Forged stainless steel
Rack and Pinion Actuator BR 31a
Typ SRP und DAP

Application:

The stainless steel actuators are a corrosion resistant rack and pinion actuator particular engineered for corrosive environments or sanitary.

They are manufracted by using forged high quality stainless steel body material in A182 F316/ EN10088/3 1.4401

- Quarter turn 90°
- Air supply to 10 bar

Appropriate Field of applications:

- Food Industry
- Pharmaceutical
- Sanitary
- Cosmetics
- Enology
- Marine and Offshore Plant
- Corrosive environments

These actuators are manufactured in Double acting and Spring Return versions.

The stainless steel actuators are also available with optional polished surface, particulary for Sanitary and Pharmaceutical applications.

Features and Benefits:

- High performance
- Full compliance with worldwide latest specifications
- Simple, compact and modern shape to avoid cavity contamination and corrosive deposit build up
- Namur air connection for easy installation of solenoid valves
- Compliance with the latest standards:
  ISO 5211 and DIN 3337
- Two independent external travel stop adjustments, of ±4° in both, open and close positions
- Integral drive shaft made of F316
- Dual piston rack and pinion design for compact construction, symmetric mounting position, long life cycle and fast operation. Reverse rotation can be performed on site by simply inverting the pistons
- Modular preloaded spring cartridge design. With coated springs for simple versatile range, greater safety and corrosion resistance

Fig. 1 – Forged stainless steel Actuator BR 31a

Fig. 2 – Forged stainless steel Actuator BR 31a

Dimensions and Weights:

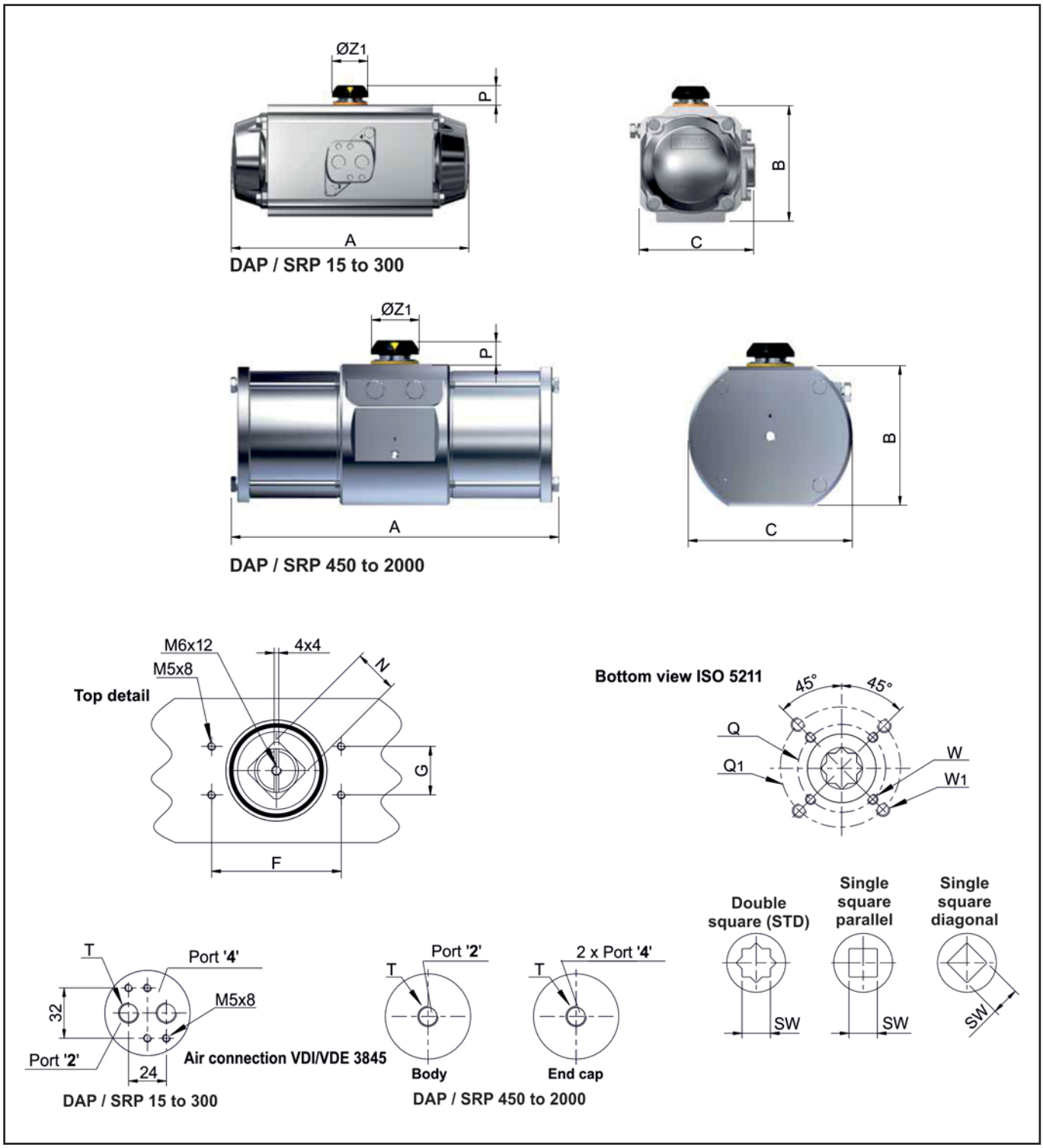

Fig. 3 - Dimensional drawing

Actuator	15		30		60		100		150		300		450		900		2000	
Type	DAP	SRP	DAP	SRP	DAP	SRP	DAP	SRP	DAP	SRP	DAP	SRP	DAP	SRP	DAP	SRP	DAP	SRP
A	141		159		211		248		268		345		412		492		630	
B	69		85		102		115		127		157		177		220.5		298.5	
C (Approx.)	75		86		99		114		128		159		210		250		335	
F	80		80		80		80		80		80		80		130		130	
G	30		30		30		30		30		30		30		30		30	
N	11		11		17		17		17		27		27		36		36	
P	20		20		20		20		20		30		30		50		50	
T ISO 228	1/8“		1/4“		1/4“		1/4“		1/4“		1/4“		1/4“		1/4“		3/8“	
ØZ1	37		37		37		37		37		51		60		68		104	
ISO Flange	F04		F05		F05 + F07		F05 + F07		F07 + F10		F07 + F10		F10 + F12		F14		F16	
Q	42		50		50		50		70		70		102		140		165	
Q1	-		-		70		70		102		102		125		-		-	
W	M5		M6		M6		M6		M8		M8		M10		M16		M20	
W1	-		-		M8		M8		M10		M10		M12		-		-	
Optional ISO Flange	F03		-		-		-		-		-		-		F10 + F12		-	
SW x lmin.	9x11		11x12		14x16		17x19		17x19		22x24		27x29		27x29		36x39	
	11x12		14x16		17x19		-		22x24		27x29		-		36x39		46x49	
Opening time in Sec. [1)]	0.2	0.25	0.25	0.3	0.3	0.4	0.4	0.5	0.5	0.7	0.9	1.2	1.2	1.5	2	2.4	3.5	4.1
Closing time in Sec. [1)]	0.2	0.3	0.3	0.35	0.35	0.5	0.5	0.6	0.6	0.9	1.1	1.4	1.4	1.8	2.2	2.8	4	4.6
Air volume opening in L	0.09		0.16		0.31		0.51		0.71		1.54		2.41		4.26		10	
Air volume closing in L	0.15		0.26		0.49		0.78		1.11		2.34		3.78		6.89		15.2	
Approx. weight in kg	2.7	2.9	3.8	4.0	6.0	6.4	8.8	8.4	12.3	13.3	22.6	24.5	34.6	37.7	58	65	135	150

Table 1 - Dimensions in mm and weights in kg

Note: [1)] The above moving times of the actuator are obtained in the following test conditions:

For Type DAP / SRP 15 to 450:
(1) Room temperature, (2) Actuator stroke 90°, (3) Solenoid valve with orifice of Ø 4 mm and a flow capacity Qn 400L/min., (4) Inside pipe diameter 8 mm, (5) Medium clear air, (6) Air supply pressure 5,5 bar (79,75 Psi), (7) Actuator without external resistance load.

For Type DAP / SRP 900 to 2000:
(1) Room temperature, (2) Actuator stroke 90°, (3) Solenoid valve with orifice of Ø 11 mm and a flow capacity Qn 600L/min., (4) Inside pipe diameter 11 mm, (5) Medium clear air, (6) Air supply pressure 5,5 bar (79,75 Psi), (7) Actuator without external resistance load

Cautions:
obviously on the field applications when one or more of the above parameter are different, the moving time will be different.

Operating torques for single-acting actuators Type SRP

Type SRP	Spring no.	Air torque (Nm) at 2.5 to 4.2 bar										Spring torque	
		2.5 bar		3 bar		3.5 bar		4 bar		4.2 bar		Start	End
		0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	90°	0°
15	2/3	**5.0**	**3.0**	7.0	4.7	8.0	6.3	10.0	8.0	10.7	8.7	5.3	3.3
	3	4.0	1.9	**6.0**	**3.6**	7.7	5.3	9.3	6.9	10.0	7.6	6.4	4.0
	3/4			5.3	2.5	**7.0**	**4.2**	8.7	5.8	9.4	6.6	7.4	4.6
	4					6.3	3.0	**8.0**	**5.0**	**8.7**	**5.5**	8.5	5.3
	4/5							7.3	3.7	8.1	4.4	9.6	5.9
30	2/3	**9.1**	**6.2**	12.0	9.2	15.0	12.1	17.9	15.0	19.1	16.2	8.4	6.0
	3	8	4.5	**10.9**	**7.5**	13.9	10.4	16.8	13.3	18.0	14.5	10.1	7.0
	3/4			9.8	5.8	**12.8**	**8.7**	15.7	11.6	16.9	12.8	11.8	7.8
	4					11.6	7.0	**14.6**	**10.0**	**15.7**	**11.1**	13.5	9.0
	4/5							13.5	8.3	14.6	9.4	15.2	10.0
60	2/3	**18.0**	**11.8**	23.8	17.6	29.7	23.4	35.5	29.9	37.8	31.6	17.3	11.1
	3	15.8	8.3	**21.6**	**14.1**	27.5	19.9	33.3	25.8	35.6	28.1	20.8	13.3
	3/4			19.4	10.7	**25.2**	**16.5**	31.1	22.3	33.4	24.6	24.2	15.5
	4					23.0	13.0	**28.8**	**18.8**	**31.2**	**21.2**	27.7	17.7
	4/5							26.2	15.4	29.0	17.7	31.2	19.9
100	2/3	**27.4**	**16.9**	36.6	26.0	45.7	35.2	54.9	44.3	58.5	48.0	28.9	18.3
	3	23.8	11.1	**32.9**	**20.3**	42.1	29.4	51.2	38.6	54.9	42.2	34.7	22.0
	3/4			29.2	14.5	**38.4**	**23.6**	47.5	32.8	51.2	36.4	40.4	25.7
	4					34.7	17.9	**43.9**	**27.0**	**47.5**	**30.7**	46.2	29.3
	4/5							40.2	21.2	43.9	24.9	52.0	33.0
150	2/3	**41.1**	**27.1**	54.4	40.4	67.7	53.7	81.0	67.0	86.3	72.3	39.4	25.3
	3	36.1	19.2	**49.4**	**32.5**	62.7	45.8	76.0	59.1	81.3	64.4	47.3	30.4
	3/4			44.3	24.6	**57.6**	**37.9**	70.9	51.2	76.2	56.5	55.1	35.5
	4					52.5	30.0	**65.8**	**43.3**	**71.1**	**48.7**	63.0	40.5
	4/5							60.8	35.5	66.1	40.8	70.9	45.6
300	2/3	**86.0**	**56.1**	114	83.8	141	111	169	139	180	150	82.4	52.5
	3	75.5	39.6	**103**	**67.3**	131	95.0	159	123	170	134	98.9	63.0
	3/4			93.0	50.8	**120**	**78.5**	148	106	159	117	115	73.5
	4					110	62.0	**138**	**89.7**	**149**	**101**	132	84.0
	4/5							127	73.3	138	84.3	148	94.5
450	2/3	**135**	**88.6**	179	132	222	176	265	219	283	236	129	82.4
	3	119	63.0	**162**	**106**	206	150	249	193	266	211	155	99.0
	3/4			146	80.0	**189**	**124**	233	167	250	185	180	115
	4					173	98.0	**216**	**142**	**233**	**159**	206	132
	4/5							200	116	217	133	232	148
900	2/3	**225**	**146**	301	223	378	299	455	376	485	406	237	158
	3	193	99.0	**270**	**175**	346	252	423	329	454	359	284	190
	3/4			238	128	**315**	**205**	391	281	422	312	332	221
	4					283	157	**360**	**234**	**390**	**264**	379	253
	4/5							328	186	359	217	426	285
2000	2/3	**533**	**372**	712	551	890	730	1069	908	1141	980	521	360
	3	461	268	**640**	**447**	818	625	997	804	1068	876	625	433
	3/4			568	343	**746**	**521**	925	700	996	771	730	505
	4					674	417	**853**	**596**	**924**	**667**	834	577
	4/5							781	491	852	563	938	649

Table 2a - Operating torques for single-acting actuators Type SRP

Operating torques for double-acting actuators Type DAP:

Type DAP	Air torque (Nm) at 2.5 to 8 bar												
	2.5 bar	3 bar	3.5 bar	4 bar	4.2 bar	4.5 bar	5 bar	5.5 bar	6 bar	6.5 bar	7 bar	7.5 bar	8 bar
15	8.3	10.0	11.6	13.3	14.0	15.0	16.6	18.3	19.9	21.6	23.3	24.9	26.6
30	14.7	17.6	20.5	23.5	24.6	26.4	29.3	32.0	35.2	38.1	41.0	44.0	46.9
60	29.1	34.9	40.7	46.5	48.9	52.4	58.2	64.0	69.8	75.6	81.4	87.3	93.1
100	45.8	54.9	64.1	73.2	76.9	82.4	91.5	101	110	120	128	138	146
150	66.5	79.8	93.1	106	112	120	133	146	160	173	186	199	213
300	138	166	194	222	233	249	277	305	332	360	388	415	443
450	217	261	304	348	365	391	435	478	522	565	609	652	696
900	383	459	536	613	643	689	766	842	919	996	1072	1149	1225
2000	893	1072	1251	1430	1501	1608	1787	1966	2144	2318	2502	2684	2859

Table 3 - Operating torques for double-acting actuators Type DAP

Operating torques for single-acting actuators Type SRP

Type SRP	Spring no.	Air torque (Nm) at 4.5 to 8 bar										Spring torque	
		4.5 bar		5 bar		5.5 bar		6 bar		8 bar		Start	End
		0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	90°	0°
15	4	9.7	6.4	11.3	8.1	13.0	9.8	14.7	11.4			8.5	5.3
	4/5	**9.0**	**5.4**	10.7	7.0	12.3	8.7	14.0	10.0	20.6	17.0	9.6	5.9
	5	8.4	4.3	**10.0**	**6.0**	11.7	7.6	13.3	9.3	20.0	16.0	10.6	6.6
	5/6			9.4	4.9	**11.0**	**6.6**	13.0	8.2	19.3	14.9	11.7	7.3
	6					10.4	6.0	**12.0**	**7.2**	**18.7**	**13.8**	12.8	7.9
30	4	17.5	12.9	20.4	15.8	23.4	18.7	26.3	21.7			13.5	9.0
	4/5	**16.4**	**11.2**	19.3	14.1	22.3	17.1	25.2	20.0	36.9	31.7	15.2	10.0
	5	15.3	9.5	**18.2**	**12.4**	21.1	15.4	24.1	18.3	35.8	30.0	16.9	11.1
	5/6			17.1	10.8	**20.0**	**13.7**	23.0	16.6	34.7	28.3	18.6	12.0
	6					18.9	12.0	**21.9**	**14.9**	**33.6**	**26.7**	20.2	13.3
60	4	34.7	24.7	40.5	30.5	46.3	36.8	52.1	42.1			27.7	17.7
	4/5	**32.5**	**21.2**	38.3	27.0	44.1	32.8	49.9	38.6	73.2	61.9	31.2	19.9
	5	30.2	17.7	**36.1**	**23.6**	41.9	29.4	47.7	35.2	71.0	58.5	34.6	22.1
	5/6			33.8	20.1	**39.7**	**25.9**	45.5	31.7	68.7	55.0	38.1	24.3
	6					37.5	22.4	**43.3**	**28.3**	**66.5**	**51.5**	41.5	26.5
100	4	53.0	36.2	62.2	45.3	71.3	54.5	80.5	63.6			46.2	29.3
	4/5	**49.4**	**30.4**	58.5	39.5	67.7	48.7	76.8	57.8	113	94.5	52.0	33.0
	5	45.7	24.6	**54.8**	**33.8**	64.0	42.9	73.1	52.1	110	88.7	57.8	36.7
	5/6			51.2	28.0	**60.3**	**37.1**	69.5	46.3	106	82.9	63.5	40.3
	6					56.7	31.4	**65.8**	**40.5**	**102**	**77.1**	69.3	44
150	4	79.1	56.6	92.4	69.9	106	83.2	119	96.5			63.0	40.5
	4/5	**74.0**	**48.8**	87.3	62.1	101	75.3	114	88.6	167	142	70.9	45.6
	5	69.0	40.9	**82.3**	**54.2**	95.6	67.5	109	80.8	162	134	78.8	50.7
	5/6			77.2	46.3	**90.5**	**59.6**	104	72.9	157	126	86.7	55.7
	6					85.4	51.7	**99.0**	**65.0**	**152**	**118**	94.5	60.8
300	4	165	117	193	145	221	173	248	201			132	84.0
	4/5	**155**	**101**	182	129	210	156	238	184	349	295	148	94.5
	5	144	84.0	**172**	**112**	200	140	227	168	338	278	165	105
	5/6			161	96.0	**189**	**123**	217	151	328	262	181	116
	6					179	107	**206**	**135**	**317**	**245**	198	126
450	4	260	185	303	229	347	272	390	316			206	132
	4/5	**243**	**159**	287	203	330	246	374	290	547	464	232	148
	5	227	134	**270**	**177**	314	221	357	264	531	438	258	165
	5/6			254	151	**297**	**195**	341	238	515	412	283	181
	6					281	169	**324**	**213**	**498**	**386**	309	198
900	4	436	310	513	387	589	464	666	540			379	253
	4/5	**405**	**263**	481	340	558	416	634	493	941	799	426	285
	5	373	216	**450**	**292**	526	369	603	445	909	752	474	316
	5/6			418	245	**495**	**321**	571	398	877	704	521	348
	6					463	274	**540**	**351**	**846**	**657**	568	379
2000	4	1032	774	1210	953	1389	1132	1568	1310			834	577
	4/5	**959**	**670**	1138	849	1317	1028	1495	1206	2210	1921	938	649
	5	887	566	**1066**	**745**	1245	923	1423	1102	2138	1817	1042	721
	5/6			994	640	**1173**	**819**	1351	998	2066	1713	1146	793
	6					1101	715	**1279**	**894**	**1994**	**1608**	1251	865

Tabelle 2b - Operating torques for single-acting actuators Type SRP

General technical data:

Operation		Single acting	Double acting
Max. perm. air supply pressure		10 bar [1)]	
Sizes		15 • 30 • 60 • 100 • 150 • 300 • 450 • 900 • 2000	
Perm. temperature range		Continuous operating -40°C to 80°C	
Connection to valve		DIN ISO 5211	
Connection for Positioner or signal equipment	Type 15 - 150	VDI VDE 3845, Größe 1	
	Type 220 - 600	VDI VDE 3845, Größe 2	
	Type 900 - 5000	VDI VDE 3845, Größe 4	
Connection for Solenoid valve		VDI VDE 3845	

Table 4 – technical data

[1)] **Note:** Operating torques for 15 bar on request.

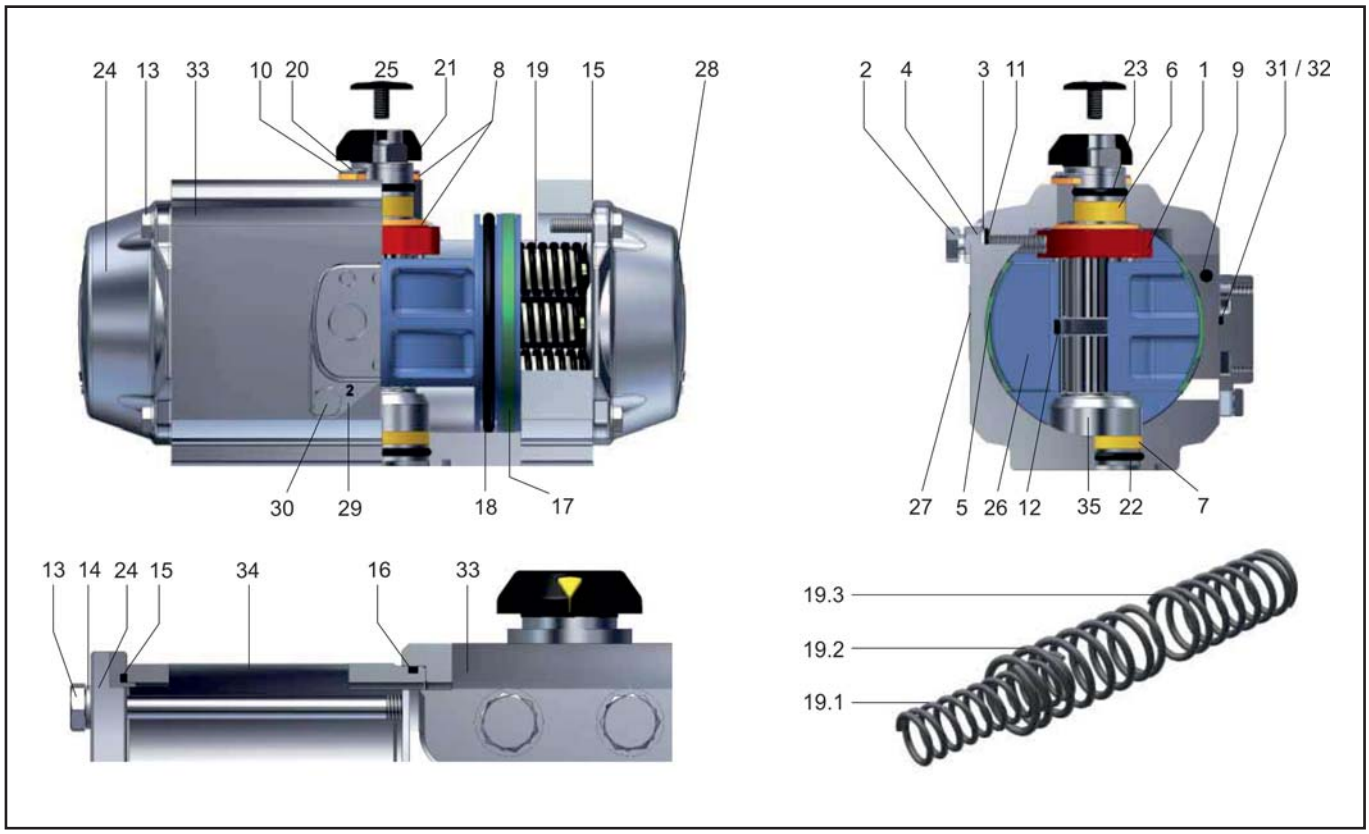

Fig. 4 - Forged stainless steel Rack and Pinion Actuator BR 31a

Item	Qty.	Description	Material
1	1	Octi cam	Stainless steel [1] Carbon steel, zinc coated
2	2	Stop cap screw	A2-70 / optional A4-70
3	2	Washer	A2 / optional A4
4	2	Nut (Stop screw)	A2-70 / optional A4-70
5	2	Bearing (Piston back)	High-grade polymers
6	1	Bearing (Pinion top)	High-grade polymers
7	1	Bearing (Pinion bottom)	High-grade polymers
8	2	Thrust bearing (Pinion)	High-grade polymers
9[2]	2[2]	Plug	M-NBR / Silicone
10	1	Thrust washer	AISI 304
11	2	O-ring (Stop screw)	M-NBR
12	2	Piston guide	High-grade polymers
13	8	Cap screw (End cap)	A4-70
14[3]	8	Washer	A4
15	2	O-ring (end cap)	M-NBR
16[3]	2	O-ring (Body extensions)	M-NBR
17	2	Bearing (Piston head)	High-grade polymers
18	2	O-ring (Piston)	M-NBR
19	max. 12	Spring cartridge	SiCr Spring alloy steel

Item	Qty.	Description	Material
20	1	Spring clip (Pinion)	AISI 302
21	1	Position indicator	High-grade polymers
22	1	O-ring (Pinion bottom)	M-NBR
23	1	O-ring (Pinion top)	M-NBR
24	2	End cap	1.4408 / A351 CF8M [4]
			1.4401 / A182 F316 [3]
25	1	Cap screw (Indicator)	High-grade polymers
26	2	Piston	Pressure die cast aluminium alloy anodized
27	1	Actuator identifications label	Polyester-Silver
28	2	End cap label	Polyester-Silver
29	1	Namur connection plate	1.4401 / A182 F316 [5]
			1.4408 / A351 CF8M
30	2	Cap screw (Connection plate)	A4-70
31	1	O-ring (Port 2)	M-NBR
32	1	O-ring (Port 4)	M-NBR
33	1	Body	1.4401 / A182 F316
34	2	Body extensions	1.4401 / A182 F316
35	1	Integral drive shaft	1.4401 / A182 F316

Table 5 - List of parts

[1] for Type DAP / SRP 15 to 150, [2] not for Type DAP / SRP 450 and larger, [3] for Type DAP / SRP 450 and larger,
[4] for Type DAP / SRP 15 to 300, [5] for Type DAP / SRP 15