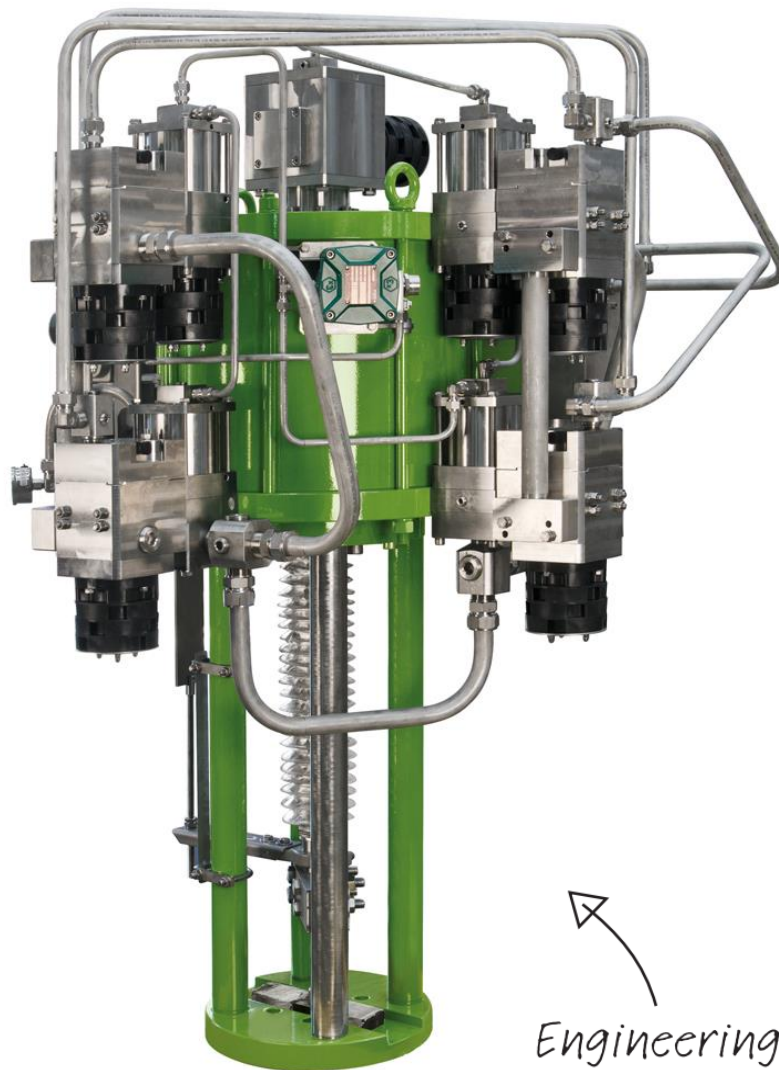


SC/V - VALVE ACTUATOR DOUBLE ACTING INSTRUCTION MANUAL 5017



*Engineering
GREAT Solutions*


STI S.r.l. has taken every care in collecting and verifying the documentation contained in this Instruction Manual. The information herein contained are reserved property of STI S.r.l.

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1 GENERAL INFORMATION

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. The operators shall adopt the safety precautions required by the country where the product is installed. This Instruction Manual is realized in accordance with the Directive 2006/42/CE.
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1.1 Generalities

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

1.2 Manufacturer

With respect to Machinery Directive 2006/42/EC, the Manufacturer of the described SC/V valve actuator is STI S.r.l. as specified on the 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

1.3 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 two years from the date of shipment to the first user. 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, improper maintenance or which have been modified or repaired by unauthorised personnel.

1.4 Manufacturer's liability

The SC/V valve 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 devices, protective devices (glasses, clothing, gloves, etc), tools and transport equipment.

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

- use SC/V valve actuator in other applications than the designated ones;
- use of the SC/V valve actuator in contravention of local safety at work legislation;
- lack of care during transport, installation, operations, maintenances of the SC/V valve actuator or incorrect application of the instructions provided on the SC/V valve actuator label and in this manual;
- modifications or repairs without STI S.r.l. authorisation;
- work done on the unit by unqualified or unsuitable operators.

Considering that STI S.r.l. has no direct control over particular applications, operation or maintenance conditions, it is the operator's responsibility to comply with all applicable safety rules; it is the sole responsibility of the operator to ensure that the local health and safety regulations are adhered to. Depending on the specific working conditions, additional precautions may be requested. Please inform STI S.r.l. urgently if you face unsafe situations not described in this Instruction Manual.

1.5 Applicable Standards and Directives

- EN ISO 12100: 2010: Safety of machinery - General principles for design. Risk asses and risk reduction.
- EN ISO 80079-36: 2016: Non-electrical equipment for explosive atmospheres – Basic method and requirement.
- EN ISO 80079-37: 2016: Non-electrical equipment for explosive atmospheres – Non electrical type of protection constructional safety “c”, control of ignition source “b”, liquid immersion “k”.
- 2006/42/EC Machinery Directive.
- 2014/68/EU Pressure Equipments Directive (PED)
- 2014/34/EU Directive concerning equipment for use in potentially explosive atmospheres (ATEX)
- 2014/35/EU Directive for Low Voltage Equipment (LV)**
- 2014/30/EU Directive relating to the Electromagnetic Compatibility (EMC)**

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

1.6 Symbology used

Dangerous symbols: 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

Obligation symbols: if these symbols are shown, the corresponding direction shall be followed.



General obligation (with the possible supplementary signboard)



Must wear protective clothing.



Must wear protective footwear.



Must wear protective helmet.



Must wear protective glasses



Must wear earplugs

2 DEVICE DESCRIPTION

The SC/V valve actuator is made by three main parts:

- the cylinder group, with a piston inside that divides the internal volume in two chambers. A stem connects the piston to the valve stem;
- the yoke, that fix the cylinder to the valve;
- the manual override (if required).

Different kind of pneumatic accessories could be mounting on the SC/V valve actuator depending on the performance required.



Figure 1 – SC/V valve actuator

3 TECHNICAL DATA

Model	Double Acting	
	Casting Actuators	No Casting Actuators
Cylinder material	Aluminum	Carbon steel, Stainless steel, Fiber (*)
Size (cylinder diameter) / Stroke (**)	150mm/≤40mm 200mm/≤150mm 250mm/≤150mm 320mm/≤300mm	200mm, 260mm, 300mm, 330mm, 390mm, 400mm, 420mm, 500mm, 520mm, 600mm, 635mm, 650mm, 735mm, 800mm, 835mm, 850mm, 935mm, 1000mm, 1040mm, 1100mm, 1200mm, 1300mm, 1420mm, 1500mm
Standard design pressure (***)	10 bar	10 bar
Standard operating temperature range (****)	-20°C/+70°C	-20°C/+70°C
Expected lifetime	20 years	20 years

(*) Fiber cylinders allowed only in hazardous areas **Zone 2, 22** (see Section 4)

(**) 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 CONDITIONS of INSTALLATION and LABELS

4.1 General label

Every SC/V valve actuator installed in non-classified area (non-hazardous) is provided with a label contains the main operating conditions and serial number according to the figure 2.

The label may change if the SC/V valve actuator is sold with reference to a Certificate of product issued by a Notified Body or Certificate of Conformity issued by STI S.r.l, as per following figures 2a, 2b or 2c.


		STI s.r.l. Via Dei Caravaggi 15 24040 LEVATE(Bg)-ITALY	
		www.imi-critical.com - FAX +39 035 2928247	
MODELLO Model	<input type="text"/>	MATRICOLA Ident. No	<input type="text"/>
DN Size	<input type="text"/> mm	CORSA Stroke	<input type="text"/> mm
		ALIM.MAX Supply	<input type="text"/> bar
SEGNALE Signal	3 ÷ 15 psi <input type="checkbox"/>	0.2 ÷ 1 bar <input type="checkbox"/>	4 ÷ 20mA <input type="checkbox"/>
CAMPO SPECIALE Special range	<input type="text"/>	AZIONE Action	D. <input type="checkbox"/> R. <input type="checkbox"/> ON/OFF <input type="checkbox"/>
SIGLA Tag.No	<input type="text"/>		

Figure 2 – SC/V standard label

4.2 Labels for metallic cylinders installed in hazardous areas

Every SC/V valve actuator with metallic cylinder installed in hazardous areas **Zone 1 and 21 or Zone 2 and 22** is provided with a label contains the main operating conditions, serial number and marking according to the Rules for classified areas as per figures 2a and 2b.



		STI s.r.l. Via Dei Caravaggi 15 24040 LEVATE(Bg)-ITALY	
		www.imi-critical.com - FAX +39 035 2928247	
		Ref. INERIS EQEN 031073/15	
		IP66/67M	
Ex h II <input type="checkbox"/> T <input type="checkbox"/> Gb / Ex h III C T <input type="checkbox"/> °C Db		Certificate IECEx NE 19.0025	
MODELLO Model	<input type="text"/>	DN Size	<input type="text"/>
		CORSA Stroke	<input type="text"/> mm
MATRICOLA Ident. N°	<input type="text"/>	Tag N°	<input type="text"/>
SEGNALE Signal	3-15 Psi <input type="checkbox"/>	4-20mA <input type="checkbox"/>	CAMPO SPECIALE Special Range <input type="text"/>
AZIONE Action	Reverse <input type="checkbox"/>	Direct <input type="checkbox"/>	On-Off <input type="checkbox"/> ALIM. Supply <input type="text"/> bar

Figure 2a – SC/V label ATEX/IECEx version



 STI s.r.l. Via Dei Caravaggi 15 24040 LEVATE(Bg)-ITALY www.imi-critical.com - FAX +39 035 2928247		 0496	
 II2GD Ref. INERIS EQEN 031073/15		IP66/67M	
Ex h II <input type="checkbox"/> T <input type="checkbox"/> Gb / Ex h III C T <input type="checkbox"/> °C Db Certificate IECEx INE 19.0025			
PS	<input type="text"/> bar	TMax	<input type="text"/> °C
MODELLO	<input type="text"/>	DN	<input type="text"/>
Model		Size	
MATRICOLA	<input type="text"/>	Tag	<input type="text"/>
Serial n°		N°	
SEGNALE	<input type="text"/>	ANNO DI FABBRICA	<input type="text"/>
Signal		Year of fabrication	
AZIONE	<input type="text"/>	ALIMENTAZIONE	<input type="text"/>
Action		Supply	bar

Figure 2b – SC/V label ATEX/IECEx + PED version

4.3 Label for fiber cylinders installed in hazardous areas

Every SC/V valve actuator with fiber-cylinder can be installed only in hazardous areas **Zone 2 and 22** marked with label shown in Figure 2c.







 STI s.r.l. Via Dei Caravaggi 15 24040 LEVATE(Bg)-ITALY www.imi-critical.com - FAX +39 035 2928247			
 II2GD Ref. INERIS EQEN 031073/15		IP66/67M	
Ex h II <input type="checkbox"/> T <input type="checkbox"/> Gc / Ex h III C T <input type="checkbox"/> °C Dc Certificate IECEx INE 19.0025			
MODELLO	<input type="text"/>	DN	<input type="text"/>
Model		Size	
MATRICOLA	<input type="text"/>	Tag	<input type="text"/>
Ident. N°		N°	
SEGNALE	3-15 Psi <input type="checkbox"/>	4-20mA <input type="checkbox"/>	CAMPO SPECIALE <input type="text"/>
Signal			Special Range
AZIONE	Reverse <input type="checkbox"/>	Direct <input type="checkbox"/>	On-Off <input type="checkbox"/>
Action			ALIM. Supply <input type="text"/> bar

Figure 2c – SC/V label ATEX/IECEx for installation in Zones 2 and 22

Warning 	<p>It is severely forbidden to use the SC/V valve actuator under conditions other than those provided on the label.</p> <p>Fiber cylinders allowed only in hazardous areas Zones 2 and 22.</p>
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Important 	<p>It is forbidden to modify the information and the marks without previous written authorization by STI S.r.l..</p> <p>Do not remove the label and/or replace with other label.</p>
---	--

5 OPERATING CONDITIONS AND INTENDED USE

<p>Warning</p> 	<p>It is severely forbidden to use the SC/V valve actuator for purpose or application other than those for which it was designed and here specified.</p>
---	--

5.1 Operating conditions

The label fastened on the SC/V valve actuator contains the main operating conditions for the specified application (see Section 4). Other operating conditions are reported on the documents accompanying the actuator. For general operating conditions see Section 3.

5.2 Intended use


The SC/V valve actuator series has been specifically designed for control valves, typically used in on-off application or regulation mode. In order to open/close the valve without the support of the supply fluid, in some application the manual override is required. Every manual override is provided with a label contains the correct using steps.




Figure 3 – Manual override standard label

After the manual override using, take off the manual override pin and then check the correct behavior of the SC/V valve actuator with a functional test or a visual check of the pin.

6 TRANSPORT

<p>Warning</p> 	<p>The following instructions must be respected:</p> <ul style="list-style-type: none">- operations must be carried out only by skilled operators;- always wear protective clothing, gloves, and eyewear to prevent personal injury. Check with your process or safety engineer for any additional measures that must be taken to protect against process media.
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<p>Important</p> 	<p>The lifting and handling should be made in compliance with the laws and provisions in force.</p>
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Lift the SC/V valve actuator with belts, using its eyebolts. Make sure that the belts never scratches the accessories and pneumatic/electric connection.

7 RECEPTION

SC/V valve actuator leave the factory in perfect condition. Performances of each unit are guaranteed by tests and data reported on a specific Test Report. At the reception of the SC/V valve actuator:


- check that the model correspond with that of order confirmation;
- check that the pneumatic diagrams, wiring diagrams and dimensional drawing are furnished with document accompanying the actuator;
- check that the SC/V valve actuator was not damaged during transportation. If necessary renovate the painting according to the specification reported on the order confirmation.

8 STORAGE

In order to maintain the guaranteed actuator performances until the SC/V valve actuator is installed on site, proper attention must be observed for preservation during the storage period. If the SC/V valve actuator needs storage before installation:

- place it in a dry, clean place and take all necessary measures to avoid contact with dust, dirt and humidity during storage;
- make sure that connection protections and/or the mechanical locks will not be removed during the storage;
- storage temperature must be between -20°C and +40°C.

9 INSTALLATION

<p>Warning</p> 	<p>The following instructions must be respected:</p> <ul style="list-style-type: none"> - operations must be carried out only by skilled operators; - always wear protective clothing, gloves, and eyewear to prevent personal injury. Check with your process or safety engineer for any additional measures that must be taken to protect against process media.
---	--

<p>Important</p> 	<p>Not performing the following procedures will invalidate the product warranty.</p>
---	--

9.1 Checks to be performed before installation



It is recommended to check the SC/V valve actuator conditions before the installation, then:

- prepare the necessary tools for the assembly and setting of the unit;
- check that the coupling dimensions meet the specified coupling dimensions;
- clean the SC/V valve actuator surfaces and remove anything that might prevent a perfect adherence with the valve;


9.2 Alignment of the SC/V valve actuator


After installation on the valve:

- check that the SC/V valve actuator are correctly mounted on the valve and the actuator is perfectly aligned with the valve stem;
- make sure that there is no abnormal binding, sticking or jumping in the motion of the system (actuator/applied load) for the whole shaft;

<p>Warning</p> 	<p>Do not lift the valve with the SC/V valve actuator eyebolts</p>	
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9.3 Pneumatic connections


Warning 	<p>Check that the values of pneumatic supply available are compatible with those reported on the label of the SC/V 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.</p>
---	--

Important 	<p>For easier maintenance, it is recommended to install a filter with five micron cartridge and shut-off valve on the supply connection.</p>
---	--

It is required to follow this steps during the pneumatic connection:


- no lubricators on supply fluid line is required;
- use pipes and connections appropriate as for type, rating, material and dimensions;
- properly deburr the ends of rigid pipes;
- properly clean the interior of pipes sending through them plenty of the supply fluid;
- use pipe sealant sparingly and only on male threads. A non-hardening sealant is strongly recommended;
- fasten the connection pipes so that no irregular strains or loosening of threaded connections occur;
- make the pneumatic connections according to the pneumatic diagram;
- check the absence of leakages from pneumatic connections. If necessary tighten the nuts of the pipe-fittings;
- after connecting the actuator, gradually increase the supply pressure up to the maximum operating pressure.


9.4 Earthing connection

Warning 	<p>Check if the SC/V valve actuator has a properly earthing connection.</p>
---	---

The earthing connection is guaranteed through the fixing flange of the SC/V valve actuator. If the earthing connection of the system where SC/V valve actuator is mounted is not guaranteed, it is required to ensure a directly earthing connection.

10 INSTRUCTION FOR THE OPERATORS

<p>Warning</p> 	<p>The following instructions must be respected:</p> <ul style="list-style-type: none">- operations must be carried out only by skilled operators;- always wear protective clothing, gloves, and eyewear to prevent personal injury. Check with your process or safety engineer for any additional measures that must be taken to protect against process media.
---	---

<p>Important</p> 	<p>Any repair work other than the operations outlines in this Instruction Manual is allowed only if STI S.r.l. authorises it.</p>
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10.1 Field activities

During the start-up of the SC/V valve actuator:


- check that the pressure and quality of the supply fluid (filtering degree, dehydration, etcetera) are as prescribed;
- check if the operating condition are as prescribed;
- check if the actuator is perfectly aligned with the valve stem;
- check that there are no leak of the pneumatic connections;
- check that there are no leak of the accessories mounted on the SC/V valve actuator;
- check that there are no leak of the cylinder of SC/V valve actuator;
- remove all rust on the SC/V valve actuator surfaces;
- repair paint-coat that has been damaged, in accordance with the applicable painting specifications;
- perform a complete functional test.

10.2 Residual Risks

Reasonably foreseeable misuse:

- risk due to movements of loads during transport and installation;
- crushing during transport and installation;
- installation in ambient with not planned conditions;
- metal temperature at high or very low values as consequence of ambient temperature as to be considered as a risk of person injury in case of contact;
- insert incorrect motive fluid into the system;
- supply pressure out of planned range;
- emissions of hazardous substances where dangerous gases are used as motive fluid.

11 MAINTENANCE

<p>Warning</p> 	<p>The following instructions must be respected:</p> <ul style="list-style-type: none"> - operations must be carried out only by skilled operators (STI operators or operators qualified by STI are recommended); - always wear protective clothing, gloves, and eyewear to prevent personal injury. Check with your process or safety engineer for any additional measures that must be taken to protect against process media.
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Before any type of operation and/or maintenance is performed, make sure that:

- actuator, accessories and all connected equipment are not under pressure and in safe conditions;
- fluid supply, power or other energy sources and signals are disconnected;
- actuator is free from any mechanism able to move.

11.1 Periodic Inspections and maintenance

Periodic visual inspections are recommended. The user shall:

- plan and provide for a periodic cleaning/maintenance program that will maintain the external surface of the SC/V valve actuator free from excessive layer of dust;
- lubrication the external mechanical devices in motion every six months (see Section 12.3 for the correct grease type);
- check painting status of the entire actuator at least every three months. If any damage on the painting film is present, the user shall immediately carry out an adequate painting touch-up;
- replace the gaskets and the grease every 2- 3 years depending on the actuator operating conditions; see enclosed annexes for any details:
 - o 150-200-250-320 – Casting Cylinder;
 - o 200 – No Casting Cylinder;
 - o 260-330-390 – No Casting Cylinder;
 - o 300-400-500 – No Casting Cylinder;
 - o 420-520-600-650-800-850 – No Casting Cylinder.

11.2 Extraordinary maintenance

In case of extraordinary maintenance, following malfunction and related troubleshooting, proceed as written in Section 13.

11.3 Greases

SC/V 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)

(*) Fiber cylinders allowed only in hazardous areas **Zones 2 and 22** (see Section 4)

12 PARTS LIST GENERAL ASSEMBLY

12.1 Casting Actuator

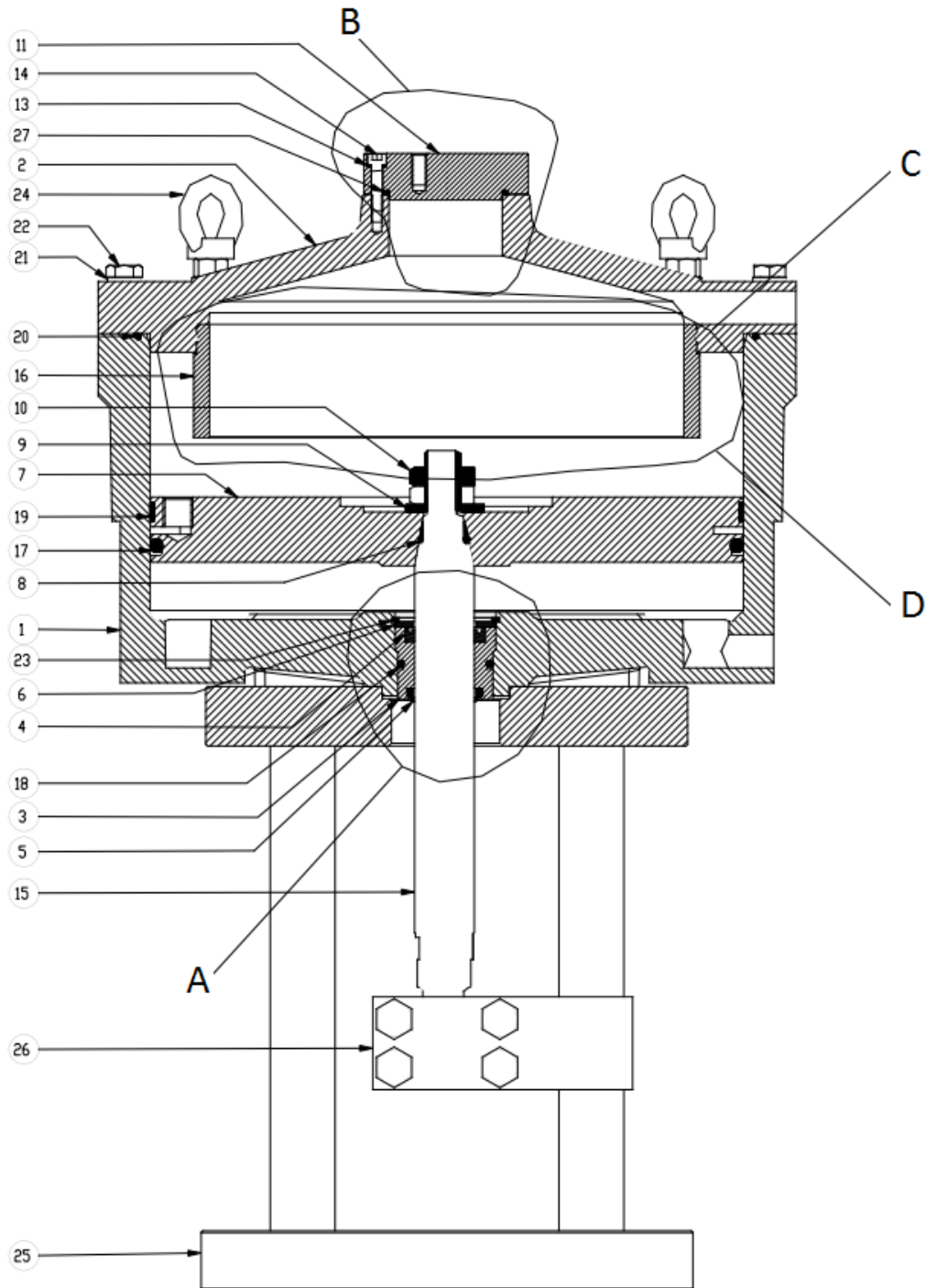


Figure 4 – Casting Actuator: typical design

POS.	DESCRIZIONE
1	CYLINDER
2	COVER
3	BUSHING
4	GASKET
5	DUST SEAL GASKET
6	PROTECTION WASHER
7	PISTON
8	SEALING RING
9	FLAT WASHER
10	LOW NUT
11	COUPLING FLANGE
13	WASHER
14	SCREW
15	STEM
16	STROKE LIMITATOR
17	SEALING RING
18	SEALING RING
19	SLIDING RING
20	SEALING RING
21	LOCK WASHER
22	SCREW
23	STOP RING
24	LIFTING LUG
25	YOKE
26	CONNECTOR STEM
27	SEALING RING

Figure 5 – Casting Actuator: typical design

POS.	DESCRIPTION
3	BUSHING
4	GASKET
5	DUST SEAL GASKET
6	PROTECTION WASHER
15	STEM
18	SEALING RING
23	STOP RING
28	BEARING BUSHING

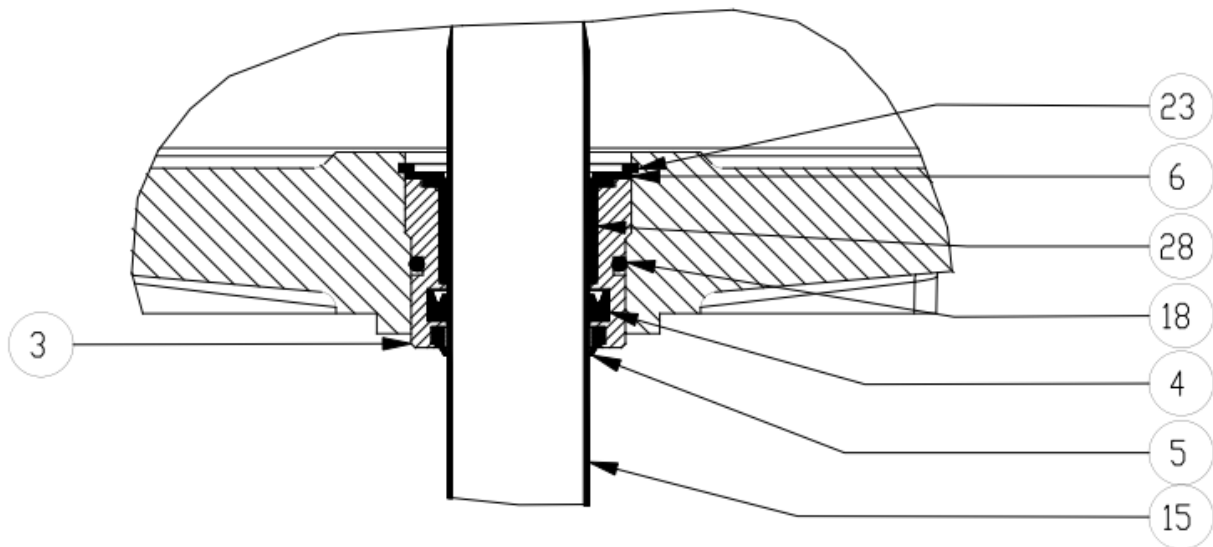


Figure 6 – Casting Actuator: option A

POS.	DESCRIPTION
7	PISTON
9	FLAT WASHER
11	COUPLING FLANGE
13	KNURLED WASHER SCHDNRR
14	SCREW TCEI
15	STEM
27	SEALING RING OR 3243
29	STEM CONTROL LEVER
30	SEALING RING OR 115
31	BEARING GLYPG 121420 F
32	DUST SEAL GASKET ASDB 12-4

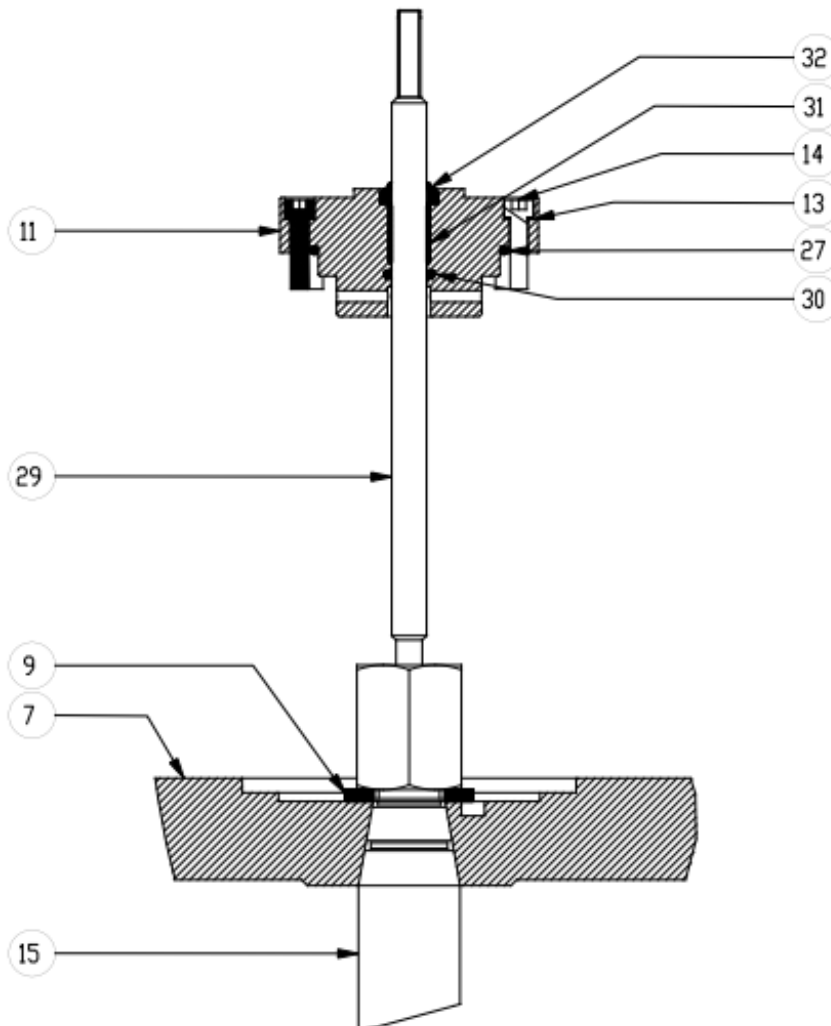
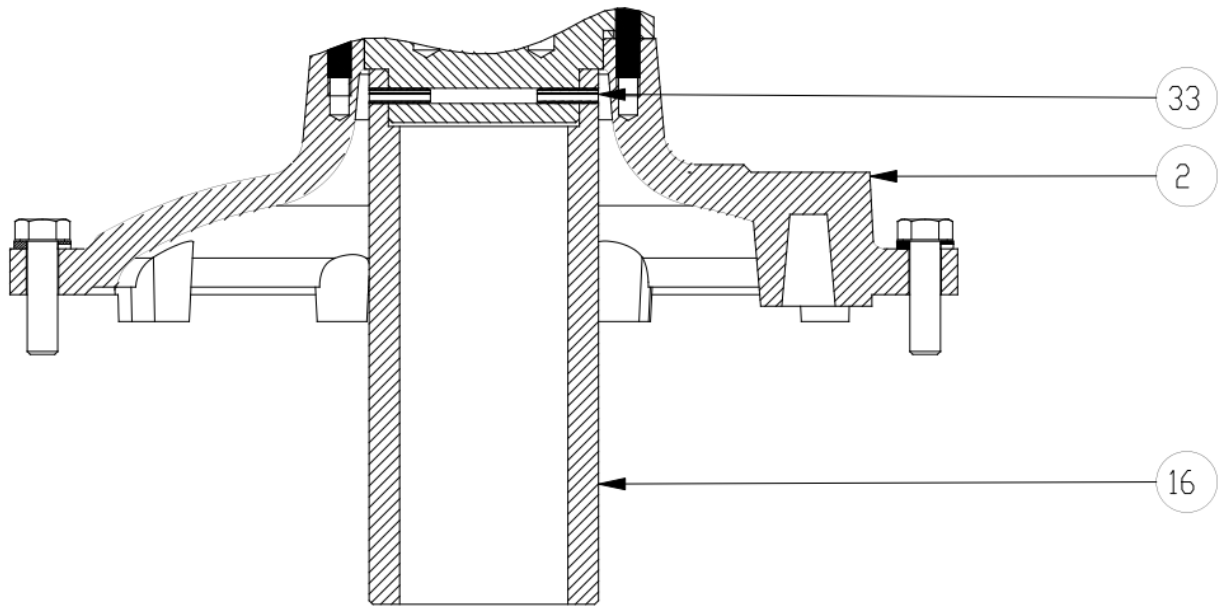


Figure 7 – Casting Actuator: option B



POS.	DESCRIPTION
2	UPPER COVER
16	STROKE LIMITATOR
33	ELASTIC PIN

Figure 8 – Casting Actuator: option C

POS.	DESCRIPTION
2	COVER
16	STROKE LIMITATOR
34	SCREW

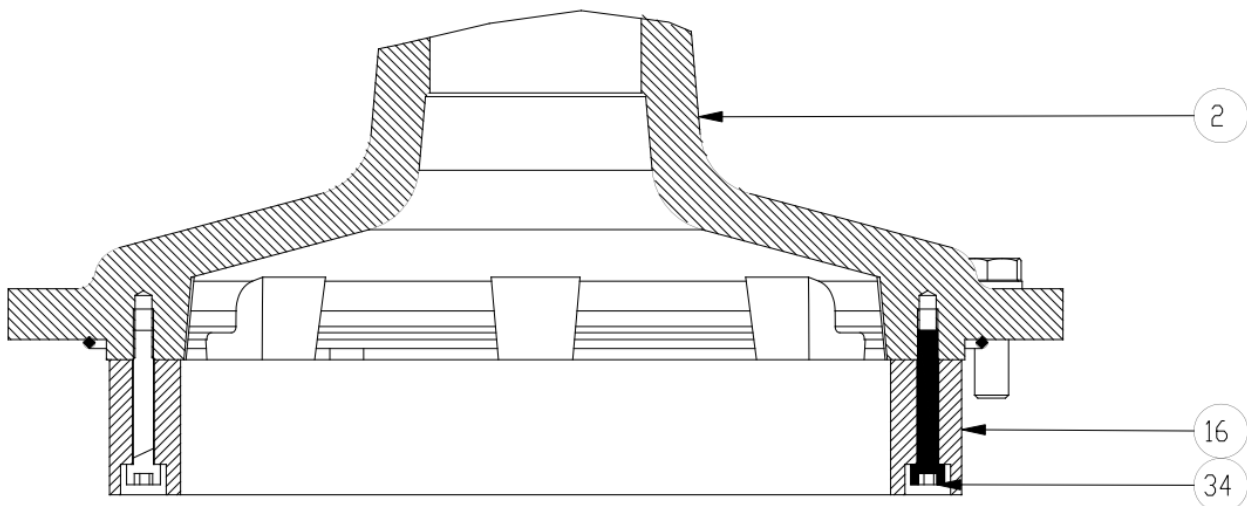


Figure 9 – Casting Actuator: option D

12.2 No Casting Actuator

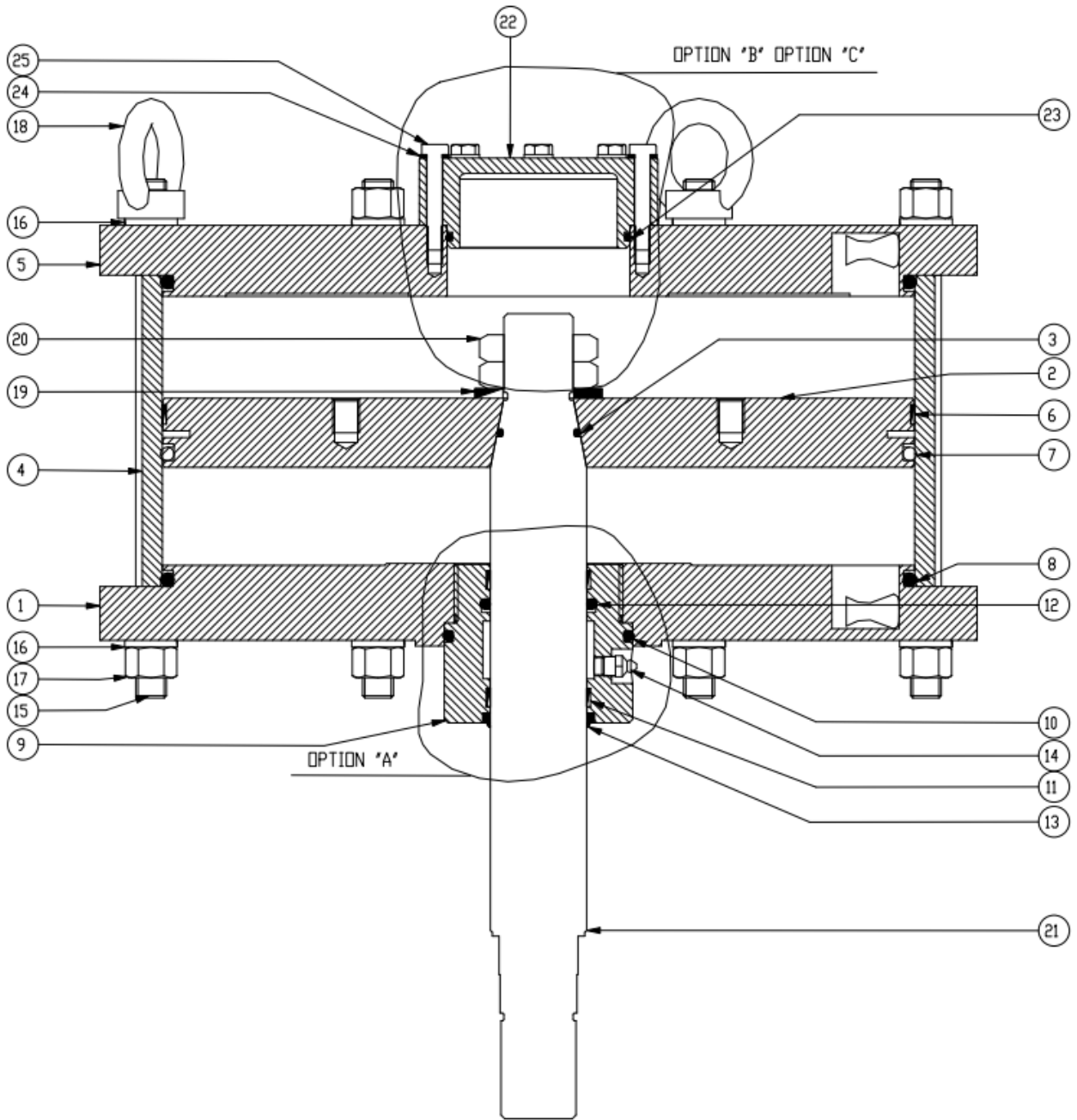
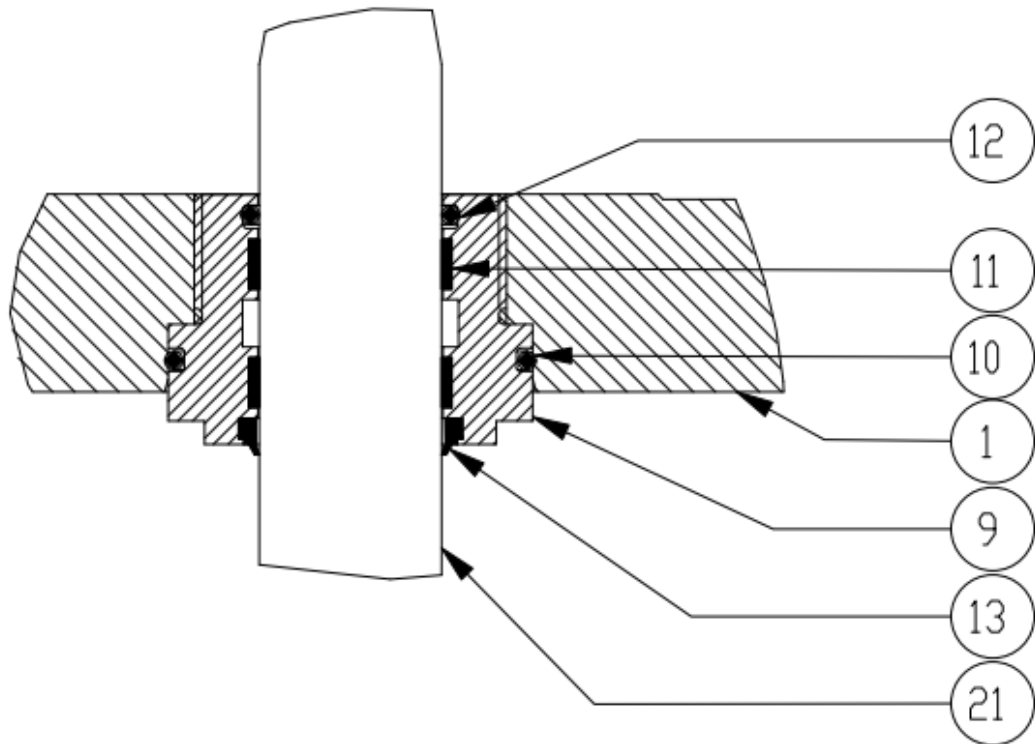


Figure 10 – No Casting Actuator: typical design

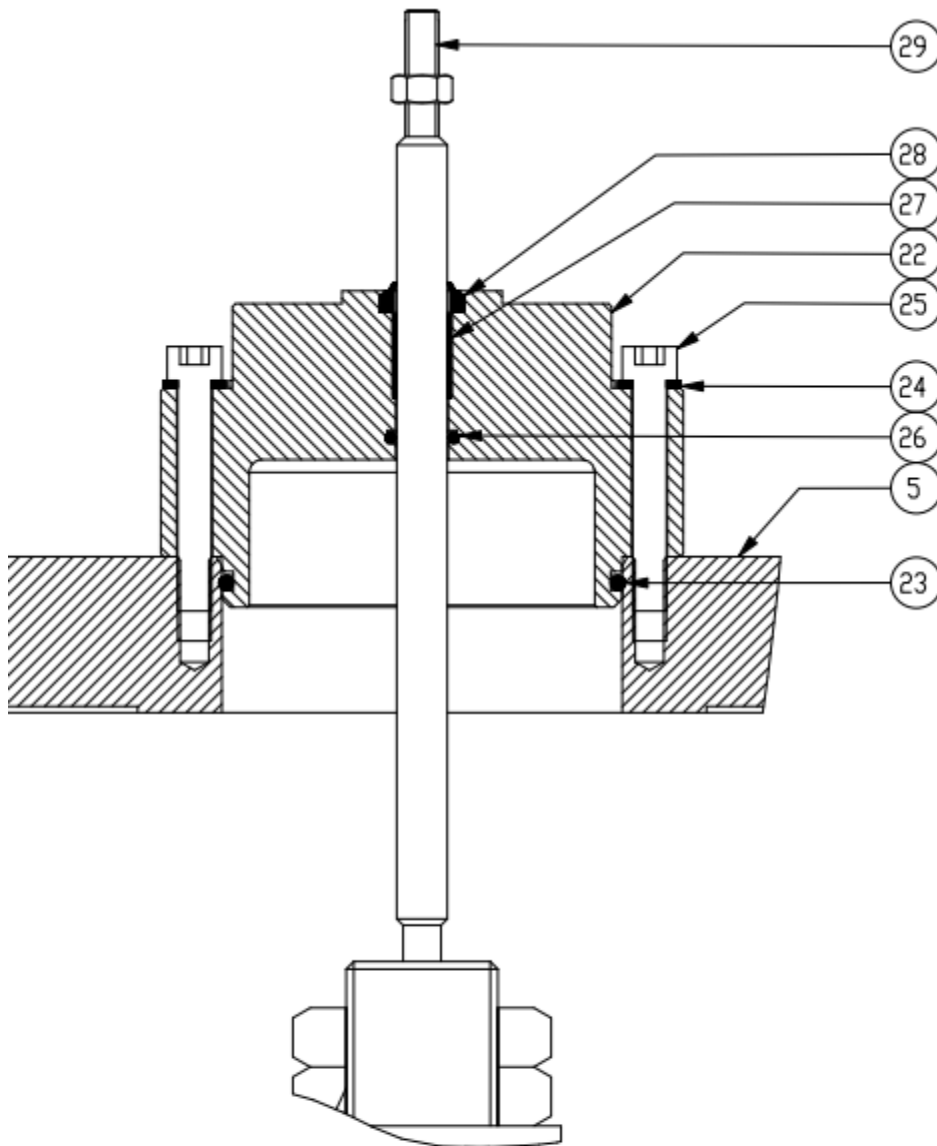
POS.	DESCRIPTION
1	LOWER CAP
2	PISTON
3	SEALING RING
4	CYLINDER
5	UPPER CAP
6	PISTON SLIDING RING
7	SEALING RING
8	SEALING RING
9	BUSHING
10	SEALING RING
11	STEM SLIDING RING
12	SEALING RING
13	DUST SEAL GASKET
14	GREASE NIPPLE
15	TIE-ROD
16	LOCK WASHER
17	HIGH NUT
18	LIFTING LUGS
19	FLAT WASHER
20	LOW NUT
21	STEM
22	COUPLING FLANGE
23	SEALING RING
24	LOCK WASHER
25	SCREW

Figure 11 – No Casting Actuator: typical design



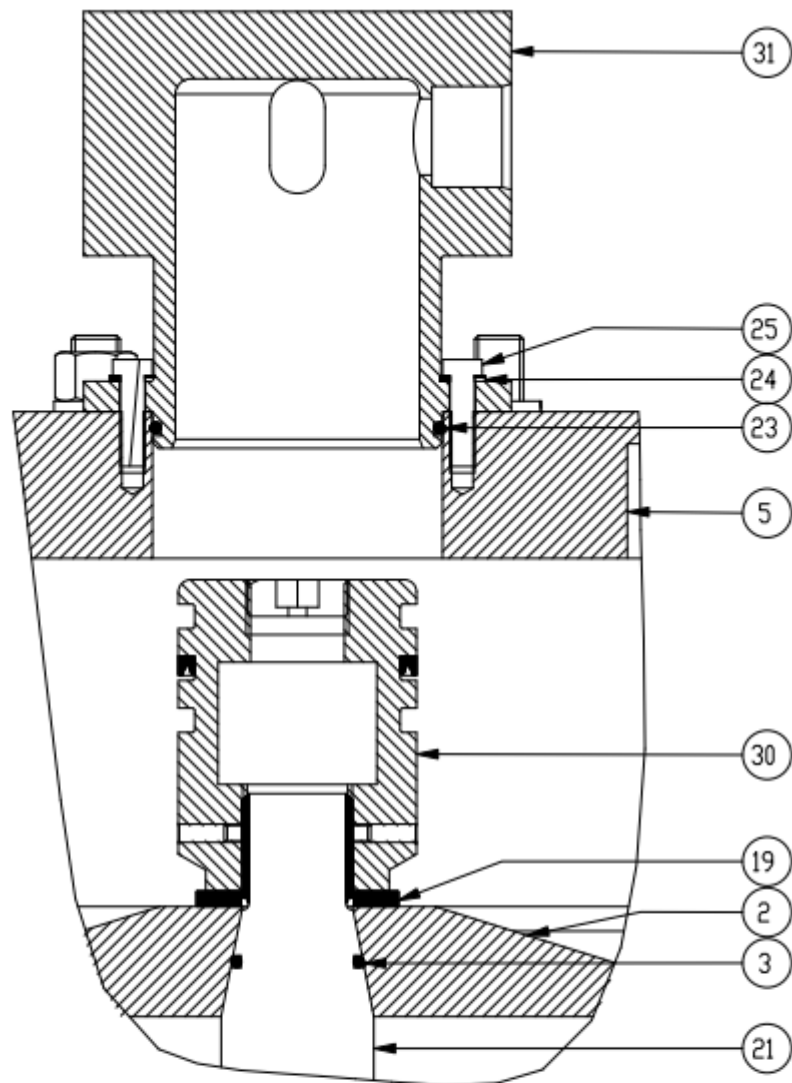
POS.	DESCRIPTION
1	LOWER HEAD
9	BUSHING
10	STEM SEALING RING
11	STEM SLIDING RING
12	SEALING RING
13	DUST SEAL GASKET
21	STEM

Figure 12 – No Casting Actuator: option A



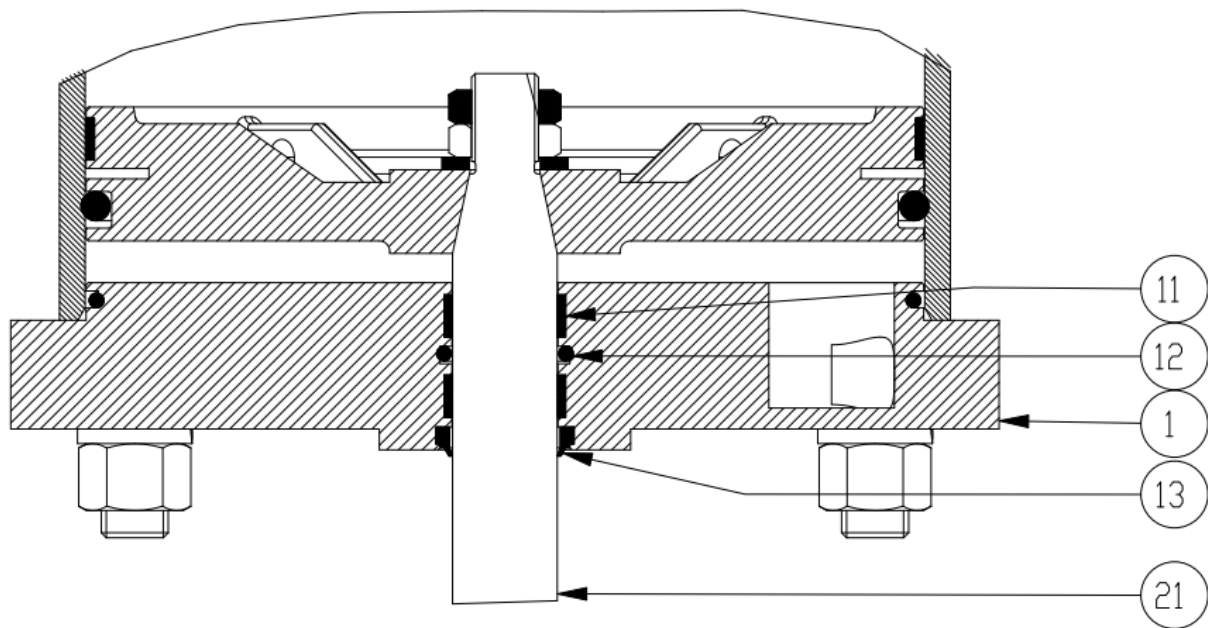
	DESCRIPTION
5	UPPER CAP
22	COUPLING FLANGE
23	SEALING RING
24	LOCK WASHER
25	SCREW
26	SEALING RING
27	BEARING
28	DUST SEAL GASKET
29	STEM CONTROL LEVEL

Figure 13 – No Casting Actuator: option B



PDS.	DESCRIPTION
2	PISTON
3	SEALING RING
5	UPPER CAP
19	FLAT WASHER
21	STEM
23	SEALING RING
24	LOCK WASHER-
25	SCREW
30	DAMPER KIT
31	COUPLING FLANGE

Figure 14 – No Casting Actuator: option C




POS.	DESCRIPTION
1	LOWER CAP
11	STEM SLID RING
12	SEALING RING
13	DUST SEAL GASKET
21	STEM

Figure 15 – No Casting Actuator: option D

13 TROUBLESHOOTING


EVENT	POSSIBLE CAUSE	REMEDY
SC/V 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 SC/V valve actuator in a safety condition and remove the obstruction
	Damaged actuator internal component	Call STI S.r.l.
SC/V 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.
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.
---	--


14 SPARE PARTS


Contact STI S.r.l. for the gasket kit required for the gaskets replacement. Other spare parts can be sent to the customer if required.

15 DISASSEMBLING

<p>Important</p> 	<p>The customer can disassemble the SC/V valve actuator only for the gaskets/grease replacement (see Section 11). In other cases, the disassembling is not allowed if it is not authorized by STI.</p>
---	--

16 DECOMMISSIONING

<p>Warning</p> 	<p>The following instructions must be respected:</p> <ul style="list-style-type: none"> - operations must be carried out only by skilled operators; - always wear protective clothing, gloves, and eyewear to prevent personal injury. Check with your process or safety engineer for any additional measures that must be taken to protect against process media.
---	--


<p>Important</p> 	<p>Check local authority regulation before disposal.</p>
--	--

SUBJECT	HAZARDOUS	RECYCABLE	DISPOSAL
Metals	No	Yes	Use licensed recyclers
Plastics	No	Yes	Use specialist recyclers
Rubber (seals, 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

ANNEX A_SC/V150-200-250-320: Casting Cyl.

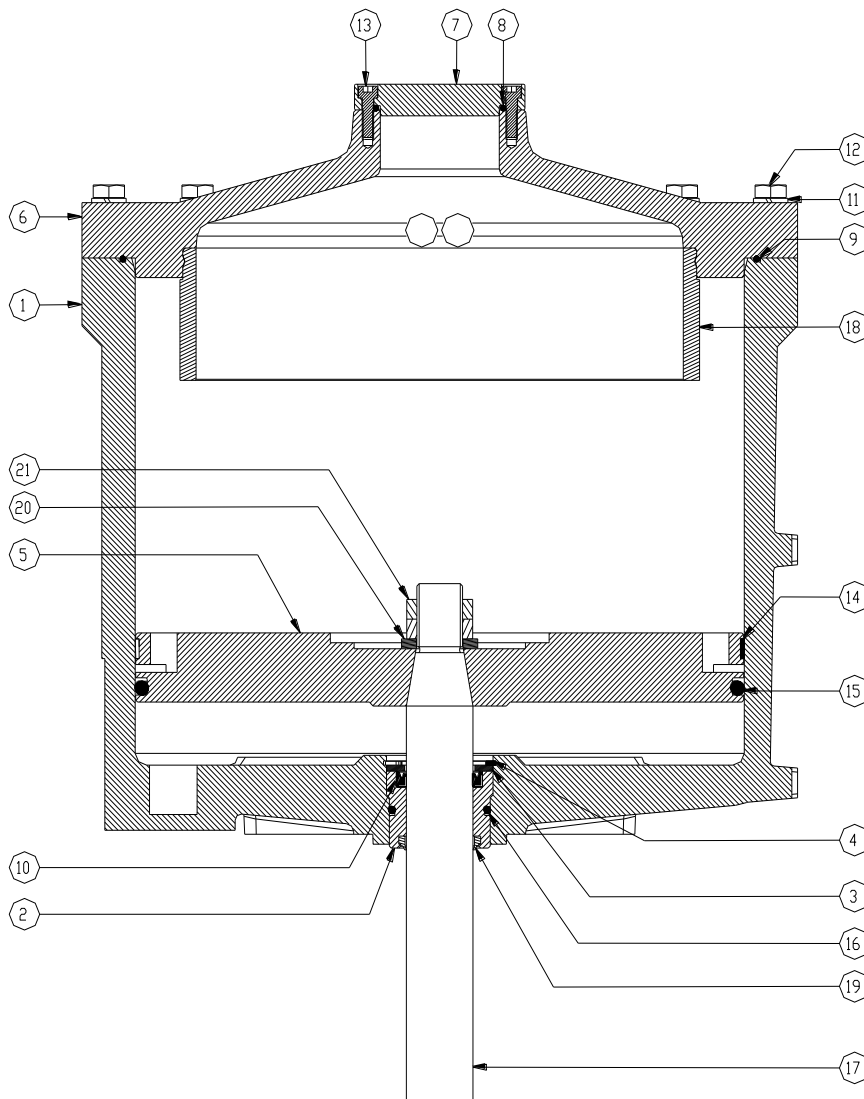
GASKETS REPLACEMENT

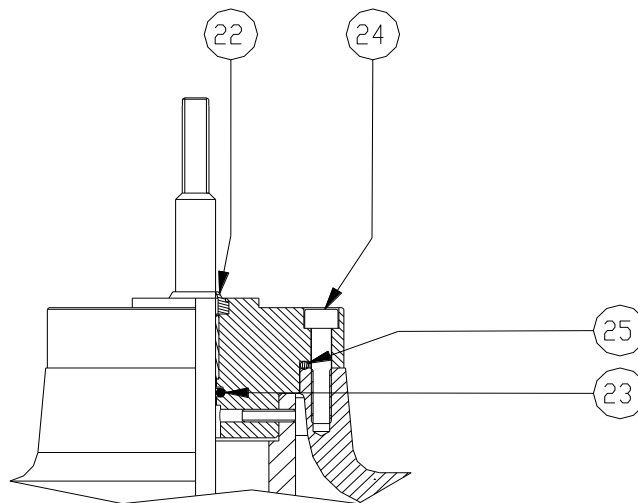
SC/V 150-200-250-320: Casting Cylinder

<p>Warning</p> 	<p>The following instructions must be respected:</p> <ul style="list-style-type: none"> - operations must be carried out only by qualified staff (STI operators or operators qualified by STI are recommended); - always wear protective clothing, gloves, and eyewear to prevent personal injury. Check with your process or safety engineer for any additional measures that must be taken to protect against process media.
---	--

During the gaskets replacement:

- take care to not damage gaskets grooves during maintenance;
- use only the grease type shown in the enclosed table.





Disassembling:

- 9.1 Disconnect the actuator from the air supply and ensure the actuator is not pressurized.
- 9.2 Disconnect the actuator stem from the valve stem.
- 9.3 Disassemble the upper actuator cover by removing the screws (pos.12) and all the accessories / fittings where needed.
- 9.4 Remove the shaft (pos.17) and piston (pos.5) from the cylinder (pos.1).
- 9.5 Remove o-ring (pos. 9) from the cylinder.
- 9.6 Remove the sliding ring (pos. 14) and o-ring (pos.15) from the piston.
- 9.7 Remove snap ring (pos.4). Push the bushing (pos.2) towards the inside of the actuator and remove the gaskets (pos.3,10 and 19).
- 9.8 For stroke lengths of less than 100 mm (top mounting positioner):
 - 9.8.1 remove screws (pos.24);
 - 9.8.2 remove the positioner and its linkage and remove the flange;
 - 9.8.3 replace the wiper ring (pos.22) and o-rings (pos.25 e 23).

Replacement:

- 9.9 Clean the actuator parts with a mild detergent suitable for grease using a brush, then dry with a cloth and compressed air.
- 9.10 Apply grease on the rough parts of the bottom of the cylinder. Do not apply grease of the machined surfaces on the bottom of the cylinder.
- 9.11 Apply grease to the o-rings and install them on the bushings. Insert and fix the bushing into the cylinder.
- 9.12 Fill the grease reservoir along the outer rim of the piston.


Important 	Apply grease to the gaskets prior installation.
---	--

- 9.13 Install new gaskets kit.
- 9.14 Apply grease to the inside surface of the cylinder.
- 9.15 Install the sliding ring on the piston.
- 9.16 Install the o-ring on the piston and remove the excess grease.
- 9.17 Insert the piston into the cylinder.
- 9.18 Mount the upper cover on the actuator. Torque the nuts to the value indicated into the table below.
- 9.19 Test the piston movement using an air gun.
- 9.20 Plumb all pneumatic connections and check for air leaks at 1 bar (0,1 MPa) air supply pressure. If there are no leaks, repeat the test at 7 bar (0,7 MPa).
- 9.21 Remove the excess grease from the shaft.

SC/V	Torque [Nm]
150	10 (7,4 lbf-ft)
200	14 (10,3 lbf-ft)
250	18 (13,3 lbf-ft)
320	20 (14,7 lbf-ft)

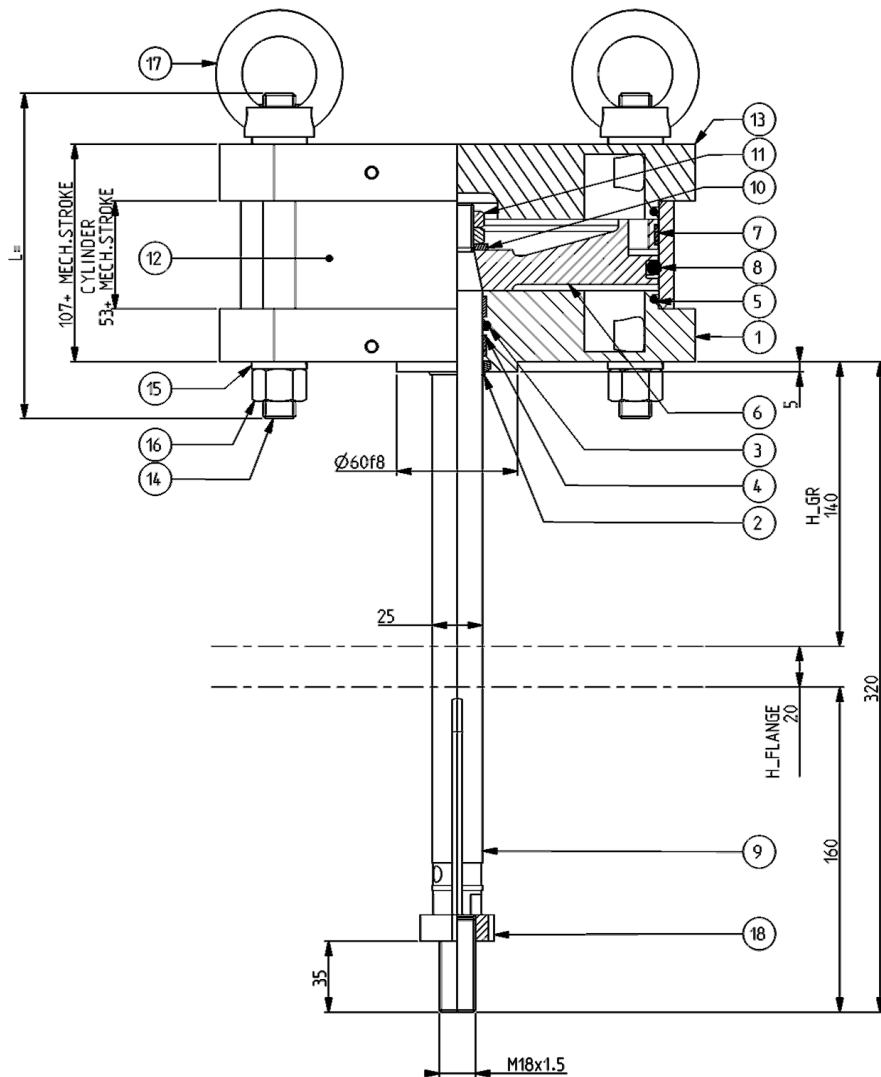
ANNEX B_SC/V200: No Casting Cyl.

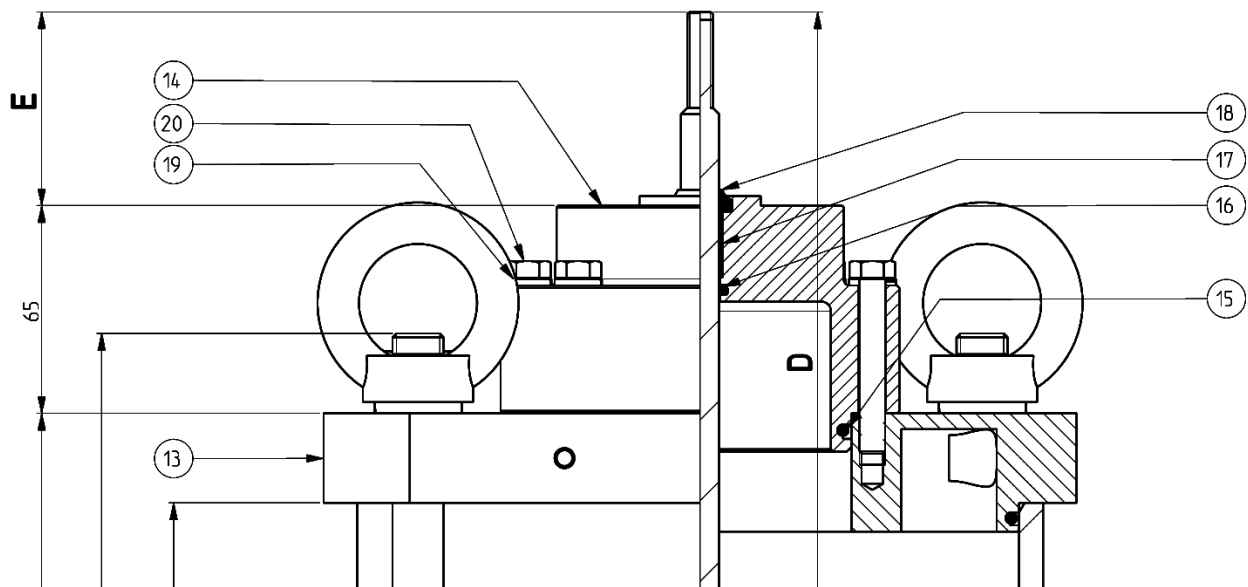
GASKETS REPLACEMENT SC/V 200: No Casting Cylinder

<p>Warning</p> 	<p>The following instructions must be respected:</p> <ul style="list-style-type: none"> - operations must be carried out only by qualified staff (STI operators or operators qualified by STI are recommended); - always wear protective clothing, gloves, and eyewear to prevent personal injury. Check with your process or safety engineer for any additional measures that must be taken to protect against process media.
---	--

During the gaskets replacement:

- take care to not damage gaskets grooves during maintenance;
- use only the grease type shown in the enclosed table.





Disassembling:

- 9.1 Disconnect the actuator from the air supply and ensure the actuator is not pressurized.
- 9.2 Disconnect the actuator stem from the valve stem.
- 9.3 Disassemble the actuator cover by removing the screws (pos.17 and/or 16) and all the accessories / fittings where needed.
- 9.4 Remove the shaft (pos.9) and piston (pos.6) from the cylinder (pos.12).
- 9.5 Remove o-rings (pos. 5) from the caps.
- 9.6 Remove the sliding ring (pos. 7) and o-ring (pos.8) from the piston.
- 9.7 Remove rings end dust seal from the lower cap (pos. 2-3-4).
- 9.8 For stroke lengths of less then 100 mm (top mounting positioner):
 - 9.8.1 remove the positioner and its linkage and remove screws(pos 20);
 - 9.8.2 remove the flange (pos.14);
 - 9.8.3 remove the wiper ring (pos.18) and o-rings (pos.15 e 16).

Replacement:

- 9.9 Clean the actuator parts with a mild detergent suitable for grease using a brush, then dry with a cloth and compressed air.
- 9.10 Apply grease on the rough parts of the bottom of the cylinder. Do not apply grease of the machined surfaces on the bottom of the cylinder.
- 9.11 Install rings on cups of cylinder and flange (if necessary) after apply grease.
- 9.12 Fill the grease reservoir along the outer rim of the piston.

<p>Important</p> 	<p>Apply grease to the gaskets prior installation.</p>
---	---


- 9.13 Install new gaskets kit.
- 9.14 Apply grease to the inside surface of the cylinder.
- 9.15 Install the sliding ring on the piston.
- 9.16 Install the o-ring on the piston and remove the excess grease.
- 9.17 Fill the grease reservoir along the outer rim of the lower cup.
- 9.18 Insert the piston into the cylinder paying attention to assembly direction.
- 9.19 Mount the assemble piston-cylinder on the lower cup of actuator. Torque the nuts to the value indicated into the table below.

- 9.20 Test the piston movement using an air gun.
- 9.21 Plumb all pneumatic connections and check for air leaks at 1 bar (0,1 MPa) air supply pressure. If there are no leaks, repeat the test at 7 bar (0,7 MPa).
- 9.22 Remove the excess grease from the shaft.

SC/V	Torque [Nm]
200	14 (10,3 lbf-ft)

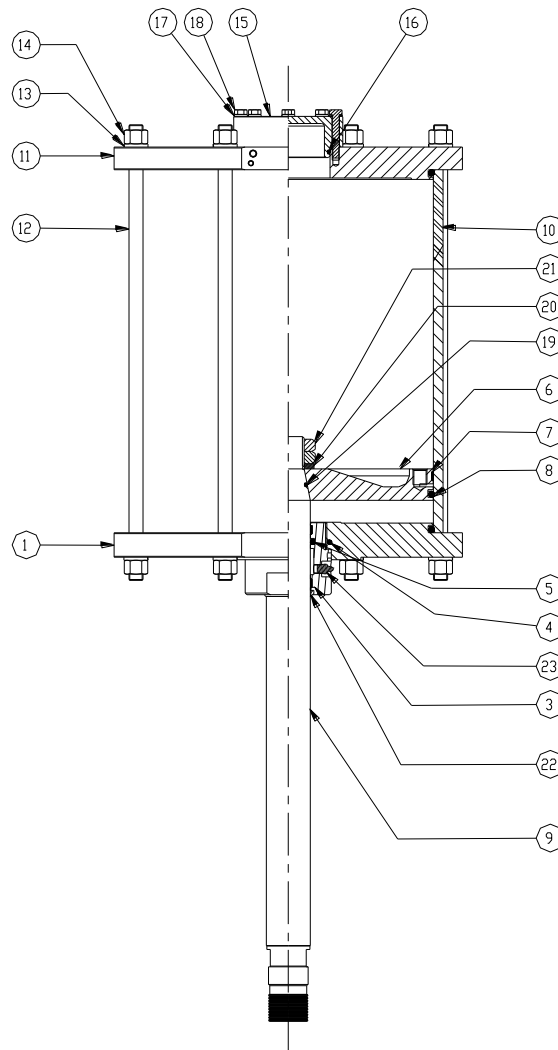
ANNEX C_SC/V260-330-390: No Casting Cyl.

GASKETS REPLACEMENT SC/V 260-330-390: No Casting Cylinder

<p>Warning</p> 	<p>The following instructions must be respected:</p> <ul style="list-style-type: none"> - operations must be carried out only by qualified staff (STI operators or operators qualified by STI are recommended); - always wear protective clothing, gloves, and eyewear to prevent personal injury. Check with your process or safety engineer for any additional measures that must be taken to protect against process media.
---	--

During the gaskets replacement:

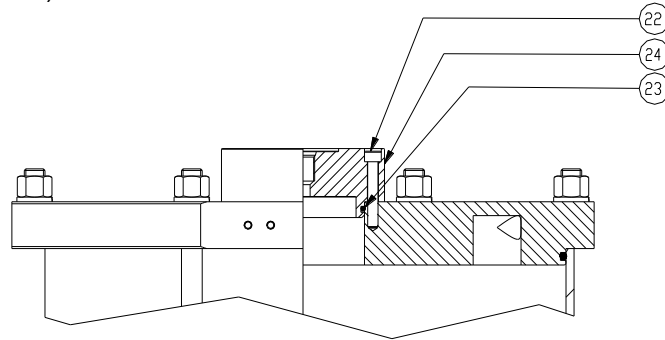
- take care to not damage gaskets grooves during maintenance;
- use only the grease type shown in the enclosed table.



Disassembling:


- 9.1 Disconnect the actuator from the air supply and ensure the actuator is not pressurized.
- 9.2 Disconnect the actuator stem from the valve stem.

- 9.3 Disassemble the upper actuator cover by removing the nuts (pos.14) and all the accessories / fittings where needed.
- 9.4 Remove the shaft (pos.9) and piston (pos.6) from the cylinder (pos.10).
- 9.5 Remove o-ring from the upper cover.
- 9.6 Remove the sliding ring (pos.7) and o-ring (pos.8) from the piston.
- 9.7 Remove the bushing and the gaskets (pos.3,4,5 and 22 of page C1).
- 9.8 For stroke lengths of less than 100 mm (top mounting positioner):
 - 9.8.1 Remove screws (pos.22 of this page);
 - 9.8.2 Remove the accessories and the bushing (pos.24);
 - 9.8.3 replace o-ring (pos.23).



Replacement:

- 9.9 Clean the actuator parts with a mild detergent suitable for grease using a brush, then dry with a cloth and compressed air.
- 9.10 apply grease on the back cover of the cylinder.
- 9.11 Apply grease to the o-rings and install them on bushing. Insert the bushing into the back cover.
- 9.12 Fill the grease reservoir along the outer rim of the piston.


<p>Important</p> 	<p>Apply grease to the gaskets prior installation.</p>
---	---

- 9.13 Install new gaskets kit.
- 9.14 Apply grease to the inside surface of the cylinder.
- 9.15 Install the sliding ring on the piston.
- 9.16 Install the o-ring on the piston and remove the excess grease.
- 9.17 Insert the piston into the cylinder
- 9.18 Mount the upper cover on the actuator and torque tie rods nuts to the value indicated on the table below.
- 9.19 Apply grease to the bushing chamber using the relevant lubricator.
- 9.20 Test the piston movement using an air gun.
- 9.21 Plumb all pneumatic connections and check for air leaks at 1 bar (0,1 MPa) air supply pressure. If there are no lacks, repeat the test at 7 bar (0,7 MPa).
- 9.22 Remove the excess grease from the shaft.

SC/V	Torque [Nm]
260	60 (44,2 lbf-ft)
330	60 (44,2 lbf-ft)
390	70 (51,2 lbf-ft)

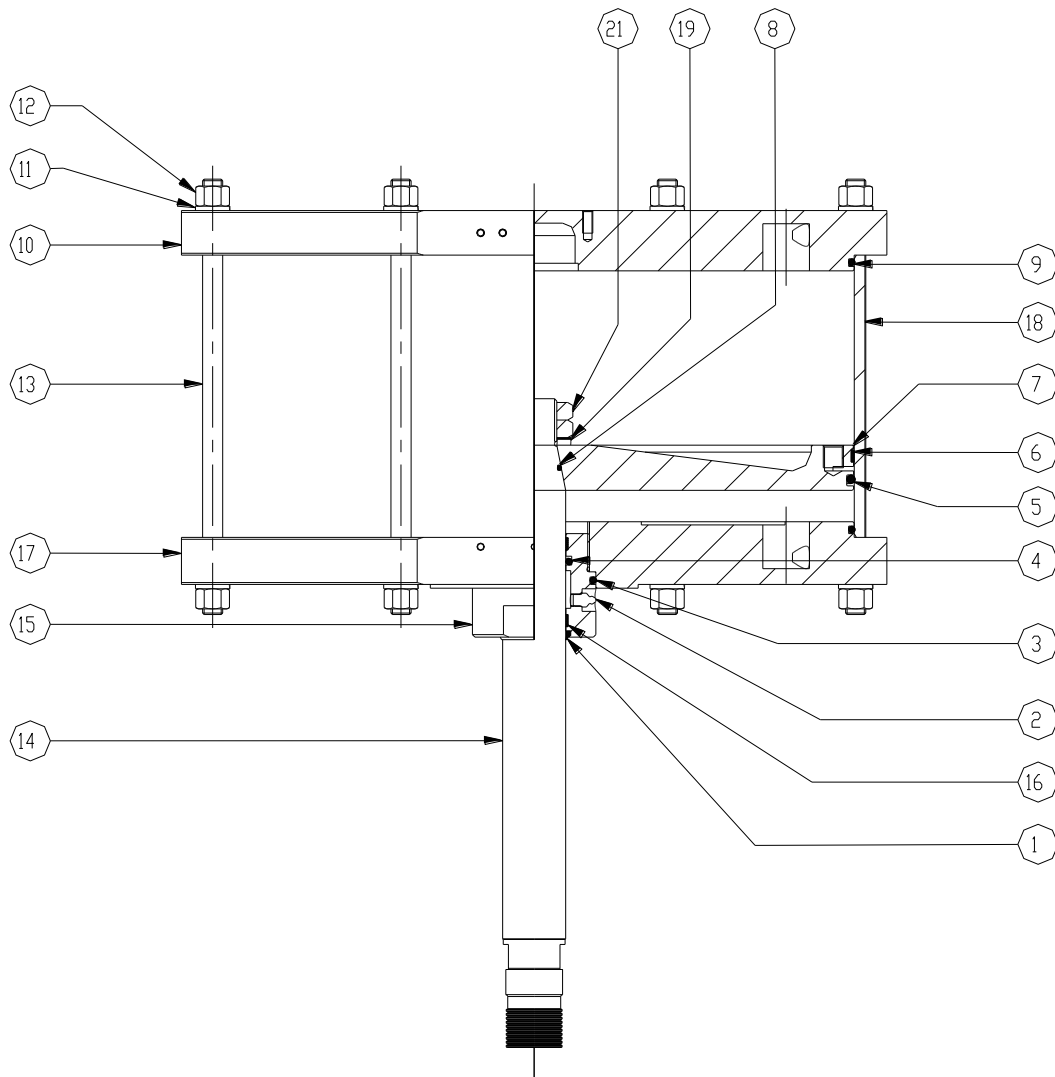
ANNEX D_SC/V300-400-500: No Casting Cyl.

GASKETS REPLACEMENT SC/V 300-400-500: No Casting Cylinder

<p>Warning</p> 	<p>The following instructions must be respected:</p> <ul style="list-style-type: none"> - operations must be carried out only by qualified staff (STI operators or operators qualified by STI are recommended); - always wear protective clothing, gloves, and eyewear to prevent personal injury. Check with your process or safety engineer for any additional measures that must be taken to protect against process media.
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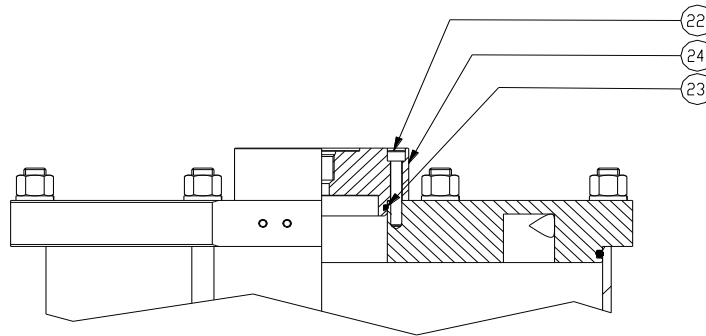
During the gaskets replacement:

- take care to not damage gaskets grooves during maintenance;
- use only the grease type shown in the enclosed table.




Disassembling:

- 9.1 Disconnect the actuator from the air supply and ensure the actuator is not pressurized.
- 9.2 Disconnect the actuator stem from the valve stem
- 9.3 Disassemble the upper cover by unscrewing the nuts (pos.12) and removing all the accessories / fittings where needed.
- 9.4 Remove the shaft (pos.14) and piston (pos.7) from the cylinder (pos.10).
- 9.5 Remove o-ring (pos. 9) away from the upper cover.
- 9.6 Remove the sliding ring (pos.6) and o-ring (pos. 5) from the piston.
- 9.7 Remove the bushing (pos.15) and the gaskets (pos.1.3,4 and 16).
- 9.8 For stroke lengths of less than 100 mm (top mounting positioner):
 - 9.8.1 remove screws (pos.22);
 - 9.8.2 remove the accessories and the bushing (pos.24);
 - 9.8.3 replace OR (pos.23).



Replacement:

- 9.9 Clean the actuator parts with a mild detergent suitable for grease using a brush, then dry with a cloth and compressed air.
- 9.10 Apply grease on the rough parts of the bottom of the cylinder.
- 9.11 Apply grease o-ring and install them on bushing. Insert the bushing into bottom cover.
- 9.12 Fill the grease reservoir along the outer rim of the piston.

<p>Important</p> 	<p>Apply grease to the gaskets prior installation.</p>
---	---


- 9.13 Install new gaskets kit.
- 9.14 Apply grease to the inside surface of the cylinder.
- 9.15 Install the sliding ring on the piston.
- 9.16 Install the o-ring on the piston and remove the excess grease.
- 9.17 Assemble the piston into the cylinder.
- 9.18 Mount the upper cover of the actuator and torque the nuts to the value indicated in the table below.
- 9.19 Introduce grease into the bushing chamber using relevant lubricator.
- 9.20 Test the piston movement using an air gun.
- 9.21 Arrange all pneumatic connections and check possible air losses at 1 bar (0,1 MPa) air supply pressure. If there are no losses, repeat the test at 7 bar (0,7 MPa) air supply pressure.
- 9.22 Clean the excess grease from the shaft.

SC/V	Torque [Nm]
300	70 (51,6 lbf-ft)
400	70 (51,6 lbf-ft)
500	70 (51,6 lbf-ft)

ANNEX E_SC/V420-520-600-650-800-850: No Casting Cyl.

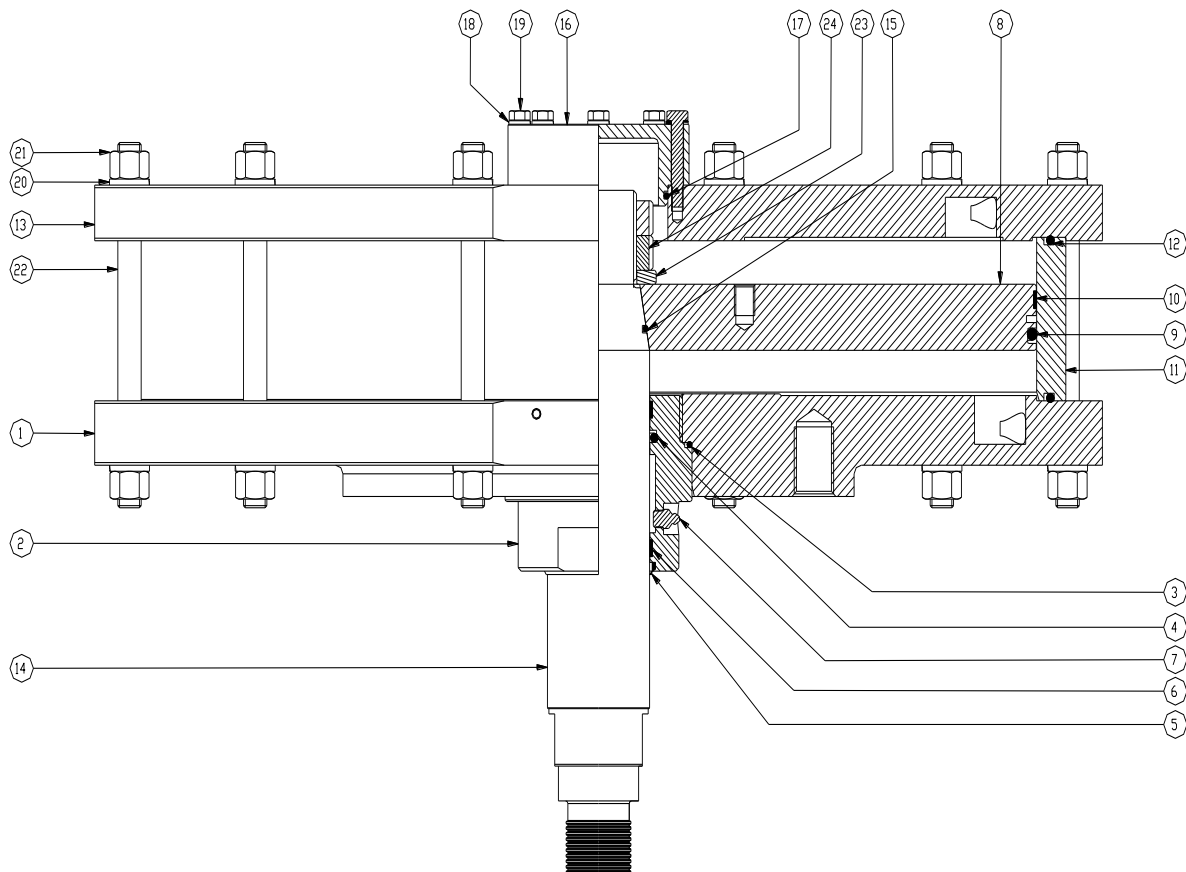
GASKETS REPLACEMENT

SC/V 420-520-600-650-800-850: No Casting Cylinder

<p>Warning</p> 	<p>The following instructions must be respected:</p> <ul style="list-style-type: none"> - operations must be carried out only by qualified staff (STI operators or operators qualified by STI are recommended); - always wear protective clothing, gloves, and eyewear to prevent personal injury. Check with your process or safety engineer for any additional measures that must be taken to protect against process media.
---	--

During the gaskets replacement:

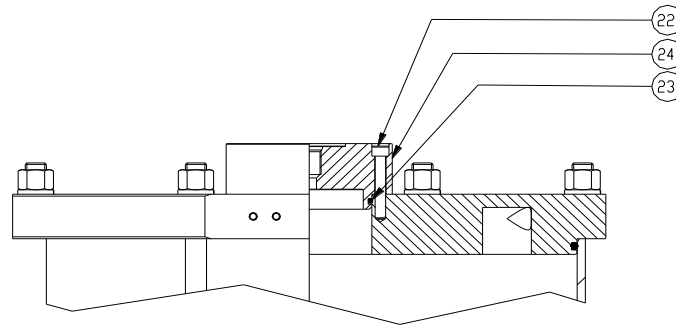
- take care to not damage gaskets grooves during maintenance;
- use only the grease type shown in the enclosed table.



Disassembling:


- 9.1 Disconnect the actuator from the air supply and ensure the actuator is not pressurized.
- 9.2 Disconnect the actuator stem from the valve stem
- 9.3 Disassemble the upper cover unscrewing the screw (pos.21) and removing all the accessories / fittings where needed
- 9.4 Remove the shaft (pos.14) and piston (pos.8) from the cylinder (pos.11).
- 9.5 Remove o-ring (pos.12) from the cylinder
- 9.6 Remove the sliding ring (pos.10) and o-ring (pos. 9) from the piston.
- 9.7 Remove the bushing (pos.15) and gaskets (pos.3,4,5,and 6) from the bottom cover.

- 9.8 For stroke lengths of less than 100 mm (top mounting positioner):
- 9.8.1 remove the screw (pos.22);
 - 9.8.2 remove the accessories and the bushing (pos.24);
 - 9.8.3 replace OR (pos.23).



Replacement:

- 9.9 Clean the actuator parts with a mild detergent suitable for grease using a brush, then dry with a cloth and compressed air.
- 9.10 Apply grease on the bottom of the cylinder.
- 9.11 Apply grease to the o-rings and install them on bushing. Insert the bushing into bottom cover.
- 9.12 Fill the grease reservoir along the outer rim of the piston.

<p>Important</p> 	<p>Apply grease to the gaskets prior installation.</p>
---	---

- 9.13 Install new gaskets kit.
- 9.14 Apply grease to the inside surface of the cylinder.
- 9.15 Install the sliding ring on the piston.
- 9.16 Install the o-ring on the piston and remove the excess grease.
- 9.17 Insert the piston and the cylinder.
- 9.18 Mount the upper cover on the actuator and torque tie rods nuts to the value indicated on the table below.
- 9.19 Apply grease to the bushing chamber using the relevant lubricator.
- 9.20 Test the piston movement using an air gun.
- 9.21 Plumb all pneumatic connections and check for air leaks at 1 bar (0,1 MPa) air supply pressure. If there are no lacks, repeat the test at 7 bar (0,7 MPa).
- 9.22 Remove the excess grease from the shaft.

SC/V	Torque [Nm]
420	35 (25,8 lbf-ft)
520	70 (51,6 lbf-ft)
600-650-800-850	<i>See dedicated dimensional drawing</i>

ANNEX F_ SC/V - VALVE ACTUATORS TO BE PLACED ON THE MARKET IN GREAT BRITAIN (ENGLAND, WALES AND SCOTLAND).

For Actuators to be placed on UK market (England, Wales and Scotland) the following is valid:

Applicable Regulations

- Supply of Machinery (Safety) Regulations 2008
- Pressure Equipment (Safety) Regulations 2016
- Equipment and Protective Systems Intended for use in Potentially Explosive Atmospheres Regulations 2016

A proper UK Declaration of Conformity will be issued according to the Applicable Regulations.

Label

Every SC/V valve actuator is provided with a label contains the main operating conditions and serial number. The label may change if the SC/V 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..

Labels for UK market are:




		STI s.r.l. Via Dei Caravaggi 15 24040 LEVATE(Bg)-ITALY			
		www.imi-critical.com - FAX +39 035 2928247			
		II2GD Ref. XXXXXXXXXX		IP66/67M	
Ex h II <input type="checkbox"/> T <input type="checkbox"/> Gb / Ex h III C T <input type="checkbox"/>		°C Db		Certificate IECEx INE 19.0025	
MODELLO Model	<input type="text"/>	DN Size	<input type="text"/>	CORSA Stroke	<input type="text"/> mm
MATRICOLA Ident. N°	<input type="text"/>	Tag N°	<input type="text"/>		
SEGNALE Signal	3-15 Psi <input type="checkbox"/>	4-20mA <input type="checkbox"/>	CAMPO SPECIALE <input type="text"/>		
AZIONE Action	Reverse <input type="checkbox"/>	Direct <input type="checkbox"/>	On-Off <input type="checkbox"/>	ALIM. Supply	<input type="text"/> bar

Figure 1 – label for UKSI/IECEX SC/V version



	STI s.r.l. Via Dei Caravaggi 15 24040 LEVATE(Bg)-ITALY www.imi-critical.com - FAX +39 035 2928247	UK CA 0496
	II2GD Ref. XXXXXXXXX	IP66/67M
Ex h II <input type="checkbox"/>	T <input type="checkbox"/> Gb / Ex h III C T <input type="checkbox"/>	°C Db Certificate IECEx INE 19.0025
PS	bar	TMax <input type="text"/> °C
MODELLO		Tmin <input type="text"/> °C
Model		DN Size <input type="text"/>
MATRICOLA		CORSA
Serial n°		Stroke <input type="text"/> mm
SEGNALE		Tag N° <input type="text"/>
Signal		ANNO DI FABBRICA
AZIONE		Year of fabrication <input type="text"/>
Action		ALIMENTAZIONE
		Supply <input type="text"/> bar

Figure 2 – label for UKSI/IECEX/PER SC/V version





	STI s.r.l. Via Dei Caravaggi 15 24040 LEVATE(Bg)-ITALY www.imi-critical.com - FAX +39 035 2928247	UK CA
	II2GD Ref. XXXXXXXXX	IP66/67M
Ex h II <input type="checkbox"/>	T <input type="checkbox"/> Gc / Ex h III C T <input type="checkbox"/>	°C Dc Certificate IECEx INE 19.0025
MODELLO		DN Size <input type="text"/>
Model		CORSA
MATRICOLA		Stroke <input type="text"/> mm
Ident. N°		Tag N° <input type="text"/>
SEGNALE	3-15 Psi <input type="checkbox"/>	4-20mA <input type="checkbox"/>
Signal		CAMPO SPECIALE
AZIONE	Reverse <input type="checkbox"/>	Special Range <input type="text"/>
Action	Direct <input type="checkbox"/>	On-Off <input type="checkbox"/>
		ALIM. Supply <input type="text"/> bar

Figure 3 – label for UKSI/IECEX SC/V version with non-metallic cylinders

Warning	
	It is severely forbidden to use the SC/V 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 other label.

STI S.r.l.

Via Dei Caravaggi 15
24040 Levate (BG) Italy
Tel. +39 035 2928.2
Fax +39 035 2928.247
www.imi-critical.com