

bar-agturn®

The versatile pneumatic actuator



Objective

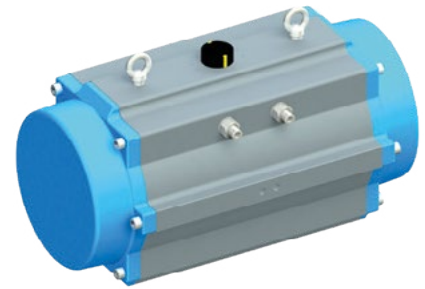
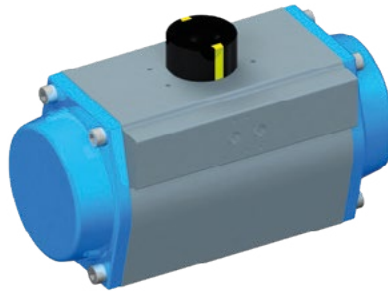
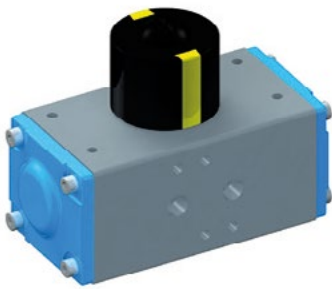
With 40 years of experience in automation we are able to meet the current requirements of the valve market and together with the bar-agturn we have developed a new pneumatic quarter-turn actuator for our diverse customer groups.

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

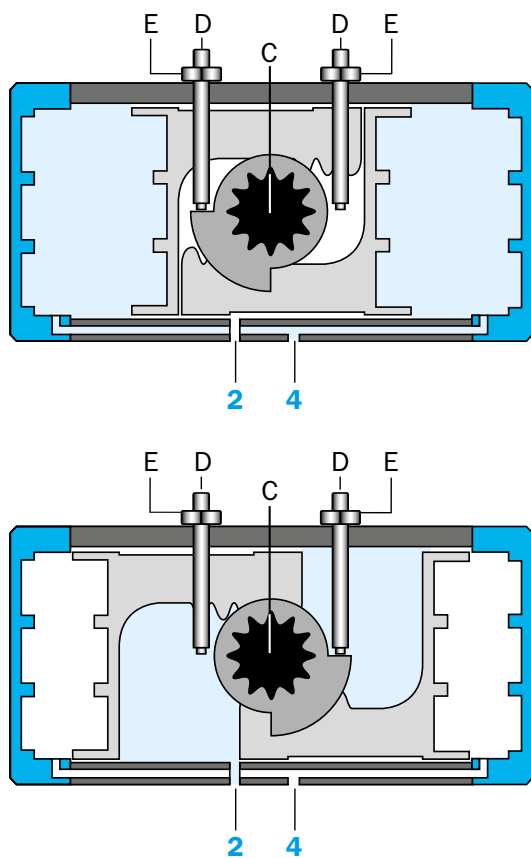
- a suitable rotary actuator is available for each application of shut-off valves due to 18 different sizes and torques from 2 to 13.040 Nm
- the high-quality powder coating of the cap and casing made of hard-coated aluminium allows the usage even in aggressive environmental conditions
- the solenoid 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



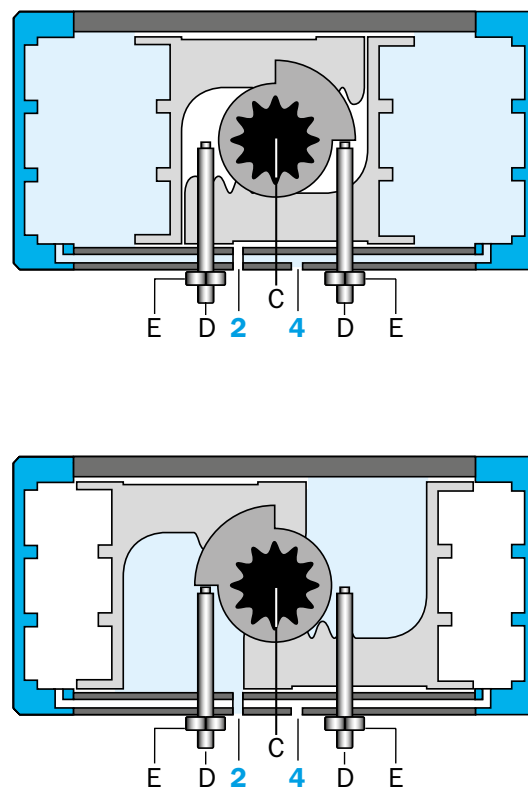
Technical data

	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

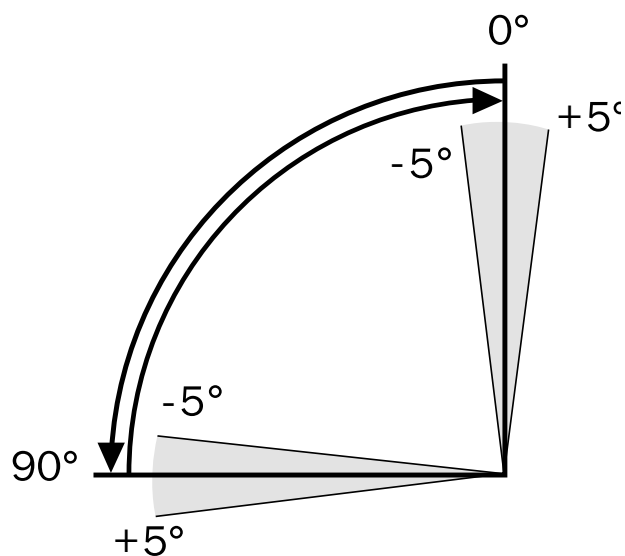


Function double-acting GD-240 to -400

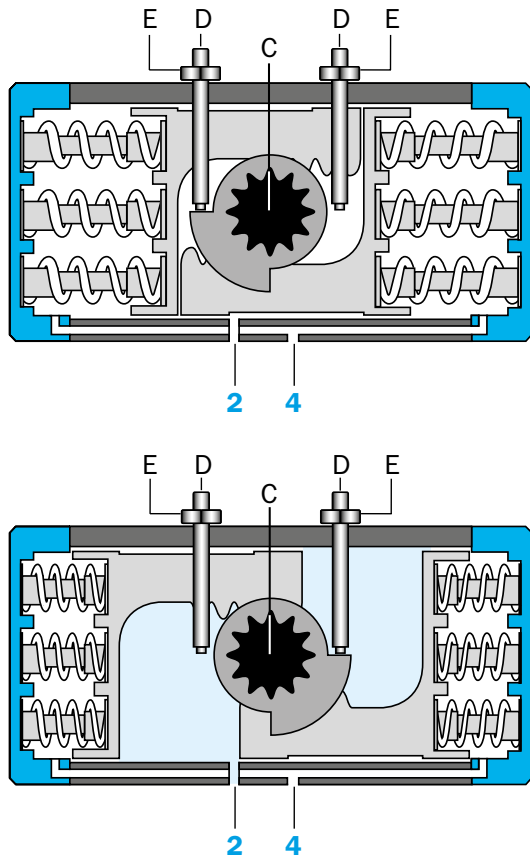


If the two outer chambers are pressurised via connection „4“, the pistons move towards each other into the basic position (0°). The force of both pistons is transmitted to the pinion „C“ via the racks. If connection „2“ is pressurised and connection „4“ is vented, the pistons move apart into the 90°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

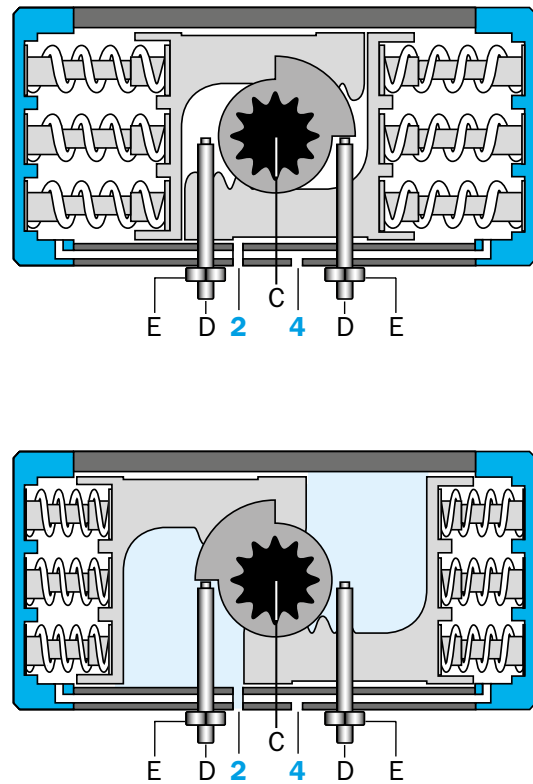
The pivoting angle can be adjusted between + 5° and - 5° in a pressureless state in both positions with the end position adjustment screws „D“ and secured with the lock nut „E“.



Function single-acting GS-052 to -210



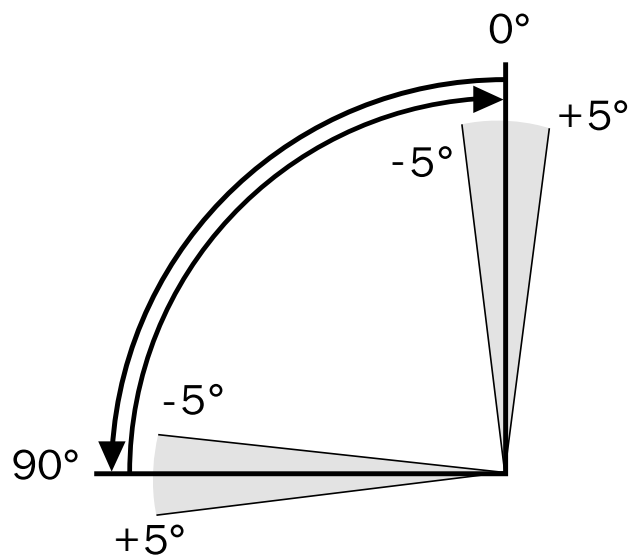
Function single-acting GS-240 to -400



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 double-acting actuators, type GD [Nm]

When determining the actuator sizes, a safety factor for the valve must always be taken into account. The recommended safety factor is minimum 30%. Since this safety factor is subject to the operating conditions, the required safety factor may possibly be much higher.

Type	Pneumatic applied torque Md N [Nm] at minimum control pressure P _{st} [bar]										
	2	2,5	3	3,5	4	4,5	5	5,5	6	7	8
GD-032	3	4	5	5	6	7	8	8	9	11	12
GD-040	5	6	7	8	10	11	12	13	14	17	19
GD-052	8	10	12	14	16	18	20	22	24	28	32
GD-063	14	18	21	25	28	32	35	39	42	49	56
GD-075	20	25	30	35	40	45	50	55	60	70	79
GD-083	31	38	46	53	61	69	76	84	92	107	122
GD-092	45	56	67	79	90	101	112	124	135	157	180
GD-105	65	81	98	114	130	146	163	179	195	228	260
GD-125	101	127	152	178	203	228	254	279	304	355	406
GD-140	174	217	260	304	347	390	434	477	521	607	694
GD-160	264	331	397	463	529	595	661	727	793	925	1058
GD-190	426	533	639	746	852	959	1066	1172	1279	1492	1705
GD-210	521	651	781	911	1041	1171	1302	1432	1562	1822	2082
GD-240	765	956	1148	1339	1530	1721	1913	2104	2295	2678	3060
GD-270	1162	1453	1743	2034	2324	2615	2905	3196	3486	4067	4648
GD-300	1594	1993	2391	2790	3188	3587	3985	4384	4782	5579	6376
GD-350	2387	2983	3580	4177	4773	5370	5967	6563	7160	8353	9546
GD-400	3256	4070	4884	5698	6512	7326	8140	8954	9768	11396	13024

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

When determining the actuator sizes, a safety factor for the valve must always be taken into account. The recommended safety factor is minimum 30%. Since this safety factor is subject to the operating conditions, the required safety factor may possibly be much higher.

The colour-marked torques have a balanced ratio between air and spring torque.

		Spring force		Pneumatic applied torque Md N [Nm] at minimum control pressure P _{st} [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	
Type	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-052	1	0,8	1,2	6,8	7,2	8,8	9,2	10,8	11,2	12,8	13,2	14,8	15,2	16,8	17,2	18,8	19,2	20,8	21,2	22,8	23,2	26,8	27,1	30,8	31,1
	2	1,6	2,4	5,6	6,4	7,6	8,4	9,6	10,4	11,6	12,3	13,6	14,3	15,6	16,3	17,6	18,3	19,6	20,3	21,6	22,3	25,6	26,3	29,6	30,3
	3	2,5	3,6	4,4	5,5	6,4	7,5	8,4	9,5	10,4	11,5	12,4	13,5	14,4	15,5	16,4	17,5	18,4	19,5	20,4	21,5	24,4	25,5	28,4	29,5
	4	3,3	4,7	3,2	4,7	5,2	6,7	7,2	8,7	9,2	10,7	11,2	12,7	13,2	14,7	15,2	16,7	17,2	18,7	19,2	20,7	23,2	24,7	27,2	28,7
	5	4,1	5,9	2,1	3,9	4,1	5,9	6,1	7,9	8,0	9,9	10,0	11,9	12,0	13,9	14,0	15,9	16,0	17,9	18,0	19,9	22,0	23,9	26,0	27,9
	6	4,9	7,1	0,9	3,1	2,9	5,1	4,9	7,1	6,9	9,1	8,9	11,1	10,9	13,1	12,9	15,1	14,9	17,1	16,8	19,1	20,8	23,1	24,8	27,1
	7	5,7	8,3			1,7	4,3	3,7	6,3	5,7	8,3	7,7	10,3	9,7	12,3	11,7	14,3	13,7	16,3	15,7	18,3	19,7	22,2	23,7	26,2
	8	6,5	9,5					2,5	5,4	4,5	7,4	6,5	9,4	8,5	11,4	10,5	13,4	12,5	15,4	14,5	17,4	18,5	21,4	22,5	25,4
	9	7,4	10,7					1,3	4,6	3,3	6,6	5,3	8,6	7,3	10,6	9,3	12,6	11,3	14,6	13,3	16,6	17,3	20,6	21,3	24,6
	10	8,2	11,9							2,1	5,8	4,1	7,8	6,1	9,8	8,1	11,8	10,1	13,8	12,1	15,8	16,1	19,8	20,1	23,8
	11	9,0	13,1									2,9	7,0	4,9	9,0	6,9	11,0	8,9	13,0	10,9	15,0	14,9	19,0	18,9	23,0
	12	9,8	14,2									1,7	6,2	3,7	8,2	5,7	10,2	7,7	12,2	9,7	14,2	13,7	18,2	17,7	22,2
GS-063	1	1,4	2,1	12,0	12,6	15,5	16,1	19,0	19,7	22,5	23,2	26,0	26,7	29,5	30,2	33,1	33,7	36,6	37,2	40,1	40,7	47,1	47,8	54,2	54,8
	2	2,9	4,2	9,9	11,2	13,4	14,7	16,9	18,2	20,4	21,7	23,9	25,2	27,5	28,8	31,0	32,3	34,5	35,8	38,0	39,3	45,0	46,3	52,1	53,4
	3	4,3	6,3	7,8	9,7	11,3	13,3	14,8	16,8	18,3	20,3	21,9	23,8	25,4	27,3	28,9	30,8	32,4	34,3	35,9	37,9	42,9	44,9	50,0	51,9
	4	5,8	8,4	5,7	8,3	9,2	11,8	12,7	15,3	16,2	18,8	19,8	22,4	23,3	25,9	26,8	29,4	30,3	32,9	33,8	36,4	40,9	43,5	47,9	50,5
	5	7,2	10,5	3,6	6,9	7,1	10,4	10,6	13,9	14,2	17,4	17,7	20,9	21,2	24,4	24,7	28,0	28,2	31,5	31,7	35,0	38,8	42,0	45,8	49,0
	6	8,6	12,5	1,5	5,4	5,0	8,9	8,6	12,5	12,1	16,0	15,6	19,5	19,1	23,0	22,6	26,5	26,1	30,0	29,6	33,5	36,7	40,6	43,7	47,6
	7	10,1	14,6			2,9	7,5	6,5	11,0	10,0	14,5	13,5	18,0	17,0	21,6	20,5	25,1	24,0	28,6	27,6	32,1	34,6	39,1	41,6	46,2
	8	11,5	16,7					4,4	9,6	7,9	13,1	11,4	16,6	14,9	20,1	18,4	23,6	21,9	27,1	25,5	30,7	32,5	37,7	39,5	44,7
	9	13,0	18,8					2,3	8,1	5,8	11,6	9,3	15,2	12,8	18,7	16,3	22,2	19,9	25,7	23,4	29,2	30,4	36,3	37,4	43,3
	10	14,4	20,9							3,7	10,2	7,2	13,7	10,7	17,2	14,3	20,8	17,8	24,3	21,3	27,8	28,3	34,8	35,3	41,8
	11	15,8	23,0									5,1	12,3	8,6	15,8	12,2	19,3	15,7	22,8	19,2	26,3	26,2	33,4	33,3	40,4
	12	17,3	25,1									3,0	10,8	6,6	14,4	10,1	17,9	13,6	21,4	17,1	24,9	24,1	31,9	31,2	39,0

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			
Type	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-075	1	2	3	17	18	22	23	27	28	32	33	37	38	42	43	47	48	52	53	57	58	67	68	77	78		
	2	4	6	14	16	19	21	24	26	29	31	34	36	39	41	44	46	49	51	54	56	64	66	74	76		
	3	6	9	11	14	16	19	21	24	26	29	31	34	36	39	41	44	46	49	51	54	61	64	71	73		
	4	8	12	8	12	13	17	18	22	23	27	28	32	33	37	38	42	43	47	48	52	58	61	68	71		
	5	10	15	5	10	10	15	15	20	20	25	25	30	30	35	35	40	40	45	45	49	55	59	65	69		
	6	12	18	2	8	7	13	12	18	17	23	22	28	27	33	32	37	37	42	42	47	52	57	62	67		
	7	14	21			4	11	9	16	14	21	19	25	24	30	29	35	34	40	39	45	49	55	59	65		
	8	16	24					6	14	11	18	16	23	21	28	26	33	31	38	36	43	46	53	56	63		
	9	18	27					3	11	8	16	13	21	18	26	23	31	28	36	33	41	43	51	53	61		
	10	20	30							5	14	10	19	15	24	20	29	25	34	30	39	40	49	50	59		
	11	22	33									7	17	12	22	17	27	22	32	27	37	37	47	47	57		
	12	25	36									4	15	9	20	14	25	19	30	24	35	34	45	44	55		
GS-083	1	3	5	26	27	34	35	41	43	49	50	56	58	64	65	72	73	79	81	87	88	102	104	117	119		
	2	6	9	21	24	29	32	37	39	44	47	52	55	60	62	67	70	75	78	82	85	98	100	113	116		
	3	9	14	17	21	25	29	32	36	40	44	47	52	55	59	63	67	70	74	78	82	93	97	108	113		
	4	13	18	12	18	20	26	28	33	35	41	43	48	50	56	58	64	66	71	73	79	89	94	104	109		
	5	16	23	8	15	15	22	23	30	31	38	38	45	46	53	54	61	61	68	69	76	84	91	99	106		
	6	19	27	3	12	11	19	19	27	26	35	34	42	41	50	49	57	57	65	64	73	80	88	95	103		
	7	22	32			6	16	14	24	22	31	29	39	37	47	45	54	52	62	60	70	75	85	90	100		
	8	25	36					9	21	17	28	25	36	32	44	40	51	48	59	55	66	70	82	86	97		
	9	28	41					5	18	13	25	20	33	28	40	35	48	43	56	51	63	66	79	81	94		
	10	31	45							8	22	16	30	23	37	31	45	39	53	46	60	61	75	77	91		
	11	34	50									11	27	19	34	26	42	34	49	42	57	57	72	72	88		
	12	38	54									7	23	14	31	22	39	29	46	37	54	52	69	68	84		
GS-092	1	5	7	38	40	49	52	61	63	72	74	83	85	94	97	106	108	117	119	128	130	151	153	173	175		
	2	9	13	32	36	43	47	54	58	65	69	77	81	88	92	99	103	110	114	121	126	144	148	166	171		
	3	14	20	25	31	36	42	47	54	59	65	70	76	81	87	92	99	104	110	115	121	137	143	160	166		
	4	18	27	18	27	29	38	41	49	52	60	63	71	74	83	86	94	97	105	108	116	131	139	153	161		
	5	23	33	11	22	23	33	34	44	45	56	56	67	68	78	79	89	90	101	101	112	124	134	146	157		
	6	28	40	5	17	16	29	27	40	39	51	50	62	61	73	72	85	83	96	95	107	117	130	140	152		
	7	32	47			9	24	21	35	32	46	43	58	54	69	66	80	77	91	88	103	110	125	133	147		
	8	37	54			3	19	14	31	25	42	36	53	48	64	59	75	70	87	81	98	104	120	126	143		
	9	41	60					7	26	18	37	30	48	41	60	52	71	63	82	75	93	97	116	120	138		
	10	46	67							12	33	23	44	34	55	45	66	57	77	68	89	90	111	113	134		
	11	51	74									16	39	28	50	39	62	50	73	61	84	84	107	106	129		
	12	55	80									10	35	21	46	32	57	43	68	55	80	77	102	99	124		
GS-105	1	7	10	55	58	72	75	88	91	104	107	120	123	137	140	153	156	169	172	185	188	218	221	250	253		
	2	13	19	46	52	62	68	78	84	94	100	111	117	127	133	143	149	159	165	176	182	208	214	241	247		
	3	20	29	36	45	52	61	68	77	85	94	101	110	117	126	133	142	150	159	166	175	198	207	231	240		
	4	27	39	26	38	43	55	59	71	75	87	91	103	108	120	124	136	140	152	156	168	189	201	221	233		
	5	33	48	17	32	33	48	49	64	65	80	82	97	98	113	114	129	130	145	147	162	179	194	212	227		
	6	40	58	7	25	23	41	39	57	56	74	72	90	88	106	104	122	121	139	137	155	169	187	202	220		
	7	47	68			13	34	30	51	46	67	62	83	78	99	95	116	111	132	127	148	160	181	192	213		
	8	53	77					20	44	36	60	53	77	69	93	85	109	101	125	118	142	150	174	183	207		
	9	60	87							27	54	43	70	59	86	75	102	92	119	108	135	140	167	173	200		
	10	67	97							17	47	33	63	49	79	66	96	82	112	98	128	131	161	163	193		
	11	73	106									24	57	40	73	56	89	72	105	89	122	121	154	154	187		
	12	80	116									14	50	30	66	46	82	63	99	79	115	111	147	144	180		
GS-125	1	10	15	86	91	112	116	137	142	162	167	188	192	213	218	239	243	264	269	289	294	340	345	391	395		
	2	21	30	71	81	97	106	122	131	147	157	173	182	198	207	223	233	249	258	274	284	325	334	376	385		
	3	31	45	56	70	82	96	107	121	132	146	158	172	183	197	208	222	234	248	259	273	310	324	360	375		
	4	42	60	41	60	66	85	92	111	117	136	143	161	168	187	193	212	219	237	244	263	295	313	345	364		
	5	52	75	26	49	51	75	77	100	102	126	127	151	153	176	178	202	204	227	229	252	280	303	330	354		
	6	62	91	11	39	36	64	62	90	87	115	112	140	138	166	163	191	188	217	214	242	265	293	315	343		
	7	73	106			21	54	47	79	72	105	97	130	123	155	148	181	173	206	199	232	249	282	300	333		
	8	83	121					31	69	57	94	82	120	108	145	133	170	158	196	184	221	234	272	285	323		
	9	94	136							42	84	67	109	92	135	118	160	143	185	169	211	219	261	270	312		
	10	104	151							27	74	52	99	77	124	103	150	128	175	153	200	204	251	255	302		
	11	114	166									37	88	62	114	88	139	113	165	138	190	189	241	240	291		
	12	125	181									22	78	47	103	73	129	98	154	123	180	174	230	225	281		

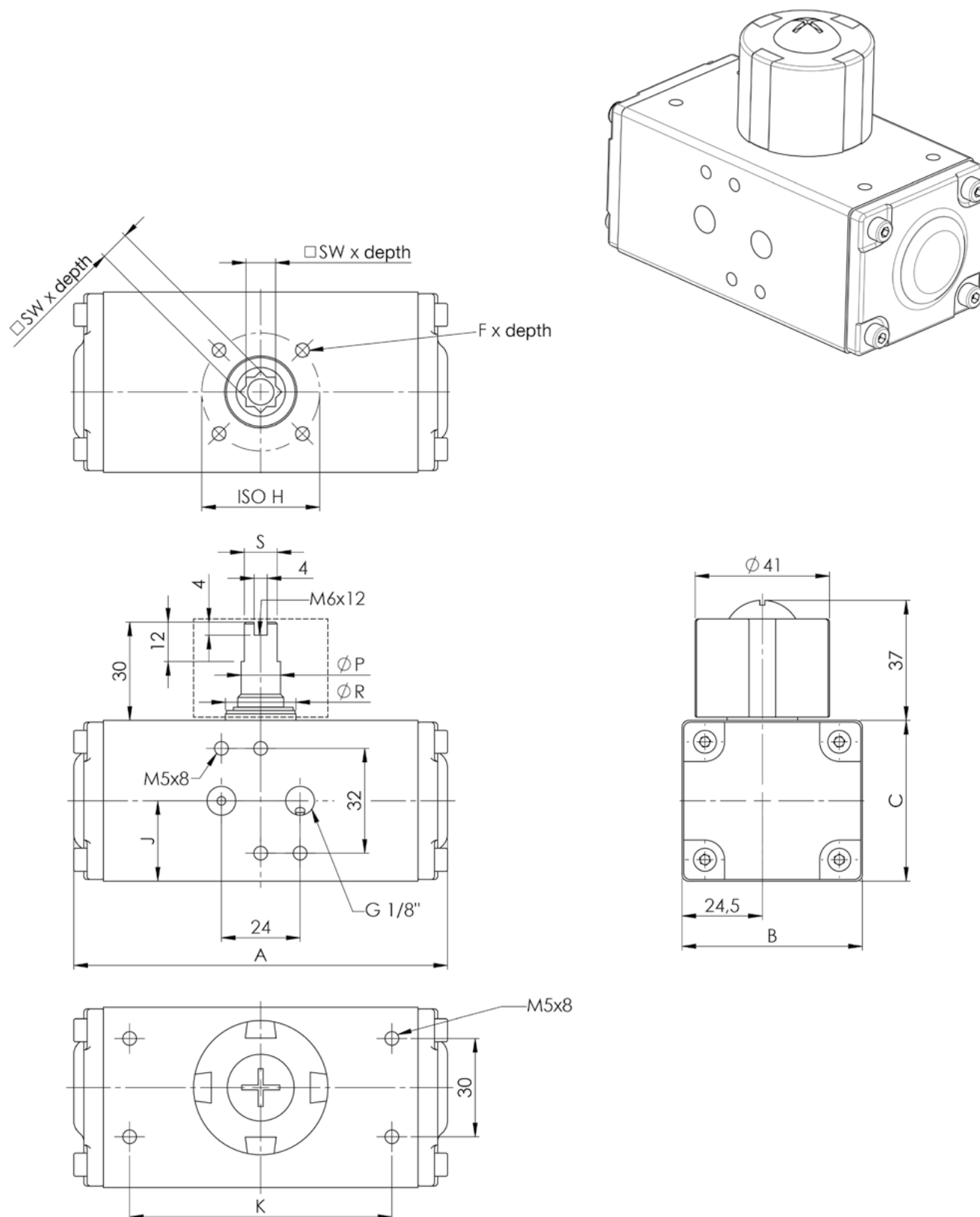
Torques – single-acting actuators, type GS [Nm]

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			
Type	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-140	1	18	26	148	156	191	199	234	242	278	286	321	329	365	373	408	416	451	459	495	503	581	589	668	676		
	2	36	52	122	138	165	181	209	225	252	268	295	311	339	355	382	398	425	442	469	485	556	572	642	658		
	3	53	77	96	120	139	164	183	207	226	250	270	294	313	337	356	380	400	424	443	467	530	554	617	641		
	4	71	103	70	102	114	146	157	189	200	233	244	276	287	319	330	363	374	406	417	449	504	536	591	623		
	5	89	129	44	85	88	128	131	171	175	215	218	258	261	302	305	345	348	388	391	432	478	518	565	605		
	6	107	155	19	67	62	110	105	154	149	197	192	240	235	284	279	327	322	371	366	414	452	501	539	587		
	7	124	181			36	93	80	136	123	179	166	223	210	266	253	309	296	353	340	396	427	483	513	570		
	8	142	207					54	118	97	162	140	205	184	248	227	292	271	335	314	378	401	465	487	552		
	9	160	232							71	144	115	187	158	231	201	274	245	317	288	361	375	447	462	534		
	10	178	258							45	126	89	169	132	213	176	256	219	300	262	343	349	430	436	516		
	11	195	284									63	152	106	195	150	238	193	282	236	325	323	412	410	499		
	12	213	310									37	134	81	177	124	221	167	264	211	307	297	394	384	481		
GS-160	1	27	39	225	237	291	303	357	369	423	436	489	502	556	568	622	634	688	700	754	766	886	898	1018	1030		
	2	54	79	186	210	252	276	318	342	384	408	450	475	516	541	582	607	648	673	715	739	847	871	979	1003		
	3	81	118	146	183	212	249	279	315	345	381	411	447	477	514	543	580	609	646	675	712	807	844	940	976		
	4	108	157	107	156	173	222	239	288	305	354	371	420	438	486	504	553	570	619	636	685	768	817	900	949		
	5	136	197	68	129	134	195	200	261	266	327	332	393	398	459	464	525	530	592	597	658	729	790	861	922		
	6	163	236	28	102	94	168	161	234	227	300	293	366	359	432	425	498	491	564	557	631	689	763	822	895		
	7	190	275			55	141	121	207	187	273	253	339	320	405	386	471	452	537	518	603	650	736	782	868		
	8	217	315					82	180	148	246	214	312	280	378	346	444	412	510	478	576	611	709	743	841		
	9	244	354							109	219	175	285	241	351	307	417	373	483	439	549	571	681	704	814		
	10	271	393							69	192	135	258	202	324	268	390	334	456	400	522	532	654	664	787		
	11	298	433									96	231	162	297	228	363	294	429	360	495	493	627	625	759		
	12	325	472									57	203	123	270	189	336	255	402	321	468	453	600	586	732		
GS-190	1	44	63	363	383	469	489	576	596	683	702	789	809	896	915	1002	1022	1109	1129	1215	1235	1429	1448	1642	1661		
	2	87	127	299	339	406	445	513	552	619	659	726	765	832	872	939	978	1045	1085	1152	1191	1365	1405	1578	1618		
	3	131	190	236	295	343	402	449	508	556	615	662	721	769	828	876	935	982	1041	1089	1148	1302	1361	1515	1574		
	4	175	254	173	252	279	358	386	465	492	571	599	678	706	784	812	891	919	998	1025	1104	1238	1317	1452	1530		
	5	218	317	109	208	216	314	322	421	429	528	536	634	642	741	749	847	855	954	962	1060	1175	1274	1388	1487		
	6	262	380	46	164	152	271	259	377	366	484	472	590	579	697	685	804	792	910	898	1017	1112	1230	1325	1443		
	7	306	444			89	227	196	334	302	440	409	547	515	653	622	760	728	866	835	973	1048	1186	1261	1399		
	8	350	507					132	290	239	396	345	503	452	610	559	716	665	823	772	929	985	1142	1198	1356		
	9	393	571							175	353	282	459	389	566	495	672	602	779	708	886	921	1099	1135	1312		
	10	437	634							112	309	219	416	325	522	432	629	538	735	645	842	858	1055	1071	1268		
	11	481	697									155	372	262	479	368	585	475	692	581	798	795	1011	1008	1225		
	12	524	761									92	328	198	435	305	541	411	648	518	755	731	968	944	1181		
GS-210	1	53	77	443	467	573	597	703	728	834	858	964	988	1094	1118	1224	1248	1354	1378	1484	1508	1745	1769	2005	2029		
	2	107	155	366	414	496	544	626	674	756	804	886	934	1016	1065	1147	1195	1277	1325	1407	1455	1667	1715	1928	1976		
	3	160	232	288	361	418	491	549	621	679	751	809	881	939	1011	1069	1141	1199	1272	1329	1402	1590	1662	1850	1922		
	4	213	310	211	307	341	437	471	567	601	698	731	828	862	958	992	1088	1122	1218	1252	1348	1512	1609	1773	1869		
	5	267	387	133	254	264	384	394	514	524	644	654	774	784	905	914	1035	1044	1165	1175	1295	1435	1555	1695	1816		
	6	320	465	56	200	186	331	316	461	446	591	577	721	707	851	837	981	967	1111	1097	1242	1357	1502	1618	1762		
	7	374	542			109	277	239	407	369	537	499	668	629	798	759	928	890	1058	1020	1188	1280	1449	1540	1709		
	8	427	620					161	354	291	484	422	614	552	744	682	875	812	1005	942	1135	1203	1395	1463	1655		
	9	480	697							214	431	344	561	474	691	604	821	735	951	865	1082	1125	1342	1385	1602		
	10	534	775							137	377	267	508	397	638	527	768	657	898	787	1028	1048	1288	1308	1549		
	11	587	852									189	454	319	584	450	714	580	845	710	975	970	1235	1230	1495		
	12	640	929									112	401	242	531	372	661	502	791	632	921	893	1182	1153	1442		
GS-240	1	78	114	651	687	843	878	1034	1069	1225	1260	1416	1452	1608	1643	1799	1834	1990	2026	2181	2217	2564	2599	2947	2982		
	2	157	228	537	608	729	800	920	991	1111	1182	1303	1373	1494	1565	1685	1756	1876	1947	2068	2138	2450	2521	2833	2903		
	3	235	341	424	530	615	721	806	912	997	1104	1189	1295	1380	1486	1571	1677	1763	1869	1954	2060	2336	2443	2719	2825		
	4	314	455	310	451	501	643	692	834	884	1025	1075	1217	1266	1408	1458	1599	1649	1790	1840	1982	2223	2364	2605	2747		
	5	392	569	196	373	387	564	579	756	770	947	961	1138	1152	1329	1344	1521	1535	1712	1726	1903	2109	2286	2491	2668		
	6	470	683	82	295	274	486	465	677	656	868	847	1060	1039	1251	1230											

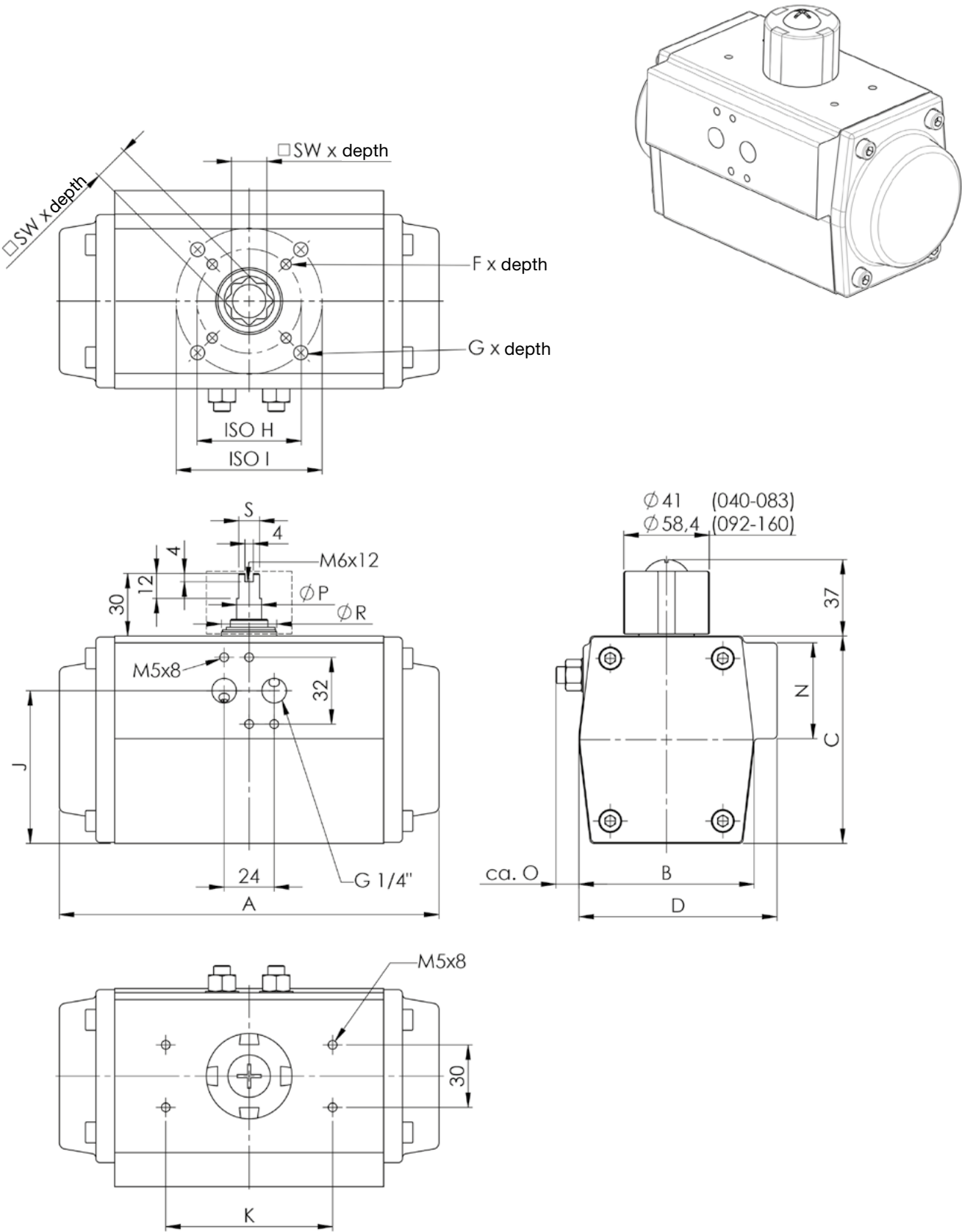
Torques – single-acting actuators, type GS [Nm]

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			
Type	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		
	3	787	1234	2022	2469	2836	3283	3650	4097	4464	4911	5278	5725	6092	6539	6906	7353	7720	8167	8534	8981	10162	10609	11790	12237		
	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		
	7	1837	2880	376	1419	1190	2233	2004	3047	2818	3861	3632	4675	4446	5489	5260	6303	6074	7117	6888	7931	8516	9559	10144	11187		
	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		
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	16																										

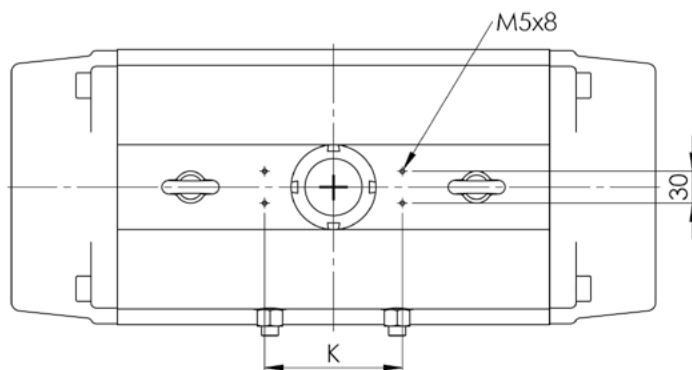
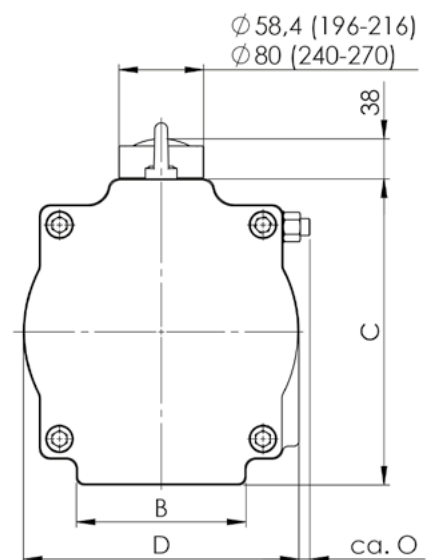
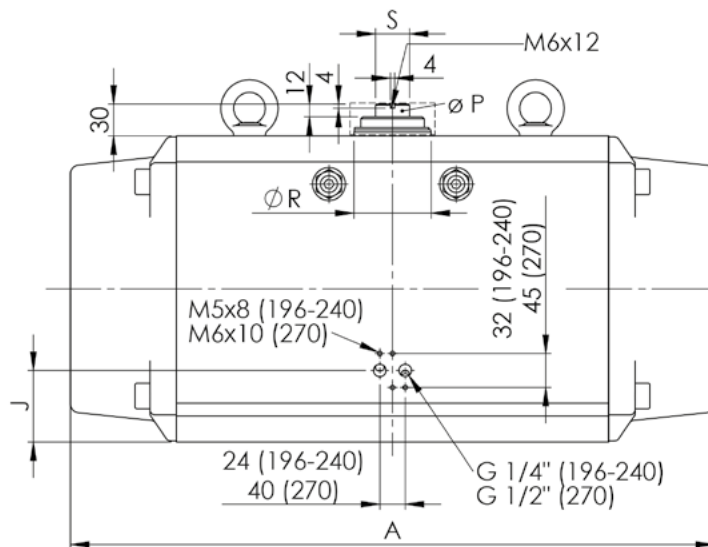
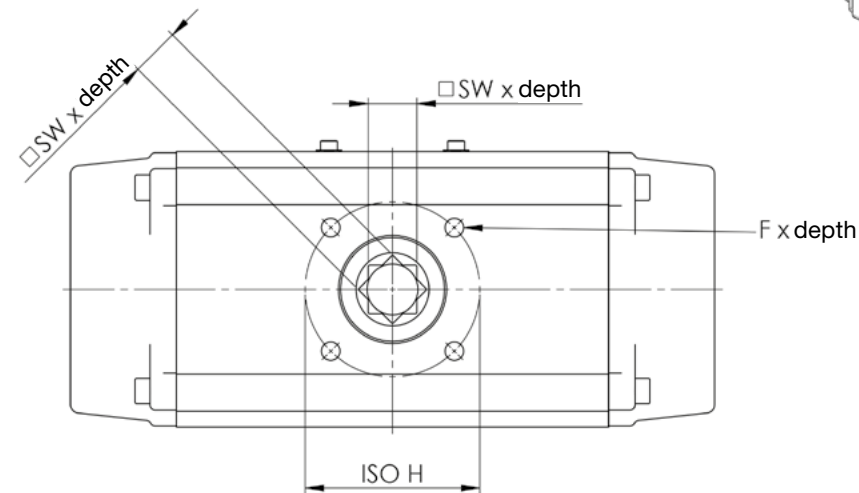
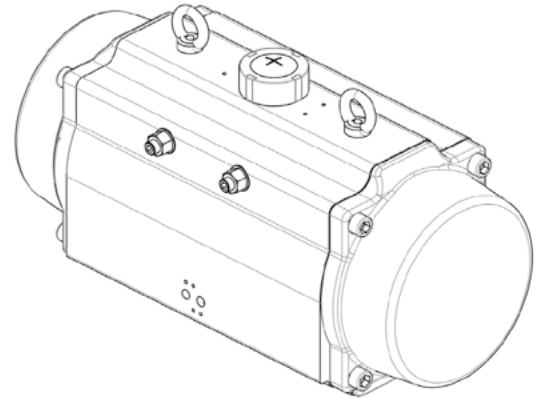
Dimensional drawings for type GD-032



Dimensional drawings for type GD-040 and GD/GS-052 to -160



Dimensional drawings for type GD/GS-196 to -270



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

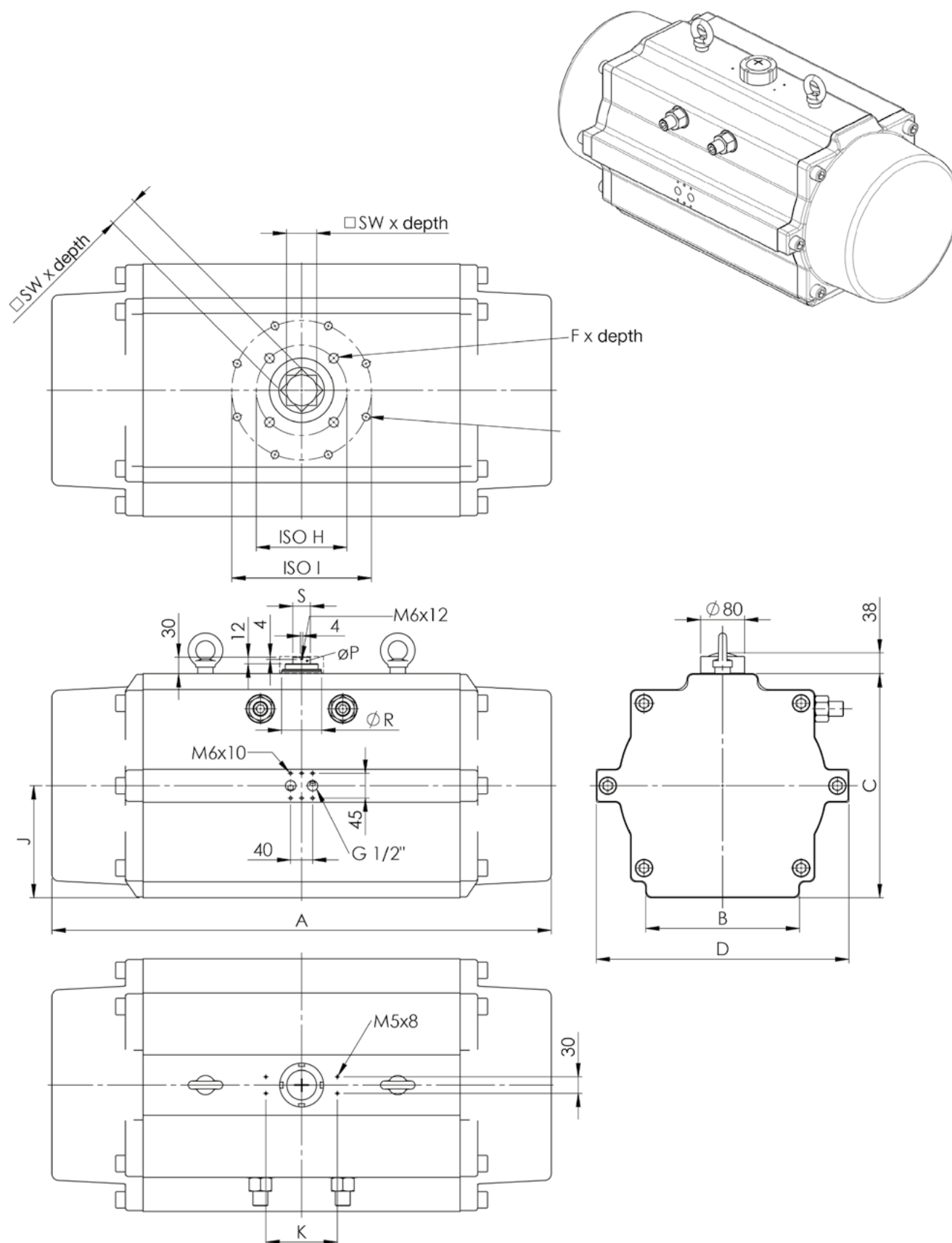


Table of dimensions

Type GD GS	A	B	C	D	E	F x depth	G x depth	ISO H	ISO I	J	K	N	O	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	60	72	74,5	1/4"	M5x8	M6x9	ø36/F03	ø50/F05	48	80	46	9	ø12	ø21,5	10	11x14
063	165	72	88	83	1/4"	M6x10	M8x13	ø50/F05	ø70/F07	61	80	46	12	ø12	ø26,5	10	14x18
075	182	84	99,5	95	1/4"	M6x10	M8x13	ø50/F05	ø70/F07	73,3	80	46	11	ø12	ø26,5	10	17x19
083	208	92	109	103	1/4"	M6x10	M8x13	ø50/F05	ø70/F07	80	80	46	12	ø12	ø26,5	10	17x21
092	262	102	116,5	109,5	1/4"	M6x10	M8x13	ø50/F05	ø70/F07	91	80	46	9	ø18	ø35	14	17x21
105	270	115	133	124,5	1/4"	M8x13	M10x16	ø70/F07	ø102/F10	99,5	80	46	7,5	ø18	ø35	14	22x26
125	301	135	155	142	1/4"	M8x13	M10x16	ø70/F07	ø102/F10	127	80	46	8,5	ø28	ø46	20	22x26
140	395	152	172		1/4"	M10x16	M12x19	ø102/F10	ø125/F12	138	(*)	75	7	ø28	ø51	20	27x31
160	454	174	197		1/4"	M10x16	M12x19	ø102/F10	ø125/F12	159,5	(*)	84	6	ø28	ø51	20	27x31
196	528	130	230	206	1/4"	M16x24		ø140/F14		51	130		8,5	ø44	ø61	32	36x40
216	536	130	255	216	1/4"	M16x24		ø140/F14		58,5	130		10,5	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]
032	0,73	0,09
040	0,9	0,19
052	1,3	0,28
063	2,0	0,44
075	2,55	0,64
083	3,25	0,9
092	5,24	1,37
105	6,06	1,83
125	10,00	3,0
140	14,02	4,7
160	24,52	6,9
196	33,2	11,3
216	39,7	15,0
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
196	40,2	5,9
216	49,2	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

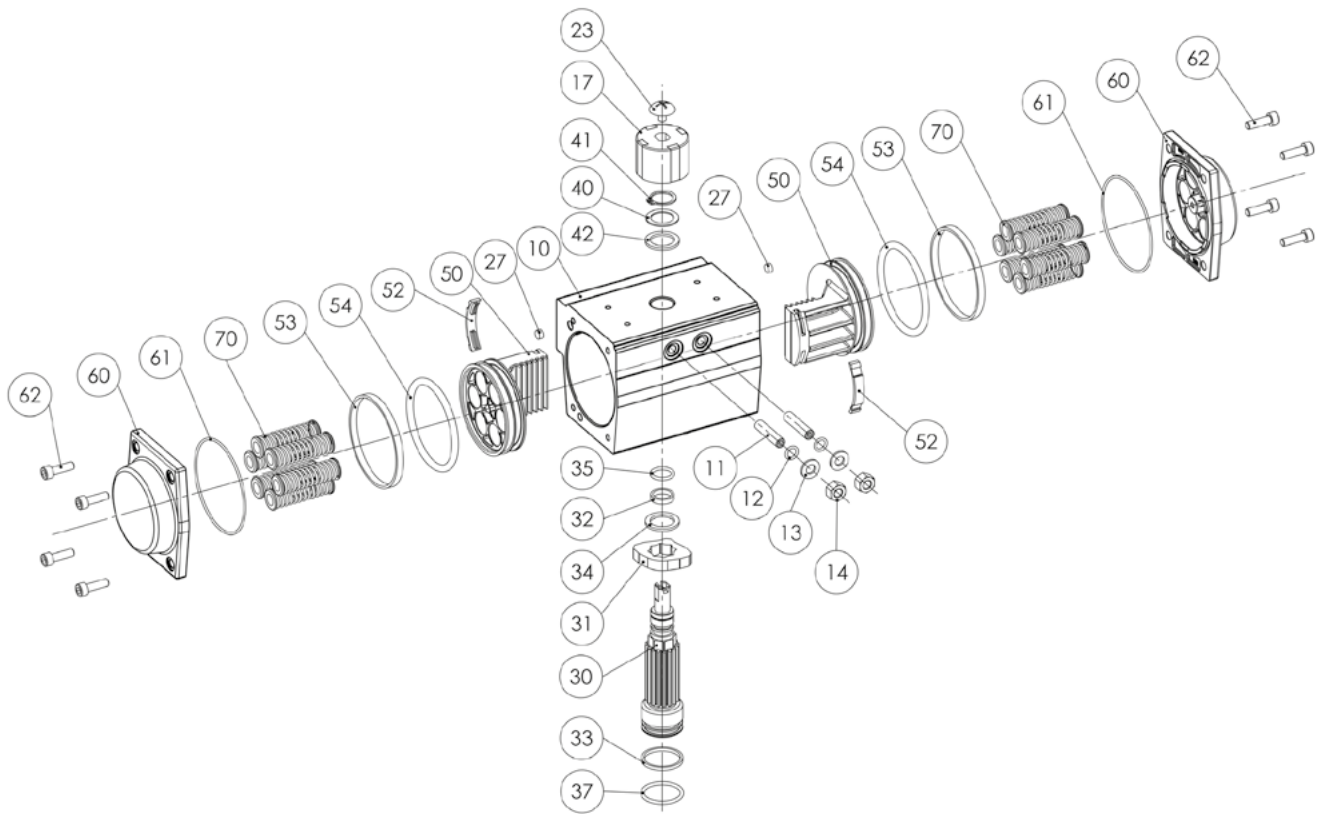
* Weight with 12 springs

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

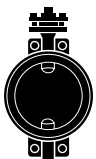
10	Casing		30	Pinion			
11	Stop screw	Not applicable to size -032	31	Stop pin	Not applicable to size -032	50	Piston
12	Seal Stop screw	Not applicable to size -032	32	Pinion bearing upper	Not applicable to size -032	52	Guiding shoe
13	Washer	Not applicable to size -032	33	Pinion bearing lower	Not applicable to size -032	53	Guide ring
14	Lock nut	Not applicable to size -032	34	Inside thrust washer		54	Piston sealing
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
27	Sealing plug	Not applicable to size -032	42	Outside thrust washer			Not applicable to -032 and -040

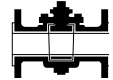
* Slings from GD/GS-160

Schematic diagram



Mounting options

2/2-way valve	Drive pinion design	Operating way	Installation variant
	Octagon = V 	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 	Octagon = V 	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

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