

bar-agturn[®]

The versatile pneumatic actuator

Technical data sheet

DYSTRYBUTOR
Valmark Sp. z o.o.
tel: (22) 868 58 58
mail: biuro@valmark.pl



Objective

With 40 years of experience in automation we are able to meet the current requirements of the valve market and together with the bar-acturn we have developed a new pneumatic quarter-turn actuator for our diverse customer groups.

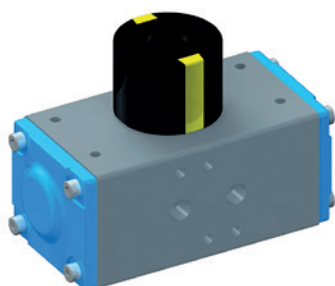
Thanks to its special design, robust construction and great versatility in technical characteristics, we fulfil the demands from the plant designer and plant manufacturer to the user.

This covers a very wide range of torque values and swivel angles.

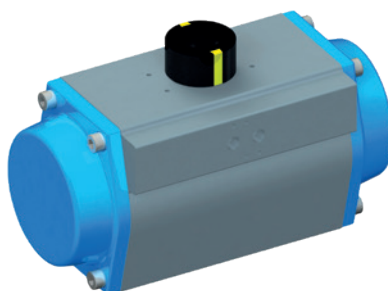
Use

- a suitable rotary actuator is available for each application of shut-off valves due to 18 different sizes and torques from 2 to 13.040 Nm
- the high-quality powder coating of the cap and casing made of hard-coated aluminium allows the usage even in aggressive environmental conditions
- the solenoid valve interface is located high on the profile and easily accessible which optimizes the installation of pilot valves
- the end position adjustment on the opposite side of the solenoid valve connection facilitates the adjustment process
- the standardised interface VDI/VDE 3845 can be used to set up all commercially available signal and control devices
- the position indicator is part of the product which is equipped with variable clips for displaying the valve position
- the end positions can be configured between 0° and 90° as well as from + 5° to -5°, whereby the valve can be optimally adjusted
- there are 2 ISO flange patterns available for most of the sizes per each actuator size to ensure flexible automation of valves
- the octagonal pinion connection adapts a parallel or diagonal selector shaft alignment of the valve and ensures a space-saving actuator construction
- simple assembly and disassembly of the safety springs which are designed for a balanced ratio between pneumatic torque and spring torque
- each control pressure is assigned to a defined number of springs and facilitates the actuator selection based on the torques
- a laser engraving on the actuator casing marks the flange patterns and air connections for a clear allocation
- the serial number is also laser engraved; this helps to trace the actuator manufacturing at any time
- precisely milled piston tooth system ensures smoother running, optimum torque and low wear
- a long service life is achieved by using the plain bearing for all moving parts
- the actuators cover a wide range of applications thanks to the actuator variants with different swivel angles
- a reduced stock level is achieved by using identical caps for single- and double-acting actuators
- the unmistakable design is patent-protected and guarantees the original actuator type with a design based on the principle „Form follows function“
- elevated failsafe performance by our SIL 3 certified actuators

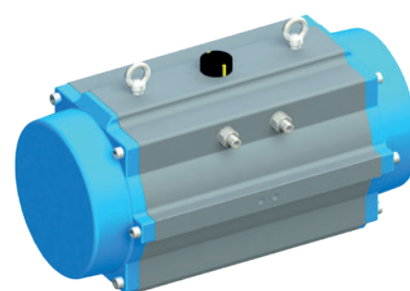
Type GD-032



Type GD/GS-040 to -270



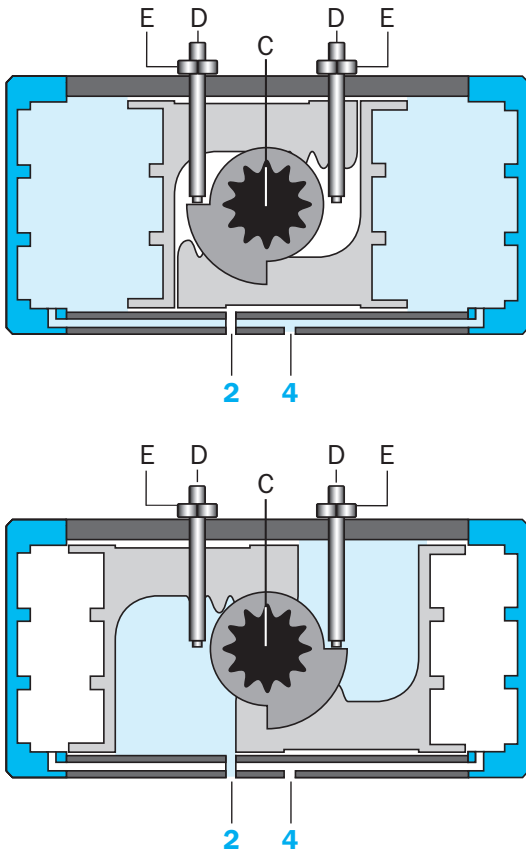
Type GD/GS-300 to -400



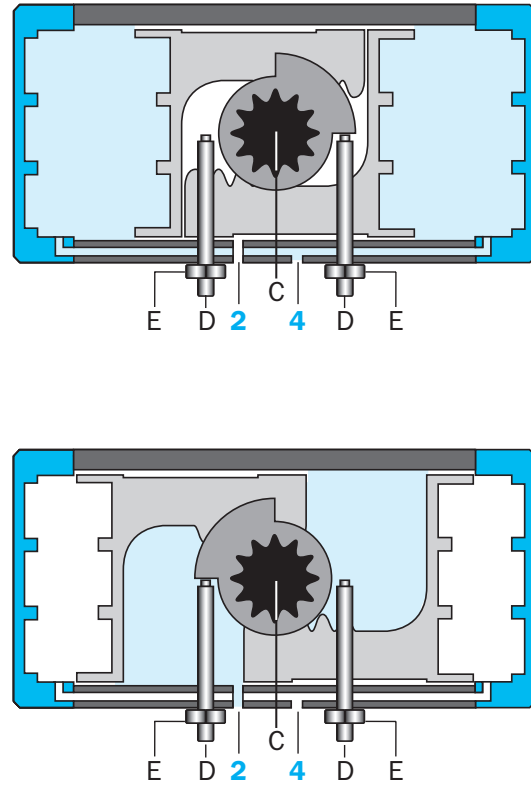
Technical data

	Standard model	Options available
Construction type	pneumatic twin-piston quarter-turn actuator type GD = double-acting type GS = single-acting (with spring return)	
Design features	rack-and-pinion principle with self-centering piston guide in the casing; single-acting: with safety springs	
Installation position	any desired	
Standards	connection point actuator signal device: acc. to VDI/VDE 3845 (NAMUR) connection point actuator/control valve: acc. to NAMUR or VDI/VDE 3845 connection point actuator/valve: four or eight internal threads in the actuator casing: acc. to EN ISO 5211	different mounting and connection dimensions are possible actuator pinion optionally with double-D bore according to EN ISO 5211 or according to customer requirements
Materials	casing: aluminium-alloy, hard anodized cap: aluminium-alloy, powder-coated piston/rack: aluminium-alloy pinion: corrosion-protected steel seals: NBR bearings: made of plastic with very good sliding properties screws: stainless steel A2	casing coating: powder-coated; PTFE cap coating: PTFE pinion: stainless steel 303; AISI 316 seals: FKM
Ambient temperature	-20 °C to +80 °C	low temperature design: -40 °C to +80 °C high temperature design: -20 °C to +160 °C
Nominal pivoting angle	double-acting: 90°, 120°, 180° single-acting: 90° nominal pivoting angle can be adjusted as standard from + 5° to -5° in both end positions	differing rotating angles, e.g. 135° swivel angle limitation up to 100 %
Torque	2 to 13.040 Nm	
Control pressure	2 to 8 bar	
Control medium / Quality	filtered air with regard to residual oil content, dust and water minimum according to DIN ISO 8573-1: 2010 [7:-:4]	upon request also can be operated with other non-aggressive, gaseous or liquid media
Certificates	SIL 3 by TÜV Rheinland, test basis IEC 61508 Parts 1-2 and 4-7:2010	

**Function double-acting
GD-032 to -210**

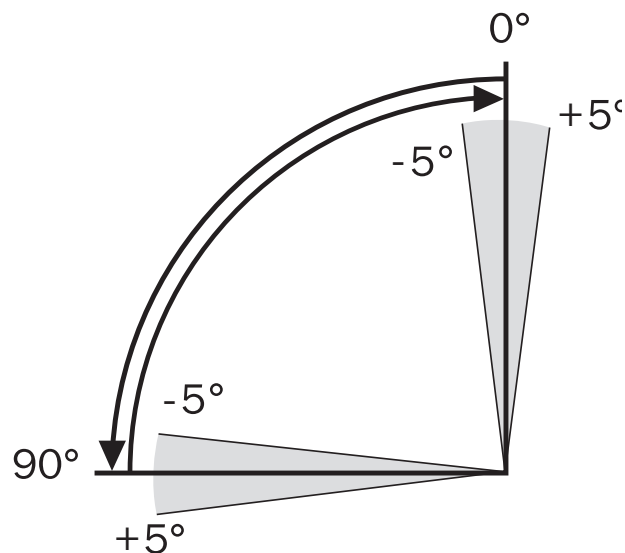


**Function double-acting
GD-240 to -400**

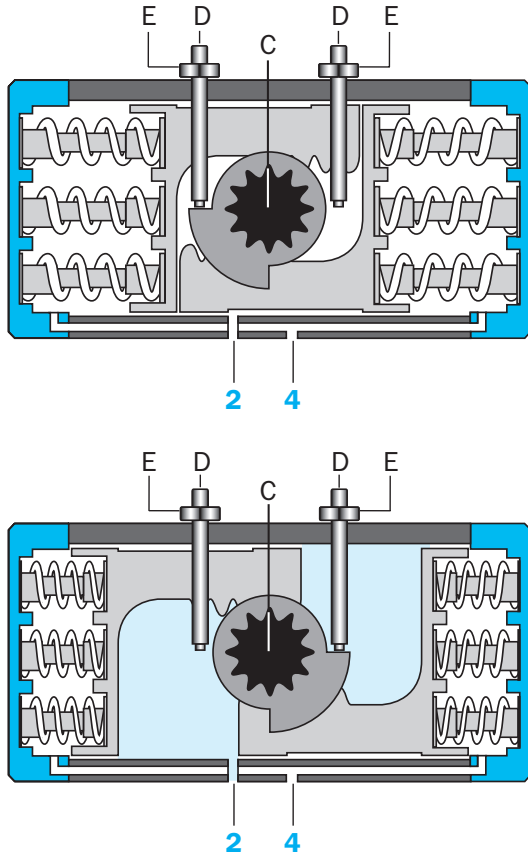


If the two outer chambers are pressurised via connection „4“, the pistons move towards each other into the basic position (0°). The force of both pistons is transmitted to the pinion „C“ via the racks. If connection „2“ is pressurised and connection „4“ is vented, the pistons move apart into the 90° position.

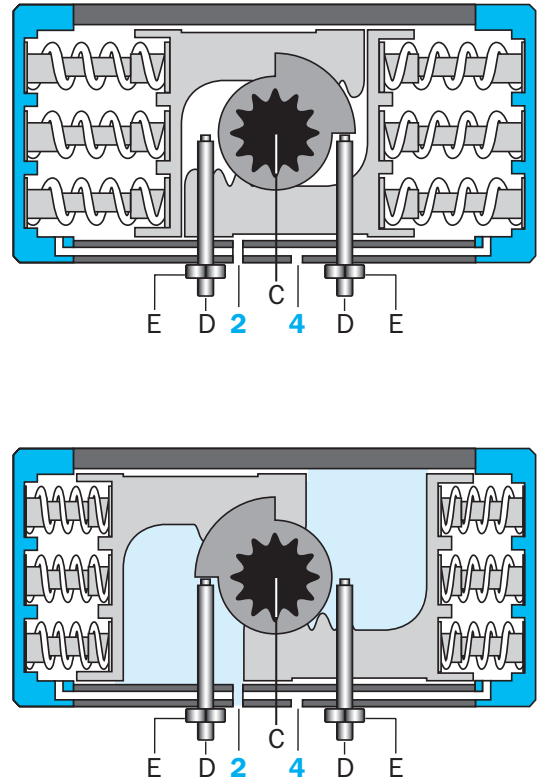
The pivoting angle can be adjusted between + 5° and - 5° in a pressureless state in both positions with the end position adjustment screws „D“ and secured with the lock nut „E“.



**Function single-acting
GS-052 to -210**



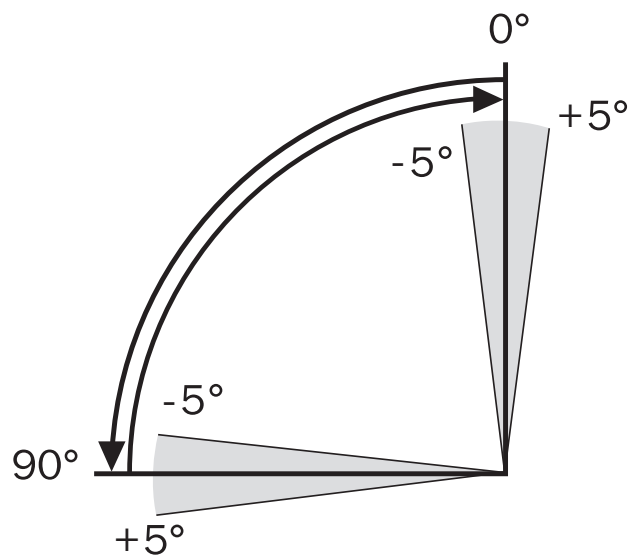
**Function single-acting
GS-240 to -400**



In the single-acting model the springs push the pistons back into the basic position and air is exhausted from connection „2“.

The number of springs can be adapted to the available control pressure.

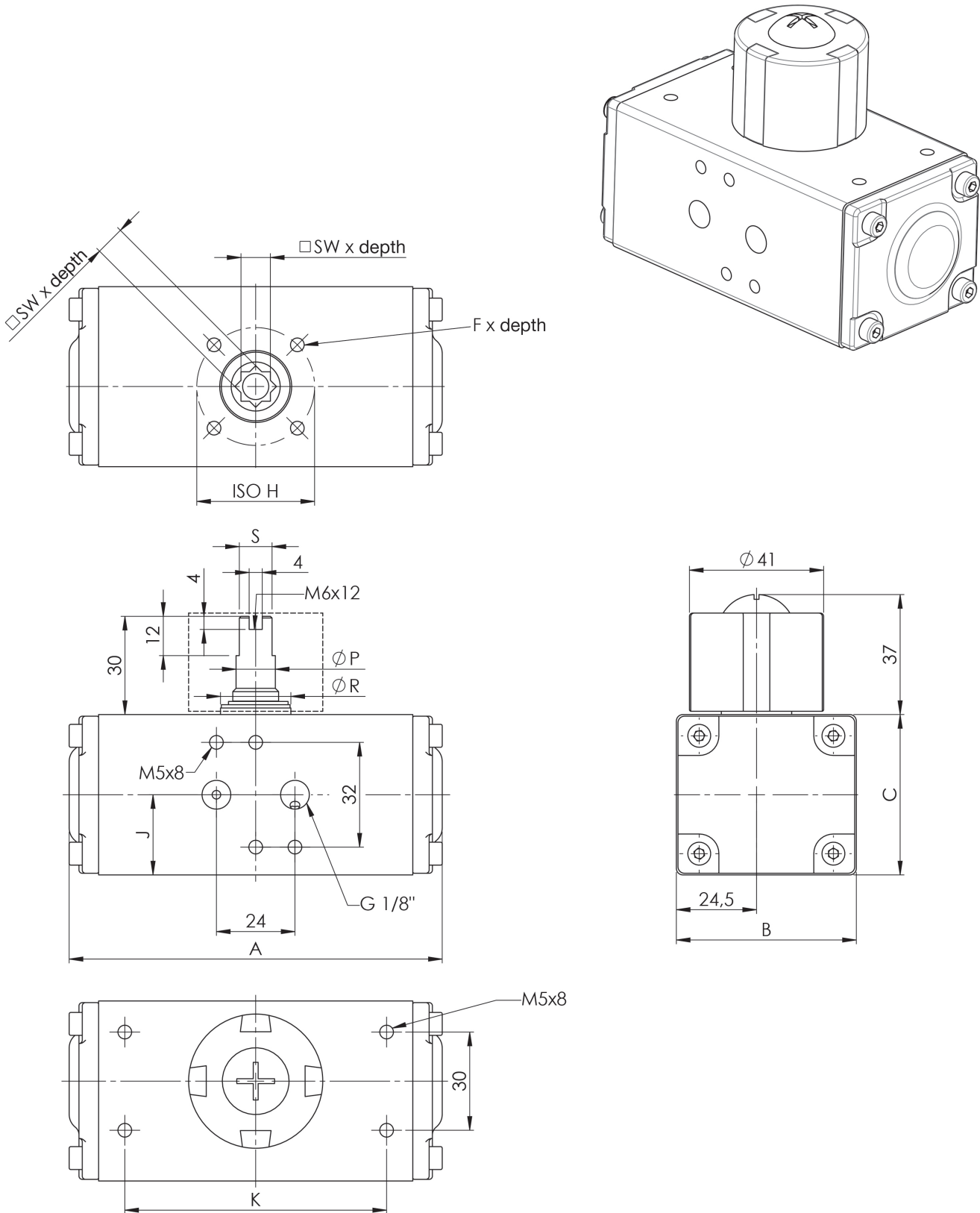
The setting of the end positions is carried out as described under „Function double-acting“.



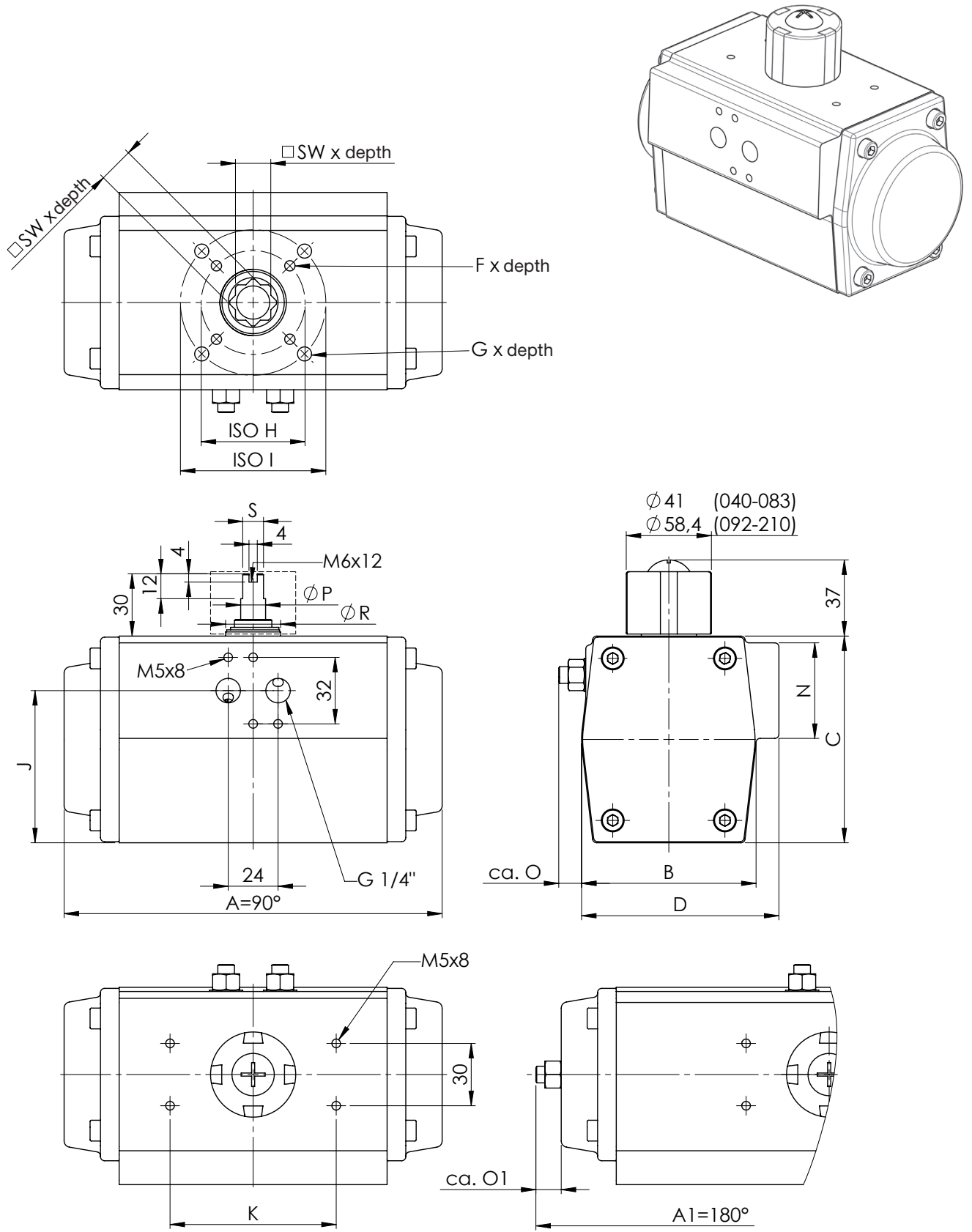
Torques – single-acting actuators, type GS [Nm]

		Spring force		Pneumatic applied torque Md N [Nm] at minimum control pressure Pst [bar]																						
		Md F [Nm]		2,0		2,5		3,0		3,5		4,0		4,5		5,0		5,5		6,0		7,0		8,0		
Typ	Spring code	Md min	Md max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	
GS-270	1	119	173	989	1043	1280	1333	1570	1624	1860	1914	2151	2205	2441	2495	2732	2786	3022	3076	3313	3367	3894	3948	4475	4529	
	2	238	346	816	924	1107	1214	1397	1505	1688	1795	1978	2086	2269	2376	2559	2667	2850	2957	3140	3248	3721	3828	4302	4409	
	3	357	518	643	805	934	1095	1224	1386	1515	1676	1805	1967	2096	2257	2386	2547	2677	2838	2967	3128	3548	3709	4129	4290	
	4	476	691	471	686	761	976	1052	1266	1342	1557	1632	1847	1923	2138	2213	2428	2504	2719	2794	3009	3375	3590	3956	4171	
	5	596	864	298	566	588	857	879	1147	1169	1438	1460	1728	1750	2019	2041	2309	2331	2600	2622	2890	3203	3471	3783	4052	
	6	715	1037	125	447	415	738	706	1028	996	1319	1287	1609	1577	1900	1868	2190	2158	2481	2449	2771	3030	3352	3611	3933	
	7	834	1210			243	619	533	909	824	1200	1114	1490	1404	1781	1695	2071	1985	2362	2276	2652	2857	3233	3438	3814	
	8	953	1383					360	790	651	1081	941	1371	1232	1661	1522	1952	1813	2242	2103	2533	2684	3114	3265	3695	
	9	1072	1555							478	961	768	1252	1059	1542	1349	1833	1640	2123	1930	2414	2511	2995	3092	3576	
	10	1191	1728							305	842	596	1133	886	1423	1176	1714	1467	2004	1757	2295	2338	2876	2919	3457	
	11	1310	1901									423	1014	713	1304	1004	1595	1294	1885	1585	2176	2166	2757	2746	3338	
	12	1429	2074									250	895	540	1185	831	1476	1121	1766	1412	2057	1993	2637	2574	3218	
GS-300	1	163	237	1357	1431	1755	1829	2154	2227	2552	2626	2951	3024	3349	3423	3748	3821	4146	4220	4545	4618	5342	5415	6139	6212	
	2	327	474	1120	1267	1518	1666	1917	2064	2315	2463	2714	2861	3112	3260	3511	3658	3909	4056	4308	4455	5104	5252	5901	6049	
	3	490	711	883	1104	1281	1502	1680	1901	2078	2299	2477	2698	2875	3096	3273	3495	3672	3893	4070	4292	4867	5089	5664	5885	
	4	653	948	646	940	1044	1339	1443	1737	1841	2136	2239	2534	2638	2933	3036	3331	3435	3730	3833	4128	4630	4925	5427	5722	
	5	817	1185	408	777	807	1176	1205	1574	1604	1972	2002	2371	2401	2769	2799	3168	3198	3566	3596	3965	4393	4762	5190	5559	
	6	980	1423	171	614	570	1012	968	1411	1367	1809	1765	2208	2164	2606	2562	3005	2961	3403	3359	3801	4156	4598	4953	5395	
	7	1144	1660			333	849	731	1247	1130	1646	1528	2044	1927	2443	2325	2841	2724	3240	3122	3638	3919	4435	4716	5232	
	8	1307	1897					494	1084	893	1482	1291	1881	1690	2279	2088	2678	2487	3076	2885	3475	3682	4272	4479	5069	
	9	1470	2134							656	1319	1054	1717	1452	2116	1851	2514	2249	2913	2648	3311	3445	4108	4242	4905	
	10	1634	2371							418	1156	817	1554	1215	1953	1614	2351	2012	2750	2411	3148	3208	3945	4005	4742	
	11	1797	2608									580	1391	978	1789	1377	2188	1775	2586	2174	2985	2971	3782	3768	4579	
	12	1960	2845									343	1227	741	1626	1140	2024	1538	2423	1937	2821	2734	3618	3531	4415	
GS-350	1	245	355	2031	2142	2628	2738	3225	3335	3821	3932	4418	4528	5014	5125	5611	5721	6208	6318	6804	6915	7997	8108	9191	9301	
	2	489	710	1676	1897	2273	2494	2870	3090	3466	3687	4063	4284	4659	4880	5256	5477	5853	6073	6449	6670	7642	7863	8836	9056	
	3	734	1065	1321	1653	1918	2249	2515	2846	3111	3442	3708	4039	4304	4636	4901	5232	5498	5829	6094	6425	7287	7619	8481	8812	
	4	978	1420	967	1408	1563	2005	2160	2601	2756	3198	3353	3794	3950	4391	4546	4988	5143	5584	5739	6181	6933	7374	8126	8567	
	5	1223	1775	612	1163	1208	1760	1805	2357	2401	2953	2998	3550	3595	4146	4191	4743	4788	5340	5384	5936	6578	7129	7771	8323	
	6	1468	2130	257	919	853	1515	1450	2112	2046	2709	2643	3305	3240	3902	3836	4498	4433	5095	5029	5692	6223	6885	7416	8078	
	7	1712	2485			498	1271	1095	1867	1691	2464	2288	3061	2885	3657	3481	4254	4078	4850	4674	5447	5868	6640	7061	7833	
	8	1957	2840					740	1623	1336	2219	1933	2816	2530	3413	3126	4009	3723	4606	4319	5202	5513	6396	6706	7589	
	9	2201	3195							981	1975	1578	2571	2175	3168	2771	3765	3368	4361	3964	4958	5158	6151	6351	7344	
	10	2446	3550							627	1730	1223	2327	1820	2923	2416	3520	3013	4117	3610	4713	4803	5906	5996	7100	
	11	2691	3905									868	2082	1465	2679	2061	3275	2658	3872	3255	4469	4448	5662	5641	6855	
	12	2935	4260									513	1838	1110	2434	1706	3031	2303	3627	2900	4224	4093	5417	5286	6610	
GS-400	1	262	411	2845	2994	3659	3808	4473	4622	5287	5436	6101	6250	6915	7064	7729	7878	8543	8692	9357	9506	10985	11134	12613	12762	
	2	525	823	2433	2731	3247	3545	4061	4359	4875	5173	5689	5987	6503	6801	7317	7615	8131	8429	8945	9243	10573	10871	12201	12499	
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	4	1050	1646	1610	2206	2424	3020	3238	3834	4052	4648	4866	5462	5680	6276	6494	7090	7308	7904	8122	8718	9750	10346	11378	11974	
	5	1312	2057	1199	1944	2013	2758	2827	3572	3641	4386	4455	5200	5269	6014	6083	6828	6897	7642	7711	8456	9339	10084	10967	11712	
	6	1575	2469	787	1681	1601	2495	2415	3309	3229	4123	4043	4937	4857	5751	5671	6565	6485	7379	7299	8193	8927	9821	10555	11449	
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	8	2100	3292			778	1970	1592	2784	2406	3598	3220	4412	4034	5226	4848	6040	5662	6854	6476	7668	8104	9296	9732	10924	
	9	2362	3703					1181	2522	1995	3336	2809	4150	3623	4964	4437	5778	5251	6592	6065	7406	7693	9034	9321	10662	
	10	2625	4115					769	2260	1583	3074	2397	3888	3211	4702	4025	5516	4839	6330	5653	7144	7281	8772	8909	10400	
	11	2887	4526							1172	2811	1986	3625	2800	4439	3614	5253	4428	6067	5242	6881	6870	8509	8498	10137	
	12	3149	4938							760	2549	1574	3363	2388	4177	3202	4991	4016	5805	4830	6619	6458	8247	8086	9875	
	13	3412	5349									1163	3100	1977	3914	2791	4728	3605	5542	4419	6356	6047	7984	7675	9612	
	14	3674	5761									751	2838	1565	3652	2379	4466	3193	5280	4007	6094	5635	7722	7263	9350	
	15	3937	6172												1154	3389	1968	4203	2782	5017	3596	5831	5224	7459	6852	9087
	16	4199	6584												742	3127	1556	3941	2370	4755	3184	5569	4812	7197	6440	8825

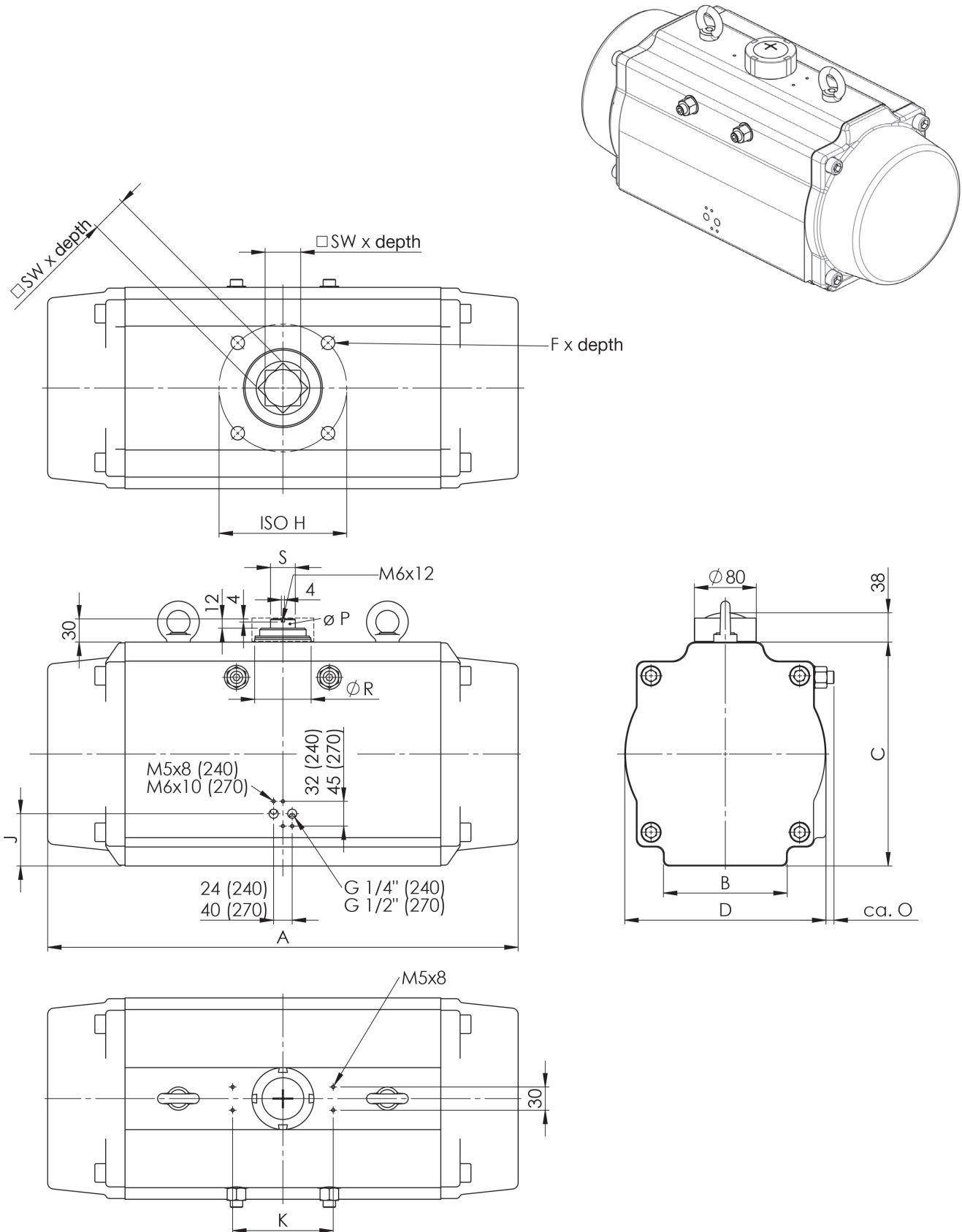
Dimensional drawings for type GD-032



Dimensional drawings for type GD-040 and GD/GS-52 to -210



Dimensional drawings for type GD/GS-240 and -270



Dimensional drawings for type GD/GS-300, -350 and -400

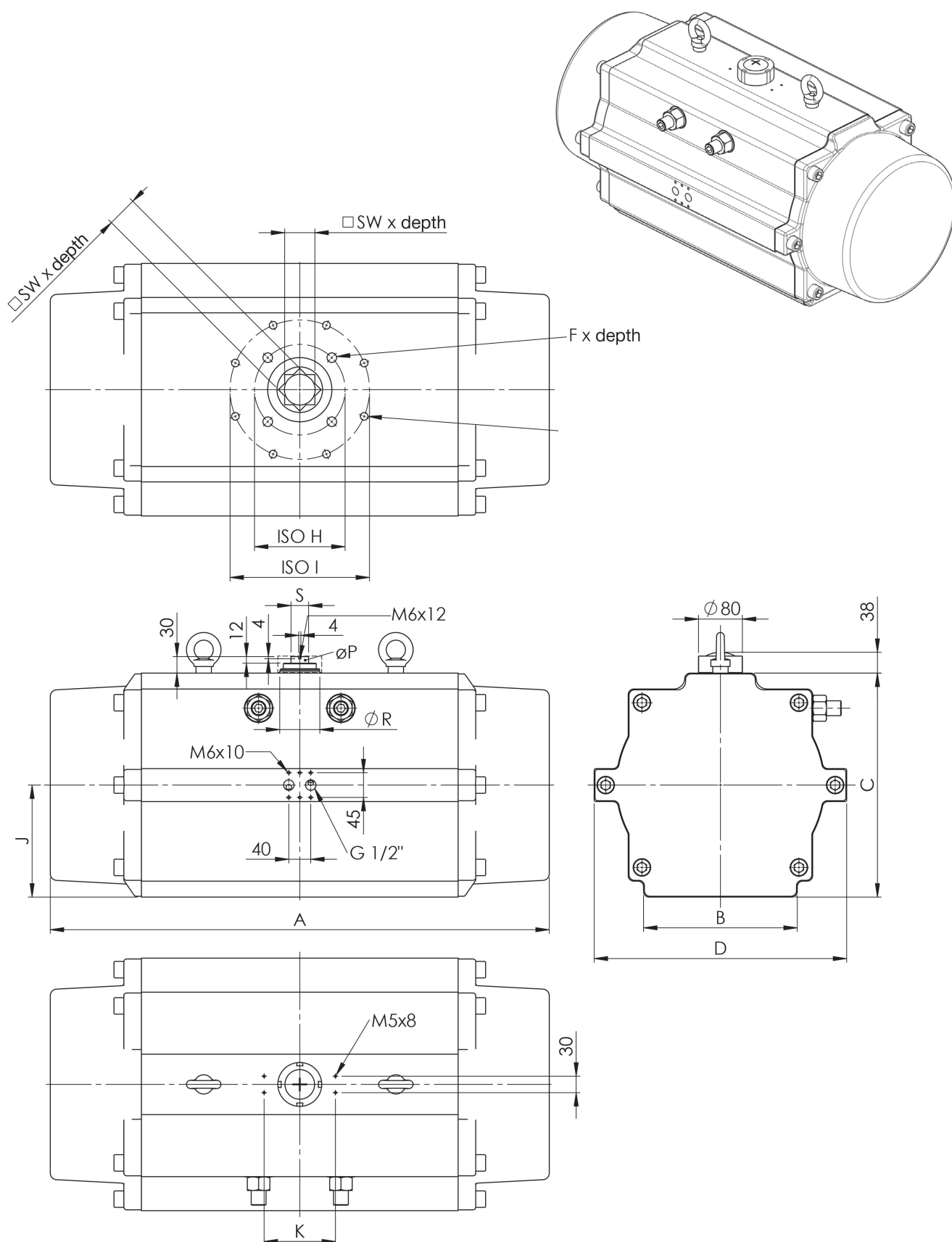


Table of dimensions

Type GD GS	A	A1	B	C	D	E	F x depth	G x depth	ISO H	ISO I	J	K	N	O	O1	P	R	S	SW x depth
032	114		55	49		1/8"	M5x8		ø36/F03		24,5	80				ø12	ø21,5	10	9x11
040	120		60,5	60		1/4"	M5x8	M6x9	ø36/F03	ø50/F05	24	80		15		ø12	ø21,5	10	11x14
052	147	210	60	72	74,5	1/4"	M5x8	M6x9	ø36/F03	ø50/F05	48	80	46	9	16	ø12	ø21,5	10	11x14
063	165	241	72	88	83	1/4"	M6x10	M8x13	ø50/F05	ø70/F07	61	80	46	12	14	ø12	ø26,5	10	14x18
075	182	258	84	99,5	95	1/4"	M6x10	M8x13	ø50/F05	ø70/F07	73,3	80	46	11	14	ø12	ø26,5	10	17x19
083	208	302	92	109	103	1/4"	M6x10	M8x13	ø50/F05	ø70/F07	80	80	46	12	16	ø12	ø26,5	10	17x21
092	262	375	102	116,5	109,5	1/4"	M6x10	M8x13	ø50/F05	ø70/F07	91	80	46	9	22	ø18	ø35	14	17x21
105	270	397	115	133	124,5	1/4"	M8x13	M10x16	ø70/F07	ø102/F10	99,5	80	46	7,5	16	ø18	ø35	14	22x26
125	301	443	135	155	142	1/4"	M8x13	M10x16	ø70/F07	ø102/F10	127	80	46	8,5	23	ø28	ø46	20	22x26
140	395	585	152	172		1/4"	M10x16	M12x19	ø102/F10	ø125/F12	138	(*)	75	7	16	ø28	ø51	20	27x31
160	454	675	174	197		1/4"	M10x16	M12x19	ø102/F10	ø125/F12	159,5	(*)	84	6	15	ø28	ø51	20	27x31
190	528	781	206	230		1/4"	M16x24		ø140/F14		188	130	100	8,5	38	ø44	ø61	32	36x40
210	536	789	226	255		1/4"	M16x24		ø140/F14		205,5	130	115	10,5	35	ø44	ø73	32	36x40
240	608		160	289	260	1/4"	M20x25		ø165/F16		67,5	130		10,5		ø44	ø73	32	46x50
270	721		160	328	294	1/2"	M20x25		ø165/F16		79	130		13,5		ø44	ø73	32	46x50
300	769		210	348	406	1/2"	M20x25		ø165/F16		174	130				ø44	ø73	32	46x60
350	909		280	408	460	1/2"	M20x25	M16x25	ø165/F16	ø254/F25	204	130				ø44	ø73	32	55x60
400	925		300	480	516	1/2"	M20x25	M16x25	ø165/F16	ø254/F25	240	130				ø44	ø73	32	55x60

* For actuator sizes 140 and 160, dimension **K** is 80 and 130 mm.

Double-acting actuators

Type GD	Weight [kg]	Volume/double stroke [L]	Type GD	Weight [kg]	Volume/double stroke [L]
032	0,73	0,09	/	/	/
040	0,9	0,19	/	/	/
052	1,3	0,28	052/180	1,9	0,47
063	2,0	0,44	063/180	2,9	0,79
075	2,55	0,64	075/180	3,7	1,13
083	3,25	0,9	083/180	4,9	1,6
092	5,24	1,37	092/180	6,6	2,45
105	6,06	1,83	105/180	9,0	3,48
125	10,00	3,0	125/180	13,0	5,65
140	14,02	4,7	140/180	21,0	9,16
160	24,52	6,9	160/180	31,0	13,69
190	32,4	11,3	190/180	46,0	22,33
210	39,8	15,0	210/180	54,0	28,53
240	57,0	20,0	/	/	/
270	78,7	31,0	/	/	/
300	121,7	53,5	/	/	/
350	210,2	81,4	/	/	/
400	280	108,6	/	/	/

Single-acting actuators

Type GS	Weight* [kg]	Volume/double stroke [L]
032	/	/
040	/	/
052	1,43	0,12
063	2,17	0,21
075	2,81	0,30
083	3,67	0,43
092	6,01	0,64
105	6,9	0,95
125	11,38	1,6
140	16,42	2,5
160	28,32	3,7
190	39,4	5,9
210	49,3	7,5
240	70,0	11,0
270	100,3	17,0
300	149,12	23,8
350	259,3	35,1
400	325	52,6

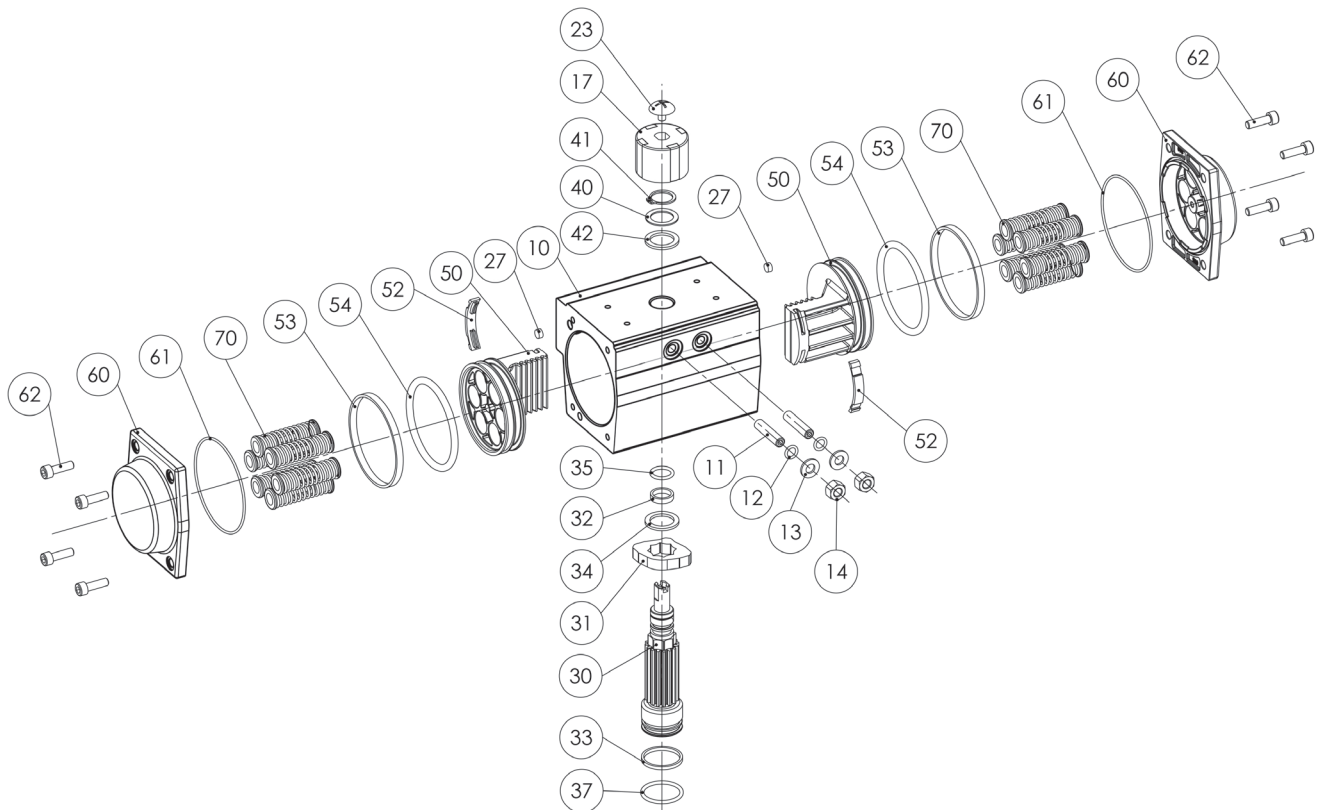
* Weight with 12 springs

Components GD-032 to -040 and GD/GS-052 to -400




10	Casing		30	Pinion				
11	Stop screw	Not applicable to size -032	31	Stop pin	Not applicable to size -032	50	Piston	
12	Seal Stop screw	Not applicable to size -032	32	Pinion bearing upper	Not applicable to size -032	52	Guiding shoe	Not applicable to size -032
13	Washer	Not applicable to size -032	33	Pinion bearing lower	Not applicable to size -032	53	Guide ring	Not applicable to -032 and -040, 2 x to size -350 and -400
14	Lock nut	Not applicable to size -032	34	Inside thrust washer		54	Piston sealing	2 x for size -400
17	Position indicator		35	Seal pinion upper		60	Cap	
23	Fixing screw for position indicator		37	Seal pinion lower		61	Cap seal	
25*	Ring nut	Size -160 to -400	40	Support washer		62	Cap screws	
26*	Plastic washer	Size -160 to -400	41	Lock washer		70	Springs	Not applicable to -032 and -040
27	Sealing plug	Not applicable to size -032	42	Outside thrust washer				





* Slings from GD/GS-160

Schematic diagram



Mounting options

2/2-way valve	Drive pinion design	Operating way	Installation variant
		Single-acting spring force "close"	F
		Single-acting spring force "open"	H
	Double-D = Z (upon request) 	Single-acting spring force "close"	A
		Single-acting spring force "open"	D

2/2-way valve	Drive pinion design	Operating way	Installation variant
 Ball valve and tap cock 		Single-acting spring force "close"	F
		Single-acting spring force "open"	H
	Double-D = Z (upon request) 	Single-acting spring force "close"	A
		Single-acting spring force "open"	D

Order code (example)

G	S	-	0	7	5	/	0	9	0	-	0	7	-	F05/07	-	V14	-	F	
G	D	-	0	7	5	/	0	9	0	-			-	F05/07	-	V14	-	F	
Operating way			Type				Pivoting angle 90°				Amount of springs		ISO flange pattern			Pinion design*		Installation variant	
GS = single-acting GD = double-acting																			

* **V** = octagon with size **Z** = Double-D with size

DYSTRYBUTOR
Valmark Sp. z o.o.
tel: (22) 868 58 58
mail: biuro@valmark.pl

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bar
A WATTS Brand

bar pneumatische Steuerungssysteme GmbH
Auf der Hohl 1 • 53547 Dattenberg • Germany
Tel. +49 (0) 2644 96070 • Fax +49 (0) 2644 960735
bar-info@wattswater.com • www.bar-gmbh.de