



Manufacturer of shut-off and control valves

TECHNICAL DATA SHEET

**Pneumatic rotary actuator
ELEPHANT PA-x-x double-acting
and with return springs**



+34 900 433 073, sales@valveelephant.com
Carrer d'Aragó, 264, 3-1, 08007 Barcelona, Spain

1. GENERAL PRODUCT INFORMATION

1.1. Product name: Double-acting pneumatic rotary actuator ELEPHANT PA-x-x with return springs.

1.2. Purpose: Pneumatic actuators PA-x-x are designed for automation of the control process of quarter-turn valves.

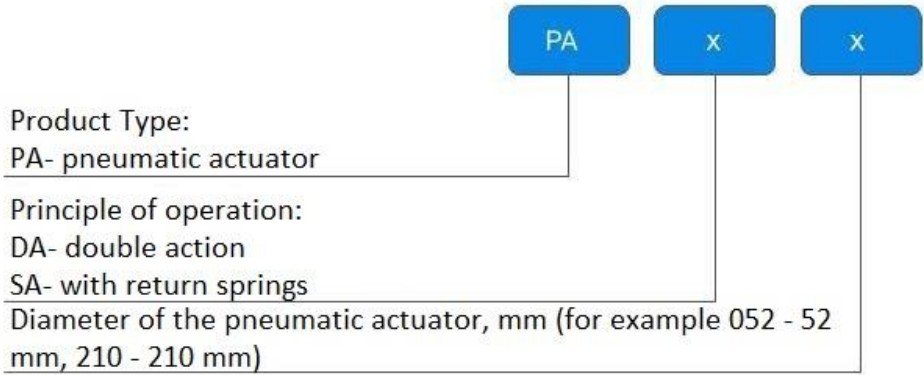
1.3. Operating principle.

1.3.1. PA-DA-x double-acting pneumatic actuators use two ports to supply the control medium and create movement in both directions, both to open and close the valve. One port is used to move the piston in one direction and the other port is used to move the piston in the opposite direction.

1.3.2 Pneumatic actuators with return springs PA-SA-x use one port for supplying the control medium and movement in one direction, and return to the initial position is realized by means of springs.



1.4. Deciphering of the designation:



2. BASIC TECHNICAL DATA AND CHARACTERISTICS

Table 1

Type of pneumatic actuator	DA - double-acting SA - with return springs
Nominal pressure PN, bar	12
Working pressure, bar	2...8
Working medium	filtered compressed air
Maximum particle diameter of the working medium, μm^2	≤ 30
Ambient temperature, °C	от -20 до +80
Swivel angle, °	0 - 90
Swivel angle adjustment, %	± 5
Position indicator	open/closed
Top connection standard	NAMUR
Air connection standard	NAMUR
Average life, closing/opening cycles	70,000 (in non-aggressive environment and medium pressure and temperature values)



3. BASIC MATERIALS

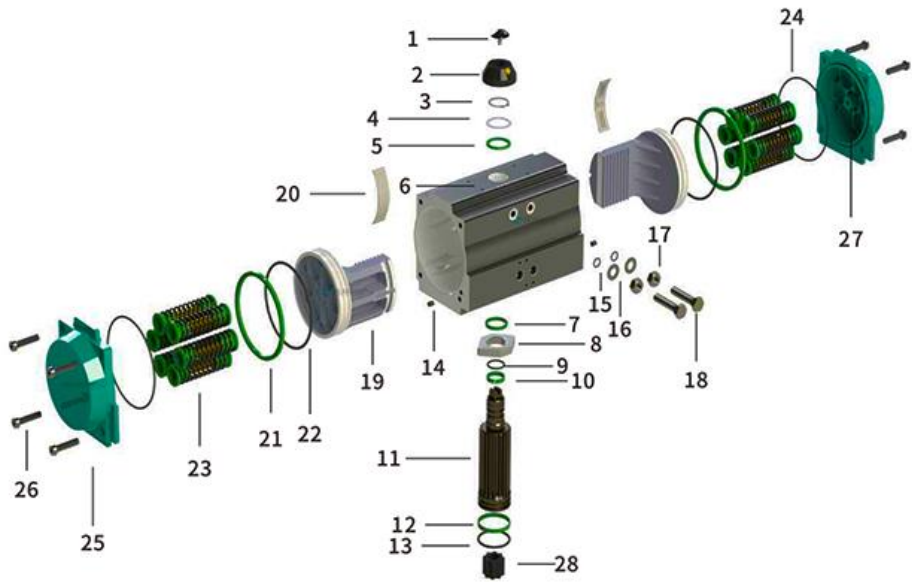


Figure 1.



Table 2 specification

№	Part name	Material
1	Indicator screw	ABS plastic
2	Position indicator	ABS plastic
3	Spring clip	stainless steel 304
4	Metal washer	stainless steel 304
5	Pressure washer	engineering plastic
6	Housing	extruded aluminum alloy with hard anodizing
7	Pressure washer	engineering plastic
8	Limiter	alloy steel
9	Shaft sealing ring upper	NBR
10	Upper shaft sliding ring	engineering plastic
11	Shaft	nickel plated alloy steel
12	Shaft sliding ring lower	engineering plastic
13	Shaft O-ring lower	NBR
14	Plug	NBR
15	O-ring of the adjusting screws	NBR
16	Washer of the adjusting screw	stainless steel 304
17	Lock nut of the adjusting screw	stainless steel 304
18	Adjustment screw	stainless steel 304
19	piston	die-cast aluminum alloy
20	Piston guide plate	engineering plastic
21	Piston sliding ring	engineering plastic
22	Piston O-ring	NBR
23	Spring set	spring steel
24	Cover O-ring	NBR
25	End cap	cast aluminum with polyester coating
26	Cover screw	stainless steel 304
27	Stop screw	stainless steel 304
28	Adapter	carbon steel



4. BASIC DIMENSIONS

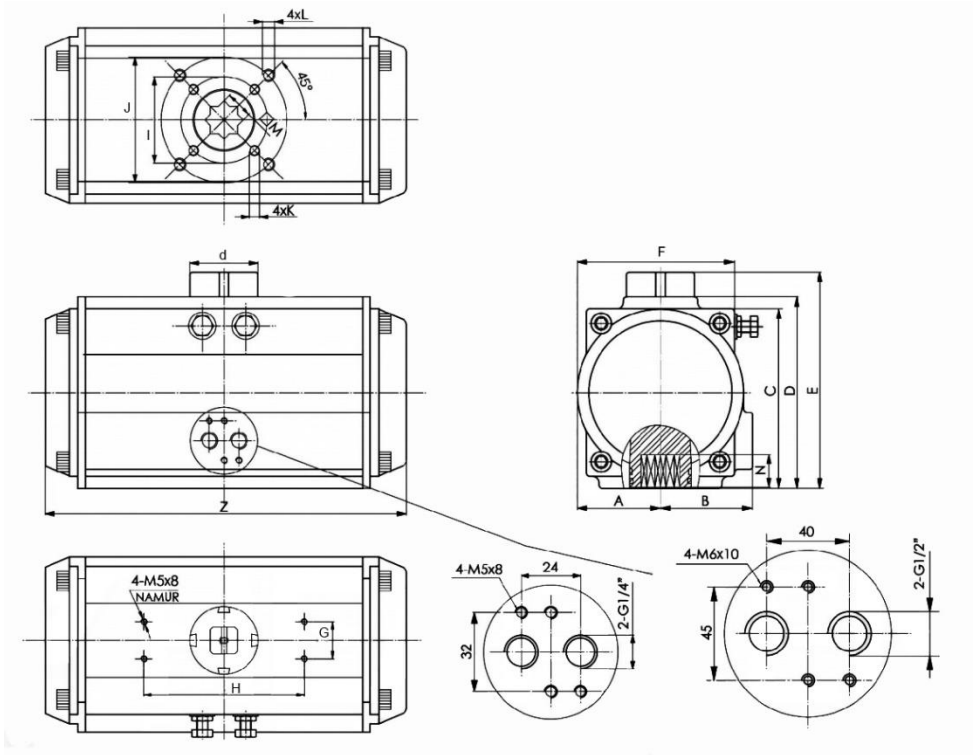


Fig.2



Table 3

Model	A, mm	B, mm	C, mm	D, mm	E, mm	F, mm	G, mm	H, mm
PA-x-052	30	41,5	65,5	72	92	65	30	80
PA-x-065	36	47	81	88	108	72	30	80
PA-x-083	46	57	98,5	108,7	128,7	92	30	80
PA-x-105	57,5	64	122,5	133	153	109,5	30	80
PA-x-130	67,5	74,5	145,5	155	185	127,5	30	130
PA-x-140	75	77	161	172	202	137,5	30	130
PA-x-160	87	87	184	197	227	159	30	130
PA-x-210	113	113	235,5	255	285	210	30	130
PA-x-270	147	147	299	326	356	273	30	130
PA-x-300	162	174	330	350	380	312	30	130
PA-x-350	190	195	483	410	440	365	30	130

Table 4

Model	I, mm	J, mm	M, mm	N, mm	Z, mm	d, mm	K	L
PA-x-052	36	50	11x11	14	147	40	M5x8	M6x10
PA-x-065	50	70	14x14	18	168	40	M6x10	M8x13
PA-x-083	50	70	17x17	21	204	40	M6x10	M8x13
PA-x-105	70	102	22x22	26	268	40	M8x13	M10x16
PA-x-130	70	102	22x22	26	301	55	M8x13	M10x16
PA-x-140	102	125	27x27	31	390	55	M10x16	M12x20
PA-x-160	102	125	27x27	31	458	55	M10x16	M12x20
PA-x-210	-	140	36x36	40	532	80	-	M16x25
PA-x-270	-	165	46x46	50	718	80	-	M20x25
PA-x-300	-	165	46x46	50	760	80	-	M20x25
PA-x-350	165	254	46x46	50	920	80	M20x25	8xM16x25



5. TECHNICAL PARAMETERS

Table 5

Model	DA Weight , kg	SA Weight , kg	Air flow rate to open, l/min	Closing air flow rate, l/min	Air supply connection	ISO flange type
PA-x-052	1,4	1,5	0,12	0,16	NAMUR G 1/4"	F03/F05
PA-x-065	2	2,1	0,21	0,23	NAMUR G 1/4"	F05/F07
PA-x-083	3,1	3,6	0,43	0,47	NAMUR G 1/4"	F05/F07
PA-x-105	6,8	6,9	0,95	0,88	NAMUR G 1/4"	F07/F10
PA-x-130	8,9	10,1	1,6	1,4	NAMUR G 1/4"	F07/F10
PA-x-140	13	15	2,5	2,2	NAMUR G 1/4"	F10/F12
PA-x-160	20	24	3,7	3,2	NAMUR G 1/4"	F10/F12
PA-x-210	47	55	7,5	7,5	NAMUR G 1/4"	F14
PA-x-270	97	118	17	14	NAMUR G 1/2"	F16
PA-x-300	110	130	23,8	29,7	NAMUR G 1/2"	F16
PA-x-350	186	234	35,1	46,3	NAMUR G 1/2"	F16/F25



6. PNEUMATIC ACTUATOR

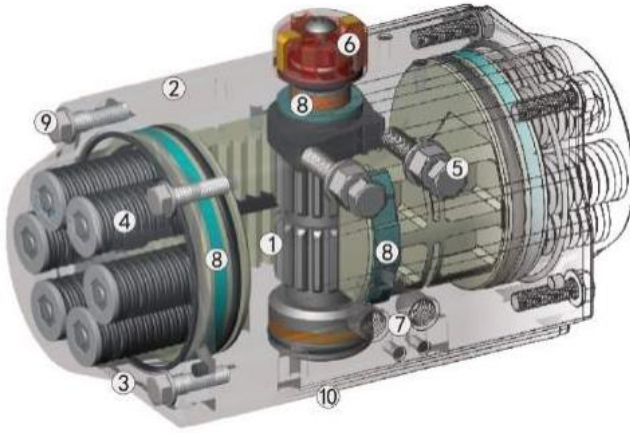


Fig.3

1. The shaft, pinion and two pistons are designed symmetrically to ensure stable and fast operation. The actuator has high precision and large output power.
2. The extruded cylinder body is made of high quality aluminum alloy with deeply anodized surface to extend the service life and reduce the friction coefficient.
3. All types of actuators have the same cylinder body and end caps, both for single-acting spring return actuators and double-acting actuators. Actuators can be easily transformed for different types of applications: for double-acting or single-acting by installing or removing springs.
4. The number of combined springs in the unloaded state can be safely increased or decreased either during assembly or during “on-site” operation.
5. Two adjusting screws on the side of the actuator that is mounted on the valve are provided to fine-tune the opening and closing positions of the valve. Special adjustment screws, which can be installed in the end caps, are much longer and are used when full or partial stroke adjustment is required.
6. 3D-Visual position indicator, has open or closed position markings. The output shaft has a standard connector in accordance with NAMUR. All optional accessories such as limit switch unit, electric positioner or position transmitter can be mounted and attached to it.

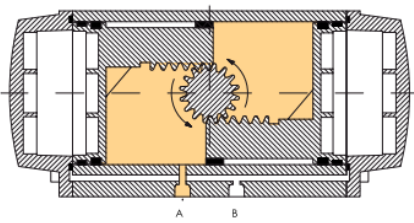
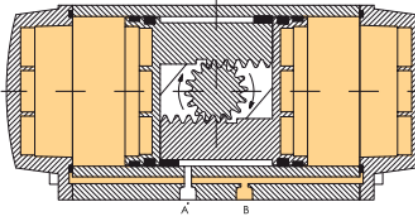


7. The compressed air interface complies with the NAMUR standard for connecting the NAMUR pneumatic valve directly. The thread size depends on the size of the pneumatic actuator.
8. The composite material used for the sliding rings on the piston housing and the linings on the back of the rack, the piston sealing rings and the toothed output shaft are grease-lubricated to protect against metal-to-metal friction. This ensures low friction and extended service life. No additional maintenance is required during operation.
9. All fasteners are made of stainless steel and are corrosion resistant.
10. The connection size for the valve is made according to the latest version of IS05211, which guarantees the interchangeability and universality of the actuators.

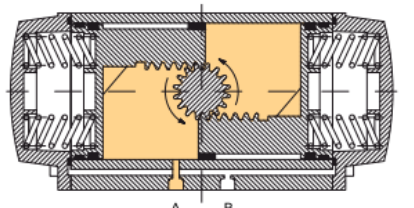
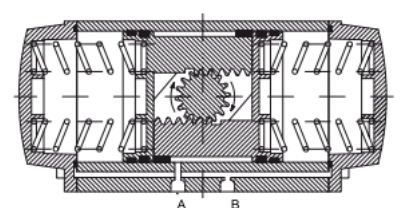


6. OPERATING PRINCIPLE OF PNEUMATIC ACTUATORS

6.1. Double-acting pneumatic actuator – PA-DA-x

	
<p>When compressed air is supplied from inlet A, the left and right pistons move in the opposite direction, the secondary gear rotates and air exits through port B.</p>	<p>Air is supplied through port B, the left and right pistons move toward the center, the gear rotates and air exits through port A.</p>

6.2. Pneumatic actuator with return springs – PA-SA-x

	
<p>When compressed air is supplied from inlet A, the left and right pistons move in the opposite direction, the secondary gear rotates and air exits through the hole B.</p>	<p>When there is no supply air, both pistons move to the center under the action of the springs, the gear rotates and air escapes through the hole A.</p>



7. TORQUE VALUES DEPENDING ON THE CONTROL MEDIUM PRESSURE

7.1. For double-acting pneumatic actuators – PA-DA-x

Table 6

Model	Working medium pressure in the system, bar									
	2	2,5	3	4	4,5	5	5,5	6	7	8
	Output torque, N*m									
PA-DA-052	8	10	12	16	18	20	22	24	28	32
PA-DA-065	15	18	22	29	33	36	40	44	51	58
PA-DA-083	31	39	47	63	70	78	86	94	110	125
PA-DA-105	66	83	99	132	149	165	182	198	231	264
PA-DA-130	100	125	150	200	226	251	276	301	351	401
PA-DA-140	171	214	256	342	385	427	470	513	598	684
PA-DA-160	266	332	399	532	598	665	731	798	931	1064
PA-DA-210	532	665	798	1064	1197	1330	1463	1596	1862	2128
PA-DA-270	1170	1462	1754	2339	2632	2924	3216	3509	4094	4679
PA-DA-300	1526	1908	2289	3052	3434	3815	4197	4578	5341	6104
PA-DA-350	2285	2856	3427	4570	5141	5712	6283	6854	7997	9139



7.2. For pneumatic actuators with return springs – PA-SA-x

Table 7

		Working medium pressure in the system, bar																
		2,5		3		4		5		6		7		8				
Angle of rotation		0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	90°	0°	
Model	Number of springs	Torque at medium supply, N*m														Spring return torque, N*m		
PA-SA-052	5	5,7	3,8	7,6	5,7	//	//	//	//	//	//	//	//	//	//	//	6,2	4,3
	6	4,9	2,5	6,9	4,5	10,9	8,5	//	//	//	//	//	//	//	//	//	7,4	5
	7	4	1,3	6	3,3	9,8	7,3	14	10,4	//	//	//	//	//	//	//	8,6	5,9
	8	//	//	5,2	2	9,2	6	13,2	9,1	17,2	14,1	//	//	//	//	//	9,9	6,7
	9	//	//	4,3	0,8	8,3	4,8	12,3	7,9	16,3	12,8	20,3	16,8	//	//	//	11,1	7,6
	10	//	//	//	//	7,4	3,6	11,5	6,7	15,5	11,6	19,5	15,6	//	//	//	12,4	8,5
	11	//	//	//	//	6,6	2,3	10,6	5,4	14,6	10,4	18,6	14,3	22,6	18,3	13,6	9,3	9,3
	12	//	//	//	//	//	//	9,7	4,2	13,8	9,1	17,8	12,2	21,8	17,1	14,8	10,2	10,2
PA-SA-065	5	11,4	7,7	15	11,4	22,3	14,9	//	//	//	//	//	//	//	//	//	10,4	6,8
	6	10,1	5,7	13,6	9,3	20,9	16,6	28,3	23,9	//	//	//	//	//	//	//	12,5	8,2
	7	8,6	3,6	12,5	7,2	19,5	14,5	26,8	21,9	//	//	//	//	//	//	//	14,6	9,6
	8	//	//	10,9	5,1	18,2	12,4	25,5	19,8	32,8	27	40,1	34,3	//	//	//	16,7	10,9
	9	//	//	//	//	16,8	10,4	24,1	17,7	31,4	24,9	38,7	32,2	//	//	//	18,8	12,3
	10	//	//	//	//	1,4	8,2	22,8	15,6	30	22,8	37,3	30,1	44,7	37,4	20,9	13,7	13,7
	11	//	//	//	//	//	//	21,5	13,5	28,7	20,7	36	28	43,3	35,3	22,9	15	15
	12	//	//	//	//	//	//	20	11,4	27,3	18,6	34,6	25,9	41,9	33,3	25	16,4	16,4
PA-SA-083	5	23,3	16,1	31,1	24	46,8	39,7	//	//	//	//	//	//	//	//	//	23	15,8
	6	20,1	11,5	28	19,3	43,7	35,1	59,4	50,7	//	//	//	//	//	//	//	27,6	19
	7	17	6,9	24,8	14,8	40,5	30,5	56,2	46,2	//	//	//	//	//	//	//	32,2	22,1
	8	//	//	21,7	10,1	37,4	25,8	53,1	41,5	68,8	57,2	84,5	72,9	//	//	//	36,8	23,2
	9	//	//	//	//	34,2	21,3	49,9	37	65,6	52,6	81,2	68,3	//	//	//	41,4	28,5
	10	//	//	//	//	31	16,6	46,7	32,3	62,4	48	78,1	63,7	93,8	79,3	46	31,6	31,6
	11	//	//	//	//	//	//	43,6	27,7	59,3	43,4	75	59,1	90,6	74,8	50,6	34,8	34,8
	12	//	//	//	//	//	//	40,4	23,2	56,1	38,9	71,7	54,5	87,4	70,2	55,2	38	38
PA-SA-105	5	51	33,4	67,5	49,9	100,6	83	//	//	//	//	//	//	//	124,5	//	49,2	31,6
	6	44,7	23,5	61,1	40	94,2	73,2	127,3	106,2	//	//	//	//	//	//	//	59,1	38
	7	38,4	13,7	54,9	30,3	87,9	63,4	121	96,4	//	//	//	//	//	//	//	68,9	44,3
	8	//	//	48,5	20,4	81,6	53,5	114,7	86,5	147,7	119,6	180,8	152,7	//	//	//	78,7	50,6
	9	//	//	//	//	75,3	43,7	108,4	76,8	141,5	109,8	174,5	142,9	//	//	//	88,6	56,9
	10	//	//	//	//	68,9	33,4	102	66,5	135,1	99,6	168,2	132,6	201,2	165,7	98,4	63,3	63,3
	11	//	//	//	//	//	//	95,7	57	127,7	90,1	161,8	123,1	194,8	156,2	108,3	69,6	69,6
	12	//	//	//	//	//	//	89,4	47,5	122,5	80,6	155,5	113,6	188,6	146,7	118,1	75,9	75,9
PA-SA-130	5	73	47	98	72	148	122	//	//	//	//	//	//	//	//	//	79	52
	6	63	31	88	56	138	107	188	157	//	//	//	//	//	//	//	94	63



	7	52	15	77	40	127	90	178	141	//	//	//	//	//	//	110	73
	8	//	//	67	25	117	75	167	125	217	176	268	226	//	//	125	84
	9	//	//	//	//	107	59	157	109	207	159	257	210	//	//	141	94
	10	//	//	//	//	96	44	146	94	196	144	247	194	297	245	157	105
	11	//	//	//	//	//	//	136	78	186	128	236	178	286	228	173	115
	12	//	//	//	//	//	//	125	63	176	113	226	163	276	213	188	125
PA-SA-140	5	128	85	171	127	256	213	//	//	//	//	//	//	//	//	129	86
	6	111	59	154	102	239	187	325	273	//	//	//	//	//	//	155	103
	7	94	33	137	76	222	162	308	247	//	//	//	//	//	//	181	120
	8	//	//	120	50	205	136	291	221	376	307	462	392	//	//	206	137
	9	//	//	//	//	187	110	273	196	358	281	444	367	//	//	232	155
	10	//	//	//	//	170	84	256	169	341	255	427	340	512	426	258	172
	11	//	//	//	//	//	//	238	143	324	229	409	314	495	400	284	189
	12	//	//	//	//	//	//	221	118	307	203	392	289	478	374	310	206



Table 8

		Working medium pressure in the system, bar															
		2,5		3		4		5		6		7		8			
Angle of rotation		0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	90°	0°
Model	Number of springs	Torque at medium supply, N*m														Spring return torque, N*m	
PA-SA-160	5	193	124	259	191	392	324	//	//	//	//	//	//	//	//	208	140
	6	165	83	232	149	365	282	498	415	//	//	//	//	//	//	250	168
	7	137	41	203	107	336	240	469	373	//	//	//	//	//	//	292	196
	8	//	//	176	66	309	199	442	237	575	465	708	598	//	//	333	223
	9	//	//	//	//	280	157	413	290	546	423	679	556	//	//	375	251
	10	//	//	//	//	253	115	386	248	519	381	652	514	785	647	417	279
	11	//	//	//	//	//	//	358	207	491	340	624	473	757	606	458	307
	12	//	//	//	//	//	//	330	165	463	298	596	431	729	564	500	335
PA-SA-210	5	390	285	523	418	789	684	//	//	//	//	//	//	//	//	380	275
	6	335	209	468	342	734	608	1000	874	//	//	//	//	//	//	456	385
	7	280	133	413	266	679	532	945	798	//	//	//	//	//	//	532	385
	8	//	//	358	190	624	456	890	722	1156	988	1422	1254	//	//	608	440
	9	//	//	//	//	569	380	835	646	1101	912	1367	1178	//	//	684	495
	10	//	//	//	//	514	304	780	570	1046	836	1312	1102	1578	1368	760	550
	11	//	//	//	//	//	//	725	494	991	760	1257	1026	1523	1292	836	605
	12	//	//	//	//	//	//	670	418	936	684	1202	950	1468	1216	912	660
PA-SA-270	5	903	675	1195	968	1779	1552	//	//	//	//	//	//	//	//	787	560
	6	790	519	1083	811	1667	1396	2252	1984	//	//	//	//	//	//	943	672
	7	679	361	972	654	1556	1238	2141	1823	//	//	//	//	//	//	1101	783
	8	//	//	860	497	1444	1081	2029	1666	2614	2252	3199	2836	//	//	1258	895
	9	//	//	//	//	1332	923	1917	1509	2502	2094	3087	2678	//	//	1416	1007
	10	//	//	//	//	1220	767	1805	1352	2390	1937	2974	2521	3560	3107	1572	1119
	11	//	//	//	//	//	//	1693	1194	2278	1779	2862	2364	3448	2949	1730	1231
	12	//	//	//	//	//	//	1582	1037	2167	1623	2751	2207	3336	2792	1887	1342
PA-SA-300	5	1097	729	//	//	//	//	//	//	//	//	//	//	//	//	1061	730
	6	935	494	1316	875	//	//	//	//	//	//	//	//	//	//	1273	876
	7	772	258	1153	639	1916	1402	//	//	//	//	//	//	//	//	1485	1022
	8	//	//	991	403	1754	1166	2517	1929	//	//	//	//	//	//	1697	1168
	9	//	//	//	//	1592	930	2355	1693	3118	2456	//	//	//	//	1909	1314
	10	//	//	//	//	1430	695	2193	1458	2956	2221	3719	2984	4482	3747	2122	1460



	11	//	//	//	//	//	//	//	2030	1222	2793	1985	3556	2748	4319	3511	2334	1606
	12	//	//	//	//	//	//	//	1868	986	2631	1749	3394	2512	4157	3275	2546	1752
PA-SA-350	5	1553	964	//	//	//	//	//	//	//	//	//	//	//	//	//	1702	1173
	6	1292	586	1863	1157	//	//	//	//	//	//	//	//	//	//	//	2043	1408
	7	1031	208	1602	779	2745	1922	//	//	//	//	//	//	//	//	//	2383	1642
	8	//	//	1341	401	2484	1544	3626	2686	//	//	//	//	//	//	//	2724	1877
	9	//	//	//	//	2224	1165	3336	2307	4508	3449	//	//	//	//	//	3064	212
	10	//	//	//	//	1963	787	3105	1929	4247	3071	5390	4214	6532	5356	3405	2346	
	11	//	//	//	//	//	//	2844	1551	3986	2693	5129	336	6271	4978	3745	2581	
	12	//	//	//	//	//	//	2584	1172	3726	2314	4869	3457	6011	4599	4086	2816	

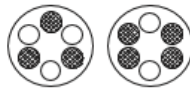
8. RETURN SPRING INSTALLATION DIAGRAM



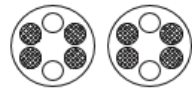
5 springs



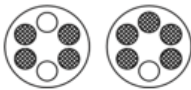
6 springs



7 springs



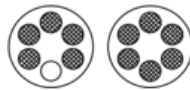
8 springs



9 springs



10 springs



11 springs



12 springs



9. INSTALLATION AND OPERATING INSTRUCTIONS

9.1. Safety precautions during installation and operation of pneumatic actuators must be observed.

be observed in accordance with the procedure established at the enterprise.

9.2 Pneumatic actuators may be installed, operated and serviced by the following personnel

personnel who have studied the pneumatic actuators design, safety rules and the requirements of this passport.

requirements of this passport.

9.3 Pneumatic actuators can be mounted on various quarter-turn valves according to further instructions.

valves according to further instructions.

9.4 Installation procedure:

9.4.1 Check pneumatic actuator pinion - valve stem connection.

9.4.2 Ensure that the valve and pneumatic actuator are in the closed position before proceeding with the installation.

9.4.3 Place the mounting bracket on the valve and tighten all fasteners. Do not fully tighten the bolts until the entire assembly is properly centered and installed.

9.4.4 Mounting with brackets: Align the valve and actuator to eliminate forces on the system. Tighten all assembly fasteners.

9.4.5 Direct mounting: position the actuator on the valve, taking care when inserting the valve stem into the actuator pinion. Insert the screws on the underside of the flange and manually tighten and align them to eliminate forces on the system. Tighten all retaining screws.

9.4.6 Operate the unit several times to ensure that it operates properly. If the unit does not operate properly, disassemble the unit and repeat steps 8.4.1 through 8.4.4.

9.4.7 After completing the installation work, the actuator travel must be set by means of the travel limiters (see Fig. 3 item 5) to ensure that the valve operates correctly. The pneumatic actuators have an adjustment range of $\pm 5\%$.

Note: Do not remove actuator covers when pressure is applied to the actuator.

9.5 Maintenance of the pneumatic actuator is essentially limited to the proper provision of compressed air treatment and monitoring of the compressed air supply. compressed air treatment process and monitoring the operation of these devices.



10. TRANSPORTATION AND STORAGE CONDITIONS

10.1. Storage of pneumatic actuators should be carried out in accordance with the procedure established at the enterprise.

10.2 Transportation of pneumatic actuators is carried out in the manufacturer's packing in accordance with the procedure established at the enterprise.

11. UTILIZATION

11.1 The product is disposed of in accordance with the procedure established at the enterprise (remelting, burial, resale).



8. WARRANTY OBLIGATIONS

8.1. Warranty period - 12 months from the date of commissioning, but not more than 18 months from the date of sale.

8.2. The warranty applies to equipment installed and used in accordance with the installation instructions and product specifications described in this data sheet.

8.3. The manufacturer guarantees compliance of the product with safety requirements, provided that the consumer complies with the rules of transport, storage, installation and operation.

8.4. The warranty covers all defects caused by the fault of the manufacturer.

8.5. The warranty does not apply:

- parts and materials of the product subject to wear and tear;
- for cases of damage caused by:
 - modifications to the original design of the product;
 - violation of general installation recommendations;
 - faults caused by improper maintenance and storage; improper operation and use of the equipment.

9. WARRANTY TERMS

9.1. Claims to the quality of the goods may be made during the warranty period.

9.2. Defective products are repaired or exchanged for new ones free of charge during the warranty period. ELEPHANT decides whether to replace or repair the product. The replaced product or its parts resulting from the repair shall become the property of 'ELEPHANT'.

9.3. Costs related to dismantling, installation and transport of the defective product during the warranty period shall not be reimbursed to the Buyer.

9.4. If the claim is unfounded, the Buyer shall pay the costs of diagnostics and expertise of the product.

9.5. Products are accepted for warranty repair (as well as for return) fully assembled.



WARRANTY CARD № _____

№	Product Name	Packs

Name and address of the trading organisation _____

Date of sale _____ Seller's signature _____

Stamp or seal of the trading organisation _____ Acceptance stamp _____

I agree with the terms and conditions of the warranty:

Buyer _____ (signature)

Warranty period - 12 months from the date of commissioning, but not more than 18 months from the date of sale.

For warranty repairs, complaints and product quality claims, please contact ELEPHANT at: Carrer d'Aragó,264,3-1,08007 Barcelona, Spain. E-mail address: sales@valveelephant.com.

When making a complaint about the quality of goods, the buyer shall present the following documents:

1. A free-form application, which shall specify:
 - name of the organisation or full name of the buyer, actual address, contact telephone numbers;
 - name and address of the organisation that carried out the installation;
 - basic parameters of the system in which the product was used;
 - a brief description of the defect.
2. Document confirming the purchase of the product (delivery note, receipt)..
3. Act of hydraulic test of the system in which the product was installed.
4. This completed warranty card.

A note on the return or exchange of goods _____

Date: « ___ » _____ 202__yr. Caption _____

