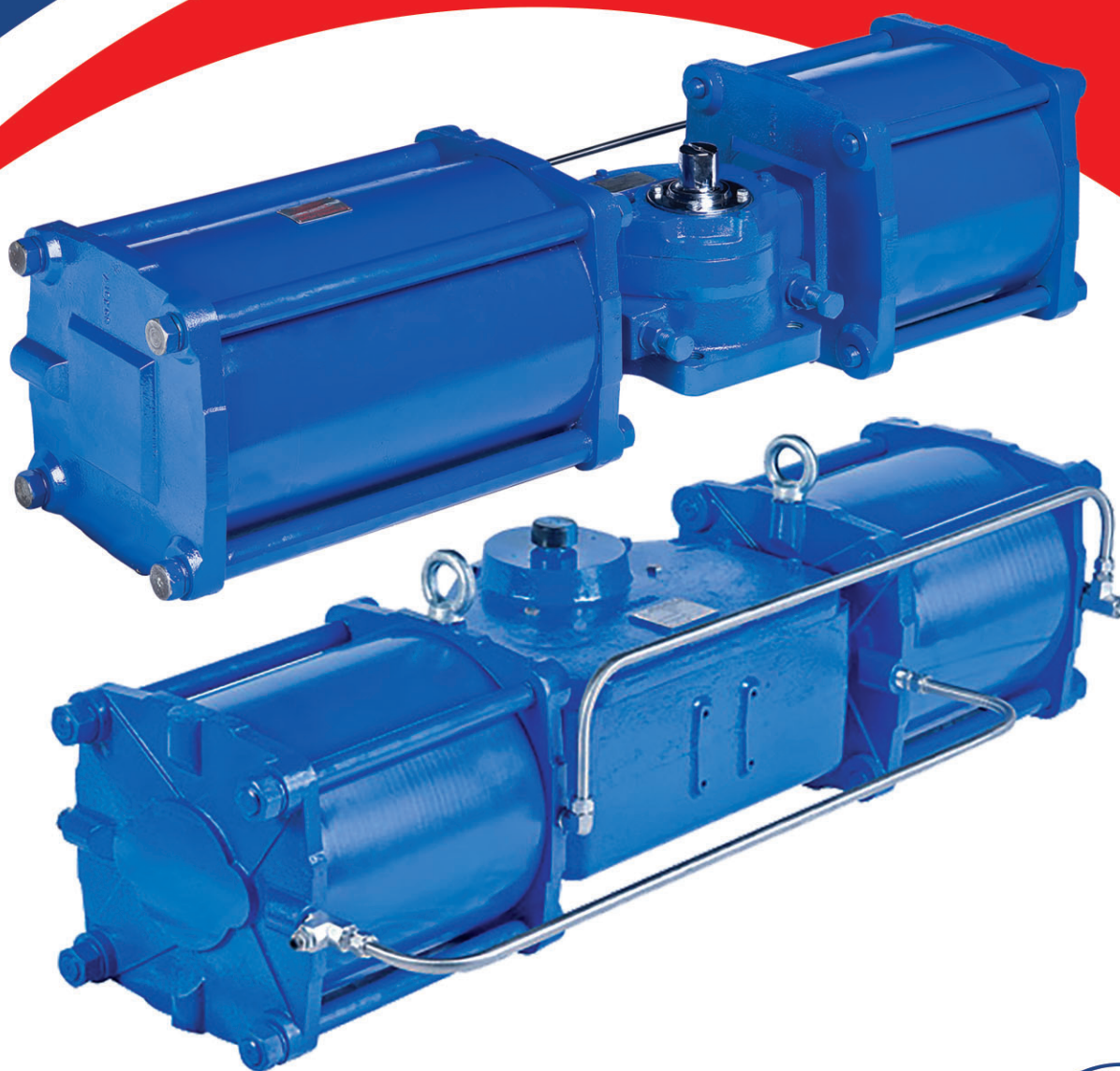


# DelTorq<sup>®</sup> SERIES 25

## Pneumatic Scotch Yoke Actuators

Double Acting and Spring Return



[delvalflow.com](http://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.

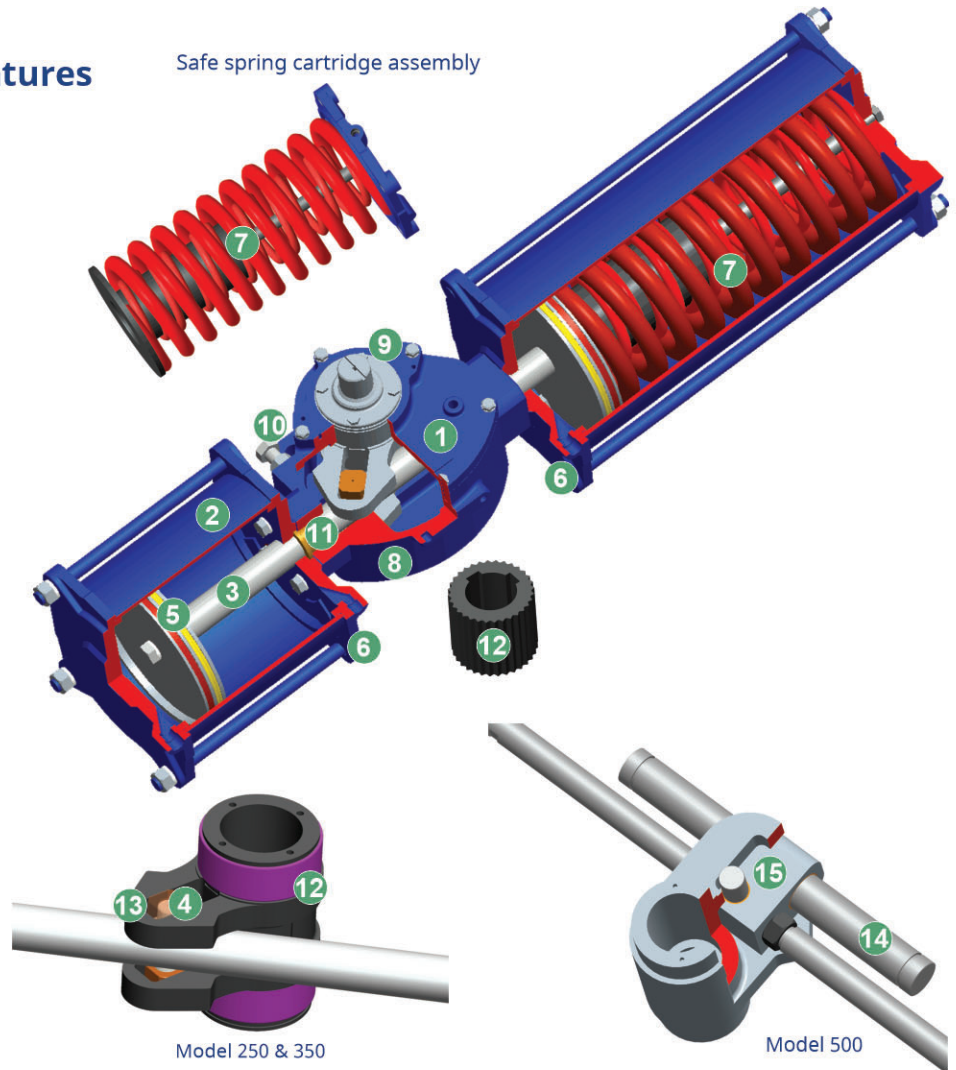
### 8. ISO 5211 Mounting Pattern

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)

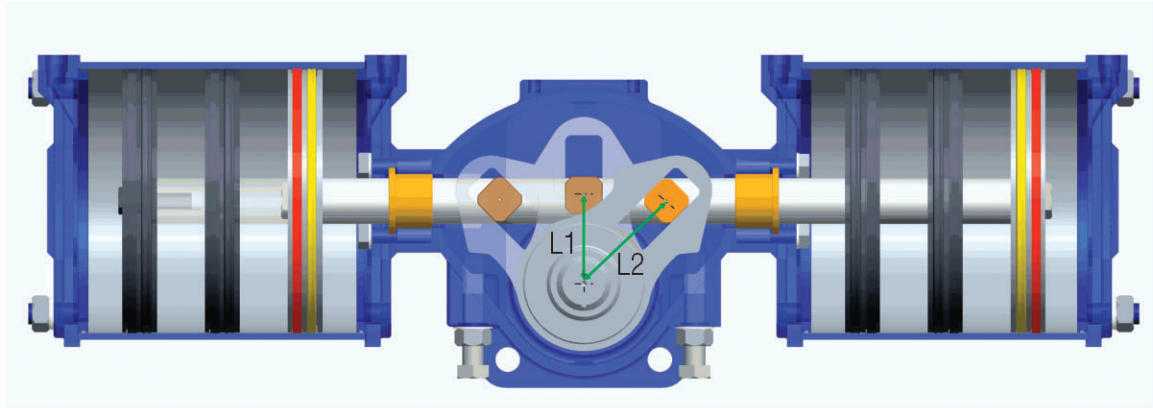
The guide bar and guide block connection bearing with guide bar support the transverse force and ensure proper support of the piston to give high cycle life and smooth operation.

### 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.

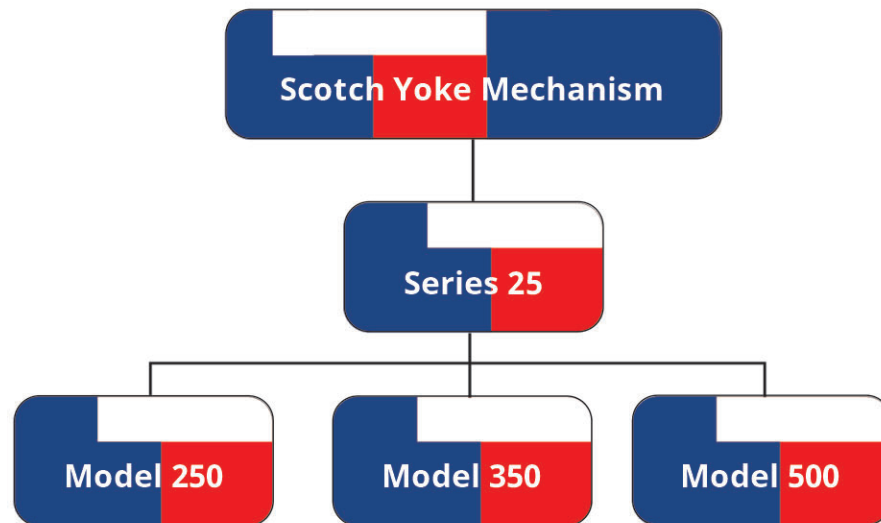
# SCOTCH YOKE MECHANISM

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

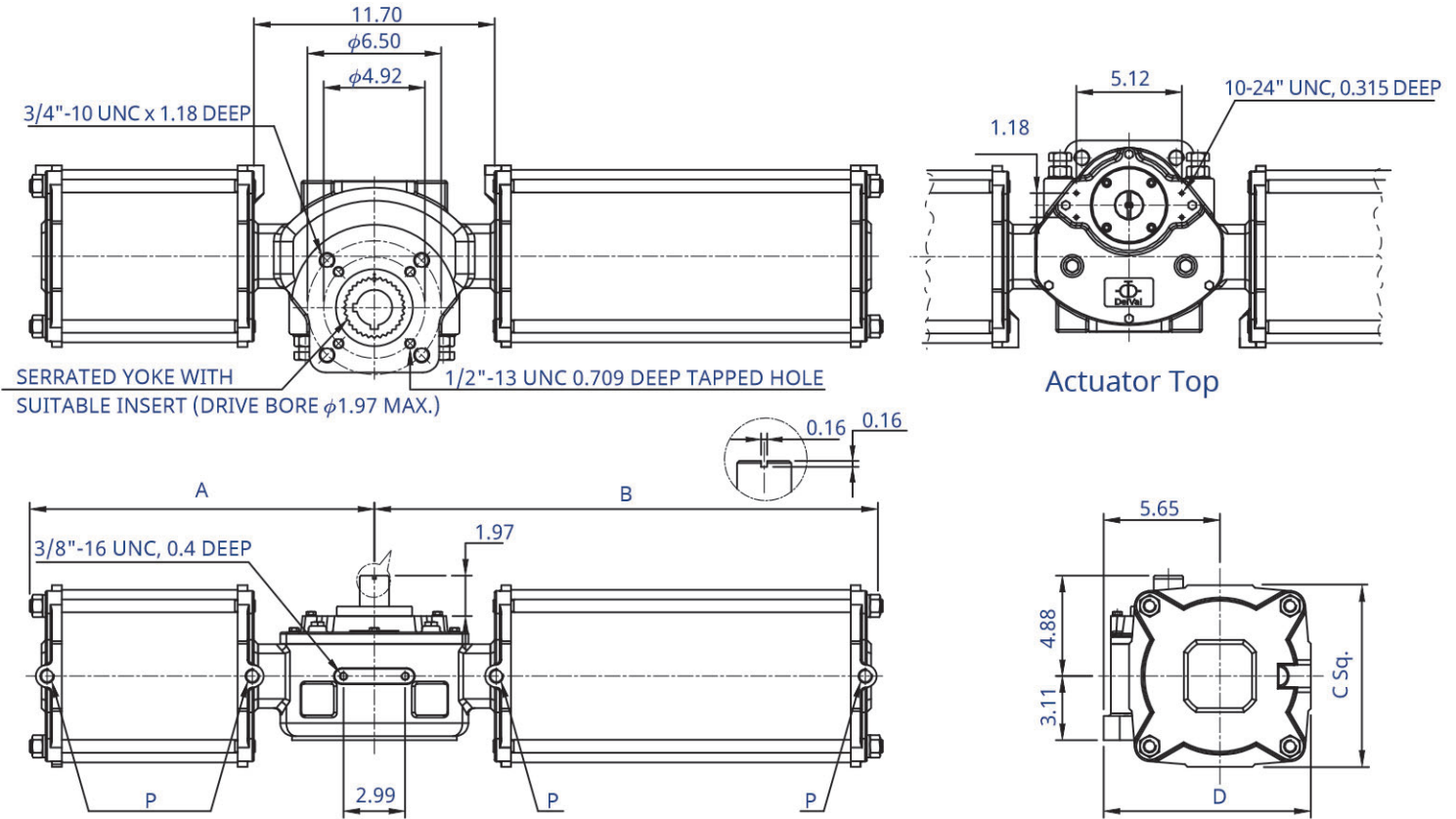


## Standards and Specifications

**Standard Working Temperature:** -4°F to +176°F (with Nitrile O-ring)  
**Low Temperatures:** -40°F to +302°F (Optional with Silicone O-ring)  
**High Temperatures:** -4°F to +356°F (Optional with Viton O-ring)  
**Maximum Working Pressure:** 130 Psi  
**Operating Media:** Clean dry air, nitrogen, non-corrosive gas or sweet gas  
**Supply Pressure:** 43 to 130 Psi  
**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 (Lbf-Inch)

Model	Type	Air Supply Pressure(Psi)			
		40 (SR 40)	60 (SR 60)	80 (SR 80)	100 (SR 100)
250-06	PB	4921	7381	10709	13390
	PE	2735	4098	4593	5735
	SB	4699	7053	10239	12797
	SE	2611	3912	4390	5487
	RUN	1965	2956	3938	4921
250-07	PB	6744	10116	14691	18355
	PE	3744	5620	6292	7868
	SB	6452	9673	14036	17550
	SE	3584	5372	6018	7523
	RUN	2699	4053	5399	6753
250-08	PB	8770	13160	17550	23877
	PE	4868	7310	9744	10231
	SB	8390	12576	16771	22824
	SE	4655	6983	9310	9779
	RUN	3513	5266	7027	8779
250-10	PB	13735	20603	29904	37382
	PE	7629	11443	12815	16019
	SB	13133	19691	28586	35736
	SE	7292	10939	12248	15311
	RUN	5496	8248	10992	13744

## Double Acting Actuator Torques (Lbf-Inch)

Model	Type	Air Supply Pressure(Psi)			
		40 (SR 40)	60 (SR 60)	80 (SR 80)	100 (SR 100)
250-06	Break	7310	10965	14620	18284
	Run	4779	7169	9558	11956
250-07	Break	10027	15045	20054	25072
	Run	6558	9832	13116	16390
250-08	Break	13045	19567	26081	32603
	Run	8531	12788	17054	21320
250-10	Break	20417	30630	40834	N.A.
	Run	13355	20028	26700	

## Dimension (Inch)

Model	A	B					C	D	P
		DA	SR 40	SR 60	SR 80	SR 100			
250-06	16.92	16.93	23.90	23.90	24.57	26.22	6.81	9.06	3/8" NPT
250-07	16.73	16.73	24.25	24.25	25.28	26.69	7.87	9.61	3/8" NPT
250-08	17.32	17.32	24.13	24.13	27.17	27.44	8.98	10.08	1/2" NPT
250-10	17.91	17.91	25.35	25.79	26.06	28.19	11.14	11.06	1/2" NPT

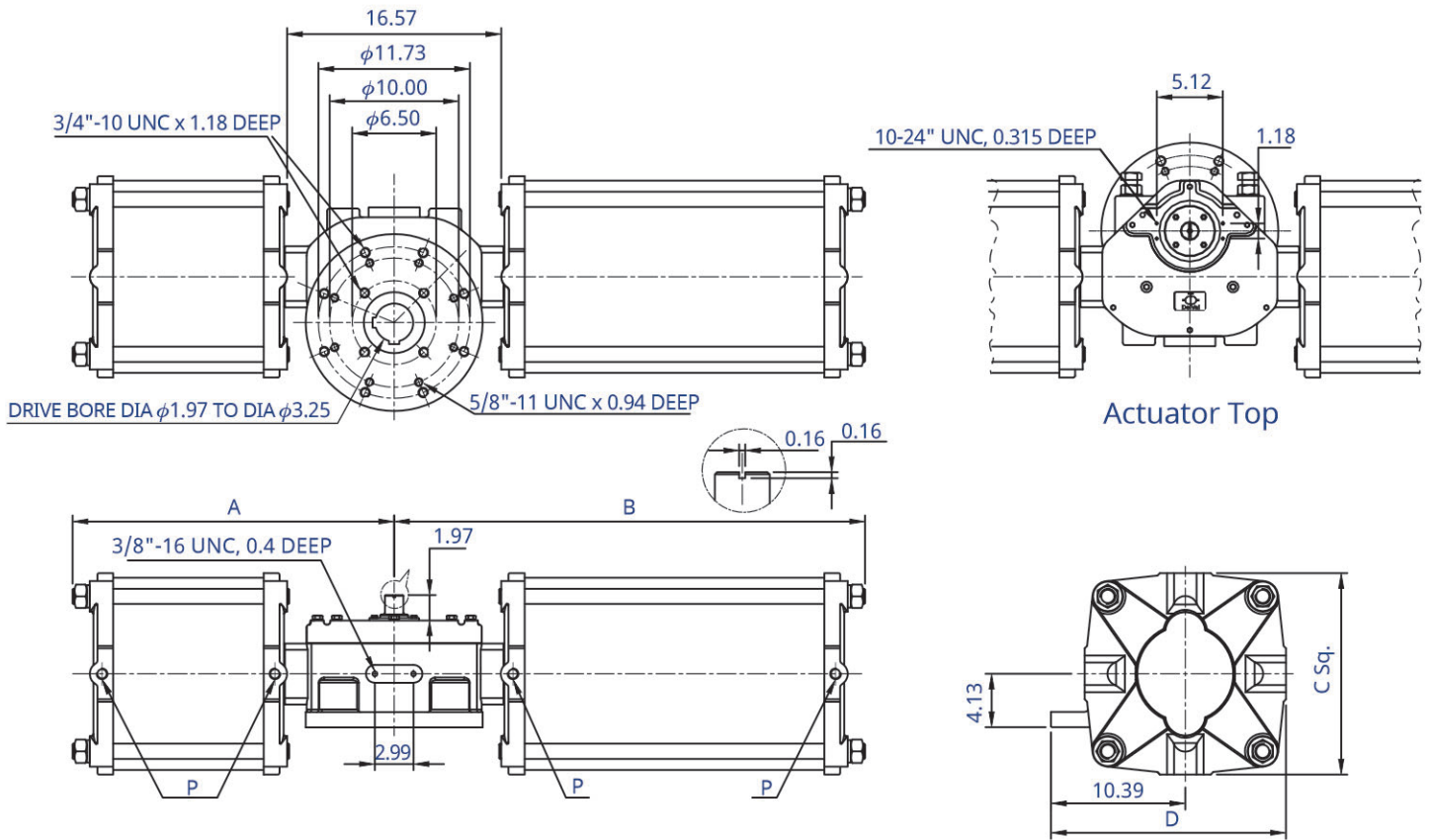
Model	App Weight (Lbs)				
	DA	SR 40	SR 60	SR 80	SR 100
250-06	267	137	143	143	172
250-07	316	170	176	176	198
250-08	364	203	209	209	256
250-10	559	313	320	320	335

Volume (Inch <sup>3</sup> ) at 14.5 Psi Pressure	
Model	Open / Close
250-06	382
250-07	523
250-08	686
250-10	1078

For spring return actuator refer volume as mentioned in the table and for double acting multiply values by 2.  
 Air consumption = Volume (inch<sup>3</sup>) x air supply pressure in psi  
 i.e. 250-10-DA at 60 psi = 1078 x 60 x 2 = 129360 inch<sup>3</sup>  
 250-10-SR at 60 psi = 1078 x 60 = 64680 inch<sup>3</sup>.

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.  
 DelVal reserves rights to change contents without notice.

# DIMENSIONS, WEIGHTS AND TORQUES (25 - 350)



## Spring Return Actuator Torques (Lbf-Inch)

Model	Type	Air Supply Pressure (Psi)			
		40 (SR 40)	60 (SR 60)	80 (SR 80)	100 (SR 100)
350-10	PB	19470	29205	38931	48666
	PE	10806	16213	21621	27019
	SB	18612	27913	37214	46524
	SE	10328	15496	20665	25833
	RUN	7788	11691	15585	19479
350-12	PB	29187	43781	58366	72959
	PE	16204	24302	32409	40506
	SB	27895	41843	55790	69747
	SE	15488	23231	30975	38719
	RUN	11682	17523	23364	29205
350-14	PB	39542	59313	79084	98855
	PE	21957	32931	43905	54888
	SB	37798	56693	75597	94491
	SE	20983	31479	41967	52463
	RUN	15824	23736	31648	39568

## Double Acting Actuator Torques (Lbf-Inch)

Model	Type	Air Supply Pressure (Psi)			
		40 (SR 40)	60 (SR 60)	80 (SR 80)	100 (SR 100)
350-10	Break	28940	43409	57879	72349
	Run	18921	28382	37843	47303
350-12	Break	43383	65083	86774	108466
	Run	28364	42551	56737	70915
350-14	Break	58782	88173	117563	N.A.
	Run	38436	57649	76871	

## Dimension (Inch)

Model	A	B				C	D	P	
		DA	SR 40	SR 60	SR 80				SR 100
350-10	23.54	23.54	31.06	34.50	37.59	39.94	28.76	15.47	1/2" NPT
350-12	23.93	23.93	31.06	34.50	37.63	39.94	28.76	17.02	3/4" NPT
350-14	24.41	24.41	31.06	34.50	37.59	39.94	28.76	17.83	3/4" NPT

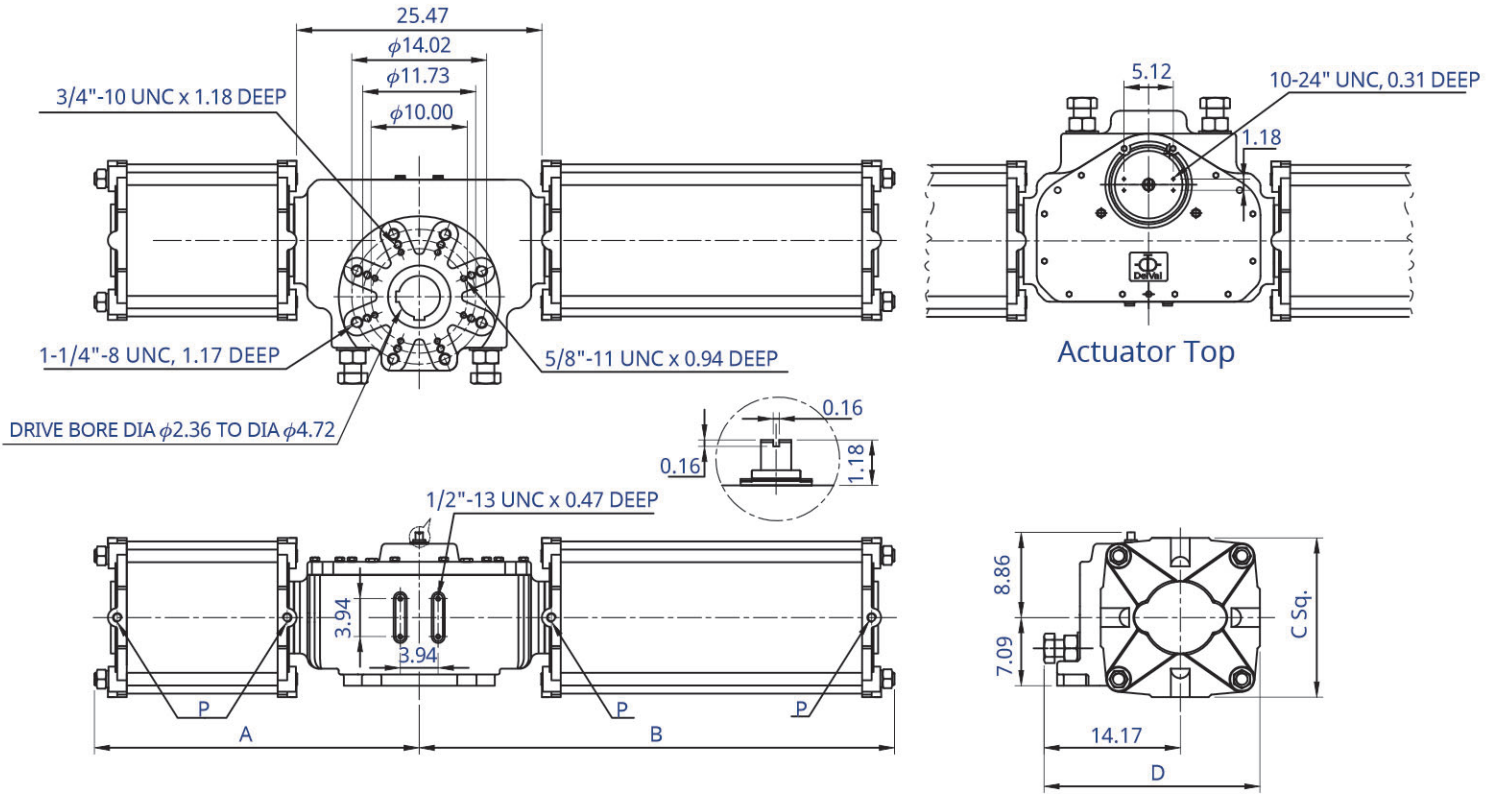
For spring return actuator refer volume as mentioned in the table and for double acting multiply values by 2.  
 Air consumption = Volume (inch<sup>3</sup>) x air supply pressure in psi  
 i.e. 350-10-DA at 60 psi = 1119 x 60 x 2 = 134280 inch<sup>3</sup>  
 350-10-SR at 60 psi = 1119 x 60 = 67140 inch<sup>3</sup>.

Model	App Weight (Lbs)				
	DA	SR 40	SR 60	SR 80	SR 100
350-10	694	827	882	948	1036
350-12	705	860	926	1003	1069
350-14	727	871	974	1058	1146

Volume (Inch <sup>3</sup> ) at 14.5 Psi Pressure	
Model	Open / Close
350-10	1119
350-12	1622
350-14	2217

Actual torque are in the range of  $\pm 5^\circ$  of the above value. In-between torque values are to be interpolated.  
 PB = Pneumatic Break, PE = Pneumatic End, SB = Spring Break, SE = Spring End.  
 DelVal reserves rights to change contents without notice.

# DIMENSIONS, WEIGHTS AND TORQUES (25 - 500)



## Spring Return Actuator Torques (Lbf-Inch)

Model	Type	Air Supply Pressure(Psi)			
		40 (SR 40)	60 (SR 60)	80 (SR 80)	100 (SR 100)
500-12	PB	42153	63233	84314	105386
	PE	23408	35108	46808	58516
	SB	40294	60446	80588	100740
	SE	22373	33559	44746	55932
	RUN	16868	25311	33745	42179
500-14	PB	57118	85677	107058	142786
	PE	31710	47569	63419	79278
	SB	54596	81889	109191	136485
	SE	30311	45471	60623	75783
	RUN	22860	34294	45719	57153
500-16	PB	74234	111351	148468	185585
	PE	41214	61826	82429	103041
	SB	70959	106439	141919	177398
	SE	39400	59100	78792	98492
	RUN	29709	44569	59419	74278
500-18	PB	91828	127697	178637	229596
	PE	52560	68782	100094	122413
	SB	88296	132449	176593	229737
	SE	49029	73535	98049	122555
	RUN	36878	55711	74278	92845
500-20	PB	114608	169354		
	PE	67260	106200		
	SB	106439	141919		
	SE	59100	78792		
	RUN	44772	59693		
500-22	PB	129847			
	PE	66614			
	SB	141919			
	SE	78792			
	RUN	59693			

## Double Acting Actuator Torques (Lbf-Inch)

Model	Type	Air Supply Pressure(Psi)			
		40 (SR 40)	60 (SR 60)	80 (SR 80)	100 (SR 100)
500-12	Break	62667	94005	125334	156672
	Run	40976	61463	81951	102439
500-14	Break	84907	127360	169814	212267
	Run	55516	83279	111032	138795
500-16	Break	110360	165539	220710	275890
	Run	72154	108236	144317	180390
500-18	Break	140857	201249	276686	352150
	Run	92093	131582	180912	230250
500-20	Break	171787	245419	337451	
	Run	112351	160512	220701	Consult Factory
500-22	Break	208763	298227	410065	
	Run	136538	195045	268190	

Volume (Inch <sup>3</sup> ) at 14.5 Psi Pressure	
Model	Open / Close
500-12	3093
500-14	4218
500-16	5517
500-18	6989
500-20	8633
500-22	10451

## Dimension (Inch)

Model	A	B					C	D	P
		DA	SR 40	SR 60	SR 80	SR 100			
500-12	32.67	32.67	32.67	44.08	48.29	53.21	56.56	13.78	21.06
500-14	33.46	33.46	33.46	44.16	49.04	53.53	55.93	15.59	21.96
500-16	33.46	33.46	33.46	44.95	49.00	53.73	58.06	16.53	23.03
500-18	35.43	35.42	35.42	46.44	49.40	53.92	59.04	19.68	24.01
500-20	35.43	35.42	35.42	53.73	53.73			21.65	26.57
500-22	35.43	35.42	35.42	54.12			Consult Factory	23.62	27.55

For spring return actuator refer volume as mentioned in the table and for double acting multiply values by 2. Air consumption = Volume (inch<sup>3</sup>) x air supply pressure in psi  
 i.e. 500-12-DA at 60 psi = 3093 x 60 x 2 = 371160 inch<sup>3</sup>  
 500-12-SR at 60 psi = 3093 x 60 = 185580 inch<sup>3</sup>.

## App Weight (Lbs)

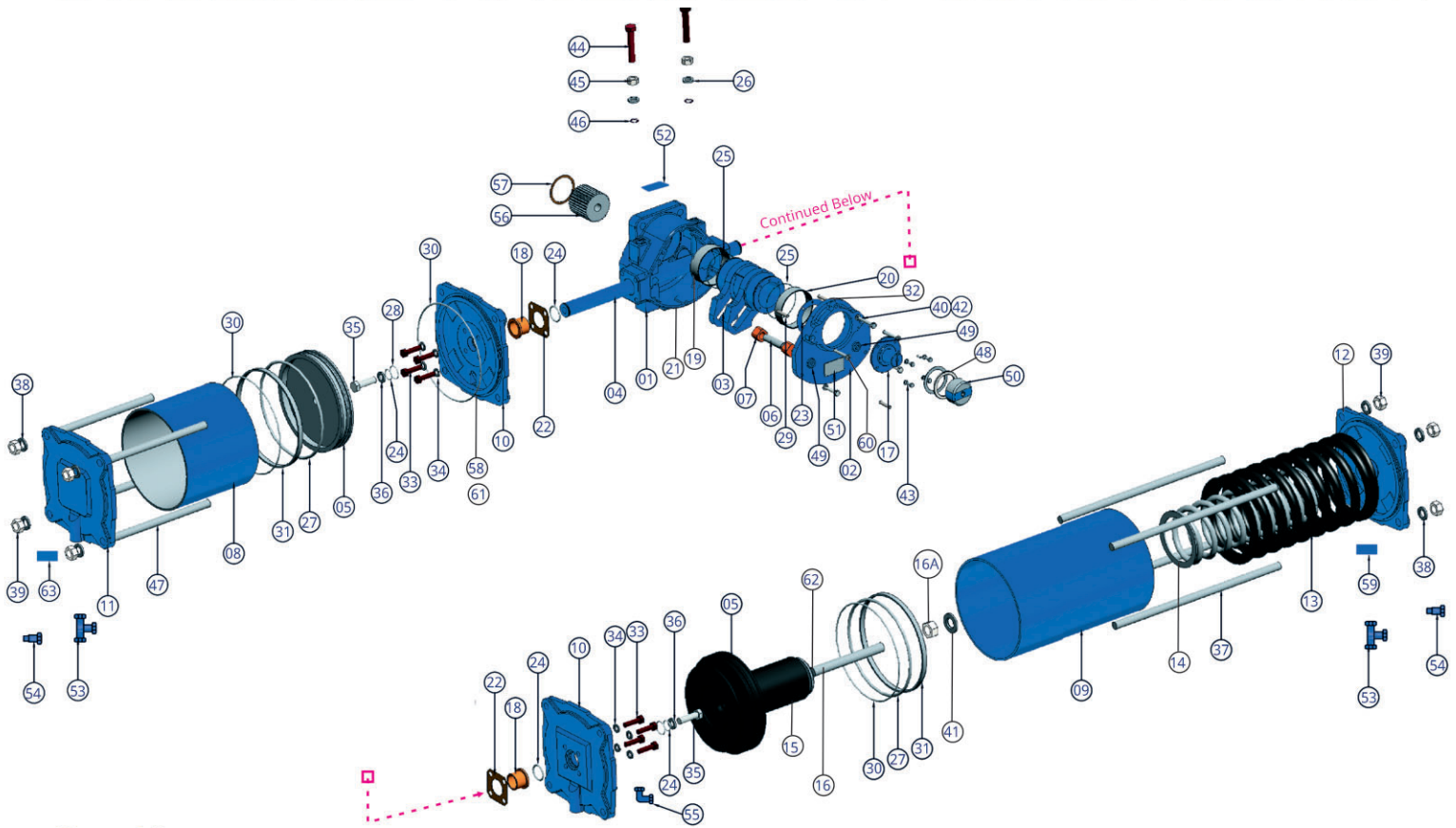
Model	DA	SR 40	SR 60	SR 80	SR 100
500-12	1278	1470	1488	1587	1697
500-14	1333	1640	1664	1774	1871
500-16	1421	1802	1829	1962	2072
500-18	1505	1999	2028	2178	2299
500-20	1596	2219	2250		
500-22	1029	2462			Consult Factory

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.

DelVal reserves rights to change contents without notice.

# 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.

DelVal reserves rights to change the contents without notice.

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



### Manufacturing & Sales International DelVal Flow Controls Pvt. Ltd.

Gat No: 25, Kavathe  
Post-Javale, Tal. Khandala  
Dist. Satara Pin-412801 | India  
salesindia@delvalflow.com

### Manufacturing & Sales Americas DelVal Flow Controls USA

6068 Highway 73  
Geismar, Louisiana 70734 | USA  
T: +1 833-DELVAL1  
F: +1 225-744-4328  
sales@delvalflow.com

### International Projects DelVal Flow Controls USA

77 Sugar Creek Center Blvd.,  
Suite 600  
Sugar Land, Texas 77478 | USA  
T: +1 833-DELVAL1  
projects@delvalflow.com

### Middle East DelVal Flow Controls Middle East Company Ltd.

Factory No. 103, 3rd Industrial  
Area.  
Dammam | Saudi Arabia  
T: +966 13 864 2040  
salesmea@delvalflow.com

### Australia DelVal Flow Controls (ANZ) Pty Ltd.

Unit 6, 561 Great Western  
Highway, Werrington,  
NSW 2747 | Australia  
T: +61 (0)2 97431271  
delvalanz@delvalflow.com