



SUNG DO

Pneumatic Rotary Actuators
Rack Pinion & Scotch Yoke
Double Acting & Spring Return



SUNG DO

SUNG DO

CONTENTS

◦ Features	03
Rack & Pinion Design	
◦ Construction	03
◦ Travel Stop Adjustment	04
◦ General Technical Data	04
◦ Operation	04
◦ Volume Calculation	05
◦ Operating Time	05
◦ Torque Curve	06
Rack & Pinion Design	
◦ Torque Output	06
Double Acting	
◦ Torque Output	07
Spring Return	
◦ Feature	08
Scotch Yoke Design	
◦ Torque Curve	08
Scotch Yoke Design	
◦ Dimensions	09
SDAC10-SDAC20	
◦ Dimensions	10
SDAC40-SDAC1750	
◦ Dimensions & Torque	11
SDAC2500-SDAC3500	
◦ Bill of Materials	12
Rack & Pinion Design	
◦ Bill of Materials	13
Scotch Yoke Design	
◦ Declutchable Gear	
Overrides	14
◦ Accessories Solenoid Valves	
Limit Switches & Positioner	15



Construction

A) Body(A) :

Extruded Aluminum alloy Body is hard Anodized with both internal and external corrosion protection for longer life and lower coefficient of friction.

B) Piston Rack & Pinion(B) :

Diecasted Aluminum dual Piston Rack is designed in compact construction for symmetric mounting position and long life cycle and fast operation. Reverse rotation can be accomplished in the field by simply inverting the pistons.

Electroless Nickel plated Pinion Shaft make high efficiency through involute gearing with optimized bearing and designed in Blow-out Proof with some internal safety rings.

C) DoubleTravel Stops & Cam(C) :

Dual independent external Travel Stops allow an easy and precise adjustment up to full $\pm 5^\circ$ in both

directions in the open and close positions for an top side of Pinion Shaft is limited in its rotation by adjusting Travel Stops and is designed to absorb the maximum rated torque of the actuator and the maximum impact loads.

D) Compact & Modular Design(A) :

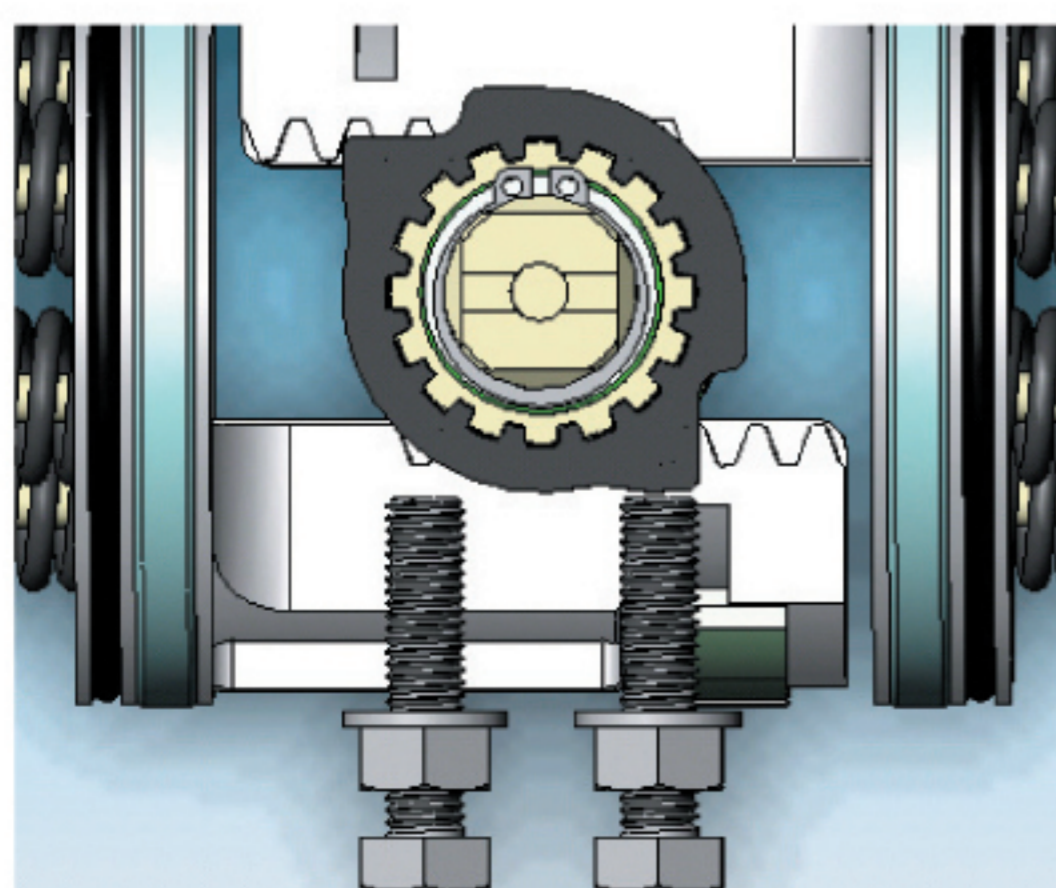
The compact design with identical body and end caps simplifies the conversion from double acting or single acting configurations by adding and removing the modular spring cartridge.

E) Mounting(E) :

Actuators are in full conformance to the latest worldwide specifications relating to the accessories and valve mounting interfaces as like ISO 5211, DIN 3337 and VDI/VDE 3845 NAMUR.



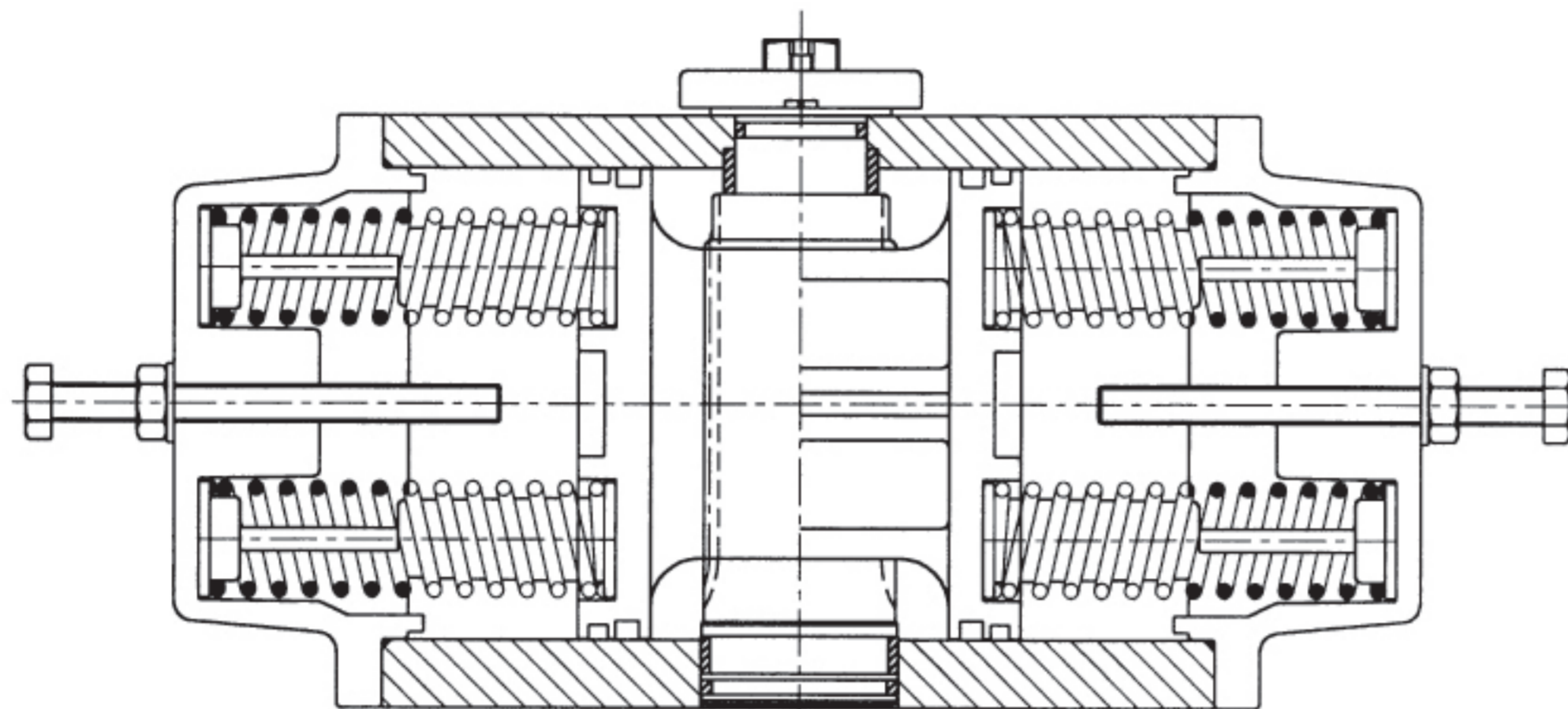
FULL OPEN / CLOSE POSITION ADJUSTMENT



Our actuator stroke is adjusted upto $\pm 5^\circ$ in both directions
Left special bolt is for open adjustment and Right special bolt is for close adjustment

SUNG DO

100% Travel Stop Adjustment



When the customers require to make the actuator stroke in less than 90° as like 15°, 45°, 60°, 80° The actuator is supplied with longer bolts in both end caps to allow stroke adjustment from 0° to 90°

General Technical Data

- **Standard Working Temperature**

- 20°C ~ + 80°C (-4°F ~ 175°F)
- available upto -40 °C only by changing to the O-ring material.

- **Maximum Working Pressure** : 150psig

- **Operating Media**

- Clean, Dry Air, Hydraulic Oil
- Non-Corrosive Gas

- **Travel Stop**

- Rack & Pinion : ±5°
- Scotch Yoke DA : ±5°
- Scotch Yoke SR : ±5°

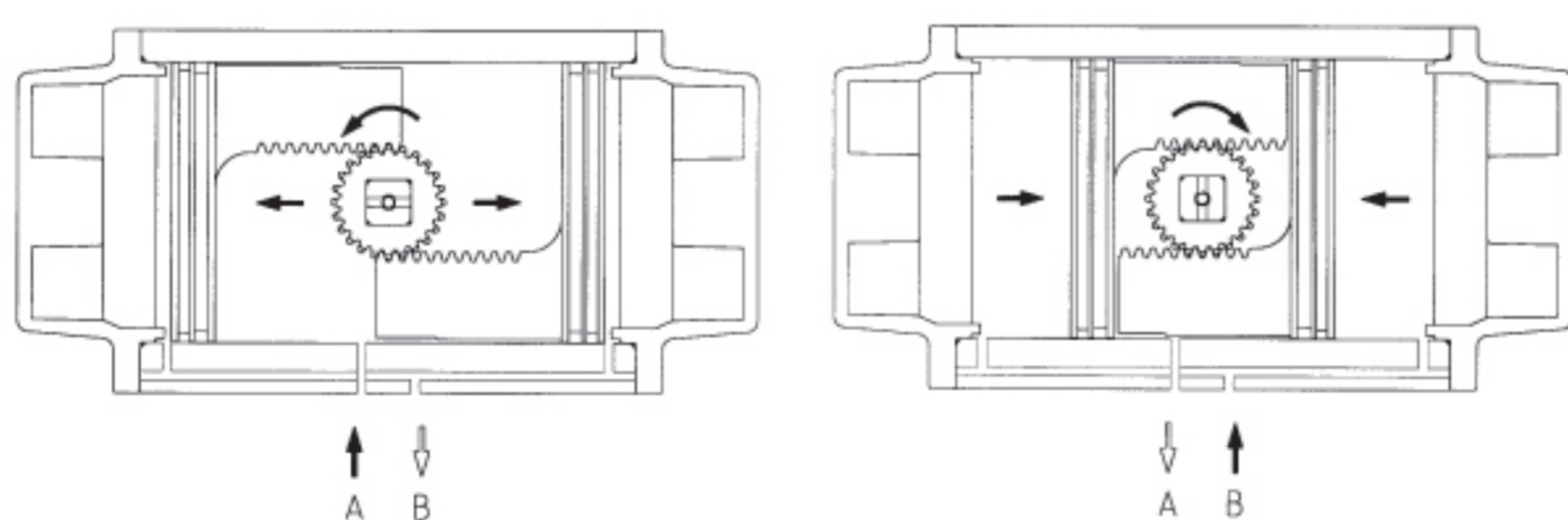
- **Rotation** : 90°

- **Air Supply** : 40psi -150 psi

- **Permanently Lubricated Units**

Operation

- **Double Acting Operation**



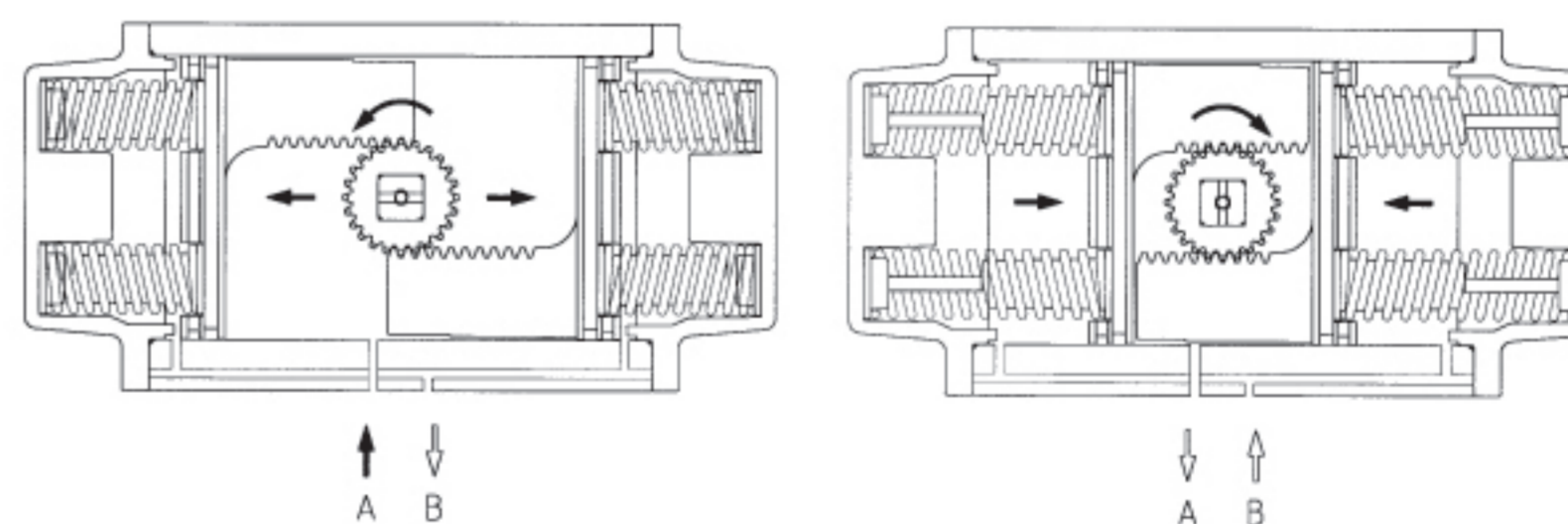
CCW

Air is supplied to port A forcing the pistons away from each other (toward ends), rotating drive pinion counterclockwise and exhausting air out of Port B.

CW

Air is supplied to Port B forcing the pistons toward each other (toward center), rotating drive pinion clockwise and exhausting air out of Port A.

- **Spring Return Operation**



CCW

Air is supplied to port A forcing the pistons away from each other (toward ends), rotating drive pinion counterclockwise, compressing springs and exhausting air out of Port B.

FAIL CW

Air failure (loss of pressure) allows compressed springs to force pistons toward each other (toward center), rotating drive pinion clockwise and exhausting air out of Port A.

¹⁾(Unit is capable of failure in counterclockwise direction by reversing pistons inside of housing.)

Volume Calculation

The air consumption rate of SDAC is computed as following equations.

The numerical value obtained from equations below is on the basis of a full

reciprocal operation and does not demonstrate the air consumption rate per operating time.

● Spring Return Actuator

<SR Series>

$$V = B \times \left(\frac{P+1}{1} \right) \times N$$

● Double Acting Actuator

<DA Series>

$$V = (B + A) \times \left(\frac{P+1}{1} \right) \times N$$

● Where ;

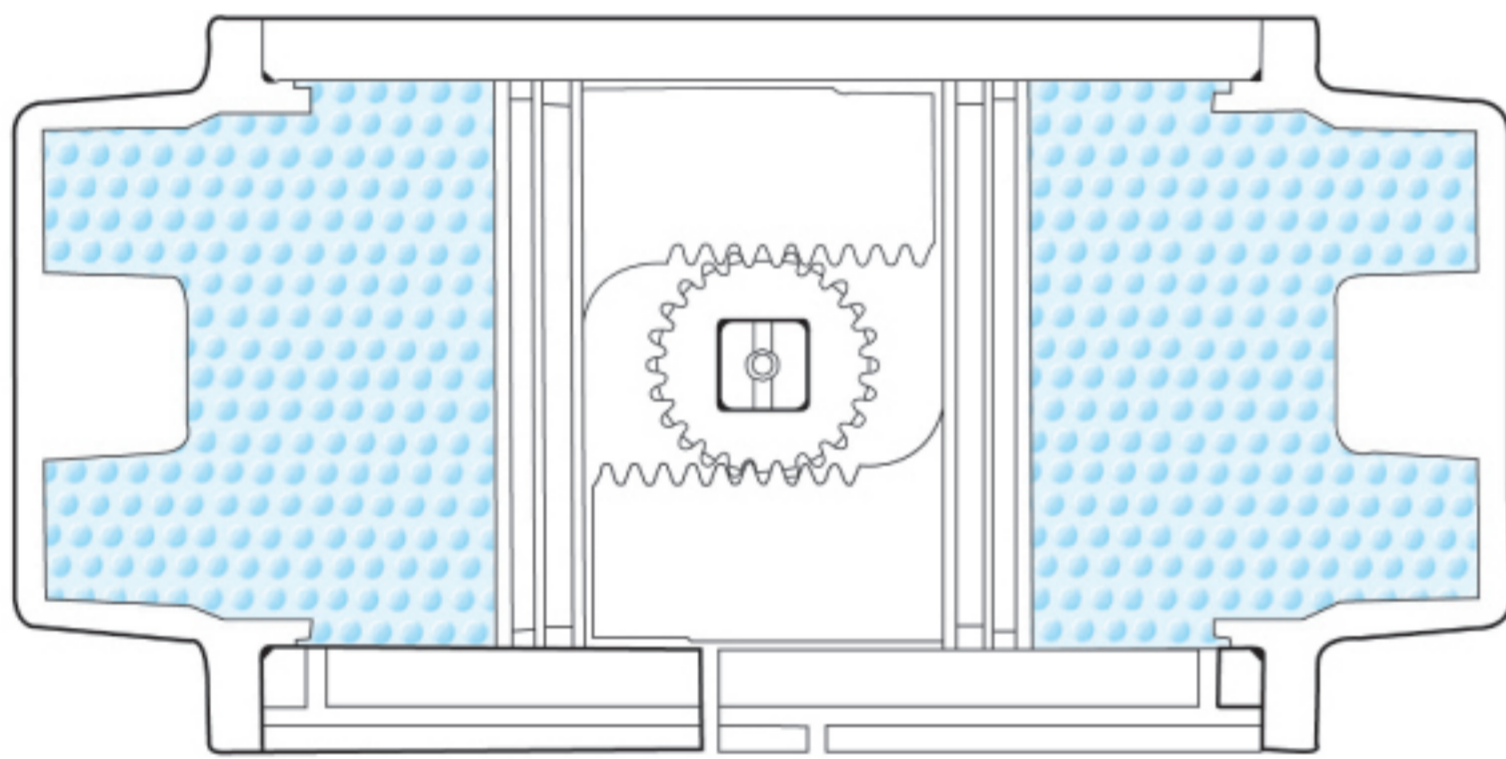
V = Air Consumption
(N Liter)

P = Supply Air Pressure
(kgf/cm²G)

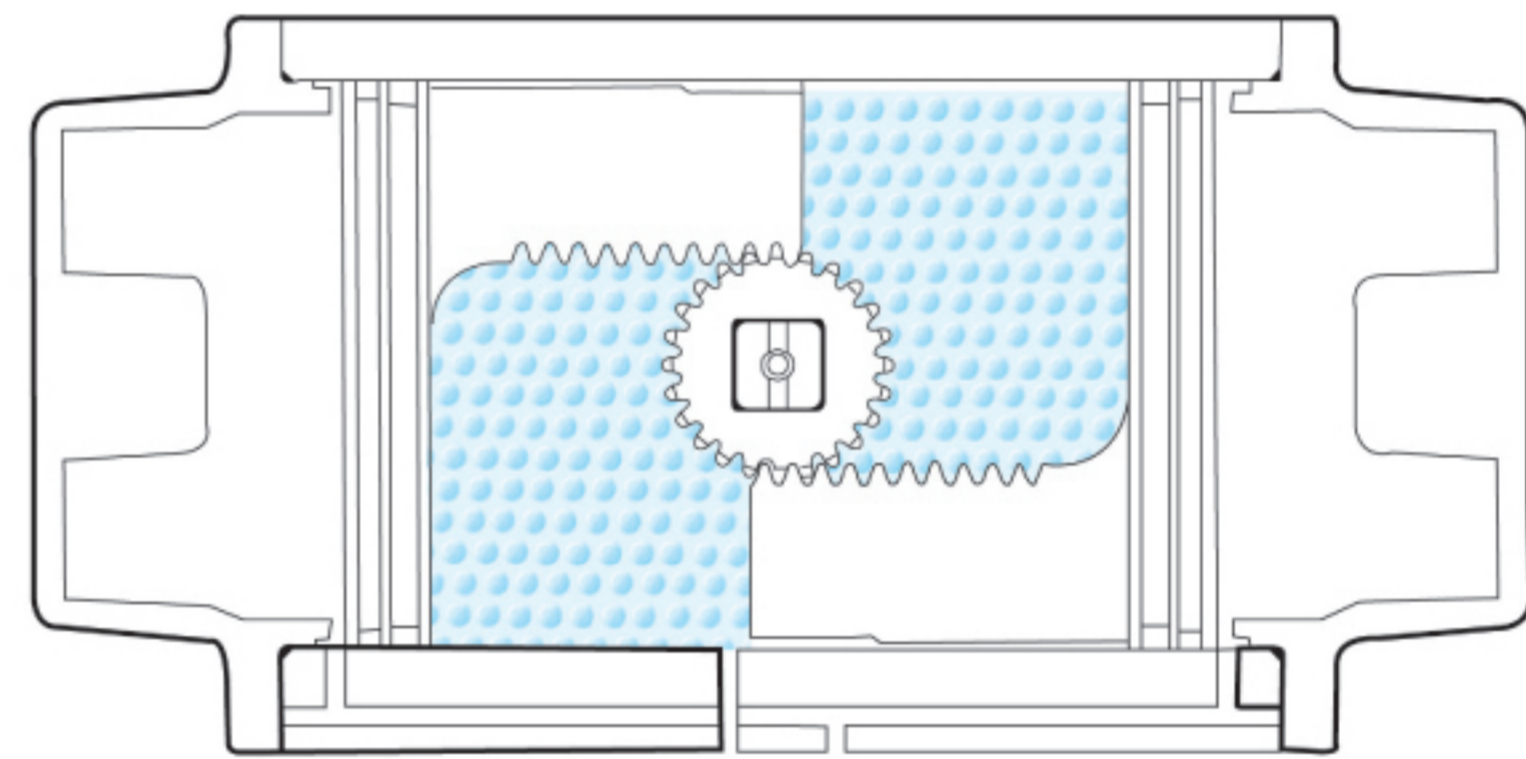
A,B = Actuator Volume
(Liter)

N = Operation Times

Volume " A



Volume " B

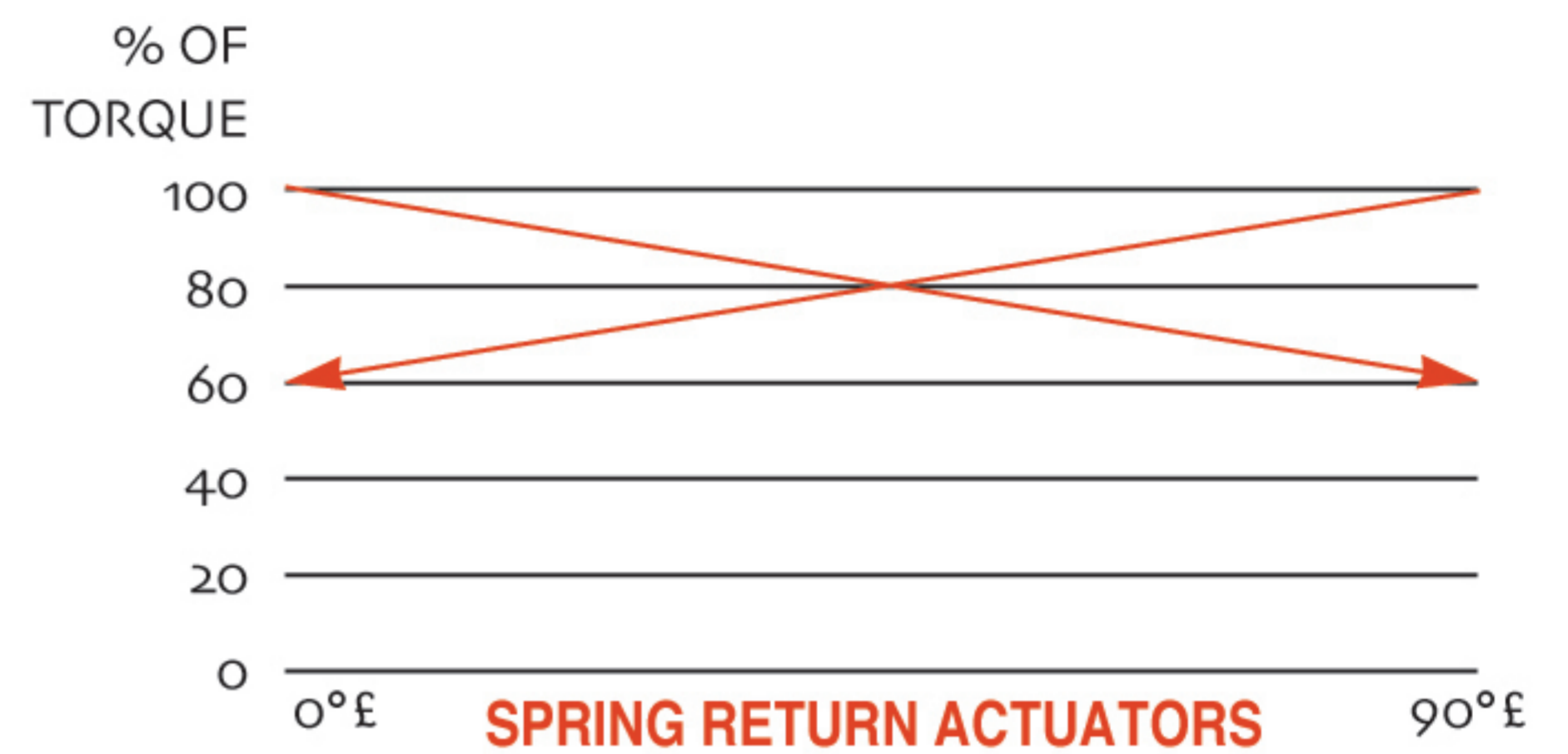
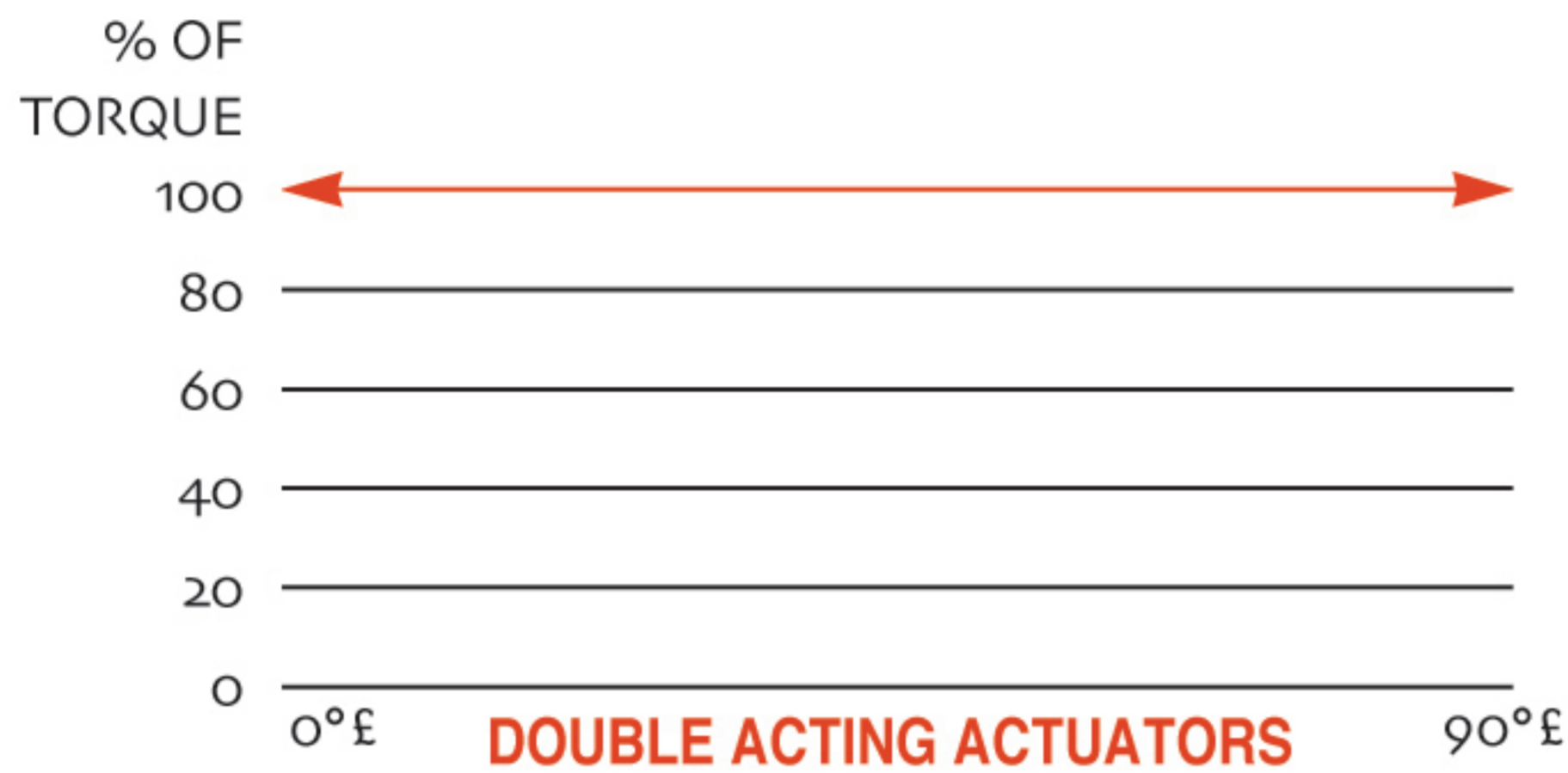


Air Consumption

Unit : N Liter / Stroke

Model	Volume	3	3.5	4	4.5	5	5.5	6	6.6	
DOUBLE ACTING	10 DA	0.16	0.68	0.76	0.84	0.91	0.99	1.06	1.14	1.21
	20 DA	0.13	0.88	0.99	1.10	1.20	1.31	1.42	1.53	1.64
	40 DA	0.31	1.24	1.40	1.55	1.71	1.86	2.02	2.17	2.33
	80 DA	0.93	3.73	4.20	4.67	5.13	5.60	6.06	6.53	7.00
	130 DA	1.44	5.77	6.49	7.21	7.93	8.65	9.37	10.09	10.82
	200 DA	1.90	7.60	8.55	9.50	10.45	11.40	12.35	13.30	14.25
	300 DA	4.37	17.48	19.67	21.85	24.04	26.22	28.41	30.59	32.78
	500 DA	6.31	25.24	28.40	31.55	34.71	37.86	41.02	44.17	47.33
	850 DA	8.41	33.63	37.84	42.04	46.24	50.45	54.65	58.86	63.06
	1200 DA	12.50	50.00	56.25	62.50	68.75	75.00	81.25	87.50	93.75
	1750 DA	15.94	63.76	71.73	79.70	87.67	95.64	103.61	111.58	119.55
	2500 DA	13.68	54.72	61.56	68.40	75.24	82.08	88.92	95.76	102.60
3500 DA	20.24	80.96	91.08	101.20	111.32	121.44	131.56	141.68	151.80	
SINGLE ACTING	20 SR	0.14	0.56	0.63	0.70	0.76	0.83	0.90	0.97	1.04
	40 SR	0.18	0.72	0.81	0.90	0.99	1.08	1.17	1.26	1.35
	80 SR	0.38	1.51	1.70	1.89	2.07	2.26	2.45	2.64	2.83
	130 SR	0.59	2.36	2.66	2.95	3.25	3.54	3.84	4.13	4.43
	200 SR	0.83	3.21	3.61	4.02	4.42	4.82	5.22	5.62	6.02
	300 SR	1.89	7.54	8.48	9.43	10.37	11.31	12.25	13.20	14.14
	500 SR	2.99	12.00	13.50	15.00	16.49	17.99	19.49	20.99	22.49
	850 SR	3.90	15.60	17.55	19.50	21.45	23.40	25.35	27.30	29.25
	1200 SR	6.60	24.26	27.29	30.32	33.35	36.38	39.42	42.45	45.48
	1750 SR	7.79	31.14	35.03	38.92	42.81	46.70	50.60	54.49	58.38
	2500 SR	5.08	20.32	22.86	25.40	27.94	30.48	33.02	35.56	38.10
	3500 SR	9.59	38.35	43.14	47.94	52.73	57.52	62.32	67.11	71.90

**SDAC10-SDAC1750
Rack & Pinion Design**



Torque Output

**SDAC10-SDAC1750
DOUBLE ACTING TORQUE**

MODEL	PSI@ BAR@	40	60	70	80	100	120
		2.8	4.2	5	5.6	7	8.4
SDAC 10	N.m	3.6	5.4	6.4	7.2	9.0	10.8
	lbf.in	31.8	47.7	56.7	63.5	79.4	95.3
SDAC 20	N.m	9	14	17	19	24	28
	lbf.in	83	125	149	167	209	250
SDAC 40	N.m	20	29	35	39	49	59
	lbf.in	173	260	309	346	433	519
SDAC 80	N.m	45	67	80	90	112	135
	lbf.in	397	596	709	794	993	1192
SDAC 130	N.m	63	95	113	126	158	189
	lbf.in	558	837	997	1116	1395	1674
SDAC 200	N.m	86	128	153	171	214	257
	lbf.in	758	1136	1353	1515	1894	2273
SDAC 300	N.m	146	218	260	291	364	437
	lbf.in	1288	1933	2301	2577	3221	3865
SDAC 500	N.m	209	314	374	418	523	628
	lbf.in	1852	2778	3307	3704	4630	5556
SDAC 850	N.m	393	589	701	785	982	1178
	lbf.in	3475	5213	6206	6951	8688	10426
SDAC 1200	N.m	584	876	1043	1168	1460	1752
	lbf.in	5168	7752	9228	10336	12920	15504
SDAC 1750	N.m	685	1027	1223	1370	1712	2054
	lbf.in	6061	9091	10823	12121	15152	18182

Convert Kgf.m to N.m= Devide kgf.m by 9.8, Convert N.m to kgf.m= Multiplied N.m by 9.8
 Convert N.m to Lb.in= Devide kgf.m by 8.86, Convert Lb.in to N.m = Multiplied N.m by 8.86
 Onvert Kgf.m to Lb.in= Devide kgf.m by 86.8, Convert Lb.in to kgf.m = Multiplied N.m by 86.8
 Note : Torques are actual. Please be sure to include appropriate safety factors and all service conditions variables when sizing.
 3 way(master-slave)assemblies should use a 35% safety factor. Call factory for assistance.

Scotch Yoke Design

SDAC is designed to acquire maximum torque output at the beginning of valve operation with most efficient force required.

Double Piston-Double Power
SDAC has twice bigger torque as compared to the single cylinder by means of the double piston operated simultaneously that is made up of 2 seperated pistons.

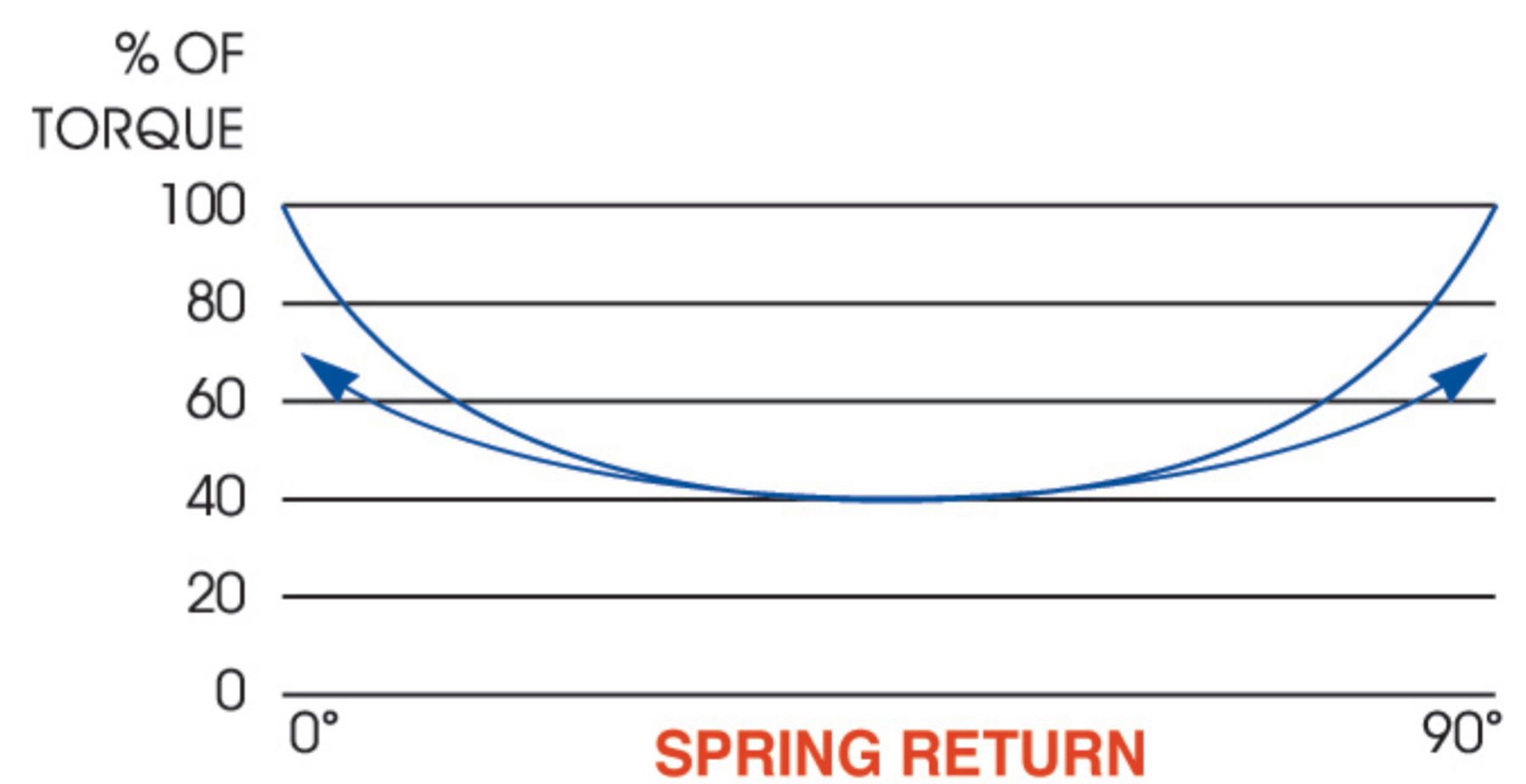
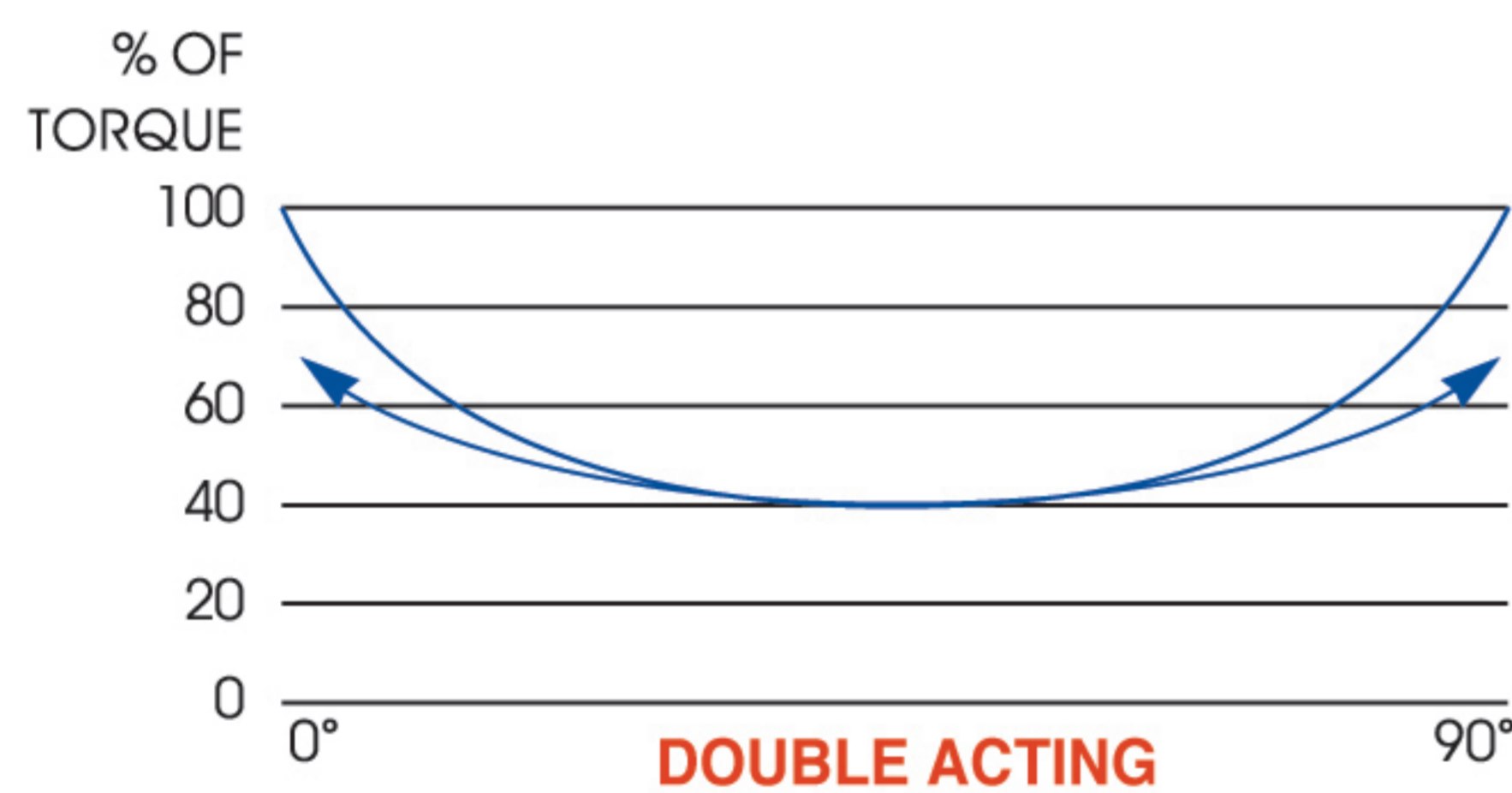
Various materials and coatings
The housing of SDAC is finely proof against corrosive environment and mechanical impact through hard-anodizing surface treatment. Other surface treatment are available on request and stainless steel is available as the housing materials.
-Epoxy coated Aluminum Alloy Housing
Urethane coated Aluminum Alloy Housing

Other major component materials
Cap : Epoxy coated Aluminum Alloy or Anodizing
Piston : Aluminum Alloy
Shaft : Zinc plated Steel / Stainless Steel
Gasket : NBR O ring
Design Temperature :
-20°...~+80°... with NBR O-ring
40~150°... with Viton O-ring

Interchangeability
DIN/ISO 5211 part 1,2 :Rotary Cylinder and Valve
NAMUR or VDI/VDE 3845 : Cylinder and Signal Unit
Other special specification can be applicable on request.

Torque Curves

SDAC2500-SDAC3500 Scotch Yoke Design



Double Acting Torque

Unit : N.m

MODEL	2.8			4.2			5.6			7		
	0°£	R	90°£	0°£	R	90°£	0°£	R	90°£	0°£	R	90°£
SDAC 2500	1100.7	433.4	1016.3	1651.0	650.1	1524.4	2201.3	866.8	2032.6	2751.6	1083.5	2540.7
SDAC 3500	2201.3	866.8	2032.6	3302.0	1300.2	3048.8	4402.6	1733.6	4065.1	5503.3	2166.9	5081.4
SDAC 7000	4402.6	1733.6	4065.1	6603.9	2600.3	6097.7	8805.2	3467.1	8130.2	11006.5	4333.9	10162.8

Spring Return Torque : 4.2bar

Unit : N.m

MODEL	SPRING TORQUE			2.8			4.2			5.6		
	0°£	R	90°£	0°£	R	90°£	0°£	R	90°£	0°£	R	90°£
SDAC 2500	317.9	196.2	626.8	782.8	237.2	389.5	1333.1	453.9	897.6	1883.4	670.6	1405.8
SDAC 3500	635.7	392.4	1253.6	1565.6	474.3	779.0	2666.2	907.7	1795.3	3766.9	1341.1	2811.6
SDAC 7000	1271.5	784.9	2507.1	3131.3	948.7	1558.0	5332.4	1815.4	3590.6	7533.7	2682.2	5623.1

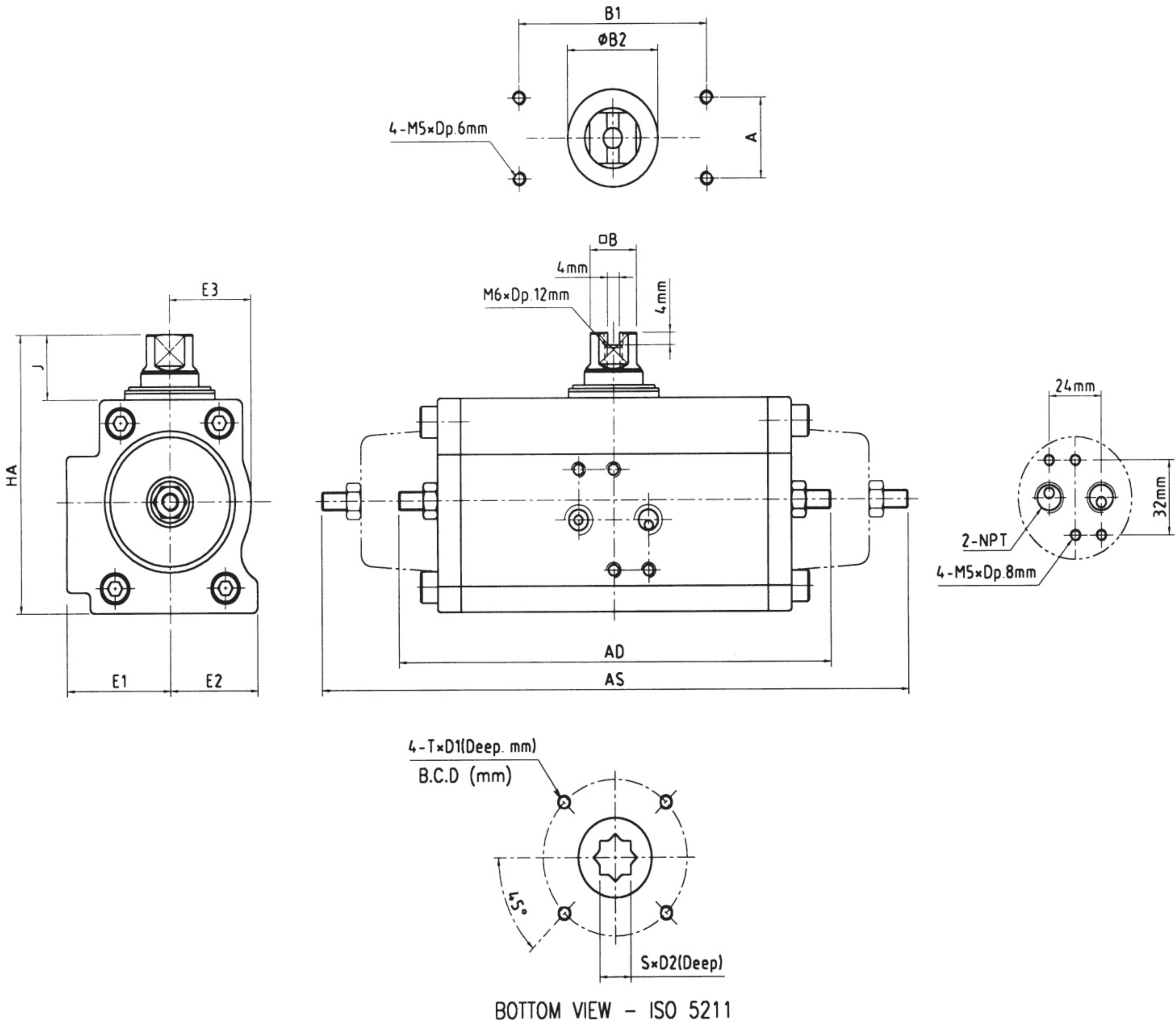
Spring Return Torque : 5.6bar

Unit : N.m

MODEL	SPRING TORQUE			2.8			4.2			5.6		
	0°£	R	90°£	0°£	R	90°£	0°£	R	90°£	0°£	R	90°£
SDAC 2500	508.1	313.7	1001.9	592.5	119.7	14.3	1142.8	336.4	522.5	1693.2	553.1	1030.6
SDAC 3500	1016.3	627.4	2003.9	1185.0	239.4	28.7	2285.7	672.8	1044.9	3386.3	1106.2	2061.2
SDAC 7000	2032.5	1254.7	4007.8	2370.1	478.8	57.3	4571.4	1345.6	2089.9	6772.7	2212.4	4122.5

DIMENSIONS SDAC10-SDAC20

SUNG DO

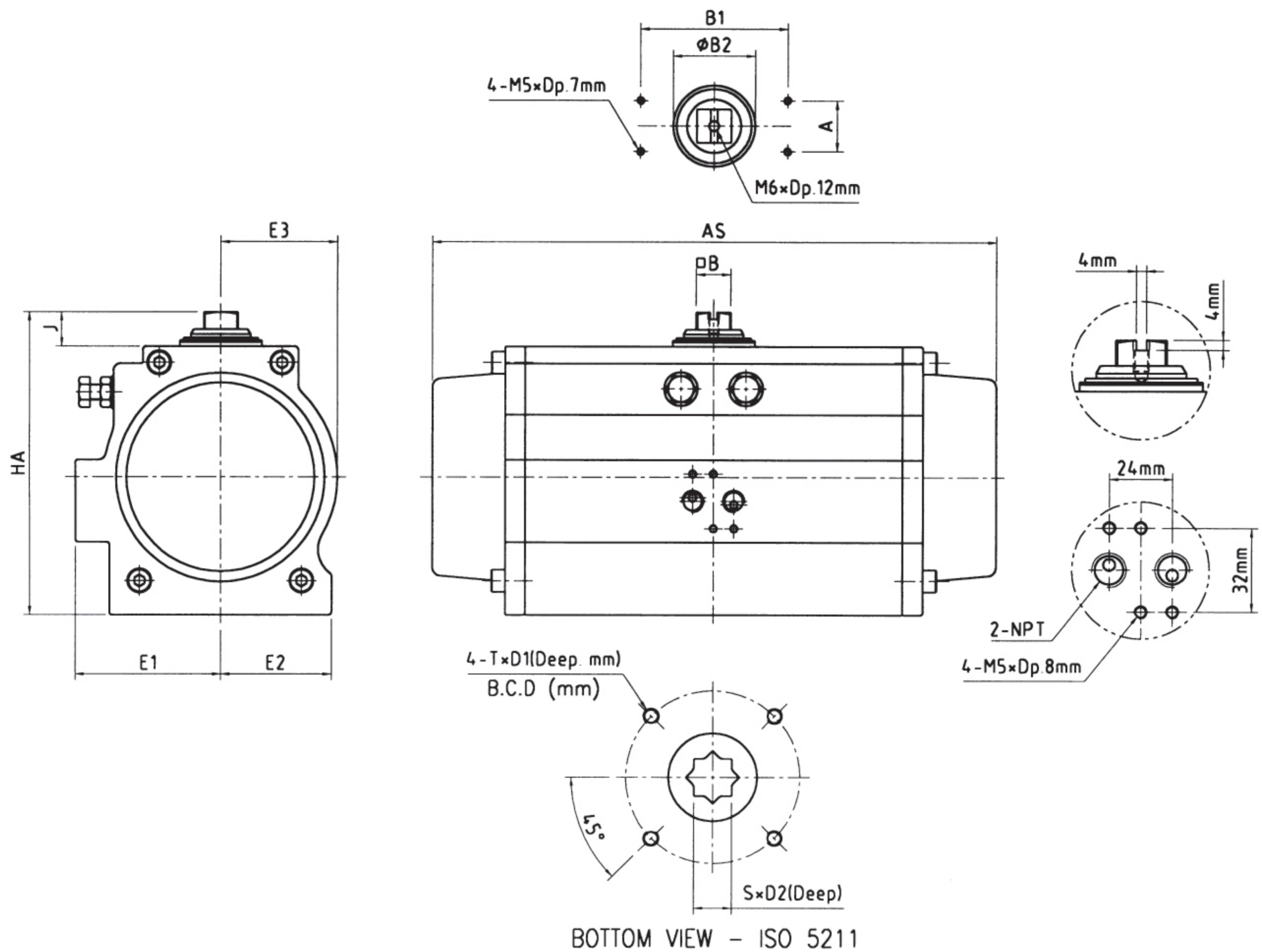


Dimensions

MODEL	unit	A	AS	AD	tWB	B1	$\phi B2$	E1	E2	E3	HA	J	T	D1	B.C.D	S	D2	NPT	WEIGHT
SDAC 10	m.m	25	N/A	116	9	50	20	28	21	21	68.5	20	M5	6	36	9	10	1/8 [°]	1
	inch	0.984		4.57	0.354	1.969	0.788	1.102	0.827	0.827	2.697	0.787	10-24UNC			0.354	0.394		
SDAC 20	m.m	30	204.5	152	16	80	31	35.5	30	28	90	20	1-4 [°] 20UNC	8	42	11	16	1/8 [°]	1.3 (DA)
	inch	1.181	8.051	5.984	0.630	3.150	1.22	1.398	1.181	1.102	3.543	0.787				0.433	0.63		1.6 (SR)

DIMENSIONS SDAC40-SDAC1750

SUNG DO



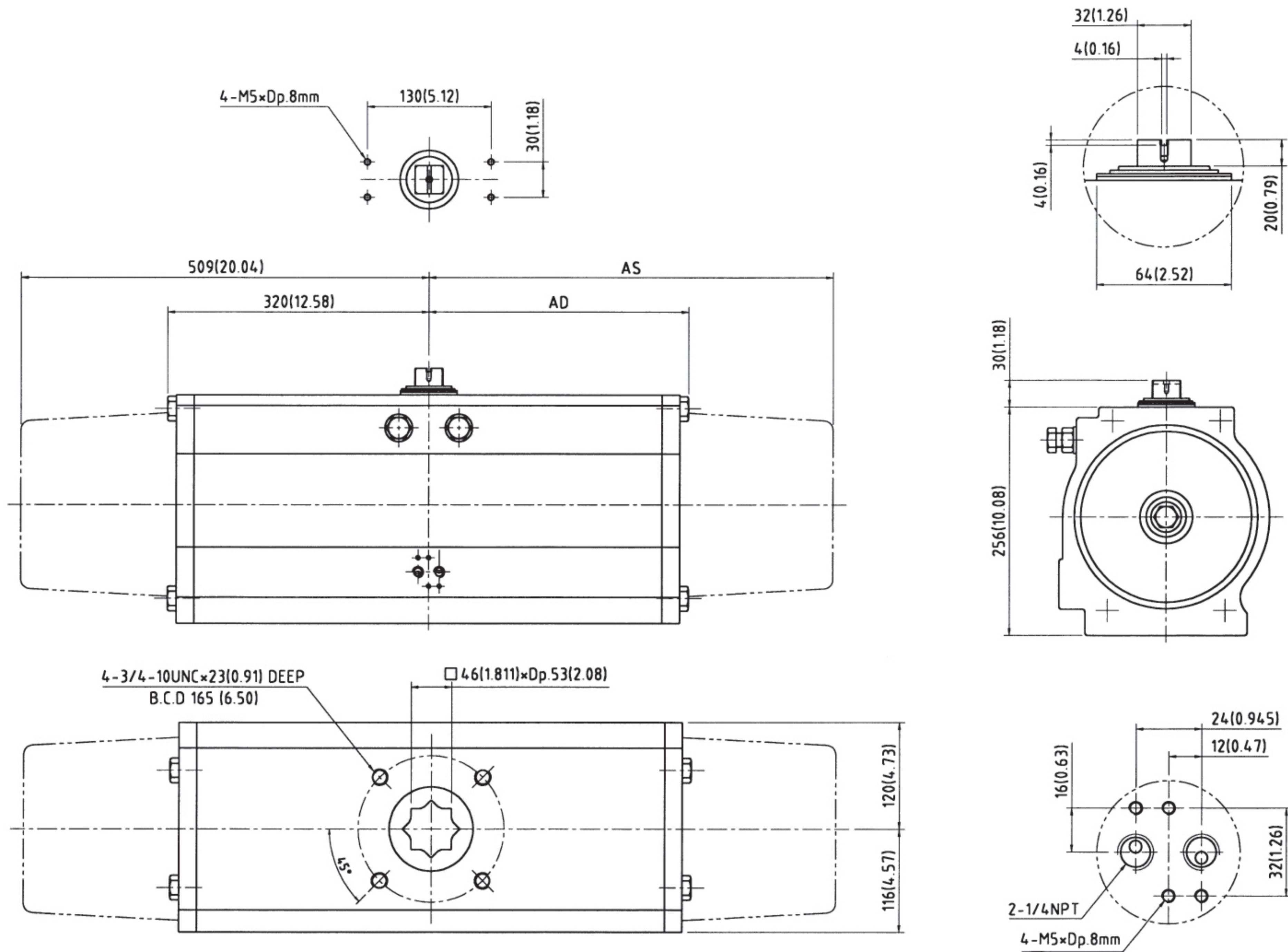
Dimensions

MODEL	unit	A	AS	ϕB	B1	$\phi B2$	E1	E2	E3	HA	J	T	D1	B.C.D	S	D2	NPT	WEIGHT
SDAC 40	m.m	30	202	16	80	31	45.5	38	36	107	20	1/4"-20UNC	10	50	14	18	1/8"	2.3(DA)
	inch	1.181	7.95	0.63	3.15	1.22	1.791	1.496	1.417	4.213	0.787	5/16"-18UNC	12	70	0.551	0.709	1/8"	2.5(SR)
SDAC 80	m.m	30	236	16	80	31	63	49	43	134	20	5/16"-18UNC	12	70	19	19	1/4"	3.8(DA)
	inch	1.181	9.29	0.63	3.15	1.22	2.48	1.929	1.693	5.276	0.787	5/16"-18UNC	12	70	0.748	0.748	1/4"	4.2(SR)
SDAC 130	m.m	30	276	16	80	36	69	50	53.5	144	20	5/16"-18UNC	12	70	19	21	1/4"	5.3(DA)
	inch	1.181	10.87	0.63	3.15	1.471	2.717	1.969	2.106	5.669	0.787	5/16"-18UNC	12	70	0.748	0.827	1/4"	6(SR)
SDAC 200	m.m	30	291	16	80	41	73.5	55	58.5	154	20	5/16"-18UNC	12	70	19	21	1/4"	7.8(DA)
	inch	1.181	11.46	0.63	3.15	1.614	2.894	2.165	2.303	6.063	0.787	3/8"-16UNC	16	102	0.748	0.827	1/4"	8.7(SR)
SDAC 300	m.m	30	353	20	80	48	85	65	68.5	177	20	5/16"-18UNC	12	70	22	26	1/4"	10.9(DA)
	inch	1.181	13.9	0.787	3.15	1.89	3.346	2.559	2.697	6.969	0.787	3/8"-16UNC	16	102	0.866	1.024	1/4"	12(SR)
SDAC 500	m.m	30	385	20	130	53	94	71	76	206	30	3/8"-16UNC	16	102	27	30	1/4"	14.5(DA)
	inch	1.181	15.16	0.787	5.118	2.087	3.701	2.795	2.992	8.11	1.181	3/8"-16UNC	16	102	1.063	1.181	1/4"	16.6(SR)
SDAC 850	m.m	30	532	20	130	61	99	76	95	241	30	1/2"-13UNC	20	125	27	30	1/4"	27.4(DA)
	inch	1.181	20.95	0.787	5.118	2.402	3.898	2.992	3.740	9.488	1.181	1/2"-13UNC	20	125	1.063	1.181	1/4"	35.9(SR)
SDAC 1200	m.m	30	576	32	130	68	109	84	105	263	30	5/8"-11UNC	22	140	36	43	1/4"	37(DA)
	inch	1.181	22.68	1.26	5.118	2.677	4.291	3.307	4.134	10.354	1.181	5/8"-11UNC	22	140	1.417	1.693	1/4"	44(SR)
SDAC 1750	m.m	30	619	32	130	74	120	91	116	287	30	5/8"-11UNC	23	140	36	43	1/4"	46(DA)
	inch	1.181	24.37	1.26	5.118	2.913	4.724	3.583	4.567	11.299	1.181	5/8"-11UNC	23	140	1.417	1.693	1/4"	54.5(SR)

NOTE : Travel Stopper in SDAC40A, 80A is attached on the reverse side.

DIMENSIONS SDAC2500-SDAC3500

SUNG DO



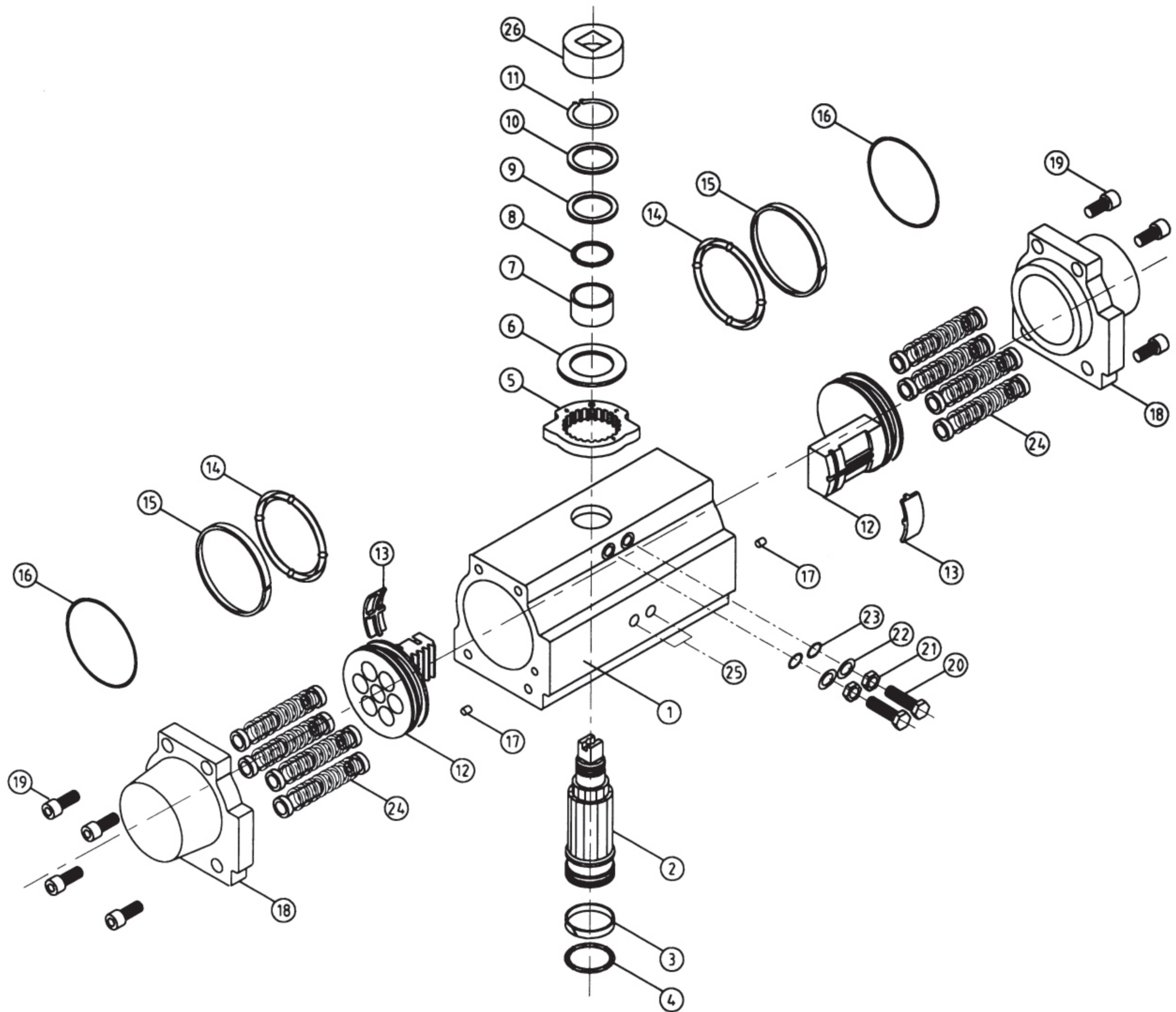
Dimensions

MODEL	Unit	AS	A D	WEIGHT		VOLUME (CU.IN.PER 90DEG)		CYCLE TIMES(SEC. PER 90DEG)	
				D A	SR	C W	CC W	C W	CC W
SDAC 2500	m m	175	175	46	62	498	295	5	5
	inch	6.89	6.89						
SDAC 3500	m m	509	320	71	91	618	556	9	9
	inch	20.04	12.58						

BILL OF MATERIALS

Rack & Pinion Design

SUNG DO

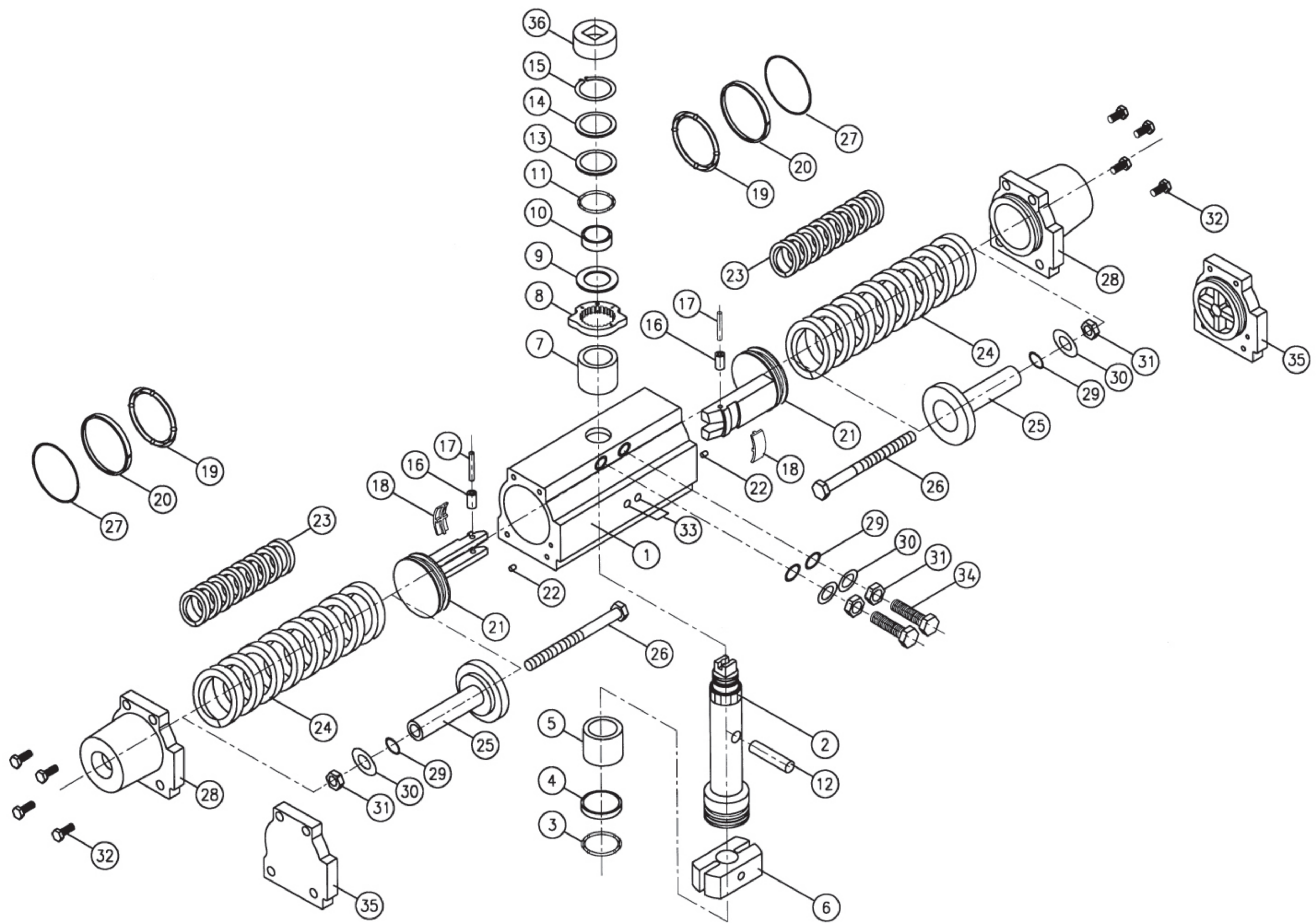


BILL OF MATERIALS

DESCRIPTION	QTY	MATERIAL	REMARKS	DESCRIPTION	QTY	MATERIAL	REMARKS
1	1	A6NO1ST5	Hard Anodized	14	2	N.B.R	
2	1	S45C	Electroless Nickel Plating	15	2	PTFE	
3	1	NYLON 4/6 (TP-601)		16	2	N.B.R	
4	1	N.B.R		17	2	N.B.R	
5	1	CARBON STEEL	Phosphate Coating	18	2	ADC 12/AC 2B-F	Epoxy Coated
6	1	PTFE		19	8	SUS 304	
7	1	NYLON 4/6 (TP-601)		20	2	N.B.R	
8	1	N.B.R		21	2	SUS 304	
9	1	RTFE		22	2	SUS 304	
10	1	SUS304		23	2	SUS 304	
11	1	SK5	Electroless Nickel Plating	24	VARIES	SWPB	Epoxy Coated
12	2	ADC 12/AC 2B-F	Dichromate Dipped	25	2	POLY ETHYLENE	
13	2	NYLON 6		26	1	POLY ETHYLENE	

BILL OF MATERIALS SUNG DO

Scotch Yoke Design

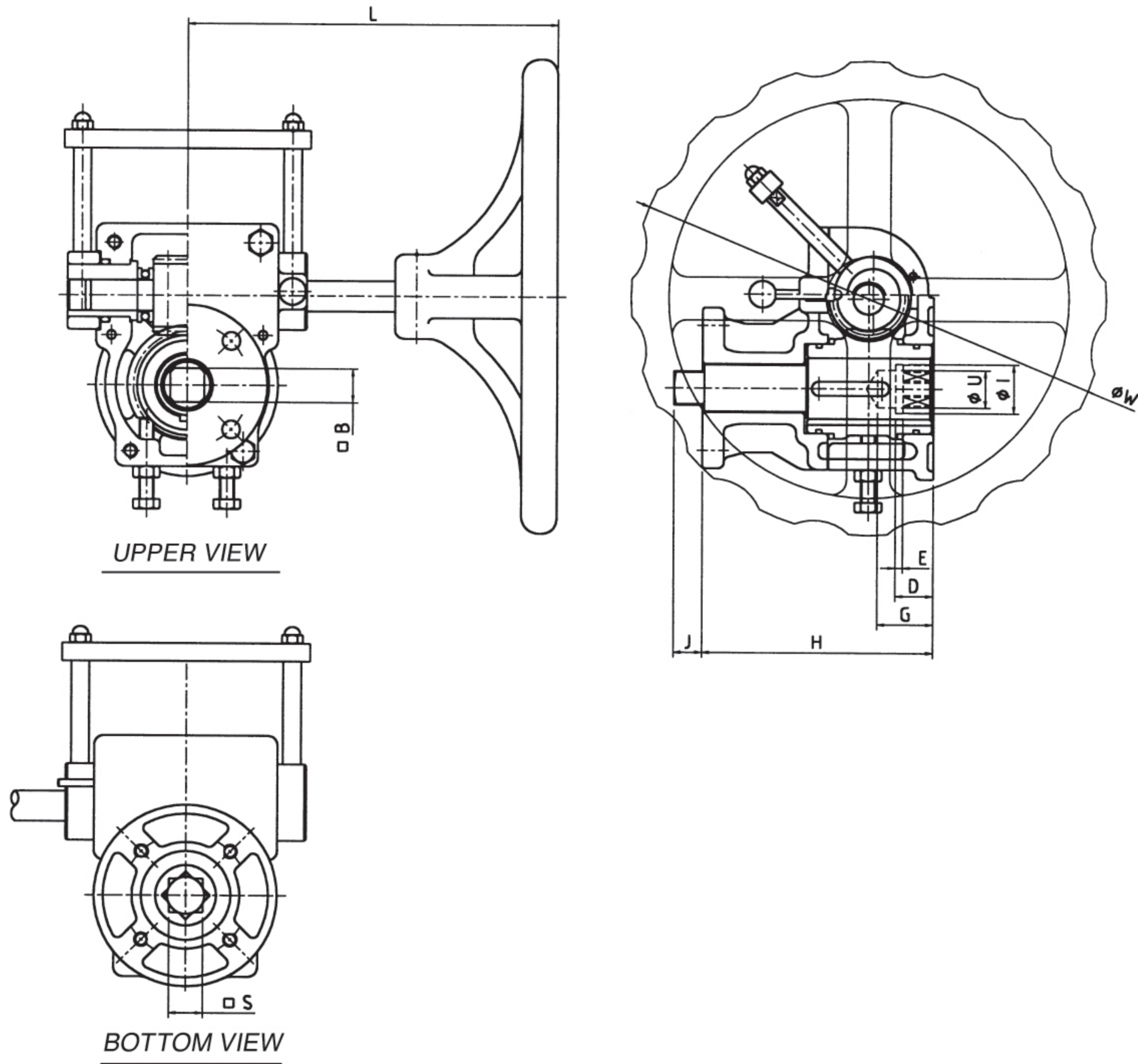


BILL OF MATERIALS

DESCRIPTION	QTY	MATERIAL	REMARKS	DESCRIPTION	QTY	MATERIAL	REMARKS
1	1	A6NO1ST5	Hard Anodized	19	1/2	N.B.R	
2	1	S45C	Electroless Nickel Plating	20	1/2	PTFE	
3	1	N.B.R		21	1/2	AC2B-F	
4	1	NYLON 4/6 (TP-601)		22	2	N.B.R	
5	1	NYLON 4/6 (TP-601)		23	1/2	SUP 10	
6	1	S45C	Nitriding	24	1/2	SUP 10	
7	1	NYLON 4/6 (TP-601)		25	1/2	AC2B-F	
8	1	SCM21	Phosphate Coating	26	1/2	SCM435	Electroless Nickel Plating
9	1	PTFE		27	2	N.B.R	
10	1	NYLON 4/6 (TP-601)		28	1/2	AC2B-F	Epoxy Coating
11	1	N.B.R		29	1/2	N.B.R	
12	1	S45C-D		30	1/2	SPCC	Electroless Nickel Plating
13	1	RTFE		31	1/2	SUS 304	
14	1	SUS 304		32	8	SUS 304	
15	1	SK5	Electroless Nickel Plating	33	2	POLY ETHYLENE	
16	1/2	BEARING STEEL	Nitriding	34	2	SUS 304	
17	1/2	S45C-D	Nitriding	35	1/2	AC2B-F	Epoxy Coating
18	1/2	NYLON6		36	1	POLY ETHYLENE	

DECLUTCHABLE GEAR OVERRIDES

SUNG DO



ATTACHABLE MOUNTING

CODE	ISO5211				
	F07	F10	F12	F14	F16
B.C.D	70	102	125	140	165
UPPER 4- ϕ H	10	12	14	18	22
BOTTOM 4-TAP	5/16	3/8	1/2	5/8	3/4
R30	UPPER	ϕ			
	BOTTOM	ϕ			
R42	UPPER		ϕ		
	BOTTOM		ϕ		
R50	UPPER			ϕ	
	BOTTOM			ϕ	
R68	UPPER				ϕ
	BOTTOM				ϕ
R90	UPPER				ϕ
	BOTTOM				ϕ

TORQUE OUT PUT

RATIO	ATTACHABLE ACTUATOR							WEIGHT (Kg)
	SPRING RETURN			DOUBLE ACTING				
R30	40SR	~	200SR	40DA	80DA	130DA	200DA	10.5
R42	300SR			300DA	500DA	850DA		23
R50	500SR	850SR		(1200DA)	(1750DA)			38
R68	1200SR	1750SR		(2500DA)				64.2
R90	2500SR	3500SR		3500DA				126.1

DIMENSIONS

Unit : mm

RATIO	SPEC										
	L	ϕ W	H	ϕ wB	J	ϕ wS	D	E	ϕ TI	ϕ TU	G
R30	207	265	129	19	16	19	21	4	27.5	21	31
R42	224	387	158	22	21	22	27	6	33	24.5	37
				22	21	22	27	6	33	24.5	37
R50	260	463	174	27	26	27	30	8	39	30.5	37
				36	35	36	44	12	53	42	56
R68	365	650	210	46	52	46	54	16	68	52	64

SUNG DO

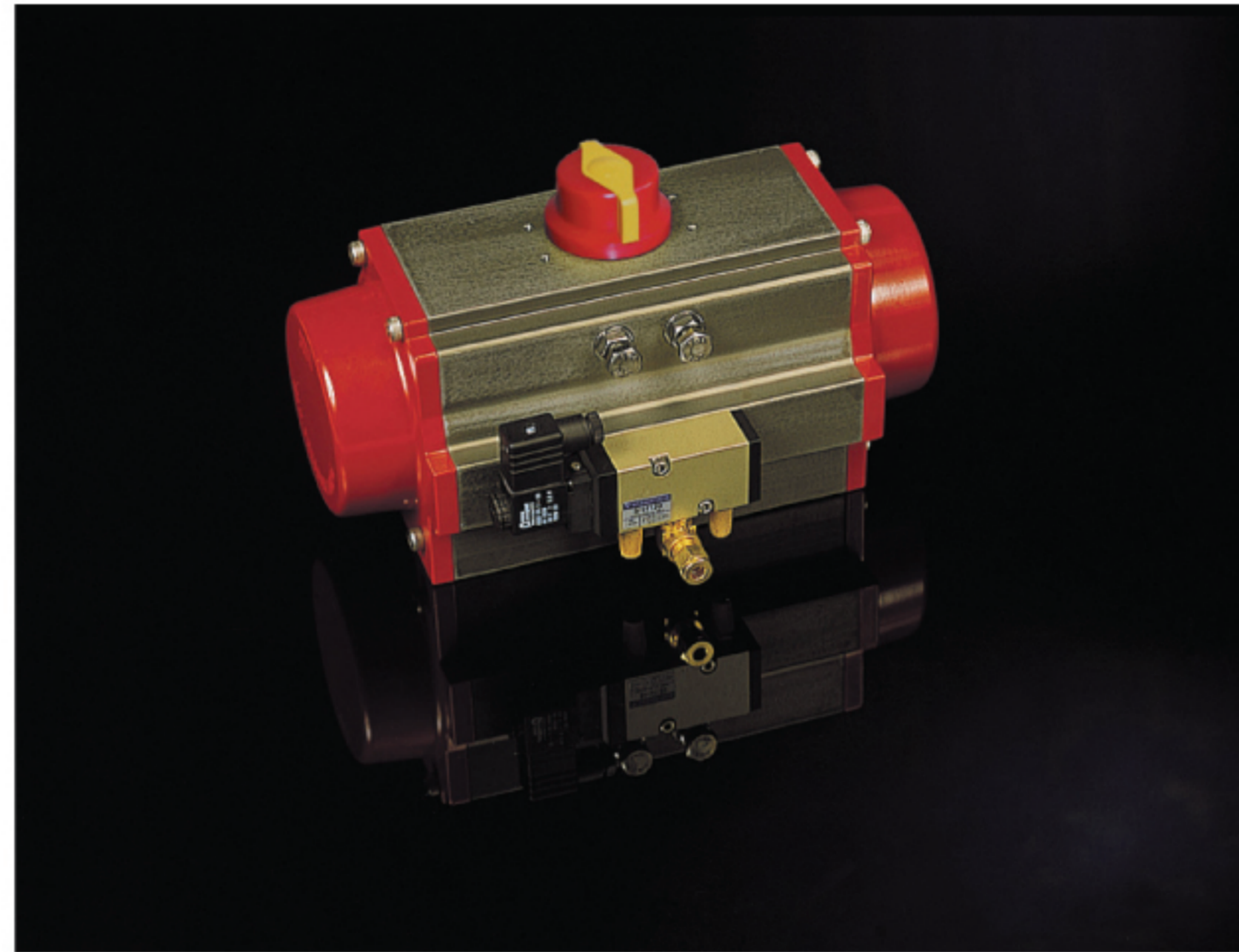
- Direct Mount ASCO Series
- Nipple Mount Available
- Weatherproof/Explosion Proof
- Intrinsically Safe Coil Available
- Various Voltages-AC or DC
- Quick Exhaust Modification
- 2 or 3 Position Control
- Exhaust Speed Controls

- General Purpose
- Weatherproof
- 2 SPDT Standard
- Indicator
- Easy Set CAMS

- IP6100 Features:
 - Modular Design
 - Pneumatic 3-15psi or
 - Electro-Pneumatic 4-20mA
 - Integral Limit Switches
 - Integral Transmitter
 - Position Indicator

ACCESSORIES

Solenoid Valves



ASCO or BAR

NEMA 4 Direct Mount Solenoid

ASCO or BAR

NEMA 7 Direct Mount Solenoid

Limit Switches



APL SERIES **Limit Switch**

(2)SPDT Mechanical Switches Standard

Positioners



SMC SERIES **IP6100 or 5100** **Integral Options**

(S E E
SUPPLEMENTAL
DATA SHEET)

Sample Specification

Actuator shall be SUNG DO SDAC series rack and pinion design.
Body to be hard anodized, extruded aluminum for corrosion protection and shall have a base wide enough for stable mounting to valve mounting pads. Internals to feature dual aluminum piston racks and a one-piece electroless nickel plated blow-out proof pinion. Pinion shall also have significant body housing bearings with O ring seals on the ID and OD. Unit to have adjustable travel stops. Fasteners and hardware to be stainless steel. Standard bottom mounting dimensions to conform to ISO5211 and accessory mounting to NAMUR-VDI/VDE.



SUNG DO VALVE CO., LTD.

本社製工場：仁川廣域市 南洞區 古棧洞 685-5(南洞工團 115B 6L)

TEL : (032) 819 - 4055~8

FAX : (032) 819 - 4 0 5 9

<http://www.sungdovalve.com>

E-mail:sdvv@chollian.net

釜山營業所：釜山廣域市 中區 中央洞 4街 76-1(松南빌딩 540號)

TEL : (051) 464-8 3 3 7

FAX : (051) 465-6 9 6 3

HEAD OFFICE & FACTORY

115B 6L NAMDONG IND. COMPLEX

685-5 GOJAN-DONG, NAMDONG-GU, INCHON, KOREA

TEL : (82 32) 819 - 4055~8

FAX : (82 32) 819 - 4 0 5 9

<http://www.sungdovalve.com>

E-mail:sdvv@chollian.net

PUSAN OFFICE

SONG NAM B/D 5F

76-1 CHUNGANG-DONG, 4GA, CHUNG-GU, PUSAN, KOREA

TEL : (82 51) 464-8 3 3 7

FAX : (82 51) 465-6 9 6 3