Product Data Sheet
VCPDS-16218-US Rev. 4
May 2025

Biffi FCBA300 Series

Pneumatic Actuators

BIFFI

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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 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 TopWorx™ 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 7,160 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 to 10,027 lb-in.

Torque Ratings

Double-Acting Actuators

FCBA300 Series

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

Table 1.

Actuator Model	Stroke Direction Start/Minimum/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/Minimum/End (lbf-in)																				
FCBA730	Start	Outboard	7160	8106	9053	9999	10946	11893	12839	13786	14733	15680	16627	17574	18521	19468	Exceeds MOP	-	-	40	7160	105	19468
	Minimum		3810	4304	4798	5292	5787	6281	6775	7269	7763	8258	8752	9246	9741	10235		-	-		3810		10235
	End		7291	8237	9183	10128	11074	12020	12966	13911	14857	15803	16749	17695	18641	19587		-	-		7291		19587
	Start	Inboard	7117	8058	8998	9939	10880	11821	12762	13703	14644	15585	16527	17468	18409	19351		-	-		7117		19351
	Minimum		3810	4304	4798	5292	5787	6281	6775	7269	7763	8258	8752	9246	9741	10235		-	-		3810		10235
	End		7336	8287	9239	10190	11141	12093	13045	13996	14948	15899	16851	17803	18755	19707		-	-		7336		19707
FCBA830	Start	Outboard	9485	10728	11972	13215	14459	15703	16947	18191	19435	Exceeds MOP	-	-	-	-	-	-	-	40	9485	80	19435
	Minimum		5031	5680	6329	6978	7627	8276	8925	9574	10224		-	-	-	-	-	-	-		5031		10224
	End		9628	10870	12112	13354	14596	15838	17081	18323	19565		-	-	-	-	-	-	-		9628		19565
	Start	Inboard	9427	10663	11900	13136	14372	15608	16845	18081	19318		-	-	-	-	-	-	-		9427		19318
	Minimum		5031	5680	6329	6978	7627	8276	8925	9574	10224		-	-	-	-	-	-	-		5031		10224
	End		9686	10936	12186	13435	14685	15935	17185	18434	19684		-	-	-	-	-	-	-		9686		19684
FCBA930	Start	Outboard	12127	13708	15288	16869	18449	20030	Exceeds MOP	-	-	-	-	-	-	-	-	-	-	40	12127	65	20030
	Minimum		6417	7242	8067	8891	9716	10541		-	-	-	-	-	-	-	-	-	-		6417		10541
	End		12281	13859	15437	17015	18594	20172		-	-	-	-	-	-	-	-	-	-		12281		20172
	Start	Inboard	12054	13625	15196	16767	18338	19909		-	-	-	-	-	-	-	-	-	-		12054		19909
	Minimum		6417	7242	8067	8891	9716	10541		-	-	-	-	-	-	-	-	-	-		6417		10541
	End		12356	13944	15531	17119	18707	20295		-	-	-	-	-	-	-	-	-	-		12356		20295
FCBA1030	Start	Outboard	16134	18225	20315	Exceeds MOP	-	-	-	-	-	-	-	-	-	-	-	-	-	40	16134	50	20315
	Minimum		8518	9608	10698		-	-	-	-	-	-	-	-	-	-	-	-	-		8518		10698
	End		16301	18387	20474		-	-	-	-	-	-	-	-	-	-	-	-	-		16301		20474
	Start	Inboard	16037	18115	20192		-	-	-	-	-	-	-	-	-	-	-	-	-		16037		20192
	Minimum		8518	9608	10698		-	-	-	-	-	-	-	-	-	-	-	-	-		8518		10698
	End		16400	18499	20598		-	-	-	-	-	-	-	-	-	-	-	-	-		16400		20598

Spring-Return Actuators

FCBA300 Series

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

Table 2.

Actuator Model	Spring Torque Start/Minimum/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/Minimum/End (lbf-in)																				
FCBA730-SR40	Start	4059	4077	4966	5856	6746	7636	8526	9417	11197	12978	14759	16540	18321	20103	Exceeds MOP	-	-	-	35	3187	135	20994
	Minimum	1651	1686	2163	2637	3108	3579	4048	4518	5455	6393	7329	8265	9202	10138		-	-	-		1201		10607
	End	2294	2372	3271	4171	5071	5971	6871	7772	9572	11372	13173	14974	16775	18576		-	-	-		1472		19477
FCBA730-SR60	Start	6406	-	-	Please consult factory	5566	6456	7346	8236	10017	11797	13578	15359	17141	18923	20704	Exceeds MOP	-	-	52	5032	140	20704
	Minimum	2541	-	-		2123	2607	3086	3562	4508	5450	6390	7330	8267	9205	10143		-	-		1827		10143
	End	3478	-	-		2718	3618	4518	5419	7219	9019	10820	12621	14422	16223	18024		-	-		2178		18024
FCBA730-SR80	Start	9041	-	-	-	-	-	-	Please consult factory	9165	10945	12726	14507	16289	18070	19852	Exceeds MOP	-	-	72	7740	145	20743
	Minimum	3383	-	-	-	-	-	-		3507	4472	5426	6374	7319	8261	9203		-	-		2716		9673
	End	4332	-	-	-	-	-	-		4578	6378	8179	9979	11780	13582	15383		-	-		3137		16284
FCBA730-SR100	Start	11350	-	-	-	-	-	-	-	Please consult factory	9789	11570	13351	15132	16914	18696	20478	Exceeds MOP	-	90	9789	150	20478
	Minimum	4257	-	-	-	-	-	-	-		3461	4447	5412	6367	7317	8264	9209		-		3461		9209
	End	5491	-	-	-	-	-	-	-		4063	5864	7665	9466	11267	13068	14870		-		4063		14870
FCBA830-SR40	Start	5394	5448	6618	7787	8956	10126	11295	12465	14804	17144	19484	Exceeds MOP	-	-	-	-	-	-	35	4279	105	20654
	Minimum	2191	2253	2879	3500	4119	4737	5354	5971	7202	8433	9663		-	-	-	-	-	-		1616		10278
	End	3062	3191	4373	5555	6738	7920	9102	10284	12649	15014	17379		-	-	-	-	-	-		2009		18561
FCBA830-SR60	Start	8752	-	-	Please consult factory	7723	8893	10062	11232	13571	15911	18251	20591	Exceeds MOP	-	-	-	-	-	54	7490	110	20591
	Minimum	3315	-	-		2799	3444	4078	4706	5953	7193	8430	9664		-	-	-	-	-		2668		9664
	End	4298	-	-		3371	4553	5735	6918	9282	11647	14012	16377		-	-	-	-	-		3135		16377
FCBA830-SR80	Start	12015	-	-	-	-	-	-	Please consult factory	12234	14573	16913	19253	Exceeds MOP	-	-	-	-	-	73	10596	115	20423
	Minimum	4450	-	-	-	-	-	-		4641	5910	7163	8410		-	-	-	-	-		3732		9030
	End	5638	-	-	-	-	-	-		6012	8377	10742	13107		-	-	-	-	-		4357		14289
FCBA830-SR100	Start	15378	-	-	-	-	-	-	-	-	Please consult factory	15676	18016	20356	Exceeds MOP	-	-	-	-	92	13804	120	20356
	Minimum	5570	-	-	-	-	-	-	-	-		5825	7102	8362		-	-	-	-		4779		8362
	End	6879	-	-	-	-	-	-	-	-		7370	9735	12101		-	-	-	-		5478		12101

Spring-Return Actuators

FCBA300 Series

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

Table 3.

Actuator Model	Spring Torque Start/Minimum/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/Minimum/End (lbf-in)																				
FCBA930-SR40	Start	6930	7010	8496	9982	11468	12954	14440	15927	18900	Exceeds MOP	-	-	-	-	-	-	-	-	5524		20386
	Minimum	2810	2893	3688	4477	5264	6049	6832	7616	9180		-	-	-	-	-	-	-	-	2084	85	9962
	End	3939	4111	5613	7115	8617	10119	11621	13123	16127		-	-	-	-	-	-	-	-	2610		17629
FCBA930-SR60	Start	11419	-	-	Please consult factory	10202	11688	13174	14661	17634	20607	Exceeds MOP	-	-	-	-	-	-	-	10202		20607
	Minimum	4184	-	-		3569	4397	5207	6009	7597	9176		-	-	-	-	-	-	-	3569	90	9176
	End	5208	-	-		4117	5619	7121	8623	11627	14632		-	-	-	-	-	-	-	4117		14632
FCBA930-SR80	Start	15367	-	-	-	-	-	-	Please consult factory	15701	18674	Exceeds MOP	-	-	-	-	-	-	-	13620		20161
	Minimum	5663	-	-	-	-	-	-		5933	7546		-	-	-	-	-	-	-	4778	95	8345
	End	7145	-	-	-	-	-	-		7670	10675		-	-	-	-	-	-	-	5567		12177
FCBA930-SR100	Start	19333	-	-	-	-	-	-	-	-	Please consult factory	19677	Exceeds MOP	-	-	-	-	-	-	17001		21164
	Minimum	7159	-	-	-	-	-	-	-	-		7455		-	-	-	-	-	-	5972	105	8265
	End	9120	-	-	-	-	-	-	-	-		9703		-	-	-	-	-	-	6999		11206
FCBA1030-SR40	Start	9319	9456	11421	13387	15352	17317	19283	21249	Exceeds MOP	-	-	-	-	-	-	-	-	-	7491		21249
	Minimum	3740	3864	4916	5960	7001	8039	9075	10111		-	-	-	-	-	-	-	-	-	2794	70	10111
	End	5199	5456	7441	9427	11412	13398	15384	17370		-	-	-	-	-	-	-	-	-	3470		17370
FCBA1030-SR60	Start	15341	-	-	Please consult factory	13876	15842	17807	19773	Exceeds MOP	-	-	-	-	-	-	-	-	-	13876		21739
	Minimum	5502	-	-		4762	5864	6939	8001		-	-	-	-	-	-	-	-	-	4762	75	9056
	End	6678	-	-		5375	7361	9347	11332		-	-	-	-	-	-	-	-	-	5375		13318
FCBA1030-SR80	Start	20016	-	-	-	-	-	-	Please consult factory	20363	Exceeds MOP	-	-	-	-	-	-	-	-	16825		20363
	Minimum	7611	-	-	-	-	-	-		7906		-	-	-	-	-	-	-	-	5957	80	7906
	End	10027	-	-	-	-	-	-		10618		-	-	-	-	-	-	-	-	7044		10618

Performance Data

Double-Acting Actuators

FCBA300 Series

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

Table 4.

Actuator Model	Volume (cu. in.) ▲		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	105	200	112.3	117.2
FCBA830	341	633	80	200	124.9	129.8
FCBA930	433	713	65	174	138.7	143.6
FCBA1030	572	834	50	174	154.1	159.0

Spring-Return Actuators

FCBA300 Series

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

Table 5.

Actuator Model	Volume (cu. in.) ▲	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	135	200	135.7	141.7
FCBA730-SR60	562	140	200	138.0	144.0
FCBA730-SR80	562	145	200	140.2	146.2
FCBA730-SR100	562	150	200	141.2	147.2
FCBA830-SR40	633	105	200	150.4	156.7
FCBA830-SR60	633	110	200	154.5	160.8
FCBA830-SR80	633	115	200	157.9	164.1
FCBA830-SR100	633	120	200	162.1	168.3
FCBA930-SR40	713	85	174	166.0	172.6
FCBA930-SR60	713	90	174	172.4	178.9
FCBA930-SR80	713	95	174	176.6	183.1
FCBA930-SR100	713	105	174	184.4	191.0
FCBA1030-SR40	834	70	174	187.4	194.3
FCBA1030-SR60	834	75	174	192.4	199.4
FCBA1030-SR80	834	80	174	200.1	207.0

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.

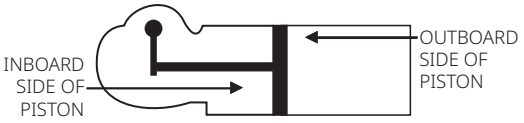
** **Maximum Allowable Working Pressure (MAWP)** is the maximum static pressure that may be applied to a fully stroked actuator against the travel stops.

FCBA-SRXX-M3HW mechanical handwheel overrides are available on these models. The override adds approximately 2 lb / 0.9 kg to the weight of the standard CBA 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.



Actuator Dimensions (in.)

Double-Acting Actuators - FCBAX30

Figure 1.

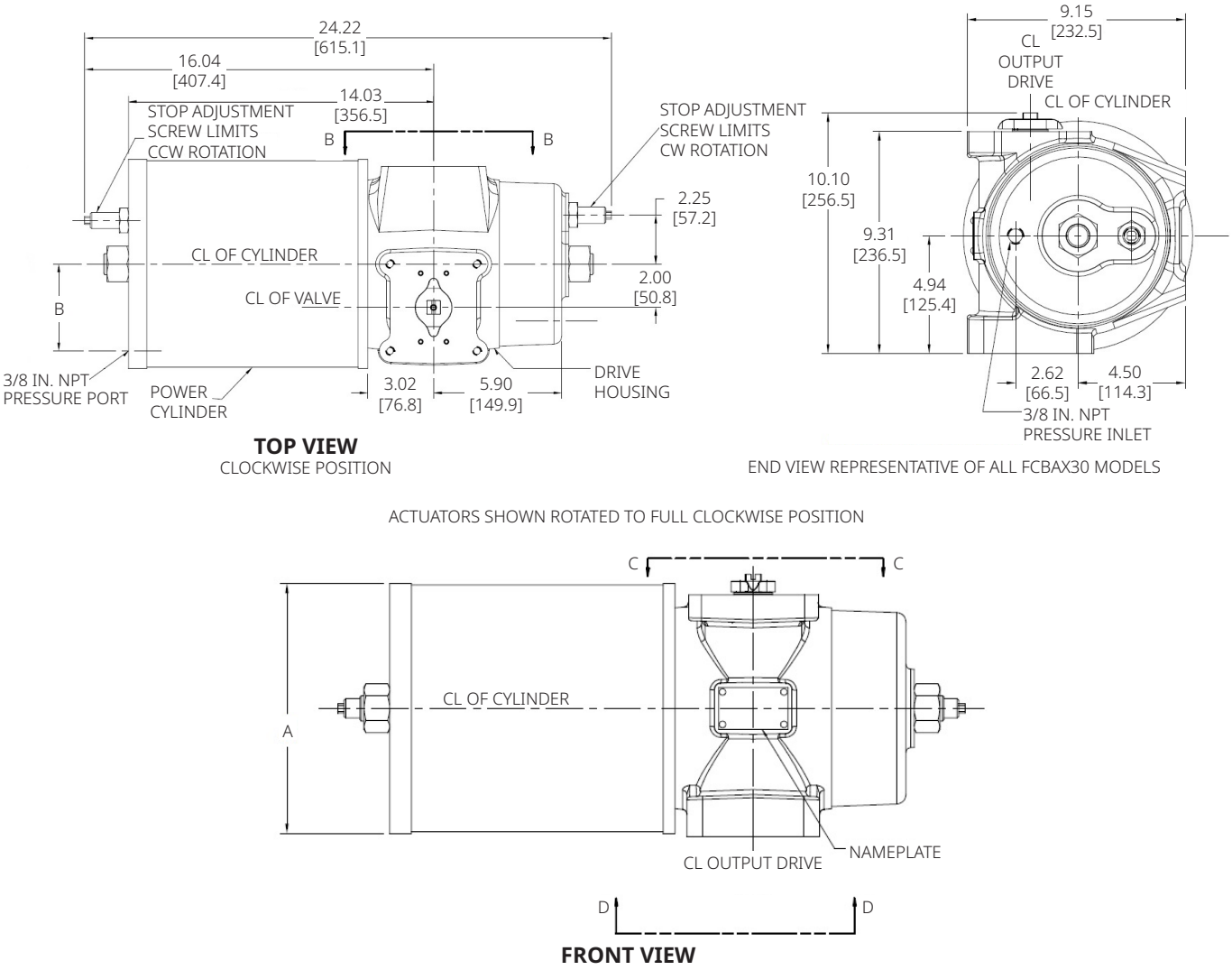
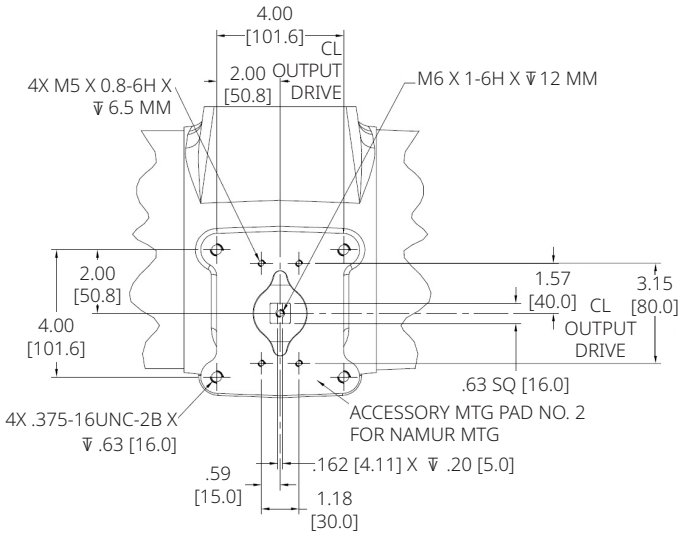


Table 6.

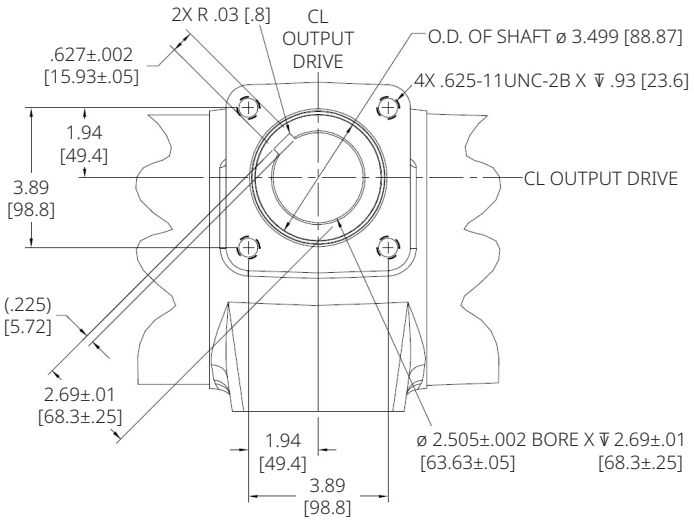
Actuator Model	A	B
FCBA730	7.63	3.00
FCBA830	8.63	3.50
FCBA930	9.63	4.00
FCBA1030	10.88	4.50

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

Figure 2.

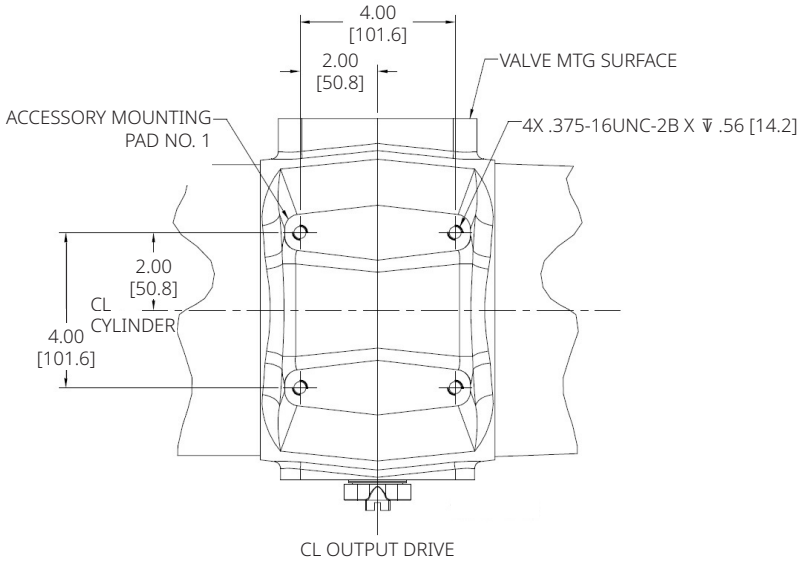


VIEW C-C



VIEW D-D
VALVE MTG SURFACE

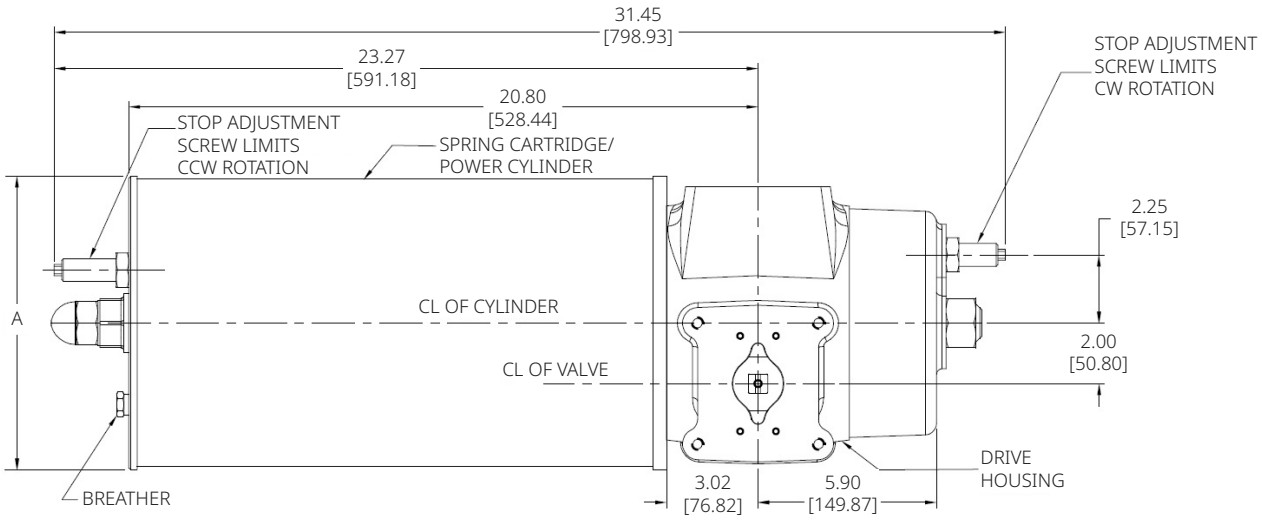
ACTUATORS SHOWN ROTATED TO FULL CLOCKWISE POSITION



VIEW B-B

Spring-Return Actuators - FCBAX30-SRX

Figure 3.



TOP VIEW
CLOCKWISE (FAIL MODE) POSITION

Table 7.

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 are available on request.
Contact factory with correct model designation and serial number.
All dimensions are expressed in inches and dimensions in brackets are in millimeters.

Handwheel Override Dimensions (in.)

Double-Acting Actuators - FCBAX30-M3HW

Figure 4.

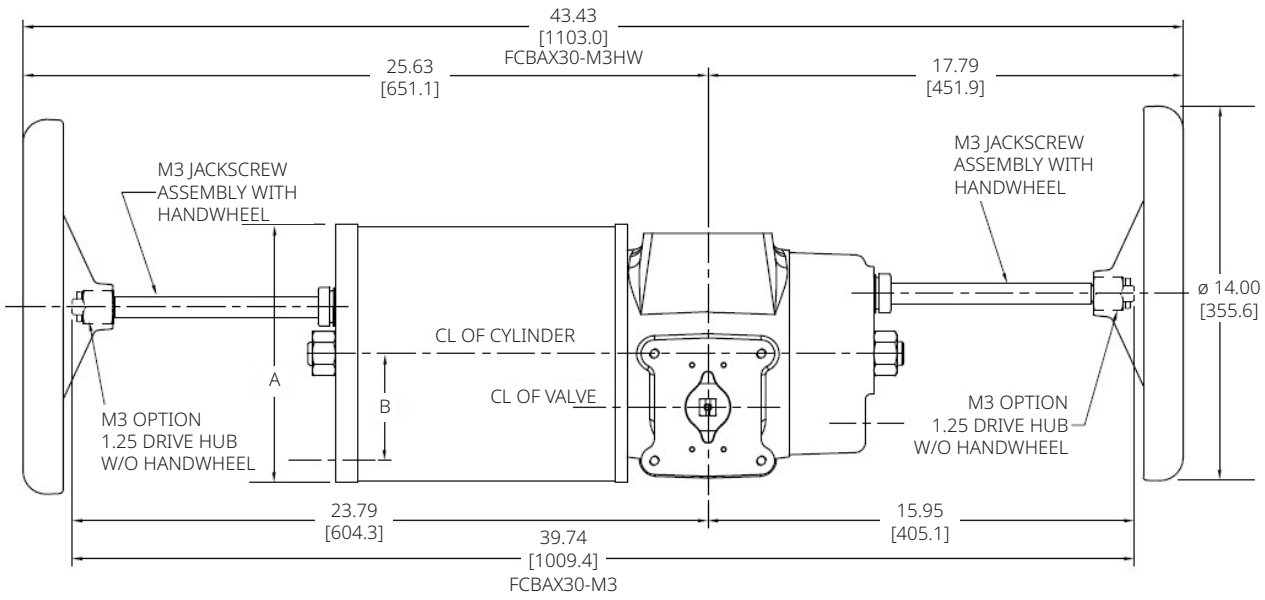


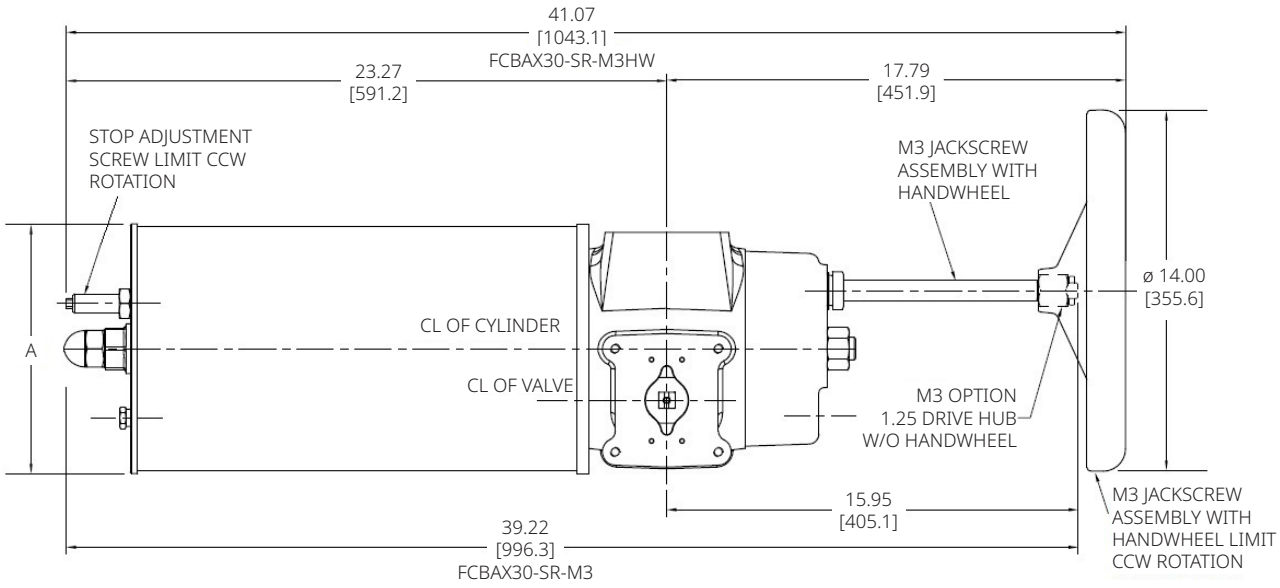
Table 8.

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 are available on request.
Contact factory with correct model designation and serial number.
All dimensions are expressed in inches and dimensions in brackets are in millimeters.

Spring-Return Actuators - FCBAX30-SRX-M3HW

Figure 5.



TOP VIEW

Table 9.

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 are available on request.
Contact factory with correct model designation and serial number.
All dimensions are expressed in inches and dimensions in brackets are in millimeters.

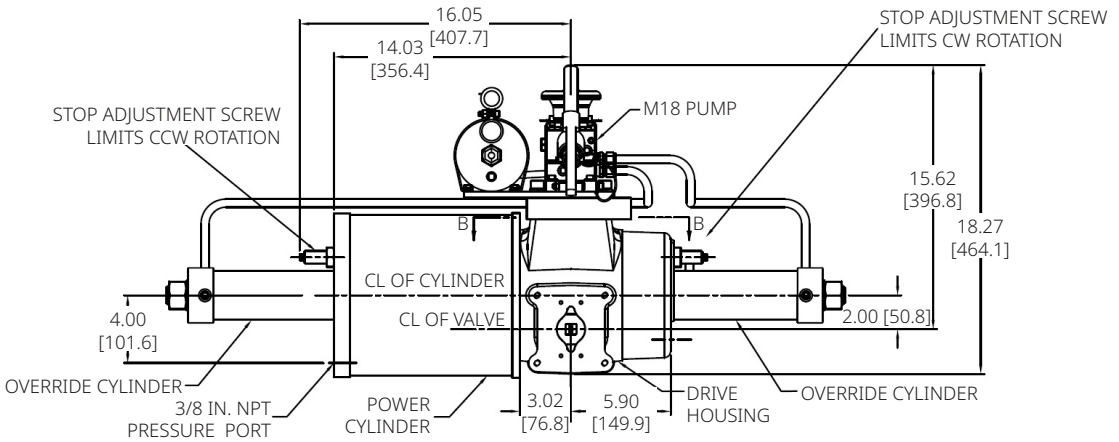
Hydraulic Override Dimensions (in.)

Double-Acting Actuators - FCBAX30-M18

Figure 6.

TOP VIEW
CLOCKWISE POSITION

ACTUATORS SHOWN ROTATED TO FULL CLOCKWISE POSITION

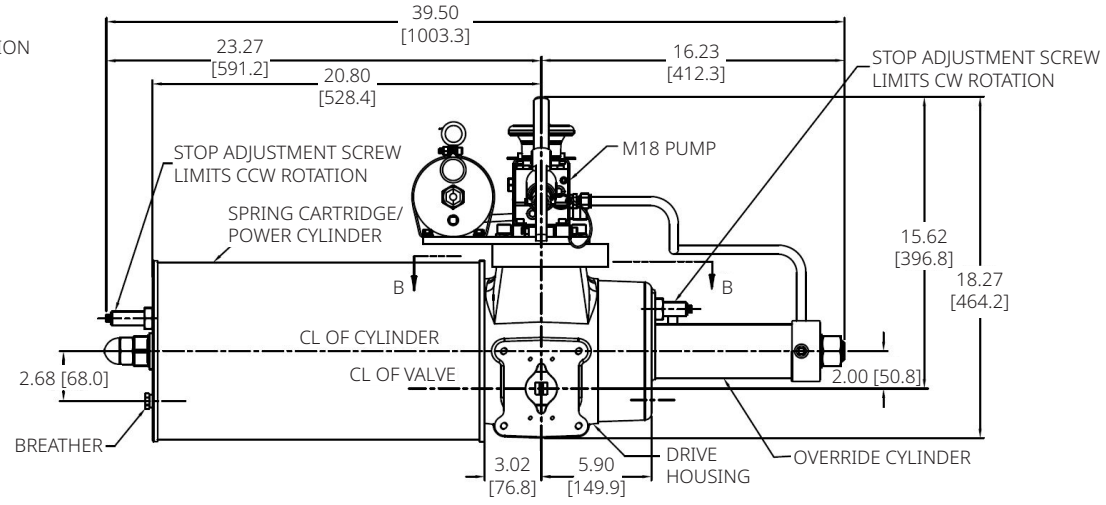


NOTES:
Other dimensions refer to base actuator pages.
Not Certified dimensional drawings. Such drawings are available on request.
Contact factory with correct model designation and serial number.
All dimensions are expressed in inches and dimensions in brackets are in millimeters.

Spring-Return Actuators - FCBAX30-SRX-M18

Figure 7.

TOP VIEW
CLOCKWISE (FAIL MODE) POSITION



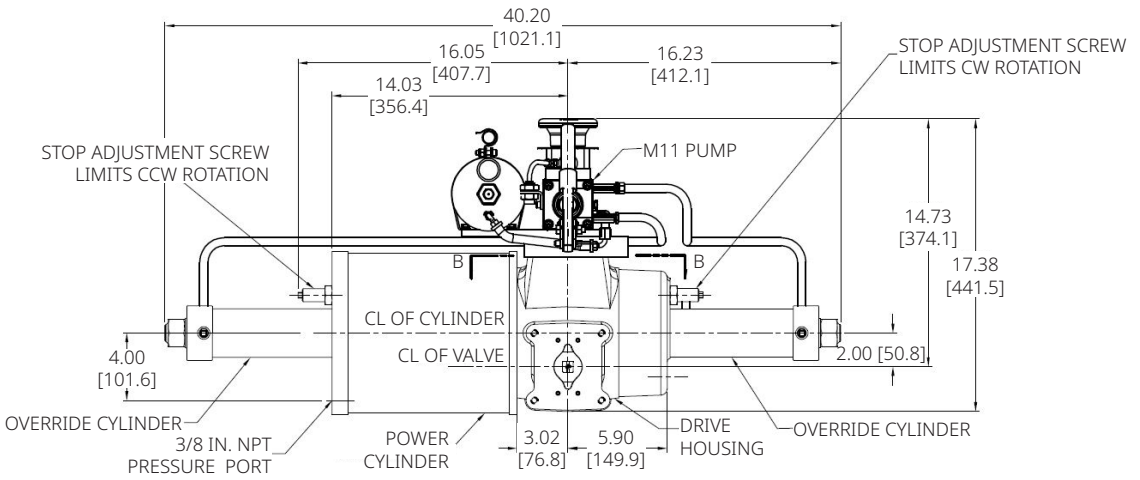
NOTES:
Other dimensions refer to base actuator pages.
Not Certified dimensional drawings. Such drawings are available on request.
Contact factory with correct model designation and serial number.
All dimensions are expressed in inches and dimensions in brackets are in millimeters.

Double-Acting Actuators - FCBAX30-M11

Figure 8.

TOP VIEW
CLOCKWISE POSITION

ACTUATORS SHOWN
ROTATED TO FULL
CLOCKWISE POSITION

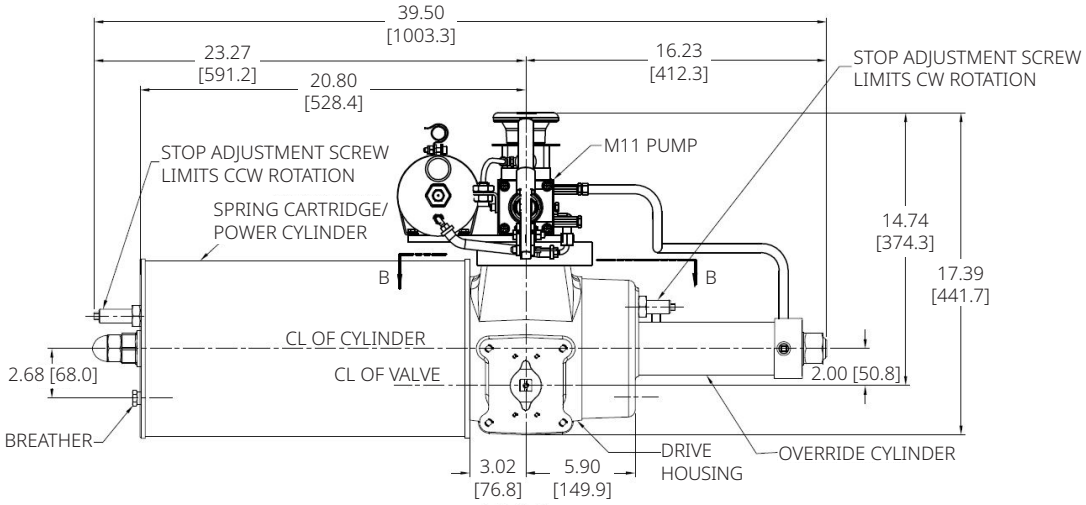


NOTES:
Other dimensions refer to base actuator pages.
Not Certified dimensional drawings. Such drawings available on request.
Contact factory with correct model designation and serial number.
All dimensions are expressed in inches and dimensions in brackets are in millimeters.

Spring-Return Actuators - FCBAX30-SRX-M11

Figure 9.

TOP VIEW
CLOCKWISE (FAIL MODE) POSITION

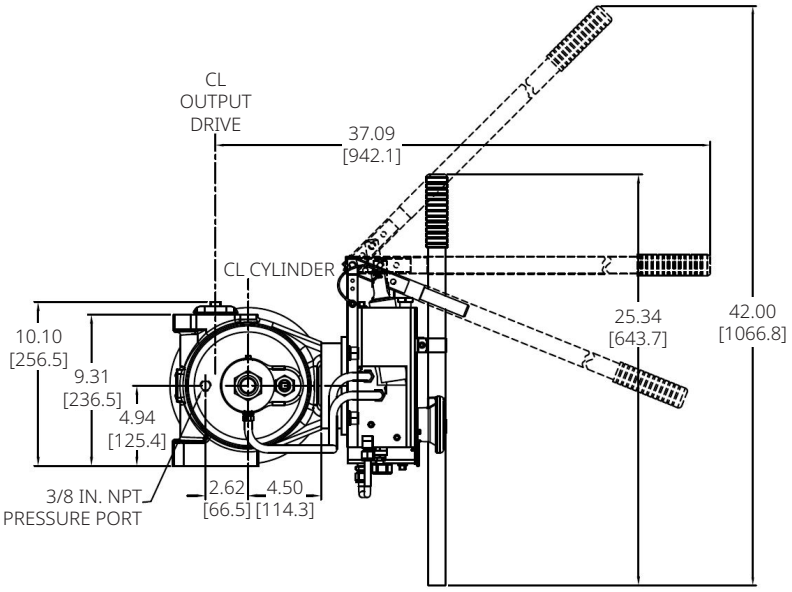


NOTES:
Other dimensions refer to base actuator pages.
Not Certified dimensional drawings. Such drawings available on request.
Contact factory with correct model designation and serial number.
All dimensions are expressed in inches and dimensions in brackets are in millimeters.

Figure 10.

END VIEW

END VIEW REPRESENTATIVE
OF ALL FCBAX30-M18 MODELS

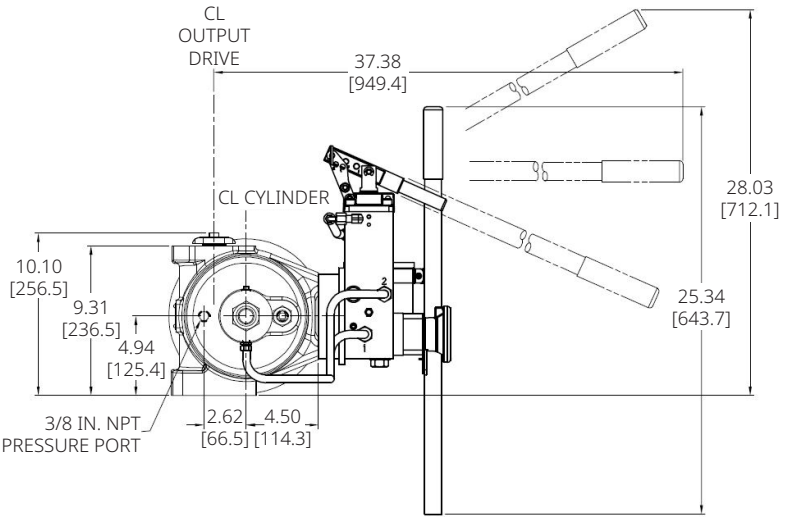


NOTES:
Other dimensions refer to base actuator pages.
Not Certified dimensional drawings. Such drawings available on request.
Contact factory with correct model designation and serial number.
All dimensions are expressed in inches and dimensions in brackets are in millimeters.

Figure 11.

END VIEW

END VIEW REPRESENTATIVE
OF ALL FCBAX30-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 and dimensions in brackets are in millimeters.

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