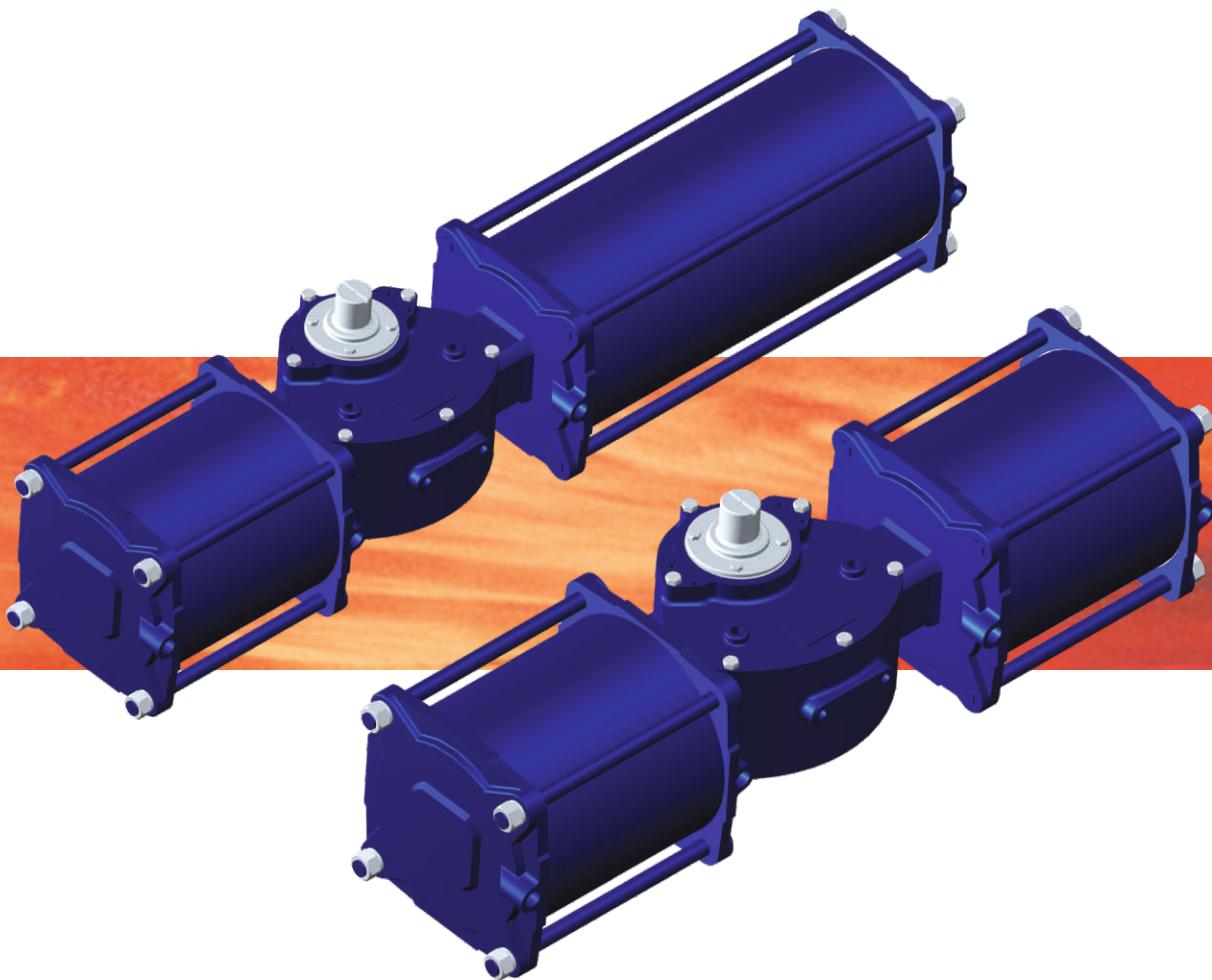




Series 25

Pneumatic Scotch Yoke Actuator
Double Acting and Spring Return



Leading the Industry with Innovation by Design

About Us:

Scotch Yoke Actuator, Quality and Performance you can count on!

In a few short years since the company was formed, DelVal Flow Controls has emerged as a leader in the actuator market. Leading the industry with innovation by design has become the trademark of all DelVal® products. From its unique universal shaft adapter concept to its scotch yoke design with its unique spring design, DelVal® is fast becoming the standard for valve actuation and automation in the oil, gas, water and wastewater, industrial, mining and power industries around the world. DelVal Flow Controls offers a wide range of pneumatic, hydraulic and electric DelTorq® actuators. Our designs are proven performers in the harshest and most challenging environments. The DelVal® and DelTorq® brand means performance, quality, and reliability you can count on.

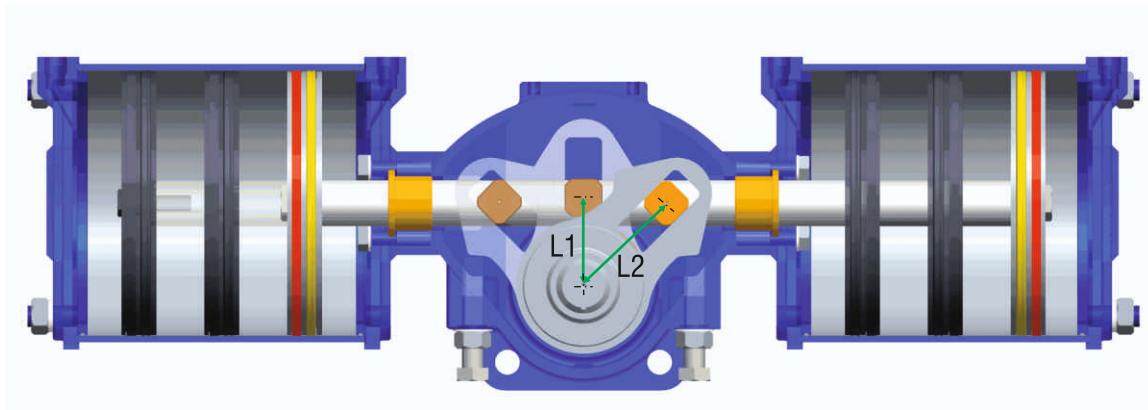
Most DelTorq® actuators are designed to mount directly to ball, butterfly, and non-lubricated plug valves, or any quarter-turn rotating mechanism. On valves where direct mounting is not possible, pre-engineered mounting is available for close mounting. All actuators are manufactured in a modern plant equipped with state-of-the-art facilities under a robust quality assurance program complying with ISO 9001-2000.

DelVal® Valves and DelTorq® Pneumatic Actuators and accessories are marketed and sold worldwide by an experienced team of domestic and international representatives. Our sales offices work closely with the representatives to ensure that our customers' expectations are met and exceeded. A network of authorized distributors stock DelVal® and DelTorq® products for immediate delivery to the oil, gas and industrial markets.

Certifications:

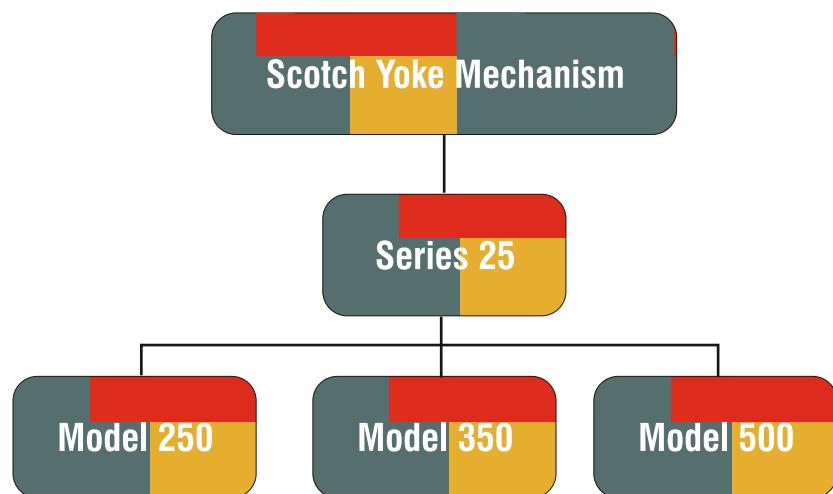
Scotch Yoke Mechanism

The scotch-yoke mechanism produces torque that closely matches the required torque characteristic of most quarter-turn valves. As per the characteristic of the valve, the scotch-yoke produces its highest torque at the start and the end of each stroke, providing maximum torque at opening & closing of the valve.



As the piston moves, the length of the moment arm is changing constantly. Because the effective moment arm is longest at the start and the end of the stroke (L2), the starting torque (torque output at the start and the end of a stroke) approaches nearly twice the magnitude of the minimum torque (L1) (torque output at the shortest moment arm length). Thus, scotch yoke mechanism torque output allows the use of a smaller piston, shorter moment arm and lower operating pressures than many other mechanisms.

Classification:



Design and Construction Series 25 - Model 250/350/500

Design Features

1. Ductile Iron Housing provides better strength with water ingress protection meeting IP 67 grade.

2. Hard Chrome Plated, Honed Finished Cylinder Bore increases seal life.

3. Hard Chrome Plated Steel Piston Rod provides strength and corrosion resistance for enduring high cycle applications.

4. Heat Treated Stainless Steel Thrust Pin transfers piston force to the steel yoke for efficient transmission of torque.

5. Guide Bands And Piston Quad Seals ensure low-friction piston guidance during operation to protect cylinder walls from potential scoring and provide continuous cylinder wiping action.

6. Spring Return Actuators pre-piped with stainless steel tubing to provide air to both pistons with one single connection.

7. Compact Design utilizing a unique two piston design.

8. Unique "Safe Spring Cartridge" Design allows the actuator to be safely assembled and disassembled in the field without the need for special tools. A double acting actuator can be converted to spring return unit by simply changing the cylinder and installing corresponding size of spring cartridge assembly. A spring return can be converted to a double acting actuator by removing the spring cartridge.

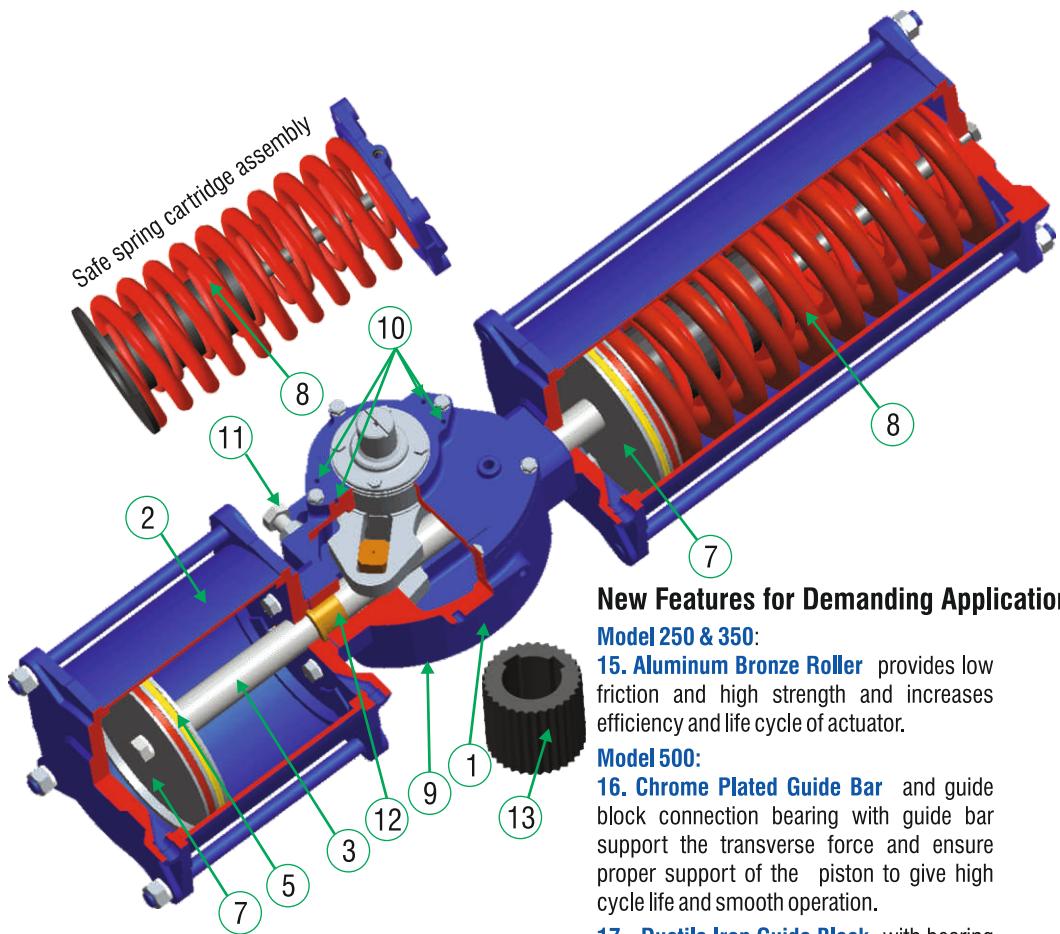
9. ISO 5211 Mounting Pattern provides easy valve / actuator mounting using international standards.

10. Top Cover Drilled To Namur Standards Namur drive slot in shaft on top of yoke enables accessory driven components to maintain a compact assembly.

11. Bi-directional Travel Stop located in the main housing to provide adjustment in open and closed direction $\pm 5^\circ$.

12. Phosphor Bronze Piston Rod Bushing provides low-friction support. Precise alignment of the piston rod increases efficiency and provides extended actuator life and efficient torque transmission.

13 & 14. High Strength Yoke The yoke is a very critical part of the scotch yoke actuator. This part is most often where the life of the actuator is controlled. The yoke converts the linear force to torque. On 250 yoke arm DelTorg® uses 17-4 Ph stainless steel as standard for this critical part. Unique hollow yoke design permits the use of a universal adapter for direct mounting to quarter turn valves.



New Features for Demanding Applications:

Model 250 & 350:

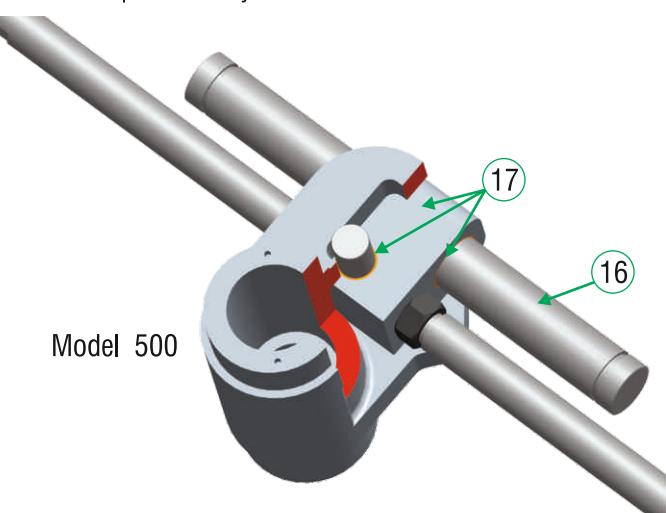
15. Aluminum Bronze Roller provides low friction and high strength and increases efficiency and life cycle of actuator.

Model 500:

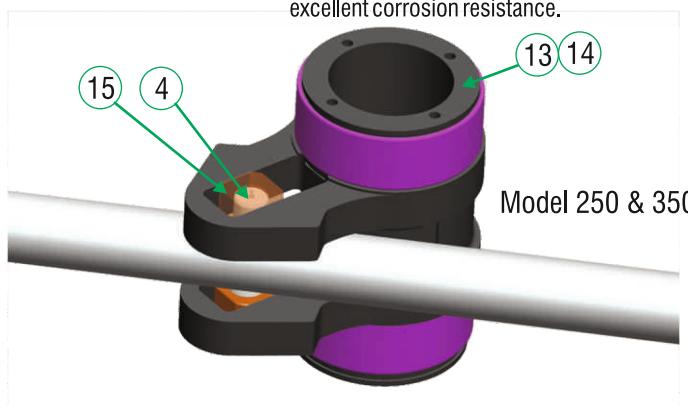
16. Chrome Plated Guide Bar and guide block connection bearing with guide bar support the transverse force and ensure proper support of the piston to give high cycle life and smooth operation.

17. Ductile Iron Guide Block with bearing ensures proper lubrication to pin & guide bar, provides low friction and increases efficiency of the actuator.

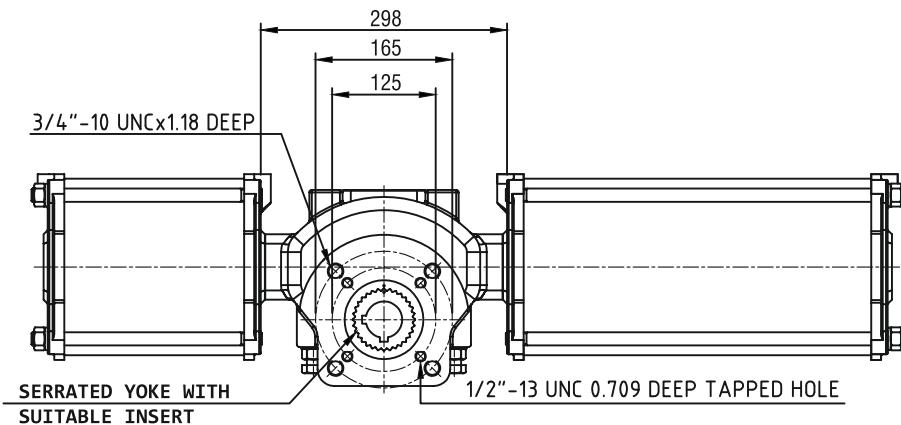
18. Corrosion Protection All casting components are coated on all surfaces through a process of liquid passivation based on trivalent chromium to achieve excellent corrosion resistance.



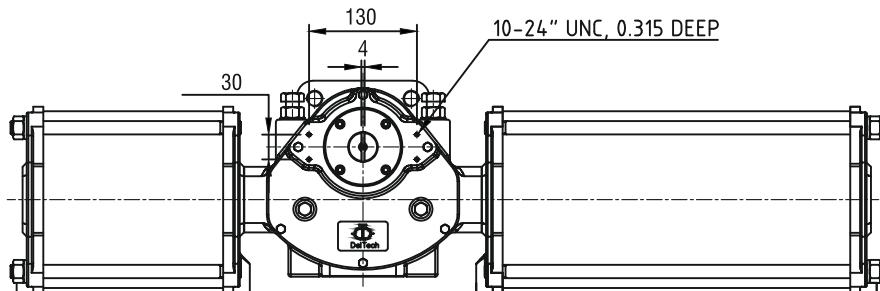
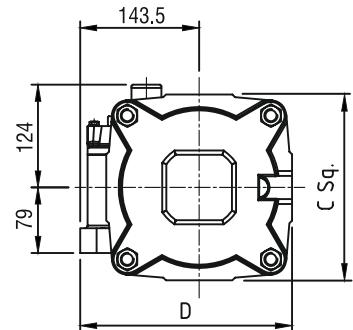
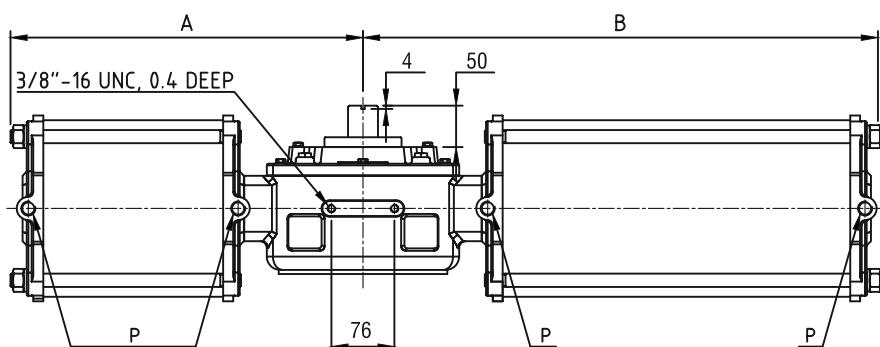
Model 500



Model 250 & 350



MODEL	App. Weight in (Kg)				
	DA	SR 40	SR 60	SR 80	SR 100
250-06	55	62	65	70	78
250-07	65	77	80	85	90
250-08	75	92	95	100	116
250-10	115	142	145	150	152



MODEL	VOLUME (Cm³)			
	Open / Close			
250-06		6231		
250-07		7077		
250-08		11179		
250-10		17251		

Spring Return Torques (Nm)

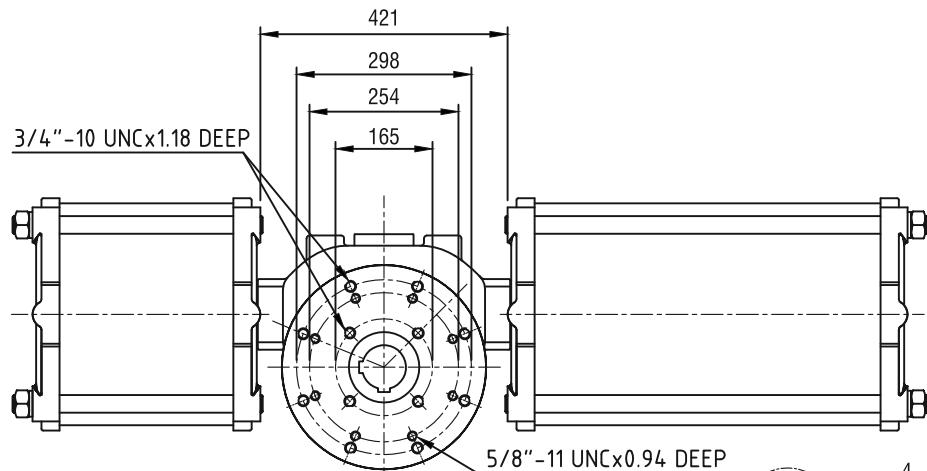
Model	Torque(Nm)	Air Supply Pressure (Bar)			
		2.8	4	5.5	7
250-06	PB	556	834	1112	1389
	PE	309	463	617	771
	SB	531	797	1063	1328
	SE	295	442	590	737
	RUN	222	334	445	556
250-07	PB	762	1143	1524	1905
	PE	423	635	846	1058
	SB	729	1093	1457	1821
	SE	405	607	809	1011
	RUN	305	458	610	763
250-08	PB	991	1487	1983	2478
	PE	550	826	1101	1376
	SB	948	1421	1895	2369
	SE	526	789	1052	1315
	RUN	397	595	794	992
250-10	PB	1552	2328	3104	3880
	PE	862	1293	1723	2154
	SB	1484	2225	2967	3709
	SE	824	1236	1647	2059
	RUN	621	932	1242	1553

Double Acting Torques (Nm)

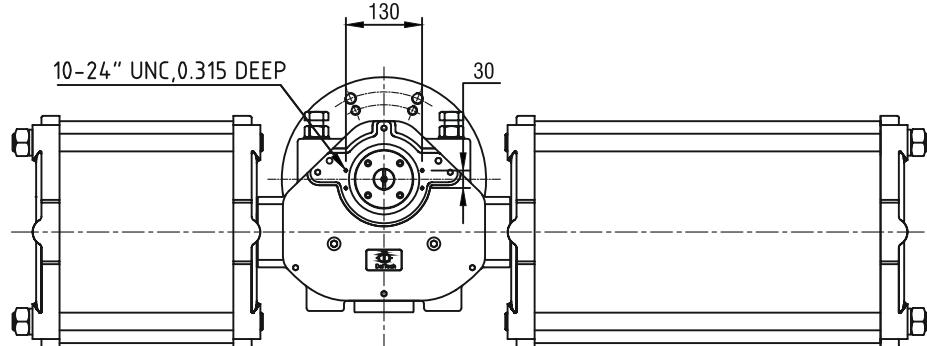
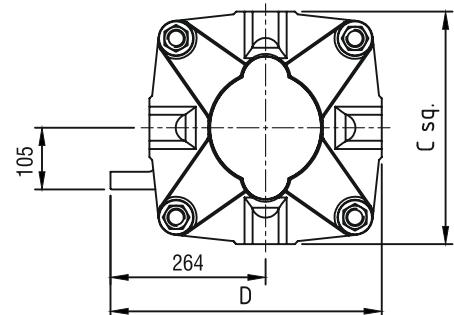
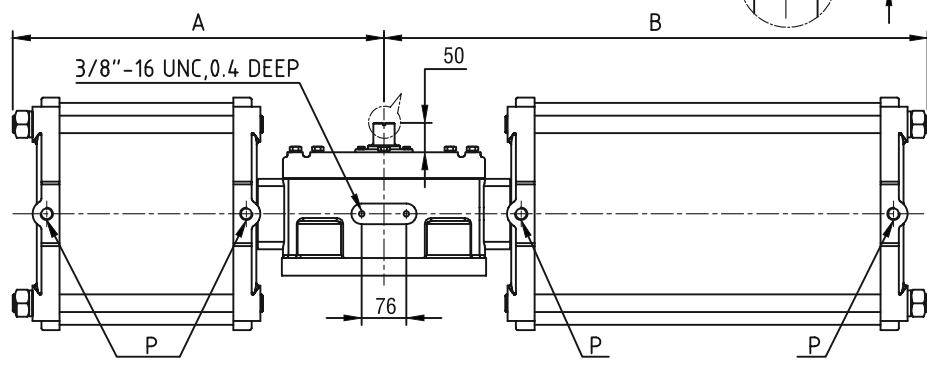
MODEL	TORQUE (Nm)	AIR SUPPLY PRESSURE (Bar)			
		2.8	4	5.5	7
250-06	BREAK	826	1239	1652	2066
	RUN	540	810	1080	1351
250-07	BREAK	1133	1700	2266	2833
	RUN	741	1111	1482	1852
250-08	BREAK	1474	2211	2947	3684
	RUN	964	1445	1927	2409
250-10	BREAK	2307	3461	4614	N.A.
	RUN	1509	2263	3017	

Dimension (mm)

MODEL	A	B					C	D	P
		DA	SR 40	SR 60	SR 80	SR 100			
250-06	415	415	485	525	565	640	173	230	3/8" NPT
250-07	420	420	500	565	560	630	200	244	3/8" NPT
250-08	425	425	515	560	570	625	224	256	1/2" NPT
250-10	443	443	560	585	600	600	275	281	1/2" NPT



MODEL	App. Weight in (Kg)				
	DA	SR 40	SR 60	SR 80	SR 100
350-10	315	375	400	430	470
350-12	320	390	420	455	485
350-14	330	395	442	480	520



MODEL	VOLUME (Cm³)			
	Open / Close			
350-10	12574			
350-12	18950			
350-14	25326			

Spring Return Torques (NM)

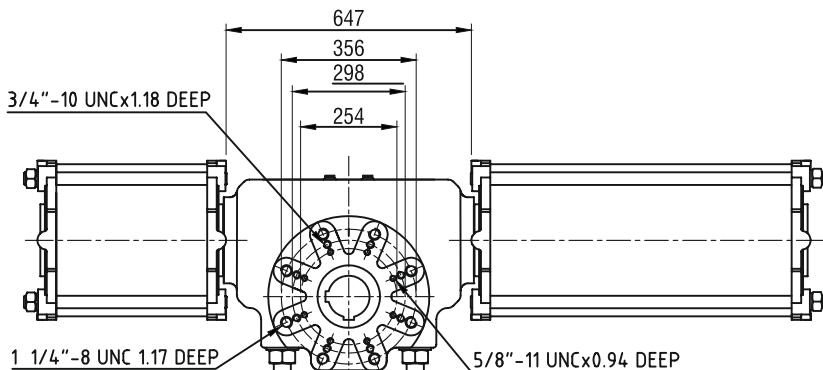
MODEL	TORQUE (N-M)	AIR SUPPLY PRESSURE (Bar)			
		2.8	4	5.5	7
350-10	PB	2200	3300	4399	5499
	PE	1221	1832	2443	3053
	SB	2103	3154	4205	5257
	SE	1167	1751	2335	2919
	RUN	880	1321	1761	2201
350-12	PB	3298	4947	6595	8244
	PE	1831	2746	3662	4577
	SB	3152	4728	6304	7881
	SE	1750	2625	3500	4375
	RUN	1320	1980	2640	3300
350-14	PB	4468	6702	8936	11170
	PE	2481	3721	4961	6202
	SB	4271	6406	8542	10677
	SE	2371	3557	4742	5928
	RUN	1788	2682	3576	4471

Double Acting Torques (N-M)

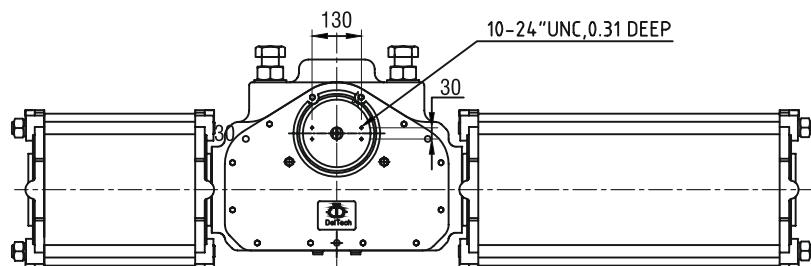
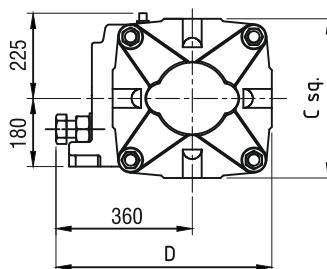
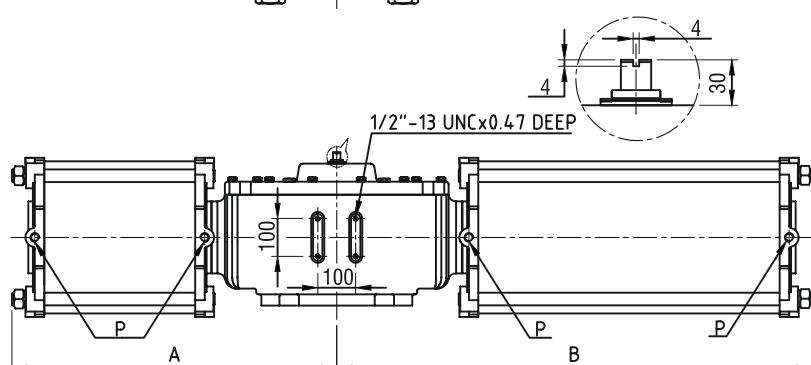
MODEL	TORQUE (N-m)	AIR SUPPLY PRESSURE (Bar)			
		2.8	4	5.5	7
350-10	BREAK	3270	4905	6540	8175
	RUN	2138	3207	4276	5345
350-12	BREAK	4902	7354	9805	12256
	RUN	3205	4808	6411	8013
350-14	BREAK	6642	9963	13284	N.A.
	RUN	4343	6514	8686	

Dimensions (MM)

MODEL	A	B					C	D	P
		DA	SR 40	SR 60	SR 80	SR 100			
350-10	610	610	820	880	995	1167	275	400	1/2" NPT
350-12	620	620	815	890	955	1009	342	435	3/4" NPT
350-14	632.5	632.5	805	894	974	1035	396	462	3/4" NPT



MODEL	App. Weight in (Kg)				
	DA	SR 40	SR 60	SR 80	SR 100
500-12	580	667	675	720	770
500-14	605	744	755	805	849
500-15	626	775	785	829	890
500-16	644	817	829	890	940



MODEL	VOLUME (Cm³) Open / Close	
	Open	Close
500-12	28753	
500-14	58879	
500-15	66581	
500-16	76528	

Spring Return Torques (N·M)

MODEL	TORQUE N·M	AIR SUPPLY PRESSURE (Bar)			
		2.8	4	5.5	7
500-12	PB	4763	7145	9527	11908
	PE	2645	3967	5289	6612
	SB	4553	6830	9106	11383
	SE	2528	3792	5056	6320
	RUN	1906	2860	3813	4766
500-14	PB	6454	9681	12097	16134
	PE	3583	5375	7166	8958
	SB	6169	9253	12338	15422
	SE	3425	5138	6850	8563
	RUN	2583	3875	5166	6458
500-15	PB	7300	10950	14600	18250
	PE	4053	6079	8106	10132
	SB	6978	10467	13956	17445
	SE	3874	5811	7748	9685
	RUN	2922	4383	5843	7304
500-16	PB	8388	12582	16776	20970
	PE	4657	6986	9314	11643
	SB	8018	12027	16036	20045
	SE	4452	6678	8903	11129
	RUN	3357	5036	6714	8393

Double Acting Torques (N·M)

MODEL	TORQUE (N·M)	AIR SUPPLY PRESSURE (Psi)			
		2.8	4	5.5	7
500-12	BREAK	7081	10622	14162	17703
	RUN	4630	6945	9260	11575
500-14	BREAK	9594	14391	19188	23985
	RUN	6273	9410	12546	15683
500-15	BREAK	10852	16278	21704	27130
	RUN	7096	10643	14191	17739
500-16	BREAK	12470	18705	24939	31174
	RUN	8153	12230	16307	20383

Dimensions (MM)

MODEL	A	B							
		DA	SR 40	SR 60	SR 80	SR 100			
500-12	830	830	1120	1227	1352	1437	350	535	3/4" NPT
500-14	838	838	1122	1246	1336	1421	396	558	3/4" NPT
500-15	857	857	1141	1245	1345	1475	420	570	3/4" NPT
500-16	850	850	1142	1245	1360	1440	450	585	3/4" NPT

Optional Features

Fail-Safe Operation:

Each DelTorq® actuator is capable of fail-safe operation using either stored compressed gas (air) or a mechanical spring.

Optional Accessories

Series 83 DelMonitor:

This valve position monitor mounts directly to the top of the actuator with a special compact bracket. The standard highly visible indicator shows valve position locally, and the internal switches indicate valve position to a remote location. Standard switches are two single poles double throws (SPDT). Micro switches are rated at 10 amps, 125 or 250 VAC, 220 VDC. The housing is rated to IP65/IP67.



Trims:

Trim options for these actuators include seals for high and low temperature applications. The actuator is designed to resist affects of environmental conditions.

Series 85 3-Way and 4-Way Solenoid Valve:

Series 85 solenoid valves are 3-way or 4-way, 5 ported 2 position piloted spool type single or dual solenoid valves designed for air or gas service. Valves are made of rugged anodized aluminum. A built-in manual operator allows manual operation when desired or during an electrical power outage. All valves are supplied with all necessary hardware for a direct mount installation.



Optional Three Coat Offshore Protective Coating System:

The basic three-coat offshore protective coating is a Zinc based coat applied to an actuator that has been sand blasted to specifications. A tie coat is then applied. The valve is then finished and protected with a light gray polyurethane topcoat. This offshore protective coating is applied at the factory using newly machined castings. 100% of the actuator surface including the area under the tag coated leaving no area for corrosion to start.

Series 87 Positioner:

The Series 87 positioner offers a diverse mix of positioners and feedback for direct mounting to all DelTorq® actuators. Available in pneumatic and electropneumatic designs with low air consumption and high accuracy for use on single or double acting actuators. Quality design and product performance are coupled with competitive pricing and excellent service to provide a cost effective approach to accurate control and position feedback.



How to Order DelTorq Pneumatic Scotch Yoke Actuators

Series	Size		Operation	Trim / Other Variables / Specials					
	□ □	□ □ □		□ □	□ □	□	□ □ □	□ □	
Series	Housing	*Cylinder	Pressure Connection	Spring Pressure Rating	Manual Override	Shaft Rotation	**Insert Size	Special Options	
25 = Scotch Yoke Actuator	250 = 2.5" Yoke Arm	06 = 6" Ø	SR = Spring Return	000=For DA actuators	DJ=Double Jackscrew	C = Fail Clockwise Direction (Standard for SR)	Refer to the "available insert option" chart for the 2.5" yoke arm. For insert option of 3.5" and 5" yoke arm, please contact factory.	00= No special requirements (Ductile iron housing, chrome plated steel cylinder and ductile iron end caps)	
	350 = 3.5" Yoke Arm	07 = 7" Ø	DA = Double Acting	040=Rated for 2.8 BAR	SJ=Single Jackscrew	F = Fail Counter Clockwise Direction		SS = Stainless steel housing, cylinder and end caps	
	500 = 5.0" Yoke Arm	08 = 8" Ø		060=Rated for 4 BAR	00=None	S = Standard for Double Acting Models		OP = 3 coat offshore protective coating system	
		10 = 10" Ø		080=Rated for 5.5 BAR	DH=Double Acting Hydraulic	Y = Reverse Acting for Double Acting Models			
		12 = 12" Ø		100=Rated for 7 BAR	SH=Single Acting Hydraulic				
		14 = 14" Ø							
		15 = 15" Ø							
		16 = 16" Ø							

**Available insert option only for 2.5" yoke arm

000 = Blank

55S = 22 SQ.

56S = 27 SQ.

58S = 36 SQ.

05D = 30 X 22 DD.

89D = 35 X 24 DD.

22R = 35 R/10 SQ. KEY

68R = 40 R/ 12 X 8 KEY

73R = 40 R/ 10 SQ KEY

71R = 44.4 R / 9.525 SQ. KEY

17R = 45 R / 14 X 9 KEY

25R = 50 R / 12 X 10 KEY

90R = 50 R / 14 X 9 KEY

* Available cylinder sizes against corresponding yoke arm

Series	Yoke Arm	Cylinder Size
25	2.5"	6", 7", 8", 10"
25	3.5"	10", 12", 14"
25	5.0"	12", 14", 15", 16"

All statements, technical information and recommendations in the bulletin are for general use only. DelVal Flow Controls is not responsible for suitability or compatibility of these products in relation to system requirements. Consult DelVal Flow Controls distributors or factory for the specific requirements and material selection for your intended application. DelVal Flow Controls reserves the right to change or modify product design or product without prior notice. DelVal® - Registered trademark of DelVal Flow Controls.

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