



COMMITTED TO
QUALITY

P Series
Scotch Yoke Pneumatic Actuator



GM APE Automation (India) Pvt. Ltd.
Manufacturer of Pneumatic Actuators



Company Profile

GM APE Automation (India) Pvt.Ltd.was Founded in the Year 2019 as a Group Company of GM Engineering Pvt.Ltd. which is in the business of manufacturing Ball, Gate Globe, Check, Butterfly, Forged Steel Valves, Plug Valves, PFA / FEPLined Valves and Fittings since 1996. A customer driven organizational philosophy, Investment in the Best Technology and human resources has enabled us to constantly meet high standards set by our customers. GM APE Automation (India) Pvt.Ltd. is a company having technical tie-up with a Germany based Company. GM APE Automation is accredited with **ISO 9001:2015 Certification by TÜV Rheinland.**

GM Valve Group (GM Group as we know it) had its beginning in 1996 in a single business operation. Our headquarter is in Rajkot, Gujarat. We are diversified manufacturers of Industrial Valves, Fittings, Actuators and allied products to the Oil-&-Gas, Nuclear Power, Chemical-&-Fertilizer Industry, etc.

We at GM APE Automation (India) Pvt. Ltd. are in the business of manufacturing of Pneumatic Actuators meeting to International Standards like: **DIN EN 15714-1** and **SS EN 15714-3**. As part of our primary objective, we have developed range of Pneumatic Actuators. The products are widely used in Chemical, Refinery, Petrochemical, Fertilizer, Pharmaceuticals, Oil Exploration, Thermal & Nuclear Power, Mining, Food & Beverage, Effluent Treatment & Sewerage, Water Treatment, Cooling Towers and Process Industries.

GM APE Automation's strength is quality products at affordable prices, prompt delivery and the unflinching commitment to excel. Our Goal is to bring to India world class products with Technical Collaborations from different parts of the world and supply Indian Customers world class products at affordable rates. We aim to fulfill the 'Make In India' initiative of our country and make it a huge success. The products of our group companies have been enjoying a sustained presence in the national market since 1996. Our Core Strength is in timely investment in technology upgradation, process innovation, shorter development cycles, a rigorous and disciplined process-based approach to continuous improvement in all aspects of business has helped to constantly meet the standards set by the customers.

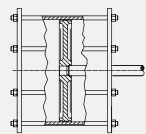
Right from Raw Material, through engineering, die creation, fabrication, testing, cleaning and shipment, orders are handled with a level of quality that only comes from years of attention to detail. Using the latest, computer aided tools, equipment and dedicated personnel, our quality assurance department will guarantee each actuator meets the required specification.

We, at GM APE Automation use established stringent processes and monitoring practices for consistent quality. All our locations adhere to country-specific regulatory and licensing mandates.

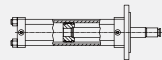


Modular Construction

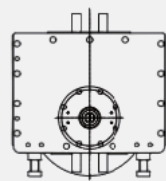
Pneumatic, Hydraulic
Double Acting, Spring Return
Screw Manual,
Gear Manual,
Hydraulic Manual ,
Declutchable Gear Manual



Pneumatic module



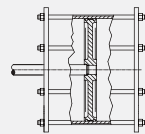
Hydraulic module



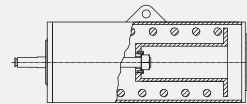
Drive module



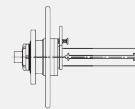
End plate



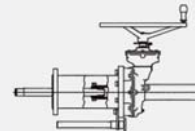
Pneumatic module



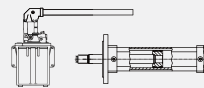
Spring module



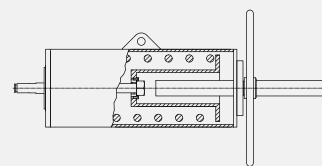
DA screw manual



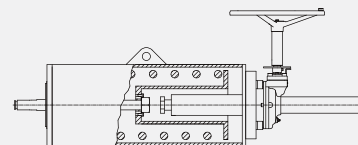
DA Gear manual



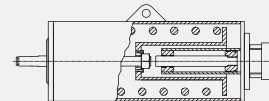
DA Hydraulic manual



Spring module with screw manual



Spring module with gear manual



Spring module with hydraulic manual

Specifications

Output Torque

DA: 200 ~ 500,000Nm

SR : 80 ~ 500,000Nm

Stroke: $0^{\circ} \pm 6^{\circ}$ ~ $90^{\circ} \pm 6^{\circ}$

Operating Pressure: 2 ~ 8bar

Cylinder Design Pressure:

10 bar

Working Temperature

Standard: -20°C ~ $+80^{\circ}\text{C}$

High Temp: -15°C ~ $+150^{\circ}\text{C}$

Low Temp: -40°C ~ $+80^{\circ}\text{C}$

Extreme Low Temp: -60°C ~ $+80^{\circ}\text{C}$

NAMUR

The top indicator complies with the NAMUR, facilitating the installation of positioners and limit switches.

ISO 5211

ISO 5211 flange for easy valve mounting.

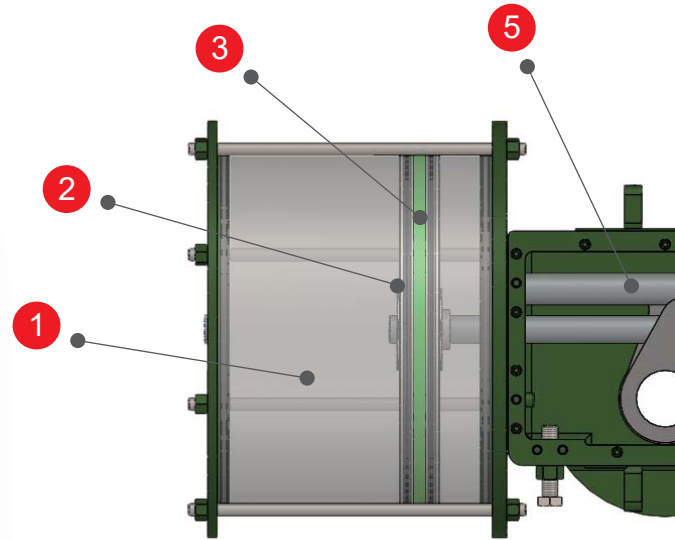
Manual Override Options:

Screw Manual.

Gear Manual,

Hydraulic Manual,

Declutchable Gear Manual



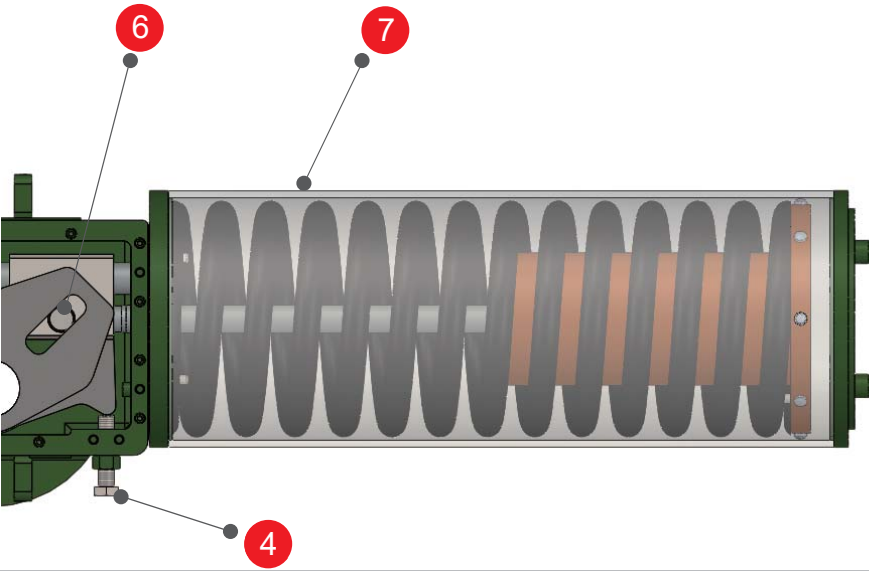
Symmetric



Canted

Symmetrical yokes can output a relatively balanced torque, high torque at the start and end of the stroke and lower in running progress.

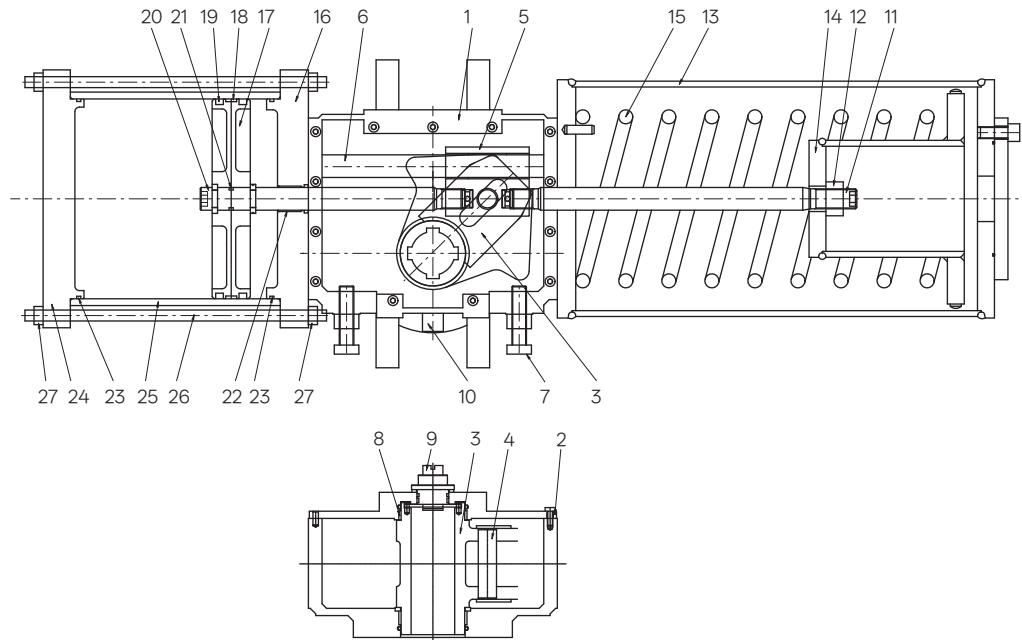
Canted yokes output higher break torque. In some cases, it can reduce the actuator size.



Specifications & Features

- 1 The interior of the cylinder is honed and hard chrome plated to ensure smooth operation and prevent corrosion.
- 2 The dual sealings design significantly enhances the reliability and durability of the cylinder's sealing performance.
- 3 The grease of the guide bands is firmly locked by dual-sealings maintaining the lubricity of the piston and extending the service life of the sealings.
- 4 The bi-directional travel adjustment screws allow a precise adjustment of $\pm 6^\circ$ stroke on both open and close position.
- 5 The guide bar provides lateral load-bearing for the cylinder piston rod, reduces the lateral force wear of the piston rod and piston, and makes the transmission more stable and reliable.
- 6 The transmission pins are precisely processed from high-strength materials, maximizing torque transmission and effectively reducing wear and local stress.
- 7 The integrated welded spring module is made of high-strength alloy spring steel, providing stable output torque throughout its entire life cycle and enhancing corrosion resistance and safety.

Part List



No.	Part	Material			
		Standard Temp.	High Temp.	Low Temp.	Extreme Low Temp.
		-20~80°C (-4~176°F)	-15~150°C (5~302°F)	-40~80°C (-40~176°F)	-60~80°C (-76~176°F)
1	Housing	Carbon Steel		Low Temperature Alloy Steel	
2	Housing Cover	Carbon Steel		Low Temperature Alloy Steel	
3	Yoke	Ductile Iron Casting			Low Temperature Alloy Steel Casting
4	Drive Pin	Low Temperature Alloy Steel			
5	Guide Block	Carbon Steel		Low Temperature Alloy Steel	
6	Guide Bar	Low Temperature Alloy Steel			
7	Travel Stop Screw	Carbon Steel		Low Temperature Alloy Steel	
8	Bearing	Soft Steel+Bronze+PTFE			
9	Position Indicator	Stainless Steel			
10	Breath Valve	Stainless Steel			
11	Spring Rod	Low Temp.Alloy Steel			
12	Tension Nut	Carbon Steel		Low Temp.Alloy Steel	
13	Spring Cylinder	Carbon Steel		Low Temp.Alloy Steel	
14	Spring Seat	Carbon Steel		Low Temp.Alloy Steel	
15	Spring	Spring Steel			Low Temperature Alloy Steel Casting
16	Connect Cover	Aluminum alloy			
		Carbon Steel		Low Temperature Alloy Steel	
17	Piston	Aluminum alloy			
		Carbon Steel		Low Temperature Alloy Steel	
18	Guide Ring	Acetal Plastic			
19	Piston Seal	NBR	VITON	HNBR-LT	Silicon Rubber
20	Piston Rod	Low Temperature Alloy Steel			
21	Piston Rod Seal	NBR	VITON	HNBR-LT	Silicon Rubber
22	Bearing	Soft Steel+Bronze+PTFE			
23	Cylinder Seal	NBR	VITON	HNBR-LT	Silicon Rubber
24	Cylinder Cover	Aluminum alloy			
		Carbon Steel		Low Temperature Alloy Steel	
25	Cylinder	Carbon Steel		Low Temperature Alloy Steel	
26	Tie Bar	Carbon Steel		Low Temperature Alloy Steel	
27	Nut	Carbon Steel		Low Temperature Alloy Steel	

Torque Table

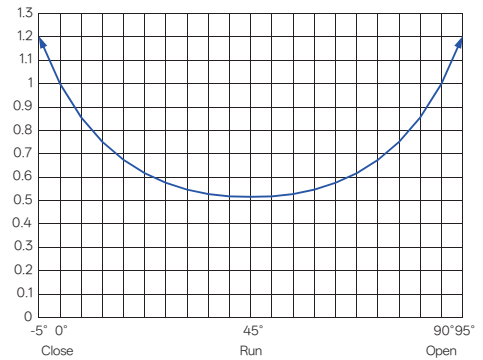


Double Acting Actuator



Spring Return Actuator

Output Torque (Nm) Symmetric Yoke Double Acting



Actuator Model	Direction	3.5BarG			4BarG			4.5BarG			5BarG			5.5BarG			6BarG		
		Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End
GP00-DCC-W04	In+Outboard	254	136	252	291	155	288	327	175	324	364	194	360						
GP01-DCC-W05	In+Outboard	446	238	443	510	272	506	574	306	569	638	341	632						
GP02-DCC-W06	In+Outboard	852	454	843	973	519	964	1095	584	1084	1216	649	1205						
GP03-DCC-W08	Inboard	1136	610	1122	1298	697	1282	1460	784	1443	1623	871	1603	1785	959	1763	1947	1046	1923
	Outboard	1154	620	1140	1319	708	1303	1484	797	1465	1648	885	1628	1813	974	1791	1978	1062	1954
GP03-DCC-W09	Inboard	1378	740	1361	1575	846	1556	1772	952	1750	1969	1057	1945	2166	1163	2139	Exceeds MOP		
	Outboard	1396	750	1379	1596	857	1576	1795	964	1773	1995	1071	1970	2194	1178	2167	Exceeds MOP		
GP04-DCC-W09	Inboard	1599	858	1578	1827	981	1804	2056	1103	2029	2284	1226	2254	2513	1349	2480	2741	1471	2705
	Outboard	1629	875	1608	1862	999	1838	2095	1124	2067	2328	1249	2297	2560	1374	2527	2793	1499	2757
GP04-DCC-W10	Inboard	2074	1113	2047	2370	1272	2339	2666	1431	2631	2962	1590	2924	3259	1749	3216	3555	1908	3508
	Outboard	2104	1129	2076	2405	1291	2373	2705	1452	2670	3006	1613	2966	3306	1775	3263	3607	1936	3560
GP04-DCC-W11	Inboard	2609	1400	2575	2982	1600	2943	3354	1800	3310	3727	2000	3678	4100	2200	4046	Exceeds MOP		
	Outboard	2639	1417	2605	3016	1619	2977	3393	1821	3349	3770	2024	3721	4147	2226	4093	Exceeds MOP		
GP05-DCC-W11	Inboard	3269	1756	3228	3736	2007	3690	4203	2258	4151	4670	2509	4612	5137	2760	5073	5604	3011	5535
	Outboard	3321	1784	3280	3796	2039	3748	4270	2294	4217	4745	2549	4685	5219	2804	5154	5693	3059	5622
GP05-DCC-W12	Inboard	4286	2302	4232	4898	2631	4837	5511	2960	5442	6123	3289	6046	6735	3618	6651	7347	3947	7256
	Outboard	4338	2330	4284	4958	2663	4896	5577	2996	5508	6197	3329	6120	6817	3662	6732	7436	3995	7344
GP05-DCC-W14	Inboard	5137	2760	5073	5871	3154	5798	6605	3548	6523	7339	3943	7248	8073	4337	7972	Exceeds MOP		
	Outboard	5189	2788	5125	5931	3186	5857	6672	3584	6589	7413	3982	7321	8155	4381	8053	Exceeds MOP		
GP06-DCC-W14	Inboard	6246	3353	6172	7138	3832	7053	8031	4311	7935	8923	4790	8817	9815	5269	9698	10708	5748	10580
	Outboard	6351	3409	6276	7258	3896	7172	8166	4383	8069	9073	4870	8965	9980	5357	9862	10888	5844	10758
Actuator Model	Direction	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End
		3.5BarG			4BarG			4.5BarG			5BarG			5.5BarG			6BarG		

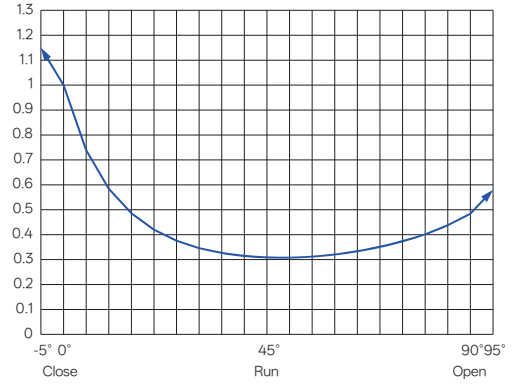


Symmetric Yoke Double Acting

Actuator Model	Direction	3.5BarG			4BarG			4.5BarG			5BarG			5.5BarG			6BarG		
		Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End
GP06-DCC-W16	Inboard	8190	4396	8093	9360	5024	9249	10530	5652	10405	11700	6280	11561	12870	6908	12717	14040	7537	13873
	Outboard	8295	4453	8197	9480	5089	9368	10665	5725	10538	11850	6361	11709	13035	6997	12880	14220	7633	14051
GP06-DCC-W18	Inboard	10394	5579	10270	11879	6376	11737	13363	7173	13204	14848	7970	14671	16333	8767	16139	Exceeds MOP		
	Outboard	10499	5635	10374	11998	6440	11856	13498	7246	13338	14998	8051	14820	16498	8856	16302	Exceeds MOP		
GP07-DCC-W18	Inboard	13295	7110	13136	15194	8126	15013	17093	9141	16890	18992	10157	18766	20892	11173	20643	22791	12188	22520
	Outboard	13496	7218	13336	15424	8249	15241	17352	9280	17146	19280	10311	19051	21208	11342	20956	23136	12373	22861
GP07-DCC-W20	Inboard	16460	8803	16265	18812	10060	18588	21163	11318	20912	23515	12575	23235	25866	13833	25559	28218	15091	27882
	Outboard	16662	8911	16464	19042	10184	18816	21423	11457	21168	23803	12730	23520	26183	14002	25872	28564	15275	28224
GP07-DCC-W22	Inboard	20699	11070	20453	23656	12651	23375	26613	14232	26297	29570	15814	29219	32527	17395	32140	Exceeds MOP		
	Outboard	20901	11178	20652	23887	12774	23603	26873	14371	26553	29858	15968	29503	32844	17565	32453	Exceeds MOP		
GP08-DCC-W22	Inboard	25123	13466	24850	28711	15389	28400	32300	17313	31950	35889	19237	35500	39478	21160	39050	43067	323084	42600
	Outboard	25466	13650	25189	29104	15600	28788	32742	17549	32386	36379	19499	35985	40017	21449	39583	43655	23399	43182
GP08-DCC-W25	Inboard	31887	17091	31541	36442	19533	36047	40997	21975	40553	45553	24416	45058	50108	26858	49564	54663	29299	54070
	Outboard	32230	17275	31880	36834	19743	36435	41438	22211	40989	46043	24679	45543	50647	27147	50097	55251	29615	54652
GP08-DCC-W28	Inboard	39447	21144	39019	45082	24164	44593	50717	27185	50167	56353	30205	55741	61988	33226	61315	67623	36246	66890
	Outboard	39790	21327	39358	45474	24374	44981	51159	27421	50604	56843	30468	56226	62527	33515	61849	68211	36561	67471
GP08-DCC-W30	Inboard	46560	24956	46055	53212	28522	52635	59863	32087	59214	66515	35652	65793	Exceeds MOP					
	Outboard	46904	25140	46395	53604	28732	53022	60305	32323	59650	67005	35915	66278	Exceeds MOP					
GP09-DCC-W28	Inboard	46182	24728	45628	52779	28261	52146	59376	31794	58664	65974	35326	65182	72571	38859	71700	79168	42391	78219
	Outboard	46793	25056	46231	53477	28635	52836	60162	32214	59440	66847	35794	66045	73531	39373	72649	80216	42952	79254
GP09-DCC-W30	Inboard	54547	29208	53893	62339	33380	61592	70132	37553	69291	77924	41725	76989	85717	45898	84688	93509	50070	92387
	Outboard	55158	29535	54496	63038	33754	62282	70918	37973	70067	78797	42193	77852	86677	46412	85637	94557	50631	93423
GP09-DCC-W32	Inboard	60506	32398	59780	69150	37027	68320	77793	41655	76860	86437	46283	85400	95081	50912	93940	103724	55540	102480
	Outboard	61117	32726	60384	69848	37401	69010	78579	42076	77636	87310	46751	86263	96041	51426	94889	104772	56101	103515
GP09-DCC-W33	Inboard	65176	34899	64394	74486	39884	73593	83797	44870	82792	93108	49855	91991	102419	54841	101190	111729	59826	110389
	Outboard	65787	35226	64998	75185	40258	74283	84583	45291	83568	93981	50323	92854	103379	55355	102139	112777	60388	111424
GP09-DCC-W36	Inboard	76740	41091	75820	87703	46961	86651	98666	52831	97482	109629	58702	108314	120591	64572	119145	131554	70442	129976
	Outboard	77351	41418	76423	88401	47335	87341	99452	53252	98259	110502	59169	109176	121552	65086	120094	132602	71003	131012
GP09-DCC-W28	In+Outboard	92974	49784	91859	106256	56896	104982	119538	64008	118104	132820	71120	131227	Exceeds MOP					
	Outboard	94884	50806	93746	108439	58065	107138	121994	65323	120531	135549	72581	133923	Exceeds MOP					
GP09-DCC-W40	Inboard	95495	51134	94350	109137	58439	107828	122780	65743	121307	136422	73048	134786	Exceeds MOP					
	Outboard	94884	50806	93746	108439	58065	107138	121994	65323	120531	135549	72581	133923	Exceeds MOP					
GP10-DCC-W36	Inboard	102073	54746	100942	116655	62567	115363	131237	70387	129783	145819	78208	144204	160400	86029	158624	174982	93850	173044
	Outboard	103104	55299	101962	117833	63199	116528	132562	71098	131094	147291	78998	145660	162021	86898	160226	176750	94798	174792
GP10-DCC-W40	Inboard	126258	67717	124860	144295	77391	142697	162332	87065	160534	180368	96739	178371	198405	106413	196208	216442	116086	214045
	Outboard	127289	68270	125879	145473	78023	143862	163657	87776	161845	181841	97529	179827	200025	107282	197810	218210	117034	215793
GP10-DCC-W44	Inboard	152989	82054	151294	174844	93776	172908	196700	105498	194521	218555	117220	216134	240411	128942	237748	262266	140664	259361
	Outboard	154020	82607	152314	176022	94408	174073	198025	106209	195832	220028	118010	217591	242031	129811	239350	264034	141612	261109
GP10-DCC-W48	Inboard	182265	97756	180246	208303	111721	205996	234341	125686	231745	260379	139651	257495	Exceeds MOP					
	Outboard	183296	98309	181266	209481	112353	207161	235666	126397	233056	261851	140441	258951	Exceeds MOP					
GP21-DCC-W36	In+Outboard	237661	127184	234827	271612	145353	268374	305564	163522	301921	339515	181691	335468	373467	199861	369014	407419	218030	402561
GP21-DCC-W40	In+Outboard	293828	157242	290325	335803	179705	331800	377779	202168	373275	419754	224631	414750	461730	247094	456225	503705	269557	497700
GP21-DCC-W44	In+Outboard	355907	190464	351664	406751	216763	401902	457595	244882	452140	508439	272091	502377						
GP21-DCC-W48	In+Outboard	423899	226849	418845	484456	259256	478680	545013	291663	538515									
Actuator Model	Direction	3.5BarG			4BarG			4.5BarG			5BarG			5.5BarG			6BarG		



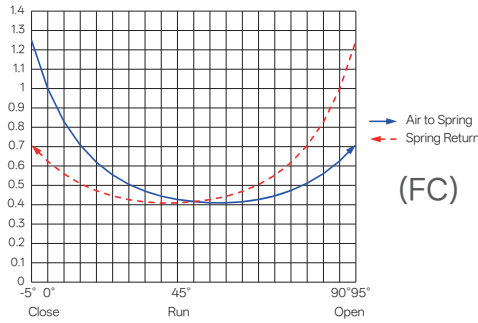
Output Torque (Nm) Canted Yoke Double Acting



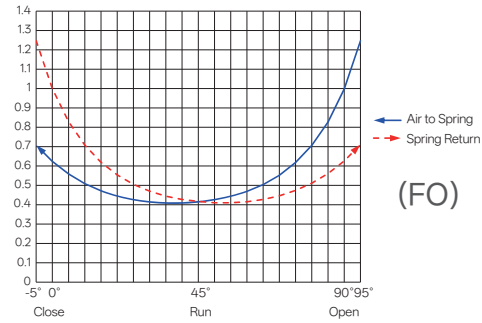
Actuator Model	Direction	3.5BarG			4BarG			4.5BarG			5BarG			5.5BarG			6BarG		
		Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End
GP14-DCC-W09	Inboard	2371	737	1173	2710	842	1340	3048	948	1508	3387	1053	1675	3726	1158	1843	4065	1263	2010
	Outboard	1212	768	2383	1385	878	2723	1559	987	3063	1732	1097	3404	1905	1207	3744	2078	1317	4084
GP14-DCC-W10	Inboard	3075	956	1521	3514	1092	1738	3953	1229	1955	4393	1365	2172	Exceeds MOP					
	Outboard	1565	992	3077	1789	1133	3516	2013	1275	3956	2236	1417	4395	Exceeds MOP					
GP15-DCC-W11	Inboard	4848	1509	2399	5540	1725	2742	6233	1941	3085	6925	2156	3427	7618	2372	3770	8311	2588	4113
	Outboard	2471	1567	4860	2824	1790	5554	3177	2014	6249	3530	2238	6943	3883	2462	7637	4236	2686	8331
GP16-DCC-W14	Inboard	9261	2881	4586	10583	3293	5241	11906	3704	5896	13229	4116	6551	14552	4527	7206	15875	4939	7861
	Outboard	4724	2990	9298	5399	3417	10627	6074	3844	11955	6749	4271	13283	7424	4699	14611	8099	5126	15940
GP16-DCC-W16	Inboard	12143	3778	6013	13878	4317	6872	15612	4857	7731	17347	5397	8590	Exceeds MOP					
	Outboard	6170	3905	12145	7052	4463	13880	7933	5021	15614	8815	5579	17349	Exceeds MOP					
GP17-DCC-W18	Inboard	19702	6095	9752	22517	6966	11145	25331	7837	12539	28146	8707	13932	30960	9578	15325	33775	10449	16718
	Outboard	10031	6316	19750	11464	7219	22572	12897	8121	25393	14330	9024	28214	15763	9926	31036	17196	10828	33857
GP17-DCC-W20	Inboard	24394	7547	12075	27878	8625	13799	31363	9703	15524	34848	10781	17249	Exceeds MOP					
	Outboard	12384	7798	24383	14153	8912	27866	15922	10026	31349	17691	11140	34833	Exceeds MOP					
GP18-DCC-W22	Inboard	37237	11567	18456	42557	13220	21093	47876	14872	23729	53196	16525	26366	58516	18177	29002	63835	19830	31639
	Outboard	18933	11947	37314	21638	13654	42645	24343	15360	47976	27048	17067	53306	29753	18774	58637	32457	20481	63967
GP18-DCC-W25	Inboard	47263	14682	23425	54015	16779	26772	60767	18877	30118	67519	20974	33465	Exceeds MOP					
	Outboard	23963	15120	47226	27386	17281	53972	30809	19441	60719	34232	21601	67466	Exceeds MOP					
GP19-DCC-W28	Inboard	68450	21215	33883	78228	24246	38723	88007	27276	43563	97785	30307	48404	107564	33338	53244	117342	36369	58084
	Outboard	34789	21946	68479	39758	25081	78262	44728	28216	88045	49698	31352	97828	54668	34487	107610	59637	37622	117393
GP19-DCC-W30	Inboard	80849	25058	40020	92399	28638	45737	103949	32217	51454	115498	35797	57172	127048	39377	62889	Exceeds MOP		
	Outboard	41008	25870	80722	46866	29565	92253	52724	33261	103785	58583	36957	115317	64441	40652	126849	Exceeds MOP		
GP19-DCC-W32	Inboard	89681	27795	44392	102493	31766	50734	115304	35737	57075	128116	39708	63417	Exceeds MOP					
	Outboard	45438	28664	89442	51929	32759	102220	58420	36854	114997	64912	40949	127775	Exceeds MOP					
GP19-DCC-W33	Inboard	96603	29941	47818	110403	34218	54649	124203	38495	61480	138004	42772	68312	Exceeds MOP					
	Outboard	48910	30855	96276	55897	35262	110030	62884	39670	123784	69871	44078	137538	Exceeds MOP					
GP20-DCC-W36	Inboard	151309	47041	74982	172925	53761	85693	194540	60481	96405	216156	67201	107117	237772	73921	117829	259387	80641	128540
	Outboard	76670	48432	151055	87623	55351	172634	98576	62270	194213	109529	69189	215793	120482	76108	237372	131434	83027	258951
GP20-DCC-W40	Inboard	187160	58187	92748	213897	66499	105997	240634	74811	119247	267372	83124	132497	Exceeds MOP					
	Outboard	94654	59793	186487	108177	68335	213129	121699	76877	239770	135221	85419	266411	Exceeds MOP					
GP31-DCC-W32	In+Outboard	277750	86013	137488	317429	98301	157130	357107	110589	176771	396786	122876	196412	436465	135164	216053	476143	147452	235695
		139310	87806	274262	159211	100350	313442	179113	112894	352622	199014	125438	391803	218916	137981	430983	238817	150525	470163
GP31-DCC-W36	In+Outboard	352232	109079	174357	402551	124661	199266	452869	140244	224174	503188	155827	249082	Exceeds MOP					
		176667	111353	347808	201906	127260	397495	227144	143168	447182	252382	159075	496869	Exceeds MOP					
Actuator Model	Direction	3.5BarG			4BarG			4.5BarG			5BarG			5.5BarG			6BarG		

Output Torque (Nm)

Symmetric Yoke Spring Return (FC/FO)



(FC)



(FO)

Actuator Model	Spring Torque			3.5BarG			4BarG			4.5BarG			5BarG			5.5BarG			6BarG			
	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End	
GP00-SC4/SO4-W04	187	78	103	151	58	67	187	78	103	223	97	139	260	116	175	296	136	211				
GP00-SC5/SO5-W04	234	97	129				161	58	57	197	78	93	234	97	129	270	116	165				
GP00-SC6/SO6-W04	280	116	154										208	78	82	244	97	118	280	116	154	
GP01-SC4/SO4-W05	328	136	181	264	102	117	328	136	181	392	170	244	455	204	307	519	238	370				
GP01-SC5/SO5-W05	410	170	226				282	102	99	346	136	162	410	170	226	474	204	289	537	238	352	
GP01-SC6/SO6-W05	492	204	271										364	136	144	428	170	208	492	204	271	
GP02-SC4/SO4-W06	626	260	344	504	195	224	626	260	344	747	324	465	869	389	585	991	454	706				
GP02-SC5/SO5-W06	782	324	430				539	195	189	661	260	310	782	324	430	904	389	551	1025	454	671	
GP02-SC6/SO6-W06	939	389	516										695	260	275	817	324	396	939	389	516	
GP03-SC4/SO4-W09	890	423	676	693	317	482	890	423	676	1087	529	871	1284	634	1065	1481	740	1260	1678	846	1454	
GP03-SC5/SO5-W09	1133	538	861	507	202	242	704	308	437	900	413	631	1097	519	826	1294	625	1020	1491	731	1215	
GP03-SC6/SO6-W09	1445	687	1098				463	159	128	660	265	323	857	371	517	1054	476	712	1251	582	906	
GP03-SC4/SO4-W10	890	423	676	1100	536	884	1355	673	1136	1610	809	1387	1865	946	1639	2120	1083	1891	Exceeds MOP			
GP03-SC5/SO5-W10	1133	538	861	913	420	644	1168	557	896	1423	694	1148	1678	831	1400	1933	968	1651	2188	1105	1903	
GP03-SC6/SO6-W10	1445	687	1098	673	272	336	928	409	587	1183	546	839	1438	683	1091	1693	820	1343	1948	957	1595	
GP03-SC3/SO3-W11	1133	538	861	1372	667	1097	1693	839	1414	2013	1011	1730	Exceeds MOP									
GP03-SC4/SO4-W11	1445	687	1098	1132	518	789	1452	690	1105	1773	863	1422	2093	1035	1738	Exceeds MOP						
GP03-SC5/SO5-W11	1854	881	1409	817	324	385	1138	496	701	1458	668	1018	1779	840	1335	2099	1013	1651	Exceeds MOP			
GP04-SC4/SO4-W11	1685	800	1279	1313	600	912	1685	800	1279	2058	1000	1647	2431	1200	2015	2803	1400	2383	3176	1600	2751	
GP04-SC5/SO5-W11	2157	1024	1637	950	376	446	1323	576	814	1695	776	1182	2068	976	1550	2441	1176	1918	2813	1376	2285	
GP04-SC6/SO6-W11	2702	1283	2051				903	318	276	1276	518	644	1649	718	1012	2022	918	1380	2394	1118	1748	
GP04-SC3/SO3-W12	1685	800	1279	2120	1034	1709	2609	1296	2191	3097	1558	2672	3585	1820	3154	4073	2082	3636	Exceeds MOP			
GP04-SC4/SO4-W12	2157	1024	1637	1758	810	1244	2246	1072	1725	2734	1334	2207	3222	1596	2689	3710	1858	3170	4198	2120	3652	
GP04-SC5/SO5-W12	2702	1283	2051	1339	551	706	1827	813	1188	2315	1075	1669	2803	1337	2151	3291	1599	2633	3779	1861	3115	
GP04-SC6/SO6-W12	3383	1606	2568				1303	490	516	1791	752	997	2279	1014	1479	2767	1276	1961	3256	1538	2443	
GP04-SC3/SO3-W14	2157	1024	1637	2434	1173	1911	3019	1487	2488	3604	1801	3066	4189	2115	3643	Exceeds MOP						
GP04-SC4/SO4-W14	2702	1283	2051	2015	914	1374	2600	1228	1951	3185	1542	2528	3770	1856	3105	4354	2170	3682	Exceeds MOP			
GP04-SC5/SO5-W14	3383	1606	2568	1492	591	702	2076	905	1279	2661	1219	1856	3246	1533	2433	3831	1847	3010	4416	2160	3587	
GP05-SC4/SO4-W14	3319	1577	2521	2585	1183	1796	3319	1577	2521	4053	1971	3246	4786	2366	3970	5520	2760	4695	6254	3154	5420	
GP05-SC5/SO5-W14	4246	2018	3226	1871	742	880	2605	1136	1605	3339	1530	2329	4073	1925	3054	4807	2319	3779	5540	2713	4504	
GP05-SC6/SO6-W14	5469	2599	4155				1664	555	397	2398	949	1122	3132	1344	1847	3866	1738	2571	4600	2132	3296	
GP05-SC3/SO3-W16	3319	1577	2521	4173	2036	3365	5134	2552	4314	6095	3069	5263	7056	3585	6211	8017	4101	7160	Exceeds MOP			
GP05-SC4/SO4-W16	4246	2018	3226	3459	1595	2449	4420	2111	3397	5381	2628	4346	6342	3144	5295	7303	3660	6244	8264	4176	7193	
GP05-SC5/SO5-W16	5469	2599	4155	2519	1014	1241	3480	1530	2190	4441	2046	3139	5401	2563	4088	6362	3079	5037	7323	3595	5985	
GP05-SC6/SO6-W16	6846	3253	5201				2421	876	830	3382	1392	1779	4342	1908	2728	5303	2425	3677	6264	2941	4626	
GP05-SC3/SO3-W18	4246	2018	3226	5260	2562	4226	6478	3217	5429	7696	3871	6632	8914	4525	7835	Exceeds MOP						
GP05-SC4/SO4-W18	5469	2599	4155	4319	1981	3019	5537	2636	4222	6755	3290	5425	7973	3944	6628	9191	4599	7830	Exceeds MOP			
GP05-SC5/SO5-W18	6846	3253	5201	3260	1327	1659	4478	1981	2862	5696	2636	4065	6914	3290	5268	8132	3944	6471	Exceeds MOP			
GP06-SC4/SO4-W18	6929	3188	4891	5444	2391	3423	6929	3188	4891	8414	3985	6358	9899	4782	7825	11384	5579	9292	12868	6376	10759	
GP06-SC5/SO5-W18	8616	3964	6081	4239	1615	1756	5724	2412	3224	7209	3209	4691	8694	4006	6158	10179	4803	7625	11663	5600	9092	
GP06-SC6/SO6-W18	10741	4942	7581				4206	1434	1124	5691	2231	2591	7176	3028	4058	8660	3825	5525	10145	4622	6992	
Actuator Model	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End	
	Spring Torque			3.5BarG			4BarG			4.5BarG			5BarG			5.5BarG			6BarG			

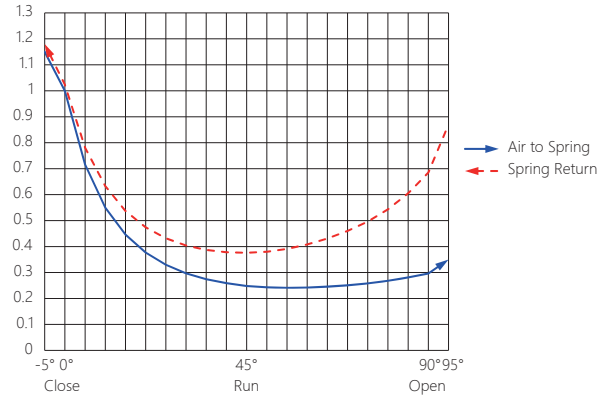


Symmetric Yoke Spring Return (FC/FO)

Actuator Model	Spring Torque			3.5BarG			4BarG			4.5BarG			5BarG			5.5BarG			6BarG		
	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End
GP06-SC3/SO3-W20	6929	3188	4891	7907	3713	5857	9744	4699	7672	11580	5685	9486	13417	6670	11301	15253	7656	13116	17090	8642	14931
GP06-SC4/SO4-W20	8616	3964	6081	6702	2937	4190	8539	3923	6005	10375	4908	7819	12212	5894	9634	14048	6880	11449	15885	7866	13264
GP06-SC5/SO5-W20	10741	4942	7581	5184	1959	2090	7020	2945	3905	8857	3931	5719	10694	4916	7534	12530	5902	9349	14367	6888	11164
GP06-SC6/SO6-W20	13555	6236	9567				5011	1650	1125	6847	2636	2939	8684	3622	4754	10521	4608	6569	12357	5594	8384
GP06-SC3/SO3-W22	8616	3964	6081	9999	4707	7448	12307	5945	9728	14615	7184	12008	16922	8423	14289	Exceeds MOP					
GP06-SC4/SO4-W22	10741	4942	7581	8481	3729	5348	10789	4968	7628	13097	6206	9908	15404	7445	12189	17712	8684	14469	Exceeds MOP		
GP06-SC5/SO5-W22	13555	6236	9567	6472	2434	2568	8779	3673	4848	11087	4912	7128	13395	6150	9409	15702	7389	11689	18010	8628	13969
GP07-SC4/SO4-W22	14558	6326	8990	11601	4744	6068	14558	6326	8990	17515	7907	11912	20472	9488	14834	23429	11070	17756	26386	12651	20678
GP07-SC5/SO5-W22	18330	7965	11320	9243	3105	2341	12200	4687	5263	15157	6268	8185	18114	7849	11107	21071	9431	14029	24028	11012	16951
GP07-SC6/SO6-W22	22952	9973	14174				9311	2678	696	12268	4259	3618	15225	5841	6540	18182	7422	9461	21139	9004	12383
GP07-SC3/SO3-W25	14558	6326	8990	17153	7713	11554	20903	9719	15260	24653	11724	18965	28403	13730	22671	32153	15735	26376	Exceeds MOP		
GP07-SC4/SO4-W25	18330	7965	11320	14795	6074	7827	18545	8080	11533	22295	10085	15238	26045	12091	18944	29796	14096	22649	33546	16102	26355
GP07-SC5/SO5-W25	22952	9973	14174	11906	4066	3260	15656	6071	6965	19406	8077	10671	23156	10082	14376	26907	12088	18082	30657	14093	21787
GP07-SC6/SO6-W25	27732	12050	17127				12668	3994	2242	16418	6000	5947	20169	8005	9653	23919	10011	13358	27669	12016	17064
GP07-SC3/SO3-W28	18330	7965	11320	21000	9393	13958	25637	11872	18540	30273	14352	23121	34910	16831	27702	Exceeds MOP					
GP07-SC4/SO4-W28	22952	9973	14174	18111	7384	9391	22748	9864	13972	27384	12343	18554	32021	14823	23135	Exceeds MOP					
GP07-SC5/SO5-W28	27732	12050	17127	15123	5307	4667	19760	7786	9249	24396	10266	13830	29033	12746	18412	33669	15225	22993	Exceeds MOP		
GP07-SC4/SO4-W30	27732	12050	17127	20961	8429	10436	26432	11355	15842	31903	14280	21247	37373	17206	26653	Exceeds MOP					
GP08-SC4/SO4-W28	28070	12082	16828	22435	9062	11253	28070	12082	16827	33705	15103	22402	39341	18123	27976	44976	21144	33550	50611	24164	39124
GP08-SC5/SO5-W28	34110	14682	20448	18774	6462	5279	24410	9482	10853	30045	12503	16427	35680	15523	22002	41316	18544	27576	46951	21564	33150
GP08-SC6/SO6-W28	40489	17428	24273				20543	6737	4543	26179	9757	10117	31814	12778	15692	37449	15798	21266	43084	18819	26840
GP08-SC4/SO4-W30	34110	14682	20448	25888	10275	12316	32539	13840	18895	39191	17405	25474	45842	20970	32053	52494	24536	38633	59145	28101	45212
GP08-SC5/SO5-W30	40489	17428	24273	22021	7529	6005	28673	11094	12585	35324	14659	19164	41976	18224	25743	48627	21790	32323	55279	25355	38902
GP08-SC3/SO3-W32	28070	12082	16828	34615	15590	23302	41991	19544	30597	49366	23497	37892	56742	27450	45188	64117	31403	52483	Exceeds MOP		
GP08-SC6/SO6-W32	53497	23026	32071				26580	8599	5446	33956	12552	12741	41331	16506	20037	48706	20459	27332	56082	24412	34627
GP08-SC4/SO4-W33	40489	17428	24273	31060	12373	14945	39002	16631	22802	46945	20888	30658	54887	25145	38515	62830	29402	46371	70773	33660	54228
GP08-SC5/SO5-W33	53497	23026	32071	23176	6774	2079	31118	11032	9935	39061	15289	17791	47004	19546	25648	54946	23803	33504	62889	28061	41361
GP09-SC4/SO4-W36	55221	23481	32093	44257	17610	21261	55220	23481	32093	66183	29351	42924	77146	35221	53755	88109	41091	64587	99072	46961	75418
GP09-SC5/SO5-W36	68651	29192	39899	36357	11900	7992	47320	17770	18823	58283	23640	29655	69246	29510	40486	80208	35380	51318	91171	41250	62149
GP09-SC6/SO6-W36	84026	35729	48834				38276	11232	3633	49239	17102	14464	60201	22972	25295	71164	28842	36127	82127	34713	46958
GP09-SC3/SO3-W40	55221	23481	32093	62401	27326	39188	75956	34584	52580	89511	41842	65972	103066	49100	79365	116621	56358	92757	130176	63616	106149
GP09-SC4/SO4-W40	68651	29192	39899	54501	21615	25919	68056	28873	39311	81611	36131	52703	95166	43389	66095	108721	50647	79488	122275	57905	92880
GP09-SC5/SO5-W40	84026	35729	48834	45457	15077	10728	59012	22335	24120	72567	29593	37512	86122	36851	50905	99676	44109	64297	112321	51368	77689
GP09-SC6/SO6-W40	100948	42925	58669				49058	15140	7402	62613	22398	20794	76168	29656	34186	89723	36914	47578	103278	44172	60971
GP09-SC3/SO3-W44	68651	29192	39899	74555	32353	45732	90975	41145	61955	107395	49937	78178	123814	58729	94400	140234	67521	110623	Exceeds MOP		
GP09-SC4/SO4-W44	84026	35729	48834	65511	25815	30541	81931	34607	46764	98350	43399	62987	114770	52192	79210	131190	60984	95432	Exceeds MOP		
GP09-SC5/SO5-W44	100948	42925	58669	55557	18620	13823	71977	27412	30046	88397	36204	46268	104816	44996	62491	121236	53788	78714	137656	62580	94937
GP09-SC4/SO4-W48	100948	42925	58669	77521	30381	35523	97079	40853	54846	116636	51325	74169	136193	61797	93492	Exceeds MOP					
GP10-SC4/SO4-W44	110087	46888	64040	88232	35166	42426	110087	46888	64040	131943	58610	85653	153798	70332	107267	175654	82054	128880	197509	93776	150494
GP10-SC5/SO5-W44	134381	57235	78172	73941	24819	18401	95796	36540	40015	117652	48262	61628	139507	59984	83241	161363	71706	104855	183218	83428	126468
GP10-SC6/SO6-W44	171363	72986	99685				74043	20790	3443	95898	32512	25056	117754	44234	46670	139609	55956	68283	161465	67678	89897
GP10-SC4/SO4-W48	134381	57235	78172	103217	40521	47353	129255	54486	73103	155293	68451	98852	181331	82416	124602	207369	96381	150351	233406	110346	176101
GP10-SC5/SO5-W48	171363	72986	99685	81464	24770	10782	107502	38735	36531	133539	52700	62281	159577	66665	88030	185615	80630	113780	211653	94595	139529
GP10-SC6/SO6-W48	214412	91322	124728							108216	34365	19708	134254	48330	45458	160292	62295	71207	186330	76260	96957
GP10-SC3/SO3-W52	110087	46888	64040	149330	67936	102848	179914	84339	133094	210498	100742	163339	241082	117146	193584	271666	133549	223829	Exceeds MOP		
GP10-SC3/SO3-W56	134381	57235	78172	169407	76021	112810	204901	95058	147911	240395	114094	183011	275888	133131	218112	Exceeds MOP					
GP10-SC4/SO4-W56	171363	72986	99685	147654	60270	76239	183148	79307	111339	218641	98344	146440	254135	117380	181540	Exceeds MOP					
GP10-SC5/SO5-W56	214412	91322	124728	122331	41935	33666	157824	60971	68767	193318	80008	103867	228811	99045	138968	264305	118081	174068	Exceeds MOP		
GP21-SC5/S5-W56	264983	112610	154014	132043	41468	22659	173174	63479	63300	214305	85490	103940	255436	107501	144581	296567	129512	185221	337697	151523	225862
GP21-SC4/SO4-W64	264983	112610	154014	220728	88927	110287	274528	117718	163446	328329	146510	216604	382129	175301	269763	435929	204092	322922	489729	232883	376080
GP21-SC5/SO5-WT56	529965	225220	308027	264087	82936	45320	346349	126958	126600	428611	170980	207881	510872	215002	289162	Exceeds MOP					
GP21-SC4/SO4-WT64	529965	225220	308027	441457	177855	220575	549057	235437	326892												
Actuator Model	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End
	Spring Torque			3.5BarG			4BarG			4.5BarG			5BarG			5.5BarG			6BarG		



Output Torque (Nm) Canted Yoke Spring Return (FC)



Actuator Model	Spring Torque			3.5BarG			4BarG			4.5BarG			5BarG			5.5BarG			6BarG		
	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End
GP13-SC4-W08	673	368	959	712	164	170	953	239	289	1193	314	408	1434	389	527	1675	464	646	1915	539	765
GP13-SC5-W08	825	451	1177				733	158	139	973	232	258	1214	307	377	1455	382	496	1695	457	615
GP13-SC6-W08	1035	565	1475							671	121	51	912	195	170	1152	270	289	1393	345	408
GP13-SC3-W09	673	368	959	1072	276	348	1363	367	492	1655	458	637	1947	549	781	2239	639	926	Exceeds MOP		
GP13-SC4-W09	825	451	1177	852	195	197	1143	285	342	1435	376	486	1727	467	631	2019	558	775	Exceeds MOP		
GP13-SC5-W09	1035	565	1475				841	173	135	1133	264	280	1425	355	424	1717	446	569	2009	537	713
GP13-SC3-W10	825	451	1177	1455	382	496	1833	500	683	2211	618	870	Exceeds MOP								
GP13-SC4-W10	1035	565	1475	1152	270	289	1530	388	477	1908	506	664	2287	623	851	Exceeds MOP					
GP14-SC4-W10	1201	656	1711	1340	314	337	1779	451	554	2218	587	771	2658	724	988	3097	860	1206	3536	997	1423
GP14-SC5W10	1534	838	2185				1298	273	226	1738	409	443	2177	546	660	2616	682	877	3055	819	1095
GP14-SC6-W10	1970	1076	2806										1548	313	231	1987	450	448	2426	586	665
GP14-SC3-W11	1201	656	1711	2133	561	729	2686	732	1002	3239	904	1276	3791	1076	1549	4344	1248	1822	Exceeds MOP		
GP14-SC4-W11	1534	838	2185	1653	383	401	2205	555	674	2758	726	948	3311	898	1221	3863	1070	1494	4416	1242	1767
GP14-SC5-W11	1970	1076	2806				1576	322	245	2129	494	518	2681	665	791	3234	837	1065	3787	1009	1338
GP14-SC6-W11	2467	1348	3514										1963	400	301	2516	571	574	3068	743	848
GP14-SC3-W12	1534	838	2185	2851	755	993	3574	980	1351	4298	1205	1709	Exceeds MOP								
GP14-SC4-W12	1970	1076	2806	2221	522	564	2945	747	922	3669	972	1280	4393	1197	1638	Exceeds MOP					
GP14-SC5-W12	2467	1348	3514				2227	482	432	2951	707	790	3674	932	1147	4398	1157	1505	Exceeds MOP		
GP15-SC4-W12	2472	1351	3522	2786	656	707	3694	939	1157	4602	1222	1606	5510	1504	2055	6418	1787	2505	7326	2070	2954
GP15-SC5-W12	3098	1694	4415				2789	604	539	3697	886	988	4605	1169	1438	5513	1452	1887	6421	1734	2336
GP15-SC6-W12	3881	2122	5532							2566	467	216	3474	750	665	4382	1033	1114	5290	1315	1564
GP15-SC3W14	2472	1351	3522	4049	1049	1332	5137	1388	1871	6225	1727	2409	7313	2066	2948	8402	2405	3487	Exceeds MOP		
GP15-SC4-W14	3098	1694	4415	3144	714	714	4232	1053	1253	5320	1392	1792	6409	1731	2330	7497	2070	2869	8585	2408	3407
GP15-SC5-W14	3881	2122	5532				3101	634	480	4189	973	1019	5277	1312	1558	6366	1650	2096	7454	1989	2635
GP15-SC6-W14	4999	2733	7125										3663	714	455	4752	1052	994	5840	1391	1532
GP15-SC3-W16	3098	1694	4415	5499	1448	1880	6924	1891	2585	8349	2335	3291	Exceeds MOP								
GP15-SC4-W16	3881	2122	5532	4368	1028	1108	5793	1472	1813	7218	1916	2518	8643	2359	3223	Exceeds MOP					
GP15-SC5-W16	4999	2733	7125				4179	874	710	5604	1318	1416	7029	1761	2121	8453	2205	2826	Exceeds MOP		
GP16-SC4-W16	4721	2577	6734	5324	1253	1353	7058	1793	2212	8793	2333	3071	10528	2872	3930	12263	3412	4789	13997	3952	5648
GP16-SC5-W16	6089	3323	8684				5083	1062	862	6818	1601	1721	8553	2141	2580	10287	2681	3439	12022	3220	4298
GP16-SC6-W16	7629	4164	10880							4594	778	202	6329	1318	1061	8063	1857	1920	9798	2397	2779
GP16-SC3-W18	4721	2577	6734	8591	2269	2971	10792	2954	4061	12993	3639	5151	15195	4324	6241	17396	5009	7331	Exceeds MOP		
GP16-SC4-W18	6089	3323	8684	6615	1538	1621	8817	2223	2711	11018	2908	3801	13219	3593	4891	15421	4278	5981	17622	4963	7071
GP16-SC5-W18	7629	4164	10880				6593	1400	1191	8794	2085	2281	10996	2770	3372	13197	3454	4462	15398	4139	5552
GP16-SC6-W18	9510	5191	13564							6077	1078	424	8278	1763	1514	10479	2448	2604	12681	3133	3694
GP16-SC3-W20	6089	3323	8684	10266	2674	3429	12989	3521	4777	15712	4368	6126	18435	5216	7474	Exceeds MOP					
GP16-SC4-W20	7629	4164	10880	8043	1851	1909	10766	2698	3258	13489	3545	4606	16212	4392	5954	Exceeds MOP					
GP16-SC5-W20	9510	5191	13564				8048	1692	1400	10771	2539	2749	13494	3386	4097	16217	4233	5445	Exceeds MOP		
Actuator Model	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End
	Spring Torque			3.5BarG			4BarG			4.5BarG			5BarG			5.5BarG			6BarG		

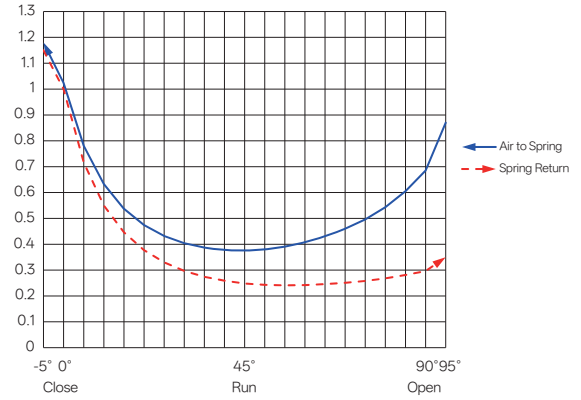


Canted Yoke Spring Return (FC)

Actuator Model	Spring Torque			3.5BarG			4BarG			4.5BarG			5BarG			5.5BarG			6BarG					
	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End			
GP17-SC4-W20	9755	5297	13918	10299	2358	2447	13784	3436	4172	12769	4514	5897	20754	5592	7622	24239	6670	9347	27723	7748	11072			
GP17-SC5-W20	12172	6609	17366				10292	2150	1786	13777	3228	3511	17262	4306	5236	20747	5385	6961	24231	6463	8686			
GP17-SC6-W20	15371	8347	21931							9154	1526	354	12639	2604	2078	16123	3683	3803	19608	4761	5528			
GP17-SC3-W22	9755	5297	13918	16581	4301	5556	20963	5657	7726	25346	7013	9895	29728	8368	12064	34110	9724	14233	Exceeds MOP					
GP17-SC4-W22	12172	6609	17366	13089	3016	3171	17471	4371	5340	21854	5727	7509	26236	7083	9678	30618	8438	11847	35000	9794	14017			
GP17-SC5-W22	15371	8347	21931				12848	2669	2182	17230	4025	4351	21612	5381	6520	25995	6736	8690	30377	8092	10859			
GP17-SC6-W22	19248	10451	27461							11630	1963	526	16012	3319	2695	20394	4675	4864	24776	6030	7033			
GP17-SC3-W25	12172	6609	17366	21317	5561	7243	26874	7280	9994	32432	9000	12745	Exceeds MOP											
GP17-SC4-W25	15371	8347	21931	16693	3859	4086	22251	5578	6836	27808	7298	9587	33366	9017	12338	Exceeds MOP								
GP17-SC5-W25	19248	10451	27461	11093	1797	260	16650	3516	3011	22208	5236	5762	27766	6955	8513	33323	8674	11263	Exceeds MOP					
GP18-SC4-W25	18661	10154	26650	20305	4717	4987	27057	6814	8333	33809	8911	11680	40561	11009	15026	47313	13106	18373	54065	15204	21719			
GP18-SC5-W25	23383	12723	33393	13484	2195	321	20236	4292	3667	26988	6390	7014	33740	8487	10360	40492	10585	13707	47244	12682	17053			
GP18-SC6-W25	29760	16193	42501							17774	2984	712	24526	5081	4059	31278	7179	7405	38030	9276	10752			
GP18-SC3-W28	18661	10154	26650	31511	8198	10541	39864	10792	14681	48217	13387	18821	56569	15982	22961	64922	18576	27101	Exceeds MOP					
GP18-SC4-W28	23383	12723	33393	24690	5676	5875	33043	8271	10015	41395	10865	14155	49748	13460	18295	58101	16055	22435	66453	18649	26575			
GP18-SC5-W28	29760	16193	42501				23829	4865	3713	32182	7459	7853	40534	10054	11993	48887	12649	16133	57240	15244	20273			
GP18-SC6-W28	38320	20851	54725													28169	5483	3535	36522	8078	7675	44875	10673	11815
GP18-SC3-W32	23383	12723	33393	42744	11284	14823	53676	14680	20242	64608	18076	25660	Exceeds MOP											
GP18-SC4-W32	29760	16193	42501	33531	7878	8522	44463	11274	13940	55395	14670	19358	66326	18066	24777	Exceeds MOP								
GP18-SC5-W32	38320	20851	54725				32097	6703	5482	43029	10099	10901	53961	13495	16319	64893	16891	21737	Exceeds MOP					
GP19-SC4-W32	34878	18973	49750	39294	9211	9973	52106	13182	16315	64917	17153	22656	77729	21124	28998	90541	25095	35340	103352	29065	41681			
GP19-SC5-W32	44949	24452	64116				37557	7816	6376	50368	11787	12718	63180	15758	19060	75991	19728	25401	88803	23699	31743			
GP19-SC6-W32	56288	30620	80289							33987	5745	1528	46799	9716	7870	59611	13687	14212	72422	17658	20553			
GP19-SC3-W36	34878	18973	49750	63356	16669	21884	79606	21705	29927	95855	26742	37970	112104	31778	46013	128353	36814	54057	Exceeds MOP					
GP19-SC4-W36	44949	24452	64116	48807	11303	11945	65056	16339	19988	81305	21375	28032	97554	26412	36075	113803	31448	44118	130052	36484	52161			
GP19-SC5-W36	56288	30620	80289	32426	5262	756	48675	10298	8799	64925	15334	16842	81174	20370	24885	97423	25406	32929	113672	30442	40972			
GP19-SC6-W36	68894	37478	98271							46713	8617	4401	62962	13653	12445	79211	18689	20488	95460	23725	28531			
GP19-SC3-W40	44949	24452	64116	75700	19638	25257	95791	25865	35202	115882	32092	45147	135973	38319	55092	Exceeds MOP								
GP19-SC4-W40	56288	30620	80289	59319	13597	14068	79410	19824	24013	99501	26050	33958	119592	32277	43902	139683	38504	53847	Exceeds MOP					
GP19-SC5-W40	68894	37478	98271	41108	6880	1627	61199	13107	11572	81290	19333	21517	101380	25560	31462	121471	31787	41407	Exceeds MOP					
GP19-SC3-W44	56288	30620	80289	89043	22809	28781	113380	30352	40828	137718	37895	52875	Exceeds MOP											
GP19-SC4-W44	68894	37478	98271	70832	16092	16340	95169	23635	28387	119506	31178	40434	143843	38721	52481	Exceeds MOP								
GP20-SC4-W40	80287	42493	106879	79020	16498	13435	105757	24810	26685	132494	33122	39935	159231	41435	53184	185968	49747	66434	212705	58060	79684			
GP20-SC5-W40	98303	52028	130862				81491	15455	8888	108228	23768	22138	134965	32080	35387	161702	40392	48637	188439	48705	61887			
GP20-SC6-W40	118130	62522	157257							81522	13472	2551	108259	21785	15801	134996	30097	29051	161733	38410	42300			
GP20-SC3-W44	80287	42493	106879	118644	28817	33072	151042	38889	49126	183440	48961	65181	215838	59033	81236	248235	69105	97291	Exceeds MOP					
GP20-SC4-W44	98303	52028	130862	94378	19462	15274	126776	29534	31329	159174	39606	47384	191572	49679	63439	223969	59751	79494	256367	69823	95549			
GP20-SC5-W44	118130	62522	157257				100070	19239	11743	132468	29311	27798	164865	39383	43852	197263	49456	59907	229661	59528	75962			
GP20-SC6-W44	139769	73974	186063							103322	18075	6421	135719	28147	22476	168117	38220	38531	200515	48292	54586			
GP20-SC4-W48	118130	62522	157257	111070	22659	17194	149668	34659	36321	188266	46658	55448	226863	58658	74576	265461	70658	93703	Exceeds MOP					
GP20-SC5-W48	139769	73974	186063				120522	23423	14945	159119	35422	34072	197717	47422	53199	236315	59422	72326	274912	71421	91453			
GP20-SC3-W52	98303	52028	130862	184949	47620	60157	230285	61714	82623	275621	75809	105090	Exceeds MOP											
GP20-SC4-W52	139769	73974	186063	129096	26088	19194	174433	40183	41661	219769	54278	64127	265106	68372	86594	Exceeds MOP								
GP31-SC4-W60	212090	111399	278363	208338	42693	33357	278373	64381	68024	348407	86069	102692	418442	107758	137359	488476	129446	172027	558511	151134	206695			
GP31-SC4-WT60	424179	222798	556726	416676	85386	66714	556745	128763	136049															
Actuator Model	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End			
	Spring Torque			3.5BarG			4BarG			4.5BarG			5BarG			5.5BarG			6BarG					



Output Torque (Nm) Canted Yoke Spring Return (FO)



Actuator Model	Spring Torque			3.5BarG			4BarG			4.5BarG			5BarG			5.5BarG			6BarG		
	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End
GP13-SO4-W08	962	241	292	549	289	713	670	365	951	790	442	1188	911	518	1426	1032	595	1663	1153	671	1901
GP13-SO5-W08	1179	296	358	482	233	498	603	309	736	723	386	973	844	462	1211	965	539	1448	1086	615	1686
GP13-SO6-W08	1479	371	449	390	156	203	511	233	440	631	309	678	752	386	915	873	462	1153	993	539	1390
GP13-SO3-W09	962	241	292	729	403	1068	876	496	1356	1022	588	1644	1169	681	1932	1315	774	2220	Exceeds MOP		
GP13-SO4-W09	1179	296	358	662	347	853	809	440	1141	955	533	1429	1102	625	1717	1248	718	2006	Exceeds MOP		
GP13-SO5-W09	1479	371	449	570	270	558	717	363	846	863	456	1134	1010	549	1422	1156	642	1710	1302	734	1998
GP13-SO3-W10	1179	296	358	965	539	1448	1155	659	1821	1344	779	2195	Exceeds MOP								
GP13-SO4-W10	1479	371	449	873	462	1153	1062	582	1526	1252	702	1899	1442	823	2273	Exceeds MOP					
GP14-SO4-W10	1712	429	520	1016	538	1344	1236	678	1777	1456	818	2210	1677	957	2643	1897	1097	3076	2118	1237	3510
GP14-SO5-W10	2187	548	664	870	417	876	1090	556	1309	1310	696	1742	1531	836	2175	1751	975	2608	1972	1115	3042
GP14-SO6-W10	2808	704	852	678	257	263	899	397	696	1119	537	1129	1340	676	1563	1560	816	1996	1780	956	2429
GP14-SO3-W11	1712	429	520	1414	791	2126	1691	966	2671	1968	1142	3216	2246	1318	3761	2523	1493	4306	Exceeds MOP		
GP14-SO4-W11	2187	548	664	1268	669	1658	1545	845	2203	1822	1020	2748	2100	1196	3293	2377	1372	3838	2654	1547	4383
GP14-SO5-W11	2808	704	852	1077	510	1046	1354	685	1591	1631	861	2136	1908	1037	2681	2186	1212	3226	2463	1388	3771
GP14-SO6-W11	3517	882	1067	858	328	346	1136	503	891	1413	679	1436	1690	855	1981	1967	1030	2526	2245	1206	3071
GP14-SO3-W12	2187	548	664	1869	1050	2840	2232	1280	3553	2595	1510	4267	Exceeds MOP								
GP14-SO4-W12	2808	704	852	1678	890	2227	2041	1121	2941	2404	1351	3655	2767	1581	4369	Exceeds MOP					
GP14-SO5-W12	3517	882	1067	1459	709	1528	1823	939	2242	2186	1169	2955	2549	1399	3669	2912	1629	4383	Exceeds MOP		
GP15-SO4-W12	3524	885	1070	2104	1117	2794	2560	1406	3690	3015	1695	4586	3471	1984	5482	3926	2273	6378	4382	2561	7274
GP15-SO5-W12	4418	1110	1341	1829	888	1912	2285	1177	2808	2740	1466	3704	3196	1754	4600	3651	2043	5496	4107	2332	6392
GP15-SO6-W12	5534	1390	1680	1485	601	810	1941	890	1706	2396	1179	2602	2852	1468	3498	3308	1757	4394	3763	2046	5290
GP15-SO3-W14	3524	885	1070	2738	1519	4040	3284	1865	5114	3830	2211	6188	4376	2558	7262	4922	2904	8336	Exceeds MOP		
GP15-SO4-W14	4418	1110	1341	2463	1290	3158	3009	1636	4232	3555	1982	5306	4101	2528	6380	4647	2674	7454	5193	3021	8528
GP15-SO5-W14	5534	1390	1680	2119	1003	2056	2665	1349	3130	3211	1695	4204	3757	2042	5278	4303	2388	6352	4849	2734	7426
GP15-SO6-W14	7128	1790	2164	1628	594	484	2174	940	1558	2720	1286	2632	3266	1633	3705	3813	1979	4779	4359	2325	5853
GP15-SO3-W16	4418	1110	1341	3645	2039	5483	4359	2492	6889	5074	2946	8295	Exceeds MOP								
GP15-SO3-W16	5534	1390	1680	3301	1752	4381	4016	2206	5787	4731	2659	7193	5446	3112	8599	Exceeds MOP					
GP15-SO5-W16	7128	1790	2164	2810	1343	2808	3525	1797	4214	4240	2250	5620	4955	2703	7026	5670	3156	8432	Exceeds MOP		
GP16-SO4-W16	6733	1690	2045	4020	2131	5342	4890	2682	7055	5761	3233	8768	6631	3784	10481	7501	4335	12194	8372	4885	13907
GP16-SO5-W16	8683	2179	2638	3420	1632	3417	4290	2182	5130	5160	2733	6843	6031	3284	8556	6901	3835	10269	7771	4386	11982
GP16-SO6-W16	10879	2730	3305	2744	1069	1248	3614	1620	2961	4484	2171	4674	5355	2722	6387	6225	3272	8100	7095	3823	9813
GP16-SO3-W18	6733	1690	2045	5659	3168	8568	6763	3868	10742	7868	4567	12916	8972	5266	15090	10077	5965	17263	Exceeds MOP		
GP16-SO5-W18	8683	2179	2638	5059	2669	6643	6163	3368	8816	7268	4067	10990	8372	4766	13164	9477	5465	15338	10581	6164	17512
GP16-SO5-W18	10879	2730	3305	4383	2106	4474	5487	2805	6648	6592	3504	8822	7696	4204	10996	8801	4903	13170	9905	5602	15343
GP16-SO6-W18	13562	3404	4120	3557	1419	1825	4661	2118	3998	5766	2817	6172	6870	3516	8346	7975	4215	10520	9079	4914	12694
GP16-SO3-W20	8683	2179	2638	6891	3828	10248	8257	4693	12937	9623	5558	15626	10989	6422	18315	Exceeds MOP					
GP16-SO4-W20	10879	2730	3305	6215	3266	8080	7581	4130	10769	8947	4995	13457	10313	5860	16146	Exceeds MOP					
GP16-SO5-W20	13562	3404	4120	5389	2578	5430	6755	3443	8119	8121	4308	10808	9487	5172	13497	10853	6037	16186	Exceeds MOP		
Actuator Model	Start	Run	End	3.5BarG			4BarG			4.5BarG			5BarG			5.5BarG			6BarG		
Actuator Model	Spring Torque			3.5BarG			4BarG			4.5BarG			5BarG			5.5BarG			6BarG		



Canted Yoke Spring Return (FO)

Actuator Model	Spring Torque			3.5BarG			4BarG			4.5BarG			5BarG			5.5BarG			6BarG			
	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End	
GP17-SO4-W20	13915	3473	4226	7953	4158	10347	9700	5259	13788	11448	6359	17229	13196	7460	20670	14944	8561	24111	16691	9661	27552	
GP17-SO5-W20	17363	4334	5273	6892	3280	6942	8639	4380	10383	10387	5481	13824	12135	6582	17266	13883	7682	20707	15630	8783	24148	
GP17-SO6-W20	21928	5473	6659	5487	2117	2435	7235	3217	5876	8983	4318	9317	10730	5419	12758	12478	6519	16199	14226	7620	19640	
GP17-SO3-W22	13915	3473	4226	11103	6142	16550	13301	7526	20877	15499	8910	25204	17696	10294	29532	19894	11678	33859	Exceeds MOP			
GP17-SO4-W22	17363	4334	5273	10042	5264	13145	12240	6648	17472	14438	8032	21800	16636	9416	26127	18833	10799	30454	21031	12183	34781	
GP17-SO5-W22	21928	5473	6659	8638	4101	8638	10835	5485	12965	13033	6869	17292	15231	8253	21619	17429	9636	25947	19627	11020	30274	
GP17-SO6-W22	27458	6853	8338	6936	2692	3177	9134	4076	7504	11332	5460	11832	13530	6844	16159	15728	8228	20486	17925	9612	24813	
GP17-SO3-W25	17363	4334	5273	14168	7862	21270	16956	9617	26757	19743	11372	32245	Exceeds MOP									
GP17-SO4-W25	21928	5473	6659	12764	6699	16762	15551	8454	22250	18339	10209	27738	21126	11964	33226	Exceeds MOP						
GP17-SO5-W25	27458	6853	8338	11063	5290	11302	13850	7045	16789	16637	8800	22277	19425	10556	27765	22212	12311	33253	Exceeds MOP			
GP18-SO4-W25	26643	6677	8101	15509	8156	20385	18895	10293	27060	22282	12430	33734	25669	14568	40409	29056	16705	47084	32443	18842	53759	
GP18-SO5-W25	33385	8367	10151	13434	6435	13720	16821	8572	20394	20207	10709	27069	23594	12846	33744	26981	14983	40419	30368	17120	47093	
GP18-SO6-W25	42491	10648	12920	10632	4110	4718	14019	6247	11393	17405	8384	18068	20792	10521	24742	24179	12658	31417	27566	14795	38092	
GP18-SO3-W28	26643	6677	8101	21129	11703	31462	25319	14347	39720	29509	16991	47977	33699	19634	56234	37889	22278	64492	Exceeds MOP			
GP18-SO4-W28	33385	8367	10151	19055	9982	24797	23244	12625	33055	27434	15269	41312	31624	17913	49569	35814	20557	57826	40004	23200	66084	
GP18-SO5-W28	42491	10648	12920	16253	7656	15796	20442	10300	24053	24632	12944	32310	28822	15588	40568	33012	18231	48825	37202	20875	57082	
GP18-SO6-W28	54712	13711	16636	12492	4536	3715	16682	7180	11972	20871	9823	20229	25061	12467	28486	29251	15111	36744	33441	17755	45001	
GP18-SO3-W32	33385	8367	10151	28111	15696	42645	33594	19156	53452	39078	22616	64259	Exceeds MOP									
GP18-SO4-W32	42491	10648	12920	25309	13371	33644	30792	16831	44451	36276	20291	55258	41759	23751	66065	Exceeds MOP						
GP18-SO5-W32	54712	13711	16636	21548	10250	21563	27031	13710	32370	32515	17171	43177	37999	20631	53984	43482	24091	64791	Exceeds MOP			
GP19-SO4-W32	49771	12445	15114	29668	15672	39406	36094	19726	52056	42520	23780	64705	48947	27834	77355	55373	31888	90005	61799	35942	102654	
GP19-SO5-W32	64142	16038	19479	25245	12004	25216	31672	16058	37866	38098	20111	50516	44524	24165	63165	50950	28219	75815	57377	32273	88465	
GP19-SO6-W32	80322	20084	24392	20266	7873	9241	26692	11927	21890	33119	15981	34540	39545	20035	47190	45971	24089	59840	52397	28143	72489	
GP19-SO3-W36	49771	12445	15114	41737	23286	63164	49888	28428	79208	58038	33570	95252	66189	38711	111295	74339	43853	127339	Exceeds MOP			
GP19-SO4-W36	64142	16038	19479	37315	19618	48974	45465	24759	65018	53616	29901	81062	61766	35043	97106	69917	40184	113149	78067	45326	129193	
GP19-SO5-W36	80322	20084	24392	32336	15487	32999	40486	20629	49043	48637	25770	65086	56787	30912	81130	64937	36054	97174	73088	41195	113217	
GP19-SO6-W36	98312	24582	29855	26800	10895	15236	34950	16036	31280	43101	21178	47324	51251	26320	63368	59402	31461	79411	67552	36603	95455	
GP19-SO3-W40	64142	16038	19479	50804	28127	75528	60882	34485	95365	70959	40842	115202	81037	47199	135039	Exceeds MOP						
GP19-SO4-W40	80322	20084	24392	45825	23997	59552	55903	30354	79389	65980	36712	99226	76058	43069	119063	86135	49426	138900	Exceeds MOP			
GP19-SO5-W40	98312	24582	29855	40289	19405	41790	50367	25762	61627	60444	32119	81464	70522	38477	101301	80600	44834	121138	Exceeds MOP			
GP19-SO3-W44	80322	20084	24392	60734	33402	88900	72942	41103	112930	85149	48804	136960	Exceeds MOP									
GP19-SO4-W44	98312	24582	29855	55199	28810	71138	67406	36511	95168	79614	44212	119197	91821	51913	143227	Exceeds MOP						
GP20-SO4-W40	106883	25157	27232	66321	33667	79341	79734	42140	105766	93146	50612	132191	106559	59085	158617	119971	67557	185042	133384	76030	211467	
GP20-SO5-W40	130866	30801	33342	60135	27913	55637	73548	36386	82063	86961	44858	108488	100373	53331	134913	113786	61804	161338	127198	70276	187764	
GP20-SO6-W40	157262	37014	40068	53328	21581	29550	66740	30053	55975	80153	38526	82400	93565	46999	108825	106978	55471	135251	120390	63944	161676	
GP20-SO3-W44	106883	25157	27232	86199	46223	118503	102451	56490	150523	118703	66756	182543	134955	77023	214563	151207	87289	246583	Exceeds MOP			
GP20-SO4-W44	130866	30801	33342	80013	40470	94800	96265	50736	126820	112517	61003	158840	128769	71269	190859	145022	81535	222879	161274	91802	254899	
GP20-SO5-W44	157262	37014	40068	73205	34137	68712	89457	44404	100732	105709	54670	132752	121962	64937	164772	138214	75203	196792	154466	85469	228811	
GP20-SO6-W44	186069	43794	47407	65775	27226	40241	82028	37493	72261	98280	47759	104280	114532	58026	136300	130784	68292	168320	147036	78558	200340	
GP20-SO4-W48	157262	37014	40068	94976	47890	11604	114338	60121	149751	133700	72352	187899	153062	84583	226046	172425	96814	264193	Exceeds MOP			
GP20-SO5-W48	186069	43794	47407	87546	40979	83133	106908	53210	121280	126270	65441	159427	145633	77672	197575	164995	89903	235722	184357	102134	273869	
GP20-SO3-W52	130866	30801	33342	125447	69170	184314	148190	83537	229121	170933	97903	273929	Exceeds MOP									
GP20-SO4-W52	186069	43794	47407	111210	55927	129755	133952	70293	174562	156695	84660	219370	179438	99026	264177	Exceeds MOP						
GP31-SO4-W60	278319	65195	70651	174301	88428	209261	209428	110569	278416	244555	132709	347571	279682	154849	416726	314809	176990	485880	349936	199130	555035	
GP3-SO4-WT60	556638	130389	141303	348602	176857	418521	418856	221138	556831	Exceeds MOP												
Actuator Model	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End	
	Spring Torque			3.5BarG			4BarG			4.5BarG			5BarG			5.5BarG			6BarG			



How to Order

GP 03 SC 4 W09 + SM + HT + HC

Series	Drive module code	Acting type	Spring size	Cylinder size	Manual Overrides	Working Temp	Others
--------	-------------------	-------------	-------------	---------------	------------------	--------------	--------

Symmetric yoke welded body	00	F07	spring return only	3	W04	SM	Screw manual	Standard -20°C-+80°C				
	01	F10		4	W05	GM	Gear manual					
	02	F12		5	W06	HM	Hydraulic manual					
	03	F14		6	W08							
	04	F16	DCC	Double acting single cylinder, air to port A, rotate counterclockwise, valve open		W09	HT		High Temp -15°C-+150°C			
	05	F25		DCW	Double acting single cylinder, air to port A, rotate clockwise, valve close					W10		
	06	F30			DDC	Double acting, double cylinders				W11		
	07	F35				SC				Spring return, air failure to close (clockwise)		W12
	08	F40								SO	Spring return, air failure to open	
	09	F48				W16						
	10	F60				W18						
13	F14	W20										
14	F16	W22										
15	F25	W25										
16	F30	W28										
17	F35	W30										
18	F40	W32										
19	F48	W33										
20	F60	W36										
31	F80	W40										
		W44										
		W48										
		W52										
		W56										
		WT44										
		WT48										

HC	High Cycle
3P	3-position
BF	Buffer Design
C	Customized

Note: Tandem power module for WT44/WT48/WT52/WT60

Example product code:
GP03-SC4-W09+SM+HT+HC



GM APE Automation (India) Pvt. Ltd.

Plot No. 2835, Near GM Flowlines,
Opp. Jyoti CNC, GIDC: Lodhika,
Village: Metoda - 360 021, Dist Rajkot, INDIA.

☎ + 91 90990 85060, + 91 75739 85025

🌐 www.gmautomation.in

✉ sales@gmautomation.in



*In the process of continuous R&D of the product, the information given is subject to change.

© GM APE Automation (India) PVT. LTD., All Rights Reserved. Reproduction in whole or in part without permission is prohibited.

