QUIFER ACTUATORS SL.
CONSTRUCCIÓN DE ACTUADORES, REDUCTORES
Y ACCESORIOS PARA VÁLVULAS.

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INSTALLATION AND MAINTENANCE INSTRUCTIONS SCOTCH YOKE ACTUATOR KSY/M-100

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1.-SPECIAL HAZARDOUS AREA

The Scotch Yoke pneumatic actuators manufactured by QUIFER ACTUATORS S.L. are designed to be used in the following potential explosive zones: Zone 1 & 2 for gases and Zone 21 & 22 for dust.

CE Ex II 2GD C T6 / T85ºC IP-67 Ta: -20 / +80ºC

2.-GENERAL SAFETY PRECAUTIONS

The Scotch Yoke Pneumatic Actuators series are specifically designed to operate quarter turn valves, such as ball, butterfly and plug valves. As such they should be:

- Used as specified.
- Regularly maintained to remain in good working order.
- Not be modified without first consulting QUIFER ACTUATORS SL or an authorised agent.

BEWARE; METAL SURFACES ARE EXCELLENT HEAT CONDUCTORS.
PROTECT HANDS AND EXPOSED SKIN WHENEVER HANDLING ACTUATOR OR ACCESSORIES IN EXTREME TEMPERATURE ENVIRONMENTS.
BEWARE; NEVER WORK ON AN ACTUATOR WITH ELECTRICAL OR / AND AIR MAINS CONNECTED.
BEWARE AT ALL TIMES; KEEP FINGERS CLEAR OF ALL MOVING PARTS.
BEWARE; HEAVY ITEM, SECURE THE ACTUATOR WHILE HANDLING, INSTALLING OR MANTAINING USING THE SUPPORT POINTS AND SUITABLE SLINGS FOR THE ACTUATOR WEIGHT.

3.-ACTUATOR DESIGNATION

The actuators are designated as follows:

- KSY-XXX-YYY ⇨Double acting actuators of 90º
- KSYM-XXX-YYY-MMM ⇨Spring return actuators of 90º

Where XXX designates actuator size
Where YYY designates actuador cilinder
Where MMM designates actuador spring

4.-GENERAL DATA

▪ Interface for positioner or signal transmitters dimensions with 4 threads M6 forming a 160 x 160 mm square.
▪ *Connection to valve:* ISO 5211:2001 F30.
▪ *Air connections:* 2 of 1/2"NPT.
▪ *Working pressure:* From 3 to 10 bar double acting
From 4 to 10 bar spring return
▪ *Media:* Air or non corrosive gas
▪ *Working temperature:* -20ºC to 100ºC
▪ *Lubrication:* Free for its normal life
▪ *Rotation:* Anti-clockwise to OPEN.
▪ *Travel stop adjustment:* 90º ± 10º (5º at each end)

5.-INSTALATION

5.1. - Installation procedure.

1. Check that the coupling dimensions of the valve flange and stem or of the relevant extension meet the actuator coupling dimensions.
2. Determine valve direction of rotation and whether valve is **Normally Open (N/O)** or **Normally Closed (N/C)**.
3. Rotate valve stem to correct operating position (**N/O o**r **N/C**)
4. Place the valve in the vertical position and grease the valve stem.
5. Clean the valve flange and remove anything that might prevent a perfect adherence to the actuator.
6. If a mounting turret or adaptor is needed, attach mounting turret or adaptor to valve using correctly sized fasteners (nuts and Bolts). Do not fully tighten the bolts at this time.
7. When a coupling piece is needed, insert coupling piece onto the valve stem, making sure that the coupling is correctly engaged.
8. Determine the actuator direction of rotation.
9. Lift the actuator using the support points and a suitable sling for the actuator weight.
10. Clean the actuator flange and remove anything that might prevent a prefect adherence to the valve.
11. Mount the actuator on to the valve directly or onto the mounting turret or adapter ensuring the valve stem or the coupling piece engages properly into drive sleeve of the actuator drive. This should be done without forcing only with the weight of the actuator.
12. If a mounting turret or adapter is needed, secure mounting turret to valve tightening the fasteners fully. If the actuator is mounted directly to the valve, check if the holes of the valve flange meet the threads of the actuator flange. If yes secure the actuator to the valve using correctly sized bolts.
13. At this point check that both actuator and valve are in the correct operation mode (N/O or N/C).
14. If the actuator is not mounted correctly, remove the actuator and repeat the installation procedure.

5.2. – Travel stop adjustment.

When the actuator has been bolted to the valve flange or to adapter, the position of the stop bolts should be checked to ensure the full opening and closing of the valve. If the travel positions are not correct, the travel stop screws may be adjusted by first loosening the travel stop nut and then screwing or unscrewing the travel stop screw until the desired travel position is achieved. Stroke the yoke away from the travel stop screw when adjusting, then return it to check position. When the correct position is obtained, re-tighten the travel stop nut.

6.-MAINTENANCE

6.1. – Maintenance procedure

The KSY/KSYM- Scotch yoke actuator series have been designed to work for long periods in the hardest conditions without any major maintenance than periodic seals replacement and actuator re-grease. However, depending upon the actuator operating conditions: e.g. extended duty, contaminated operating medium (air/gas) or any abnormal operating conditions a preventive maintenance is required. The procedure is as follows:

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1. Ensure that the actuator correctly operates the valve and with the required operating times cycling the actuator several times with all the existing controls.
2. Check that the signals to the remote control desk are correct.
3. Verify that the media supply pressure is within the required range.
4. Check visually the external components of the actuator looking for physical damage.
5. Check paints and coatings of the actuator in order to ensure corrosion protection. If needed repair paint or coating damage with applicable paint.

7.-STORAGE

7.1. - Storage procedure

For those applications where the actuator is not put into immediate service (or is used in an intermediate function) it is recommended that the actuator is cycled, under air pressure, at least once every three months. Indoor storage, wherever possible, is recommended. Care should be taken to plug the cylinder ports to keep them free from the ingress of foreign particles and/or moisture. Actuators should not be stored in an aggressive atmosphere.

8.-DISASSEMBLY AND ASSEMBLY

BEWARE; METAL SURFACES ARE EXCELLENT HEAT CONDUCTORS.
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BEWARE; NEVER WORK ON AN ACTUATOR WITH ELECTRICAL OR / AND AIR MAINS CONNECTED.
BEWARE AT ALL TIMES; KEEP FINGERS CLEAR OF ALL MOVING PARTS.
BEWARE; HEAVY ITEM, SECURE THE ACTUATOR DURING MAINTENACE OPERATIONS USING THE SUPPORT POINTS AND SUITABLE SLINGS FOR THE ACTUATOR WEIGHT.

When maintenance or O-Ring replacement is required, please disassemble and assemble the actuator as follows:

8.1. – Disassembly

1- Remove all control accessories, such as solenoid valves, positioners, and limit switches Etc, from the actuator.
2- Remove the travel stops nuts and their O-Rings (21,22)
3- Remove the Indicator from its location (19)
4- Remove the cover and the guide pins from the body (17,24,31)
5- Remove the spring cartridge by loosing the spring flange fixing bolts. (33)
6- Loosen the Tie rod nuts and remove them from the outer end cap (40,47)
7- Remove the outer end cap. (36)
8- Remove the air cylinder. (35)
9- Loosen the two lock bolts from the piston rod nut, otherwise you could not unfasten the piston rod nut (38)
10- Remove the piston. (37)
11- Remove the air cylinder flange inner end cap by loosing the flange fixing bolts. (34)
12- Remove the Piston Rod and the Spring Rod. (32,16)
13- Loosen the guide bar prisoner bolts
14- Remove the guide bar. (8)
15- Remove the guide block from the actuator (5)
16- Remove the circlips from the sliding block pin (11)
17- Remove the sliding blocks (9)
18- Remove the guide block from the yoke (5)

8.2.- Assembly

1- Place the guide block (5) bushing into de guide block and after this is achieved place the two guide block O-Rings. The guide block bushing has three groves which have to be greased completely.
2- Place all bushings Piston Rod Bushing, Spring Rod bushing Lower and Upper bushings in their locations in the housing and cover (16,32). First place the o-rings in their locations and grease all the bushings, they are provide with grease grooves in order to ensure that they remain properly greased during their normal operational time
3- Place the yoke (3) into its location in the lower bushing, ensuring that the contact point is completely greased
4- Place the guide bar(8) in its location. Ensure before doing it that the guide block is properly greased
5- Screw the Air Cylinder Rod and the Spring Rod (16,32).
6- Assemble the air cylinder flange to the main housing.(34) Remember to place the Klingerit seal between the housing and the air cylinder flange (25, 13)
7- Assemble the piston in the air cylinder rod(37), first place its O-rings and grease it. When placed, fix the piston with its washer and its nut. Lock the nut with its two locking bolts(38,39)
8- Place the air cylinder, at this point place the PTFE bearings while you are introducing the air cylinder, otherwise they would fell down (42,46)
9- Mount the air cylinder end cap with its O-ring and the tie rods(35) Fix the Tie Rods with washer and nut each (44,45).
10- When the complete air cylinder is fixed and secured to the housing operate it with air and place the actuator in the Closing position. This will allow you to assemble the spring cartridge correctly.(33)
11- Place the Spring Cartridge. Beware there will be a moment it will be harder to introduce it. This caused because the spring will start to be compressed.
12- Put the Guiding pins and after that the cover onto the housing (17,24,31)
13- Place the indicator and fix it with its bolts(19,20)
14- Place the travel stops (21,22) at each end. Fix the travel stops with the travel stop nut and travel stop cap. Remember to adjust the rotation angle from 0º to -1º and 90º to +1º.

REMEMBER; GREASE ALL CONTACT AND MOVING PIECES BEFORE ASEMBLING MOST PIECES ARE SUPPLIED WITH GREASE GROOVES TO ENSURE THE ACTUATOR IS PROPERLY GREASED TO ITS NORMAL LIFE TIME