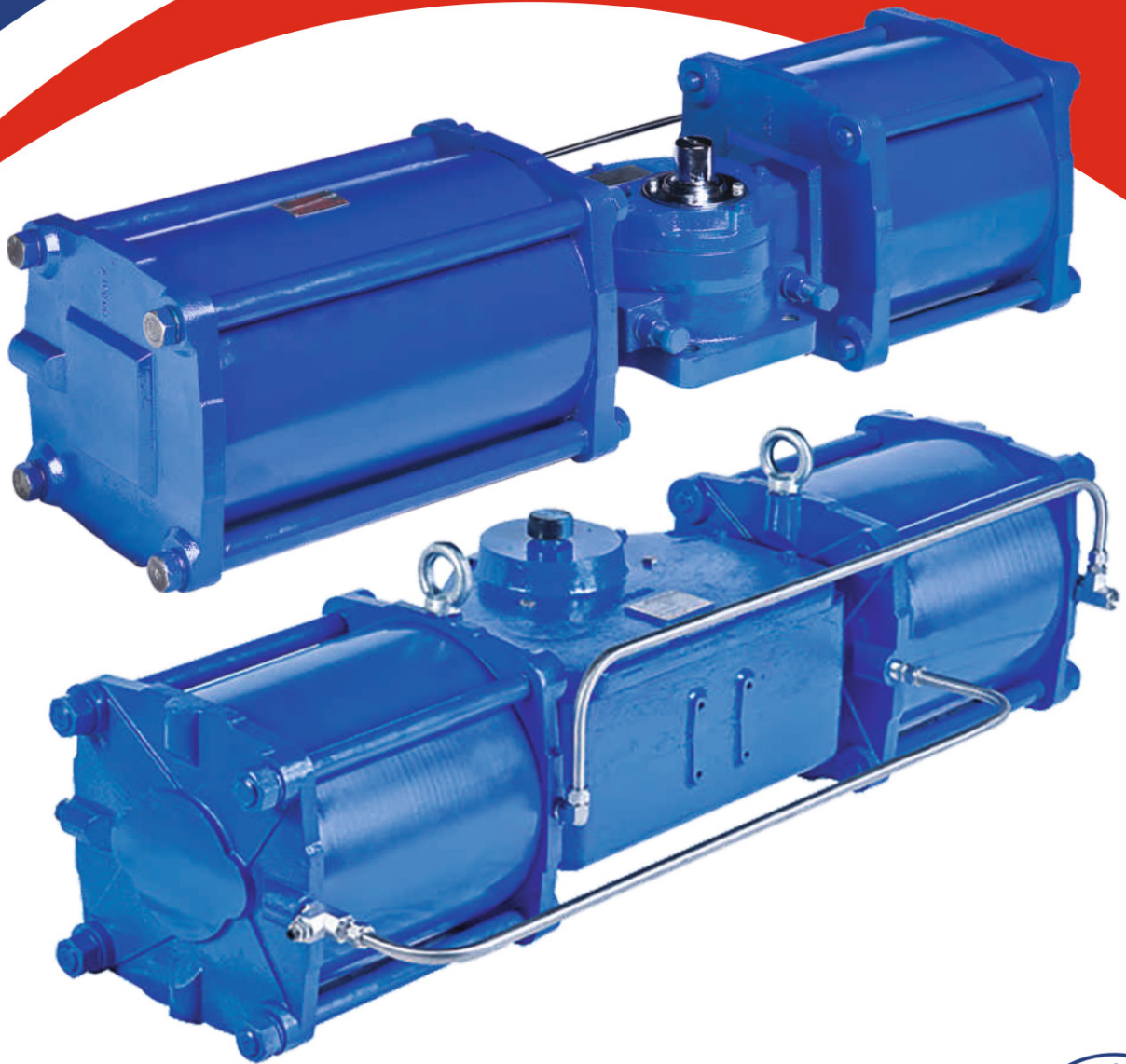


DelTorq[®] SERIES 25

Pneumatic Scotch Yoke Actuators
Double Acting and Spring Return



delvalflow.com

1-833-DELVAL1



STANDARD FEATURES

Quality & Performance

DelVal Flow Controls provides a wide range of quality products with the reliability you can count on. All Series 25 actuators are manufactured in ISO 9001 certified facilities with a robust quality management system.

Design Construction and Features

1. Ductile Iron Housing

Ductile iron housing provides better strength with water ingress protection meeting IP 67 grade.

2. Hard Chrome Plated, Honed Finished Cylinder Bore

The chrome plated cylinder bore increases seal life.

3. Hard Chrome Plated Steel Piston Rod

The piston rod provides strength and corrosion resistance for enduring high cycle applications.

4. Heat Treated Stainless Steel Thrust Pin

The thrust pin transfers piston force to the steel yoke for efficient transmission of torque.

5. Guide Bands And Piston Quad Seals

Guide bands and piston 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. Unique "Safe Spring Cartridge" Design

The 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.

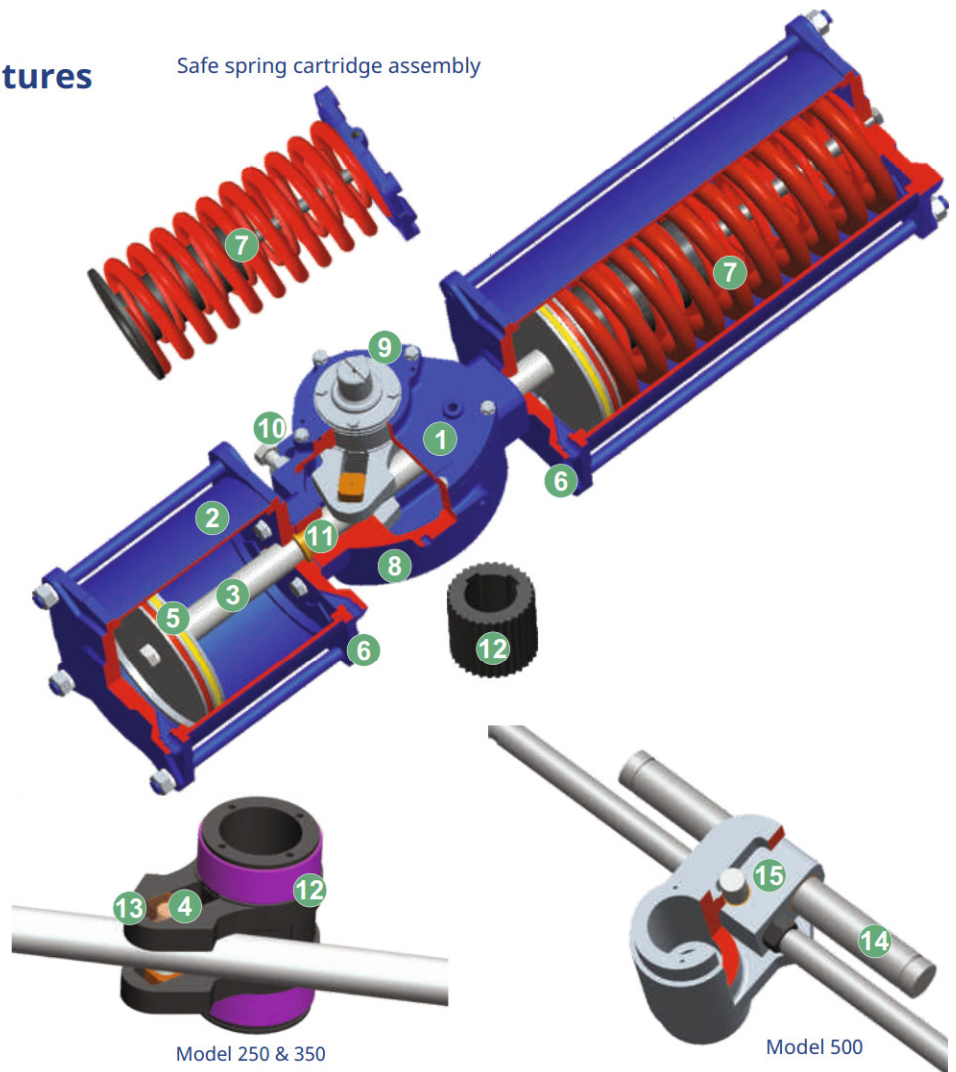
8. ISO 5211 Mounting Pattern

The mounting pattern provides easy valve/actuator mounting using international standards.

9. Top Cover Drilled To Namur Standards

Namur drive slot in shaft on top of yoke enables accessory driven components to maintain a compact assembly.

Safe spring cartridge assembly



Model 250 & 350

Model 500

10. Bi-directional Travel Stop

The travel stop is located in the main housing to provide adjustment in open and closed direction $\pm 5^\circ$.

11. Phosphor Bronze Piston Rod Bushing

The bushing provides low-friction support. Precise alignment of the piston rod increases efficiency and provides extended actuator life and efficient torque transmission.

12. 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 DelTorq® 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.

13. Aluminum Bronze Roller (25-250 and 25-350)

The roller provides low friction and high strength and increases efficiency and life cycle of actuator.

14. Chrome Plated Guide Bar (25-500)

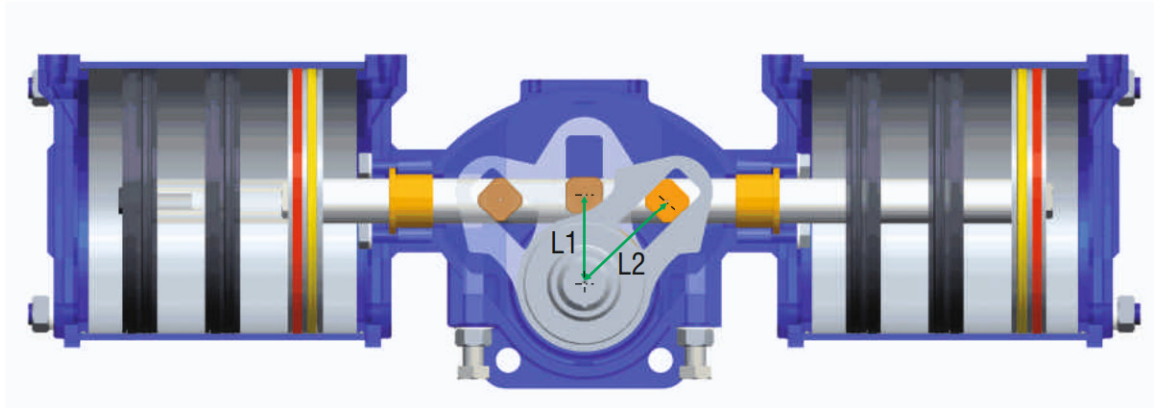
The guide bar and guide block connection bearing with guide bar support the transverse force and ensure proper support of the piston to give high cycle life and smooth operation.

15. Ductile Iron Guide Block (25-500)

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

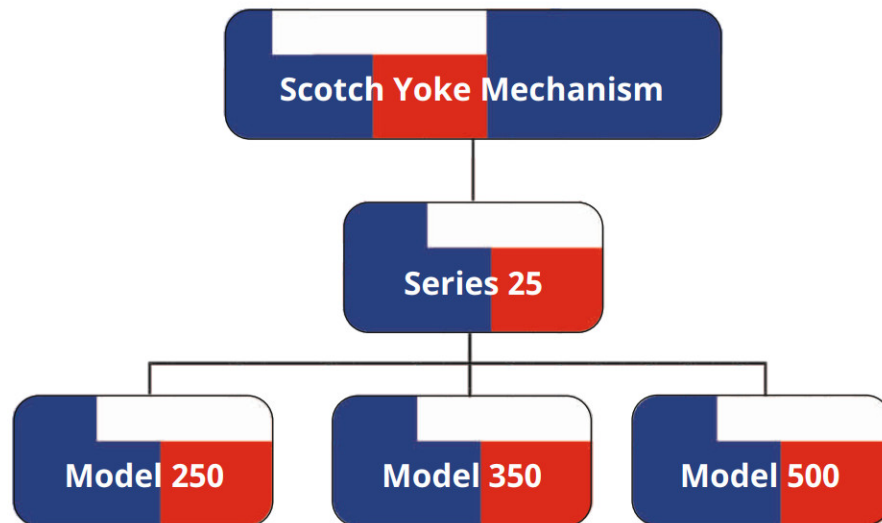
SCOTCH YOKE MECHANISM

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 and 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

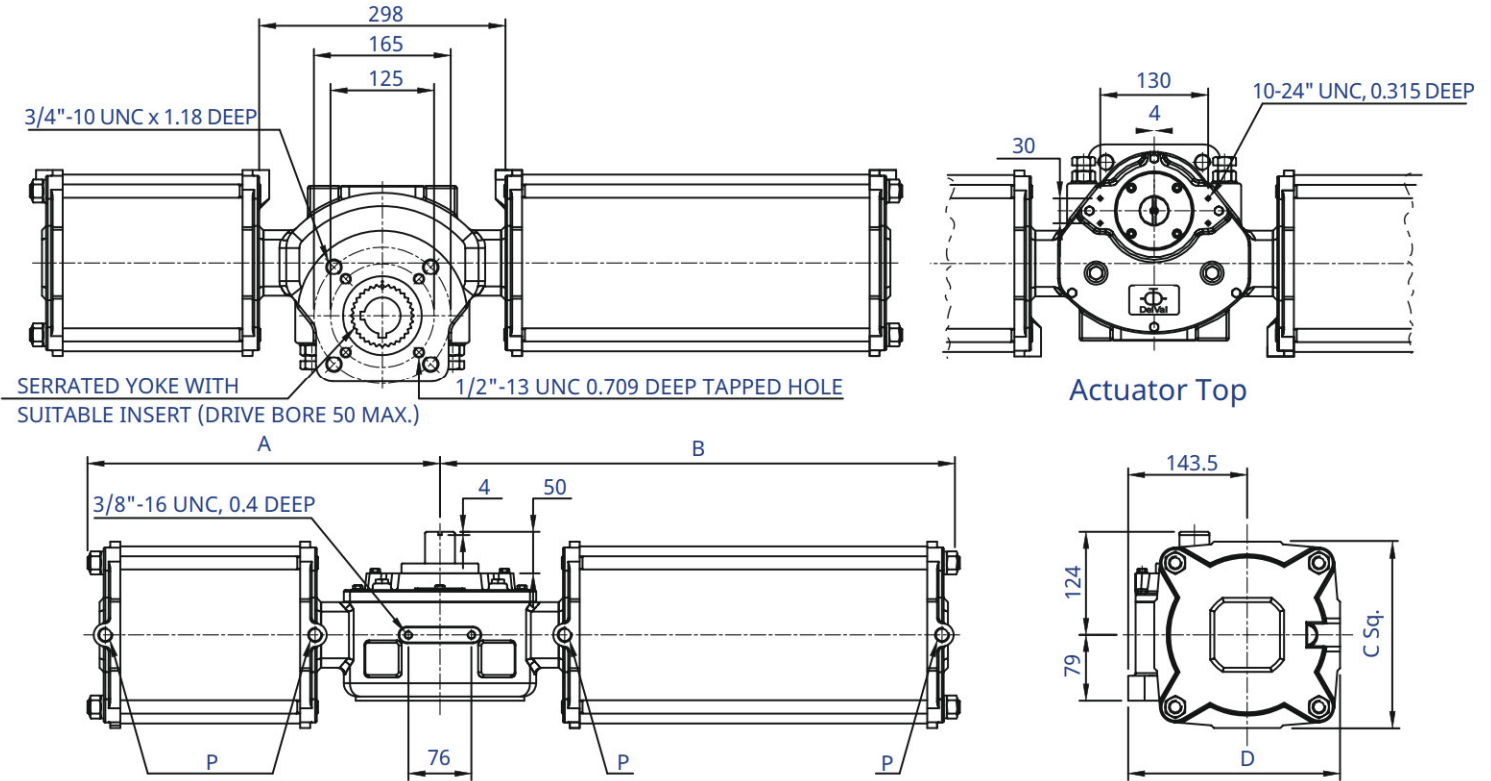


Standards and Specifications

Standard Working Temperature: -20°C to +80°C (with Nitrile O-ring)
Low Temperatures: -40°C to +150°C (Optional with Silicone O-ring)
High Temperatures: -20°C to +180°C (Optional with Viton O-ring)
Maximum Working Pressure: 9 bar
Operating Media: Clean dry air, nitrogen, non-corrosive gas or sweet gas
Supply Pressure: 3 to 9 bar
Rotation: 0 +/-5° to 90 +/-5°

Top Accessories Mounting Interface: VDI/VDE 3845
Valve Mounting Interface: ISO 5211
Housing Ingress Protection: IEC 60529 IP 67
Housing Surface Coating: Epoxy coated blue (RAL 5010)

DIMENSIONS, WEIGHTS AND TORQUES (25 - 250)



Spring Return Actuator Torques (Nm)

Model	Type	Air Supply Pressure (Bar)			
		2.8 (SR 40)	4.0 (SR 60)	5.5 (SR 80)	7.0 (SR 100)
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	348	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 Actuator Torques (Nm)

Model	Type	Air Supply Pressure (Bar)			
		2.8 (SR 40)	4.0 (SR 60)	5.5 (SR 80)	7.0 (SR 100)
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	430	430	607	607	624	666	173	230	3/8" NPT
250-07	425	425	616	616	642	678	200	244	3/8" NPT
250-08	440	440	613	613	690	697	228	256	1/2" NPT
250-10	455	455	644	655	662	716	283	281	1/2" NPT

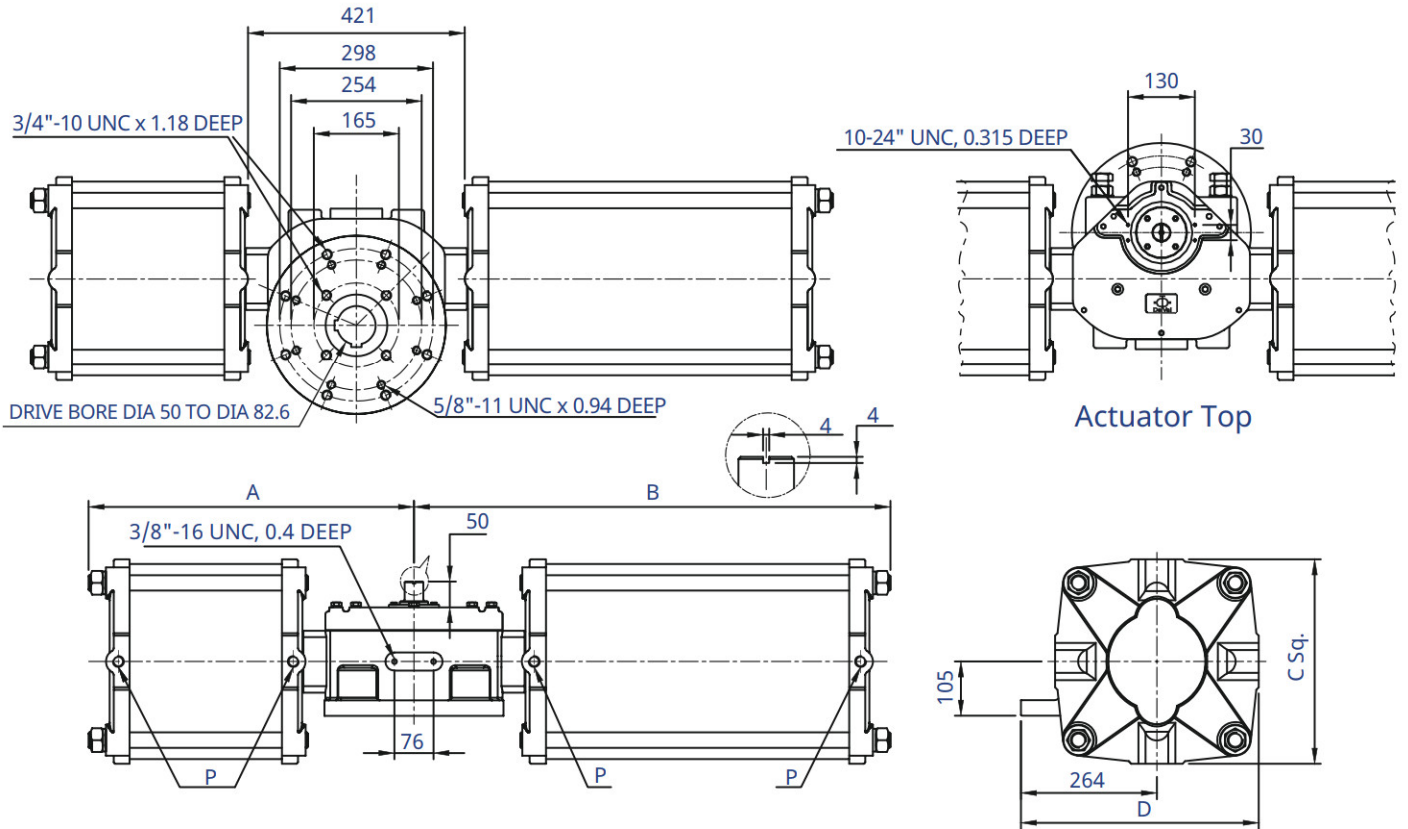
For spring return actuator refer volume as mentioned in the table and for double acting multiply values by 2.
 Air consumption = Volume (cm³) x air supply pressure in bar
 i.e. 250-10-DA at 4 bar = 17669 x 4 x 2 = 141352 cm³
 250-10-SR at 4 bar = 17669 x 4 = 70676 cm³.

App Weight (Kg)					
Model	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

Volume (cm ³) at 1 bar pressure	
Model	Open / Close
250-06	6252
250-07	8571
250-08	11247
250-10	17669

Actual torque are in the range of ±5° of the above value. In-between torque values are to be interpolated.
 PB = Pneumatic Break, PE = Pneumatic End, SB = Spring Break, SE = Spring End.
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DIMENSIONS, WEIGHTS AND TORQUES (25 - 350)



Spring Return Actuator Torques (Nm)

Model	Type	Air Supply Pressure(Bar)			
		2.8 (SR 40)	4.0 (SR 60)	5.5 (SR 80)	7.0 (SR 100)
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
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 Actuator Torques (Nm)

Model	Type	Air Supply Pressure(Bar)			
		2.8 (SR 40)	4.0 (SR 60)	5.5 (SR 80)	7.0 (SR 100)
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	

Dimension (mm)

Model	A	B					C	D	P
		DA	SR 40	SR 60	SR 80	SR 100			
350-10	610.0	610.0	805	894	974	1035	275	401.5	1/2" NPT
350-12	620.0	620.0	805	894	975	1035	354	441.0	3/4" NPT
350-14	632.5	632.5	805	894	974	1035	396	462.0	3/4" NPT

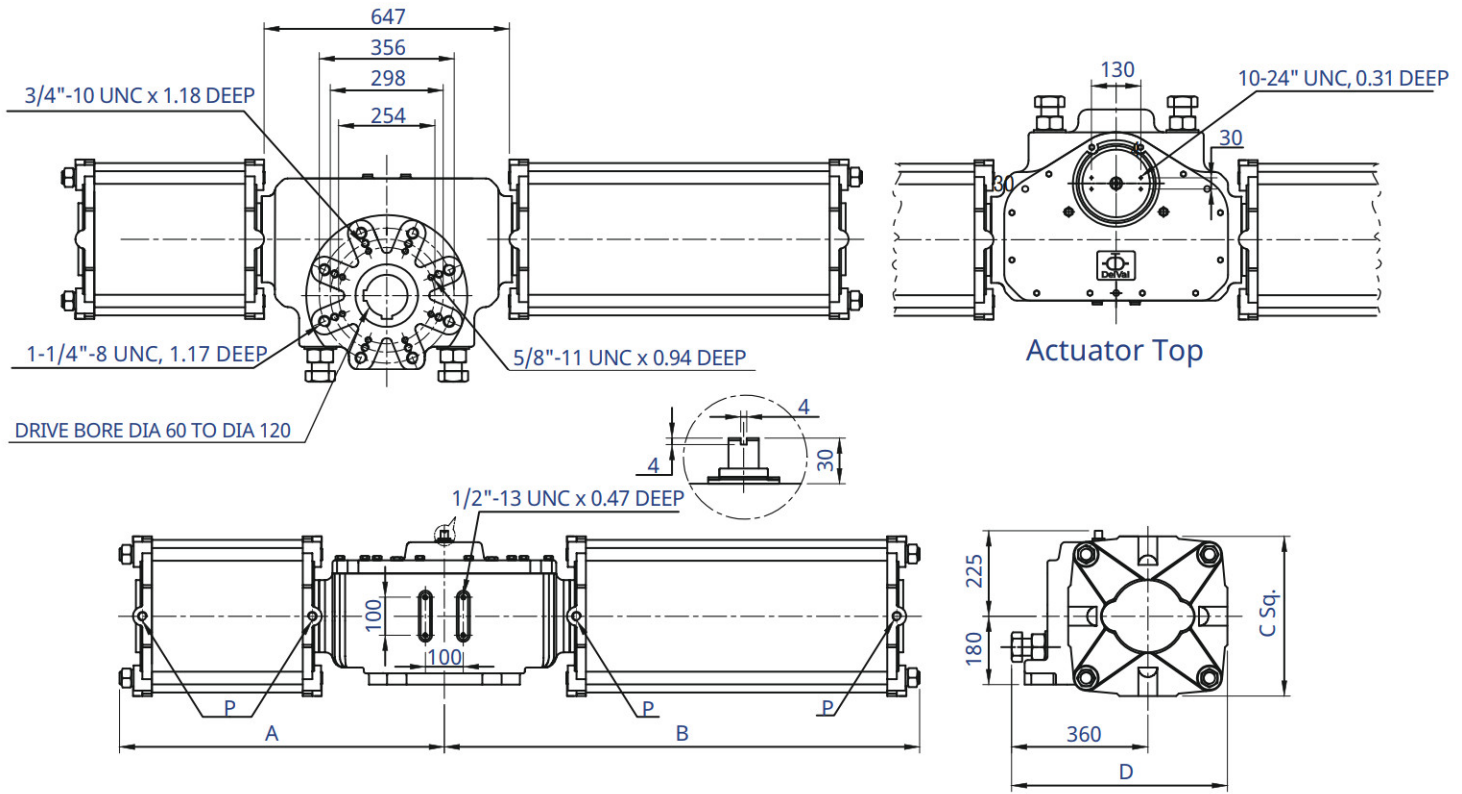
For spring return actuator refer volume as mentioned in the table and for double acting multiply values by 2.
 Air consumption = Volume (cm³) x air supply pressure in bar
 i.e. 350-10-DA at 4 bar = 18332 x 4 x 2 = 146656 cm³
 350-10-SR at 4 bar = 18332 x 4 = 73328 cm³.

App Weight (Kg)					
Model	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

Volume (cm ³) at 1 bar pressure	
Model	Open / Close
350-10	18332
350-12	26583
350-14	36333

Actual torque are in the range of ±5° of the above value. In-between torque values are to be interpolated.
 PB = Pneumatic Break, PE = Pneumatic End, SB = Spring Break, SE = Spring End.
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DIMENSIONS, WEIGHTS AND TORQUES (25 - 500)



Spring Return Actuator Torques (Nm)

Model	Type	Air Supply Pressure(Bar)			
		2.8 (SR 40)	4.0 (SR 60)	5.5 (SR 80)	7.0 (SR 100)
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
500-16	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
500-18	PB	10376	14429	20185	25943
	PE	5939	7772	11310	13832
	SB	9977	14966	19954	25959
	SE	5540	8309	11079	13848
500-20	RUN	4197	6295	8393	10491
	PB	12950	19136	Consult Factory	
	PE	7600	12000		
	SB	12027	16036		
	SE	6678	8903		
RUN	5059	6745			
500-22	PB	14672	Consult Factory		
	PE	7527			
	SB	16036			
	SE	8903			
	RUN	6745			

Double Acting Actuator Torques (Nm)

Model	Type	Air Supply Pressure(Bar)			
		2.8 (SR 40)	4.0 (SR 60)	5.5 (SR 80)	7.0 (SR 100)
500-12	Break	7081	10622	14162	17703
	Run	4630	6945	9260	11575
500-14	Break	9594	14391	19188	23985
	Run	6273	9410	12546	15683
500-16	Break	12470	18705	24939	31174
	Run	8153	12230	16307	20383
500-18	Break	15916	22740	31264	39791
	Run	10406	14868	20442	26017
500-20	Break	19411	27731	38130	Consult Factory
	Run	12695	18137	24938	
500-22	Break	23589	33698	46335	Consult Factory
	Run	15428	22039	30304	

Volume (cm ³) at 1 bar pressure	
Model	Open / Close
500-12	50709
500-14	69155
500-16	90440
500-18	114568
500-20	141523
500-22	171321

Dimension (mm)

Model	A	B					C	D	P
		DA	SR 40	SR 60	SR 80	SR 100			
500-12	830	830	1120	1227	1352	1437	350	535	3/4" NPT
500-14	850	850	1122	1246	1360	1421	396	558	3/4" NPT
500-16	850	850	1142	1245	1365	1475	420	585	3/4" NPT
500-18	900	900	1180	1255	1370	1500	500	610	3/4" NPT
500-20	900	900	1365	1365	Consult Factory		550	675	3/4" NPT
500-22	900	900	1375	Consult Factory		600	700	3/4" NPT	

For spring return actuator refer volume as mentioned in the table and for double acting multiply values by 2. Air consumption = Volume (cm³) x air supply pressure in bar
 i.e. 500-12-DA at 4 bar = 50709 x 4 x 2 = 405672 cm³
 500-10-SR at 4 bar = 50709 x 4 = 202836 cm³.

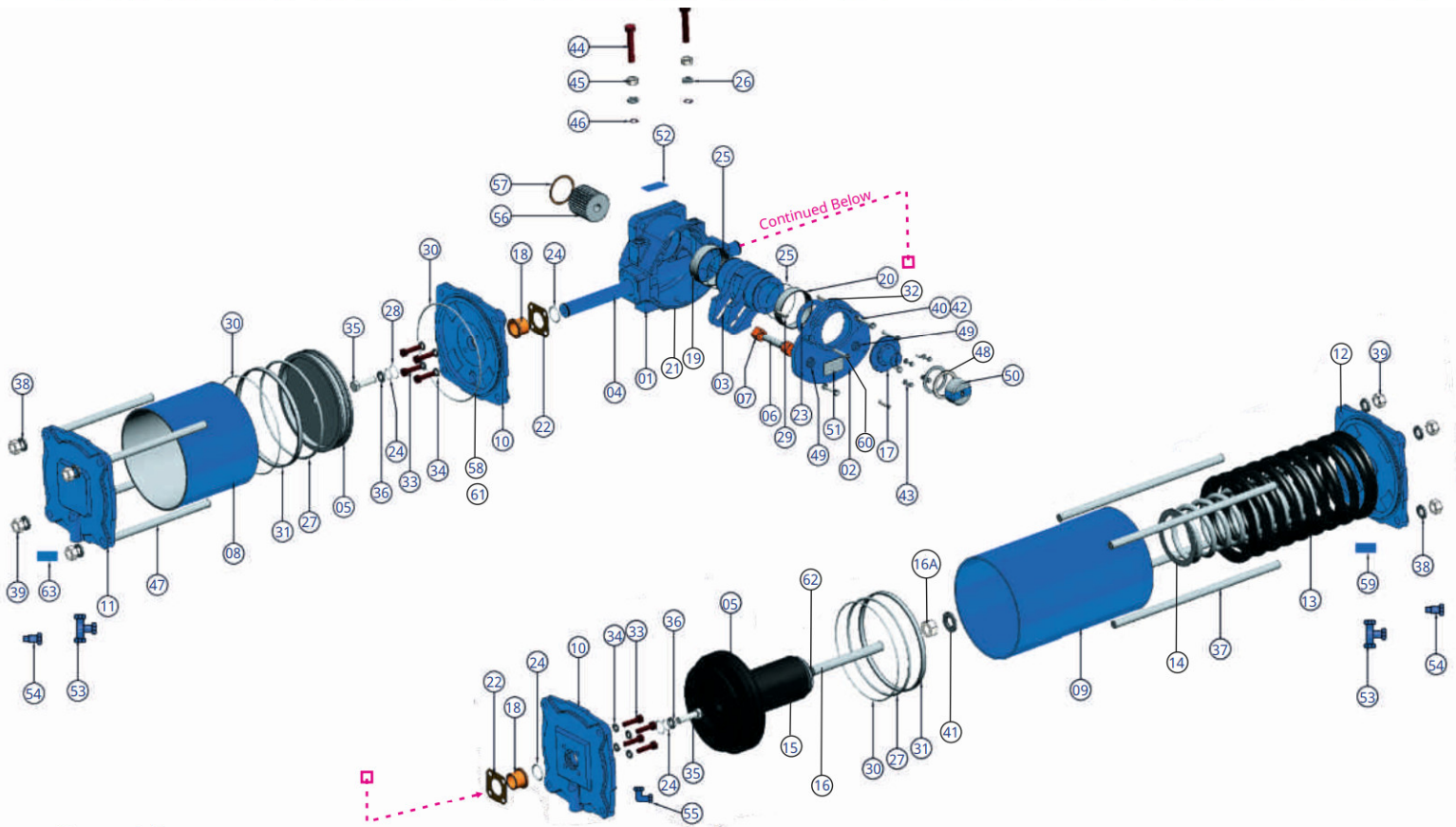
App Weight (Kg)					
Model	DA	SR 40	SR 60	SR 80	SR 100
500-12	580	667	675	720	770
500-14	605	744	755	805	849
500-16	644	817	829	890	940
500-18	683	907	920	988	1043
500-20	724	1007	1021	Consult Factory	
500-22	767	1117	Consult Factory		

Actual torque are in the range of ±5° of the above value. In-between torque values are to be interpolated.

PB = Pneumatic Break, PE = Pneumatic End, SB = Spring Break, SE = Spring End.

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STANDARD MATERIALS OF CONSTRUCTION



Part List

Item	Description	*Standard Material
01	Bottom Housing	Ductile Iron Gr. 100-70-03
02	Housing Top Cover	Ductile Iron Gr. 100-70-03
03	Yoke	17-4ph - 2.5" Yoke & DI 3.5" & 5"
04	Piston Rod	En24 Chrome Plated
05	Piston	Ductile Iron Gr. 100-70-03
06	Yoke Pin	En24 (Full Hardened)
**07	Yoke Pin Roller	AB2 (Aluminum Bronze)
08	Cylinder	Carbon Steel
09	Cylinder Spring side	Carbon Steel
10	Cylinder/Spring Side Adpt. Plate	Ductile Iron Gr. 100-70-03
11	Cylinder Side End Plate	Ductile Iron Gr. 100-70-03
12	Spring Side End Plate	Ductile Iron Gr. 100-70-03
13	Outer Spring	50CRV4 (Powder Coated)
14	Inner Spring	50CRV4 (Powder Coated)
15	Spring Guide Cup	Ductile Iron Gr. 100-70-03
16	Spring Cartridge Mounting Rod	HTS Gr. 10.9
16A	Spring Mounting Rod Nut	HTS Gr. 10.9
17	Yoke Mounted Indication Plate	En8 (Black Passivated)
**18	Piston Rod Bearing	Ph Bronze
**19	Steel Backup Bearing	DU (Steel + PTFE)
**20	Steel Backup Bearing (Top cover)	DU (Steel + PTFE)
**21	Housing/Top Cover Gasket	Champion AF 159
**22	Housing End Gasket	Champion AF 159
**23	Yoke Indication Plate Gasket	Champion AF 159
**24	O-Ring	NBR (Nitrile)
**25	O-Ring	NBR (Nitrile)
**26	O-Ring	NBR (Nitrile)
**27	O-Ring	NBR (Nitrile)
**28	O-Ring	NBR (Nitrile)
**29	O-Ring	NBR (Nitrile)
**30	Piston Seal	NBR (Nitrile)
**31	Piston Band	Nylon 6 (Mos2 Filled)

*Other materials may be available upon request.

**Recommended spares.

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Item	Description	*Standard Material
32	Dowel Pin	En24 (Induction Hardened)
33	Adaptor Plate Hex Bolt	HTSGr.10.9
**34	Adapter Bolt Dowty Washer	Carbon Steel Zinc Plated
35	Piston Bolt	HTS Gr. 10.9
**36	Piston Bolt Spring Washer	Spring Steel
37	Spring Side Tie Rod	HTS Gr. 10.9
**38	Tie Rod Washer	Spring Steel
39	Tie Rod Nut	HTS Gr. 10.9
**40	Housing Top Cover Hex Bolt	HTS Gr. 10.9
41	Locater rod punch washer	SS 304
**42	Top Cover Hex Bolt Washer	Spring Steel
43	Indicator Plate Hex Bolt	SS 304
44	Stroke Adj. Bolts	HTS Gr. 10.9
45	Stroke Adj. Bolt Nut	HTS Gr. 10.9
**46	Stroke Adj. Bolts M/C Washer	SS 304
47	Tie Rod Cylinder Side	HTS Gr. 10.9
48	Position indicator washer	SS 304
49	Greasing Plug	Carbon Steel
50	Local Position Indicator	Plastic
51	Name Plate	SS 304
52	Pressure Name Plate	SS 304
53	Tee	SS 304
54	Connector	SS 304
55	Elbow	SS 304
56	Insert	En8
57	Circlip	70 C6
58	1/2" NPT Plug	Carbon Steel Zinc Plated
59	Warning Name Plate For Plug	SS 304
60	Top Cover Countersunk Bolt	HTS Gr. 10.9
61	Silencer	Brass
62	Locking Plate & Pin Assembly	CS Trivalent Passivated
63	Warning Name Plate	SS 304

DI = Ductile Iron, SS = Stainless Steel, HTS = High Tensile Steel, CS= Carbon Steel

100% TESTING 100% SERIALIZATION



CERTIFICATES



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