

Biffi FCBA-300 Series

Pneumatic Actuators



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Introduction

The Biffi™ FCBA-300 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 degree) 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 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 300-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
- Five-Year Warranty
- Its NAMUR topworks mounting configuration allows the FCBA-300 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 FCBA-300 Series provides models in both spring-return and double-acting configurations. They have guaranteed minimum torque outputs ranging from 7,160 lb-in to 20,598 lb-in 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 2,294 lb-in to 10,027 lb-in.

Torque Ratings - (Pneumatic)

Double-Acting Actuators

FCBA-300 Series

All Published Torques are Guaranteed Minimum Values (Units are Imperial).

Table 1.

Actuator Model	Stroke Direction Start/Min./End		Operating Pressure (psig)																MinOP (psig)	Torque @ MinOP (lbf-in)	MOP (psig)	Torque @ MOP (lbf-in)	
			40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115					120
			Pressure Torque Output: Start/Min./End (lbf-in)																				
FCBA730	Start	Outboard	7,160	8,106	9,053	9,999	10,946	11,893	12,839	13,786	14,733	15,680	16,627	17,574	18,521	19,468	Exceeds MOP	-	-	40	7,160	105	19,468
	Minimum		3,810	4,304	4,798	5,292	5,787	6,281	6,775	7,269	7,763	8,258	8,752	9,246	9,741	10,235		-	-		3,810		10,235
	End		7,291	8,237	9,183	10,128	11,074	12,020	12,966	13,911	14,857	15,803	16,749	17,695	18,641	19,587		-	-		7,291		19,587
	Start	Inboard	7,117	8,058	8,998	9,939	10,880	11,821	12,762	13,703	14,644	15,585	16,527	17,468	18,409	19,351		-	-		7,117		19,351
	Minimum		3,810	4,304	4,798	5,292	5,787	6,281	6,775	7,269	7,763	8,258	8,752	9,246	9,741	10,235		-	-		3,810		10,235
	End		7,336	8,287	9,239	10,190	11,141	12,093	13,045	13,996	14,948	15,899	16,851	17,803	18,755	19,707		-	-		7,336		19,707
FCBA830	Start	Outboard	9,485	10,728	11,972	13,215	14,459	15,703	16,947	18,191	19,435	Exceeds MOP	-	-	-	-	-	-	-	40	9,485	80	19,435
	Minimum		5,031	5,680	6,329	6,978	7,627	8,276	8,925	9,574	10,224		-	-	-	-	-	-	-		5,031		10,224
	End		9,628	10,870	12,112	13,354	14,596	15,838	17,081	18,323	19,565		-	-	-	-	-	-	-		9,628		19,565
	Start	Inboard	9,427	10,663	11,900	13,136	14,372	15,608	16,845	18,081	19,318		-	-	-	-	-	-	-		9,427		19,318
	Minimum		5,031	5,680	6,329	6,978	7,627	8,276	8,925	9,574	10,224		-	-	-	-	-	-	-		5,031		10,224
	End		9,686	10,936	12,186	13,435	14,685	15,935	17,185	18,434	19,684		-	-	-	-	-	-	-		9,686		19,684
FCBA930	Start	Outboard	12,127	13,708	15,288	16,869	18,449	20,030	Exceeds MOP	-	-	-	-	-	-	-	-	-	-	40	12,127	65	20,030
	Minimum		6,417	7,242	8,067	8,891	9,716	10,541		-	-	-	-	-	-	-	-	-	-		6,417		10,541
	End		12,281	13,859	15,437	17,015	18,594	20,172		-	-	-	-	-	-	-	-	-	-		12,281		20,172
	Start	Inboard	12,054	13,625	15,196	16,767	18,338	19,909		-	-	-	-	-	-	-	-	-	-		12,054		19,909
	Minimum		6,417	7,242	8,067	8,891	9,716	10,541		-	-	-	-	-	-	-	-	-	-		6,417		10,541
	End		12,356	13,944	15,531	17,119	18,707	20,295		-	-	-	-	-	-	-	-	-	-		12,356		20,295
FCBA1030	Start	Outboard	16,134	18,225	20,315	Exceeds MOP	-	-	-	-	-	-	-	-	-	-	-	-	40	16,134	50	20,315	
	Minimum		8,518	9,608	10,698		-	-	-	-	-	-	-	-	-	-	-	-		-		8,518	10,698
	End		16,301	18,387	20,474		-	-	-	-	-	-	-	-	-	-	-	-		-		16,301	20,474
	Start	Inboard	16,037	18,115	20,192		-	-	-	-	-	-	-	-	-	-	-	-		-		16,037	20,192
	Minimum		8,518	9,608	10,698		-	-	-	-	-	-	-	-	-	-	-	-		-		8,518	10,698
	End		16,400	18,499	20,598		-	-	-	-	-	-	-	-	-	-	-	-		-		16,400	20,598

Spring-Return Actuators

FCBA-300 Series

All Published Torques are Guaranteed Minimum Values (Units are Imperial).

Table 2.

Actuator Model	Spring Torque Start/Min./End (lbf-in)		Operating Pressure (psig)																	MinOP (psig)	Torque @ MinOP (lbf-in)	MOP (psig)	Torque @ MOP (lbf-in)	
			40	45	50	55	60	65	70	80	90	100	110	120	130	140	150	160	165					
			Pressure Torque Output: Start/Min./End (lbf-in)																					
FCBA730-SR40	Start	4,059	4,077	4,966	5,856	6,746	7,636	8,526	9,417	11,197	12,978	14,759	16,540	18,321	20,103		-	-	-		3,187		20,994	
	Minimum	1,651	1,686	2,163	2,637	3,108	3,579	4,048	4,518	5,455	6,393	7,329	8,265	9,202	10,138	Exceeds MOP	-	-	-	35	1,201	135	10,607	
	End	2,294	2,372	3,271	4,171	5,071	5,971	6,871	7,772	9,572	11,372	13,173	14,974	16,775	18,576		-	-	-		1,472		19,477	
FCBA730-SR60	Start	6,406	-	-		5,566	6,456	7,346	8,236	10,017	11,797	13,578	15,359	17,141	18,923	20,704		-	-		5,032		20,704	
	Minimum	2,541	-	-	Please consult factory	2,123	2,607	3,086	3,562	4,508	5,450	6,390	7,330	8,267	9,205	10,143	Exceeds MOP	-	-	52	1,827	140	10,143	
	End	3,478	-	-		2,718	3,618	4,518	5,419	7,219	9,019	10,820	12,621	14,422	16,223	18,024		-	-		2,178		18,024	
FCBA730-SR80	Start	9,041	-	-	-	-	-	-		9,165	10,945	12,726	14,507	16,289	18,070	19,852		-	-		7,740		20,743	
	Minimum	3,383	-	-	-	-	-	-	Please consult factory	3,507	4,472	5,426	6,374	7,319	8,261	9,203	Exceeds MOP	-	-	72	2,716	145	9,673	
	End	4,332	-	-	-	-	-	-		4,578	6,378	8,179	9,979	11,780	13,582	15,383		-	-		3,137		16,284	
FCBA730-SR100	Start	11,350	-	-	-	-	-	-	-		9,789	11,570	13,351	15,132	16,914	18,696	20,478		-	-		9,789		20,478
	Minimum	4,257	-	-	-	-	-	-	-	Please consult factory	3,461	4,447	5,412	6,367	7,317	8,264	9,209	Exceeds MOP	-	-	90	3,461	150	9,209
	End	5,491	-	-	-	-	-	-	-		4,063	5,864	7,665	9,466	11,267	13,068	14,870		-	-		4,063		14,870
FCBA830-SR40	Start	5,394	5,448	6,618	7,787	8,956	10,126	11,295	12,465	14,804	17,144	19,484		-	-	-	-	-	-		4,279		20,654	
	Minimum	2,191	2,253	2,879	3,500	4,119	4,737	5,354	5,971	7,202	8,433	9,663	Exceeds MOP	-	-	-	-	-	-	35	1,616	105	10,278	
	End	3,062	3,191	4,373	5,555	6,738	7,920	9,102	10,284	12,649	15,014	17,379		-	-	-	-	-	-		2,009		18,561	
FCBA830-SR60	Start	8,752	-	-		7,723	8,893	10,062	11,232	13,571	15,911	18,251	20,591		-	-	-	-	-		7,490		20,591	
	Minimum	3,315	-	-	Please consult factory	2,799	3,444	4,078	4,706	5,953	7,193	8,430	9,664	Exceeds MOP	-	-	-	-	-	54	2,668	110	9,664	
	End	4,298	-	-		3,371	4,553	5,735	6,918	9,282	11,647	14,012	16,377		-	-	-	-	-		3,135		16,377	
FCBA830-SR80	Start	12,015	-	-	-	-	-	-		12,234	14,573	16,913	19,253		-	-	-	-	-		10,596		20,423	
	Minimum	4,450	-	-	-	-	-	-	Please consult factory	4,641	5,910	7,163	8,410	Exceeds MOP	-	-	-	-	-	73	3,732	115	9,030	
	End	5,638	-	-	-	-	-	-		6,012	8,377	10,742	13,107		-	-	-	-	-		4,357		14,289	
FCBA830-SR100	Start	15,378	-	-	-	-	-	-	-		15,676	18,016	20,356		-	-	-	-	-		13,804		20,356	
	Minimum	5,570	-	-	-	-	-	-	-	Please consult factory	5,825	7,102	8,362	Exceeds MOP	-	-	-	-	-	92	4,779	120	8,362	
	End	6,879	-	-	-	-	-	-	-		7,370	9,735	12,101		-	-	-	-	-		5,478		12,101	

Spring-Return Actuators

FCBA-300 Series

All Published Torques are Guaranteed Minimum Values (Units are Imperial).

Table 3.

Actuator Model	Spring Torque Start/Min./End (lbf-in)		Operating Pressure (psig)																	MinOP (psig)	Torque @ MinOP (lbf-in)	MOP (psig)	Torque @ MOP (lbf-in)		
			40	45	50	55	60	65	70	80	90	100	110	120	130	140	150	160	165						
			Pressure Torque Output: Start/Min./End (lbf-in)																						
FCBA930-SR40	Start	6,930	7,010	8,496	9,982	11,468	12,954	14,440	15,927	18,900	-	-	-	-	-	-	-	-	-	-	35	5,524	85	20,386	
	Minimum	2,810	2,893	3,688	4,477	5,264	6,049	6,832	7,616	9,180	Exceeds MOP	-	-	-	-	-	-	-	-	-	-	35	2,084	85	9,962
	End	3,939	4,111	5,613	7,115	8,617	10,119	11,621	13,123	16,127	-	-	-	-	-	-	-	-	-	-	-	35	2,610	85	17,629
FCBA930-SR60	Start	11,419	-	-	10,202	11,688	13,174	14,661	17,634	20,607	-	-	-	-	-	-	-	-	-	-	55	10,202	90	20,607	
	Minimum	4,184	-	-	Please consult factory	3,569	4,397	5,207	6,009	7,597	Exceeds MOP	-	-	-	-	-	-	-	-	-	-	55	3,569	90	9,176
	End	5,208	-	-	4,117	5,619	7,121	8,623	11,627	14,632	-	-	-	-	-	-	-	-	-	-	-	55	4,117	90	14,632
FCBA930-SR80	Start	15,367	-	-	-	-	-	-	15,701	18,674	-	-	-	-	-	-	-	-	-	-	73	13,620	95	20,161	
	Minimum	5,663	-	-	-	-	-	-	Please consult factory	5,933	Exceeds MOP	-	-	-	-	-	-	-	-	-	-	73	4,778	95	8,345
	End	7,145	-	-	-	-	-	-	7,670	10,675	-	-	-	-	-	-	-	-	-	-	-	73	5,567	95	12,177
FCBA930-SR100	Start	19,333	-	-	-	-	-	-	-	19,677	-	-	-	-	-	-	-	-	-	-	91	17,001	105	21,164	
	Minimum	7,159	-	-	-	-	-	-	-	Please consult factory	7,455	Exceeds MOP	-	-	-	-	-	-	-	-	-	91	5,972	105	8,265
	End	9,120	-	-	-	-	-	-	-	9,703	-	-	-	-	-	-	-	-	-	-	-	91	6,999	105	11,206
FCBA1030-SR40	Start	9,319	9,456	11,421	13,387	15,352	17,317	19,283	21,249	-	-	-	-	-	-	-	-	-	-	-	35	7,491	70	21,249	
	Minimum	3,740	3,864	4,916	5,960	7,001	8,039	9,075	10,111	Exceeds MOP	-	-	-	-	-	-	-	-	-	-	-	35	2,794	70	10,111
	End	5,199	5,456	7,441	9,427	11,412	13,398	15,384	17,370	-	-	-	-	-	-	-	-	-	-	-	-	35	3,470	70	17,370
FCBA1030-SR60	Start	15,341	-	-	13,876	15,842	17,807	19,773	-	-	-	-	-	-	-	-	-	-	-	-	55	13,876	75	21,739	
	Minimum	5,502	-	-	Please consult factory	4,762	5,864	6,939	8,001	Exceeds MOP	-	-	-	-	-	-	-	-	-	-	-	55	4,762	75	9,056
	End	6,678	-	-	5,375	7,361	9,347	11,332	-	-	-	-	-	-	-	-	-	-	-	-	-	55	5,375	75	13,318
FCBA1030-SR80	Start	20,016	-	-	-	-	-	-	20,363	-	-	-	-	-	-	-	-	-	-	-	71	16,825	80	20,363	
	Minimum	7,611	-	-	-	-	-	-	Please consult factory	7,906	Exceeds MOP	-	-	-	-	-	-	-	-	-	-	71	5,957	80	7,906
	End	10,027	-	-	-	-	-	-	10,618	-	-	-	-	-	-	-	-	-	-	-	-	71	7,044	80	10,618

Performance Data - (Pneumatic)

Double-Acting Actuators

FCBA-300 Series

All Published Torques are Guaranteed Minimum Values (Units are Imperial).

Table 4.

Actuator Model	Volume (cu. in.) ▲		Maximum System Pressure (MSP)* (psig)	Maximum Operating Pressure (MOP)* (psig)	Maximum Allowable Working Pressure (MAWP)** (psig)	Approximate Weight of Actuator (lb)	
	Outboard	Inboard (Housing)				Ductile Iron Housing	Carbon Steel Housing
FCBA730	260	562	120	105	200	112.3	117.2
FCBA830	341	633	90	80	200	124.9	129.8
FCBA930	433	713	70	65	170	138.7	143.6
FCBA1030	572	834	55	50	130	154.1	159.0

Spring-Return Actuators

FCBA-300 Series

All Published Torques are Guaranteed Minimum Values (Units are Imperial).

Table 5.

Actuator Model	Volume (cu. in.) ▲	Maximum System Pressure (MSP)* (psig)	Maximum Operating Pressure (MOP)* (psig)	Maximum Allowable Working Pressure (MAWP)** (psig)	Approximate Weight of Actuator (lb)	
					Ductile Iron Housing	Carbon Steel Housing
FCBA730-SR40	562	150	135	200	135.7	141.7
FCBA730-SR60	562	155	140	200	138.0	144.0
FCBA730-SR80	562	160	145	200	140.2	146.2
FCBA730-SR100	562	165	150	200	141.2	147.2
FCBA830-SR40	633	125	105	160	150.4	156.7
FCBA830-SR60	633	125	110	160	154.5	160.8
FCBA830-SR80	633	130	115	160	157.9	164.1
FCBA830-SR100	633	140	120	160	162.1	168.3
FCBA930-SR40	713	120	85	200	166.0	172.6
FCBA930-SR60	713	120	90	200	172.4	178.9
FCBA930-SR80	713	120	95	200	176.6	183.1
FCBA930-SR100	713	120	105	200	184.4	191.0
FCBA1030-SR40	834	95	70	160	187.4	194.3
FCBA1030-SR60	834	100	75	160	192.4	199.4
FCBA1030-SR80	834	110	80	160	200.1	207.0

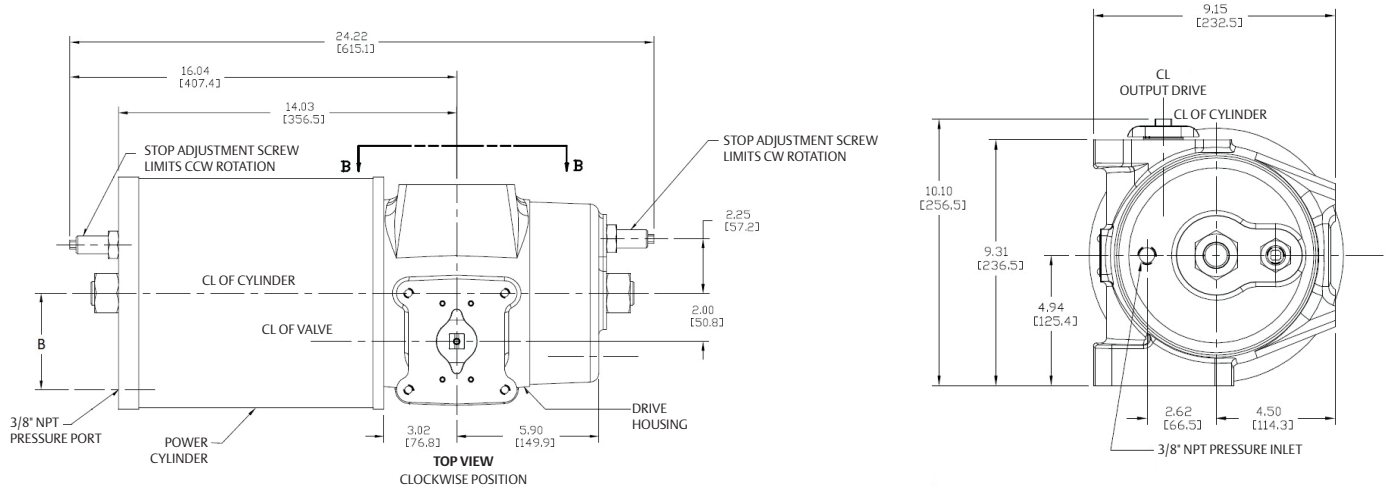
NOTES:

- ◆ FCB-SRXXM mechanical handwheel overrides are available on these models. The override adds approximately 2 lb (0.8 kg) to the weight of the standard FCB model.
- ▲ 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. 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 above.



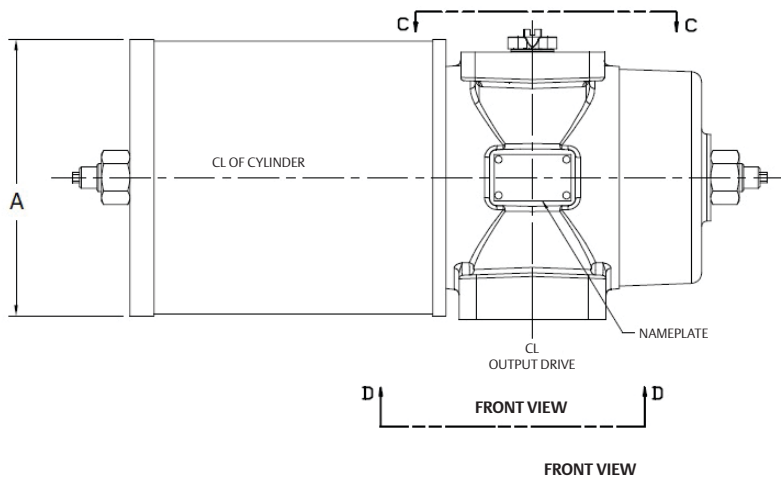
Dimensions (in.)

Double-Acting Actuators - FCBA30



END VIEW REPRESENTATIVE OF ALL X30 MODELS

ACTUATORS SHOWN ROTATED TO FULL CLOCKWISE POSITION

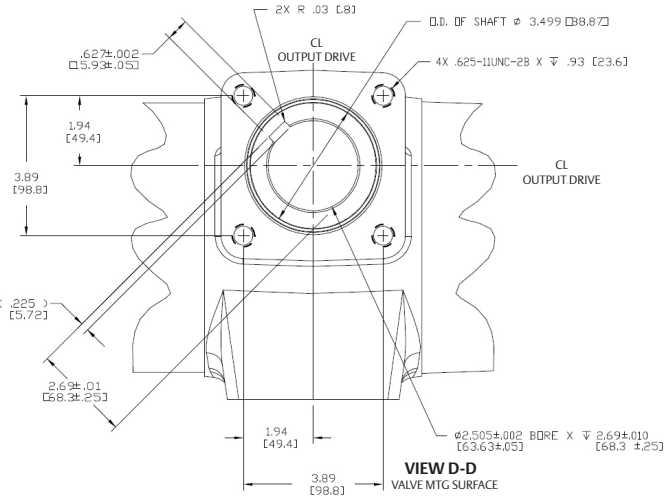
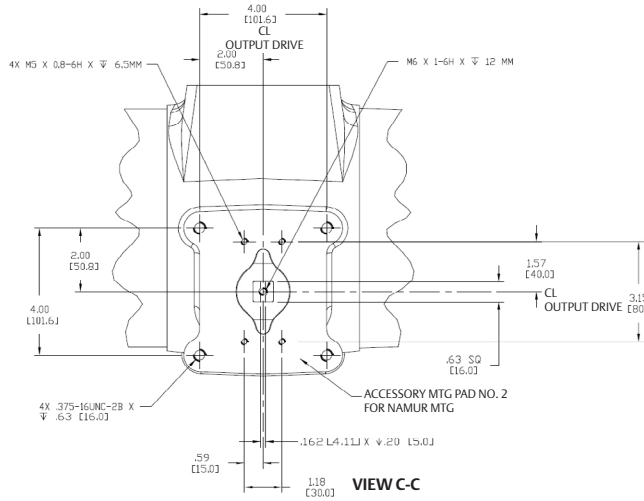


FRONT VIEW

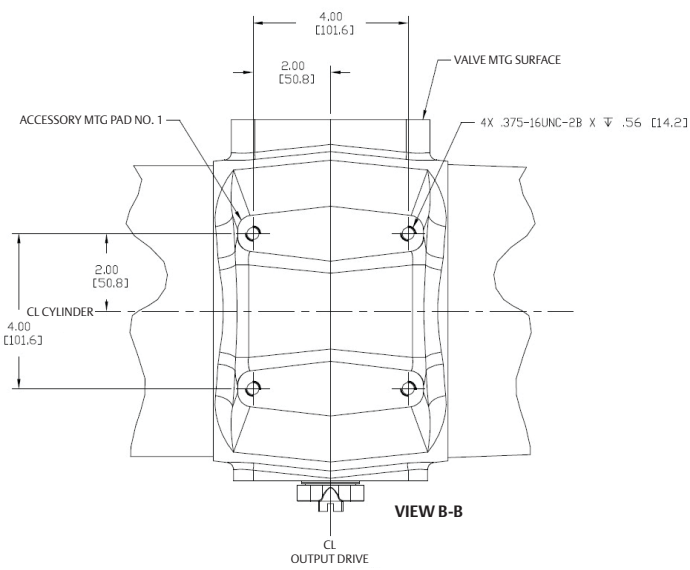
Actuator Model	A	B
FCBA730	7.63	3.00
FCBA830	8.63	3.50
FCBA930	9.63	4.00
FCBA1030	10.88	4.50

NOTES:

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

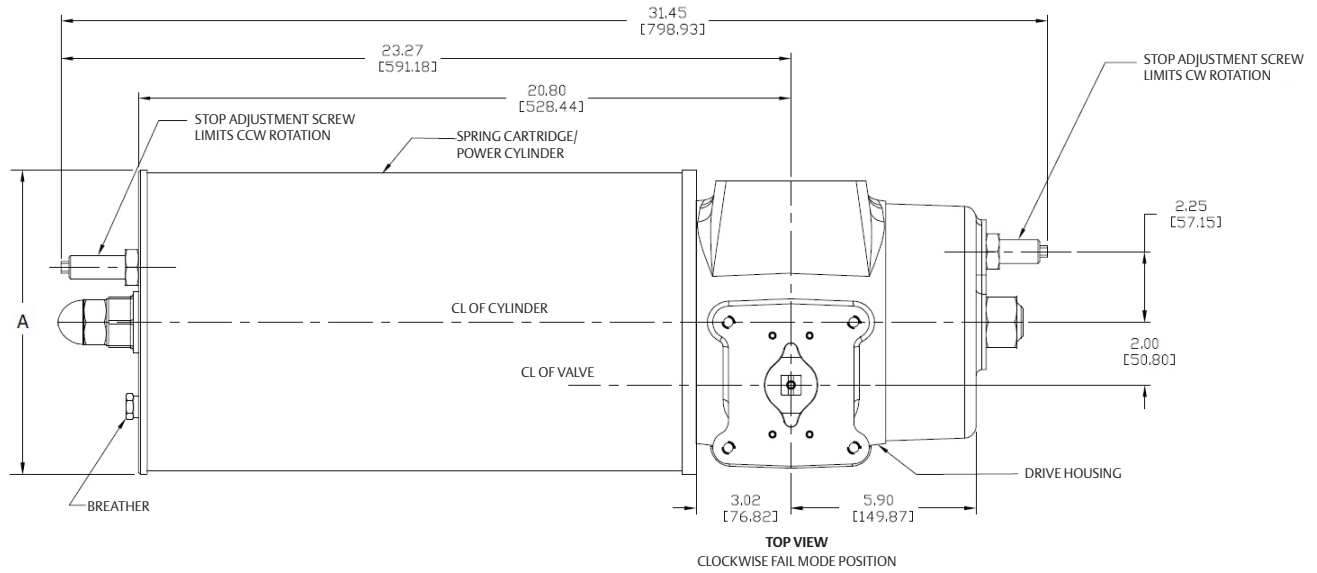


ACTUATORS SHOWN ROTATED TO FULL CLOCKWISE POSITION



Dimensions (in.)

Spring-Return Actuators - FCBA30-SRX



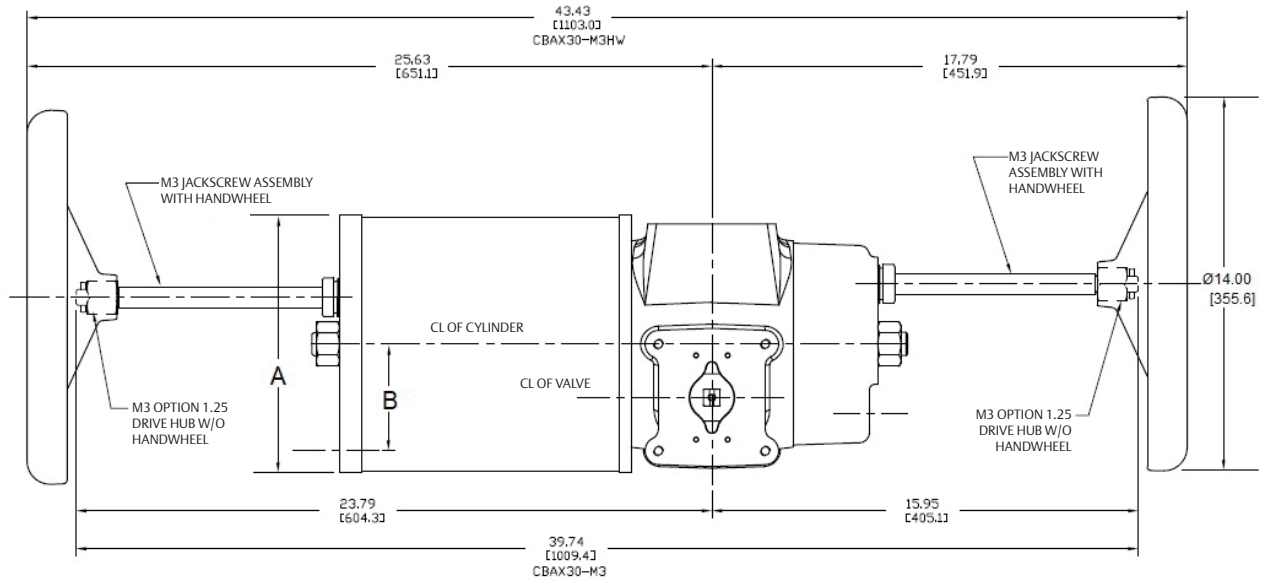
Actuator Model	A
FCBA730-SRX	7.69
FCBA830-SRX	8.69
FCBA930-SRX	9.69
FCBA1030-SRX	11.00

NOTES:

Other dimensions refer to Double-Acting page.
 Not Certified dimensional drawings. Such drawings available on request.
 Contact factory with correct model designation and serial number.
 All dimensions are expressed in inches.

Dimensions (in.) - M3(HW) Override

Double-Acting Actuators - FCBAX30-M3(HW)



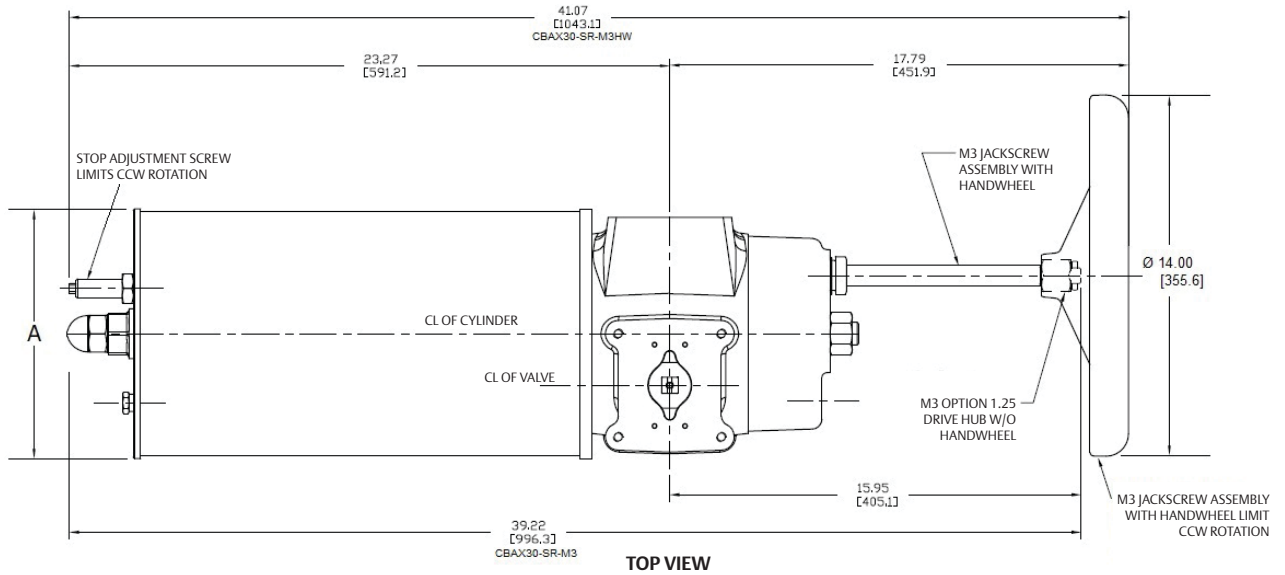
Actuator Model	A	B
FCBA730-M3HW	7.63	3.00
FCBA830-M3HW	8.63	3.50
FCBA930-M3HW	9.63	4.00
FCBA1030-M3HW	10.88	4.50

NOTES:

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

Dimensions (in.) - M3(HW) Override

Spring-Return Actuators - FCBA30-SRX-M3(HW)



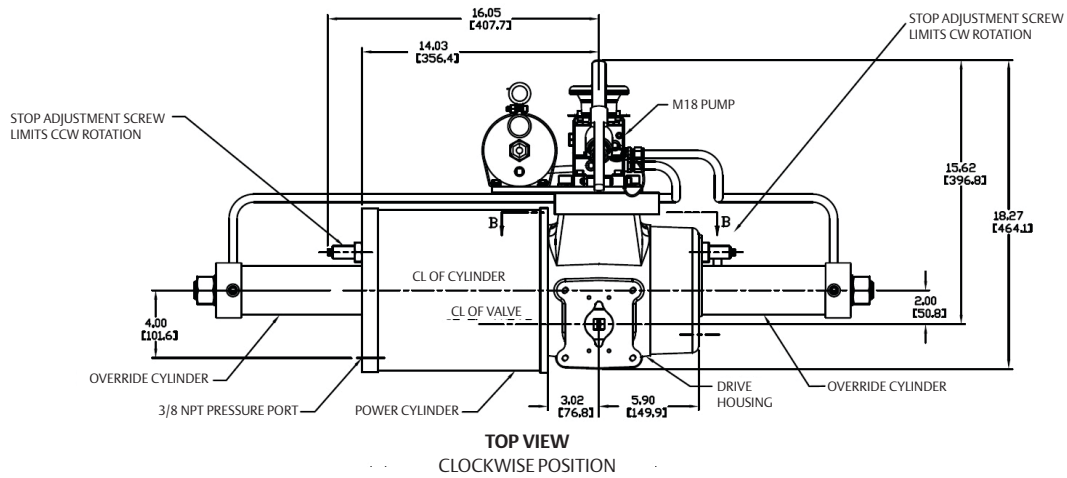
Actuator Model	A
FCBA730-SRX-M3HW	7.69
FCBA830-SRX-M3HW	8.69
FCBA930-SRX-M3HW	9.69
FCBA1030-SRX-M3HW	11.00

NOTES:

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

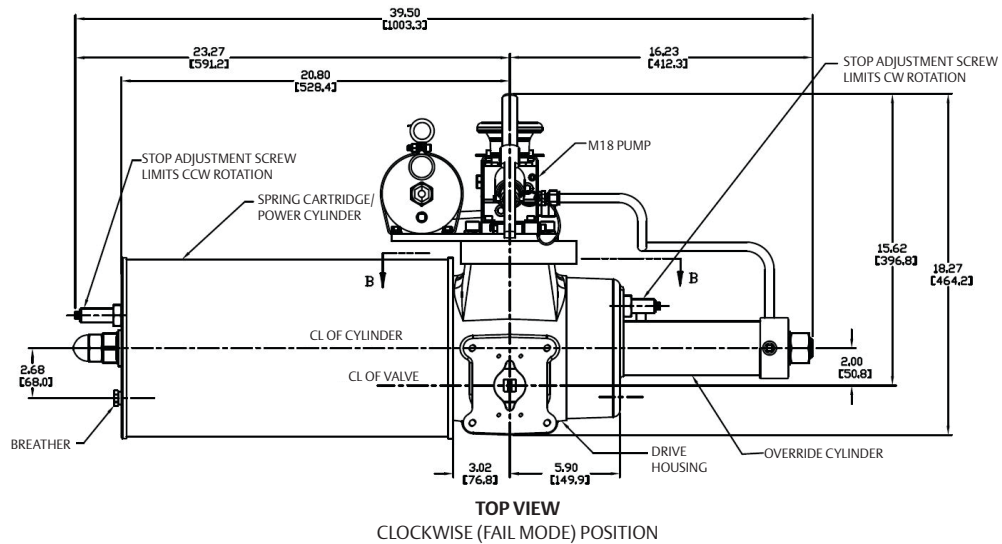
Dimensions (in.) - Hydraulic Override

Double-Acting Actuators - FCBAX30-M18



ACTUATORS SHOWN ROTATED TO FULL CLOCKWISE POSITION

Spring-Return Actuators - FCBAX30-SRX-M18

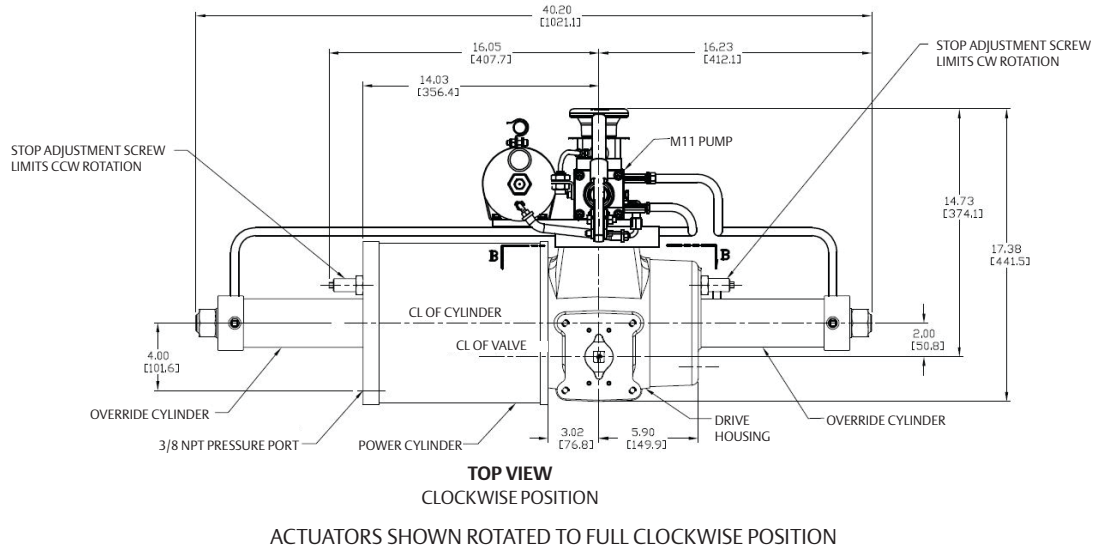


NOTES:

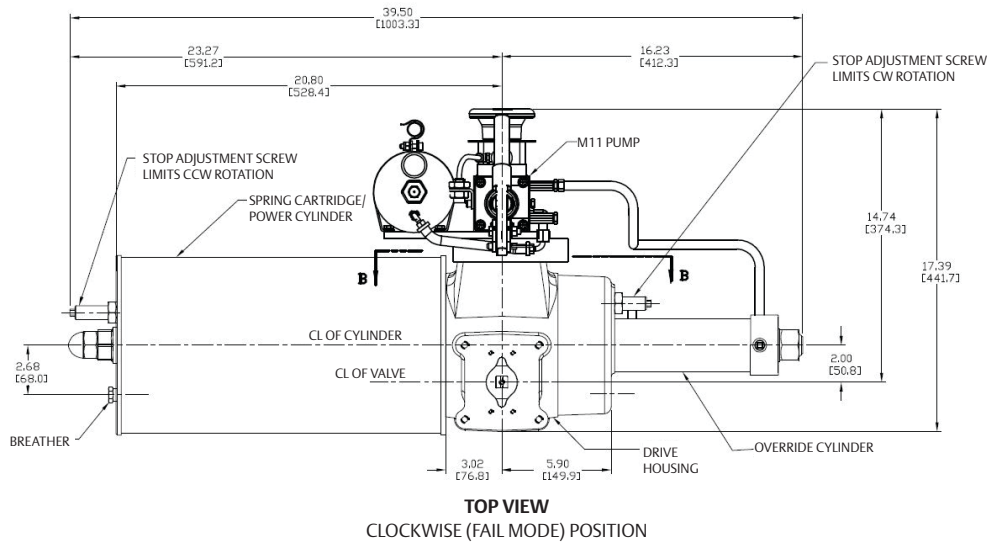
Other dimensions refer to base actuator pages.
 Not Certified dimensional drawings. Such drawings available on request.
 Contact factory with correct model designation and serial number.
 All dimensions are expressed in inches.

Dimensions (in.) - Hydraulic Override

Double-Acting Actuators - FCBAX30-M11



Spring-Return Actuators - X30-SRX-M11

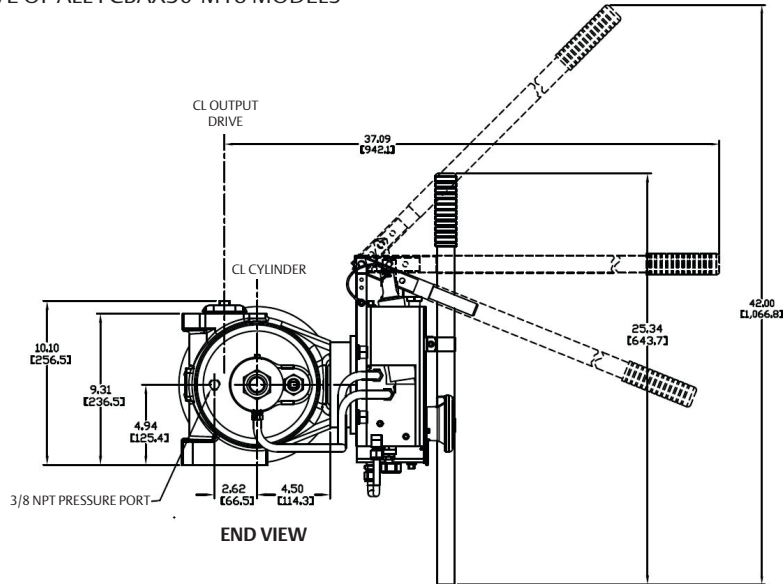


NOTES:

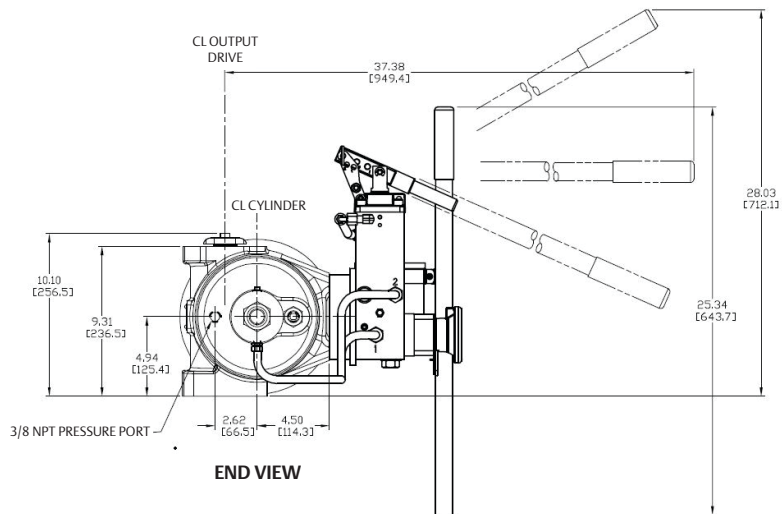
Other dimensions refer to base actuator pages.
 Not Certified dimensional drawings. Such drawings available on request.
 Contact factory with correct model designation and serial number.
 All dimensions are expressed in inches.

Dimensions (in.) - Hydraulic Override

END VIEW REPRESENTATIVE OF ALL FCBAX30-M18 MODELS



END VIEW REPRESENTATIVE OF ALL X30-M11 MODELS



NOTES:

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

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