

# FORGED STAINLESS STEEL RACK AND PINION ACTUATOR "S" Series



**AIR TORQUE**®


PRZEDSTAWICIEL W POLSCE:

**ARA**  
PNEUMATIK

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

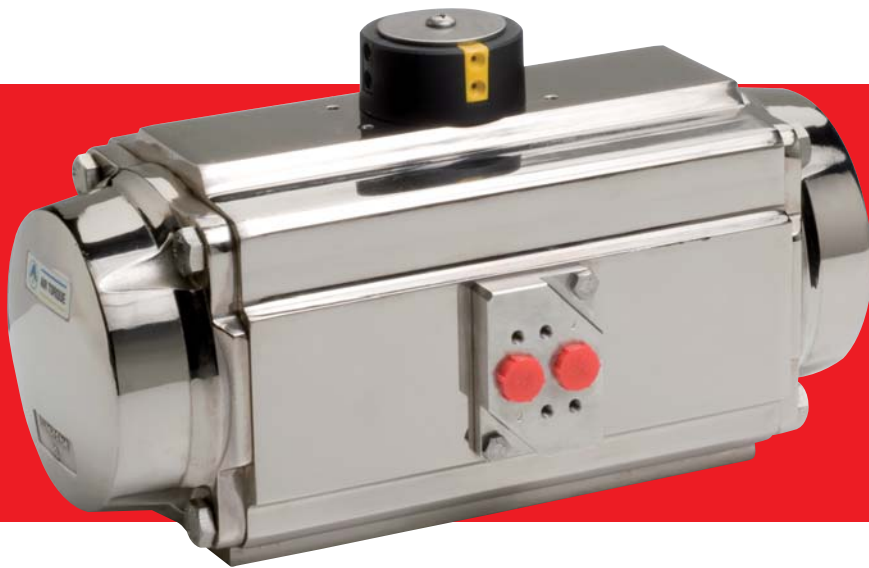
They are manufactured by using forged high quality stainless steel body material in A182 F316/ EN 10088/3 1.4401.

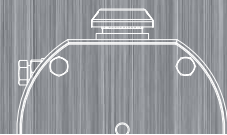
The Air Torque "S" Series stainless steel actuators are well suited for automating butterfly, ball, and plug valves in harsh, corrosive environments and they are available in both Double Acting and Spring Return versions.

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  $-5^\circ$  up to  $+5^\circ$  on the close position, and for  $+5^\circ$  up to  $-5^\circ$  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**

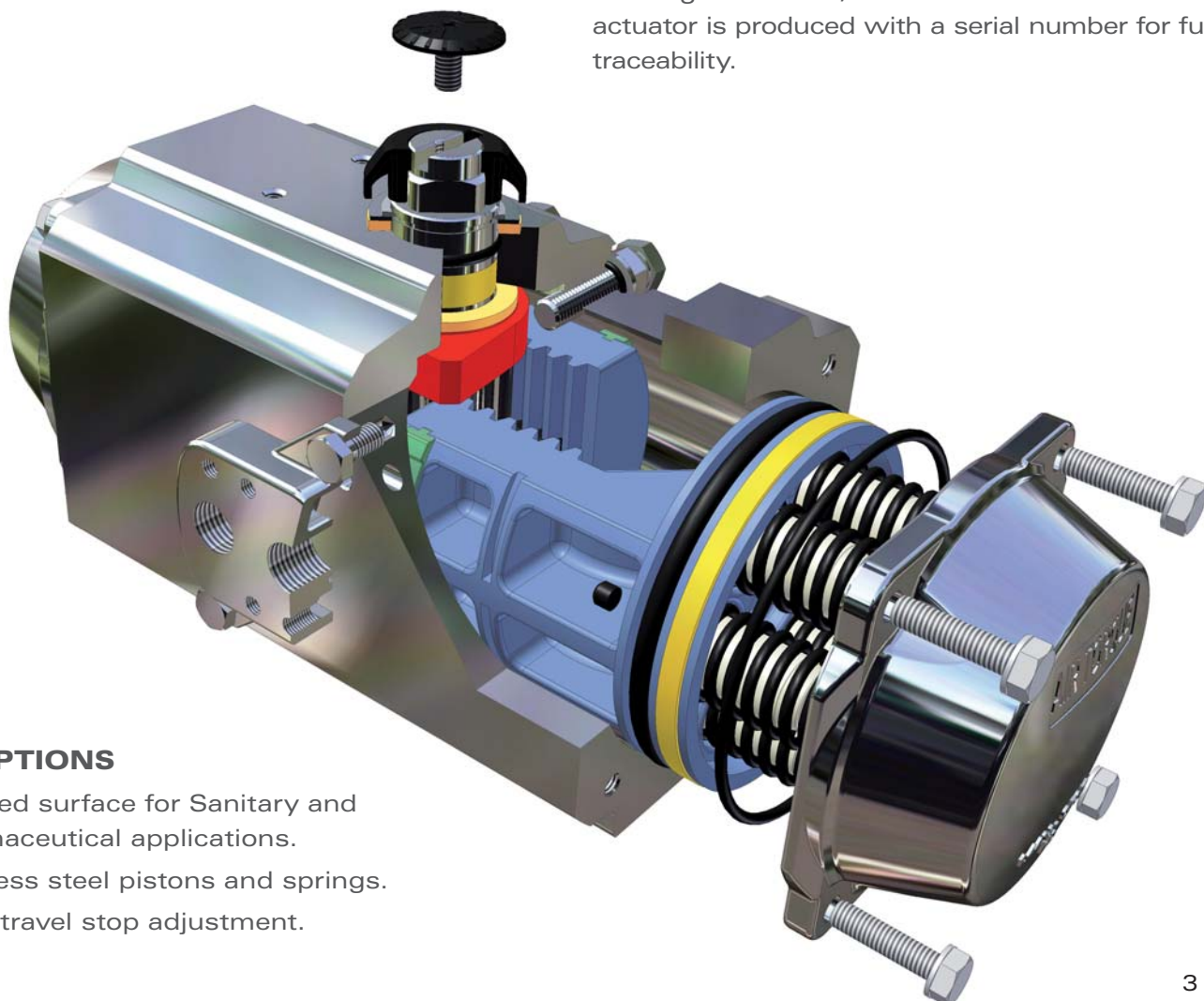
Cartridge design in high grade coated steel for simple range versatility, greater safety and corrosion resistance.

- **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**

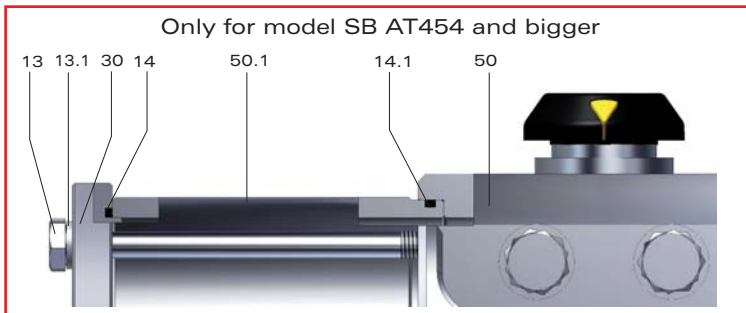
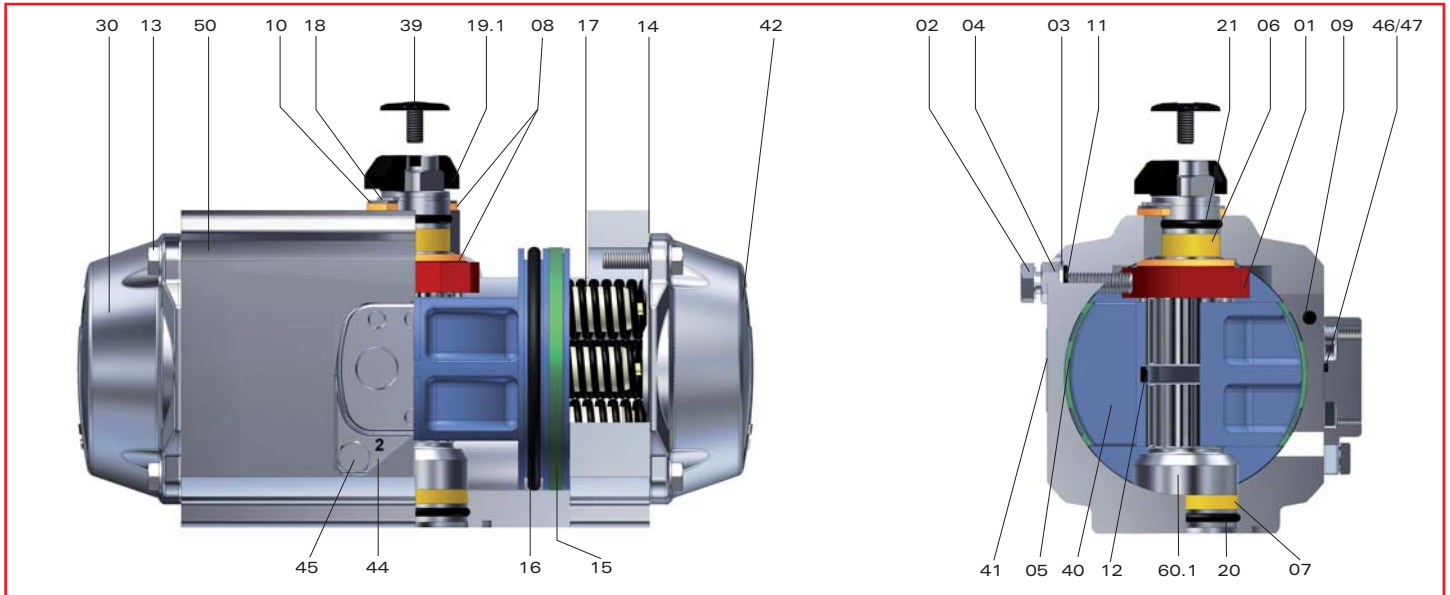
Each actuator is marked with detailed information regarding product description, connections and working conditions; furthermore each individual actuator is produced with a serial number for full traceability.



## MAIN OPTIONS

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

# MATERIAL AND CONSTRUCTION

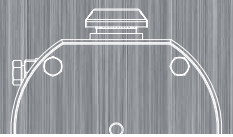


| PART N° | Spare Parts | UNIT Q.TY / NOTE | PART DESCRIPTION   | STANDARD MATERIAL   |
|---------|-------------|------------------|--|---|
| 01      |             | 1                | OCTI-CAM (Stop arrangement)                                    | Stainless Steel (only for SB AT054U ÷ SB AT304)<br>Carbon 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<br>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<br>"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<br>SPRING (Cartridge)                  |   |
| 17.1    |             | max. 4           | SPRING   | SiCr Spring alloy Steel coated  |
| 17.2    |             |                  | 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<br>for SB AT454 and bigger<br>END CAP | Stainless Steel 1.4408 (EN 10283) / CF8M (ASTM A351), ENP<br>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<br>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<br>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  |

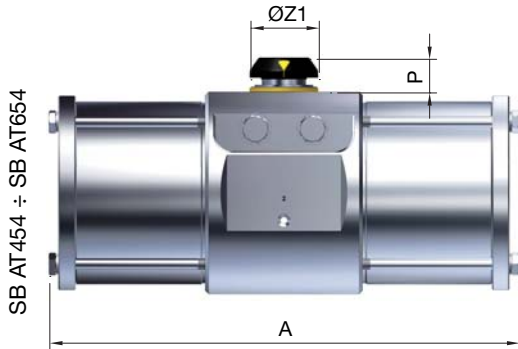
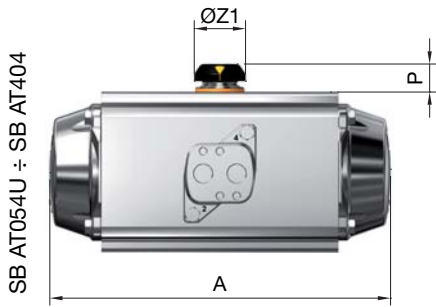
○ Parts included in Complete spare parts kit

□ Parts included in "O" ring spare parts kit

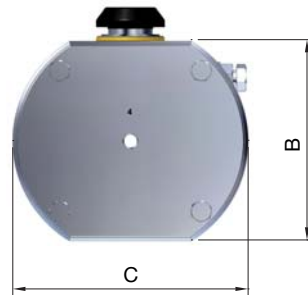
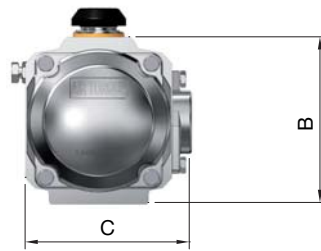
# METRIC DIMENSIONS AND TECHNICAL DATA



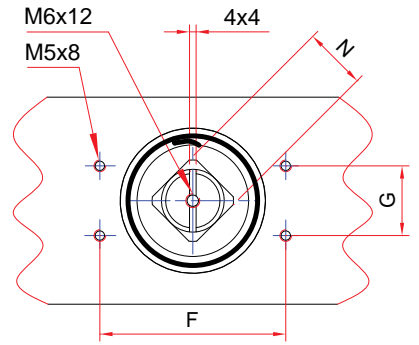
## FRONT VIEW



## SIDE VIEW

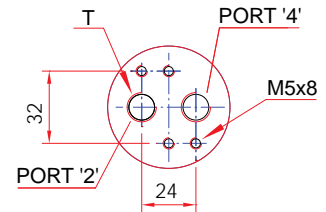


## TOP DETAIL

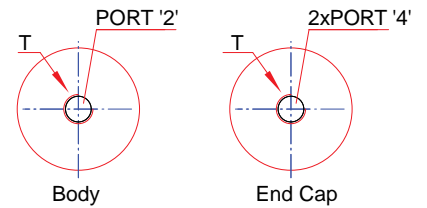


## AIR CONNECTION VDI/VEDE 3845

### SB AT054U ÷ SB AT404



### SB AT454 ÷ SB AT654



| 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"          | 1/4"         | 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 | -     |       |
|---------------------|-----|-------|-------|-------|-------|-------|-------|-----------|-------|-------|
| CH x I min.         | DS  | 9x11  | 11x12 | 14x16 | 17x19 | 17x19 | 22x24 | 27x29     | 27x29 | 36x39 |
|                     |     | 11x12 | 14x16 | 17x19 | -     | 22x24 | 27x29 | -         | 36x39 | 46x49 |

\*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 |

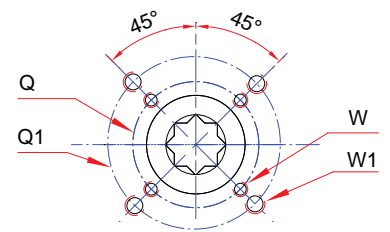
Note: (A) The above moving times of the actuator are obtained in the following test conditions:

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.

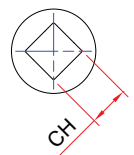
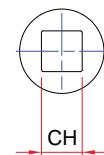
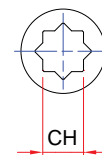
## BOTTOM VIEW ISO 5211



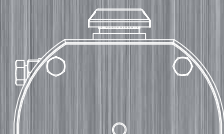
DOUBLE SQUARE (STD)

SINGLE SQUARE PARALLEL

SINGLE SQUARE DIAGONAL







## 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.

## AFFILIATE DISTRIBUTORS

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Website: www.airtorque.it



**AIR TORQUE**



ATEX 94/9/EC



SIL3 IEC 61508



GOST-R



TYPE APPROVAL

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