

CBA300 Series Pneumatic Actuators

Improved Design - Compact, Lightweight To Suit All Applications And Environment



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Emerson is the global leader in valve automation, providing reliable solutions for the most demanding service in the process industry.

CBA300 actuators combine the strength of scotch-yoke actuation cost efficiency and high performance.

Protects against water ingress, adding to the life of the actuator by retarding corrosion.

Suitable for fail-safe service.

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 and chemical 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.

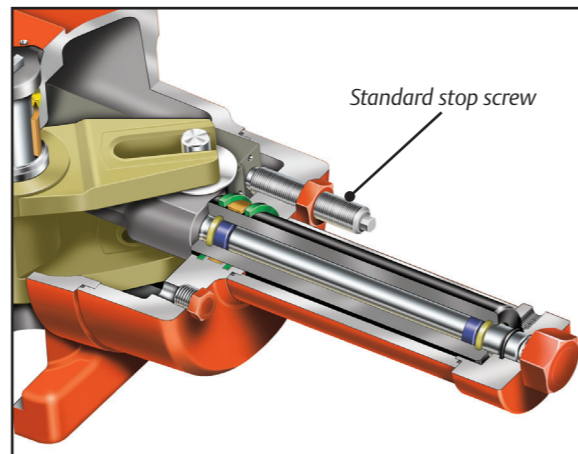
The Bettis™ CBA300 pneumatic actuator incorporates the most advanced features from a proven history in the scotch-yoke design, assuring operating efficiency and cost-effectiveness. They are lightweight and compact, making them ideally suited for automating virtually any quarter turn (90 degree) rotating mechanism, including ball, butterfly, and plug valves. Economical and requiring little maintenance, these actuators come with a variety of options to meet your demanding valve automation needs.

CBA300 Series Applications And Features

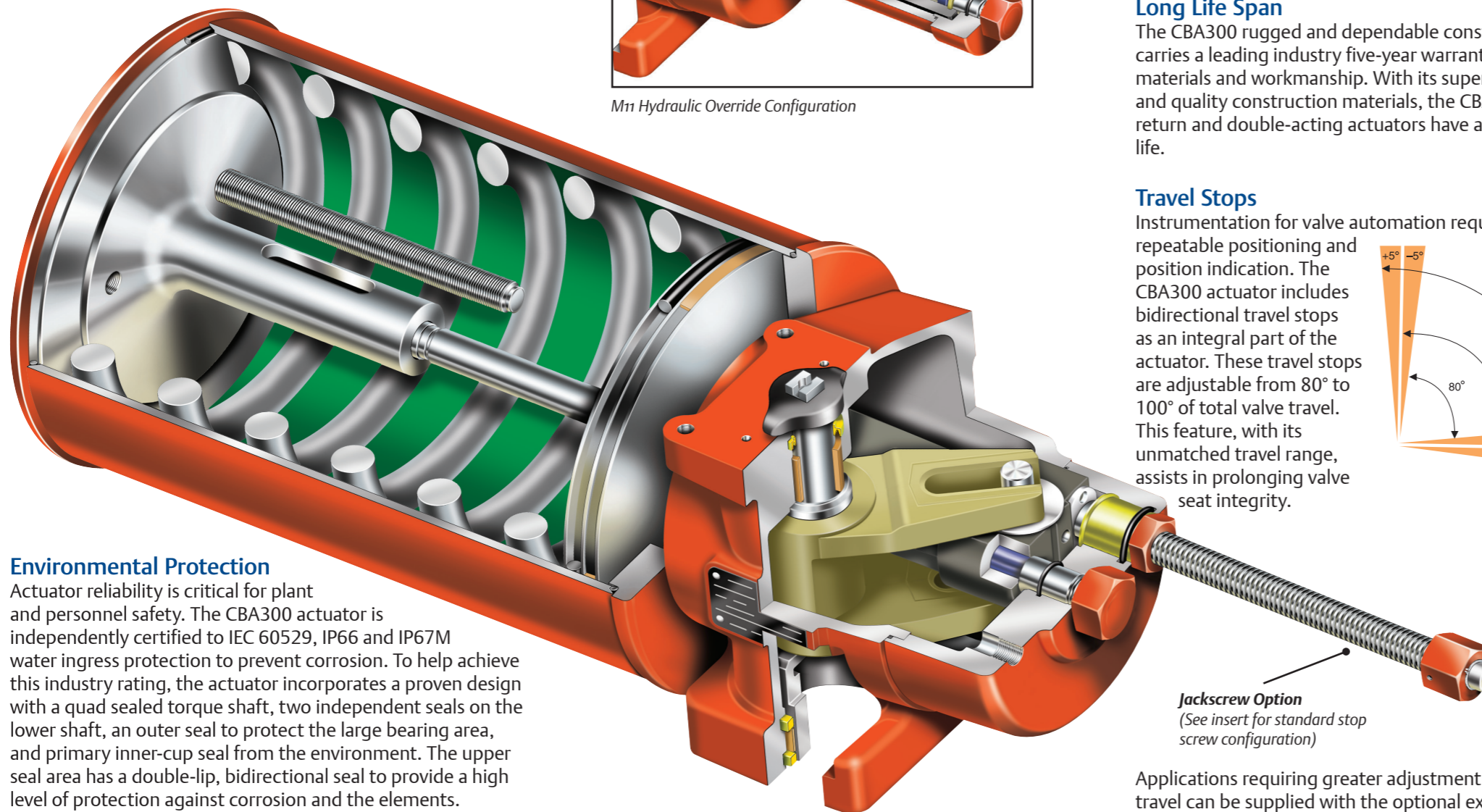
- PED 97/23/EC compliant to meet the stringent requirements of pressure mounting vessels
- Meets both IP66 and IP67M specifications for submergence and severe high pressure water deluge test. This offers superior water ingress and corrosion protection. The actuator has no gaskets and is totally O-ring sealed
- Compatible with NAMUR TopWorx™ mounting configuration allowing it to be internationally accepted and provides the ability to utilize standardized accessories for close coupling or direct mounting on the valve
- Provides models in both spring-return and double-acting configurations. With guaranteed minimum torque outputs ranging from 7,388 lb-in to 20,337 lb-in (835 to 2,333 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 2,532 lb-in to 10,457 lb-in (286 to 1,182 Nm)
- Scotch yoke design provides optimum torque curves for quarter-turn operation
- Light weight, easy installation, and compact for tight piping configurations
- Increased actuator efficiency and corrosion resistance are possible with a Xylan fluoropolymer coating on the interior of the power cylinder. Permanently bonded coating is highly resistant to abrasion, thermal shock and provides excellent lubricity and low friction properties
- 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 97/23/EC)
- Close Loop Instrument System for actuators **should always be used** for the following applications: high humidity, salt air, corrosive dust, inks and dyes and 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 Principle

CBA300 double-acting and single-acting (spring-return) pneumatic actuators are designed in such a way that there are no moving parts on the outside (with the exception of the position indicator) making them safe, easy to install and virtually maintenance free.



M11 Hydraulic Override Configuration



Environmental Protection

Actuator reliability is critical for plant and personnel safety. The CBA300 actuator is independently certified to IEC 60529, IP66 and IP67M water ingress protection to prevent corrosion. To help achieve this industry rating, the actuator incorporates a proven design with a quad sealed torque shaft, two independent seals on the lower shaft, an outer seal to protect the large bearing area, and primary inner-cup seal from the environment. The upper seal area has a double-lip, bidirectional seal to provide a high level of protection against corrosion and the elements.

Extreme temperatures require different solutions to maintain peak operational integrity and reliability. The CBA300 actuator is available in three different temperature trims:

- Standard trim is suitable for -20°F to +200°F (-29°C to +93°C)
- Optional high temperature trim allows operation from 0°F to +350°F (-18°C to +177°C)
- Special non-PED low temperature trim 40°F to +150°F (-40°C to +66°C)
- Factory built or upgrades available
- Pneumatic operating pressures range from 40 to 150 psig (3 to 10 bar)

High Performance Springs

CBA300 actuators have high strength and performance alloy carbon steel springs, protected by Tactyl 50, a pliable self-healing coating. The spring further extends with the shot peening of the springs during manufacture, and additional step that further differentiates its quality from others.

Override Options

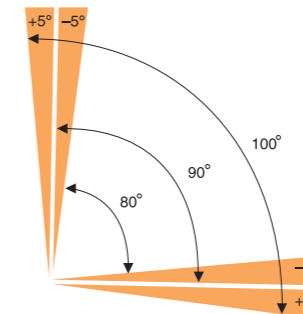
Override modules used to reposition a valve and provide full rated torque in the event of a power loss can be supplied with a jackscrew and hex nut adaptor or a jackscrew with hand wheel. CBA300 actuators come with a blowout-proof jackscrew that absorbs impact loads at maximum recommended actuator speeds. Double-acting models can be supplied with one or two jackscrews. The M11 hydraulic override is also available.

Long Life Span

The CBA300 rugged and dependable construction carries a leading industry five-year warranty on both materials and workmanship. With its superior design and quality construction materials, the CBA300 spring-return and double-acting actuators have a long service life.

Travel Stops

Instrumentation for valve automation requires repeatable positioning and position indication. The CBA300 actuator includes bidirectional travel stops as an integral part of the actuator. These travel stops are adjustable from 80° to 100° of total valve travel. This feature, with its unmatched travel range, assists in prolonging valve seat integrity.



Jackscrew Option
(See insert for standard stop screw configuration)

Applications requiring greater adjustment of valve travel can be supplied with the optional extended travel stops for full valve stroke travel adjustment and use as a lockout device. Consult the factory for this option.

Safety Integrity Level (SIL)

CBA300 actuators are suitable for use within the demanding applications of a SIL environment. These actuators have a Failure Modes and Effects Diagnostics Analysis (FMEDA) capability with reporting performed through Exida.com™ for SIL suitability. They can be combined with other SIL-rated components such as solenoid valves, switches, and regulators. When a Fisher, TÜV-certified FIELDVUE® controller is added to the CBA300, 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 CBA300 then becomes an integral component in controlling the final control element in SIL 1, 2 or 3 applications.

Efficient Bearing Design

Bearings assist in enhancing the life cycle of the actuators by providing smooth and consistent torque output. The CBA300 actuator pistons have three field replaceable bearings. In addition, the actuator features PTFE-coated upper and lower torque shaft bearings for wear resistance and is easily maintained in the field.



Emerson WACC provides actuators for specialty applications such as fire-retardant coatings and treatments

For detailed technical information go to
www.bettis.com/technical-data
Document number [DOC.DSB.CBA300.A4]

Actuator / Accessory Interfaces

Standards and Certifications

Bettis CBA300 pneumatic actuators are manufactured to meet the following worldwide quality and safety standards:



ISO-9001



ABS

PED/97/23/EC –
Pressure
Equipment
Directive



**Bettis CBA300
with Topworx Positioner**



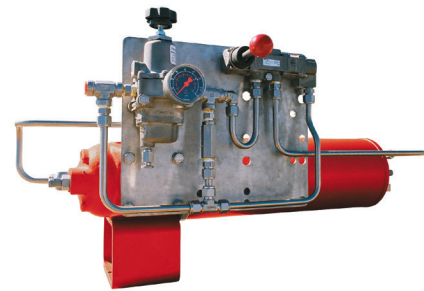
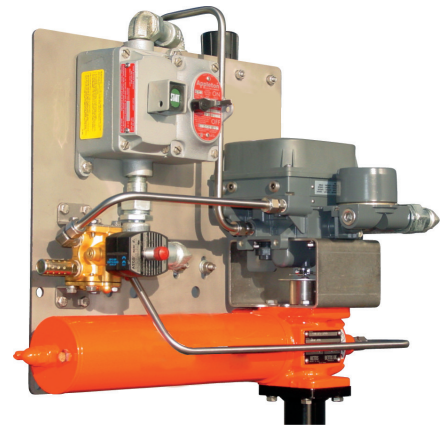
**Bettis CBA300
with Wireless Transmitter**

Valve Automated Packages

Emerson offers a complete valve operating system as a solution for final valve control. Combining the CBA300 actuator and controls with the selected valve into a single system at any of our international Actuation Technologies World Automation Configuration Centers (WACC) – are perfect for large international projects.

Through the use of our global Actuation Technologies World Automation Configuration Centers, Emerson can integrate its products with a complete offering of control options, including world-class PlantWeb® digital plant architecture and the entire range of automation solutions.

Supporting our Actuation Technologies, Emerson has pre-engineered and documented a series of commonly required and approved control system that will reduce lead times, simplify purchasing, installation and start-up.



Other Emerson controls and accessories:

Fisher™

- Digital Valve Controllers
- Positioners
- Regulators

TopWorx™

- Switch Boxes
- Wireless Position Monitoring

ASCO Numatics™

- Solenoid Valves

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).



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Data sheet

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Bettis CBA-300 Series

Technical data sheet - T ^ d æ



Data sheet

Sheet No.: C3PM 1.01 Rev. C

Date: January 2011

CBA-300 Series

Torque Ratings – (Pneumatic)

All Published Torques are Guaranteed Minimum Values.

Double-Acting Actuators

CBA-300-Series

Actuator Model	Stroke Position	Operating Pressure (Bar)						
		3	3.5	4	5	5.5	6	7
		Pressure Torque Output Start/Min./End (Nm)						
CBA730	Start/End	908	1059	1211	1513	1664	1816	2118
	Minimum	522	609	696	870	957	1044	1218
CBA830	Start/End	1192	1390	1589	1986	2185		
	Minimum	685	799	914	1142	1256		
CBA930	Start/End	1513	1765	2018				
	Minimum	870	1015	1160				
CBA1030	Start/End	1999	2333					
	Minimum	1150	1341					

Spring-Return Actuators

CBA-300-Series

Actuator Model	Spring Torque (Nm) Start/Min./End		Operating Pressure (Bar)											
			3	3.5	4	5	5.5	6	7	7.5	8	9	9.5	10
			Pressure Torque Output Start/Min./End (Nm)											
CBA730-SR40	Start	495	564	738	905	1186	1349	1510	1797	1957	2115	2406		
	Min.	199	222	319	409	551	639	725	872	956	1039	1188		
	End	286	313	504	681	946	1119	1287	1563	1729	1892	2174		
CBA730-SR60	Start	763		599	775	1049	1221	1388	1672	1837	2001	2290	2452	
	Min.	297		195	296	432	525	614	755	844	930	1076	1161	
	End	422		217	411	659	845	1024	1289	1465	1637	1912	2082	
CBA730-SR80	Start	1055				940	1116	1286	1565	1733	1899	2184	2349	
	Min.	390				300	405	500	638	729	819	960	1048	
	End	517				324	522	711	961	1145	1324	1587	1763	
CBA730-SR100	Start	1328						1162	1437	1611	1782	2066	2235	2403
	Min.	486						382	518	614	709	846	937	1025
	End	654						442	681	875	1062	1318	1502	1683
Actuator Model	Spring Torque (Nm) Start/Min./End		Pressure Torque Output Start/Min./End (Nm)											
			3	3.5	4	5	5.5	6	7	7.5	8	9	9.5	10
			Operating Pressure (Bar)											

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Data sheet

Sheet No.: C3PM 1.02 Rev. C

Date: January 2011

CBA-300 Series

Torque Ratings – (Pneumatic)

All Published Torques are Guaranteed Minimum Values.

Spring-Return Actuators

CBA-300-Series (cont.)

Actuator Model	Spring Torque (Nm) Start/Min./End		Operating Pressure (Bar)														
			3	3.5	4	5	5.5	6	7	7.5	8	9	9.5	10			
			Pressure Torque Output Start/Min./End (Nm)														
CBA830-SR40	Start	649	741	970	1188	1557	1771	1982	2360								
	Min.	263	296	424	544	733	850	964	1158								
	End	375	412	663	896	1244	1470	1690	2053								
CBA830-SR60	Start	1018		837	1069	1436	1662	1883	2262	2481							
	Min.	389		254	392	573	697	816	1004	1121							
	End	524		255	515	842	1090	1329	1680	1914							
CBA830-SR80	Start	1375				1262	1495	1721	2092	2315							
	Min.	516				398	538	664	848	970							
	End	676				422	686	937	1268	1513							
CBA830-SR100	Start	1744						1571	1935	2162	2386						
	Min.	642						498	681	811	936						
	End	816						532	844	1100	1347						
CBA930-SR40	Start	844	965	1262	1547	2026	2306										
	Min.	346	389	558	716	964	1118										
	End	488	536	862	1166	1618	1913										
CBA930-SR60	Start	1349		1101	1393	1862	2148	2427									
	Min.	505		296	512	752	918	1074									
	End	631		296	626	1040	1357	1660									
CBA930-SR80	Start	1794				1612	1907	2194									
	Min.	675				520	705	873									
	End	850				532	867	1186									
CBA930-SR100	Start	2240						1955	2415								
	Min.	848						656	896								
	End	1073						709	1106								
CBA1030-SR40	Start	1122	1285	1677	2053	2687											
	Min.	456	513	738	946	1274											
	End	636	701	1132	1534	2131											
CBA1030-SR60	Start	1799		1490	1874	2496											
	Min.	660		372	678	996											
	End	803		372	810	1356											
CBA1030-SR80	Start	2326				2063	2455										
	Min.	902				695	935										
	End	1182				753	1195										
Actuator Model	Spring Torque (Nm) Start/Min./End		Pressure Torque Output Start/Min./End (Nm)														
			3	3.5	4	5	5.5	6	7	7.5	8	9	9.5	10			
			Operating Pressure (Bar)														



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Sheet No.: C3PM 2.01 RevB

Date: August 2010

CBA-300 Series

Performance Data – (Pneumatic)

Double-Acting Actuators

CBA-300 Series

Actuator Model	Volume (cu cm) ▲		Maximum Operating Pressure (MOP)* (Bar)	Maximum Allowable Working Pressure (MAWP)** (Bar)	Approximate Weight of Actuator (kg)
	Outboard	Inboard (Housing)			
CBA 730	4260.6	9209.5	7.2	13.8	59
CBA 830	5588.0	10373.0	5.5	13.8	63.5
CBA 930	7095.6	11683.9	4.5	11.7	70.3
CBA 1030	9373.4	13666.8	3.4	9.0	77.1

Spring-Return Actuators

CBA-300 Series

Actuator Model	Volume (cu cm) ▲	Maximum Operating Pressure (MOP)* (Bar)	Maximum Allowable Working Pressure (MAWP)** (Bar)	Approximate Weight of Actuator (kg)
◆ CBA730-SR40	9209.5	9.3	13.8	71.7
SR60	9209.5	9.7	13.8	72.8
SR80	9209.5	10.0	13.8	73.9
SR100	9209.5	10.3	13.8	74.4
◆ CBA830-SR40	10373.0	7.2	13.8	81.6
SR60	10373.0	7.6	13.8	83.7
SR80	10373.0	8.0	13.8	85.3
SR100	10373.0	8.3	13.8	87.3
◆ CBA930-SR40	11683.9	5.9	11.7	88.5
SR60	11683.9	6.2	11.7	91.6
SR80	11683.9	6.6	11.7	93.7
SR100	11683.9	7.2	11.7	93.0
◆ CBA1030-SR40	13666.8	4.8	9.0	99.8
SR60	13666.8	5.2	9.0	102.5
SR80	13666.8	5.5	9.0	105.9

Notes:

◆ CBA-SRXXM mechanical handwheel overrides are available on these models. The override adds approximately 12 lbs. (5kg) to the weight of the standard CB model.

▲ Maximum volume including cavity required for calculating consumption per stroke.

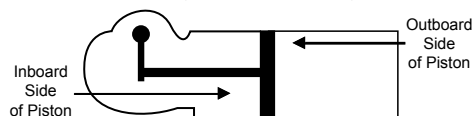
** **Maximum Operating Pressure (MOP)** - The pressure required to produce the maximum rated torque of the actuator.

*** **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



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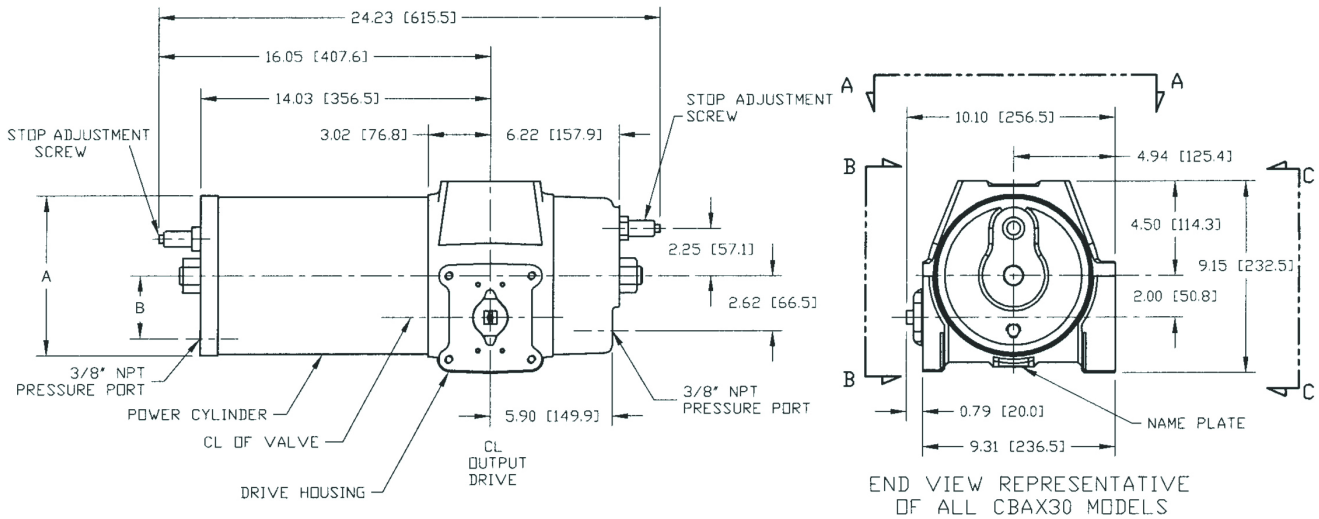
Data sheet

Sheet No.: C3PM 3.01 RevB
 Date: August 2010

CBA-300 Series

Dimensions – (Pneumatic) mm.

Double-Acting Actuators CBAX30



ACTUATORS SHOWN ROTATED TO FULL CLOCKWISE POSITION

Actuator Model	A	B
CBA 730	193.8	76.2
CBA 830	219.2	88.9
CBA 930	244.6	101.6
CBA 1030	276.4	114.3

Note: Not Certified dimensional drawings. Such drawings available on request.
 Contact factory with correct model designation and serial number.
Metric dimensions in parentheses.



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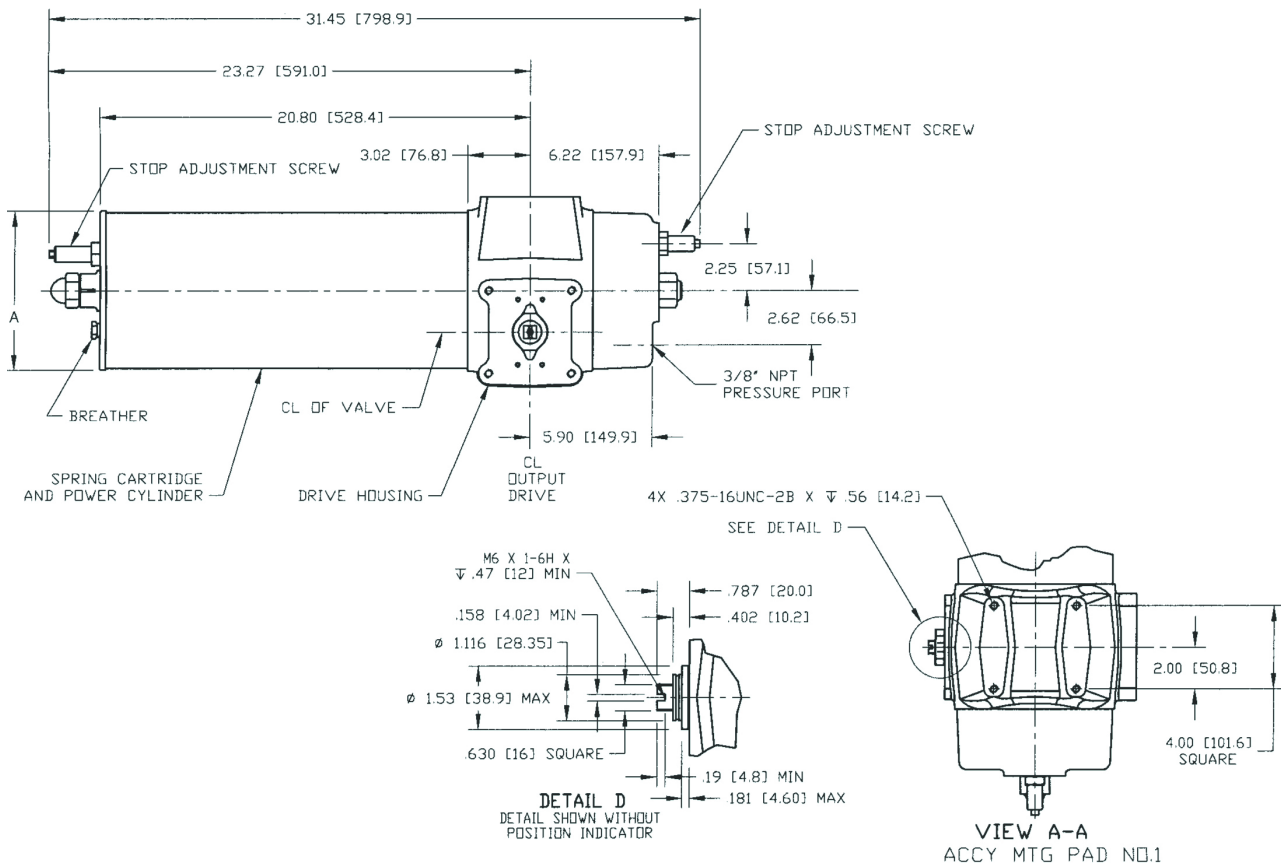
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Sheet No.: C3PM 3.02 RevB
Date: August 2010

CBA-300 Series

Dimensions – (Pneumatic) mm.

Spring-Return Actuators CBAX30-SRX



ACTUATORS SHOWN ROTATED TO FULL CLOCKWISE POSITION

Actuator Model	A
CBA 730-SRX	195.3
CBA 830-SRX	220.7
CBA 930-SRX	246.1
CBA 1030-SRX	279.4

Note: Not Certified dimensional drawings. Such drawings available on request.
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Metric dimensions in *parentheses*.

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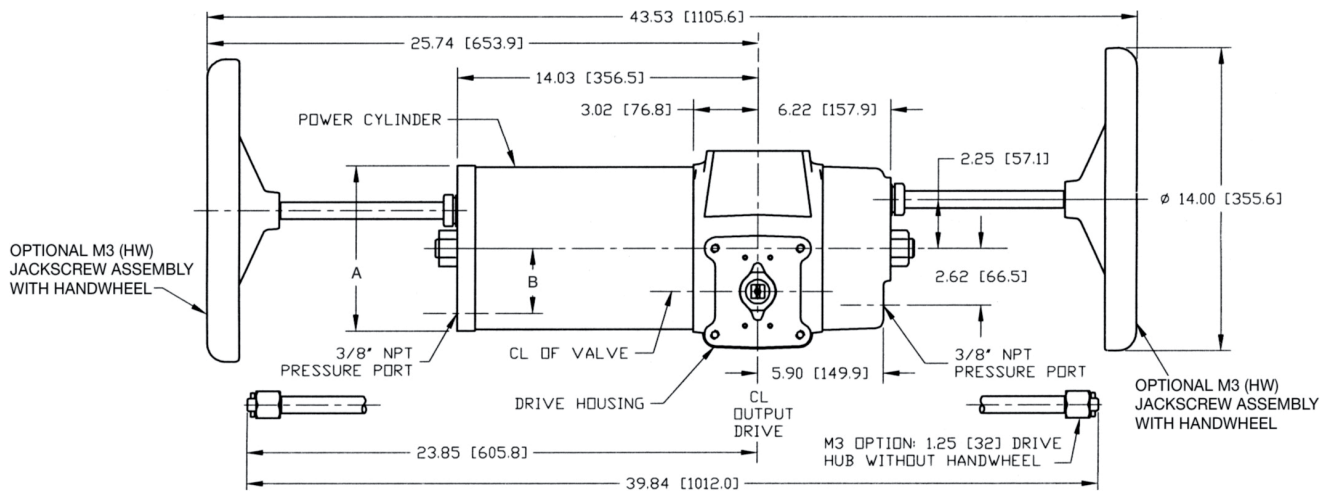
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CBA-300 Series

Dimensions – (Pneumatic) mm.

M3(HW) Override
Double-Acting Actuators
CBAX30-M3(HW)



Actuator Model	A	B
CBA 730-M3HW	193.8	76.2
CBA 830-M3HW	219.2	88.9
CBA 930-M3HW	244.6	101.6
CBA 1030-M3HW	276.4	114.3

Note: Not Certified dimensional drawings. Such drawings available on request.
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Metric dimensions in parentheses.



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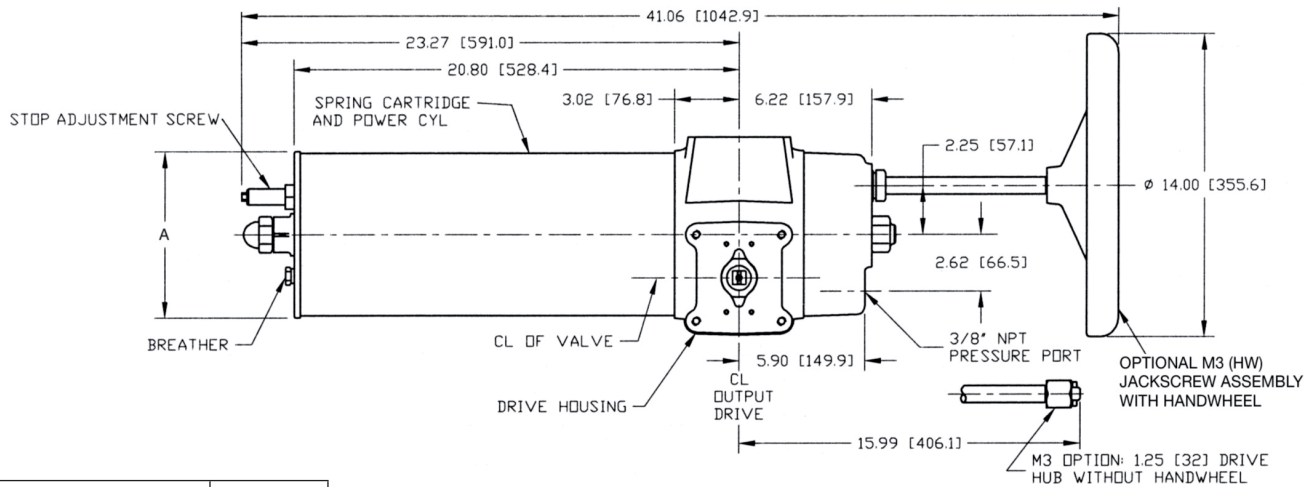
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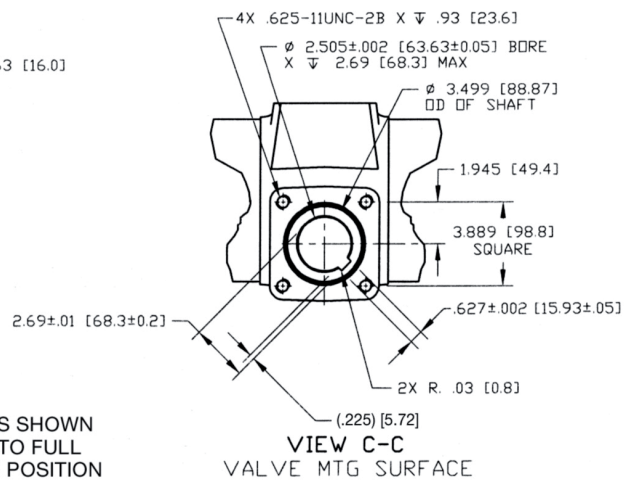
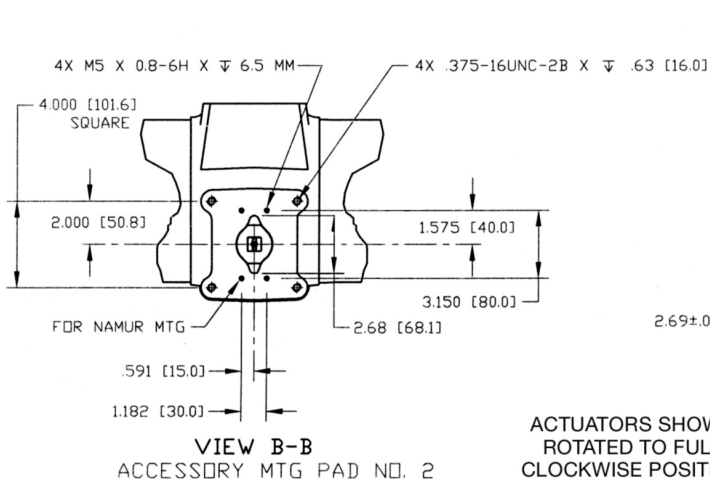
CBA-300 Series

Dimensions – (Pneumatic) mm.

M3(HW) Override
Spring-Return Actuators
CBAX30-SRX-M3(HW)



Actuator Model	A
CBA 730-SRX-M3HW	195.3
CBA 830-SRX-M3HW	220.7
CBA 930-SRX-M3HW	246.1
CBA 1030-SRX-M3HW	279.4



Note: Not Certified dimensional drawings. Such drawings available on request.
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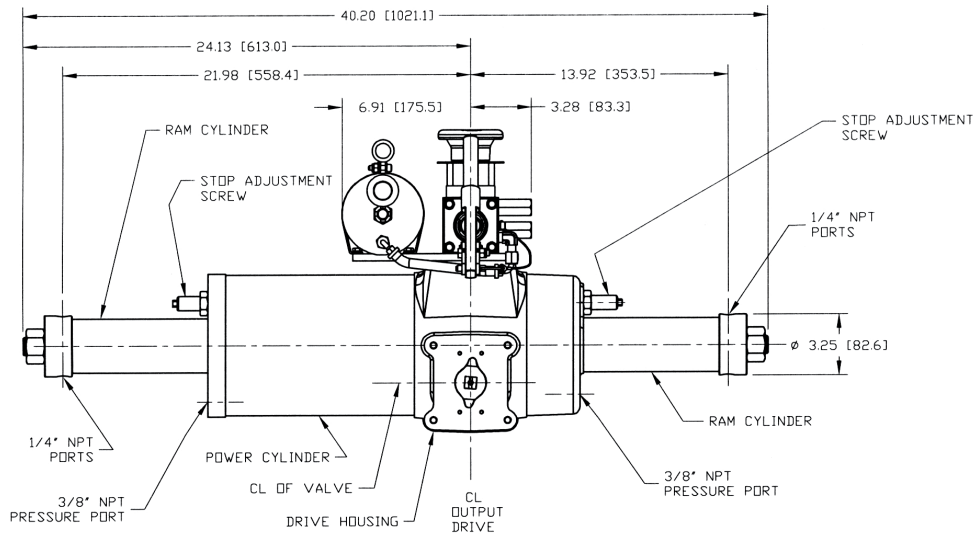
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CBA-300 Series

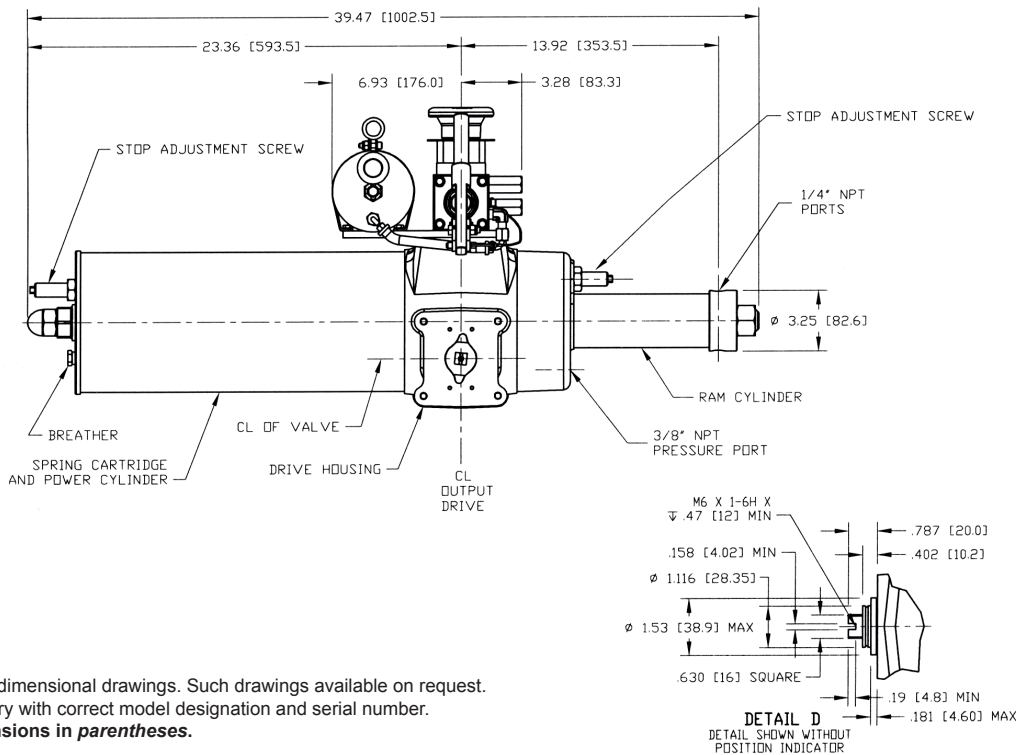
Dimensions – (Pneumatic) mm.

M11 Override Double-Acting Actuators CBAX30-M11



ACTUATORS SHOWN ROTATED TO FULL CLOCKWISE POSITION

Spring-Return Actuators CBAX30-SRX-M11



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Contact factory with correct model designation and serial number.
Metric dimensions in *parentheses*.

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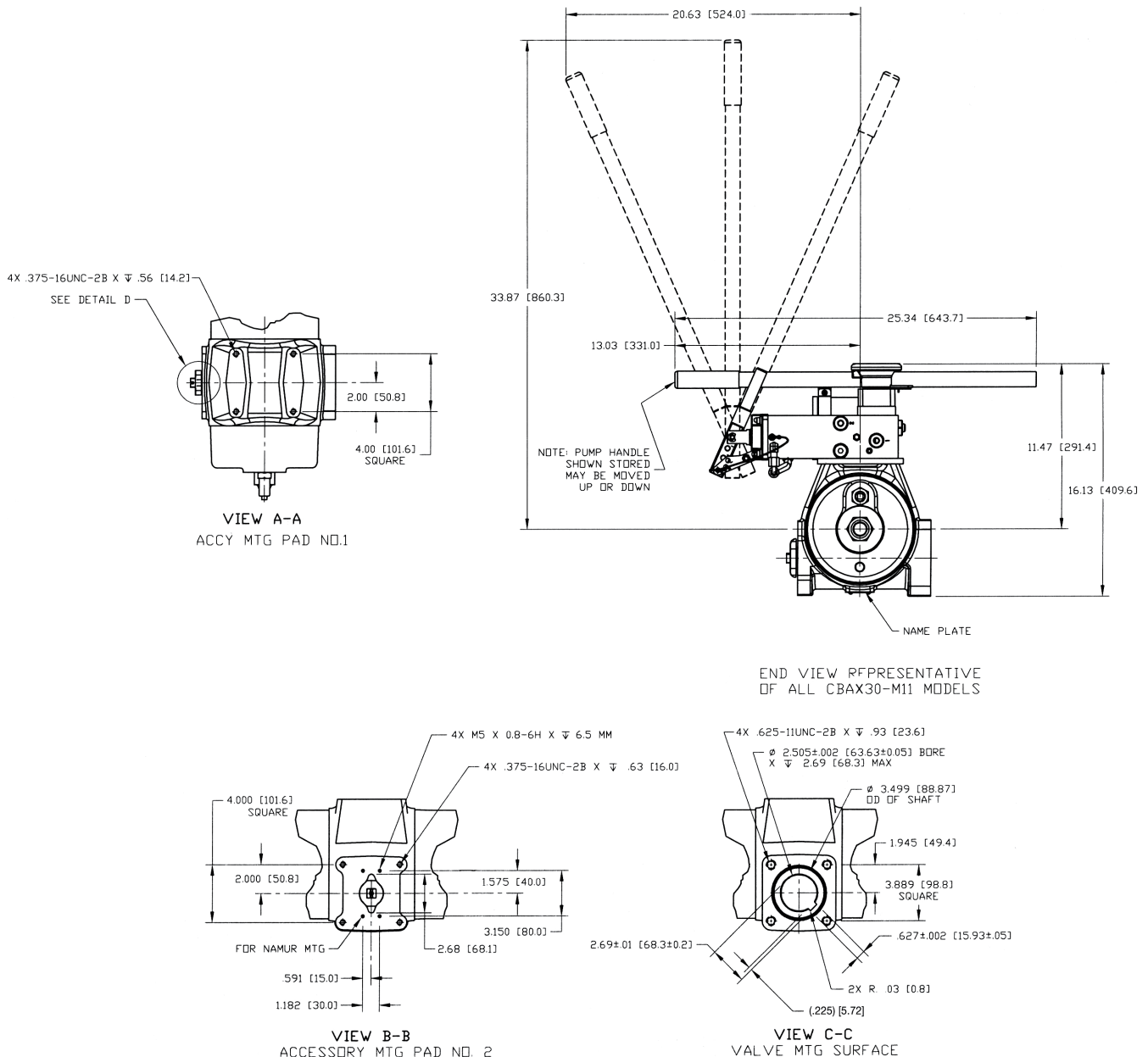
Sheet No.: C3PM 3.06 RevB

Date: August 2010

CBA-300 Series

Dimensions – (Pneumatic) mm.

M11 Override
Spring-Return Actuators
CBAX30-SRX-M11



Note: Not Certified dimensional drawings. Such drawings available on request.
 Contact factory with correct model designation and serial number.
Metric dimensions in parentheses.



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Data sheet

Sheet No.: C3PM 2.01 RevB

Date: August 2010

CBA-300 Series

Performance Data – (Pneumatic)

Double-Acting Actuators

CBA-300 Series

Actuator Model	Volume (cu cm) ▲		Maximum Operating Pressure (MOP)* (Bar)	Maximum Allowable Working Pressure (MAWP)** (Bar)	Approximate Weight of Actuator (kg)
	Outboard	Inboard (Housing)			
CBA 730	4260.6	9209.5	7.2	13.8	59
CBA 830	5588.0	10373.0	5.5	13.8	63.5
CBA 930	7095.6	11683.9	4.5	11.7	70.3
CBA 1030	9373.4	13666.8	3.4	9.0	77.1

Spring-Return Actuators

CBA-300 Series

Actuator Model	Volume (cu cm) ▲	Maximum Operating Pressure (MOP)* (Bar)	Maximum Allowable Working Pressure (MAWP)** (Bar)	Approximate Weight of Actuator (kg)
◆ CBA730-SR40	9209.5	9.3	13.8	71.7
SR60	9209.5	9.7	13.8	72.8
SR80	9209.5	10.0	13.8	73.9
SR100	9209.5	10.3	13.8	74.4
◆ CBA830-SR40	10373.0	7.2	13.8	81.6
SR60	10373.0	7.6	13.8	83.7
SR80	10373.0	8.0	13.8	85.3
SR100	10373.0	8.3	13.8	87.3
◆ CBA930-SR40	11683.9	5.9	11.7	88.5
SR60	11683.9	6.2	11.7	91.6
SR80	11683.9	6.6	11.7	93.7
SR100	11683.9	7.2	11.7	93.0
◆ CBA1030-SR40	13666.8	4.8	9.0	99.8
SR60	13666.8	5.2	9.0	102.5
SR80	13666.8	5.5	9.0	105.9

Notes:

◆ CBA-SRXXM mechanical handwheel overrides are available on these models. The override adds approximately 12 lbs. (5kg) to the weight of the standard CB model.

▲ Maximum volume including cavity required for calculating consumption per stroke.

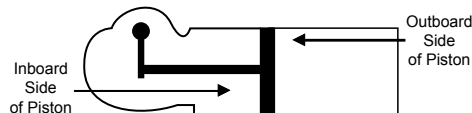
** **Maximum Operating Pressure (MOP)** - The pressure required to produce the maximum rated torque of the actuator.

*** **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



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