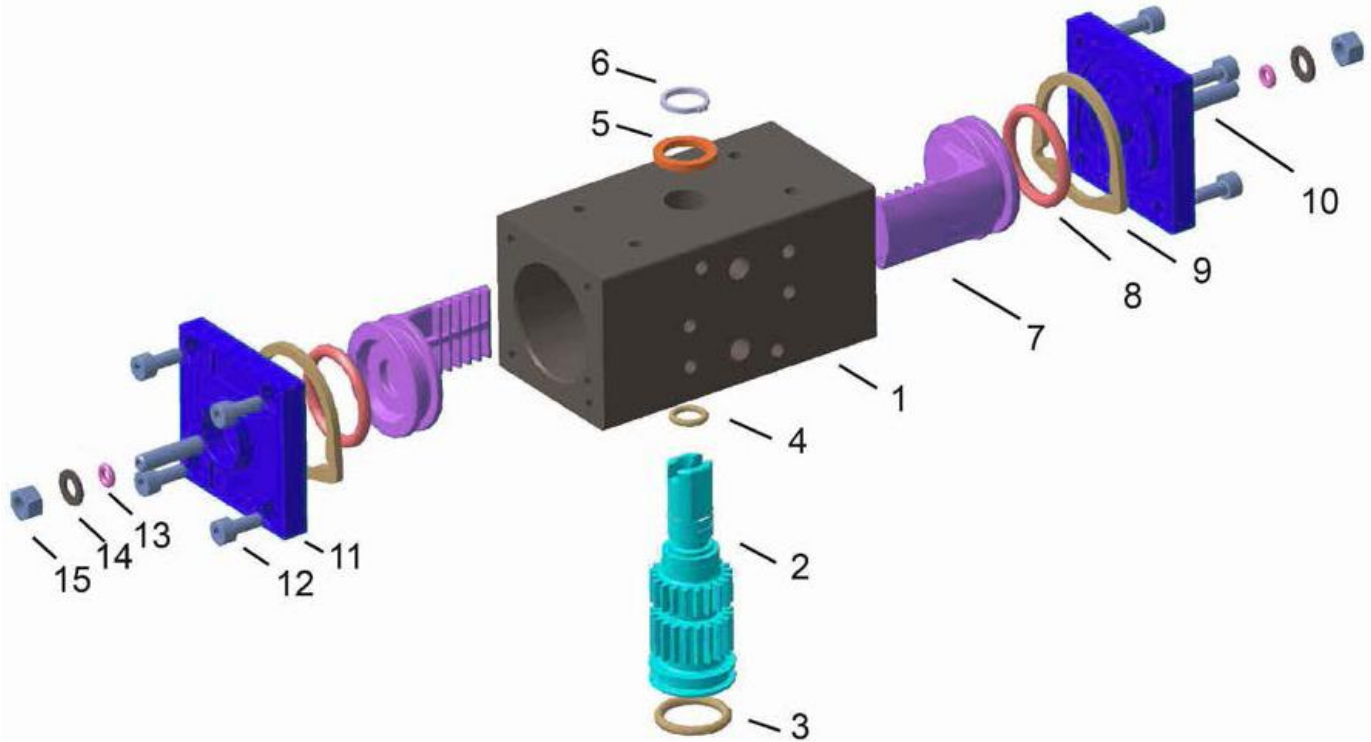


Pneumatic Actuator Parts MH DA(SR)32 List

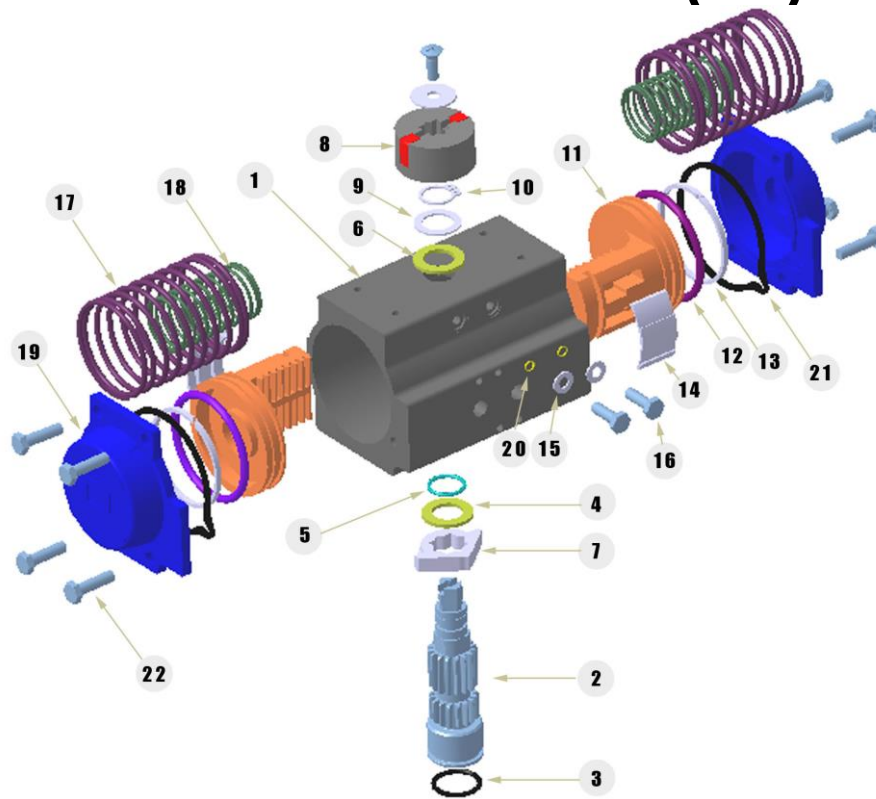


Part No.	DESCRIPTION	MATERIAL	QTY. (DA)	QTY. (SR)
1	BODY	EXTRUDED ALUMINUM	1	1
2	ANTI-BLOWOUT PINION	STEEL	1	1
3 *	BOTTOM PINION O-RING *	NBR70	1	1
4 *	TOP PINION O-RING *	NBR70	1	1
5 *	TOP PINON SPACE *	POM	1	1
6 *	PINION SNAP RING *	STAINLESS STEEL	1	1
7	PISTON	DIE CAST ALUMINUM	2	2
8 *	PISTON O-RING *	NBR70	2	2
9 *	END CAP SEALS *	NBR70	2	2
10	TRAVEL STOP BOLT	STAINLESS STEEL	2	2
11	END CAP	DIE CAST ALUMINUM	2	2
12	END CAP BOLTS	STAINLESS STEEL	8	8
13	TRAVEL STOP O-RING	NBR70	2	2
14	TRAVEL STOP WAHSER	STAINLESS STEEL	2	2
16	TRAVEL STOP NUT	STAINLESS STEEL	2	2

* Parts subject to wear

Parts subject to wear. Please contact the factory seller for replacement kits.

Pneumatic Actuator Parts MH DA(SR)52~140 List

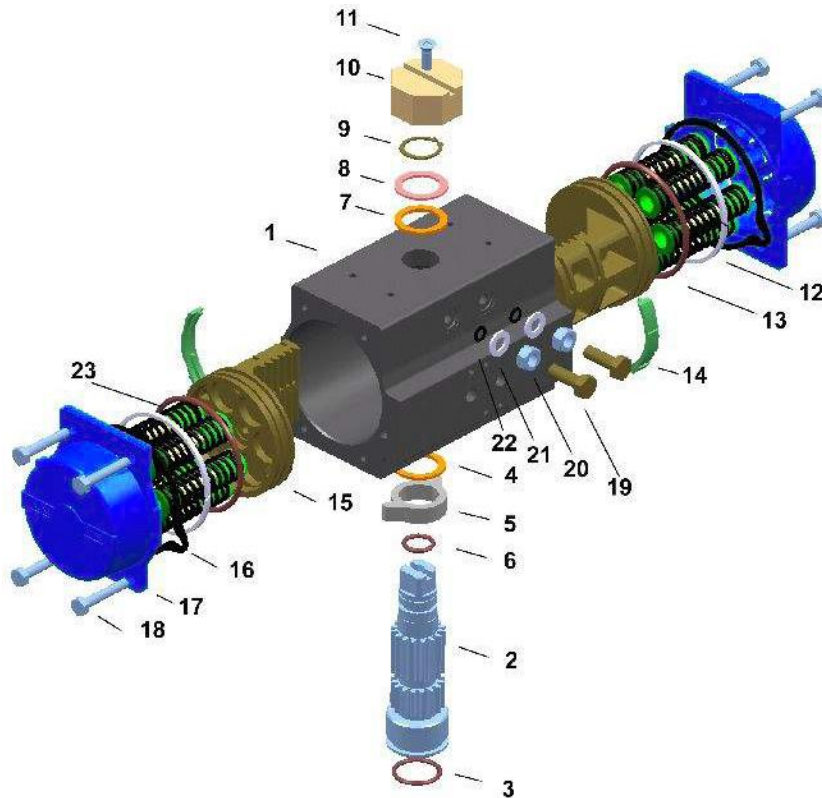


Part No.	DESCRIPTION	MATERIAL	QTY. (DA)	QTY. (SR)
1	BODY	EXTRUDED ALUMINUM	1	1
2	ANTI-BLOWOUT PINION	STEEL	1	1
3	LOWER PINION O-RING*	NBR70	1	1
4	PINION SPACER RING	POM	1	1
5	STOP ADJUSTMENT	STAINLESS STEEL	1	1
6	TOP PINION O-RING	NBR70	1	1
7	SPACER RING*	POM	1	1
8	PINION WASHER	STAINLESS STEEL	1	1
9	PINION SNAP RING	STAINLESS STEEL	1	1
10	POSITION INDICATOR	Nylon	1	1
11	PISTON	DIE CAST ALUMINUM	2	2
12	PISTON THRUST BLOCK	POM	2	2
13	PISTON O-RING*	NBR70	2	2
14	ANTI-FRICTION RING*	POM	2	2
15	END CAP SEALS	NBR70	8	8
16	END CAP	DIE CAST ALUMINUM	1	1
17	END CAP BOLTS	STAINLESS STEEL	8	8
18	STOP BOLT	STAINLESS STEEL	2	2
19	STOP NUT	STAINLESS STEEL	2	2
20	STOP BOLT WASHER	STAINLESS STEEL	2	2
21	STOP BOLT O-RING	NBR70	2	2
22	SPRING SETs	STEEL	N/A	Per Req.

* Parts subject to wear

Parts subject to wear. Please contact the factory or your MH distributor for replacement kits.

Pneumatic Actuator Parts MH DA(SR)160~270 List



Part No.	DESCRIPTION	MATERIAL	QTY. (DA)	QTY. (SR)
1	BODY	EXTRUDED ALUMINUM	1	1
2	ANTI-BLOWOUT PINION	STEEL	1	1
3 *	LOWER PINION O-RING*	NBR70	1	1
4 *	PINION SPACER RING	POM	1	1
5	STOP ADJUSTMENT	STAINLESS STEEL	1	1
6 *	TOP PINION O-RING	NBR70	1	1
7 *	SPACER RING*	POM	1	1
8	PINION WASHER	STAINLESS STEEL	1	1
9	PINION SNAP RING	STAINLESS STEEL	1	1
10	POSITION INDICATOR	Nylon	1	1
11	INDICATOR BOLT	Nylon + SS STEEL	1	1
12 *	ANTI-FRICTION RING*	POM	2	2
13 *	PISTON O-RING*	NBR70	2	2
14 *	PISTON THRUST	POM	2	2
15	PISTON	DIE CAST ALUMINUM	2	2
16	END CAP SEALS	NBR70	2	2
17	END CAP	DIE CAST ALUMINUM	2	2
18	END CAP BOLTS	STAINLESS STEEL	8	8
19	STOP BOLT	STAINLESS STEEL	2	2
20	STOP NUT	STAINLESS STEEL	2	2
21	STOP BOLT WASHER	STAINLESS STEEL	2	2
22	STOP BOLT O-RING	NBR70	2	2
23	SPRING SETs	STEEL	N/A	Max.12

* Parts subject to wear

Parts subject to wear. Please contact the factory or your MH distributor for replacement kits.

MH SERIES OPERATION AND SELECTION GUIDE

Double Acting Actuators

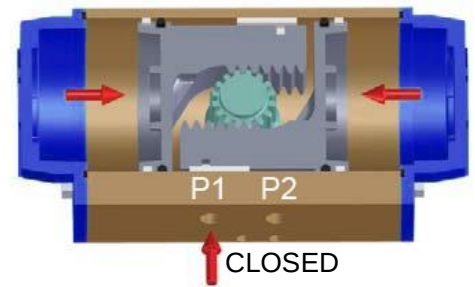
ACTUATOR OVERVIEW

- All listed output torques are expressed in inch pounds of torque (in. lbs.).
- Charts for available air pressure are expressed in pounds per square inch (P.S.I.).
- MH actuators offer $\pm 5^\circ$ adjustment in the open and closed positions on MH-52 through MH-125 models. For all other models, adjustment is in the open position only. The closed position is 0° fixed. Optional retrofit kits are available to allow for adjustment in both open and closed positions on the MP-160, MP-200 and MP-270 models.

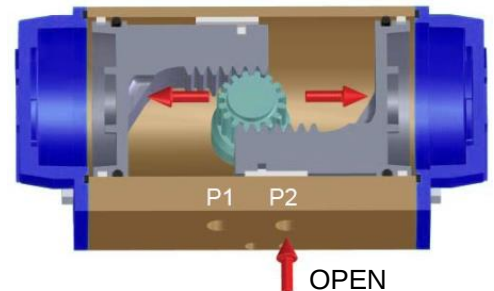
DOUBLE ACTING ACTUATOR SIZING

1. Establish the valve manufacturer's breakaway or seating/unseating torque, then add 20% as a safety factor (e.g. 115 in. lbs. valve breakaway torque $\times 20\% = 138$ in. lbs.).
2. Determine available air pressure to the actuator (e.g. 60 P.S.I.).
3. Refer to the chart, find the 60 P.S.I. columns and scan down until a torque value greater than the valve torque is found (e.g. 141 in. lbs.). Then go to the left to determine the MH[®] model number. In this sample case, the selected actuator would be the MP52DA.

NOTE: The MP[®] double acting actuator has no torque drop through the full 90° stroke.



Air to Port 1 (P1) forces the pistons inwards, causing the pinion to turn clockwise.



Air to Port 2 (P2) forces the pistons outwards, causing the pinion to turn counterclockwise.

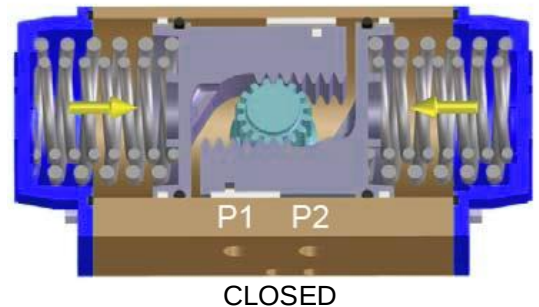
Spring Return Actuators

SPRING RETURN ACTUATOR TERMINOLOGY

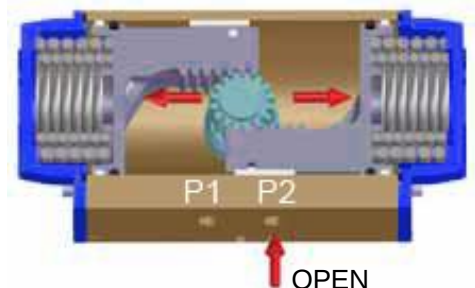
1. **AIR STROKE:** When air is supplied to the actuator, the pistons compress the springs. The greater the spring compression, the less torque output the actuator can supply.
2. **SPRING STROKE:** When air is removed from the actuator, the stored energy in the springs forces the pistons inward. At full compression, the spring is at its maximum torque output. This is the **SPRING START**. When springs are uncompressed, this is the **SPRING END**.
3. **FAIL POSITION:** Standard MH actuators are preset for fail closed (CW) operation, but can be adjusted easily for fail open (CCW) rotation.

SPRING RETURN ACTUATOR SIZING

1. Establish the valve manufacturer's seating torque (closing) and breakaway torque (opening). Add a 20% safety factor (e.g. a valve torque of 80 in. lbs. $\times 20\% = 96$ in. lbs.).
2. Refer to the spring torque column and select the **SPRING END TORQUE** that equals or exceeds the required valve torque (i.e. the MP model MP-63 with a 80# spring set, which has a spring end of 111 in. lbs. and a spring start of 196 in. lbs.).
3. Determine the available air line pressure to the actuator (e.g. 80 P.S.I.). Refer to the 80 P.S.I. column and scan down to where it intersects with the MP-63 with an 80# spring. In this case, the end spring torque is 111 in. lbs. Which exceeds the required 96 in. lbs. required?



Loss of air pressure on Port 2 causes springs to drive the pistons inward. The pinion turns clockwise to close while air exhausts from Port 2.

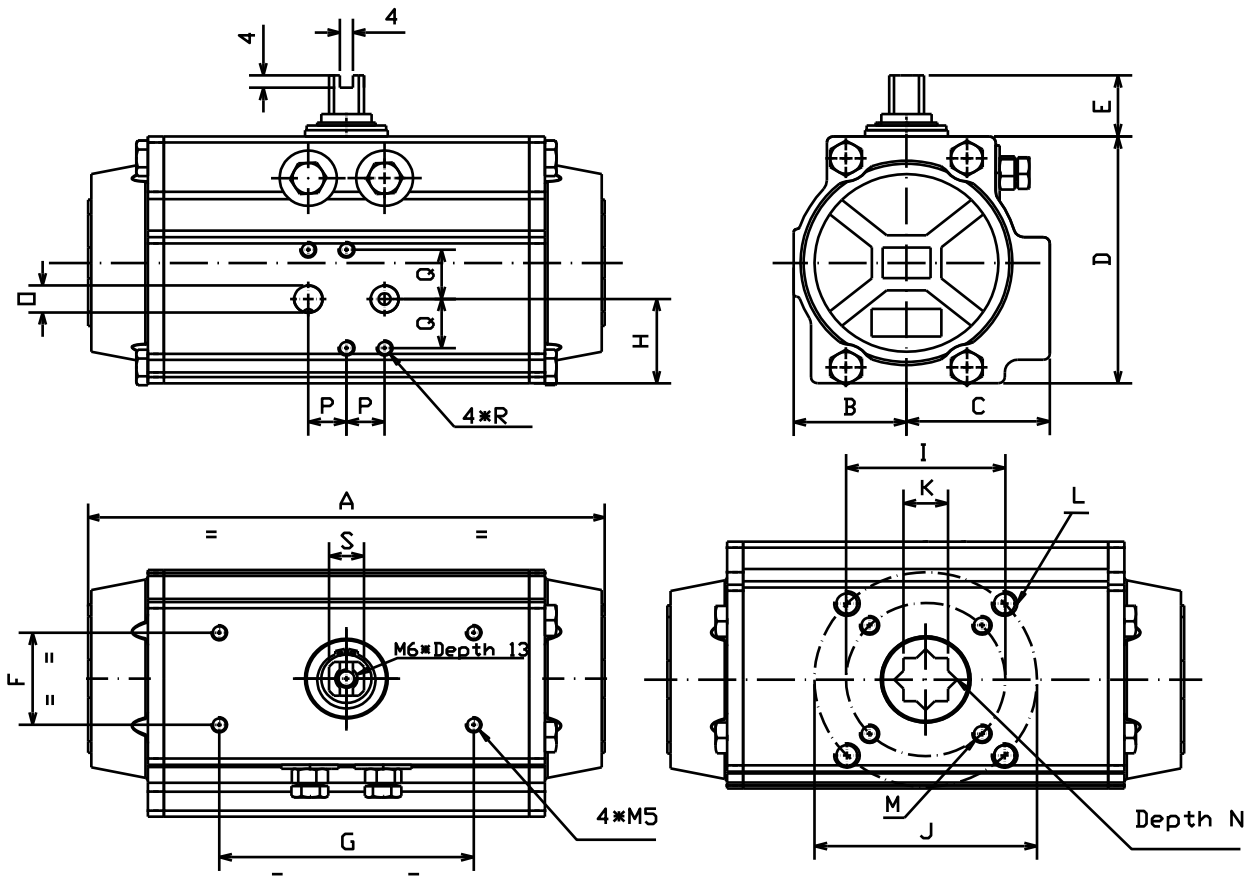


Air to Port 2 (P2) forces the pistons outwards, causing the springs to compress. The pinion turns counterclockwise.

SPRING SET COMBINATION OPTIONS

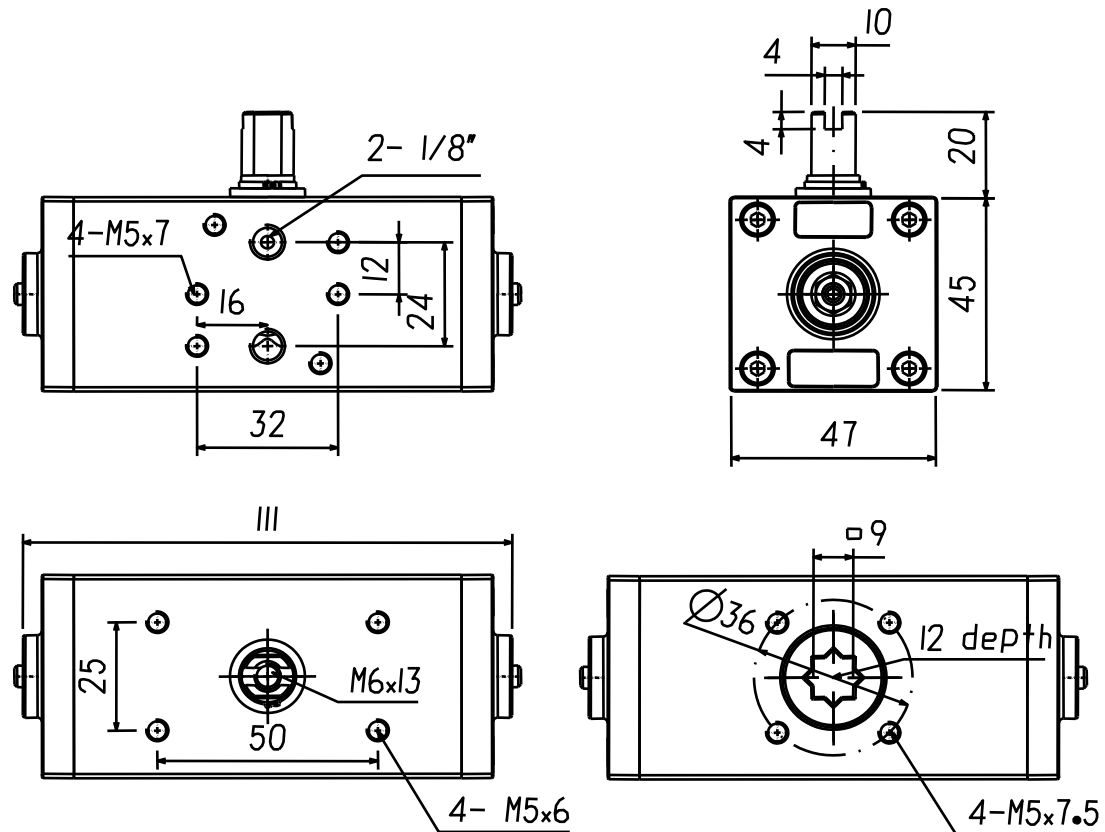
MH-52SR TO MH-140SR				MH-160SR AND MH-200SR					MH-270SR		
EXTERNAL SPRING	INTERNAL SPRING	AIR SUPPLY	SET #	EXTERNAL SPRING	CENTRAL SPRING	INTERNAL SPRING	AIR SUPPLY	SET #	SPRINGS PER SIDE	AIR SUPPLY	SET #
1	1	40PSI	1	X	2	X	40PSI	1	2/3	40PSI	1
2	X	50PSI	2	2	X	X	50PSI	2	3/3	50PSI	2
1	2	60PSI	3	1	2	X	60PSI	3	3/4	60PSI	3
2	1	70PSI	4	2	X	2	70PSI	4	4/4	70PSI	4
2	2	80PSI	5	2	2	X	80PSI	5	4/5	80PSI	5
				2	2	2	100PSI	6	5/5	100PSI	6
									5/6	110PSI	7
									6/6	120PSI	8

PNEUMATIC ACTUATOR MODELS 52 THROUGH 270



MOD	ISO5211	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
52	F03-F05	138	30	41	70	20	30	80	26.5	36	50	11	M6*9	M5*7.5	12	1/8"	12	16	M5*7	11
63	F05-F07	162	35.5	45	81	20	30	80	27.5	50	70	14	M8*12	M6*8	16	1/8"	12	16	M5*7	11
75	F05-F07	208	42	52.5	97	20	30	80	35	50	70	17	M8*12	M6*8	19	1/8"	12	16	M5*7	17
85	F05-F07	245	49	60	116	20	30	80	46	50	70	17	M8*12	M6*8	19	1/8"	12	16	M5*7	17
100	F07-F10	266	55	68	122	20	30	80	50	70	102	17	M10*14	M8*8	20	1/4"	12	16	M5*7	17
115	F07-F10	310	64	73	142	30	30	130	50	70	102	22	M10*14	M8*12	24	1/4"	12	16	M5*7	27
125	F07-F10	340	68	80	154	30	30	130	61	70	125	22	M10*14	M8*12	24	1/4"	12	16	M5*7	27
145	F10-F12	401	78.5	90	179	30	30	130	73	102	125	27	M12*18	M10*15	29	1/4"	12	16	M5*7	27
160	F10-F12	430	86.5	100	192	30	30	130	83.5	102	-	27	M12*18	M10*15	29	1/4"	12	16	M5*7	27
180	F14	482	102	102	222	30	30	130	60	140	-	36	-	M16*25	39	1/4"	12	16	M5*7	30
200	F14	532	112	112	244	30	30	130	63	140	-	36	-	M16*25	39	1/4"	12	16	M5*7	30
240	F16	662	133	133	288	30	30	130	85	165	-	46	-	M20*30	49	3/8"	20	22.5	M6*8	30
270	F16	730	153	153	323	30	30	130	106	165	-	46	-	M20*30	49	1/2"	20	22.5	M6*8	30

PNEUMATIC ACTUATOR MODELS 32



PNEUMATIC DOUBLE ACTING TORQUE

MODLE	Air supply pressure(bar)							
	2.5	3	4	5	5.5	6	7	8
	Torque output double acting actuators(NM)							
MP-32DA	3.5	4.2	6	7.5	8	9	10	11.5
MP-52DA	8.3	10	13.3	16.6	18.3	19.9	23.3	26.6
MP-63DA	14.7	17.6	23.5	29.3	32	35.2	41	46.9
MP-75DA	29	35	46.5	58.2	64	70	82	93
MP-85DA	45.8	54.9	73.2	91.5	101	110	128	146
MP-100DA	66	79.8	106	133	146	160	186	213
MP-115DA	107	129	172	215	236	258	301	344
MP-125DA	138	166	222	277	305	332	388	443
MP-145DA	217	261	348	435	478	522	609	696
MP-160DA	284	340	454	567	624	681	794	908
MP-180DA	383	459	613	766	842	919	4172	1225
MP-200DA	532	638	851	1064	1170	1276	1489	1702
MP-240DA	1160	1392.5	1857	2321	2553	2785	3249	3713
MP-270DA	1550	1860	2480	3100	3410	3720	4341	4961

PNEUMATIC SPRING RETURN TORQUE

MODEL	SET	Spring Torque		Air supply pressure (bar)													
				3		4		5		5,5		6		7		8	
		Air Torque Output (N.M)															
0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°
MP-52SR	3/3	4	5.8	5.9	4.1	9.3	7.4	12.6	10.8	14.2	12.4						
	4/4	5.4	7.8			7.9	5.5	11.2	8.8	12.9	10.5	14.6	12.1	17.9	15.5		
	5/5	6.7	9.7					9.9	6.9	11.5	8.5	13.2	10.2	16.5	13.5	19.8	16.8
	6/6	8.1	11.7							10.2	6.6	11.9	8.2	15.2	11.6	18.5	14.9
MP-63SR	3/3	7	10.1	10.1	10.9	7.5	16.8	13.3	22.74	19.2	25.6	22.1					
	4/4	9	13.5			14.6	10	20.4	15.8	23.4	18.7	26.3	21.7	32.2	27.5		
	5/5	11.1	16.9					18.2	12.4	21.1	15.4	24.1	18.3	29.9	24.2	35.8	30
	6/6	13.3	20.2							18.9	12	21.9	14.9	27.7	20.8	33.6	26.7
MP-75SR	3/3	13.2	20.8	21.6	14	33.3	25.8	44.9	37.4	50.7	43.2						
	4/4	17.7	27.7			28.8	18.8	40.5	30.5	46.3	36.3	52.1	42.1	63.7	53.7		
	5/5	22.1	34.6					36.1	23.6	41.9	29.4	47.7	35.2	59.3	46.8	71	58.5
	6/6	26.5	41.5							37.5	22.4	43.3	28.3	54.9	39.9	66.5	51.5
MP-85SR	3/3	22	34.7	32.9	20	51.2	38.6	69.5	56.9	78.7	66						
	4/4	29.3	46.2			43.2	27	62.2	45.3	71.3	54.5	80.5	63.6	98.8	81.9		
	5/5	36.7	57.8					54.8	33.8	63	42.9	73.1	52.1	91.5	70.4	109	88.7
	6/6	44	69.3							56.7	31.4	65.8	40.5	84.1	58.8	102	77.1
MP-100SR	3/3	30.4	47.3	49.4	32	75	59.1	102	85.7	115	99						
	4/4	40.5	63			65.8	43.3	92.4	69.9	105	83.2	119	96.5	145	123		
	5/5	50.7	78.8					82.3	54.2	95.6	67.5	108	80.8	135	107	162	133
	6/6	60.8	94.5							85.4	51.7	98.7	65	125	91.6	151	118
MP-115SR	3/3	49.2	78.6	79.7	50	122	93.3	166	136	187	157						
	4/4	65.6	105			106	67.41	149	110	171	131	192	153	235	196		
	5/5	82	131					133	83.9	154	105	176	126	218	169	261	212
	6/6	98.4	157							138	79.2	159	100	202	186	245	186
MP-125SR	3/3	63	98.9	103	67	159	123	214	178	242	206						
	4/4	84	132			138	90	193	145	221	173	248	201	304	256		
	5/5	105	165					171	112	200	140	227	168	283	223	338	278
	6/6	126	198							179	107	206	135	262	190	317	245
MP-145SR	3/3	99	155	162	106	249	193	336	280	379	324						
	4/4	132	206			216	142	303	229	347	272	390	316	477	403		
	5/5	165	258					270	177	314	221	357	264	444	351	531	438
	6/6	198	309							281	169	324	213	411	299	498	386
MP-160SR	3/3	135	199	206	141	319	255	433	368	489	425						
	4/4	180	266			274	188	388	302	444	358	501	415	615	528		
	5/5	224	332					343	235	400	292	456	349	570	462	683	575
	6/6	269	399							355	225	411	282	525	396	638	509
MP-180SR	3/3	190	284	270	175	423	329	576	482	653	558						
	4/4	253	379			360	234	513	387	589	464	666	540	819	693		
	5/5	316	474					450	292	526	369	603	445	756	599	909	752
	6/6	379	568							463	274	540	351	693	504	846	657
MP-200SR	3/3	255	378	383	260	596	473	808	686	915	792						
	4/4	340	504			511	347	723	560	830	666	936	772	1149	985		
	5/5	425	630					638	434	745	540	851	646	1064	859	1277	1072
	6/6	510	756							660	414	766	520	979	733	1192	946
FP-240SR	3/3	563	842	830	550	1294	1014	1758	1478	1990	1710						
	4/4	750	1123			1107	733	1571	1198	1803	1430	2035	1662	2499	2126		
	5/5	937	1404			920	453	1384	917	1616	1149	1848	1381	2312	1845	2776	2309
	6/6	1124	1685					1197	636	1429	868	1661	1100	2125	1564	2589	2028
FP-270SR	3/3	790	1184	1168	774	1821	1427	2473	2079	2800	2406						
	4/4	1054	1579			1557	1032	2210	1684	2536	2011	2863	2337	3515	2990		
	5/5	1317	1974			1294	637	1947	1290	2273	1616	2599	1942	3252	2595	3905	3248
	6/6	1580	2369					1683	895	2010	1221	2336	1548	2989	2200	3641	2853

* Spring 6 pcs is for application with 6 bar air pressure. Spring 8pcs as standard for factory setting.

TECHNICAL DATA

Actuator air consumption chart(liter) (1 liter =1000cm³)

Model	32	52	63	75	85	100	115	125	140	160	180	200	240	270
DA	0.07	0.23	0.44	0.83	1.15	1.88	3.03	3.96	5.42	8.24	11.46	15.59	33	46.3
SR	-	0.1	0.18	0.35	0.53	0.82	1.31	1.7	2.4	3.5	4.58	6.26	14	19.5

Double Acting Volume is CW+CCW Cycle

Weight chart (kg)

Model	32	52	63	75	85	100	115	125	140	160	180	200	240	270
DA	0.5	1.1	1.6	2.9	4.2	5.6	9.1	10	15	21.3	26.8	36.7	60	86
SR	-	1.4	1.7	3.2	4.7	6.4	10.8	13.5	20.5	24.5	32	42.8	70	102

Working time (sec.)

Model	32	52	63	75	85	100	115	125	140	160	180	200	240	270
CW DA	0.1	0.2	0.3	0.4	0.5	0.6	0.8	1.1	1.4	1.7	2.3	3.2	4.5	6
CCW DA	0.1	0.2	0.3	0.3	0.4	0.5	0.7	1	1.2	1.5	2	2.7	4	5.5
CW SR	-	0.3	0.4	0.5	0.6	0.9	1	1.4	1.8	2.1	2.9	4	5.5	7.4
CCW SR	-	0.3	0.3	0.4	0.5	0.7	0.9	1.2	1.6	2	2.5	3.6	5	7

Cycle time got without valve and should be use as a guide only.
Cycle time can be increase dramatically for actual application.