ISO 9001
Certi. No. 99-925

INSTRUCTION MANUAL

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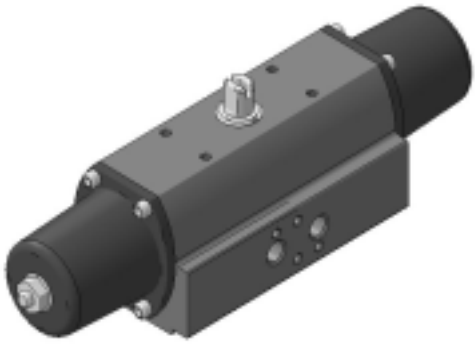
Pneumatic Rotary Actuator

APD ~ Series

APS ~ Series

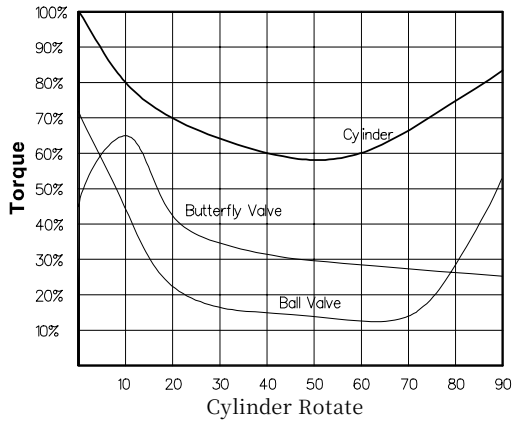


APHD ~, APHS ~ Series

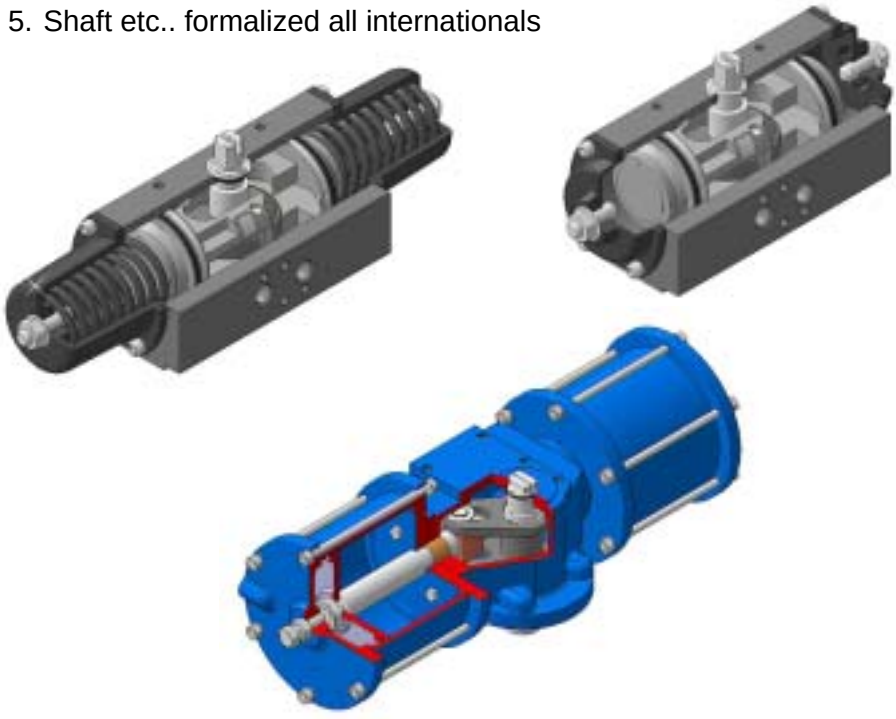
D E S C R I P T I O N

" VALMAC " Pneumatic Rotary Actuator is Scotch-Yoke Type Quarter Turn Actuator.

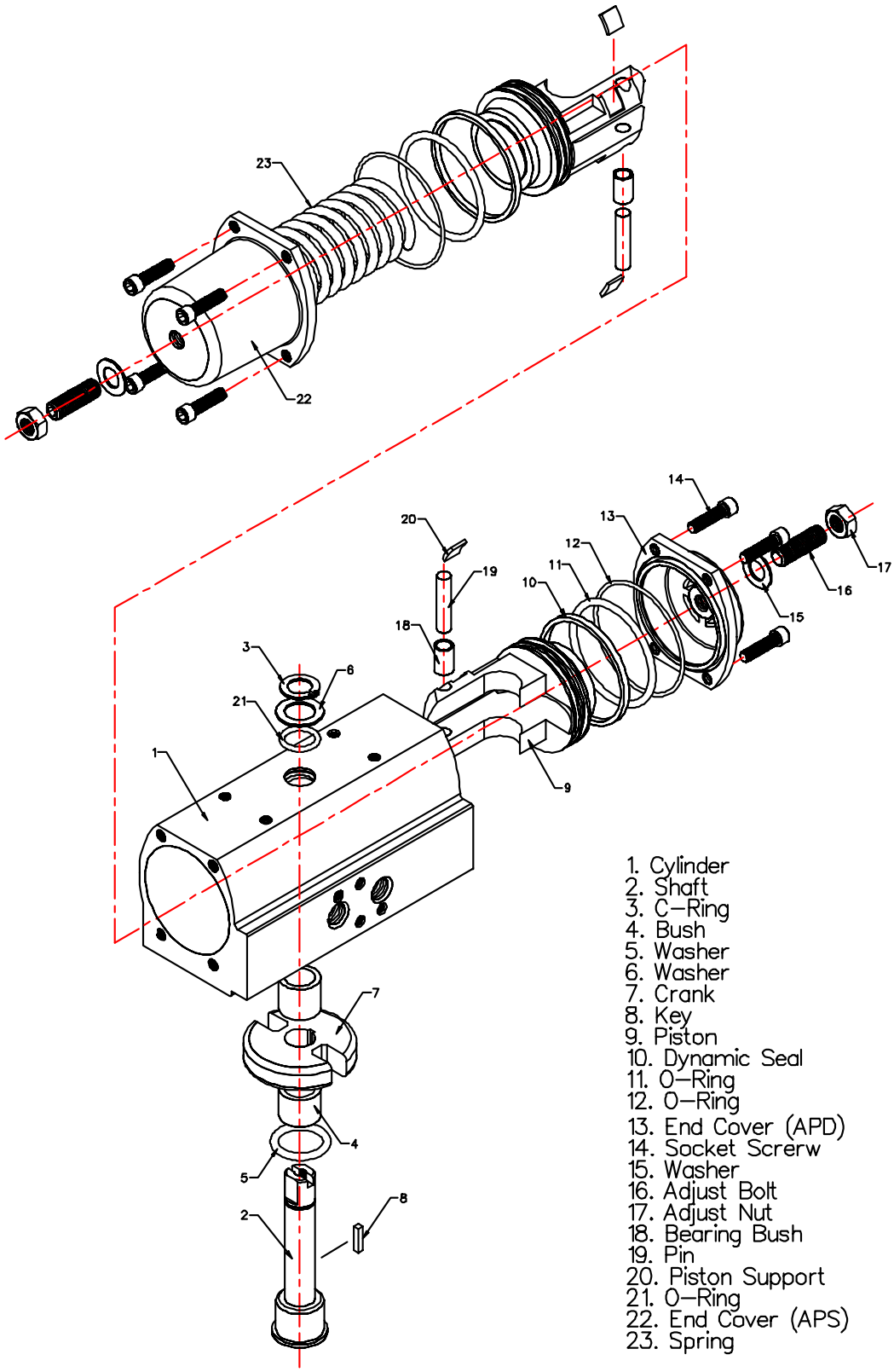
1. SCOTCH-YOKE type displays force such as valve torque curve.
   Usually, rotary type valve in open (close) case, it is more big when torque is progressing.
   Because rack & pinion type has torque of straight line form, cylinder's size grows than SCOTCH-YOKE type at same valve drive.



2. DOUBLE PISTON RING (EPDM & TEFLON).
3. NO METAL TO METAL TOUTCH.
   Sticking cylinder interior and piston's contact are kept teflon place softly on piston side.
4. SURFACE - HARD ANODIZED.
   Is more smooth more than general anodizing and very strong implantation and impact.
5. Shaft etc.. formalized all internationals



ASSEMBLY DRAWING & PART LIST



1. Cylinder
2. Shaft
3. C-Ring
4. Bush
5. Washer
6. Washer
7. Crank
8. Key
9. Piston
10. Dynamic Seal
11. O-Ring
12. O-Ring
13. End Cover (APD)
14. Socket Screrw
15. Washer
16. Adjust Bolt
17. Adjust Nut
18. Bearing Bush
19. Pin
20. Piston Support
21. O-Ring
22. End Cover (APS)
23. Spring

INSTALLATION

1. SUPPLY :

Must use air or gas etc. that remove water or this material to keep operation state of most suitable.

2. SUPPLY PRESSURE :

DOUBLE ACTING ACTUATOR : 4 ~ 7 kg/㎠
SPRING RETURN ACTUATOR : 5.5 ~ 7 kg/㎠
With upside, need supply pressure.

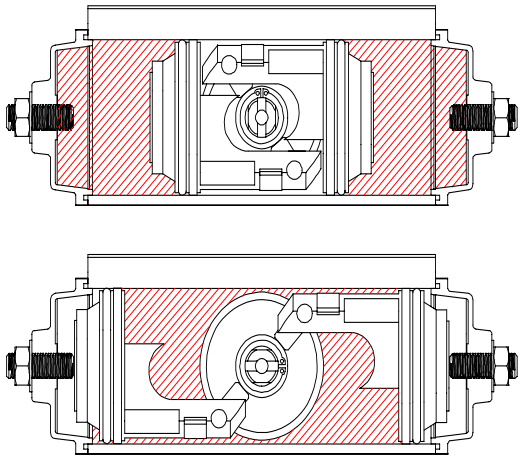
3. SUPPLY SIZE :

APD/APS 40 : NPT 1/8"
APD/APS 50 ~ 140 : NPT 1/4"
APHD/APHS 200 ~ 300 : NPT 3/8"

4. SUPPLY CONSUMPTION

In actuator's 90° turning case, necessary supply pressure wastage is same with chart below.

S I Z E		Cylinder Volume	
		A	B
APS 50	APD 50	0.13	0.11
APS 65	APD 65	0.25	0.24
APS 80	APD 80	0.54	0.48
APS 100	APD 100	0.97	0.86
APS 140	APD 140	2.74	2.45



5. ACTION TIME

4 BAR standard average operation time is same with lower part.

UNIT : SECONDS

MODEL	APD 40	APD 50	APD 65	APD 80	APD 100	APD 140
TIME	0.8	1.2	1.5	1.8	2.2	2.5

ACTUATOR TORQUE

" VALMAC " Pneumatic Double Acting Actuators Output Torques (N-m)

MODEL	ANGLE	3Bar	4Bar	5Bar	6Bar	7Bar	8Bar
APD50	0˚	32.1	42.9	53.6	64.3	75	85.7
	45˚	16.1	21.4	26.8	32.1	37.5	42.9
	90˚	24.1	32.1	40.2	48.2	56.3	64.3
APD65	0˚	64.3	85.7	107.1	128.6	150	171.4
	45˚	32.1	42.9	53.6	64.3	75	85.7
	90˚	48.2	64.3	80.4	96.4	112.5	128.6
APD80	0˚	128.6	171.4	214.3	254.1	300	342.9
	45˚	64.3	85.7	107.4	128.6	150	171.4
	90˚	90.4	120	160.7	192.6	225	257.1
APD100	0˚	257.3	342.9	426.6	514.3	600	885.7
	45˚	128.6	171.4	214.3	257.1	300	342.9
	90˚	192.9	257.1	321.4	385.7	450	514.3
APD140	0˚	625.3	715.3	880	1135.6	1263.5	1452.1
	45˚	344.1	445.3	560	760.3	815.7	992.5
	90˚	485.7	615.3	720	1030.5	1135.2	1265.3

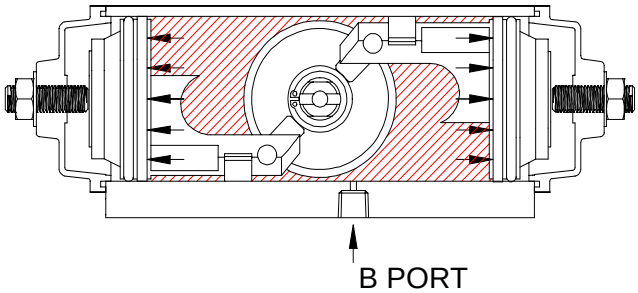
" VALMAC " Pneumatic Spring Return Actuators Output Torques (N-m)

MODEL	ANGLE	2.8Bar(40PSI)		4.2Bar(60PSI)		5.6Bar(80PSI)	
		SPRING	AIR	SPRING	AIR	SPRING	AIR
APS50	0˚	15	10	22.5	15	30	20
	45˚	7.5	7.5	11.3	11.3	15	15
	90˚	10	15	15	22.5	20	30
APS65	0˚	30	20	45	30	60	40
	45˚	15	15	22.5	22.5	30	30
	90˚	20	30	30	45	40	60
APS80	0˚	60	40	90	60	120	80
	45˚	30	30	45	45	60	60
	90˚	40	40	60	90	80	120
APS100	0˚	120	120	180	120	240	160
	45˚	60	60	90	90	120	120
	90˚	80	80	120	180	160	240
APS140	0˚	360	360	520	480	680	480
	45˚	220	220	260	260	340	340
	90˚	280	280	480	520	480	680

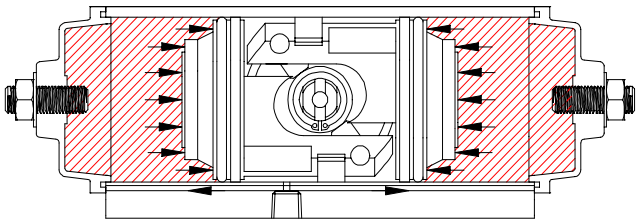
O P E R A T I O N

1. DOUBLE ACTING ACTUATOR operation

If air is supplied to chamber central through supply "B" port, piston's both is pushed finally and crank that take to piston this time rotates for direction half an hour and air of piston both end is exhausted through "A" port by air pressure. Also, supply in "A" case, crank rotates for watch direction and central air is exhausted by "B" port.



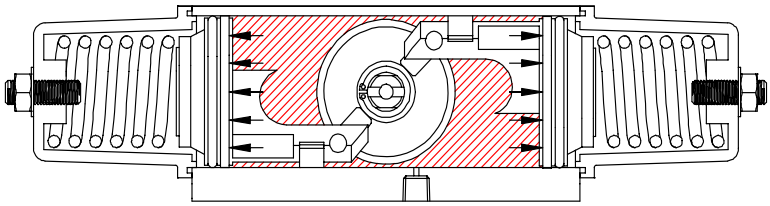
B PORT



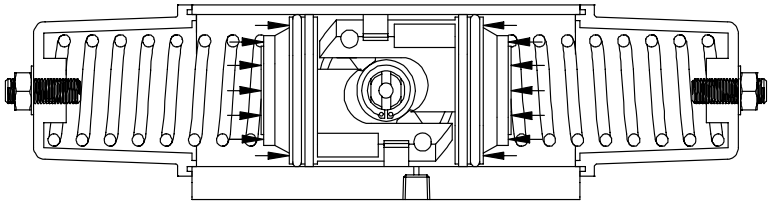
A PORT

2. SPRING RETURN ACTUATOR operation

If air is supplied to chamber central through supply "B" port, both is pushed finally and crank that take to piston this time rotates for direction half an hour piston compresses spring by air pressure.
If do to discharge supply "B" port's air, piston moves to central by spring tension and crank rotates for watch direction.



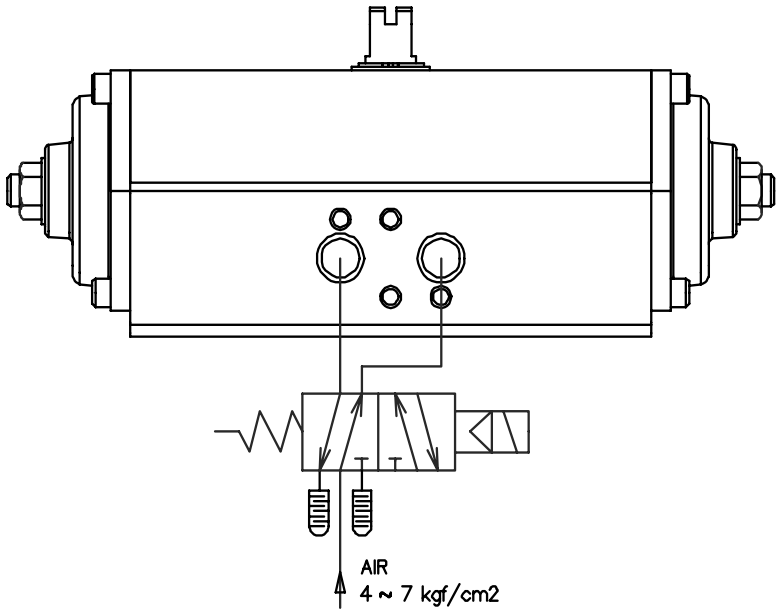
B PORT



B PORT

ACTUATOR & SOLENOID VALVE

1. DOUBLE ACTING ACTUATOR



2. SPRING RETURN ACTUATOR