

INSTRUCTION FOR THE ASSEMBLY, ADJUSTMENT AND MAINTENANCE OF THE QUARTER TURN PNEUMATIC & HYDRAULIC ACTUATORS

GENERAL NOTES:

The actuators are delivered with plugged connections. Above connections must remain plugged if not utilized or must be replugged with the relevant plug or reconnected after any testing operation.



WARNING:

Before to carry out any operation on the actuator, the electric power supply must be shut-off (if applicable).



WARNING:

Before to carry out any operation on the actuator, the actuator control group must be isolated from the pneumatic/hydraulic supply source.



WARNING:

Before to carry out any operation on the actuator, the control group must be discharged from the pressure therein trapped, particular care shall be taken on storage tanks and pressure filters.



WARNING:

Every operation on the actuator must be performed by skill personnel equipped with safety clothes and devices (gloves, helmet, glasses, ecc.)

1) ASSEMBLY

Warning:



NOTE: No special tools are required for these operations, but only some Allen wrenches and hexagonal wrenches of the required sizes.

Before the installation, please check that the actuator was not damaged during the transportation.

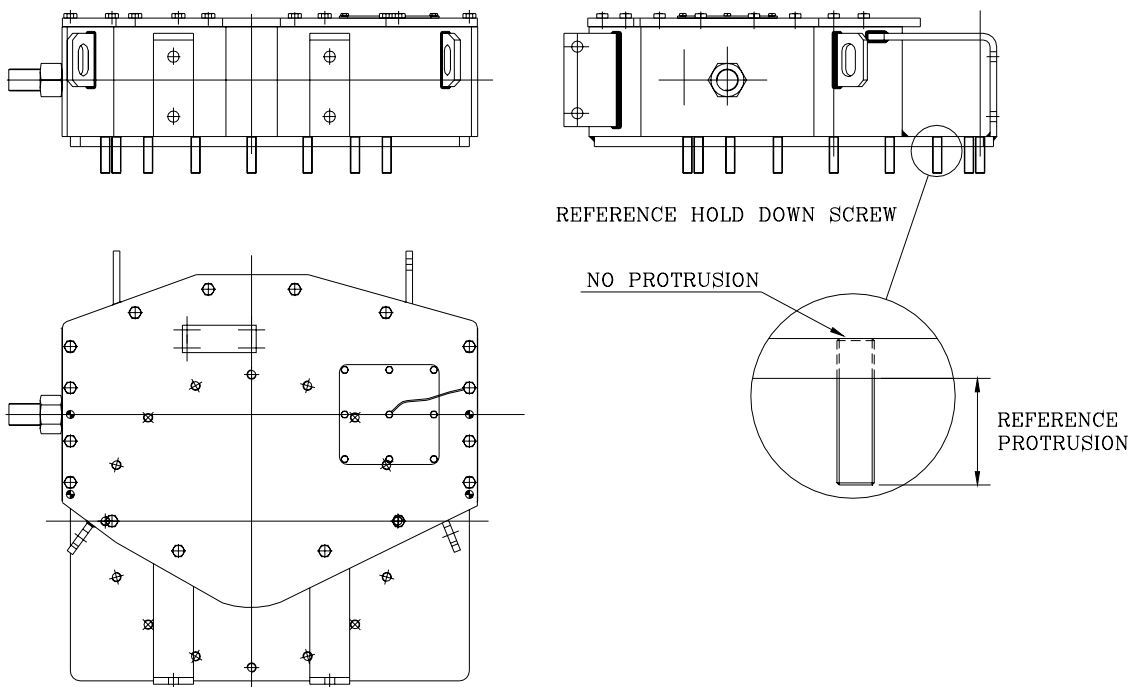
The actuator is shipped mounted on the valve. In case it is necessary to assembly the actuator onto the valve, proceed as follows:

- a) Clean the flange of the valve.
- b) Lubricate the shaft of the valve with oil or grease.
- c) Set up the actuator into the same valve position
- d) Lift the actuator by means of adequate hooks and cable to render the actuator perfectly horizontal (this is very important for easy coupling) utilizing the existing eyebolt on the actuator.
- e) Clean the actuator flange.
- f) Connect the valve shaft inside the bush of the actuator and lower the actuator on the valve.
- g) Uniformly tighten the nuts of the holding down screws.

WARNING (for HT, MT and ST actuators without adaptor piece only):

While tightening the nuts of the hold down screws always verify the hold down screw does not turn together with the nut.

Always verify the hold down screw protrusion under the actuator frame is the same as the one shown in the following figure.



2) ADJUSTMENT

Warning:

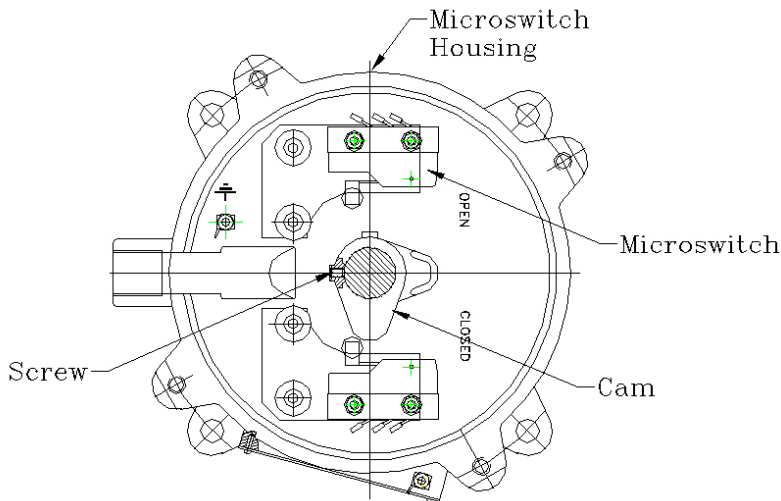


NOTE: No special tools are required for these operations, but only some Allen wrenches and hexagonal wrenches of the required sizes.

The actuator is shipped already adjusted. If it is necessary to change the adjustment, proceed as follows:

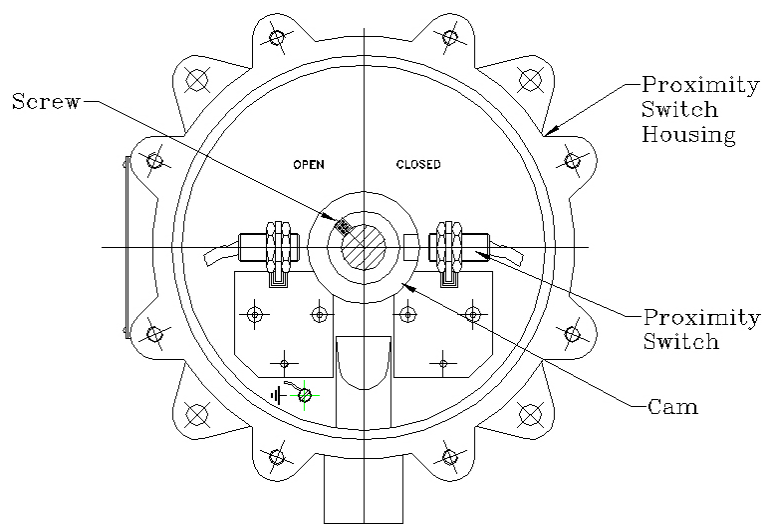
a) Actuators equipped with Ledeen Microswitch Housing with Mechanical Switches

Electric microswitch adjustment: remove the cover from the microswitch housing; loosen the screw clamping the cam. Rotate the cam on the shaft until the microswitch is actuated in the desired working position. Tighten the screw of the cam. For correct adjustment it is necessary that the microswitch is actuated slightly before the mechanical stop.



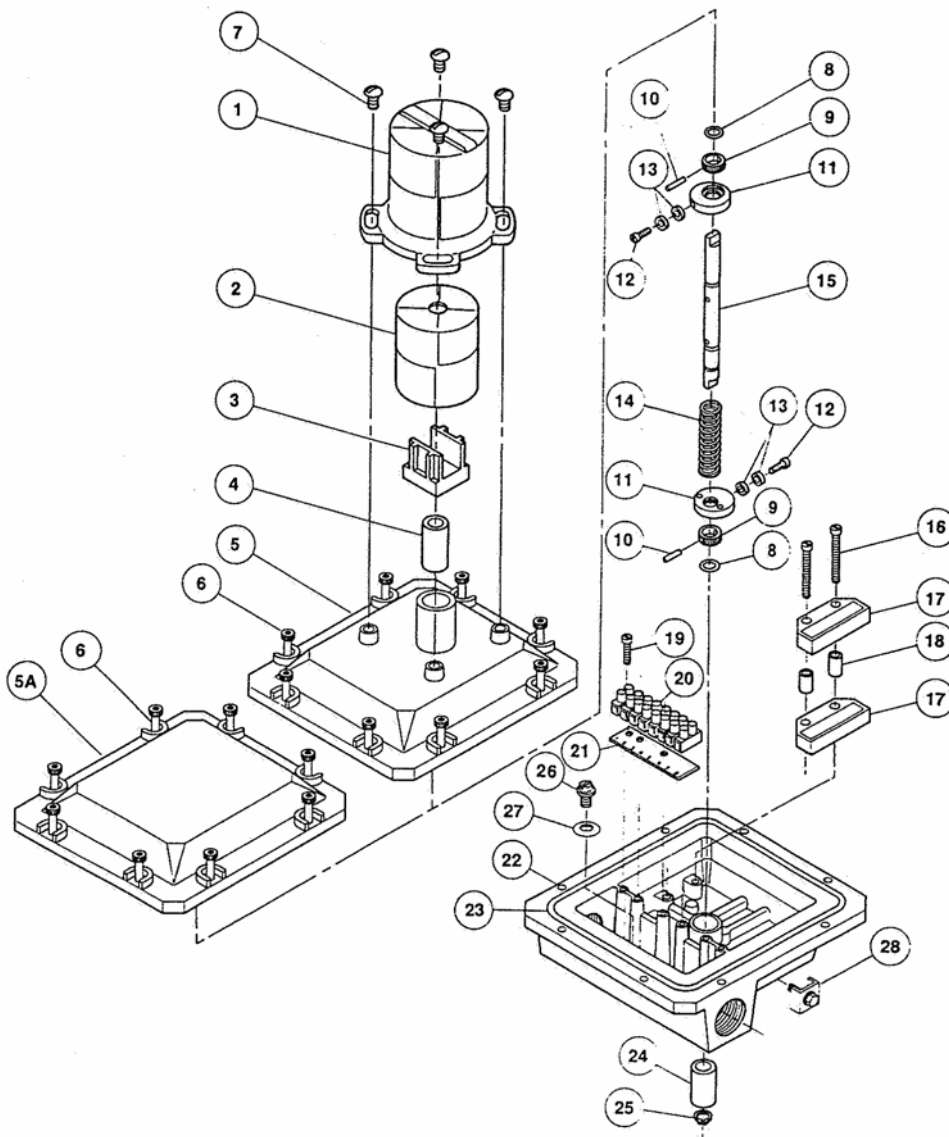
b) Actuators equipped with Ledeen Microswitch Housing with Proximity Switches

Proximity switch adjustment: remove the cover from the proximity switches housing, loosen the screw clamping the cam. Rotate the cam on the shaft until the proximity switch is actuated in the desired working position. Tighten the screw of the cam. For correct adjustment it is necessary that the proximity switch is actuated slightly before the mechanical stop.



c) Actuators equipped with Westlock Microswitch Housing with Proximity Switches

Proximity sensor adjustment: remove the cover (5) from the Westlock proximity sensor housing (22), by unscrewing the clamping screws(6). In order to adjust the upper proximity sensor (17) lower the cam (11) laying over the spring (14); the lower proximity sensor (17) is adjusted by lifting the cam (11) under spring (14). Rotate the cam (11) until the proximity switch (16) is actuated in the desired working position. Reassemble the cover (5) on the proximity sensor housing (22), by screwing the clamping screws (6). For correct adjustment it is necessary that the proximity sensor is actuated slightly before the mechanical stops.



- 1. Outer Beacon Housing
- 2. Inner Beacon Cylinder
- 3. Beacon Coupler
- 4. Bushing
- 5. Beacon Cover
- 5A. Flat Cover
- 6. Cover Screws M5 x .8
- 7. Beacon Cover Screws M5 x .8
- 8. O-Ring
- 9. Spline

- 10. Roll Pin
- 11. Cam
- 12. Magnet Screw
- 13. Magnets
- 14. Shaft Spring
- 15. Shaft
- 16. Sensor Screws M3 x .4
- 17. Magnum Sensor
- 18. Sensor Spacers
- 19. Terminal Strip Screws M2 x .4

- 20. 8 pt. Terminal Strip
- 21. Terminal Marker Strip
- 22. Housing
- 23. Housing Gasket
- 24. Bushing
- 25. Circlip
- 26. Earth Screw M5 x .8
- 27. Cup Washer
- 28. Earth Assembly

d) **Actuators equipped with GLOBTOP Microswitch Housing with Proximity Switches**

Proximity sensor adjustment:

- 1) Place the actuator pinion in “close” position and check that the indicator is above the desired sensor (make the same check in “open” position).
In contrary cases extract the regulating block (fig.1) rotate 90 degrees and re-insert in the requested position.
- 2) Push in the regulating blade, relative to the proximity sensor under adjustment, and turn until the sensor is activated (fig.2) then release.
The blade can be regulated in steps of 2 degrees up to a maximum of ± 10 , whereas the notches present on the cover corresponds with 4 degrees of adjustment
- 3) Put actuator pinion in the open position and repeat point 2

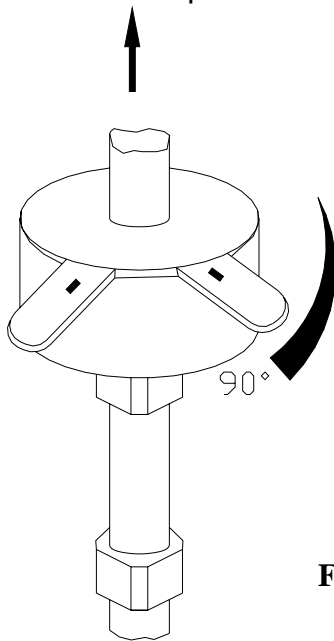


Fig.1

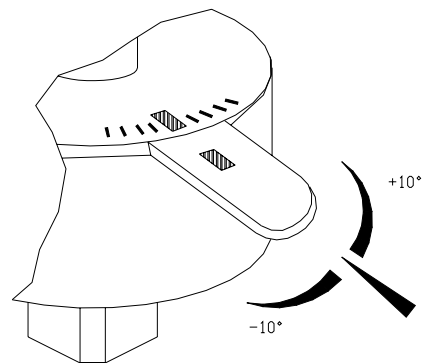
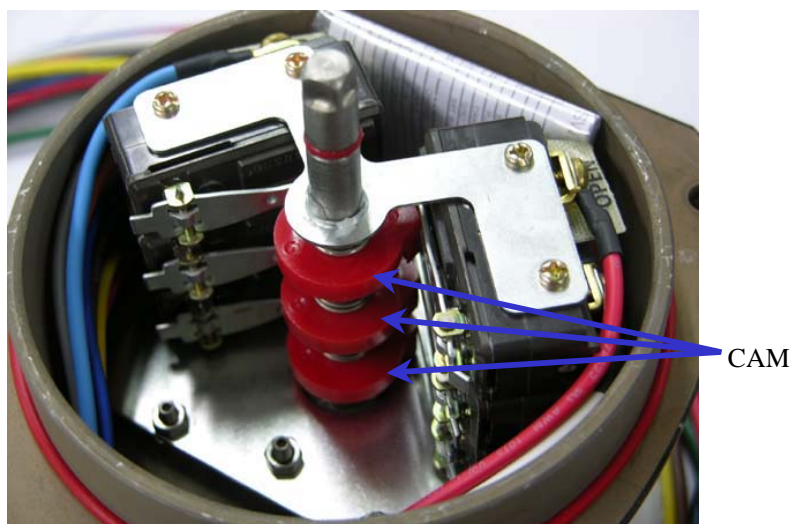


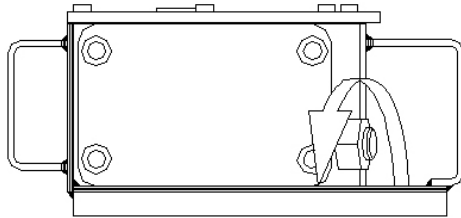
Fig.2

e) **Actuators equipped with I-TORK Microswitch Housing with Proximity Switches**

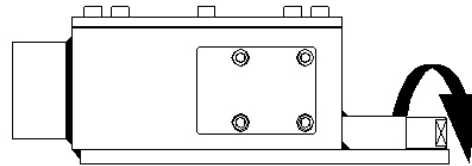
I-Tork proximity sensor adjustment: remove the cover from the microswitch housing. Push the cam, turn to adjust the setting of the cam on the shaft until the microswitch is actuated in the desired position, release the cam. For correct adjustment it is necessary that the proximity switch is actuated slightly before the mechanical stop.



- f) Adjustment of mechanical stops: screw or unscrew the dowels placed on the frame for “GS” and “SY” actuators

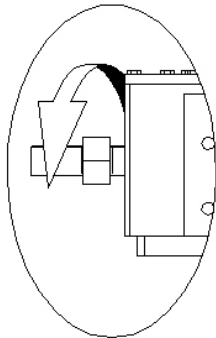


Actuator Type: SY

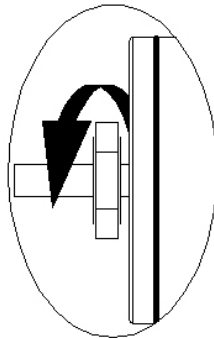


Actuator Type: GS

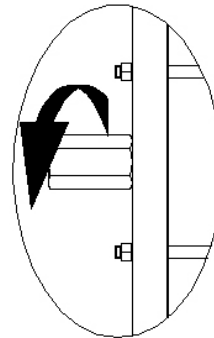
on the spring container and the cylinder for “HT”, “MT” and “ST” spring return actuators
on the cylinder and the frame for “HT”, “MT” and “ST” double acting actuators



Frame

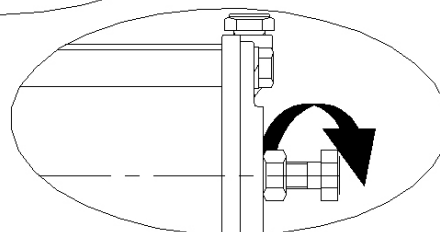
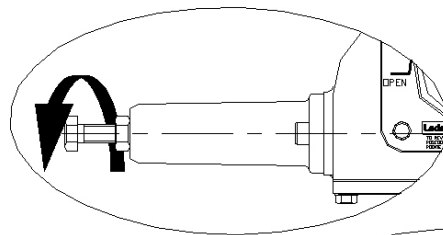


Spring Container



Pneumatic Cylinder

on the cylinder and the frame for “VA” actuators

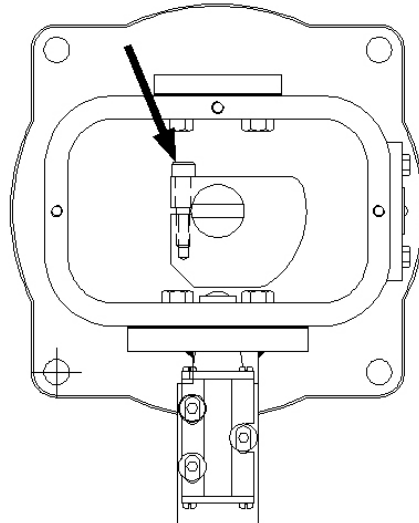


after having loosened the locking nuts. By screwing the dowels the angular stroke is reduced: unscrewing the angular stroke is increased.

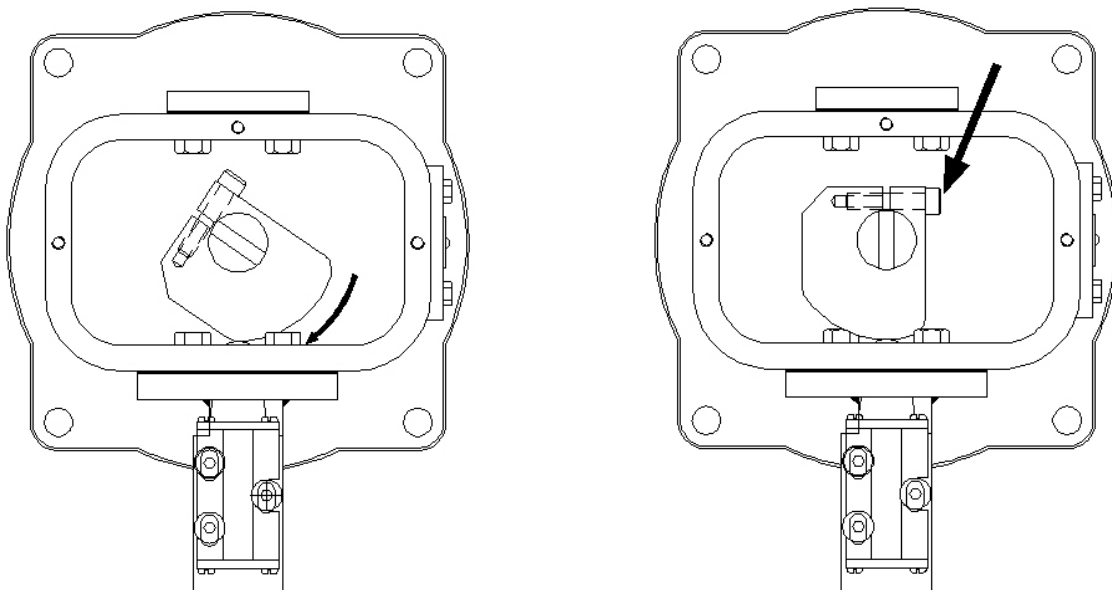
NOTE: In case of Spring Return Actuators, before adjusting the end stop relevant to the cylinder, it is necessary to pressurize the same with low pressure in order to reduce the pressure provided by the spring thrust against the end stop to be adjusted.

g) **Actuators equipped with Pneumatic Microswitch**

Adjustment of pneumatic microswitch: remove the position indicator or the microswitch housing, loosen the screw clamping the cam.



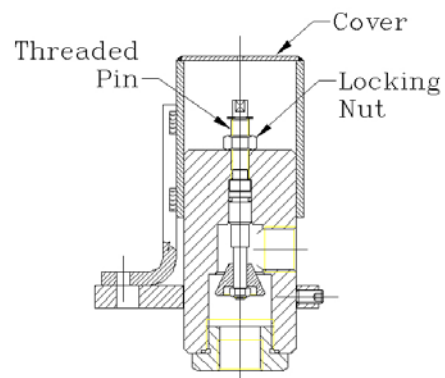
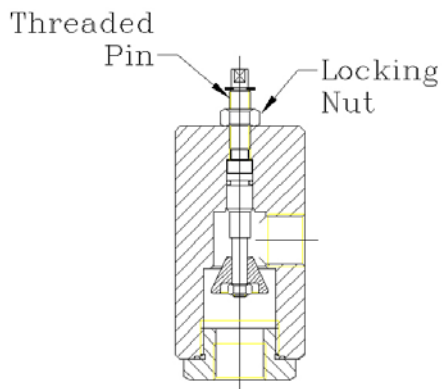
Rotate the cam of the shaft until the pneumatic microswitch is actuated in the desired working position and fix the screw clamping the cam.



The pneumatic microswitch is normally open type, so it remains closed until the cam acts on the microswitch pusher. This means that the adjustment of the microswitch must be carried out in the relevant actuator end position.

h) **Actuators equipped with Flow Control Valve**

Operation speed adjustment: the time of manoeuvre can be adjusted by screwing or unscrewing the threaded pin of the flow control valve after having removed the cover (if any) and loosened the locking nut. By screwing the threaded pin, the time of manoeuvre is reduced. Once the speed is adjusted, tighten the lock nut and screw on the protection cover. After actuating the flow control valves, as above described, it is necessary to check that the operation time is the required one.



3) ACTUATOR START UP

Warning:



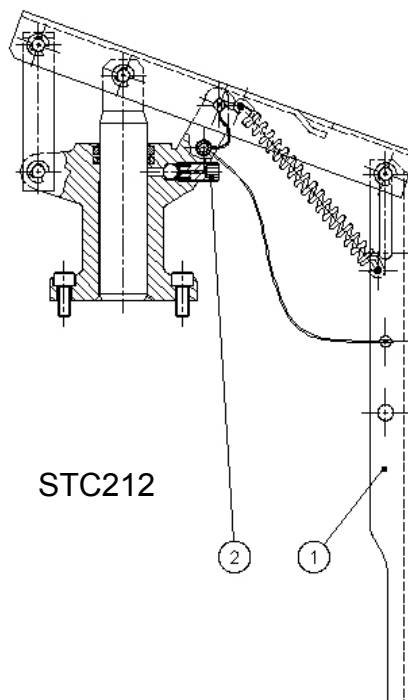
NOTE: No special tools are required for these operations, but only some Allen wrenches and hexagonal wrenches of the required sizes.

- a) Carry out the electrical in accordance with the electrical wiring diagram. Protect the cables by means of a flexible tubing, explosion-proof type.
- b) Check the correct tightening of the connections.
- c) Bleed the air from the cylinder, if necessary, by removing the plug mounted on the flange (for hydraulic actuators only).
- d) Check the correct working of the actuator with the pneumatic/hydraulic supply and the spring (if applicable) in open and closed direction.
- e) Check the correct working of the actuator by means of the manual override (handwheel or hand pump) (if applicable). In case of handwheel for double acting actuators, it is necessary to keep the actuator in one end stroke position, depressurise the control system and the cylinder and clutch the handwheel lever for the manual operation (clockwise direction) by slightly moving the handwheel, if necessary.
- f) Check the correct pneumatic and/or hydraulic piping seal.
- g) Restore the paintwork of the components which have been damaged during transportation and assembling after having removed the rust.

Actuators equipped with Hand-Pump

If the hand pump working is not effective, carry out the following draining procedure (refer to DWG. STC212):

- a) completely lift the hand pump lever (1);
- b) loosen the socket head screw (2), in order to exhaust the air from the pump;
- c) completely lower the hand pump lever (1);
- d) tighten the socket head screw (2);
- e) repeat points from a) to d) until the oil drops out from the socket head screw (2).



4) MAINTENANCE

Every maintenance operation on the actuator must be carried out only after having closed the pressure taps, to prevent undesired operation and enable the operating personnel to work in safe conditions.

4-1) ROUTINE MAINTENANCE

Warning:



Every 6 months:

- a) Check the correct valve position signalling on the control panel.
- b) Check the correct working of the actuator with pneumatic/hydraulic supply by manually stroking the same for a small percentage not to affect the flow in the main line. The actuator shall be operated back just after the partial stroke end line is reached. This operation can be automatically performed by means of the partial stroke test facility, if any.
- c) Check the correct working of the manual override (handwheel or hand pump) by operating the actuator for a small percentage not to affect the flow in the main line. The actuator shall be operated back just after the partial stroke end line is reached.

Every year:

- a) Check the lubrication of the scotch yoke and if necessary lubricate with RENOCAL FN20 or equivalent grease.
- b) Check that there is no leakage from the stem of the cylinder.
- c) Remove, if any, the condensation in the housing, by actuating the pressure relief valve placed on the bottom of the housing.

Every 3 year:

- a) Check that the oil is in good condition and that it is always clear (if applicable).

4-2) EXTRAORDINARY MAINTENANCE

Warning:



- a) In case of leakage from the pneumatic or hydraulic cylinder, disassemble, clean the o-ring grooves and substitute the o-ring if damaged.
- b) If there is a leakage from the pneumatic or hydraulic piping, tighten the fitting nuts, or, if necessary, change them if damaged.
- c) In case of malfunction or leakage from the pneumatic or hydraulic valves, disassemble referring to the technical literature, clean with care and replace damaged components.

4-3) INSTRUCTION FOR REPLACEMENT OF TEFLON SEALS

Warning:



When the seals need to be replaced, it is necessary to check before assembly, that their seats are clean and lubricated.

In order to replace the sealing, proceed as follows:

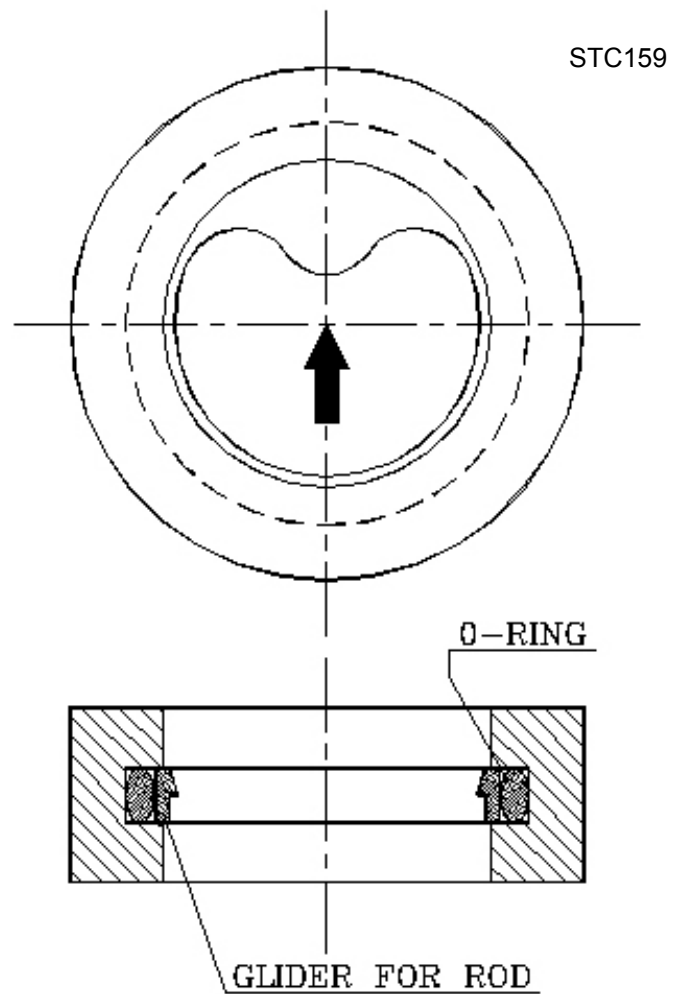
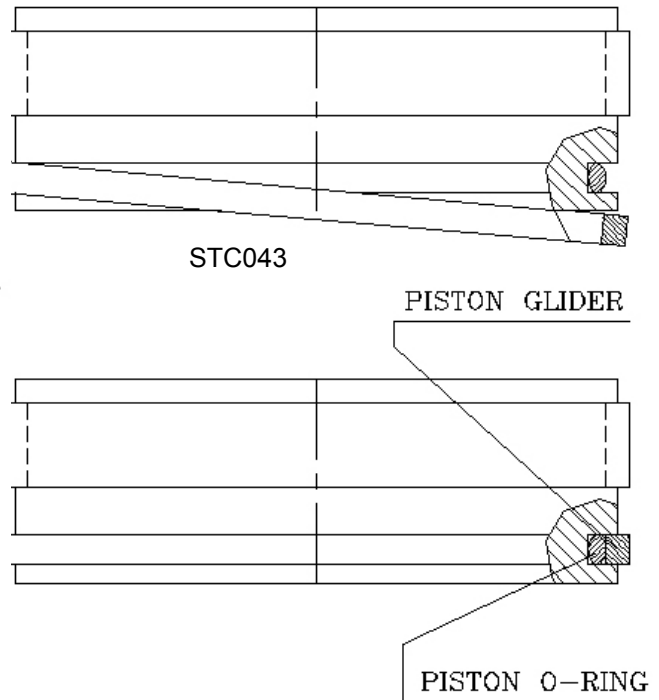
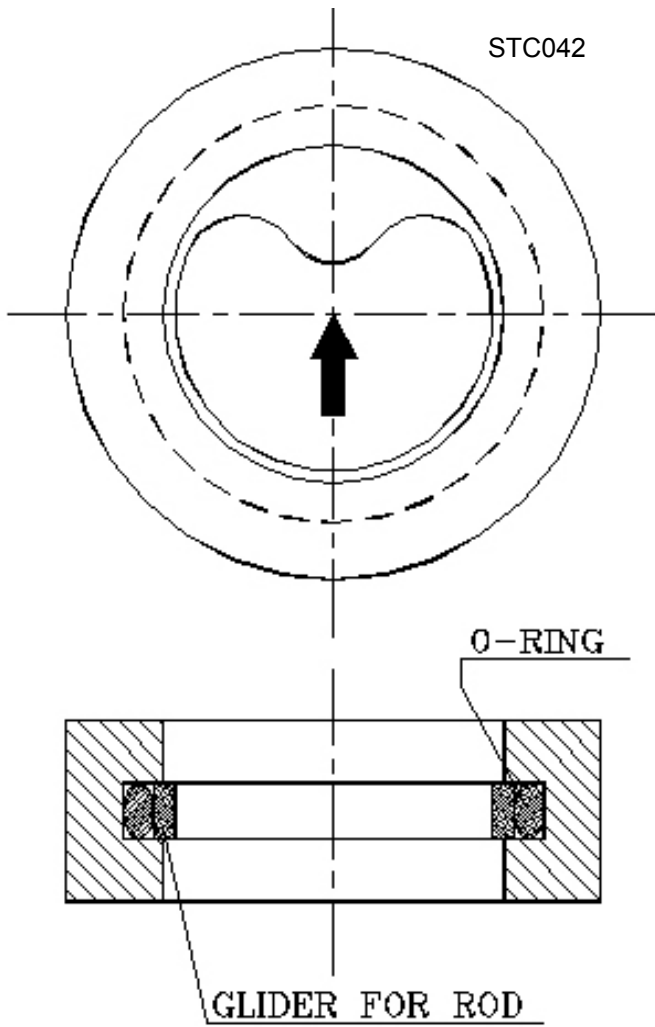
a) O-ring and pistons (applicable to Piston Type Cylinders only):

First of all mount the rubber o-ring. Insert then the teflon glider over the o-ring by enlarging it with the fingers (see dwg. STC043).

The elastic memory of the glider will recover its original dimensions after a while.

b) Rod seals:

Mount the rubber o-ring in the seat. Collapse the teflon glider and insert it inside the o-ring (see dwg. STC042 or dwg. STC159 for Plunger Type Cylinders).



5) REMARKS

5.1 ORIGINAL SPARE PARTS

Failure on the part of the Customer to use genuine **Ledeen Facility** spare parts, exempt **Ledeen Facility** from any responsibility for indemnity on claims.

5.2 OPERATIVE STAFF

The maintenance-staff assigned to the product **Ledeen Facility** must have the qualified technical preparation to perform the function. The lack of the above-mentioned preparation, included therein, the non disposability to effect adequate instructional courses by specialized technicians **Ledeen Facility** at the workshops of the maintenance firm, cannot be imputed to the company **Ledeen Facility**, who will be considered exempt from any responsibility on claims. Also the lack of knowledge, on the part of the operative personnel, of the manuals and instruction books supplied by **Ledeen Facility** in the languages indicated in the supply contract, cannot be imputed to **Ledeen Facility**.

5.3 DAMAGES DERIVED FROM USE

Any damage derived from corrosion, encrustations, pollution, oxidation, dust, wear or gradual deterioration of the materials, for which the customer did not specify the adaptability limits, will be at the Customer's own loss.

5.4 INTERRUPTIONS AND SUSPENDING

Damages derived from a period of instrument use failure, during which the instrument wasn't in maintenance condition to assure a perfect preservation, will be at the customer's own loss.

5.5 MODIFICATION OF THE ACTUATOR

Damages derived from any modifications made by the customer without the preventive approval **Ledeen Facility** especially if in dissimilarity to the initial conditions established in the buying order, will be at the Customer's own loss.

6) STORAGE CONDITIONS

The following procedure must be applied during storage in order to guarantee the correct working of the actuator after installation.

The actuator must be stored in a place, which has adequate protection against environmental damage.

The recommended environmental conditions are:

- Ambient temperature: minimum - 20 °C / maximum + 70 °C
- Relative humidity: < 75%

Depending on the storage type, the recommendations are the following:

6.1 INDOOR STORAGE

- Restore the paintwork of the components that have been damaged during the transport.
- Keep the actuators higher than ground level.
- Check that the internal electric components (where present) are perfectly dry, then close accurately.

6.2 - OUTDOORS STORAGE

- Restore the paintwork of the components that have been damaged during the transport.
- Keep the actuators above ground level.
- Check that the junction boxes internal parts are perfectly dry and eventually insert a bag with anti-condensation salt, then close accurately.
- Check that the internal electric components (where present) are perfectly dry, when it is not possible to keep the actuator energised, insert a bag with anti-condensation salt, then close accurately.

To store the machine at temperatures below of -30°C and up to $+70^{\circ}\text{C}$ it is necessary to carry out additional checks and tests from time to time, depending on the ambient conditions.

6.3 LONG-STORAGE CONDITIONS

In the event of long-storage we recommend to carry out the ordinary maintenance operations following the times scheduled.

7) ACTUATOR DISABLEMENT

At the end of the operating life of the actuator, to finally disable the actuator please carry out the following operations:

- Open the gearbox enclosure;
- Remove the lubricants taking care not to pollute the environment;
- Clean the gearbox internally using a mixture of water and degreasing soap;
- Dispose of the cleaning fluid and lubricants extracted from the actuator, according to the local laws regarding the disposal of waste material.
- After the actuator's disablement, all casings must be sent to the scrapping service.

8) SAFETY OF THE POWER SUPPLY CONNECTION (IF APPLICABLE)

Before carrying out any operation on the actuator, check that the power supply is off.

Before connecting the actuator:

Verify the absence of the power supply and always connect the ground cable to the actuator first.

Check that the power supply line characteristics are in accordance with the nameplate and installation manual data.

9) SAFETY RECOMMENDATIONS

Check that the ground resistance complies with the limits allowed by the National Laws relevant to the country where the actuator is installed.

If the actuator is installed in a hazardous area, do not use naked flames and/or devices that could cause sparks.

At the end of any intervention on the actuator please check that all the boxes and covers are properly closed.

The operators assigned to the actuator's maintenance must be authorised personnel or otherwise must have attended a training course dedicated to the use and maintenance of the actuator.

10) ELECTROSTATIC DISCHARGES PREVENTION


The actuator handling must be carried out using the handling ring supplied with the actuator.

In order to prevent the electro-static charges storage, attention must be paid during the cleaning of any external component made from plastic material.

The plastic material must be cleaned only with a damp cloth or with antistatic products.


11) MARKING (ACCORDING TO 94/9/EC DIRECTIVE)

Please refers to the following marking example:

CE  II 2 G Eex d IIB T5

Where:

CE = symbol of conformity to the EC applicable directives

 = Atex symbol

II = group II (surface)

2 = apparatus of category 2

G = explosive atmosphere with presence of gas, vapours, fogs

Eex d IIB T5 = type of protection, gas group, temperature class



Hazardous area	Installation category according to ATEX directive No. 94/9/CE	
Gas, fog or vapours	Zone 1	2G
Gas, fog or vapours	Zone 2	3G

12) NAMEPLATE DESCRIPTION

The actuator's nameplate shows the following data:

1. Contract No.
2. Purchase Order No.
3. Customer item
4. Year of manufacturing
5. Valve and Actuator Tag Number
6. Actuator S/N
7. Actuator model
8. Actuator supply pressure (if applicable)
9. Action on air failure
10. Actuator shaft rotation
11. Valve size and rating
12. Explosion-proof marking, followed by the apparatus group and category
13. Atex Technical File No.
14. CE mark
15. Name and complete address of the manufacturer

See for reference the nameplate drawing below.

CONTRACT	<input type="text"/>
ORDER N°	<input type="text"/>
ITEM N°	<input type="text"/>
YEAR	<input type="text"/>
<input type="radio"/> ACTUATOR TAG NUMBER	<input type="text"/>
VALVE TAG NUMBER	<input type="text"/>
ACTUATOR SERIAL NUMBER	<input type="text"/>
ACTUATOR MODEL	<input type="text"/>
ACTUATOR RATED SUPPLY PRESS.	<input type="text"/>
ACTION ON AIR FAILURE	<input type="text"/>
<input type="radio"/> ACTUATOR MAX. SHAFT ROTATION	<input type="text"/>
VALVE SIZE / RATING	<input type="text"/>
  <input style="width: 50px;" type="text"/> TCF N. <input style="width: 50px;" type="text"/>	
Cooper Cameron Valves Italy Ledeen Facility Via Gandini 4 – 27058 Voghera (PV) – Italy	