

Series 5500 Pneumatically Operated Spring Opposed Diaphragm Actuators

Series 5500 Features

Performance

- Reliability.
- High Power.
- Full response.
- Low Hysteresis.
- Field Reversible.

Design Flexibility :

- Reversible fail action without extra parts in the field.
- Wide selection of optional accessories available.
- Compact and simple design.
- Inviolable rolling diaphragm simplifies actuator design.
- Variable stroke up to 5".

Design Integrity :

- Multi spring construction.
- One piece spindle on top and bottom dry bushing guide.
- Low stressed alloy steel springs.

Quality Manufacturing :

- High quality material with trace ability throughout manufacture.
- Quality Assurance system in accordance with ISO 9001.
- Comprehensively tested to ensure specified performance on site.

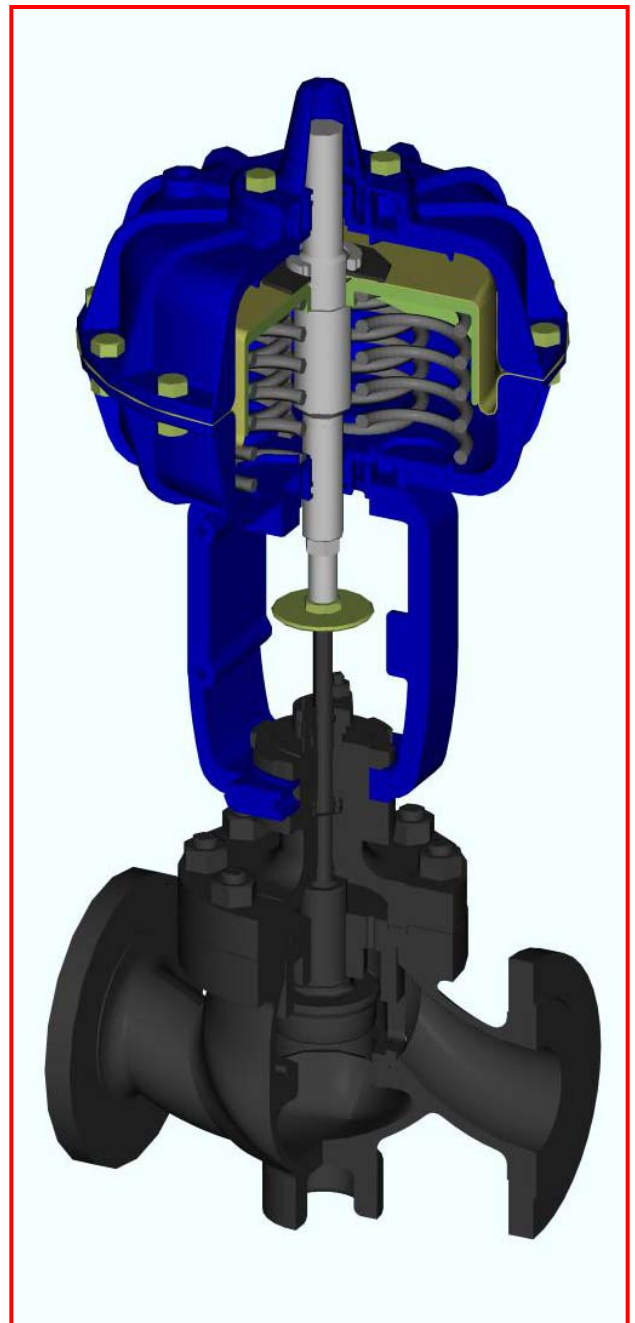


Figure 1. 5500 Series Spring Opposed Diaphragm Actuator.

General

The ** diaphragm actuators has been designed to control accurately the flow and pressure of fluid in response to demand of fine process control as well as various plant systems. These actuators have been developed for powerful and high performance pneumatic actuating of linear motion valves as well as rotating valves. It consist of four spring which are produced for high stiffness that is defined as the ability of the actuator to with stand suddenly changing dynamic force of fluids acting on the valve stem. The action of valves can be changed by removing of the cap and four mounting bolts, turning the actuator over, and replacing the cap.

- Simple cost effective design
- Long stroke and wide application.
- Strong seating force.
- Compact and light weight.

Table 1. Standard Materials of Construction

Part Description	Material
Yoke	Cast Iron
Diaphragm Cover	Die-cast Aluminum
Spring Case	Die-cast Aluminum
Diaphragm	EPDM / NBR
Seals	NBR
Spring	Carbon Steel
Spindle	Stainless Steel

Alternative material combinations suitable for offshore and extremely corrosive duties are available. Consult factory for details.

Table 2. Actuator Working Conditions.

Max. working pressure	5.0 kgf/cm ² G
Max working temp.	90 °C
Minimum working temp.	-40 °C
Minimum storage temp.	-55 °C

Standard actuators are suitable of air operation.

Actuators for low temperature or high temperature applications are available on request.

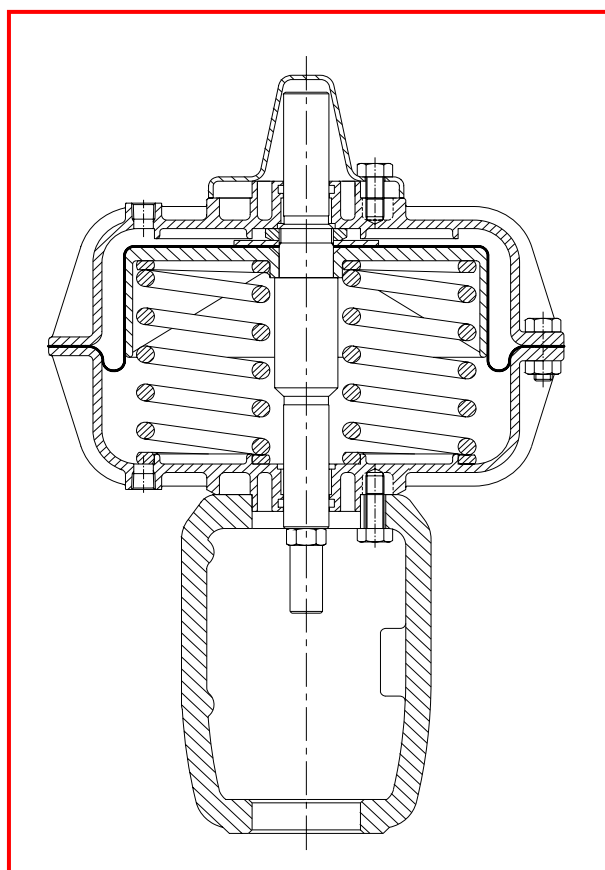


Figure 2. Cross Sectional Drawing 5500 Series Diaphragm Actuator (Direct Acting).

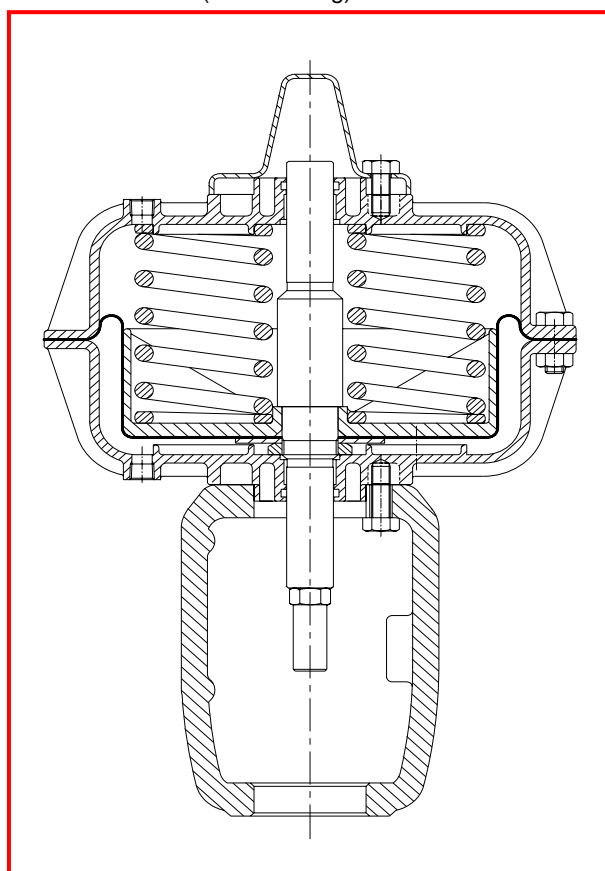


Figure 3. Cross Sectional Drawing 5500 Series Diaphragm Actuator (Reverse Acting).

Guide to Accessory Options

Top Mounted Handwheel (Fig. 4 to 6.)

The top mounted handwheel is of the continuously connected design. It is available for T-0 and T-1 actuators and may be fitted retrospectively without any modification of the standard unit. The handwheel is capable of providing operating forces in either direction and does not rely on the actuator spring to provide return motion. The handwheel can also act as a limit stop to limit either the amount of valve opening or closing.

For the T-2,T-3,T-4 and T-5 actuators, the top mounted handwheel are continuously connected by permanently lubricated bevel gear or worm gear box. The gearing has been selected to ensure easy operation even with the maximum actuator power.

Rotary Motion (Fig. 7)

The linear output force is connected into a rotating torque by linkage system as strong as scotch-yoke construction. The long stroke has a advantage of high torque and pneumatic stiffness with excellent throttling capabilities. Special yoke and linkage assemblies are designed specially into a light weight, compact and rugged for quarter turn application.

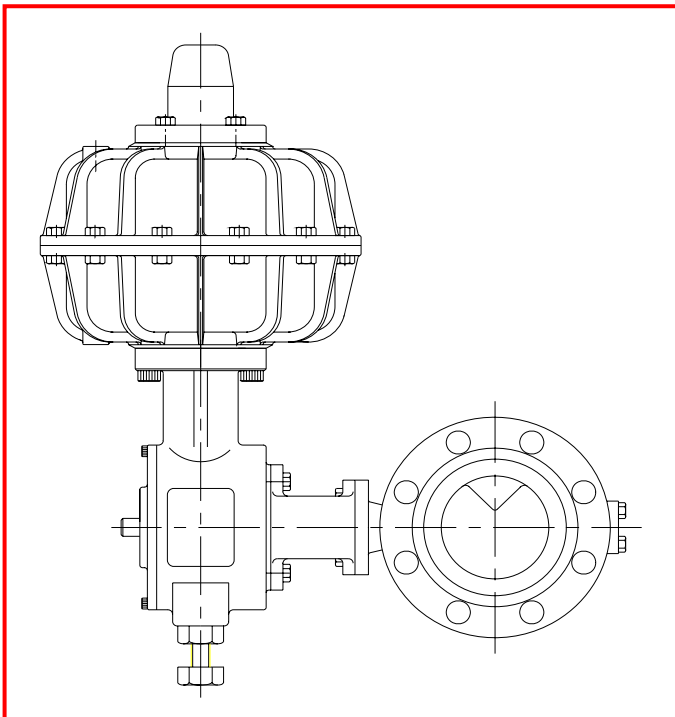


Figure 7. Rotary Motion Actuator with V-Notch Valve.

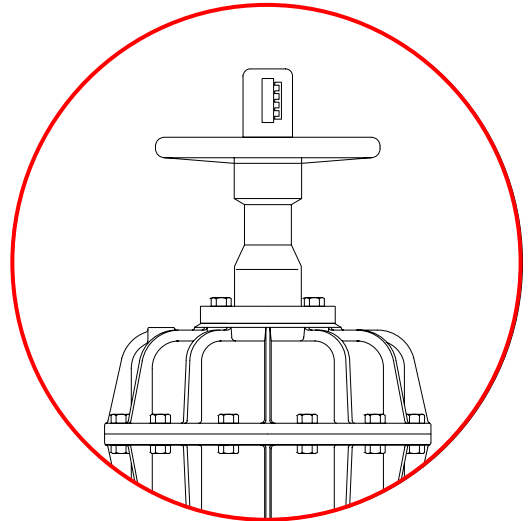


Figure 4. Top Mounted Manual Handwheel Unit (T-0,T-1).

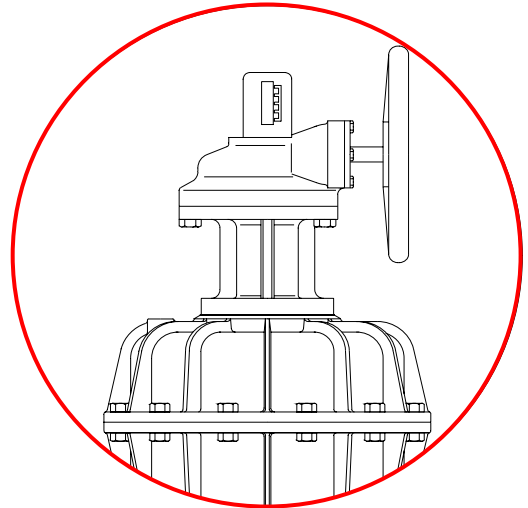


Figure 5. Top Side Mounted Manual Handwheel Unit. (T-1, T-2, T-3)

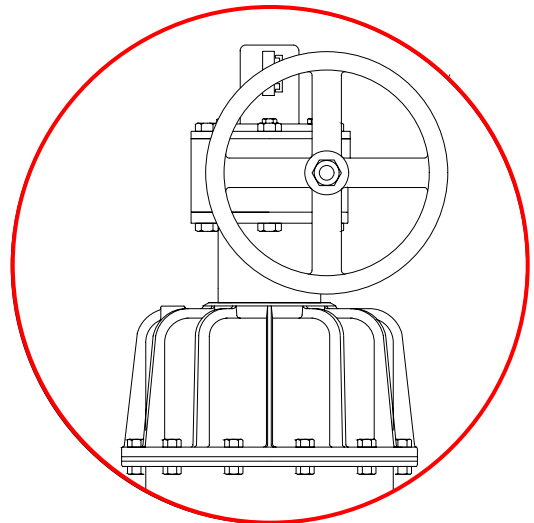
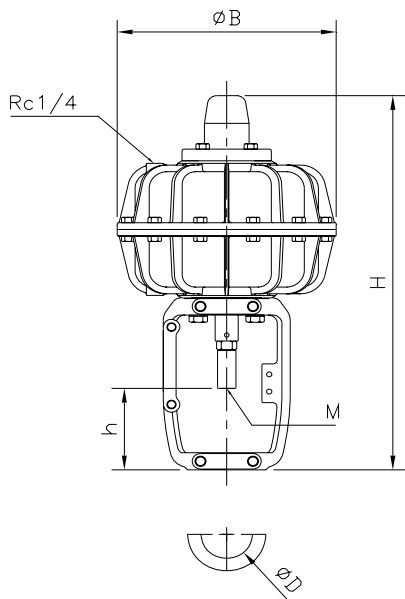


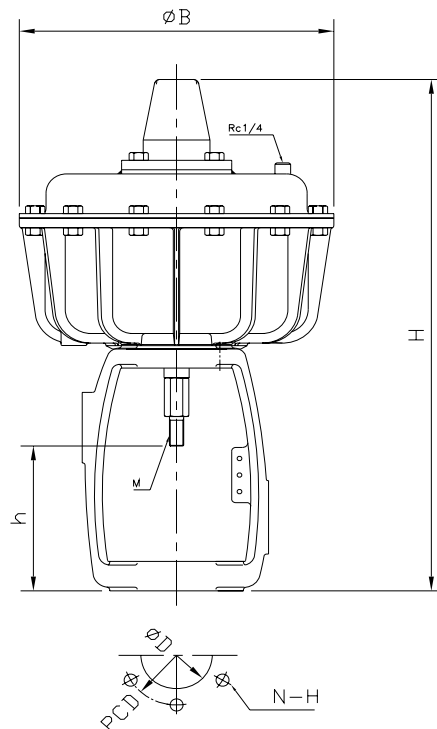
Figure 6. Top Side Mounted Manual Handwheel Unit (T-4, T-5).

AO-5500 DIMENSION TABLE

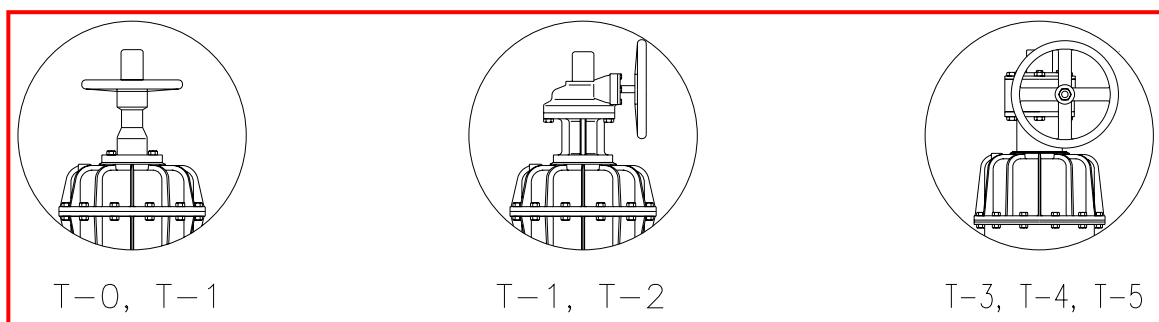
Standard Diaphragm Actuator
From T-0 to T-3



Standard Diaphragm Actuator
From T-4 to T-5



Manual Hand Wheel



5500 Dimension

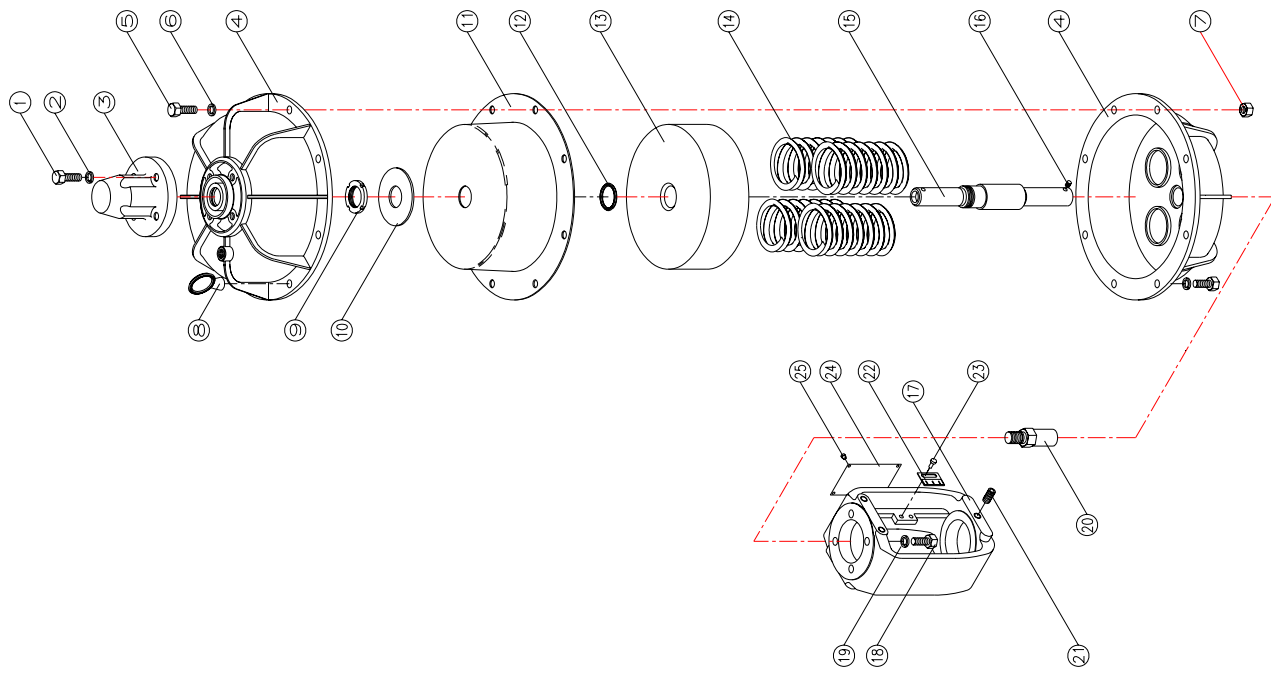
	H	h		ØB	M	ØD	PCD	N - H	Weight (kg)
		RA	DA						
T-0	347	117	141	200	M12 X 1.5P	60	-	-	5.0
T-1	436	95	130	245	M12 X 1.5P	60	-	-	13.6
T-2	447	86	130	285	M12 X 1.5P	60	-	-	16.0
T-3	592	141	198	335	M12 X 1.5P M18 X 1.5P	60 100	135	6 - Ø19	31.0
T-4	696	140 145	197 245	400	M18 X 1.5P	100	135	6 - Ø19	54.5 56.4
T-5	812	170	283	500	UNF7/8-9THD	100	135	6 - Ø19	105

Pressure Drop (ΔP) Limitation

A0-5500 SERIES (Spring Range 1~3kgf/cm2G)

Unit : kg/cm2G

	UNBALANCE						BALANCE					
Size	T-0	T-1	T-2	T-3	T-4	T-5	T-0	T-1	T-2	T-3	T-4	T-5
Eff. Ares (cm)	175	270	350	515	725	1210	175	270	350	515	725	1210
Max. Stroke (mm)	20	30	38	50	50/100	100	20	30	38	50	50/100	100
Thrust (Kgf)	166	256	332	489	688	1149	166	256	332	489	688	1149
3/4"	36.3	55.9	72.5	106.7			145.1	223.8	290.1			
1"	24.1	37.2	48.2	71	99.9		128.2	197.8	256.4			
1 1/2"		18.2	23.5	34.6	48.8		92	141.9	183.9	270.6		
2"		10.7	13.9	20.5	28.8			112.6	146	214.8		
2 1/2"		7.1	9.2	13.5	19	31.8		89.5	116	170.6	240.2	
3"			6.5	9.6	13.5	22.5			96.2	141.6	199.3	
4"			3.8	5.5	7.8	13				113.3	159.4	266.1
5"				3.5	4.9	8.2				81	114.1	190.4
6"				2.5	3.5	5.8				47.2	53.2	88.8
8"											52.7	87.9
10"											50.1	83.7
12"											49.1	82
14"											15.9	26.5
16"											12.9	21.5



NO.	NAME OF PARTS	MATERIALS	Q'TY	REMARKS
25	RIVET	AC4C	2	
24	NAME PLATE	SUS304	1	
23	DRIVER SCREW	SUS304	2	
22	STROKE PLATE	SUS304	1	
21	FIX SCREW	S25C	1	
20	ADAPTOR	SUS303	1	
19	SPRING WASHER	SUS304	1	
18	HEX.HEAD BOLT	SUS304	1	
17	YOKE	FCQ200	1	
16	SET SCREW	SUS304	1	
15	SPINDLE	SUS304	1	
14	SPRING	SUP9	4	
13	DIAPHRAGM PLATE	AC4C	1	
12	O-RING	NBR	1	
11	DIAPHRAGM	NBR	1	
10	BACK PLATE	S45C	1	
9	LOCK NUT	SUS304	1	
8	EYE NUT	S25C	2	
7	HEX NUT	S25C	-	
6	SPRING WASHER	S25C	-	
5	HEX.HEAD BOLT	S25C	-	
4	DIAPHRAGM COVER	AC4C	1	
3	CAP	S45C	1	
2	SPRING WASHER	S25C	2	
1	CAP BOLT	S25C	2	

Actuator

5500 linear

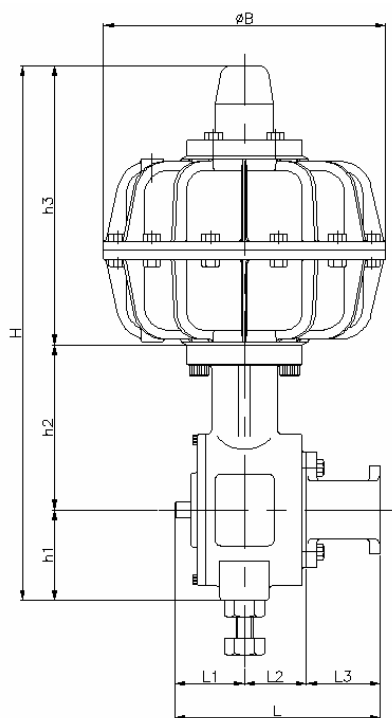
Spring Range 1~3kgf/cm²G

Size	T-0	T-1	T-2	T-3	T-4	T-5
Max. Stroke (mm)	20	30	38	50	50/100	100
Eff. Ares (cm)	175	270	350	515	725	1210
Thrust (Kgf)	166	256	332	489	688	1149

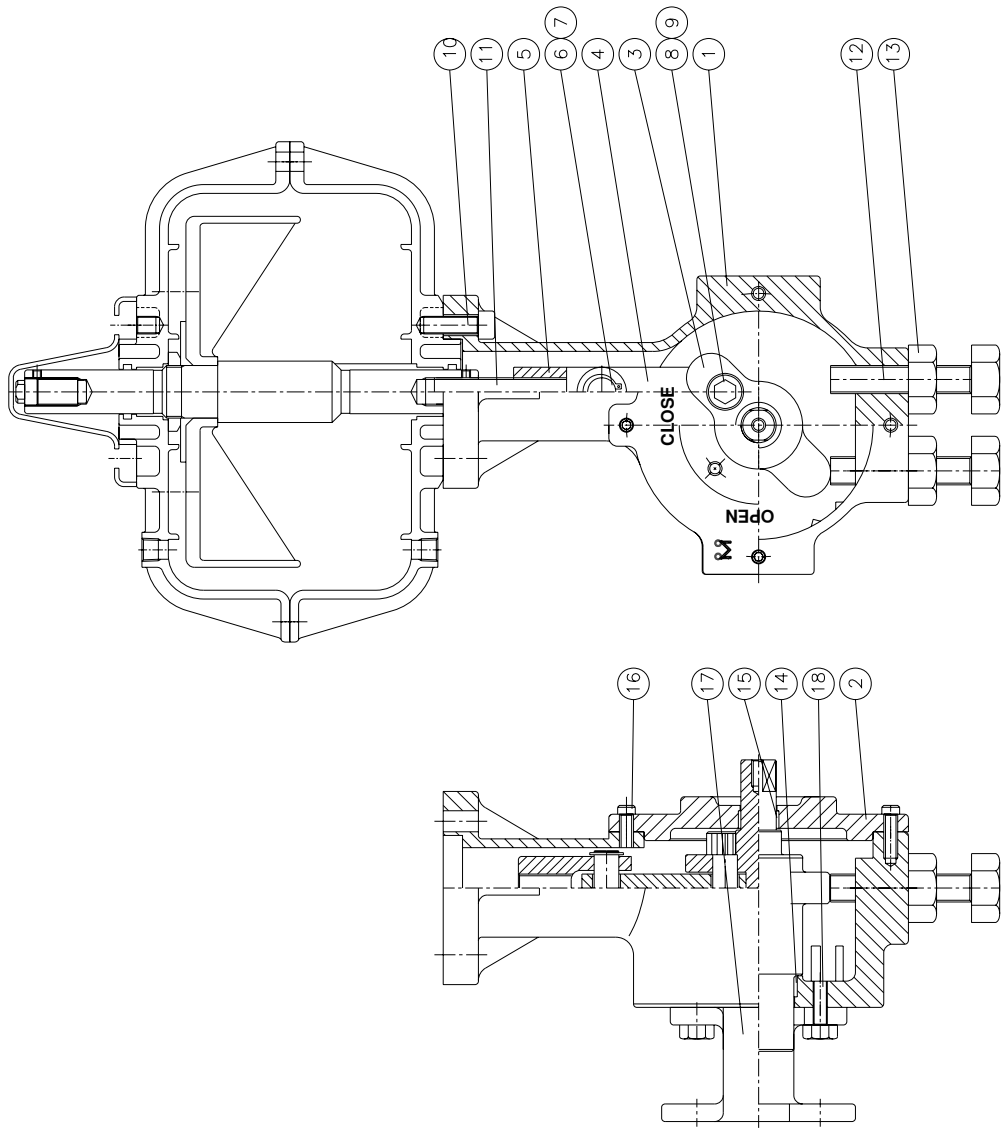
5500 Rotary

Size		T-2	T-3	T-4	T-5
Max. Stroke (mm)		38	50	50/100	100
Eff. Ares (cm)		350	515	725	1210
Torque (kgf)	Max.	12	23	64	108
	Min.	8.5	16.2	45.6	76.2

QUARTER TURN YOKE BOX DIMENSION TABLE



SIZE	B	h1	h2	h3	H	L1	L2	L3	L
T-0	-	-	-	-	-	-	-	-	-
T-1	245	85	179	248	512	73	68	65	206
T-2	285	85	179	257	521	73	68	65	206
T-3	335	220	196	323	739	85	75	90	250
T-4	400	285	248	300	833	105	95	110	310
T-5	500	300	335	335	970	105	95	110	310



NO.	NAME OF PARTS	MATERIALS	Q'TY	REMARKS
20				
19				
18	HEX.HEAD BOLT	S45C		
17	YOKE	S10C	4	
16	HEX.HEAD BOLT	FC20	1	
15	DU BUSH	SUS304	4	
14	DU BUSH	**	1	
13	LOCK NUT	**	1	
12	STOPPER BOLT	S10C	2	
11	ADAPET BOLT	S10C	2	
10	HEX.WRENCH BOLT	SUS304	1	
9	HEX.WRENCH BOLT	S45C	4	
8	DU BUSH	S45C	1	
7	C-RING	**	2	
6	JOINT PIN	**	1	
5	JOINT	S45C	1	
4	LINK	S45C	1	
3	LEVER ARM	SCPH2	1	
2	COVER	FC20	1	
1	YOKE BOX	FC20	1	