PA Series Diaphragm Type Pneumatic Actuator

Operating & Maintenance Manual

Please keep it safely for future reference.
1) Introduction

PA-190, PA-260, PA-260x2 and PA-350x2 series, a type of unilateral single-acting pneumatic actuators manufactured under license of Keyvalve Company Limited. The springs at one-side are pre-tightened to close the valve, clean air from the other side is supplied to open the valve or vice versa. Compact structure, stable thrust output, easy installation and maintenance are the key features of PA series.

2) Structure

2.1 Actuator type: Single-acting diaphragm type pneumatic actuator
2.2 Drive mode: Unilateral springs pre-tightened, single-acting pneumatic actuated
2.3 Connection: Threaded stem with coupling
2.4 Output type: Linear travel
2.5 Diaphragm material: Neoprene and nylon
2.6 Max. air supply: 0.6 MPa
2.7 Effective acting area: PA-190 (280 cm²), PA-260 (530 cm²), PA-260x2 (1060 cm²), PA-350x2 (1920 cm²)
2.8 Body material: Aluminum alloy ACD12 or carbon steel A216WCB
2.9 Manual override handwheel: optional

3) Assembly & Installation

3.1 During assembly, kindly refer to Diagram 1.0 and check the diaphragm part 14, upper body part 5 and lower body part 2 of actuator to ensure no dirt is attached. The diaphragm can be cleaned by plain water and it is not allowed for contact with oil.

3.2 Install the guiding bush part 15, PTFE seal rings set part 16, 17, 18, 19 and locking bush part 20 carefully to the lower body of actuator, hand tighten the locking bush.

3.3 Install the diaphragm attached to the diaphragm cover part 13. Then, install the stem part 21 through the locking bush and make sure it is locked to the diaphragm cover with a nut part 8, washer part 9 and positioning disc part 10. Make sure diaphragm is sitting in all grooves with good condition.

3.4 After the diaphragm has been installed, put on the springs part 11 to the spring guide part 12 according to requirement of application.

3.5 Then, put on the upper body of actuator and make sure upper and lower body are attached evenly. Make sure diaphragm is sitting properly in the groove.

3.6 Use torque wrench to fully tighten four pieces of long bolts at four different equally distributed points. Then, install and tighten the remaining standard bolts part 4 and nuts part 3 in parallel. Make sure force applied evenly when locking the nuts.

3.7 After that, take out the four pieces of long bolts and replace it with standard bolts. Make sure all the nuts are fully tightened.

3.8 Install the hanger eye part 7, silencer part 6, position indicator part 22, and indicator coupling part 1 according to Diagram 1.0.

3.9 Before installing the pneumatic actuator to the valve, please check the springs and air supply details on metal plate whether is matching the requirements of the application. The air supply of pneumatic actuator shall not exceed 0.6 MPa.
4) Spring Orientation Guidelines

4.1 Switching from normally close to normally open PA-260

4.1.1 Inner structure of PA-260 diaphragm pneumatic actuator - normally close. Refer to Diagram 2.0.

4.1.2 Take off any four pieces of equally distributed bolts on the pneumatic actuator. Install 4 pieces of long bolts and lock it with nuts, by which to avoid the cap bouncing outwards. Remove the other remaining standard bolts, then followed by taking off the long bolts slowly with uniform torque. Remove the nut on the stem. Refer to Diagram 3.0.

4.1.3 At the same time, take off the diaphragm cover with diaphragm attached. Then, replace the stem (please consult engineer for stem selection). Please take precaution to avoid damaging the sealing parts. Refer to Diagram 4.0.

4.1.4 Reverse installing the diaphragm cover after replacing the stem. Then, install the number of springs uniformly according to requirement of the application. Install the 4 pieces of long bolts and nuts back to the equally distributed holes. Make sure the edge of the diaphragm is placed properly in sealing groove of actuator body. Then, install the remaining standard bolts uniformly. Take off the long bolts and nuts, and lock the holes with standard bolts. Refer to Diagram 5.0.

4.1.5 Inner structure of PA-260 diaphragm pneumatic actuator - normally open. Refer to Diagram 6.0.
5) Maintenance

5.1 The pneumatic actuator shall be kept in dry and ventilated area. Diaphragm shall be taken extra care.

5.2 Pneumatic actuator which has been kept for long time need to be inspected and cleaned periodically.

5.3 After installation, pneumatic actuator needs to be inspected from time to time. Inspection is needed for the below:
   - Diaphragm condition.
   - Any possible leakage point of actuator.
   - Actuator’s stem movement condition.
   - Any abnormal sound inside the actuator.

5.4 After pneumatic actuator is repaired, it shall go through sealing performance test and output thrust test. The test result shall be documented for future reference.

5.5 Please contact Keyvalve engineer if serious damages are found on upper and lower body, diaphragm and springs which the immediate replacement is needed.