

# G-Series Pneumatic and Hydraulic Actuators

## Next Generation Actuation Technologies Solutions



**BETTIS™**



Reseller, Stockist, Distributor  
[www.globalsupplyline.com.au](http://www.globalsupplyline.com.au)  
[sales@globalsupplyline.com.au](mailto:sales@globalsupplyline.com.au)  
Full stock list [click here](#)





Bettis™ G-Series  
with Wireless Transmitter

*Emerson sets the standards for innovation and quality in pneumatic and hydraulic valve automation*

*Lightweight, efficient and reliable - all in a compact, modular package*

*Available with either symmetric or canted yokes to suit your operating requirements*



Bettis G-Series  
with Topworx™ Positioner

## Design and Construction

Emerson, a leading pioneer in the valve automation and control industry for more than 55-years, has developed numerous innovations that have become today's industry standards. With continued focus on ingenuity, reliability, quality and product safety, our entire product offering is considered to be the global standard for automating valves in the oil & gas, power generation, pulp and paper, petrochemical, chemical, wastewater, and numerous other process industries. Performance has been the main differentiator. Emerson is recognized for effectiveness and reliability in some of the world's most difficult operating environments.

G-Series pneumatic and hydraulic actuators provide the latest in valve actuation design. A highly unique and reliable means for operating ball, butterfly or plug valves along with louvers, dampers and other 90 degree rotating mechanisms, the G-Series carries an industry leading five-year warranty on materials and workmanship.

### G-Series Application And Features

- PED 97/23/EC compliant to meet the stringent requirements of pressure mounting vessels
- Meets both IP66 and IP67M specifications for submergence and high pressure water deluge test. Offers superior water ingress and corrosion protection
- Suitability for use within the demanding applications of a SIL environment
- Available in both spring-return or double-acting configurations and can operate with either a symmetric or canted yoke
- Offers multiple configurations, with a modular design that enables safe field maintenance and reduced inventory costs
- More compact than other actuators of equal torque output – 1/3 lighter and 1/2 smaller
- Interchangeable power and spring modules for quick reversal of the fail-safe mode
- Close Loop Instrument System for actuators **should always be used** for the following applications: high humidity, salt air, corrosive dust, inks and dyes, wash downs. The closed loop system routes the operating media being exhausted from the power side of the cylinder to the vented side of the cylinder. Maximum pressure on the vented side of the power cylinder is to be 5 to 8 psig
- 5-Year Warranty



## Operating Ranges

G-Series has guaranteed torque outputs for spring-return models in excess of 3,000,000 lb-in (339,000 Nm) and double-acting 12,581 – 6,000,000 lb-in (1420 – 678,000 Nm).

Operating pressures are:

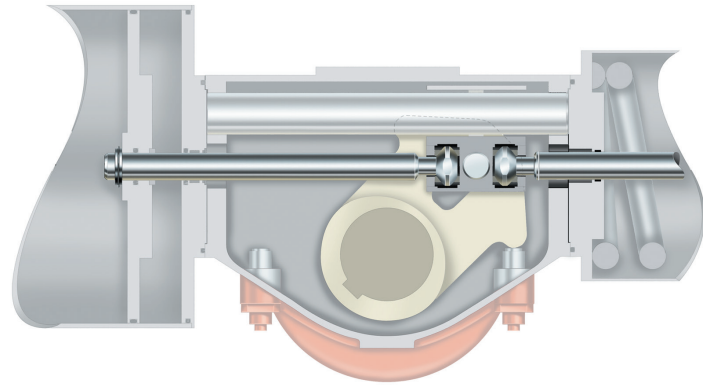
Pneumatic – 40-220 psig (3-14 Bar)

Hydraulic – to 5,000 psig (345 Bar)

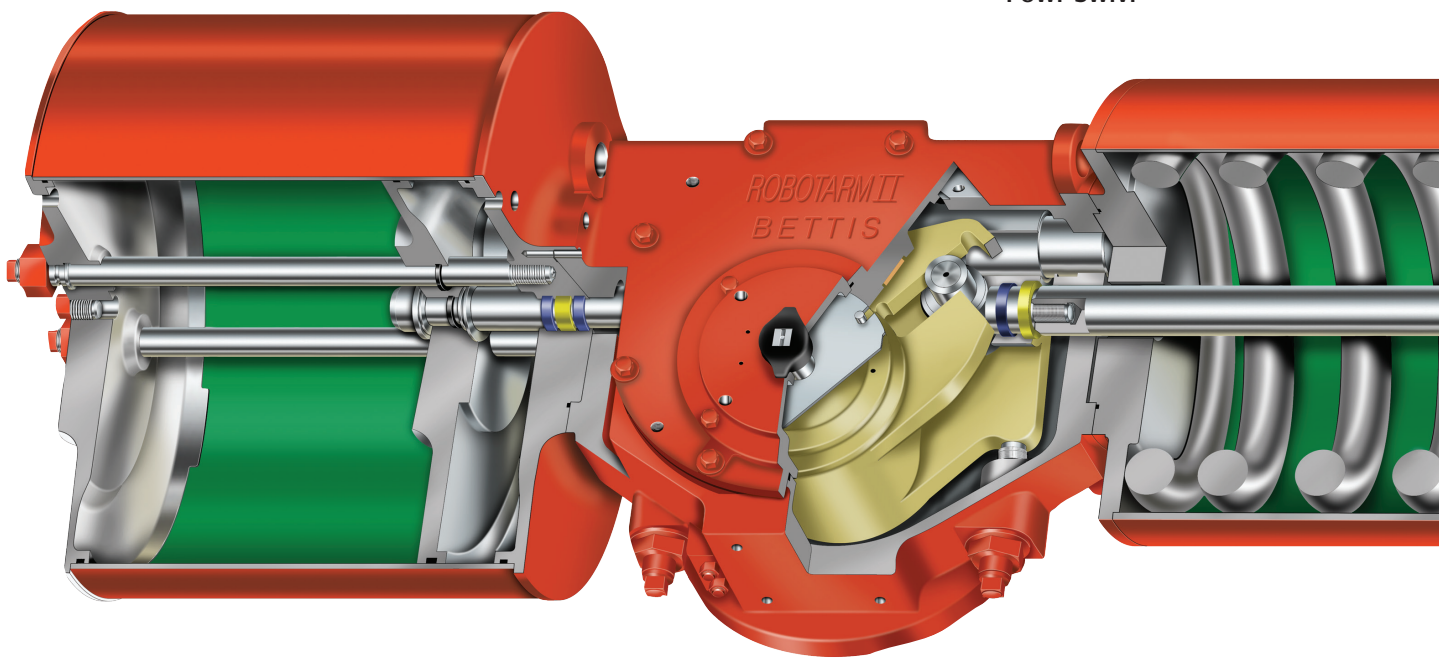
Standard Trim	High Temp. Trim (-10)	Low Temp. Trim (-11)	
None-PED and PED		None-PED	PED
-20°F to +200°F	0°F to +350°F	-40°F to +150°F	Consult Factory
-29°C to +93°C	-18°C to +177°C	-40°C to +66°C	

## Reduces Wear

The Powr-Swivl™ piston rod and guide block connection compensates for side load deflection and reduces wear. Seal-lubricating bearings protect sliding and rotating components.

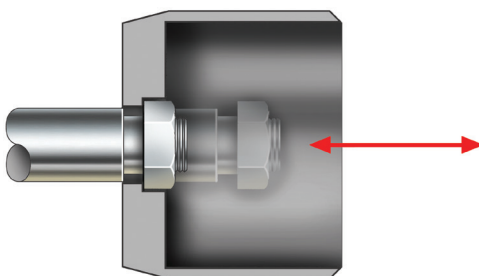


Powr-Swivl™



## Promotes Safety

The patented Tension-Lok™ device positively locks the spring module to allow its safe removal and installation, eliminating accidental release of the spring force.



Tension-Lok™

## Resists Corrosion

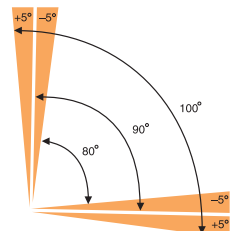
Tie-bars on pneumatic power modules are corrosion resistant, and internal and external surfaces are coated to protect in harsh environments.

## Seals Positively

With dual drive module vent checks, breather seals, total O-ring sealing and no gaskets, the G-Series prevents water ingress and seals out the environment.

## Bidirectional Travel Stops

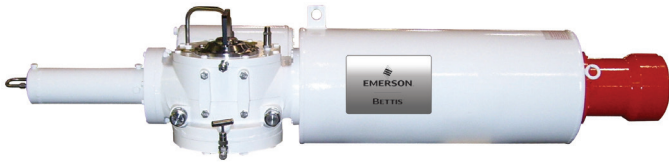
Integral bidirectional travel stops, adjustable from 80° to 100° of total valve travel, assist G-Series in prolonging valve seat integrity.



## Other G-Series Actuation Solutions

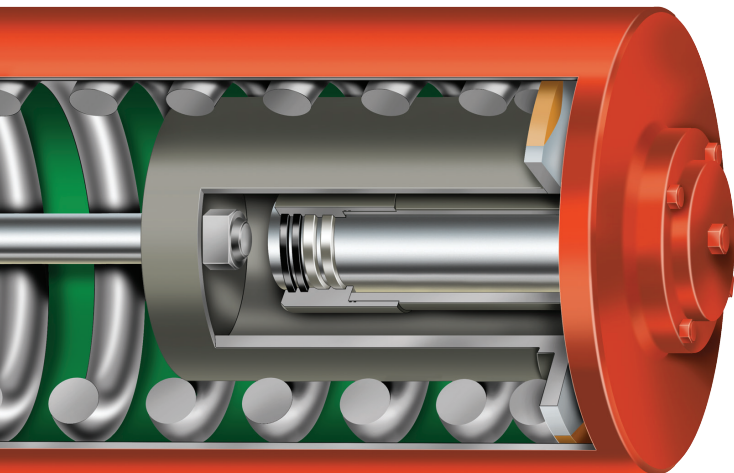
### GS-Series

Emerson actuators have long been a preferred brand for use in marine environments. GS-Series actuators are well suited for splash zone, riser and other offshore fail-safe applications. They are available with diver or ROV intervention systems.



### NG-Series

NG-Series actuators have been independently tested to include LOCA (Loss of Cooling Accident), meets IEEE 382 standards, seismic and various aging processes required to meet current nuclear qualification criteria.



### GH-Series

The GH-Series actuators provide specialized higher maximum operating pressures (MOP) where required. Available in either canted (model GHC) or symmetric (GH) yoke configurations for spring-return, fail-safe projects. An optional SRO spring is available for higher spring start and end torques.

### Safety Integrity Level (SIL)

G-Series actuators are well suited for demanding SIL applications. These actuators have a Failure Modes and Effects Diagnostics Analysis (FMEDA) capability with reporting performed through Exida.com™ for SIL suitability. When a Fisher, TÜV-certified FIELDVUE® controller is added to the G-Series, it is capable of partial stroke testing and providing continuous monitoring of supply pressure, valve position and pressure values to verify proper working condition. The G-Series then becomes an integral component in controlling the final control element in SIL 1, 2 or 3 applications.

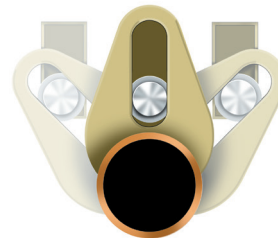
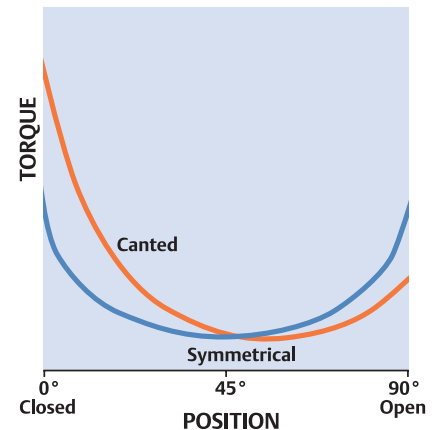
### Jackscrew is available for the G1, G2, and G3

Offered in a variety of mechanical and manual overrides, the G-Series with the M11 hydraulic override may also be used with either spring-return pneumatic or hydraulic models. The M3 jackscrew manual override for G1, G2, and G3 models is available with or without handwheel.

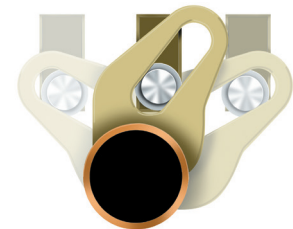
### Symmetric or Canted Yokes

G-Series actuators available with either symmetric or canted yokes. Traditional symmetric yokes provide efficient operation at both the break and end positions.

Canted (or inclined) yokes have a torque advantage in applications where higher break torque is needed to unseat the valve, with less critical needs at the run or full open positions.



Symmetric Yoke



Canted Yoke

### Other Emerson controls and accessories:

#### Fisher™

- Digital Valve Controllers
- Positioners
- Regulators

#### TopWorx™

- Switch Boxes
- Wireless Position Monitoring

#### ASCO Numatics™

- Solenoid Valves

For more detailed technical information go to our online documentation at [www.bettis.com/technical-data](http://www.bettis.com/technical-data)

# Options

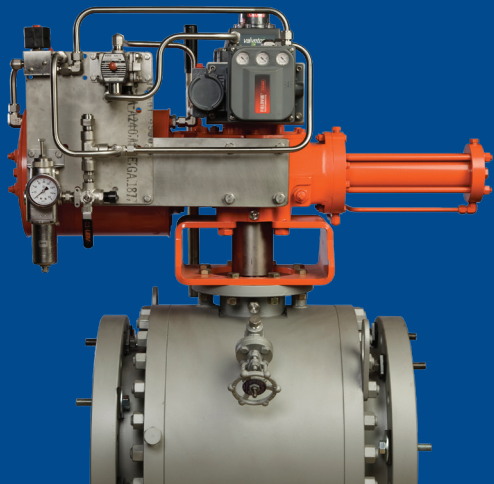
## Overrides

Emerson offers a variety of mechanical and manual overrides for G-Series models. The M11 hydraulic override can be used with either spring-return pneumatic or hydraulic models. The M3 jackscrew manual override for G1, G2 and G3 models is available with or without handwheel. The G-Ride (shown) is an economical external non-declutchable mechanical override for G4 and G5 spring-return models available with standard hex nut or handwheel.



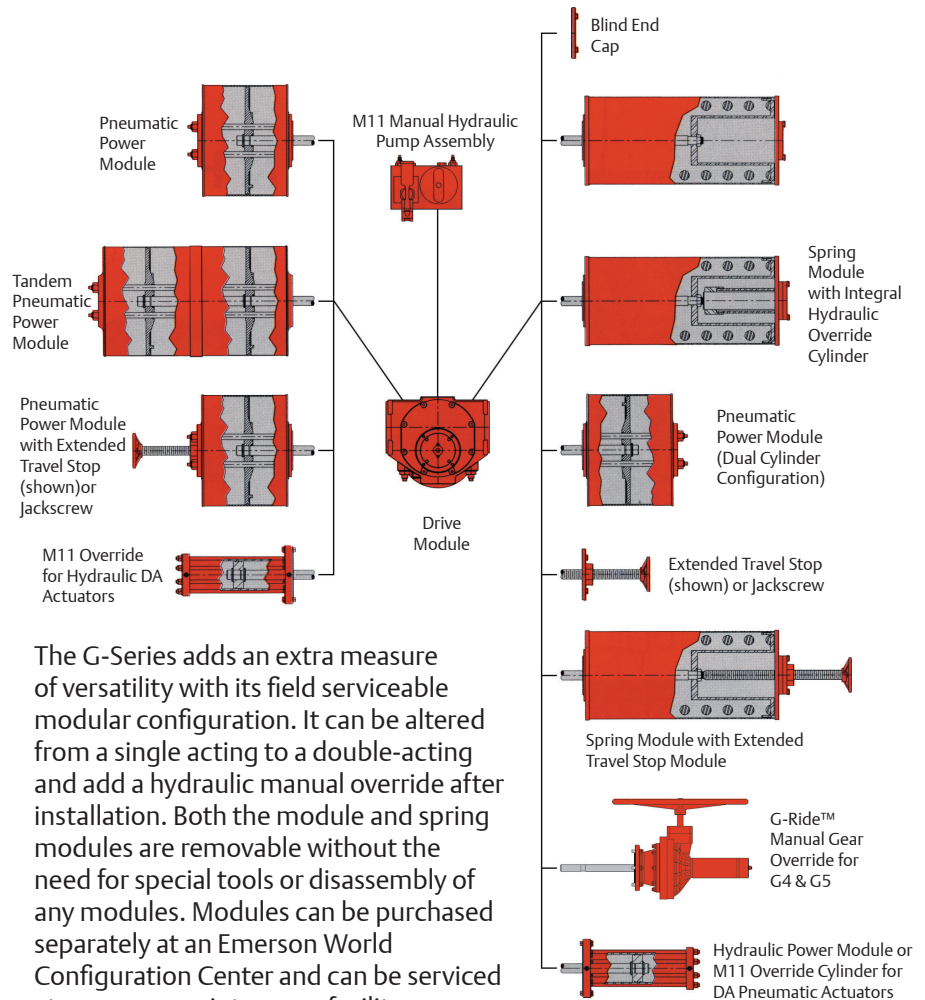
## Automated Valve Packages

Emerson offers complete valve operating systems for final valve control. At our World Area Configuration Centers (WACC), we combine the G-Series actuator, controls and a valve in a single system. We can integrate a complete controls offering including world-class PlantWeb® digital plant architecture. We also supply BettisSystems™, pre-engineered and documented controls packages, available at our WACC reducing lead times, simplifying purchasing and installation.



# Modular Versatility

- Enables Online Field Maintenance
- Lowers Inventory



The G-Series adds an extra measure of versatility with its field serviceable modular configuration. It can be altered from a single acting to a double-acting and add a hydraulic manual override after installation. Both the module and spring modules are removable without the need for special tools or disassembly of any modules. Modules can be purchased separately at an Emerson World Configuration Center and can be serviced at your own maintenance facility.

**Note:** The above graphic is for illustration purposes only. Please consult factory for certified dimensional drawings.

## Standards and Certifications

G-Series actuators are manufactured to meet the following worldwide quality and safety standards:



PED/97/23/EC –  
Pressure  
Equipment  
Directive

## Shell DEP 2016 Compliance

World's very first complete actuator product line that successfully passed stringent "Shell Endurance Test" per Shell DEP 2016 and EN15714-3 Standard. The test was supervised and monitored by Shell and Lloyd agency throughout and the final result was certified by Shell Projects & Technology PACO Principal Technical Expert.

Download [Shell DEP Acceptance of Endurance Testing](#) on Bettis G-Series webpage.



[www.globalsupplyline.com.au](http://www.globalsupplyline.com.au)

Global Supply Line are Bettis resellers and stockists. We are an approved Emerson Actuator distributor.

We can supply/ quote complete actuator packages for emergency supply within Australia, New Zealand, Papua New Guinea and all overseas locations from our Adelaide Emerson Approved Automation Centre.

[Click here](#) for our full on line stock list.

**World Area Configuration Centers (WACC) offer sales support, service, inventory and commissioning to our global customers. Choose the WACC or sales office nearest you:**

**NORTH & SOUTH AMERICA**

19200 Northwest Freeway  
Houston TX 77065  
USA  
T +1 281 477 4100

Av. Hollingsworth  
325 Iporanga Sorocaba  
SP 18087-105  
Brazil  
T +55 15 3413 8888

**ASIA PACIFIC**

No. 9 Gul Road  
#01-02 Singapore 629361  
T +65 6777 8211

No. 1 Lai Yuan Road  
Wuqing Development Area  
Tianjin 301700  
P. R. China  
T +86 22 8212 3300

**MIDDLE EAST & AFRICA**

P. O. Box 17033  
Jebel Ali Free Zone  
Dubai  
T +971 4 811 8100

P. O. Box 10305  
Jubail 31961  
Saudi Arabia  
T +966 3 340 8650

24 Angus Crescent  
Longmeadow Business Estate East  
P.O. Box 6908 Greenstone  
1616 Modderfontein Extension 5  
South Africa  
T +27 11 451 3700

**EUROPE**

Holland Fisor 6  
Székesfehérvár 8000  
Hungary  
T +36 22 53 09 50

Strada Biffi 165  
29017 Fiorenzuola d'Arda (PC)  
Italy  
T +39 0523 944 411

This product is only intended for use in large-scale fixed installations excluded from the scope of Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS 2).

For complete list of sales and manufacturing sites, please visit [www.emerson.com/actuationtechnologieslocations](http://www.emerson.com/actuationtechnologieslocations) or contact us at [info.actuationtechnologies@emerson.com](mailto:info.actuationtechnologies@emerson.com)

©2018 Emerson. All rights reserved.

The Emerson logo is a trademark and service mark of Emerson Electric Co. Bettis™ is a mark of the Emerson family of companies. All other marks are property of their respective owners.

# Torque - Pneumatic Double-Acting Actuator

Actuator Model	Metric Unit	Stroke Direction	Operating Pressure, barg																MinOP barg	MOP barg	
			2.7	3	3.5	4	4.5	5	6	7	8	9	10	11	12	12.5	13	13.5			14
Air Torque Output, Nm																					
G01x08	Start	Outboard	861	964	1,135	1,306	1,477	1,648	1,990	2,332	2,674	3,016	3,358	3,701	4,043	4,214	4,386	4,557		2.8	13.2
	Min		466	520	609	699	788	877	1,056	1,235	1,414	1,593	1,771	1,950	2,129	2,219	2,308	2,397			
	End		858	960	1,130	1,300	1,470	1,640	1,981	2,321	2,662	3,003	3,344	3,684	4,025	4,196	4,366	4,537			
G01x08	Start	Inboard	848	949	1,117	1,286	1,454	1,623	1,960	2,297	2,634	2,971	3,308	3,646	3,983	4,152	4,321	4,489		2.8	13.2
	Min		459	512	599	687	775	863	1,039	1,215	1,391	1,567	1,743	1,919	2,095	2,183	2,271	2,359			
	End		844	945	1,113	1,281	1,448	1,616	1,952	2,288	2,623	2,959	3,295	3,631	3,967	4,136	4,304	4,472			
G01x09	Start	Outboard	1,105	1,236	1,453	1,670	1,888	2,105	2,540	2,975	3,410	3,845	4,281							2.8	10.4
	Min		595	664	777	891	1,004	1,118	1,345	1,572	1,800	2,027	2,254								
	End		1,100	1,230	1,447	1,663	1,879	2,096	2,529	2,962	3,395	3,829	4,262								
G01x09	Start	Inboard	1,092	1,221	1,436	1,651	1,866	2,081	2,511	2,941	3,371	3,801	4,232							2.8	10.4
	Min		588	655	767	879	991	1,104	1,328	1,552	1,777	2,001	2,225								
	End		1,088	1,216	1,430	1,644	1,858	2,073	2,501	2,929	3,358	3,787	4,215								
G01x10	Start	Outboard	1,476	1,649	1,937	2,224	2,512	2,800	3,375	3,951	4,527									2.8	7.9
	Min		791	881	1,031	1,182	1,332	1,482	1,783	2,083	2,384										
	End		1,470	1,642	1,928	2,215	2,501	2,788	3,361	3,934	4,507										
G01x10	Start	Inboard	1,464	1,635	1,920	2,206	2,491	2,777	3,347	3,918	4,490									2.8	7.9
	Min		783	873	1,021	1,170	1,319	1,468	1,766	2,063	2,361										
	End		1,458	1,629	1,913	2,197	2,481	2,766	3,334	3,903	4,472										
G01x12	Start	Outboard	2,133	2,380	2,792	3,203	3,615	4,027												2.8	5.5
	Min		1,137	1,266	1,480	1,695	1,910	2,125													
	End		2,124	2,369	2,779	3,189	3,599	4,009													
G01x12	Start	Inboard	2,121	2,367	2,776	3,186	3,596	4,005												2.8	5.5
	Min		1,129	1,257	1,470	1,684	1,897	2,111													
	End		2,113	2,358	2,766	3,173	3,581	3,990													
G01x14	Start	Outboard	2,600	2,900	3,401	3,901	4,401													2.8	4.6
	Min		1,383	1,540	1,801	2,062	2,323														
	End		2,589	2,888	3,386	3,884	4,382														
G01x14	Start	Inboard	2,589	2,888	3,386	3,885	4,383													2.8	4.6
	Min		1,375	1,531	1,791	2,050	2,310														
	End		2,579	2,877	3,373	3,869	4,366														

## Torque - Pneumatic Double-Acting Actuator

Actuator Model	Metric Unit	Stroke Direction	Operating Pressure, barg																MinOP barg	MOP barg	
			2.7	3	3.5	4	4.5	5	6	7	8	9	10	11	12	12.5	13	13.5			14
			Air Torque Output, Nm																		
G2x09	Start	Outboard	1,337	1,495	1,758	2,021	2,284	2,547	3,074	3,600	4,127	4,653	5,180	5,707	6,234	6,497	6,761	7,024		2.8	12.9
	Min		721	803	941	1,078	1,216	1,353	1,628	1,903	2,178	2,453	2,728	3,003	3,279	3,416	3,554	3,691			
	End		1,332	1,489	1,751	2,013	2,275	2,537	3,061	3,585	4,110	4,634	5,159	5,683	6,208	6,470	6,733	6,995			
G2x09	Start	Inboard	1,321	1,477	1,738	1,998	2,258	2,518	3,038	3,559	4,080	4,600	5,121	5,642	6,163	6,424	6,684	6,945		2.8	12.9
	Min		711	793	929	1,064	1,200	1,336	1,607	1,879	2,150	2,422	2,694	2,965	3,237	3,373	3,509	3,645			
	End		1,316	1,472	1,731	1,990	2,249	2,509	3,027	3,546	4,064	4,583	5,102	5,621	6,140	6,400	6,659	6,919			
G2x10	Start	Outboard	1,787	1,995	2,344	2,692	3,040	3,388	4,085	4,781	5,478	6,175	6,872							2.8	9.7
	Min		958	1,067	1,248	1,430	1,612	1,794	2,158	2,521	2,885	3,249	3,613								
	End		1,779	1,987	2,334	2,681	3,027	3,374	4,068	4,762	5,455	6,149	6,844								
G2x10	Start	Inboard	1,771	1,979	2,324	2,669	3,015	3,360	4,051	4,742	5,433	6,124	6,816							2.8	9.7
	Min		948	1,056	1,236	1,416	1,597	1,777	2,137	2,497	2,858	3,218	3,578								
	End		1,765	1,971	2,315	2,659	3,003	3,347	4,036	4,724	5,413	6,102	6,790								
G2x12	Start	Outboard	2,581	2,880	3,378	3,876	4,374	4,873	5,869	6,866										2.8	6.9
	Min		1,376	1,532	1,792	2,052	2,312	2,572	3,092	3,612											
	End		2,570	2,868	3,364	3,860	4,356	4,853	5,845	6,838											
G2x12	Start	Inboard	2,567	2,864	3,360	3,855	4,351	4,847	5,838	6,830										2.8	6.9
	Min		1,366	1,521	1,780	2,038	2,296	2,555	3,071	3,588											
	End		2,557	2,853	3,347	3,841	4,335	4,829	5,817	6,805											
G2x14	Start	Outboard	3,147	3,510	4,115	4,720	5,326	5,931												2.8	5.6
	Min		1,674	1,864	2,179	2,495	2,811	3,127													
	End		3,134	3,495	4,098	4,701	5,304	5,907													
G2x14	Start	Inboard	3,133	3,495	4,098	4,701	5,304	5,907												2.8	5.6
	Min		1,665	1,853	2,167	2,482	2,796	3,110													
	End		3,122	3,482	4,083	4,684	5,284	5,885													
G2x16	Start	Outboard	4,174	4,653	5,451	6,250														2.8	4.2
	Min		2,213	2,463	2,880	3,296															
	End		4,162	4,640	5,436	6,233															
G2x16	Start	Inboard	2,204	2,453	2,868	3,283														2.8	4.2
	Min		4,146	4,622	5,416	6,209															
	End																				



# Torque - Pneumatic Double-Acting Actuator

Actuator Model	Metric Unit	Stroke Direction	Operating Pressure, barg																MinOP barg	MOP barg	
			2.7	3	3.5	4	4.5	5	6	7	8	9	10	11	12	12.5	13	13.5			14
			Air Torque Output, Nm																		
G3x10	Start	Outboard	2,162	2,415	2,837	3,259	3,680	4,102	4,946	5,790	6,634	7,479	8,323	9,168	10,012	10,435	10,857	11,280	11,702	2.8	13.8
	Min		1,159	1,291	1,512	1,732	1,952	2,173	2,613	3,054	3,494	3,935	4,376	4,817	5,257	5,478	5,698	5,919	6,139		
	End		2,154	2,406	2,826	3,246	3,666	4,087	4,927	5,768	6,609	7,450	8,291	9,133	9,974	10,395	10,816	11,237	11,658		
G3x10	Start	Inboard	2,131	2,381	2,797	3,213	3,629	4,045	4,878	5,711	6,544	7,377	8,210	9,043	9,876	10,293	10,710	11,127	11,544	2.8	13.8
	Min		1,142	1,272	1,489	1,706	1,923	2,140	2,574	3,008	3,442	3,876	4,310	4,744	5,179	5,396	5,613	5,830	6,047		
	End		2,124	2,373	2,787	3,202	3,617	4,032	4,861	5,691	6,521	7,351	8,182	9,012	9,843	10,258	10,673	11,089	11,504		
G3x12	Start	Outboard	3,128	3,491	4,095	4,699	5,304	5,908	7,117	8,326	9,536	10,745	11,955							2.8	9.8
	Min		1,668	1,857	2,172	2,488	2,803	3,119	3,749	4,380	5,011	5,642	6,273								
	End		3,116	3,477	4,079	4,681	5,283	5,885	7,090	8,294	9,499	10,704	11,909								
G3x12	Start	Inboard	3,099	3,458	4,057	4,656	5,255	5,854	7,052	8,251	9,449	10,648	11,847							2.8	9.8
	Min		1,650	1,837	2,149	2,461	2,774	3,086	3,710	4,334	4,959	5,583	6,207								
	End		3,088	3,446	4,043	4,640	5,237	5,834	7,028	8,223	9,417	10,612	11,807								
G3x14	Start	Outboard	3,816	4,257	4,992	5,726	6,461	7,196	8,665	10,135	11,605									2.8	8.1
	Min		2,031	2,261	2,644	3,027	3,411	3,794	4,561	5,327	6,094										
	End		3,802	4,241	4,973	5,704	6,436	7,168	8,632	10,097	11,561										
G3x14	Start	Inboard	3,788	4,226	4,955	5,685	6,414	7,144	8,603	10,063	11,522									2.8	8.1
	Min		2,013	2,241	2,621	3,001	3,381	3,761	4,521	5,281	6,042										
	End		3,775	4,211	4,938	5,665	6,392	7,119	8,574	10,028	11,483										
G3x16	Start	Outboard	5,065	5,647	6,617	7,586	8,556	9,526	11,466											2.8	6.2
	Min		2,687	2,990	3,496	4,001	4,507	5,013	6,025												
	End		5,046	5,626	6,591	7,557	8,524	9,490	11,422												
G3x16	Start	Inboard	5,039	5,618	6,583	7,548	8,513	9,478	11,408											2.8	6.2
	Min		2,669	2,970	3,473	3,975	4,478	4,980	5,985												
	End		5,022	5,599	6,560	7,522	8,484	9,445	11,369												
G3x20	Start	Outboard	8,087	9,009	10,546	12,083														2.8	3.9
	Min		4,271	4,751	5,552	6,354															
	End		8,056	8,975	10,506	12,037															
G3x20	Start	Inboard	8,066	8,985	10,518	12,051														2.8	3.9
	Min		4,253	4,732	5,530	6,327															
	End		8,038	8,955	10,482	12,010															

# Torque - Pneumatic Double-Acting Actuator

Actuator Model	Metric Unit	Stroke Direction	Operating Pressure, barg																MinOP barg	MOP barg	
			2.7	3	3.5	4	4.5	5	6	7	8	9	10	11	12	12.5	13	13.5			14
			Air Torque Output, Nm																		
G4x12	Start	Outboard	3,786	4,225	4,957	5,689	6,421	7,154	8,618	10,083	11,548	13,013	14,478	15,944	17,410	18,143	18,876	19,609	20,342	2.8	13.8
	Min		2,020	2,250	2,632	3,014	3,396	3,779	4,543	5,308	6,073	6,837	7,602	8,367	9,132	9,514	9,897	10,279	10,662		
	End		3,770	4,208	4,937	5,666	6,395	7,124	8,582	10,041	11,500	12,959	14,418	15,878	17,338	18,067	18,797	19,528	20,258		
G4x12	Start	Inboard	3,732	4,166	4,888	5,610	6,332	7,055	8,499	9,944	11,389	12,835	14,280	15,726	17,172	17,895	18,619	19,342	20,065	2.8	13.8
	Min		1,989	2,215	2,592	2,968	3,345	3,721	4,474	5,227	5,981	6,734	7,487	8,240	8,994	9,370	9,747	10,124	10,501		
	End		3,718	4,150	4,869	5,589	6,308	7,028	8,467	9,906	11,346	12,786	14,226	15,666	17,107	17,827	18,547	19,268	19,988		
G4x14	Start	Outboard	4,622	5,157	6,047	6,938	7,828	8,719	10,500	12,282	14,063	15,845	17,628	19,410	21,193	22,085	22,976	23,868	24,760	2.8	13.4
	Min		2,462	2,741	3,205	3,670	4,135	4,600	5,530	6,459	7,389	8,319	9,249	10,179	11,110	11,575	12,040	12,505	12,970		
	End		4,603	5,135	6,022	6,909	7,796	8,682	10,456	12,231	14,005	15,780	17,555	19,330	21,105	21,993	22,881	23,769	24,657		
G4x14	Start	Inboard	4,570	5,099	5,979	6,860	7,741	8,622	10,384	12,146	13,909	15,672	17,435	19,198	20,962	21,844	22,725	23,607	24,490	2.8	13.4
	Min		2,431	2,706	3,165	3,624	4,083	4,542	5,461	6,379	7,297	8,216	9,134	10,053	10,971	11,431	11,890	12,350	12,809		
	End		4,553	5,079	5,956	6,834	7,711	8,589	10,344	12,100	13,856	15,612	17,368	19,125	20,881	21,760	22,639	23,517	24,396		
G4x16	Start	Outboard	6,141	6,846	8,022	9,198	10,374	11,551	13,903	16,256	18,610	20,963	23,317							2.8	10.1
	Min		3,259	3,627	4,241	4,855	5,468	6,082	7,310	8,537	9,765	10,992	12,220								
	End		6,115	6,818	7,989	9,160	10,331	11,503	13,846	16,189	18,532	20,876	23,220								
G4x16	Start	Inboard	6,091	6,791	7,958	9,125	10,292	11,459	13,793	16,128	18,463	20,798	23,133							2.8	10.1
	Min		3,228	3,593	4,201	4,809	5,417	6,025	7,241	8,457	9,673	10,889	12,105								
	End		6,068	6,765	7,927	9,090	10,252	11,415	13,740	16,066	18,392	20,718	23,045								
G4x20	Start	Outboard	9,813	10,932	12,797	14,662	16,527	18,393	22,124											2.8	6.3
	Min		5,185	5,769	6,742	7,714	8,687	9,660	11,605												
	End		9,772	10,887	12,744	14,601	16,459	18,316	22,032												
G4x20	Start	Inboard	9,769	10,883	12,740	14,597	16,454	18,312	22,027											2.8	6.3
	Min		5,154	5,734	6,701	7,668	8,635	9,602	11,536												
	End		9,732	10,841	12,691	14,541	16,391	18,242	21,942												
G4x24	Start	Outboard	14,351	15,978	18,690	21,402	24,114													2.8	4.3
	Min		7,558	8,406	9,819	11,233	12,647														
	End		14,292	15,912	18,613	21,313	24,014														
G4x24	Start	Inboard	14,314	15,938	18,643	21,348	24,054													2.8	4.3
	Min		7,526	8,371	9,779	11,187	12,595														
	End		14,260	15,877	18,572	21,267	23,962														
G4x28	Start	Outboard	20,208	22,503																2.8	3.1
	Min		10,655	11,852																	
	End		20,124	22,409																	
G4x28	Start	Inboard	20,181	22,473																2.8	3.1
	Min		10,624	11,817																	
	End		20,104	22,387																	

# Torque - Pneumatic Double-Acting Actuator

Actuator Model	Metric Unit	Stroke Direction	Operating Pressure, barg																MinOP barg	MOP barg	
			2.7	3	3.5	4	4.5	5	6	7	8	9	10	11	12	12.5	13	13.5			14
			Air Torque Output, Nm																		
G5x16	Start	Outboard	7,923	8,832	10,347	11,863	13,378	14,894	17,925	20,956	23,988	27,020	30,052	33,085	36,118	37,635	39,151	40,668	42,185	2.8	13.8
	Min		4,199	4,673	5,463	6,254	7,044	7,834	9,414	10,995	12,575	14,156	15,737	17,317	18,898	19,689	20,479	21,270	22,060		
	End		7,893	8,799	10,308	11,818	13,327	14,837	17,857	20,877	23,897	26,918	29,938	32,960	35,981	37,492	39,003	40,514	42,025		
G5x16	Start	Inboard	7,799	8,694	10,187	11,679	13,171	14,664	17,649	20,635	23,621	26,607	29,593	32,580	35,567	37,061	38,555	40,049	41,542	2.8	13.8
	Min		4,128	4,594	5,371	6,148	6,925	7,702	9,256	10,810	12,364	13,918	15,472	17,027	18,581	19,358	20,136	20,913	21,690		
	End		7,773	8,665	10,152	11,640	13,127	14,615	17,590	20,566	23,542	26,518	29,494	32,471	35,448	36,937	38,426	39,915	41,404		
G5x20	Start	Outboard	12,673	14,117	16,524	18,930	21,337	23,744	28,558	33,373	38,187	43,003	47,818	52,634						2.8	11.3
	Min		6,690	7,443	8,697	9,951	11,206	12,460	14,969	17,478	19,987	22,497	25,006	27,516							
	End		12,625	14,064	16,461	18,859	21,256	23,654	28,450	33,246	38,042	42,839	47,637	52,434							
G5x20	Start	Inboard	12,557	13,988	16,373	18,758	21,144	23,529	28,300	33,072	37,844	42,616	47,389	52,162						2.8	11.3
	Min		6,618	7,363	8,604	9,846	11,087	12,328	14,811	17,293	19,776	22,259	24,742	27,225							
	End		12,515	13,941	16,318	18,696	21,073	23,450	28,206	32,961	37,717	42,473	47,230	51,987							
G5x24	Start	Outboard	18,544	20,645	24,147	27,649	31,151	34,654	41,659	48,664	55,670									2.8	7.7
	Min		9,757	10,852	12,677	14,502	16,326	18,151	21,801	25,450	29,100										
	End		18,473	20,567	24,055	27,544	31,033	34,522	41,501	48,480	55,459										
G5x24	Start	Inboard	18,437	20,527	24,009	27,491	30,974	34,457	41,423	48,389	55,356									2.8	7.7
	Min		9,686	10,773	12,584	14,396	16,207	18,019	21,642	25,265	28,888										
	End		18,375	20,458	23,929	27,400	30,871	34,342	41,284	48,227	55,171										
G5x28	Start	Outboard	26,120	29,085	34,026	38,967	43,909	48,851												2.8	5.5
	Min		13,763	15,308	17,884	20,460	23,036	25,612													
	End		26,021	28,974	33,897	38,820	43,743	48,666													
G5x28	Start	Inboard	26,026	28,980	33,904	38,829	43,753	48,678												2.8	5.5
	Min		13,691	15,229	17,791	20,354	22,917	25,479													
	End		25,939	28,883	33,791	38,699	43,607	48,515													
G5x32	Start	Outboard	34,258	38,135	44,598	51,061														2.8	4.2
	Min		18,021	20,042	23,410	26,778															
	End		34,128	37,990	44,429	50,867															
G5x32	Start	Inboard	34,177	38,046	44,494	50,942														2.8	4.2
	Min		17,950	19,963	23,318	26,673															
	End		34,063	37,919	44,345	50,772															
G5x36	Start	Outboard	43,493	48,405																2.8	3.3
	Min		22,851	25,410																	
	End		43,328	48,221																	
G5x36	Start	Inboard	43,427	48,333																2.8	3.3
	Min		22,779	25,331																	
	End		43,282	48,171																	

# Torque - Pneumatic Double-Acting Actuator

Actuator Model	Metric Unit	Stroke Direction	Operating Pressure, barg																MinOP barg	MOP barg	
			2.7	3	3.5	4	4.5	5	6	7	8	9	10	11	12	12.5	13	13.5			14
			Air Torque Output, Nm																		
G7x20	Start	Outboard	15,458	17,224	20,167	23,111	26,055	28,999	34,887	40,776	46,666	52,556	58,447	64,339	70,231	73,177	76,123	79,070	82,016	2.8	13.8
	Min		8,178	9,099	10,635	12,170	13,706	15,242	18,313	21,385	24,456	27,528	30,600	33,672	36,745	38,281	39,817	41,353	42,890		
	End		15,396	17,156	20,087	23,020	25,952	28,884	34,749	40,615	46,481	52,348	58,216	64,084	69,953	72,887	75,822	78,757	81,692		
G7x20	Start	Inboard	15,272	17,017	19,926	22,836	25,745	28,655	34,475	40,295	46,116	51,938	57,760	63,583	69,406	72,318	75,230	78,143	81,055	2.8	13.8
	Min		8,067	8,976	10,491	12,006	13,521	15,036	18,066	21,097	24,127	27,158	30,189	33,220	36,251	37,767	39,282	40,798	42,314		
	End		15,218	16,957	19,857	22,756	25,655	28,555	34,354	40,154	45,955	51,756	57,558	63,360	69,163	72,065	74,967	77,869	80,771		
G7x24	Start	Outboard	22,665	25,239	29,528	33,818	38,107	42,397	50,977	59,558	68,139	76,721	85,303	93,887	102,470	106,763				2.8	12.3
	Min		11,947	13,289	15,525	17,762	19,998	22,235	26,708	31,181	35,654	40,128	44,602	49,076	53,550	55,787					
	End		22,576	25,139	29,411	33,684	37,956	42,229	50,775	59,322	67,869	76,417	84,966	93,515	102,065	106,340					
G7x24	Start	Inboard	22,492	25,047	29,304	33,561	37,819	42,077	50,593	59,110	67,628	76,146	84,664	93,184	101,704	105,964				2.8	12.3
	Min		11,836	13,166	15,381	17,597	19,813	22,029	26,461	30,893	35,325	39,758	44,191	48,623	53,056	55,273					
	End		22,414	24,959	29,201	33,444	37,687	41,930	50,416	58,903	67,391	75,879	84,368	92,858	101,348	105,593					
G7x28	Start	Outboard	31,977	35,612	41,669	47,727	53,785	59,843	71,961	84,080	96,200	108,321								2.8	8.7
	Min		16,871	18,766	21,926	25,086	28,245	31,405	37,725	44,045	50,365	56,686									
	End		31,851	35,471	41,504	47,538	53,572	59,606	71,676	83,747	95,819	107,892									
G7x28	Start	Inboard	31,821	35,438	41,467	47,496	53,525	59,555	71,615	83,676	95,738	107,802								2.8	8.7
	Min		16,760	18,643	21,782	24,921	28,060	31,200	37,478	43,757	50,036	56,316									
	End		31,709	35,314	41,321	47,329	53,338	59,346	71,364	83,383	95,403	107,424									
G7x32	Start	Outboard	41,974	46,730	54,657	62,584	70,511	78,439	94,296											2.8	6.6
	Min		22,105	24,585	28,718	32,852	36,985	41,119	49,386												
	End		41,808	46,545	54,441	62,336	70,232	78,129	93,922												
G7x32	Start	Inboard	41,836	46,576	54,478	62,379	70,281	78,184	93,989											2.8	6.6
	Min		21,994	24,461	28,574	32,687	36,800	40,913	49,140												
	End		41,689	46,413	54,287	62,161	70,035	77,910	93,660												
G7x36	Start	Outboard	53,320	59,347	69,393	79,439	89,485	99,532												2.8	5.2
	Min		28,040	31,183	36,420	41,657	46,895	52,132													
	End		53,109	59,112	69,118	79,124	89,131	99,138													
G7x36	Start	Inboard	53,201	59,216	69,240	79,264	89,289	99,314												2.8	5.2
	Min		27,929	31,059	36,276	41,493	46,710	51,927													
	End		53,015	59,008	68,997	78,987	88,976	98,966													
G7x228	Start	Outboard	63,741	70,986	83,062	95,138	107,214													2.8	4.3
	Min		33,630	37,410	43,708	50,007	56,306														
	End		63,489	70,705	82,733	94,761	106,790														
G7x228	Start	Inboard	63,855	71,113	83,210	95,308	107,406													2.8	4.3
	Min		33,630	37,410	43,708	50,007	56,306														
	End		63,631	70,864	82,919	94,974	107,030														

# Torque - Pneumatic Double-Acting Actuator

Actuator Model	Metric Unit	Stroke Direction	Operating Pressure, barg																MinOP barg	MOP barg	
			2.7	3	3.5	4	4.5	5	6	7	8	9	10	11	12	12.5	13	13.5			14
			Air Torque Output, Nm																		
G8x24	Start	Outboard	26,760	29,800	34,866	39,932	44,999	50,065	60,199	70,334	80,469	90,605	100,742	110,879	121,018	126,087	131,157	136,227	141,297	2.8	13.8
	Min		14,106	15,691	18,332	20,973	23,614	26,255	31,538	36,820	42,103	47,386	52,669	57,953	63,237	65,878	68,520	71,162	73,804		
	End		26,661	29,689	34,736	39,783	44,831	49,879	59,975	70,071	80,169	90,267	100,366	110,466	120,567	125,617	130,668	135,719	140,770		
G8x24	Start	Inboard	26,429	29,431	34,436	39,441	44,446	49,451	59,463	69,475	79,488	89,501	99,515	109,531	119,546	124,555	129,563	134,572	139,581	2.8	13.8
	Min		13,910	15,473	18,077	20,682	23,287	25,891	31,101	36,311	41,521	46,731	51,942	57,152	62,363	64,969	67,574	70,180	72,786		
	End		26,342	29,335	34,324	39,312	44,301	49,290	59,269	69,248	79,228	89,209	99,191	109,173	119,157	124,149	129,141	134,133	139,126		
G8x28	Start	Outboard	37,786	42,083	49,243	56,404	63,565	70,727	85,051	99,376	113,703	128,031	142,361	156,692	171,024					2.8	11.9
	Min		19,937	22,177	25,912	29,646	33,381	37,116	44,585	52,055	59,526	66,996	74,467	81,939	89,411						
	End		37,646	41,926	49,060	56,194	63,328	70,463	84,734	99,006	113,279	127,554	141,830	156,108	170,387						
G8x28	Start	Inboard	37,474	41,735	48,838	55,941	63,045	70,149	84,358	98,568	112,779	126,992	141,206	155,422	169,639					2.8	11.9
	Min		19,740	21,959	25,657	29,355	33,053	36,752	44,149	51,546	58,944	66,341	73,740	81,138	88,537						
	End		37,352	41,599	48,679	55,759	62,839	69,920	84,082	98,246	112,412	126,578	140,746	154,915	169,086						
G8x32	Start	Outboard	49,629	55,254	64,629	74,004	83,379	92,755	111,509	130,263	149,020	167,777								2.8	9.0
	Min		26,136	29,069	33,957	38,845	43,733	48,621	58,398	68,175	77,952	87,730									
	End		49,444	55,048	64,388	73,728	83,069	92,410	111,093	129,778	148,464	167,152									
G8x32	Start	Inboard	49,337	54,929	64,250	73,572	82,893	92,216	110,861	129,508	148,157	166,807								2.8	9.0
	Min		25,939	28,850	33,702	38,554	43,405	48,257	57,961	67,666	77,370	87,076									
	End		49,176	54,750	64,041	73,332	82,623	91,915	110,500	129,086	147,674	166,263									
G8x36	Start	Outboard	63,069	70,200	82,085	93,970	105,856	117,742	141,516	165,291										2.8	7.1
	Min		33,166	36,883	43,079	49,274	55,470	61,666	74,057	86,450											
	End		62,834	69,938	81,779	93,620	105,461	117,303	140,988	164,675											
G8x36	Start	Inboard	62,800	69,901	81,736	93,572	105,409	117,245	140,920	164,597										2.8	7.1
	Min		32,970	36,665	42,824	48,983	55,142	61,302	73,621	85,940											
	End		62,595	69,673	81,470	93,267	105,065	116,863	140,461	164,060											
G8x40	Start	Outboard	78,106	86,920	101,611	116,302	130,994	145,686	175,072											2.8	5.8
	Min		41,028	45,622	53,279	60,936	68,593	76,250	91,564												
	End		77,815	86,596	101,232	115,869	130,506	145,143	174,420												
G8x40	Start	Inboard	77,863	86,650	101,296	115,943	130,590	145,238	174,534											2.8	5.8
	Min		40,831	45,404	53,024	60,645	68,265	75,886	91,128												
	End		77,609	86,368	100,966	115,565	130,164	144,764	173,965												
G8x232	Start	Outboard	98,881	110,088	128,768	147,449	166,130													2.8	4.5
	Min		52,075	57,919	67,658	77,398	87,138														
	End		98,512	109,678	128,288	146,899	165,511														
G8x232	Start	Inboard	99,052	110,279	128,991	147,703	166,417													2.8	4.5
	Min		52,075	57,919	67,658	77,398	87,138														
	End		98,729	109,919	128,570	147,222	165,874														
G8x236	Start	Outboard	125,761	139,980	163,680															2.8	3.6
	Min		66,136	73,549	85,903																
	End		125,292	139,458	163,070																
G8x236	Start	Inboard	125,978	140,222	163,963															2.8	3.6
	Min		66,136	73,549	85,903																
	End		125,567	139,765	163,428																

# Torque - Pneumatic Double-Acting Actuator

Actuator Model	Metric Unit	Stroke Direction	Operating Pressure, barg																MinOP barg	MOP barg	
			2.7	3	3.5	4	4.5	5	6	7	8	9	10	11	12	12.5	13	13.5			14
			Air Torque Output, Nm																		
G10x28	Start	Outboard	49,332	54,945	64,300	73,655	83,011	92,368	111,082	129,798	148,516	167,235	185,957	204,680	223,405	232,768	242,132	251,496	260,861	2.8	13.8
	Min		26,049	28,978	33,859	38,740	43,622	48,503	58,266	68,030	77,794	87,559	97,324	107,090	116,856	121,739	126,622	131,506	136,389		
	End		49,150	54,743	64,063	73,384	82,706	92,028	110,673	129,320	147,969	166,620	185,273	203,927	222,583	231,912	241,242	250,571	259,901		
G10x28	Start	Inboard	48,721	54,266	63,508	72,750	81,993	91,237	109,725	128,216	146,708	165,202	183,698	202,195	220,695	229,945	239,196	248,447	257,699	2.8	13.8
	Min		25,689	28,577	33,392	38,206	43,021	47,835	57,465	67,095	76,726	86,357	95,989	105,621	115,253	120,070	124,886	129,703	134,520		
	End		48,562	54,089	63,301	72,513	81,726	90,940	109,368	127,798	146,230	164,664	183,099	201,537	219,976	229,196	238,417	247,638	256,860		
G10x32	Start	Outboard	64,885	72,243	84,506	96,770	109,034	121,299	145,830	170,363	194,898	219,436	243,975	268,517	293,060	305,333	317,606	329,879	342,153	2.8	13.8
	Min		34,194	38,032	44,429	50,826	57,222	63,619	76,414	89,209	102,005	114,801	127,597	140,395	153,192	159,591	165,991	172,390	178,790		
	End		64,647	71,977	84,196	96,414	108,633	120,853	145,294	169,737	194,182	218,629	243,078	267,529	291,982	304,209	316,437	328,666	340,895		
G10x32	Start	Inboard	64,300	71,593	83,748	95,904	108,060	120,217	144,532	168,849	193,168	217,489	241,813	266,138	290,466	302,630	314,795	326,961	339,127	2.8	13.8
	Min		33,834	37,632	43,961	50,291	56,622	62,952	75,613	88,274	100,936	113,599	126,262	138,926	151,590	157,922	164,255	170,587	176,920		
	End		64,091	71,360	83,475	95,591	107,708	119,825	144,061	168,299	192,539	216,781	241,025	265,271	289,519	301,644	313,770	325,896	338,022		
G10x36	Start	Outboard	82,537	91,872	107,432	122,992	138,553	154,115	185,240	216,367	247,496	278,628	309,762	340,899						2.8	10.9
	Min		43,431	48,300	56,414	64,529	72,644	80,758	96,989	113,220	129,451	145,683	161,916	178,149							
	End		82,233	91,534	107,037	122,540	138,044	153,548	184,558	215,571	246,586	277,603	308,623	339,645							
G10x36	Start	Inboard	81,980	91,255	106,712	122,170	137,628	153,087	184,007	214,929	245,853	276,780	307,709	338,641						2.8	10.9
	Min		43,071	47,899	55,947	63,995	72,043	80,091	96,188	112,285	128,383	144,482	160,581	176,680							
	End		81,713	90,957	106,364	121,772	137,180	152,588	183,408	214,229	245,053	275,879	306,707	337,538							
G10x40	Start	Outboard	102,285	113,832	133,077	152,322	171,568	190,815	229,311	267,809	306,309	344,813								2.8	8.8
	Min		53,760	59,781	69,815	79,850	89,885	99,920	119,991	140,062	160,134	180,206									
	End		101,909	113,413	132,587	151,762	170,937	190,113	228,467	266,824	305,183	343,544									
G10x40	Start	Inboard	101,762	113,251	132,399	151,548	170,698	189,849	228,151	266,457	304,764	343,075								2.8	8.8
	Min		53,400	59,380	69,348	79,316	89,284	99,252	119,189	139,127	159,066	179,005									
	End		101,431	112,882	131,968	151,055	170,142	189,230	227,408	265,589	303,772	341,957									
G10x232	Start	Outboard	129,079	143,717	168,115	192,514	216,915	241,316	290,122	338,931										2.8	6.9
	Min		68,028	75,664	88,390	101,117	113,844	126,571	152,027	177,483											
	End		128,604	143,188	167,497	191,806	216,117	240,428	289,054	337,685											
G10x232	Start	Inboard	129,294	143,956	168,395	192,835	217,276	241,718	290,605	339,496										2.8	6.9
	Min		68,028	75,664	88,390	101,117	113,844	126,571	152,027	177,483											
	End		128,872	143,487	167,847	192,207	216,568	240,930	289,658	338,390											
G10x236	Start	Outboard	164,381	182,975	213,966	244,959	275,953	306,948												2.8	5.5
	Min		86,502	96,199	112,361	128,524	144,686	160,849													
	End		163,776	182,302	213,179	244,058	274,938	305,819													
G10x236	Start	Inboard	164,655	183,280	214,323	245,367	276,412	307,459												2.8	5.5
	Min		86,502	96,199	112,361	128,524	144,686	160,849													
	End		164,118	182,683	213,625	244,568	275,512	306,457													
G10x240	Start	Outboard	203,878	226,895	265,256	303,619	341,983													2.8	4.4
	Min		107,160	119,161	139,164	159,166	179,169														
	End		203,128	226,060	264,280	302,502	340,725														
G10x240	Start	Inboard	204,218	227,272	265,698	304,124	342,552													2.8	4.4
	Min		107,160	119,161	139,164	159,166	179,169														
	End		203,553	226,532	264,832	303,134	341,437														

## Torque - Pneumatic Double-Acting Actuator

Actuator Model	Metric Unit	Stroke Direction	Operating Pressure, barg																MinOP barg	MOP barg	
			2.7	3	3.5	4	4.5	5	6	7	8	9	10	11	12	12.5	13	13.5			14
			Air Torque Output, Nm																		
G13x40	Start	Outboard	131,089	145,892	170,565	195,239	219,914	244,590	293,943	343,300	392,661	442,024	491,392	540,762	590,136	614,824	639,513	664,203	688,893	2.8	13.8
	Min		68,927	76,647	89,515	102,383	115,251	128,119	153,857	179,595	205,334	231,074	256,815	282,557	308,299	321,171	334,043	346,915	359,787		
	End		130,601	145,349	169,930	194,512	219,095	243,679	292,849	342,022	391,199	440,379	489,562	538,748	587,938	612,534	637,131	661,729	686,328		
G13x40	Start	Inboard	129,920	144,594	169,051	193,509	217,968	242,428	291,350	340,276	389,204	438,136	487,072	536,011	584,953	609,425	633,898	658,372	682,847	2.8	13.8
	Min		68,224	75,867	88,604	101,342	114,080	126,819	152,296	177,774	203,253	228,732	254,213	279,695	305,177	317,919	330,660	343,402	356,144		
	End		129,480	144,104	168,478	192,853	217,229	241,606	290,363	339,122	387,885	436,651	485,421	534,193	582,970	607,359	631,749	656,140	680,532		
G13x44	Start	Outboard	159,172	177,119	207,030	236,943	266,857	296,771	356,603	416,438	476,277	536,120	595,967	655,817						2.8	11.4
	Min		83,616	92,974	108,572	124,170	139,768	155,367	186,564	217,763	248,962	280,163	311,364	342,567							
	End		158,579	176,459	206,260	236,061	265,863	295,666	355,275	414,888	474,504	534,124	593,747	653,375							
G13x44	Start	Inboard	158,043	175,864	205,567	235,271	264,976	294,682	354,097	413,515	472,937	532,363	591,792	651,225						2.8	11.4
	Min		82,913	92,194	107,661	123,129	138,597	154,066	185,003	215,941	246,881	277,821	308,762	339,705							
	End		157,507	175,268	204,870	234,474	264,078	293,683	352,896	412,113	471,334	530,558	589,786	649,017							
G13x48	Start	Outboard	189,967	211,357	247,007	282,658	318,311	353,964	425,274	496,588	567,906	639,228	710,554							2.8	9.7
	Min		99,713	110,866	129,454	148,042	166,631	185,220	222,398	259,578	296,758	333,940	371,123								
	End		189,259	210,570	246,087	281,606	317,126	352,646	423,691	494,739	565,792	636,848	707,908								
G13x48	Start	Inboard	188,880	210,150	245,599	281,050	316,502	351,955	422,864	493,777	564,694	635,614	706,539							2.8	9.7
	Min		99,010	110,085	128,543	147,001	165,460	183,919	220,837	257,756	294,677	331,598	368,521								
	End		188,240	209,437	244,767	280,098	315,429	350,762	421,430	492,103	562,779	633,460	704,144								
G13x52	Start	Outboard	223,459	248,592	290,481	332,371	374,262	416,154	499,941	583,733	667,529									2.8	8.3
	Min		117,215	130,318	152,157	173,996	195,835	217,674	261,354	305,035	348,717										
	End		222,627	247,666	289,399	331,133	372,868	414,604	498,080	581,559	665,043										
G13x52	Start	Inboard	222,419	247,437	289,134	330,832	372,531	414,231	497,635	581,043	664,455									2.8	8.3
	Min		116,513	129,538	151,246	172,955	194,664	216,374	259,793	303,214	346,636										
	End		221,665	246,598	288,154	329,710	371,268	412,827	495,948	579,073	662,202										

## Torque - Pneumatic Double-Acting Actuator

Actuator Model	Metric Unit	Stroke Direction	Operating Pressure, barg																MinOP barg	MOP barg	
			2.7	3	3.5	4	4.5	5	6	7	8	9	10	11	12	12.5	13	13.5			14
			Air Torque Output, Nm																		
G13x240	Start	Outboard	260,828	290,285	339,382	388,480	437,580	486,681	584,889	683,103										2.8	6.9
	Min		137,151	152,514	178,119	203,725	229,331	254,938	306,152	357,369											
	End		259,857	289,204	338,118	387,033	435,950	484,869	582,711	680,560											
G13x240	Start	Inboard	261,191	290,689	339,854	389,020	438,188	487,358	585,702	684,053										2.8	6.9
	Min		137,151	152,514	178,119	203,725	229,331	254,938	306,152	357,369											
	End		260,306	289,704	338,702	387,701	436,703	485,706	583,717	681,734											
G13x244	Start	Outboard	316,995	352,739	412,312	471,888	531,465	591,044	710,208											2.8	5.7
	Min		166,529	185,168	216,233	247,299	278,365	309,432	371,567												
	End		315,815	351,425	410,777	470,131	529,486	588,843	707,563												
G13x244	Start	Inboard	317,436	353,229	412,886	472,544	532,204	591,866	711,195											2.8	5.7
	Min		166,529	185,168	216,233	247,299	278,365	309,432	371,567												
	End		316,360	352,032	411,486	470,942	530,400	589,859	708,784												
G13x248	Start	Outboard	378,585	421,214	492,265	563,319	634,374	705,431												2.8	4.8
	Min		198,723	220,951	257,997	295,043	332,091	369,138													
	End		377,175	419,646	490,432	561,221	632,012	702,804													
G13x248	Start	Inboard	379,111	421,800	492,950	564,102	635,256	706,412												2.8	4.8
	Min		198,723	220,951	257,997	295,043	332,091	369,138													
	End		377,826	420,370	491,279	562,189	633,102	704,017													
G13x252	Start	Outboard	445,570	495,685	579,213	662,743														2.8	4.1
	Min		233,728	259,856	303,403	346,951															
	End		443,910	493,839	577,056	660,275															
G13x252	Start	Inboard	446,189	496,374	580,018	663,665														2.8	4.1
	Min		233,728	259,856	303,403	346,951															
	End		444,676	494,692	578,052	661,415															



## Torque - Pneumatic Spring Return Actuator

Actuator Model	Metric Unit	Spring Torque Nm	Operating Pressure, barg																		MinOP barg	MOP barg		
			1.5	2	2.5	3	3.5	4	5	6	7	8	9	10	11	11.5	12	12.5	13	13.5			14	
			Air Torque Output, Nm																					
G01x08-SR0	Start	2,748													1,491	1,654	1,818	1,981	2,145	2,309	2,472	11.7	13.2	
	Min	1,233													579	667	754	841	928	1,014	1,100			
	End	1,971													723	885	1,048	1,210	1,373	1,536	1,698			
G01x09-SR0	Start	2,741												1,642	2,059	2,476	2,685	2,893	3,102	3,311	3,519	3,728	9.1	13.8
	Min	1,232												661	883	1,103	1,213	1,323	1,432	1,541	1,651	1,760		
	End	1,964												873	1,287	1,702	1,910	2,117	2,325	2,532	2,740	2,947		
G01x10-SR0	Start	2,733									1,755	2,309	2,862	3,416	3,970	4,247	4,524						6.9	11.4
	Min	1,230									723	1,016	1,307	1,597	1,887	2,032	2,176							
	End	1,956									985	1,536	2,086	2,637	3,187	3,463	3,738							
G01x12-SR0	Start	2,720							1,839	2,633	3,428	4,222											4.8	8.0
	Min	1,226							770	1,189	1,605	2,020												
	End	1,944							1,069	1,859	2,648	3,438												
G01x14-SR0	Start	2,710							1,723	2,688	3,654	4,620											3.9	6.3
	Min	1,224							710	1,220	1,726	2,231												
	End	1,933							953	1,913	2,873	3,834												
G01x08-SR1	Start	2,068												1,178	1,504	1,831	1,995	2,158	2,322	2,486	2,649	2,813	8.8	13.2
	Min	975												516	689	860	946	1,032	1,117	1,203	1,288	1,374		
	End	1,633												748	1,073	1,398	1,560	1,723	1,886	2,048	2,211	2,373		
G01x09-SR1	Start	2,062									1,148	1,565	1,982	2,399	2,817	3,025	3,234	3,443	3,651	3,860	4,069		6.9	13.8
	Min	973									502	722	940	1,159	1,377	1,485	1,594	1,703	1,812	1,921	2,030			
	End	1,626									719	1,133	1,548	1,963	2,377	2,585	2,792	3,000	3,207	3,415	3,622			
G01x10-SR1	Start	2,053							989	1,542	2,096	2,649	3,203	3,756	4,310	4,587	4,864						5.2	11.4
	Min	971							419	711	1,001	1,290	1,579	1,868	2,157	2,301	2,446							
	End	1,618							560	1,110	1,661	2,211	2,761	3,312	3,862	4,138	4,413							
G01x12-SR1	Start	2,041						989	1,386	2,180	2,974	3,768	4,562										3.7	8.0
	Min	968						421	631	1,047	1,462	1,876	2,290											
	End	1,605						560	955	1,744	2,534	3,323	4,113											
G01x14-SR1	Start	2,031				1,097	1,580	2,063	3,029	3,995	4,961												3.0	6.3
	Min	965				481	735	988	1,493	1,996	2,500													
	End	1,595				668	1,148	1,628	2,588	3,549	4,509													

# Torque - Pneumatic Spring Return Actuator

Actuator Model	Metric Unit	Spring Torque Nm	Operating Pressure, barg																		MinOP barg	MOP barg		
			1.5	2	2.5	3	3.5	4	5	6	7	8	9	10	11	11.5	12	12.5	13	13.5			14	
			Air Torque Output, Nm																					
G01x08-SR2	Start	1,729										724	1,051	1,378	1,705	2,032	2,195	2,359	2,522	2,686	2,849	3,013	7.4	13.2
	Min	837										318	490	661	832	1,003	1,089	1,174	1,259	1,345	1,430	1,515		
	End	1,434											435	760	1,085	1,410	1,735	1,897	2,060	2,223	2,385	2,548		
G01x09-SR2	Start	1,723								932	1,349	1,766	2,183	2,600	3,017	3,225	3,434	3,643	3,851	4,060	4,269	5.8	13.8	
	Min	835								428	647	865	1,083	1,301	1,518	1,627	1,736	1,845	1,954	2,063	2,171			
	End	1,427									641	1,056	1,470	1,885	2,300	2,715	2,922	3,129	3,337	3,544	3,752			3,959
G01x10-SR2	Start	1,714							1,189	1,743	2,296	2,849	3,403	3,957	4,510	4,787	5,064	4.4	11.4					
	Min	833							565	854	1,143	1,432	1,721	2,009	2,298	2,442	2,587							
	End	1,419								897	1,448	1,998	2,548	3,098	3,649	4,200	4,475			4,750				
G01x12-SR2	Start	1,702				792	1,189	1,586	2,380	3,174	3,968	4,762	3.0	8.0										
	Min	829				359	567	775	1,189	1,603	2,017	2,431												
	End	1,406				503	897	1,292	2,081	2,871	3,660	4,450												
G01x14-SR2	Start	1,691			815	1,298	1,780	2,263	3,229	4,195	5,161	2.5	6.3											
	Min	827			373	626	879	1,131	1,634	2,138	2,641													
	End	1,396			525	1,005	1,485	1,965	2,925	3,886	4,846													
G01x08-SR3	Start	1,507									908	1,234	1,561	1,888	2,215	2,378	2,542	2,705	2,869	3,033	3,196	6.5	13.2	
	Min	732									425	596	767	938	1,109	1,194	1,280	1,365	1,450	1,536	1,621			
	End	1,251										656	981	1,306	1,631	1,956	2,118	2,281	2,444	2,606	2,769			2,931
G01x09-SR3	Start	1,500							698	1,115	1,532	1,949	2,366	2,783	3,200	3,409	3,617	3,826	4,035	4,243	4,452	5.1	13.8	
	Min	730							316	535	753	971	1,189	1,406	1,624	1,733	1,842	1,950	2,059	2,168	2,277			
	End	1,245								448	862	1,277	1,691	2,106	2,521	2,935	3,143	3,350	3,558	3,765	3,973			4,180
G01x10-SR3	Start	1,492						819	1,373	1,926	2,479	3,033	3,586	4,140	4,694	4,971	5,248	3.9	11.4					
	Min	728						382	671	960	1,249	1,538	1,826	2,115	2,404	2,548	2,692							
	End	1,236							568	1,118	1,668	2,219	2,769	3,319	3,870	4,420	4,696			4,971				
G01x12-SR3	Start	1,479				976	1,373	1,769	2,563	3,357	4,152	4,946	2.7	8.0										
	Min	724				466	674	881	1,295	1,709	2,123	2,537												
	End	1,224				724	1,118	1,513	2,302	3,092	3,881	4,671												
G01x14-SR3	Start	1,469			998	1,481	1,964	2,447	3,412	4,378	5,344	2.2	6.3											
	Min	722			480	733	985	1,236	1,740	2,243	2,746													
	End	1,214			746	1,226	1,706	2,186	3,146	4,107	5,067													

## Torque - Pneumatic Spring Return Actuator

Actuator Model	Metric Unit	Spring Torque Nm	Operating Pressure, barg																	MinOP barg	MOP barg		
			1.5	2	2.5	3	3.5	4	5	6	7	8	9	10	11	11.5	12	12.5	13			13.5	14
			Air Torque Output, Nm																				
G01x08-SR4	Start	1,279								746	1,072	1,399	1,726	2,053	2,380	2,543	2,707	2,870	3,034	3,197	3,361	5.5	13.2
	Min	630								358	529	700	870	1,041	1,212	1,297	1,382	1,468	1,553	1,638	1,724		
	End	1,088									558	883	1,208	1,533	1,858	2,183	2,345	2,508	2,670	2,833	2,996		
G01x09-SR4	Start	1,272					446	863	1,280	1,697	2,114	2,531	2,948	3,365	3,573	3,782	3,991	4,199	4,408	4,617	4.1	13.8	
	Min	629					201	421	639	856	1,074	1,291	1,509	1,726	1,835	1,944	2,053	2,162	2,270	2,379			
	End	1,081					261	675	1,089	1,504	1,918	2,333	2,748	3,162	3,370	3,577	3,785	3,992	4,200	4,407			
G01x10-SR4	Start	1,264				708	984	1,537	2,091	2,644	3,197	3,751	4,305	4,858	5,135	5,412					3.3	11.4	
	Min	626				341	485	774	1,063	1,352	1,640	1,929	2,217	2,506	2,650	2,794							
	End	1,073				520	795	1,345	1,895	2,446	2,996	3,546	4,097	4,647	4,923	5,198							
G01x12-SR4	Start	1,251		743	1,140	1,537	1,934	2,728	3,522	4,316	5,110										2.3	8.0	
	Min	623		362	570	777	984	1,398	1,811	2,225	2,639												
	End	1,060		556	951	1,345	1,740	2,529	3,319	4,108	4,898												
G01x14-SR4	Start	1,241	680	1,163	1,646	2,128	2,611	3,577	4,543	5,509											1.9	6.3	
	Min	620	331	584	836	1,087	1,339	1,842	2,345	2,849													
	End	1,050	493	973	1,453	1,933	2,413	3,373	4,334	5,294													

## Torque - Pneumatic Spring Return Actuator

Actuator Model	Metric Unit	Spring Torque Nm	Operating Pressure, barg																	MinOP barg	MOP barg			
			1.5	2	2.5	3	3.5	4	5	6	7	8	9	10	11	11.5	12	12.5	13			13.5	14	
			Air Torque Output, Nm																					
G2x09-SR1	Start	3,554													2,161	2,666	2,918	3,171	3,423	3,676	3,929		9.7	12.9
	Min	1,642													923	1,189	1,322	1,455	1,587	1,720	1,852			
	End	2,706													1,322	1,824	2,075	2,327	2,578	2,829	3,080			
G2x10-SR1	Start	3,544										1,794	2,463	3,133	3,803								7.4	9.7
	Min	1,639										728	1,084	1,436	1,787									
	End	2,696										957	1,623	2,289	2,955									
G2x12-SR1	Start	3,529							1,895	2,856	3,817												5.1	6.9
	Min	1,635							785	1,293	1,797													
	End	2,681							1,058	2,013	2,969													
G2x14-SR1	Start	3,516						1,754	2,923	4,092													4.1	5.6
	Min	1,632						713	1,331	1,943														
	End	2,669						918	2,080	3,242														
G2x16-SR1	Start	3,501				1,695	2,466	3,238	4,782														3.2	4.2
	Min	1,628				684	1,094	1,499	2,307															
	End	2,653				858	1,626	2,393	3,929															
G2x09-SR2	Start	3,070										1,463	1,968	2,472	2,977	3,230	3,482	3,735	3,987	4,240		8.5	12.9	
	Min	1,437										604	871	1,137	1,402	1,534	1,666	1,798	1,930	2,062				
	End	2,397										800	1,302	1,804	2,306	2,557	2,808	3,059	3,311	3,562				
G2x10-SR2	Start	3,060								1,435	2,105	2,775	3,445	4,115								6.3	9.7	
	Min	1,435								590	945	1,297	1,647	1,998										
	End	2,387								773	1,439	2,105	2,771	3,437										
G2x12-SR2	Start	3,044							2,207	3,167	4,128											4.5	6.9	
	Min	1,431							1,001	1,505	2,007													
	End	2,372							1,540	2,495	3,451													
G2x14-SR2	Start	3,032					1,481	2,065	3,234	4,403												3.7	5.6	
	Min	1,428					621	930	1,542	2,153														
	End	2,359					818	1,399	2,562	3,724														
G2x16-SR2	Start	3,016				2,006	2,778	3,550	5,093													2.8	4.2	
	Min	1,423				902	1,307	1,710	2,516															
	End	2,344				1,340	2,108	2,875	4,411															

## Torque - Pneumatic Spring Return Actuator

Actuator Model	Metric Unit	Spring Torque Nm	Operating Pressure, barg																	MinOP barg	MOP barg			
			1.5	2	2.5	3	3.5	4	5	6	7	8	9	10	11	11.5	12	12.5	13			13.5	14	
			Air Torque Output, Nm																					
G2x09-SR3	Start	2,750												1,721	2,226	2,731	3,235	3,488	3,740	3,993	4,245	4,498	7.6	12.9
	Min	1,288												759	1,025	1,289	1,553	1,685	1,817	1,949	2,081	2,213		
	End	2,140												1,118	1,620	2,122	2,624	2,875	3,126	3,377	3,628	3,879		
G2x10-SR3	Start	2,740								1,693	2,363	3,033	3,703	4,373	5.7	9.7								
	Min	1,285							746	1,098	1,449	1,799	2,149											
	End	2,130							1,090	1,756	2,422	3,088	3,755											
G2x12-SR3	Start	2,725					1,504	2,465	3,426	4,387	4.0	6.9												
	Min	1,281					648	1,154	1,656	2,158														
	End	2,115					902	1,857	2,813	3,768														
G2x14-SR3	Start	2,713				1,739	2,323	3,492	4,661	3.3	5.6													
	Min	1,278				776	1,083	1,694	2,304															
	End	2,103				1,136	1,717	2,879	4,041															
G2x16-SR3	Start	2,697		1,492	2,264	3,036	3,808	5,351	2.5	4.2														
	Min	1,274		648	1,055	1,459	1,862	2,667																
	End	2,087		890	1,658	2,425	3,193	4,728																
G2x09-SR4	Start	2,454								1,501	2,006	2,510	3,015	3,520	3,773	4,025	4,278	4,530	4,783	6.8	12.9			
	Min	1,136								645	912	1,177	1,441	1,705	1,837	1,969	2,101	2,233	2,364					
	End	1,857								911	1,413	1,915	2,417	2,919	3,170	3,421	3,672	3,923	4,174					
G2x10-SR4	Start	2,444					1,309	1,978	2,648	3,318	3,987	4,657	5.1	9.7										
	Min	1,134					544	899	1,250	1,600	1,950	2,300												
	End	1,847					719	1,385	2,051	2,717	3,383	4,050												
G2x12-SR4	Start	2,428				1,308	1,789	2,749	3,710	4,671	3.6	6.9												
	Min	1,130				547	802	1,306	1,808	2,310														
	End	1,832				719	1,197	2,152	3,108	4,063														
G2x14-SR4	Start	2,416			1,440	2,024	2,608	3,777	4,946	3.0	5.6													
	Min	1,127			620	928	1,235	1,845	2,455															
	End	1,820			850	1,431	2,012	3,174	4,336															
G2x16-SR4	Start	2,400		1,777	2,549	3,320	4,092	5,636	2.2	4.2														
	Min	1,122		802	1,207	1,610	2,013	2,818																
	End	1,804		1,185	1,953	2,720	3,488	5,023																

## Torque - Pneumatic Spring Return Actuator

Actuator Model	Metric Unit	Spring Torque Nm	Operating Pressure, barg																	MinOP barg	MOP barg				
			1.5	2	2.5	3	3.5	4	5	6	7	8	9	10	11	11.5	12	12.5	13			13.5	14		
			Air Torque Output, Nm																						
G3x10-SR1	Start	6,240														3,896	4,299	4,703	5,107	5,511	5,915	6,319	10.7	13.8	
	Min	2,867														1,656	1,870	2,083	2,295	2,507	2,719	2,930			
	End	4,731														2,401	2,803	3,205	3,606	4,008	4,410	4,812			
G3x12-SR1	Start	6,221										3,128	4,289	5,451	6,613									7.4	9.8
	Min	2,863										1,250	1,867	2,478	3,087										
	End	4,712										1,638	2,793	3,949	5,104										
G3x14-SR1	Start	6,206								3,470	4,884	6,298	7,713											6.1	8.1
	Min	2,859								1,436	2,183	2,925	3,665												
	End	4,697								1,977	3,384	4,791	6,199												
G3x16-SR1	Start	6,187							4,317	6,188	8,058													4.6	6.2
	Min	2,854							1,888	2,870	3,848														
	End	4,678							2,820	4,681	6,542														
G3x20-SR1	Start	6,148			3,840	5,325	6,811																	2.9	3.9
	Min	2,844			1,644	2,426	3,203																		
	End	4,639			2,346	3,823	5,301																		
G3x10-SR2	Start	5,438											2,895	3,702	4,510	4,914	5,317	5,721	6,125	6,529	6,933	9.3	13.8		
	Min	2,502											1,181	1,609	2,034	2,246	2,458	2,669	2,881	3,092	3,303				
	End	4,120											1,592	2,395	3,198	3,600	4,002	4,404	4,805	5,207	5,609				
G3x12-SR2	Start	5,419										3,742	4,904	6,065	7,227									6.5	9.8
	Min	2,497										1,633	2,243	2,852	3,459										
	End	4,101										2,435	3,590	4,746	5,901										
G3x14-SR2	Start	5,404						2,669	4,084	5,498	6,913	8,327												5.3	8.1
	Min	2,493						1,066	1,816	2,558	3,298	4,036													
	End	4,086						1,368	2,775	4,181	5,589	6,996													
G3x16-SR2	Start	5,385					3,061	4,931	6,802	8,672														4.0	6.2
	Min	2,488					1,279	2,264	3,243	4,219															
	End	4,067					1,757	3,618	5,478	7,339															
G3x20-SR2	Start	5,346		2,969	4,454	5,940	7,425																	2.6	3.9
	Min	2,478		1,238	2,022	2,800	3,575																		
	End	4,029		1,666	3,143	4,621	6,098																		

## Torque - Pneumatic Spring Return Actuator

Actuator Model	Metric Unit	Spring Torque Nm	Operating Pressure, barg																		MinOP barg	MOP barg					
			1.5	2	2.5	3	3.5	4	5	6	7	8	9	10	11	11.5	12	12.5	13	13.5			14				
			Air Torque Output, Nm																								
G3x10-SR3	Start	4,749													2,616	3,424	4,231	5,039	5,442	5,846	6,250	6,654	7,058	7,462	8.1	13.8	
	Min	2,187													1,081	1,509	1,933	2,356	2,568	2,779	2,990	3,201	3,412	3,623			
	End	3,594													1,475	2,278	3,081	3,884	4,286	4,687	5,089	5,491	5,893	6,295			
G3x12-SR3	Start	4,730								3,109	4,271	5,432	6,594	7,756											5.7	9.8	
	Min	2,182								1,346	1,957	2,565	3,172	3,778													
	End	3,575								1,965	3,120	4,276	5,431	6,587													
G3x14-SR3	Start	4,715								3,198	4,612	6,027	7,441	8,856											4.7	8.1	
	Min	2,179								1,396	2,139	2,879	3,617	4,355													
	End	3,560								2,053	3,460	4,867	6,274	7,681													
G3x16-SR3	Start	4,696						2,655	3,590	5,460	7,330	9,201													3.5	6.2	
	Min	2,174						1,112	1,606	2,586	3,562	4,538															
	End	3,541						1,513	2,443	4,303	6,164	8,025															
G3x20-SR3	Start	4,657			3,498	4,983	6,468	7,954																	2.2	3.9	
	Min	2,163			1,565	2,344	3,120	3,894																			
	End	3,503			2,351	3,829	5,306	6,784																			
G3x10-SR4	Start	4,156													2,264	3,071	3,878	4,685	5,493	5,897	6,301	6,704	7,108	7,512	7,916	7.2	13.8
	Min	1,917													935	1,363	1,787	2,210	2,632	2,843	3,054	3,264	3,475	3,686	3,897		
	End	3,142													1,262	2,064	2,867	3,670	4,474	4,875	5,277	5,679	6,081	6,482	6,884		
G3x12-SR4	Start	4,137								2,403	3,564	4,725	5,887	7,048	8,210											5.0	9.8
	Min	1,912								1,012	1,625	2,233	2,840	3,446	4,052												
	End	3,123								1,400	2,555	3,710	4,865	6,021	7,177												
G3x14-SR4	Start	4,122							2,239	3,653	5,067	6,481	7,896	9,311												4.1	8.1
	Min	1,908							928	1,675	2,415	3,153	3,891	4,629													
	End	3,108							1,236	2,643	4,050	5,457	6,864	8,271													
G3x16-SR4	Start	4,103				2,174	3,109	4,044	5,914	7,785	9,655															3.1	6.2
	Min	1,903				898	1,393	1,883	2,861	3,837	4,811																
	End	3,089				1,172	2,102	3,032	4,893	6,753	8,614																
G3x20-SR4	Start	4,064		2,467	3,952	5,437	6,923	8,408																		1.9	3.9
	Min	1,893		1,062	1,843	2,620	3,394	4,168																			
	End	3,051		1,464	2,941	4,418	5,896	7,373																			

## Torque - Pneumatic Spring Return Actuator

Actuator Model	Metric Unit	Spring Torque Nm	Operating Pressure, barg																	MinOP barg	MOP barg					
			1.5	2	2.5	3	3.5	4	5	6	7	8	9	10	11	11.5	12	12.5	13			13.5	14			
			Air Torque Output, Nm																							
G4x14-SR1	Start	12,762													7,448	9,157	10,012	10,866	11,721	12,575	13,430	14,285	10.3	13.4		
	Min	5,723													2,948	3,858	4,310	4,760	5,210	5,659	6,107	6,555				
	End	9,215													3,935	5,634	6,484	7,333	8,183	9,033	9,883	10,733				
G4x16-SR1	Start	12,739													8,444	10,707	12,970	15,234						7.8	10.1	
	Min	5,717													3,483	4,680	5,869	7,055								
	End	9,192													4,925	7,175	9,426	11,676								
G4x20-SR1	Start	12,692							8,298	11,898	15,498													4.9	6.3	
	Min	5,705							3,413	5,313	7,200															
	End	9,145							4,780	8,359	11,939															
G4x24-SR1	Start	12,658					8,619	11,241	16,484															3.4	4.3	
	Min	5,696					3,588	4,972	7,718																	
	End	9,111					5,099	7,706	12,920																	
G4x28-SR1	Start	12,513			8,629	12,330	16,032	19,734																2.3	3.1	
	Min	5,658			3,637	5,587	7,526	9,460																		
	End	8,967			5,109	8,789	12,470	16,150																		
G4x12-SR2	Start	11,169													7,248	7,948	8,649	9,350	10,050	10,751	11,452	11.0	13.8			
	Min	4,929													2,884	3,258	3,631	4,001	4,371	4,740	5,109					
	End	7,786													3,891	4,588	5,284	5,981	6,678	7,375	8,072					
G4x14-SR2	Start	11,151													7,195	8,903	10,612	11,467	12,321	13,176	14,030	14,885	15,740	9.0	13.4	
	Min	4,924													2,860	3,769	4,671	5,120	5,569	6,017	6,464	6,912	7,359			
	End	7,768													3,839	5,537	7,236	8,086	8,936	9,785	10,635	11,485	12,335			
G4x16-SR2	Start	11,127													7,637	9,899	12,162	14,425	16,689						6.8	10.1
	Min	4,918													3,099	4,298	5,488	6,674	7,858							
	End	7,745													4,278	6,528	8,778	11,028	13,279							
G4x20-SR2	Start	11,080						6,153	9,753	13,353	16,953													4.1	6.3	
	Min	4,906						2,309	4,229	6,120	8,002															
	End	7,699						2,803	6,382	9,962	13,541															
G4x24-SR2	Start	11,046				7,452	10,074	12,696	17,939															3.0	4.3	
	Min	4,897				3,014	4,403	5,779	8,520																	
	End	7,665				4,095	6,701	9,308	14,522																	
G4x28-SR2	Start	10,901		6,383	10,084	13,785	17,487	21,189																2.1	3.1	
	Min	4,859		2,483	4,451	6,393	8,328	10,261																		
	End	7,521		3,031	6,711	10,392	14,072	17,753																		



## Torque - Pneumatic Spring Return Actuator

Actuator Model	Metric Unit	Spring Torque Nm	Operating Pressure, barg																	MinOP barg	MOP barg				
			1.5	2	2.5	3	3.5	4	5	6	7	8	9	10	11	11.5	12	12.5	13			13.5	14		
			Air Torque Output, Nm																						
G4x12-SR3	Start	9,403												5,673	7,074	8,475	9,176	9,876	10,577	11,278	11,979	12,680	9.2	13.8	
	Min	4,159												2,208	2,957	3,698	4,067	4,435	4,803	5,170	5,537	5,904			
	End	6,566												2,860	4,253	5,646	6,343	7,040	7,737	8,433	9,130	9,827			
G4x14-SR3	Start	9,385											6,714	8,422	10,131	11,840	12,694	13,549	14,403	15,258	16,113	16,967	7.6	13.4	
	Min	4,154											2,770	3,674	4,572	5,468	5,915	6,362	6,809	7,256	7,702	8,148			
	End	6,548											3,895	5,594	7,293	8,992	9,841	10,691	11,541	12,391	13,240	14,090			
G4x16-SR3	Start	9,361									6,602	8,864	11,127	13,390	15,653	17,916							5.7	10.1	
	Min	4,148									2,714	3,910	5,098	6,282	7,465	8,646									
	End	6,525									3,784	6,033	8,283	10,533	12,783	15,034									
G4x20-SR3	Start	9,314					5,581	7,381	10,981	14,580	18,181													3.6	6.3
	Min	4,136					2,176	3,136	5,029	6,911	8,791														
	End	6,478					2,769	4,559	8,138	11,717	15,297														
G4x24-SR3	Start	9,280			6,058	8,680	11,301	13,923	19,167															2.5	4.3
	Min	4,127			2,438	3,826	5,201	6,572	9,308																
	End	6,444			3,243	5,850	8,457	11,064	16,277																
G4x28-SR3	Start	9,135		7,610	11,311	15,013	18,714	22,416																1.7	3.1
	Min	4,089		3,304	5,249	7,185	9,116	11,047																	
	End	6,300		4,787	8,467	12,147	15,827	19,508																	
G4x12-SR4	Start	7,760											5,334	6,735	8,136	9,537	10,237	10,938	11,639	12,340	13,041	13,741	7.7	13.8	
	Min	3,467											2,209	2,950	3,687	4,421	4,788	5,154	5,521	5,887	6,253	6,619			
	End	5,510											3,101	4,493	5,886	7,280	7,976	8,673	9,370	10,066	10,763	11,460			
G4x14-SR4	Start	7,742									4,360	6,068	7,776	9,484	11,193	12,901	13,756	14,610	15,465	16,320	17,174	18,029	6.3	13.4	
	Min	3,462									1,691	2,602	3,502	4,397	5,291	6,184	6,630	7,076	7,522	7,968	8,414	8,860			
	End	5,492									2,132	3,830	5,528	7,227	8,926	10,625	11,474	12,324	13,174	14,024	14,874	15,723			
G4x16-SR4	Start	7,718							5,401	7,663	9,926	12,188	14,451	16,715	18,978									4.8	10.1
	Min	3,456							2,253	3,446	4,632	5,815	6,996	8,177	9,357										
	End	5,469							3,168	5,417	7,666	9,916	12,166	14,416	16,667										
G4x20-SR4	Start	7,671			4,843	6,643	8,443	12,042	15,642	19,243														3.0	6.3
	Min	3,443			1,965	2,918	3,864	5,746	7,625	9,502															
	End	5,422			2,613	4,402	6,192	9,771	13,350	16,930															
G4x24-SR4	Start	7,638		4,499	7,120	9,742	12,363	14,985	20,229															2.1	4.3
	Min	3,434		1,786	3,175	4,549	5,918	7,285	10,018																
	End	5,389		2,270	4,877	7,483	10,090	12,697	17,910																

## Torque - Pneumatic Spring Return Actuator

Actuator Model	Metric Unit	Spring Torque Nm	Operating Pressure, barg																	MinOP barg	MOP barg				
			1.5	2	2.5	3	3.5	4	5	6	7	8	9	10	11	11.5	12	12.5	13			13.5	14		
			Air Torque Output, Nm																						
G5x20-SR1	Start	28,966													22,835	27,460	32,085	34,398	36,711						
	Min	12,112													8,897	11,363	13,806	15,023	16,237						
	End	18,054													11,967	16,568	21,168	23,469	25,769						
G5x24-SR1	Start	28,922								21,678	28,429	35,181													
	Min	12,100								8,279	11,879	15,436													
	End	18,010								10,817	17,532	24,247													
G5x28-SR1	Start	28,734						19,164	28,709	38,254															
	Min	12,051						6,973	12,090	17,114															
	End	17,824						8,317	17,810	27,304															
G5x32-SR1	Start	28,659			18,406	24,655	30,903	43,402																	
	Min	12,031			6,571	9,952	13,264	19,824																	
	End	17,748			7,562	13,777	19,993	32,425																	
G5x36-SR1	Start	28,583		20,452	28,375	36,298	44,221																		
	Min	12,011		7,710	11,944	16,116	20,267																		
	End	17,673		9,597	17,478	25,358	33,239																		
G5x16-SR2	Start	26,024															18,825	20,272	21,720	23,167	24,615				
	Min	10,595															6,768	7,560	8,343	9,121	9,894				
	End	15,309															8,158	9,598	11,038	12,478	13,918				
G5x20-SR2	Start	25,963												21,031	25,655	30,280	34,906	37,219	39,532						
	Min	10,579												7,982	10,458	12,907	15,340	16,554	17,767						
	End	15,248												10,353	14,953	19,553	24,154	26,454	28,755						
G5x24-SR2	Start	25,920							17,749	24,499	31,250	38,001													
	Min	10,567							6,188	9,846	13,420	16,967													
	End	15,205							7,088	13,802	20,517	27,232													
G5x28-SR2	Start	25,732					17,213	21,985	31,530	41,075															
	Min	10,517					5,949	8,563	13,630	18,642															
	End	15,018					6,556	11,302	20,795	30,290															
G5x32-SR2	Start	25,656			21,227	27,475	33,724	46,223																	
	Min	10,497			8,170	11,505	14,800	21,350																	
	End	14,943			10,547	16,763	22,978	35,410																	
G5x36-SR2	Start	25,580		23,273	31,195	39,118	47,041																		
	Min	10,477		9,286	13,485	17,647	21,793																		
	End	14,867		12,583	20,463	28,343	36,224																		

## Torque - Pneumatic Spring Return Actuator

Actuator Model	Metric Unit	Spring Torque Nm	Operating Pressure, barg																	MinOP barg	MOP barg				
			1.5	2	2.5	3	3.5	4	5	6	7	8	9	10	11	11.5	12	12.5	13			13.5	14		
			Air Torque Output, Nm																						
G5x16-SR3	Start	20,927													15,470	18,364	19,812	21,259	22,706	24,154	25,602	27,049	9.9	13.8	
	Min	8,710													5,836	7,390	8,160	8,927	9,692	10,454	11,217	11,976			
	End	12,888													7,469	10,348	11,787	13,227	14,667	16,107	17,546	18,986			
G5x20-SR3	Start	20,866								14,217	18,841	23,465	28,090	32,715	37,340	39,653	41,966						6.2	11.3	
	Min	8,694								5,164	7,655	10,102	12,532	14,955	17,373	18,580	19,788								
	End	12,827								6,222	10,822	15,421	20,021	24,622	29,222	31,523	33,823								
G5x24-SR3	Start	20,822					13,433	20,183	26,933	33,684	40,435													4.1	7.7
	Min	8,682					4,737	8,373	11,929	15,465	18,991														
	End	12,784					5,443	12,157	18,871	25,586	32,301														
G5x28-SR3	Start	20,634			14,876	19,648	24,419	33,964	43,509															3.0	5.5
	Min	8,633			5,590	8,148	10,669	15,674	20,660																
	End	12,597			6,878	11,624	16,371	25,864	35,358																
G5x32-SR3	Start	20,558			17,412	23,661	29,910	36,158	48,657															2.3	4.2
	Min	8,613			6,974	10,285	13,566	16,836	23,359																
	End	12,522			9,401	15,616	21,831	28,047	40,479																
G5x36-SR3	Start	20,483		17,785	25,707	33,630	41,552	49,476																1.8	3.3
	Min	8,593		7,190	11,378	15,529	19,667	23,800																	
	End	12,446		9,771	17,651	25,532	33,412	41,293																	
G5x16-SR4	Start	17,450										11,684	14,578	17,472	20,367	21,814	23,261	24,709	26,156	27,604	29,052		8.3	13.8	
	Min	7,319										4,267	5,829	7,366	8,893	9,653	10,413	11,172	11,929	12,687	13,444				
	End	10,896										5,169	8,047	10,926	13,805	15,244	16,684	18,124	19,564	21,003	22,443				
G5x20-SR4	Start	17,389						11,595	16,219	20,843	25,467	30,092	34,717	39,343	41,655	43,968							5.2	11.3	
	Min	7,303						4,230	6,714	9,154	11,579	13,997	16,412	18,825	20,031	21,236									
	End	10,836						5,080	9,679	14,278	18,878	23,478	28,078	32,679	34,980	37,280									
G5x24-SR4	Start	17,345					12,061	15,435	22,185	28,936	35,687	42,438											3.6	7.7	
	Min	7,292					4,491	6,304	9,863	13,397	16,921	20,440													
	End	10,792					5,543	8,900	15,614	22,328	29,043	35,758													
G5x28-SR4	Start	17,158			12,107	16,878	21,650	26,422	35,966	45,512													2.6	5.5	
	Min	7,242			4,574	7,127	9,641	12,142	17,130	22,107															
	End	10,606			5,589	10,335	15,081	19,828	29,321	38,815															
G5x32-SR4	Start	17,082		13,167	19,415	25,663	31,912	38,161	50,659														1.9	4.2	
	Min	7,222		5,166	8,482	11,761	15,027	18,289	24,804																
	End	10,530		6,643	12,858	19,073	25,288	31,504	43,936																

## Torque - Pneumatic Spring Return Actuator

Actuator Model	Metric Unit	Spring Torque Nm	Operating Pressure, barg																	MinOP barg	MOP barg				
			1.5	2	2.5	3	3.5	4	5	6	7	8	9	10	11	11.5	12	12.5	13			13.5	14		
			Air Torque Output, Nm																						
G7x24-SR1	Start	57,293												39,138	47,393	55,649	59,777	63,905	68,034	72,163			9.5	12.3	
	Min	23,399												13,688	18,197	22,613	24,805	26,987	29,165	31,338					
	End	33,978												15,949	24,158	32,368	36,473	40,578	44,683	48,788					
G7x28-SR1	Start	57,065										46,435	58,124	69,815										6.7	8.7
	Min	23,339										17,761	24,010	30,187											
	End	33,752										23,206	34,829	46,454											
G7x32-SR1	Start	56,972							41,112	56,429	71,747													5.1	6.6
	Min	23,314							14,879	23,124	31,218														
	End	33,660							17,913	33,144	48,375														
G7x36-SR1	Start	56,879						42,160	61,589	81,021														4.1	5.2
	Min	23,289						15,470	25,874	36,104															
	End	33,567						18,954	38,275	57,596															
G7xT28-SR1	Start	56,359					45,715	57,400	80,772															3.4	4.3
	Min	23,152					17,567	23,818	36,141																
	End	33,050					22,490	34,109	57,349																
G7x24-SR2	Start	50,582										34,734	42,989	51,244	59,500	63,628	67,757	71,885	76,014				8.4	12.3	
	Min	20,720										12,256	16,747	21,149	25,512	27,686	29,855	32,021	34,187						
	End	30,149										14,411	22,620	30,828	39,038	43,143	47,248	51,353	55,458						
G7x28-SR2	Start	50,355								38,598	50,286	61,976	73,666											5.9	8.7
	Min	20,659								14,455	20,720	26,898	33,041												
	End	29,923									18,254	29,876	41,499	53,124											
G7x32-SR2	Start	50,262							44,964	60,281	75,599													4.6	6.6
	Min	20,635							17,901	26,018	34,067														
	End	29,830								24,583	39,814	55,046													
G7x36-SR2	Start	50,168					36,297	46,011	65,441	84,872														3.6	5.2
	Min	20,610					13,233	18,476	28,751	38,935															
	End	29,738					15,965	25,625	44,945	64,267															
G7xT28-SR2	Start	49,648				37,882	49,566	61,252	84,624															3.0	4.3
	Min	20,472				14,261	20,530	26,707	38,972																
	End	29,221				17,541	29,160	40,779	64,020																

## Torque - Pneumatic Spring Return Actuator

Actuator Model	Metric Unit	Spring Torque Nm	Operating Pressure, barg																	MinOP barg	MOP barg			
			1.5	2	2.5	3	3.5	4	5	6	7	8	9	10	11	11.5	12	12.5	13			13.5	14	
			Air Torque Output, Nm																					
G7x20-SR3	Start	41,718													30,297	35,940	38,762	41,583	44,405	47,227	50,050	52,872	10.1	13.8
	Min	17,171													11,124	14,174	15,681	17,181	18,675	20,166	21,653	23,139		
	End	25,110													13,771	19,382	22,188	24,994	27,800	30,606	33,412	36,218		
G7x24-SR3	Start	41,661											31,606	39,860	48,114	56,370	64,626	68,754	72,882	77,011	81,139		7.0	12.3
	Min	17,156											11,839	16,265	20,633	24,974	29,301	31,462	33,622	35,779	37,935			
	End	25,053											15,072	23,279	31,488	39,696	47,906	52,011	56,116	60,221	64,326			
G7x28-SR3	Start	41,433								32,036	43,724	55,412	67,101	78,792									4.9	8.7
	Min	17,096								12,149	18,391	24,550	30,679	36,793										
	End	24,827								15,500	27,122	38,744	50,367	61,992										
G7x32-SR3	Start	41,340					27,116	34,774	50,089	65,406	80,724												3.7	6.6
	Min	17,071					9,462	13,642	21,766	29,805	37,815													
	End	24,734					10,608	18,222	33,451	48,682	63,914													
G7x36-SR3	Start	41,247				31,708	41,422	51,136	70,566	89,997													3.0	5.2
	Min	17,046				12,007	17,205	22,334	32,521	42,673														
	End	24,642				15,174	24,833	34,493	53,813	73,135														
G7xT28-SR3	Start	40,727			31,323	43,007	54,692	66,377	89,749														2.5	4.3
	Min	16,909			11,955	18,202	24,361	30,489	42,710															
	End	24,125			14,791	26,409	38,028	49,647	72,888															
G7x20-SR4	Start	35,007												28,507	34,149	39,792	42,613	45,435	48,257	51,079	53,901	56,723	8.5	13.8
	Min	14,492												11,095	14,106	17,089	18,576	20,059	21,540	23,021	24,499	25,976		
	End	21,280												14,831	20,441	26,052	28,858	31,664	34,470	37,276	40,082	42,888		
G7x24-SR4	Start	34,950									27,204	35,457	43,711	51,966	60,221	68,477	72,605	76,734	80,862	84,991			5.9	12.3
	Min	14,477									10,395	14,801	19,154	23,484	27,805	32,117	34,273	36,428	38,581	40,733				
	End	21,224									13,535	21,742	29,950	38,158	46,367	54,576	58,681	62,786	66,891	70,997				
G7x28-SR4	Start	34,723						24,202	35,888	47,575	59,263	70,952	82,643										4.1	8.7
	Min	14,416						8,835	15,103	21,258	27,383	33,491	39,594											
	End	20,998						10,550	22,170	33,792	45,414	57,037	68,662											
G7x32-SR4	Start	34,630				23,311	30,968	38,625	53,941	69,257	84,576												3.2	6.6
	Min	14,392				8,362	12,506	16,567	24,611	32,619	40,614													
	End	20,905				9,665	17,278	24,892	40,122	55,352	70,584													
G7x36-SR4	Start	34,536			25,846	35,559	45,273	54,988	74,418	93,849													2.5	5.2
	Min	14,367			9,771	14,964	20,083	25,176	35,330	45,463														
	End	20,812			12,185	21,844	31,503	41,163	60,483	79,805														
G7XT28-SR4	Start	34,016		23,491	35,175	46,859	58,543	70,228	93,600														2.1	4.3
	Min	14,229		8,639	14,914	21,071	27,195	33,302	45,500															
	End	20,295		9,844	21,461	33,080	44,698	56,318	79,558															

# Torque - Pneumatic Spring Return Actuator

Actuator Model	Metric Unit	Spring Torque Nm	Operating Pressure, barg																	MinOP barg	MOP barg			
			1.5	2	2.5	3	3.5	4	5	6	7	8	9	10	11	11.5	12	12.5	13			13.5	14	
			Air Torque Output, Nm																					
G8x24-SR1	Start	84,709															53,300	58,153	63,007	67,860	72,714	77,568	11.9	13.8
	Min	36,543															19,972	22,591	25,188	27,771	30,344	32,909		
	End	56,810																25,606	30,433	35,260	40,088	44,916		
G8x28-SR1	Start	84,436											51,595	65,369	79,143	92,919	99,808	106,697	113,586				8.4	11.9
	Min	36,471											19,147	26,552	33,847	41,095	44,711	48,321	51,927					
	End	56,539											23,910	37,610	51,311	65,013	71,865	78,717	85,569					
G8x32-SR1	Start	84,325											67,807	85,879	103,952	122,027							6.4	9.0
	Min	36,442											27,861	37,408	46,896	56,357								
	End	56,429											40,035	58,010	75,987	93,965								
G8x36-SR1	Start	84,215								55,923	78,866	101,810	124,756										5.0	7.1
	Min	36,413								21,527	33,730	45,789	57,796											
	End	56,319								28,215	51,035	73,856	96,680											
G8x40-SR1	Start	84,105								54,661	83,050	111,440											4.1	5.8
	Min	36,384								20,866	35,952	50,846												
	End	56,209								26,960	55,197	83,435												
G8xT32-SR1	Start	83,324					66,781	84,846	120,979														3.2	4.5
	Min	36,179					27,589	37,136	56,083															
	End	55,433					39,014	56,983	92,923															
G8xT36-SR1	Start	83,103			54,797	77,734	100,671	123,610															2.6	3.6
	Min	36,121			21,223	33,433	45,491	57,497																
	End	55,214			27,094	49,909	72,724	95,540																
G8x24-SR2	Start	68,164													47,445	57,151	62,004	66,857	71,710	76,564	81,417	86,271	9.7	13.8
	Min	30,151													19,333	24,469	27,024	29,573	32,120	34,662	37,202	39,742		
	End	48,154													27,576	37,229	42,057	46,884	51,711	56,539	61,367	66,195		
G8x28-SR2	Start	67,891											46,527	60,299	74,072	87,847	101,623	108,511	115,400	122,289			6.8	11.9
	Min	30,079											18,942	26,225	33,460	40,671	47,867	51,465	55,060	58,652				
	End	47,882											26,662	40,361	54,061	67,762	81,464	88,316	95,168	102,020				
G8x32-SR2	Start	67,780							40,371	58,440	76,510	94,582	112,656	130,731									5.2	9.0
	Min	30,050							15,664	25,262	34,751	44,202	53,640	63,064										
	End	47,773							20,540	38,512	56,486	74,461	92,438	110,416										
G8x36-SR2	Start	67,670						41,686	64,627	87,569	110,514	133,460											4.1	7.1
	Min	30,021						16,390	28,535	40,555	52,538	64,500												
	End	47,663						21,847	44,666	67,486	90,307	113,131												
G8x40-SR2	Start	67,559					49,171	63,365	91,754	120,144													3.3	5.8
	Min	29,992					20,403	27,893	42,759	57,575														
	End	47,553					29,293	43,410	71,647	99,886														
G8xT32-SR2	Start	66,779			39,356	57,420	75,484	93,550	129,683														2.6	4.5
	Min	29,788			15,390	24,994	34,482	43,933	62,791															
	End	46,777			19,530	37,497	55,465	73,434	109,374															
G8xT36-SR2	Start	66,558		40,564	63,500	86,437	109,375	132,314															2.1	3.6
	Min	29,730		16,090	28,240	40,260	52,241	64,202																
	End	46,558		20,731	43,545	66,360	89,175	111,991																

## Torque - Pneumatic Spring Return Actuator

Actuator Model	Metric Unit	Spring Torque Nm	Operating Pressure, barg																	MinOP barg	MOP barg		
			1.5	2	2.5	3	3.5	4	5	6	7	8	9	10	11	11.5	12	12.5	13			13.5	14
			Air Torque Output, Nm																				
G8x24-SR3	Start	57,796																				8.2	13.8
	Min	25,602																					
	End	40,879																					
G8x28-SR3	Start	57,523								40,070	53,841	67,613	81,386	95,161	108,937	115,826	122,715	129,604				5.8	11.9
	Min	25,531								16,441	23,715	30,938	38,140	45,335	52,519	56,111	59,703	63,295					
	End	40,608									23,274	36,971	50,669	64,369	78,070	91,773	98,625	105,477	112,329				
G8x32-SR3	Start	57,412								47,685	65,754	83,825	101,896	119,970	138,045							4.4	9.0
	Min	25,502								20,491	29,980	39,428	48,860	58,284	67,704								
	End	40,498									30,848	48,821	66,794	84,770	102,747	120,725							
G8x36-SR3	Start	57,302						37,530	49,000	71,941	94,884	117,828	140,774									3.4	7.1
	Min	25,473						15,127	21,203	33,237	45,219	57,181	69,138										
	End	40,389							20,747	32,156	54,974	77,794	100,616	123,439									
G8x40-SR3	Start	57,192				42,292	56,485	70,679	99,068	127,458												2.8	5.8
	Min	25,444				17,682	25,160	32,596	47,419	62,218													
	End	40,279				25,484	39,601	53,719	81,956	110,195													
G8xT32-SR3	Start	56,411			46,670	64,734	82,799	100,864	136,997													2.2	4.5
	Min	25,239			20,224	29,713	39,161	48,591	67,431														
	End	39,503			29,839	47,806	65,774	83,743	119,683														
G8xT36-SR3	Start	56,190		47,878	70,814	93,751	116,689	139,628														1.7	3.6
	Min	25,182		20,908	32,942	44,925	56,885	68,840															
	End	39,283		31,040	53,854	76,668	99,483	122,300															

# Torque - Pneumatic Spring Return Actuator

Actuator Model	Metric Unit	Spring Torque Nm	Operating Pressure, barg																	MinOP barg	MOP barg				
			1.5	2	2.5	3	3.5	4	5	6	7	8	9	10	11	11.5	12	12.5	13			13.5	14		
			Air Torque Output, Nm																						
G10x32-SR1	Start	195,285																				11.4	13.8		
	Min	78,991																							
	End	113,556																							
G10x36-SR1	Start	195,140													152,769	182,741	212,716	227,704				8.9	10.9		
	Min	78,952													56,474	72,627	88,567	96,492							
	End	113,412													71,337	101,153	130,970	145,880							
G10x40-SR1	Start	194,995													142,764	179,887	217,013					7.2	8.8		
	Min	78,914													51,007	71,121	90,855								
	End	113,268													61,385	98,314	135,245								
G10xT32-SR1	Start	193,998													164,672	211,802						5.7	6.9		
	Min	78,649													63,279	88,437									
	End	112,277													83,178	130,061									
G10xT36-SR1	Start	193,708													181,254	241,181						4.5	5.5		
	Min	78,572													72,231	103,997									
	End	111,988													99,673	159,286									
G10xT40-SR1	Start	193,418													141,158	178,271	252,503					3.6	4.4		
	Min	78,496													50,564	70,690	110,009								
	End	111,700													59,787	96,706	170,549								
G10x28-SR2	Start	157,461																				12.1	13.8		
	Min	64,906																							
	End	95,405																							
G10x32-SR2	Start	157,316																				9.2	13.8		
	Min	64,867																							
	End	95,260																							
G10x36-SR2	Start	157,171																				7.2	10.9		
	Min	64,829																							
	End	95,116																							
G10x40-SR2	Start	157,026																				5.8	8.8		
	Min	64,790																							
	End	94,972																							
G10xT32-SR2	Start	156,029																				4.6	6.9		
	Min	64,526																							
	End	93,981																							
G10xT36-SR2	Start	155,739																				3.6	5.5		
	Min	64,449																							
	End	93,693																							
G10xT40-SR2	Start	155,449																				2.9	4.4		
	Min	64,372																							
	End	93,404																							



# Torque - Pneumatic Spring Return Actuator

Actuator Model	Metric Unit	Spring Torque Nm	Operating Pressure, barg																	MinOP barg	MOP barg								
			1.5	2	2.5	3	3.5	4	5	6	7	8	9	10	11	11.5	12	12.5	13			13.5	14						
			Air Torque Output, Nm																										
G10x28-SR3	Start	143,587																			114,400	123,364	132,327	141,292	150,257	159,222	168,187	11.0	13.8
	Min	57,025																			41,522	46,413	51,253	56,061	60,847	65,610	70,362		
	End	79,971																				50,992	59,908	68,825	77,742	86,660	95,578		
G10x32-SR3	Start	143,442													105,652	129,221	152,792	176,365	188,153	199,940	211,729	223,518	235,307	247,097	8.3	13.8			
	Min	56,986													36,695	49,594	62,207	74,699	80,917	87,127	93,322	99,512	105,701	111,874					
	End	79,827													42,290	65,735	89,183	112,632	124,358	136,084	147,810	159,537	171,265	182,993					
G10x36-SR3	Start	143,297														126,740	156,708	186,678	216,651	246,626	261,614						6.6	10.9	
	Min	56,948													48,273	64,305	80,156	95,920	111,640	119,487									
	End	79,683													63,267	93,078	122,891	152,706	182,524	197,434									
G10x40-SR3	Start	143,152														102,435	139,553	176,674	213,797	250,923						5.3	8.8		
	Min	56,909													34,930	55,186	74,898	94,439	113,906										
	End	79,539													39,090	76,013	112,939	149,868	186,799										
G10xT32-SR3	Start	142,156														104,334	151,456	198,582	245,712						4.1	6.9			
	Min	56,643													36,323	61,853	86,770	111,512											
	End	78,548													40,978	87,853	134,732	181,615											
G10xT36-SR3	Start	141,866														125,281	155,241	215,163	275,090						3.3	5.5			
	Min	56,566													47,880	63,915	95,531	126,939											
	End	78,260													61,816	91,618	151,227	210,840											
G10xT40-SR3	Start	141,576															100,844	137,955	175,067	212,181	286,412				2.6	4.4			
	Min	56,489															34,475	54,758	74,473	94,016	132,907								
	End	77,971															37,506	74,423	111,341	148,260	222,102								
G10x28-SR4	Start	115,062																								8.8	13.8		
	Min	46,723																											
	End	67,166																											
G10x32-SR4	Start	114,917																							6.7	13.8			
	Min	46,684																											
	End	67,022																											
G10x36-SR4	Start	114,772																							5.3	10.9			
	Min	46,646																											
	End	66,878																											
G10x40-SR4	Start	114,627																							4.1	8.8			
	Min	46,607																											
	End	66,733																											
G10xT32-SR4	Start	113,630																							3.4	6.9			
	Min	46,343																											
	End	65,742																											
G10xT36-SR4	Start	113,340																							2.6	5.5			
	Min	46,266																											
	End	65,454																											
G10xT40-SR4	Start	113,050																							2.1	4.4			
	Min	46,189																											
	End	65,166																											

## Torque - Pneumatic Spring Return Actuator

Actuator Model	Metric Unit	Spring Torque Nm	Operating Pressure, barg																		MinOP barg	MOP barg	
			1.5	2	2.5	3	3.5	4	5	6	7	8	9	10	11	11.5	12	12.5	13	13.5			14
			Air Torque Output, Nm																				
G13x40-SR1	Start	434,082															333,233	356,949	380,665	404,382	428,100	12.5	13.8
	Min	168,452															113,871	127,087	140,110	152,987	165,776		
	End	230,379															130,166	153,763	177,360	200,957	224,556		
G13x44-SR1	Start	433,885											339,861	397,456	426,255	455,054						10.3	11.4
	Min	168,399											117,620	149,264	164,809	180,250							
	End	230,183											136,761	194,066	222,720	251,375							
G13x48-SR1	Start	433,697											382,328	451,059								8.6	9.7
	Min	168,349											141,059	178,137									
	End	229,997											179,014	247,400									
G13x52-SR1	Start	433,510										329,444	410,277	491,113								7.4	8.3
	Min	168,299										111,809	156,238	199,517									
	End	229,810										126,396	206,822	287,252									
G13xT40-SR1	Start	432,016									331,051	425,875										6.3	6.9
	Min	167,898									113,256	165,180											
	End	228,324									127,995	222,342											
G13xT44-SR1	Start	431,621							337,509	452,663												5.2	5.7
	Min	167,792							116,957	179,613													
	End	227,931							134,420	248,995													
G13xT48-SR1	Start	431,246					311,088	448,512														4.1	4.8
	Min	167,692					101,974	177,457															
	End	227,559					108,132	244,865															
G13xT52-SR1	Start	430,871					326,755	407,572	569,211													3.7	4.1
	Min	167,591					111,039	155,508	241,622														
	End	227,186					123,720	204,131	364,958														

## Torque - Pneumatic Spring Return Actuator

Actuator Model	Metric Unit	Spring Torque Nm	Operating Pressure, barg																	MinOP barg	MOP barg								
			1.5	2	2.5	3	3.5	4	5	6	7	8	9	10	11	11.5	12	12.5	13			13.5	14						
			Air Torque Output, Nm																										
G13x40-SR2	Start	374,651																			315,513	339,227	362,941	386,657	410,373	434,090	457,808	10.8	13.8
	Min	146,104																			114,558	127,489	140,291	153,012	165,674	178,277	190,853		
	End	200,823																			142,094	165,688	189,283	212,880	236,477	260,074	283,673		
G13x44-SR2	Start	374,454													311,978	369,569	427,164	455,963	484,762									8.9	11.4
	Min	146,051													112,648	143,874	174,620	189,900	205,132										
	End	200,627													138,576	195,878	253,183	281,837	310,492										
G13x48-SR2	Start	374,266													274,585	343,309	412,036	480,767										7.4	9.7
	Min	146,001													91,787	129,746	166,605	203,038											
	End	200,441													101,372	169,750	238,131	306,517											
G13x52-SR2	Start	374,079													278,324	359,152	439,984	520,821										6.3	8.3
	Min	145,950													93,943	138,329	181,474	224,187											
	End	200,254													105,091	185,513	265,939	346,369											
G13xT40-SR2	Start	372,585													360,759	455,583												5.4	6.9
	Min	145,550													139,706	190,265													
	End	198,768													187,112	281,459													
G13xT44-SR2	Start	372,190													367,216	482,371												4.5	5.7
	Min	145,444													143,243	204,500													
	End	198,375													193,537	308,112													
G13xT48-SR2	Start	371,815													272,087	340,796	478,220											3.7	4.8
	Min	145,344													91,059	129,068	202,365												
	End	198,002													98,886	167,250	303,982												
G13xT52-SR2	Start	371,440													275,648	356,463	437,280	598,919										3.2	4.1
	Min	145,243													93,177	137,604	180,757	265,976											
	End	197,630													102,429	182,838	263,248	424,075											

## Torque - Pneumatic Spring Return Actuator

Actuator Model	Metric Unit	Spring Torque Nm	Operating Pressure, barg																	MinOP barg	MOP barg				
			1.5	2	2.5	3	3.5	4	5	6	7	8	9	10	11	11.5	12	12.5	13			13.5	14		
			Air Torque Output, Nm																						
G13x40-SR3	Start	312,240													256,186	303,608	351,033	374,747	398,462	422,177	445,893	469,610	493,328	9.0	13.8
	Min	121,251													91,194	117,020	142,390	154,988	167,539	180,073	192,569	205,065	217,520		
	End	165,484													109,805	156,988	204,175	227,770	251,365	274,961	298,558	322,156	345,754		
G13x44-SR3	Start	312,043												232,326	289,910	347,498	405,089	462,684	491,483	520,283	7.4	11.4			
	Min	121,198												77,852	109,649	140,537	171,069	201,439	216,574	231,697					
	End	165,288												86,065	143,359	200,657	257,959	315,264	343,918	372,573					
G13x48-SR3	Start	311,855											241,386	310,105	378,829	447,556	516,288	6.2	9.7						
	Min	121,148											83,007	120,560	157,202	193,489	229,618								
	End	165,102											95,079	163,453	231,831	300,213	368,598								
G13x52-SR3	Start	311,668													233,020	313,844	394,672	475,505	556,341	5.3	8.3				
	Min	121,097													78,310	122,596	165,607	208,226	250,651						
	End	164,915													86,755	167,173	247,595	328,021	408,451						
G13xT40-SR3	Start	310,173													301,461	396,279	491,103	4.5	6.9						
	Min	120,697													116,441	166,963	216,937								
	End	163,429													154,852	249,193	343,541								
G13xT44-SR3	Start	309,779													230,019	287,590	402,737	517,891	3.7	5.7					
	Min	120,591													77,180	109,023	170,448	231,070							
	End	163,036													83,769	141,051	255,619	370,194							
G13xT48-SR3	Start	309,404													238,900	307,607	376,316	513,740	3.1	4.8					
	Min	120,491													82,307	119,891	156,538	228,950							
	End	162,664													92,606	160,968	229,331	366,064							
G13xT52-SR3	Start	309,029													230,356	311,168	391,983	472,800	634,440	2.6	4.1				
	Min	120,390													77,536	121,878	164,896	207,516	292,263						
	End	162,291													84,104	164,511	244,919	325,329	486,156						

## Torque - Pneumatic Spring Return Actuator

Actuator Model	Metric Unit	Spring Torque Nm	Operating Pressure, barg																	MinOP barg	MOP barg			
			1.5	2	2.5	3	3.5	4	5	6	7	8	9	10	11	11.5	12	12.5	13			13.5	14	
			Air Torque Output, Nm																					
G13x40-SR4	Start	252,809										191,060	238,475	285,894	333,316	380,741	404,455	428,170	451,885	475,601	499,318	523,036	7.3	13.8
	Min	98,903										65,530	91,532	116,892	142,009	166,987	179,441	191,895	204,321	216,741	229,162	241,577		
	End	135,928										74,564	121,742	168,922	216,105	263,292	286,887	310,482	334,078	357,675	381,273	404,872		
G13x44-SR4	Start	252,612								204,453	262,034	319,618	377,206	434,797	492,392	521,191	549,990	6.0	11.4					
	Min	98,850								73,027	104,206	134,793	165,155	195,395	225,557	240,635	255,683							
	End	135,732								87,891	145,182	202,476	259,775	317,076	374,382	403,035	431,690							
G13x48-SR4	Start	252,424							202,378	271,094	339,813	408,537	477,264	545,995	5.0	9.7								
	Min	98,800							71,913	109,071	145,484	181,632	217,656	253,614										
	End	135,546							85,826	154,196	222,570	290,948	359,330	427,715										
G13x52-SR4	Start	252,237						181,908	262,728	343,552	424,380	505,213	586,049	4.1	8.3									
	Min	98,749						60,428	104,635	147,481	189,976	232,314	274,562											
	End	135,359						65,459	145,872	226,290	306,712	387,138	467,568											
G13xT40-SR4	Start	250,742					188,954	236,357	331,169	425,987	520,811	3.7	6.9											
	Min	98,349					64,934	90,961	141,444	191,323	240,996													
	End	133,873					72,469	119,634	213,969	308,310	402,658													
G13xT44-SR4	Start	250,348			202,158	259,727	317,298	432,445	547,599	3.0	5.7													
	Min	98,243			72,394	103,591	134,180	194,780	255,058															
	End	133,480			85,607	142,886	200,168	314,736	429,311															
G13xT48-SR4	Start	249,973		199,903	268,608	337,315	406,024	543,448	2.6	4.8														
	Min	98,142		71,229	108,408	144,826	180,973	252,949																
	End	133,107		83,363	151,723	220,085	288,448	425,181																
G13xT52-SR4	Start	249,598		260,064	340,876	421,691	502,508	664,148	2.1	4.1														
	Min	98,042		103,925	146,777	189,271	231,606	316,074																
	End	132,735		143,221	223,628	304,036	384,446	545,273																