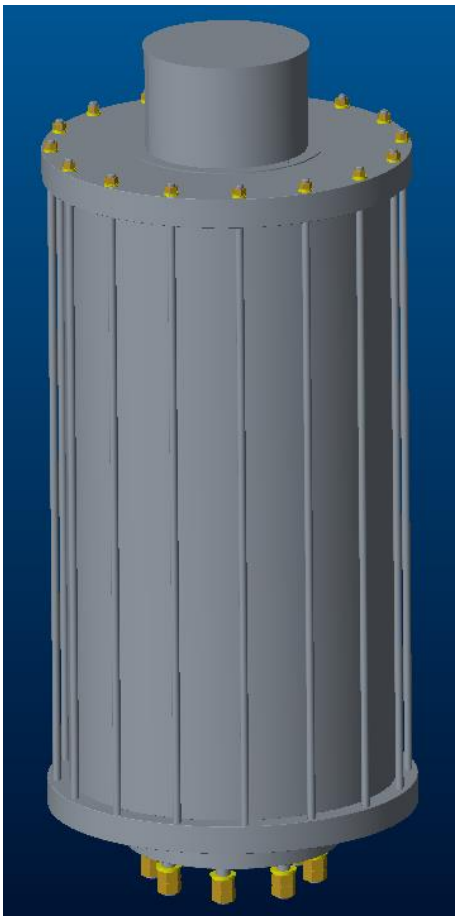
Linear pneumatic actuator
ARA Series
Single acting version With Spring

INSTRUCTION MANUAL 6000



Engineering
GREAT Solutions

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1 GENERAL INFORMATION

1.1 General Warnings

Important 	**This Instruction Manual is an integral part of the machine, it should be carefully read before carrying out any operation and it should be kept for future references.** **This Instruction Manual covers the ARA actuators in the base version without any accessories and/or control panel.** **In case accessories and/or control panel are foreseen mounted on the actuator an additional Section to this Instruction Manual will be attached to the specific actuator.** **This Instruction Manual is realized in accordance with the Directive 2006/42/CE.**

1.2 Generalities

STI S.r.l. actuators are conceived, manufactured and controlled according to the Quality Control System in compliance with EN ISO 9001 International Standard.

1.3 Manufacturer

With respect to Machinery Directive 2006/42/EC the Manufacturer of the described SC/VH actuator series, is **STI S.r.l.** as specified on the machinery label.

STI S.r.l. Via Dei Caravaggi 15
24040 Levate (BG) Italy
Tel. +39 035 2928.2
Fax +39 035 2928.247
imisti.sales@imi-critical.com

1.4 Terms and conditions

STI S.r.l. guarantees each single product to be free from defects and to conform to current goods specifications. The warranty period is one year from the date of installation by the first user, or eighteen months from the date of shipment to the first user, whichever occurs first.
The warranty does not cover special products or components not covered by warranty in their turn by subcontractors. No warranty is given for products which have been subject to improper storage, improper installation, misuse, or corrosion, or which have been modified or repaired by unauthorised personnel.
Repair work due to improper use will be charged at standard rates.

1.5 Manufacturer's Liability

STI S.r.l. declines all liability in the event of:

- use of the actuator in contravention of local safety at work legislation
- incorrect installation, disregard or incorrect application of the instructions provided on the actuator nameplate and in this manual
- modifications without STI's authorisation
- work done on the unit by unqualified or unsuitable persons.

1.6 Applicable Standards and Directives

- EN ISO 12100:2010: Safety of machinery - General principles for design. Risk asses and risk reduction.
- 2006/42/EC Machinery Directive.
- 2014/68/EU Pressure Equipments Directive (PED)
- 2014/35/EU Directive for Low Voltage Equipment (LV)**
- 2014/30/EU Directive relating to the Electromagnetic Compatibility (EMC)**
- 2014/34/EU Directive concerning equipment for use in potentially explosive atmospheres (ATEX)

** Applicable only when electrical control panel is supplied integrate with the actuator

1.7 Symbology Used

1.7.1 Signs of warning

Be careful where these symbols are shown, they indicate a potentially hazardous situation and they warn that if the steps are not properly performed, MAY RESULT CAUSING serious injury, death or long-term risks to the health of exposed persons.

GENERAL DANGER

DANGER POWER SUPPLY

CRUSHING HAZARD

1.7.2 Sings of obbligation

General obligation (with the possible supplementary signboard)

Must wear protective clothing.

Obligation to wear protective footwear.

Is required to wear a helmet.

Is required to protect the eyes.

Obligation to protect your hearing.

2 DEVICE DESCRIPTION

2.1 General Description

ARA single acting actuators with spring, are suitable for the operation of valves for ON-OFF and modulating heavy-duty service.
The ARA valve actuator is made by three main parts:

- the external cylinder group, with a piston inside that divides the internal volume in two chambers. A stem connects the piston to the valve stem;
- The internal cylinder group that permits to transform through cams the valve movement into roto-translatory;
- the yoke, that fix the cylinder to the valve.

Different kind of pneumatic accessories can be mounted on the ARA valve actuator depending on the performance required.

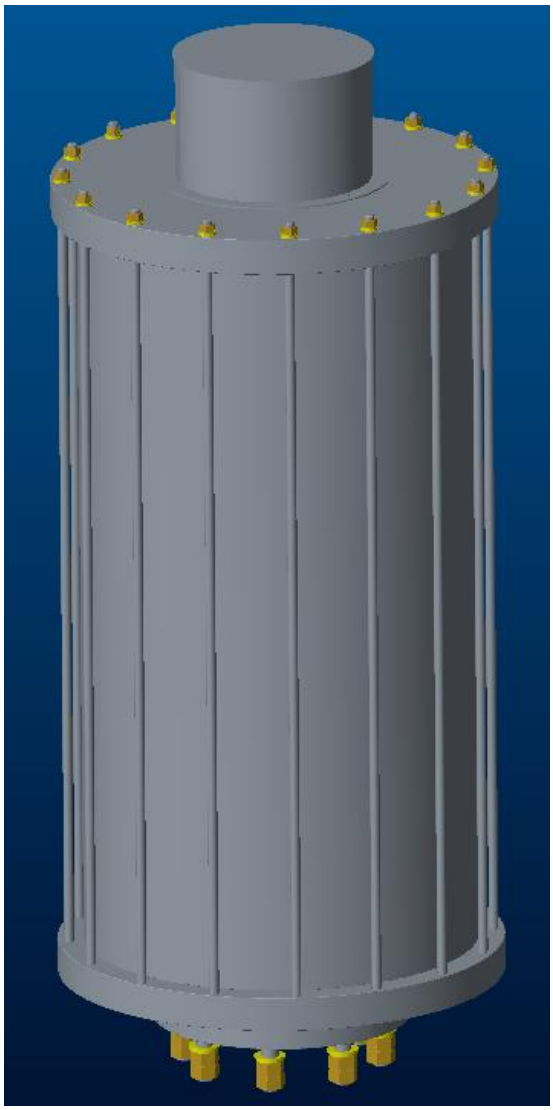


Fig. 1: ARA actuator series

2.2 Actuator coding description

X	Version
S	Single acting version
D	Double acting

YYYY	Cylinder Nominal Diameter (mm)		

...	Selection Table TBD										

3 Technical data

Model	Single Acting
	No Casting Actuators
Cylinder material	Carbon steel, Stainless steel, Fiber
Size (cylinder diameter) / Stroke (*)	200mm, 260mm, 300mm, 330mm, 390mm, 400mm, 420mm, 500mm, 520mm, 600mm, 635mm, 650mm, 735mm, 835mm, 850mm, 935mm, 1000mm, 1100mm, 1200mm, 1300mm, 1420mm
Standard design pressure (**)	10bar
Standard operating temperature range (***)	-20°C/+70°C
Expected lifetime	20 years

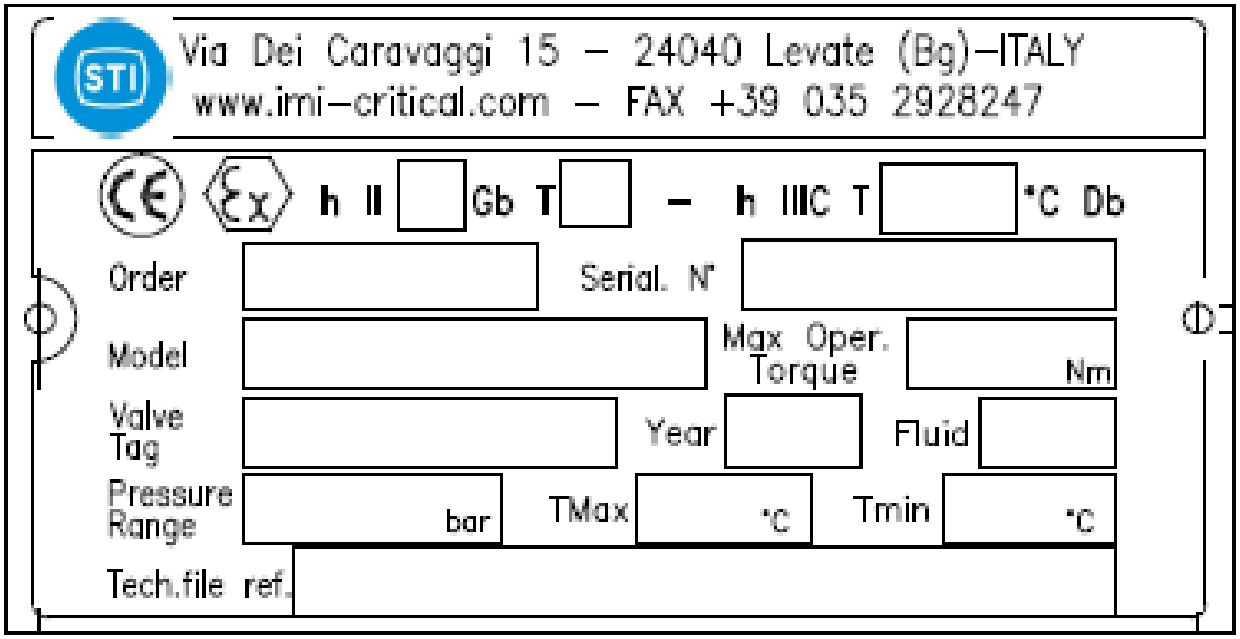
(*) Stroke for No Casting Actuators not defined in this table.

(**) For some special application the design pressure is 12 bar.

(***) For some special application the operating temperature range could be another one included in the extended temperature range from -60°C to 100°C.

4 IDENTIFICATION PLATE

Every ARA valve actuator is provided with a label containing the main operating conditions and serial number. The label may change if the ARA valve actuator is sold with reference to a Certificate of product and/or system issued by Notified Body Exterior or Certificate of Conformity issued by STI S.r.l..



Warning	**It is severely forbidden to use the ARA valve actuator under conditions other than those provided on the label.**

Important	**It is forbidden to modify the information and the marks without previous written authorization by STI S.r.l..** **Do not remove the label and/or replace with another label.**

5 INSTALLATION

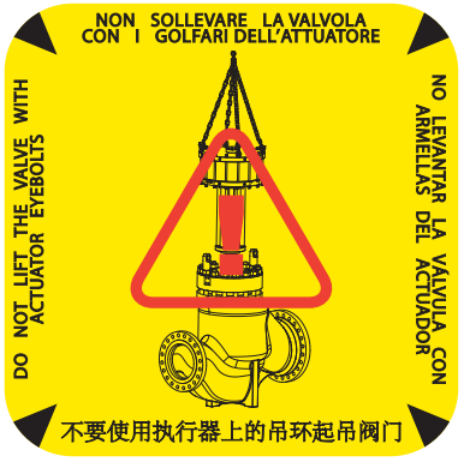
	Important: Not performing the following procedures will invalidate the product guarantee.

5.1 Transport

	Important: The lifting and handling should be made by qualified staff and in compliance with the laws and provisions in force.

	Warning: Lift the ARA actuator with belts, using its eyebolts. Make sure that the belts never scratches the accessories and pneumatic/electric connection.

Warning	Avoid that during the handling, the actuator passes above the staff. The actuator should be handled with appropriate lifting means. The weight is reported on the delivery bill and on overall-dimensions drawings furnished with the documents accompanying the actuator. For base actuator dimensions and weights please consult www.stiactuation.com

Warning	**Do not lift the valve with the ARA valve actuator eyebolts**	

5.2 Reception

- Check that the model, the serial number of the actuator and the technical data reported on the identification plate correspond to those of order confirmation (Sect. 4).
- Check that the actuator is equipped with the fittings as provided for by order confirmation.
- Check that the actuator was not damaged during transportation: if necessary renovate the painting according to the specification reported on order confirmation.
- If the actuator is received already assembled with the valve, its settings have already been made at the factory.

- If the actuator is delivered separately from the valve, it is necessary to check, and, if required, to adjust, the settings of the mechanical stops when provided (Sect. 7.2).

5.3 Storage

All the actuators ARA leave the factory in perfect condition. Performances of each unit are guaranteed by individual test and data reported on a specific test certificate issued for each unit.
In order to maintain these characteristics until the ARA actuator is installed on site, proper attention must be observed for preservation during the storage period.
If the actuator needs storage, before installation follow these steps:

- Place it on a wood surface pallet or on metallic support, so that they are not in direct contact with the ground, in order not to deteriorate the area of valve coupling, later it must be packed with appropriate covering.
- Make sure that plastic plugs are present on the hydraulic and electrical connections (if present).
- Check that the limit switch box (if any) is properly closed.

If the storage is long-term or outdoor:

- Keep the actuator protected from direct weather conditions.
- Replace plastic plugs of pneumatic and electrical connections (if any) with metal plugs that guarantee perfect tightness.
- Coat with oil, grease or protection disc, the valve coupling area.
- Periodically operate the actuator (Sect.6).

5.4 Requirements of Stability

- Conditions in which the machinery meets the requirement of stability during: use, transportation, assembly, dismantling when out of service, testing or foreseeable breakdowns, are shown in the warnings at the beginning of this section.
- The actuator must be put, with extreme caution, in a right position on a plane surface and with adapted capacity to the load to support.
- Do not use actuator eye bolts lifting of valve-actuator package.
- Concerning the requirement of stability during installation and disassembling, it is possible to refer to the next chapters 5.6 and 5.7.

5.5 Interface document and dimensional drawing

Pneumatic diagrams, wiring diagrams and dimensional drawing are furnished with document accompanying the actuator.

5.6 Installation

Warning 	Before proceeding with any installation the following instructions must be respected: - Always wear protective clothing, gloves, and eyewear to prevent personal injury. - Use the lifting point foreseen on the actuator to move the actuator: if different instructions are not well specified the lifting points foreseen on the actuator must be used only to move the actuator. - Check with your process or safety engineer for any additional measures that must be taken to protect against process media.

5.6.1 Checks to be performed before installation

If the ARA actuator is purchased separately, proceed as follows before assembling it onto the valve:

1) Check that the coupling dimensions of the actuator/coupling block flange and stem meet the specified coupling dimensions.
2) Prepare the necessary tools for the assembly and setting of the unit.

3) Check that the outer surface of the actuator is free from dust and dirt.
4) Clean the actuator flange and remove anything that might prevent a perfect adherence to the actuator/coupling block flange and joint especially all traces of grease.

5.6.2 Assembling of the actuator on the valve

The actuator can be assembled on top of the valve flange by using the lifting eyelets installed on pneumatic cylinder flange.

The assembly position of the actuator, with reference to the valve, must comply with the plant requirements

To assemble the actuator onto the valve proceeds as follows:

- Move the valve and the actuator to their fails position
- Connect a sling to the support points of the actuator and lift it: make sure the sling is suitable for the actuator weight
- Lower the actuator onto the valve in such a way that the insert bush, assembled on the valve stem, enters the actuator drive sleeve. This coupling must take place without forcing and only with the weight of the actuator.
- When the insert bush has entered the actuator drive sleeve, check the holes / pin of the valve flange meet the actuator holes and pin, otherwise rotate the mounting bracket to obtain a right assembling.

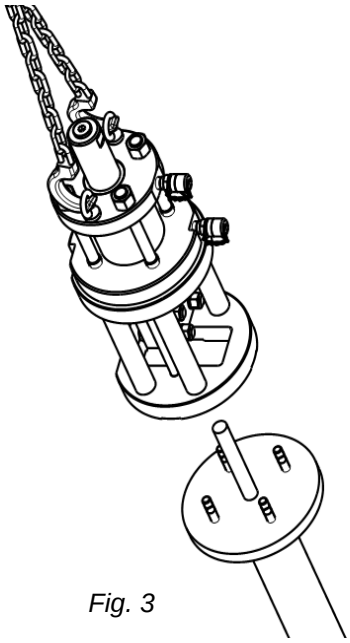


Fig. 3

Important	**To guarantee the correct transmission of thrust from the actuator to valve stem without phenomena of slip it is important to remove any trace of oil and/or grease from the mating surfaces of valve and actuator or bracket and tighten the nuts fixing the bolts with the torque specified into the following Table 1**

Table 1

Threading	Tightening torque (Nm)	Threading	Tightening torque (Nm)
M8	20	M24	550
M10	40	M27	800
M12	70	M30	1200
M14	110	M33	1400
M16	150	M36	1800
M20	300		

The torque values in Table 1 have been calculated considering the materials ASTM A320 grade L7/ASTM A193 grade B7 for screws or tie rods and ASTM A194 grade 4 for the nuts.
Alternative bolting permitted i.e. ASTM A193 B8M (or B8M3) for tie rods and ASTM A194 Gr.8M for the nuts, provided that yield strength of screws or tie rods is over than 450 Mpa.

5.6.3 Pneumatic Connections

Warning 	Check that the values of pneumatic supply available are compatible with those reported on the label of the ARA valve actuator: a pressure regulator is absolutely necessary when supply pressure is higher than max operating pressure. User must consider and take all precautions to avoid that pressurized parts are not used out of specified range and to avoid exposure to fire. Use pipes and connections appropriate as for type, rating, material and dimensions. The connection should be made by qualified staff.

- Properly deburr the ends of rigid pipes.
- Properly clean the interior of pipes sending through them plenty of the supply fluid used in the system.
- Carry out the flushing operation before assembling the pipes.
- Mould and fasten the connection pipes so that no irregular strains at entries or loosening of threaded connections occur.
- Make the connections according to the operating diagram.
- Check the absence of leakages from pneumatic connections. If necessary tighten the nuts of the pipe-fittings.

5.6.4 Electrical Connections (If any)

Warning	
	Before carrying out electrical connections, switch off any power and control lines. Use components appropriate as for type, material and dimensions. The connections should be made by qualified staff.

- Introduce connection cables.
- Make the connections in compliance with applicable wiring diagrams on the documentation supplied.
- Screw the cable gland.
- Replace the plastic plugs of unused entries with metal plugs.

5.6.5 Grounding connection

If the grounding connection is not guaranteed trough mechanical parts where actuator is mounted, it is necessary to ensure a directly grounding connection on provided point of actuator.

5.7 Disassembling

Warning	
	**Before starting the disassembly operations it is mandatory to disconnect the pneumatic power and to exhaust the cylinder and any other pressure retaining component mounted on the actuator.** Before removing the screws between actuator and valve or adaptor flange or mounting bracket, the actuator should be connected with appropriate lifting means. Lift the actuator as shown in Fig.2. The lifting points are appropriate for handling the actuator alone and not for the valve + actuator assembly.

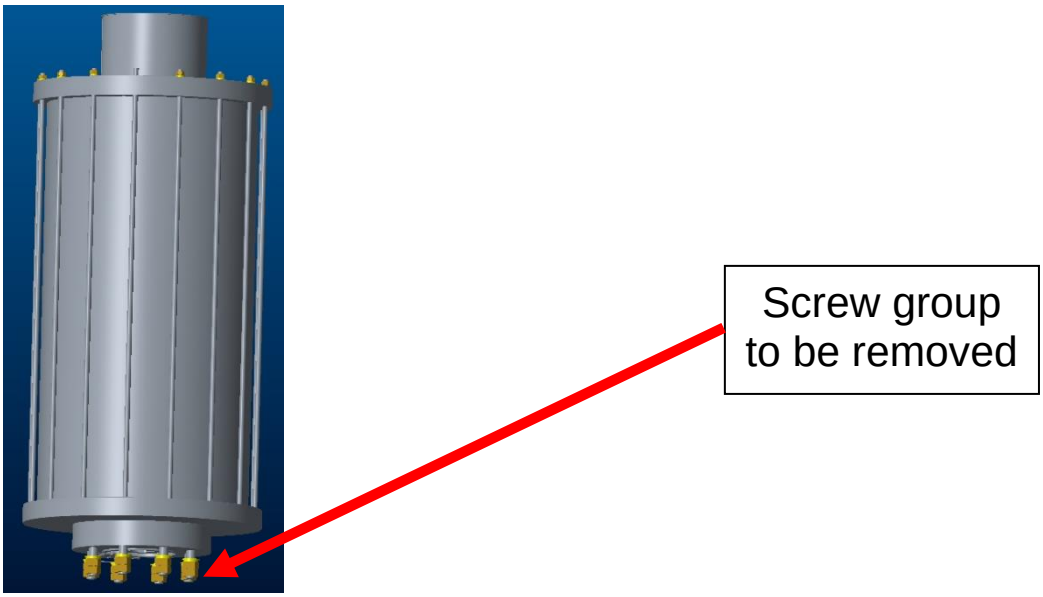


Fig. 4 – Disassembling of the actuator

6 OPERATION AND USE

6.1 Operation description

The ARA series is a pneumatic actuator designed for on-off and control service and is applicable over a wide range of pressure, temperatures and environments.
Depending which valve is attached, the valve either opens or closes.

6.2 Intended use

The machinery covered in this Instruction Manual is single acting pneumatic ARA actuator series with spring designed to operate an industrial valve for ON-OFF or modulating heavy duty service.

This ARA actuator is produced by **STI srl** [Manufacturer] and identified by a label with a product designation code. **STI srl** will not be liable for any possible damage or physical injury resulting from use in other than the designated applications or by lack of care during installation, operation, adjustment and maintenance of the machine. Such risks lie entirely with the user. Depending on the specific working conditions, additional precautions may be requested. Considering that **STI srl** has no direct control over particular applications, operation or maintenance conditions, it is the operator's responsibility to comply with all applicable safety rules. Please inform **STI srl** urgently if you face unsafe situations not described in this Instruction Manual. It is the sole responsibility of the operator to ensure that the local health and safety regulations are adhered to.
ARA actuator is designed in accordance with the applicable International Rules and Specifications, but the following Regulations must be observed in any case:

- the general and safety regulations
- the plant specific regulations and requirements
- the proper use of personal and protective devices (glasses, clothing, gloves, etc)
- the proper use of tools, lifting and transport equipment.

Warning 	**It is severely forbidden to use the ARA actuators series for purpose or application other than those for which it was designed and here above specified.**

6.3 Reasonably foreseeable misuse

A short list of reasonably foreseeable misuse:

- Installation in ambient with not planned conditions: i.e. climatic conditions different from the specified conditions;
- Insert incorrect fluid into the system;
- Supply pressure out of required range;
- Lifting of the actuator with valve through eye bolts.

6.4 Operating limits

Operating conditions are described in paragraph 3, the nameplate fastened on the actuator contains the main actuator operating condition for the specified application.

Warning	
	**It is severely forbidden to use the actuator under conditions other than those provided on the nameplate.**

6.5 Residual Risks

Warning	
	**The actuator has parts under pressure. Use the due caution.** **Use individual protections provided for by the laws and provisions in force.**

- Risk due to movements of loads during load displacements, assemblage and maintenance servicing.
- Electrical risk due to an incorrect application of the instruction.
- Crushing during assemblage and maintenance servicing.
- Extreme metal temperature at high (over than 80°C) or very low values as consequence of ambient temperature has to be considered as a risk of person injury in case of contact.
- Emissions of hazardous substances when special pneumatic fluid, different from these indicated at paragraph 8.6, are used as motive energy. (In this case it is recommended to refer to the material safety data sheet of the pneumatic fluid which is used).

7 Instructions for the operator

7.1 Start Up

During the start-up of the actuator, proceed as follows:

- Check that the pressure and quality of the fluid supply (filtering degree, dehydration) are as prescribed.
- Check that the feed voltage values of the electric components (solenoid valve coils, micro-switches, pressure switches, etc.) are as prescribed.
- Connect the actuator to the pneumatic feed line with fittings and tubing in accordance to project specifications. They must be sized correctly to guarantee the necessary flow for the operation of the actuator, with pressure drops not exceeding the maximum allowable value. The shape of the connecting piping must not cause excessive stress to the inlets of the actuator. The piping must be suitably fastened so as not to cause excessive stress or loosening of threaded connections, if the system undergoes strong vibrations.
- Every precaution must be taken to ensure that any solid or liquid contaminants, which may be present in the pipework to the actuator, are removed to avoid possible damages to the unit or loss of performance.
- The inside of the pipes used for the connections must be well-cleaned before use: wash them with suitable substances and blow through them. The ends of the tubes must be well deburred and cleaned.
- Connect the electrical feed, control and signal lines to the actuator, by linking them up with the terminal blocks of the electrical components. To do this, the housing covers must be removed without damaging the coupling surfaces, the O-rings or the gaskets.
- Remove the plugs from the cable entries.
- For electrical connections use components (cable glands, cables, hoses, conduits) in line with project and hazardous area requirements and codes applicable to the plant specifications (mechanical protection and/or explosion-proof protection).
- Screw the cable glands tightly into the threaded inlets, to guarantee the weatherproof and explosion-proof protection (if applicable).
- Insert the connection cables into the electrical enclosures through the cable glands and connect the cable wires to the terminals according to the applicable wiring diagram.
- If conduits are used, it is advisable to carry out the connection to the electrical enclosures by inserting hoses so as not to cause anomalous stress on the housing cable entries.
- Replace the plastic plugs of the unused enclosure entries by metal ones, to guarantee perfect weatherproof tightness and to comply with the explosion-proof protection codes (where applicable).

Once the connections are completed:

- check that the actuator controls work properly (remote control, local control, emergency controls, etc.)
- operate the actuator and check that it functions correctly, that the operation times meet the plant requirements and that there are no leakages in the pneumatic connections. If necessary, tighten the nuts of the pipe fittings.
- Check that the required remote signals (valve position, air pressure, etc.) are correct.
- Check that the setting of the components of the actuator control unit (pressure regulator, pressure switches, flow control valves, etc.) meet the plant requirements.
- Remove all rust and, in accordance with the applicable painting specifications, repair paint-coat that has been damaged during transport, storage or assembly.

8 MAINTENANCE

Important 	Before performing any maintenance operations always wear protective gloves, clothing, and eyewear.

Warning 	Before proceeding with any maintenance operation the following instructions must be respected: Disconnect any operating lines providing pneumatic pressure, electric power, or a control signal to the actuator. Be sure the actuator cannot suddenly open or close the valve. Close the pneumatic feed line and make sure that there is no pressure in the actuator cylinder and the control unit, to ensure safety of maintenance staff.

Warning 	Use only STI original spare parts. STI cannot accept responsibility for any damages that occur from using spare parts or fastening materials from other manufacturers. If STI products (i.e. gasket, o-ring etc) have been on store for longer periods check these for corrosion or deterioration before using these products.

8.1 Periodic Inspections

Inspect the general conditions at regular intervals: recommended frequency of inspection is once every two years but this frequency could be changed depending on the installation and working conditions.

- Check that the actuator operates the valve correctly and with the required operating times. If the actuator operation is very infrequent, carry out a few opening and closing operations with all the existing controls (remote control, local control, emergency controls, etc.), if this is allowed by the conditions of the plant.
- Check that the signals to the remote control desk are correct.
- Check that the pneumatic supply pressure value is within the required range.
- If there is a filter on the actuator please check the proper functionality.
- Check that the external components of the actuator are in good conditions.
- Check all the paint-coat of the actuator. If some areas are damaged, repair the paint-coat according to the applicable specification.
- Check that there is no leak in the pneumatic connections. If necessary tighten the nuts of the pipe-fittings.

Warning 	Take care that a build-up of dust or dirt on the actuator can inhibit cooling and contribute to increase surface temperature. The user should plan and provide for a periodic cleaning/maintenance program that will maintain the external surface of the actuator free from excessive layer of dust.

8.2 Special maintenance

Under normal condition the actuator doesn't need special maintenance.
If there are leaks in the pneumatic cylinder or a malfunction in the mechanical components, or in case of scheduled preventive maintenance, the actuator must be disassembled and seals or any other defective parts must be replaced.
Replacement of seals must be done with reference to the attached sectional drawing and adopting the relevant procedures.in section 10.

8.3 Repairs

When needed, repair must only be carried out with Manufacturer's original spare parts.
Original spare parts must be required to the Manufacturer with reference to the item numbers shown in Section 10.
To ensure that right spare is provided, **serial number** printed on the ARA series label must be specified when spares are ordered.

Assemble the nuts (please refer to cylinder sectional dwg.) onto the tie rods. Tighten the nuts to the recommended torque as per Table 1 in sec. 5.6.2, alternating between opposite corners.

Important	
	**After maintenance operations carry out a few actuator operations to check that its stroking is regular and that there is no leak through the seals and fittings.**

8.4 **Mechanism Lubrication**

ARA series does not need lubrication during his life. However, it's possible to utilize following grease during special maintenance operations.

ARA cylinder material	**Very Low temperature (Tmin ≤ -40°C)**	**Low temperature (-40°C< Tmin <-20°C)**	**Standard temperature (-20°C ≤ T ≤ -70°C)**	**High temperature (Tmax > 70°C)**
Aluminum	RHEOLUBE 361F (Tecnolube seal)	RHOESIL 500F (Tecnolube seal)	MOLYGUARD IDROSFER	SYNTHY 101 (Tecnolube seal)
Nickel plated carbon steel	RHEOLUBE 361F (Tecnolube seal)	RHOESIL 500F (Tecnolube seal)	MOLYGUARD IDROSFER	SYNTHY 101 (Tecnolube seal)
Chrome plated carbon steel	RHEOLUBE 361F (Tecnolube seal)	RHOESIL 500F (Tecnolube seal)	POLIMER 400/1 (Tecnolube seal)	SYNTHY 101 (Tecnolube seal)
Stainless steel	RHEOLUBE 361F (Tecnolube seal)	RHOESIL 500F (Tecnolube seal)	POLIMER 400/1 (Tecnolube seal)	SYNTHY 101 (Tecnolube seal)
Fiber	RHEOLUBE 361F (Tecnolube seal)	RHOESIL 500F (Tecnolube seal)	POLIMER 400/1 (Tecnolube seal)	SYNTHY 101 (Tecnolube seal)

Manual override material	**Very Low temperature (Tmin ≤-40°C)**	**Low temperature (-40°C<Tmin<-20°C)**	**Standard temperature**	**High temperature (Tmax > 70°C)**
All material	MOLIKOTE	MU EP (Agip)	MU EP (Agip)	MU EP (Agip)

9 TROUBLESHOOTING

EVENT	POSSIBLE CAUSE	REMEDY
ARA valve actuator doesn't move	Lack of pneumatic supply	Check supply line
	Low supply pressure	Adjust supply pressure
	Pneumatic circuit failure	Call STI S.r.l.
	Thrust on stem not enough (valve seizing)	Call valve manufacturer
	Thrust on stem not enough (wrong actuator sizing)	Call STI S.r.l.
	Presence of an external obstruction	Put the ARA valve actuator in a safety condition and remove the obstruction
	Damaged actuator internal component	Call STI S.r.l.
ARA valve actuator doesn't move in a linear way	Lubricators unsuitable	Replace the lubricators
		Call STI S.r.l.
	Stem misalignment	Check the actuator stem alignment
		Call STI S.r.l.
	Thrust on stem not enough (valve seizing)	Call valve manufacturer
	Thrust on stem not enough (wrong actuator sizing)	Call STI S.r.l.
Opening/Closing time not satisfy	Incorrect positioner calibration	Call STI S.r.l.
	Pneumatic circuit not suitable	Call STI S.r.l.
	Wrong actuator sizing	Call STI S.r.l.
	Wrong spring selection	Call STI S.r.l.
	Spring vent clopping (if any)	Check the spring vent
Leakages from pneumatic cylinder	Deterioration and/or damage of gasket	Replace the gaskets
		Call STI S.r.l.
	Deterioration and/or damage of the cylinder or the upper/lower cap	Call STI S.r.l.
	Incorrect tie rods tighten	Call STI S.r.l.
Leakages from pneumatic circuit	The nuts of pipe fittings are not tighten enough	Tighten the nuts
	An accessory does not work correctly	Call STI S.r.l.

Important	
	**If another event happens or another possible cause of the above events has been detected, call STI S.r.l.**

10 PARTS LIST GENERAL ASSEMBLY

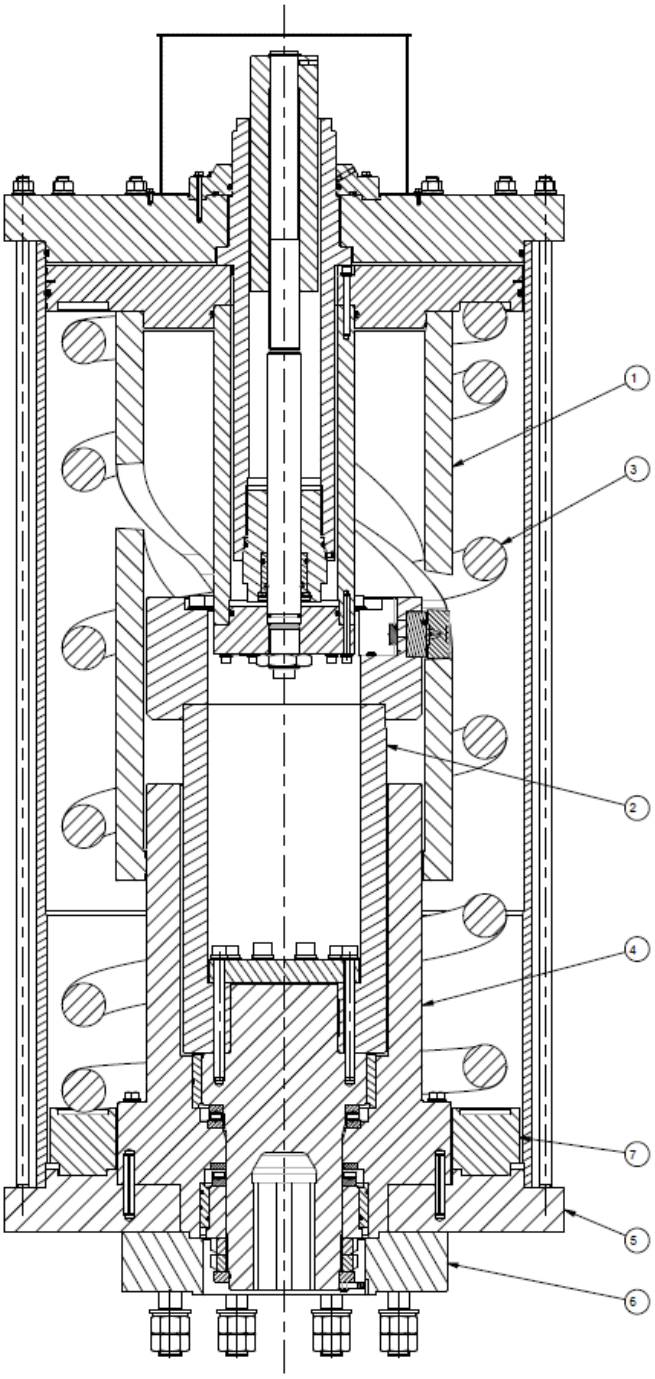
This section includes the drawings and parts lists of each component and subassembly of ARA series.

	**Important:** When ordering spare parts, please indicate the serial number embossed on the actuator nameplate.

	**Important:** When ordering spare parts, please refer to the spare part kit on the attached drawings.

	**Important:** When ordering spare parts, use ONLY original STI spare parts.

10.1 **ARA Single Acting**



POS.	Q.TY'	DESCRIPTION
1	1	ASSIEME CAMMA PISTONE
2	1	ASSIEME ALBERO ROTELLE
3	1	SPRING REGULATION LEFT
4	1	ANTIROTAZIONE
5	1	TESTATE
6	1	PROLUNGA 2
7	1	DIST MOLLA REG

Figure 6 – Stem Extended Casting Actuator: typical design

11 SPARE PARTS

Spare part kit for ARA series

No spare part kit will be provided. For any issue with the ARA actuator, the same will have to be sent to IMI STI to be inspected and eventual replacement mounted.

12 DECOMMISSIONING

Disposal and recycling

	**Warning:** Before disassembling actuator it is necessary to intercept the pneumatic connection to discharge pneumatic cylinder to the atmosphere. If present discharge also the pressure from back-up tank.
	**Warning:** Refer to section 5.1 and section 5.4 to lifting and storage procedure **Warning:** If the actuator can be operated, put the actuator in fail safe position and unscrew totally the stopper screw. **Warning:** The demolition of actuator parts should be made from specialized personnel.

Before starting a large area should be created around the actuator so to allow any kind of movement without problems of further risks created by work site.

Subject	Hazardous	Recyclable	Disposal
Metals	No	Yes	Use licensed recyclers
Plastics	No	Yes	Use specialist recyclers
Rubber (seals and o-rings)	Yes	No	May require special treatment before disposal, use specialist waste disposal companies
Oil and grease	Yes	Yes	May require special treatment before disposal, use specialist waste disposal companies
Electric and Electronic equipment	Yes	Yes	Use specialist recyclers

	**Warning:** Do not re-use parts or components which appear to be in good condition after they have been checked or replaced by qualified personnel and declared unsuitable for use.

	**Important:** In all cases check local authority regulation before disposal.

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