

PERSIAN

PNEUMATIC ACTUATORS



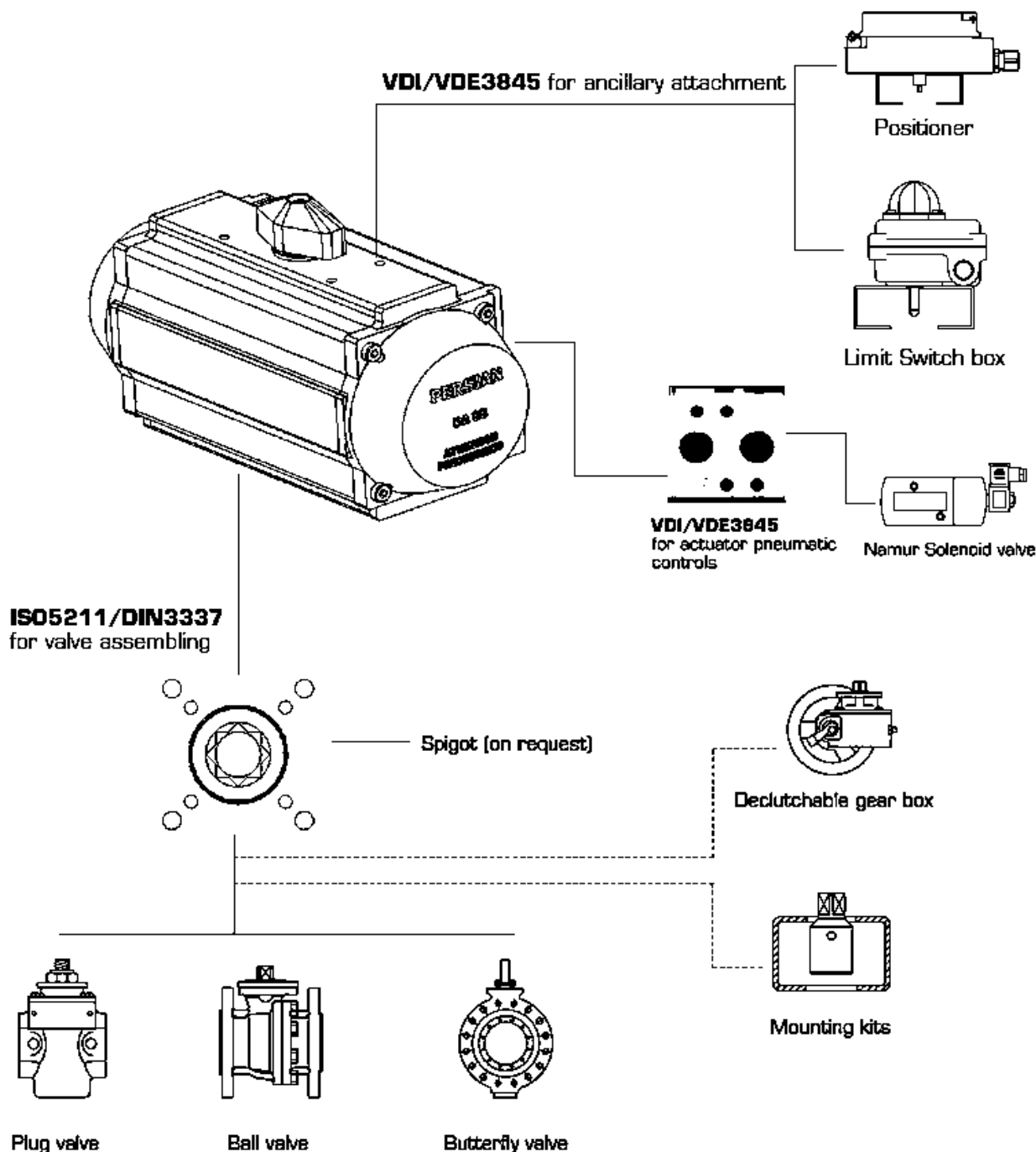
6

MONTH WARRANTY

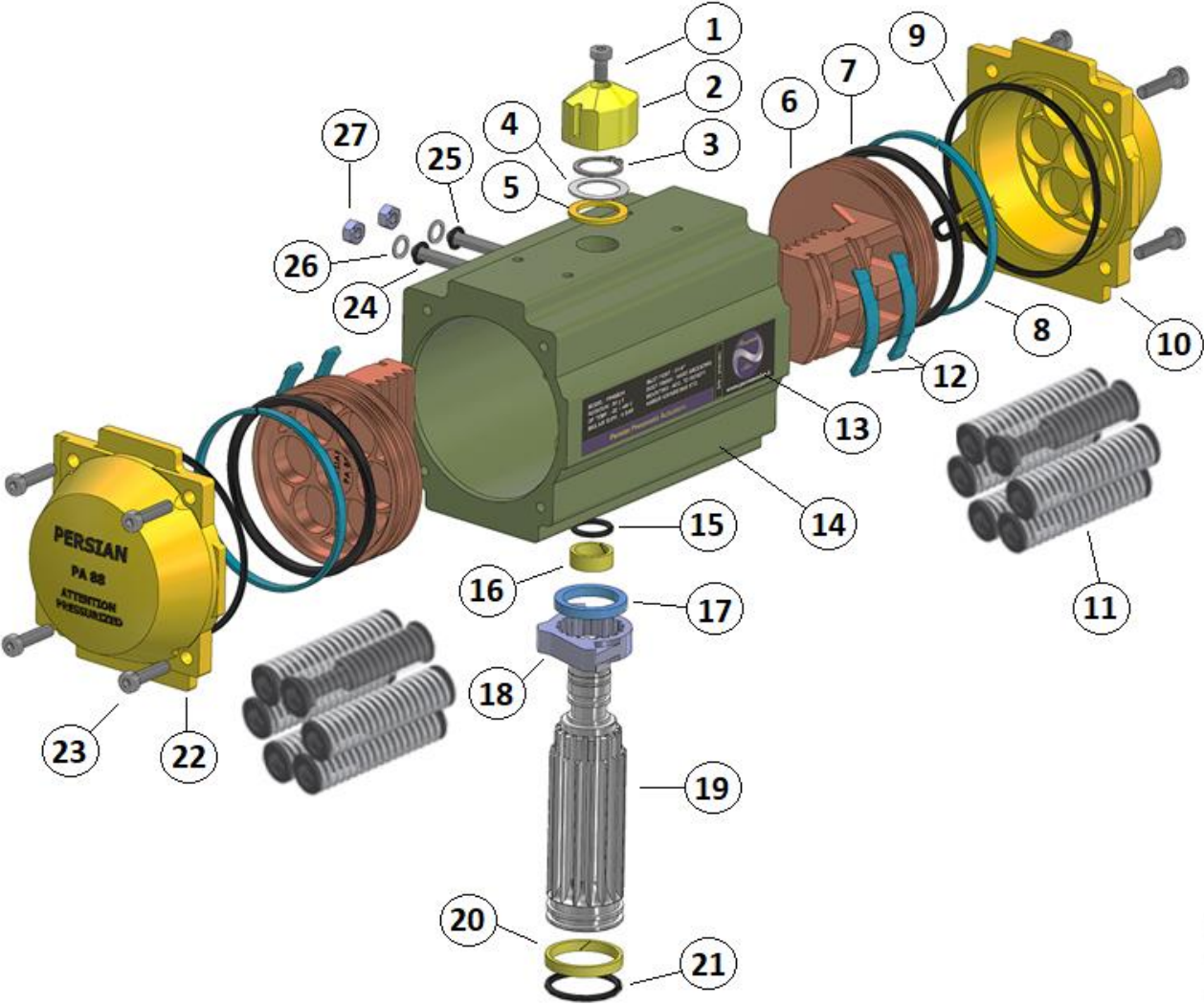
Installation, Operation and Maintenance Manual

for the

Persian Pneumatic Actuator's



Parts and Materials



Parts and Materials

Item	Description	Qty	Standard Material	Protection	Optional Material
1	Indicator screw	1	Stainless Steel		
2	Indicator	1	Plastic		
3	Ring retainer	1	Stainless Steel		
4	Thrust washer	1	Stainless Steel		
5	Outside washer	1	Engineered Plastic		
6	Piston	2	Cast Aluminum	Anodized	Steel
7	O-ring (piston)	2	NBR		Viton / Silicone
8	Bearing (piston)	2	Engineered Plastic		
9	O-ring (end cap)	2	NBR		Viton / Silicone
10	Right End cap	1	Cast Aluminum	Powder coated	Steel
11	Spring	14	Spring Steel		
12	Skates	4	Engineered Plastic		
13	Name Plate	1	Plastic		Aluminum
14	Body	1	Extruded Aluminum	Hard Anodized	Steel
15	O-ring (pinion top)	1	NBR		Viton / Silicone
16	Bearing (pinion top)	1	Engineered Plastic		Viton / Silicone
17	Inside washer	1	Engineered Plastic		
18	Cam	1	Alloy Steel		
19	Pinion	1	Alloy Steel	Hard Nickle	Steel
20	Bearing (pinion bottom)	1	Engineered Plastic		
21	O-ring (pinion bottom)	1	NBR		Viton / Silicone
22	Left End cap	1	Cast Aluminum	Powder coated	
23	Cap screw	8	Stainless Steel		
24	Adjust screw	2	Stainless Steel		
25	O-ring (Adjust screw)	2	NBR		Viton / Silicone
26	Washer (Adjust screw)	2	Stainless Steel		
27	Nut (adjust screw)	2	Stainless Steel		

Mounting Instructions

1 Remove any manual opening device from the valve, leaving the valve stem clear. Make sure that the shape and size of the stem or adapter fits the actuator output and that the rotation is not hindered. Ensure the actuator and valve are in the same position: counter clockwise (0°) or clockwise (90°).

2 Mount the actuator onto the valve, positioning it well on the stem. Make sure that the rotation direction is correct

WARNING! USE THE FOLLOWING PRECAUTIONS!

Do not put your hands inside the valve.

Pre-compressed springs must not be disassembled from the caps. Doing so could be very dangerous.

Notes:

We strongly recommend checking the cleanliness of the air supply pipes, especially if plant filters are not present. A spring return actuator must be provided with a filter **on the air outlet hole to prevent dust and other substances from sucking up into the actuator.**

A spacer between the actuator and valve will be necessary with fluids at high temperature

▶ **OPERATING MEDIA**

Use dry or lubricated air or inert/non-corrosive gases that are compatible with internal actuator parts and lubricant. The operating media must have a dew point equal to -4°F (-20°C) or at least 50°F (10°C) below ambient temperature. The maximum particle size must not exceed $30\mu\text{m}$.

▶ **SUPPLY PRESSURE**

The maximum supply pressure is 116 psi (8 bar).

▶ **OPERATING TEMPERATURE**

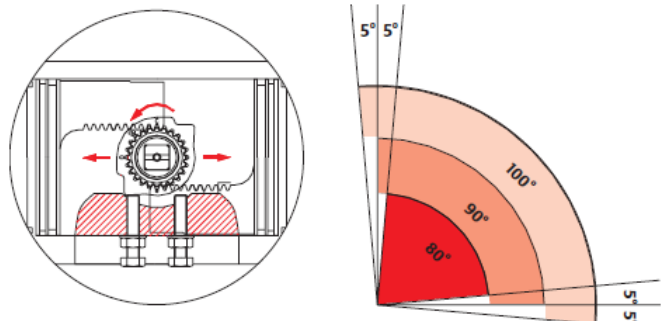
Standard product from -4 to $+176^{\circ}\text{F}$ (-20 to $+80^{\circ}\text{C}$).

Low temperature actuator with silicon O-rings from -4 to $+176^{\circ}\text{F}$ (-20 to $+80^{\circ}\text{C}$).

High temperature actuator with FPM O-rings from $+5$ to $+300^{\circ}\text{F}$ (-15 to $+150^{\circ}\text{C}$).

▶ **STROKE**

Standard construction: 90° rotation with stroke adjustment at 0° and $90^{\circ}\pm 5^{\circ}$ by using travel stops.



Double Acting Actuator

Sizing

The suggested safety factor for double acting actuators under normal working conditions is 20 to 30%.

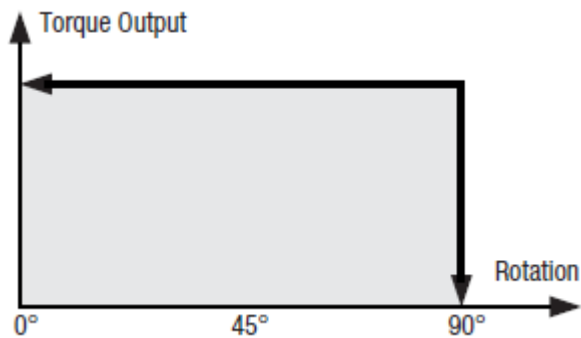
Example:

Valve torque needed = 885 in-lb (100 N.m)

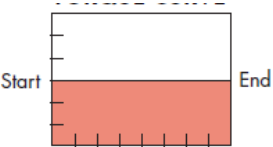
The torque safety factor (1 + 30%) = 1150 in-lb (130 N.m)

Air supply = 72 psi (5 bar)

Using the below table, the minimum model is PAA110590.



ATOMATOR SERIES DOUBLE ACTING TORQUE CURVE

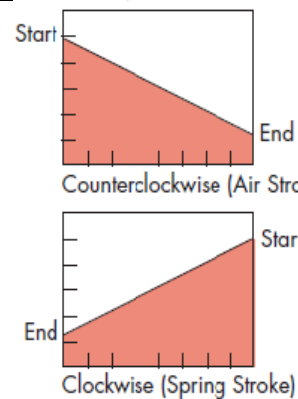


The Double Acting Actuator has a constant output torque throughout travel from start to end, clockwise or counterclockwise rotation.

DOUBLE ACTING PENUMATIC OPERATED TORQUE OUTPUT N.M (LB-INS)

Actuator Size	Air Supply Pressure Bar (PSIG)						
	2(30)	3(45)	4(60)	5(75)	6(90)	7(105)	8(120)
40	6 (53)	10 (88)	13 (115)	16 (140)	20 (177)	22 (194)	26 (230)
52	8 (70)	12 (106)	16 (140)	20 (177)	28 (247)	30 (265)	34 (300)
63	15 (132)	22 (194)	30 (265)	37 (327)	44 (389)	52 (460)	58 (513)
88	40 (354)	48 (424)	65 (575)	98 (867)	120 (1062)	136 (1200)	158 (1398)
105	66 (584)	83 (734)	132 (1168)	166 (1469)	200 (1770)	232 (2053)	265 (2345)

SINGLE ACTING TORQUE CURVE



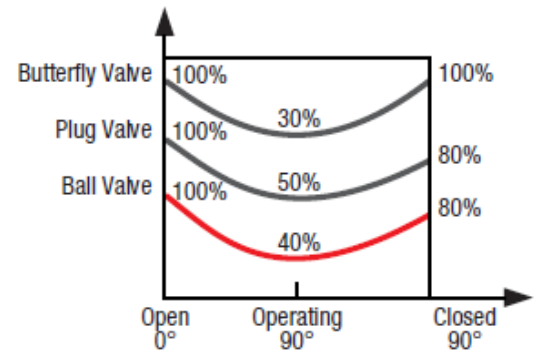
Spring Return Actuators

Sizing

The suggested safety factor for spring return actuator under normal working conditions is 30 to 50%.

Notes: During the restoration, the spring return actuator's output torque will not be affected by the air input from Port B, but just the opposite; it will help the restoration of springs.

We can help you choose the best suited spring return actuator if we know the valve's torque for break, run and close/reseat.



Example:

The max torque needed by a valve = 425 in-lb (48 N.m) & Air Supply = 6 bar

Use the following table to select suitable actuator for Butterfly, Ball or Plug valve:

Butterfly Valve					
Normal Open	Air Stroke		Spring Stroke		Selected Actuator
	0°	90°	90°	0°	
	start \geq 48*30%	end \geq 48	start \geq 48	end \geq 48*30%	
Normal Close	start \geq 48	end \geq 48*30%	start \geq 48*30%	end \geq 48	PA08866

Ball Valve					
Normal Open	Air Stroke		Spring Stroke		Selected Actuator
	0°	90°	90°	0°	
	start \geq 48*40%	end \geq 48*80%	start \geq 48	end \geq 48*40%	
Normal Close	start \geq 48	end \geq 48*40%	start \geq 48*40%	end \geq 48*80%	PA08855

Plug Valve					
Normal Open	Air Stroke		Spring Stroke		Selected Actuator
	0°	90°	90°	0°	
	start \geq 48*50%	end \geq 48*80%	start \geq 48	end \geq 48*50%	
Normal Close	start \geq 48	end \geq 48*50%	start \geq 48*50%	end \geq 48*80%	PA08855

Notes:

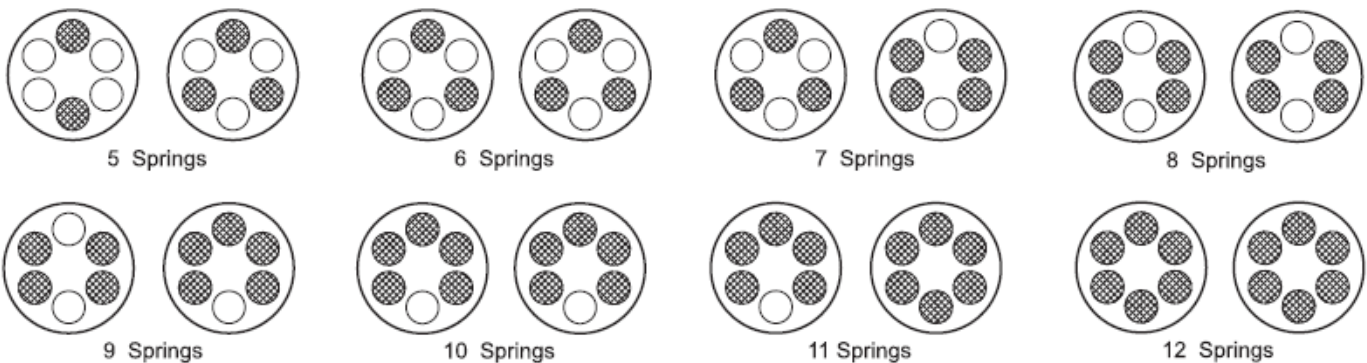
Ensure the torque required to operate the valve is compatible with the actuator torque, which depends on both actuator type and air supply.

The required torque depends not only on the valve, but on the working conditions and the plant's safety margins.

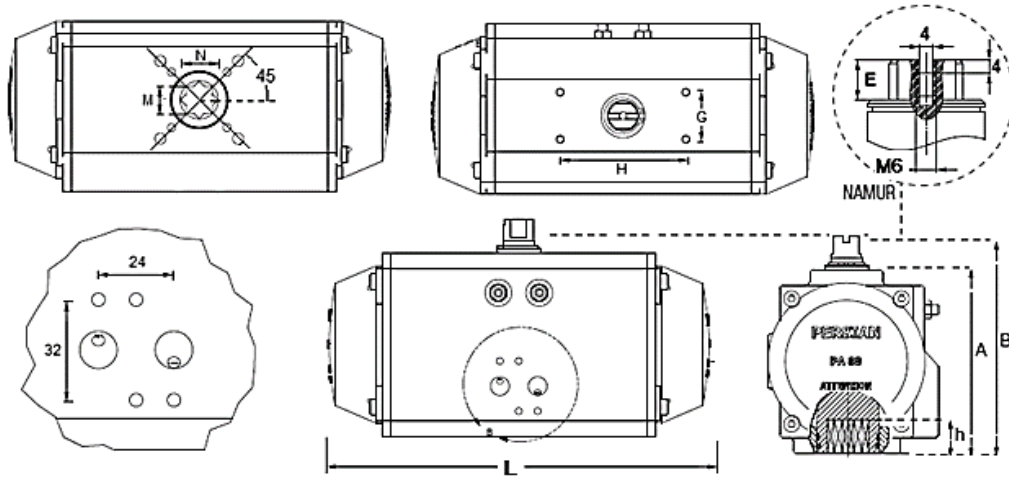
Torque Output: Spring Return Actuators, N.m

Model	size	Spring N	Air pressure, bar												Spring Torque NM			
			2.5		3		4		5		6		7		8		Start	Stop
			Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop		
			0	90	0	90	0	90	0	90	0	90	0	90	0	90	90	0
PAAI05290	052	5	6	4	8	6											6	4
		6	5	3	7	5	11	9									7	5
		7	4	1	6	3	3	10	7	14	10						9	6
		8			5	2	9	6	13	9	17	14					10	7
		9			4	1	8	5	12	8	16	13	20	17			11	8
		10					7	4	12	7	16	12	20	16			12	9
		11					7	2	11	5	15	10	19	14	23	18	14	9
		12							10	4	14	9	18	12	22	17	15	10
PAAI06390	063	5	11	8	15	11	22	15									10	7
		6	10	6	14	9	21	17	28	24							13	8
		7	9	4	13	7	20	15	27	22							15	10
		8			11	5	18	12	26	20	33	27	40	34			17	11
		9					17	10	24	18	31	25	39	32			19	12
		10					14	8	23	16	30	23	37	30	45	37	21	14
		11							22	14	29	21	36	28	43	35	23	15
		12							20	11	27	19	35	26	42	33	25	16
PAAI08890	088	5	31	20	42	31	65	54									30	20
		6	26	13	38	24	60	47	85	70							37	24
		7	22	6	33	17	53	40	77	62							44	29
		8			28	11	50	32	73	55	94	78	118	99			51	33
		9					45	25	67	47	90	70	110	91			58	38
		10					40	18	61	40	84	61	103	84	129	106	65	43
		11							58	32	50	56	100	78	123	100	72	47
		12							52	26	73	48	97	72	120	94	79	52
PAAI10590	105	5	51	33	68	50	101	83									49	32
		6	45	24	61	40	94	73	127	106							59	38
		7	38	14	55	30	88	63	121	96							69	44
		8			49	20	82	54	115	87	148	120	181	153			79	51
		9					75	44	108	77	142	110	175	143			89	57
		10					69	33	102	67	135	100	168	133	201	166	98	63
		11							96	57	129	90	162	123	195	156	108	70
		12							89	48	123	81	156	114	189	147	118	76

Spring Mounting

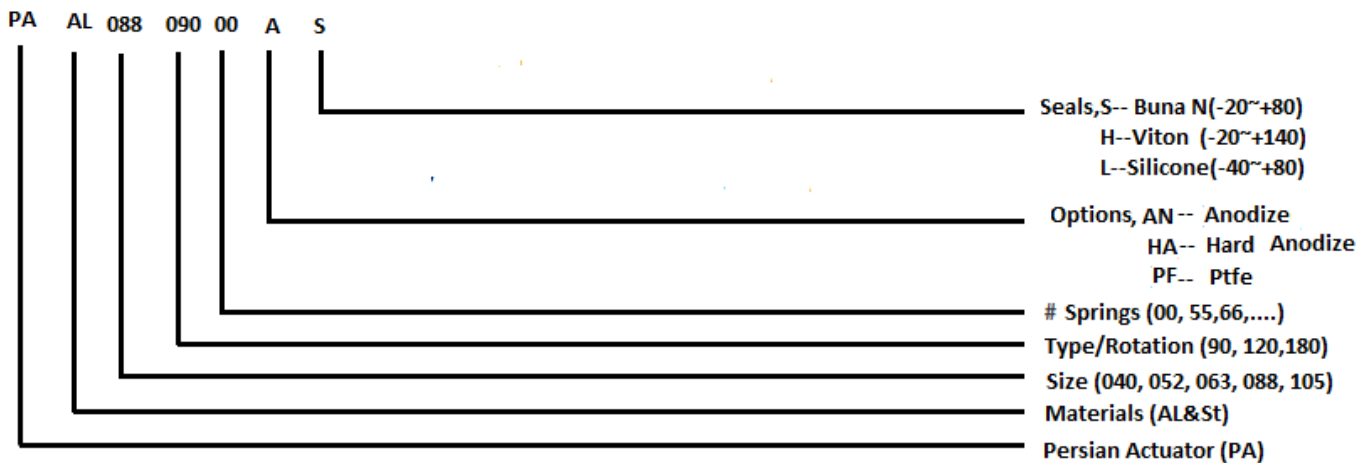


Dimensions



Model	A (mm)	B (mm)	G (mm)	H (mm)	L (mm)	h (mm)	M (mm)	N (mm)	Weight (kg)		NAMUR
									Spring Return	Double Acting	Air Supply
PA04090	61	81	30	80	118	-	11	11	-	0.85	NPT 1/4"
PA05290	72	93	30	80	146	-	11	11	-	1.2	NPT 1/4"
PA06390	85	105	30	80	172	-	11	11	-	1.75	NPT 1/4"
PA08890	117	138	30	80	235	-	17	17	-	3.9	NPT 1/4"
PA10590	152	152	30	80	268	-	22	22	-	5.8	NPT 1/4"

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