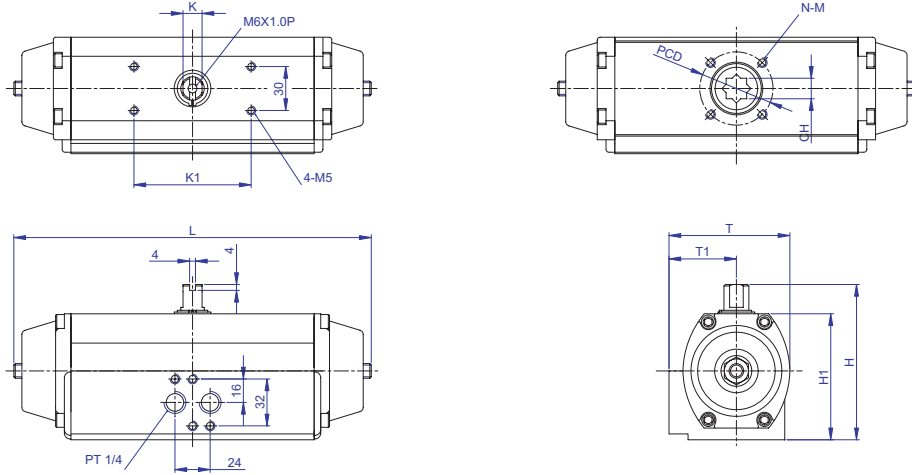
### SINGLE ACTING TYPE : MODEL APS50 ~ APS210





# DIMENSION TABLE

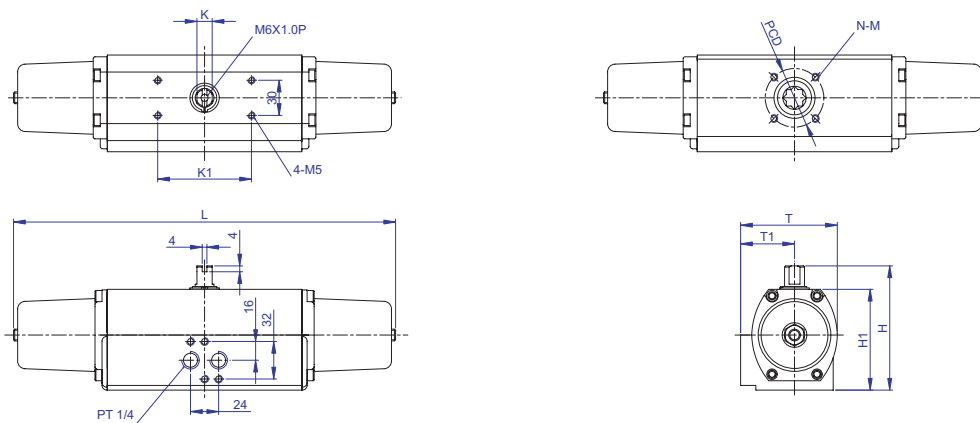
## DOUBLE ACTING TYPE : MODEL APD50 ~ APD210



UNIT : mm

Size	L	T	T1	H	H1	K	K1	ISO	CH	DEPTH	PCD	N-M	WEIGHT
APD 50	188	69	40	87	67	11	80	F03/F05	11X11	15	36/50	4-M5/M6	1.5
APD 65	234	83	46	108	86	13	80	F05/F07	14X14	17	50/70	4-M6/M8	2.5
APD 80	286	98	56	123	103	17	80	F07	17X17	21	70	4-M8	4
APD 100	344	114	62	143	123	22	80	F07/F10	22X22	26	70/102	4-M8/M10	7
APD 125	443	136	68	164	144	22	80	F07/F10	22X22	26	70/102	4-M8/M10	11
APD 140	486	158	79	180	160	22	80	F10/F12	27X27	30	102/125	4-M10/M12	17.5
APD 160	560	178	86	210	190	26	80	F10/F12	27X27	42	102/125	4-M10/M12	25
								F14	36X36		140	4-M16	
APD 210	620	230	110	280	261	36	130	F16	36X36	50	165	4-M20	44.5
									46X46	60			

## FAIL SAFE TYPE : MODEL APS50 ~ APS210

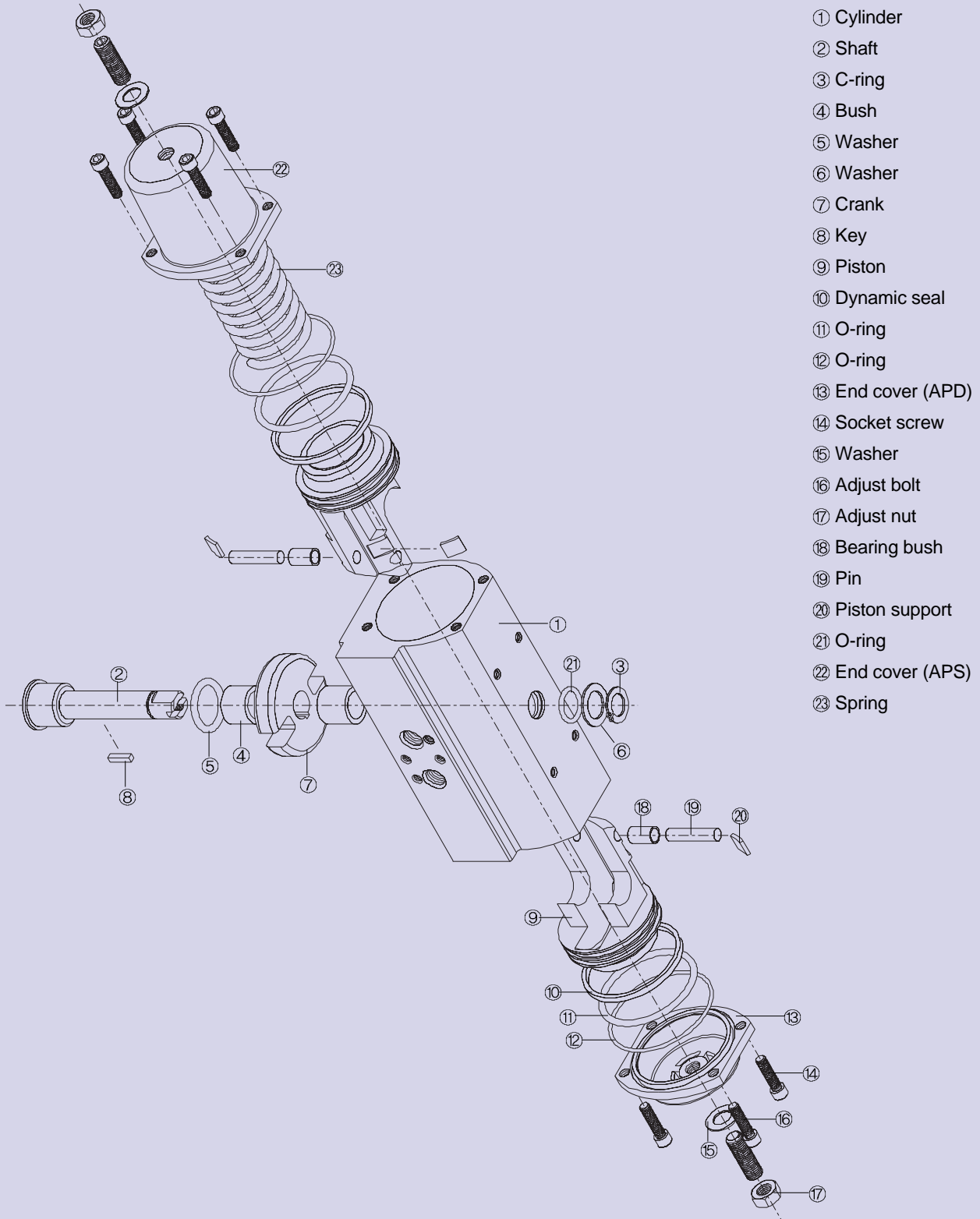


UNIT : mm

Size	L	T	T1	H	H1	K	K1	ISO	CH	DEPTH	PCD	N-M	WEIGHT
APS 50	258	69	40	87	67	11	80	F03/F05	11X11	15	36/50	4-M5/M6	1.6
APS 65	320	83	46	108	86	13	80	F05/F07	14X14	17	50/70	4-M6/M8	3.2
APS 80	418	98	56	123	103	17	80	F07	17X17	21	70	4-M8	5.4
APS 100	506	114	62	143	123	22	80	F07/F10	22X22	26	70/102	4-M8/M10	9.5
APS 125	694	136	68	164	144	22	80	F07/F10	22X22	26	70/102	4-M8/M10	17
APS 140	716	158	79	180	160	22	80	F10/F12	27X27	32	102/125	4-M10/M12	24
APS 160	850	178	86	210	190	26	80	F10/F12	27X27	42	102/125	4-M10/M12	35
								F14	36X36		140	4-M16	
APS 210	980	230	110	280	261	36	130	F16	36X36	50	165	4-M20	72.5
									46X46	60			

# ASSEMBLY DRAWING & PARTS LIST

## APD , APS SERIES



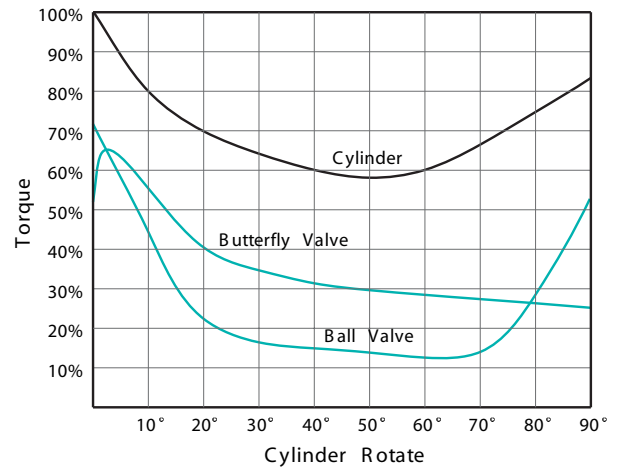


# ACTUATOR & VALVE TORQUE

## TORQUE CURVE

※Scotch-yoke Design

The Sy-Pa Actuator design which produces the ideal torque curve that is mostly similar to the required curve of valves operation.



## TORQUE TABLE

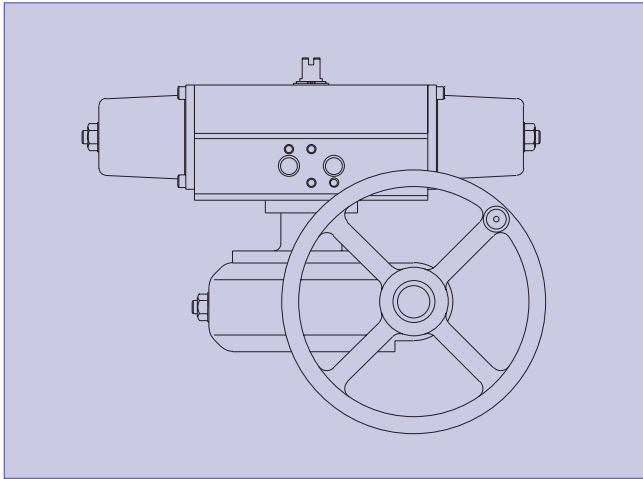
“ Sy-Pa ” Double Acting Actuators Output Torques (N-m)

MODEL	ANGLE	3Bar	4Bar	5Bar	6Bar	7Bar	8Bar
APD50	0°	32	42	53	64	75	85
	45°	16	21	26	32	37	42
	90°	24	32	40	48	56	64
APD65	0°	64	85	107	128	150	171
	45°	32	42	53	64	75	85
	90°	48	64	80	96	112	128
APD80	0°	128	171	214	254	300	342
	45°	64	85	107	128	151	171
	90°	90	120	160	192	225	257
APD100	0°	257	342	426	514	601	885
	45°	128	171	214	257	300	342
	90°	192	257	321	385	494	514
APD125	0°	419	564	664	778	907	1,036
	45°	250	332	434	520	606	692
	90°	377	499	600	717	836	955
APD140	0°	625	715	880	1,135	1,263	1,452
	45°	344	445	560	760	815	992
	90°	485	615	720	1,030	1,135	1,265
APD160	0°	979	1,120	1,379	1,779	1,979	2,275
	45°	539	697	878	1,191	1,277	1,554
	90°	760	964	1,128	1,614	1,779	1,982
APD210	0°	1,980	2,800	3,300	3,920	-	-
	45°	1,100	1,460	1,920	2,300	-	-
	90°	1,670	2,150	2,800	3,350	-	-

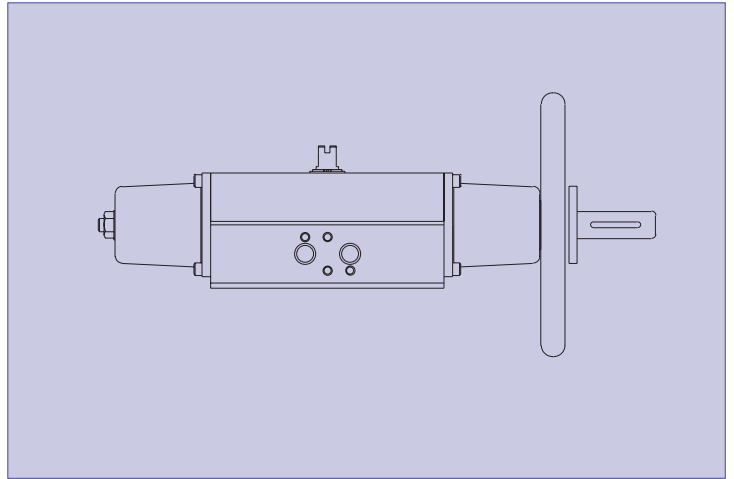
“ Sy-Pa ” Spring Return Actuators Output Torques (N-m )

MODEL	ANGLE	2.8Bar(40PSI)		4.2Bar(60PSI)		5.6Bar(80PSI)	
		AIR	SPRING	AIR	SPRING	AIR	SPRING
APS 50	0°	15	10	22	15	30	20
	45°	7	7	11	11	15	15
	90°	10	15	15	22	20	30
APS 65	0°	30	30	45	30	60	40
	45°	15	15	22	22	30	30
	90°	20	30	30	45	40	60
APS 80	0°	60	40	90	60	120	80
	45°	30	30	45	45	60	60
	90°	40	60	60	90	80	120
APS 100	0°	120	80	180	120	240	160
	45°	60	60	90	90	120	120
	90°	80	120	120	180	160	240
APS 125	0°	280	130	340	200	480	270
	45°	110	110	170	170	230	230
	90°	130	280	200	340	270	480
APS 140	0°	360	280	520	480	680	480
	45°	220	220	260	260	340	340
	90°	280	360	480	520	480	680
APS 160	0°	564	439	815	752	1,066	752
	45°	345	345	407	407	533	533
	90°	439	564	752	815	752	1,066
APS 210	0°	1,200	670	1,620	1,050	2,170	1,420
	45°	560	560	940	940	1,260	1,260
	90°	670	1,200	1,050	1,620	1,420	2,170

# MANUAL HANDWHEEL



Declutched Handwheel for Double Acting & Spring return



Screw type Handwheel for Spring return

## AIR CONSUMPTION

\*Spring return Cylinder  
< APS Series >

$$V = B \times \left( \frac{P+1}{1} \right) \times N$$

\*Double Acting Cylinder  
< APD Series >

$$V = (B + A) \times \left( \frac{P+1}{1} \right) \times N$$

V = Air Consumption  
(N Liter)

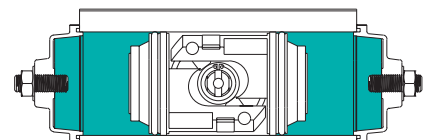
P = Supply Air Pressure  
(Kgf/cm<sup>2</sup>)

A, B = Cylinder Volume  
(Liter)

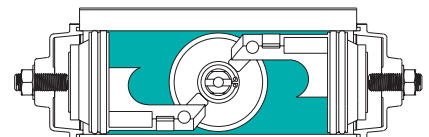
N = Operation Time

SIZE		Cylinder Volume (L)	
		A	B
APS 50	APD50	0.13	0.11
APS 65	APD65	0.25	0.24
APS 80	APD80	0.54	0.48
APS 100	APD100	0.97	0.86
APS 125	APD125	1.78	1.68
APS 140	APD140	2.74	2.45
APS 160	APD160	4.22	3.74
APS 210	APD210	9.97	6.19

Volume "A"



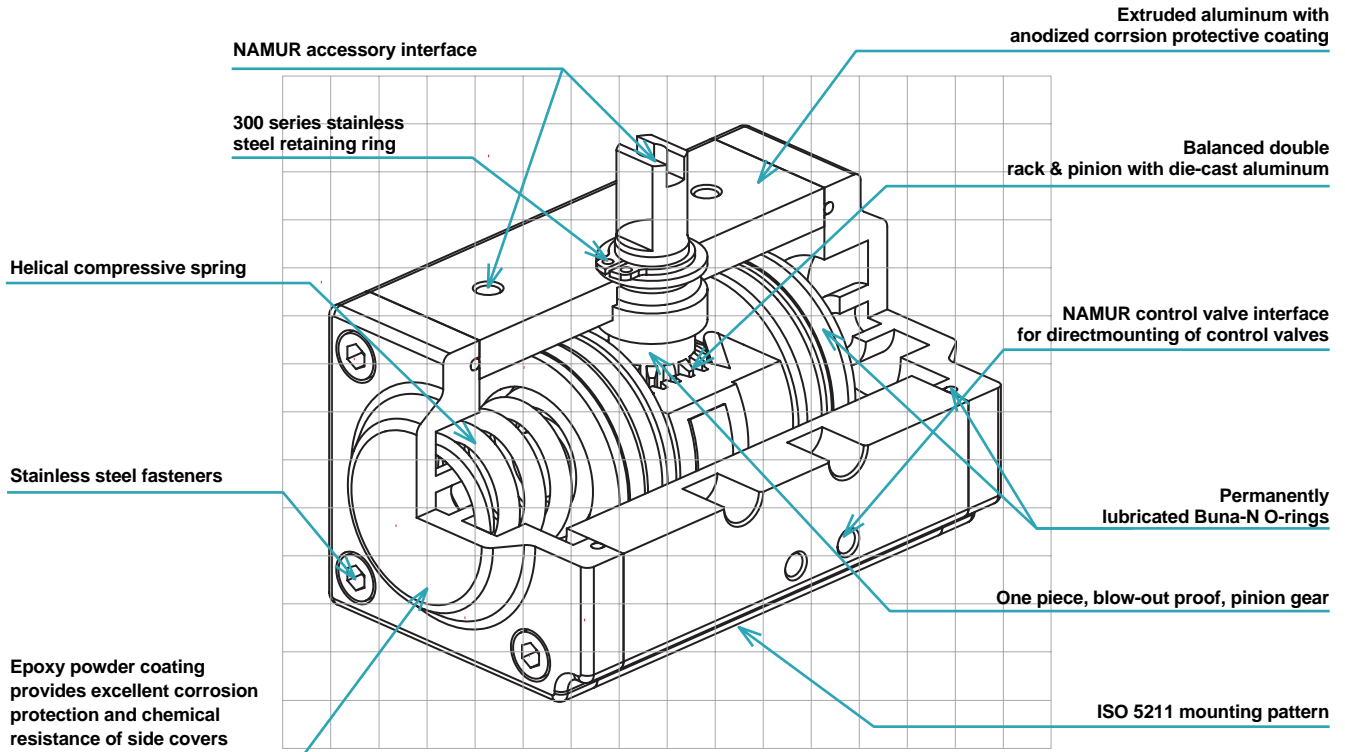
Volume "B"



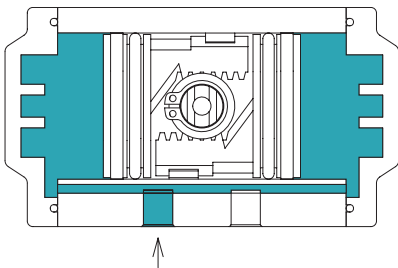


# RACK & PINION ACTUATOR

## FEATURES



## TORQUE TABLE

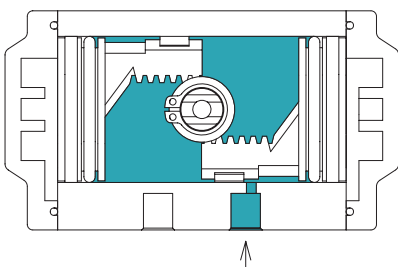


Air Volume :  
0.07 Liter

### APD40 DOUBLE ACTING (bar, N-m)

PRESSURE	3	4	5	6	7	8
TORQUE	6.2	8.3	10.4	12.4	14.5	16.4

※Please be sure to include appropriate safety factors and all service conditions variables when sizing.



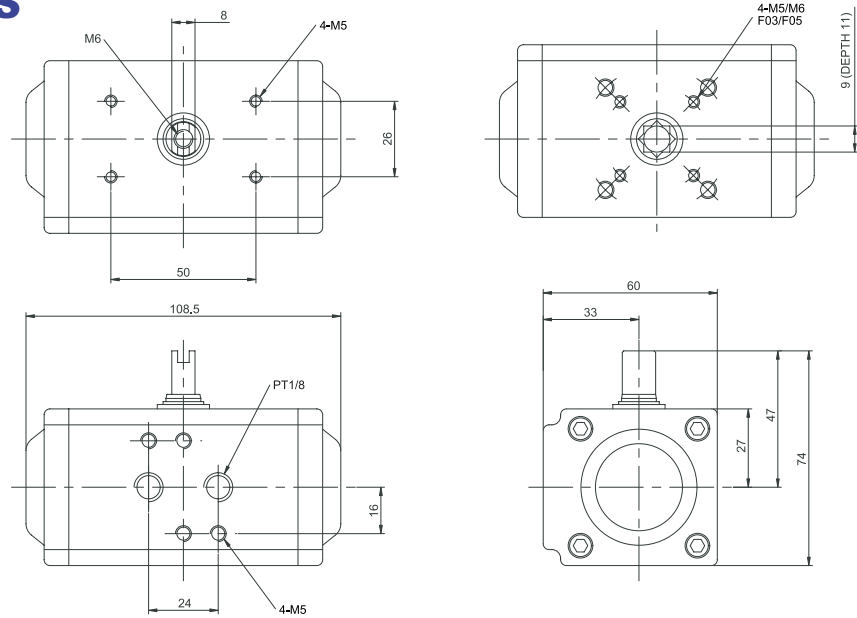
Air Volume :  
0.06 Liter

### APS40 SINGLE ACTING (bar, N-m)

PRESSURE	3.4		4.1		4.8	
	0	90	0	90	0	90
AIR	3.2	1.9	4.3	3.4	5.7	4.5
SPRING	4.7	3.6	4.7	3.8	4.7	3.6

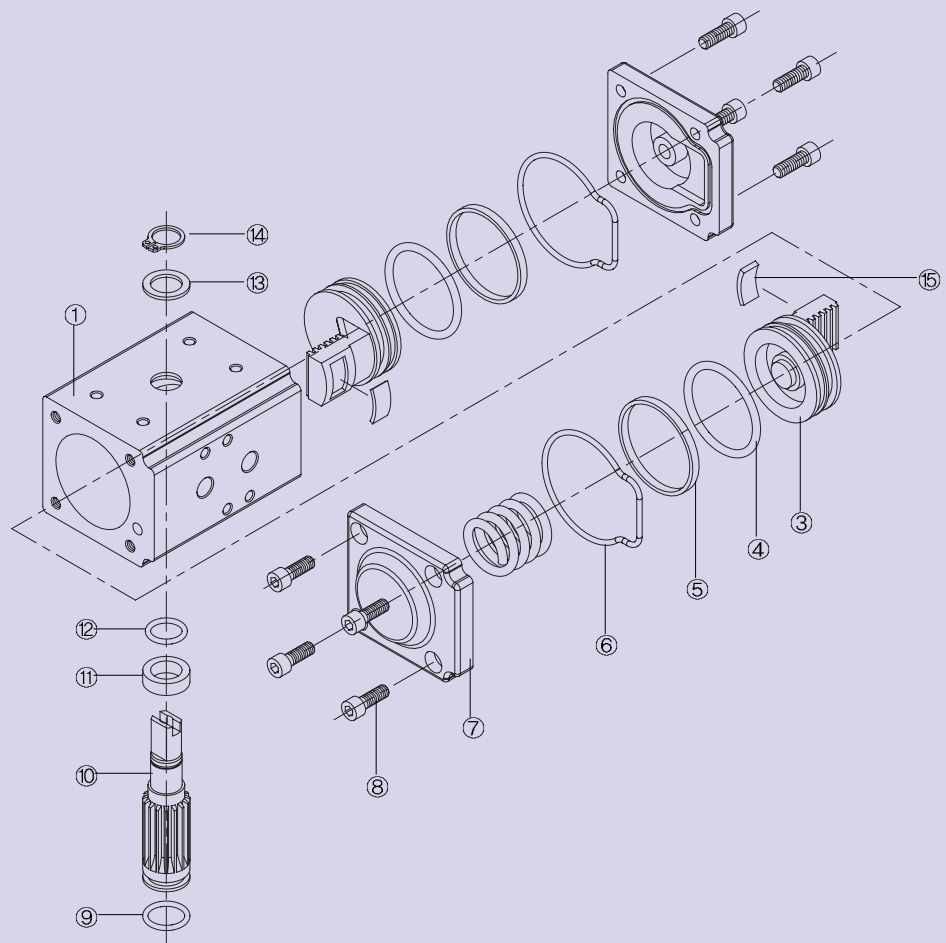
# ASSEMBLY DRAWING & DIMENSIONS

## DIMENSIONS



## ASSEMBLY DRAWING

- ① Housing
- ② Piston
- ③ O-ring #1
- ④ Guide Ring
- ⑤ Seal Ring
- ⑥ Spring
- ⑦ Side Cover
- ⑧ Wrench Bolt
- ⑨ O-ring #2
- ⑩ Shaft
- ⑪ Stopper
- ⑫ O-ring #3
- ⑬ Plastic Washer
- ⑭ Snap Ring
- ⑮ Guide Plater

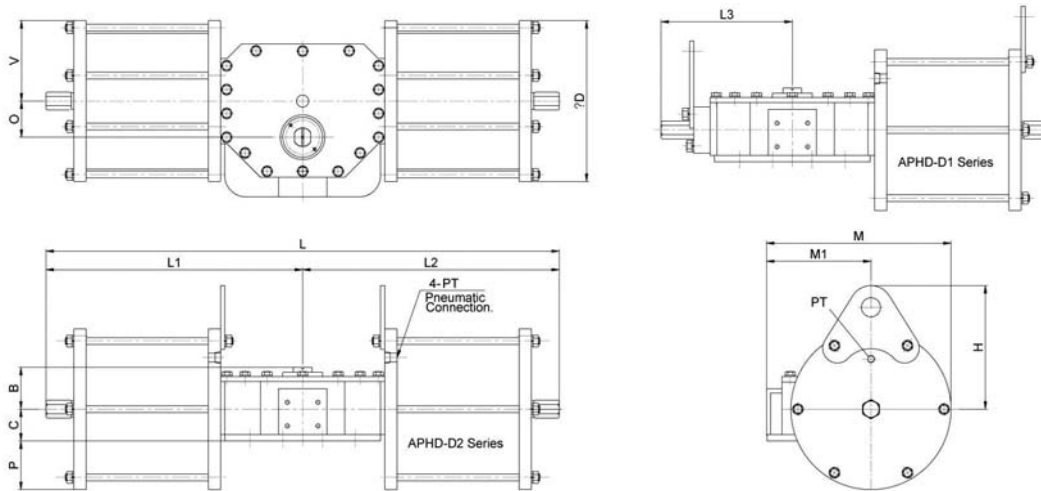






# DOUBLE ACTING

## APHD series



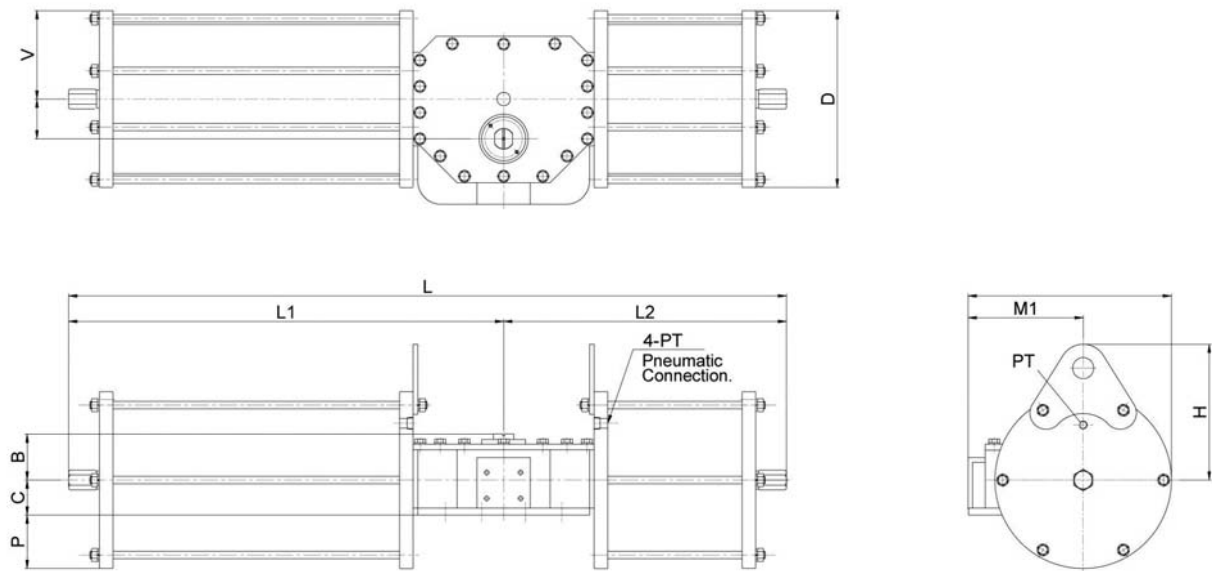
UNIT : mm

Model	L	L1	L2	B	C	P	O	V	D	M1	M	H	PT	Volume(liter)	Weight(Kg)
APHD200-55-D1	671	219.5	451.5	96	66	73.5	55	139.5	279	199.5	339	248	3/8	3.6	85
APHD200-55-D2	903	451.5	451.5	96	66	73.5	55	139.5	279	199.5	339	248	3/8	5.4	134
APHD245-65-D1	752	248	504	107	77	85.5	65	162.5	325	232.5	395	294	3/8	5.2	115
APHD245-65-D2	1008	504	504	107	77	85.5	65	162.5	325	232.5	395	294	3/8	10.4	178
APHD295-85-D1	893	287	606	105	75	114.5	85	189	378	229	418	319	3/8	10.2	142
APHD295-85-D2	1212	606	606	105	75	114.5	85	189	378	229	418	319	3/8	20.4	219
APHD330-130-D2	1332	666	666	119	89	118.5	130	207.5	415	234.5	442	338	1/2	43.4	456
APHD380-130-D2	1598	799	799	144	114	121	130	235	470	245	480	360	1/2	74.8	743
APHD470-130-D1	1390	490	900	144	114	121	130	280	560	390	670	415	3/4	37.4	480
APHD470-130-D2	1598	799	799	144	114	171	130	285	570	395	680	415	3/4	121	910

MODEL	ANGULAR POSITION	OPERATING SUPPLY PRESSURE (bar/N-m)						
		3.5	4	5	6	7	8	10
APHD200-55-D1	0	855	977	1,221	1,465	1,709	1,953	2,442
	45	604	691	863	1,036	1,209	1,381	1,727
	90	855	977	1,221	1,465	1,709	1,953	2,442
APHD200-55-D2	0	1,709	1,953	2,442	2,930	3,418	3,906	4,883
	45	1,209	1,381	1,727	2,072	2,417	2,763	3,453
	90	1,709	1,953	2,442	2,930	3,418	3,906	4,883
APHD245-65-D1	0	1,516	1,732	2,165	2,598	3,031	3,464	4,330
	45	1,072	1,225	1,531	1,837	2,144	2,450	3,062
	90	1,516	1,732	2,165	2,598	3,031	3,464	4,330
APHD245-65-D2	0	3,031	3,464	4,330	5,196	6,062	6,928	8,660
	45	2,144	3,450	3,062	3,675	4,287	4,900	6,125
	90	3,031	3,464	4,330	5,196	6,062	6,928	8,660
APHD295-85-D1	0	2,873	3,284	4,105	4,926	5,747	6,567	8,209
	45	2,032	2,322	2,903	3,483	4,064	4,645	5,806
	90	2,873	3,284	4,105	4,926	5,747	6,567	8,209
APHD295-85-D2	0	5,747	6,567	8,209	9,851	11,493	13,135	16,419
	45	4,064	4,645	5,806	6,967	8,128	9,289	11,611
	90	5,747	6,567	8,209	9,851	11,493	13,135	16,419
APHD330-130-D2	0	10,998	12,569	15,711	18,854	21,996	25,138	31,423
	45	7,778	8,889	11,111	13,334	15,556	17,778	22,223
	90	10,998	12,569	15,711	18,854	21,996	25,138	31,423
APHD380-130-D2	0	14,583	16,667	20,833	25,000	29,166	33,333	41,666
	45	10,313	11,787	14,733	17,680	20,627	23,574	29,467
	90	14,583	16,667	20,833	25,000	29,166	33,333	41,666
APHD470-130-D1	0	11,155	12,748	12,884	15,460	22,309	25,496	31,870
	45	7,889	9,016	9,112	10,934	15,777	18,031	22,539
	90	11,155	12,748	12,884	15,460	22,309	25,496	31,870
APHD470-130-D2	0	22,309	25,496	25,767	30,921	44,618	50,992	63,740
	45	15,777	18,031	18,223	21,868	31,555	36,062	45,078
	90	22,309	25,496	25,767	30,921	44,618	50,992	63,740

# SPRING RETURN

## APHS series



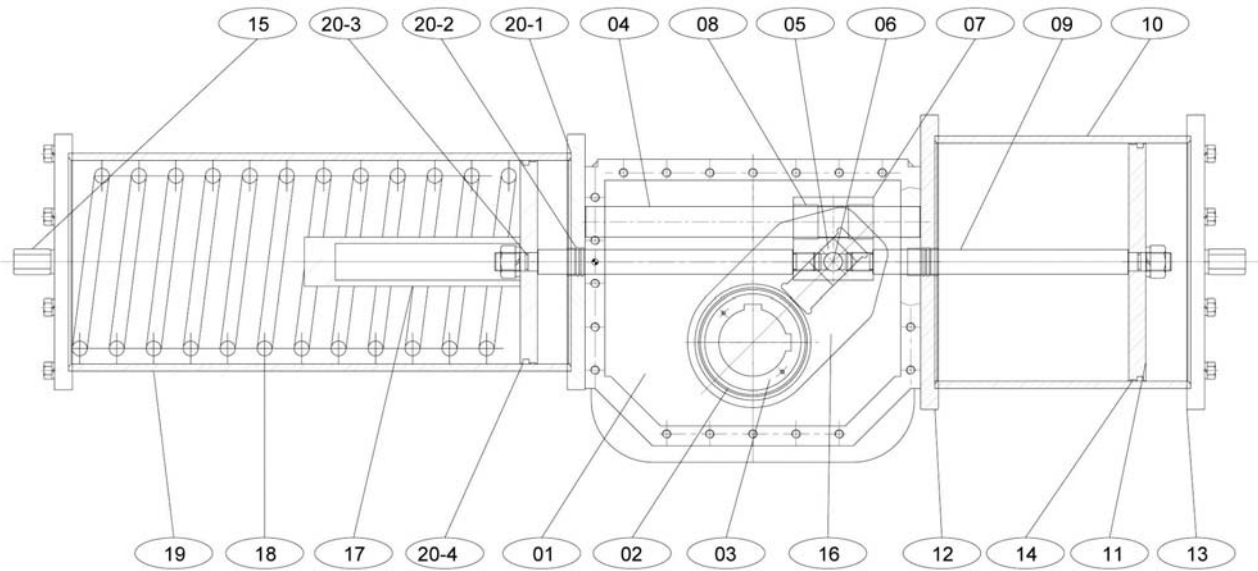
UNIT : mm

MODEL	L	L1	L2	B	C	P	O	V	D	M1	M	H	PT	Volume(liter)	Weight(Kg)
APHS 200-55-C2	1181	729.5	451.5	85	66	73.5	55	139.5	279	169.5	309	253	3/8	3.8	145
APHS 245-65-C2	1220	735	485	105	75	85	65	160	320	190	350	294	3/8	7.7	185
APHS 295-85-C2	1474	886	588	105	75	115	85	190	380	230	420	319	1/2	14.7	217
APHS 330-85-C2	2275	1510	765	115	85	118	100	203	406	235	460	360	1/2	21.7	281

MODEL	ANGULAR POSITION	SPRING TORQUE	OPERATING SUPPLY PRESSURE (bar/N-m)			
			3.5	4	5.5	6
APHS 200-55-C2	0	732	977	1,221	1,954	2,198
	45	659	550	722	1,241	1,413
	90	989	720	964	1,697	1,941
APHS 245-65-C2	0	1,136	1,390	1,750	2,833	3,193
	45	1,020	766	1,021	1,786	2,041
	90	1,543	983	1,343	2,426	2,786
APHS 295-85-C2	0	2,147	2,708	3,402	5,482	6,176
	45	1,952	1,481	1,972	3,443	3,934
	90	2,890	1,965	2,659	4,739	5,433
APHS 330-85-C2	0	2,697	3,471	4,395	7,168	8,095
	45	2,457	1,853	2,534	4,465	7,934
	90	3,659	2,430	3,326	6,098	7,105

# ASSEMBLY DRAWING & PARTS LIST

**APHD, APHS series**



NO	DESCRIPTION	MAT'L	REMARK	Q'TY
01	Housing	SB-41	Carbon steel	1
02	Yoke bushing	BsBn	Bronze	2
03	Yoke holder	S-45C	Carbon steel	1
04	Thrust rod	S-45C	Cr or Ni plated	1
05	Sliding block	BsBn	Bronze	2
06	Thrust pin	S-45C	Cr or Ni plated	1
07	Guide block	S-45C	Carbon steel	1
08	Bearing		Alloy steel	6
09	Piston rod	S-45C	Cr or Ni plated	2
10	Cylinder tube	STKM	Cr or Ni plated	2
11	Piston	SB-41	Carbon steel	2
12	Middle cover	SB-41	Carbon steel	2
13	End cover	SB-41	Carbon steel	2
14	Sliding guide ring	Graphite	Teflon	2
15	Stop nut		Stainless steel	2
16	Yoke	S-45C	Carbon steel	2
17	Spring guide		Carbon steel	1
18	Coil spring		Alloy steel	1
19	Spring cartridge	STKM	Carbon steel	
20-1	O-ring	Viton		2
20-2	O-ring	Viton		4
20-3	O-ring	Viton		2
20-4	O-ring	Viton		4



www.dongjooAP.com

# SYNCPA



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