PNEUCON

Rotary Actuator

BUILT IN RELIABILITY

TÜV NORD ISO 9001 CE Ex SIL IEC 61508 / IEC 61511

Company Profile

Pneucon Automation Pvt. Ltd. is a renowned & popular force in the arena of 'Design', 'Development', and 'Manufacturing' of a innovative range of Automated Valves. Our commitment extends beyond standardized solutions, catering to the diverse and customized automation demands of modern Process Industries. Pneucon boasts a fully integrated division conceptually reacting swiftly to all customer demands and technical supports. Apart from benefiting from the inherent synergies arising from its business verticals, the company's diversified products contribute to Pneucon becoming as a One Stop Solution to all the customers under a single roof.

Design and Engineering

The Engineering department's mission revolves around design innovation, utilizing advanced technology & continuous use of new design techniques. The Design Team experts have acquired competence over years to produce high-quality automated innovative products suitable for the world of process industries. We are able to provide a complete design activity according to the customer requests, producing concept solutions.

Manufacturing

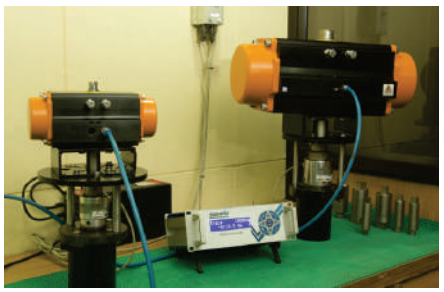
Pneucon manufacturing unit is equipped with the latest machines, and test facilities. Our production team of skilled workers ensure to employ latest state –of-the-art modern techniques in the entire cycle of production under stringent quality control procedures & norms. Pneucon make Valves, Pneumatic Rotary Actuators, Scotch Yoke Actuators, Limit switches & all other accessories are manufactured to the highest degree of accuracy to ensure performance & reliability.

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

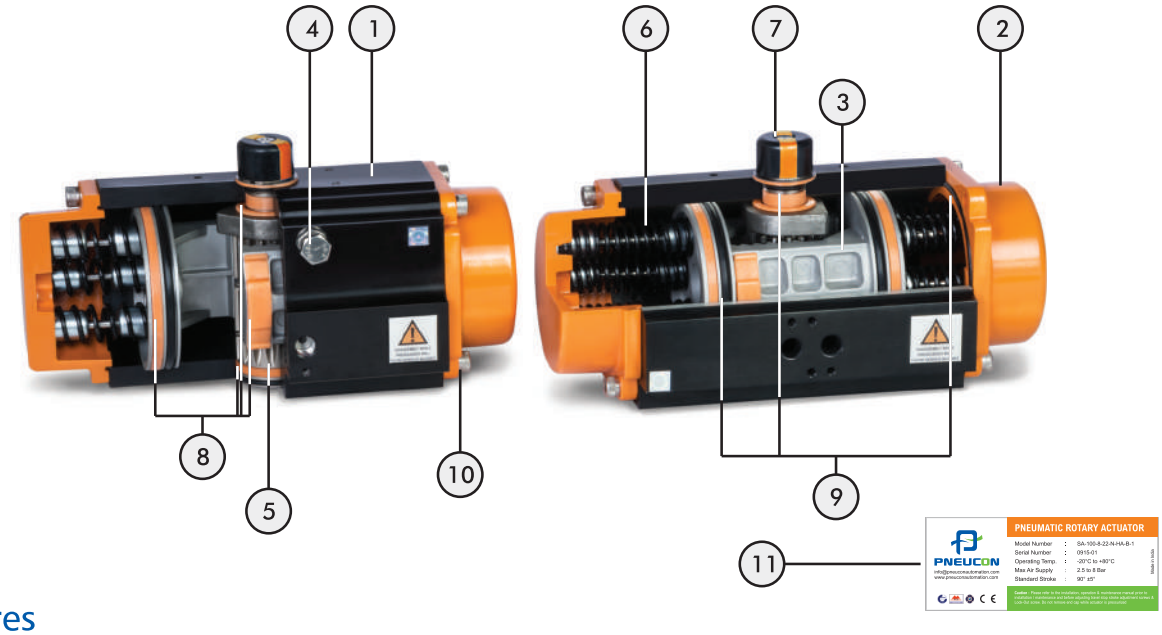
The interchangeability of the spares has proven to be the best service support on site to the end users. The interchangeability of the spares has proven to be the best service support on site to the end users.



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 Nickle Plating), Fiber Powder Coated, PFA, ECTFE for more aggressive environments.

2 End Caps

Diecasted aluminum end caps are primerely 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 agressive 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 ± 5° between 85° to 95° at both opening and closing directions for accurate valve allignment. 0-90° full scale limit position adjustment can also be offered optionally.

5 Pinion (Drive Shaft)

Anti Blow Out proof steel pinion is Zinc Flake coated in order to reduce friction provide maximum wear resistance and protection against corrosion under severe conditions which are certified for more than 1000 hours Salt Spray Test. This component fully confirms to the latest standards of IS 5211, DIN 3337, NAMUR. Double square, Parallel or Diagonal square or key way type shaft can be supplied in accordance with the 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 °C to +80 °C temperature ranges. For high and low temperature applications Viton (-20 °C ~ +150 °C) and Silicone (-50 °C ~ +180 °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.

PRODUCT LIFE CYCLE Pneucon make actuators have been tested and certified for 1 million Life Cycle Test.

Output Torques

of Single Acting Actuator Springs in Nm

Actuator Model	Springs Set	3		3.5		4		4.5		5		5.5		6		7		8		Spring Torque	
		0	90°	0	90°	0	90°	0	90°	0	90°	0	90°	0	90°	0	90°	0	90°	90°	0
		START	END	START	END	START	END	START	END	START	END	START	END	START	END	START	END	START	END	START	END
055	05	10	8	12	10	16	13	17	15	20	17	23	20							7	4
	06	10	6	11	9	15	11	16	13	19	16	22	18	24	21					8	5
	07	9	5	10	7	14	10	16	12	18	14	20	17	23	19	28	24			10	6
	08			10	6	13	9	15	10	17	13	20	15	22	18	27	23	33	28	11	7
	09					12	8	14	9	16	11	19	14	21	16	26	21	32	26	12	8
	10							13	8	15	10	18	12	20	15	26	20	31	25	14	8
	11									14	9	17	11	19	13	25	18	30	23	15	9
	12											16	10	19	12	24	17	29	22	16	10
065	05	17	12	21	16	27	22	29	25	33	29									11	7
	06	15	11	19	14	25	20	28	22	32	27	36	31							13	8
	07	14	8	18	12	24	17	26	20	31	24	35	28	39	33					15	9
	08			17	10	22	15	25	18	29	22	33	26	37	30	46	38			17	11
	09					21	13	23	15	28	19	32	24	36	28	44	36	52	44	19	12
	10							22	13	26	17	30	21	34	25	43	34	50	42	21	13
	11									25	15	29	19	33	23	41	31	49	40	24	15
	12											27	16	32	21	40	29	48	37	26	16
075	05	24	16	30	23	39	32	43	35	49	42									19	12
	06	21	12	27	19	36	27	40	31	46	38	52	44							22	15
	07	18	9	24	14	33	23	37	27	44	33	49	40	55	46					26	17
	08			22	10	31	19	34	23	41	29	47	36	53	42	65	54			30	20
	09					28	15	32	19	38	25	44	32	50	38	63	50	75	62	34	22
	10							29	15	35	21	42	27	48	34	60	46	73	58	37	24
	11									33	17	39	23	45	30	57	42	70	54	41	27
	12											36	19	43	25	54	38	67	50	45	29
085	05	36	25	45	35	57	47	62	52	71	61									26	17
	06	32	20	41	29	53	42	59	47	68	55	77	65							31	20
	07	28	14	38	23	49	36	55	41	64	50	73	59	82	68					36	23
	08			34	17	47	30	51	36	60	45	70	53	79	62	97	81			41	27
	09					43	24	49	30	57	39	66	48	75	56	93	75	112	93	47	30
	10							45	24	53	33	62	43	71	51	90	69	108	87	52	33
	11									49	28	59	37	68	46	86	63	104	82	57	37
	12											55	31	64	40	82	58	101	76	62	40
100	05	55	39	69	52	89	72	97	80	110	94									41	25
	06	49	30	63	44	83	63	92	71	105	85	119	99							49	30
	07	45	21	58	35	78	54	86	62	99	76	113	91	127	104					57	35
	08			52	26	72	46	80	53	95	67	108	82	122	96	150	123			65	40
	09					66	37	75	45	89	58	102	73	116	87	145	114	173	142	73	45
	10							69	36	83	49	98	64	111	78	139	105	167	133	81	50
	11									78	41	92	55	105	69	133	97	162	124	89	55
	12											86	47	99	60	128	88	156	115	97	60
115	05	93	67	116	90	148	122	162	136	186	159									64	41
	06	84	53	107	76	139	108	153	122	177	145	198	169							77	49
	07	75	39	98	62	130	95	144	108	168	131	191	154	212	178					90	57
	08			90	49	121	80	135	94	159	117	182	140	203	163	250	208			103	65
	09					112	66	126	80	150	102	173	126	196	149	241	196	288	241	115	73
	10							117	66	141	89	164	112	187	135	232	182	279	226	128	81
	11									132	75	155	98	178	121	223	167	270	212	141	89
	12											146	84	169	106	214	153	261	198	154	97
125	05	121	89	152	119	194	161	213	180	241	208									82	52
	06	110	71	140	101	183	143	201	161	229	192	260	220							98	62
	07	98	53	129	84	171	125	190	143	218	174	248	202	279	232					114	73
	08			117	65	160	107	178	125	206	156	237	186	267	214	328	272			131	83
	09					148	90	166	107	197	137	225	168	256	196	316	257	377	318	147	94
	10							155	90	185	119	214	150	244	180	305	239	365	299	163	104
	11									174	101	202	131	232	162	293	221	354	282	180	114
	12											193	113	221	144	282	202	342	262	196	125
150	05	196	144	249	197	322	268	354	299	406	357									151	102
	06	175	110	226	162	299	234	331	265	383	318	437	370							182	123
	07	153	77	203	129	276	200	308	232	360	284	413	337	465	389					212	143
	08			182	96	254	169	285	198	338	251	390	330	443	356	543	460			242	164
	09					231	135	262	166	315	217	367	269	420	322	520	427	625	527	273	184
	10							240	133	292	183	345	236	397	288	497	393	602	493	303	205
	11									269	150	322	202	374	255	479	360	579	464	333	225
	12											299	170	352	221	457	326	557	431	364	246
175	05	303	224	381	302	490	411	532	458	610	531									215	143
	06	271	176	349	254	458	363	500	410	578	488	656	561							258	172
	07	240	129	317	207	427	316	473	362	546	440	624	513	702	591					301	201
	08			286	161	395	268	442	315	514	392	592	471	670	544	826	699			343	229
	09					363	220	410	266	488	345	561	423	638	496	794	652	950	808	386	258
	10							378	219	457	297	529	375	607	453	762	604	918	760	429	287
	11									424	250	497	328	575	405	731	556	886	712	472	315
	12											470	280	543	358	699	509	855	664	515	344
200	05	464	351	578	469	744	631	815	702	934	821									321	219
	06	415	279	529	398	695	559	766	630	885	749	1004	868							386	263
	07	366	208	485	326	646	493	718	559	836	678	955	796	1074	915					450	307
	08			437	255	598	421	669	493	788	606	907	725	1025	844	1263	1081			514	351
	09					549	350	620	421	739	535	858	654	977	772	1214	1010	1452	1247	578	395
	10							572	350	690	469	809	582	928	701	1165	939	1403	1176	643	438
	11									642	397	760	511	879	630	1117	867	1354	1105	707	482
	12											712	444	830	558	1068	796	1305	1033	771	526
250	05	688	506	875	693	1062	880	1249	1067	1436	1254									616	434
	06	601	383	788	570	975	757	1162	944	1349	1131	1536	1318							740	521
	07	514	259	701	446	896	633	1075	820	1262	1007	1449	1194	1636	1381					863	608
	08			614	323	801	510	988	697	1175	884	1362	1071	1549	1258	1923	1632			986	695
	09					714	387	901	574	1088	761	1275	948	1463	1135	1837	1509	2211	1883	1109	782
	10							815	451	1002	638	1189	825	1376	1012	1750	1386	2124	1760	1233	869
	11									915	514	1102	701	1289	888	1663	1262	2037	1636	1356	955
	12											1015	578	1202	765	1576	1139	1950	1513	1479	1042

Note – Actual values are in range of ±5% of above values

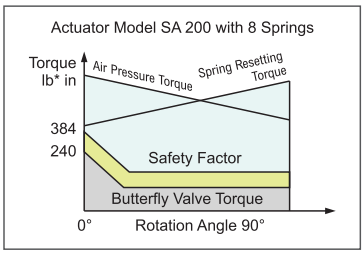
Actuator Selection

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)

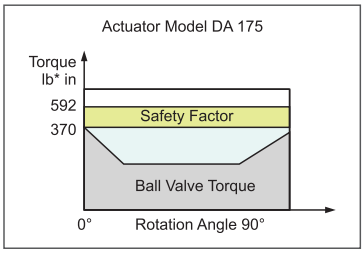
Selection of Single Acting Actuator

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 351Nm 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



PNEUCON MAKE ACTUATORS ARE CE ATEX CERTIFIED & SIL CERTIFIED.
CE ATEX Certificate No. 07136/1/2024-POP-01
SIL 1, SIL 2, SIL 3 Certificate No. T1112CERT232.1

Double – Acting Actuators Torque Output

Actuator Size	Air Supply Pressure (Bar)									
	3	3.5	4	4.2	4.5	5	5.5	6	7	8
055	14	17	19	21	22	25	27	30	35	40
065	24	28	32	34	36	41	45	49	57	65
075	37	44	49	51	55	62	68	74	87	99
085	53	62	72	75	81	90	98	107	126	144
100	83	97	110	116	124	139	153	167	195	221
115	137	161	184	193	205	229	252	275	322	369
125	179	208	238	250	268	299	229	359	420	481
150	310	362	415	436	467	515	567	620	725	830
175	463	536	613	645	691	769	847	925	1081	1237
200	703	821	940	940	1059	1177	1296	1415	1653	1890
250	1100	1200	1450	1530	1650	1850	2030	2220	2500	2810

Actuator Data

					Cylinder Volumes (Cm3)		Weight (Kg)		
Model	Min / Max Air Supply Pressure	Rotation Angle	Operating Temp.	Cylinder Diameter	Opening	Closing	Cycle Time (Sec.)	Double Acting	Single Spring
045	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	45	75	120	0.2	0.9	
055				55	145	145	0.3	1.55	0.017
065				65	260	320	0.35	2.3	0.031
075				75	360	560	0.45	2.9	0.049
085				85	535	840	0.6	4.2	0.075
100				100	840	1220	0.8	5.6	0.107
115				115	1350	1955	1	9.2	0.154
125				125	1700	2700	1.3	11.5	0.233
150				150	2900	4465	1.5	22.0	0.374
175				175	4350	6800	2	29.0	0.559
200				200	6900	11000	3.5	48.0	1.008
250				250	10200	13750	5	50	1.6

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

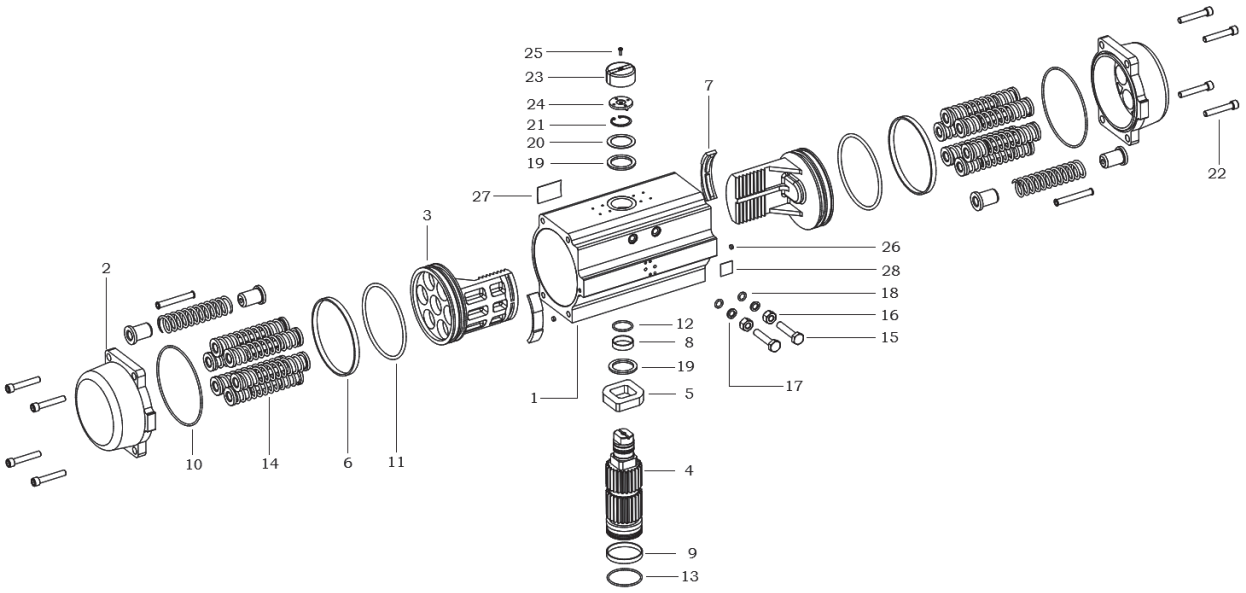
Spring Components

Spring Quantity	Spring Installation Mode
5	
6	
7	
8	

Spring Quantity	Spring Installation Mode
9	
10	
11	
12	

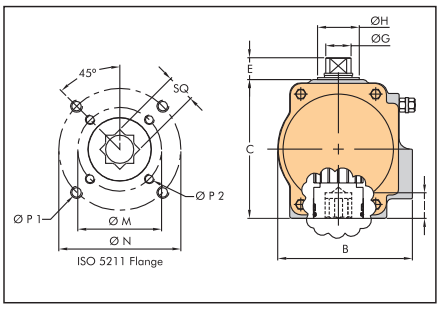
Note – Springs set corresponds to the required torque output of the Actuator Model.

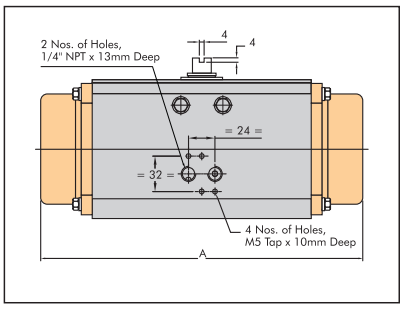
Exploded View with BOM

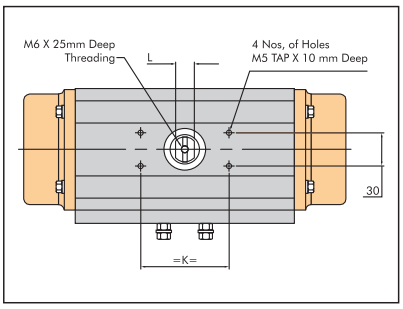


Sr. No.	NAME OF PART	PART REF. No.	MATERIAL SPECIFICATION	TOTAL QTY.	STANDARD SURFACE TREATMENT	OPTIONAL SURFACE TREATMENT & MATERIAL
1	Body	01	EXTRUDED ALUMINIUM ALLOY	1	HARD ANODIZED	HARD ANODIZED + EPOXY POLYESTER or PTFE/NICKEL PLATING
2	End Cap	02	ALUMINIUM	2	POWDER COATING	
3	Rack Piston	03	ALUMINIUM	2		
4	Pinion	04	CARBON STEEL	1	ZINC FLAKE COATING	ELOTROLESS NICKEL PLATING or CROME PLATING / STAINLESS STEEL.
5	Pinion Cam	05	STAINLESS STEEL	1		
6	Piston Guide	06	ENGINEERING PLASTIC	2		
7	Piston Pad	07	ENGINEERING PLASTIC	2		
8	Top Guide for Pinion	08	ENGINEERING PLASTIC	1		
9	Bottom Guide for Pinion	09	ENGINEERING PLASTIC	1		
10	'O' Ring for End Cap	10	NBR	2		VITON / SILICON
11	'O' Ring for Piston	11	NBR	2		VITON / SILICON
12	'O' Ring for Pinion Top	12	NBR	1		VITON / SILICON
13	'O' Ring for Pinion Bottom	13	NBR	1		VITON / SILICON
14	Spring Set	14 SET	II D	0-12		
15	Hex Screw for Stroke Adjustment	15	STAINLESS STEEL	2		
16	Hex Nut for Stroke Adjustment	16	STAINLESS STEEL	2		
17	Machine Plain Washer(Stroke Adjustment)	17	STAINLESS STEEL	2		
18	'O' Ring for Stroke Adjustment	18	NBR	2		VITON / SILICON
19	Washer for Pinion	19	ENGINEERING PLASTIC	2		
20	Pinion Washer	20	STAINLESS STEEL	1		
21	Circlip External	21	STAINLESS STEEL	1		
22	Allen Cap Screw for End Cap	22	STAINLESS STEEL	8		
23	Indicator	24	ENGINEERING PLASTIC	1		
24	Indicator Guide	25	ENGINEERING PLASTIC	1		
25	Indicator counter bolt	26	STAINLESS STEEL	1		
26	Vent Plug	27	NBR	2		VITON / SILICON
27	Name Plate Sticker	28	STICKER	1		
28	Caution Sticker	29	DOME STICKER	1		

Dimensions







Sr.No.	SIZE	A	B	C	E	F	G	H	I	K	L	M	N	P1	P2	SQ
1	45	162.2	62	66.2	19.5	16	22	33	11	80	Ø22	50	70	M8X12	M6X9	09X09
2	55	169	73	76	20	14	15	23	18	80	12	50	70	M8X12	M6X9	11X11
3	65	216	84.5	87.8	20	14	18	29	18	80	14	50	70	M8X15	M6X12	14X14
4	75	232	93.5	98	20	14	18	30	18	80	14	50	70	M8X15	M6X15	17X17
5	85	271	105.5	108.7	20	14	21	34	18	80	17	50	70	M8X15	M6X15	17X17
6	100	293	122	125.7	20	12	23	38	23	80/130	17	70	102	M10X20	M8X15	22X22
7	115	346	139.5	140.5	20	12	30	47	23	80/130	20	70	102	M10X20	M8X15	22X22
8	125	405	149	152.5	20	12	30	47	30	80/130	20	102	125	M12X25	M10X20	22X22
9	150	475	183	186.5	30	20	38	55	30	80/130	30	102	125	M12X25	M10X20	27X27
10	175	521	210	215	30	18	43	62	30	80/130	32	102	125	M12X25	M10X20	27X27
11	200	641	237.5	248	30	19	50	72	45	80/130	36	125	165	M18X35	M12X25	36X36
12	250	700	289	253	30	15	45	60	63	130	55	-	140	M16X20	-	46

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 Positoner is used for modulating application. It can be provided with either integrated or a seperate position transmitter

Actuator Model Number

1 ACTUATOR TYPE	2 SIZE	3 SPRINGS SET	4 PINION SQUARE	5 SEALS	6 BODY PROTECTION	7 PINION MATERIAL	8 ROTATION	9 SPECIAL REQUIREMENT
SA	055	05	09	N*	HA*	M*	1*	TO BE SPECIFIED
DA	065	06	11	V	EN	B	2	
	075	07	14	S	EP	C	3	
	085	08*	17	O	FP	O	4	
	100	09	22		OO			
	115	10	27					
	125	11	36					
	150	12	00					
	175	00						
	200							

1 ACTUATOR TYPE
SA - SINGLE ACTING
DA - DOUBLE ACTING

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

3 SPRINGS SET
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
00 - 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 Springs Set No 5 Pinion Square 09 X 09, Nitrile Seal, Hard Anodized Body with Pinion Material EN8 & Body Rotation 90°C 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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