

# STAINLESS STEEL ACTUATORS

DESIGN & CONSTRUCTION



## STAINLESS STEEL BODY

- The all SS-housing is ideal for sanitary, pulp and paper, marine and a variety of other applications where corrosion resistance is crucial.

## UNIQUE DRIVE PINION

- One piece stainless steel alloy shaft, precision machined gear and teeth for precise control

## BEARINGS

- Replaceable top and bottom TFE Pinion Bearings to ensure low friction, stability above 400°F, and chemical resistance

## TRAVEL STOPS

- Provides +/-4° travel adjustment in outboard direction

## ACCESSORY MOUNTING

- Manufactured to NAMUR to provide international standardized mounting

## STAINLESS STEEL PISTONS

- Precision cast pistons are guided through full face engagement with the pinion and piston guide

## NAMUR SLOTTED SHAFT

- Standard to provide a self-centering positive drive for positioners and a variety of switches

## ACTUATOR MOUNTING

- Manufactured in accordance with ISO 5211.

## PRE-LOADED CARTRIDGES

- Converts a standard double acting actuator to a spring return unit by simply removing the end caps and adding the spring cartridges

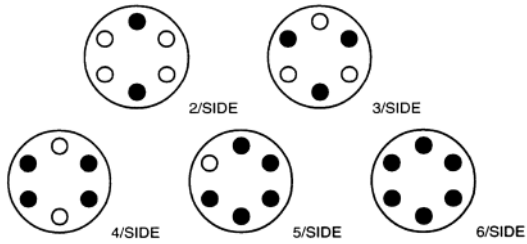
## NAMUR SOLENOID MOUNTING

- International standard for direct mounting of solenoid valves

# STAINLESS STEEL ACTUATORS

## OPERATION

The Apollo Stainless Steel actuator is manufactured with an integral and internal air manifold. The solenoid mounting pad is manufactured to Namur dimensional standards as to allow for the direct mounting of various manufacturers' solenoid valves and other flow control devices. For applications not requiring a direct mount solenoid valve, ports are tapped to NPT standards (American National Standard taper threads).

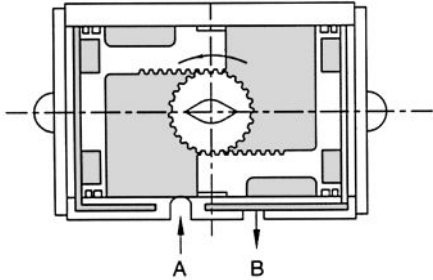


### REVERSE ROTATION

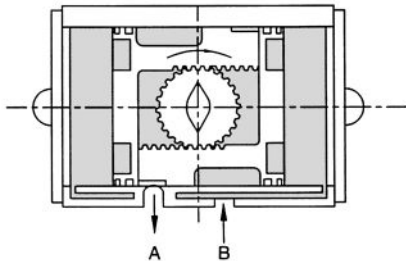
When required, a clockwise rotation of the drive pinion, by means of air to PORT A can be achieved by reversing the pistons inside the actuator body (rotate 180 degrees).

### SPRING CONFIGURATION

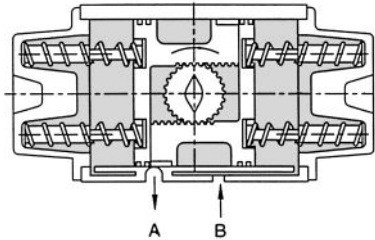
Each Stainless Steel actuator comes with a complete spring pack (6 springs per side with nylon retainers) unless otherwise specified. When less than the full spring pack is desired for various torque outputs (see torque chart); springs can be removed from the actuator end caps. It is very important that springs be arranged in a symmetrical manner (positioned as shown) so that unwarranted side-loads do not occur between the pistons and actuator body. CAUTION: Refer to operation and maintenance instructions before disassembly and removal of springs.



Air to PORT A: Pressure applied enters center of chamber forcing the pistons outward and rotating the drive pinion in a counter-clockwise direction and forcing exhaust air out of PORT B.



Air to PORT B: Air pressure enters the outer chambers forcing the pistons inward and rotating the drive pinion in a clockwise direction while forcing exhaust air out of PORT A.



Loss of air pressure in the center chamber allows energy in the compressed springs to force the pistons inward, resulting in a clockwise rotation of the drive pinion while exhaust air leaves via PORT A.

### CORROSION RESISTANCE

All metal components are cast or machined from Stainless Steel which offers excellent resistance to most corrosive chemicals as well as industrial atmospheres.

### NO LUBRICATION

All actuators are factory lubricated for the optimum life of the actuator under normal conditions. Teflon® piston bearings are used because of their self-lubricating properties.

### SIMPLE MAINTENANCE

Each actuator is designed for ease of maintenance. Should you wish to change a spring rating or completely rebuild a unit, total disassembly and reassembly is easily performed in just minutes with standard shop tools.

### ISO/NAMUR MOUNTING

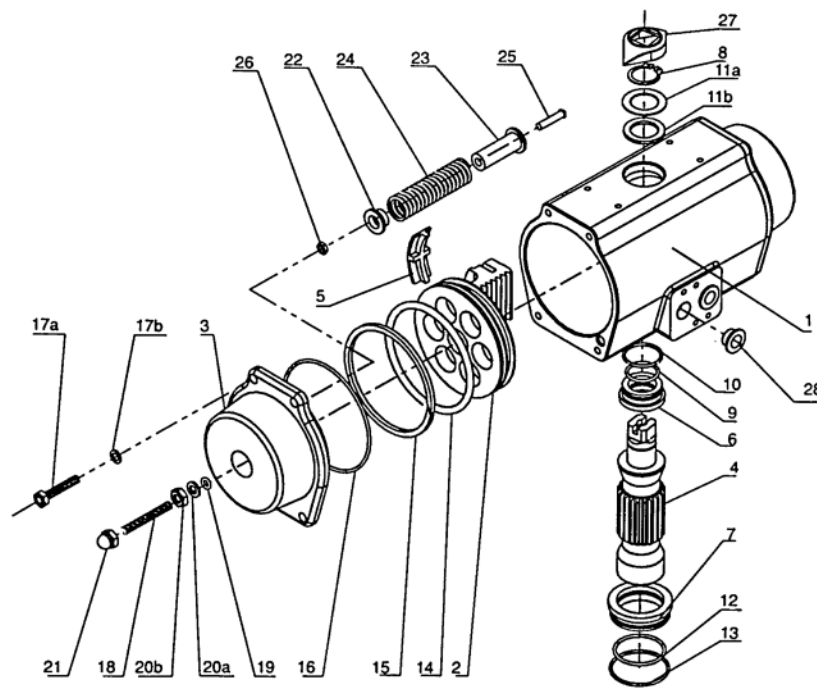
By using ISO/Namur standards, our actuators lend themselves to a host of various manufacturers' direct mount accessories. Solenoid valves, limit switches, positioners, etc. bolt directly to the actuator and in turn reduces the cost of assembly and installation of automated packages. Flexibility for future system modifications is greatly enhanced.

### QUALITY

Each part of the actuator must pass a stringent quality test before it can be incorporated into an assembly. All materials used in construction must be certified and tested to prove their proper composition. After machining, every part is dimensionally evaluated to assure it meets acceptable tolerance.

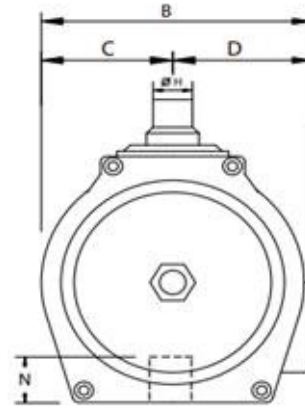
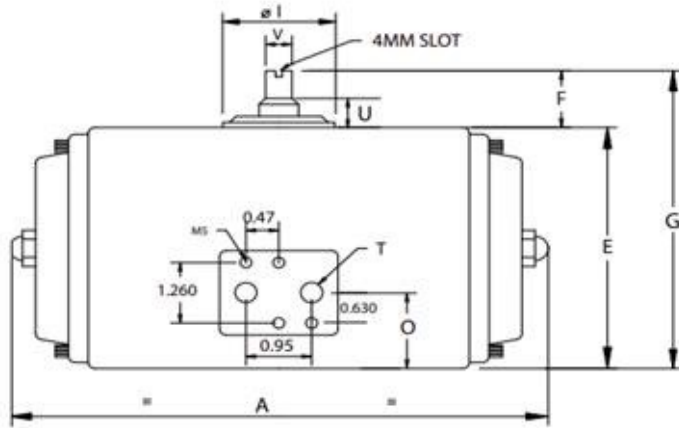
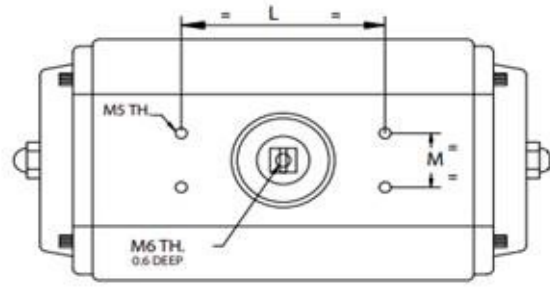
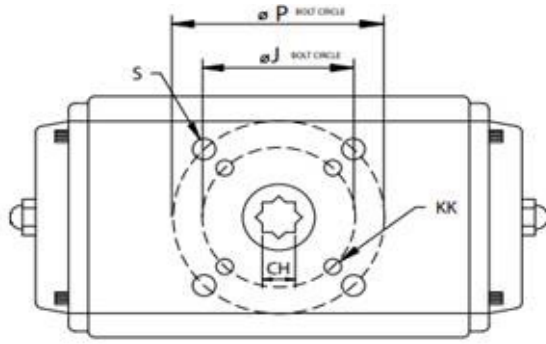
### SAFETY

All actuator bodies and end caps are investment cast stainless steel, rugged and built to last. Thick wall castings mean protection for actuator internal porting and components as well as maintenance and operating personnel. Our unique drive pinion design ensures blowout proof protection. Spring retainers are incorporated to allow safe removal of end caps during spring torque rating change or rebuild process.



PART	QTY	MATERIAL
1	1	304 Stainless Steel
2	2	303 Stainless Steel
3	2	Stainless Steel
4	1	17-4 Stainless Steel
5	2	Nylon 6
6	1	Teflon
7	1	Teflon
8	1	Stainless Steel
9	1	Viton
10	1	Viton
11a	1	Stainless Steel
11b	1	Nylon 6
12	1	Viton
13	1	Viton
14	2	Viton
15	2	Nylon 6

PART	QTY	MATERIAL
16	2	Nitrile
17a	8	18-8 Stainless Steel
17b	8	Stainless Steel
18	2	Stainless Steel
19	2	Nitrile
20a	2	Stainless Steel
20b	2	Stainless Steel
21	2	Stainless Steel
22	*	Nylon 6
23	*	Nylon 6
24	*	Plated CS
25	*	Stainless Steel
26	*	Stainless Steel
27	1	Nylon
28	2	Nylon 6



ACTUATOR MODEL	A	B	C	D	E	F	G	CH	J
3SS045X0A 3SD04500A	7.56	2.56	1.15	1.15	2.56	0.787	3.34	0.433	1.42
3SS060X0A 3SD06000A	7.34	2.92	1.39	1.39	3.18	0.787	3.97	0.551	1.97
3SS085X0A 3SD08500A	8.37	3.97	1.91	1.91	4.24	0.787	5.03	0.669	1.97
3SSI05X0A 3SD10500A	10.53	4.75	2.29	2.29	5.23	0.787	6.02	0.866	2.76
3SSI25X0A 3SD12500A	12.2	5.39	2.69	2.69	6.09	1.181	7.27	0.866	2.76
3SSI40X0A 3SD14000A	19.29	6.26	3.11	3.11	6.89	1.181	8.07	1.063	4.02
3SSI60X0A 3SD16000A	21.1	6.85	3.43	3.43	7.76	1.181	8.94	1.063	4.02

ACTUATOR MODEL	L	N	M	P	S	T	V	KK
3SS045X0A 3SD04500A	3.15	0.58	1.181	1.97	M6 x 10	1/4" NPT	0.633	M5 x 8
3SS060X0A 3SD06000A	3.15	0.59	1.181	N/A	M6 x 10	1/4" NPT	0.633	n/a
3SS085X0A 3SD08500A	3.15	0.66	1.181	2.76	M8 x 13	1/4" NPT	0.635	M6 x 10
3SSI05X0A 3SD10500A	3.15	0.77	1.181	N/A	M8 x 13	1/4" NPT	0.629	n/a
3SSI25X0A 3SD12500A	5.12	0.97	1.181	4.02	M10 x 16	1/4" NPT	0.865	M8 x 13
3SSI40X0A 3SD14000A	5.12	1.18	1.181	4.92	M12 x 20	1/4" NPT	0.865	M10 x 16
3SSI60X0A 3SD16000A	5.12	1.18	1.181	4.92	M12 x 20	1/4" NPT	0.865	M10 x 16



# STAINLESS STEEL ACTUATORS

## TECHNICAL DATA

ACTUATOR MODEL	VOLUME (IN <sup>2</sup> PER 90° CYCLE)	AIR CONSUMPTION (SCF PER 90° ROTATION)*		WEIGHT (LB)
		CW	CCW	
3SS045X0A	45	8.5	6.5	9
3SS060X0A	60	17.5	14.8	16
3SS085X0A	85	36.5	24.5	23
3SS105X0A	105	72	49.3	37
3SS125X0A	125	196	147	52
3SS140X0A	140	358	278	75
3SS170X0A	170	542	382	188
3SS210X0A	210	753	470	258

Notes: \*Temperature and atmospheric conditions could change values above.

### ACTUATOR WEIGHTS

ACTUATOR MODEL	DA (LBS)	SR (LBS)
3SS045	5.0	5.5
3SS060	8.0	8.5
3SS085	14.0	14.5
3SS105	25.5	27.0
3SS125	38.5	40.5
3SS140	63.5	65.5
3SS160	80.0	83.0

### DOUBLE ACTING TORQUE (IN LBS)

ACTUATOR MODEL	40 PSI	60 PSI	80 PSI	100 PSI	120 PSI
<b>3SD04500A</b>	71	107	143	178	214
<b>3SD06000A</b>	171	256	342	427	512
<b>3SD08500A</b>	370	555	740	925	1,110
<b>3SD10500A</b>	624	936	1,249	1,561	1,873
<b>3SD12500A</b>	1,214	1,822	2,429	3,036	3,643
<b>3SD14000A</b>	2,034	3,051	4,068	5,085	6,102
<b>3SD16000A</b>	3,102	4,653	6,204	7,755	9,306



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## SPRING RETURN TORQUE

### SPRING RETURN TORQUE

ACTUATOR MODEL	SPRING SET#*	SPRING STROKE		TORQUE (INCH/LB) VS. AIR SUPPLY PRESSURE (PSI)							
				40		60		80		100	
		END	BREAK	END	BREAK	END	BREAK	END	BREAK	END	BREAK
3SS045X0A	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
3SS060X0A	3	67	136	35	104	120	189	206	375	291	360
	4	90	182			94	166	160	252	245	337
	5	119	207					125	230	200	315
	6	135	273							154	292
3SS085X0A	3	167	273	106	203	282	388	467	573	652	758
	4	223	364			191	332	376	517	561	702
	5	279	430					284	461	429	646
	6	335	523							378	590
3SS105X0A	3	346	574	65	278	362	590	675	903	987	1,215
	4	461	766			170	475	483	788	795	1,110
	5	576	956					293	673	605	985
	6	692	1,141							420	869
3SS125X0A	3	651	941	336	563	881	1,171	1,288	1,778	1,895	2,385
	4	760	1,222			689	953	1,105	1,560	1,514	2,167
	5	1,080	1,602					927	1,349	1,134	1,956
	6	1,301	1,790							1,153	1,735
3SS140X0A	3	808	1,359	655	1,226	1,592	2,243	2,517	3,260	3,525	4,277
	4	1,071	2,087			1,200	1,980	1,983	2,997	3,166	4,014
	5	1,345	2,607					1,755	2,623	2,625	3,740
	6	1,610	3,026							2,340	3,475
3SS160X0A	3	1,522	2,098	895	1,580	2,420	3,131	4,022	4,682	4,657	6,233
	4	2,035	3,133			1,720	2,618	3,122	4,169	4,822	5,720
	5	2,550	3,690					2,467	3,654	3,588	5,205
	6	3,054	4,893							3,333	4,701

\* X in Actuator Model is Spring Set



# SECTION R

## REVISIONS

PAGE	DATE	DESCRIPTION
REVISION A	03JUNE21	Released new tech data sheet
R-26	03JUNE21	Replaced actuator photo with new product
		Revised heading to Stainless Steel Body and wording under it.
R-29	03JUNE21	Replaced images and dimensional chart with new information
R 32	13JULY21	Updated part number matrix with suffix "A" for new supplier.