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

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INSTALLATION, SAFETY & MAINTENANCE INSTRUCTIONS

1- SPECIAL HAZARDOUS AREAS

The Rack & Pinion 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.

Low Temperature:
CE Ex II 2GD C T6 / T85ºC IP-67 Ta: -50 / +80ºC

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

High Temperature:
CE Ex II 2GD C T6 / T85ºC IP-67 Ta: -20 / +150ºC

2- GENERAL SAFETY PRECAUTIONS.

The QUIFER Rack and Pinion Pneumatic Actuators 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 or an Authorised Quifer agent.

BEWARE; METAL SURFACES ARE EXCELLENT HEAT CONDUCTORS.

Protect HANDS and EXPOSED SKIN whenever handling ACTUATOR OR ACCESSORIES in extreme temperature environments.

BEWARE AT ALL TIMES; KEEP FINGERS CLEAR OF ALL MOVING PARTS.

3- ACTUATOR DESIGNATION

The actuators are designated as follows:

KP-xxx ⇒ Double Acting Actuators
KPM-xxx -yy ⇒ Single Acting Actuators

xxx Designates actuator size.
yy Denotes the number of springs.

4- GENERAL DATA

Interface for positioner or signal transmitters dimensions in accordance with: **VDI/VDE-3845**
Valve connection flange according to: **ISO-5211**
Solenoid valve interface: **DIN228/1**
Working pressure: 1 - 8 Bar Double Acting Actuators
3 - 8 Bar Single Acting Actuators.
Medium: Air or non-corrosive gas.

Working temperature: Low Temp -50ºC to +80ºC / Standard Temp. -20ºC to +80ºC / High Temperature -20ºC to +150ºC

Travel stop adjustment: 0º±2,5º to 90º±2,5º

5- INSTALLATION

BEWARE; NEVER WORK ON AN ACTUATOR WITH MAINS AIR CONNECTED.
BEWARE AT ALL TIMES; KEEP FINGERS CLEAR OF ALL MOVING PARTS

A) Determine valve direction of rotation.
B) Determine correct operating quadrant for mounting bracket according to direction of rotation and whether valve is Normally Open (N/O) or Normally Closed (N/C).
C) Attach bracket/actuator/valve assembly as follows:

1) Rotate valve stem to correct operating position (N/O or N/C).
2) Attach mounting bracket to valve. Do not fully tighten the bolts at this time.
3) Insert coupling onto valve stem making that sure that the coupling is correctly engaged.
4) Mount actuator onto the valve ensuring the coupling insert engages properly into drive sleeve of the actuator drive shaft.
5) Secure bracket to valve using correctly sized fasteners (nuts & bolts) and tighten them fully.
6) At this point CHECK that both *actuator and valve* are in the correct operation mode (N/O or N/C).
7) If the actuator is not mounted correctly, remove the actuator and repeat the mounting procedure.

6- MAINTENANCE

All actuators are supplied with sufficient lubrication for their normal working life. However if required, a recommended lubricant is OPTIMOL LONGTIME 2 grease.

Depending upon the actuator operating conditions: e.g. extended duty; contaminated operating medium (air/gas) or any other abnormal operating conditions. Regular inspection and replacement of internal seals is recommended. Spare Parts Kits are available and can be easily obtained by contacting QUIFER ACTUATORS SL.

Spare Parts Kits are identical for both double and single acting versions.

Springs are supplied as complete sets with preloading inserts.

7- STORAGE

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 3 months. When it is not possible to cycle with air the actuator should be manually turned through 2 – 3 strokes. 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, which could be harmful to the elastomeric seals.

8- DISASSEMBLY AND ASSEMBLY INSTRUCTIONS

7.1.- Disassembly

BEWARE AT ALL TIMES; THE ACTUATOR MUST BE ISOLATED FROM BOTH MAINS AIR AND ELECTRICALLY BEFORE STARTING ANY MAINTENANCE OPERATION.

1- Remove all control accessories, such as solenoid valves, positioners, and limit switches Etc, from the actuator.
2- Remove the travel stop nut (18) and screw (19) from both end caps (5).
3- Remove both inner travel stop bolts (16).
4- Remove both end caps (5) removing all end cap bolts (15).
5- Remove pistons (2) by rotating the drive shaft (3) clockwise.
6- Release the drive shaft (3) by removing the retaining ring (7) and thrust washer (6).

The actuator is now completely disassembled and maintenance can begin.

7.2.- Assembly

1- Replace all bearings (4,9) and seals (8,10,15,18), ensuring that all components are clean and greased.
2- Before assembling components, ensure the drive shaft, piston teeth and springs (if spring-return actuator) are well greased.
3- Before assembly, ensure cylinder valve ports are free of dirt and grease by blowing through with an air gun. Hold actuator with valve ports facing towards you and the Drive Shaft location hole uppermost.
4- Lower the drive shaft (3) into the body (1), and fix it by installing the thrust washer (6) and the retaining ring (7) into place.
5- Rotate the drive shaft (3) clockwise until the 4mm drive shaft top groove is at 45º to the bottom right. At this point assemble both pistons (2) by pushing them simultaneously into the body (1).
6- ***Check that the 4 mm drive shaft top groove is at right angles to the piston bore***. If it is not, then the piston rack (2) is out of position with the drive shaft, repeat the process until the groove ***is at right angles (90^{o})*** to the piston bore.
7- Install the Springs (13) (only requires in spring return actuators)
8- Fit end caps (5) and end cap bolts (14).
9- Install the inner travel stop bolts (16). Finally install the outer travel stop stud (19) and nut (18).

Now the actuator is completely assembled. But will require adjustment of the travel stops when it is mounted to the process valve. (Covered in Section 8)
At this point check the actuator does not leak and rotates through 90^{o} .

9- TRAVEL STOP ADJUSTMENT

To correctly adjust a quarter turn actuator proceed as follows:

1- Connect pneumatic solenoid valve to A and C (or directly to the NAMUR interface).
2- Loosen travel stop lock-nut (18).
3- Unscrew and remove the travel stop screw (19), O-Ring (20) and nut (18) as one assembly.
4- In order to adjust the Inner travel stop bolts (16) (normally these adjust the Open Position) Rotate them clockwise or anti-clockwise to set valve obturator (Ball, Plug or Butterfly) position. Ensure both travel stop bolts are equally adjusted, this is best achieved by adjusting only one until the desired position is set and then adjusting the other until resistance is felt, at this point the bolts are correctly set.
5- Once the inner travel stop is adjusted connect air to the cylinder port A. When the pistons are fully extended against the end caps, install the outer stop bolt assembly, travel stop screw (19), O-Ring (20) and lock-nut (18) until they touch the head of the inner travel stop (16).
6- Tighten the travel stop nut (18). It is also very important to make sure that both endstops are equally adjusted, work only on one-bolt and when it is correctly adjusted the second can be tightened until resistance is felt and then tighten the lock-nuts.