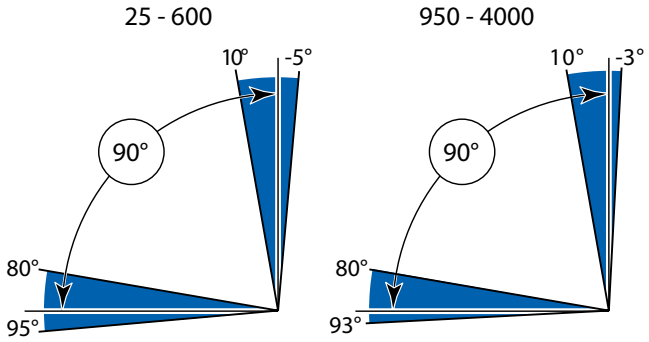
PNEUMATIC ACTUATOR
FIG. PD - PE

GENERAL FEATURES:

- Rack and pinion actuator
- Travel stop adjustment: 0°~90° -5°/+10° and +80° ~ +95° (size 25 ~ size 600)
  0°~90° -3°/+10° and +80° ~ +93° (size 950 ~ size 4000)



- Working temperature: Standard: -20 °C ~ 80 °C
  Low temperature version (Silicone): -40°C ~ 80°C
  High temperature version (Viton): -10°C ~ 120°C)
- Working pressure: 3 ~ 8 bar
- Coupling according to ISO 5211 and DIN 3337
- Mounting of solenoid valves according to Namur Std.
- Mounting of limit switches according to Namur
- Min. 500.000 cycles

FIGURE:

PD: double acting
PE: spring return, normally closed
PEO: spring return, normally open



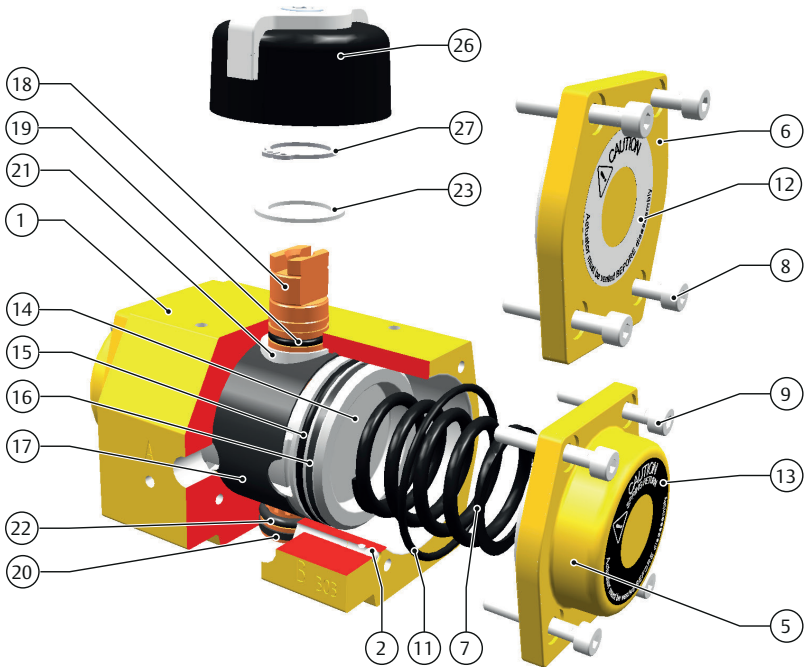


ATEX

DESIGN STANDARDS	
Mounting of solenoid valves	NAMUR Std.
Mounting of devices	NAMUR VDI, NAMUR VDE 3845 Std.
Coupling according	ISO 5211, DIN 3337
TESTS AND CERTIFICATES	
Safety	ATEX II 2 GD, SIL3
Quality Assurance	CE/PED, ISO9001

Subject to changes

PD 0012 / PE 0012



MATERIALS:

Item	Description	Material
1	Body	Extruded aluminium alloy (polyurethane coated)
2 *	B-port ball	Steel
5	End cap spring return	Cast Aluminium alloy (polyurethane coated)
6	End cap double acting	Cast Aluminium alloy (polyurethane coated)
7	Spring cartridge	Spring steel (electrophoretic coated)
8	End cap screw	Stainless steel
9	End cap screw	Stainless steel
11 *	O-ring end cap	Nitrile rubber
12	Warning sticker double acting	Polyester
13	Warning sticker spring return	Polyester
14	Piston	Cast aluminium alloy (chromated)
15 *	Bearing piston	PTFE, 25% carbon filled
16 *	O-ring piston	Nitrile rubber
17 *	Guide band	Nylatron
18	Pinion	High grade aluminium (hard anodized)
19 *	Bearing pinion top	POM
20 *	Bearing pinion bottom	POM
21 *	O-ring pinion top	Nitrile rubber
22 *	O-ring pinion bottom	Nitrile rubber
23 *	Thrust bearing pinion	Black POM (UV stabilized)
26	Indicator assembly	ABS + stainless steel screw
27 *	Circlip	Spring steel (Deltatone coated)

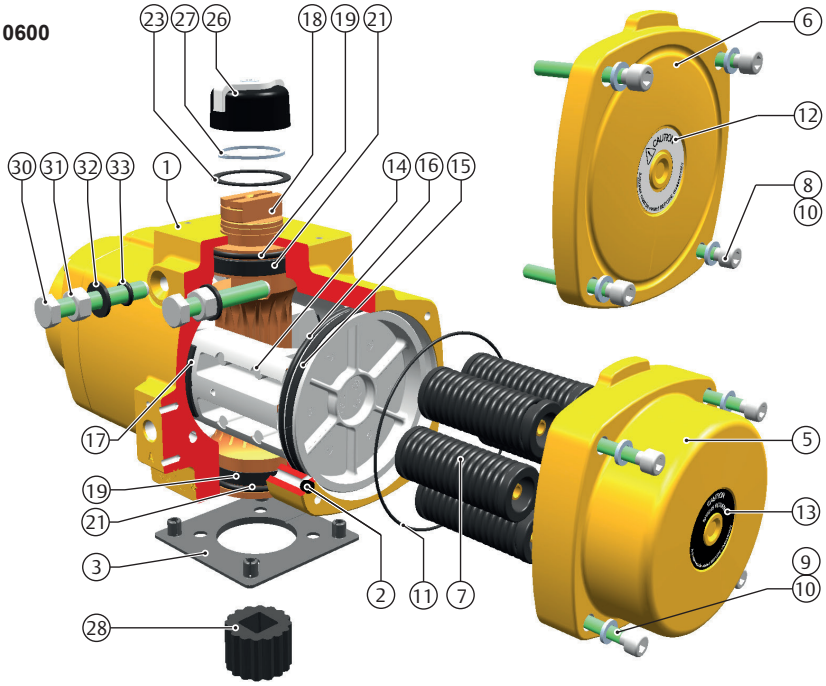
*included in repair kit

Low temperature components:
- Castrol Optitemp TT1 grease
- Silicone (MVQ70 rubber) O-ring seals

High temperature components:
- Castrol high temperature grease
- Viton (FPM) O-ring seals
- PTFE 25% carbon filled piston rings
- Nylon 66 + aramid fibre & PTFE bearing strip piston rack and pinion bearing

Subject to changes

PD 0025 - 0600 / PE 0012 - 0600



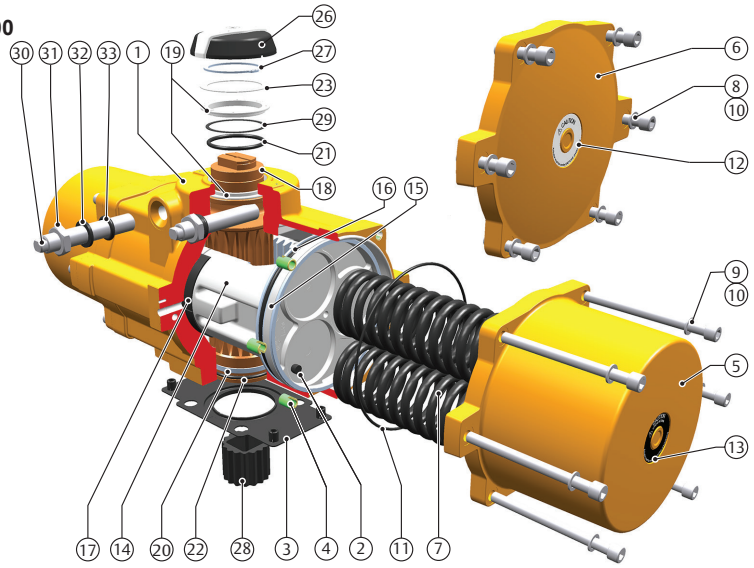
MATERIALS:

Item	Description	Material
1	House	Cast Aluminium alloy (polyurethane coated)
2 *	B-port seal	Silicon rubber
3	Center plate (option)	Nylon PA6, black
5	End cap spring return	Cast Aluminium alloy (polyurethane coated)
6	End cap double acting (High end caps for also for spring return up to type 0100)	Cast Aluminium alloy (polyurethane coated)
7	Spring cartridge	Spring steel (electrophoretic coated)
8	End cap screw	Stainless Steel
9	End cap screw	Stainless Steel
10	End cap screw washer	Stainless Steel
11 *	O-ring end cap	Nitrile rubber
12	Warning sticker double acting	Polyester
13	Warning sticker spring return	Polyester
14	Piston	Cast Aluminium alloy (chromated)
15 *	Bearing piston	PTFE 25% carbon-filled
16 *	O-ring piston	Nitrile rubber
17 *	Bearing strip piston rack	POM
18	Pinion	High grade aluminium (hard anodized)
19 *	Bearing pinion	POM
21 *	O-ring pinion	Nitrile rubber
23 *	Thrust bearing pinion	POM, black UV stabilized
26	Indicator assembly	ABS + stainless steel screw
27 *	Circlip	Spring steel (Deltatone coated)
28	Drive insert	Aluminium (anodized)
30	Limit stop screw	Stainless steel
31	Limit stop nut	Stainless steel
32 *	Limit stop washer	PA66
33 *	O-ring limit stop	Nitrile rubber

*included in repair kit

Subject to changes

PD 0950 - 2500 / PE 0950 - 2500



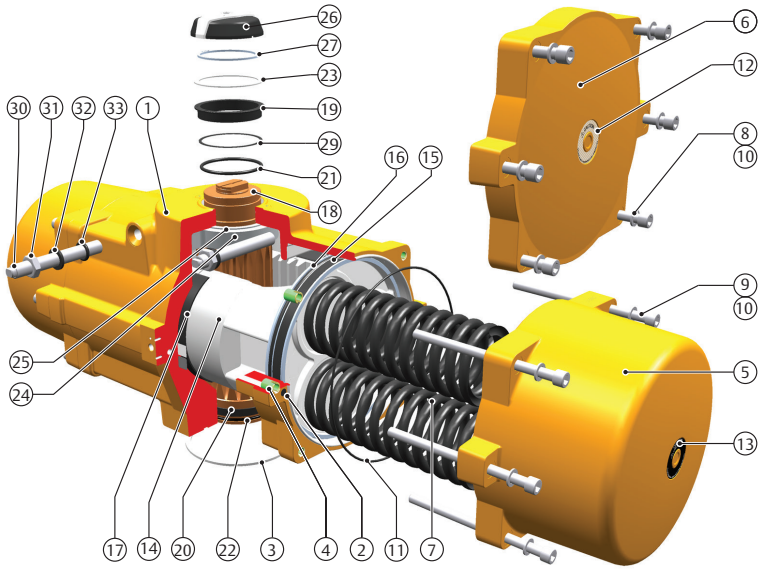
MATERIALS:

Item	Description	Material
1	House	Cast Aluminium alloy (polyurethane coated)
2 *	B-port seal	Silicon rubber
3	Center plate (option)	Nylon PA6, black
4	Thread insert	Steel
5	End cap spring return	Cast Aluminium alloy (polyurethane coated)
6	End cap double acting	Cast Aluminium alloy (polyurethane coated)
7	Springs	Spring steel, electrophoretic coated
8	End cap screw	Stainless Steel
9	End cap screw	Stainless Steel
10	End cap screw washer	Stainless Steel
11 *	O-ring end cap	Nitrile rubber
12	Warning sticker double acting	Polyester
13	Warning sticker spring return	Polyester
14	Piston	Cast Aluminium alloy (chromated)
15 *	Bearing piston	PTFE 25% carbon-filled
16 *	O-ring piston	Nitrile rubber
17 *	Bearing strip piston rack	POM
18	Pinion	High grade aluminium (hard anodized)
19 *	Bearing pinion top	POM
20 *	Bearing pinion bottom	POM
21 *	O-ring pinion top	Nitrile rubber
22 *	O-ring pinion bottom	Nitrile rubber
23 *	Thrust bearing pinion	POM black (UV stabilized)
26	Indicator assembly	ABS + stainless steel screw
27 *	Circlip	Spring steel (Deltatone coated)
28	Drive insert	Aluminium (anodized)
29 *	Backup ring	POM
30	Limit stop screw	Stainless steel
31	Limit stop nut	Stainless steel
32 *	Limit stop washer	PA66
33 *	O-ring limit stop	Nitrile rubber

*included in repair kit

Subject to changes

PD 4000 / PE 4000



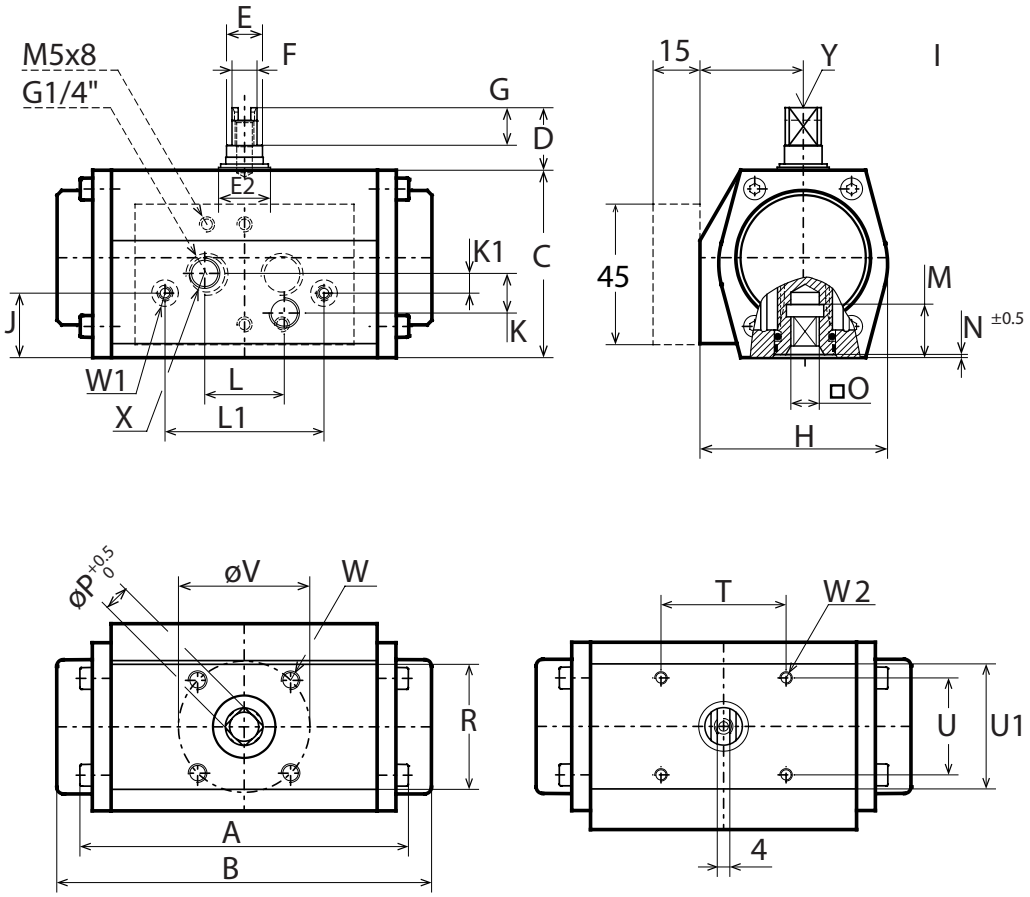
MATERIALS:

Item	Description	Material
1	House	Cast Aluminium alloy (polyurethane coated)
2 *	B-port seal	Silicon rubber
3	Center ring	Stainless Steel AISI 304
4	Thread insert	Steel
5	End cap spring return	Cast Aluminium alloy (polyurethane coated)
6	End cap double acting	Cast Aluminium alloy (polyurethane coated)
7	Springs	Spring steel (electrophoretic coated)
8	End cap screw	Stainless Steel
9	End cap screw	Stainless Steel
10	End cap screw washer	Stainless Steel
11 *	O-ring end cap	Nitrile rubber
12	Warning sticker double acting	Polyester
13	Warning sticker spring return	Polyester
14	Piston assembly	Cast Aluminium alloy (chromated)
15 *	Bearing piston	PTFE 25% carbon-filled
16 *	O-ring piston	Nitrile rubber
17 *	Bearing strip piston rack	POM
18	Pinion	High grade aluminium (hard anodized)
19 *	Bearing pinion top	POM
20 *	Bearing pinion bottom	POM
21 *	O-ring pinion top	Nitrile rubber
22 *	O-ring pinion bottom	Nitrile rubber
23 *	Thrust washer pinion	POM black (UV stabilized)
24	Cam stroke adjustment	Steel
25 *	Cam thrust washer	POM black (UV stabilized)
26	Indicator assembly	ABS + stainless steel screw
27	Circlip	Spring steel (Deltatone coated)
29 *	Backup ring	POM
30	Limit stop screw	Stainless steel
31	Limit stop nut	Stainless steel
32 *	Limit stop washer	PA66
33 *	O-ring limit stop	Nitrile rubber

*included in repair kit

Subject to changes

TYPE 12:



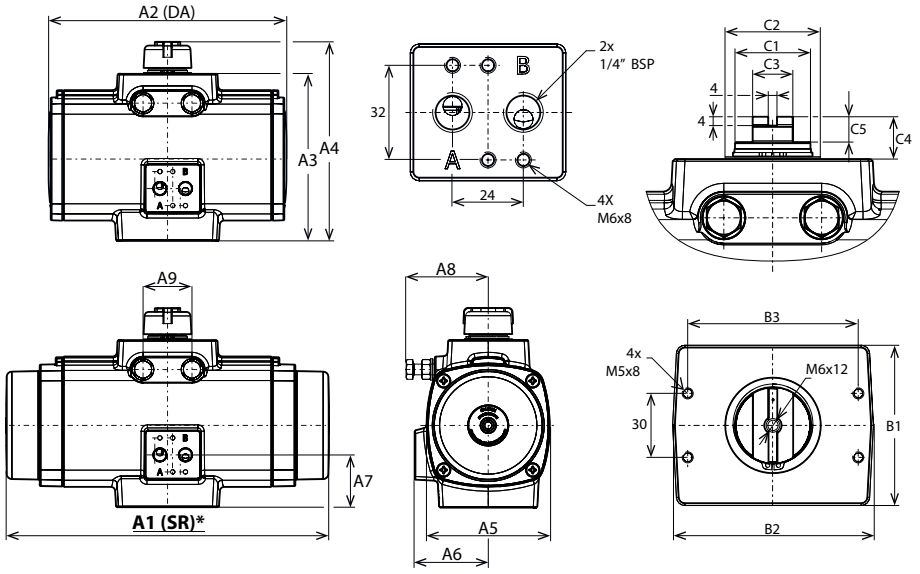
DIMENSIONS: (mm)

TYPE	A	B	C	D	E	F	G	H	I	J	K	K1	L	L1	M
0012	103	118	60	20	16	10	12	60	33,0	21	12,7	6,4	25,4	50,8	16,5

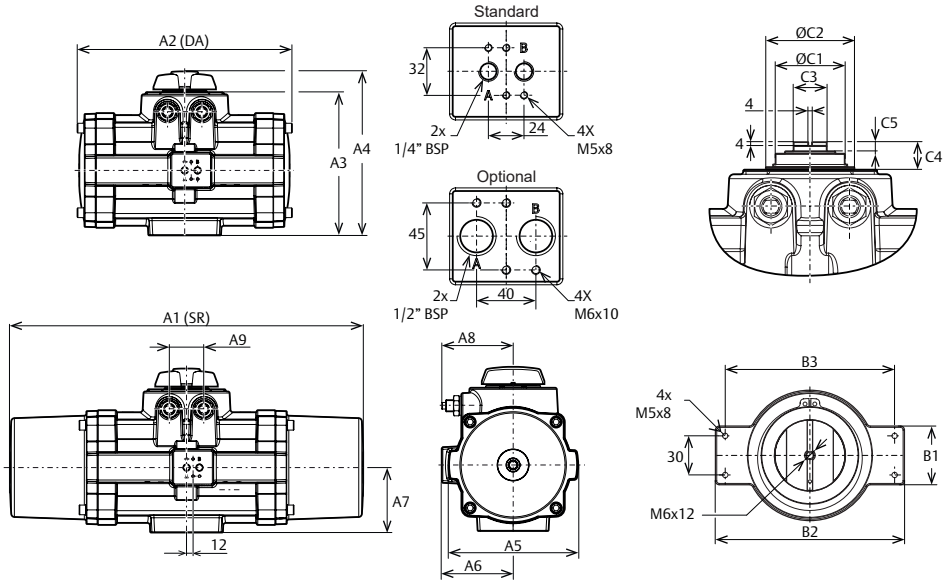
TYPE	N	O Max.	O Min.	P	T	U	V	W	W1	W2	X	Y	Kg (PD)	Kg (PE)
0012	1	9,14	9,05	12,1	40	31	42	M6x8	M4x7	M4x7	G 1/8"	M6x12	0,6	0,7

Subject to changes

TYPE 25-350:



TYPE 600-4000:



DIMENSIONS: (mm)

TYPE	A1*	A2*	A3	A4	A5	A6	A7	A8	A9	B1	B2	B3	C1	C2	C3	C4	C5	Kg (PD)	Kg (PE)
0025	166	166	91	119	82	49	30	48	18	43	94	80	16	23	10	20	12	1,4	1,6
0040	192	192	112	139	95	55	34	58	25	45	94	80	22	30	14	20	12	2,1	2,3
0065	217	217	124	151	104	58	38	69	27	50	94	80	22	30	14	20	12	2,8	3,3
0100	247	247	131	158	115	64	38	69	28	60	97	80	22	30	14	20	12	3,5	4,3
0150	304	223	157	185	127	69	49	75	46	75	94	80	34	45	14	20	12	4,9	6,6
0200	362	256	163	191	134	72	49	87	46	75	94	80	36	45	19	20	12	6	8,3
0350	385	269	201	230	165	85	42	109	46	85	100	80	36	45	19	20	12	10,2	14,5
0600	476	336	248	292	199	102	67	132	60	98	148	130	55	65	19	30	10	20	26
0950	658	400	268	305	239	131	121	131	64	45	145	130	65	83	36	30	10	36	41
1600	732	462	302	339	306	149	137 (140) **	156	85	45	145	130	75	96	36	30	10	41	62
2500	877	550	354	392	350	170	157 (160) **	181	102	45	145	130	95	118	36	30	10	64	100
4000	959	649	389	427	400	196	184 (186) **	175	184	45	145	130	96	115	36	30	10	103	147

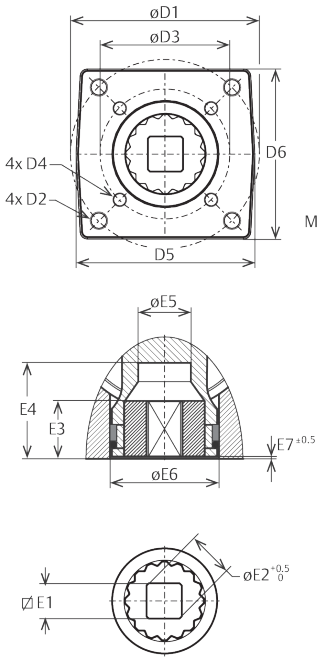
* Up to and including type 0100, single and double acting actuators have the same end caps. See drawing with dimension **A1 (SR)**

** Values between brackets for optional 1/2" connection

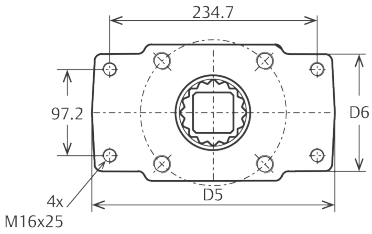
Subject to changes

TYPE 25-4000:

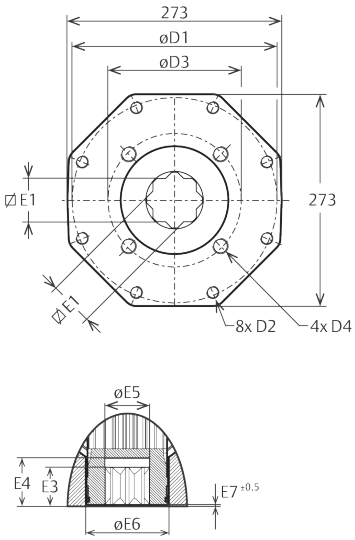
25-950



1600 & 2500



4000



DIMENSIONS: (mm)

TYPE	ISO1	D1	D2	ISO2	D3	D4	D5	D6
0025	F05	50	M6x10	F03	36	M5x8	50	48
0040	F07	70	M8x13	F05	50	M6x10	68	65
0065	F07	70	M8x13	F05	50	M6x10	68	65
0100	F07	70	M8x13	F05	50	M6x10	66	63
0150	F10	102	M10x15	F07	70	M8x13	97	92
0200	F10	102	M10x15	F07	70	M8x13	94	90
0350	F10	102	M10x15	F07	70	M8x13	94	94
0600	F12	125	M12x18	F10	102	M10x16	118	113
0950	F14	140	M16x25	F10	102	M10x16	135	130
1600	F16	165	M20x20	F25 *	-	-	280	132
2500	F16	165	M20x20	F25 *	-	-	280	132
4000	F25	254	M16x25	F16	165	M20x20	273	269

TYPE	E1 Max.	E1 Min.	E2	E3	E4	E5	E6	E7
0025	11,08	11	14,1	15	34	14,1	24,5	0,5
0040	14,08	14	18,1	15	34	18,1	34,5	1
0065	14,08	14	18,1	15	34	21,1	34,5	1
0100	17,09	17	22,4	18	34	23,5	38	1
0150	17,08	17	22,4	27,5	50	28,5	56,5	1,2
0200	22,1	22	28,2	27,5	50	32,1	56,5	1,2
0350	22,1	22	28,2	27,5	50	32,1	56,5	1,2
0600	27,11	27	36,2	27,5	50	36,5	67,5	1,2
0950	36,16	36	58,2	48,5	65,5	48	86	1
1600	46,16	46	60,2	59,5	81,5	60	104	1
2500	46,16	46	60,2	59,5	81,5	60	125	1
4000	55,24	55	72,2	61,5	76,75	73	133	1

* For 1600 & 2500 there are only 4 holes of the F25 drilling pattern

Subject to changes

PNEUMATIC ACTUATOR
Torque - FIG. PD

TYPE PD	Output Torque For Double Acting in Nm																	
	2 bar		3 bar		3,5 bar		4 bar		4,5 bar		5 bar		5,5 bar		6 bar		6,5 bar		7 bar		8 bar	
	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°
12	4,8		7,3		8,5		9,7		10,9		12,2		13,4		14,6		15,9		17,1		19,6	
25	9		13		16		18		20		23		25		27		29		32		36	
40	17		25		29		34		38		42		47		51		55		59		68	
65	25		38		45		51		58		64		71		77		84		90		103	
100	38		57		66		76		86		95		105		115		124		134		153	
150	60		91		106		122		137		153		168		183		199		214		245	
200	82		124		146		167		188		209		230		251		272		293		335	
350	143		216		253		290		326		363		400		436		473		510		583	
600	243		368		430		492		554		617		679		741		804		866		991	
950	368		557		651		746		840		935		1029		1124		1218		1312		1501	
1600	617		934		1092		1250		1408		1566		1725		1883		2041		2199		2516	
2500	956		1447		1692		1937		2182		2427		2673		2918		3163		3408		3899	
4000	1552		2348		2746		3144		3542		3940		4338		4736		5134		5532		6327	

Subject to changes

PNEUMATIC ACTUATOR
Torque - FIG. PE

TYPE PE	Spring set	Output Torque For Spring Return in Nm																		Spring stroke	
		3 bar		3,5 bar		4 bar		4,5 bar		5 bar		5,5 bar		6 bar		7 bar		8 bar			
		0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	END	START
12	20	2	-	4	1	5	2	6	3	8	5	9	6	10	7	13	10	15	12	5	7
25	10	12	10	14	13	17	15	19	17	21	20	24	22	26	25	31	29	36	34	2	4
	20	9	6	12	9	14	11	16	13	19	16	21	18	24	21	28	25	33	30	4	7
	30	7	2	9	4	11	7	14	9	16	12	19	14	21	17	26	21	31	26	7	11
	40	-	-	-	-	9	3	11	5	14	8	16	12	19	14	21	17	26	21	9	14
	50	-	-	-	-	-	-	9	1	11	4	14	6	16	8	21	13	26	18	11	18
	60	-	-	-	-	-	-	-	-	-	-	11	2	13	4	18	9	23	14	13	21
40	10	22	19	26	24	31	28	36	33	40	37	45	42	49	46	58	55	67	64	4	7
	20	17	12	22	16	26	21	31	25	35	30	40	34	44	39	53	48	62	57	8	13
	30	12	4	17	9	21	13	26	18	31	22	35	27	40	31	49	40	58	49	12	20
	40	-	-	12	1	17	6	21	10	26	15	30	19	35	24	44	33	53	42	17	26
	50	-	-	-	-	-	-	17	3	21	7	26	12	30	16	39	25	48	34	21	33
	60	-	-	-	-	-	-	-	-	-	-	21	4	25	9	34	18	43	27	25	39
65	10	33	29	40	36	47	43	54	50	61	57	68	63	75	70	88	84	102	98	6	10
	20	26	17	33	24	40	31	47	38	53	45	60	52	67	59	81	72	95	86	13	20
	30	19	5	25	12	32	19	39	26	46	33	53	40	60	47	74	61	87	74	19	31
	40	-	-	-	-	25	8	32	14	39	21	46	28	52	35	66	49	80	63	26	41
	50	-	-	-	-	-	-	24	3	31	10	38	17	45	23	59	37	73	51	32	51
	60	-	-	-	-	-	-	-	-	-	-	31	5	38	12	52	25	65	39	39	61
100	10	49	43	60	53	70	64	80	74	90	84	100	94	111	104	131	125	151	145	9	15
	20	39	26	49	36	59	47	69	57	79	67	90	77	100	87	120	108	141	128	19	30
	30	28	9	38	19	48	30	59	40	69	50	79	60	89	70	109	91	130	111	28	44
	40	-	-	27	2	38	13	48	23	58	33	68	43	78	53	99	74	119	94	37	59
	50	-	-	-	-	-	-	37	6	47	16	57	26	68	36	88	57	108	77	47	74
	60	-	-	-	-	-	-	-	-	-	-	47	9	57	19	77	40	98	60	56	89
150	10	79	69	96	86	112	102	128	118	145	135	161	151	177	167	210	200	243	233	15	24
	20	62	42	79	59	95	75	111	91	128	108	144	124	160	140	193	173	226	206	30	47
	30	45	15	62	32	78	48	94	64	111	81	127	97	143	113	176	146	209	179	44	71
	40	-	-	45	5	61	21	77	37	94	54	110	70	126	86	159	119	192	152	59	94
	50	-	-	-	-	-	-	60	10	77	26	93	43	109	59	142	92	175	124	74	118
	60	-	-	-	-	-	-	-	-	-	-	76	16	92	32	125	65	158	97	89	141
200	10	108	94	131	117	153	139	175	161	198	184	220	206	242	228	287	273	332	318	21	33
	20	85	57	107	79	129	102	152	124	174	146	196	169	219	191	263	236	308	280	41	65
	30	61	19	83	42	106	64	128	86	150	109	173	131	195	153	240	198	284	243	62	98
	40	-	-	-	-	82	26	104	49	127	71	149	93	171	116	216	161	261	205	82	131
	50	-	-	-	-	-	-	81	11	103	34	125	56	148	78	192	123	237	168	103	163
	60	-	-	-	-	-	-	-	-	-	-	102	18	124	41	169	85	213	130	124	196

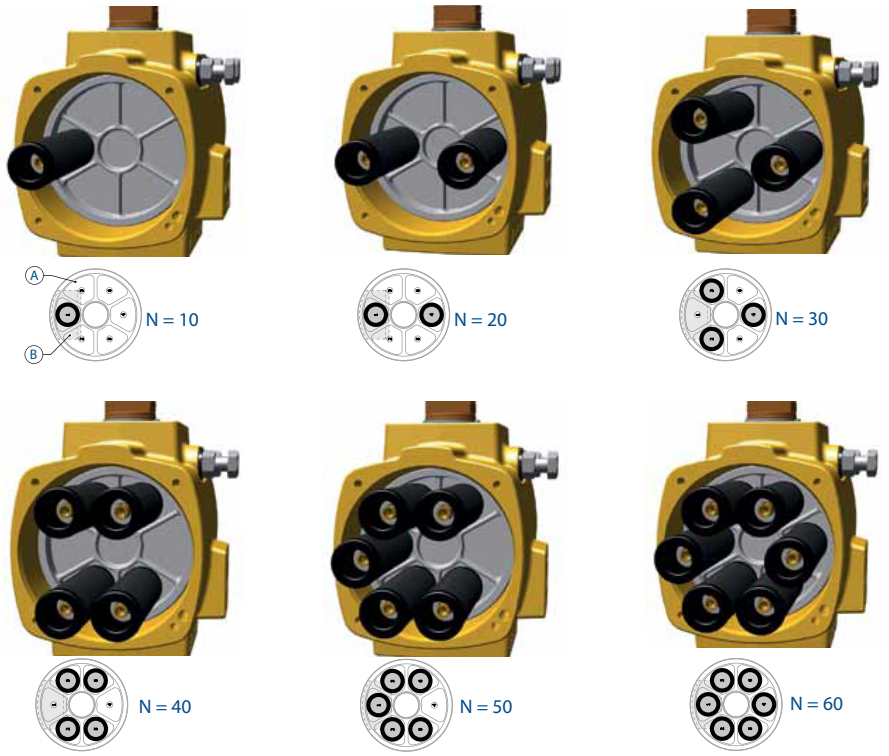
Subject to changes

PNEUMATIC ACTUATOR
Torque - FIG. PE

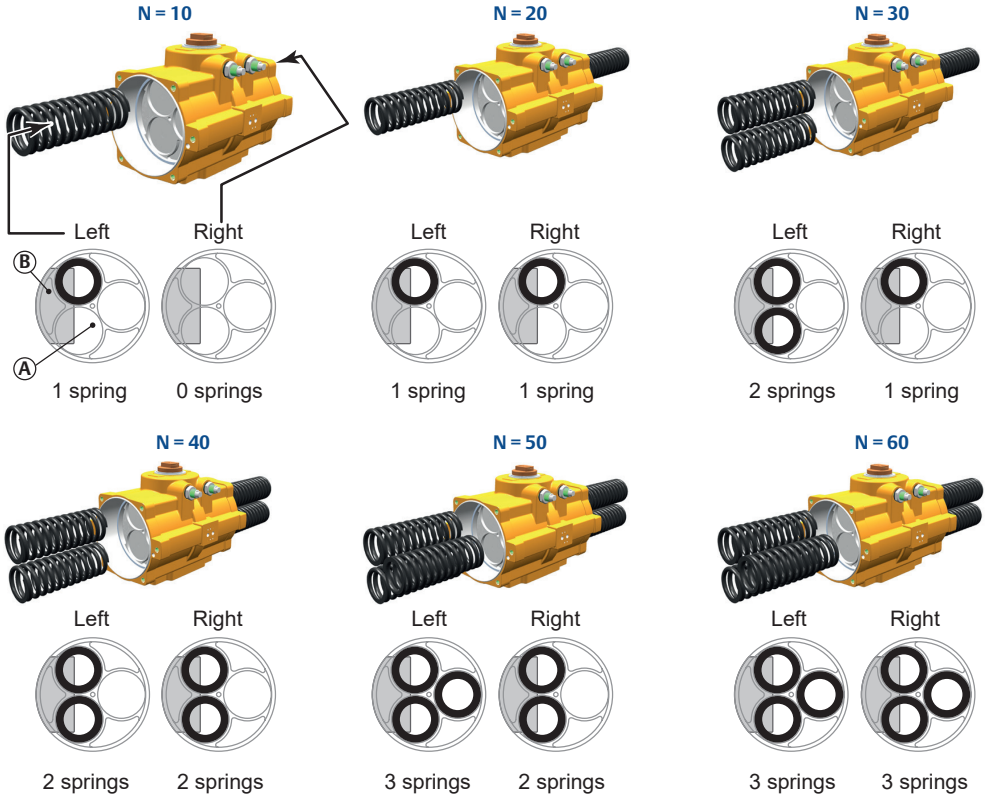
TYPE PE	Spring set	Output Torque For Spring Return in Nm																		Spring stroke	
		3 bar		3,5 bar		4 bar		4,5 bar		5 bar		5,5 bar		6 bar		7 bar		8 bar			
		0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	END	START
350	10	189	165	227	204	266	243	305	281	344	320	383	359	422	398	499	476	577	553	35	56
	20	148	101	187	139	226	178	265	217	303	256	342	295	381	334	459	411	537	489	70	112
	30	108	36	146	75	185	114	224	153	263	192	302	231	341	269	418	347	496	425	106	168
	40	-	-	106	11	145	50	184	89	222	127	261	166	300	205	378	283	455	360	141	224
	50	-	-	-	-	-	-	143	24	182	63	221	102	260	141	337	218	415	296	176	280
	60	-	-	-	-	-	-	-	-	-	-	180	38	219	77	297	154	374	232	211	335
600	10	320	279	386	345	452	411	518	477	584	543	650	609	716	675	848	807	980	939	60	96
	20	251	169	317	235	383	301	449	367	515	433	581	499	647	565	779	697	911	829	121	192
	30	181	59	247	125	313	191	379	257	445	323	511	389	577	455	709	587	841	719	181	287
	40	-	-	178	15	244	81	310	147	376	213	442	279	508	345	640	477	772	609	241	383
	50	-	-	-	-	-	-	241	37	307	103	373	169	439	235	571	367	703	499	302	479
	60	-	-	-	-	-	-	-	-	-	-	303	59	369	125	501	257	633	389	362	575
950	10	481	427	579	525	677	623	775	721	873	819	971	917	1069	1015	1265	1211	1461	1407	77	121
	20	385	276	483	374	581	472	679	570	777	668	875	766	973	864	1169	1060	1365	1256	155	242
	30	288	125	386	223	484	321	582	418	680	516	778	614	876	712	1072	908	1268	1104	232	363
	40	-	-	289	71	387	169	485	267	583	365	681	463	779	561	975	757	1171	953	309	484
	50	-	-	-	-	-	-	389	116	487	214	585	312	683	410	879	606	1075	802	387	605
	60	-	-	-	-	-	-	-	-	390	63	488	161	586	259	782	455	978	651	464	726
1600	10	808	710	972	874	1136	1038	1300	1202	1465	1367	1629	1531	1793	1695	2122	2023	2450	2352	129	207
	20	647	450	811	615	975	779	1139	943	1304	1107	1468	1271	1632	1436	1960	1764	2289	2093	258	415
	30	486	191	650	355	814	520	978	684	1142	848	1307	1012	1471	1176	1799	1505	2128	1833	387	622
	40	-	-	489	96	653	260	817	425	981	589	1146	753	1310	917	1638	1246	1967	1574	516	830
	50	-	-	-	-	-	-	656	165	820	330	984	494	1149	658	1477	986	1806	1315	644	1037
	60	-	-	-	-	-	-	-	-	659	70	823	234	988	399	1316	727	1644	1056	773	1244
2500	10	1276	1133	1530	1388	1785	1642	2039	1896	2294	2151	2548	2405	2803	2660	3312	3169	3820	3678	180	295
	20	1050	765	1305	1019	1559	1274	1814	1528	2068	1783	2323	2037	2577	2292	3086	2801	3595	3309	361	589
	30	825	397	1079	651	1334	905	1588	1160	1843	1414	2097	1669	2352	1923	2860	2432	3369	2941	541	884
	40	-	-	854	283	1108	537	1363	792	1617	1046	1871	1301	2126	1555	2635	2064	3144	2573	722	1178
	50	-	-	-	-	883	169	1137	423	1391	678	1646	932	1900	1187	2409	1696	2918	2205	902	1473
	60	-	-	-	-	-	-	911	55	1166	310	1420	564	1675	819	2184	1327	2693	1836	1083	1768
4000	10	2063	1846	2476	2259	2889	2672	3302	3085	3715	3498	4128	3911	4541	4324	5367	5150	6193	5976	299	473
	20	1690	1255	2103	1668	2516	2081	2929	2494	3342	2907	3755	3320	4168	3733	4994	4559	5820	5385	598	945
	30	1316	664	1729	1077	2142	1490	2555	1903	2968	2316	3381	2729	3794	3142	4620	3968	5446	4794	896	1418
	40	943	73	1356	486	1769	899	2182	1312	2595	1725	3008	2138	3421	2551	4247	3377	5073	4203	1195	1891
	50	-	-	-	-	1395	309	1808	722	2221	1135	2634	1548	3047	1961	3873	2787	4699	3613	1494	2363
	60	-	-	-	-	-	-	1435	131	1848	544	2261	957	2674	1370	3500	2196	4326	3022	1793	2836

Subject to changes

PE0025 - PE600



PE0950 - PE4000



A: Piston top view
B: Position of piston rack

Subject to changes

PNEUMATIC ACTUATOR
Operating speed - FIG. PD - PE

TYPE	Cycle time in seconds			
	Spring return		Double acting	
	A-port pressurized	Spring stroke	A-port pressurized	B-port pressurized
12	0,4	0,4	0,4	0,4
25	0,5	0,4	0,5	0,4
40	0,6	0,5	0,6	0,5
65	0,7	0,5	0,6	0,6
100	0,8	0,6	0,8	0,7
150	1,0	0,8	0,9	0,8
200	1,3	0,9	1,0	1,0
350	1,9	1,3	1,4	1,5
600	3,2	1,9	2,2	2,2
950	6,6	2,2	2,4	2,0
1600	10,6	3,5	3,6	3,3
2500	16,9	5,7	5,8	5,2
4000	29,1	9,2	9,2	9,0

TEST CONDITIONS:

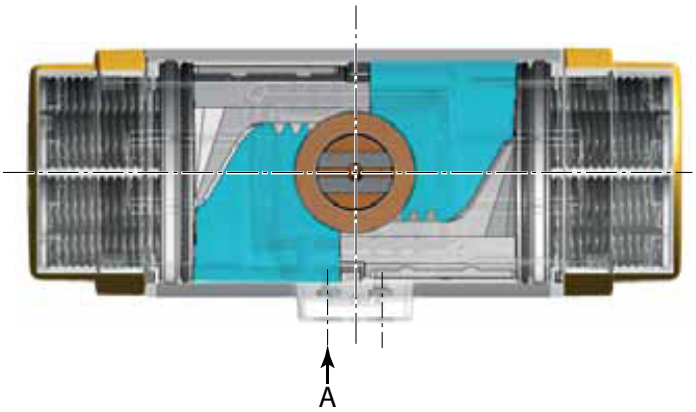
1. Solenoid valve capacity: 0.6m³/h
2. Pipe diameter: 6 mm
3. Medium: Clean air
4. Supply pressure: 5.5 bar
5. Load: Average load
6. Stroke: 90°
7. Temperature: Room temperature

Subject to changes

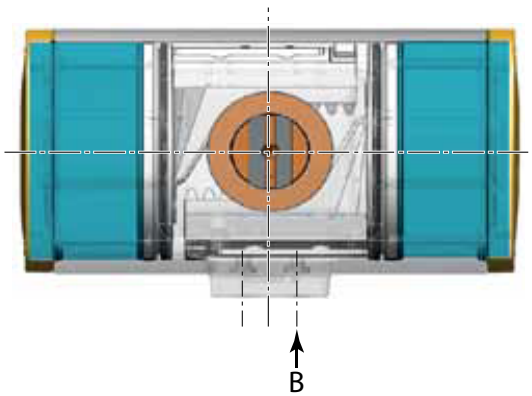
TYPE	Actuator volumes		
	Max. volume (liters)		
	Central chamber	End cap chamber	Volume displaced
12	0,05	0,06	0,04
25	0,14	0,20	0,08
40	0,26	0,37	0,15
65	0,40	0,56	0,22
100	0,60	0,90	0,30
150	1,00	0,80	0,50
200	1,30	1,00	0,70
350	2,10	1,90	1,20
600	3,60	3,30	2,10
950	4,90	4,60	3,20
1600	7,90	7,30	5,40
2500	12,60	11,90	8,30
4000	21,70	19,00	13,50

TYPE	Consumption per stroke (liters)					
	Outward stroke			Inward stroke		
	2 bar	4 bar	8 bar	2 bar	4 bar	8 bar
12	0,14	0,24	0,44	0,16	0,28	0,52
25	0,36	0,46	1,20	0,48	0,88	1,70
40	0,67	1,20	2,20	0,89	1,60	3,10
65	1,02	1,80	3,40	1,30	2,40	4,70
100	1,50	2,70	5,00	2,00	3,80	7,20
150	2,40	4,30	8,10	2,10	3,60	6,70
200	3,20	5,70	11,00	2,80	4,90	9,10
350	5,50	9,80	18,00	5,00	8,80	16,00
600	9,40	17,00	31,00	8,70	15,00	28,00
950	13,00	23,00	43,00	12,00	22,00	40,00
1600	21,00	37,00	69,00	20,00	35,00	64,00
2500	34,00	59,00	109,00	32,00	56,00	104,00
4000	57,00	100,00	187,00	52,00	89,00	165,00

Volume central chamber
Single and double acting



Volume end cap chamber
Double acting



Subject to changes