

ID

SERIES

PRODUCT BULLETIN

DOUBLE ACTING & SPRING RETURN

Torques to 500,000 in-lb (56,500 Nm)

Pressure to suit size

Temperatures from

-20°F to +185°F (-28°C to +85°C)

90° Rotation ($\pm 5^\circ$ at each end of travel)

PNEUMATIC ACTUATORS



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OPERATION AND PIPING

D series actuators may be operated with instrument air, hydraulic fluid, water, or other power gases and fluids. Always ensure that the media is compatible with the materials of construction and that the pressure does not exceed the maximum allowable.

All QTRCO actuators are shipped in the Fail-Close or Left-Hand orientation unless ordered as Fail-Open or Right-Hand. The mode of operation may be reversed in the field simply by turning the actuator top-side down.

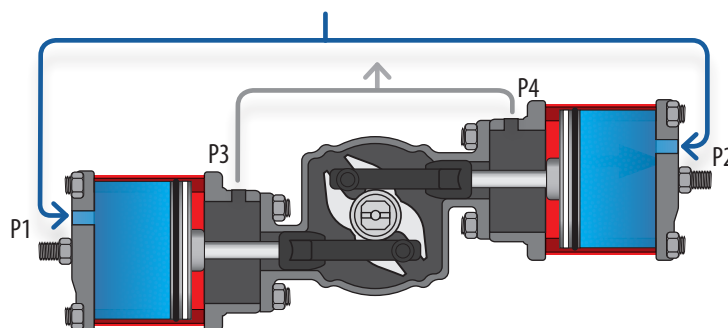
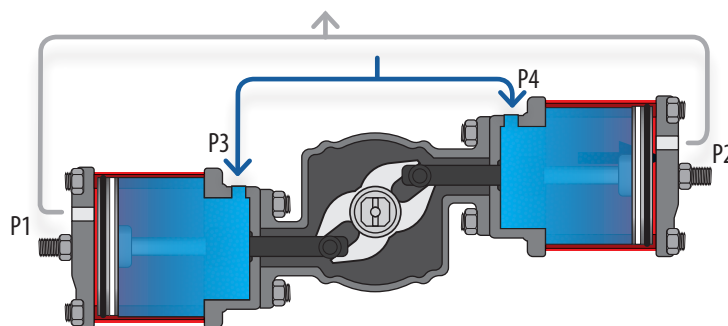
1. **Fail-Close (Left-Hand):** pressure on the end cap ports P1 & P2 pushes the pistons inward resulting in counterclockwise rotation. Exhaustion of pressure allows springs to push outward on the piston and cause clockwise rotation.
2. **Fail-Open (Right-Hand):** pressure on the end cap ports P1 & P2 pushes the pistons inward resulting in clockwise rotation. Exhaustion of pressure allows springs push outward on the piston and cause counterclockwise rotation.
3. **Double Acting (Left-Hand):** pressure on the end cap ports P1 & P2 pushes the piston inward and causes counterclockwise rotation. Pressure to ports P3 & P4 pushes outward on the pistons and cause clockwise rotation.
4. **Double Acting (Right-Hand):** pressure on the end cap port(s) pushes the piston(s) inward and causes clockwise rotation. Pressure to ports P3 & P4 pushes outward on the piston(s) and cause counterclockwise rotation.

D SERIES-PRODUCT BULLETIN

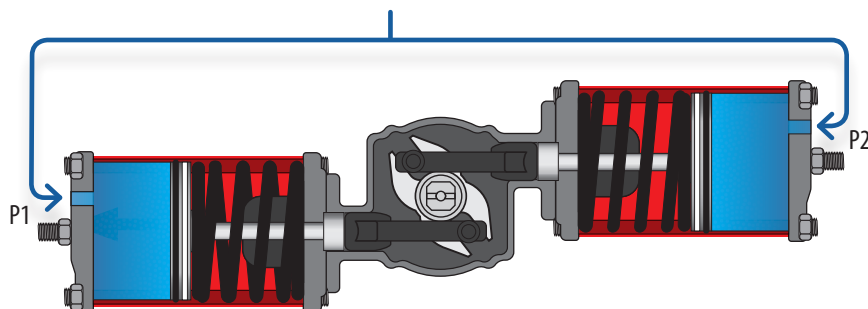
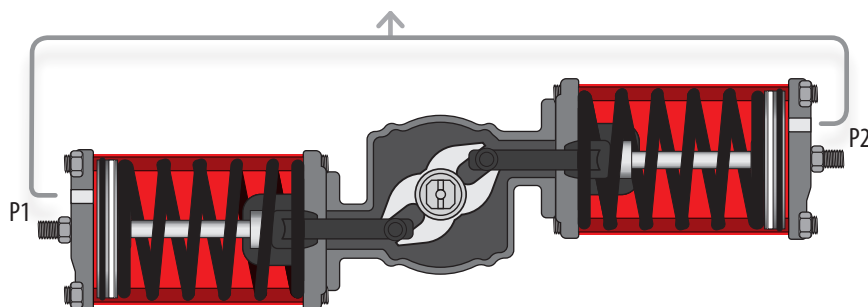
PIPING GUIDELINES:

1. Both endcap pressure ports P1 and P2 must be pressurized simultaneously for proper operation.
2. Pressure ports P1 and P2 are typically connected together and powered by a single pathway.
3. For all Double Acting (DA) models, both base plate pressure ports P3 and P4 must be pressurized simultaneously for proper operation. These ports are not present on SR models.
4. Pressure ports P3 and P4 are typically connected together and powered by a single pathway.
5. Body ports P5 and P6 (shown in dimensional drawing on page 6) are breather vents which should be fitted with a strainer on SR models and may be plugged on DA models.

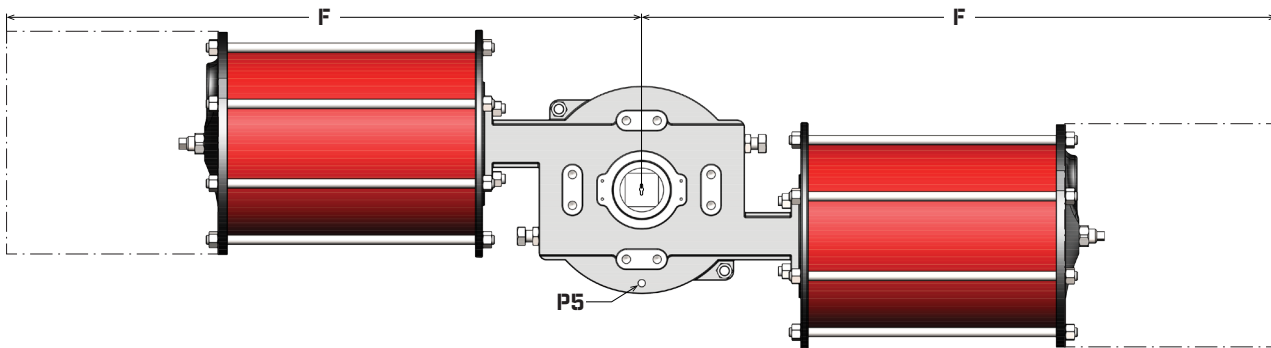
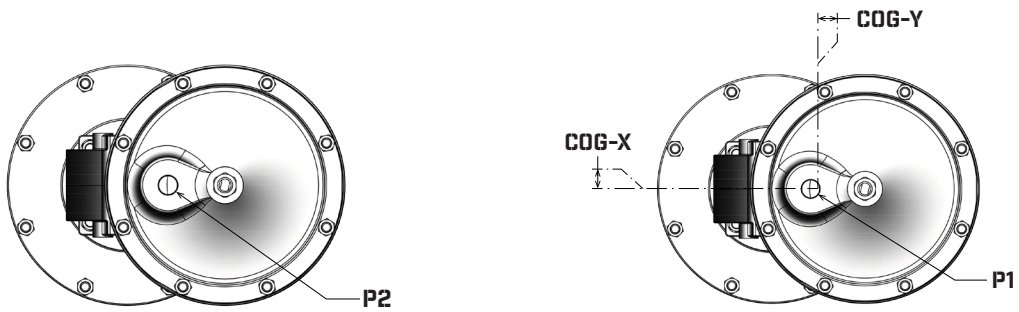
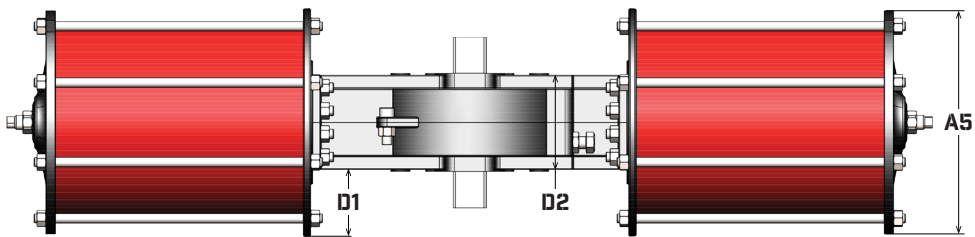
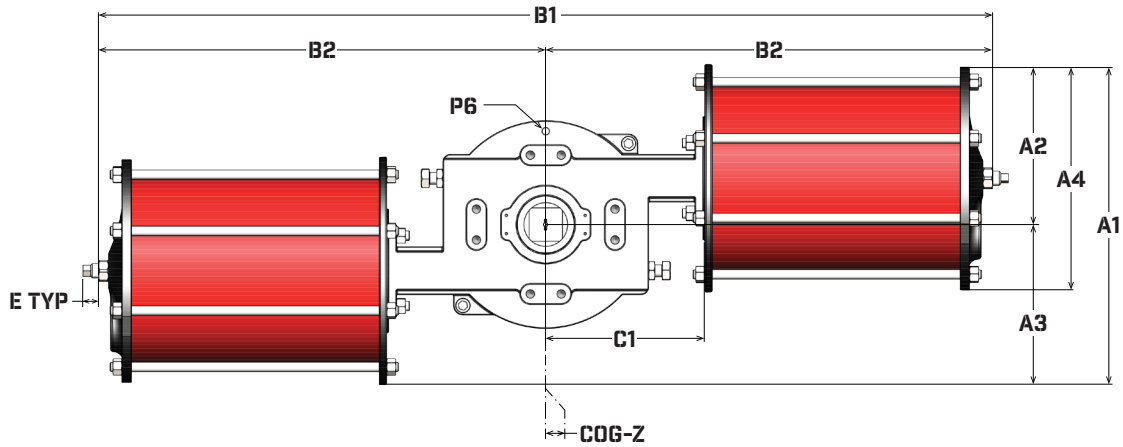
DOUBLE ACTING (DA)



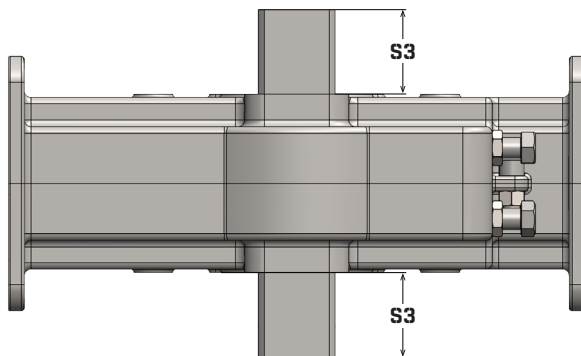
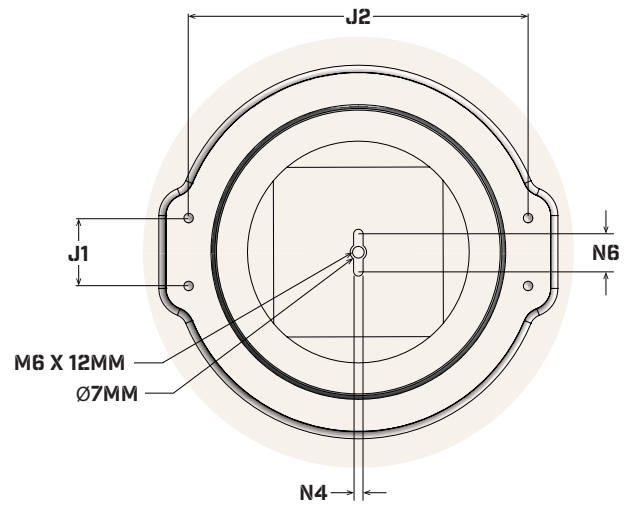
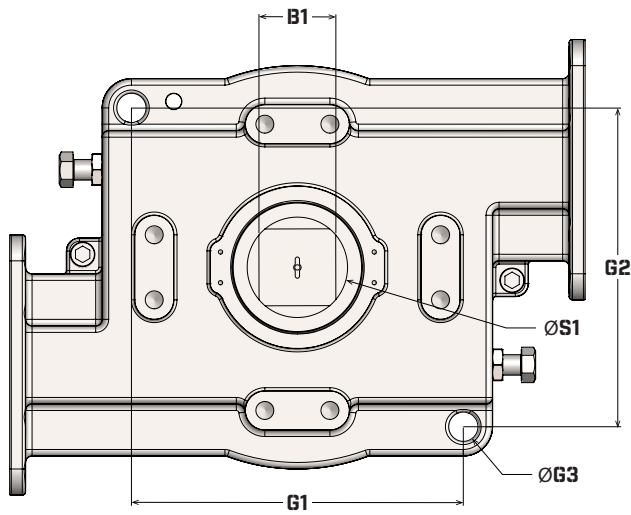
SPRING RETURN (SR)



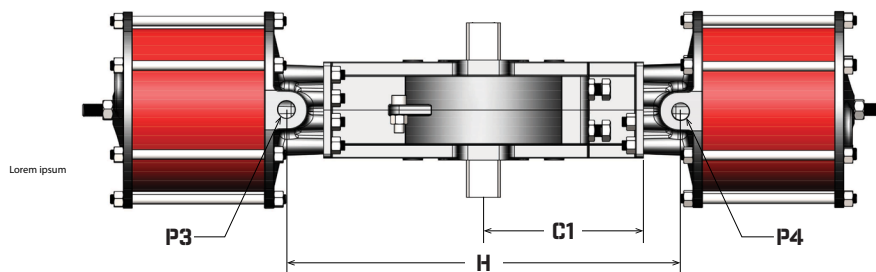
DIMENSIONS AND TECHNICAL DATA



DIMENSIONS AND TECHNICAL DATA



DIMENSIONS BELOW FOR DOUBLE ACTING MODELS ONLY



DIMENSIONS AND TECHNICAL DATA (IMPERIAL, INCHES)

ENVELOPE DIMENSIONS		DD04			DD06				DD08			
		DA-C030	SR-C030	SR-C040	DA-C030	DA-C040	SR-C040	SR-C050	DA-C040	DA-C050	SR-C050	SR-C060
Width Total	A1	4.88	4.88	6.05	5.38	6.55	6.55	7.54	7.55	8.54	8.54	9.56
Width Side 1	A2	2.44	2.44	3.02	2.69	3.28	3.27	3.77	3.77	4.27	4.27	4.78
Width Side 2	A3	2.44	2.44	3.02	2.69	3.28	3.27	3.77	3.77	4.27	4.27	4.78
Width Cylinder	A4	3.38	3.38	4.55	3.38	4.55	4.55	5.54	4.55	5.54	5.54	6.56
Height Cylinder	A5	3.38	3.38	4.55	3.38	4.55	4.55	5.54	4.55	5.54	5.54	6.56
Length Total	B1	15.872	19.00	19.40	18.40	19.08	22.07	22.61	24.45	25.25	28.98	29.58
Length Side 1	B2	7.94	9.50	9.70	9.20	9.54	11.04	11.30	12.23	12.63	14.49	14.79
Length Side 2	B3	7.94	9.50	9.70	9.20	9.54	11.04	11.30	12.23	12.63	14.49	14.79
Flange Distance	C1	8.12	5.91	5.91	8.65	9.46	6.88	6.88	12.42	12.41	9.13	9.14
Max Bracket Width	C2	5.56	5.56	5.56	3.22	3.22	6.44	6.44	8.69	8.69	8.69	8.69
Flange Depth	D1	0.51	0.51	1.01	0.33	0.83	0.83	1.33	0.68	1.18	1.18	1.68
Body Depth	D2	2.49	2.49	2.49	2.83	2.83	2.83	2.83	3.14	3.14	3.14	3.14
Stop Extension	E TYP	0.47	0.47	0.47	0.71	0.63	0.63	0.71	0.66	0.72	0.72	0.66
Maint Clearance	F1	11	15	15	13	13	17	17	17	17	23	23
Maint Clearance	F2	11	15	15	13	13	17	17	17	17	23	23
Lifting Eye Dim X	G1											
Lifting Eye Dim Y	G2											
Lifting Eye Diameter	G3											
P3 - P4 Distance	H	7.8			9.1	9.0			12.0	12.1		

MOUNTING PATTERN

Pattern X	J1	4 BOLT MOUNTING PATTERN ON A 3.5" BCD	0.75	0.75	0.75	0.75	1.25	1.25	1.25	1.25
Pattern Y	J2		3.31	3.31	3.31	3.31	4.88	4.88	4.88	4.88
Thread	J3	M8-1.25	M10-1.5	M10-1.5	M10-1.5	M10-1.5	M12-1.75	M12-1.75	M12-1.75	M12-1.75
Thread Depth		0.47	0.50	0.50	0.50	0.50	0.63	0.63	0.63	0.63

ACCESSORY PATTERN

Length	N1											
Width	N2											
Height	N3	0.984	0.984	0.984	0.894	0.894	0.894	0.894	0.894	0.894	0.894	0.894
Slot Width	N4	0.157	0.157	0.157	0.157	0.157	0.157	0.157	0.157	0.157	0.157	0.157
Slot Depth	N5	0.197	0.197	0.197	0.197	0.197	0.197	0.197	0.197	0.197	0.197	0.197
Thread	N6											
Thread Depth												

Mounting and accessory patterns are identical on both sides.

DIMENSIONS AND TECHNICAL DATA (IMPERIAL, INCHES)

DRIVE DIMENSIONS		DD04			DD06				DD08			
		DA-C030	SR-C030	SR-C040	DA-C030	DA-C040	SR-C040	SR-C050	DA-C040	DA-C050	SR-C050	SR-C060
Shaft Diameter	S1	0.982	0.982	0.982	1.100	1.100	1.100	1.100	1.652	1.652	1.652	1.652
Square Drive Size	S2	0.746	0.746	0.746	0.864	0.864	0.864	0.864	1.258	1.258	1.258	1.258
Shaft Length	S3	0.984	0.984	0.984	1.142	1.142	1.142	1.142	1.693	1.693	1.693	1.693
AIR/FLUID VOLUME cubic inches (cuin)	BODY SIDE	33			41	70			99	158		
	ENDCAP SIDE	25.08	25.08	44.27	33.09	58.53	58.53	91.38	87.03	135.92	135.92	199
PORT SIZE NPT (P1, P2, P3, P4)		1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"
NPT (P5, P6 breather vents)		1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"

Sizes DD04, DD06, and DD08 have a single body port on the side of the actuator

STROKE TIME seconds	RECOMMENDED MINIMUM	DD04			DD06				DD08			
		0.75	0.75	0.75	1.0	1.0	1.0	1.0	1.5	1.5	1.5	1.5

Stroke time varies with supply pressure, temperature, spring rate, travel adjustment, working medium, and valve torque. Values shown with no valve resistance.

CENTER OF GRAVITY	COGx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	COGy	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	COGz	-0.01	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	-0.01

WEIGHT pounds (lb)	14.98	S94: 23.92		20.66	28.52	S94: 32.72	S94: 45.11	40.66	49.36	S94: 58.11	S94: 78.64
		S92: 15.75				S93: 32.34	S93: 44.61			S93: 57.81	S93: 77.26
S82: 15.57	S82: 23.61	S92: 30.97	S92: 42.39	S92: 56.27	S92: 73.47						
S72: 15.26	S72: 23.42	S82: 32.11	S82: 43.56	S82: 57.84	S82: 76.31						
S62: 15.19	S62: 22.74	S72: 31.72	S72: 43.06	S72: 57.54	S72: 74.92						
	S52: 21.96	S62: 30.36	S62: 40.83	S62: 56.00	S62: 71.13						
S42: 15.06	S42: 21.76	S52: 28.79	S52: 38.60	S52: 54.54	S52: 67.01						
		S42: 28.41	S42: 38.10	S42: 54.24	S42: 65.62						

MAVT (See Page 21 for definition) in-lb	2,625	2,625	2,625	5,250	5,250	5,250	5,250	10,500	10,500	10,500	10,500
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TEMPERATURE LIMITS

STANDARD

-20°F to 185°F

Environmental temperature requirements may limit the use of certain trim materials.

Temperature ranges may be extended with proper insulation.

DIMENSIONS AND TECHNICAL DATA (IMPERIAL, INCHES)

ENVELOPE DIMENSIONS		DD10		DD12				DD14			
		DA-C060	SR-C060	DA-C060	DA-C080	SR-C080	SR-C100	DA-C080	DA-C100	DA-C120	SR-C120
Width Total	A1	10.50	10.50	10.50	13.19	13.19	17.50	14.80	18.50	20.70	20.80
Width Side 1	A2	5.25	5.25	5.25	6.59	6.59	8.75	7.40	9.25	10.35	10.40
Width Side 2	A3	5.25	5.25	5.25	6.59	6.59	8.75	7.40	9.25	10.35	10.40
Width Cylinder	A4	6.50	6.50	6.50	8.75	8.75	12.50	8.75	12.50	14.80	14.80
Height Cylinder	A5	6.50	6.50	6.50	8.75	8.75	12.50	8.75	12.50	14.80	14.80
Length Total	B1	31.40	37.20	40.20	41.40	43.40	45.00	47.00	48.50	49.00	58.00
Length Side 1	B2	15.70	18.60	20.10	20.70	21.70	22.50	23.50	24.20	24.50	29.00
Length Side 2	B3	15.70	18.60	20.10	20.70	21.70	22.50	23.50	24.20	24.50	29.00
Flange Distance	C1	6.38	6.38	7.41	7.41	7.41	7.41	10.19	12.50	12.00	10.19
Max Bracket Width	C2	9.34	9.34	13.83	13.83	13.83	13.83	19.09	19.09	19.09	19.09
Flange Depth	D1	1.22	1.22	0.05	1.57	1.44	3.44	1.20	3.07	4.21	4.21
Body Depth	D2	4.10	4.10	5.60	5.60	5.60	5.60	6.40	6.40	6.40	6.40
Stop Extension	ETYP	0.66	0.72	0.66	0.43	0.43	0.86	0.80	1.30	1.30	1.15
Maint Clearance	F1	23	30	28	29	34	35	34	33	33	45
Maint Clearance	F2	23	30	28	29	34	35	34	33	33	45
Lifting Eye Dim X	G1										
Lifting Eye Dim Y	G2										
Lifting Eye Diameter	G3										
P3 - P4 Distance	H	14.1		20.0	19.5			22.8	25.1	24.1	

MOUNTING PATTERN

Pattern X	J1	1.75	1.75	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Pattern Y	J2	6.50	6.50	8.00	8.00	8.00	8.00	8.00	9.00	9.00	9.00
Thread	J3	M12-1.75	M12-1.75	M16-2	M16-2	M16-2	M16-2	M16-2	M16-2	M16-2	M16-2
Thread Depth		0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75

ACCESSORY PATTERN

Length	N1	5.118	5.118	5.118	5.118	5.118	5.118	5.118	5.118	5.118	5.118
Width	N2	1.181	1.181	1.181	1.181	1.181	1.181	1.181	1.181	1.181	1.181
Height	N3	1.181	1.181	1.181	1.181	1.181	1.181	1.181	1.181	1.181	1.181
Slot Width	N4	0.157	0.157	0.157	0.157	0.157	0.157	0.157	0.157	0.157	0.157
Slot Depth	N5	0.197	0.197	0.197	0.197	0.197	0.197	0.197	0.197	0.197	0.197
Thread	N6	M5-0.8	M5-0.8	M5-0.8	M5-0.8	M5-0.8	M5-0.8	M5-0.8	M5-0.8	M5-0.8	M5-0.8
Thread Depth		0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38

Mounting and accessory patterns are identical on both sides.

DIMENSIONS AND TECHNICAL DATA (IMPERIAL, INCHES)

DRIVE DIMENSIONS		DD10		DD12				DD14			
		DA-C060	SR-C060	DA-C060	DA-C080	SR-C080	SR-C100	DA-C080	DA-C100	DA-C120	SR-C120
Shaft Diameter	S1	1.888	1.888	2.360	2.360	2.360	2.360	2.833	2.833	2.833	2.833
Square Drive Size	S2	1.415	1.415	1.809	1.809	1.809	1.809	2.163	2.163	2.163	2.163
Shaft Length	S3	1.530	1.530	1.960	1.960	1.960	1.960	2.371	2.371	2.371	2.371
AIR/FLUID VOLUME cubic inches (cuin)	BODY SIDE	325		406	704			746	1,075	1,606	
	ENDCAP SIDE	263	263	327	610	610	908	692	1,056	1,576	1,576
PORT SIZE NPT (P1, P2, P3, P4)		1/4"	1/4"	1/4"	1/4"	1/4"	1/2"	1/4"	1/2"	1"	1"
NPT (P5, P6 breather vents)		1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"
STROKE TIME seconds	RECOMMENDED MINIMUM	2.0	2.0	2.5	2.5	2.5	2.5	3.0	3.0	3.0	3.0

Stroke time varies with supply pressure, temperature, spring rate, travel adjustment, working medium, and valve torque. Values shown with no valve resistance.

CENTER OF GRAVITY	COGx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	COGy	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.05	0.13	0.03
	COGz	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

WEIGHT pounds (lb)	83.4	S01: 117	123	158	S01: 213	S01: 270	205	285	350	S01: 481
		S02: 114			S02: 209	S02: 235				S02: 450
		S03: 113			S03: 207	S03: 257				S03: 417
										S04: 414

MAVT (See Page 21 for definition) in-lb	14,000	14,000	28,000	28,000	28,000	28,000	56,000	56,000	56,000	56,000
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TEMPERATURE LIMITS

STANDARD	Environmental temperature requirements may limit the use of certain trim materials.
-20°F to 185°F	Temperature ranges may be extended with proper insulation.

DIMENSIONS AND TECHNICAL DATA (IMPERIAL, INCHES)

ENVELOPE DIMENSIONS		DD16			DD18				DD20				
		DA-C100	DA-C120	SR-C160	DA-C120	DA-C160	SR-C160	SR-C200	DA-C120	DA-C160	DA-C200	SR-C200	SR-C240
Width Total	A1	20.25	22.30	26.50	24.20	28.50	28.50	33.20	26.75	30.22	34.96	35.00	39.00
Width Side 1	A2	10.13	11.15	13.25	12.10	14.25	14.25	16.60	13.375	15.11	17.48	17.50	19.50
Width Side 2	A3	10.13	11.15	13.25	12.10	14.25	14.25	16.60	13.375	15.11	17.48	17.50	19.50
Width Cylinder	A4	12.70	14.80	19.00	14.80	19.00	18.70	23.40	15.25	18.7	23.4	23.40	27.40
Height Cylinder	A5	12.70	14.80	19.00	14.80	19.00	18.75	23.40	15.25	18.75	23.4	23.40	27.40
Length Total	B1	58.000	58.60	69.00	69.00	70.80	90.20	92.60	86	86	90.2	99.00	101.00
Length Side 1	B2	29.00	29.30	34.50	34.50	35.40	45.10	46.30	43	43	45.1	49.50	50.50
Length Side 2	B3	29.00	29.30	34.50	34.50	35.40	45.10	46.30	43	43	45.1	49.50	50.50
Flange Distance	C1	11.06	11.06	11.06	13.13	13.13	13.13	13.13	15.75	15.75	15.75	15.75	15.75
Max Bracket Width	C2	18.64	18.64	18.64	22.78	22.78	22.78	22.78	27.2	27.2	27.2	27.2	27.2
Flange Depth	D1	2.90	3.90	6.10	3.00	5.10	5.10	7.50	2.52	4.066	6.5	6.50	8.50
Body Depth	D2	6.90	6.90	6.90	8.50	8.50	8.50	8.50	10.5	10.5	10.5	10.50	10.50
Stop Extension	ETYP	0.63	1.35	1.50	1.30	1.50	1.50	2.50	1.24	2.3	2.5	3.50	4.75
Maint Clearance	F1	40	40	55	48	49	74	75	59	58	61	80	81
Maint Clearance	F2	40	40	55	48	49	74	75	59	58	61	80	81
Lifting Eye Dim X	G1	12.26	12.26	12.29	9.00	9.00	9.00	9.00	9.91	9.91	9.91	9.91	9.91
Lifting Eye Dim Y	G2	6.38	6.38	6.38	7.30	7.30	7.30	7.30	8.83	8.83	8.83	8.83	8.83
Lifting Eye Diameter	G3	1.13	1.13	1.13	0.94	0.94	0.94	0.94	1.06	1.06	1.06	1.06	1.06
P3 - P4 Distance	H	30.2	29.7		34.5	35.2			44.1	47.0	46.2		

MOUNTING PATTERN

Pattern X	J1	2.50	2.50	2.50	3.00	3.00	3.00	3.00	4.00	4.00	4.00	4.00	4.00
Pattern Y	J2	11.00	11.00	11.00	14.00	14.00	14.00	14.00	16.50	16.50	16.50	16.50	16.50
Thread	J3	M20-2.5	M20-2.5	M20-2.5	M24-3	M24-3	M24-3	M24-3	M30-3.5	M30-3.5	M30-3.5	M30-3.5	M30-3.5
Thread Depth		1.00	1.00	1.00	1.50	1.50	1.50	1.50	1.5	1.5	1.5	1.5	1.5

ACCESSORY PATTERN

Length	N1	5.906	5.906	5.906	7.480	7.480	7.480	7.480	9.252	9.252	9.252	9.252	9.252
Width	N2	1.181	1.181	1.181	1.181	1.181	1.181	1.181	1.181	1.181	1.181	1.181	1.181
Height	N3	1.181	1.181	1.181	1.181	1.181	1.181	1.181	1.181	1.181	1.181	1.181	1.181
Slot Width	N4	0.157	0.157	0.157	0.157	0.157	0.157	0.157	0.157	0.157	0.157	0.157	0.157
Slot Depth	N5	0.197	0.197	0.197	0.197	0.197	0.197	0.197	0.197	0.197	0.197	0.197	0.197
Thread	N6	M5-0.8	M5-0.8	M5-0.8	M5-0.8	M5-0.8	M5-0.8	M5-0.8	M5-0.8	M5-0.8	M5-0.8	M5-0.8	M5-0.8
Thread Depth		0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38

Mounting and accessory patterns are identical on both sides.

DIMENSIONS AND TECHNICAL DATA (IMPERIAL, INCHES)

DRIVE DIMENSIONS		DD16			DD18				DD20				
		DA-C100	DA-C120	SR-C160	DA-C120	DA-C160	SR-C160	SR-C200	DA-C120	DA-C160	DA-C200	SR-C200	SR-C240
Shaft Diameter	S1	3.856	3.856	3.856	6.140	6.140	6.140	6.140	7.636	7.636	7.636	7.636	7.636
Square Drive Size	S2	2.951	2.951	2.951	4.722	4.722	4.722	4.722	5.982	5.982	5.982	5.982	5.982
Shaft Length	S3	3.240	3.240	3.240	4.724	4.724	4.724	4.724	5.984	5.984	5.984	5.984	5.984

Note: Sizes D18 and D20 have a removable accessory slot attached to the output drive. The accessory slot does not have a threaded center hole.

AIR/FLUID VOLUME cubic inches (cuin)	BODY SIDE	1,475	1,908		2,468	4,350			2,900	5,117	8,099		
	ENDCAP SIDE	1,486	1,961	3,479	2,539	4,510	4,510	7,011	2,987	5,302	8,318	8,318	11,981

PORT SIZE NPT (P1, P2, P3, P4)	1/2"	1"	1 1/2"	1"	1 1/2"	1 1/2"	1 1/2"	1"	1 1/2"	1 1/2"	1 1/2"	1 1/2"	1 1/2"
NPT (P5, P6 breather vents)	3/8"	3/8"	3/8"	1/2"	1/2"	1/2"	1/2"	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"

STROKE TIME seconds	RECOMMENDED MINIMUM	4.0	4.0	4.0	5.0	5.0	5.0	5.0	6.0	6.0	6.0	6.0	6.0
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Stroke time varies with supply pressure, temperature, spring rate, travel adjustment, working medium, and valve torque. Values shown with no valve resistance.

CENTER OF GRAVITY	COGx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	COGy	0.03	0.08	0.02	0.10	0.10	0.00	0.00	0.00	0.00	0.10	0.00	0.00
	COGz	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00

WEIGHT pounds (lb)	178	206	S01: 416	321	391	S01: 688	S01: 862	541	608	771	S01: 1,368	S01: 1,809
			S02: 397			S02: 579	S02: 753				S02: 1,268	S02: 1,711
			S03: 364			S03: 508	S03: 682				S03: 1,196	S03: 1,633
			S04: 373								S04: 1,126	S04: 1,501
			S05: 320									S05: 1,407
												S06: 1,329

MAVT (See Page 21 for definition) in-lb	112,000	112,000	112,000	280,000	280,000	280,000	280,000	500,000	500,000	500,000	500,000	500,000
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TEMPERATURE LIMITS

STANDARD

-20°F to 185°F

Environmental temperature requirements may limit the use of certain trim materials.
Temperature ranges may be extended with proper insulation.

DIMENSIONS AND TECHNICAL DATA (METRIC, MILLIMETERS)

ENVELOPE DIMENSIONS		DD04			DD06				DD08			
		DA-C030	SR-C030	SR-C040	DA-C030	DA-C040	SR-C040	SR-C050	DA-C040	DA-C050	SR-C050	SR-C060
Width Total	A1	124.0	124.0	153.7	136.7	166.4	166.4	191.5	191.8	216.9	216.9	242.8
Width Side 1	A2	62.0	62.0	76.7	68.3	83.3	83.1	95.8	95.8	108.5	108.5	121.4
Width Side 2	A3	62.0	62.0	76.7	68.3	83.3	83.1	95.8	95.8	108.5	108.5	121.4
Width Cylinder	A4	85.9	85.9	115.6	85.9	115.6	115.6	140.7	115.6	140.7	140.7	166.6
Height Cylinder	A5	85.9	85.9	115.6	85.9	115.6	115.6	140.7	115.6	140.7	140.7	166.6
Length Total	B1	403.1	482.6	492.8	467.4	484.6	560.6	574.3	621.0	641.4	736.1	751.3
Length Side 1	B2	201.7	241.3	246.4	233.7	242.3	280.4	287.0	310.6	320.8	368.0	375.7
Length Side 2	B3	201.7	241.3	246.4	233.7	242.3	280.4	287.0	310.6	320.8	368.0	375.7
Flange Distance	C1	206.2	150.1	150.1	219.7	240.3	174.8	174.8	315.5	315.2	231.9	232.2
Max Bracket Width	C2	141.2	141.2	141.2	81.8	81.8	163.6	163.6	220.7	220.7	220.7	220.7
Flange Depth	D1	13.0	13.0	25.7	8.4	21.1	21.1	33.8	17.3	30.0	30.0	42.7
Body Depth	D2	63.2	63.2	63.2	71.9	71.9	71.9	71.9	79.8	79.8	79.8	79.8
Stop Extension	E TYP	11.9	11.9	11.9	18.0	16.0	16.0	18.0	16.8	18.3	18.3	16.8
Maint Clearance	F1	279.4	381.0	381.0	330.2	330.2	431.8	431.8	431.8	431.8	584.2	584.2
Maint Clearance	F2	279.4	381.0	381.0	330.2	330.2	431.8	431.8	431.8	431.8	584.2	584.2
Lifting Eye Dim X	G1											
Lifting Eye Dim Y	G2											
Lifting Eye Diameter	G3											
P3 - P4 Distance	H	198.1			231.1	228.6			304.8	307.3		

MOUNTING PATTERN

Pattern X	J1	4 BOLT MOUNTING PATTERN ON A 88.9 mm BCD	19.1	19.1	19.1	19.1	31.8	31.8	31.8	31.8
Pattern Y	J2		84.1	84.1	84.1	84.1	124.0	124.0	124.0	124.0
Thread	J3	M8-1.25	M10-1.5	M10-1.5	M10-1.5	M10-1.5	M12-1.75	M12-1.75	M12-1.75	M12-1.75
Thread Depth		11.9	12.7	12.7	12.7	12.7	16.0	16.0	16.0	16.0

ACCESSORY PATTERN

Length	N1											
Width	N2											
Height	N3	25.0	25.0	25.0	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7
Slot Width	N4	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Slot Depth	N5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Thread	N6											
Thread Depth												

Mounting and accessory patterns are identical on both sides.

DIMENSIONS AND TECHNICAL DATA (METRIC, MILLIMETERS)

DRIVE DIMENSIONS		DD04			DD06				DD08			
		DA-C030	SR-C030	SR-C040	DA-C030	DA-C040	SR-C040	SR-C050	DA-C040	DA-C050	SR-C050	SR-C060
Shaft Diameter	S1	24.95	24.95	24.95	27.95	27.95	27.95	27.95	41.95	41.95	41.95	41.95
Square Drive Size	S2	18.95	18.95	18.95	21.95	21.95	21.95	21.95	31.95	31.95	31.95	31.95
Shaft Length	S3	25.00	25.00	25.00	29.00	29.00	29.00	29.00	43.00	43.00	43.00	43.00

AIR/FLUID VOLUME cubic inches (L)	BODY SIDE	0.5			0.7	1.1			1.6	2.6		
	ENDCAP SIDE	0.4	0.4	0.7	0.5	1.0	1.0	1.5	1.4	2.2	2.2	3.3

PORT SIZE		1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"
NPT (P1, P2, P3, P4)												
NPT (P5, P6 breather vents)		1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"

Sizes DD04, DD06, and DD08 have a single body port on the side of the actuator

STROKE TIME seconds	RECOMMENDED MINIMUM	0.75	0.75	0.75	1.0	1.0	1.0	1.0	1.5	1.5	1.5	1.5
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Stroke time varies with supply pressure, temperature, spring rate, travel adjustment, working medium, and valve torque. Values shown with no valve resistance.

CENTER OF GRAVITY	COGx	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	COGy	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	COGz	-0.3	-0.3	-0.3	0.0	0.0	0.0	0.0	0.0	0.0	-0.3	-0.3

WEIGHT kilograms (kg)	6.81	S94: 10.87		9.39	12.97	S94: 14.87	S94: 20.50	18.48	22.44	S94: 11.42	S94: 15.66
		S92: 7.16				S93: 14.70	S93: 20.28			S93: 11.36	S93: 15.37
		S82: 7.08	S82: 10.73			S92: 14.08	S92: 19.27			S92: 11.04	S92: 14.59
		S72: 6.94	S72: 10.65			S82: 14.59	S82: 19.80			S82: 11.36	S82: 15.18
		S62: 6.90	S62: 10.34			S72: 14.42	S72: 19.57			S72: 11.30	S72: 14.89
			S52: 9.98			S62: 13.80	S62: 18.56			S62: 10.98	S62: 14.11
			S42: 6.85			S52: 13.09	S52: 17.54			S52: 10.68	S52: 13.26
						S42: 12.91	S42: 17.32			S42: 10.62	S42: 12.97

MAVT (See Page 21 for definition) N-m	297	297	297	583	583	583	583	1,186	1,186	1,186	1,186
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TEMPERATURE LIMITS

STANDARD Environmental temperature requirements may limit the use of certain trim materials.
-28°C to 85°C Temperature ranges may be extended with proper insulation.

DIMENSIONS AND TECHNICAL DATA (METRIC, MILLIMETERS)

ENVELOPE DIMENSIONS		DD10		DD12				DD14			
		DA-C060	SR-C060	DA-C060	DA-C080	SR-C080	SR-C100	DA-C080	DA-C100	DA-C120	SR-C120
Width Total	A1	266.7	266.7	266.7	335.0	335.0	444.5	375.9	469.9	525.8	528.3
Width Side 1	A2	133.4	133.4	133.4	167.4	167.4	222.3	188.0	235.0	262.9	264.2
Width Side 2	A3	133.4	133.4	133.4	167.4	167.4	222.3	188.0	235.0	262.9	264.2
Width Cylinder	A4	165.1	165.1	165.1	222.3	222.3	317.5	222.3	317.5	375.9	375.9
Height Cylinder	A5	165.1	165.1	165.1	222.3	222.3	317.5	222.3	317.5	375.9	375.9
Length Total	B1	797.6	944.9	1021.1	1051.6	1102.4	1143.0	1193.8	1231.9	1244.6	1473.2
Length Side 1	B2	398.8	472.4	510.5	525.8	551.2	571.5	596.9	614.7	622.3	736.6
Length Side 2	B3	398.8	472.4	510.5	525.8	551.2	571.5	596.9	614.7	622.3	736.6
Flange Distance	C1	162.1	162.1	188.2	188.2	188.2	188.2	258.8	317.5	304.8	258.8
Max Bracket Width	C2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Flange Depth	D1	31.0	31.0	1.3	39.9	36.6	87.4	30.5	78.0	106.9	106.9
Body Depth	D2	104.1	104.1	142.2	142.2	142.2	142.2	162.6	162.6	162.6	162.6
Stop Extension	ETYP	16.8	18.3	16.8	10.9	10.9	21.8	20.3	33.0	33.0	29.2
Maint Clearance	F1	584.2	762.0	711.2	736.6	863.6	889.0	863.6	838.2	838.2	1143.0
Maint Clearance	F2	584.2	762.0	711.2	736.6	863.6	889.0	863.6	838.2	838.2	1143.0
Lifting Eye Dim X	G1										
Lifting Eye Dim Y	G2										
Lifting Eye Diameter	G3										
P3 - P4 Distance	H	358.1		508.0	495.3			579.1	637.5	612.1	

MOUNTING PATTERN

Pattern X	J1	44.5	44.5	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8
Pattern Y	J2	165.1	165.1	203.2	203.2	203.2	203.2	203.2	228.6	228.6	228.6
Thread	J3	M12-1.75	M12-1.75	M16-2	M16-2	M16-2	M16-2	M16-2	M16-2	M16-2	M16-2
Thread Depth		19.1	19.1	19.1	19.1	19.1	19.1	19.1	19.1	19.1	19.1

ACCESSORY PATTERN

Length	N1	130.0	130.0	130.0	130.0	130.0	130.0	130.0	130.0	130.0	130.0
Width	N2	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Height	N3	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Slot Width	N4	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Slot Depth	N5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Thread	N6	M5-0.8	M5-0.8	M5-0.8	M5-0.8	M5-0.8	M5-0.8	M5-0.8	M5-0.8	M5-0.8	M5-0.8
Thread Depth		9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7

Mounting and accessory patterns are identical on both sides.

DIMENSIONS AND TECHNICAL DATA (METRIC, MILLIMETERS)

DRIVE DIMENSIONS		DD10		DD12				DD14			
		DA-C060	SR-C060	DA-C060	DA-C080	SR-C080	SR-C100	DA-C080	DA-C100	DA-C120	SR-C120
Shaft Diameter	S1	47.95	47.95	59.95	59.95	59.95	59.95	71.95	71.95	71.95	71.95
Square Drive Size	S2	35.95	35.95	45.95	45.95	45.95	45.95	54.95	54.95	54.95	54.95
Shaft Length	S3	38.86	38.86	49.78	49.78	49.78	49.78	60.22	60.22	60.22	60.22
AIR/FLUID VOLUME liters (L)	BODY SIDE	5.3		6.7	11.5			12.2	17.6	26.3	
	ENDCAP SIDE	4.3	4.3	5.4	10.0	10.0	14.9	11.3	17.3	25.8	25.8
PORT SIZE NPT (P1, P2, P3, P4)		1/4"	1/4"	1/4"	1/4"	1/4"	1/2"	1/4"	1/2"	1"	1"
	NPT (P5, P6 breather vents)	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"
STROKE TIME seconds	RECOMMENDED MINIMUM	2.0	2.0	2.5	2.5	2.5	2.5	3.0	3.0	3.0	3.0

Stroke time varies with supply pressure, temperature, spring rate, travel adjustment, working medium, and valve torque. Values shown with no valve resistance.

CENTER OF GRAVITY	COGx	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	COGy	0.0	0.0	0.0	0.0	0.0	0.8	0.0	1.3	3.3	0.8
	COGz	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

WEIGHT pounds (lb)	38	S01: 53	56	72	S01: 97	S01: 123	93	129	159	S01: 218
		S02: 52			S02: 95	S02: 109				S02: 204
		S03: 51			S03: 94	S03: 119				S03: 189
										S04: 188

MAVT (See Page 21 for definition) N-m	1,582	1,582	3,164	3,164	3,164	3,164	6,327	6,327	6,327	6,327
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TEMPERATURE LIMITS

STANDARD	Environmental temperature requirements may limit the use of certain trim materials.
-28°C to 85°C	Temperature ranges may be extended with proper insulation.

DIMENSIONS AND TECHNICAL DATA (METRIC, MILLIMETERS)

ENVELOPE DIMENSIONS		DD16			DD18				DD20				
		DA-C100	DA-C120	SR-C160	DA-C120	DA-C160	SR-C160	SR-C200	DA-C120	DA-C160	DA-C200	SR-C200	SR-C240
Width Total	A1	514.4	566.4	673.1	614.7	723.9	723.9	843.3	26.75	30.22	34.96	35.00	39.00
Width Side 1	A2	257.3	283.2	336.6	307.3	362.0	362.0	421.6	13.375	15.11	17.48	17.50	19.50
Width Side 2	A3	257.3	283.2	336.6	307.3	362.0	362.0	421.6	13.375	15.11	17.48	17.50	19.50
Width Cylinder	A4	322.6	375.9	482.6	375.9	482.6	475.0	594.4	15.25	18.7	23.4	23.40	27.40
Height Cylinder	A5	322.6	375.9	482.6	375.9	482.6	476.3	594.4	15.25	18.75	23.4	23.40	27.40
Length Total	B1	1473.2	1488.4	1752.6	1752.6	1798.3	2291.1	2352.0	86	86	90.2	99.00	101.00
Length Side 1	B2	736.6	744.2	876.3	876.3	899.2	1145.5	1176.0	43	43	45.1	49.50	50.50
Length Side 2	B3	736.6	744.2	876.3	876.3	899.2	1145.5	1176.0	43	43	45.1	49.50	50.50
Flange Distance	C1	280.9	280.9	280.9	333.5	333.5	333.5	333.5	15.75	15.75	15.75	15.75	15.75
Max Bracket Width	C2	473.5	473.5	473.5	578.6	578.6	578.6	578.6	27.2	27.2	27.2	27.2	27.2
Flange Depth	D1	73.7	99.1	154.9	76.2	129.5	129.5	190.5	2.52	4.066	6.5	6.50	8.50
Body Depth	D2	175.3	175.3	175.3	215.9	215.9	215.9	215.9	10.5	10.5	10.5	10.50	10.50
Stop Extension	ETYP	16.0	34.3	38.1	33.0	38.1	38.1	63.5	1.24	2.3	2.5	3.50	4.75
Maint Clearance	F1	1016.0	1016.0	1397.0	1219.2	1244.6	1879.6	1905.0	59	58	61	80	81
Maint Clearance	F2	1016.0	1016.0	1397.0	1219.2	1244.6	1879.6	1905.0	59	58	61	80	81
Lifting Eye Dim X	G1	311.4	311.4	312.2	228.6	228.6	228.6	228.6	9.91	9.91	9.91	9.91	9.91
Lifting Eye Dim Y	G2	162.1	162.1	162.1	185.4	185.4	185.4	185.4	8.83	8.83	8.83	8.83	8.83
Lifting Eye Diameter	G3	28.7	28.7	28.7	23.9	23.9	23.9	23.9	1.06	1.06	1.06	1.06	1.06
P3 - P4 Distance	H	767.1	754.4		876.3	894.1			44.1	47.0	46.2		

MOUNTING PATTERN

Pattern X	J1	63.5	63.5	63.5	76.2	76.2	76.2	76.2	4.00	4.00	4.00	4.00	4.00
Pattern Y	J2	279.4	279.4	279.4	355.6	355.6	355.6	355.6	16.50	16.50	16.50	16.50	16.50
Thread	J3	M20-2.5	M20-2.5	M20-2.5	M24-3	M24-3	M24-3	M24-3	M30-3.5	M30-3.5	M30-3.5	M30-3.5	M30-3.5
Thread Depth		25.4	25.4	25.4	38.1	38.1	38.1	38.1	1.5	1.5	1.5	1.5	1.5

ACCESSORY PATTERN

Length	N1	150.0	150.0	150.0	190.0	190.0	190.0	190.0	9.252	9.252	9.252	9.252	9.252
Width	N2	30.0	30.0	30.0	30.0	30.0	30.0	30.0	1.181	1.181	1.181	1.181	1.181
Height	N3	30.0	30.0	30.0	30.0	30.0	30.0	30.0	1.181	1.181	1.181	1.181	1.181
Slot Width	N4	4.0	4.0	4.0	4.0	4.0	4.0	4.0	0.157	0.157	0.157	0.157	0.157
Slot Depth	N5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	0.197	0.197	0.197	0.197	0.197
Thread	N6	M5-0.8	M5-0.8	M5-0.8	M5-0.8	M5-0.8	M5-0.8	M5-0.8	M5-0.8	M5-0.8	M5-0.8	M5-0.8	M5-0.8
Thread Depth		9.7	9.7	9.7	9.7	9.7	9.7	9.7	0.38	0.38	0.38	0.38	0.38

Mounting and accessory patterns are identical on both sides.

DIMENSIONS AND TECHNICAL DATA [METRIC, MILLIMETERS]

DRIVE DIMENSIONS		DD16			DD18				DD20				
		DA-C100	DA-C120	SR-C160	DA-C120	DA-C160	SR-C160	SR-C200	DA-C120	DA-C160	DA-C200	SR-C200	SR-C240
Shaft Diameter	S1	97.95	97.95	97.95	155.95	155.95	155.95	155.95	193.95	193.95	193.95	193.95	193.95
Square Drive Size	S2	74.95	74.95	74.95	119.95	119.95	119.95	119.95	151.95	151.95	151.95	151.95	151.95
Shaft Length	S3	82.30	82.30	82.30	120.00	120.00	120.00	120.00	152.00	152.00	152.00	152.00	152.00

Note: Sizes D18 and D20 have a removable accessory slot attached to the output drive. The accessory slot does not have a threaded center hole.

AIR/FLUID VOLUME cubic inches (cuin)	BODY SIDE	24.2	31.3		40.4	71.3			47.5	83.9	132.7	0.0	
	ENDCAP SIDE	24.4	32.1	57.0	41.6	73.9	73.9	114.9	48.9	86.9	136.3	136.3	11,981

PORT SIZE NPT (P1, P2, P3, P4)	1/2"	1"	1 1/2"	1"	1 1/2"	1 1/2"	1 1/2"	1"	1 1/2"	1 1/2"	1 1/2"	1 1/2"
NPT (P5, P6 breather vents)	3/8"	3/8"	3/8"	1/2"	1/2"	1/2"	1/2"	3/4"	3/4"	3/4"	3/4"	3/4"

STROKE TIME seconds	RECOMMENDED MINIMUM	4.0	4.0	4.0	5.0	5.0	5.0	5.0	6.0	6.0	6.0	6.0	6.0
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Stroke time varies with supply pressure, temperature, spring rate, travel adjustment, working medium, and valve torque. Values shown with no valve resistance.

CENTER OF GRAVITY	COGx	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	COGy	0.8	2.0	0.5	2.5	2.5	0.0	0.0	0.0	0.0	0.1	0.0	0.0
	COGz	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0

WEIGHT pounds (lb)	81	94	S01: 191	148	180	S01: 315	S01: 394	250	280	354	S01: 625	S01: 825
			S02: 183			S02: 265	S02: 344				S02: 580	S02: 779
			S03: 168			S03: 233	S03: 312				S03: 547	S03: 743
			S04: 172								S04: 515	S04: 683
			S05: 140									S05: 641
												S06: 605

MAVT (See Page 21 for definition) N-m	12,654	12,654	12,654	31,636	31,636	31,636	31,636	79,089	79,089	79,089	79,089	79,089
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TEMPERATURE LIMITS

STANDARD Environmental temperature requirements may limit the use of certain trim materials.
-28°C to 85°C Temperature ranges may be extended with proper insulation.

OUTPUT TORQUE DATA

The following tables show output torque for common pressures. For additional output information, download the interactive torque tables at QTRCO.com. Actuators may generate more torque than the maximum rating at higher pressures (refer to page 6 for torque ratings). Actuators should not be sized above their maximum torque rating unless there is no possibility that the valve will resist with a value above that rating.

AMT – Actuator Maximum Torque: The maximum possible torque output that the actuator can produce with a given springset at a given pressure (Usage: AMT@80psig, AMT@4barg, AMT@MAWP, etc). This number is often used to determine whether or not actuator torque output will exceed valve MAST.

MAVT – Max Allowable Valve Torque: The maximum torque resistance that the actuator can overcome without risk of unexpected fatigue or failure.

MAVTP – Max Allowable Valve Torque Pressure:
The pressure at which MAVT may be reached for a given actuator.

MAWP – Max Allowable Working Pressure: The maximum pressure that may be safely applied to the actuator cylinder(s). (MAWP is always greater than or equal to MAVTP.)

MAVTP vs MAWP explanation:

QTRCO actuators may be operated at pressures up to the MAWP in cases where the valve torque requirement will not exceed the MAVT rating of the actuator. When it is conceivable that the valve may resist with a torque greater than the MAVT rating of the actuator, such as with a torque seated valve or in an application that commonly sees higher than specified valve resistance due to sticking, the maximum pressure should be limited to MAVTP. Operating an actuator at a pressure greater than MAVTP when the torque resistance is greater than MAVT may result in unexpected fatigue or failure.

DOUBLE ACTING (IN-LB)

	40 psig			60 psig			80 psig			100 psig			120 psig			MAVT in-lbs	MAVTP psig	MAWP psig	
	Start	Min.	End	Start	Min.	End	Start	Min.	End	Start	Min.	End	Start	Min.	End				
04DA	-C030	873	381	632	1,309	572	949	1,745	763	1,265	2,181	953	1,581	2,618	1,144	1,897	2,625	86	120
	-C040	1,551	678	1,124	2327	1017	1686	3,102	1,356	2,248	3,878	1,695	2,811	4,653	2,034	3,373	2,625	48	120
06DA	-C030	1,163	508	843	1,745	763	1,265	2,327	1,017	1,686	2,908	1,271	2,108	3,490	1,525	2,530	5,250	120	120
	-C040	2,068	904	1,499	3,102	1,356	2,248	4,136	1,808	2,998	5,170	2,260	3,747	6,204	2,712	4,497	5,250	73	120
08DA	-C040	3,102	1,356	2,248	4,653	2,034	3,373	6,204	2,712	4,497	7,756	3,390	5,621	9,307	4,067	6,745	10,500	62	120
	-C050	4,847	2,118	3,513	7,271	3,178	5,270	9,694	4,237	7,027	12,118	5,296	8,783	14,542	6,355	10,540	10,500	97	120
10DA	-C060	9,854	4,072	6,938	14,781	6,107	10,407	19,708	8,143	13,876	24,635	10,179	17,345	29,562	12,215	20,814	14,000	41	120
12DA	-C060	12,318	5,129	8,673	18,477	7,693	13,009	24,636	10,257	17,345	30,795	12,821	21,681	36,954	15,386	26,018	28,000	65	120
	-C080	21,898	9,048	15,418	32,847	13,572	23,127	43,796	18,096	30,836	54,745	22,620	38,545	65,694	27,144	46,254	28,000	37	120
14DA	-C080	26,278	10,858	18,502	39,417	16,286	27,753	52,556	21,715	37,004	65,695	27,144	46,255	78,834	32,573	55,506	56,000	61	120
	-C100	41,059	16,964	28,909	61,588	25,446	43,363	82,117	33,928	57,817	102,646	42,410	72,271	123,176	50,892	86,726	56,000	39	120
16DA	-C100	51,324	21,206	36,136	76,985	31,808	54,204	102,647	42,411	72,272	128,309	53,014	90,340	153,971	63,617	108,408	112,000	62	120
	-C120	73,906	30,536	52,037	110,859	45,804	78,055	147,812	61,072	104,073	184,765	76,340	130,091	221,718	91,608	156,110	112,000	43	120
18DA	-C120	96,078	39,698	67,648	144,117	59,546	101,471	192,156	79,395	135,295	240,195	99,244	169,119	288,234	119,093	202,943	280,000	83	120
	-C160	170,806	70,573	120,262	256,208	105,859	180,393	341,611	141,145	240,524	427,014	176,431	300,655	512,417	211,718	360,786	280,000	47	120
20DA	-C120	113,323	46,822	79,790	169,984	70,233	119,684	226,645	93,644	159,579	283,306	117,055	199,474	339,968	140,466	239,369	700,000	120	120
	-C160	201,463	83,240	141,848	302,194	124,859	212,772	402,925	166,479	283,696	503,656	208,099	354,620	604,388	249,719	425,544	700,000	99	120
	-C200	314,786	130,062	221,638	472,179	195,093	332,456	629,572	260,124	443,275	786,965	325,155	554,094	944,358	390,186	664,913	700,000	64	120

D SERIES - PRODUCT BULLETIN

DOUBLE ACTING (N-M)

	2.8 bar			4.1 bar			5.5 bar			6.9 bar			8.3 bar			MAVT N-m	MAVTP bar	MAWP bar	
	Start	Min.	End	Start	Min.	End	Start	Min.	End	Start	Min.	End	Start	Min.	End				
04DA	-C030	99	43	71	148	65	107	197	86	143	246	108	179	296	129	214	297	5.9	8.3
	-C040	175	77	127	263	115	190	350	153	254	438	192	318	526	230	381	297	3.3	8.3
06DA	-C030	131	57	95	197	86	143	263	115	190	329	144	238	394	172	286	593	8.3	8.3
	-C040	234	102	169	350	153	254	467	204	339	584	255	423	701	306	508	593	5.0	8.3
08DA	-C040	350	153	254	526	230	381	701	306	508	876	383	635	1,052	460	762	1,186	4.3	8.3
	-C050	548	239	397	822	359	595	1,095	479	794	1,369	598	992	1,643	718	1,191	1,186	6.7	8.3
10DA	-C060	1,113	460	784	1,670	690	1,176	2,227	920	1,568	2,783	1,150	1,960	3,340	1,380	2,352	1,582	2.8	8.3
12DA	-C060	1,392	579	980	2,088	869	1,470	2,783	1,159	1,960	3,479	1,449	2,450	4,175	1,738	2,940	3,164	4.5	8.3
	-C080	2,474	1,022	1,742	3,711	1,533	2,613	4,948	2,045	3,484	6,185	2,556	4,355	7,422	3,067	5,226	3,164	2.6	8.3
14DA	-C080	2,969	1,227	2,090	4,454	1,840	3,136	5,938	2,453	4,181	7,423	3,067	5,226	8,907	3,680	6,271	6,327	4.2	8.3
	-C100	4,639	1,917	3,266	6,959	2,875	4,899	9,278	3,833	6,532	11,597	4,792	8,166	13,917	5,750	9,799	6,327	2.7	8.3
16DA	-C100	5,799	2,396	4,083	8,698	3,594	6,124	11,598	4,792	8,166	14,497	5,990	10,207	17,396	7,188	12,248	12,654	4.3	8.3
	-C120	8,350	3,450	5,879	12,525	5,175	8,819	16,701	6,900	11,759	20,876	8,625	14,698	25,051	10,350	17,638	12,654	3.0	8.3
18DA	-C120	10,855	4,485	7,643	16,283	6,728	11,465	21,711	8,970	15,286	27,138	11,213	19,108	32,566	13,456	22,929	31,636	5.7	8.3
	-C160	19,298	7,974	13,588	28,948	11,960	20,382	38,597	15,947	27,176	48,246	19,934	33,969	57,895	23,921	40,763	31,636	3.2	8.3
20DA	-C120	12,804	5,290	9,015	19,206	7,935	13,522	25,607	10,580	18,030	32,009	13,225	22,538	38,411	15,871	27,045	79,089	8.3	8.3
	-C160	22,762	9,405	16,027	34,143	14,107	24,040	45,524	18,810	32,053	56,905	23,512	40,067	68,287	28,214	48,080	79,089	6.8	8.3
	-C200	35,566	14,695	25,042	53,349	22,043	37,562	71,132	29,390	50,083	88,915	36,738	62,604	106,698	44,085	75,125	79,089	4.4	8.3

SPRING RETURN (IN-LB)								MAVT in-lbs	MAVTP psig	MAWP psig
Left Hand (FAIL CLOSE)	SPRINGS	40 psig	60 psig	80 psig	100 psig	120 psig				
04 SR-C030- S42	Start	308	581	1,018	1,454	1,890	2,326	2,625	134	120
	Minimum	162	214	405	596	787	977			
	End	291	306	614	921	1228	1,535			
SR-C030- S62	Start	493	432	868	1,304	1,740	2,177	2,625	141	120
	Minimum	254	112	308	499	690	881			
	End	441	121	428	735	1042	1,350			
04 SR-C030- S72	Start	619		720	1156	1592	2,029	2,625	147	120
	Minimum	327		233	426	617	808			
	End	589		302	609	916	1,224			
SR-C030- S82	Start	980			977	1,413	1,849	2,625	156	120
	Minimum	482			240	441	635			
	End	768			248	555	862			
SR-C030- S92	Start	1,268				1,261	1,698	2,625	162	120
	Minimum	607				268	489			
	End	920				268	575			
SR-C040- S42	Start	308	1,260	2,036	2,811	3,587	4,362	2,625	75	120
	Minimum	162	511	850	1,189	1,528	1,867			
	End	291	784	1,330	1,876	2,422	2,968			
SR-C040- S52	Start	619	962	1,738	2,513	3,289	4,064	2,625	83	120
	Minimum	327	340	681	1,020	1,359	1,698			
	End	589	473	1,019	1,565	2,111	2,657			
SR-C040- S62	Start	975	553	1,328	2,104	2,879	3,655	2,625	93	120
	Minimum	529	117	474	815	1,154	1,493			
	End	999	117	664	1,210	1,756	2,302			
04 SR-C040- S72	Start	1,283		1,037	1,812	2,588	3,364	2,625	101	120
	Minimum	692		301	646	986	1,326			
	End	1,290		356	902	1,448	1,994			
SR-C040- S82	Start	1,594		739	1,515	2,290	3,066	2,625	109	120
	Minimum	856		44	471	815	1,155			
	End	1588		44	590	1,136	1,682			
SR-C040- S94	Start	1,880			1,290	2,066	2,841	2,625	114	120
	Minimum	997			303	662	1,005			
	End	1,812			304	850	1,397			

D SERIES-PRODUCT BULLETIN

OUTPUT TORQUE DATA (CONTINUED)

The torque values above indicate the actual actuator output torque. Some values may exceed the max rating of the actuator.

		SPRING RETURN (IN-LB)						MAVT in-lbs	MAVTP psig	MAWP psig
Left Hand (FAIL CLOSE)		SPRINGS	40 psig	60 psig	80 psig	100 psig	120 psig			
06 SR-C040- S42	Start	407	1,750	2,784	3,818	4,852	5,886	5,250	108	120
	Minimum	200	694	1,147	1,598	2,050	2,502			
	End	318	1,049	1,777	2,505	3,234	3,962			
SR-C040- S52	Start	819	1,422	2,457	3,491	4,525	5,559	5,250	114	120
	Minimum	403	478	933	1,386	1,838	2,290			
	End	646	638	1,366	2,094	2,822	3,550			
SR-C040- S62	Start	1,290	922	1,956	2,990	4,024	5,058	5,250	124	120
	Minimum	664	166	664	1,119	1,572	2,025			
	End	1,147	166	894	1,622	2,350	3,079			
SR-C040- S72	Start	1,697		1,638	2,672	3,706	4,740	5,250	130	120
	Minimum	864		439	905	1,361	1,814			
	End	1,465		487	1,215	1,944	2,672			
SR-C040- S82	Start	2,109		1,310	2,344	3,378	4,412	5,250	136	120
	Minimum	1,067		76	679	1,142	1,598			
	End	1,792		76	804	1,532	2,260			
SR-C040- S92	Start	1,667		1,744	2,778	3,812	4,846	5,250	128	120
	Minimum	831		467	933	1,389	1,843			
	End	1,359		518	1,246	1,974	2,702			
SR-C040- S93	Start	2,073		1,425	2,460	3,494	4,528	5,250	134	120
	Minimum	1,031		111	711	1,174	1,630			
	End	1,677		111	839	1,567	2,295			
SR-C040- S94	Start	2,485			2,132	3,166	4,200	5,250	140	120
	Minimum	1,234			427	949	1,411			
	End	2,004			427	1,155	1,883			
SR-C050- S42	Start	580	2,767	4,382	5,998	7,614	9,230	5,250	71	120
	Minimum	287	1,112	1,819	2,524	3,230	3,936			
	End	465	1,696	2,833	3,971	5,109	6,246			
SR-C050- S52	Start	1,199	2,261	3,877	5,493	7,109	8,724	5,250	77	120
	Minimum	596	785	1,495	2,202	2,909	3,615			
	End	970	1,076	2,214	3,351	4,489	5,626			
SR-C050- S62	Start	1,759	1,598	3,214	4,830	6,446	8,061	5,250	85	120
	Minimum	920	449	1,167	1,876	2,583	3,289			
	End	1,633	517	1,654	2,792	3,930	5,067			
SR-C050- S72	Start	2,338		2,749	4,365	5,981	7,596	5,250	91	120
	Minimum	1,207		856	1,571	2,281	2,988			
	End	2,098		1,075	2,212	3,350	4,488			
SR-C050- S82	Start	2,958		2,244	3,860	5,476	7,091	5,250	97	120
	Minimum	1,517		455	1,238	1,953	2,663			
	End	2,603		455	1,593	2,730	3,868			
SR-C050- S92	Start	3,427			4,621	6,237	7,852	5,250	88	120
	Minimum	1,484			1,106	1,863	2,586			
	End	1,842			1,123	2,261	3,398			
SR-C050- S93	Start	4,007			4,156	5,772	7,387	5,250	94	120
	Minimum	1,773			544	1,530	2,270			
	End	2,307			544	1,681	2,819			
SR-C050- S94	Start	4,627				5,267	6,882	5,250	100	120
	Minimum	2,084				1,061	1,919			
	End	2,812				1,061	2,199			

OUTPUT TORQUE DATA (CONTINUED)

The torque values above indicate the actual actuator output torque. Some values may exceed the max rating of the actuator.

SPRING RETURN (IN-LB)		SPRINGS	40 psig	60 psig	80 psig	100 psig	120 psig	MAVT in-lbs	MAVTP psig	MAWP psig
Left Hand (FAIL CLOSE)										
SR-C050- S42	Start	1,153	4,130	6,553	8,977	11,401	13,824	10,500	93	120
	Minimum	524	1,554	2,615	3,675	4,734	5,793			
	End	717	2,260	3,966	5,673	7,379	9,085			
SR-C050- S52	Start	1,848	3,482	5,905	8,329	10,753	13,176	10,500	98	120
	Minimum	890	1,171	2,238	3,299	4,359	5,418			
	End	1,366	1,565	3,272	4,978	6,684	8,391			
SR-C050- S62	Start	2,677	2,493	4,917	7,340	9,764	12,188	10,500	106	120
	Minimum	1,372	666	1,750	2,814	3,875	4,935			
	End	2,354	736	2,443	4,149	5,856	7,562			
SR-C050- S72	Start	3,830		4,199	6,623	9,046	11,470	10,500	112	120
	Minimum	1,898		1,146	2,236	3,304	4,368			
	End	3,072		1,289	2,996	4,702	6,409			
SR-C050- S82	Start	4,524		3,551	5,975	8,398	10,822	10,500	117	120
	Minimum	2,263		595	1,845	2,922	3,989			
	End	3,720		595	2,301	4,008	5,714			
SR-C050- S92	Start	3,531		4,739	7,163	9,587	12,010	10,500	108	120
	Minimum	1,682		1,356	2,441	3,509	4,572			
	End	2,531		1,588	3,295	5,001	6,707			
SR-C050- S93	Start	4,684		4,022	6,446	8,869	11,293	10,500	113	120
	Minimum	2,206		435	1,836	2,925	3,997			
	End	3,249		435	2,141	3,848	5,554			
SR-C050- S94	Start	5,379			5,798	8,221	10,645	10,500	119	120
	Minimum	2,572			1,409	2,533	3,612			
	End	3,897			1,447	3,153	4,860			
SR-C060- S42	Start	1,434	5,883	9,373	12,863	16,353	19,843	10,500	66	120
	Minimum	699	2,316	3,843	5,368	6,893	8,417			
	End	1,097	3,481	5,938	8,395	10,852	13,310			
SR-C060- S52	Start	2,484	5,080	8,570	12,060	15,550	19,040	10,500	71	120
	Minimum	1,211	1,770	3,303	4,830	6,356	7,882			
	End	1,900	2,430	4,887	7,345	9,802	12,259			
SR-C060- S62	Start	3,404	3,755	7,245	10,735	14,225	17,715	10,500	79	120
	Minimum	1,795	1,187	2,727	4,255	5,781	7,307			
	End	3,226	1,510	3,968	6,425	8,882	11,339			
SR-C060- S72	Start	4,838	2,658	6,148	9,638	13,128	16,618	10,500	85	120
	Minimum	2,495	76	1,971	3,513	5,044	6,572			
	End	4,322	76	2,534	4,991	7,448	9,905			
SR-C060- S82	Start	5,889		5,344	8,834	12,324	15,814	10,500	90	120
	Minimum	3,007		1,379	2,959	4,498	6,030			
	End	5,126		1,483	3,940	6,398	8,855			
SR-C060- S92	Start	6,235		6,704	10,194	13,684	17,174	10,500	82	120
	Minimum	2,803		1,137	2,999	4,562	6,104			
	End	3,766		1,137	3,594	6,052	8,509			
SR-C060- S93	Start	7,669			9,097	12,587	16,077	10,500	88	120
	Minimum	3,504			2,146	3,784	5,345			
	End	4,863			2,160	4,618	7,075			
SR-C060- S94	Start	8,719			8,294	11,784	15,274	10,500	93	120
	Minimum	4,017			1,110	3,190	4,779			
	End	5,666			1,110	3,567	6,024			

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OUTPUT TORQUE DATA (CONTINUED)

The torque values above indicate the actual actuator output torque. Some values may exceed the max rating of the actuator.

		SPRING RETURN (IN-LB)						MAVT in-lbs	MAVTP psig	MAWP psig	
Left Hand (FAIL CLOSE)		SPRINGS	40 psig	60 psig	80 psig	100 psig	120 psig				
10	SR-C060- S03	Start	2,071	7,594	12,521	17,448	22,376	27,303	14,000	66	120
		Minimum	1,095	2,974	5,008	7,042	9,077	11,111			
		End	2,261	4,867	8,336	11,805	15,274	18,743			
	SR-C060- S02	Start	5,899	4,867	9,794	14,721	19,648	24,575	14,000	77	120
		Minimum	2,844	1,177	3,188	5,199	7,210	9,220			
		End	4,987	1,039	4,508	7,977	11,446	14,915			
	SR-C060- S01	Start	7,971		7,533	12,460	17,387	22,314	14,000	86	120
		Minimum	3,940		2,040	4,033	6,027	8,020			
		End	7,248		2,436	5,905	9,374	12,843			
12	SR-C080- S03	Start	4,915	17,012	27,961	38,910	49,859	60,808	28,000	60	120
		Minimum	2,509	6,527	11,045	15,563	20,081	24,599			
		End	4,886	10,503	18,212	25,921	33,630	41,339			
	SR-C080- S31	Start	7,616	14,489	25,438	36,387	47,337	58,286	28,000	65	120
		Minimum	3,856	5,171	9,684	14,197	18,711	23,224			
		End	7,410	7,802	15,511	23,220	30,929	38,638			
	SR-C080- S02	Start	11,085	11,023	21,972	32,921	43,870	54,819	28,000	71	120
		Minimum	5,630	3,371	7,871	12,371	16,872	21,372			
		End	10,875	4,333	12,042	19,751	27,460	35,169			
	SR-C080- S21	Start	11,430	10,537	21,486	32,435	43,385	54,334	28,000	72	120
		Minimum	5,833	3,168	7,668	12,168	16,669	21,169			
		End	11,362	3,989	11,698	19,407	27,117	34,826			
	SR-C080- S01	Start	16,000		17,086	28,035	38,984	49,933	28,000	80	120
		Minimum	8,138		5,281	9,754	14,227	18,700			
		End	15,761		7,127	14,836	22,545	30,254			
	SR-C080- S11	Start	19,046		14,076	25,025	35,974	46,923	28,000	85	120
		Minimum	9,689		3,598	8,027	12,456	16,885			
		End	18,771		4,082	11,791	19,501	27,210			
12	SR-C100- S03	Start	11,085	23,341	40,449	57,557	74,665	91,773	28,000	45	120
		Minimum	5,630	8,478	15,532	22,586	29,640	36,694			
		End	10,875	13,006	25,052	37,098	49,143	61,189			
	SR-C100- S02	Start	16,000	18,455	35,563	52,671	69,779	86,887	28,000	51	120
		Minimum	8,138	5,941	12,980	20,019	27,059	34,098			
		End	15,761	8,091	20,136	32,181	44,227	56,272			
	SR-C100- S01	Start	23,363	11,136	28,244	45,352	62,460	79,568	28,000	60	120
		Minimum	11,896	2,108	9,110	16,112	23,114	30,116			
		End	23,080	728	12,773	24,818	36,864	48,909			

OUTPUT TORQUE DATA (CONTINUED)

The torque values above indicate the actual actuator output torque. Some values may exceed the max rating of the actuator.

SPRING RETURN (IN-LB)								MAVT in-lbs	MAVTP psig	MAWP psig
Left Hand (FAIL CLOSE)	SPRINGS	40 psig	60 psig	80 psig	100 psig	120 psig				
14 SR-C120- S04	Start	25,900	35,293	64,856	94,419	123,981	153,544	56,000	54	120
	Minimum	12,855	11,452	23,605	35,758	47,912	60,065			
	End	23,832	15,729	36,544	57,359	78,173	98,988			
SR-C120- S03	Start	29,503	31,978	61,540	91,102	120,665	150,227	56,000	56	120
	Minimum	14,643	9,620	21,752	33,884	46,015	58,147			
	End	27,147	12,126	32,941	53,756	74,570	95,385			
SR-C120- S02	Start	37,246		54,416	83,979	113,541	143,104	56,000	61	120
	Minimum	18,486		17,770	29,855	41,941	54,026			
	End	34,272		25,198	46,013	66,827	87,642			
SR-C120- S01	Start	46,325		46,062	75,624	105,187	134,749	56,000	67	120
	Minimum	22,991		12,974	24,962	36,951	48,939			
	End	42,625		16,119	36,934	57,748	78,563			
16 SR-C160- S05	Start	34,383	94,749	160,443	226,137	291,832	357,526	112,000	45	120
	Minimum	18,015	36,218	63,335	90,452	117,568	144,685			
	End	36,640	58,126	104,381	150,636	196,890	243,145			
SR-C160- S04	Start	47,014	81,287	146,982	212,677	278,371	344,066	112,000	49	120
	Minimum	24,633	29,580	56,687	83,794	110,900	138,007			
	End	50,102	45,495	91,750	138,005	184,259	230,514			
SR-C160- S03	Start	52,628	75,305	140,999	206,693	272,388	338,082	112,000	51	120
	Minimum	27,575	26,630	53,733	80,836	107,938	135,041			
	End	56,084	39,881	86,136	132,391	178,645	224,900			
SR-C160- S02	Start	63,151	64,091	129,785	195,479	261,174	326,868	112,000	55	120
	Minimum	33,088	21,079	48,162	75,245	102,329	129,412			
	End	67,298	29,358	75,613	121,868	168,122	214,377			
SR-C160- S01	Start	81,397		110,341	176,035	241,730	307,424	112,000	61	120
	Minimum	42,648		38,370	65,376	92,382	119,388			
	End	86,742		57,367	103,622	149,876	196,131			

D SERIES-PRODUCT BULLETIN

OUTPUT TORQUE DATA (CONTINUED)

The torque values above indicate the actual actuator output torque. Some values may exceed the max rating of the actuator.

		SPRING RETURN (IN-LB)						MAVT	MAVTP	MAWP	
		Left Hand (FAIL CLOSE)	SPRINGS	40 psig	60 psig	80 psig	100 psig	120 psig	in-lbs	psig	psig
18	SR-C160-S03	Start	75,223	98,588	183,991	269,394	354,796	440,199	280,000	82	120
		Minimum	37,904	32,523	67,736	102,949	138,163	173,376			
		End	72,218	45,039	105,170	165,301	225,433	285,564			
	SR-C160-S02	Start	101,571	67,292	152,695	238,098	323,500	408,903	280,000	90	120
		Minimum	52,321	18,106	53,320	88,533	123,747	158,960			
		End	103,514	18,691	78,822	138,953	199,085	259,216			
	SR-C160-S01	Start	176,794			165,880	251,282	336,685	280,000	107	120
		Minimum	90,225			49,598	84,554	119,510			
		End	175,731			63,730	123,862	183,993			
18	SR-C200-S03	Start	75,223	194,666	328,107	461,549	594,991	728,433	280,000	53	120
		Minimum	37,904	72,220	127,282	182,344	237,406	292,468			
		End	72,218	112,686	206,641	300,596	394,550	488,505			
	SR-C200-S02	Start	101,571	163,370	296,812	430,254	563,696	697,138	280,000	57	120
		Minimum	52,321	57,803	112,866	167,928	222,990	278,052			
		End	103,514	86,339	180,294	274,249	368,203	462,158			
	SR-C200-S01	Start	176,794		224,594	358,036	491,478	624,920	280,000	68	120
		Minimum	90,225		74,644	129,600	184,556	239,512			
		End	175,731		105,071	199,026	292,980	386,935			
20	SR-C200-S04	Start	194,540		291,730	449,123	606,517	763,910	700,000	112	120
		Minimum	96,805		97,300	162,001	226,703	291,404			
		End	180,449		137,916	248,735	359,553	470,372			
	SR-C200-S03	Start	246,715		246,007	403,400	560,792	718,185	700,000	118	120
		Minimum	122,249		71,330	135,857	200,383	264,910			
		End	226,172		85,740	196,559	307,377	418,196			
	SR-C200-S02	Start	270,815		216,551	373,944	531,336	688,729	700,000	120	120
		Minimum	135,621		57,873	122,371	186,869	251,367			
		End	255,628		61,640	172,459	283,277	394,096			
SR-C200-S01	Start	356,035			298,448	455,840	613,233	700,000	120	120	
	Minimum	177,338			78,588	142,570	206,551				
	End	331,124			87,239	198,057	308,876				
20	SR-C240-S06	Start	246,715	227,120	453,765	680,411	907,057	1,133,703	700,000	82	120
		Minimum	122,249	64,222	157,457	250,692	343,928	437,163			
		End	226,172	72,442	232,021	391,600	551,178	710,757			
	SR-C240-S05	Start	270,815		424,309	650,955	877,601	1,104,247	700,000	84	120
		Minimum	135,621		144,063	237,291	330,519	423,747			
		End	255,628		207,921	367,500	527,078	686,657			
	SR-C240-S04	Start	356,035		348,813	575,459	802,105	1,028,751	700,000	91	120
		Minimum	177,338		101,525	194,480	287,434	380,389			
		End	331,124		122,701	282,280	441,858	601,437			
SR-C240-S03	Start	414,389			510,034	736,680	963,326	700,000	97	120	
	Minimum	208,564			162,760	255,590	348,421				
	End	396,550			223,926	383,504	543,083				
SR-C240-S02	Start	438,489			480,578	707,224	933,870	700,000	99	120	
	Minimum	221,908			149,216	241,996	334,777				
	End	426,005			199,826	359,404	518,983				
SR-C240-S01	Start	523,709			405,081	631,727	858,373	700,000	106	120	
	Minimum	263,649			105,204	197,418	289,631				
	End	501,502			114,606	274,184	433,763				

SPRING RETURN [N-M]			3 bar	4 bar	5.5 bar	7 bar	8 bar	MAVT N-m	MAVTP bar	MAWP bar	
Left Hand (FAIL CLOSE)		SPRINGS									
04	SR-C030- S42	Start	35	66	115	164	214	263	297	9.2	8.3
		Minimum	18	24	46	67	89	110			
		End	33	35	69	104	139	173			
04	SR-C030- S62	Start	56	49	98	147	197	246	297	9.7	8.3
		Minimum	29	13	35	56	78	100			
		End	50	14	48	83	118	152			
04	SR-C030- S72	Start	70		81	131	180	229	297	10.2	8.3
		Minimum	37		26	48	70	91			
		End	67		34	69	103	138			
04	SR-C030- S82	Start	111			110	160	209	297	10.7	8.3
		Minimum	54			27	50	72			
		End	87			28	63	97			
04	SR-C030- S92	Start	143				142	192	297	11.2	8.3
		Minimum	69				30	55			
		End	104				30	65			
04	SR-C040- S42	Start	35	142	230	318	405	493	297	5.2	8.3
		Minimum	18	58	96	134	173	211			
		End	33	89	150	212	274	335			
04	SR-C040- S52	Start	70	109	196	284	372	459	297	5.7	8.3
		Minimum	37	38	77	115	154	192			
		End	67	53	115	177	239	300			
04	SR-C040- S62	Start	110	62	150	238	325	413	297	6.4	8.3
		Minimum	60	13	54	92	130	169			
		End	113	13	75	137	198	260			
04	SR-C040- S72	Start	145		117	205	292	380	297	7.0	8.3
		Minimum	78		34	73	111	150			
		End	146		40	102	164	225			
04	SR-C040- S82	Start	180		83	171	259	346	297	7.5	8.3
		Minimum	97		5	53	92	131			
		End	179		5	67	128	190			
04	SR-C040- S94	Start	212			146	233	321	297	7.9	8.3
		Minimum	113			34	75	114			
		End	205			34	96	158			

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OUTPUT TORQUE DATA (CONTINUED)

The torque values above indicate the actual actuator output torque. Some values may exceed the max rating of the actuator.

SPRING RETURN (IN-LB)		SPRINGS	3 bar	4 bar	5.5 bar	7 bar	8 bar	MAVT N-m	MAVTP bar	MAWP bar
Left Hand (FAIL CLOSE)										
06 SR-C040- S42	Start	46	198	315	431	548	665	593	7.4	8.3
	Minimum	23	78	130	181	232	283			
	End	36	119	201	283	365	448			
SR-C040- S52	Start	93	161	278	394	511	628	593	7.9	8.3
	Minimum	46	54	105	157	208	259			
	End	73	72	154	237	319	401			
SR-C040- S62	Start	146	104	221	338	455	571	593	8.5	8.3
	Minimum	75	19	75	126	178	229			
	End	130	19	101	183	266	348			
SR-C040- S72	Start	192		185	302	419	536	593	9.0	8.3
	Minimum	98		50	102	154	205			
	End	166		55	137	220	302			
SR-C040- S82	Start	238		148	265	382	498	593	9.4	8.3
	Minimum	121		9	77	129	181			
	End	202		9	91	173	255			
SR-C040- S92	Start	188		197	314	431	548	593	8.8	8.3
	Minimum	94		53	105	157	208			
	End	154		59	141	223	305			
SR-C040- S93	Start	234		161	278	395	512	593	9.2	8.3
	Minimum	116		13	80	133	184			
	End	189		13	95	177	259			
SR-C040- S94	Start	281			241	358	475	593	9.7	8.3
	Minimum	139			48	107	159			
	End	226			48	130	213			
SR-C050- S42	Start	66	313	495	678	860	1,043	593	4.9	8.3
	Minimum	32	126	206	285	365	445			
	End	53	192	320	449	577	706			
SR-C050- S52	Start	135	255	438	621	803	986	593	5.3	8.3
	Minimum	67	89	169	249	329	408			
	End	110	122	250	379	507	636			
SR-C050- S62	Start	199	181	363	546	728	911	593	5.9	8.3
	Minimum	104	51	132	212	292	372			
	End	185	58	187	315	444	572			
SR-C050- S72	Start	264		311	493	676	858	593	6.3	8.3
	Minimum	136		97	177	258	338			
	End	237		121	250	378	507			
SR-C050- S82	Start	334		254	436	619	801	593	6.7	8.3
	Minimum	171		51	140	221	301			
	End	294		51	180	308	437			
SR-C050- S92	Start	387			522	705	887	593	6.1	8.3
	Minimum	168			125	210	292			
	End	208			127	255	384			
SR-C050- S93	Start	453			470	652	835	593	6.4	8.3
	Minimum	200			61	173	256			
	End	261			61	190	319			
SR-C050- S94	Start	523				595	778	593	6.9	8.3
	Minimum	235				120	217			
	End	318				120	248			

OUTPUT TORQUE DATA (CONTINUED)

The torque values above indicate the actual actuator output torque. Some values may exceed the max rating of the actuator.

SPRING RETURN [N-M]		SPRINGS	3 bar	4 bar	5.5 bar	7 bar	8 bar	MAVT N-m	MAVTP bar	MAWP bar
Left Hand (FAIL CLOSE)										
SR-C050- S42	Start	130	467	740	1,014	1,288	1,562	1,186	4.6	8.3
	Minimum	59	176	295	415	535	655			
	End	81	255	448	641	834	1,026			
SR-C050- S52	Start	209	393	667	941	1,215	1,489	1,186	4.9	8.3
	Minimum	101	132	253	373	493	612			
	End	154	177	370	562	755	948			
SR-C050- S62	Start	302	282	556	829	1,103	1,377	1,186	5.4	8.3
	Minimum	155	75	198	318	438	558			
	End	266	83	276	469	662	854			
SR-C050- S72	Start	433		474	748	1,022	1,296	1,186	5.9	8.3
	Minimum	214		129	253	373	494			
	End	347		146	339	531	724			
SR-C050- S82	Start	511		401	675	949	1,223	1,186	6.2	8.3
	Minimum	256		67	208	330	451			
	End	420		67	260	453	646			
SR-C050- S92	Start	399		535	809	1,083	1,357	1,186	5.6	8.3
	Minimum	190		153	276	396	517			
	End	286		179	372	565	758			
SR-C050- S93	Start	529		454	728	1,002	1,276	1,186	6.1	8.3
	Minimum	249		49	207	330	452			
	End	367		49	242	435	628			
SR-C050- S94	Start	608			655	929	1,203	1,186	6.4	8.3
	Minimum	291			159	286	408			
	End	440			163	356	549			
SR-C060- S42	Start	162	665	1,059	1,453	1,848	2,242	1,186	6.4	8.3
	Minimum	79	262	434	607	779	951			
	End	124	393	671	949	1,226	1,504			
SR-C060- S52	Start	281	574	968	1,363	1,757	2,151	1,186	6.8	8.3
	Minimum	137	200	373	546	718	891			
	End	215	275	552	830	1,107	1,385			
SR-C060- S62	Start	385	424	819	1,213	1,607	2,002	1,186	7.3	8.3
	Minimum	203	134	308	481	653	826			
	End	364	171	448	726	1,004	1,281			
SR-C060- S72	Start	547		695	1,089	1,483	1,878	1,186	7.7	8.3
	Minimum	282		223	397	570	743			
	End	488		286	564	842	1,119			
SR-C060- S82	Start	665		604	998	1,392	1,787	1,186	8.1	8.3
	Minimum	340		156	334	508	681			
	End	579		168	445	723	1,000			
SR-C060- S92	Start	704			1,152	1,546	1,940	1,186	7.4	8.3
	Minimum	317			339	515	690			
	End	426			406	684	961			
SR-C060- S93	Start	866			1,028	1,422	1,816	1,186	7.8	8.3
	Minimum	396			242	428	604			
	End	549			244	522	799			
SR-C060- S94	Start	985			937	1,331	1,726	1,186	8.2	8.3
	Minimum	454			125	360	540			
	End	640			125	403	681			

D SERIES-PRODUCT BULLETIN

OUTPUT TORQUE DATA (CONTINUED)

The torque values above indicate the actual actuator output torque. Some values may exceed the max rating of the actuator.

		SPRING RETURN [N-M]						MAVT N-m	MAVTP bar	MAWP bar	
Left Hand (FAIL CLOSE)		SPRINGS	3 bar	4 bar	5.5 bar	7 bar	8 bar				
10	SR-C060- S03	Start	234	956	1,359	1,965	2,571	2,974	1,582	4.6	8.3
		Minimum	124	376	543	793	1,043	1,210			
		End	255	619	903	1,329	1,756	2,040			
	SR-C060- S02	Start	667	648	1,051	1,657	2,262	2,666	1,582	5.3	8.3
		Minimum	321	173	338	585	832	997			
		End	563	186	470	897	1,323	1,607			
	SR-C060- S01	Start	901		796	1,401	2,007	2,411	1,582	5.9	8.3
		Minimum	445		208	453	698	861			
		End	819		236	663	1,089	1,373			
12	SR-C080- S03	Start	555	2,139	3,036	4,382	5,728	6,625	3,164	4.1	8.3
		Minimum	283	827	1,197	1,753	2,308	2,678			
		End	552	1,340	1,971	2,919	3,866	4,498			
	SR-C080- S31	Start	860	1,854	2,751	4,097	5,443	6,340	3,164	4.5	8.3
		Minimum	436	674	1,044	1,598	2,153	2,523			
		End	837	1,034	1,666	2,614	3,561	4,193			
	SR-C080- S02	Start	1,252	1,463	2,360	3,705	5,051	5,948	3,164	4.9	8.3
		Minimum	636	470	839	1,392	1,945	2,314			
		End	1,229	642	1,274	2,222	3,169	3,801			
	SR-C080- S21	Start	1,291	1,408	2,305	3,651	4,996	5,893	3,164	5.0	8.3
		Minimum	659	447	816	1,369	1,922	2,291			
		End	1,284	604	1,235	2,183	3,130	3,762			
	SR-C080- S01	Start	1,808		1,808	3,153	4,499	5,396	3,164	5.5	8.3
		Minimum	919		547	1,096	1,646	2,013			
		End	1,781		719	1,666	2,614	3,245			
SR-C080- S11	Start	2,152		1,468	2,813	4,159	5,056	3,164	5.9	8.3	
	Minimum	1,095		357	901	1,446	1,808				
	End	2,121		375	1,322	2,270	2,901				
12	SR-C100- S03	Start	1,252	2,977	4,378	6,481	8,584	9,985	3,164	3.1	8.3
		Minimum	636	1,098	1,676	2,543	3,410	3,988			
		End	1,229	1,708	2,695	4,176	5,656	6,643			
	SR-C100- S02	Start	1,808	2,425	3,826	5,929	8,032	9,433	3,164	3.5	8.3
		Minimum	919	811	1,388	2,253	3,118	3,695			
		End	1,781	1,153	2,140	3,620	5,101	6,088			
	SR-C100- S01	Start	2,640	1,598	2,999	5,102	7,205	8,606	3,164	4.1	8.3
		Minimum	1,344	377	951	1,811	2,672	3,246			
		End	2,608	321	1,308	2,789	4,269	5,256			

OUTPUT TORQUE DATA (CONTINUED)

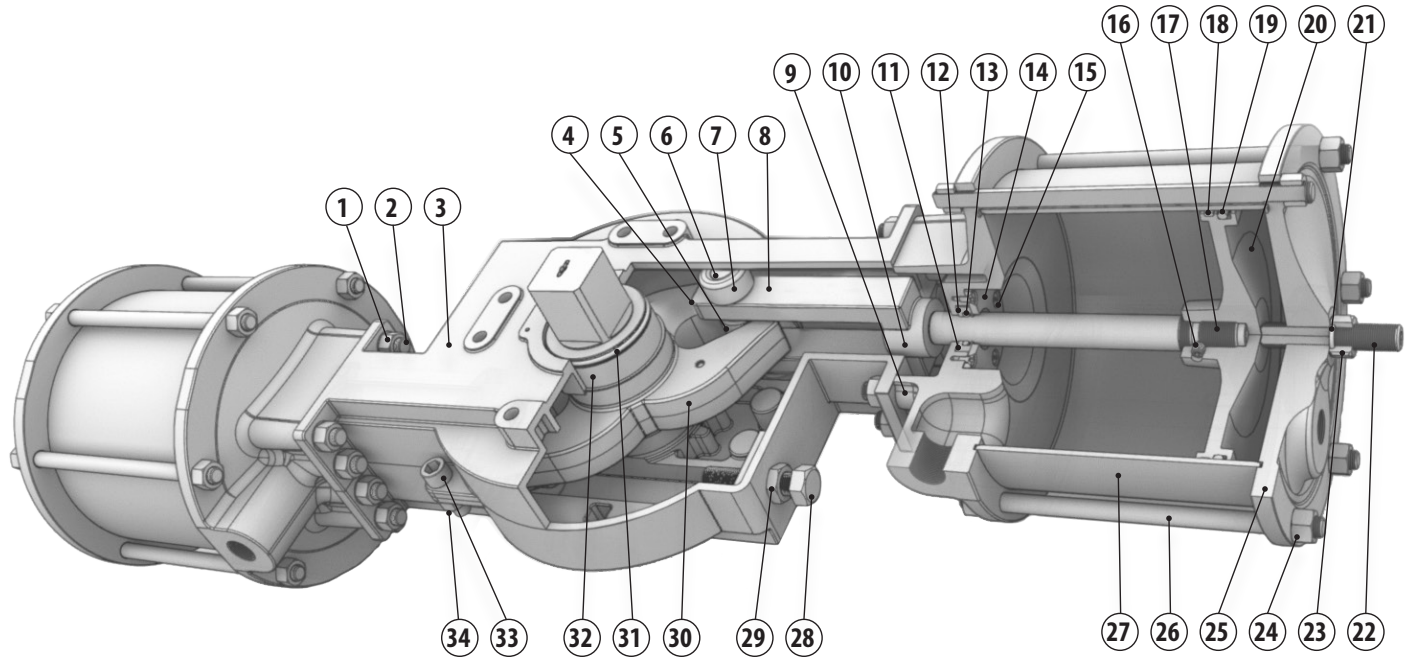
The torque values above indicate the actual actuator output torque. Some values may exceed the max rating of the actuator.

SPRING RETURN [N-M]			3 bar	4 bar	5.5 bar	7 bar	8 bar	MAVT N-m	MAVTP bar	MAWP bar	
	Left Hand (FAIL CLOSE)	SPRINGS									
14	SR-C120-S04	Start	2,926	3,988	7,328	10,668	14,008	6327	3.7	8.3	
		Minimum	1,452	1,294	2,667	4,040	5,413				6,786
		End	2,693	1,777	4,129	6,481	8,832				11,184
	SR-C120-S03	Start	3,333	3,613	6,953	10,293	13,633	6327	3.9	8.3	
		Minimum	1,654	1,087	2,458	3,828	5,199				6,570
		End	3,067	1,370	3,722	6,074	8,425				10,777
	SR-C120-S02	Start	4,208		6,148	9,488	12,828	6327	4.2	8.3	
		Minimum	2,089		2,008	3,373	4,739				6,104
		End	3,872		2,847	5,199	7,550				9,902
	SR-C120-S01	Start	5,234		5,204	8,544	11,885	6,327	4.6	8.3	
		Minimum	2,598		1,466	2,820	4,175				5,529
		End	4,816		1,821	4,173	6,525				8,876
16	SR-C160-S05	Start	3,885	10,705	18,128	25,550	32,973	12654	3.1	8.3	
		Minimum	2,035	4,092	7,156	10,220	13,283				16,347
		End	4,140	6,567	11,793	17,020	22,246				27,472
	SR-C160-S04	Start	5,312	9,184	16,607	24,029	31,452	12654	3.4	8.3	
		Minimum	2,783	3,342	6,405	9,467	12,530				15,593
		End	5,661	5,140	10,366	15,592	20,818				26,045
	SR-C160-S03	Start	5,946	8,508	15,931	23,353	30,776	12654	3.5	8.3	
		Minimum	3,116	3,009	6,071	9,133	12,195				15,258
		End	6,337	4,506	9,732	14,958	20,184				25,410
	SR-C160-S02	Start	7,135	7,241	14,664	22,086	29,509	12654	3.8	8.3	
		Minimum	3,738	2,382	5,442	8,502	11,562				14,622
		End	7,604	3,317	8,543	13,769	18,995				24,221
SR-C160-S01	Start	9,197		12,467	19,889	27,312	12654	4.2	8.3		
	Minimum	4,819		4,335	7,386	10,438				13,489	
	End	9,801		6,482	11,708	16,934				22,160	

D SERIES-PRODUCT BULLETIN

		SPRING RETURN (N-M)						MAVT N-m	MAVTP bar	MAWP bar	
Left Hand (FAIL CLOSE)		SPRINGS	3 bar	4 bar	5.5 bar	7 bar	8 bar				
18	SR-C160- S03	Start	8,499	11,139	20,788	30,437	40,087	49,736	31,636	5.7	8.3
		Minimum	4,283	3,675	7,653	11,632	15,610	19,589			
		End	8,160	5,089	11,883	18,677	25,471	32,264			
	SR-C160- S02	Start	11,476	7,603	17,252	26,901	36,551	46,200	31,636	6.2	8.3
		Minimum	5,911	2,046	6,024	10,003	13,982	17,960			
		End	11,696	2,112	8,906	15,700	22,494	29,287			
	SR-C160- S01	Start	19,975			18,742	28,391	38,040	31,636	7.4	8.3
		Minimum	10,194			5,604	9,553	13,503			
		End	19,855			7,201	13,995	20,788			
18	SR-C200- S03	Start	8,499	21,994	37,071	52,148	67,225	82,302	31,636	3.7	8.3
		Minimum	4,283	8,160	14,381	20,602	26,823	33,044			
		End	8,160	12,732	23,347	33,963	44,578	55,194			
	SR-C200- S02	Start	11,476	18,458	33,535	48,612	63,689	78,766	31,636	3.9	8.3
		Minimum	5,911	6,531	12,752	18,973	25,194	31,416			
		End	11,696	9,755	20,370	30,986	41,601	52,217			
	SR-C200- S01	Start	19,975		25,376	40,453	55,530	70,606	31,636	4.7	8.3
		Minimum	10,194		8,434	14,643	20,852	27,061			
		End	19,855		11,871	22,487	33,102	43,718			
20	SR-C200- S04	Start	21,980		32,961	50,744	68,527	86,310	79,089	7.7	8.3
		Minimum	10,937		10,993	18,304	25,614	32,924			
		End	20,388		15,582	28,103	40,624	53,145			
	SR-C200- S03	Start	27,875		27,795	45,578	63,361	81,144	79,089	8.1	8.3
		Minimum	13,812		8,059	15,350	22,640	29,931			
		End	25,554		9,687	22,208	34,729	47,250			
	SR-C200- S02	Start	30,598		24,467	42,250	60,033	77,816	79,089	8.3	8.3
		Minimum	15,323		6,539	13,826	21,113	28,401			
		End	28,882		6,964	19,485	32,006	44,527			
SR-C200- S01	Start	40,227			33,720	51,503	69,286	79,089	8.3	8.3	
	Minimum	20,036			8,879	16,108	23,337				
	End	37,412			9,857	22,377	34,898				
20	SR-C240- S01	Start	59,171			45,768	71,376	96,983	79,089	7.3	8.3
		Minimum	29,788			11,886	22,305	32,724			
		End	56,662			12,949	30,979	49,009			
	SR-C240- S02	Start	49,543			54,298	79,906	105,513	79,089	6.8	8.3
		Minimum	25,072			16,859	27,342	37,825			
		End	48,132			22,577	40,607	58,637			
	SR-C240- S03	Start	46,820			57,626	83,234	108,841	79,089	6.7	8.3
		Minimum	23,565			18,389	28,878	39,366			
		End	44,804			25,300	43,330	61,360			
SR-C240- S04	Start	40,227		39,411	65,018	90,626	116,233	79,089	6.3	8.3	
	Minimum	20,036		11,471	21,973	32,476	42,978				
	End	37,412		13,863	31,893	49,923	67,953				
SR-C240- S05	Start	30,598		47,940	73,548	99,156	124,763	79,089	5.8	8.3	
	Minimum	15,323		16,277	26,810	37,344	47,877				
	End	28,882		23,492	41,522	59,552	77,582				
SR-C240- S06	Start	27,875	25,661	51,269	76,876	102,484	128,091	79,089	5.7	8.3	
	Minimum	13,812	7,256	17,790	28,324	38,859	49,393				
	End	25,554	8,185	26,215	44,245	62,275	80,305				

PARTS DIAGRAM & MATERIALS OF CONSTRUCTION - DOUBLE ACTING



Item No.	Part Description	Material
1	Stud Hex Nut	316 SST
2	Stud	316 SST
3	Body	Ductile Iron ³
4	Clevis Pin Set Screw	316 SST
5	Yoke Roller	316 SST NIT
6	Clevis Pin	316 SST NIT
7	Body Roller	316 SST NIT
8	Clevis	Ductile Iron ³
9	Base Plate	Ductile Iron ³
10	Clevis Set Screw	316 SST
11	Seal Carrier	Acetal
12	Carrier Float Seal	Buna
13	Carrier Rod Seal	Buna
14	Carrier Retainer	316 SST
15	Carrier Retainer Screw	316 SST
16	Piston Set Screw	316 SST
17	Piston Bolt	316 SST

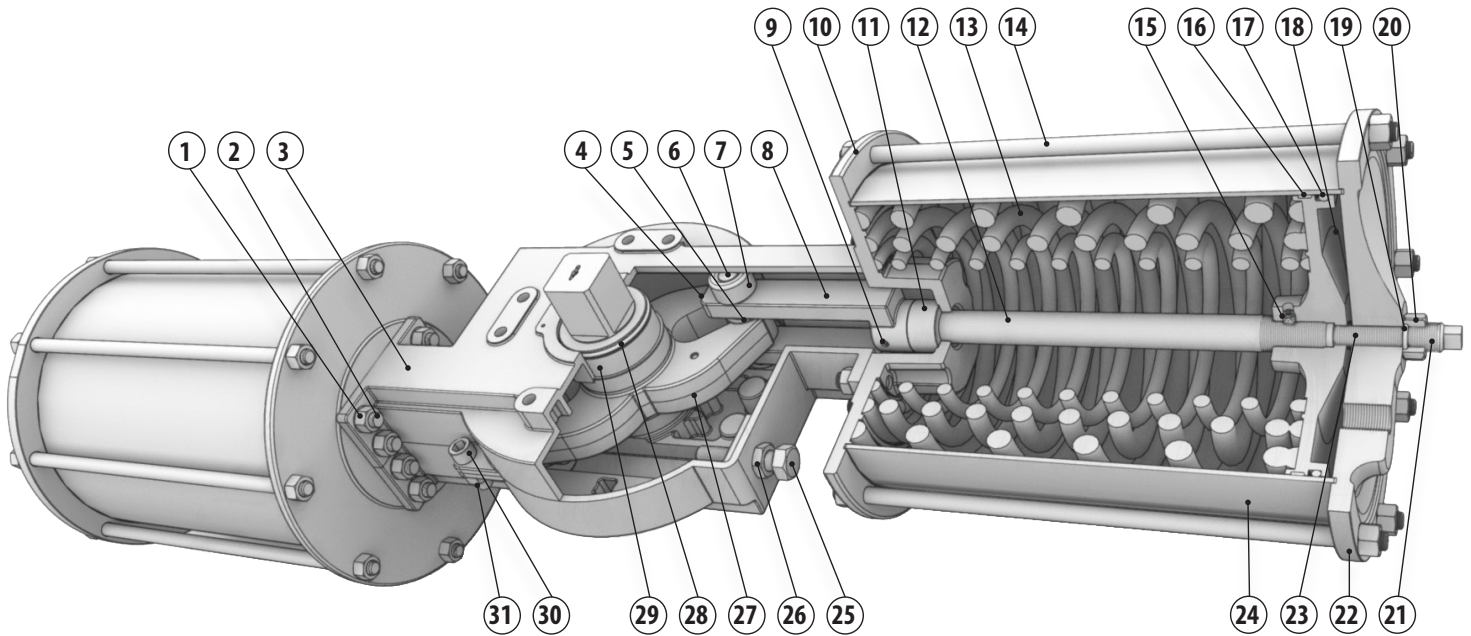
Item No.	Part Description	Material
18	Wiper Ring	PTFE
19	Piston Seal	Buna
20	Piston	Ductile Iron ³
21	Travel Stop Seal	Buna
22	End Cap Travel Stop	316 SST
23	Travel Stop Nut	316 SST
24	Tie Rod Hex Nut	316 SST
25	End Cap	Ductile Iron ²
26	Tie Rod	316 SST
27	Cylinder	Amalgon Composite ¹
28	Body Travel Stop	316 SST
29	Body Travel Stop Nut	316 SST
30	Yoke	Steel
31	Yoke Seal	Buna
32	Yoke Bushing	Buna
33	Body Fastening Nut	316 SST
34	Body Fastening Bolt	316 SST

1: "Option" materials depend on trim code, see engineering string.

2: Ductile iron components are coated or plated for corrosion resistance.

D SERIES-PRODUCT BULLETIN

PARTS DIAGRAM & MATERIALS OF CONSTRUCTION - SPRING RETURN



Item No.	Part Description	Material
1	Stud Hex Nut	316 SST
2	Stud	316 SST
3	Body	Ductile Iron ³
4	Clevis Pin Set Screw	316 SST
5	Yoke Roller	316 SST NIT
6	Clevis Pin	316 SST NIT
7	Body Roller	316 SST NIT
8	Clevis	Ductile Iron ³
9	Clevis Set Screw	316 SST
10	Spring Retainer	316 SST
11	Safety Collar	316 SST
12	Piston Bolt	316 SST
13	Springs	Chrome Silicon ¹
14	Tie Rod	316 SST
15	Piston Set Screw	316 SST
16	Wiper Ring	PTFE

Item No.	Part Description	Material
17	Piston Seal	Buna
18	Piston	Ductile Iron ³
19	Travel Stop Seal	Buna
20	End Cap Travel Stop Nut	316 SST
21	Tie Rod Hex Nut	316 SST
22	End Cap	Ductile Iron ³
23	End Cap Travel Stop	316 SST
24	Cylinder	Amalgon Composite ²
25	Body Travel Stop	316 SST
26	Body Travel Stop Nut	316 SST
27	Yoke	Steel
28	Yoke Seal	Buna
29	Yoke Bushing	Buna
30	Body Fastening Bolt	316 SST
31	Body Fastening Nut	316 SST

1: Chrome Silicon springs are powder coated. Stainless Steel springs available.

2: "Option" materials depend on trim code, see engineering string.

3: Ductile iron components are coated or plated for corrosion resistance.

ENGINEERING STRING For ordering actuators with standard options.

MODEL		SIZE		ACTION		CYLINDER SIZE				SPRING SET			TEMP	O-RINGS	CYLINDER MATERIAL		ROTATION		
1	2	3	4	5	6	7	8	9	11	12	13	14	15	16	17	18	19	20	21
D	D					-C				-S			M	4	1				H

MODEL	ACTION	SPRING SET	CYLINDER MATERIAL
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DD Ductile Iron	DA Double Acting SR Spring Return	Sxx (Omit for double acting models)	AM Amalgon SS Stainless Steel AL Aluminum
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SIZE	CYLINDER SIZE	TEMP	ROTATION
------	---------------	------	----------

04	14	C030 3 in	M -20F to 185F	LH Spring causes clockwise rotation. Air to end caps causes counter-clockwise rotation.
06	16	C040 4 in		
08	20	C060 6 in	O-RINGS 41 Buna N	RH Spring causes counter-clockwise rotation. Air to end caps causes clockwise rotation.
10	24	C080 8 in		
12		C100 10 in		
		C120 12 in		
		C160 16 in		
		C200 20 in		
		C240 24 in		

SAMPLE SPECIFICATIONS	DESCRIPTION
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DD06DA-C080-M-41-AM-LH	Ductile Iron, size 06, double acting actuator featuring eight inch cylinders, with Buna N o-rings and Amalgon cylinders
DD04SR-C040-S02-M-41-SS-RH	Ductile Iron, size 04, spring return actuator featuring four inch cylinders, , with a S2 spring set, stainless steel cylinders and counter-clockwise fail rotation.
DD18SR-C200-S04-M-41-AM-LH	Ductile Iron, size 18, spring return actuator featuring twenty inch cylinders, , with a S4 spring set, stainless steel cylinders and clockwise fail rotation.



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