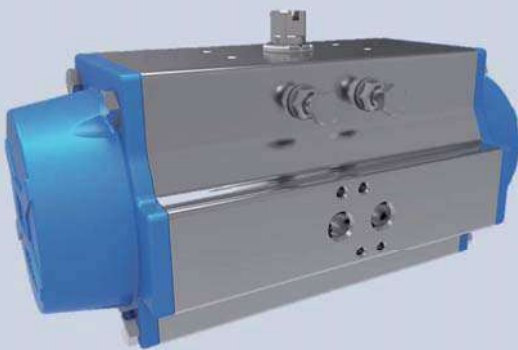




# KLINGER KRP

DA and SR Series  
Rack and Pinion



# FEATURES & BENEFITS

## COMPACT DESIGN

The KLINGER rack & pinion pneumatic actuator produces linear torque output in a compact design utilizing the same body and end caps for double-acting and spring-return units.

## NAMUR MOUNTING

Namur VDI/VDE 3845 and ISO 5211 dimensions on all sizes. No special blocks are required to mount solenoid valves, limit switches or positioners.

## DEGREE OF TRAVEL

The standard angle of rotation is 90°. Additional travel rotations through 180° are available. Two independent external travel stop adjustments permit easy and precise adjustment of  $\pm 5^\circ$  in both directions. This adjustment may be made in either the open or closed position and provides for accurate valve alignment.

## MULTIPLE OUTPUT SHAFTS

The female pinion drive is standard with a double-square output drive, and optional with a double-D drive, keyed drive and designs to meet your specific requirements.

## HIGH-CYCLE BEARINGS

Multiple bearings and guides on pistons and racks for precise operation, low friction, high cycle life and a blowout proof pinion shaft.

## RUGGED TOOTH DESIGN

The pinion teeth are engaged the full length and stroke of the piston. The pinion height allows manual override without needing to remove the indicator.

## HIGH VISIBILITY POSITION INDICATION

External open/close indicator as standard, available for all rotations.

## HIGH CYCLE-LIFE WEAR PADS

Pistons incorporate double wear pads (skates) to separate the rack from the actuator wall and serve as both guide and wear bearings.

## LONG SERVICE LIFE SPRING

Epoxy-coated special steel springs are pre-loaded with nonmetallic materials. The stainless steel end-cap fasteners are extra long to allow for spring relaxation. All parts are corrosion-resistant.

## ALTERNATIVE OPERATING MEDIA

Air pressure operation from 2.5 to 10 Bar (36 to 150 PSI). Water, nitrogen and compatible hydraulic fluids may also be used to power the actuator.

## STAINLESS STEEL FASTENERS

All external fasteners are corrosion-resistant stainless steel.

## HONED BORE FOR HIGH CYCLE-LIFE

Extruded aluminum body is internally machined and honed to exact specifications. Honing prevents dry spots from forming within the actuator bore and therefore eliminates premature seal failure—a critical aspect to long cycle-life. All external surfaces are hard anodized for corrosion resistance, with all units permanently lubricated at the factory.

## TRACEABILITY

All units are externally marked with a progressive traceable serial number.

## QUALITY ASSURANCE

100% of all units are factory pressure and leak tested, and individually boxed for shipment.

## ACCESSORIES

KLINGER offers a wide range of adapters for many different types of valves—including butterfly valves, ball valves and plug valves—as well as a variety of pneumatic and electric automation accessories suitable for diverse industrial environments.

*Please call for details.*

# DOUBLE ACTING TORQUES DA032-DA350

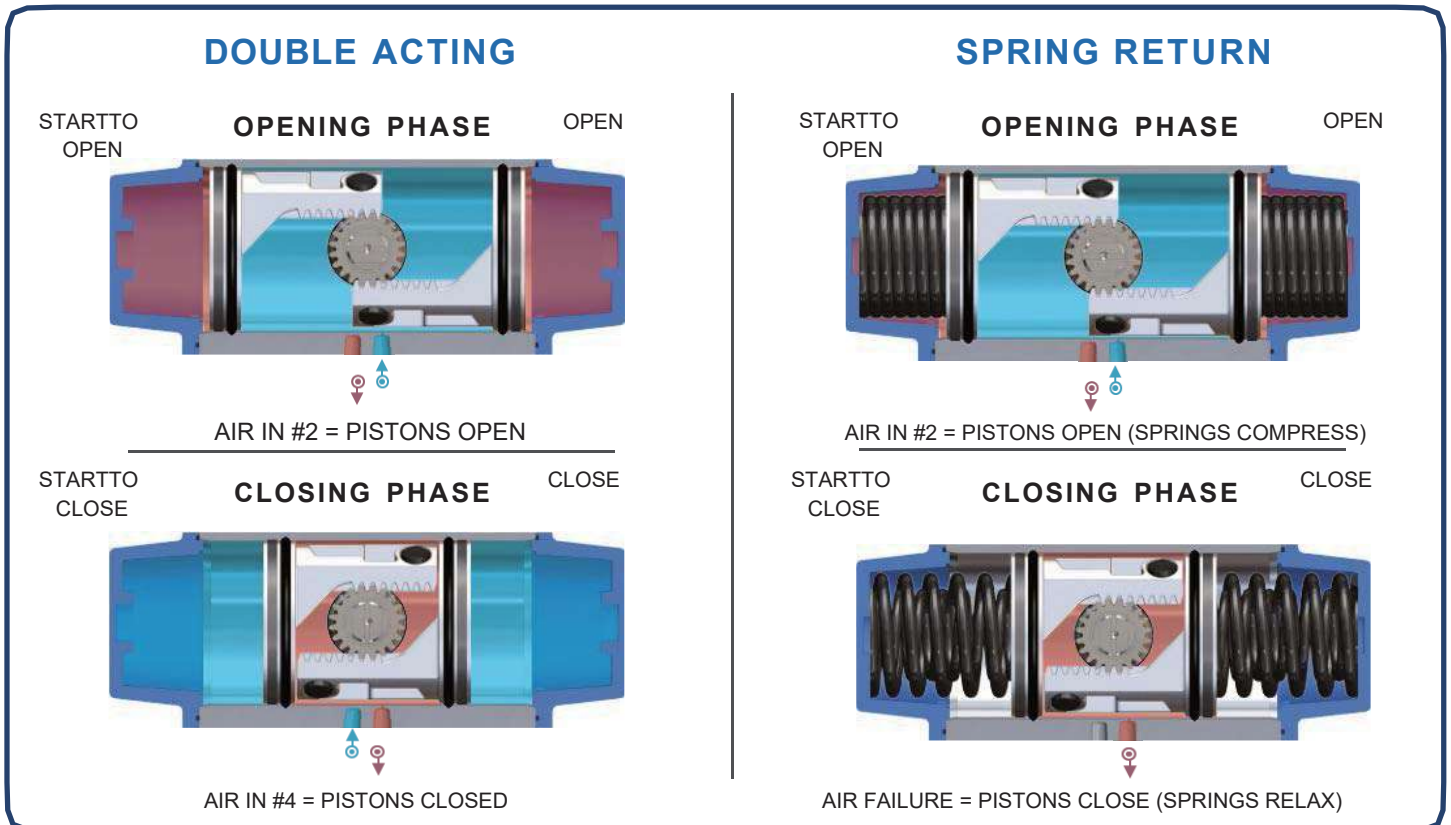


	2.5bar	3bar	4bar	4.5bar	5bar	5.5bar	6bar	7bar	8bar
DA032	3.5	4.2	5.8	6.6	7.3	8.0	8.8	10.0	11.5
DA052	9.0	11.0	14.5	16.4	18.5	20.2	22.1	25.9	30.0
DA063	15.6	19.1	26.0	26.4	33.0	36.2	39.6	46.5	53.5
DA075	29.0	35.1	47.5	53.6	60.0	66.0	72.2	84.5	97.0
DA085	41.5	50.5	68.6	77.7	87.0	96.0	105.0	123.0	141.2
DA100	66.0	80.0	108.0	122.2	136.3	150.4	164.6	193.0	221.1
DA115	109.0	132.2	179.0	202.3	226.0	249.0	272.3	319.0	366.0
DA125	143.5	174.0	235.3	274.7	297.0	327.3	358.0	419.3	481.0
DA140	205.0	246.0	328.0	369.0	410.0	451.0	493.0	575.0	657.0
DA160	298.0	356.0	470.0	529.0	588.0	647.0	705.0	822.0	940.0
DA180	441.0	530.0	708.0	797.0	886.0	975.0	1064.0	1242.0	1420.0
DA210	647.0	776.0	1035.0	1165.0	1295.0	1424.0	1554.0	1812.0	2070.0
DA240	954.0	1145.0	1527.0	1718.0	1909.0	2100.0	2291.0	2674.0	3056.0
DA270	1523.0	1828.0	2437.0	2742.0	3046.0	3351.0	3656.0	4265.0	4874.0
DA300	1709.0	2051.0	2735.0	3077.0	3419.0	3761.0	4103.0	4787.0	5471.0
DA350	2532.0	3038.0	4051.0	4557.0	5063.0	5570.0	6076.0	7089.0	8102.0

\*\* All torques in N.m, 10% safety factor is recommended.

\*\* Double Acting Operation is also known as "Air to Open, Air to Close" or "Air to Air".

## OPERATION REFERENCE DIAGRAM



# SPRING RETURN TORQUES SA052-SA160

	SPRING			2.5bar		3bar		4bar		4.5bar		5bar		5.5bar		6bar		7bar		8bar	
	Springs	MMD 0°	MMC 90°	MAD 0°	MAC 90°	MAD 0°	MAC 90°	MAD 0°	MAC 90°	MAD 0°	MAC 90°	MAD 0°	MAC 90°	MAD 0°	MAC 90°	MAD 0°	MAC 90°	MAD 0°	MAC 90°	MAD 0°	MAC 90°
SA052	S01	3.6	4.9	4.5	1.6	6.4	3.5	10.2	7.4	11.9	8.1										
	S02	4.8	6.7			5.2	1.7	9	5.6	10.9	7.5	12.8	9.4								
	S03	5.2	7.5					8.6	4.8	9.4	7	12.4	8.6	14.3	10.5	16.2	12.4				
	S04	6.5	9.3					7.3	3	8.4	4.9	11.2	6.8	13.1	8.7	15	10.6	18.8	14.5		
	S05	8.1	11.9							7.5	3.5	9.5	4.3	11.4	6.2	13.3	8.1	17.1	11.9	20.9	15.7
SA063	S01	5	9.6	8.6	2.6	12	6	18.9	12.8	21	13.5										
	S02	6.6	12.3			10.5	3.2	17.4	10.1	19	11.1	24.2	17								
	S03	8	14.5					15.9	7.9	16.4	9.8	22.8	14.8	26.2	18.2	29.6	21.7				
	S04	9.6	17.2					14.4	5.2	15.1	8	21.2	12	24.6	15.5	28.1	18.9	34.9	25.8		
	S05	12.5	22.1							14.2	5.5	18.2	7.1	21.7	10.6	25.1	14	31.9	20.9	38.8	27.7
SA075	S01	10.1	19.5	15.8	3.9	22	10.1	34.4	22.5	35.4	23.5										
	S02	13.3	25.6			18.8	4	31.2	16.4	32.1	17.1	43.5	28.7								
	S03	15.1	28.2					29.4	13.8	30.2	14.9	41.8	26.1	48	32.3	54.1	38.5				
	S04	18.3	34.3					26.2	7.7	27.3	12	38.6	20	44.8	26.2	50.9	32.4	63.3	44.8		
	S05	23.2	43							20.7	9	33.6	11.3	39.8	17.5	46	23.7	58.3	36.1	70.7	48.4
SA085	S01	16.1	27.3	22.2	7.6	31.3	16.6	49.5	34.8	50	35.3										
	S02	19.9	33.7			27.6	10.3	45.7	28.4	46.3	30	63.9	46.6								
	S03	24.3	40.8					41.3	21.3	42.4	25	59.4	39.5	68.5	48.6	77.6	57.6				
	S04	28.1	47.1					37.5	15	38.9	22.1	55.7	33.1	64.8	42.2	73.8	51.3	92	69.4		
	S05	36.3	60.6							32.1	16	47.5	19.6	56.6	28.7	65.6	37.8	83.8	55.9	101.9	74.1
SA100	S01	24.6	44.6	36	10.1	50.2	24.2	78.4	52.5	79.2	53.4										
	S02	32.6	58.9			42.2	9.9	70.5	38.1	71	45	98.7	66.4								
	S03	35.9	63.7					67.1	33.3	68.1	37.2	95.4	61.6	109.5	75.7	123.6	89.9				
	S04	43.9	78					59.1	19	62	30	87.4	47.3	101.5	61.4	115.7	75.5	143.9	103.8		
	S05	55.2	97.2							55	20	76.1	28.1	90.2	42.3	104.3	56.4	132.6	84.7	160.8	112.9
SA115	S01	41	74.4	61.3	18.4	84.7	41.8	131.4	88.5	135.4	99.6										
	S02	50.7	94.4			74.9	21.8	121.6	68.5	128.5	80.4	168.3	115.2								
	S03	60.8	108.1					111.6	54.7	115.4	65.7	158.3	101.5	181.6	124.8	205	148.2				
	S04	70.6	128.1					101.8	34.8	105.5	45.8	148.5	81.5	171.9	104.9	195.2	128.2	241.9	174.9		
	S05	90.4	161.8							98.5	32.2	128.7	47.8	152	71.1	175.4	94.5	222.1	141.2	268.8	187.9
SA125	S01	53.1	99.1	80.2	21.2	110.9	51.9	172.2	113.2	179.1	118.5										
	S02	63.3	117.5			100.7	33.5	162.1	94.8	169.2	98.6	223.4	156.1								
	S03	81.1	148.4					144.2	63.9	149.2	68.8	205.5	125.2	236.2	155.9	266.8	186.5				
	S04	91.3	166.9					134.1	45.5	138.3	56	195.4	106.8	226.1	137.5	256.7	168.1	318	229.4		
	S05	119.2	216.2							113.7	40	167.4	57.5	198.1	88.1	228.7	118.8	290.1	180.1	351.4	241.4
SA140	S01	82	152	119	36	160	77	242	159	260	227										
	S02	92	172			149	56	231	138	239	194	313	220								
	S03	117	221					205	86	217	162	287	168	328	209	369	250				
	S04	128	240					193	64	196	129	275	146	316	187	358	229	440	311		
	S05	164	308									238	72	279	114	320	155	402	237	484	319
SA 160	S01	114	187.1	181.9	113.4	237.6	180.5	374.8	304.6	440.4	363.2										
	S02	128.3	211.9			244.4	157.3	365.9	283.5	426.7	346.8	491.1	408.4								
	S03	164.8	279					312.7	197.1	374.8	255.8	432.5	322.6	498.2	388.6	555.4	454.2				
	S04	172.6	293.6					294.5	176.8	358.6	236.9	419.2	289.4	482.2	361.4	542.8	424.8	645.9	531		
	S05	233.7	390.5					264.2	104.2	296.4	158.6	361.7	218.4	419.4	281.3	481.2	336.3	604.7	452	729.5	572

\*\* All torques in N.m,10% safety factor is recomm ended.

\*\* Spring Return Actuators are also known as "Air to Open, Spring to Close" or "Air to Spring".

# SPRING RETURN TORQUES SA180-SA350

	SPRING			2.5bar		3bar		4bar		4.5bar		5bar		5.5bar		6bar		7bar		8bar	
	Springs	MMD 0°	MMC 90°	MAD 0°	MAC 90°	MAD 0°	MAC 90°	MAD 0°	MAC 90°	MAD 0°	MAC 90°	MAD 0°	MAC 90°	MAD 0°	MAC 90°	MAD 0°	MAC 90°	MAD 0°	MAC 90°	MAD 0°	MAC 90°
SA180	S06	171	271	270	170	373	289	546	462	633	549										
	S08	229	361			325	213	498	386	584	472	671	559								
	S10	286	451					449	309	536	395	622	482	709	569	795	655				
	S12	343	541							487	319	574	405	660	492	747	578	920	751		
	S14	400	631									525	329	612	415	698	502	871	675	1044	848
SA210	S06	270	421	377	226	477	349	712	584	830	702										
	S08	360	562			400	229	636	465	754	582	871	700								
	S10	451	702					559	345	677	463	795	581	912	699	1030	816				
	S12	541	843							600	344	718	461	836	579	954	697	1189	933		
	S14	631	983									642	342	759	460	887	578	1113	813	1348	1049
SA240	S06	384	577	570	377	702	509	1064	871	1245	1052										
	S08	512	770			574	316	936	678	1117	859	1298	1040								
	S10	640	962					808	486	989	667	1170	848	1351	1029	1532	1210				
	S12	768	1154							861	474	1042	655	1223	836	1404	1017	1766	1379		
	S14	896	1347									914	463	1095	644	1276	825	1638	1187	2000	1549
SA270	S06	659	1098	864	425	1169	730	1778	1339	2083	1644										
	S08	879	1464			949	364	1558	973	1863	1278	2167	1582								
	S10	1099	1830					1338	607	1643	912	1947	1216	2252	1521	2557	1826				
	S12	1319	2196							1423	546	1727	850	2032	1155	2337	1460	2946	2069		
	S14	1538	2562									1508	484	1813	789	2118	1094	2727	1703	3336	2312
SA300	S06	762	1291	947	418	1289	760	1973	1444	2315	1786										
	S08	1016	1722			1035	329	1719	1013	2061	1355	2403	1697								
	S10	1270	2152					1465	583	1807	925	2149	1267	2491	1609	2833	1951				
	S12	1524	2582							1553	495	1895	837	2237	1179	2579	1521	3263	2205		
	S14	1778	3013									1641	406	1983	748	2325	1090	3009	1774	3693	2458
SA350	S06	872	1539	1660	993	2166	1499	3179	2512	3685	3018										
	S08	1163	2052			1875	986	2888	1999	3394	2505	3900	3011								
	S10	1454	2565					2597	1486	3103	1992	3609	2498	4116	3005	4622	3511				
	S12	1744	3078							2813	1479	3319	1985	3826	2492	4332	2998	5345	4011		
	S14	2035	3591									3028	1472	3535	1979	4041	2485	5054	3498	6067	4511

\*\* All torques in N.m,10% safety factor is recommended.

\*\* Spring Return Actuators are also known as "Air to Open, Spring to Close" or "Air to Spring".

## SPRINGS SETTING OF SINGLE ACTING MODELS



### SA052-AS160

SET	Left Side		Right Side	
	External	Internal	External	Internal
S01	1	-	-	1
S02	1	-	1	-
S03	1	1	-	1
S04	1	1	1	-
S05	1	1	1	1

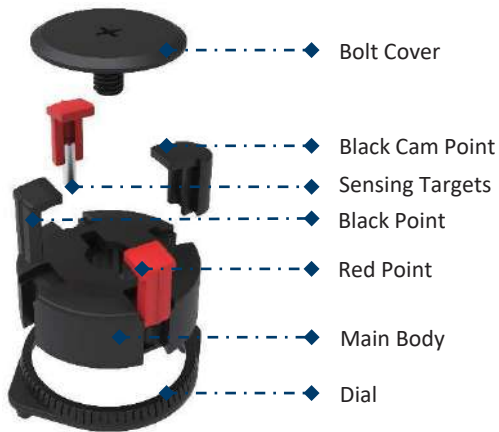
\* Left/Right Side : See from the face with air port



### SA180-AS350

SET	Left Side	Right Side
S06	3	3
S07	4	3
S08	4	4
S09	5	4
S10	5	5
S11	6	5
S12	6	6
S13	7	6
S14	7	7

## POSITION INDICATOR STRUCTURE



Code	Bolt Cover	Main Body	Dial	Black Point	Red Point	Black Cam Point	Sensing Targets
Blank	1	1	1	2	2	0	0
A	1	1	1	2	2	0	2
B	1	1	1	1	2	1	0
*							

\* For other options, to contact us for detail.



Slot Vertical Actuator



Slot Parallel Actuator

# HOW TO ORDER

1	2	3	4	5	6	7	—	8	9	10
---	---	---	---	---	---	---	---	---	---	----

1-Type	
DA	Double Acting
SA	Single Acting with Springs Return

2-Size			
032	Size 032	140	Size 140
052	Size 052	160	Size 160
063	Size 063	180	Size 180
075	Size 075	210	Size 210
085	Size 085	240	Size 240
100	Size 100	270	Size 270
115	Size 115	300	Size 300
125	Size 125	350	Size 350

3-Output Drive			
DS09	9mm Double square For Size 032	DS27	27mm Double square For Size 140-160
DS11	11mm Double square For Size 052	DS36	36mm Double square For Size 180-210
DS14	14mm Double square For Size 063	DS46	46mm Double square For Size 240-300
DS17	17mm Double square For Size 075-100	DS55	55mm Double square For Size 350
DS22	22mm Double square For Size 115-125		

\*Options to see ACTUATOR REFERENCE TABLE  
\*For flat or key(s) Drive, to contact us for detail.

4-Pinion Rotation	
C*	A(2) port air release, spring return or B(4) port air in, pinion clockwise rotation(Top view), slot vertical actuator;
P	A(2) port air release, spring return or B(4) port air in, pinion clockwise rotation(Top view), slot parallel actuator;
R*	A(2) port air release, spring return or B(4) port air in, pinion counterclockwise rotation(Top view), slot parallel actuator;
V	A(2) port air release, spring return or B(4) port air in, pinion counterclockwise rotation(Top view), slot vertical actuator;

5-Mounting			
0300	Flange F03, For Size 032	1014	Flange F10 -F14, For Size 180
0305	Flange F03-F05, For Size 052	1400	Flange F14, For Size 210
0507	Flange F05 -F07, For Size 063-085	1600	Flange F16, For Size 240-300
0710	Flange F07 -F10, For Size 100-125	1625	Flange F16 -F25, For Size 350
1012	Flange F10 -F12, For Size 140-160		

\*Options to see ACTUATOR REFERENCE TABLE

6- Springs Set					
Blank	Double - Acting	For all size	S06	3+3 Springs	For size 180 -350
S01	1+1 Springs	For size 052 - ,160	S08	4+4 Springs	
S02	2+ / Springs		S10	5+5 Springs	
S03	1+2 Springs		S12	6+6 Springs	
S04	2+1 Springs		S14	7+7 Springs	
S05	2+2 Springs		*S07/S09/S11/S13 also available ,to contact us for detail.		

7-Amb. Temp	
Blank	Standard Temp : -20 °C to 85 °C
H	High Temp. : -20 °C to 120 °C
L	Low Temp. : -40 °C to 80 °C

UH/UL - ultra high/low Temp available, to contact us for detail.

8-Additional Options	
Body and end cap surface treatment	
Blank	Body hard anodized – silver color End caps epoxy painted – blue RAL5015
AA	Body hard anodized – silver color End caps epoxy painted – Orange RAL2008

\*For other options, to contact us for detail.

9-Additional Options	
Position Indicator	
Blank	two black and red points
A	two black and red points, two sensing targets

\*For other options, to contact us for detail.

10-Custom Options	
Body/Pinion/End cap custom options	
TPL.AHRF100	Body custom AHRF100
TPL.AHRF100.ASCF100	Body custom AHRF100, Pinion custom ASCF100

\*For other options, to contact us for detail.

\*Note :

- 1) Not all combinations available, and special solutions not shown are possible. Please call factory for details.
- 2) KLINGER reserves the right to change or modify products without prior notice & without incurring any obligation to make such changes on products previously or subsequently sold.



# AIR CONSUMPTION / WEIGHTS

## SAMPLE PART NUMBERS

**SA063DS14C0507S04-AAA TPL.AHRF063.ASCF063**

Type = Single Acting

SIZE = 063

OUTPUT DRIVE = 14mm DSQ

Pinion Rotation = C

Mounting = F05-F07

Spings Set= S04

Amb. Temp= blank-Standard Temp

Body and end cap surface treatment = AA

Position Indicator = A

Body/Pinion/End cap custom options = TPL.AHRF063 .ASCF063

## ACTUATOR REFERENCE TABLE

	Standard Drive (mm)	Optional Drive (mm)	Standard ISO Pattern	Optional ISO Pattern
032	9	—	F03	—
052	11	9	F03 - F05	—
063	14	11	F05 - F07	F04
075	17	11 / 14	F05 - F07	—
085	17	11 / 14	F05 - F07	—
100	17	14	F07 - F10	—
115	22	17	F07 - F10	—
125	22	17	F07 - F10	—
140	27	22	F10 - F12	—
160	27	22	F10 - F12	—
180	36	27	F10 - F14	F12
210	36	27	F14	F12
240	46	36	F16	F14
270	46	36	F16	F14 *
300	46	36	F16	F14 *
350	55	46	F16 - F25	—

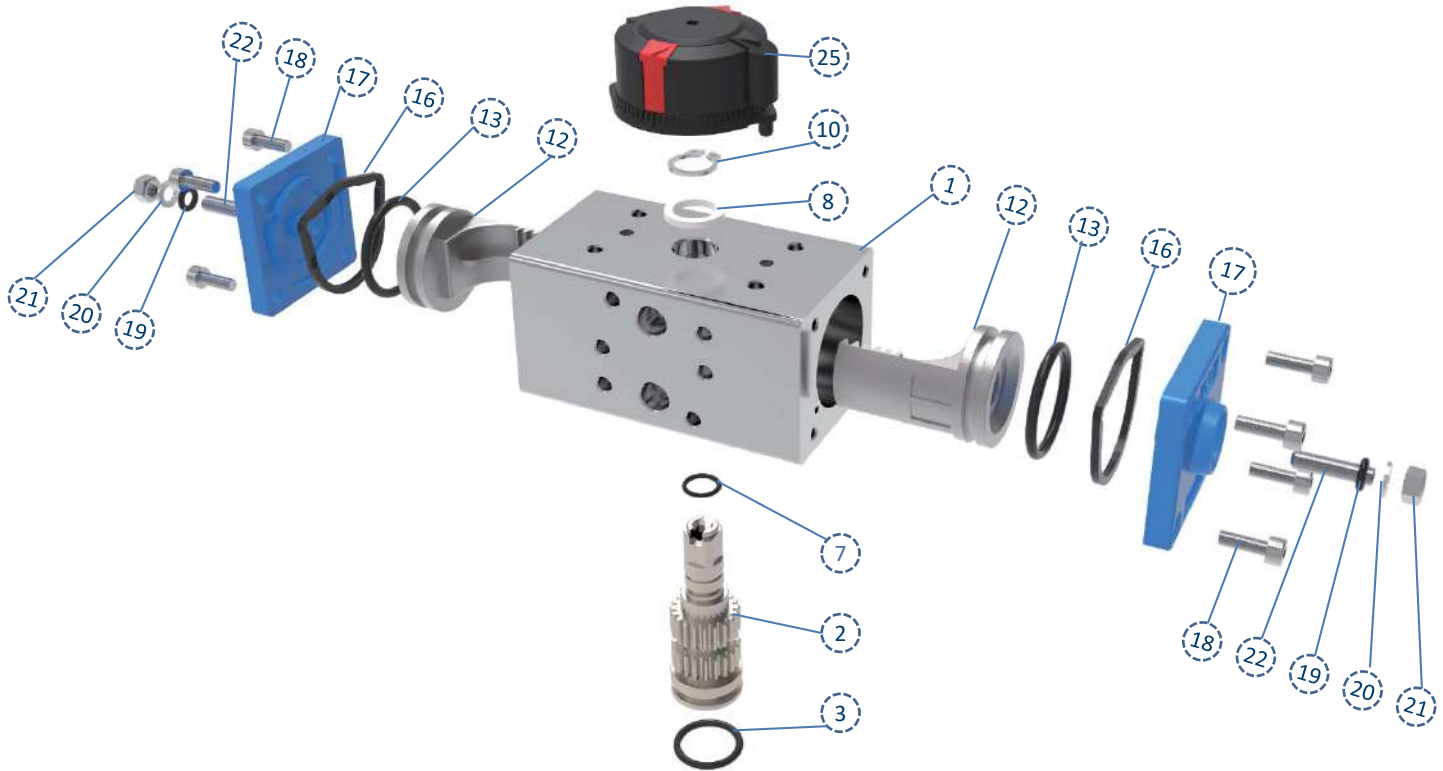
\*\* Contact for Confirmation

	Double Acting					Spring Return			
	Weight (Kg)	Working Time (sec.)		Air Consumption (L)		Weight (Kg)	Working Time (sec.)		Air Consumption(L)
		CCW	CW	CCW	CW		CCW	CW	
032	0.5	0.03	0.03	0.04	0.03	NA	NA	NA	NA
052	1.05	0.03	0.03	0.10	0.13	1.22	0.04	0.03	0.10
063	1.50	0.04	0.04	0.19	0.23	1.80	0.07	0.04	0.19
075	2.55	0.05	0.05	0.36	0.44	3.20	0.11	0.06	0.36
085	3.40	0.06	0.06	0.51	0.64	4.30	0.22	0.09	0.51
100	5.05	0.07	0.07	0.79	1.00	6.55	0.28	0.11	0.79
115	8.20	0.12	0.12	1.29	1.71	11.00	0.43	0.23	1.29
125	10.00	0.15	0.15	1.63	2.21	13.50	0.57	0.19	1.63
140	15.30	0.26	0.23	2.36	3.16	20.00	0.79	0.37	2.26
160	19.50	0.30	0.27	3.61	5.12	24.40	0.94	0.33	3.61
180	25.80	1.20	1.50	5.50	8.50	34.30	2.30	2.80	5.50
210	32.50	1.80	2.00	7.80	12.50	46.00	2.80	3.20	7.80
240	49.70	2.20	2.50	11.70	18.00	68.00	3.20	3.50	11.70
270	78.20	2.60	2.90	19.00	27.50	108.50	3.60	3.90	19.00
300	87.00	2.70	3.00	21.50	29.50	117.30	3.70	4.20	21.50
350	129.40	3.00	3.50	33.20	37.50	182.90	4.30	5.00	33.20

\*\* Note: Spring return weights consider actuator fitted with max number of springs possible. Air consumption is normalized at standard temperature and pressure.



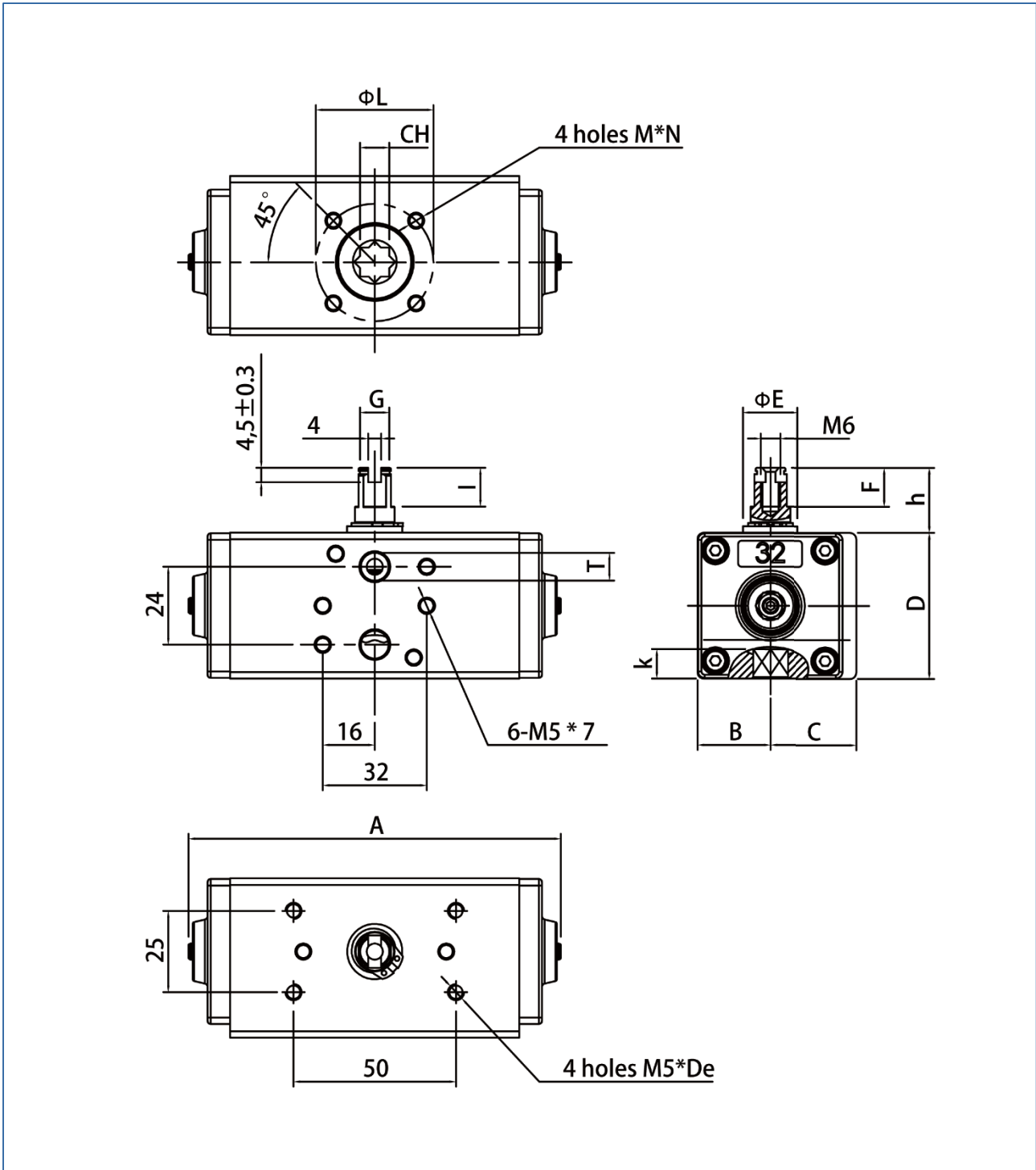
# 032 EXPLODED VIEW



#	DESCRIPTION	MATERIALS	NOTE
25	Position Indicator	PP	
22	Stop Bolt	Stainless Steel	
21	Stop Bolt Retaining Nut	Stainless Steel	
20	Stop Bolt Retaining Nut Ring	Stainless Steel	
19	Stop Bolt O-Ring	NBR	
18	End Cap Fixing Screw	Stainless Steel	
17	End Cap	Die Cast Aluminum-Epoxy Resin Coating	
16	End Cap Seat	NBR	
13	Piston O-Ring	NBR	
12	Piston	Die Cast Aluminum	
10	Pinion Snap Ring	Nickel Plated Steel	
8	Top Pinion Spacer Ring	POM	
7	Top Pinion O-Ring	NBR	
3	Lower Pinion O-Ring	NBR	
2	Anti-Blowout Pinion	Nickel Plated Steel	
1	Body	Extruded Aluminum-Hard Anodized	

## NOTE

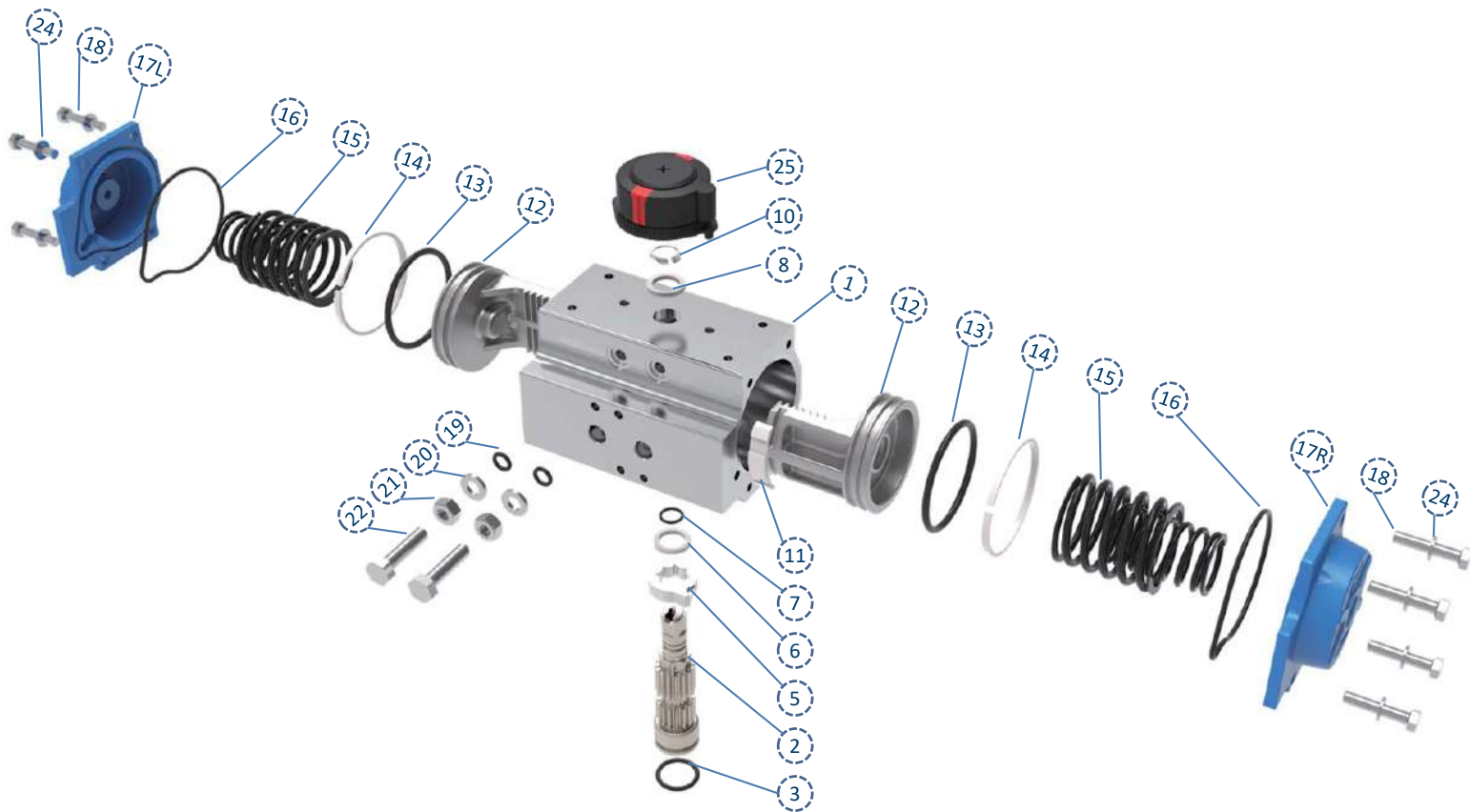
The 032 is the smallest actuator in our rack and pinion lineup.  
The 032 is only available in double-acting configuration.



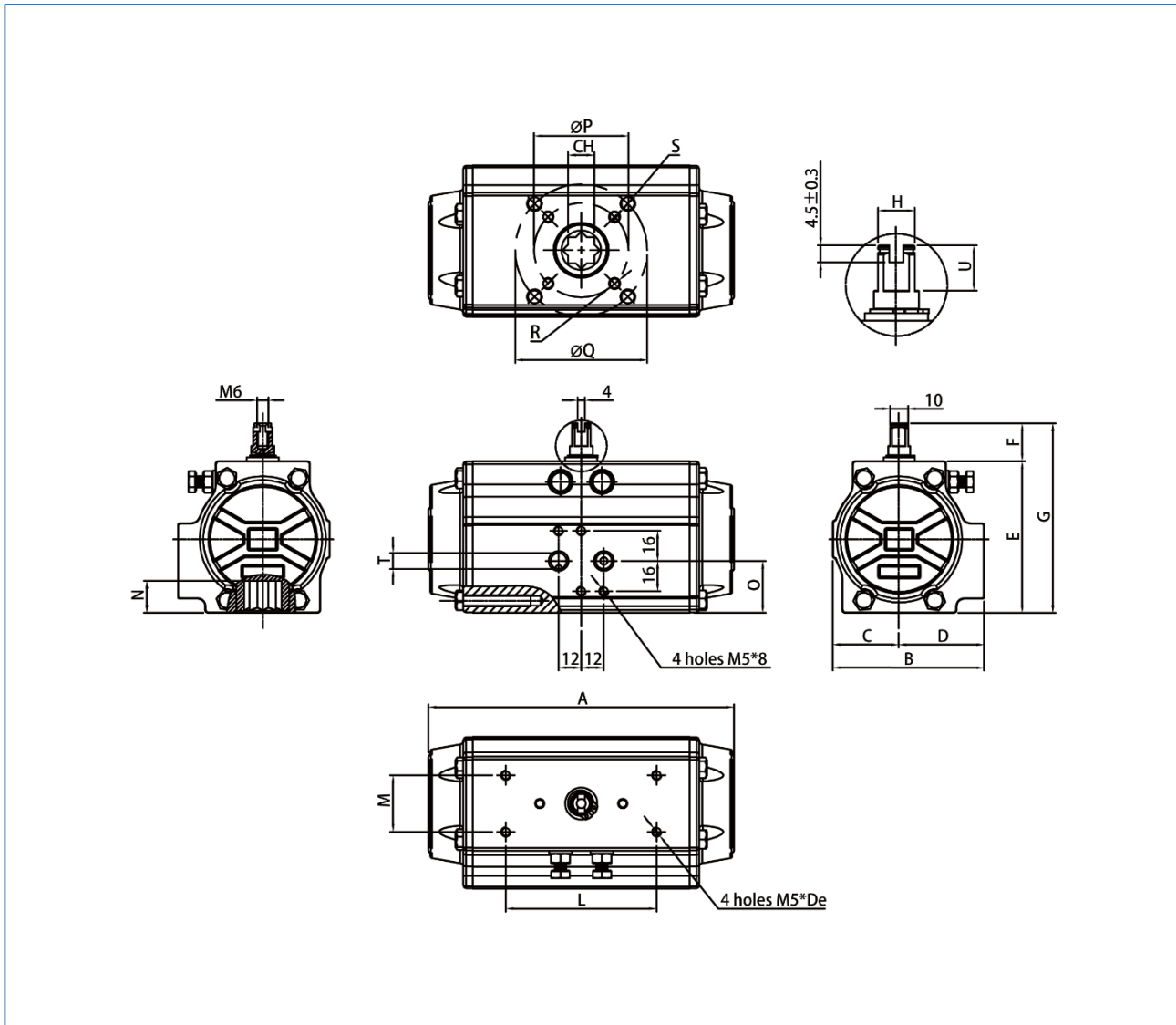
\*Only available in Double Acting configuration.

	A	B	C	D	$\Phi E$	F	CH	h	I	$\Phi L$	M*N	De	T	k
032	114.6	22.5	26.5	45	17	12	9	20	14.5	36	M5*7.5	8	1/8"	12

# 052 - 160 EXPLODED VIEW

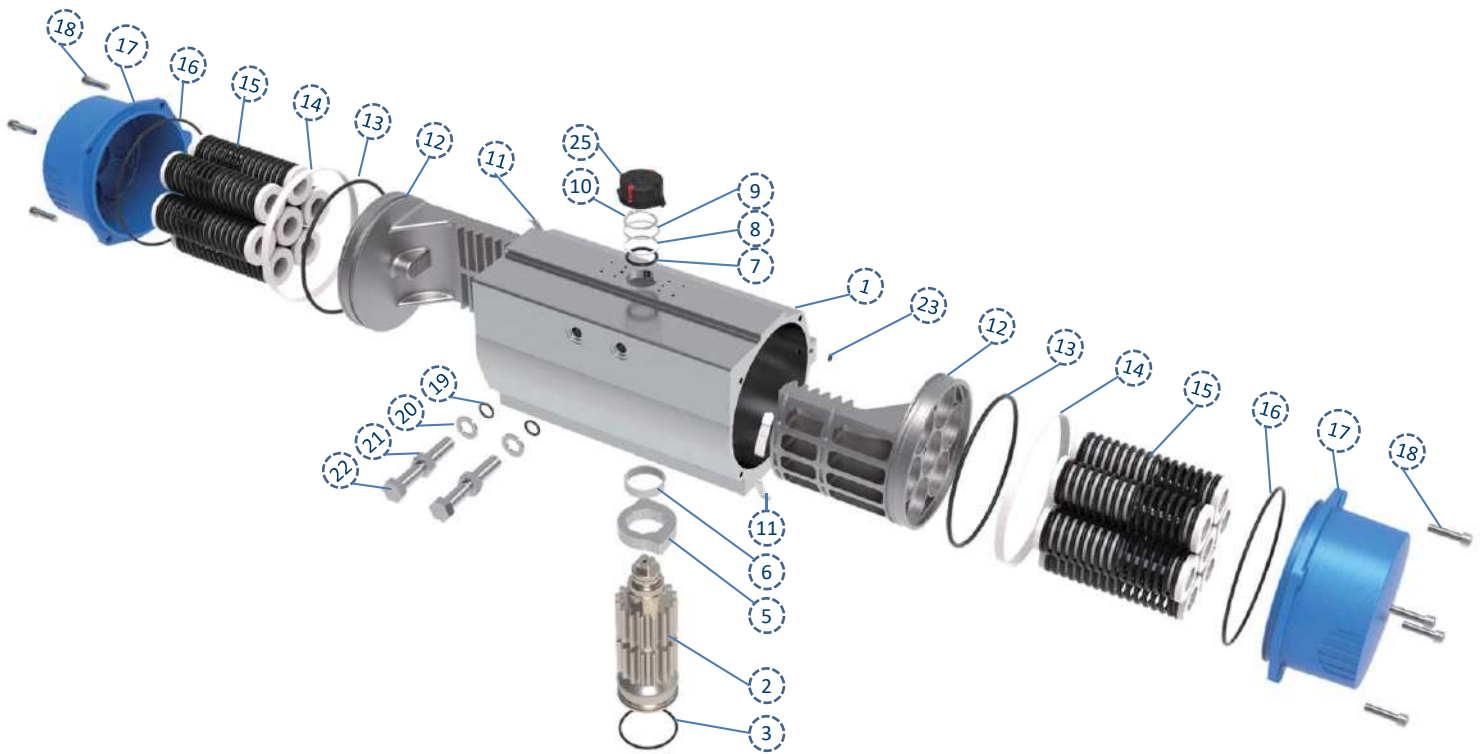


#	DESCRIPTION	MATERIALS	NOTE
25	Position Indicator	PP	
24	End Cap Fixing Screw Ring	Stainless Steel	Only Spring-return Model
22	Stop Bolt	Stainless Steel	
21	Stop Bolt Retaining Nut	Stainless Steel	
20	Stop Bolt Retaining Nut Ring	Stainless Steel	
19	Stop Bolt O-Ring	NBR	
18	End Cap Fixing Screw	Stainless Steel	
17L/R	End Cap	Die Cast Aluminum-Epoxy Resin Coating	
16	End Cap Seat	NBR	
15	Springs	Spring Steel With Electrophoresis	Only Spring-return Model
14	Antifriction Ring	POM	
13	Piston O-Ring	NBR	
12	Piston	Die Cast Aluminum	
11	Piston Thrust Block	POM	
10	Pinion Snap Ring	Nickel Plated Steel	
8	Top Pinion Spacer Ring	POM	
7	Top Pinion O-Ring	NBR	
6	Cam Spacer Ring	POM	
5	Cam	Steel	
3	Lower Pinion O-Ring	NBR	
2	Anti-Blowout Pinion	Nickel Plated Steel	
1	Body	Extruded Aluminum-Hard Anodized	



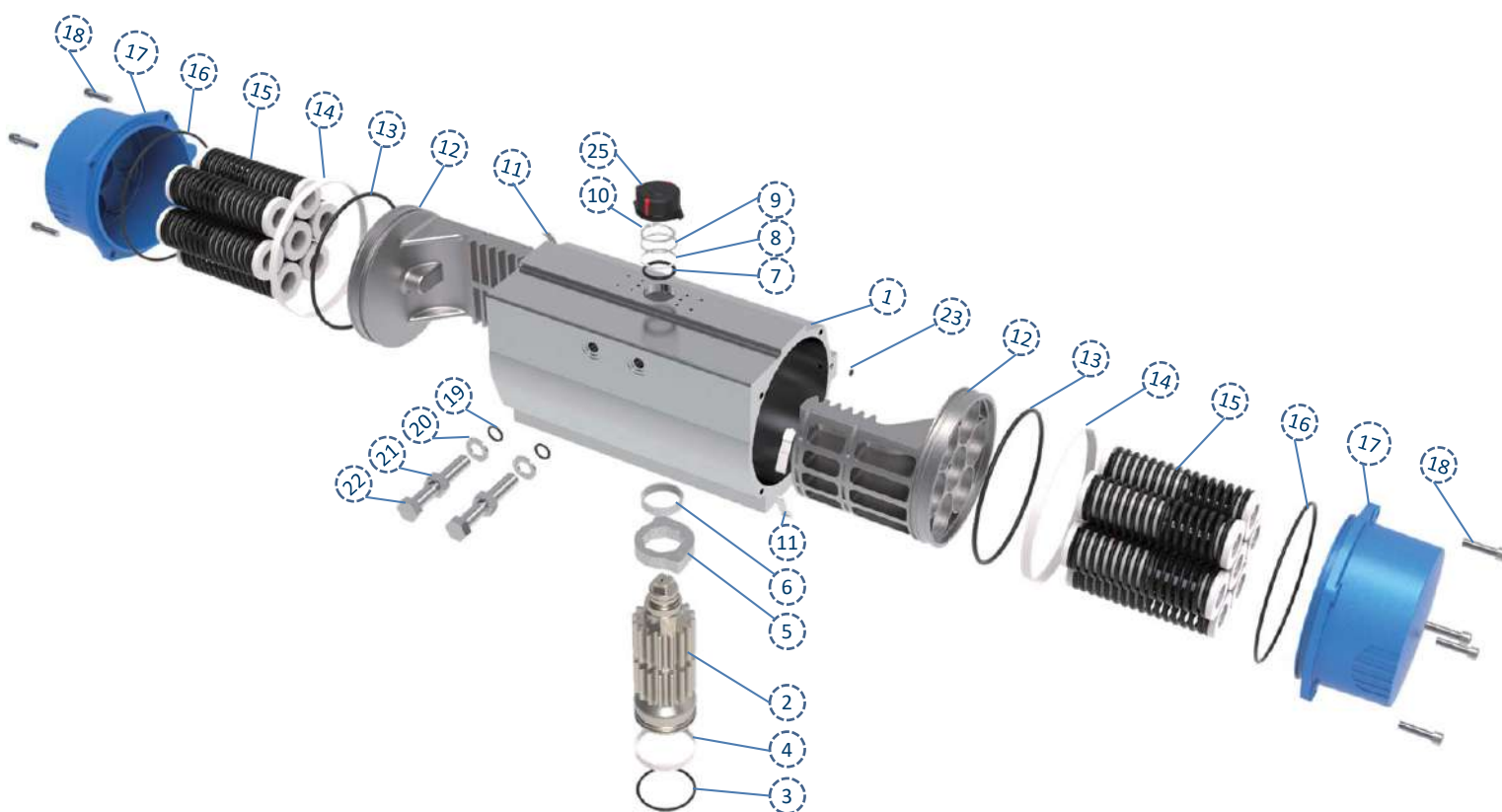
	A	B	C	D	E	F	G	CH	L	M	N	O	ØP	ØQ	R	S	De	T	U
<b>052</b>	142	71	30	41	69.5	20	89.5	11	80	30	12	26.5	36	50	M5*7.5	M6*8	4.5	1/8"	12
<b>063</b>	162	80.5	35.5	45	80.5	20	100.5	14	80	30	16	27.5	50	70	M6*8	M8*12	8	1/8"	12
<b>075</b>	208	94.5	42	52.5	97	20	117	17	80	30	20	35	50	70	M6*8	M8*12	8	1/8"	12
<b>085</b>	237	106	47.5	58.5	108.5	20	128.5	17	80	30	25	42	50	70	M6*8	M8*12	8	1/8"	12
<b>100</b>	272	123	55	68	121.5	20	141.5	17	80	30	25	50	70	102	M8*10	M10*15	8	1/4"	12
<b>115</b>	337	137	64	73	141.5	30	172	22	80&130	30	32	50	70	102	M8*12	M10*15	8	1/4"	16
<b>125</b>	366	148	68	80	153.5	30	183.5	22	80&130	30	32	61	70	102	M8*12	M10*15	8	1/4"	16
<b>140</b>	431	164	77	87	175.5	30	205.9	27	80&130	30	32	71.6	102	125	M10*15	M12*18	8	1/4"	16
<b>160</b>	512	187	87	100	193.5	30	223	27	80&130	30	32	80	102	125	M10*15	M12*18	8	1/4"	16

# 180 - 240 EXPLODED VIEW

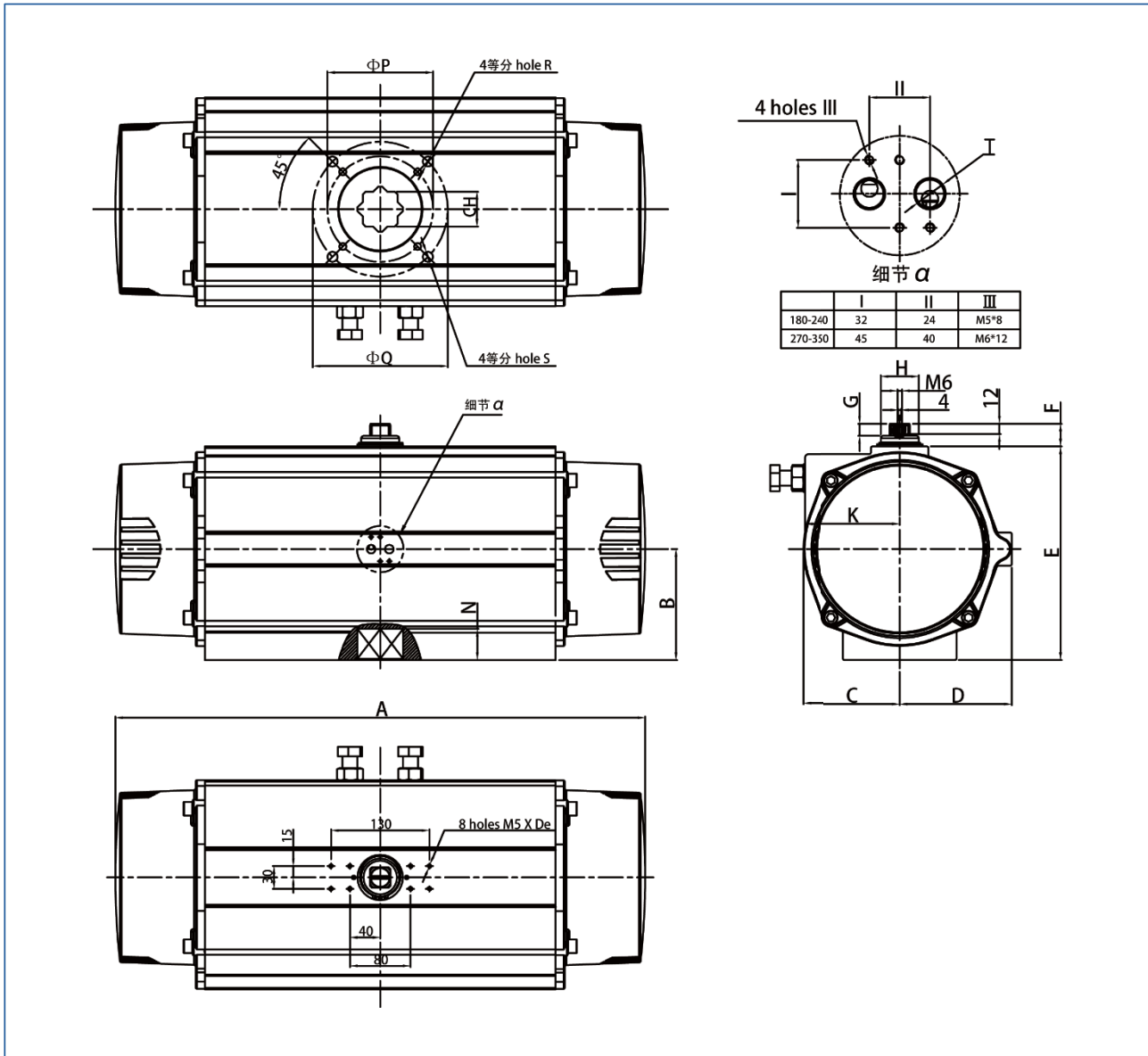


#	DESCRIPTION	MATERIALS	NOTE
25	Position Indicator	PP	
23	Body O-Ring	NBR	
22	Stop Bolt	Stainless Steel	
21	Stop Bolt Retaining Nut	Stainless Steel	
20	Stop Bolt Retaining Nut Ring	Stainless Steel	
19	Stop Bolt O-Ring	NBR	
18	End Cap Fixing Screw	Stainless Steel	
17	End Cap	Die Cast Aluminum-Epoxy Resin Coating	
16	End Cap Seat	NBR	
15	Springs	Spring Steel With Electrophoresis	Only Spring-return Model
14	Antifriction Ring	POM	
13	Piston O-Ring	NBR	
12	Piston	Die Cast Aluminum	
11	Piston Thrust Block	POM	
10	Pinion Snap Ring	Nickel Plated Steel	
9	Pinion Washer	Stainless Steel	
8	Top Pinion Spacer Ring	POM	
7	Top Pinion O-Ring	NBR	
6	Cam Spacer Ring	POM	
5	Cam	Steel	
3	Lower Pinion O-Ring	NBR	
2	Anti-Blowout Pinion	Nickel Plated Steel	
1	Body	Extruded Aluminum-Hard Anodized	

## 270 - 350 EXPLODED VIEW



#	DESCRIPTION	MATERIALS	NOTE
25	Position Indicator	PP	
23	Body O-Ring	NBR	
22	Stop Bolt	Stainless Steel	
21	Stop Bolt Retaining Nut	Stainless Steel	
20	Stop Bolt Retaining Nut Ring	Stainless Steel	
19	Stop Bolt O-Ring	NBR	
18	End Cap Fixing Screw	Stainless Steel	
17	End Cap	Die Cast Aluminum-Epoxy Resin Coating	
16	End Cap Seat	NBR	
15	Springs	Spring Steel With Electrophoresis	Only Spring-return Model
14	Antifriction Ring	POM	
13	Piston O-Ring	NBR	
12	Piston	Die Cast Aluminum	
11	Piston Thrust Block	POM	
10	Pinion Snap Ring	Nickel Plated Steel	
9	Pinion Washer	Stainless Steel	
8	Top Pinion Spacer Ring	POM	
7	Top Pinion O-Ring	NBR	
6	Cam Spacer Ring	POM	
5	Cam	Steel	
4	Lower Pinion Spacer Ring	POM	
3	Lower Pinion O-Ring	NBR	
2	Anti-Blowout Pinion	Nickel Plated Steel	
1	Body	Extruded Aluminum-Hard Anodized	



	A	B	C	D	E	F	G	ØH	K	CH	N	ØP	ØQ	R	S	De	T
180	574	114	96.5	116	219	30	15	50.3	93	36	40	102	—	M10*15	—	8	1/4"
210	608	130	111.5	131	250	30	15	50.3	110	36	40	140	140	M16*24	M16*24	8	1/4"
240	698	147	128.5	148	283	30	15	50.3	126.5	46	50	165	—	M20*28	—	8	1/4"
270	768	172	154	176	332	30	16	50.3	145	46	60	165	—	M20*28	—	8	1/2"
300	818	172	154	176	332	30	16	50.3	145	46	60	165	—	M20*28	—	8	1/2"
350	912	—	164	195	408	30	12	—	—	55	60	165	254	M20*25	M16*25	8	1/2"



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