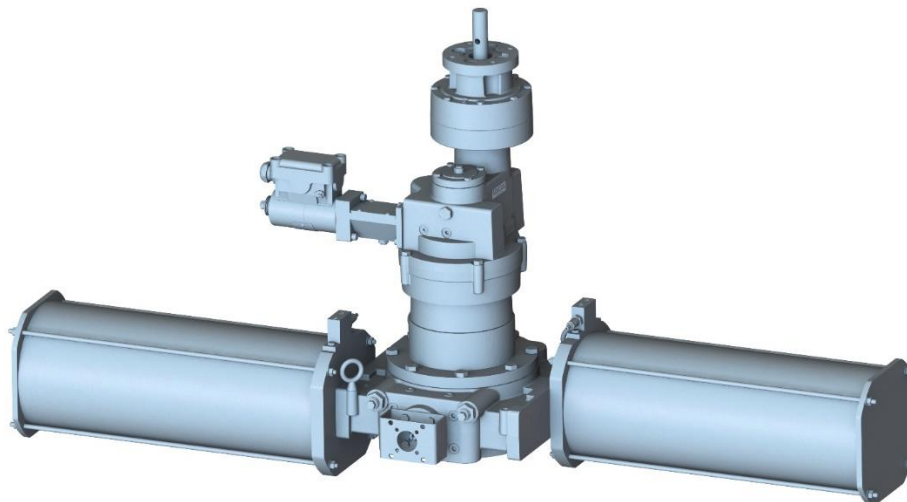


WedgeRock RSDR-G1 PRODUCT SHEET

MECHANICAL FAIL-SAFE OPERATOR FOR EMERGENCY SHUT DOWN APPLICATIONS



Features, Options & Configurability

- | | |
|---|--|
| <ul style="list-style-type: none"> • High-efficiency gear train • Self-Locking design • Mechanical stops with $\pm 5^\circ$ adjustment at each end of quarter-turn travel • 90% grease-filled, maintenance-free for life • Elastomer ingress seals, tested to IP68 rating • Input shaft options: parallel or perpendicular to output • Adjustable fail-stroke time • NAMUR mounting for absolute valve position indication • Input lockout feature • Modular design for quarter-turn applications accommodates: <ul style="list-style-type: none"> ○ Fail-Clockwise ○ Fail-Counterclockwise | <ul style="list-style-type: none"> • Release Signal Options: <ul style="list-style-type: none"> ○ Electric ○ Hi-Lo Pressure Pilot • Supports partial stroke testing • Compatible with: <ul style="list-style-type: none"> ○ Electric valve actuators ○ Manual handwheel operation • Configurable application-specific material and temperature configurations • Machined for direct mount <ul style="list-style-type: none"> ○ Standard Flanges to MSS SP101 & ISO 5211 ○ Custom Bolt Patterns • Available Certifications: <ul style="list-style-type: none"> ○ ATEX compliant ○ SIL 3 capable |
|---|--|

PURPOSE ENGINEERED - QUALITY MANUFACTURED - PERFORMANCE TESTED

The information in this document is subject to change without notice. Updated documents can be requested or obtained from our website.

WedgeRock RSDR-G1

GENERAL OVERVIEW

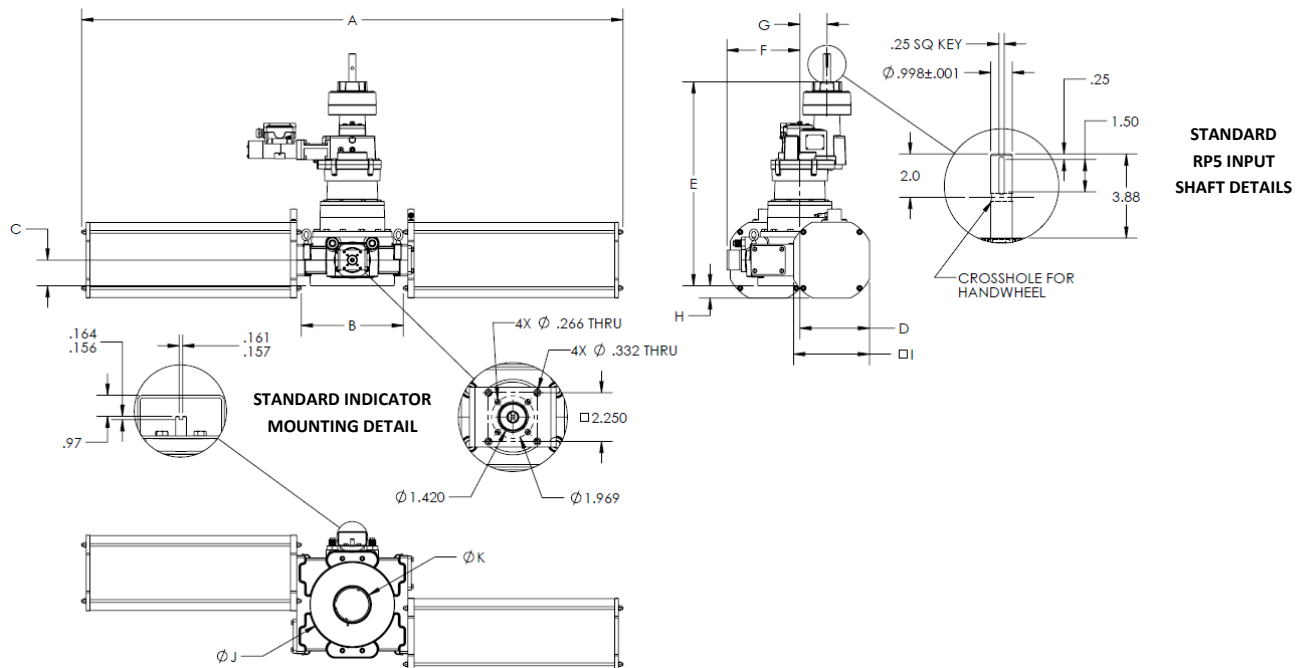
MANUAL AND MOTORIZED OPERATION							
MODEL	MAX BORE W/ SQUARE KEY PER ANSI B17.1	MAX BORE W/ RECTANGULAR KEY PER ANSI B17.1	MAX CIRCUMSCRIBED DIAMETER OF DRIVE FEATURE	MAX STEM ENGAGEMENT	STANDARD FLANGE	FLANGE RANGE	
	DIMENSIONS FOR REMOVABLE SPLINED DRIVER						
	IN (MM)	IN (MM)	IN (MM)	IN (MM)		MIN	MAX
RSDR6	2.38 (60)	2.50 (64)	2.97 (75)	3.69 (94)	F/FA14	F/FA12	F/FA16
RSDR7	3.00 (76)	3.25 (83)	3.70 (94)	4.10 (104)	F/FA16	F/FA14	F16/FA19
RSDR8	3.50 (89)	3.75 (95)	4.41 (112)	6.06 (154)	F/FA25	F/FA16	F/FA25
RSDR9	4.13 (105)	4.38 (111)	5.12 (130)	6.19 (157)	F/FA30	F/FA25	F/FA30
RSDR10	4.13 (105)	4.38 (111)	5.12 (130)	6.70 (170)	F/FA30	F/FA25	F/FA35
RSDR12	5.88 (149)	6.25 (159)	7.33 (186)	8.94 (227)	F/FA35	F/FA25	F/FA40
RSDR14	7.50 (191)	7.75 (197)	9.21 (234)	11.06 (281)	F/FA48	F/FA35	F/FA48
RSDR18	10.00 (254)	11.00 (279)	12.75 (324)	13.00 (330)	F/FA60	F/FA40	F/FA60
RSDR24	11.00 (279)	12.00 (305)	14.00 (356)	15.00 (381)	F/FA60	F/FA48	32" OD (813mm)
RSDR36	12.50 (318)	13.00 (330)	15.00 (381)	18.00 (457)	As Required	F/FA60	44" OD (1118mm)

Other frame sizes available if required. Contact WedgeRock for more information.

WedgeRock RSDR-G1

ENVELOPE DIMENSIONS

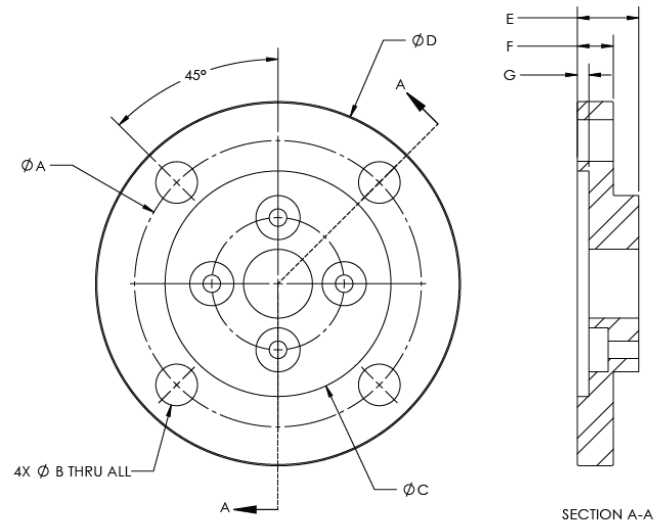
RSDR ENVELOPE DIMENSIONS AND WEIGHT												
MODEL	A	B	C	D	E	F	G	H	I	J	K	WEIGHT
	IN (MM)	IN (MM)	IN (MM)	IN (MM)	IN (MM)	IN (MM)	IN (MM)	IN (MM)	IN (MM)	IN (MM)	IN (MM)	LBS (KG)
RSDR6	48.3 (1,227)	10.0 (254)	2.3 (58)	6.9 (175)	21.4 (544)	8.2 (208)	3.8 (97)	1.5 (38)	7.5 (191)	8.8 (224)	3.7 (94)	363 (165)
RSDR7	57.9 (1,471)	11.9 (302)	2.4 (61)	7.8 (198)	23.8 (605)	9.1 (231)	3.8 (97)	1.8 (46)	8.5 (216)	9.9 (251)	4.4 (112)	475 (215)
RSDR8	74.9 (1,902)	14.1 (358)	3.6 (91)	9.6 (244)	28.2 (716)	10.1 (257)	3.8 (97)	1.7 (43)	10.5 (267)	11.6 (295)	5.3 (135)	737 (334)
RSDR9	96.0 (2,438)	20.0 (508)	4.0 (102)	13.5 (343)	29.5 (749)	12.7 (323)	3.8 (97)	3.5 (89)	15.0 (381)	13.8 (351)	6.8 (173)	1427 (647)
RSDR10	96.0 (2,438)	20.0 (508)	3.9 (99)	13.5 (343)	36.1 (917)	12.7 (323)	3.8 (97)	3.6 (91)	15.0 (381)	16.7 (424)	6.8 (173)	1840 (835)
RSDR12	127.3 (3,233)	25.0 (635)	5.6 (142)	16.9 (429)	38.9 (988)	15.7 (399)	3.8 (97)	3.8 (97)	18.8 (478)	18.5 (470)	8.8 (224)	3382 (1,534)
RSDR14	148.8 (3,780)	30.8 (782)	7.0 (178)	22.0 (559)	45.6 (1,158)	18.6 (472)	3.8 (97)	5.5 (140)	25.0 (635)	21.7 (551)	11.0 (279)	5371 (2,436)
RSDR18	148.8 (3,780)	30.8 (782)	7.0 (178)	25.0 (635)	52.3 (1,329)	20.0 (508)	4.3 (108)	5.5 (140)	25.0 (635)	27.0 (686)	14.3 (362)	8702 (3,947)
RSDR24	192.0 (4,877)	40.0 (1,016)	8.5 (216)	27.0 (686)	58.4 (1,483)	24.0 (610)	4.3 (108)	7.2 (183)	30.0 (762)	32.0 (813)	16.3 (413)	10494 (4,760)
RSDR36	256.0 (6,502)	53.3 (1,355)	10.0 (254)	36.0 (914)	73.8 (1,873)	30.0 (762)	4.3 (108)	9.6 (244)	38.0 (965)	44.0 (1,118)	19.3 (489)	17351 (7,870)
Dimensions represent most common configurations. Other dimensional configurations possible.												
Values subject to change with design updates.												
Weight may vary with final configuration.												



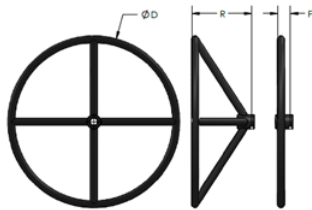
WedgeRock MOTOR ADAPTERS

	A	B	C	D	E	F	G
	IN	IN	IN	IN	IN	IN	IN
	(MM)	(MM)	(MM)	(MM)	(MM)	(MM)	(MM)
FA10	4.00 (101.6)	0.41 (10.3)	2.31 (58.7)	4.92 (125.0)	0.94 (23.8)	0.69 (17.5)	0.17 (4.3)
FA14	5.50 (139.7)	0.69 (17.5)	3.75 (95.3)	6.89 (175.0)	1.31 (33.4)	0.81 (20.7)	0.16 (4.1)
FA16	6.50 (165.1)	0.80 (20.2)	5.00 (127.0)	8.27 (210.1)	1.39 (35.2)	0.81 (20.7)	0.26 (6.6)

F10	4.02 (102.0)	0.43 (11.0)	2.76 (70.0)	4.92 (125.0)	0.94 (23.8)	0.69 (17.5)	0.17 (4.3)
F14	5.51 (140.0)	0.69 (17.5)	3.94 (100.0)	6.89 (175.0)	1.31 (33.4)	0.81 (20.6)	0.17 (4.3)
F16	6.50 (165.0)	0.87 (22.0)	5.12 (130.0)	8.27 (210.0)	1.39 (35.2)	0.81 (20.7)	0.26 (6.6)

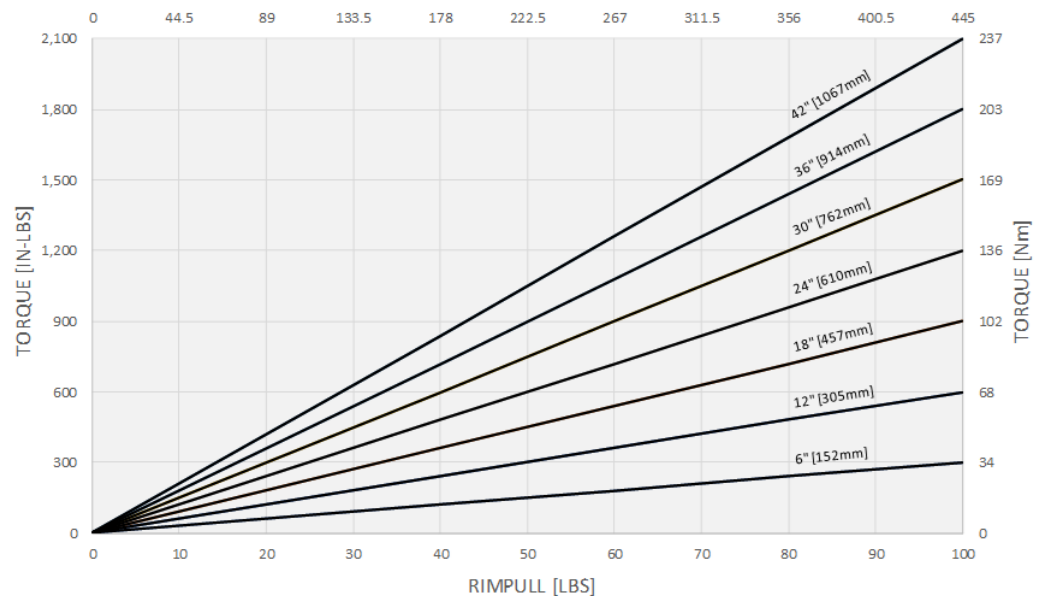


WedgeRock HANDWHEELS



D	R	F
IN	IN	IN
(MM)	(MM)	(MM)
6	5.25	1.75
(152)	(133)	(44)
12	5.25	1.75
(305)	(133)	(44)
18	6.25	1.75
(457)	(159)	(44)
24	8.38	1.75
(610)	(213)	(44)
30	10.00	1.75
(762)	(254)	(44)
36	9.63	1.75
(914)	(244)	(44)
42	10.13	1.75
(1,067)	(257)	(44)

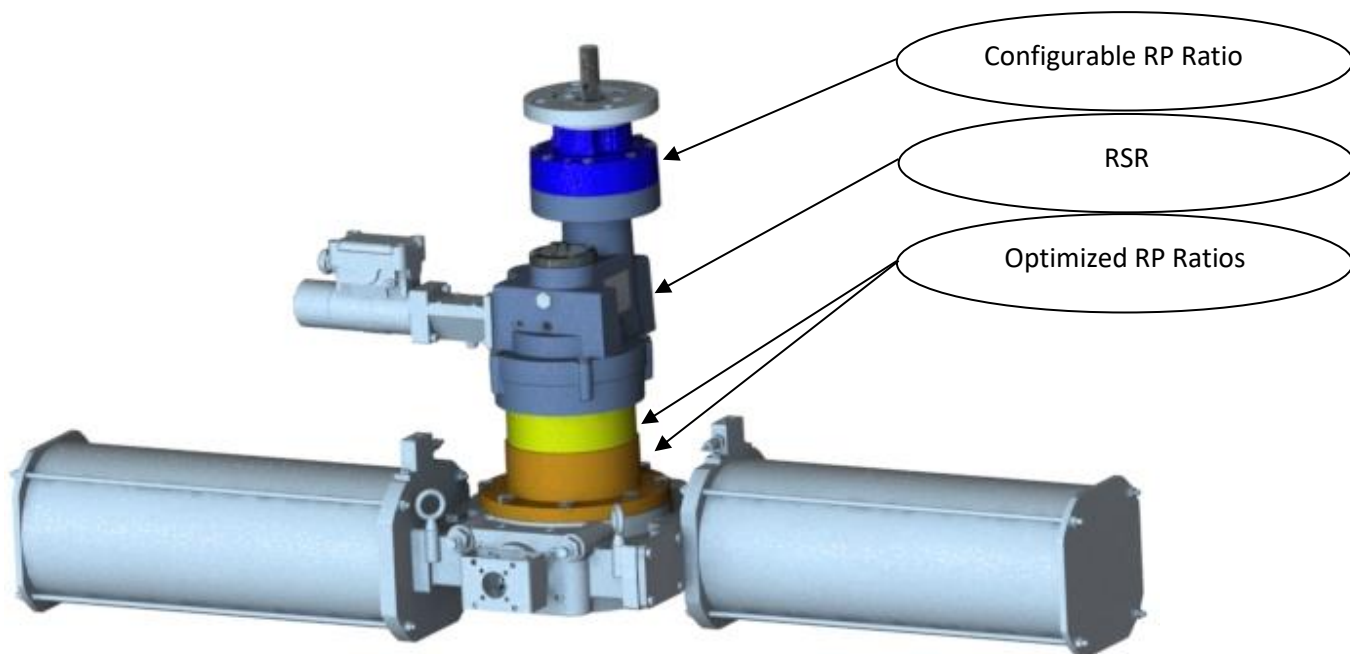
HANDWHEEL SIZE CHART
RIMPULL [N]



WedgeRock RP SERIES

AUXILIARY PLANETARY GEAR RATIOS

The RSDR utilizes RP planetary gears to optimize input torque and operating times. Below, you will find all available ratio options for each RP stage. The RSDRs displayed on the following page are designed with optimized RP ratios, allowing the final input planetary RP gear to be configured according to specific applications. Although each RP stage can be adjusted to meet application requirements, it is recommended to use the standard optimized ratios whenever possible. Note that the RSR release mechanism has a fixed ratio that cannot be altered.



COMMON RATIOS FOR RP5 & RP6

RATIO ¹ [MOST COMMON]	2.50	[2.6]	2.71	2.78	2.85	[3.00]	3.18	[3.29]	3.40	3.67	4.00	[4.20]	4.43	[5.00]	5.80	[6.33]	[9.00]
MECHANICAL ADVANTAGE ²	2.4	[2.5]	2.6	2.7	2.8	[2.9]	3.1	[3.2]	3.3	3.6	3.9	[4.1]	4.3	[4.9]	5.6	[6.1]	[8.7]

COMMON RATIOS FOR RP8-RP24

RATIO ¹ [MOST COMMON]	[2.5]	2.60	2.71	2.78 [^]	2.85	[3.00]	3.18	3.29 [^]	3.40	3.67	[4.00]	4.20 [^]	4.43	[5.00]	5.80 [^]	6.33 ^{^^}	9.00 ^{^^^}
MECHANICAL ADVANTAGE ²	[2.4]	2.5	2.6	2.7	2.8	[2.9]	3.1	3.2	3.3	3.6	[3.9]	4.1	4.3	[4.9]	5.6	6.1	8.7

COMMON RATIOS FOR RP36

RATIO ¹ [MOST COMMON]	2.44	2.63	2.86	3.17	3.60	4.25	[5.33]	6.20
MECHANICAL ADVANTAGE ²	2.3	2.5	2.7	3.0	3.4	4.0	[5.1]	5.9

[^] Catalog torque rating to be reduced by 20% using this ratio

^{^^} Catalog torque rating to be reduced by 40% using this ratio

^{^^^} Catalog torque rating to be reduced by 60% using this ratio

1) Additional ratios available upon request.

2) Mechanical advantage can fall short of published value by 10% until gearbox has worn in. Wear in should occur within 10 cycles.

OPTIMIZED PLANETARY GEAR RATIOS

OUTPUT TORQUE RATING FOR QUARTER TURN, FAIL-SAFE APPLICATIONS

Frame Size	Frame Rating In-Lbs/(Nm)	Spring Can	RSDR Output Torque In-Lbs/(Nm)						Standard Gear Stack Configuration & Ratios	Total Gear Ratio							Mechanical Advantage						RSDR Input Torque for Max Rating							
			Fail (Spring)			Max Operated				Configurable Ratio (more options available)							+/- 10%						In-Lbs/(Nm)							
			Start	Run	End	Start	Run	End		RP5 1.00 2.60 3.00 4.20 5.00 6.33 9.00																				
RSDR6	28,000 (3,164)	60	8,400 (949)	7,812 (883)	7,224 (816)	20,776 (2,348)	20,188 (2,281)	19,600 (2,215)	RP6-9.0/ RSR5-2	10	26	30	43	51	64	91	5	13	15	22	26	33	46	5265 (595)	2088 (236)	1809 (204)	1292 (146)	1086 (123)	858 (97)	603 (68)
		80	11,200 (1,266)	10,416 (1,177)	9,632 (1,088)	18,368 (2,075)	17,584 (1,987)	16,800 (1,898)																						
		100	14,000 (1,582)	13,020 (1,471)	12,040 (1,360)	15,960 (1,803)	14,980 (1,693)	14,000 (1,582)																						
RSDR7	45,000 (5,085)	60	13,500 (1,525)	12,555 (1,419)	11,610 (1,312)	33,390 (3,773)	32,445 (3,666)	31,500 (3,559)	RP6H-5.0/ RP5-3.0/ RSR5-2	16.9	44	51	71	84	107	152	9	21.7	25	35	42	53	75	5234 (591)	2075 (235)	1799 (203)	1285 (145)	1079 (122)	852 (96)	600 (68)
		80	18,000 (2,034)	16,740 (1,892)	15,480 (1,749)	29,520 (3,336)	28,260 (3,193)	27,000 (3,051)																						
		100	22,500 (2,542)	20,925 (2,364)	19,350 (2,186)	25,650 (2,888)	24,075 (2,720)	22,500 (2,542)																						
RSDR8	75,000 (8,475)	60	22,500 (2,542)	20,925 (2,364)	19,350 (2,186)	25,650 (2,888)	24,075 (2,720)	22,500 (2,542)	RP8-5.0/ RP6-5.0/ RSR5-2	28	73	84	118	141	178	253	14	36	42	58	69	88	125	5234 (591)	2075 (235)	1799 (203)	1285 (145)	1079 (122)	852 (96)	600 (68)
		80	30,000 (3,390)	27,900 (3,153)	25,800 (2,915)	49,200 (5,559)	47,100 (5,322)	45,000 (5,085)																						
		100	37,500 (4,237)	34,875 (3,941)	32,250 (3,644)	42,750 (4,831)	40,125 (4,534)	37,500 (4,237)																						
RSDR9	135,000 (15,254)	60	40,500 (4,576)	37,665 (4,256)	34,830 (3,936)	100,170 (11,319)	97,335 (10,998)	94,500 (10,678)	RP9-5.0/ RP6-9.0/ RSR5-2	51	132	152	213	253	320	456	26	65	75	105	125	158	225	5234 (591)	2075 (235)	1799 (203)	1285 (145)	1079 (122)	852 (96)	600 (68)
		80	54,000 (6,102)	50,220 (5,675)	46,440 (5,247)	88,560 (10,007)	84,780 (9,580)	81,000 (9,153)																						
		100	67,500 (7,627)	62,775 (7,083)	58,050 (6,559)	76,950 (8,695)	72,225 (8,161)	67,500 (7,627)																						
RSDR10	225,000 (25,424)	60	67,500 (7,627)	62,775 (7,083)	58,050 (6,559)	166,950 (18,864)	162,225 (18,331)	157,500 (17,797)	RP10-5.0/ RP8-5.0/ RP6-3.29/ RSR5-2	93	241	278	389	463	586	833	46	115	133	186	222	281	399	4921 (556)	1951 (220)	1691 (191)	1208 (136)	1015 (115)	801 (91)	564 (64)
		80	90,000 (10,169)	83,700 (9,458)	77,400 (8,746)	147,600 (16,678)	141,300 (15,966)	135,000 (15,254)																						
		100	112,500 (12,712)	104,625 (11,822)	96,750 (10,932)	128,250 (14,492)	120,375 (13,602)	112,500 (12,712)																						
RSDR12	400,000 (45,198)	60	120,000 (13,559)	111,600 (12,610)	103,200 (11,661)	296,800 (33,537)	288,400 (32,588)	280,000 (31,638)	RP12-5.0/ RP8-5.0/ RP6-5.0/ RSR5-2	141	366	422	591	703	890	1266	69	175	202	283	337	427	607	5756 (650)	2282 (258)	1978 (224)	1413 (160)	1187 (134)	937 (106)	659 (75)
		80	160,000 (18,079)	148,800 (16,814)	137,600 (15,548)	262,400 (29,650)	251,200 (28,384)	240,000 (27,119)																						
		100	200,000 (22,599)	186,000 (21,017)	172,000 (19,435)	228,000 (25,763)	214,000 (24,181)	200,000 (22,599)																						
RSDR14	750,000 (84,746)	60	225,000 (25,424)	209,250 (23,644)	193,500 (21,864)	556,500 (62,881)	540,750 (61,102)	525,000 (59,322)	RP14-5.0/ RP12-6.3/ RP8-9.0/ RSR5-2	320	833	961	1346	1602	2028	2884	158	399	461	645	768	972	1382	4736 (535)	1878 (212)	1628 (184)	1163 (131)	977 (110)	771 (87)	543 (61)
		80	300,000 (33,898)	279,000 (31,525)	258,000 (29,153)	492,000 (55,593)	471,000 (53,220)	450,000 (50,847)																						
		100	375,000 (42,373)	348,750 (39,407)	322,500 (36,441)	427,500 (48,305)	401,250 (45,339)	375,000 (42,373)																						
RSDR18	1,350,000 (152,542)	60	405,000 (45,783)	376,650 (42,559)	348,300 (39,356)	1,001,700 (113,186)	973,350 (109,983)	945,000 (106,780)	RP18-5.0/ RP12-5.0/ RP8-3.0/ RSR6-1.125/ RP6-9.0	759	1974	2278	3189	3797	4807	6834	364	918	1059	1483	1765	2235	3178	3709 (419)	1471 (166)	1274 (144)	910 (103)	765 (86)	604 (68)	425 (48)
		80	540,000 (61,017)	502,200 (56,746)	464,400 (52,475)	885,600 (100,068)	847,800 (95,797)	810,000 (91,525)																						
		100	675,000 (76,271)	627,750 (70,932)	580,500 (65,593)	769,500 (86,949)	722,250 (81,610)	675,000 (76,271)																						
RSDR24	2,250,000 (254,237)	60	675,000 (76,271)	627,750 (70,932)	580,500 (65,593)	1,669,500 (188,644)	1,622,250 (183,305)	1,575,000 (177,966)	RP24-5.0/ RP14-5.0/ RP8-5.0/ RSR6-1.125/ RP6-9.0	1266	3291	3797	5316	6328	8011	11391	607	1530	1765	2472	2942	3725	5296	3709 (419)	1471 (166)	1274 (144)	910 (103)	765 (86)	604 (68)	425 (48)
		80	900,000 (101,695)	837,000 (94,576)	774,000 (87,458)	1,476,000 (166,780)	1,413,000 (159,661)	1,350,000 (152,542)																						
		100	1,125,000 (127,119)	1,046,250 (118,220)	967,500 (109,322)	1,282,500 (144,915)	1,203,750 (136,017)	1,125,000 (127,119)																						
RSDR36	4,500,000 (508,475)	60	1,200,000 (135,593)	1,116,000 (126,010)	1,032,000 (116,864)	3,468,000 (391,864)	3,384,000 (382,373)	3,300,000 (372,881)	RP36-5.0/ RP18-5.0/ RP10-5.0/ RSR8-1.125/ RP8-3.0 / RP6-5.0	2109	5484	6328	8859	10547	13352	18984	981	2474	2854	3996	4757	6022	8562	4588 (518)	1819 (206)	1577 (178)	1126 (127)	946 (107)	747 (84)	526 (59)
		80	1,600,000 (180,791)	1,488,000 (168,136)	1,376,000 (155,480)	3,124,000 (352,994)	3,012,000 (340,339)	2,900,000 (327,684)																						
		100	2,000,000 (225,589)	1,860,000 (210,169)	1,720,000 (194,350)	2,780,000 (314,124)	2,640,000 (298,305)	2,500,000 (282,486)																						

WedgeRock RSDR SERIES

SERVICE CONDITIONS

Explosion Protection

Available explosion protection configuration conforms to ATEX requirements for T3 or T4. The following is the standard ATEX rating:

II 2 G Ex h IIC T4 Gb

II 2 D Ex h IIIC T135°C Db

SIL

The RSDR conforms to SIL and is certified by Exida in compliance with IEC 61508. The RSDR is SIL3 capable.

Enclosure Protection

Mechanical portion of the RSDR is designed and tested to seal while submerged in over 1m of water per IP68.

Ambient Temperature Rating

TEMPERATURE SERVICE CONDITIONS		
SERVICE CONDITION	MIN OPERATING TEMP	MAX OPERATING TEMP
	°F (°C)	°F (°C)
STANDARD SERVICE (SIL)	-40 (-40)	160 (70)
EXTENDED SERVICE	-60 (-51)	240 (115)
ATEX T4 STANDARD	-31 (-35)	160 (70)
ATEX T4 EXTENDED	-60 (-51)	160 (70)
Wider operating temperature ranges are available. Consult with factory.		

WedgeRock Mechanical Spring Return (RSDR) Operation

All Electric Spring Return Solution

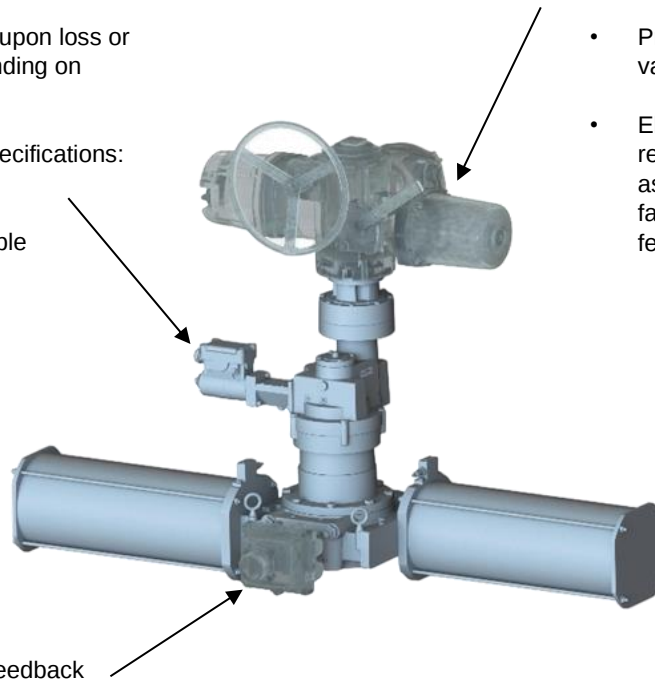
Patent Pending

Spring Release Solenoid

- Initiates fail-safe operation upon loss or application of signal, depending on configuration
- Typical electric solenoid specifications:
Signal Voltage- 24VDC
- Other signal options available

Electric Actuator (not supplied)

- Provides output torque to operate the valve and preload the spring
- Electric actuator must be configured to reference an external position indicator, as it decouples from the valve during fail-safe operation and loses position feedback



Position Indication (not supplied)

- Coupled to Valve Stem
- Sends true valve position feedback to the electric actuator
- Provides accurate local position indication for the operator

Example Mode of Operation

(Methods of operation may depend on hardware used or criteria for system failure.)

Example 1

Standard Operation

- Valve is operated in one direction by the electric actuator or handwheel, compressing the spring in the process
- Spring drives the valve in the opposite direction when the configured signal condition is met (loss or application of signal)

Fail-Safe Operation

- Spring release is initiated based on configured signal condition (either loss or presence of signal to the solenoid)
- Once the signal condition resets, the electric actuator can either recognize position from a position transmitter or reset by operating to the fail position, then the signal is restored to the solenoid re-engaging the spring. (Operation of the actuator while the solenoid has lost signal will not change the valve position from the fail state.)

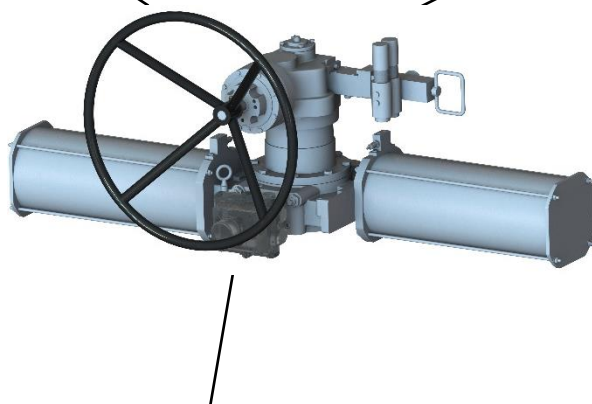
WedgeRock Mechanical Spring Return (RS) Operation

All Manual Spring Return Solution

Patent Pending

Manual Input

- Handwheel provided per application for operation.



Spring Release Line Pressure Operated (LPO)

- Starts fail-safe operation when pressure limit setting is exceeded.
 - High pressure limit setting
 - Low pressure limit setting
- Hi/Lo pressure settings from 10 to 10,000 psi.

Position Indication

- Coupled to Valve Stem.
- Provides local true valve position to operator.

Example Mode of Operation

(Methods of operation may depend on specific application.)

Example 1

Standard Operation

- Valve is operated in one direction only using handwheel. (Operation compresses the spring.)
- Operating in opposing direction
 - Valve is operated in the opposing direction by the spring when manual override button depressed on LPO.
 - Operate handwheel in opposing direction decompressing spring.

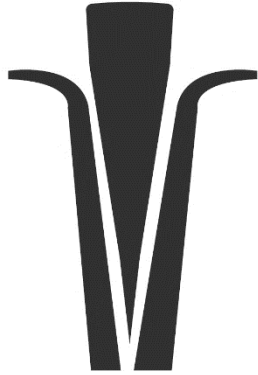
Fail-Safe Operation

- Upon pressure signal falling or exceeding set limits in the LPO, the spring is released to a fail-safe position.

LPP Reset

- When pressure returns within acceptable limits, a handle is pulled and the LPO is disengaged from the RS. The handwheel is then able to operate the RS and position the valve as needed.
- Optionally, if for example a pipeline has no pressure and the low limit is set to some value, the LPP can be configured to pull the handle to disengage the LPO from the RS before the pipeline pressure returns within set limits. The handwheel is then able to operate the RS and position the valve as needed. Once pressure returns within limits, the LPO will be able to release the spring of the RS and operate to a fail-safe position should the pressure exceed the set limits.

ABOUT WEDGEROCK



The WedgeRock name and logo symbolize the elegance of a simple and effective design and the grit, focus, and determination required to make things happen – the work required to get big things moving. Pragmatism and hard work are central to our culture and reflected in everything we do.

Don't let our dirty hands and old school approach fool you. WedgeRock brings industry leading innovation to your engineered projects in standard lead times.

With a focused approach, WedgeRock provides solutions for the most demanding torque and thrust application. Whether you need to operate valves thousands of meters below the ocean surface, or a purpose designed gear operator for your valve line, give us a call or send an email to get the partnership started.

OUR MISSION

WedgeRock provides performance engineered actuation solutions for demanding applications.

