


FORGED STAINLESS STEEL RACK AND PINION ACTUATOR "S" Series



AIR TORQUE®





The Air Torque "S" Series stainless steel actuators are a corrosion resistant rack and pinion actuator particularly engineered for corrosive environments or sanitary.

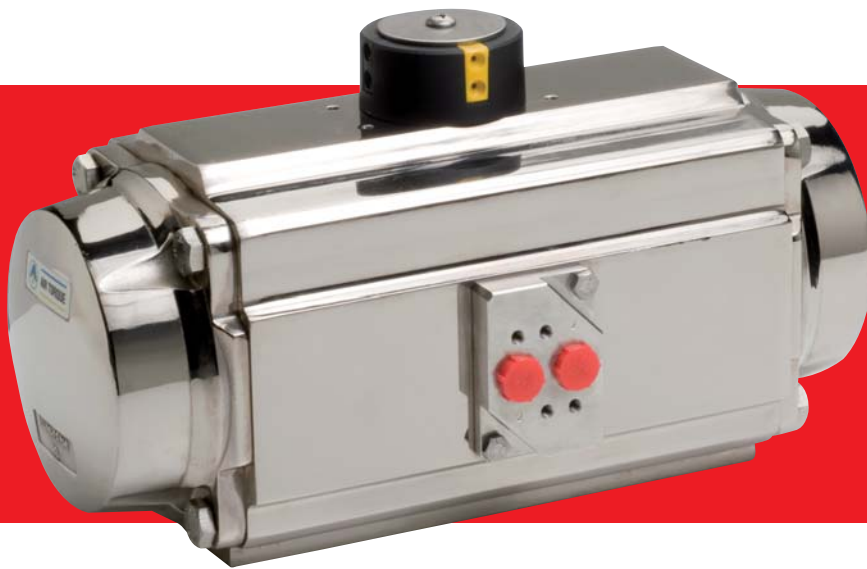
They are manufactured by using forged high quality stainless steel body material in A182 F316/ EN 10088/3 1.4401.

The Air Torque "S" Series stainless steel actuators are well suited for automating butterfly, ball, and plug valves in harsh, corrosive environments and they are available in both Double Acting and Spring Return versions.

The most typical fields of applications are:

- Chemical processing
- Pulp and paper
- Pharmaceutical
- Marine and offshore
- Food and beverage
- Sanitary
- Cosmetics

The stainless steel actuators "S" Series are also available in polished finishing particularly suitable for Pharmaceutical and Food industry where surface cleanness is requested.





- **One compact and unique design**

Compact and modern shape to avoid cavity and corrosive deposit build up. With identical body and end caps for double acting and spring return model to reduce inventory, it allows field conversion, by adding or removing modular spring cartridge.

- **Pistons design**

Dual piston rack and pinion design for compact construction, symmetric mounting position, high-cycle life and fast operation, reverse rotation can be accomplished in the field by simply inverting the pistons. Both pistons are anodized for a better corrosion and wearing resistance.

- **Two independent external travel stop adjustments**

As a standard, travel stops allowing adjustment for -5° up to $+5^\circ$ on the close position, and for $+5^\circ$ up to -5° on the open position. This allows accurate valve alignment.

- **Universal and anti-blowout drive shaft**

Integral drive-shaft is available with double square as standard to permit versatility, lower and more flexible inventory.

- **Position indication**

As standard actuators are supplied with a position indicators allowing visual actuator/valve position. Special types of position indicators suitable for direct mounting of sensors (P+F, IFM, etc.) and mechanical limit-switches available on request.

- **Multiple bearings and guide**

Bearings on piston and racks for precise operation, low friction, high cycle life with piston guides that prevent shaft blowout.

- **Modular preloaded spring**

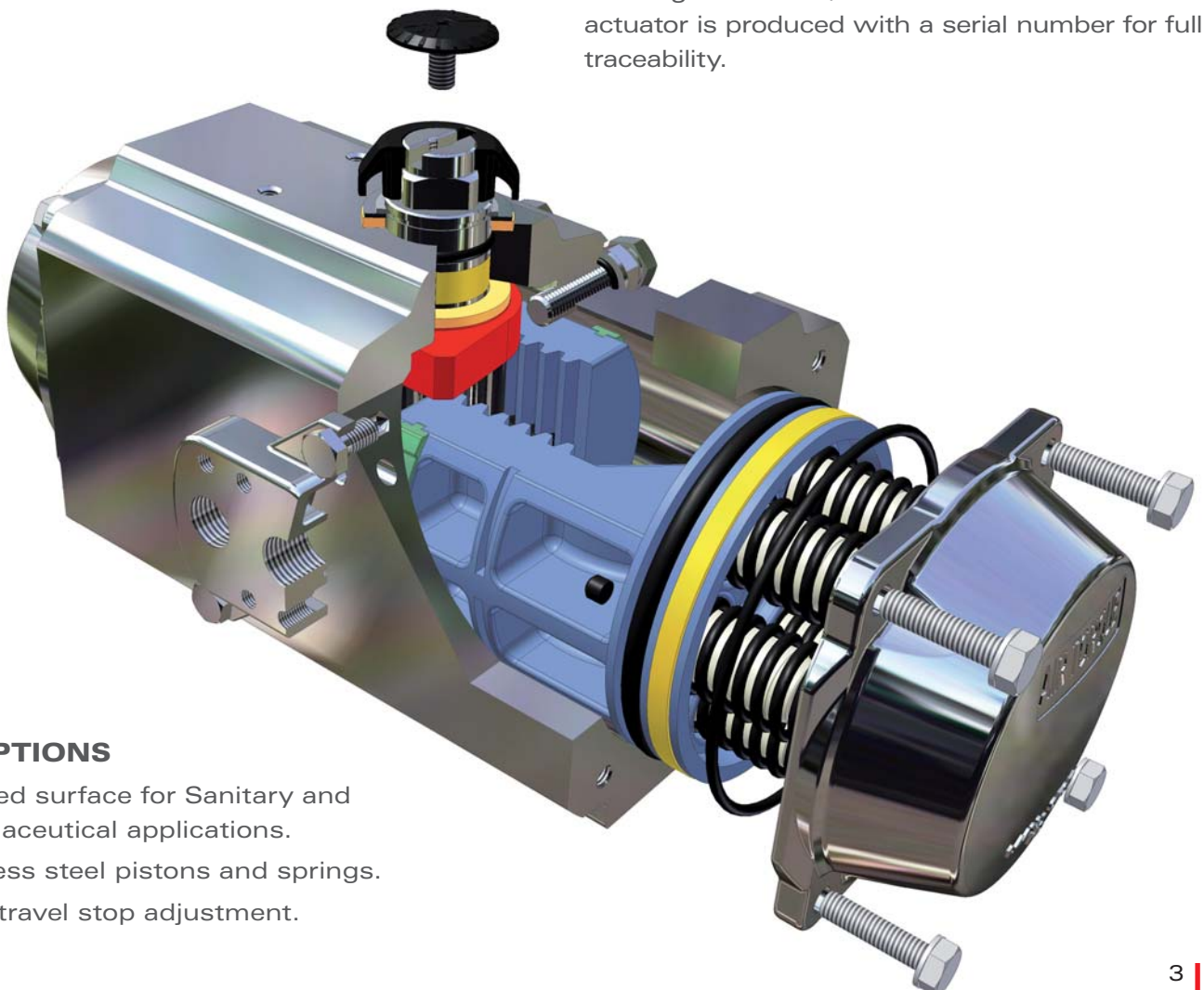
Cartridge design in high grade coated steel for simple range versatility, greater safety and corrosion resistance.

- **Full compliance**

To specifications ISO 5211, DIN 3337 and VDI/VDE 3845 providing the product interchangeability and the easiest valve automation and accessories installation. (Namur air connections only for model SB AT054U to SB AT404).

- **Actuator Marking Traceability**

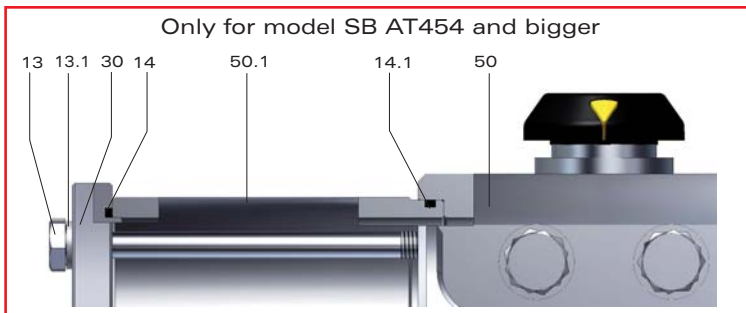
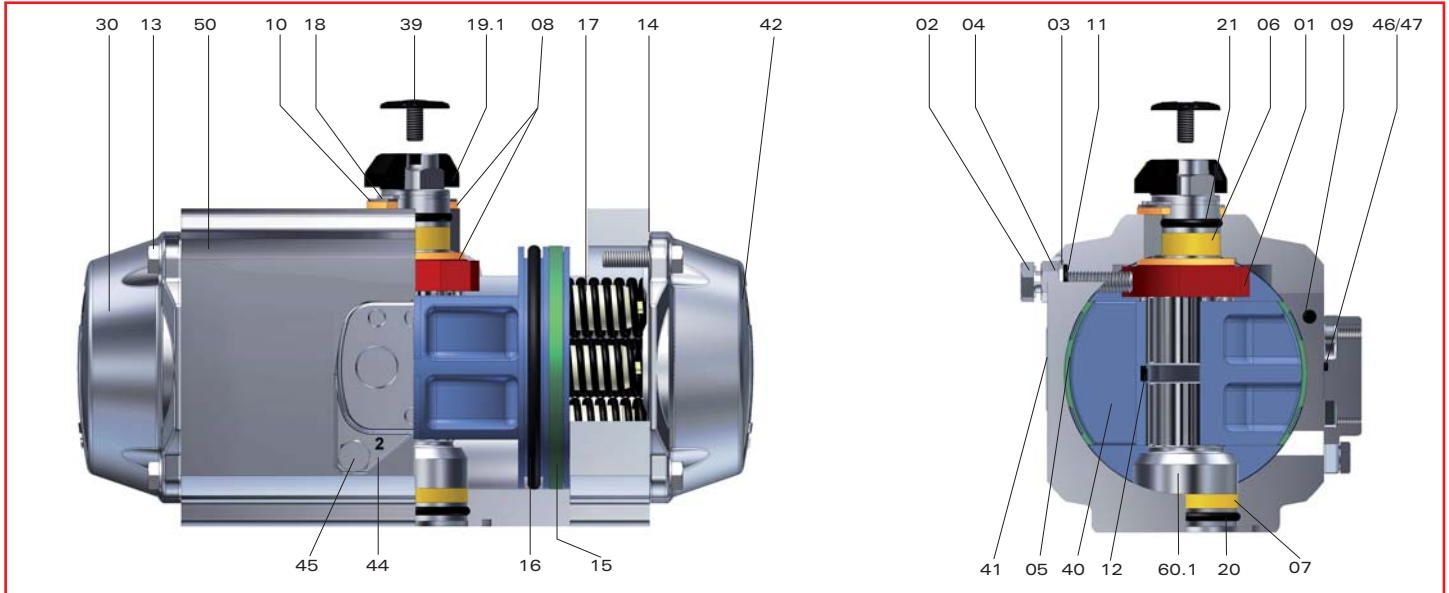
Each actuator is marked with detailed information regarding product description, connections and working conditions; furthermore each individual actuator is produced with a serial number for full traceability.



MAIN OPTIONS

1. Polished surface for Sanitary and Pharmaceutical applications.
2. Stainless steel pistons and springs.
3. 100% travel stop adjustment.

MATERIAL AND CONSTRUCTION



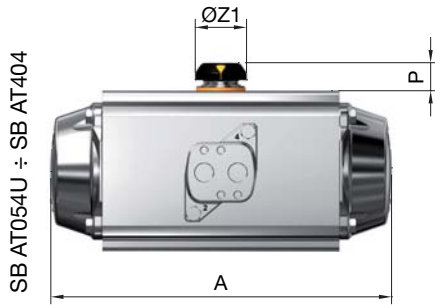
PART N°	Spare Parts	UNIT Q.TY / NOTE	PART DESCRIPTION	STANDARD MATERIAL
01		1	OCTI-CAM (Stop arrangement)	Stainless Steel (only for SB AT054U ÷ SB AT304) Carbon Steel, zinc coated
02		2	STOP CAP SCREW	Stainless Steel A2 70 (ISO 3506) / OPTIONAL Stainless Steel A4 70
03		2	WASHER	Stainless Steel A2 (ISO 3506) / OPTIONAL Stainless Steel A4
04		2	NUT (Stop screw)	Stainless Steel A2 70 (ISO 3506) / OPTIONAL Stainless Steel A4 70
05	○	2	BEARING (Piston back)	High-grade polymers
06	○	1	BEARING (Pinion top)	High-grade polymers
07	○	1	BEARING (Pinion bottom)	High-grade polymers
08	○	2	THRUST BEARING (Pinion)	High-grade polymers
09	○ □	2	PLUG	M-NBR / Silicone
10		1	THRUST WASHER (Pinion)	Stainless Steel AISI 304
11	○ □	2	"O" RING (Stop screw)	M-NBR
12		2	PISTON GUIDE	High-grade polymers
13		8	CAP SCREW (End cap)	Stainless Steel A4 70 (ISO 3506)
13.1		8	only for SB AT454 and bigger WASHER (Cap Screw end cap)	Stainless Steel A4 (ISO 3506)
14	○ □	2	"O" RING (End cap)	M-NBR
14.1	○ □	2	only for SB AT454 and bigger "O" RING (Body Extensions)	M-NBR
15	○	2	BEARING (Piston head)	High-grade polymers
16	○ □	2	"O" RING (Piston)	M-NBR
17		max. 12	for SB AT104 ÷ SB AT654 SPRING (Cartridge)	
17.1			SPRING	SiCr Spring alloy Steel coated
17.2		max. 4	only for SB AT054U SPRING	
17.3			SPRING	
18		1	SPRING CLIP (Pinion)	Stainless Steel AISI 302
19.1		1	POSITION INDICATOR	High-grade polymers
20	○ □	1	"O" RING (Pinion bottom)	M-NBR
21	○ □	1	"O" RING (Pinion top)	M-NBR
30		2	for SB AT054U ÷ SB AT404 for SB AT454 and bigger END CAP	Stainless Steel 1.4408 (EN 10283) / CF8M (ASTM A351), ENP Stainless Steel 1.4401 (EN 10088-3) / F316 (ASTM A 182), ENP
39		1	CAP SCREW (Indicator)	High-grade polymers
40		2	PISTON	Pressure Die Cast Aluminium alloy, anodized
41		1	ACTUATOR IDENTIFICATION LABEL	Polyester-Silver
42		2	END CAP LABEL	Polyester-Silver
44		1	NAMUR CONNECTION PLATE	Stainless Steel 1.4401 (EN 10088-3) / F316 (ASTM A 182) -only for SB AT054U Stainless Steel 1.4408 (EN 10283) / CF8M (ASTM A351)
45		2	CAP SCREW (Connection Plate)	Stainless Steel A4 70 (ISO 3506)
46	○ □	1	"O" RING Port 2 (Connection Plate)	M-NBR
47	○ □	1	"O" RING Port 4 (Connection Plate)	M-NBR
50		1	BODY	Stainless Steel 1.4401 (EN 10088-3) / F316 (ASTM A 182), ENP
50.1		2	only for SB AT454 and bigger BODY EXTENSIONS	Stainless Steel 1.4401 (EN 10088-3) / F316 (ASTM A 182), ENP
60.1		1	INTEGRAL DRIVE SHAFT	Stainless Steel 1.4401 (EN 10088-3) / F316 (ASTM A 182), ENP

○ Parts included in Complete spare parts kit

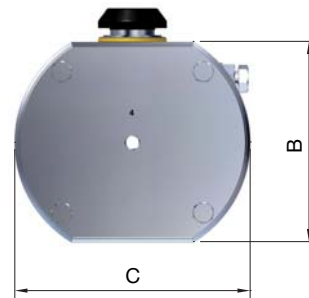
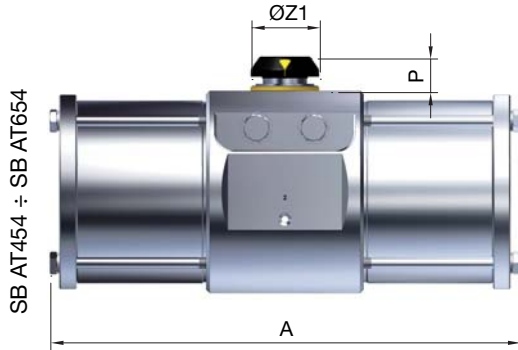
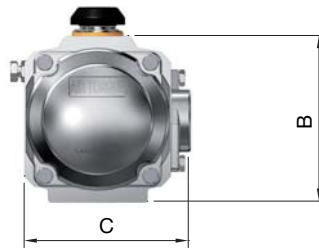
□ Parts included in "O" ring spare parts kit



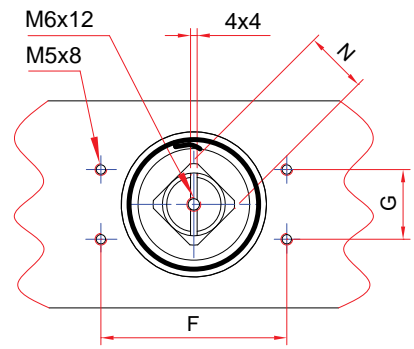
FRONT VIEW



SIDE VIEW

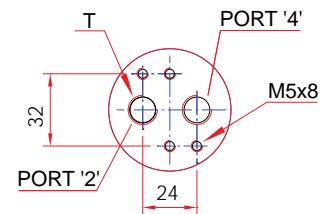


TOP DETAIL

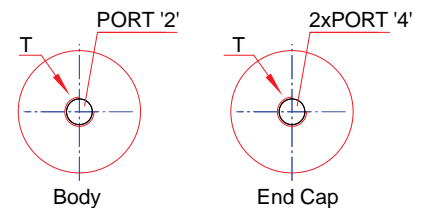


AIR CONNECTION VDI/VDE 3845

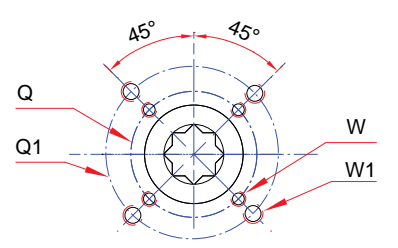
SB AT054U ÷ SB AT404



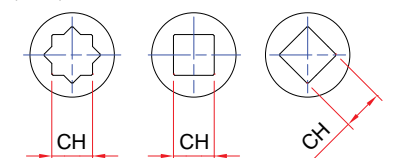
SB AT454 ÷ SB AT654



BOTTOM VIEW ISO 5211



DOUBLE SQUARE (STD) SINGLE SQUARE PARALLEL SINGLE SQUARE DIAGONAL



ACTUATOR MODEL	SB AT054U D/S	SB AT104 D/S	SB AT204 D/S	SB AT254 D/S	SB AT304 D/S	SB AT404 D/S	SB AT454 D/S	SB AT554 D/S	SB AT654 D/S
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"	1/8"	1/8"	1/8"	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	-
CH x l min.	DS	9x11	11x12	14x16	17x19	17x19	22x24	27x29	36x39
		11x12	14x16	17x19	-	22x24	27x29	-	36x39

*NPT (ANSI B1-20-1) threads available on request only for models SB AT054U ÷ SB AT404

METRIC	MODEL TYPE	SB AT054U		SB AT104		SB AT204		SB AT254		SB AT304		SB AT404		SB AT454		SB AT554		SB AT654	
		D	S	D	S	D	S	D	S	D	S	D	S	D	S	D	S	D	S
Opening Time (A)	(Sec.)	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 (A)	(Sec.)	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	(L)	0,09		0,16		0,31		0,51		0,71		1,54		2,41		4,26		10	
Air Volume Closing	(L)	0,15		0,26		0,49		0,78		1,11		2,34		3,78		6,89		15,2	
Approximate Weight	(Kg)	2,7	2,9	3,8	4,0	6,0	6,4	8,8	9,4	12,3	13,3	22,6	24,5	34,6	37,7	58	65	135	150

Note: (A) The above moving times of the actuator are obtained in the following test conditions:
For model SB AT054U ÷ SB AT454: (1) Room Temperature, (2) Actuator Stroke 90°, (3) Solenoid Valve with Orifice Of 4 mm and a flow capacity Qn 400L/min., (4) Inside pipe diameter 8 mm, (5) Medium clean air, (6) Air supply pressure 5,5 bar (79,75 Psi), (7) Actuator without external resistance load.

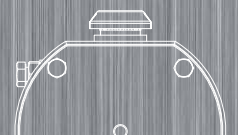
For model SB AT554 ÷ SB AT654: (1) Room Temperature, (2) Actuator Stroke 90°, (3) Solenoid Valve with Orifice Of 11 mm and a flow capacity Qn 6000L/min., (4) Inside pipe diameter 11 mm, (5) Medium clean air, (6) Air supply pressure 5,5 bar (79,75 Psi), (7) Actuator without external resistance load.

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

TORQUE OUTPUT (Nm)

SPRING RETURN TORQUE

Supply Pressure		2,5 bar		3 bar		3,5 bar		4 bar		4,2 bar		4,5 bar		5 bar		5,5 bar		6 bar		7 bar		8 bar		Spring stroke	
Model	Spring set	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°
		Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
SB AT054U	S 1	5,0	3,0	7	4,7	8	6,3	10,0	8	9,4	8,3	11,7	9,6	13,3	11,3									5,3	3,3
	S 2	4	1,9	6,0	3,6	7,7	5,3	9,3	6,9	9	7,4	11,0	8,6	12,7	10,2	14,3	11,9							6,4	4,0
	S 3			5,3	2,5	7,0	4,2	8,7	5,8	8,2	6,6	10,3	7,5	12,0	9,2	13,7	10,8	15,3	12,5					7,4	4,6
	S 4					6,3	3	8,0	5	7,6	5,8	9,7	6,4	11,3	8,1	13,0	9,8	14,7	11,4	18,0	14,7			8,5	5,3
	S 5							7,3	3,7	7,0	4,9	9,0	5,4	10,7	7,0	12,3	8,7	14,0	10	17,3	13,7	20,6	17,0	9,6	5,9
	S 6											8,4	4,3	10,0	6,0	11,7	7,6	13,3	9,3	16,7	12,6	20,0	16	10,6	6,6
	S 7													9,4	4,9	11	6,6	13	8,2	16,0	11,6	19,3	14,9	11,7	7,3
	S 8															10,4	6	12,0	7,2	15,3	10,5	18,7	13,8	12,8	7,9
SB AT104	S 05	9,1	6,2	12	9,2	15	12,1	17,9	15	19,1	16,2	20,8	17,9	23,8	20,9									8,4	5,5
	S 06	8	4,5	10,9	7,5	13,9	10,4	16,8	13,3	18	14,5	19,7	16,3	22,7	19,2	25,6	22,1							10,1	6,7
	S 07			9,8	5,8	12,8	8,7	15,7	11,6	16,9	12,8	18,6	14,6	21,5	17,5	24,5	20,4	27,4	23,4					11,8	7,8
	S 08					11,6	7	14,6	10	15,7	11,1	17,5	12,9	20,4	15,8	23,4	18,7	26,3	21,7	32,2	27,5			13,5	8,9
	S 09							13,5	8,3	14,6	9,4	16,4	11,2	19,3	14,1	22,3	17,1	25,2	20	31,1	25,9	36,9	31,7	15,2	10
	S 10											15,3	9,5	18,2	12,4	21,1	15,4	24,1	18,3	29,9	24,2	35,8	30	16,9	11,1
	S 11													20	13,7	23	16,6	28	22,5	34,7	28,3	41,6	35,3	18,6	12,2
	S 12													17,1	10,8	18,9	12	21,9	14,9	27,7	20,8	33,6	26,7	20,2	13,3
SB AT204	S 05	18	11,8	23,8	17,6	29,7	23,4	35,5	29,2	37,8	31,6	41,3	35	47,1	40,9									17,3	11,1
	S 06	15,8	8,3	21,6	14,1	27,5	19,9	33,3	25,8	35,6	28,1	39,1	31,6	44,9	37,4	50,7	43,2							21	13,3
	S 07			19,4	10,7	25,2	16,5	31,1	22,3	33,4	24,6	36,9	28,1	42,7	33,9	48,5	39,8	54,3	45,6					24,2	15,5
	S 08					23	13	28,8	18,8	31,2	21,2	34,7	24,7	40,5	30,5	46,3	36,3	52,1	42,1	63,7	53,7			27,7	17,7
	S 09							26,6	15,4	29	17,7	32,5	21,2	38,3	27	44,1	32,8	49,9	38,6	61,5	50,3	73,2	61,9	31	19,9
	S 10											30,2	17,7	36,1	23,6	41,9	29,4	47,7	35,2	59,3	46,8	71	58,5	34,6	22,1
	S 11													39,7	25,9	45,5	31,7	57,1	43,4	68,7	55	84,7	70,9	38,1	24,3
	S 12													37,5	22,4	43,3	28,3	54,9	39,9	66,5	51,5	82,5	67,5	41,5	26,5
SB AT254	S 05	27,4	16,9	36,6	26	45,7	35,2	54,9	44,3	58,5	48	64	53,5	73,2	62,6									28,9	18,3
	S 06	23,8	11,1	32,9	20,3	42,1	29,4	51,2	38,6	54,9	42,2	60,4	47,7	69,5	56,9	78,7	66							34,7	22
	S 07			29,2	14,5	38,4	23,6	47,5	32,8	51,2	36,4	56,7	41,9	65,8	51,1	75	60,2	84,2	69,4					40,4	25,7
	S 08					34,7	17,9	43,9	27	47,5	30,7	53	36,2	62,2	45,3	71,3	54,5	80,5	63,6	98,8	81,9			46,2	29,3
	S 09							40,2	21,2	43,9	24,9	49,4	30,4	58,5	39,5	67,7	49	76,8	57,8	95,1	76,1	113	94,5	52	33
	S 10											45,7	24,6	54,8	33,8	64	42,9	73,1	52,1	91,5	70,4	110	88,7	57,8	36,7
	S 11													51,2	28	60,3	37,1	69,5	46,3	87,8	64,6	106	82,9	63,5	40,3
	S 12													56,7	31,4	65,8	40,5	84,1	58,8	102	77,1	121	97,1	69,3	44
SB AT304	S 05	41,1	27,1	54,4	40,4	67,7	53,7	81	67	86,3	72,3	94,3	80,3	108	93,6									39,4	25,3
	S 06	36,1	19,2	49,4	32,5	62,7	45,8	76	59,1	81,3	64,4	89,3	72,4	103	85,7	116	99							47,3	30,4
	S 07			44,3	24,6	57,6	37,9	70,9	51,2	76,2	56,5	84,2	64,5	97	77,8	111	91,1	124	104					55,1	35,5
	S 08					52,5	30	65,8	43,3	71,1	48,7	79,1	56,6	92,4	69,9	106	83,2	119,0	96,5	146	123			63	40,5
	S 09							60,8	35,5	66,1	40,8	74,0	48,8	87,3	62,1	101	75,3	113,9	88,6	141	115	167	142	70,9	45,6
	S 10											69	40,9	82,3	54,2	95,6	67,5	109	80,8	135	107	162	134	78,8	50,7
	S 11													77,2	46,3	90,5	59,6	104	72,9	130	99	157	126	86,7	55,7
	S 12													85,4	51,7	99	65	125	92	152	118	192	151	94,5	60,8
SB AT404	S 05	86	56,1	114	83,8	141	111	169	139	180	150	197	167	224	195									82,4	52,5
	S 06	75,5	39,6	103	67,3	131	95,0	159	123	170	134	186	150	214	178	242	206							98,9	63
	S 07			92,7	50,8	120	78,5	148	106	159	117	176	134	203	162	231	189	259	217					115	73,5
	S 08					110	62	138	89,7	149	101	165	117	193	145	221	173	248	201	304	256			132	84
	S 09							127	73,3	138	84,3	155	101	182	129	210	156	238	184	293	239	349	295	148	94,5
	S 10											144	84,5	172	112	200	140	227	168	283	223	338	278	165	105
	S 11													161	95,7	189	123	217	151	272	206	328	262	181	116
	S 12													179	107	206	135	262	190	317	245	389	317	198	126
SB AT454	S 05	135	89	179	132	222	176	265	219	283	236	309	262	352	306									129	82,4
	S 06	119	63	162	106	206	149,7	249	193	266	211	293	237	336	280	379	324							155	99
	S 07			146	80	189	124	233	167	250	185	276	211	320	254	363	298	406	341					180	115
	S 08					173	98	216	142	233	159	260	185	303	229	347	272	390	316	477	403			206	132
	S 09							200	116	217	133	243	159	287	203	330	246	374	290	460	377	547	464	232	148
	S 10											227	134	270	177	314	221	357	264	444	351	531	438	258	165
	S 11													254	151	297	195	341	238	428	325	515	412	283	181



Available Options and Ordering codes:

00 **Blank:** for standard actuator
R50: 50% travel stop limitation (45° up to 90°)
R100: 100% travel stop limitation (0° up to 90°)

1 **SB:** Standard material and surface finishing, with ENP coating
SBP: Standard material and polished surface with ENP coating
SC: Standard material and surface finishing, with NO ENP coating
SCP: Standard material and polished surface with NO ENP coating

2 **90° Rotation (Standard) = AT054U to AT654**
 Other Rotation evaluated on request.

3 **D = Double Acting**
S = Spring Return

4 (A) Only for spring return: number of spring, spring set configuration
 For model AT054U: Spring Set configuration **S1/S2/S3/S4/S5/S6/S7/S8**
 For models **AT104 to AT654** = Number of Spring:
 > **05 to 12** spring for standard actuators 90° rotation

5 **ISO 5211 Flange** (See table below)

Model	ISO 5211 Flange type available		
	Standard	Options	
AT054U	F04	F03	
AT104	F05		
AT204	F05+F07		
AT254	F05+F07		
AT304	F05+F07+F10		
AT404	F07+F10		
AT454	F10+F12		
AT554	F14	F10+F12	
AT654	F16		

6 **Blank:** no spigot
Y: with spigot

7 (B) **XXDS :** dimension and double square
 (for all Square dimensions available see table below)

ISO 5211 Square dimensions and type available			
Model	Double Square		
AT054U	9	11	
AT104	11	14	
AT204	14	17	
AT254	17		
AT304	17	22	
AT404	22	27	
AT454	27		
AT554	27	36	
AT654	36	46	

8 **Blank:**
 actuator with standard seals suitable for **-40°C (-40°F) to +80°C (+176°C)**
HT : actuator construction suitable for **-15°C (+5°F) to +150°C (+302°F)**
LLT : actuator construction suitable for **-55°C (-67°F) to +80°C (+176°F)**

9 (c) **Blank:** standard assembly type ST, clockwise to close (spring to close) and close indication at air failure condition (or with pressurized port 4 for double acting) for **in line** mounting.
STR: clockwise to close (spring to close) and close indication at air failure condition (or with pressurized port 4 for double acting) for **across line** mounting.
LF: counterclockwise to close (spring to open) and open indication at air failure condition (or with pressurized port 4 for double acting) for **across line** mounting.
LFR: counterclockwise to close (spring to open) and open indication at air failure condition (or with pressurized port 4 for double acting) for **in line** mounting.

10 Further requested options

All dimensions and materials are referred to updated catalogue and/or technical data sheet.

Notes:

- A) For model AT054U the number indicated is the spring SET configuration and not spring quantity.
- B) Standard Shaft connection is a female double square. For other connections contact AIR TORQUE.
- C) For detailed information see T.D.S. n° TYAS
- D) If not specified the actuators will be supplied with standard Position Indicator Blue colour.
 Optional indicator for sensor or limit switch contact available on request, see T.D.S. n° Tab. 00011 E / Tab. 00012 E / Tab. 00013 E.

How to order examples:

00	1	2	3	4	5	6	7	8	9	10
-	SB	AT254	S	12	F05+F07	-	14 DS	HT	-	-

SB AT254, S.S actuator Series with standard material and surface finishing, with ENP coating, spring return with 12 springs, ISO flange F05-F07, without spigot, 17 mm double square and high temperature construction, standard position indicator Blue colour.

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ATEX 94/9/EC



SIL3 IEC 61508



GOST-R



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