

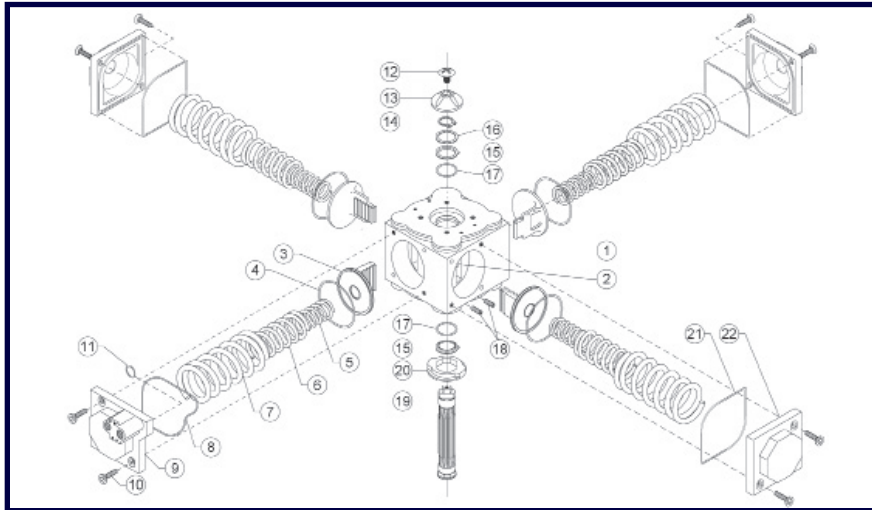


## High Performance, Four Piston, Rack & Pinion Actuators

The SVF "Quad4™" quarter-turn rack & pinion actuator is a four piston actuator which generates torque around a centrally located pinion, giving more than double the torque of single & double rack & pinion actuator designs. The increased number of pistons allows their diameter to be reduced while maintaining it's high torque, allowing the reduced size of the actuator.

### QUAD4 DESIGN FEATURES

- ✓ Bi-Directional stroke adjustment
- ✓ Internally anodized body for corrosion resistance
- ✓ Spring return covers with extended screws for safe release of springs
- ✓ ISO 5211 bottom flange for valve automation
- ✓ NAMUR output drive for installation of limit switches and positioners
- ✓ Available in Spring Return and Double Acting models
- ✓ NAMUR interface for mounting of solenoid valve



### MATERIALS OF CONSTRUCTION

ITEM #	DESCRIPTION	MATERIALS SPECIFICATIONS
1	Body	AL 356-T6
2	Pad	POM (Plastic)
3	Piston	AL 356
4	Piston O-Ring	Buna "N" (Standard), Viton
5	Inner Spring	Spring Steel
6	Middle Spring	Spring Steel
7	Outer Spring	Spring Steel
8	NAMUR Cover O-Ring	Buna "N", Viton
9	NAMUR Cover	AL 356
10	Cover Screw	Stainless Steel
11	Air Supply O-Ring	Buna "N", Viton
12	Indicator Screw	Stainless Steel
13	Indicator	Plastic (ABS)
14	Circlip/Snap-Ring	Stainless Steel
15	Thrust Washer	POM (Plastic)
16	Bearing	POM (Plastic)
17	Pinion O-Ring	Buna "N", Viton
18	Stroke Adjustment Screw	Stainless Steel
19	Pinion	Carbon Steel <sup>1</sup>
20	Stroke Adjustment Stop	Stainless Steel
21	Cover O-Ring	Buna "N", Viton
22	Spring Return Cover	Q15 - Q35: AL 356 Q45 - Q75: AL 380

<sup>1</sup> #19 (Pinion) has a Nickel Chemical Coating

### HOW TO ORDER QUAD4 ACTUATORS

SERIES	MODEL	SPRING SETS (FOR QS SERIES)		SEALS
QD = Double Acting	15	QS15 (Only): 1A 1B 1B2* 2 (*Standard)	QS20 thru QS75: 2AB   2A3 2A   2C* 2A2B   2C3 2B   3 (*Standard)	"Blank" = Buna "N" (Standard)  V = Viton (Optional)
	20			
	25			
	30			
QS = Spring Return	35	QS15 (Only): 1A 1B 1B2* 2 (*Standard)	QS20 thru QS75: 2AB   2A3 2A   2C* 2A2B   2C3 2B   3 (*Standard)	"Blank" = Buna "N" (Standard)  V = Viton (Optional)
	45			
	60			
	75			
	75			

**Order Examples:**

**QD20 = Quad4 Double Acting Actuator, Model 20**  
**QS252C = Quad4 Spring Return Actuator, Model 25, with 2C Spring Set**

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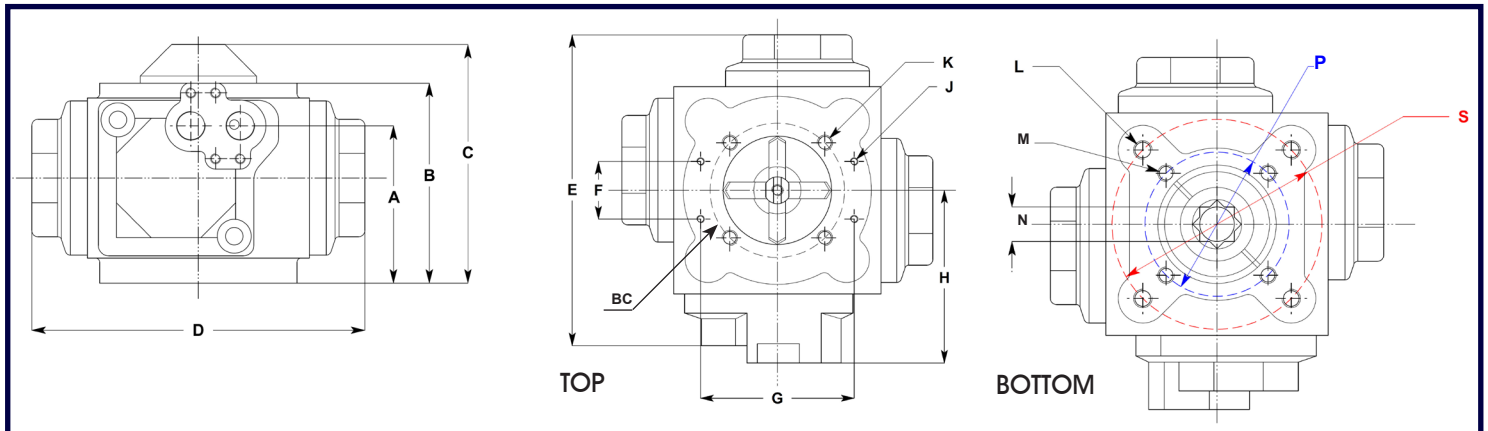
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High Performance, Four Piston, Rack & Pinion Actuators



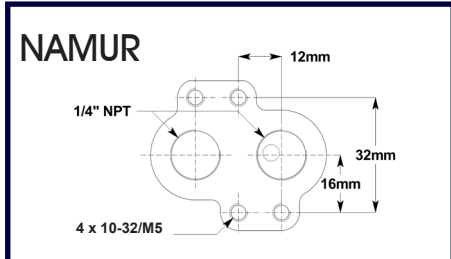
## QUAD4 DIMENSIONS

Quad4 Model	A		B		C		D		E		F		G		BC ISO	H	
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm		in.	mm
Q15	2.05	52	2.76	70	3.54	90	4.45	113	4.45	113	-	-	-	-	F05	2.62	67
Q20	2.45	62	3.17	81	3.96	101	5.16	131	5.16	131	1.18	30	3.15	80	F05	3.04	77
Q25	3.01	76	3.83	97	4.61	117	6.38	162	6.38	162	1.18	30	3.15	80	F07	3.54	90
Q30	3.69	94	4.59	117	5.38	137	7.36	187	7.36	187	1.18	30	3.15	80	F07	4.13	105
Q35	4.09	104	5.34	136	6.13	156	8.78	223	8.78	223	1.18	30	3.15	80	F10	4.76	121
Q45	5.04	128	6.46	164	7.24	184	10.75	273	10.75	273	1.18	30	3.15	80	F12	5.67	144
Q60	6.57	167	8.54	217	9.72	247	14.29	363	14.29	363	1.18	30	5.12	130	F14	7.15	182
Q75	8.24	209	10.51	267	11.69	297	17.09	434	17.09	434	1.18	30	5.12	130	F16	8.54	217



## ADDITIONAL DIMENSIONS, MOUNTING DIMENSIONS, WEIGHT

Quad4 Model	Thread Sizes				N		P			S			Weight	
	J	K	L	M	in.	mm	in.	mm	ISO	in.	mm	ISO	lbs	kg
Q15	10-32/M5	1/4-20	5/16-18	1/4-20	0.35	9	1.97	50	F05	2.76	70	F07	2	1.1
Q20	10-32/M5	1/4-20	5/16-18	1/4-20	0.43	11	1.97	50	F05	2.76	70	F07	4	1.9
Q25	10-32/M5	5/16-18	3/8-16	5/16-18	0.55	14	2.76	70	F07	4.02	102	F10	8	3.5
Q30	10-32/M5	5/16-18	3/8-16	5/16-18	0.67	17	2.76	70	F07	4.02	102	F10	11	5.0
Q35	10-32/M5	3/8-16	3/8-16	-	0.87	22	-	-	-	4.02	102	F10	20	9.0
Q45	10-32/M5	1/2-13	1/2-13	-	1.06	27	4.02	102	F10	4.92	125	F12	33	15.0
Q60	10-32/M5	5/8-11	5/8-11	-	1.42	36	-	-	-	5.51	140	F14	77	35.1
Q75	10-32/M5	5/8-11	5/8-11	-	1.42	36	-	-	-	6.50	165	F16	141	64.1



### BI-DIRECTIONAL STROKE ADJUSTMENT

Quad4 actuators feature bi-directional pinion travel stops. These stops allow for true  $\pm 5^\circ$  for valve travel adjustment to ensure precise positioning in all flow control services. The Quad4 travel stops are designed to absorb the maximum rated torque of the actuator and the maximum impact loads associated with the recommended stroke speed.

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High Performance, Four Piston, Rack & Pinion Actuators



## QUAD4 SPRING RETURN OUTPUT TORQUES (IN-LBF)

### OUTPUT AIR TO SPRING

Continued on next page >>

SUPPLY PRESSURE (psig)>>		40		60		70		80		90		100		120		SPRING OUTPUT	
MODEL	CODE	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	90°	0°
<b>Q15</b>	1A	53	30	91	65	115	91	135	111	156	131	171	147	216	189	53	27
	1B	-	-	74	40	99	67	119	86	139	105	155	123	198	161	80	44
	<i>Standard&gt;&gt;</i> 1B2	-	-	-	-	<b>83</b>	<b>43</b>	<b>102</b>	<b>61</b>	<b>122</b>	<b>80</b>	<b>139</b>	<b>98</b>	<b>180</b>	<b>134</b>	<b>106</b>	<b>62</b>
	2	-	-	-	-	-	-	-	-	105	54	123	74	161	106	133	80
<b>Q20</b>	2AB	84	43	158	110	204	158	241	192	278	227	320	270	393	339	111	66
	2A	-	-	144	88	191	137	227	170	264	205	307	249	380	317	133	80
	2A2B	-	-	126	62	174	112	210	145	246	178	289	223	362	291	159	97
	2B	-	-	-	-	157	88	192	119	228	152	272	198	344	265	186	115
	2A3	-	-	-	-	144	77	178	109	213	141	258	188	329	253	197	129
	<i>Standard&gt;&gt;</i> 2C	-	-	-	-	-	-	<b>166</b>	<b>85</b>	<b>201</b>	<b>117</b>	<b>246</b>	<b>165</b>	<b>317</b>	<b>229</b>	<b>221</b>	<b>142</b>
	2C3	-	-	-	-	-	-	-	-	189	103	235	151	304	215	236	154
	3	-	-	-	-	-	-	-	-	174	82	208	127	273	188	257	168
<b>Q25</b>	2AB	206	121	349	251	435	340	514	413	593	488	676	573	827	716	208	117
	2A	-	-	327	212	415	305	492	376	571	450	655	537	805	678	247	139
	2A2B	-	-	307	178	396	273	472	343	550	416	636	505	785	644	281	159
	2B	-	-	-	-	370	235	446	303	523	374	610	465	757	603	322	186
	2A3	-	-	-	-	347	191	421	258	498	327	586	421	732	556	370	211
	<i>Standard&gt;&gt;</i> 2C	-	-	-	-	-	-	<b>397</b>	<b>217</b>	<b>473</b>	<b>286</b>	<b>562</b>	<b>381</b>	<b>707</b>	<b>514</b>	<b>412</b>	<b>235</b>
	2C3	-	-	-	-	-	-	-	-	455	233	545	331	690	462	464	253
	3	-	-	-	-	-	-	-	-	433	193	524	293	667	422	504	274
<b>Q30</b>	2AB	327	214	566	435	722	594	851	715	981	839	1,132	991	1,396	1,243	306	188
	2A	293	155	523	369	682	533	809	652	938	773	1,091	929	1,353	1,178	372	230
	2A2B	-	-	478	272	640	443	765	558	893	677	1,048	837	1,308	1,081	469	274
	2B	-	-	439	165	598	369	721	482	848	598	1,005	762	1,262	1,002	549	319
	2A3	-	-	-	-	564	310	687	420	812	534	971	701	1,227	939	613	354
	<i>Standard&gt;&gt;</i> 2C	-	-	-	-	<b>547</b>	<b>214</b>	<b>651</b>	<b>345</b>	<b>776</b>	<b>457</b>	<b>936</b>	<b>628</b>	<b>1,190</b>	<b>861</b>	<b>690</b>	<b>389</b>
	2C3	-	-	-	-	-	-	-	-	729	370	892	545	1,144	774	778	435
	3	-	-	-	-	-	-	-	-	685	299	850	477	1,100	703	850	478
<b>Q35</b>	2AB	660	408	1,077	784	1,333	1,051	1,544	1,248	1,757	1,447	2,005	1,701	2,453	2,125	547	280
	2A	-	-	1,019	681	1,279	956	1,488	1,148	1,699	1,344	1,950	1,603	2,395	2,022	651	336
	2A2B	-	-	920	565	1,187	847	1,392	1,035	1,600	1,228	1,855	1,492	2,296	1,906	767	434
	2B	-	-	-	-	1,111	697	1,313	880	1,519	1,067	1,778	1,339	2,215	1,745	929	513
	2A3	-	-	-	-	1,051	570	1,251	747	1,455	931	1,717	1,210	2,151	1,609	1,067	576
	<i>Standard&gt;&gt;</i> 2C	-	-	-	-	-	-	<b>1,182</b>	<b>607</b>	<b>1,383</b>	<b>786</b>	<b>1,649</b>	<b>1,071</b>	<b>2,080</b>	<b>1,464</b>	<b>1,213</b>	<b>646</b>
	2C3	-	-	-	-	-	-	-	-	1,305	683	1,575	973	2,001	1,361	1,316	723
	3	-	-	-	-	-	-	-	-	1,239	573	1,512	869	1,935	1,252	1,427	788

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**QUAD4 SPRING RETURN OUTPUT TORQUES (IN-LBF)**

<< Continued from previous page

**OUTPUT AIR TO SPRING**

SUPPLY PRESSURE (psig)>>		40		60		70		80		90		100		120		SPRING OUTPUT	
MODEL	CODE	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	90°	0°
<b>Q45</b>	2AB	1,203	699	2,030	1,445	2,517	1,956	2,939	2,347	3,364	2,746	3,840	3,235	4,699	4,047	1,173	636
	2A	-	-	1,900	1,213	2,396	1,739	2,813	2,122	3,235	2,513	3,716	3,013	4,570	3,814	1,408	764
	2A2B	-	-	1,800	1,033	2,302	1,571	2,716	1,948	3,134	2,334	3,621	2,842	4,469	3,634	1,589	862
	2B	-	-	-	-	2,153	1,305	2,560	1,671	2,974	2,049	3,468	2,571	4,308	3,349	1,876	1,020
	2A3	-	-	-	-	2,031	1,087	2,434	1,444	2,843	1,815	3,343	2,348	4,178	3,116	2,111	1,148
	<i>Standard&gt;&gt;</i> 2C	-	-	-	-	-	-	<b>2,307</b>	<b>1,218</b>	<b>2,713</b>	<b>1,582</b>	<b>3,220</b>	<b>2,126</b>	<b>4,048</b>	<b>2,882</b>	<b>2,346</b>	<b>1,276</b>
	2C3	-	-	-	-	-	-	-	-	2,586	1,348	3,099	1,904	3,921	2,649	2,581	1,400
	3	-	-	-	-	-	-	-	-	2,457	1,116	2,975	1,682	3,792	2,416	2,815	1,527
<b>Q60</b>	2AB	2,922	1,761	4,874	3,528	6,031	4,736	7,035	5,671	8,049	6,621	9,168	7,771	11,214	9,706	2,670	1,438
	2A	-	-	4,591	3,015	5,767	4,258	6,761	5,174	7,766	6,109	8,899	7,283	10,931	9,194	3,185	1,716
	2A2B	-	-	4,372	2,607	5,562	3,877	6,548	4,778	7,546	5,700	8,690	6,894	10,711	8,785	3,597	1,931
	2B	-	-	-	-	5,258	3,333	6,232	4,213	7,220	5,118	8,379	6,339	10,386	8,203	4,183	2,251
	2A3	-	-	-	-	4,958	2,790	5,920	3,649	6,899	4,536	8,073	5,785	10,064	7,621	4,769	2,566
	<i>Standard&gt;&gt;</i> 2C	-	-	-	-	-	-	<b>5,634</b>	<b>3,129</b>	<b>6,603</b>	<b>4,000</b>	<b>7,792</b>	<b>5,275</b>	<b>9,768</b>	<b>7,085</b>	<b>5,309</b>	<b>2,857</b>
	2C3	-	-	-	-	-	-	-	-	6,302	3,462	7,505	4,762	9,468	6,547	5,851	3,152
	3	-	-	-	-	-	-	-	-	6,017	2,946	7,234	4,270	9,183	6,031	6,371	3,432
<b>Q75</b>	2AB	5,468	3,607	9,083	6,915	11,213	9,120	13,066	10,856	14,935	12,619	17,015	14,738	20,779	18,314	4,534	2,583
	2A	-	-	8,556	6,014	10,721	8,279	12,556	9,982	14,409	11,718	16,514	13,880	20,253	17,413	5,441	3,099
	2A2B	-	-	8,154	5,327	10,345	7,638	12,165	9,317	14,006	11,031	16,130	13,227	19,850	16,727	6,132	3,495
	2B	-	-	-	-	9,739	6,602	11,535	8,239	13,356	9,921	15,512	12,169	19,200	15,616	7,251	4,132
	2A3	-	-	-	-	9,248	5,763	11,025	7,368	12,830	9,022	15,010	11,313	18,674	14,718	8,155	4,649
	<i>Standard&gt;&gt;</i> 2C	-	-	-	-	-	-	<b>10,514</b>	<b>6,495</b>	<b>12,304</b>	<b>8,122</b>	<b>14,509</b>	<b>10,455</b>	<b>18,147</b>	<b>13,817</b>	<b>9,063</b>	<b>5,166</b>
	2C3	-	-	-	-	-	-	-	-	11,777	7,223	14,008	9,599	17,621	12,918	9,967	5,682
	3	-	-	-	-	-	-	-	-	11,251	6,323	13,507	8,743	17,095	12,019	10,873	6,199

**QUAD4 DOUBLE ACTING TORQUES**

SUPPLY PRESSURE >>	40	60	70	80	90	100	120
MODEL							
<b>Q15</b>	81	125	149	172	188	207	244
<b>Q20</b>	146	229	271	311	351	390	468
<b>Q25</b>	317	476	555	639	723	802	961
<b>Q30</b>	505	769	914	1,052	1,190	1,334	1,611
<b>Q35</b>	928	1,382	1,624	1,848	2,073	2,311	2,780
<b>Q45</b>	1,807	2,719	3,170	3,622	4,074	4,525	5,429
<b>Q60</b>	4,289	6,436	7,511	8,585	9,659	10,725	12,872
<b>Q75</b>	7,926	11,893	13,877	15,856	17,834	19,819	23,767

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## QUAD4 ACTUATOR SIZING GUIDE

### Selecting the correct Actuator (Sizing)

The output torques for each actuator model are listed in the Torque Tables (Pages 3 and 4). These values do not include a safety factor. For best results we recommend selecting an actuator model with a minimum output torque that is greater than the highest operating torque of the valve to be actuated, **plus 10%**.

#### Example for Double Acting (QD) Actuator Sizing:

Published Valve Torque: 300 in-lbs (plus 10% safety factor = 330 in-lbf)  
 Air Supply: 80 psig  
 Quad4 Model: QD25

The QD25 has the output torque value of 639 in-lbf @ 80 psig.

#### Example for Spring Return (QS) Actuator Sizing:

Published Valve Torque: 300 in-lbs (plus 10% safety factor = 330 in-lbf)  
 Air Supply: 80 psig  
 Quad4 Model: QS302C

The QS30 (2C Spring Set) has the following output torque values @ 80 psig:

Air End: 345 in-lbf  
 Spring End: 389 in-lbf

### Sizing Safety Factors

Media and other conditions can effect the operating torque of a valve. Following is a list of common Safety Factors.

MEDIA	SAFETY FACTOR
Oils, Lubricants	0.8
Liquid, clean (particle free)	1.0
Liquid, dirty (slurry), raw water	1.8
Gas, clean and wet (saturated steam)	1.0
Gas, dry (superheated steam)	1.3
Gas, dirty (natural gas)	1.5
Oxygen, Chlorine	1.5