

INSTALLATION AND MAINTENANCE INSTRUCTIONS OF VALVE POSITIONER

INTRODUCTION

A control valve positioner is the heart of most accurate and efficient control systems, by ensuring the valve responds to the controller commands and adopts the precise position.

PRINCIPLE OF OPERATION

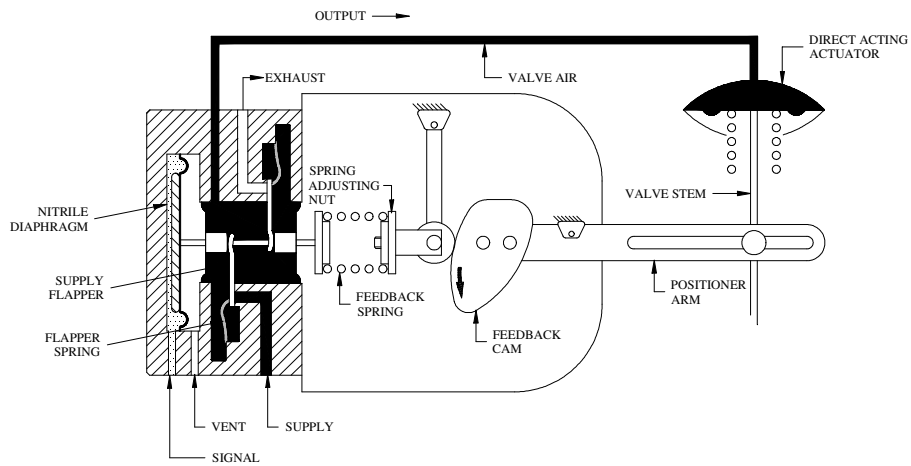
The PNEUCON PNEUMATIC VALVE POSITIONER is an instrument working on force balance principal to position the Control Valve stem in accordance to a pneumatic signal received from a controller or manual loading station.

The instrument signal is applied to the signal diaphragm. An increasing signal will drive the diaphragm and flapper-connecting stem to the right. The flapper-connecting stem will then open the supply flapper admitting supply pressure into the output which is connected to the actuator diaphragm. The exhaust flapper remains closed when the flapper connecting stem is deflected to right. The effect of increasing signal is to increase the pressure in the actuator. This increased pressure in the actuator drives the valve stem downward and rotates the positioner lever clockwise. This clockwise rotation of the lever results in a compression of range spring through cam. When the valve stem reaches the position called for by the controller, the compression in the range spring will give a balance force resulting the closure of both the flapper.

If the control signal is decreased, the force exerted by the signal diaphragm will also decrease and the force from the range spring will push the flapper-connecting stem to the left, opening the exhaust flapper. This causes a decrease actuator diaphragm pressure and allows the valve stem to move upward until a new force balance is established.

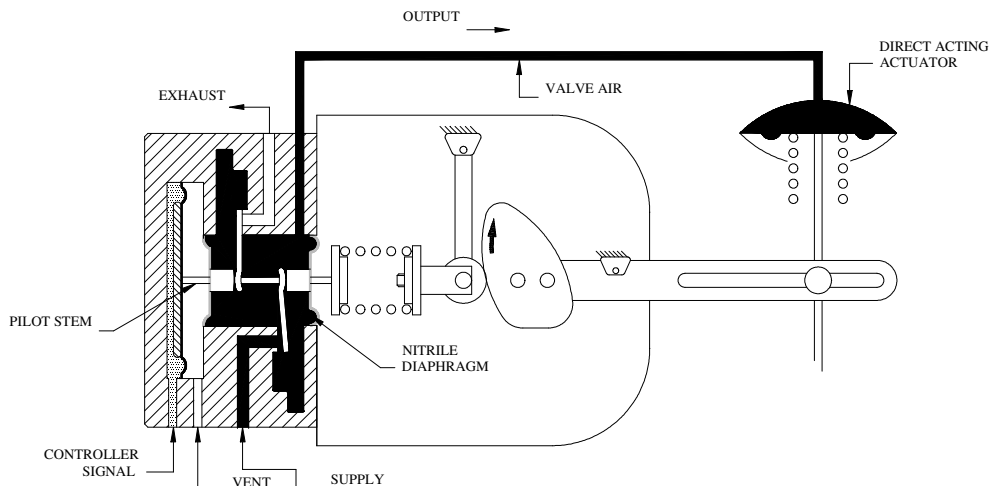
SCHMATIC DIAGRAM

DIRECT ACTING



SCHMATIC DIAGRAM

REVERSE ACTING



CHANGING POSITIONER RANGE

Four different springs are available to operate with different input signal range with 'PVP' pneumatic positioners, as listed in specification. When the Linear Characteristic Cam is used, simply by adjusting the starting point and stroke, limited change can be done range.

To change the signal range, follow the steps given below :

- 1) Release the feed back spring & remove the same.
- 2) Replace the spring suitable for desired signal range.
- 3) Repeat the calibration as described.

BY PASSING

PVP std. Model which is designated as PVP – I is available with Bypass system. Bypass system facilitates to cut off the positioner and to pass the signal pressure to valve actuator directly this enables to do short – time servicing of Positioner, without affecting the working of the valve.

To By pass the Positioner :

- 1) Unless the Bypass knob fixing screw.
- 2) Rotate selector knob clockwise and set to 'Bypass' Position.
- 3) Now the positioner is ready for "Bypass".

MAINTENANCE

- 1) Replacing Pilot relay assembly.

PVP pilot relay is factory calibrated and sealed, field disassembly is not recommended. If required, replace factory calibrated spare pilot relay assembly in following steps.

IMPORTANT : Before removing the Pilot relay assembly, note whether action of positioner is direct or reverse to avoid misalignment when reassembly.

- a) Remove 3 screws fastening assembly to body.
 - b) Inspect existing gasket and replace if necessary.
 - c) Check the action by reversing the positioner relay assembly and mount in the desired position.
 - d) Fix the 3 screws to screws to securely fasten assembly to body.
- 2) Gasket replacement :

When manifold or pilot assembly removed, if the gasket found to be worn out, change the same.

CALIBRATION

Control Valves ordered with Positioner are delivered with factory mounted and calibrated. No further adjustments are necessary. For any obvious reasons if Positioner has been disconnected and now the calibration is to be done, the same shall be done as follows :

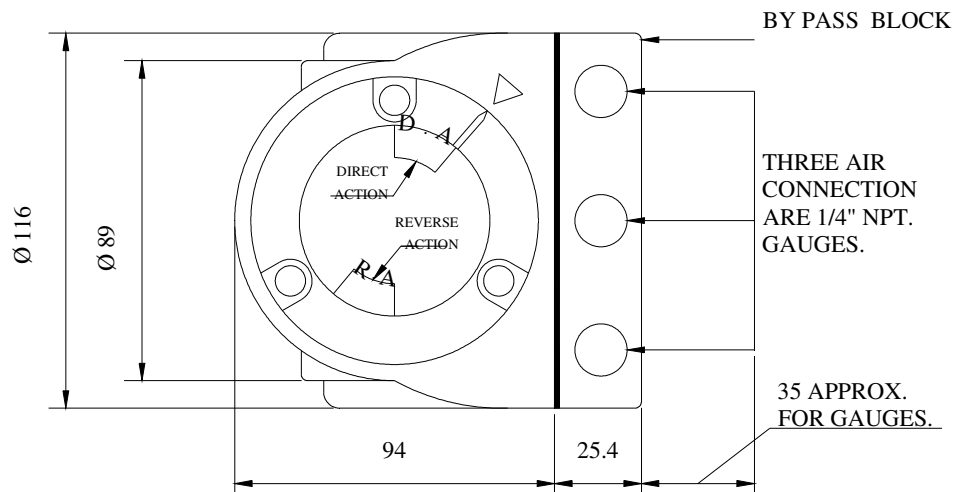
- 1) Apply regulated air pressure to actuator and adjust pressure until stem is positioned at midstroke.
- 2) Adjust motion connector assembly until positioner lever and motion connector are parallel and horizontal at midstroke.
- 3) Disconnect regulated air supply to diaphragm and connect tubing from output port of Positioner to diaphragm.
- 4) Check numbers stamped on the Positioner lever and move stroke adjusting pin to desired stroke and tighten.
- 5) To set positioner's start point, apply desired starting pressure (usually 3 PSI or 0.2 Kg/cm²) and adjust the spring adjuster until valve stem starts moving.
- 6) Set desired maximum pressure of signal range (usually 15.0 PSI or 1.0 Kg/cm²) and check for the stem stroke. If stroke is less, move stroke adjusting pin to the higher value i.e. right. If stroke is achieved at pressure lesser than desired pressure, move to lower value i.e. left.
- 7) Recheck the start point.
- 8) Repeat step 5 & 6 until travel is found within acceptable limits.

CHANGING POSITIONER ACTION

PVP Positioner can be changed from direct action to reverse action or vice versa without additional parts or special tools, the same does not demand any repositioning of Positioner or tubing.

To change action, follow the steps given below :

- 1) Release feed back spring and remove travel pin.
- 2) Remove the 3 Nos screws which fasten the pilot assembly to the housing.
- 3) Rotate the pilot by 180° and remount it to the housing. Make sure that 'DA' or 'RA' marking is properly lined with the arrow mark.
- 4) Remove the cam and fasten it in the opposite direction.
- 5) Readjust the travel pin and feedback spring.
- 6) Recalibrate as illustrated in " CALIBRATION".



TECHNICAL SPECIFICATION

UPPLY AIR PRESSURE	:	1.4 Kg/cm ² (Standard) 3.5 Kg/cm ² (Maximum)
SUPPLY CONNECTION	:	1/ 4" NPT (F)
INPUT	:	0.2 – 1.0 Kg/cm ² (Standard) 0.4 – 2.0 Kg/cm ² (Optional)
AIR CONSUMPTION	:	7.0 NL / Min (Normal)
AIR FLOW CAPACITY	:	200 NL / Min (Maximum)
HYSTERESIS	:	Within \pm 1 % of FS.
LINEARITY	:	Within \pm 1 % of FS.
DEAD BAND	:	Within 0.1 % of FS.
STROKE SPEED (maximum)	:	10 mm / second (With PDC – 55 Actuator)
STROKE	:	14.7 mm to 100 mm

MATERIAL OF CONSTRUCTION

HOUSING	:	Die cast aluminum to LM – 6
INTERNALS & LINKAGES	:	AISI 304
DIAPHRAGM	:	Nitrile / Neoprene with nylon fabric re – inforcement.
BEARINGS	:	Sintered alloys ball bearings.

NOTE :-If you experience difficulty with the installation or operation of the Valve Positioner please feel free to contact us.

[The company's policy is one of the continuous product improvement and the right is reserved to modify the specifications contained herein without notice.](#)



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