

# Rotary Actuator



*BUILT IN RELIABILITY*



## Company Profile

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PNEUCON AUTOMATION is an associate company of Pneucon Valves Pvt Ltd who are pioneer in Design, Development and Manufacture of complete range of Control Valves. Pneucon Automation is promoted to manufacture complete range of AUTOMATED ON-OFF VALVES to meet the diverse automation demands of the modern process industries.

### Design and Engineering

Pneucon Engineering department's mission is design innovation. Our ability, experience and expertise through the use of sophisticated technology and CAD/CAE equipment results in the production of high quality automated valves for wide range of applications.

### Manufacturing

Pneucon manufacturing unit is equipped with latest machineries, equipments and test facilities. Our production team of skilled workers ensure to employ latest state-of-the-art modern techniques in the entire cycle of production under stringent quality control procedures. The valves, actuators and components are manufactured to the highest degree of accuracy to ensure a trouble free long life and guaranteed interchangeability of spares.

### Quality

Pneucon products are produced in strict compliance with the Quality Management System requirements and in conformance with the engineering codes in practice and relevant standards.

### Customer Service

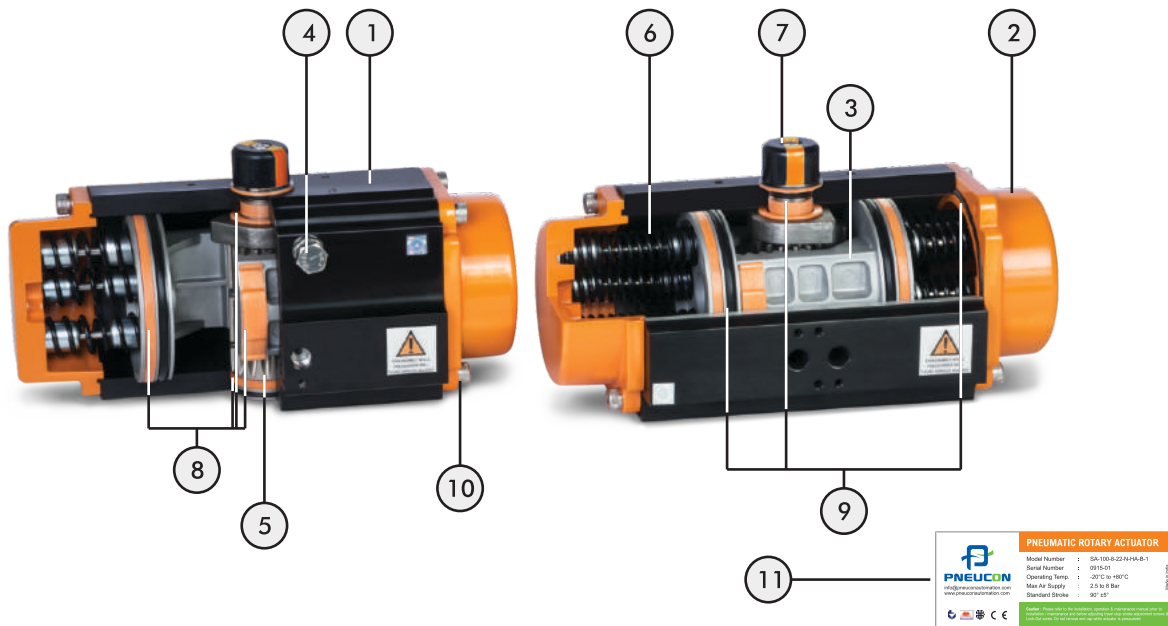
Pneucon has fully integrated customer service division, which is fully geared to react speedily to all customers enquiries and whatever technical support needed.



# Rotary Actuator

## Design

Dual Rack and pinion design with extra wide base manufactured in full compliance with the latest requirement of ISO 5211 with provision for mounting Solenoid Valves, Limit Switches & Accessories comply to NAMUR VDI/VDE 3845



## Features

### 1 Actuator Body

Extruded Aluminium Alloy body is hard anodised to protect the internal and external components against corrosion, Special Honed Internal Surface reduces the friction on moving pistons and extends the life cycle of the actuators. Alternative coatings are available such as ENP (Electroless Nickel Plating), Fiber Powder Coated, PFA, ECTFE for more aggressive environments.

### 2 End Caps

Diecasted aluminum end caps are primarily Alodine Chromatized coated which provides longer life cycles against corrosion and reduces wearing resistance. Secondary standard coating is powder polyester coating and also ENP, PFA, ECTFE etc coatings are offered alternatively for aggressive environments.

### 3 Pistons

Diecasted aluminum twin rack pistons are equipped with slide guides and seals in high engineered plastic. Alodine Chromatized coated pistons ensure longer life cycles against corrosion and wearing resistance. Pistons that are identical on both sides allow reverse rotation simply by inverting the pistons.

### 4 Travel Adjustment

Bi-directional external travel stop adjustment bolts can adjust the position  $\pm 5^\circ$  between  $85^\circ$  to  $95^\circ$  at both opening and closing directions for accurate valve alignment.  $0-90^\circ$  full scale limit position adjustment can also be offered optionally.

### 5 Pinion (Drive Shaft)

Anti Blow Out proof alloy steel pinion is electroless nickel plated in order to reduce the friction, provide maximum wear resistance and protection against corrosion under severe conditions as it fully conforms to the latest standards of ISO5211, DIN3337, NAMUR. Double square, parallel or diagonal square or key way type shaft can be supplied in accordance with customer demands.

### 6 Preloaded Springs

Modular Pre Loaded Spring Cartridge design in high grade coated steel springs provide great safety and corrosion resistance in fail safe and emergency shut down operations. Also these springs can be used for both high & Low Temperature applications.

### 7 Position Indicator

All actuators are equipped with regular position indicator showing the current state of the actuators and valves. Top of Actuator has a NAMUR slot to engage with all popular sensors and positioners.

### 8 Bearings

Low friction Bearing & guides provide high life cycle to ensure trouble free operations and stability during operation of actuators.

### 9 Seals

NBR rubber O-rings provide trouble free operation at standard temperature ranges between  $-20^\circ\text{C}$  to  $+80^\circ\text{C}$  temperature ranges. For high and low temperature applications Viton ( $-20^\circ\text{C}$  ~  $+150^\circ\text{C}$ ) and Silicone ( $-50^\circ\text{C}$  ~  $+180^\circ\text{C}$ ) seals are available optionally

### 10 Fasteners

Stainless steel fasteners for long life corrosion resistant application.

### 11 Traceability

Each individual actuator is assigned an unique identification number allowing full traceability.



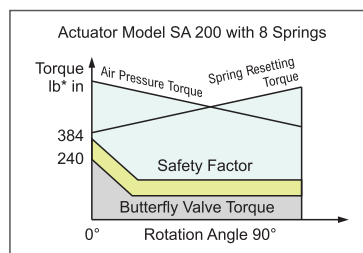
# Actuator Selection

While selecting Actuator add adequate safe value to the defined Valve torque, for example Lubricants (Oil, Greese ETC) 20%, Clear Liquid, Dry Gas & Wet Gas 40%, Soft Slurry & Dry Steam 60 %, Abrasive Slurry 100%,

(The above are approx safe recommended values)

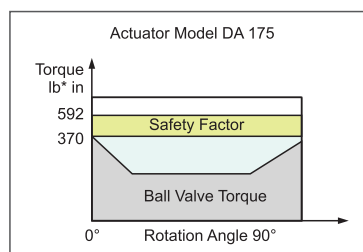
## Selection of Single Acting Actuator

When controlling a Butterfly Valve with Torque of 240Nm, Air supply pressure of 4 Bar, process media non lubricating dry steam, considering safety factor of 60% value i.e Valve Torque shall be considered as 384Nm, Select Torque Value in a Single Acting Torque output table for the nearest Spring Torque of 384Nm. i.e 514Nm for start torque and 351 Nm for end torque and then select the Air output torque, nearest to 384Nm for Air supply of 4 Bar, which is 550Nm for Start & 374 Nm for End. From the output Table the corresponding Actuator Size is 200 with 8 Nos. of Springs.



## Selection of Double Acting Actuator

When controlling a Ball Valve with Torque requirement of 370Nm, Air supply pressure of 4 Bar process media of Non Lubricating dry steam considering safety Factor of 60% i.e Valve Torque shall be considered as 592Nm, select the air supply pressure of 4 Bar in the Double acting output torque table, and then search for equal or approximate Torque data in vertical line and select 613Nm band then search leftward in the line and select Act Model DA 175



## Double – Acting Actuators Torque Output

Actuator Size	Air Supply Pressure (Bar)										
	2.5	3	3.5	4	4.2	4.5	5	5.5	6	7	8
055	12	14	17	19	21	22	25	27	30	35	40
065	20	24	28	32	34	36	41	45	49	57	65
075	31	37	44	49	51	55	62	68	74	87	99
085	45	53	62	72	75	81	90	98	107	126	144
100	69	83	97	110	116	124	139	153	167	195	221
115	114	137	161	184	193	205	229	252	275	322	369
125	149	179	208	238	250	268	299	329	359	420	481
150	257	310	362	415	436	467	515	567	620	725	830
175	385	463	536	613	645	691	769	847	925	1081	1237
200	584	703	821	940	940	1059	1177	1296	1415	1653	1890

## Spring Components



## Actuator Data

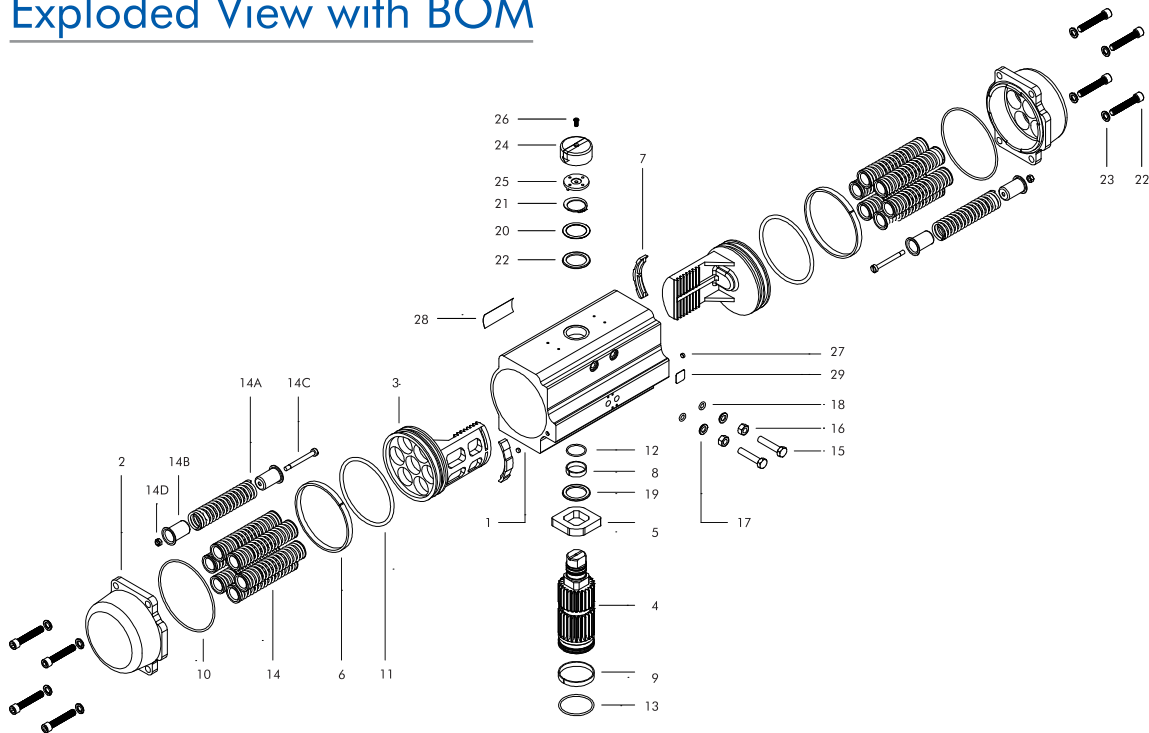
Model	Min / Max Air Supply Pressure	Rotation Angle	Operating Temp.	Cylinder Volumes (Cm3)			Weight (Kg)	
				Cylinder Diameter	Opening	Closing	Double Acting	Single Spring
055	Dry or lubricant clean compressed Air 2.5 to 8 Bar	90° ± 5° or the whole trip 0° to 90°	NBR +20°C to +80°C Viton -20°C to +150°C & Silicone -35°C to +80°C	55	145	145	1.55	0.017
065				65	260	320	2.3	0.031
075				75	360	560	2.9	0.049
085				85	535	840	4.2	0.075
100				100	840	1220	5.6	0.107
115				115	1350	1955	9.2	0.154
125				125	1700	2700	11.5	0.233
150				150	2900	4465	22.0	0.374
175				175	4350	6800	29.0	0.559
200				200	6900	11000	48.0	1.008

Note – for Actuator spring return weight please multiply number of spring selected from table with single spring weight and add double acting actuator weight

Spring Quantity	Spring Installation Mode	Spring Quantity	Spring Installation Mode
5		9	
6		10	
7		11	
8		12	

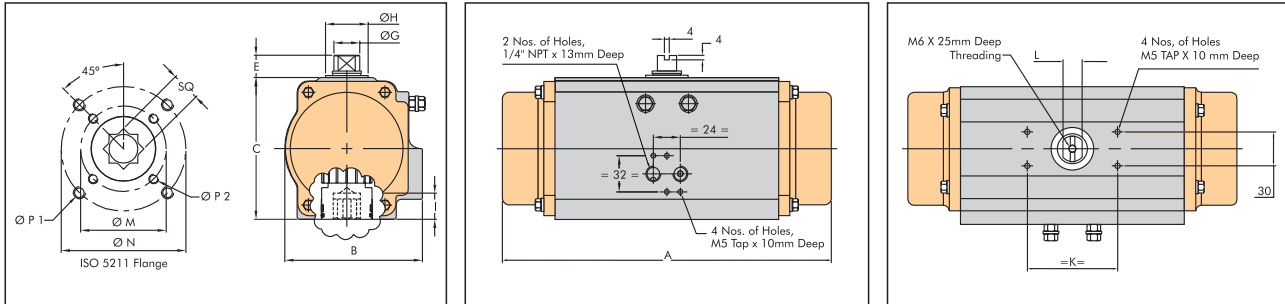


# Exploded View with BOM



SR. No.	PART NAME	PART REF. No	STANDARD MATERIAL	TOTAL QUANTITY
01	BODY	01	EXTRUDED ALUMINIUM ALLOY	1
02	END CAP	02	ALUMINIUM	2
03	RACK PISTON	03	ALUMINIUM	2
04	PINION	04	CARBON STEEL	1
05	PINION CAM	05	STAINLESS STEEL	1
06	PISTON GUIDE	06	ENGINEERING PLASTIC	2
07	PISTON PAD	07	ENGINEERING PLASTIC	2
08	TOP GUIDE FOR PINION	08	ENGINEERING PLASTIC	1
09	BOTTOM GUIDE FOR PINION	09	ENGINEERING PLASTIC	1
10	`O' RING FOR END CAP	10	NBR	2
11	`O' RING FOR PISTON	11	NBR	2
12	`O' RING FOR PINION TOP	12	NBR	1
13	`O' RING FOR PINION BOTTOM	13	NBR	1
14	SPRING ASSEMBLY	14		5-12
14A	SPRING	14A	II D	5-12
14B	RETAINER FOR SPRING	14B	MS-ZINC PLATING	10-24
14C	STUD FOR RETAINER	14C	STAINLESS STEEL	5-12
14D	NYLOCK NUT	14D	STAINLESS STEEL + NYLON	5-12
15	HEX BOLT FOR STROKE ADJUSTING	15	STAINLESS STEEL	2
16	NUT FOR STROKE ADJUSTING	16	STAINLESS STEEL	2
17	FLAT WASHER FOR STROKE ADJUSTING	17	STAINLESS STEEL	2
18	`O' RING FOR STROKE ADJUSTING	18	NBR	2
19	WASHER FOR PINION	19	DELTRIN	2
20	PINION WASHER	20	STAINLESS STEEL	1
21	CIRCLIP	21	SPRING STEEL	1
22	ALLEN CAP BOLT FOR END CAP	22	STAINLESS STEEL	8
23	SPRING WASHER	23	STAINLESS STEEL	8
24	INDICATOR	24	ENGINEERING PLASTIC	1
25	INDICATOR GUIDE	25	ENGINEERING PLASTIC	1
26	INDICATOR COUNTER BOLT	26	STAINLESS STEEL	1
27	VENT PLUG	27	NBR	2
28	NAME PLATE	28	STICKER	1
29	CAUTION LOGO	29	DOMESTICKER	1

## Dimensions



SR NO.	SIZE	A	B	C	E	F	ØG	ØH	I	K	L	ØM	ØN	P1	P2	SQ-A*	SQ-B	SQ-C
1	55	169	73	76	20	14	15	23	18	80	12	50	70	M8 X 12	M6 X 9	09 X 09	11 X 11	-
2	65	216	84.5	87.8	20	14	18	29	18	80	14	50	70	M8 X 15	M6 X 12	09 X 09	11 X 11	-
3	75	232	93.5	98	20	14	18	30	18	80	14	50	70	M8 X 15	M6 X 15	11 X 11	14 X 14	17 X 17
4	85	271	105.5	108.7	20	14	21	34	18	80	17	50	70	M8 X 15	M6 X 15	11 X 11	14 X 14	17 X 17
5	100	293	122	125.7	20	15	23	38	23	80	17	70	102	M10 X 20	M8 X 15	14 X 14	17 X 17	22 X 22
6	115	346	139.5	140.5	30	20	30	47	23	80	20	70	102	M10 X 20	M8 X 15	17 X 17	22 X 22	27 X 27
7	125	405	149	152.5	30	20	30	47	30	80	20	102	125	M12 X 25	M10 X 20	17 X 17	22 X 22	27 X 27
8	150	475	183	186.5	30	20	38	55	30	130	30	102	125	M12 X 25	M10 X 20	22 X 22	27 X 27	36 X 36
9	175	521	210	215	30	18	43	62	30	130	32	102	125	M12 X 25	M10 X 20	22 X 22	27 X 27	36 X 36
10	200	641	237.5	248	30	19	50	72	45	130	36	125	164	M18 X 35	M12 X 25	27 X 27	36 X 36	-

Note – SQ-B & SQ-C are optional for SQ-A

## Optional Accessories

### Limit Switch Enclosures



Limit Switches are used for open & close feed back and are certified for Weatherproof IP 67, Explosion Proof IIC, T6 & Intrinsic Safe IIC, T6

### 100% Travel Stopper



The stoppers are located in the end caps and allow the valve position to set anywhere between full closed to full open position

### Quick Exhaust Valve



Quick Exhaust Valve is used for faster fail position

### Speed Controller



Speed Controllers is used to control open / close timing of Actuator

### Air lock



Air Lock is used to keep Actuator in Stay Put condition in the event of loss of Air to Actuator

### Volume Booster



Volume Booster is used for faster response in opening / closing of Actuators

### De Clutchable MOR



De Clutchable MOR is used to operate the valve manually in the event of Air Failure

### Valve Positioner



Valve Positioner is used for modulating application. It can be provided with either integrated or a separate position transmitter

# Actuator Model Number

1	2	3	4	5	6	7	8	9
ACTUATOR TYPE	SIZE	NO OF SPRINGS	PINION SQUARE	SEALS	BODY PROTECTION	PINION MATERIAL	ROTATION	SPECIAL REQUIREMENT
SA DA	055 065 075 085 100 115 125 150 175 200	05 06 07 08* 09 10 11 12 00	09 11 14 17 22 27 36 00	N* V S O	HA* EN EP FP OO	M* B C O	1* 2 3 4	TO BE SPECIFIED

**1 ACTUATOR TYPE**  
SA - SINGLE ACTING  
DA - DOUBLE ACTING

**2 SIZE**  
055 | 065 | 075  
085 | 100 | 115  
125 | 150 | 175  
200

**3 NO OF SPRINGS**  
05 | 06 | 07 | 08 | 09  
10 | 11 | 12 | 00

**4 PINION SQUARE**  
09 - 09 X 09 FOR RA 055\*, 065 & 075  
11 - 11 X 11 FOR RA 055, 065\* & 075  
14 - 14 X 14 FOR RA 075\* & 085  
17 - 17 X 17 FOR RA 085\* & 100  
22 - 22 X 22 FOR RA 100\*, 115 & 125  
27 - 27 X 27 FOR RA 115\*, 125\* & 150\*  
36 - 36 X 36 FOR RA 175\* & 200\*  
00 - OTHER THAN ABOVE

**5 SEALS**  
N - NITRILE\*  
V - VITON  
S - SILICON  
O - OTHER THAN ABOVE

**6 BODY PROTECTION**  
HA - HARD ANODIZED\*  
EN - ELECTROLESS NICKLE PLATING  
EP - EPOXY COATED  
FP - FIBER POWDER COATED  
OO - OTHER THAN ABOVE

**7 PINION MATERIAL**  
M - EN 8\*  
B - SS304  
C - SS316  
O - OTHER THAN ABOVE

**8 ROTATION**  
1 - 90° CCW\* (ANTI CLOCKWISE)  
2 - 90° CW  
3 - 180° CCW  
4 - 180° CW

**9 SPECIAL REQUIREMENT**  
SPECIAL REQUIREMENT  
TO BE SPECIFIED

## EXAMPLE

SA — 055 — 05 — 09 — N — HA — M — 1 — -

Above stands SA - Single Acting, 055 Size with 5 Nos Springs, Pinion Square 09 X 09, Nitrile Seal, Hard Anodized Body with Pinion Material EN8 & Body Rotation 90° CCW

Note - i) Above marked with "\*" is default for Actuator if not specified.  
ii) for Double Acting Actuator no of spring will be 00



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