

## Valve Automation Introduction



Bradford™ stainless steel pneumatic vertical canister actuators are designed for use on butterfly valve sizes up to 4". They are available with the Bradford™ control top, in addition to other accessories.

Bradford™ stainless steel pneumatic horizontal actuators are designed for use on ball and butterfly valves. A special double acting design is for use on the B5102 series butterfly valve. Rack and pinion actuators can be used on either ball or butterfly valves.

Bradford™ aluminum pneumatic rack and pinion horizontal actuators are designed for use on all ball and butterfly valves.

Bradford™ electric actuators are designed for use on all ball and butterfly valves.

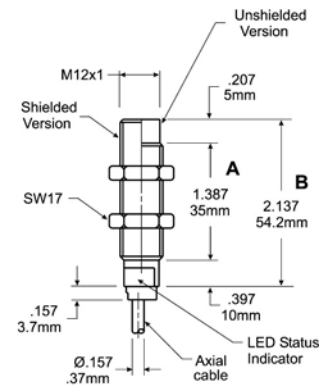
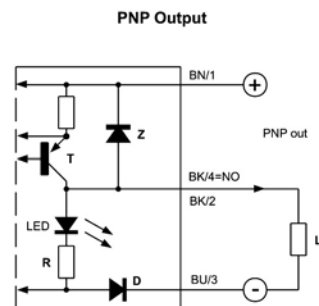
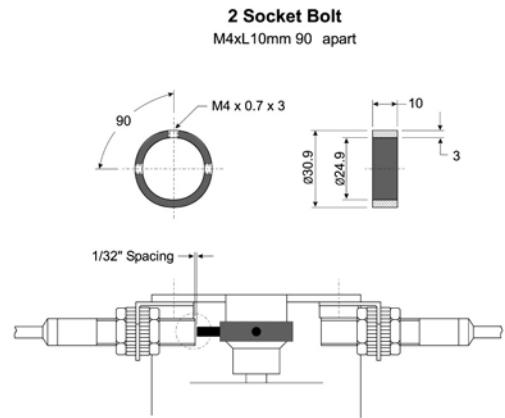
Accessories for valve automation are not limited. Dixon Hygienic can offer almost everything necessary to automate any Bradford™ valve, or any other manufacturers valve.

Dixon Hygienic products are rugged and dependable. Most actuated products can ship within 24 hours of the order being placed.

## Inductive Proximity Sensors

PART NO. PS-AM1-AP-2A	
SPECIFICATIONS	
Sensing Range	0-4mm
Housing	Unshielded - nickel plated brass housing
Output State	Normally Open
Logic	PNP
Connection	2m axial cable
Wiring	see diagram 1
Dimensions	see diagram 2
Size	M12
Power	10-30 VDC
Rating	IP 67 w/ complete overload protection
Differential Travel	2 to 10%
Repeat Accuracy	< 2%
Ripple	< 10%
No Load Supply Current	< 20mA
Load Current	< 200mA
Leakage Current	< 10µA
Voltage Drop	1.2 Volts maximum
Switching Frequency	2KHz
(tv) Time Delay before availability	100ms
Input Voltage Transient Protection	up to 30 VDC
Output Power Short-Circuit Protection	yes (switch auto resets after overload is removed)
Temperature Range	-25° to 70° C
Temperature DRIFT	10% Sr
Protection Degree (DIN 40050)	IEC IP67
LED Indicators	yellow (N.O. output energized)
Sensing Face Material	PBT
Tightening Torque	88 in-lb
Weight	70g
Material Correction Factors	SS (x0.85) - steel type FE 360(x1.00)

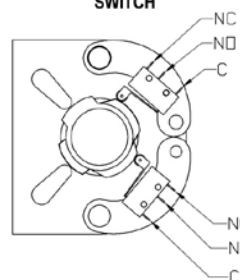
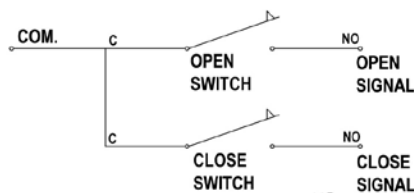
Other voltages, housings, and options available.



## Bracket Mounted Micro-Switches

These bracket mounted mechanical micro switches are mounted directly to the bracket between the actuator and the valve. This is the most economical means of sending a signal for open and close indication.

- Input voltage: 24 to 48VDC; 110 to 250 VAC
- Maximum current: 5 amps
- Life cycles mechanical: 5,000,000
- Temperature range: (40°F to 175°F) 4.5°C to 79.5°C



## Limit Switches for Pneumatic Actuators

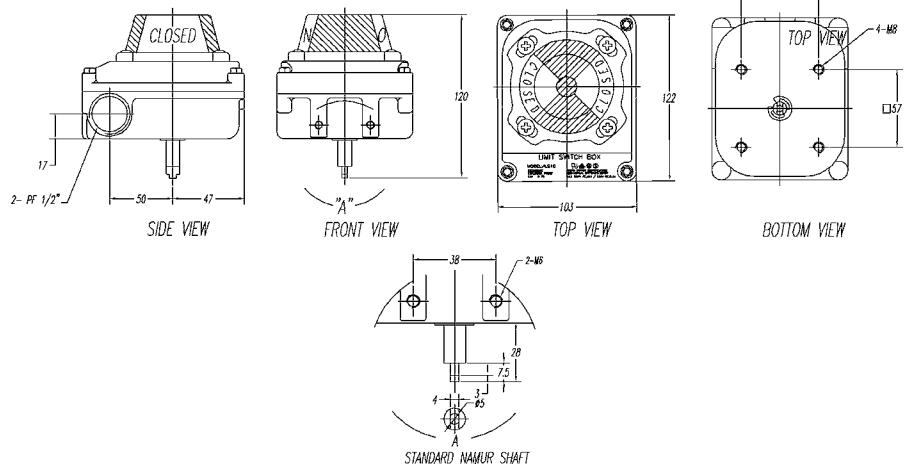
### Features

- Compact, cost-efficient, low profile limit switches for both local and remote indication of valve and/or actuator position
- Wide variety of switch options are available
- Visual position indicator
- Quick-Set cam
- Multipoint terminal strip
- Dual wire potting
- Captive cover bolts
- UL and CENEFLEC approved
- NEMA 4, 4X, 7 and 9
- Standard NAMUR mounting

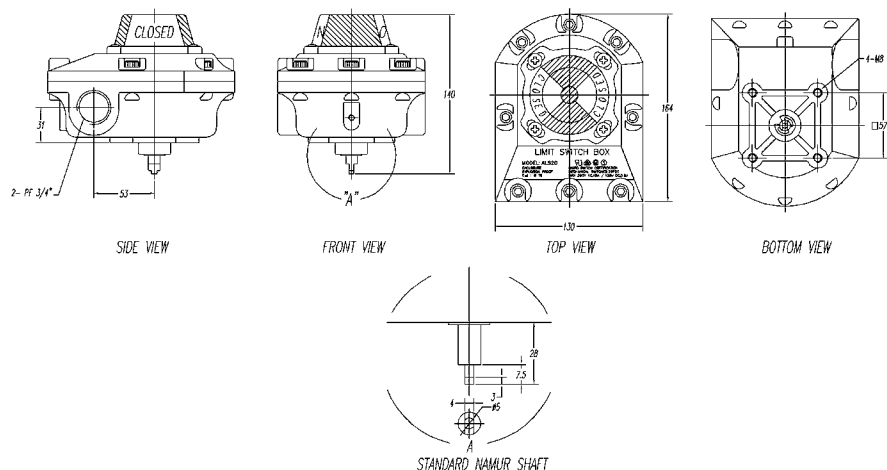
### Technical Specifications

- Enclosure: weatherproof, 1P67
- Temperature range: -4°F (20°C) to 185°F (85°C)
- Cable entry: 2 x 1/2" NPT
- Terminal strip: 8 points
- Position indicator: 0 - 90: open - yellow, close - red
- Switch type: 2 SPDT mechanical switches
- Painting: black polyester powder coating
- Bracket: stainless steel

### XLS-B4A0120P (NEMA 4/4X ENCLOSURE)



### XLS-B7A0120P (NEMA 7 ENCLOSURE)



## NAMUR Mount Solenoid Valves



### Features

- Exclusive 'pop-up' indicator provides a quick check for valve pressurisation
- Easy to use override
- Single, dual coils or 3 position configurations are available
- NEMA 4 or 7 versions are available
- Lighted DIN connectors are available
- Intrinsically safe coils are available

### Material Specifications

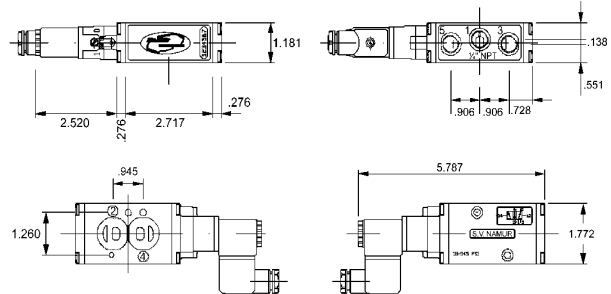
- Body: epoxy coated die cast aluminum optional body material: stainless steel
- Spool: electroless-nickel plated aluminum
- Piston: aluminum
- Spring: stainless steel
- Seal: Buna N (standard) optional seal material: EPDM
- Screws: stainless steel
- other components: technopolymer

### Technical Specifications

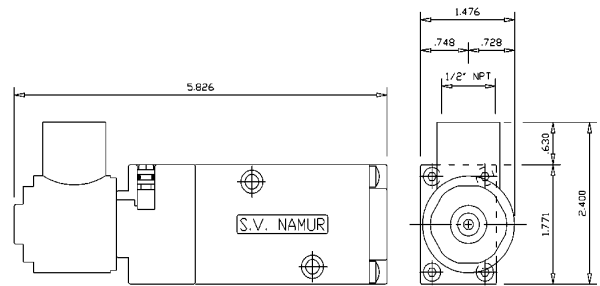
- DC Coil Voltage: 12v, 24v
- AC Coil Voltage (60Hz): 24v, 120v, 220v
- Standard Protection Class: NEMA 4 (DIN connector, as shown)
- Electrical Connection: 9mm DIN connector (DIN 43650)
- Coil Insulation: Class F
- Supply Air and Environment Temperature Limits: -20° to 70°C
- BunaN seal temperature range: -20° to 70°C
- EPDM seal temperature range: -10° to 120°

Note: Temperature ranges indicate air temperatures for seal material.

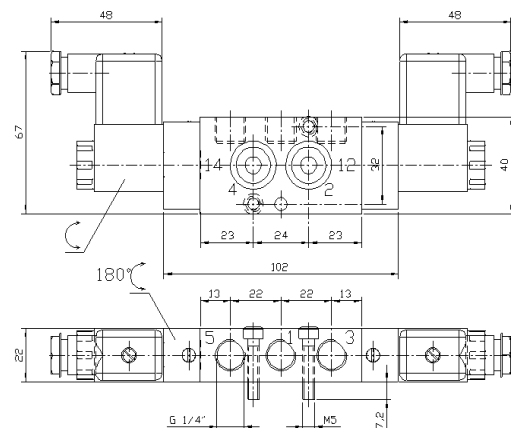
### XSO-4S4-0A NEMA 4, FOUR WAY SINGLE COIL, 115 VAC



### XSO-4S7-0A NEMA 7, FOUR WAY SINGLE COIL, 115 VAC



### XSO-4D4D-0A NEMA 4, FOUR WAY DUAL COIL, 115 VAC



## Positioners

### XPO-P4F (Pneumatic Positioner)

#### Features

- Cam characterized and force balanced
- Cast aluminum NEMA 4X housing with electrostatically applied polyester coating
- Operates on a standard 3-15 Volt PSI signal (12 PSI span, optional 24 PSI)
- Pressure gauge blocks built into the unit
- Large indicator has scaling to operate in both direct and reverse directions
- Feedback units available - call factory for details

#### Technical Specifications

- Input range: 3-15 PSI
- Supply pressure: <145 PSI
- Linearity error: <0.7 f.s.
- Hysteresis: <0.4 f.s.
- Repeatability: <0.3 f.s.
- Pressure gain: 750:1 P
- Air delivery:
 

	SCFM
@ 29 PSI (200 kPa)	9.5
@ 87 PSI (600 KPa)	28.3
@ 145 PSI	47.1
- Air consumption:
 

	SCFM
@ 29 PSI (200 kPa)	0.18
@ 87 PSI (600 KPa)	0.53
@ 145 PSI	0.88
- Temperature range: -40°F (-40°C) to 185°F (85°C)
- Air connections: 1/4" NPT
- Gauge port: 1/8" NPT
- Ingress and corrosion protection: NEMA 4X and IP 66
- Coating: Powder polyester (nickel - optional)
- Weight: 3.5 lbs.



## XPO-E4F (Electro-Pneumatic Positioner)

### Features

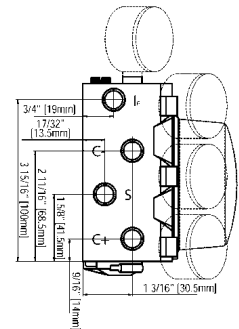
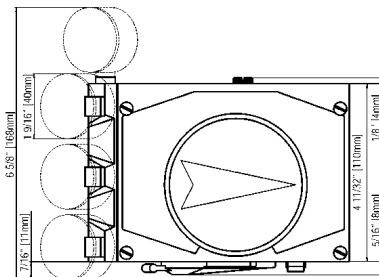
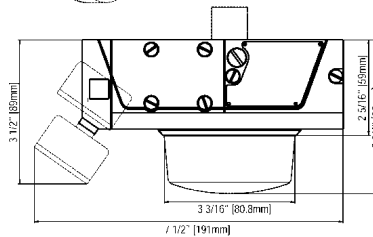
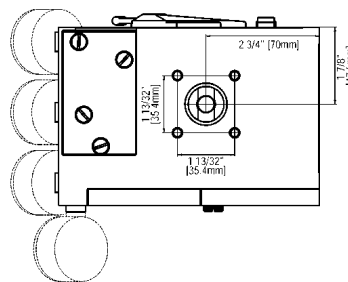
- Cam characterized and force balanced
- Cast aluminum NEMA 4X housing with electrostatically applied polyester coating
- Operates on a 4-20 mA signal
- Pressure gauge blocks built into the unit
- Large indicator has scaling to operate in both direct and reverse directions
- Feedback units available - call factory for details

### Technical Specifications

- Input range: 4-20 (R1<170 ohms)
- Supply pressure: 22-145 PSI
- Linearity error: <1.0 f.s.
- Hysteresis: <0.5 f.s.
- Repeatability: <0.3 f.s.
- Pressure gain: 750:1 P out / P in
- Air delivery: SCFM
 

@ 29 PSI (200 kPa)	9.5
@ 87 PSI (600 KPa)	28.3
@ 145 PSI	47.1
- Air consumption: SCFM
 

@ 29 PSI (200 kPa)	0.18
@ 87 PSI (600 KPa)	0.53
@ 145 PSI	0.88
- Temperature range: -40°F (-40°C) to 185°F (85°C)
- Air connections: 1/4" NPT
- Gauge port: 1/8" NPT
- Ingress and corrosion protection: NEMA 4X and IP 66
- Coating: Powder polyester (nickel - optional)
- Weight: 3.8 lbs.

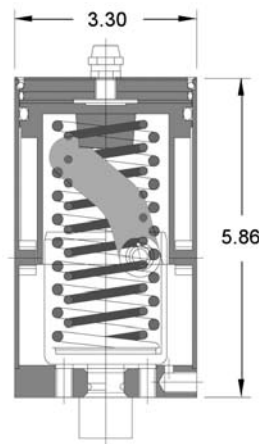




## Vertical Stainless Steel Canister

### without Control Top

- Excellent protection and corrosion resistance
- Tested to 1 million cycles
- 100% fully tested prior to shipment
- Backed by one year manufacturer's warranty
- Designed for butterfly valves sizes 1" - 4"
- Available in:
  - Air to open / air to close (ATO/ATC)
  - Air to open / spring to close (ATO/STC)
  - Spring to open / air to close (STO/ATC)



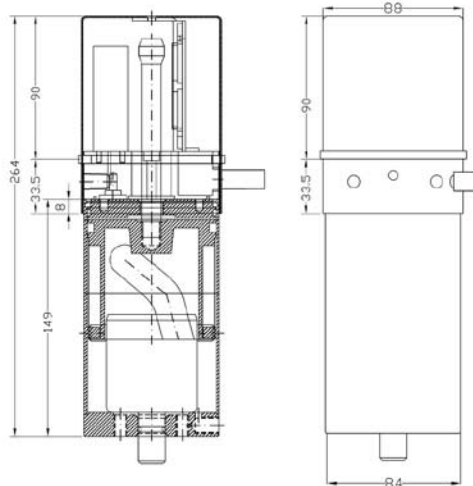
Note: All dimensions are in inches. Dimensions are approximate. Engineering dimensions are available upon request.

Specifications are subject to change without notice.

SIZES	DESCRIPTION	PART NUMBER
1" - 4"	Double Acting	VC-NR-100-DA
1" - 4"	Spring Return	VC-NR-100-SR

### with Control Top

- Excellent protection and corrosion resistance
- Tested to 1 million cycles
- 100% fully tested
- Backed by one year manufacturer's warranty
- Designed for butterfly valves sizes 1" - 4"
- Includes control top with solenoid and micro switches for flawless control
- Available in:
  - Air to open / air to close (ATO/ATC)
  - Air to open / spring to close (ATO/STC)
  - Spring to open / air to close (STO/ATC)
  - 24 volt DC solenoid
  - 110 volt AC solenoid



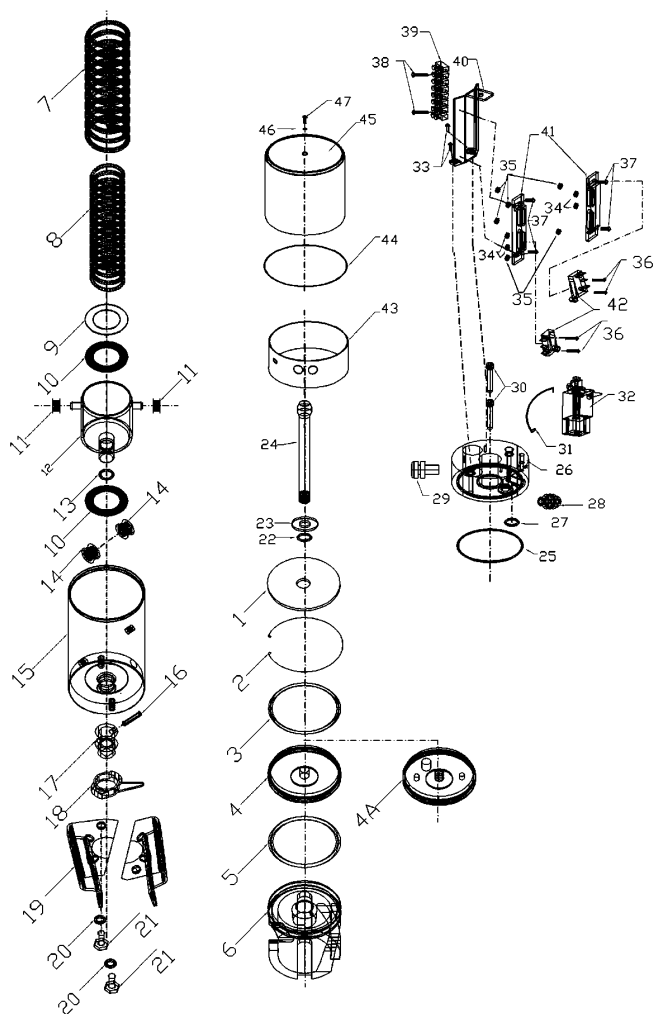
Note: All dimensions are in inches. Dimensions are approximate. Engineering dimensions are available upon request.

Specifications are subject to change without notice.

SIZES	DESCRIPTION	PART NUMBER	
		110vAC	24vDC
1" - 4"	Double Acting	VC-NR-100-DA-ZJ	VC-NR-100-DA-ZI
1" - 4"	Spring Return	VC-NR-100-SR-ZH	VC-NR-100-SR-ZG

Note: Each Bradford™ pneumatically actuated butterfly valve is shipped fully assembled, including pneumatic actuator and mounting bracket assembly. When ordering spring return actuators, please indicate if the valves need to be normally open or normally closed.

## Vertical Stainless Steel Canister and control top



### MATERIALS LIST

ITEM	DESCRIPTION	MATERIAL	QUANTITY			
			w/o Control Top	SR	DA	SR
1	top cap	304 stainless	1	1	n/a	n/a
2	retaining ring	304 stainless	1	1	1	1
3	O-ring	EPDM	1	1	1	1
4	end cap	304 stainless	1	1	n/a	n/a
4A	manifold cap	304 stainless	n/a	n/a	1	1
5	O-ring	EPDM	1	1	1	1
6	piston	aluminum	1	1	1	1
7	outer spring	302 stainless	1	n/a	1	n/a
8	inner spring	302 stainless	1	n/a	1	n/a
9	thrust drive	304 stainless	1	n/a	1	n/a
10	thrust bearing	304 stainless	2	1	2	1
11	needle bearing	304 stainless	2	2	2	2
12	drive assembly	304 stainless	1	1	1	1
13	O-ring	EPDM	1	1	1	1
14	needle bearing	304 stainless	2	2	2	2
15	body	304 stainless	1	1	1	1
16	split pin	304 stainless	1	1	1	1
17	coupler	304 stainless	1	1	1	1
18	indicator	plastic	1	1	1	1
19	bracket spring	304 stainless	2	2	2	2
20	washer	304 stainless	2	2	2	2
21	bracket bolt	304 stainless	2	2	2	2
22	O-ring	EPDM	n/a	n/a	1	1
23	washer	304 stainless	n/a	n/a	1	1
24	detection shaft	304 stainless	n/a	n/a	1	1
25	O-ring	EPDM	n/a	n/a	1	1
26	manifold	POM	n/a	n/a	1	1
27	O-ring	EPDM	n/a	n/a	1	1
28	air fitting	nickel plated brass	1	2	1	4
29	conduit entry	plastic	n/a	n/a	1	1
30	bolt	304 stainless	n/a	n/a	2	2
31	pneumatic tube	polyethylene	n/a	n/a	1	4
32	solenoid valve	anodized AL	n/a	n/a	1	2
33	bolt	304 stainless	n/a	n/a	2	2
34	nut	304 stainless	n/a	n/a	4	4
35	nut	304 stainless	n/a	n/a	6	6
36	bolt	304 stainless	n/a	n/a	4	4
37	bolt	304 stainless	n/a	n/a	4	4
38	bolt	304 stainless	n/a	n/a	2	2
39	terminal strip	plastic	n/a	n/a	1	1
40	switch rack	304 stainless	n/a	n/a	1	1
41	switch plate	POM	n/a	n/a	2	2
42	mech. micro switch	silver contact	n/a	n/a	2	2
43	manifold sleeve	304 stainless	n/a	n/a	1	1
44	cover seal	PTFE	n/a	n/a	1	1
45	cover	304 stainless	n/a	n/a	1	1
46	O-ring	Buna	n/a	n/a	1	1
47	bolt	304 stainless	n/a	n/a	1	1

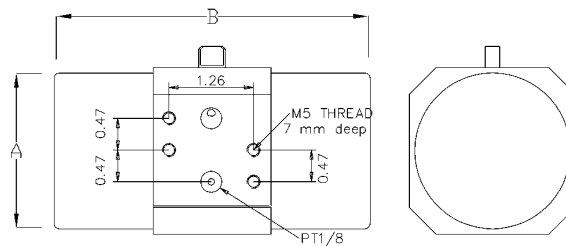


## Horizontal Double Acting Stainless Steel Actuator

- Excellent protection and corrosion resistance
- Tested to 1 million cycles
- 100% fully tested prior to shipment
- Backed by one year manufacturer's warranty
- Designed for the B5102 series butterfly valves sizes 1" - 4"
- Can be mounted on most Bradford™ BFV's up to 4"
- 6" and 8" valves must use a horizontal rack and pinion style actuator due to torque requirements
- Available in air to open / air to close (ATO/ATC)



### Dimensions

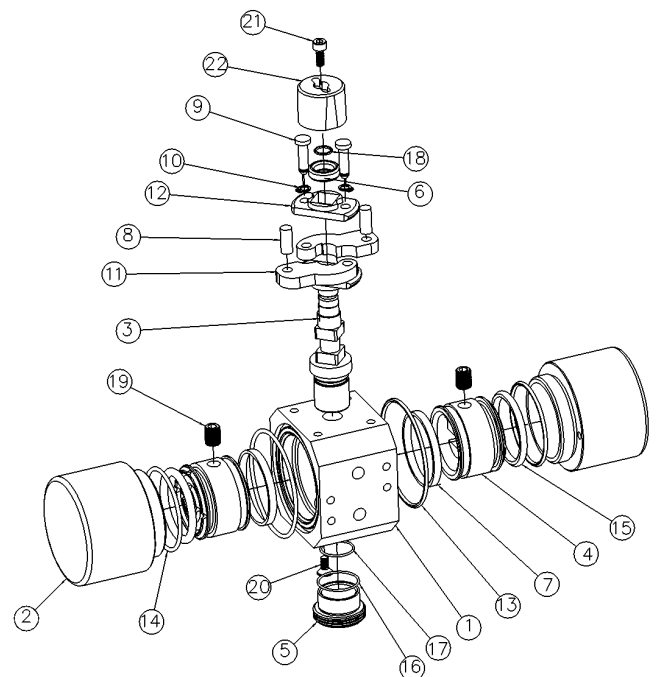


SIZES	DESCRIPTION		PART NUMBER
	A	B	
1" - 2"	2.4	3.2	RP-BS-050-DA
2½" - 4"	4.6	6.1	RP-BS-075-DA

Note: All dimensions are in inches. Dimensions are approximate. Engineering dimensions are available upon request.  
Specifications are subject to change without notice.

### MATERIALS LIST

ITEM	DESCRIPTION	MATERIAL	QTY
1	body	304 stainless	1
2	cylinder	304 stainless	2
3	pinion	304 stainless	1
4	piston	aluminum	2
5	lower bushing	17-4PH	1
6	upper bushing	17-4PH	1
7	piston ring	PTFE	2
8	pinion	high carbon steel	2
9	bolt	high carbon steel	2
10	bolt ring	high carbon steel	2
11	arm	high carbon steel	2
12	connector	304 stainless	2
13	body seal	NBR	2
14	cap seal	NBR	2
15	piston seal	NBR	2
16	bushing seal	NBR	1
17	pinion seal	NBR	1
18	ub seal	NBR	1
19	set screw	high carbon steel	2
20	flat head screw	304 stainless	1
21	socket head screw	304 stainless	1
22	indicator	aluminum	1

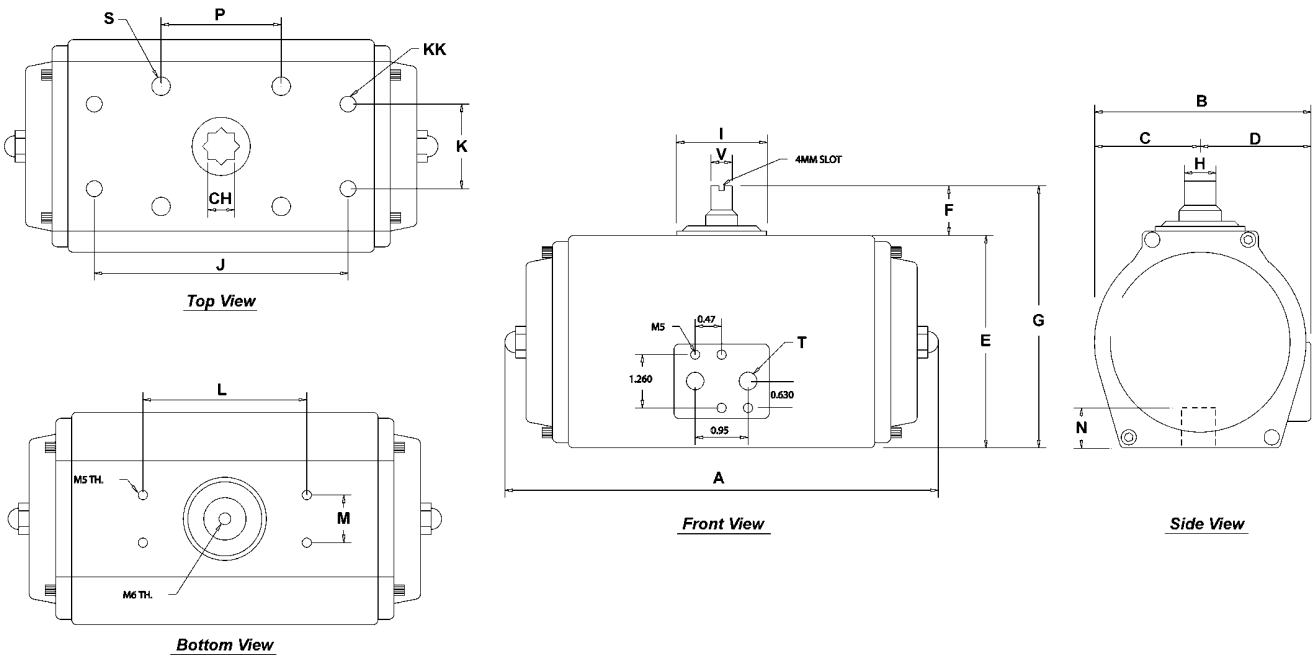


## Horizontal Rack and Pinion Stainless Steel Actuator



- Replaceable top and bottom PTFE pinion bearings ensure low friction, stability above 400°F, and chemical resistance
- Travel stops provide 4° travel adjustment
- Precision cast stainless steel pistons are guided through full face engagement with the pinion and piston guide
- NAMUR slotted shaft is standard to provide a self-centering positive drive for positioners, a variety of switches
- Drive pinion is one piece stainless steel alloy shaft, precision machined gear and teeth for precise control
- ISO 5211 mounting
- Available in:
  - Air to open / air to close (ATO/ATC)
  - Air to open / spring to close (ATO/STC)
  - Spring to open / air to close (STO/ATC)

### Dimensions (inches)



PART NO.	A	A (SR)	B	C	D	E	F	G	CH	J	L	N	M	P	S	T	V	KK
RP-BS-45 *	6.54	7.56	2.56	1.15	1.15	2.56	0.787	3.34	0.433	1.42	3.15	0.58	1.181	1.97	10-24	1/4" NPT	0.633	1/4 x 20
RP-BS-65 *	7.00	7.34	2.92	1.39	1.39	3.18	0.787	3.97	0.551	1.97	3.15	0.59	1.181	n/a	1/4 x 20	1/4" NPT	0.633	n/a
RP-BS-80 *	7.81	8.37	3.97	1.91	1.91	4.24	0.787	5.03	0.748	1.97	3.15	0.66	1.181	2.76	1/4 x 20	1/4" NPT	0.635	5/16 x 18
RP-BS-105 *	9.91	10.53	4.75	2.29	2.29	5.23	0.787	6.02	0.748	2.76	3.15	0.77	1.181	n/a	5/16 x 18	1/4" NPT	0.629	n/a
RP-BS-125 *	11.66	12.20	5.39	2.69	2.69	6.09	1.181	7.27	0.866	2.76	5.12	0.97	1.181	4.02	3/8 x 16	1/4" NPT	0.865	3/8 x 16
RP-BS-140*	14.17	19.29	6.26	3.11	3.11	6.89	1.181	8.07	1.063	4.02	5.12	1.18	1.181	4.92	3/8 x 16	1/4" NPT	0.865	1/2 x 13

\* - DA = double acting; - SR = spring return

Note: all dimensions are in inches. Dimensions are approximate. Engineering dimensions are available upon request.

Specifications are subject to change without notice.

## Horizontal Rack and Pinion Stainless Steel Actuator

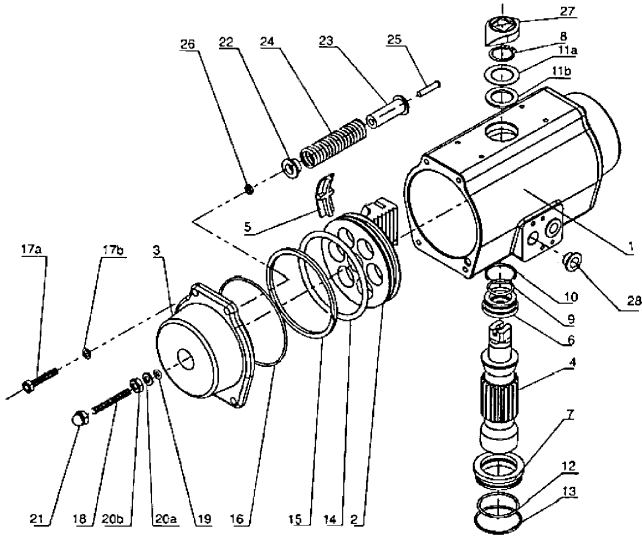
### Technical Data

TORQUE RATINGS FOR DOUBLE ACTING ACTUATOR					
PART NUMBER	40 PSI / 2.76 BAR	60 PSI / 4.14 BAR	80 PSI / 5.52 BAR	100 PSI / 6.89 BAR	120 PSI / 8.27 BAR
RP-BS-045-DA	71	107	143	178	214
RP-BS-065-DA	171	256	342	427	512
RP-BS-080-DA	370	555	740	925	1110
RP-BS-105-DA	624	936	1249	1561	1873
RP-BS-125-DA	1214	1822	2429	3036	3643
RP-BS-140-DA	2034	3051	4068	5085	6102

TORQUE RATINGS FOR SPRING RETURN ACTUATOR											
PART NUMBER	SPRING PER SIDE	SPRING TORQUE		40 PSI / 2.76 BAR		60 PSI / 4.14 BAR		80 PSI / 5.52 BAR		100 PSI / BAR	
	(5 STD)	END	BREAK	END	BREAK	END	BREAK	END	BREAK	END	BREAK
RP-BS-045-SR	3	35	57	14	36	50	72	86	108	121	143
	4	47	77	--	--	30	60	66	96	101	131
	5	60	96	--	--	--	--	47	83	82	118
	6	71	115	--	--	--	--	--	--	63	107
RP-BS-065-SR	3	67	136	35	104	120	189	206	275	291	360
	4	90	182	--	--	74	166	160	252	245	337
	5	112	227	--	--	--	--	115	230	200	315
	6	135	273	--	--	--	--	--	--	154	292
RP-BS-080-SR	3	167	273	97	203	282	388	467	573	652	758
	4	223	364	--	--	191	332	376	517	561	702
	5	279	456	--	--	--	--	284	461	469	646
	6	335	547	--	--	--	--	--	--	378	590
RP-BS-105-SR	3	346	574	50	278	362	590	675	903	987	1215
	4	461	766	--	--	170	475	483	788	795	1110
	5	576	956	--	--	--	--	293	673	605	985
	6	692	1141	--	--	--	--	--	--	420	869
RP-BS-125-SR	3	651	1141	73	563	681	1171	1288	1778	1895	2385
	4	869	1522	--	--	300	953	907	1560	1514	2167
	5	1080	1902	--	--	--	--	527	1349	1134	1956
	6	1301	2283	--	--	--	--	--	--	753	1735
RP-BS-140-SR	3	808	1859	175	1226	1192	2243	2209	3260	3226	4277
	4	1071	2487	--	--	564	1980	1581	2997	2598	4014
	5	1345	3107	--	--	--	--	961	2723	1978	3740
	6	1610	3726	--	--	--	--	--	--	1359	3475

Actuator Torque Output (In. Lbs.)

## Horizontal Rack and Pinion Stainless Steel Actuator



### MATERIALS LIST

ITEM	DESCRIPTION	MATERIAL	QTY
1	body	stainless steel	1
2	piston	stainless steel	2
3	end caps	stainless steel	2
4	pinion	stainless steel	1
5	guide bearing	nylon 6	1
6	pinion bearing (top)	TFE	1
7	pinion bearing (bottom)	TFE	1
8	snap ring	stainless steel	1
9	O-ring (inner top)	Viton®	1
10	O-ring (outer top)	Viton®	1
11A	washer	stainless steel	1
11B	bearing	nylon 6	1
12	O-ring (inner bottom)	Viton®	1
13	O-ring (outer bottom)	Viton®	1
14	O-ring (piston)	Viton®	2
15	piston bearing	nylon 6	2
16	O-ring (end cap)	Viton®	2
17A	bolts (end cap)	stainless steel	8
17B	lock washer	stainless steel	8
18	travel stop	stainless steel	2
19	O-ring (travel stop)	Viton®	2
20A	washer	stainless steel	2
20B	nut (travel stop)	stainless steel	2
21	retaining nut	stainless steel	2
22	spring retainer	nylon 6	*
23	spring	plated carbon steel	*
24	spring	plated carbon steel	*
25	spring screw	stainless steel	*
26	spring nut	stainless steel	*
27	position indicator	nylon	1
28	port plug	nylon 6	2

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## Aluminum Rack and Pinion Actuator

- Body: Extruded hard anodized aluminum alloy for wear and corrosion resistance and reduced friction.
- Heavy Duty Springs: High tensile steel springs with retainer and guide for safe and easy assembly.
- Pistons: Die-cast aluminum alloy fitted with nylon bushing guides and Buna-N seals.
- End Caps: Epoxy-coated die-cast aluminum alloy for maximum resistance to corrosive environments.
- Pinion: Electroless nickel plated carbon steel for maximum corrosion and wear resistance.
- Rotation Adjustment: A full  $\pm 5^\circ$  of travel adjustment in the open and closed positions. Standard on all sizes.
- Solenoid Interface: International NAMUR solenoid mounting interface is standard on all units.
- Indicator: A high visibility polyethylene for indication. Open/Close indication is standard on all models.
- Available in:
  - Air to open / air to close (ATO/ATC)
  - Air to open / spring to close (ATO/STC)
  - Spring to open / air to close (STO/ATC)

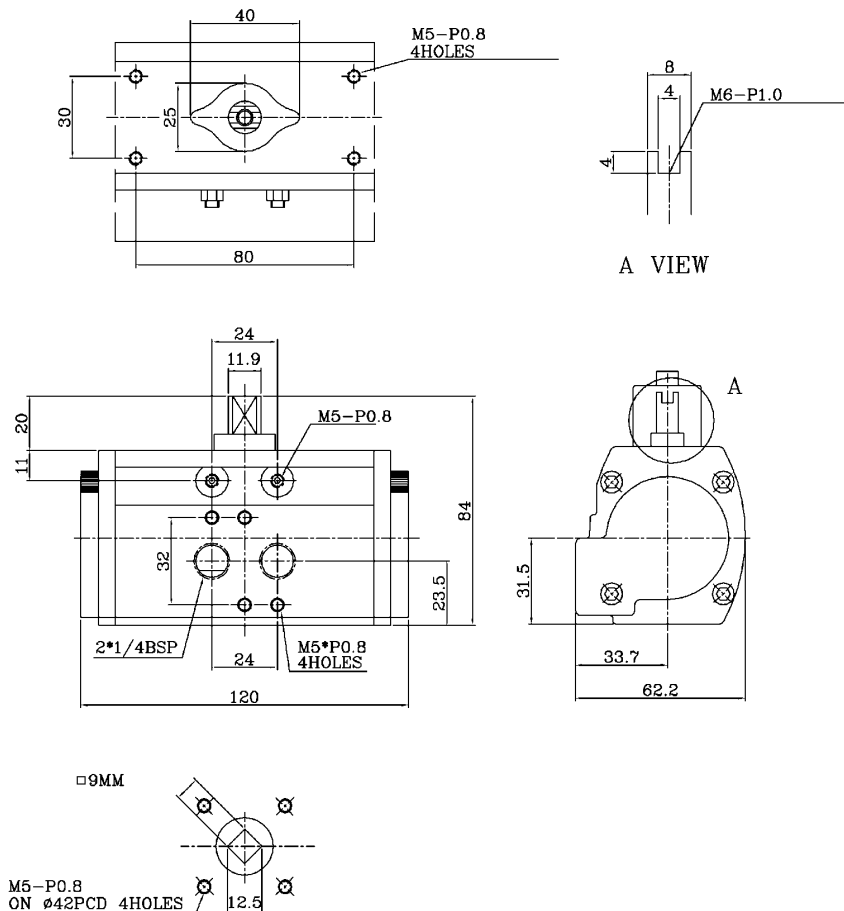


**Double Acting**



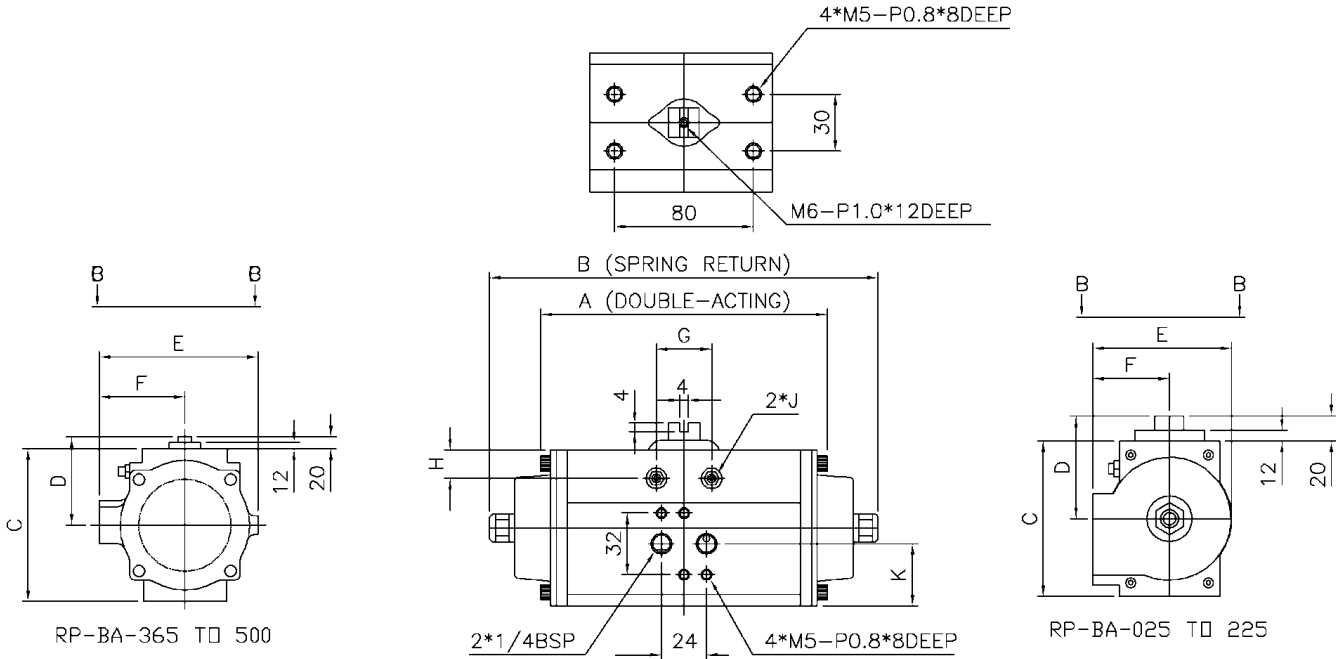
**Spring Return**

### Dimensions for RP-BA-012-DA



## Aluminum Rack and Pinion Actuator

Dimensions for RP-BA-025-DA/SR to RP-BA-500-DA/SR



RP-BA-365 TO 500

RP-BA-025 TO 225

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Part No.	ISO 5211	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	W
RP-BA-025*	F04/F05	144.3	194.6	79	57.7	81.4	47.8	32.5	12.6	M5xP0.8	29.7	14.5	11	17	M5xP0.8	8	M6xP1.0	10	50	42
RP-BA-045*	F05/F07	149.2	205.6	98	67.4	95	51.5	32.5	13.8	M6xP1.0	30.2	18.8	14	21	M6xP1.0	10	M8xP1.25	12	70	50
RP-BA-101*	F05/F07	183	250	121	79.2	119	64.5	46.2	16.6	M8xP1.25	33.5	23	17	25.5	M6xP1.0	10	M8xP1.25	12	70	50
RP-BA-225*	F07/F10	259.6	355	141	89.5	140.5	75.5	54	18.6	M10xP1.5	39	29.5	22	31	M8xP1.25	12	M10xP1.5	15	102	70
RP-BA-365*	F10/F12	304.3	422	176	99.1	185.2	105.5	79.7	27.3	M12xP1.75	97.4	35.5	27	35	M10xP1.5	15	M12xP1.75	19	125	102
RP-BA-500*	F10/F12	364.4	487	196	116.5	204.8	107.8	79.4	28.3	M12xP1.75	99	35.5	27	35	M10xP1.5	15	M12xP1.75	19	125	102

\* - DA = double acting; - SR = spring return



## Aluminum Rack and Pinion Actuator

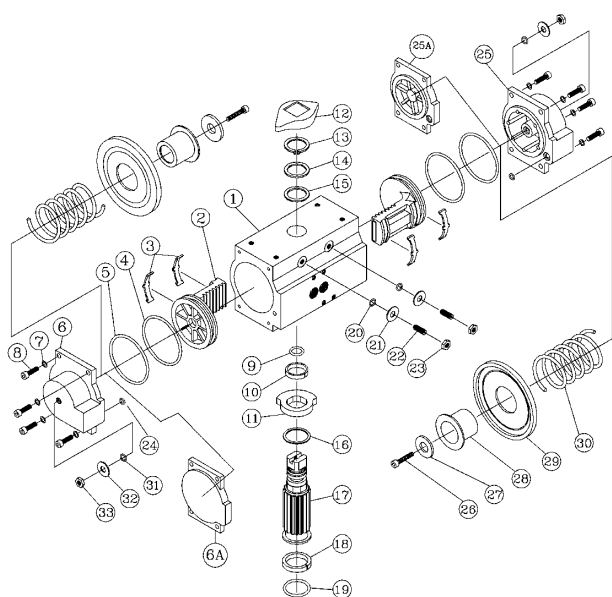
### Technical Data

TORQUE RATINGS FOR DOUBLE ACTING ACTUATOR					
PART NUMBER	40 PSI / 2.76 BAR	60 PSI / 4.14 BAR	80 PSI / 5.52 BAR	100 PSI / 6.89 BAR	120 PSI / 8.27 BAR
RP-BA-012-DA	63	94	125	156	188
RP-BA-025-DA	125	187	250	312	375
RP-BA-045-DA	225	337	450	562	675
RP-BA-101-DA	500	750	1000	1250	1500
RP-BA-225-DA	1125	1687	2250	2812	3375
RP-BA-365-DA	1825	2738	3650	4563	5475
RP-BA-500-DA	2500	3750	5000	6250	7500

TORQUE RATINGS FOR SPRING RETURN ACTUATOR													
PART NO.	SPRING SET	SPRING TORQUE		40 PSI / 2.76 BAR		60 PSI / 4.14 BAR		80 PSI / 5.52 BAR		100 PSI / 6.89 BAR		120 PSI / 8.27 BAR	
		ST.	END	ST.	END	ST.	END	ST.	END	ST.	END	ST.	END
RP-BA-025-SR	2	69	45	76	47	138	109	201	172	263	234	326	312
	3	104	67	--	--	113	70	176	133	229	195	301	258
	4	140	90	--	--	88	31	151	93	213	156	276	218
	5	175	112	--	--	--	--	126	54	189	116	251	179
	6	209	135	--	--	--	--	--	--	164	77	227	139
RP-BA-045-SR	2	126	81	135	83	248	196	361	309	473	421	586	533
	3	190	121	--	--	203	125	316	238	428	350	541	463
	4	254	162	--	--	158	54	271	167	383	279	496	392
	5	317	202	--	--	--	--	226	96	339	209	451	321
	6	381	243	--	--	--	--	--	--	293	137	406	251
RP-BA-101-SR	2	279	179	300	184	549	433	798	682	1048	931	1297	1181
	3	418	270	--	--	449	278	698	526	947	775	1196	1025
	4	559	360	--	--	350	120	599	371	848	618	1097	867
	5	698	450	--	--	--	--	500	212	749	464	998	710
	6	839	540	--	--	--	--	--	--	650	304	899	557
RP-BA-225-SR	2	659	394	690	395	1253	958	1816	1521	2379	2084	2939	2647
	3	990	590	--	--	1034	591	1596	1154	2159	1717	2722	2280
	4	1320	787	--	--	816	226	1379	788	2029	1351	2505	1914
	5	1650	984	--	--	--	--	1161	424	1724	984	2287	1549
	6	1980	1181	--	--	--	--	--	--	1506	621	2069	1181
RP-BA-365-SR	2	1053	607	1152	659	2063	1570	2975	2482	3886	3393	4797	4305
	3	1573	912	--	--	1726	996	2637	1907	3549	2819	4460	3730
	4	2091	1217	--	--	1388	423	2300	1335	3211	2246	4123	3157
	5	2625	1519	--	--	--	--	1967	744	2878	1655	3789	2566
	6	3144	1824	--	--	--	--	--	--	2540	1082	3452	1994
RP-BA-500-SR	2	1560	785	1590	803	2780	1990	3970	3180	5160	4380	6350	5570
	3	2340	1180	--	--	2380	1200	3570	2400	4760	3590	5960	4780
	4	3130	1570	--	--	1980	414	3180	1600	4370	2800	5560	3990
	5	3910	1960	--	--	--	--	2780	815	3970	2010	5160	3200
	6	4690	2360	--	--	--	--	--	--	3570	1220	4760	2410

Actuator Torque Output (In. Lbs.)

## Aluminum Rack and Pinion Actuator



### MATERIALS LIST

ITEM	DESCRIPTION	MATERIAL	QTY	
			DA	SR
1	body	anodized aluminum alloy	1	1
2	piston	die-cast aluminum alloy	2	2
3	piston bearing	nylon	4	4
4	O-ring	Buna-N	2	2
5	O-ring	Buna-N	2	2
6	end cap (left)	die-cast aluminum alloy	n/a	1
6A	end cap (left)	die-cast aluminum alloy	1	n/a
7	washer	stainless steel	8	8
8	cap screw	stainless steel	8	8
9	O-ring	Buna-N	1	1
10	bearing	nylon	1	1
11	stop cam	carbon steel	1	1
12	position indicator	polyethylene	1	1
13	retaining ring	stainless steel	1	1
14	washer	stainless steel	1	1
15	bearing	nylon	1	1
16	retaining ring	stainless steel	1	1
17	pinion	carbon steel	1	1
18	bearing	nylon	1	1
19	O-ring	Buna-N	1	1
20	O-ring	Buna-N	2	2
21	washer	stainless steel	2	2
22	stop screw	stainless steel	2	2
23	nut	stainless steel	2	2
24	O-ring	Buna-N	2	2
25	end cap (right)	die-cast aluminum alloy	n/a	1
25A	end cap (right)	die-cast aluminum alloy	1	n/a
26	screw	stainless steel	n/a	2
27	washer	stainless steel	n/a	2
28	spring guide	stainless steel	n/a	2
29	retainer	stainless steel	n/a	2
30	spring *	high tensile steel	n/a	4*
31	O-ring	Buna-N	n/a	2
32	washer	stainless steel	n/a	2
33	nut	stainless steel	n/a	2

\* #4 spring set is standard

## 180° Aluminum Rack and Pinion Actuator

- NAMUR VDI/VDE 3845 and ISO 5211 dimensions on all sizes. No special blocks are required to mount solenoid valves, limit switches or positioners.
- The standard angle of rotation is 180°. Additional travel rotations of 120°, 135°, 150° are available. MA016 and larger sizes feature a travel stop with  $\pm 10^\circ$  adjustment in both open and close directions (International Patent).
- The 'patent pending' bottom plate design, unique to Dixon Hygienic secures a captive pinion (anti-blowout system) and permits flexibility in mounting by retaining AISI 304 nuts (standard) or AISI 304 bolts (optional) In either dual ISO patterns, or to customer dimensions
- All pinions are supplied with anti-blowout retention in both directions
- The female pinion drive is standard with a double square output drive and optional with a double-D drive, keyed drive and designs to meet your specific requirements
- Shaft bearings isolate the pinion gear from the housing and support the shaft for high cycle applications
- The pinion teeth are engaged for the full length and stroke of the piston. The pinion height allows manual override without disturbing the position indication
- Extruded aluminum body is internally machined and lapped to exact specifications. All internal and external surfaces are anodized for corrosion resistance
- External open/closed indicator is standard, available for all rotations
- Pistons incorporate double wear pads to separate the rack from the actuator wall and serve as both guide and wear bearings
- Epoxy coated special steel springs are pre-loaded with non-metallic materials. The stainless steel end cap fasteners are extra long to allow for spring relaxation, all parts are corrosion resistant



**Double Acting**



**Spring Return**

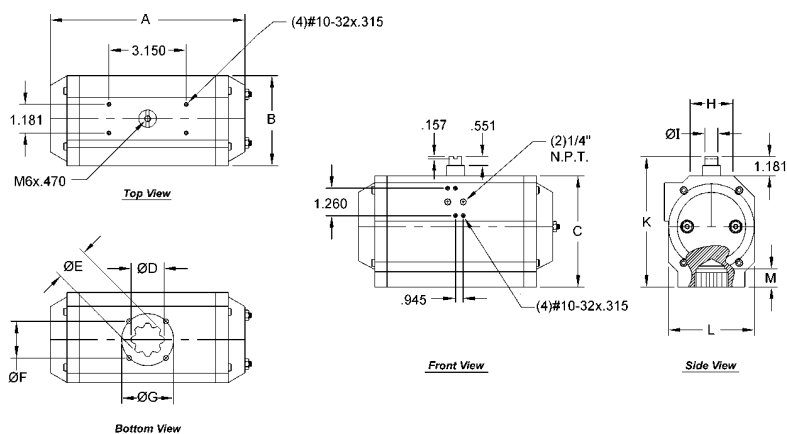
- Air pressure operation from 40 to 150 PSI. Water, nitrogen and compatible hydraulic fluids may as be used to power the actuator
- All external fasteners are corrosion resistant stainless steel
- All units are permanently lubricated at the factory with non-silicone grease
- All units are externally stamped with a progressive traceable serial number
- 100% of all units are factory pressure and leak tested

### SPECIFICATIONS

Operating pressure range	40 to 120 PSIG / 2.75 - 8.25 BAR
Maximum allowable working pressure	150 PSIG / 10.35 BAR
Operating media	Dry or lubricated non-corrosive gas
Operating temperature standard	-40°F to 176°F
Piston and pinion lubrication	Non-silicone grease
Range of rotation adjustment	Between 170° and 190° / 40°C - 80°C
Valve and accessory mounting	Standard ISO 5211 bolt patterns
Output shaft	Female - Double square
Design	Twin rack and pinion
Factory testing cycles	1 million

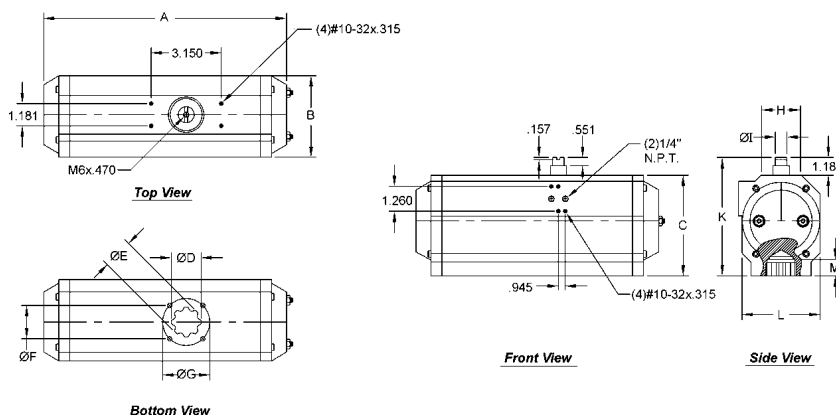
## 180° Aluminum Rack and Pinion Actuator

### Dimensions for Double Acting



PART NO.	DIMENSIONS (inches)											
	A	B	C	D (mm)	E (mm)	F	G	H	I	K	L	M
RP-MA-012-DA	4.7	2.6	2.8	11	11	n/a	F04	1.9	0.5	4	2.1	0.5
RP-MA-016-DA	9.2	3.3	3.5	14	14	n/a	F05	1.7	0.5	4.8	2.8	0.7
RP-MA-017-DA	10.8	3.3	3.5	14	14	n/a	F05	1.7	0.5	4.8	2.8	0.8
RP-MA-021-DA	9.9	3.8	4.5	17	17	n/a	F07	1.8	0.6	5.6	3.4	0.9
RP-MA-026-DA	13	3.8	4.4	17	17	n/a	F07	1.8	0.8	5.6	3.4	0.9
RP-MA-031-DA	13	4.5	5.2	17	17	n/a	F07	2.3	0.8	6.4	4.1	0.9
RP-MA-036-DA	13.7	5.4	6.5	22	22	F07	F10	2.6	0.8	7.7	5.2	1.2
RP-MA-041-DA	15.8	5.4	6.5	22	22	F07	F10	2.6	1.1	7.7	5.2	1.2
RP-MA-046-DA	20	5.9	7	22	22	F07	F10	3	1.1	8.2	5.7	1.2
RP-MA-051-DA	19.6	7.3	8.5	27	27	n/a	F12	4	1.1	9.8	7.2	1.5
RP-MA-056-DA	23.9	7.3	8.5	27	27	n/a	F12	4	1.1	9.8	7.2	1.5

### Dimensions for Spring Return



PART NO.	DIMENSIONS (inches)											
	A	B	C	D (mm)	E (mm)	F	G	H	I	K	L	M
RP-MA-015-SR	10.85	3.35	3.54	14	14	n/a	F05	1.70	0.50	4.76	2.76	0.70
RP-MA-017-SR	12.82	3.35	3.54	14	14	n/a	F05	1.70	0.50	4.76	2.76	0.80
RP-MA-020-SR	11.69	3.78	4.41	17	17	n/a	F07	1.80	0.60	5.63	3.39	0.90
RP-MA-025-SR	15.53	3.78	4.41	17	17	n/a	F07	1.80	0.80	5.63	3.39	0.90
RP-MA-030-SR	15.20	4.45	5.16	17	17	n/a	F07	2.30	0.80	6.38	4.09	0.90
RP-MA-035-SR	16.04	5.43	6.50	22	22	F07	F10	2.60	0.80	7.72	5.16	1.20
RP-MA-040-SR	18.80	5.43	6.50	22	22	F07	F10	2.60	1.10	7.72	5.16	1.20
RP-MA-045-SR	23.15	5.95	6.97	22	22	F07	F10	3.00	1.10	8.19	5.75	1.20
RP-MA-050-SR	23.41	7.28	6.97	27	27	n/a	F12	4.00	1.10	9.76	7.17	1.50
RP-MA-055-SR	27.70	7.28	8.54	27	27	n/a	F12	4.00	1.10	9.76	7.17	1.50

## 180° Aluminum Rack and Pinion Actuator

### Technical Data

TORQUE RATINGS FOR SPRING RETURN ACTUATOR													
PART NO.	SPRING SET	OPENING TORQUE		CLOSING TORQUE									
				40 PSI / 2.76 BAR		60 PSI / 4.14 BAR		80 PSI / 5.52 BAR		100 PSI / 6.89 BAR		120 PSI / 8.27 BAR	
		START	END	START	END	START	END	START	END	START	END	START	END
RP-MA-015-SR	2+2	75	53	84	62	153	131	222	200	291	269	359	337
	3+3	112	81	56	25	125	94	194	163	263	232	331	300
	4+4	150	107	--	--	99	56	168	125	237	194	305	262
	5+5	187	134	--	--	72	19	141	88	210	157	278	225
	7+5	224	160	--	--	--	--	115	51	184	120	252	188
RP-MA-017-SR	2+2	93	64	116	87	206	177	296	267	386	357	476	447
	3+3	139	96	84	41	174	131	264	221	354	311	444	401
	4+4	185	128	--	--	142	85	232	175	322	265	412	355
	5+5	232	160	--	--	110	38	200	128	290	218	380	308
	7+5	278	192	--	--	--	--	168	82	258	172	348	262
RP-MA-020-SR	2+2	122	92	158	128	283	253	408	378	533	503	658	628
	3+3	184	138	112	66	237	191	362	316	487	441	612	566
	4+4	245	184	66	5	191	130	316	255	441	380	566	505
	5+5	307	230	--	--	145	68	270	193	395	318	520	443
	7+5	369	278	--	--	97	6	222	131	347	256	472	381
RP-MA-025-SR	2+2	196	124	251	179	438	366	626	554	813	741	1001	929
	3+3	294	185	190	81	377	268	565	456	752	643	940	831
	4+4	392	247	--	--	315	170	503	358	690	545	878	733
	5+5	490	309	--	--	253	72	441	260	628	447	816	635
	7+5	588	372	--	--	--	--	378	162	565	349	753	537
RP-MA-030-SR	2+2	251	187	313	249	563	499	813	749	1063	999	1313	1249
	3+3	376	280	220	123	470	374	720	624	970	874	1220	1124
	4+4	502	374	--	--	376	248	626	498	876	748	1126	998
	5+5	627	467	--	--	283	123	533	373	783	623	1033	873
	7+5	753	560	--	--	--	--	440	247	690	497	940	747
RP-MA-035-SR	2+2	412	306	494	388	894	788	1294	1188	1694	1588	2094	1988
	3+3	617	461	339	183	739	583	1139	983	1539	1383	1939	1783
	4+4	824	614	--	--	586	376	986	776	1386	1176	1786	1576
	5+5	1029	767	--	--	433	171	833	571	1233	971	1633	1371
	7+5	1236	921	--	--	--	--	679	364	1079	764	1479	1164
RP-MA-040-SR	2+2	505	371	629	495	1129	995	1629	1495	2129	1995	2629	2495
	3+3	757	556	444	243	944	743	1444	1243	1944	1743	2444	2243
	4+4	1011	741	--	--	759	489	1259	989	1759	1489	2259	1989
	5+5	1263	929	--	--	572	237	1072	737	1572	1237	2072	1737
	7+5	1516	1113	--	--	--	--	887	484	1387	984	1887	1484
RP-MA-045-SR	2+2	890	560	1002	672	1784	1454	2565	2235	3346	3016	4127	3797
	3+3	1334	840	722	228	1504	1010	2285	1791	3066	2572	3847	3353
	4+4	1779	1120	--	--	1224	565	2005	1346	2786	2127	3567	2908
	5+5	2224	1399	--	--	945	120	1726	901	2507	1682	3288	2463
	7+5	2669	1679	--	--	--	--	1446	456	2227	1237	3008	2018
RP-MA-050-SR	2+2	1101	869	1381	1149	2506	2274	3631	3399	4756	4524	5881	5649
	3+3	1652	1304	946	598	2071	1723	3196	2848	4321	3973	5446	5098
	4+4	2203	1738	512	47	1637	1172	2762	2297	3887	3422	5012	4547
	5+5	2754	2173	--	--	1202	621	2327	1746	3452	2871	4577	3996
	7+5	3303	2607	--	--	768	72	1893	1197	3018	2322	4143	3447
RP-MA-055-SR	2+2	1487	1055	1945	1513	3445	3013	4945	4513	6445	6013	7945	7513
	3+3	2231	1583	1417	769	2917	2269	4417	3769	5917	5269	7417	6769
	4+4	2974	2111	889	26	2389	1526	3889	3026	5389	4526	6889	6026
	5+5	3718	2638	--	--	1862	782	3362	2282	4862	3782	6362	5282
	7+5	4462	3166	--	--	1334	38	2834	1538	4334	3038	5834	4538

Actuator Torque Output (In. Lbs.)



## Electric Actuation



### Features

- Conforms to CSA-C for outdoor use
- Built by an ISO9001 certified manufacturer

### Enclosure

- Lightweight powder coated aluminum alloy with plastic cover
- NEMA 4 and 4X waterproof and dust proof
- ROHS compliant

### Motor

- Extended duty cycle induction motor
- H-insulation class OM-1 and OM-A Class F on OM-2 to OM-4
- Built in thermal protection prevents motor burn out
- Includes position indicators on top of unit

### Manual Override

- Non-clutch design allows manual operation in a power outage
- Fail-safe does not allow manual operation when electric motor is operating
- Some units feature a hand wheel for manual operation
- Optional battery back-up available

### High alloy steel gear train

- Provides self-locking function to avoid valve back drive
- Factory installed high temperature lubricant, reduces maintenance

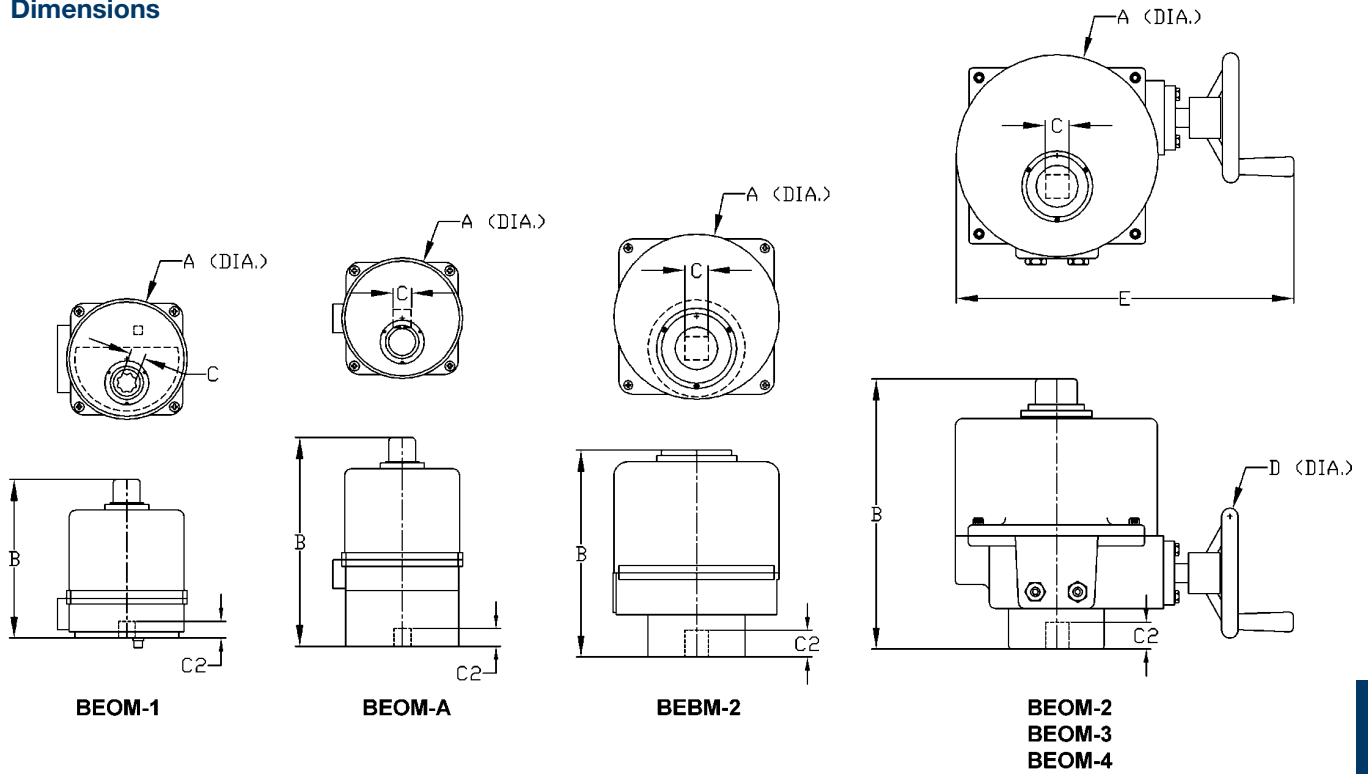
### Additional Features

- Tested to one million cycles
- One year manufacturer's warranty
- All units include heater to reduce condensation



## Electric Actuation

### Dimensions



PART NO.	INCHES (MM)						FLANGE TYPE
	A Ø	B	C SQ MAXIMUM	C2 DEPTH	D Ø	E	
BEOM-1	4.5 (114)	6.1 (155)	0.6 (14)	0.6 (15)	---	---	F03 / F05
BEOM-A	4.5 (114)	8.0 (203)	0.7 (17)	0.6 (16)	---	---	F07
BEBM-2	6.1 (154)	7.6 (192)	0.9 (22)	1.2 (30)	---	---	F07
BEOM-2 BEOM-3	7.1 (180)	10.0 (255)	0.9 (22)	1.2 (30)	4.8 (123)	12.8 (326)	F07
BEOM-4	8.5 (217)	12.5 (317)	1.4 (35)	1.6 (40)	7.6 (194)	15.5 (394)	F10