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Technical Data

HAM-LET PNEUMATIC ACTUATORS

HPA



Features:

- Pneumatic Rack and Pinion Actuators
- 90° Actuation for 2-way valves (Straight & Angle)
- Actuators comply with industry standards for interface with ISO 5211, NAMUR and VDI/VDE 3845
- Actuated valves are available factory assembled or separately, actuator and mounting kits
- Aluminum actuators are available as standard, Stainless Steel and Electric actuators are available upon request
- Limit switches, proximity sensors, position indicators, pilot valves and other accessories are available upon request
- Standard Temperature range: -32°C to 90°C (-25.6°F to 194°F)
Optional: High Temperature: -30°C to 120°C (-22°F to 248°F)
Low Temperature: -50°C to 80°C (-58°F to 176°F)

General

- Four standard actuator sizes are available upon request: Mini (designator "A1"), Small (designator "A2"), Medium (designator "A3"), and Large (designator "A4").
- Improved operational speed enables better valve opening and closing control.
- ATEX certification of Valves-Actuators' assemblies are available on request at the time of order quotation.



ALUMINIUM PNEUMATIC ACTUATOR

A1: DOUBLE ACTING

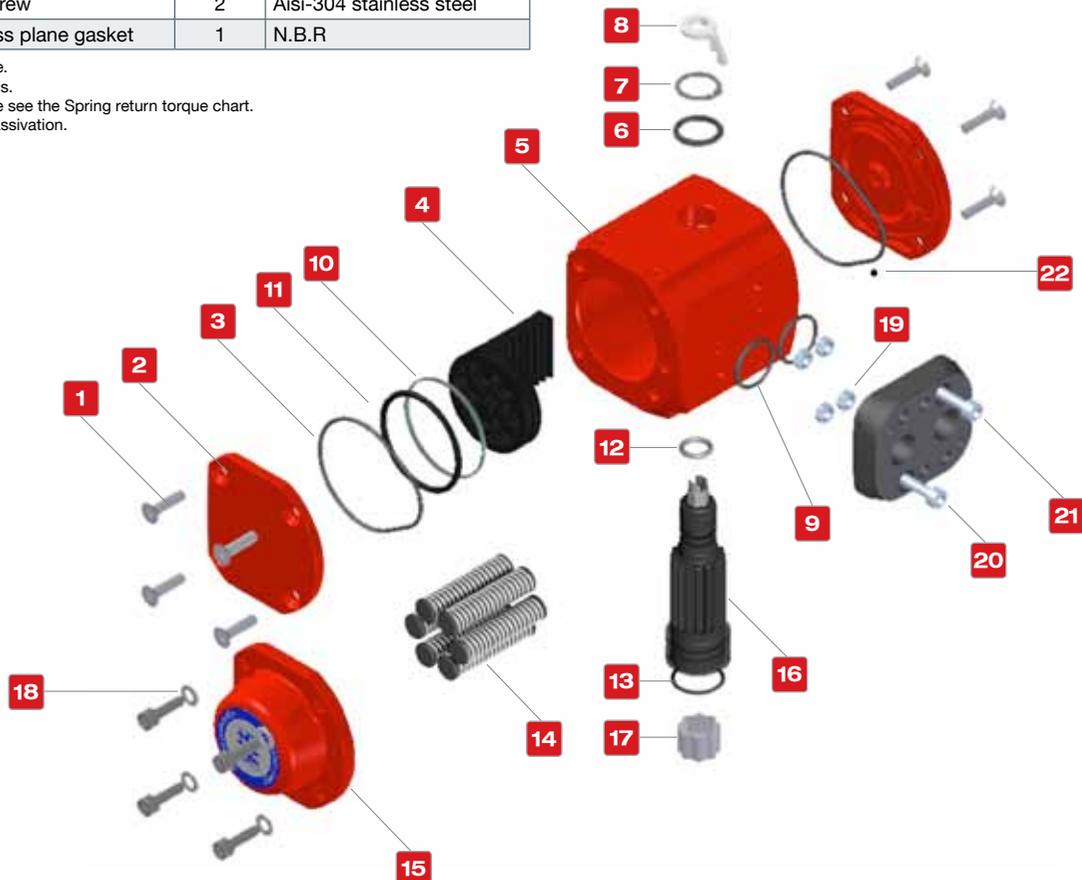
A1S: SPRING RETURN



DISASSEMBLY

No.	Description	Qty	Material
1	Cap allen screw	8	Aisi-304 stainless steel
2	Double acting cap	2	Aluminium alloy (2)+(7)
3	Cap o-ring	2	N.B.R
4	Piston	1	Polyarilamide
5	Cylinder	1	Aluminium alloy (2)+(1)
6	Washer	1	Polyamide 6
7	Spring clip	1	Stainless steel
8	Position indicator	1	Polyacetal
9	Plate o-ring	2	N.B.R.
10	Guide ring	1	Polyacetal + mb
11	Piston o-ring	1	N.B.R.
12	Shaft o-ring	1	N.B.R.
13	Shaft o-ring	1	N.B.R.
14	Preloaded springs	6	Din-17223-c (6) (4)
15	Spring return cap	1	Aluminium alloy (2) + (7)
16	Shaft	1	Polyamide + S.S.Insert
17	Drive adapter	1	Aisi-316 stainless steel
18	Spring return cap washer	4	Aisi-304 stainless steel
19	Nut	4	Aisi-304 stainless steel
20	Pneumatic connection plate	1	Polyamide + FG
21	Plate allen screw	2	Aisi-304 stainless steel
22	Watertightness plane gasket	1	N.B.R

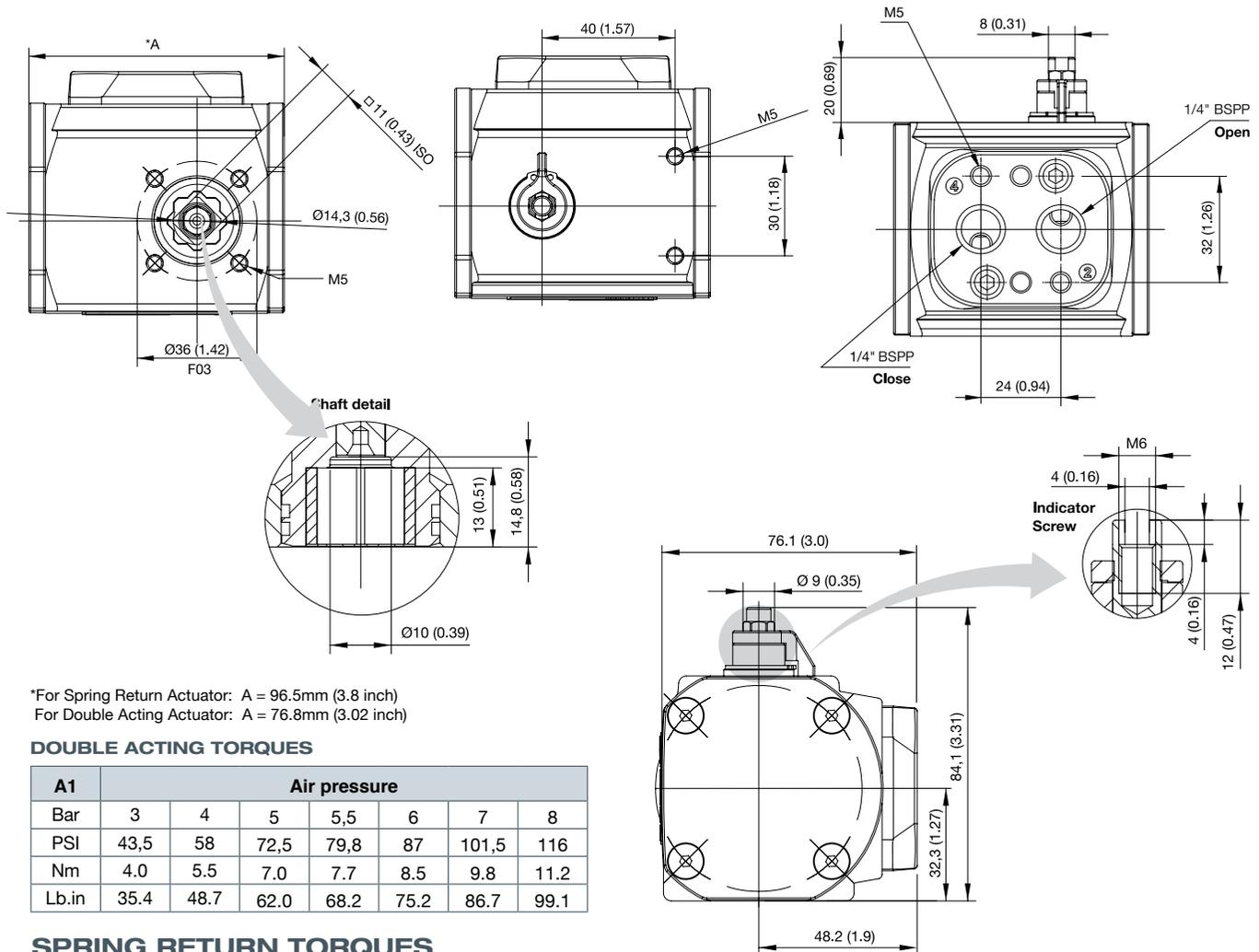
1. Covered with polyamide.
2. Covered by cataphoresis.
4. Variable quantity, please see the Spring return torque chart.
6. Trivalent chromium passivation.
7. Polyurethane



Models	Cycle time in (sec)		Weights		Capacity in litres	
	To open	To close	Kg.	Lb.	To open	To close
A1	0,1	0,1	0,65	1.43	0,07	0,03
A1S	0,15	0,15	0.72	1.58	0,07	

Cycle time w/o resistant torque at 6 bar.
Dimensiones en mm.

To calculate the consumption, multiply the above figures by the real working pressure.



*For Spring Return Actuator: A = 96.5mm (3.8 inch)
For Double Acting Actuator: A = 76.8mm (3.02 inch)

DOUBLE ACTING TORQUES

A1	Air pressure						
Bar	3	4	5	5,5	6	7	8
PSI	43,5	58	72,5	79,8	87	101,5	116
Nm	4.0	5.5	7.0	7.7	8.5	9.8	11.2
Lb.in	35.4	48.7	62.0	68.2	75.2	86.7	99.1

SPRING RETURN TORQUES

A1S	Spring Torques		Air torque at indicated pressure														
			3		4		5		5,5		6		7		8		bar
			43,5	58	72,5	79,8	87	101,5	116								
N	Initial	End	Initial	End	Initial	End	Initial	End	Initial	End	Initial	End	Initial	End	Initial	End	
6*	5.8	4					3	1.2	3.7	1.9	4.5	2.7	5.8	4	7.2	5.4	Nm
	51.3	35.6					26.4	10.6	32.6	16.8	39.7	23.9	51.2	35.4	63.5	47.8	Lb.in
5	4.9	3.4			2.1	0.6	3.6	2.1	4.3	2.8	5.1	3.6	6.4	4.9	7.8	6.3	Nm
	43.4	30.1			18.6	5.3	31.9	18.6	38.1	24.8	45.1	31.9	56.6	43.4	69	55.8	Lb.in
4	4	2.8			2.7	1.5	4.2	3	4.9	3.7	5.7	4.5	7	5.8	8.4	7.2	Nm
	35.6	24.4			24.3	13.1	37.5	26.3	43.7	32.5	50.8	39.6	62.3	51.1	74.7	63.5	Lb.in
3	3.2	2.1	1.9	0.8	3.4	2.3	4.9	3.8	5.6	4.5	6.4	5.3	7.7	6.6			Nm
	28	18.6	16.8	7.4	30.1	20.7	43.4	34	49.6	40.2	56.6	47.2	68.2	58.7			Lb.in
2	2.3	1.4	2.6	1.7	4.1	3.2	5.6	4.7	6.3	5.4	7.1	6.2					Nm
	20.4	12.4	23	15	36.3	28.3	49.6	41.6	55.8	47.8	62.8	54.9					Lb.in

N: Number of springs per side

* Standard number of springs

ALUMINIUM PNEUMATIC ACTUATOR

A2: DOUBLE ACTING

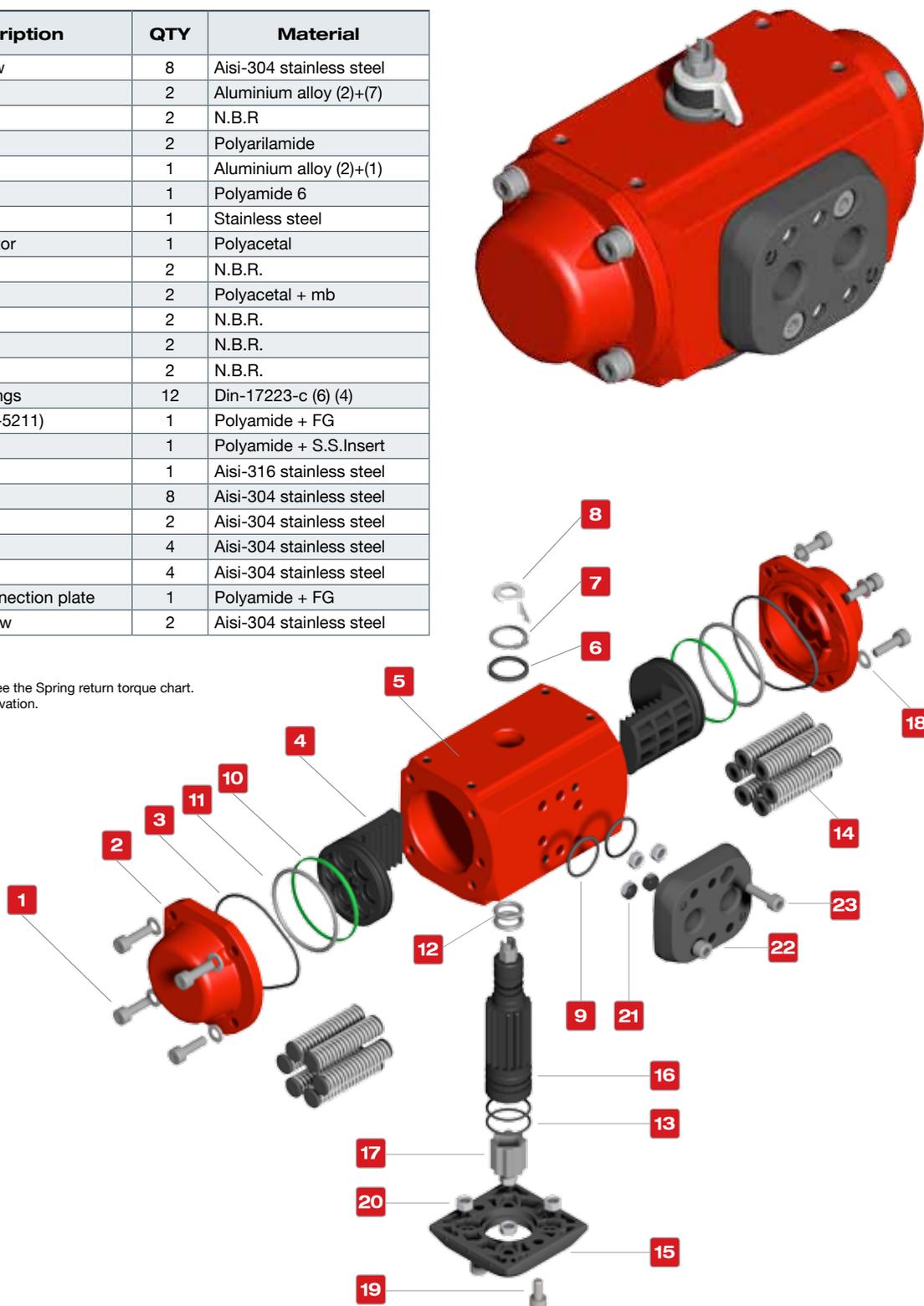
A2S: SPRING RETURN

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DISASSEMBLY

No.	Description	QTY	Material
1	Cap allen screw	8	Aisi-304 stainless steel
2	Cap	2	Aluminium alloy (2)+(7)
3	Cap o-ring	2	N.B.R
4	Piston	2	Polyarilamide
5	Cylinder	1	Aluminium alloy (2)+(1)
6	Washer	1	Polyamide 6
7	Spring clip	1	Stainless steel
8	Position indicator	1	Polyacetal
9	Plate o-ring	2	N.B.R.
10	Guide ring	2	Polyacetal + mb
11	Piston o-ring	2	N.B.R.
12	Shaft o-ring	2	N.B.R.
13	Shaft o-ring	2	N.B.R.
14	Preloaded springs	12	Din-17223-c (6) (4)
15	Base plate (iso-5211)	1	Polyamide + FG
16	Shaft	1	Polyamide + S.S.Insert
17	Drive adapter	1	Aisi-316 stainless steel
18	Cap washer	8	Aisi-304 stainless steel
19	Allen screw	2	Aisi-304 stainless steel
20	Nut	4	Aisi-304 stainless steel
21	Nut	4	Aisi-304 stainless steel
22	Pneumatic connection plate	1	Polyamide + FG
23	Plate allen screw	2	Aisi-304 stainless steel

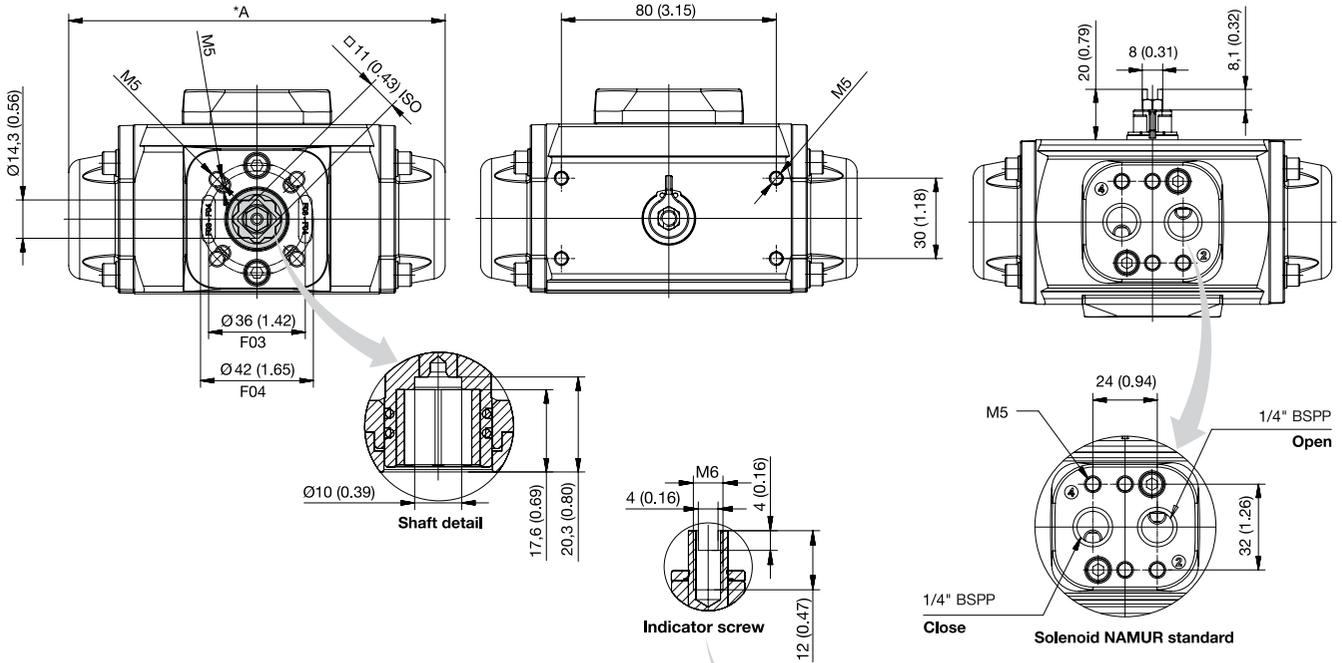
1. Covered with polyamide.
2. Covered by cataphoresis.
3. Variable quantity, please see the Spring return torque chart.
4. Trivalent chromium passivation.
7. Polyurethane



Models	Cycle time in (sec)		Weights		Capacity in litres	
	To open	To close	Kg.	Lb.	To open	To close
A2	0,1	0,1	0,92	2,02	0,075	0,11
A2S	0,15	0,15	1	2,20	0,075	

Cycle time w/o resistant torque at 6 bar.
Dimensiones en mm.

To calculate the consumption, multiply the above figures by the real working pressure.



*For Spring Return Actuator: A = 140.2mm (5.5 inch)
For Double Acting Actuator: A = 101mm (3.97 inch)

DOUBLE ACTING TORQUES

A2	Air pressure						
Bar	3	4	5	5,5	6	7	8
PSI	43,5	58	72,5	79,8	87	101,5	116
Nm	7,9	11,3	14,1	15,5	17	19,8	22,9
Lb.in	69,3	100	124,8	137,2	150,5	175,2	202,7

SPRING RETURN TORQUES

A2S	Spring Torques		Air torque at indicated pressure														bar
			3		4		5		5,5		6		7		8		
			Initial	End	Initial	End	Initial	End	Initial	End	Initial	End	Initial	End	Initial	End	
N	Initial	End	Initial	End	Initial	End	Initial	End	Initial	End	Initial	End	Initial	End	Initial	End	p.s.i
6*	10	6,7					7,4	4,1	8,8	5,5	10,3	7	13,1	9,8	16,2	12,9	Nm
	88,5	59,3					65,5	36,3	77,9	48,7	91,2	62	115,9	86,7	143,4	114,2	Lb.in
5	8,5	5,8			5,5	2,8	8,3	5,6	9,7	7	11,2	8,5	14	11,3	17,1	14,4	Nm
	75,2	51,3			48,7	24,8	73,5	49,6	85,9	62	99,1	75,2	123,9	100	151,3	127,5	Lb.in
4	7	4,6	3,3	0,9	6,7	4,3	9,5	7,1	10,9	8,5	12,4	10	15,2	12,8	18,3	15,9	Nm
	62	40,7	29,2	8	59,3	38,1	84,1	62,8	96,5	75,2	109,7	88,5	134,5	113,3	162	140,7	Lb.in
3	5,5	3,6	4,3	2,4	7,7	5,8	10,5	8,6	11,9	10	13,4	11,5	16,2	14,3			Nm
	48,7	31,9	38,1	21,2	68,2	51,3	92,9	76,1	105,3	88,5	118,6	101,8	143,4	126,6			Lb.in
2	4	2,4	5,5	3,9	8,9	7,3	11,7	10,1	13,1	11,5	14,6	13					Nm
	35,4	21,2	48,7	34,5	78,8	64,6	103,6	89,4	115,9	101,8	129,2	115,1					Lb.in

N: Number of springs per side

* Standard number of springs

ALUMINIUM PNEUMATIC ACTUATOR

A3: DOUBLE ACTING

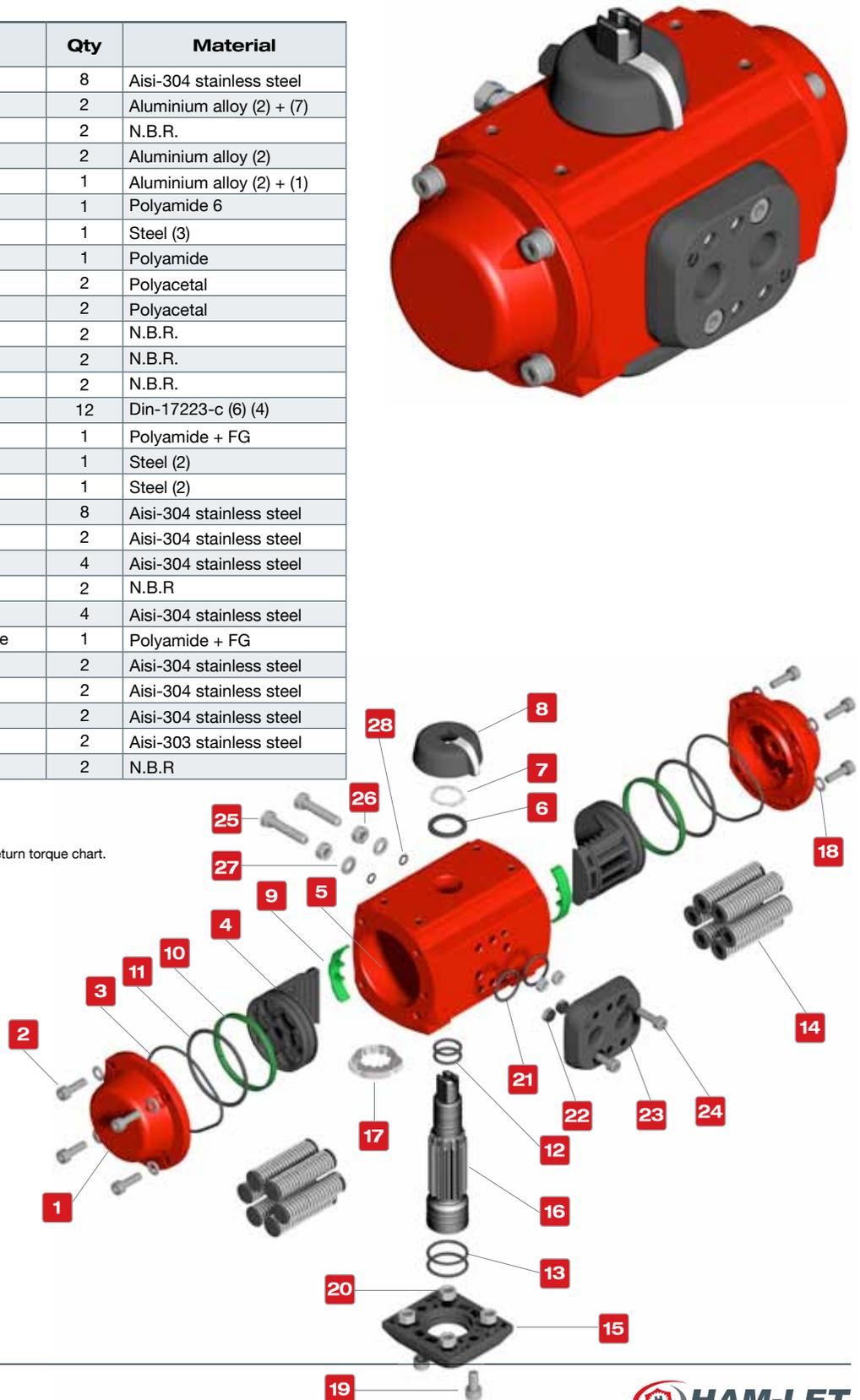
A3S: SPRING RETURN

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DISASSEMBLY

No.	Description	Qty	Material
1	Cap allen screw	8	Aisi-304 stainless steel
2	Cap	2	Aluminium alloy (2) + (7)
3	Cap-o-ring	2	N.B.R.
4	Piston	2	Aluminium alloy (2)
5	Cylinder	1	Aluminium alloy (2) + (1)
6	Washer	1	Polyamide 6
7	Spring clip	1	Steel (3)
8	Position indicator	1	Polyamide
9	Piston guide	2	Polyacetal
10	Guide ring	2	Polyacetal
11	Piston o-ring	2	N.B.R.
12	Shaft o-ring	2	N.B.R.
13	Shaft o-ring	2	N.B.R.
14	Preloaded springs	12	Din-17223-c (6) (4)
15	Base plate (iso-5211)	1	Polyamide + FG
16	Shaft	1	Steel (2)
17	Cam	1	Steel (2)
18	Cap washer	8	Aisi-304 stainless steel
19	Allen screw	2	Aisi-304 stainless steel
20	Nut	4	Aisi-304 stainless steel
21	Plate o-ring	2	N.B.R
22	Nut	4	Aisi-304 stainless steel
23	Pneumatic connection plate	1	Polyamide + FG
24	Plate allen screw	2	Aisi-304 stainless steel
25	Exagonal screw	2	Aisi-304 stainless steel
26	Nut	2	Aisi-304 stainless steel
27	Bushing	2	Aisi-303 stainless steel
28	O-ring	2	N.B.R

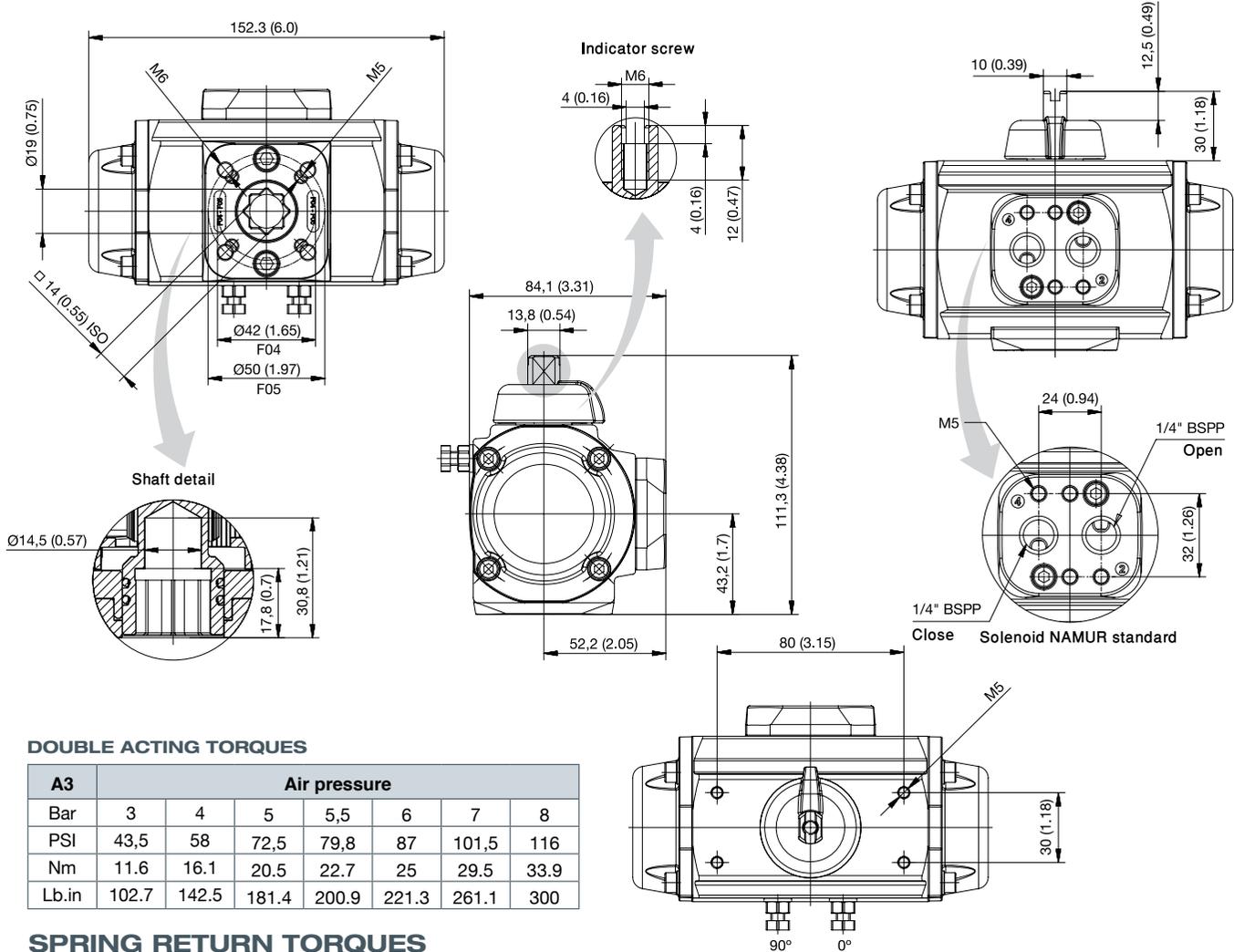
1. Covered with polyamide.
2. Covered by cataphoresis.
3. Covered by nikel - PTFE.
4. Variable quantity, please see the Spring return torque chart.
6. Trivalent chromium passivation.
7. Covered with polyurethane.



Models	Cycle time in (sec)		Weights		Capacity in litres	
	To open	To close	Kg.	Lb.	To open	To close
A3	0,15	0,15	1.40	3.09	0,15	0,18
A3S	0,2	0,2	1.625	3.58	0,15	

Cycle time w/o resistant torque at 6 bar.
Dimensiones en mm.

To calculate the consumption, multiply the above figures by the real working pressure.



DOUBLE ACTING TORQUES

A3	Air pressure						
	3	4	5	5,5	6	7	8
Bar	3	4	5	5,5	6	7	8
PSI	43,5	58	72,5	79,8	87	101,5	116
Nm	11.6	16.1	20.5	22.7	25	29.5	33.9
Lb.in	102.7	142.5	181.4	200.9	221.3	261.1	300

SPRING RETURN TORQUES

A3S	Spring Torques		Air torque at indicated pressure														
			3		4		5		5,5		6		7		8		bar
			43,5	58	72,5	79,8	87	101,5	116	p.s.i							
N	Initial	End	Initial	End	Initial	End	Initial	End	Initial	End	Initial	End	Initial	End	Initial	End	
6*	16,5	11,1					9,4	4	11,6	6,2	13,9	8,5	18,4	13	22,8	17,4	17,4Nm
	146	98,2					83,2	35,4	102,7	54,9	123	75,2	162,9	115,1	201,8	154	Lb.in
5	13,8	9,4			6,7	2,3	11,1	6,7	13,3	8,9	15,6	11,2	20,1	15,7	24,5	20,1	Nm
	122,1	83,2			59,3	20,4	98,2	59,3	117,7	78,8	138,1	99,1	177,9	139	216,8	177,9	Lb.in
4	11,1	7,6			8,5	5	12,9	9,4	15,1	11,6	17,4	13,9	21,9	18,4	26,3	22,8	Nm
	98,2	67,3			75,2	44,3	114,2	83,2	133,6	102,7	154	123	177,9	162,9	232,8	201,8	Lb.in
3	8,5	5,8	5,8	3,1	10,3	7,6	14,7	12	16,9	14,2	19,2	16,5	23,7	21			Nm
	75,2	51,3	51,3	27,4	91,2	67,3	130,1	106,2	149,6	125,7	169,9	146	209,8	185,9			Lb.in
2	5,8	3,6	8	5,8	12,5	10,3	16,9	14,7	19,1	16,9	21,4	19,2					Nm
	51,3	31,9	70,8	51,3	110,6	91,2	149,6	130,1	169	149,6	189,4	169,9					Lb.in

N: Number of springs per side

* Standard number of springs

ALUMINIUM PNEUMATIC ACTUATOR

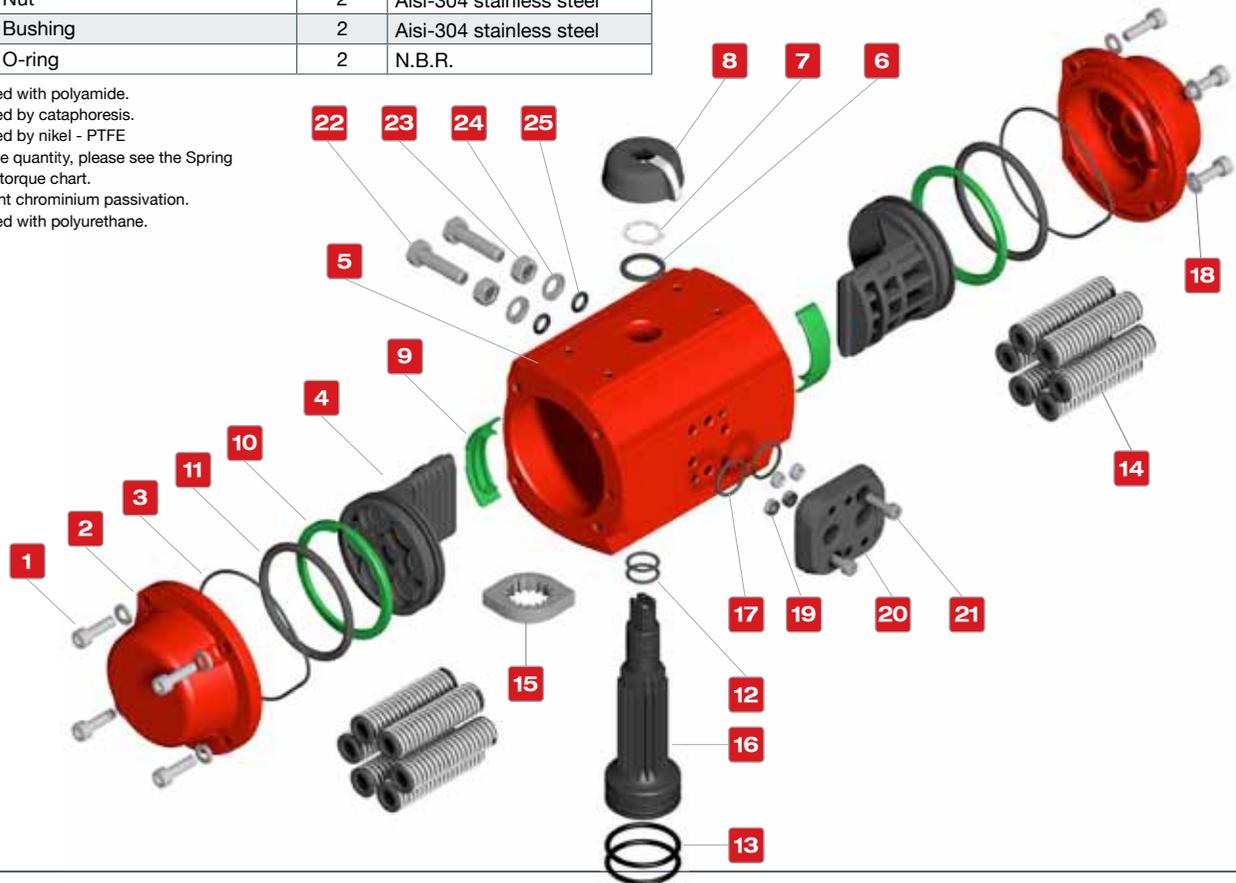
A4: DOUBLE ACTING

A4S: SPRING RETURN

DISASSEMBLY

No.	Description	Qty	Material
1	Cap allen screw	8	Aisi-304 stainless steel
2	Cap	2	Aluminium alloy (2) + (7)
3	Cap-o-ring	2	N.B.R.
4	Piston	2	Aluminium alloy (2)
5	Cylinder	1	Aluminium alloy (2) + (1)
6	Washer	1	POLYAMIDE 6
7	Spring clip	1	Steel (3)
8	Position indicator	1	Polyamide
9	Piston guide	2	Polyacetal
10	Guide ring	2	Polyacetal
11	Piston o-ring	2	N.B.R.
12	Shaft o-ring	2	N.B.R.
13	Shaft o-ring	2	N.B.R.
14	Preloaded springs	12	Din-17223-c (6) (4)
15	Cam	1	Steel (2)
16	Shaft	1	Steel (2)
17	Plate o-ring	2	N.B.R.
18	Cap washer	8	Aisi-304 stainless steel
19	Nut	4	Aisi-304 stainless steel
20	Pneumatic connection plate	1	Polyamide + FG
21	Plate allen screw	2	Aisi-304 stainless steel
22	Exagonal Screw	2	Aisi-304 stainless steel
23	Nut	2	Aisi-304 stainless steel
24	Bushing	2	Aisi-304 stainless steel
25	O-ring	2	N.B.R.

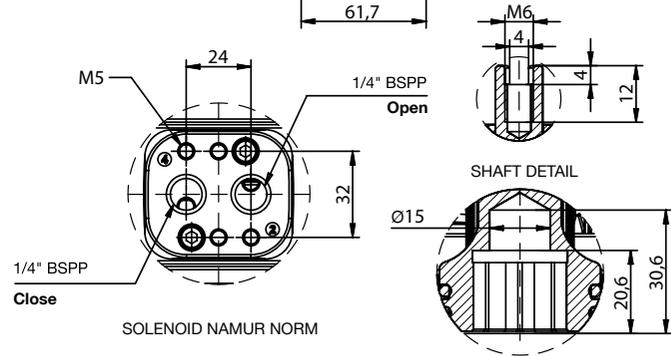
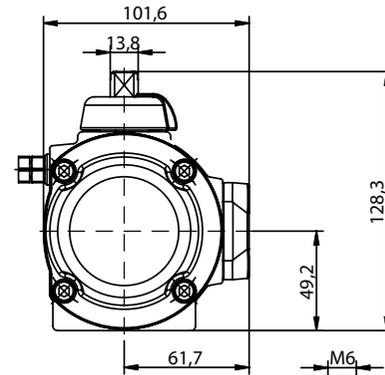
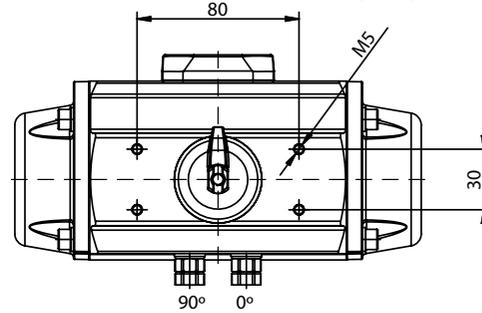
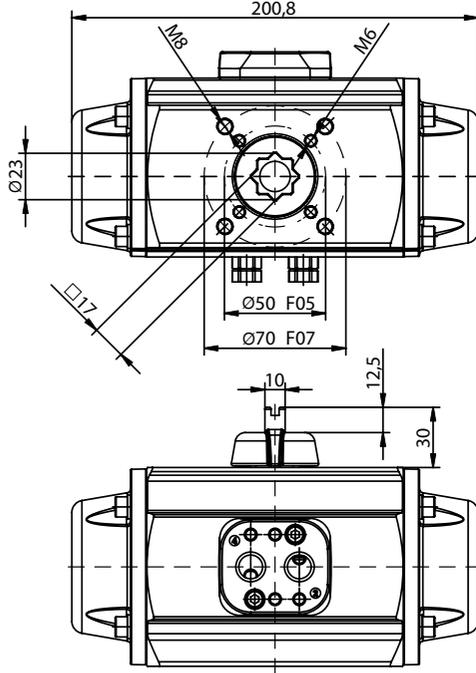
- (1) Covered with polyamide.
- (2) Covered by cataphoresis.
- (3) Covered by nikel - PTFE
- (4) Variable quantity, please see the Spring return torque chart.
- (6) Trivalent chromium passivation.
- (7) Covered with polyurethane.



Models	Cycle time in (sec)		Weights		Capacity in litres	
	To open	To close	Kg.	Lb.	To open	To close
A4	0.2	0,2	2.57	5.67	0,28	0.37
A4S	0,25	0,25	2.94	6.49	0,28	

Cycle time w/o resistant torque at 6 bar.
Dimensiones en mm.

To calculate the consumption, multiply the above figures by the real working pressure.



DOUBLE ACTING TORQUES

A4	Air pressure						
	3	4	5	5,5	6	7	8
Bar	3	4	5	5,5	6	7	8
PSI	43,5	58	72,5	79,8	87	101,5	116
Nm	23.5	32.3	41.0	45.3	49.7	58.4	67.1
Lb.in	280	286	363	401	440	517	594

SPRING RETURN TORQUES

A4S	Spring Torques		Air torque at indicated pressure														
			3		4		5		5,5		6		7		8		bar
			43,5	58	72,5	79,8	87	101,5	116								
N	Initial	End	Initial	End	Initial	End	Initial	End	Initial	19,4	Initial	End	Initial	End	Initial	End	
6*	31.4	20.9					20.1	9.6	24.4	13.9	28.8	18.3	37.5	27.0	46.2	35.7	Nm
	277.9	185					177.9	85.0	216	123	254.9	162	331.9	239	408.9	316	Lb.in
5	27	17.4			14.9	5.3	23.6	14	27.9	18.36	32.3	22.7	41	31.4	49.7	41	Nm
	239	154			131.9	46.9	208.9	123.9	246.9	162	285.9	200.9	362.9	277.9	439.9	354.9	Lb.in
4	21.8	13.9	9.6	1.7	18.4	10.5	27.1	19.2	31.4	23.5	35.8	27.9	44.5	36.6	53.2	54.3	Nm
	192.9	123	85	15	162.9	92.9	239.9	169.9	277.9	208	316.9	246.9	393.9	323.9	470.9	400.9	Lb.in
3	18.3	11.3	12.2	5.2	21	14	29.7	22.7	34	27	38.4	31.4	47.1	40.1			Nm
	162	100	108	46	185.9	123.9	262.9	200.9	300.9	239	339.9	277.9	416.9	354.9			Lb.in
2	12.2	7.8	15.7	11.3	24.5	20.1	33.2	28.8	37.5	33.1	41.9	37.5					Nm
	108	69	139	100	216.8	177.9	293.8	254.9	331.9	293	370.8	331.9					Lb.in

N: Number of springs per side

* Standard number of springs

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Quality you can trust