

proval



Pneumatic Actuators and Accessories



DORUK ENDÜSTRİ
Valve & Automation Systems



DORUK ENDÜSTRİ

Valve & Automation Systems



DORUK ENDUSTRI LTD is specialized in manufacturing high quality rotary actuators, actuator accessories and industrial valves under its registered brand name PROVAL in Dilovasi-Kocaeli, nearby Istanbul in Turkey.

PROVAL branded valves and actuators are engineered and designed by using the latest 3D CAD design software, machined in the latest technology horizontal & vertical CNC machining center.

All valves and actuators are inspected with no exception for any kind of machining failures by using most appropriate testing tools in order to achieve customer satisfaction and supply compatible products to meet their severe service applications.

The goal of DORUK ENDUSTRI is to provide our customers with the good quality, high-performance, innovative design and cost-effective process control equipments.

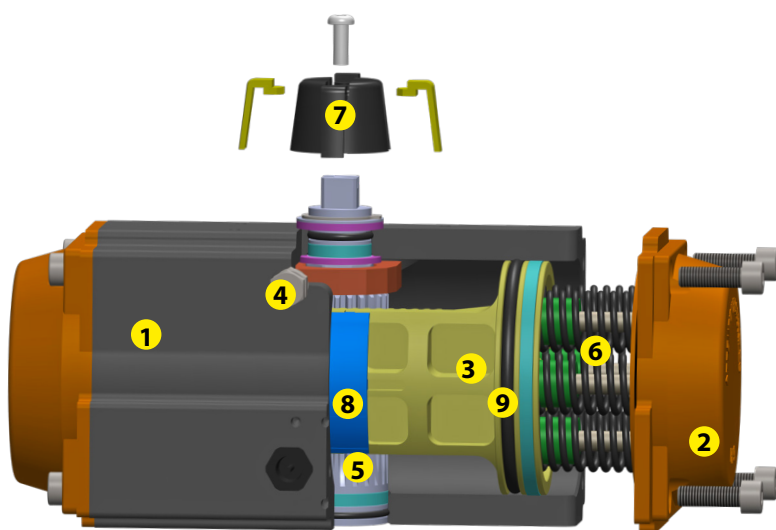
DORUK ENDUSTRI operates in 10.000 Sq.mt area factory and holds ISO9001:2015, EAC, ATEX and CE-PED certifications for products and quality assurance system. Each PROVAL valve and actuator is manufactured under strict quality management system.

PROVAL branded valves and actuators have been successfully exported to more than 80 countries worldwide.



A210 Series Pneumatic Actuators

Proval A210 Series innovative, compact design pneumatic rack and pinion rotary actuators including all critical components are manufactured in-house using dedicated state-of-the-art CNC machines following ISO quality assurance standards. Proval pneumatic actuators that can be set either to fail-open or fail-close, comes in 18 different sizes in both double and single acting types. This Series of actuators having torque figures in ranges 9 to 9767 Nm are well suited to operate part-turn valves such as plug, ball and butterfly valves.



General Features

- Compact design
- Available in 18 different sizes
- Spring return or double acting versions
- High and Low temperature executions
- Common end caps on SR and DA
- Namur accessory mounting configuration
- Bi-directional stroke adjustment bolts
- Operating media - clean, dry air or non-corrosive gases
- Modular preloaded spring cartridges
- Durable, trouble free operation

1. Actuator Body

Heavy duty extruded aluminium body having a smooth surface finish is hard anodised both externally and internally to increase corrosion resistance and life span of internal parts. Different types of protective coatings, such as ENP, PFA and ECTFE allowing actuators to be used in harsh environments are available upon request.



2. End Caps

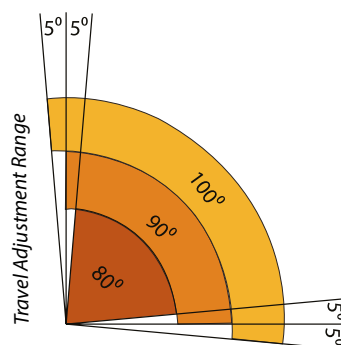
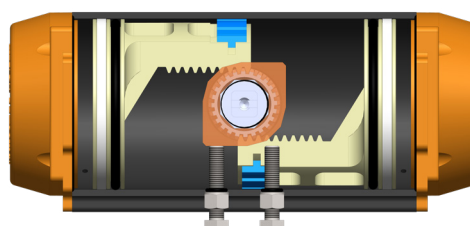
Epoxy powder coated die-cast aluminium end caps are identical for actuators in single and double acting configuration to facilitate conversion on site. Alternatively ENP, PFA, ECTFE etc coatings are available for highly aggressive environments.

3. Pistons

Die-cast aluminium pistons are treated with a special coating to decrease friction coefficient and increase wear resistance. The direction of pinion rotation (CCW to CW) can be changed by rotating the pistons 180° around their axis as the pistons installed at the both ends of the actuator are identical to each other.

4. Travel Adjustment

Each end of actuator travel (CW and CCW) can be adjusted by $\pm 5^\circ$ turning the right and left stroke adjustment bolts placed independently of each other, IN or OUT.



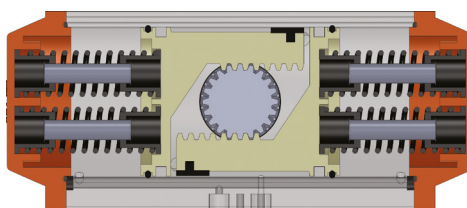


5. Pinion (Drive Shaft)

Alloy-steel shafts are designed and machined precisely in compliance with ISO5211, DIN3337, VDI/VDE 3845 standards. Plated in electroless nickel to provide substantially improved performance, wear and corrosion resistance in aggressive environments.

6. Preloaded Cartridge Springs

High grade steel spring cartridges are cathodolysis coated to provide highly improved safety and corrosion resistance in fail safe and emergency shut down operations.



7. Indicator

All actuators are furnished with a local position indicator that provides visual indication of valve/actuator position.

8. Bearings & Guides

High quality, low friction bearings and guides to avoid metal-to-metal contact and ensure reliable and stable linear motion.

9. Seals

Actuators fitted with NBR o-rings are suitable for use at temperatures ranging from -20 °C to +80 °C. FKM and Silicone O-rings are available for low and high temperature executions.



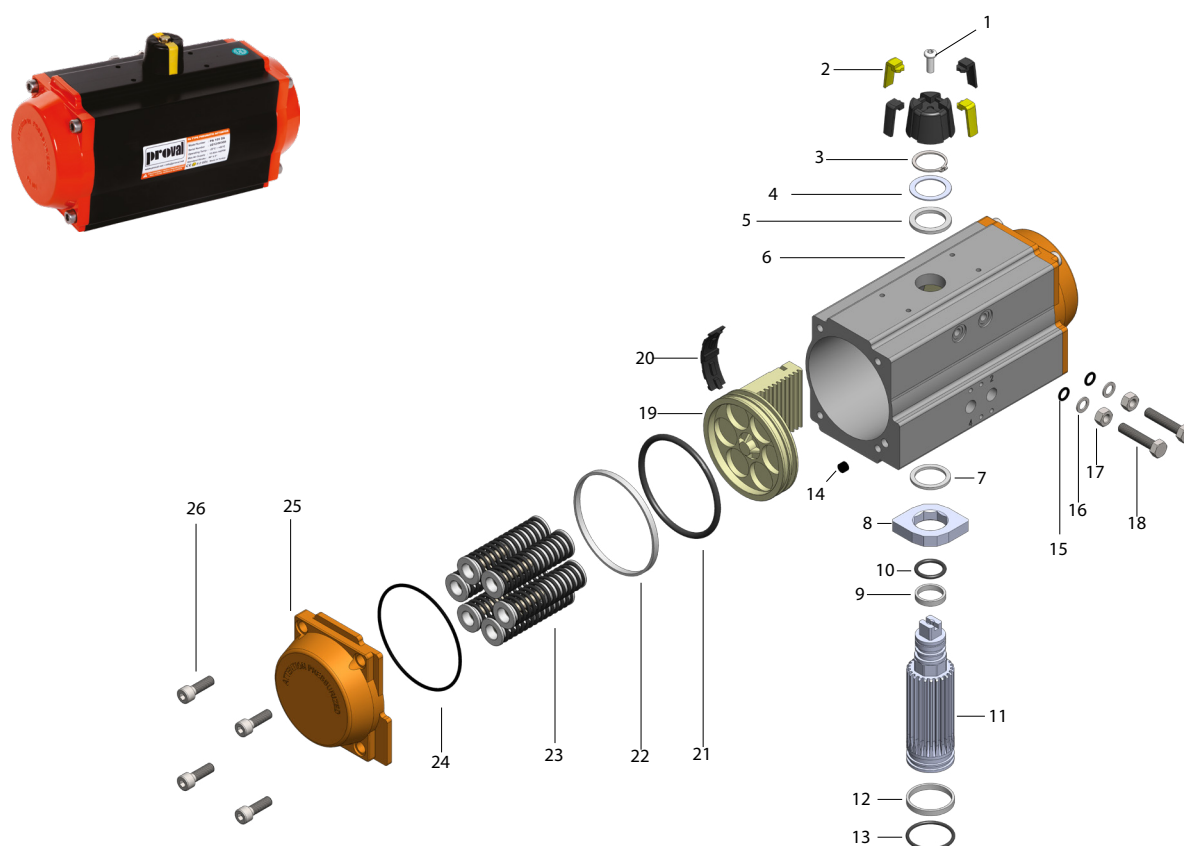
10. Traceability

A unique Serial number is assigned to all actuators to facilitate identification and provide maximum traceability.

 CE II 2 GDC Made in Turkey DISASSEMBLY WHILE PRESSURIZED WILL CAUSE SERIOUS INJURIES	PA TYPE PNEUMATIC ACTUATOR Model Nr / Type : PA 052 DA ISO Flange / Sq. : F03/F05 - 11X11 Rotation / Stroke: CCW / 90° ± 5° Inlet Port : G 1/4" Op. Temperature: -20°C ~ 80°C Max Air Supply : 8 Bar Seal / Stem Mtrl : NBR / STL+ENP Body Finish : STANDARD Serial Number : 10140255 www.proval.net 
---	--

High quality, durable and self-adhesive stickers indicating temperature/pressurating limitations of actuators are affixed to actuators and need to be strictly considered when commissioning

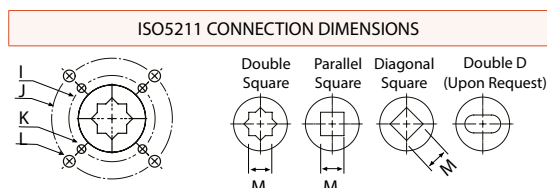
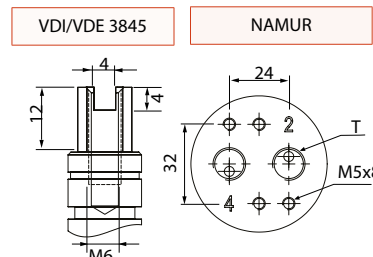
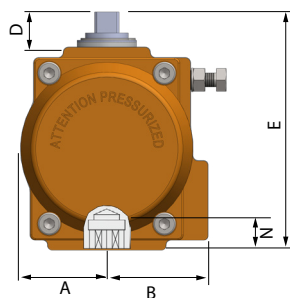
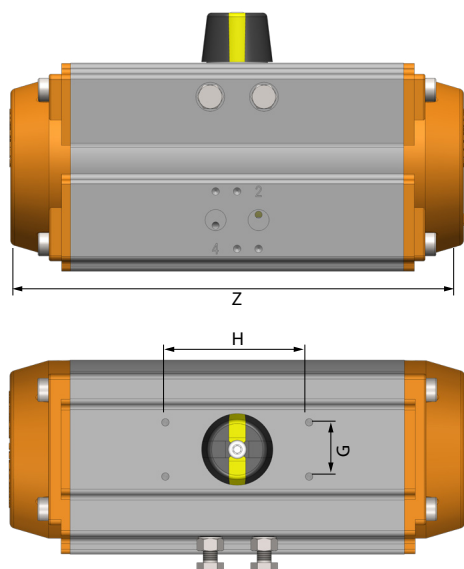
A210 Series 90° Rotation Pneumatic Actuators Part List



No.	Description	Qty	Standard Material	Protection	Optional Material
1	Indicator Screw	1	Stainless Steel	Galvanized Coating	Stainless Steel
2	Indicator	1	Plastic		
3	Circlip	1	Stainless Steel		
4	Metal Washer	1	Stainless Steel		
5	Washer	1	Engineering Plastics		
6	Body	1	Extruded Aluminium Alloy	Hard Anodizing	Stainless Steel , Epoxy / Nickel Coating
7	Inner Washer	1	Engineering Plastics		
8	Cam	1	Alloy Steel		
9	Pinion Upper Bearing	1	Engineering Plastics		
10	Pinion Upper O-Ring	1	NBR		
11	Pinion	1	Alloy Steel	Nickel Plating / Galvanized Coating	Stainless Steel
12	Pinion Lower Bearing	1	NBR		Viton/Silicone
13	Pinion Lower O-Ring	1	Engineering Plastics		
14	Sealing Plug	2	NBR		Viton/Silicone
15	Adjustment Screw O-Ring	2	NBR		Viton/Silicone
16	Washer (Adjustment Bolt)	2	Stainless Steel		
17	Nut (Adjustment Bolt)	2	Stainless Steel		
18	Stroke Adjustment Bolt	2	Stainless Steel		
19	Piston	2	Aluminium Die Cast	Alodine Coating	
20	Guide Piston	2	Engineering Plastics		
21	Piston Bearing	2	Engineering Plastics		
22	Piston O-Ring	2	NBR		Viton/Silicone
23	Cartridge Springs	0~12	Spring Steel	Cataphoresis Coating	
24	End Cap O-Ring	2	NBR		Viton/Silicone
25	End Cap	2	Cast Aluminium	Epoxy Powder Coating	Stainless Steel
26	Cap Screw	8	Stainless Steel		



A210 Series 90° Rotation Pneumatic Actuators Dimensions and Weight Information



Dimensions(mm)

Model	A	B	D	E	G	H	I	J	K	L	M	N	Z	T
PA 32	23	23	20	65	25	50	ø36	-	M5x8	-	9	14	99	G1/8"
PA 40	40	36	20	81	30	80	ø36	ø50	M5x8	M6x10	9-11	14	124	G1/4"
PA 52	30	41	20	92	30	80	ø36	ø50	M5x8	M6x10	9-11	14	154	G1/4"
PA 63	36	47	20	107,5	30	80	ø50	ø70	M6x10	M8x13	9-11-14	18	166	G1/4"
PA 75	42	53	20	119,5	30	80	ø50	ø70	M6x10	M8x13	11-14	18	186	G1/4"
PA 83	46	57	20	128,7	30	80	ø50	ø70	M6x10	M8x13	14-17	21	205	G1/4"
PA 92	50	58	20	136,8	30	80	ø50	ø70	M6x10	M8x13	14-17	21	253	G1/4"
PA 105	57,5	64	20	153	30	80	ø70	ø102	M8x13	M10x16	17-22	26	268	G1/4"
PA 125	67,5	74,5	20	175	30	80	ø70	ø102	M8x13	M10x16	22	26	301	G1/4"
PA 140	75	77	20	191,5	30	80	ø102	ø125	M10x16	M12x20	27	31	392	G1/4"
PA 160	87	87	20	217	30	80	ø102	ø125	M10x16	M12x20	27	31	451	G1/4"
PA 190	103	103	30	260	30	130		ø140		M16x25	36	40	525	G1/4"
PA 210	113	113	30	285	30	130		ø140		M16x25	36	40	532	G1/4"
PA 240	130	130	30	318	30	130		ø165		M20x25	46	50	610	G1/4"
PA 270	147	147	30	356	30	130		ø165		M20x25	46	50	722	G1/4"
PA 300	140	173	30	382	30	130		ø165		M20x25	46	55	774	G1/2"
PA 350	164	195	30	438	30	130	ø165	ø254	M20x25	M16x25	46	50	912	G1/2"
PA 400	260	260	30	494	30	130	ø165	ø254	M20x25	M16x25	46	50	945	G1/2"

Actuator Unit Weights (Kg/Pc)

Model	PA 32	PA 40	PA 52	PA 63	PA 75	PA 83	PA 92	PA 105	PA 125	PA 140	PA 160	PA 190	PA 210	PA 240	PA 270	PA 300	PA 350	PA 400
Spring Return	-	-	1,5	2,2	2,9	3,6	5,5	6,7	10,4	14,4	23,3	46,1	53,1	73,3	115,9	130,00	234,40	360,40
Double Acting	0,5	0,7	1,4	2,1	2,7	3,3	5,0	5,9	9,0	12,0	19,0	39,1	44,1	59,0	93,6	110,00	186,50	289,00

Air Consumption of Actuators (Lt/Stroke)

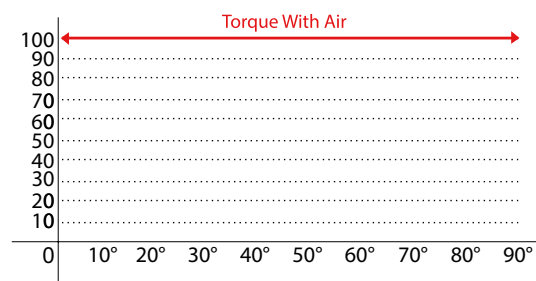
Model	PA 32	PA 40	PA 52	PA 63	PA 75	PA 83	PA 92	PA 105	PA 125	PA 140	PA 160	PA 190	PA 210	PA 240	PA 270	PA 300	PA 350	PA 400
Opening (Lt)	0,03	0,06	0,12	0,21	0,30	0,43	0,64	0,88	1,4	2,2	3,2	5,4	6,8	9	14	23,8	35,1	52,6
Closing (Lt)	0,04	0,08	0,16	0,23	0,34	0,47	0,73	0,95	1,6	2,5	3,7	5,9	7,5	11	17	29,7	46,3	36

A210 Series 90° Rotation Double Acting Pneumatic Actuators Working Principles

A210 Series Double acting actuators require compressed air to be supplied in both opening and closing strokes.

The output torques generated by actuators in double acting configuration vary mainly depending on the cylinder diameter and air supply pressure; it is simply calculated by multiplying the piston area by pitch circle radius of the pinion and by the supply pressure.

As shown in the diagram at the right the double acting pneumatic actuators are capable of offering constant torque through the 90° full stroke

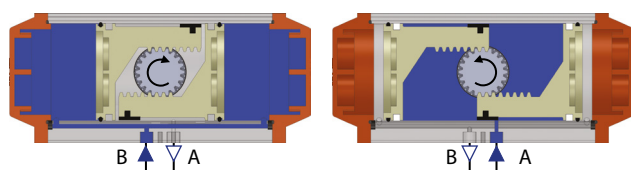


Torque Output Through Full 90° Stroke

Counter Clockwise Rotation (CCWR)

Air supplied through port B forces the piston towards each other causing the pinion to rotate clockwise while air is being exhausted through port A.

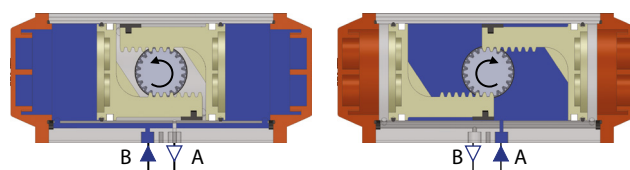
Air supplied through port A forces the piston away from each other causing the pinions to rotate counter clockwise while air is being exhausted through port B.



Clockwise Rotation (CWR)

Air supplied through port B forces the piston towards each other causing the pinion to rotate counter clockwise while air is being exhausted through port A.

Air supplied through port A forces the piston away from each other causing the pinions to rotate clockwise while air is being exhausted through port B.



The Proval actuators typically operate counter clockwise to open and clockwise to close. The direction of pinion rotation (CCW to CW) can be reversed changing the orientation of pistons as shown in the picture above.

Double Acting Actuators Torque Values (Nm)

Model	Air Supply Pressure (bar)									
	2	2,5	3	4	4,5	5	5,5	6	7	8
PA 32DA	2	3,5	4	6	7	7,5	8	9	10	12
PA 40DA	6	8	10	13	14	16	18	20	22	26
PA 52DA	8	10	12	16	18	20	22	24	28	32
PA 63DA	15	19	22	30	33	37	40	44	52	58
PA 75DA	20	26	30	40	45	50	55	60	70	80
PA 83DA	33	40	48	63	71	79	86	94	110	125
PA 92DA	45	57	68	90	102	113	124	136	158	182
PA 105DA	66	83	100	132	149	166	182	200	232	265
PA 125DA	101	126	151	202	226	252	276	301	352	402
PA 140DA	171	214	257	342	385	428	471	513	599	684
PA 160DA	266	333	399	532	600	665	732	798	932	1064
PA 190DA	426	532	639	852	958	1064	1170	1277	1490	1702
PA 210DA	532	665	798	1064	1198	1330	1463	1596	1862	2128
PA 240DA	770	962	1155	1540	1732	1924	2117	2309	2693	3078
PA 270DA	1169	1462	1755	2340	2632	2925	3217	3510	4095	4680
PA 300DA	1526	1908	2289	3052	3434	3815	4197	4578	5341	6104
PA 350DA	2285	2856	3427	4570	5141	5712	6283	6854	7997	9139
PA 400DA	3256	4069	4883	6511	7325	8139	8953	9767	11394	13022

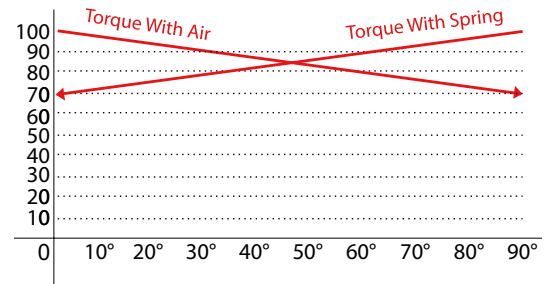


A210 Series 90° Rotation Spring Return Pneumatic Actuators Working Principles

Spring return actuators require compressed air to be supplied for the opening stroke only as they utilize pre-stressed cartridge springs for reversing the rotation.

Unlike acting actuators the output torques generated by spring return actuators depends not only on the cylinder diameter and input air pressure but also on the force created by the springs. Therefore spring return actuators are larger than the double acting actuators that produce the same torque.

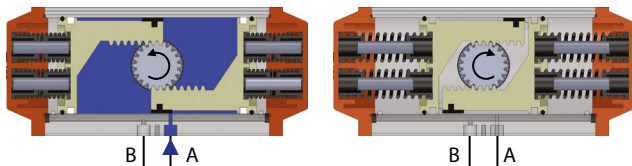
As shown in the diagram at the right, the torque curve is a straight line slopping down due to preloaded springs.



Counterclockwise Rotation (FAIL CW)

Air supplied through port A forces the piston away from each other, compressing springs and causing the pinion to rotate counter clockwise while air is being exhausted through port B.

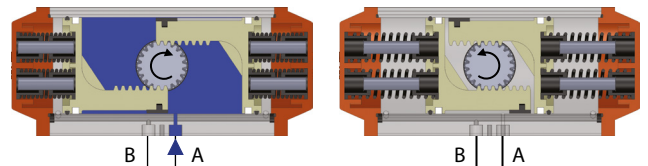
In case of loss/release of air pressure, springs forces the pistons towards each other causing the pinion to rotate counter clockwise with exhaust air existing through port A.



Clockwise Rotation (CWR)

Air supplied through port A forces the pistons away from each other, compressing springs and causing the pinion to rotate clockwise while air is being exhausted through port B.

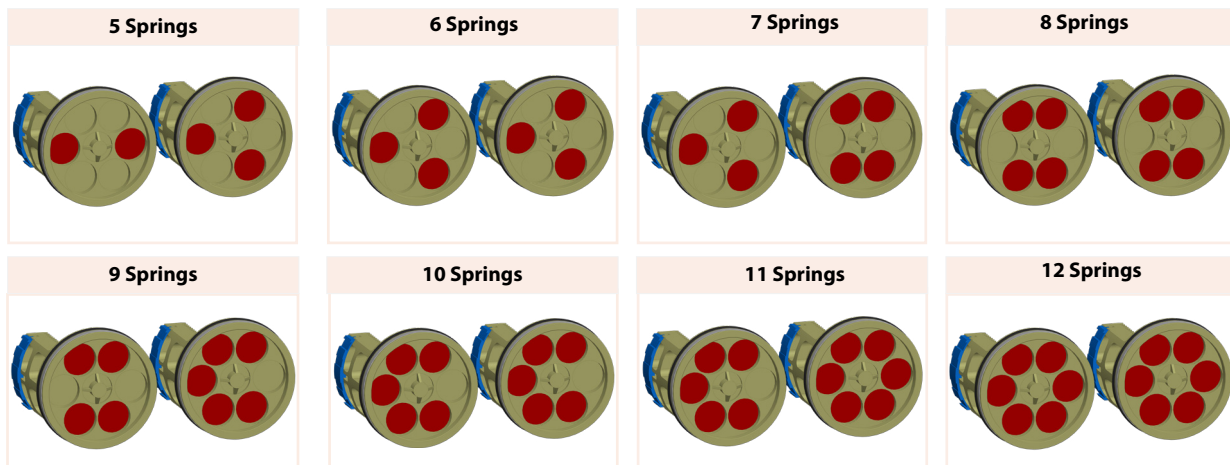
In case of loss/release of air pressure, springs forces the pistons towards each other causing the pinion to rotate counter clockwise with exhaust air existing through port A.



The proval actuators are preset for fail closed (CW) operation as standard, but can be adjusted easily for fail open (CCW) rotation.

Positioning of Springs for Spring Return Actuators

Springs must be inserted in a symmetrical manner as shown below to prevent side load from occurring between the pistons and actuators



Unless otherwise specified, Proval pneumatic actuators supplied as standard with a complete spring pack (12 springs) sized for 6 bar supply pressure. For different air supplies, actuators can be configured by removing springs from the end caps.

A210 Series 90° Rotation Single Acting Actuators Torque Output Values (Nm)

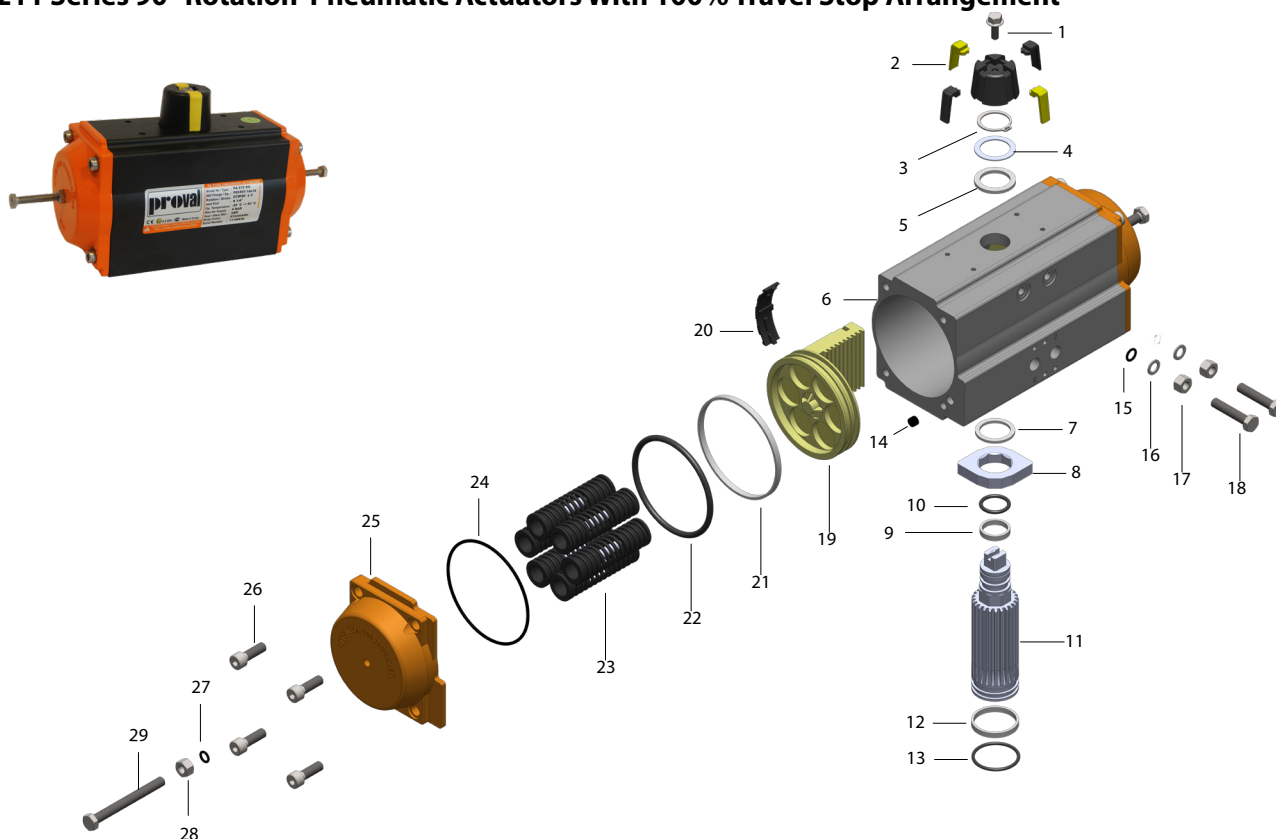
Air to Springs Torque Output Values (Nm)																Spring Torque (Nm)	
Air Supply	Nrof Springs	2,5 Bar		3 Bar		4 Bar		5 Bar		6 Bar		7 Bar		8 Bar			
Model		0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	90°	0°
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	
PA 52SR	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
								9,7	4,2	13,8	9,1	17,8	12,2	21,8	17,1	14,8	10,2
PA 63SR	5	11,4	7,7	15	11,4	22,3	16,6									10,4	6,8
	6	10,1	5,7	13,6	9,3	20,9	14,9	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
	11									21,5	13,5	28,7	20,7	36	28	43,3	35,3
									20	11,4	27,3	18,6	34,6	25,9	41,9	33,3	
																25	16,4
PA 75SR	5	14,5	10,6	19,4	15,5	29,5	25,7									14,5	10,5
	6	12,4	7,6	17,3	12,6	27,4	22,7	37,5	32,8							17,4	12,7
	7	10,4	4,8	15,2	9,7	25,3	19,9	35,4	29,9							20,3	14,8
	8			13,1	6,8	23,1	16,9	33,3	27	43,2	37	53,3	47			23,2	16,9
	9					21	14,1	31,2	24,1	41,1	34,1	51,2	44,2			26,1	19
	10					19	11,1	28,8	21,2	39	31,2	49,1	41,2	59,1	51,2	29	21,1
	11							27	18,3	37	28,3	47	38,4	57	48,4	31,9	23,2
									24,9	15,4	34,9	25,4	44,9	35,4	54,9	45,4	
																34,7	25,3
PA 83SR	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	25,3
	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
	11							43,6	27,7	59,3	43,4	75	59,1	90,6	74,8	50,6	34,8
									40,4	23,2	56,1	38,9	71,7	54,5	87,4	70,2	
																55,2	38
PA 92SR	5	33,1	22	44,2	33,2	66,8	55,9									34,4	23,3
	6	28,4	15,2	39,6	26,4	62,2	49	84,8	71,6							41,2	28
	7	23,8	8,2	34,9	19,4	57,5	42,1	80,2	64,7							48,1	32,7
	8			31,3	12,6	52,9	35,2	75,5	57,9	98,1	80,5	120,7	103			55	37,3
	9					48,2	28,4	70,9	51	93,5	73,6	116	96,1			61,9	42
	10					43,6	21,5	66,2	44,1	88,8	66,7	111,3	89,2	134	111,8	68,7	46,7
	11							61,5	37,2	84,1	59,9	106,6	82,4	129,2	105	75,6	51,4
									56,8	30,4	79,4	53	101,9	75,5	124,5	98,1	
																82,5	56
PA 105SR	5	51	33,4	67,5	49,9	100,6	83									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
	11							95,7	57	128,7	90,1	161,8	123,1	194,8	156,2	108,3	69,6
									89,4	47,5	122,5	80,6	155,5	113,6	188,6	146,7	
																118,1	75,9
PA 125SR	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
									125	63	176	113	226	163	276	213	
																188	125
PA 140SR	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
									221	118	307	203	392	289	478	374	
																310	206



A210 Series 90° Rotation Single Acting Actuators Torque Output Values (Nm)

Air to Springs Torque Output Values (Nm)																	Spring Torque (Nm)	
Air Supply	Nr of Springs	2,5 Bar		3 Bar		4 Bar		5 Bar		6 Bar		7 Bar		8 Bar				
Model		0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	90°	0°	
		Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	
PA 160SR	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	290	575	465	708	598			333	223	
	9					280	157	413	237	546	423	679	556			375	251	
	10					253	115	386	248	519	381	652	514	786	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 190SR	5	332	222	438	329	651	542									309	200	
	6	292	161	398	267	611	480	824	693							371	240	
	7	252	99	358	205	571	418	784	631							433	280	
	8			318	143	531	356	744	569	957	782	1169	995			495	320	
	9					491	295	704	507	917	720	1130	933			557	360	
	10					451	233	664	446	877	658	1090	871	1302	1084	618	400	
	11							624	384	837	597	1050	809	1263	1022	680	440	
PA 210SR	12							584	322	797	535	1010	748	1223	960	742	480	
	5	390	285	523	418	789	684									380	275	
	6	335	209	468	342	734	608	1000	874							456	330	
	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	
PA 240SR	11							725	494	991	760	1257	1026	1523	1292	836	605	
	12							670	418	936	684	1202	950	1468	1216	912	660	
	5	552	409	744	600	1129	985									554	410	
	6	470	297	662	489	1047	874	1432	1259							665	492	
	7	388	187	580	379	964	764	1349	1149							775	575	
	8			498	268	883	653	1267	1037	1652	1422	2037	1807			886	656	
	9					800	542	1185	926	1569	1311	1954	1696			998	739	
PA 270SR	10					718	431	1103	816	1488	1201	1872	1586	2257	1970	1108	821	
	11							1021	705	1406	1090	1791	1474	2176	1859	1219	903	
	12							939	594	1323	979	1708	1363	2093	1748	1330	985	
	5	903	675	1195	968	1779	1552									787	560	
	6	790	519	1083	811	1667	1396	2252	1981							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	
PA 300SR	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	
	5	1097	729													1061	730	
	6	935	494	1316	875											1273	876	
	7	772	258	1153	639	1916	1402									1485	1022	
PA 350SR	8			991	403	1754	1166	2517	1929							1697	1168	
	9					1592	930	2355	1693	3118	2456					1909	1213	
	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	
	5	1553	964													1702	1173	
	6	1292	586	1863	1157											2043	1408	
PA 400SR	7	1031	208	1602	779	2745	1929									2383	1642	
	8			1341	401	2484	1544	3626	2686							2724	1877	
	9					2224	1165	3366	2307	4508	3449					3064	2112	
	10					1936	787	3105	1929	4247	3071	5390	4214	6532	5356	3405	2346	
	11							2804	1551	3986	2693	5129	3836	6271	4978	3745	2581	
	12							2584	1172	3726	2314	4869	3457	6011	4599	4086	2816	
	7	2028	869													2880	1837	
PA 400SR	8	1736	411	2550	1225											3292	2100	
	9			2259	768	3887	2396									3703	2362	
	10			1967	311	3595	1939	5223	3567							4115	2624	
	11					3303	1482	4931	3110	6559	4738					4526	2887	
	12					3012	1025	4640	2653	6268	4281	7895	5908	9523	7536	4938	3149	
	13							4348	2195	5976	3823	7603	5450	9231	7078	5349	3412	
	14							4057	1738	5685	3866	7312	4993	8940	6621	5761	3674	
	15							3765	1281	5393	2909	7020	4536	8648	6164	6172	3937	
	16									5101	2452	6728	4079	8356	5707	6584	4199	

A211 Series 90° Rotation Pneumatic Actuators With 100% Travel Stop Arrangement



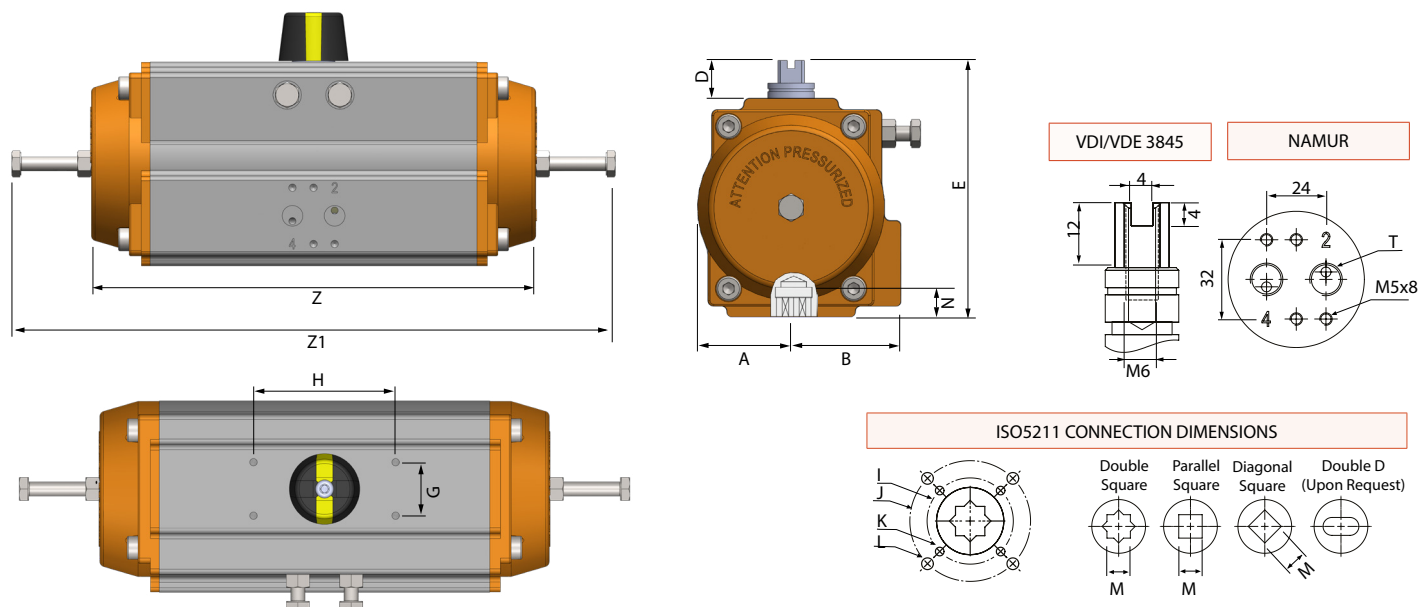
No.	Description	Qty	Standard Material	Protection	Optional Material
1	Indicator Screw	1	Stainless Steel	Galvanized	Stainless Steel
2	Indicator	1	Plastic		
3	Circlip	1	Stainless Steel		
4	Metal Washer	1	Stainless Steel		
5	Washer	1	Engineering Plastics		
6	Body	1	Extruded Aluminium Alloy	Hard Anodizing	Polyester, ENP, PFA, ECTFE Coatings
7	Inner Washer	1	Engineering Plastics		
8	Cam	1	Alloy Steel		
9	Pinion Upper Bearing	1	Engineering Plastics		Viton / Silicone
10	Pinion Upper O-Ring	1	NBR		
11	Pinion	1	Alloy Steel	Nickel Plating / Galvanized	Stainless Steel
12	Pinion Lower Bearing	1	NBR		Viton / Silicone
13	Pinion Lower O-Ring	1	Engineering Plastics		
14	Sealing Plug	2	NBR		Viton / Silicone
15	Adjustment Screw O-Ring	2	NBR		Viton / Silicone
16	Washer (Adjustment Bolt)	2	Stainless Steel		
17	Nut (Adjustment Bolt)	2	Stainless Steel		
18	Stroke Adjustment Bolt	2	Stainless Steel		
19	Piston	2	Aluminium Die Cast	Alodine Coating	
20	Guide Piston	2	Engineering Plastics		
21	Bushingslamma Washeru (Piston)	2	Engineering Plastics		
22	Piston Bearing	2	NBR		Viton / Silicone
23	Cartridge Springs	0~12	Spring Steel	Cataphoresis Coating	
24	End Cap O-Ring	2	NBR		Viton / Silicone
25	End Cap	2	Cast Aluminium	Epoxy Powder Coating	ENP, PFA, ECTFE Coatings
26	Cap Screw	8	Stainless Steel		
27	O-Ring	2	NBR		Viton / Silicone
28	Nut	2	Stainless Steel		
29	Limit Adjustment Bolt	2	Stainless Steel		



A211 Series 90° Rotation Pneumatic Actuators With 100% Travel Stop Arrangement

A211 Series pneumatic actuator has externally adjustable travel stop arrangement that permits opening of the actuator to be restricted to any position between full close ($0\pm5^\circ$) to full open ($90\pm5^\circ$) position by rotating the limit adjustment nut in clock wise or counter clockwise direction until the desired stroke (double and single acting possible) reached.

A211 Series 90° Pneumatic Actuators Dimensions and Weight Information



Dimensions(mm)

Model	A	B	D	E	G	H	I	J	K	L	M	N	Z	Z1 (0°)	Z1 (90°)	T
PA 52	30	41	20	92	30	80	ø36	ø50	M5x8	M6x10	9-11	14	146	205	236	G1/4"
PA 63	36	47	20	107	30	80	ø50	ø70	M6x10	M8x13	9-11-14	18	171	212	250	G1/4"
PA 75	42	53	20	120	30	80	ø50	ø70	M6x10	M8x13	11-14	18	186	225	263	G1/4"
PA 83	46	57	20	128	30	80	ø50	ø70	M6x10	M8x13	14-17	21	205	257	304	G1/4"
PA 92	50	58	20	136	30	80	ø50	ø70	M6x10	M8x13	14-17	21	253	276	332	G1/4"
PA 105	58	64	20	153	30	80	ø70	ø102	M8x13	M10x16	17-22	26	267	285	348	G1/4"
PA 125	68	75	20	175	30	80	ø70	ø102	M8x13	M10x16	22	26	301	349	418	G1/4"
PA 140	75	77	20	192	30	80	ø102	ø125	M10x16	M12x20	27	31	390	478	572	G1/4"
PA 160	87	87	20	217	30	80	ø102	ø125	M10x16	M12x20	27	31	451	604	714	G1/4"
PA 190	103	103	30	260	30	130		ø140		M16x25	36	40	525	634	760	G1/4"
PA 210	113	113	30	285	30	130		ø140		M16x25	36	40	532	634	758	G1/4"
PA 240	130	130	30	318	30	130		ø165		M20x25	46	50	610	658	800	G1/4"
PA 270	147	147	30	356	30	130		ø165		M20x25	46	50	722	680	850	G1/2" G1/4"

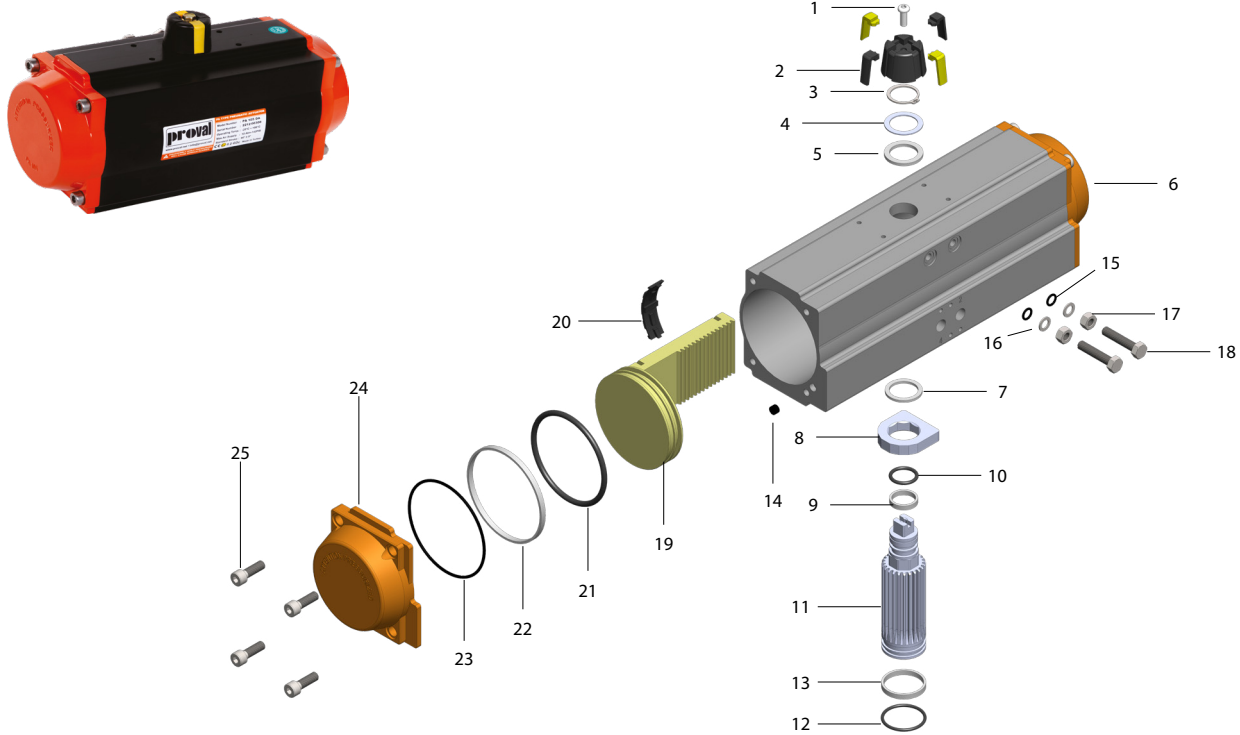
Torque Values (Nm)

Output Torque Values are identical to that of A210 Series. Please see Torque Charts on pages 62, 64, 65

Actuator Unit Weights (Kg/Pc)

Model	PA 52	PA 63	PA 75	PA 83	PA 92	PA 105	PA 125	PA 140	PA 160	PA 190	PA 210	PA 240	PA 270
Spring Return	1,6	2,3	3,0	3,7	5,6	6,8	10,6	14,7	24,0	46,8	53,8	74,0	116,6
Double Acting	1,5	2,2	2,8	3,4	5,1	6,0	9,2	12,3	19,7	39,8	44,8	59,7	94,3

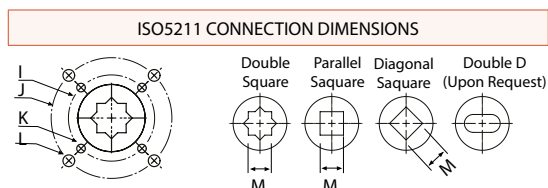
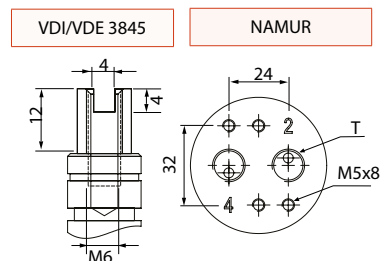
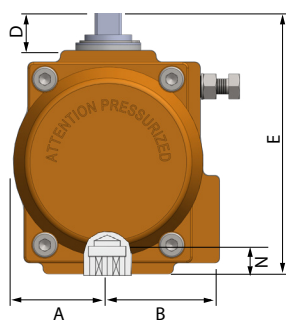
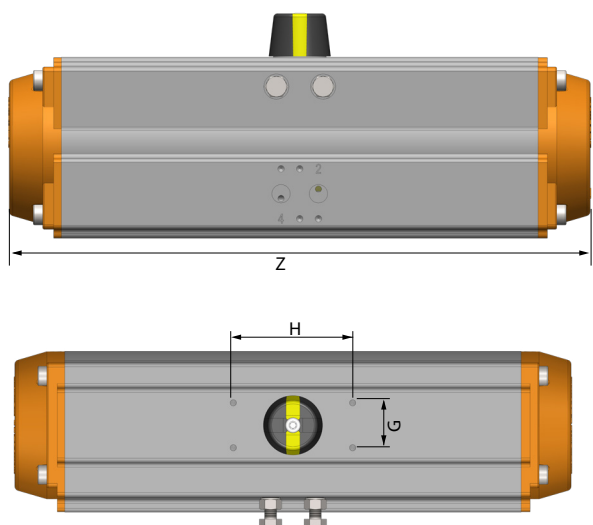
A212 Series 120°~180° Double Act. Pneumatic Actuators Part List



No.	Part Name	Qty	StandardMaterial	Protection	Optional Material
1	Indicator Screw	1	Stainless Steel		
2	Indicator	1	Plastic		
3	Circlip	1	Stainless Steel		
4	Metal Washer	1	Stainless Steel		
5	Washer	1	Engineering Plastics		
6	Body	1	Extruded Aluminium Alloy	Hard Anodizing	Stainless Steel, Epoksi/Nickel Plated
7	Inner Washer	1	Engineering Plastics		
8	Cam	1	Alloy Steel		
9	Pinion Upper Bearing	1	Engineering Plastics		
10	Pinion Upper O-Ring	1	NBR		Viton/Silicone
11	Pinion	1	Alloy Steel	Nickel Plating / Galvanized	Stainless Steel
12	Pinion Lower O-Ring	1	NBR		Viton/Silicone
13	Pinion Lower Bearing	1	Engineering Plastics		
14	Sealant	2	NBR		Viton/Silicone
15	Adjustment Screw O-Ring	2	NBR		Viton/Silicone
16	Washer (Adjustment Bolt)	2	Stainless Steel		
17	Nut (Adjustment Bolt)	2	Stainless Steel		
18	Limit Adjustment Screw	2	Stainless Steel		
19	Piston	2	Extruded Aluminium Alloy	Alodine Coating	
20	Guide Piston	2	Engineering Plastics		
21	Piston Bearing	2	Engineering Plastics		
22	Piston O-Ring	2	NBR		Viton/Silicone
23	End Cap O-Ring	2	NBR		Viton/Silicone
24	End Cap	2	Cast Aluminium	Epoxy Powder Coating	Stainless Steel
25	Cap Screw	8	Stainless Steel		



A212 Series 120°~180° Double Act. Pneumatic Actuators Dimensions



Dimensions(mm)

Model	A	B	D	E	G	H	I	J	K	L	M	N	Z 120°	Z 180°	T
PA 52	30	41,5	20	92	30	80	ø36	ø50	M5x8	M6x10	9-11	14	166	223	G1/4"
PA 63	36	47	20	107,5	30	80	ø50	ø70	M6x10	M8x13	9-11-14	18	179	246	G1/4"
PA 75	42	53	20	119,5	30	80	ø50	ø70	M6x10	M8x13	11-14	18	200	269	G1/4"
PA 83	46	57	20	128,7	30	80	ø50	ø70	M6x10	M8x13	14-17	21	222	307	G1/4"
PA 92	50	58,5	20	136,8	30	80	ø50	ø70	M6x10	M8x13	14-17	21	273	374	G1/4"
PA 105	57,5	64	20	153	30	80	ø70	ø102	M8x13	M10x16	17-22	26	291	405	G1/4"
PA 125	67,5	74,5	20	175	30	80	ø70	ø102	M8x13	M10x16	22	26	327	455	G1/4"
PA 140	75	77	20	191,5	30	80	ø102	ø125	M10x16	M12x20	27	31	426	597	G1/4"
PA 160	87	87	20	217	30	80	ø102	ø125	M10x16	M12x20	27	31	491	691	G1/4"

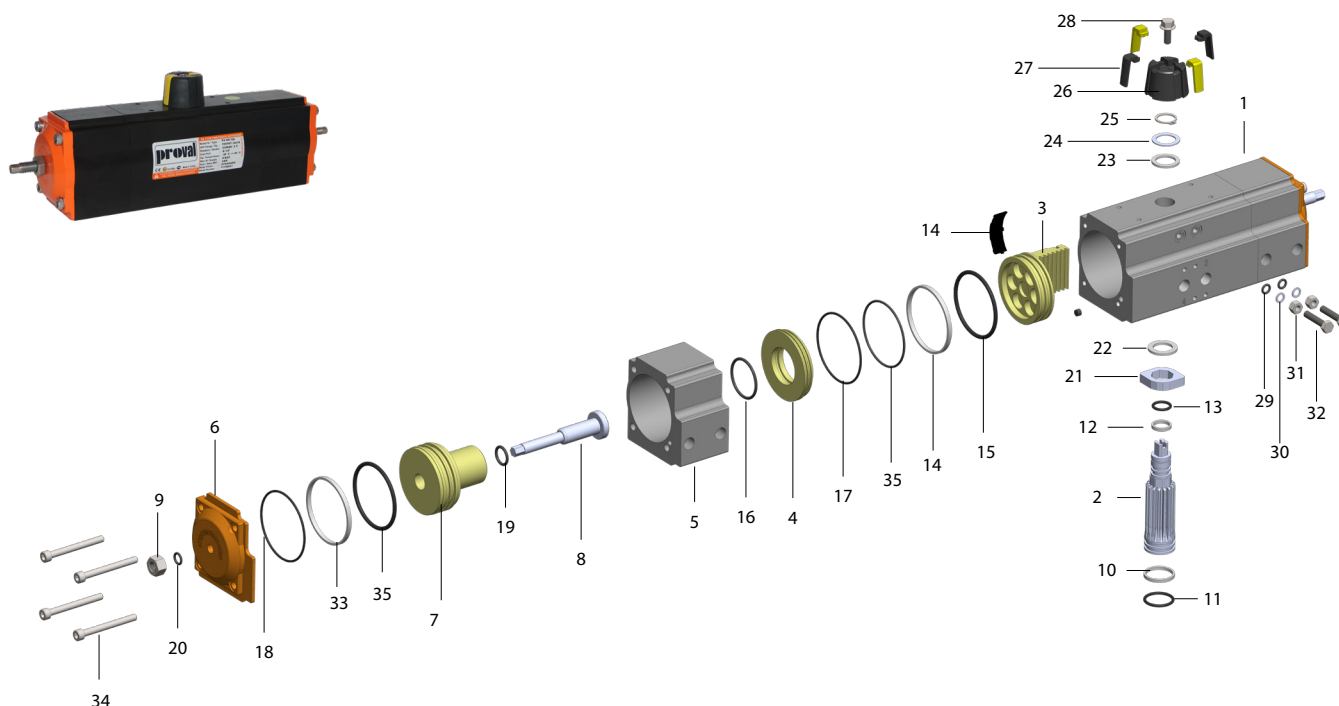
Torque Output Values (Nm)

Model	Air Supply Pressure (bar)									
	2	2,5	3	4	4,5	5	5,5	6	7	8
PA 52DA	8	10	12	16	18	20	22	24	28	32
PA 63DA	15	19	22	30	33	37	40	44	52	58
PA 75DA	20	26	30	40	45	50	55	60	70	80
PA 83DA	33	40	48	63	71	79	86	94	110	125
PA 92DA	45	57	68	90	102	113	124	136	158	182
PA 105DA	66	83	100	132	149	166	182	200	232	265
PA 125DA	101	126	151	202	226	252	276	301	352	402
PA 140DA	171	214	257	342	385	428	471	513	599	684
PA 160DA	266	333	399	532	600	665	732	798	932	1064

Actuator Unit Weights (Kg/Pc)

Model	PA 52	PA 63	PA 75	PA 83	PA 92	PA 105	PA 125	PA 140	PA 160
A212 - 120°	1,5	2,2	2,9	3,5	5,5	6,5	9,5	13	20
A212 - 180°	1,8	2,7	3,5	4,3	6,5	7,5	11,5	15,5	25,5

A213 Series 3 Position Pneumatic Actuators Part List



Part List

No	Part Name	Material	Protection	Qty
1	Body	Alu Extrusion	Anodising	1
2	Pinion	Alloy Steel	ENP Coating	1
3	Piston	Alu Die Cast	ENP Coating	2
4	Body Mid Part	Aluminium	Anodising	2
5	Body Ext. Part	Alu Extrusion	Anodising	2
6	End Cap	Die Cast Alu	Alodyne&Polyester	2
7	Auxiliary Piston	Die Cast Alu	Alodyne Coating	2
8	Shaft	Stainless Steel		2
9	Nut	Stainless Steel		2
10	Lower Stem Bushing	Engineering Plastics		1
11	Lower Stem O-Ring	NBR		1
12	Upper Stem Bushing	Engineering Plastics		1
13	Upper Stem O-Ring	NBR		1
14	Guide Piston	Engineering Plastics		2
15	Piston O-Ring	NBR		2
16	Piston Shaft O-Ring	NBR		2
17	Body O-Ring	NBR		2
18	Cap O-Ring	NBR		2

No	Part Name	Material	Protection	Qty
19	Piston Shaft O-Ring	NBR		2
20	Shaft Cap O-Ring	NBR		2
21	Cam	Alloy Steel	Galvanizing	1
22	Inner Washer	Engineering Plastics		1
23	Washer	Engineering Plastics		1
24	Metal Washer	Stainless Steel		1
25	Circlip	Stainless Steel		1
26	Indicator Body	Plastic		1
27	Indicator Part	Plastic		4
28	Indicator Screw	Stainless Steel		1
29	Adjustment Screw O-Ring	NBR		2
30	Adjustment Screw Washer	Stainless Steel		2
31	Nut	Stainless Steel		2
32	Hexagon Bolt	Stainless Steel		2
33	Outer Nut	Stainless Steel		2
34	Cap Bolt	Stainless Steel		2
35	O-Ring	NBR		2

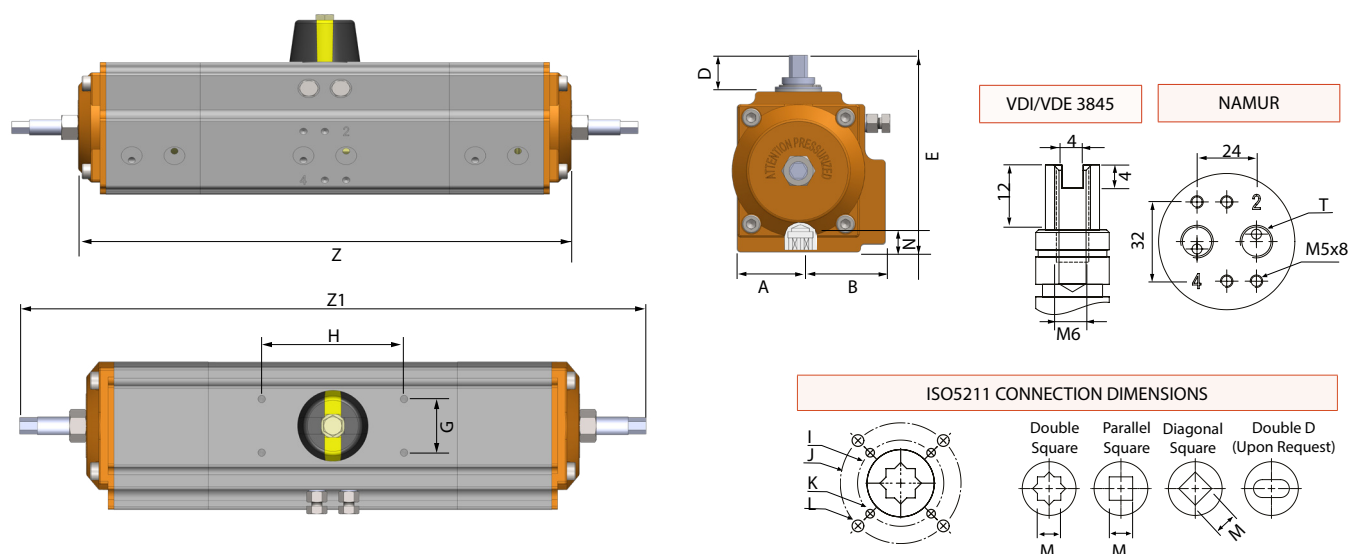


A213 Series 3 Position Pneumatic Actuators

A213 Series 3 position 90 degrees rotating rotary pneumatic actuators offers a midway position to be set in any desired position between 0 and 90 degrees by adjusting the set screws located outside of the end caps.

- Well suited for coarse-precise dosing filling, batching operations
- Field adjustable
- Double and single acting
- Namur accessory mounting configuration
- 180 degree rotation on request

A213 Series 3 Position Pneumatic Actuators Dimensions



Dimensions(mm)

Model	A	B	E	D	G	H	I	J	K	L	M	N	Z	Z1 (0°)	Z1 (90°)	T
PA 52	30	41,5	92	20	30	80	ø36	ø50	M5x8	M6x10	9-11	14	283	413	444	G1/4"
PA 63	36	47	107,5	20	30	80	ø50	ø70	M6x10	M8x13	9-11-14	18	305	445	483	G1/4"
PA 75	42	53	119,5	20	30	80	ø50	ø70	M6x10	M8x13	11-14	18	342	499	537	G1/4"
PA 83	46	57	128,7	20	30	80	ø50	ø70	M6x10	M8x13	14-17	21	377	550	597	G1/4"
PA 92	50	58,5	136,8	20	30	80	ø50	ø70	M6x10	M8x13	14-17	21	465	678	735	G1/4"
PA 105	57,5	64	153	20	30	80	ø70	ø102	M8x13	M10x16	17-22	26	492	718	781	G1/4"
PA 125	67,5	74,5	175	20	30	80	ø70	ø102	M8x13	M10x16	22	26	553	807	876	G1/4"
PA 140	75	77	191,5	20	30	80	ø102	ø125	M10x16	M12x20	27	31	720	1051	1145	G1/4"
PA 160	87	87	217	20	30	80	ø102	ø125	M10x16	M12x20	27	31	825	1209	1319	G1/4"

Torque Values (Nm)

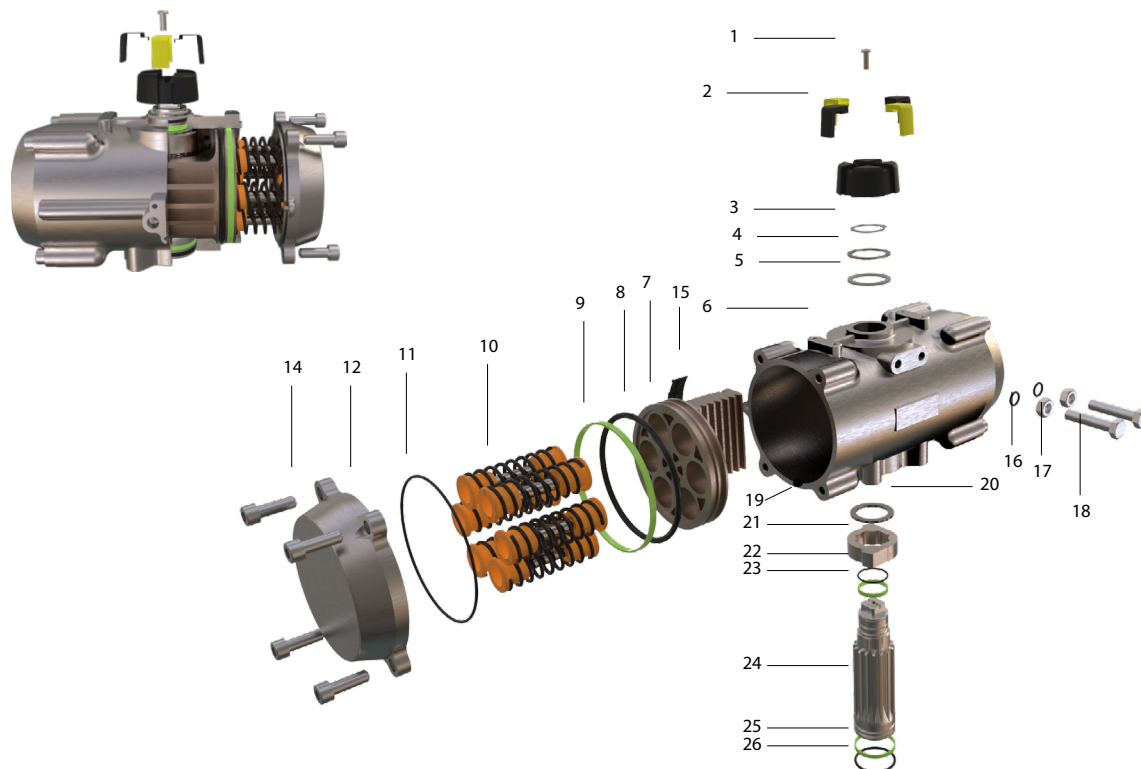
Output torque values are identical to that of A210 Series. Please see torque charts on pages 62, 64, 65

Actuator Weights (Kg/Pc)

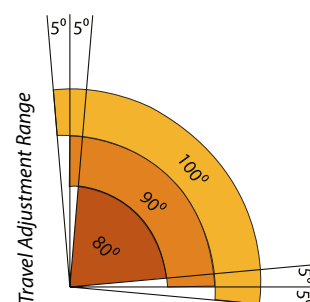
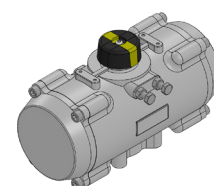
Model	PA 52	PA 63	PA 75	PA 83	PA 92	PA 105	PA 125	PA 140	PA 160
A213-DA	3,2	4,8	6,2	7,5	11,4	13,5	20,6	27,4	43,4
A213-SR	3,3	4,9	6,4	7,8	11,9	14,3	22,0	29,8	47,7

A215 Series Pneumatic Actuators

Proval A215 Series innovative, compact design pneumatic rack and pinion rotary actuators including all critical components are manufactured in-house using dedicated state-of-the-art CNC machines following ISO quality assurance standards. Proval pneumatic actuators that can be set either to fail-open or fail-close, comes in 12 different sizes in both double and single acting types. This Series of actuators having torque figures in ranges 20 to 9767 Nm are well suited to operate on part-turn valves such as plug, ball and butterfly valves.

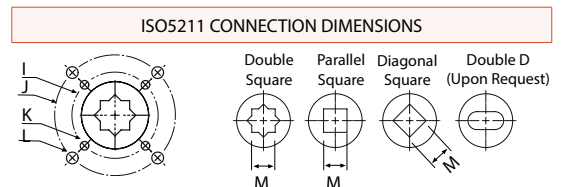
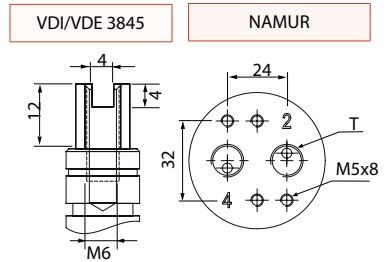
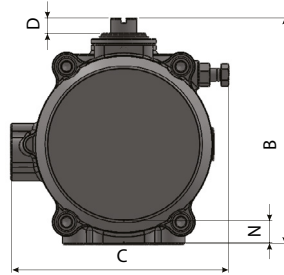
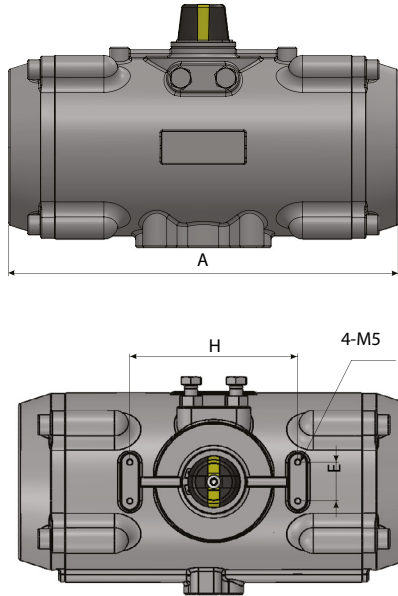


No.	Description	QTY.	Standards Material
1	Indicator Screw	1	Plastic
2	Indicator	1	Plastic
3	Circlip	1	Stainless steel
4	Washer	1	Stainless steel
5	Outside Washer	1	Engineering Plastics
6	Body	1	Stainless steel
7	Piston	2	Stainless steel
8	Piston O-ring	2	Viton/NBR
9	Piston Bearing	2	Engineering Plastics
10	Spring	0-12	Spring Steel
11	End-Cap O-ring	2	Viton/NBR
12	End-Cap	2	Stainless steel
13	Stop screw(Piston)	2	Stainless steel
14	End-Cap Stop Screw	8	Stainless steel
15	Guide Piston	2	66 Nylon 66
16	O-ring(Adjust screw)	2	NBR
17	Nut(Adjust screw)	2	Stainless steel
18	Adjust screw	2	Stainless steel
19	Plug	2	NBR
20	Inside Washer	1	Engineering Plastics
21	Cam	1	Stainless steel
22	O-ring(Top)	1	Viton/NBR
23	Bearing Top	1	Engineering Plastics
24	Pinion	1	Stainless steel
25	Bearing Bottom	1	Engineering Plastics
26	O-ring Bottom	1	Viton/NBR





A215 Series 90° Rotation Pneumatic Actuators Dimensions and Weight Information



Dimensions(mm)

Model	Dimension (mm)												
	A	B	C	D	E	H	I	J	K	L	M	N	T
PA 45	133	64	70	20	30	80	Φ36	Φ50	4-M5×7.5	4-M6×10	11	14	G 1/4"
PA 52	146	72	79	20	30	80	Φ36	Φ50	4-M5×7.5	4-M6×10	11	14	G 1/4"
PA 63	173	88	92	20	30	80	Φ50	Φ70	4-M6×10	4-M8×13	14	18	G 1/4"
PA 83	204	108	113,5	20	30	80	Φ50	Φ70	4-M6×10	4-M8×13	17	21	G 1/4"
PA 105	270	133	137	20	30	80	Φ70	Φ102	4-M8×13	4-M10×16	22	26	G 1/4"
PA 125	302	155	156,5	20	30	130	Φ70	Φ102	4-M8×13	4-M10×16	22	27	G 1/4"
PA 140	394	172	172,5	20	30	130	Φ102	Φ125	4-M10×16	4-M12×20	27	32	G 1/4"
PA 160	456	198	193	20	30	130	Φ102	Φ125	4-M10×16	4-M12×20	27	34	G 1/4"
PA 210	568	257	254	30	30	130	-	Φ140	-	4-M16×24	36	40	G 1/4"
PA 240	608	291	293	30	30	130	-	Φ165	-	4-M20×25	46	50	G 1/4"
PA 300	820	354	354	30	30	130	-	Φ165	-	4-M20×25	46	60	G 1/2"
PA 400	934	464	435	30	30	130	Φ165	Φ254	4-M20×25	8-M16×25	55	60	G 1/2"

Actuator Unit Weights (Kg/Pc)

Model	PA 45	PA 52	PA 63	PA 83	PA 105	PA 125	PA 140	PA 160	PA 210	PA 300
Spring Return	1.8	2.5	3.79	6.5	10	13.5	15.5	28	71.5	170.5
Double Acting	2.1	2.63	3.96	6.8	10.8	13.95	18.65	31.7	80.0	198.1

Air Consumption of Actuators (Lt/Stroke)

Model	PA 45	PA 52	PA 63	PA 83	PA 105	PA 125	PA 140	PA 160	PA 210	PA 300
Opening (Lt)	0.08	0.12	0.21	0.43	0.95	1.60	2.50	3.70	7.50	23.8
Closing (Lt)	0.11	0.16	0.23	0.47	0.88	1.40	2.20	3.20	7.50	29.7

Low Temperature, Silicone Leaktightness



High Temperature, FKM(Viton) Leaktightness



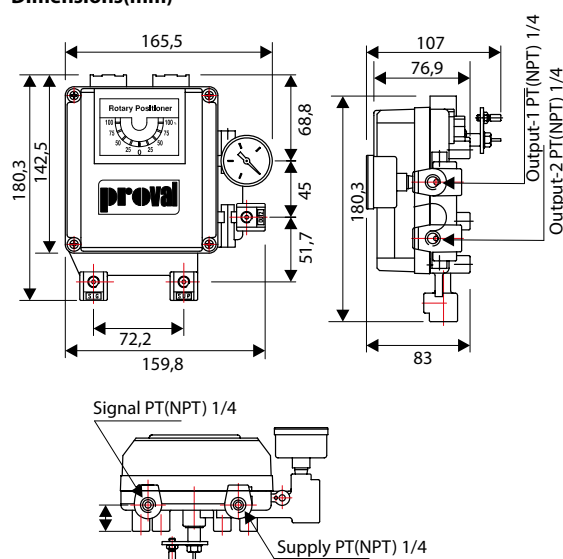
A230 Series Electro-Pneumatic Positioners

E/P Positioners are working with DC 4-20 mA or 0-10 Volt input signal and generate modulating control on rotary or linear valves.

A230 PRE positioners can be applied on both double acting and single acting actuators.

A230 PRP Pneumatic Positioners (P/P): Pneumatic positioners are working with 3-15 PSI air signal and can be applied both on double and single acting actuators.

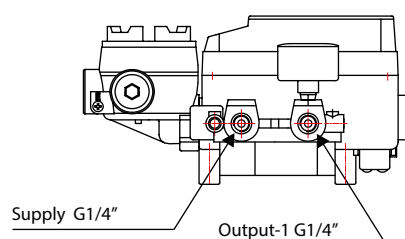
Dimensions(mm)



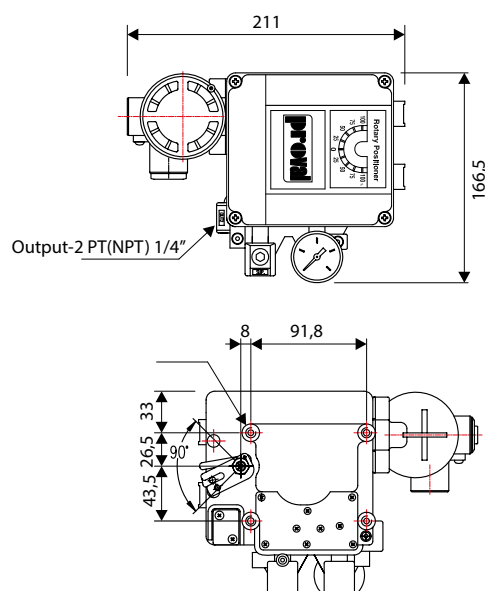
A230 PRP

Description	Proval Brand, A230 Series Pneumatic Positioners
Type	Rotary Type (90° Part Turn)
Body Material	Powder Epoxy Coated Aluminium Die Casting
Input Signal	DC 4/20 mA
Output Signal	Optionally DC 4/20 mA or 0-1 kOhm
Protection Class	IP67
Air Consumption	3 Lt/min
Working Temp.	-20° C / +70° C
Flow Capacity	80 Lt/min

A230 PRE Electro-Pneumatic Positioners (E/P): E/P Positioners are working with DC 4-20 mA or 0-10 Volt input signal and generate modulating control on rotary or linear valves. A230 PRE positioners can be applied on both double acting and single acting actuators.



Dimensions(mm)



Description	Proval Brand, A230 Series Pneumatic Positioners
Type	Rotary Type (90° Part Turn)
Body Material	Powder Epoxy Coated Aluminum Die Casting
Input Signal	DC 4/20 mA
Output Signal	Optionally DC 4/20 mA or 0-1 kOhm
Protection Class	IP67
Air Consumption	3 lt/min
Working Temp.	-20° C / +70° C
Flow Capacity	80 lt/min



A235 SS0 Series Digital Positioners

A235 SS0 Series positioners are intelligent proportional valve control devices that meet dynamic performance and precise adjustment with piezoelectric technology and optimized automatic calibration program.

General Specifications,

- Fast commissioning with automatic calibration.
- Precise control performance and high dynamic response
- Easy calibration with LCD screen and keypad
- Compatible with single and double acting actuators
- Very low air consumption due to piezoelectric valve system
- Built-in pressure regulator to eliminate changes in supply air pressure
- Trouble-free operation on any size actuator
- High resistance to shocks and vibrations
- Mounting on linear actuators according to IEC 534

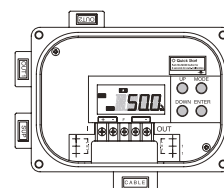
Optional Specifications

- Explosion Proof
- HART Protocol
- 2 x Alarm Switch



Technical Specifications,

Input Signal	4 – 20 mA @ 24 VDC
Voltage Drop	8.5 VDC @ 20 mA (425 Ω)
Min./ Max. Current	3.6 mA / 50 mA
Required Load Voltage ($\approx \Omega$ @20mA)	With HART : 8.5V ($\approx 425 \Omega$)
	Without HART: 9.2V ($\approx 460 \Omega$)
Air supply Pressure	1.4 - 7.0bar (20-100psi) Filtered compressed dry and non-oiled air
Output Pressure	0-100% Supply air pressure / single or double action
Shut-Off Valve	0 - 5% Range of position signal
Air Capacity	1.4 bar (20 psi) Air Supply, 6.6 kg/h=5.4N nM ³ h=3scfm
Air Consumption	<0.04kg/Hour
Humidity Limits	< 90% RH, Non-condensing
Stroke	5-80mm (Max 150mm)
Adjustable Speed	1 - 1000 (Min 1, Max 1000)
LCD Screen	4-Digit LCD Screen
Scan Time	2ms
Action Valve Action	0-100% Position Control / Direct Action (DA) / Reverse Action (RA)
Characteristic Curve	Linear, E.Q.% (1:25 or 1:50), Quick Open
	Linearity $\leq$ 0.3% / Sensitivity $\leq$ 0.2% / hysteresis $\leq$ 0.2%
Operating Temperature	-20 ~ +80°C
Protection Class	Standard IP66, Optional Explosion Proof Ex ia / Ex d
Body Material	Powder Coated Aluminum die-cast
Pneumatic Connections	G 1/4 or 1/4 NPT
Electrical Connections	2 X G 1/2" or 1/2" NPT
Weight	2.5 kg

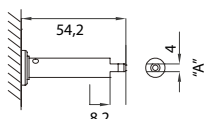
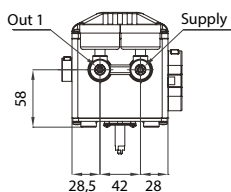
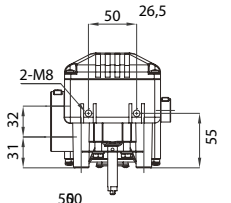
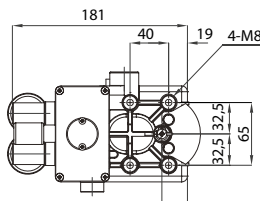
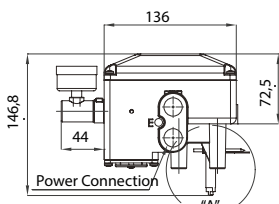
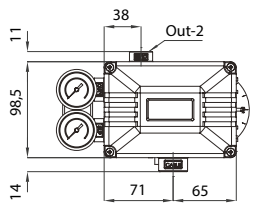


A235 Series Digital
Positioner Menu

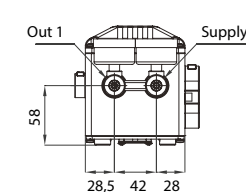
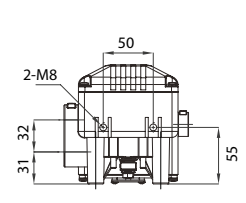
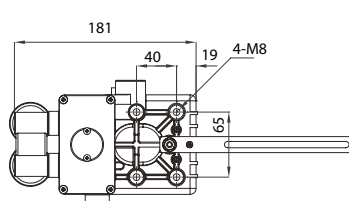
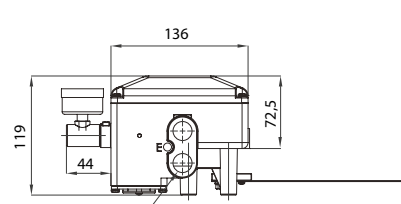
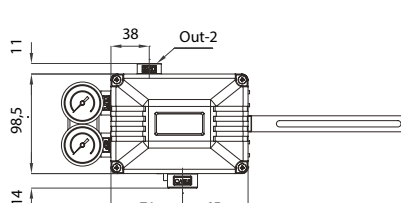


A235 Series Ex d
Explosion Proof Positioner

A235 SS0 Rotary Pozisyonerler



A235 SS0 Lineer Pozisyonerler



A240 NAMUR Type 3/2 - 5/2 Convertible Solenoid Valves

Proval A240 type general purpose 3/2 way and 5/2 way solenoid valves with namur interface configuration are interchangeable for use on either double and single acting pneumatic actuators.

General Features,

- * Direct mounting on NAMUR interface actuators
- * Easy convertible between 3/2 and 5/2 way(DA or SR) by replacing the o-ring position
- * Lockable manual operator
- * Standard IP65 enclosure single coil (spring return)

Technical Specifications,

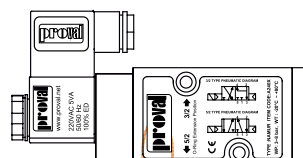
Item Code	A240-E	A240-B	A240-A	A240-C	A240-D
Power Supply	12 VDC	24 VDC	24 VAC	110 VAC	220 VAC
Power Consumption	3W	3W	5VA	5VA	5VA
Air Supply	G 1/4"				
Working Pressure	3 - 8 bar				
Protection Class	IP65				
Working Temperatur	-20° C ~ + 80° C				
Flow Capacity	720 Lt/min				

Spare Parts for Solenoid Valves

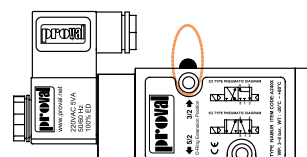
Model	Description
A240PB	9mm Coil, IP65
A240PBX	9mm Coil, Exproof
A240SP	Standard Socket
A240SPL	Socket with LED



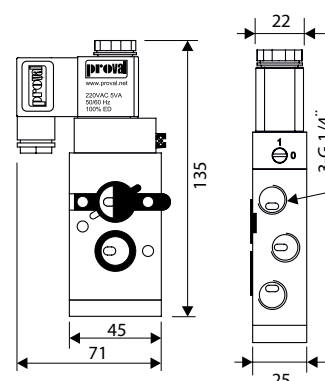
A240 SP



5/2 Way Function Solenoid Valve

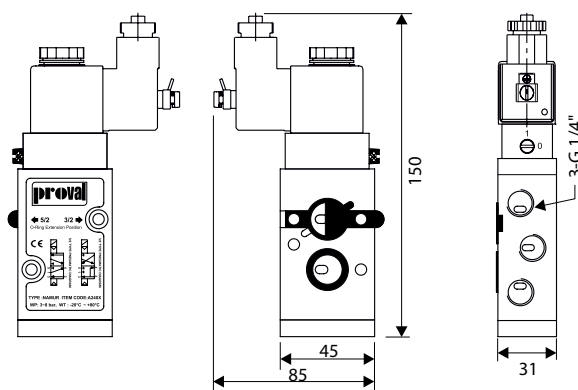


3/2 Way Function Solenoid Valve

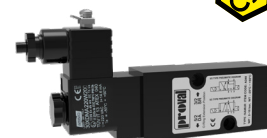


A240X Hazardous Area NAMUR Type 3/2 - 5/2 Convertible Solenoid Valves

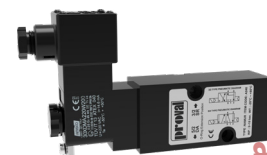
Proval A240X type 3/2 way and 5/2 way solenoid valves with namur interface configuration are interchangeable for use on either double and single acting pneumatic actuators in potentially explosive environments.



A240PBXBM



Encapsulated Coil, Ex m II T5



A240X-BDM/CDM/DDM Flameproof Coil, Ex db mb IIC T5



A240CX-BIA with Intrinsically Safe Coil Solenoid Valve, Ex ia IIC T6



A240CX-BD/CD/DD Flameproof Coil, Ex db IIC T6

Item Code	A240CX-BIA	A240X-BM	A240X-CM	A240X-DM	A240X-BDM	A240X-CDM	A240X-DDM	A240CX-BD	A240CX-CD	A240CX-DD
Power Supply	24 VDC	24 VDC	110 VAC	220 VAC	24 VDC	110 VAC	220 VAC	24VDC	110VAC	220VAC
ATEX Certificate	Ex ia IIC T6 Ga	Ex II 2G Ex mb IIC T5 Gb Ex II 2D Ex tb IIIC T95			Ex II 2G Ex db mb IIC T4/T5 Gb Ex II 2D Ex tb IIIC T130/T95°C IP66 Db			Ex II G Ex db IIC T6 Gb		
ATEX Group	Group II	Group II			Group II			Group II		
Category	2 G/D	2 G/D			2 G/D			2 G		
Zone	Zone 1,2 / 21,22	Zone 1,2 / 21,22			Zone 1,2 / 21,22			Zone 1,2		
Explosion Group	IIC	IIC			IIC			IIC		
Heat Class	T6	T5			T5			T6		
Air Supply	G 1/4"									
Working Pressure	3 - 8 bar									
Flow Capacity	720 Lt/min									

Notes : For further technical details please visit our web site.



A244 NAMUR Type 5/3 Dual Coil Solenoid Valves

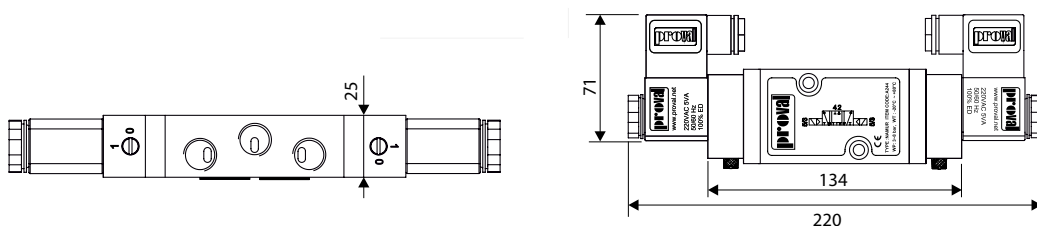
A244 Series valves are suitable for pneumatic actuators with NAMUR interface, spring return to middle position, with manual override and centre closed.

Technical Specifications,

Item Code	A244-E	A244-B	A244-A	A244-C	A244-D
Power Supply	12 VDC	24 VDC	24 VAC	110 VAC	230 VAC
Power Consumption	3W	3W	5VA	5VA	5VA
Air Supply	G 1/4"				
Working Pressure	3 - 8 bar				
Protection Class	IP65				
Working Temperature	-20° C ~ + 80° C				
Flow Capacity	720 Lt/min				



NAMUR Type Dual Coil Solenoid Valves



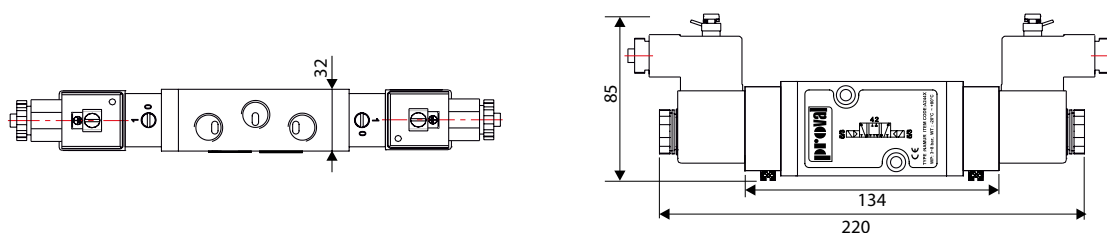
A244X Hazardous Area NAMUR Type 5/3 Dual Coil Solenoid Valves

A244X Series valves are suitable for NAMUR interface pneumatic actuators for use in potentially explosive areas, spring return to middle position, with manual override, centre closed with intrinsically safe (ia) or encapsulated (m) ATEX coils.

Item Code	A244CX-BIA	A244X-BIA	A244X-BM	A244X-CM	A244X-DM	A244X-BDM	A244X-CDM	A244X-DDM
Power Supply	24 VDC	24 VDC	24 VDC	110 VAC	220 VAC	24 VDC	110 VAC	220 VAC
ATEX Certificate	Ex ia IIC T6 Ga	Ex ia IIB T6 Ga	Ex II 2G Ex mb IIC T5 Gb Ex II 2D Ex tb IIIC T95			Ex II 2G Ex db mb IIC T4/T5 Gb Ex II 2D Ex tb IIIC T130/T95 °C IP66 Db		
ATEX Group	Group II	Group II	Group II			Group II		
Category	2 G/D	2 G/D	2 G/D			2 G/D		
Zone	Zone 1,2 / 21,22	Zone 1,2 / 21,22	Zone 1,2 / 21,22			Zone 1,2 / 21,22		
Explosion Group	IIC	IIC	IIC			IIC		
Heat Class	T6	T6	T5			T5		
Air Supply	G 1/4"							
Working Pressure	3 - 8 bar							
Flow Capacity	720 Lt/min							

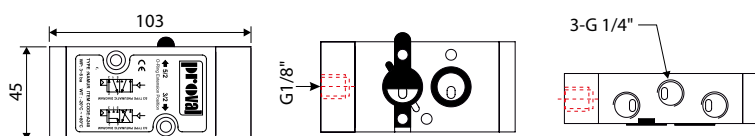


NAMUR Type Dual Coil ATEX Solenoid Valves



A246 NAMUR Type 3/2 - 5/2 Convertible Air Pilot Operated Solenoid Valves

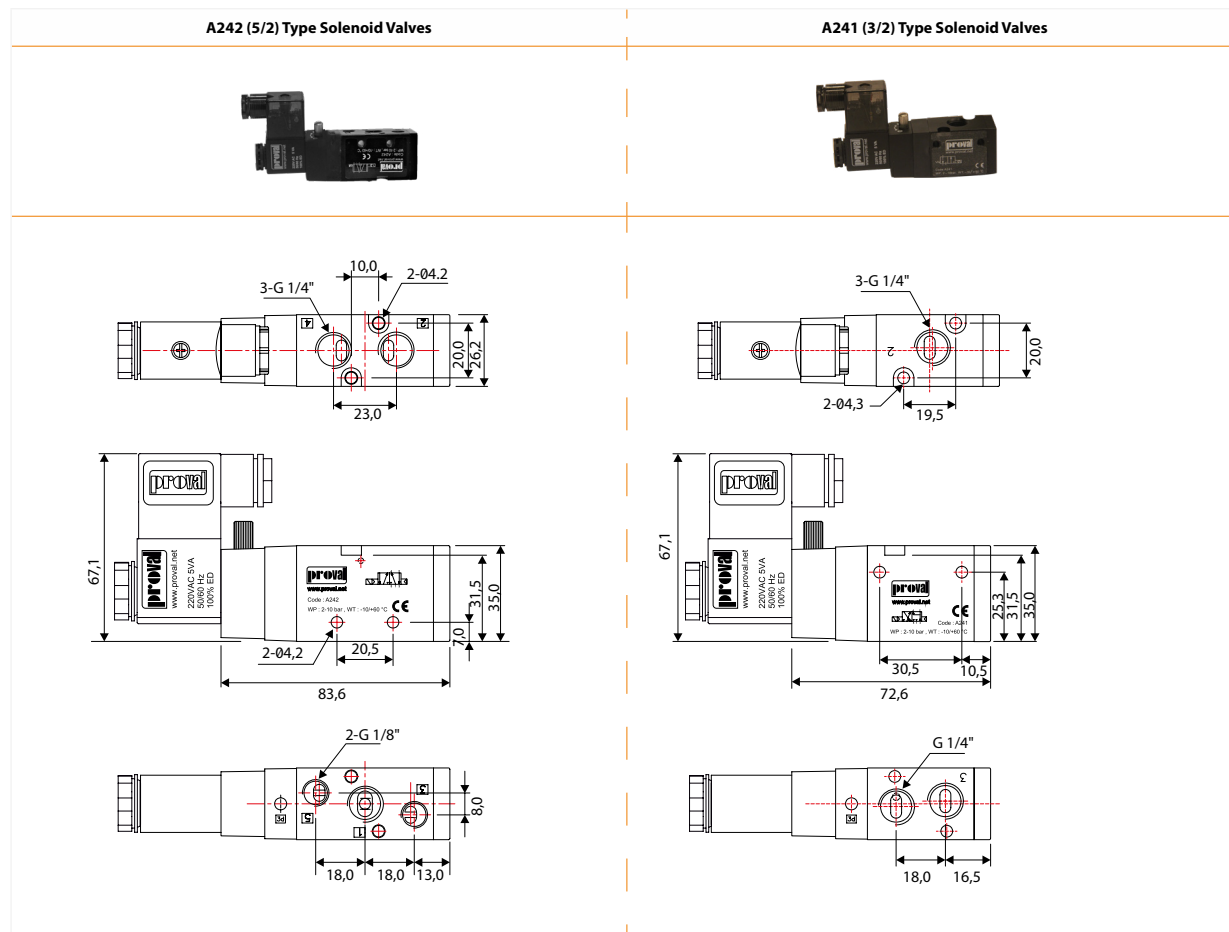
Pneumatically actuated, 3/2 - 5/2 way convertible NAMUR solenoid valves with mechanical spring, actuated by permanent signal are used on pneumatic actuators for switching the valve position.



NAMUR Type Air Pilot Solenoid Valves

A241 (3/2) / A242 (5/2) Type Solenoid Valves

Proval A241 and A242 Series air solenoid valves can be used single or assembled on a rack from 2 to 10 pcs.



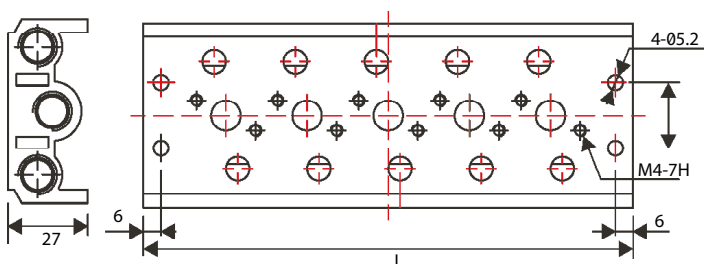
Material List

Part Name	Material
Body	Hard Anodised Aluminum Extrusion
Piston	Aluminum Extrusion
Screw	AISI316 Stainless Steel
Spring	AISI316 Stainless Steel
Seal	NBR

Technical Specifications

Power Supply	12 VDC	24 VDC	24 VAC	110 VAC	220 VAC
Power Consumption	3W	3W	5VA	5VA	5VA
Air Supply	G 1/4"				
Working Pressure	2 - 10 bar				
Protection Class	IP65 (Optional Eex m II T5 ATEX)				
Working Temperature	-20 °C ~ + 80 °C				
Flow Capacity	720 Lt/min				

5/2 Type Valve Rack



Nr. of Valves	2	3	4	5	6
L (mm)	56	84	111	139	166
Nr. of Valves	7	8	9	10	
L (mm)	194	211	249	276	

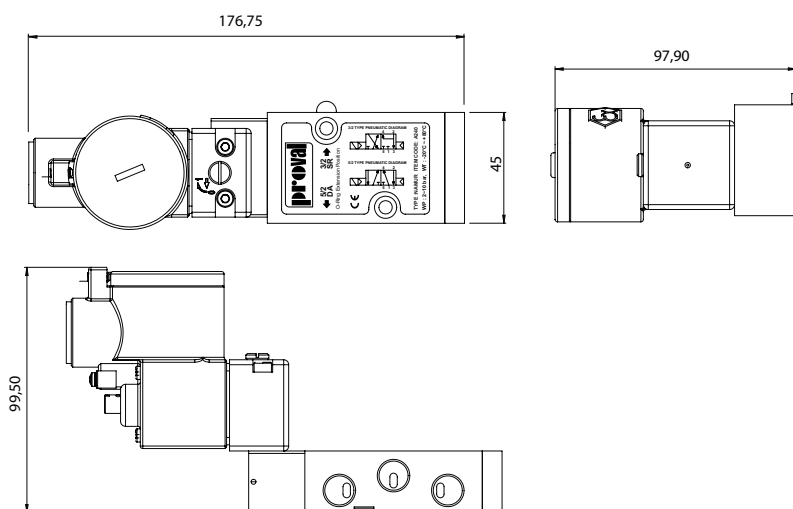


A240CX-BD/CD/DD Flameproof Coil Solenoid Valves Ex db IIC T6 Gb

A240X-BD/CD/DD type 3/2 way and 5/2 way solenoid valves with namur interface configuration are interchangeable for use on either double or single acting pneumatic actuators in potentially explosive environments. CNOMO based flameproof coils are available with M20x1,5 or 1/2" NPT threaded connection for use with standard or armoured cable glands (supplied optionally)



Dimensions(mm)



Technical Specifications;

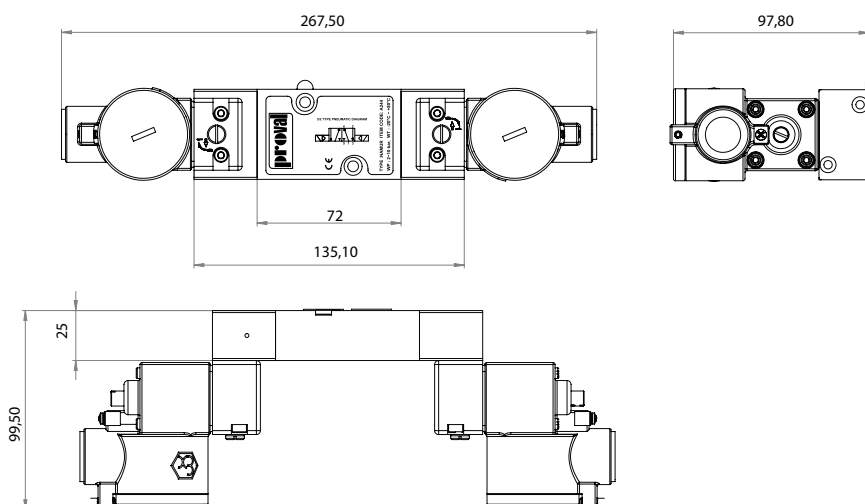
Type	NAMUR
Power Supply	24VDC / 230VAC
Function	3/2 or 5/2
Working Pressure	2-10 bar
Air Supply	G1/4" / NPT 1/4"
Electrical Connection	M20x1,5 / 1/2" NPT
Working Temperatur	-20 °C ~ + 60 °C
Flow Capacity	720 Lt/min
ATEX Certificate	Ex II 2G Ex db IIC T6 Gb

A244CX-BD/CD/DD Flameproof Dual Coil Solenoid Valves Ex db IIC T6 Gb

A244CX Series valves are suitable for NAMUR interface pneumatic actuators for use in potentially explosive areas, spring return to middle position, with manual override, centre closed with flameproof ATEX coils. CNOMO based flameproof coils are available with M20x1,5 or 1/2" NPT threaded connection for use with standard or armoured cable glands (supplied optionally)



Dimensions(mm)



Technical Specifications;

Type	NAMUR
Power Supply	24VDC / 230VAC
Function	5/2 or 5/3
Working Pressure	2-10 bar
Air Supply	G1/4"
Electrical Connection	M20x1,5 / 1/2" NPT
Working Temperatur	-20 °C ~ + 60 °C
Flow Capacity	720 Lt/min
ATEX Certificate	Ex II 2G Ex db IIC T6 Gb

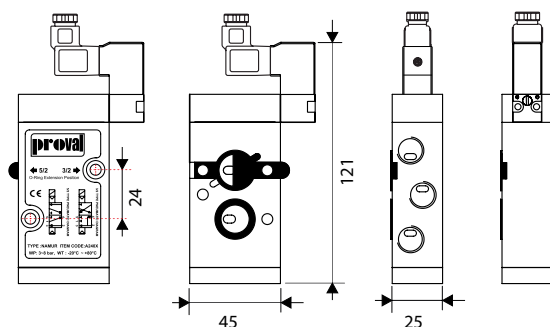
A240-AS-i Namur Type Low Current Solenoid Valve and Sensors

Solenoid valves with low power and current values for AS-i (Actuator Sensor Inference) network solutions are combined with compatible switches to control the on/off commands of the valves on the AS-i circuit and transmit the open-closed signals to the bus circuit.

By means of a single AS-i master unit, 62 valves can be controlled at a distance of max. 100 mt from a through 2-core cable. An additional 100 mt distance can be obtained with the repeater. AS-i solutions offer customers easy and flexible cabling and practical troubleshooting.



Dimensions(mm)

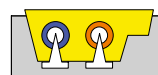


Technical Specifications,

Item Code	A240-B-ASI
Power Consumption	1~3 W (DC)
Working Pressure	2-8 bar
Protection Class	IP65
Working Temp.	-20° C ~ +80° C
Geçiş Debisi	750 lt/Min

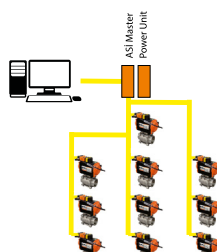
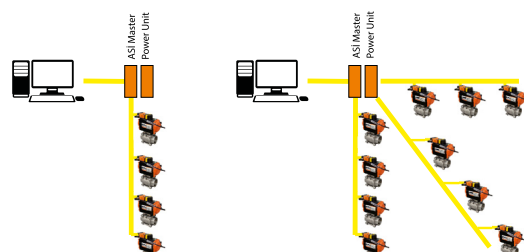


AS-I Cable



AS-I Cable with Connector

Typical AS-i Network Application Examples,



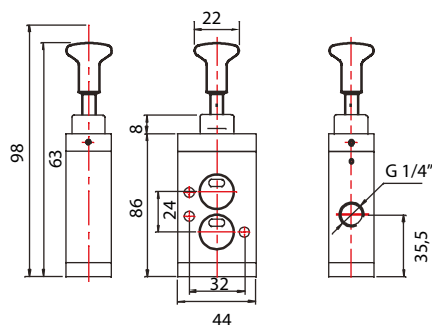
AS-i Network Compatible Actuated Valves

A175 Actuator Air Supply Block & Bleed Valves

A175 Pneumatic supply air block and bleed valves are used as a manual override bypass valve between pneumatic actuators and a Namur solenoid valve. Under normal operation, air flows freely into the actuator. In case of maintenance or manual operation via manual override gearbox (A280 Series), the spool is shifted to block pressure ports and exhaust the pressurised air from chambers of actuator for safe manual operation.

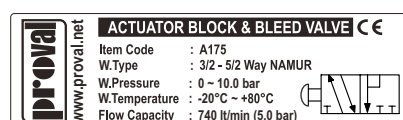


Dimensions(mm)



Material List

Part Name	Material
Body	Anodised Aluminum
Spool	Anodised Aluminum
Seal	NBR
Flow Orifice	Ø5.6mm
Working Temp.	-20°C ~ +80°C
Working Pressure	0 ~ 8 bar
Working Type	3/2 - 5/2 Valves





A250 Limit Switch Boxes

PROVAL A250 Series limit switch boxes are used on rotary valve actuators to generate open/close signal and monitor the valve position.

General Features,

- 3D continuous visual position indicator
- Easily adjustable spring forced CAM system
- Standard IP67 enclosure
- 2 pcs Open/Close mechanical or proximity switches
- Easily adjustable brackets and suitable for all NAMUR VDI/VDE interface actuators
- Terminal strip with 8 points angled to allow for easy wiring and direct connection of solenoid valve inside the switch box.

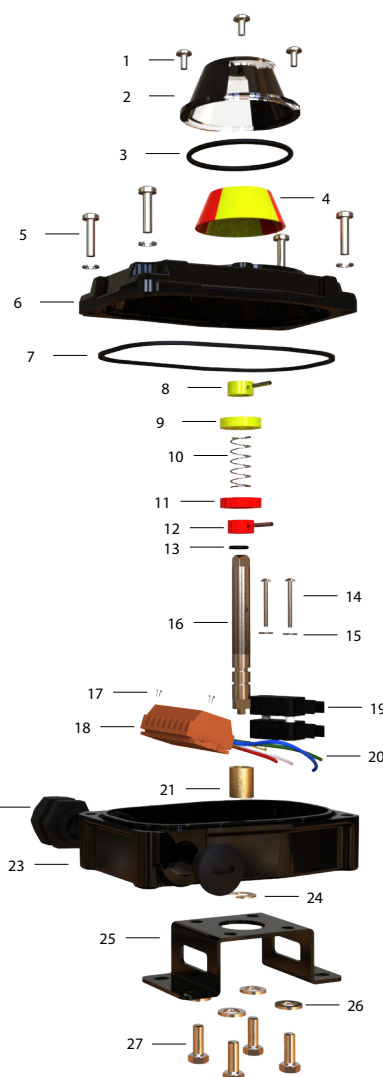
No	Part Name	Material	Qty
1	Screw	AISI304	3
2	Cover	ABS	1
3	Body Seal Ring	NBR	1
4	O/C Indicator	ABS	1
5	Cap Screw	AISI304	4
6	Cap	Alu Die Cast	1
7	Body Seal Ring	NBR	1
8	Cam	PA66	1
9	Cam	PA66	1
10	Spring	AISI304	1
11	Close Cam	PA66	1
12	Close Cam Fixing	PA66	1
13	O-Ring	NBR	1

No	Part Name	Material	Qty
14	Switch Screw	AISI304	2
15	Switch Screw Washer	AISI304	2
16	Pinion	AISI304	1
17	Terminal Block Screw	AISI304	2
18	Terminal Block	PA66	1
19	Limit Switch	Plastic	2
20	Cable Set	Copper & Plastic	1
21	Bushing	Bronz	1
22	Bling Plug	Polyamid	1
23	Body	Alu Die Cast	1
24	Circlip	AISI304	1
25	Bracket	Epoxy Coated Bracket	1
26	Washer	AISI304	4
27	Screw	AISI304	4

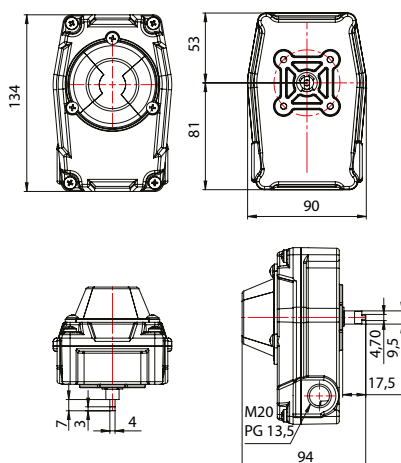


A250 PSM-PSP

Standard Switch Boxes



Dimensions(mm)



Model	Switch Brand	Switch Type
A250 PSM-1	Zipper	Micro
A250 PSM-2	Crouzet	EF83161.3
A250 PSP-1	P+F	NBB2-V3-E2
A250 PSP-2	P+F	NJ2-V3-N
A250 PSP-3	P+F	SJ3,5-N
A250 PSP-4	IFM	ISS076
A250 PSP-5	P+F	NBB3-V3-Z4

Bracket Dimensions

Model	Bracket Type	Mounting Dimension
MB-1		30x80 H: 20
MB-2		30x80 - 30x130 H: 20-30 Adjustable
MB-3		30x80 - 30x130 H: 40-50 Adjustable

Standard Indicator



L Port Valve Indicator



T Port Valve Indicator

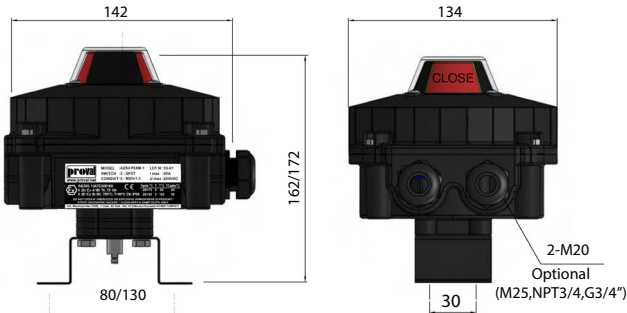


A250 Series Explosion Proof Limit Switch Boxes

A250 PPROVAL A250 PSX Series limit switch boxes are designed to integrate with pneumatically actuated quarter turn valve packages installed in potentially explosive environments and provide both visual and electrical indication of valve position.

General Features,

- Powder coated, corrosion resistant die-cast alu body
- 3D continuous visual position indicator
- Easily Adjustable, spring loaded cams
- Standard IP66 enclosure
- 2 Pc mechanical switches or Inductive sensors
- Easily adjustable brackets and suitable for all NAMUR VDI/VDE interface actuators
- Terminal strip with 8 points to allow for easy wiring and direct connection of solenoid valve inside the switch box.
- Applicable also on manual valves.



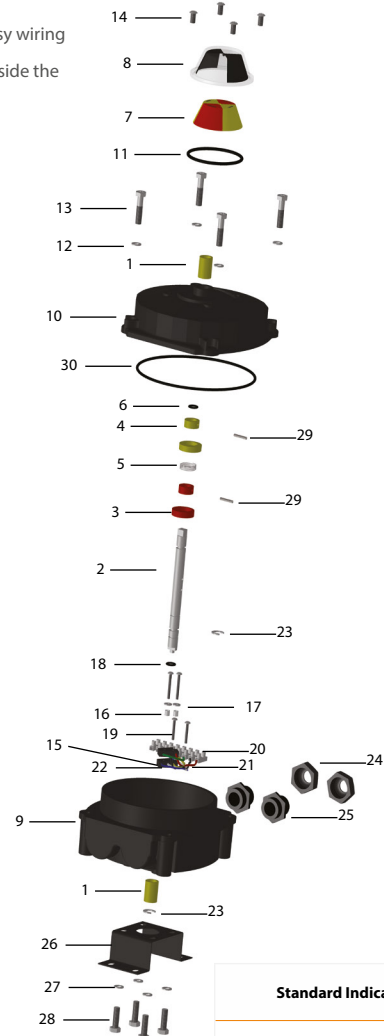
No	Part Name	Material	Qty
1	Bushing	Brass	2
2	Stem	AISI420	1
3	Cam-1	Delrin	2
4	Cam-2	Delrin	2
5	Spring	AISI301	1
6	Stem O-Ring	NBR	2
7	Indicator	ABS	1
8	Indicator Cam	Polikarbon	1
9	Body	Alu Die Cast	1
10	Cap	Alu Die Cast	1
11	Indicator Seal Ring	NBR	1
12	Thrust Washer	AISI304	4
13	Screw Cap	AISI304	4
14	Screw Indicator	AISI304	4
15	Limit Switch	Plastic	2
16	Switch Thrust Washer	AISI304	2
17	Spacer Bushing	Plastic	2
18	Screw	AISI304	2
19	Screw	AISI304	2
20	Terminal Strip	Plastic	1
21	Cable Lug	Copper	16
22	Terminal Cable Set	Copper	1
23	Circlip	AISI304	2
24	Nut Cable Gland	Plastic/Metal	1
25	Cable Gland	Plastic/Metal	1
26	Bracket	Steel	1
27	Thrust Washer	AISI304	4
28	Bolt	AISI304	4
29	Pin	Steel	2
30	Body Seal Ring	NBR	1

Explosion Proof Classification	Ex II 2 GD
	Ex d II B T6 / T5 Gb
	Ex tb IIIC T85°C ~ 100°C Db IP66
Switch Type	Mechanical (Crouzet V3)
	Proximity (IFM/Pepperl+Fuchs)
Conduit Entry	Max 4, M15/M20 or M25
Working Temp.	-20°C K8 +80°C
Terminal Strip	8 Points
Protection Class	IP67
Weight	2 Kg

Model	Switch	Model
A250 PSXM	Crouzet	EF83161.3
A250 PSXP1	P+F	NBB2-V3-E2
A250 PSXP2	P+F	NJ2-V3-N
A250 PSXP3	P+F	SJ3,5-N
A250 PSXP4	IFM	IS5076
A250 PSXP-5	P+F	NBB3-V3-Z4

Bracket Sizerleri

Model	Bracket Type	Mounting Dimensions
MB-1		30x80 H: 20
MB-2		30x80 - 30x130 H: 20-30 Adjustable
MB-3		30x80 - 30x130 H: 40-50 Adjustable



Standard Indicator



L Port Valve Indicator

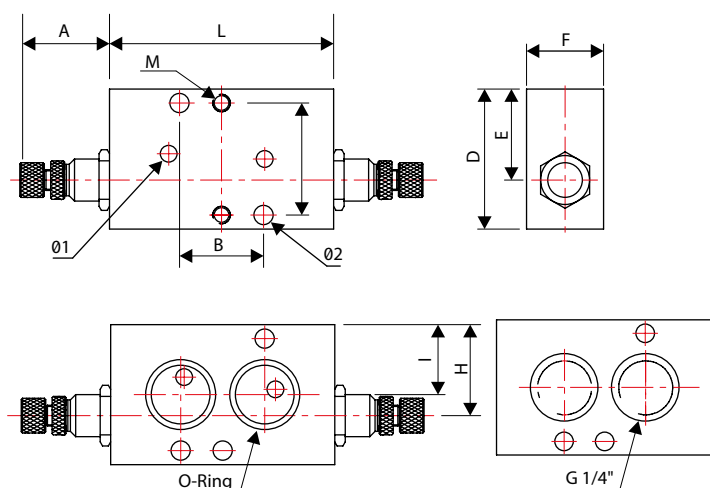


T Port Valve Indicator



A170 Actuator Speed Control Valves

A170 Series Namur speed-reducing valves are intended to be installed between solenoid valve and pneumatic actuators for precise throttling of exhaust and supply air to prevent water hammer and hydraulic shocks from occurring. Regulation of air flow is achieved by turning the easy-access, knurled screws that are located on both sides independently of each other.

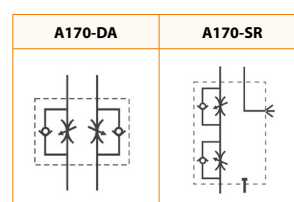


G 1/4" Adaptor Plate for non NAMUR applications of Speed Reducer Valves

Technical Specifications

Max Air Flow	1400 L/Min @ 5 bar
Working Pressure	1,5 to 10 bar
Temperature	-20 °C to +60 °C

Working Principle

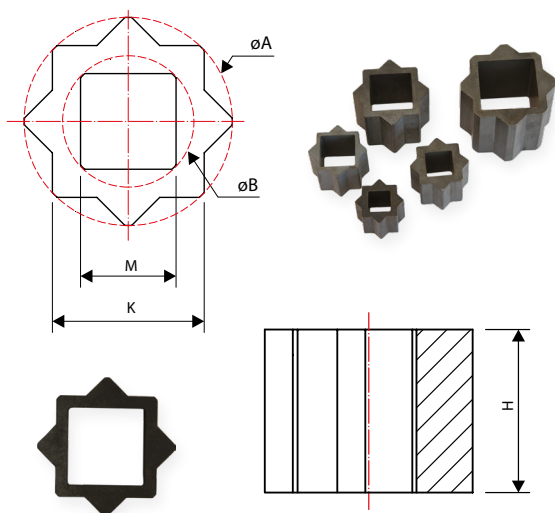


Dimensions(mm)

Type	A Min	A Max	B	L	D	E	F	H	I	M	Ø1	Ø2
A170-DA	25	32	24	64	40	20	20	20	20	M5X6	4,4	5,5
A170-SR	23	32	23	64	40	26	20	26	20	M5X6	4,4	5,5

A148 Square Reducers

Reduction adapters made of sintered steel are available in a wide variety of sizes to adapt the internal square of the actuator to the external square of the coupling or the valves.



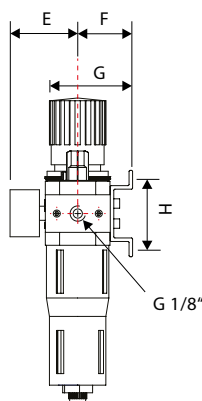
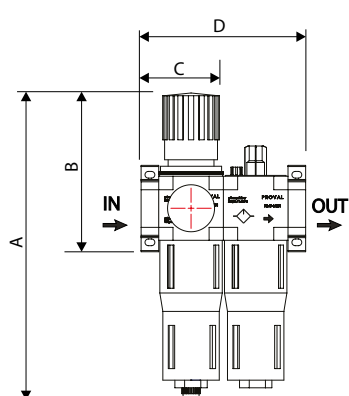
Dimensions(mm)

Type	K	-0,03 -0,05	øA	-0,1 -0,2	M	+0,14 +0,06	øB	H
11M9	11		15		9		12	12
14M9	14		19		9		12	16
14M11	14		19		11		14,8	16
17M11	17		23		11		14,8	19
17M14	17		23		14		19	19
19M14	19		26		14		19	21
19M17	19		26		17		23	21
22M14	22		30		14		19	24
22M17	22		30		17		23	24
22M19	22		30		19		26	24
27M17	27		37		17		23	29
27M19	27		37		19		26	29
27M22	27		37		22		30,3	29
36M19	36		49		19		26	38
36M22	36		49		22		30,3	38
36M27	36		49		27		37,3	38
46M36	46		60		36		60	48



A255 FRL Units

Proval A255 Series FRL units are used to filter, regulate and lubricate the pneumatic air.



A255-12



A255-14

Dimensions(mm)

Model	Internal Diameter	A	B	C	D	E	F	G	H
A255-14	G1/4"	205	70	6	104	55	39	59	35
A255-12	G1/2"	260	98	7,5	140	65,5	46,5	74	59

Pneumatic Hoses, Fittings, Silencers and Speed Reducers

Model	Description
A141-6	6 mm PU Hose (200m/Roll)
A141-8	8 mm PU Hose (100m/Roll)
A141-10	10 mm PU Hose (100m/Roll)
A141-12	12 mm Hose (100m/Roll)
A142-186	1/8" - 6mm Straight Type Metallic Fittings
A142-188	1/8" - 8mm Straight Type Metallic Fittings
A142-146	1/4" - 6mm Straight Type Metallic Fittings
A142-148	1/4" - 8mm Straight Type Metallic Fittings
A142-1410	1/4" - 10mm Straight Type Metallic Fittings
A142-1412	1/4" - 12mm Straight Type Metallic Fittings
A142-1210	1/2" - 10mm Straight Type Metallic Fittings
A142-1212	1/2" - 12mm Straight Type Metallic Fittings
A143-186	1/8" - 6mm Elbow Type Plastic Fittings
A143-188	1/8" - 8mm Elbow Type Plastic Fittings
A143-146	1/4" - 6mm Elbow Type Plastic Fittings
A143-148	1/4" - 8mm Elbow Type Plastic Fittings
A144-186	1/8" - 6mm Elbow Type Speed Reducer Fittings
A144-188	1/8" - 8mm Elbow Type Speed Reducer Fittings
A144-146	1/4" - 6mm Elbow Type Speed Reducer Fittings
A145-18	1/8" Silencer
A145-14	1/4" Silencer

A146-18	1/8" Speed Reducer with Silencer
A146-14	1/4" Speed Reducer with Silencer
A147-14	1/4" Air Valve
A149-6	6mm Connection Fittings For Panels
A149-8	8mm Connection Fittings For Panels
A150-6	6 mm Connection Fittings
A150-8	8 mm Connection Fittings
A150-10	10 mm Connection Fittings
A150-12	12 mm Connection Fittings
A151-68	6-8 mm Reducer Type Connection Fittings
A151-610	6-10 mm Reducer Type Connection Fittings
A151-612	6-12 mm Reducer Type Connection Fittings
A151-810	8-10 mm Reducer Type Connection Fittings
A151-812	8-12 mm Reducer Type Connection Fittings
A152-68	6-8 mm Reducer T Fittings
A152-610	6-10 mm Reducer T Fittings
A152-612	6-12 mm Reducer T Fittings
A152-810	8-10 mm Reducer T Fittings
A152-812	8-12 mm Reducer T Fittings
A153-6	6 mm T Fittings
A153-8	8 mm T Fittings
A153-10	10 mm T Fittings



A141



A142



A143



A144



A145



A146



A147



A149



A150



A151



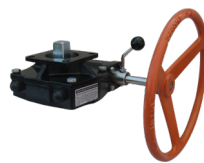
A152



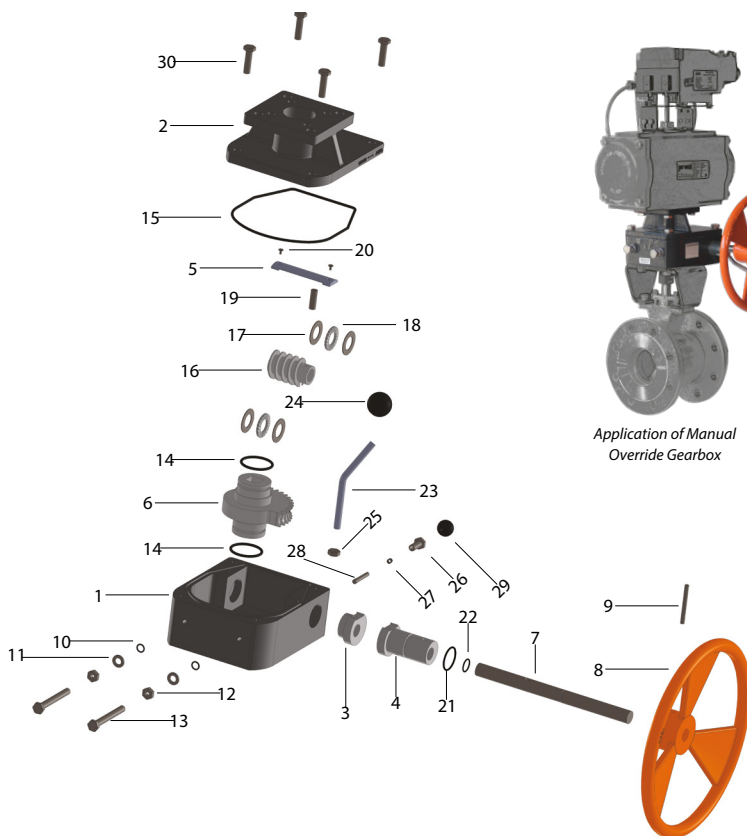
A153

A280 Manual Override Gearboxes

Manual override gearboxes employ a declutchable worm and worm wheel mechanism for manually overriding the pneumatic and hydraulic valve actuators in process applications. PROVAL MOA Series manual override gearboxes are ruggedly designed and produced for users of all industries requiring reliable manual operation of actuated valves at emergency situation.

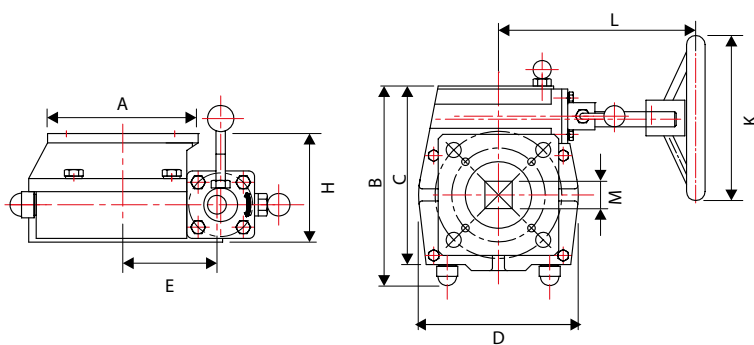


Application of Manual Override Gearbox



Material List

No	Part Name	Material	Qty
1	Body	Cast Iron	1
2	Cap	Cast Iron	1
3	Inner Eccentric Part	Carbon Steel	1
4	Outer Eccentric Part	Carbon Steel	1
5	Locking Part	Carbon Steel	1
6	Worm Gear	Ductile Iron	1
7	Shaft	AISI420	1
8	Handwheel	Cast Iron (MOA-1 / 2) Steel (MOA-3 / 7)	1
9	Pin	Carbon Steel	1
10	O-Ring	NBR	2
11	Washer	AISI304	2
12	Nut	AISI304	2
13	Hexagon Bolt	AISI304	2
14	O-Ring	NBR	2
15	Body Seal	NBR	1
16	Gear	Carbon Steel	1
17	Bushing	Carbon Steel	4
18	Bearing	Carbon Steel	2
19	Gear Pin	Carbon Steel	1
20	Bolt	AISI304	2
21	Guide Seal	NBR	1
22	Shaft Seal	NBR	1
23	Lever	Carbon Steel	1
24	Lever Head	Plastic	1
25	Locking Nut	AISI420	1
26	Locker Bolt	AISI304	1
27	Spring	Spring Steel	1
28	Locker Stem	Carbon Steel	1
29	Locker Head	Plastic	1
30	Cap Bolt	AISI304	4



Dimensions (mm)	Model	Ratio	Torque (Nm)	Weight (Kg)	Top Actuator Flange		Base Valve Flange		A	B	C	D	E	H	K	L	M
					ISO1	ISO2	ISO1	ISO2									
					F05	F07	F05	F07									
	A280-01	26:1	300	6,5	F05	F07	F05	F07	70	145	125	110	46	93	150	195	9-11-14
	A280-02	38:1	550	12,5	F07	F10	F07	F10	100	180	165	140	65	122	250	200	14-17-22
	A280-03	54:1	1200	17,0	F12 or F14		F12 or F14		130	225	199	175	85	95	300	233	27-36
	A280-04	80:1	2000	22,0	F14 or F16		F14 or F16		156	311	279	234	123	117	400	277	36
	A280-05	78:1	3100	38,0	F16		F16		162	350	322	276	142	122	600	323	46
	A280-06	98:1	6000	100,0	F25		F25		300	435	415	300	157	244	500	463	46
	A280-07	100:1	15000	180,0	F30		F30		350	592	544	470	225	278	700	558	55



CERTIFICATE



Factory / Headquarters

Mermerciler OSB. 1 Cadde 32 Sokak No.10 Köşeler Köyü,
41480 Dilovası / Kocaeli

Tel : +90 262 7281474 - Fax : +90 262 7281477

info@dorukendustri.com



Istanbul Branch Office

Şehit İlknur Keleş Sokak No:7 Hüseyin Bağdatlıoğlu Plaza
Kat:1 Kozyatağı 34742 Kadıköy / İstanbul TURKEY

Tel : +90 216 4200074 - Fax : +90 216 4200094

info@dorukendustri.com



DORUK ENDÜSTRİ
Valve & Automation Systems

www.dorukendustri.com

info@dorukendustri.com

www.proval.net

info@proval.net



Local Distributor :

