

# Biffi FCBA300 Series

Pneumatic Actuators



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## Introduction

The Biffi™ FCBA300 Series pneumatic actuators incorporate the most advanced features from a long history of developments in the scotch yoke design, assuring operating efficiency and cost-effectiveness. They are lightweight and compact, making them ideally suited for automating virtually any quarter-turn (90°) rotating mechanism, including ball, butterfly, and plug valves. They are economical and require little maintenance. They come with a variety of options to meet your demanding valve automation needs.

- Ductile iron or carbon steel housing and piston provide more strength per pound, increased durability and corrosion resistance. The pressure vessel quality housing is approved for use by ASME and the Pressure Equipment Directive (PED) 2014/68/EU.
- Increased actuator efficiency and corrosion resistance are possible with a Xylan® fluoropolymer coating on the interior of the power cylinder. This permanently bonded coating is highly resistant to abrasion, thermal shock and provides excellent lubricity and low friction properties.
- The FCBA300 Series actuators meet both IP66 and IP67M specifications for submergence and severe high pressure water deluge test. This offers superior water ingress and corrosion protection. The actuator has no gaskets and is totally O-ring sealed.
- The scotch yoke design provides optimum torque curves for quarter-turn operation.
- Its light weight assists in easy installation while its compactness allows use in tight piping configurations
- Jackscrew and hydraulic override options.
- 5-year warranty.
- Its NAMUR topworks mounting configuration allows the FCBA300 Series to be internationally accepted and promotes the ability to utilize standardized accessories that can be close coupled or direct mounted to the valve.
- Suitable for SIL 1, 2 or 3.
- The FCBA300 Series provides models in both spring-return and double-acting configurations. They have guaranteed minimum torque outputs ranging from 879 to 2303 Nm in double-acting models. Spring-return models, requiring pressure from only one travel direction, are available for fail clockwise or counterclockwise applications. The spring ending torques range from 259 to 1133 Nm.

# Torque Ratings

## Double-Acting Actuators

### FCBA300 Series

All published torques are guaranteed minimum values (units are metric).

Table 1.

Actuator Model	Stroke Direction Start/Minimum/End		Operating Pressure (barg)																MinOP (barg)	Torque @ MinOP (Nm)	MOP (barg)	Torque @ MOP (Nm)		
			2.5	3	3.5	3.8	4	4.5	5	5.2	5.5	6	6.2	6.5	7	7.2	7.5	8					8.2	
			Pressure Torque Output Start/Minimum/End (Nm)																					
FCBA730	Start	Outboard	Please consult factory	884	1039	1132	1194	1349	1505	1567	1660	1815	1877	1970	2125	2187	Exceeds MOP	-	-	2.8	822	7.2	2187	
	Minimum			470	551	599	632	713	794	826	875	956	988	1037	1118	1150		-	-		437		1150	
	End			899	1054	1147	1209	1364	1519	1581	1674	1829	1891	1984	2139	2201		-	-		837		2201	
	Start	Inboard		879	1033	1125	1187	1341	1495	1557	1650	1804	1866	1958	2112	2174		-	-		817		2174	
	Minimum			470	551	599	632	713	794	826	875	956	988	1037	1118	1150		-	-		437		1150	
	End			904	1060	1154	1216	1372	1528	1590	1684	1840	1902	1996	2152	2214		-	-		842		2214	
FCBA830	Start	Outboard	Please consult factory	1170	1374	1496	1578	1782	1986	2067	2189	Exceeds MOP	-	-	-	-	-	-	-	2.8	1089	5.5	2189	
	Minimum			620	726	790	833	939	1045	1088	1152		-	-	-	-	-	-	-		-		577	1152
	End			1186	1390	1512	1593	1797	2001	2082	2204		-	-	-	-	-	-	-		-		1105	2204
	Start	Inboard		1163	1366	1487	1568	1771	1974	2055	2176		-	-	-	-	-	-	-		-		1082	2176
	Minimum			620	726	790	833	939	1045	1088	1152		-	-	-	-	-	-	-		-		577	1152
	End			1194	1398	1521	1603	1808	2013	2095	2218		-	-	-	-	-	-	-		-		1112	2218
FCBA930	Start	Outboard	Please consult factory	1496	1755	1910	2014	2273	Exceeds MOP	-	-	-	-	-	-	-	-	-	-	2.8	1392	4.5	2273	
	Minimum			790	926	1007	1061	1196		-	-	-	-	-	-	-	-	-	-		-		736	1196
	End			1513	1771	1927	2030	2289		-	-	-	-	-	-	-	-	-	-		-		1409	2289
	Start	Inboard		1487	1744	1898	2001	2259		-	-	-	-	-	-	-	-	-	-		-		1384	2259
	Minimum			790	926	1007	1061	1196		-	-	-	-	-	-	-	-	-	-		-		736	1196
	End			1522	1782	1938	2042	2303		-	-	-	-	-	-	-	-	-	-		-		1418	2303
FCBA1030	Start	Outboard	Please consult factory	1989	Exceeds MOP	-	-	-	-	-	-	-	-	-	-	-	-	-	2.8	1852	3.4	2263		
	Minimum			1049		-	-	-	-	-	-	-	-	-	-	-	-	-		-		977	1192	
	End			2007		-	-	-	-	-	-	-	-	-	-	-	-	-		-		1871	2281	
	Start	Inboard		1977		-	-	-	-	-	-	-	-	-	-	-	-	-		-		1841	2249	
	Minimum			1049		-	-	-	-	-	-	-	-	-	-	-	-	-		-		977	1192	
	End			2020		-	-	-	-	-	-	-	-	-	-	-	-	-		-		1882	2295	

## Spring-Return Actuators

### FCBA300 Series

All published torques are guaranteed minimum values (units are metric).

Table 2.

Actuator Model	Stroke Direction Start/Minimum/End		Operating Pressure (barg)																	MinOP (barg)	Torque @ MinOP (Nm)	MOP (barg)	Torque @ MOP (Nm)	
			2.5	3	3.5	3.8	4	4.5	5	5.5	6	7	7.5	8.5	9	10	10.5	11	11.5					
			Pressure Torque Output Start/Minimum/End (Nm)																					
FCBA730-SR40	Start	459	385	531	677	765	823	969	1115	1260	1406	1698	1844	2136	2282	-	-	-	-	-	356	-	2370	
	Minimum	187	150	228	306	352	383	460	537	614	691	844	921	1074	1151	Exceeds MOP	-	-	-	-	2.4	134	9.3	1197
	End	259	192	339	487	575	634	782	929	1077	1224	1519	1667	1962	2110	-	-	-	-	-	-	162	-	2198
FCBA730-SR60	Start	724	-	-	-	631	689	835	981	1127	1273	1565	1711	2003	2149	-	-	-	-	-	573	-	2353	
	Minimum	287	-	-	Please consult factory	241	273	352	429	507	584	738	815	969	1046	Exceeds MOP	-	-	-	-	3.6	209	9.7	1153
	End	393	-	-	-	309	368	516	663	811	958	1254	1401	1696	1844	-	-	-	-	-	-	250	-	2050
FCBA730-SR80	Start	1022	-	-	-	-	-	-	885	1031	1177	1469	1615	1906	2052	2344	-	-	-	-	885	-	2344	
	Minimum	382	-	-	-	-	-	Please consult factory	313	394	473	629	707	862	939	1093	Exceeds MOP	-	-	-	5.0	313	10.0	1093
	End	489	-	-	-	-	-	-	365	513	660	955	1103	1398	1545	1841	-	-	-	-	-	365	-	1841
FCBA730-SR100	Start	1282	-	-	-	-	-	-	-	-	Please consult factory	1338	1484	1776	1922	2214	-	-	-	-	1104	-	2301	
	Minimum	481	-	-	-	-	-	-	-	-	-	519	598	755	832	987	Exceeds MOP	-	-	-	6.2	390	10.3	1034
	End	620	-	-	-	-	-	-	-	-	-	694	841	1136	1284	1579	-	-	-	-	-	458	-	1668
FCBA830-SR40	Start	609	517	708	900	1015	1092	1283	1475	1667	1858	2242	Exceeds MOP	-	-	-	-	-	-	-	478	-	2318	
	Minimum	248	201	304	406	467	508	609	710	811	911	1113	-	-	-	-	-	-	-	2.4	180	7.2	1153	
	End	346	261	454	648	764	842	1036	1229	1423	1617	2004	-	-	-	-	-	-	-	-	222	-	2082	
FCBA830-SR60	Start	989	-	-	-	876	952	1144	1336	1527	1719	2102	2294	-	-	-	-	-	-	-	837	-	2333	
	Minimum	375	-	-	Please consult factory	318	360	465	567	669	771	974	1075	Exceeds MOP	-	-	-	-	-	-	3.7	296	7.6	1095
	End	486	-	-	-	384	461	655	849	1043	1236	1624	1818	-	-	-	-	-	-	-	-	345	-	1856
FCBA830-SR80	Start	1357	-	-	-	-	-	-	1184	1376	1568	1951	2143	-	-	-	-	-	-	-	1184	-	2296	
	Minimum	503	-	-	-	-	-	Please consult factory	414	521	625	831	933	Exceeds MOP	-	-	-	-	-	-	5.0	414	7.9	1014
	End	637	-	-	-	-	-	-	479	673	867	1254	1448	-	-	-	-	-	-	-	-	479	-	1603
FCBA830-SR100	Start	1737	-	-	-	-	-	-	-	-	Please consult factory	1811	2003	Exceeds MOP	-	-	-	-	-	-	1543	-	2310	
	Minimum	629	-	-	-	-	-	-	-	-	-	680	785	Exceeds MOP	-	-	-	-	-	-	6.3	531	8.3	950
	End	777	-	-	-	-	-	-	-	-	-	874	1067	-	-	-	-	-	-	-	-	602	-	1377

## Spring-Return Actuators

### FCBA300 Series

All published torques are guaranteed minimum values (units are metric).

Table 3.

Actuator Model	Stroke Direction Start/Minimum/End		Operating Pressure (barg)																	MinOP (barg)	Torque @ MinOP (Nm)	MOP (barg)	Torque @ MOP (Nm)		
			2.5	3	3.5	3.8	4	4.5	5	5.5	6	7	7.5	8.5	9	10	10.5	11	11.5						
			Pressure Torque Output Start/Minimum/End (Nm)																						
FCBA930-SR40	Start	783	666	910	1153	1300	1397	1641	1884	2128	-	-	-	-	-	-	-	-	-	-	2.4	618	5.9	2323	
	Minimum	318	259	390	519	597	648	777	905	1033	Exceeds MOP	-	-	-	-	-	-	-	-	-	-	2.4	232	5.9	1136
	End	445	338	584	830	977	1076	1322	1568	1814	-	-	-	-	-	-	-	-	-	-	-	2.4	288	5.9	2011
FCBA930-SR60	Start	1290	-	-	-	1156	1254	1497	1741	1985	2228	-	-	-	-	-	-	-	-	-	3.8	1156	6.2	2326	
	Minimum	473	-	-	Please consult factory	405	460	593	724	854	984	Exceeds MOP	-	-	-	-	-	-	-	-	-	3.8	405	6.2	1035
	End	588	-	-	-	469	567	814	1060	1306	1552	-	-	-	-	-	-	-	-	-	-	3.8	469	6.2	1651
FCBA930-SR80	Start	1736	-	-	-	-	-	-	1523	1766	2010	-	-	-	-	-	-	-	-	-	5.0	1523	6.6	2302	
	Minimum	640	-	-	-	-	-	Please consult factory	531	666	799	Exceeds MOP	-	-	-	-	-	-	-	-	-	5.0	531	6.6	956
	End	807	-	-	-	-	-	-	613	859	1105	-	-	-	-	-	-	-	-	-	-	5.0	613	6.6	1400
FCBA930-SR100	Start	2184	-	-	-	-	-	-	-	-	-	2275	-	-	-	-	-	-	-	-	6.3	1933	7.2	2372	
	Minimum	809	-	-	-	-	-	-	-	-	-	870	Exceeds MOP	-	-	-	-	-	-	-	-	6.3	682	7.2	923
	End	1030	-	-	-	-	-	-	-	-	-	1148	-	-	-	-	-	-	-	-	-	6.3	803	7.2	1247
FCBA1030-SR40	Start	1053	902	1224	1546	1740	1868	2191	-	-	-	-	-	-	-	-	-	-	-	-	2.4	838	4.8	2384	
	Minimum	423	346	520	691	794	862	1032	Exceeds MOP	-	-	-	-	-	-	-	-	-	-	-	-	2.4	311	4.8	1133
	End	587	449	774	1099	1295	1425	1750	-	-	-	-	-	-	-	-	-	-	-	-	-	2.4	383	4.8	1945
FCBA1030-SR60	Start	1733	-	-	-	1573	1702	2024	2346	-	-	-	-	-	-	-	-	-	-	-	3.8	1573	5.2	2475	
	Minimum	622	-	-	Please consult factory	541	614	790	964	Exceeds MOP	-	-	-	-	-	-	-	-	-	-	-	3.8	541	5.2	1033
	End	755	-	-	-	612	743	1068	1393	-	-	-	-	-	-	-	-	-	-	-	-	3.8	612	5.2	1524
FCBA1030-SR80	Start	2261	-	-	-	-	-	-	1968	2291	-	-	-	-	-	-	-	-	-	-	4.9	1904	5.5	2291	
	Minimum	860	-	-	-	-	-	Please consult factory	711	888	Exceeds MOP	-	-	-	-	-	-	-	-	-	-	4.9	675	5.5	888
	End	1133	-	-	-	-	-	-	864	1189	-	-	-	-	-	-	-	-	-	-	-	4.9	799	5.5	1189

# Performance Data

## Double-Acting Actuators

### FCBA300 Series

All published torques are guaranteed minimum values (units are metric).

Table 4.

Actuator Model	Volume ▲				Maximum Operating Pressure (MOP)* (bar)	Maximum Allowable Working Pressure (MAWP)** (bar)	Approximate Weight of Actuator (kg)	
	Outboard		Inboard				Ductile Iron Housing	Carbon Steel Housing
	cu. cm.	L	cu. cm.	L				
FCBA730	4260.6	4.2606	9209	9.209	7.2	13.8	50.9	53.2
FCBA830	5588	5.588	10373	10.373	5.5	13.8	56.7	58.9
FCBA930	7095.6	7.0956	11683	11.683	4.5	12.0	62.9	65.1
FCBA1030	9373.4	9.3734	13666	13.666	3.4	12.0	69.9	72.1

## Spring-Return Actuators

### FCBA300 Series

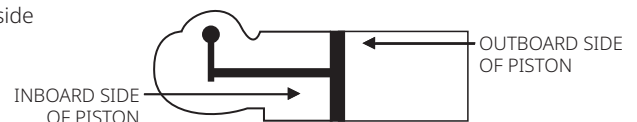
All published torques are guaranteed minimum values (units are metric).

Table 5.

Actuator Model	Volume ▲		Maximum Operating Pressure (MOP)* (bar)	Maximum Allowable Working Pressure (MAWP)** (bar)	Approximate Weight of Actuator (kg)	
	cu. cm.	L			Ductile Iron Housing	Carbon Steel Housing
FCBA730-SR40	9209	9.209	9.3	13.8	61.6	64.3
FCBA730-SR60	9209	9.209	9.7	13.8	62.6	65.3
FCBA730-SR80	9209	9.209	10.0	13.8	63.6	66.3
FCBA730-SR100	9209	9.209	10.3	13.8	64.0	66.8
FCBA830-SR40	10373	10.373	7.2	13.8	68.2	71.1
FCBA830-SR60	10373	10.373	7.6	13.8	70.1	72.9
FCBA830-SR80	10373	10.373	8.0	13.8	71.6	74.4
FCBA830-SR100	10373	10.373	8.3	13.8	73.5	76.3
FCBA930-SR40	11683	11.683	5.9	12.0	75.3	78.3
FCBA930-SR60	11683	11.683	6.2	12.0	78.2	81.1
FCBA930-SR80	11683	11.683	6.6	12.0	80.1	83.1
FCBA930-SR100	11683	11.683	7.2	12.0	83.6	86.6
FCBA1030-SR40	13666	13.666	4.8	12.0	85.0	88.1
FCBA1030-SR60	13666	13.666	5.2	12.0	87.3	90.4
FCBA1030-SR80	13666	13.666	5.5	12.0	90.8	93.9

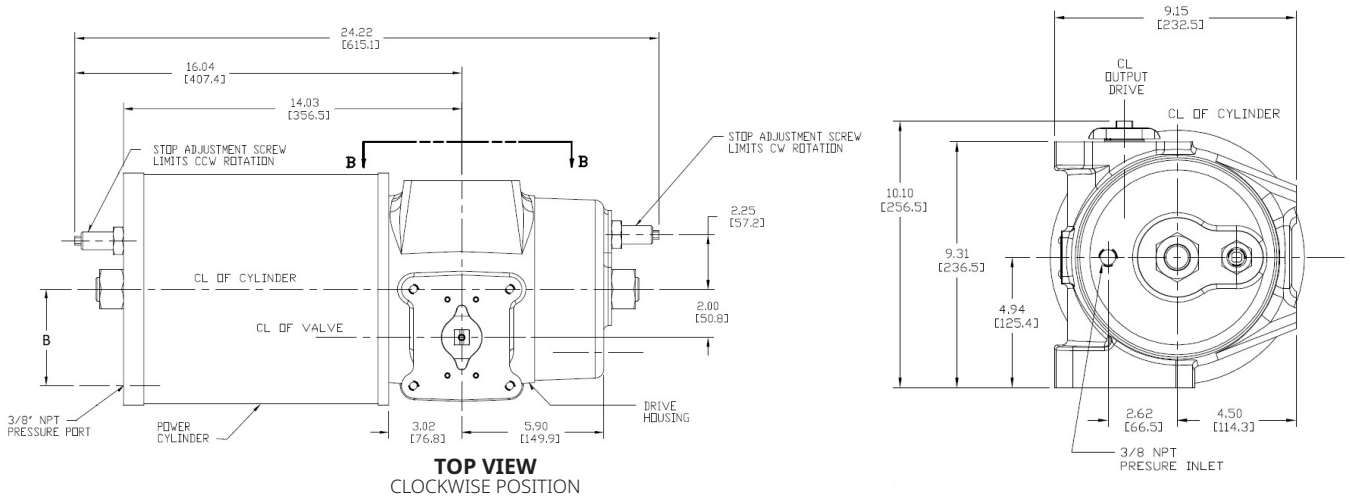
**NOTES:**

- ▲ Maximum volume including cavity required for calculating consumption per stroke.
  - \* **Maximum Operating Pressure (MOP)** is the pressure required to produce the maximum rated torque of the actuator.
  - \*\* **Maximum Allowable Working Pressure (MAWP)** is the maximum static pressure that may be applied to a fully stroked actuator against the travel stops.
- FCBA-SRXX-M3/HW mechanical handwheel overrides are available on these models.  
The override adds approximately 0.8 kg / 2 lb to the weight of the standard FCB model.  
Standard installation produces clockwise rotation when the outboard side of piston is pressurized.  
Standard installation produces counterclockwise rotation when the inboard side of piston is pressurized.  
Note: Actuator may be installed opposite of that shown.



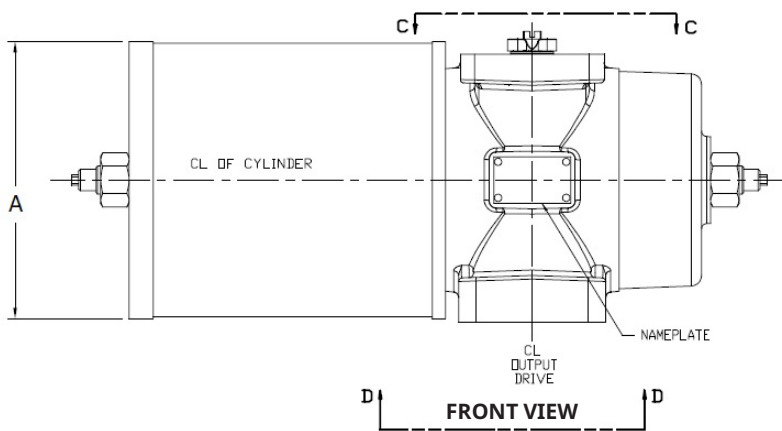
## Dimensions (mm)

### Double-Acting Actuators - FCBA300



END VIEW REPRESENTATIVE OF ALL FCBA300 MODELS

ACTUATORS SHOWN ROTATED TO FULL CLOCKWISE POSITION

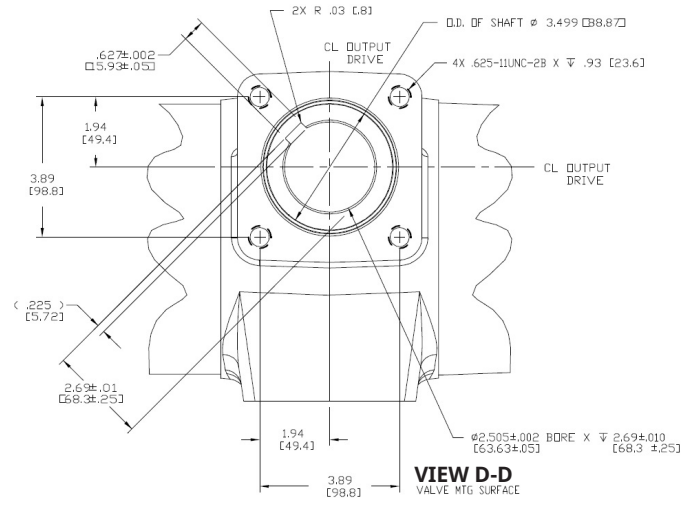
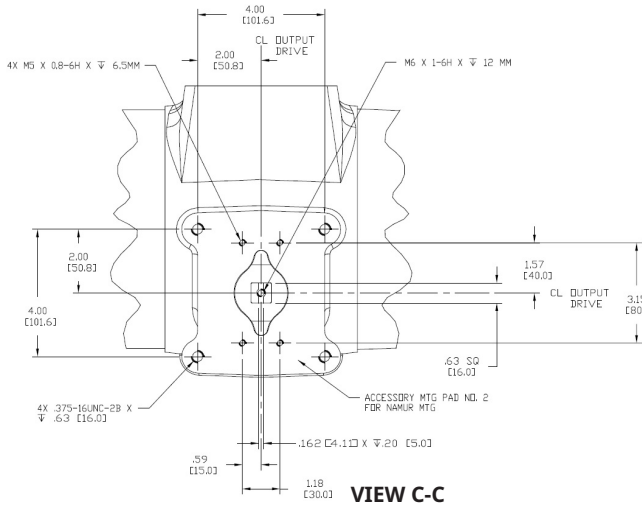


**Table 6.**

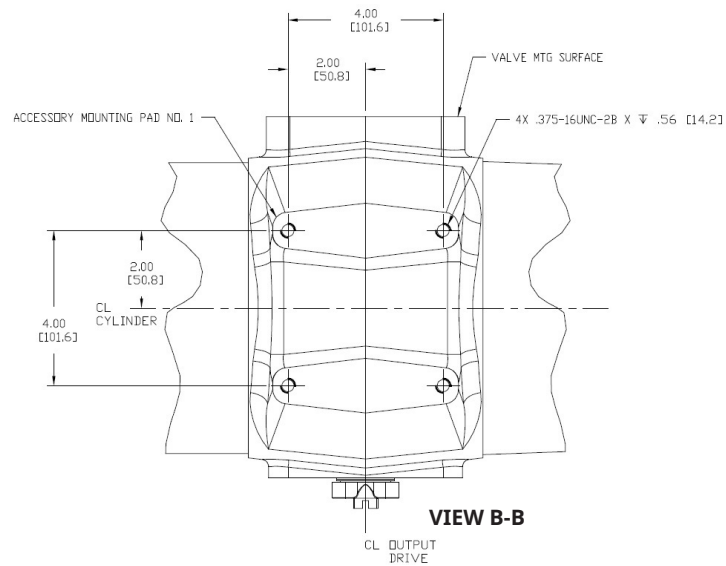
Actuator Model	A	B
FCBA730	193.8	76.2
FCBA830	219.2	88.9
FCBA930	244.6	101.6
FCBA1030	276.4	114.3

**NOTES:**

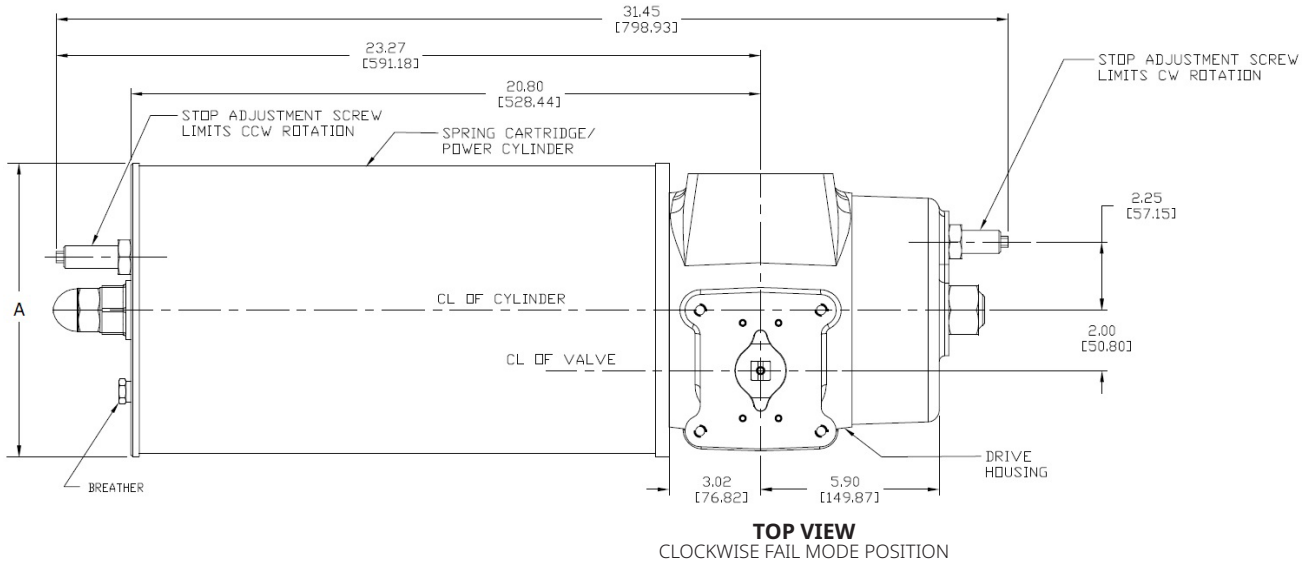
Actuators shown rotated to full clockwise position.  
Not Certified dimensional drawings. Such drawings are available on request.  
Contact factory with correct model designation and serial number.  
All dimensions are expressed in mm.



ACTUATORS SHOWN ROTATED TO FULL CLOCKWISE POSITION



## Spring-Return Actuators - FCBAX30-SRX



**Table 7.**

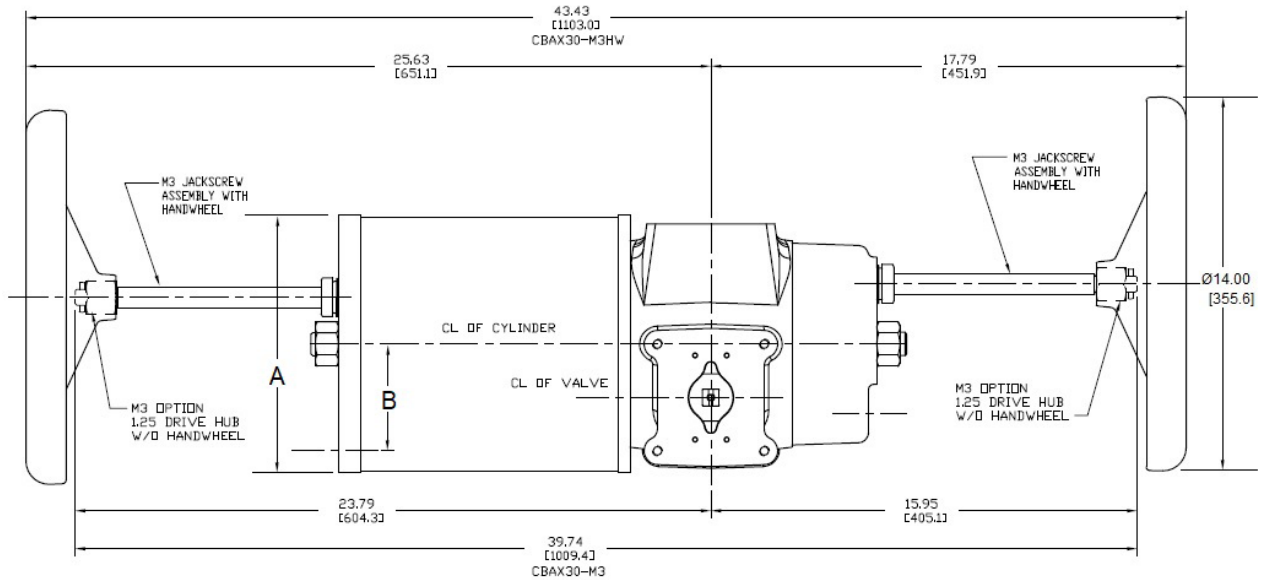
Actuator Model	A
FCBA730-SRX	195.3
FCBA830-SRX	220.7
FCBA930-SRX	246.1
FCBA1030-SRX	279.4

**NOTES:**

For other dimensions, refer to double-acting page.  
Not Certified dimensional drawings. Such drawings are available on request.  
Contact factory with correct model designation and serial number.  
All dimensions are expressed in mm.

## Dimensions (mm) - M3(HW) Override

### Double-Acting Actuators - FCBAX30-M3(HW)



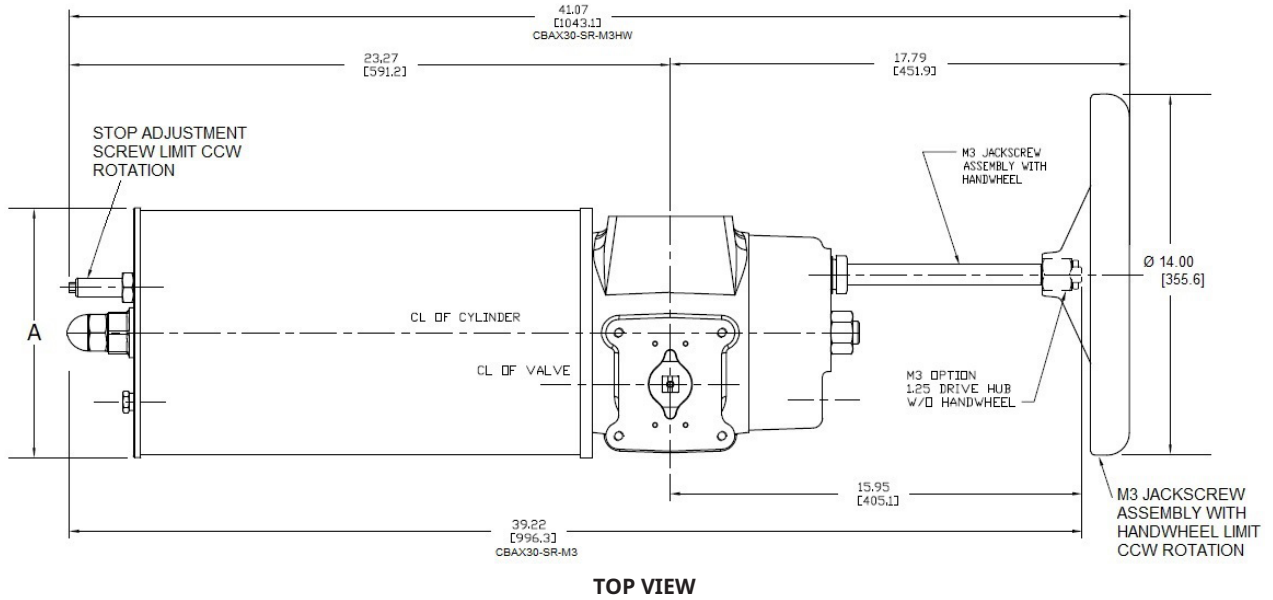
**Table 8.**

Actuator Model	A	B
FCBA730-M3HW	193.8	76.2
FCBA830-M3HW	219.2	88.9
FCBA930-M3HW	244.6	101.6
FCBA1030-M3HW	276.4	114.3

**NOTES:**

For other dimensions, refer to base actuator pages.  
 Not Certified dimensional drawings. Such drawings are available on request.  
 Contact factory with correct model designation and serial number.  
 All dimensions are expressed in mm.

## Spring-Return Actuators - FCBAX30-SRX-M3(HW)



**Table 9.**

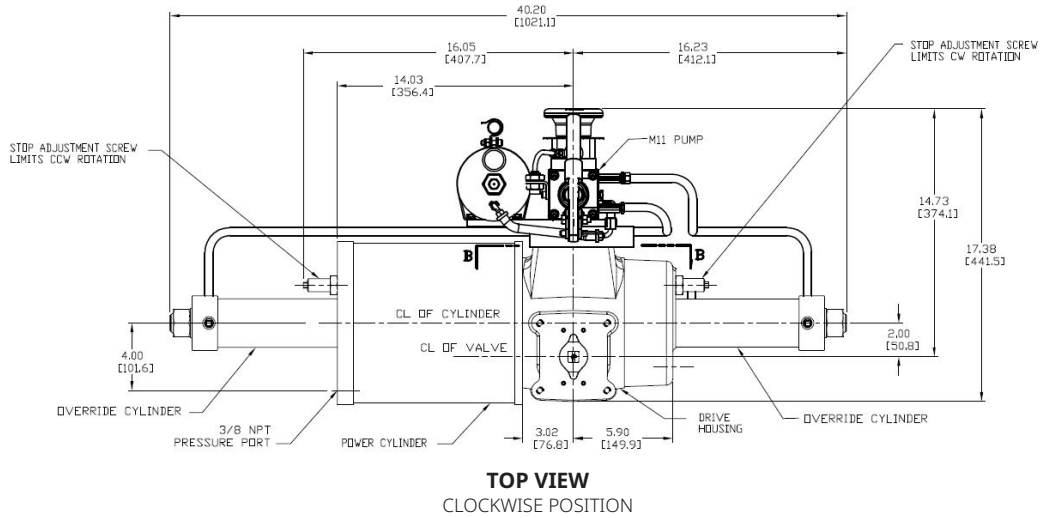
Actuator Model	A
FCBA730-SRX-M3HW	195.3
FCBA830-SRX-M3HW	220.7
FCBA930-SRX-M3HW	246.1
FCBA1030-SRX-M3HW	279.4

**NOTES:**

For other dimensions, refer to base actuator pages.  
Not Certified dimensional drawings. Such drawings are available on request.  
Contact factory with correct model designation and serial number.  
All dimensions are expressed in mm.

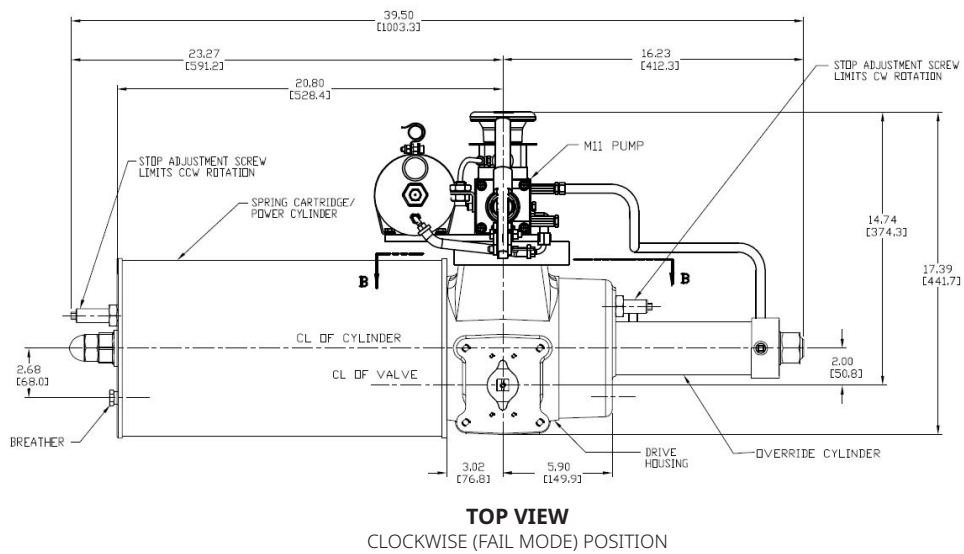


## Double-Acting Actuators - FCBA30-M11



ACTUATORS SHOWN ROTATED TO FULL CLOCKWISE POSITION

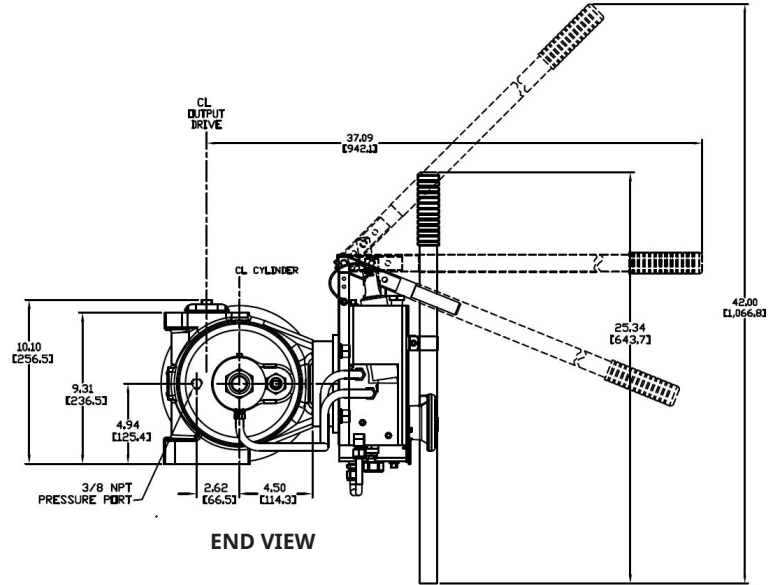
## Spring-Return Actuators - FCBA30-SRX-M11



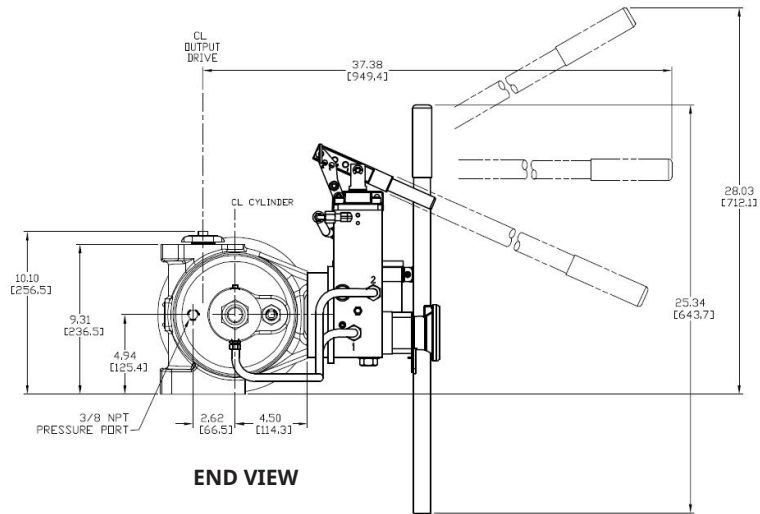
**NOTES:**

For other dimensions, refer to base actuator pages.  
Not Certified dimensional drawings. Such drawings are available on request.  
Contact factory with correct model designation and serial number.  
All dimensions are expressed in mm.

END VIEW REPRESENTATIVE OF ALL FCBA30-M18 MODELS



END VIEW REPRESENTATIVE OF ALL FCBA30-M11 MODELS



**NOTES:**

For other dimensions, refer to base actuator pages.  
 Not Certified dimensional drawings. Such drawings are available on request.  
 Contact factory with correct model designation and serial number.  
 All dimensions are expressed in mm.

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