

Introduction

- The YT-1000R & YT-1000L are advanced electro-pneumatic valve controllers for single or double acting rotary or linear actuators. No additional parts are necessary to change between single or double acting actuators and direct or reverse acting.
- Corrosion resistant coated aluminum diecast housing stands up to harsh environments.
- Pilot Valve design reduces air consumption by more than 50%
- Vibration resistant design maintains superior performance in poor conditions - no resonance effects from 5-200Hz.
- Optional Gauges and offices.



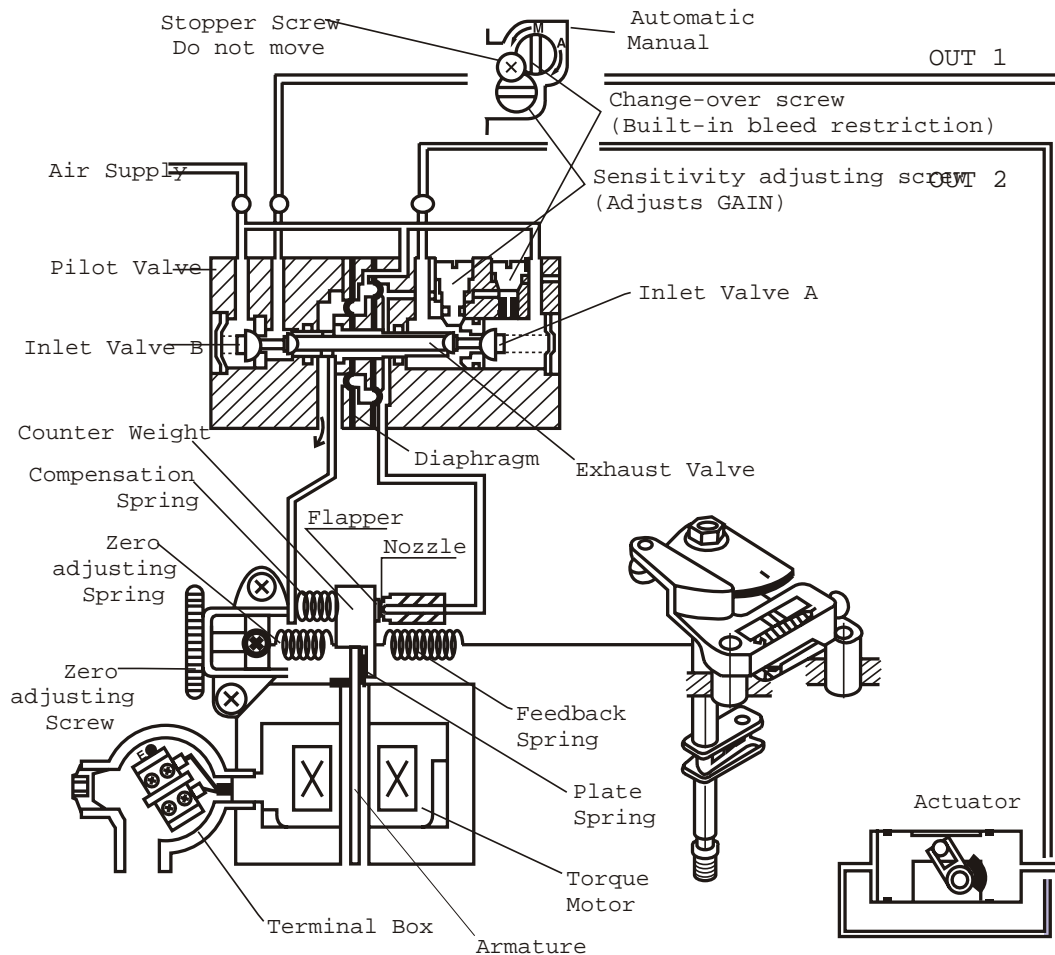
Specifications

Input Signal	4-20mA dc Split Range Available
Supply Pressure	20 to 100 PSIG
Stroke Range	0° - 90°
Connection	1/4" NPT 1/8" NPT - Gauges 1/2" NPT Conduit
Protection	Dust & Weather Proof (IP66)
Explosion - Proof	ExialIBT6, ExdmIIBT6, ExdmICT6
Operating Temperature	-4° to +160° F
Linearity	+ / - 2% F.S.
Hysteresis	+ / - 1% F.S.
Sensitivity	0.5% F.S.
Repeatability	+ / - 0.5% F.S.
Air Consumption	0.19 SCFM
Max. Flow Capacity	7 SCFM
Material	Diecast Aluminum
Weight	6.2 Lbs

Principle of Operation

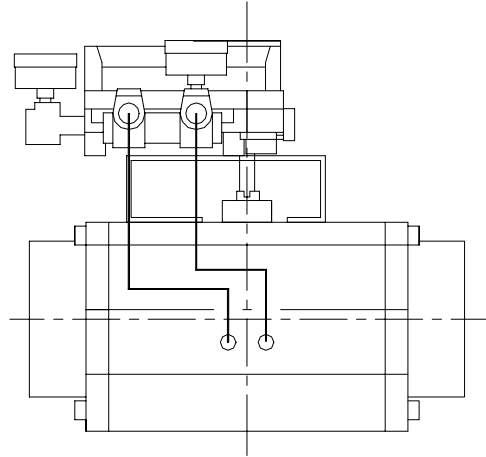
When the input signal current from the controller increases, the plate spring of the torque motor works as a pivot. As the armature receives the rotary torque in the counter-clockwise direction, the counter weight is pushed to the left. This will move the flapper to the left through the connecting spring, the gap between the nozzle and flapper widens causing the nozzle back pressure to drop. As a result, the pressure balance in the constant pressure chamber is broken, and the exhaust valve presses the inlet valve b to the right. Then the inlet port B opens, and the output pressure OUT1 increases.

The movement of the exhaust valve to the right also open exhaust port A, this causes the output pressure OUT2 to decrease. The increased port pressure of OUT1 and decreased port pressure of OUT2 generates a pressure differential across the actuator pistons. This will cause the pistons to rotate the pinion creating feedback to the positioner cam. The rotation of the cam increases the tensile force of the feedback spring acting on the balance lever. The actuator will rotate until the tensile force of the feedback spring and the force of the bellows are balanced. When the input signal decreases, the operation is reversed.



Installation

1. Mount the bracket to the actuator. The bracket kit includes mounting screws for the actuator.
2. Once the bracket has been mounted to the actuator, mount the positioner to the bracket. Be sure that the feedback lever is in perfect alignment with the rotary actuator output shaft.
3. Connect the 1/4" NPT output port from the positioner to the air ports of the actuator using instrument grade tubing and fittings. Use the diagram below for proper port configuration.

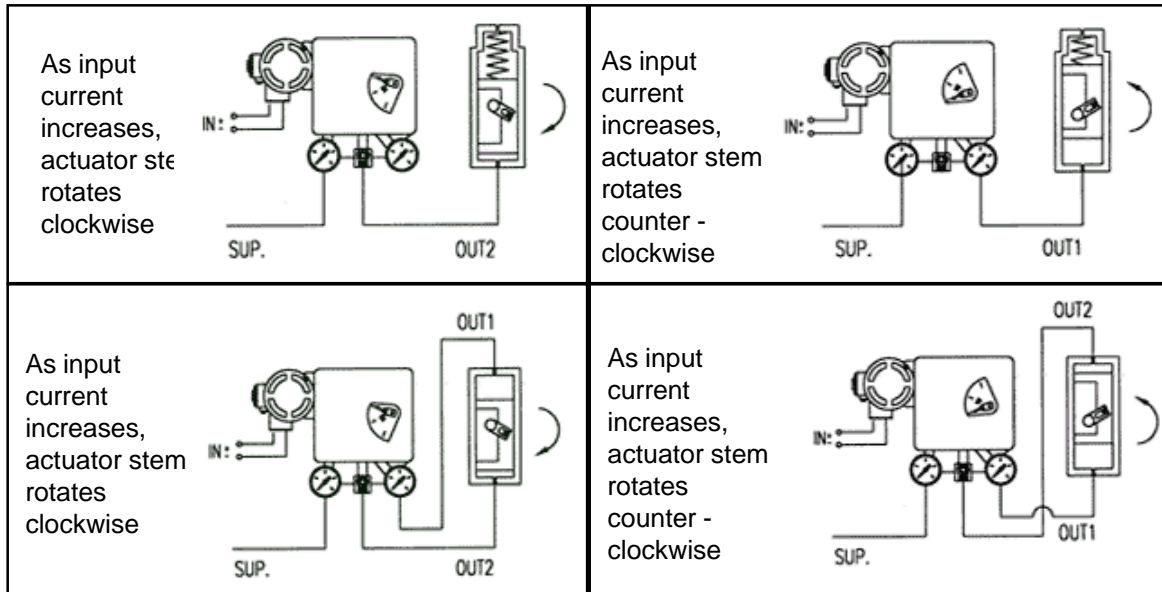


Air Piping Diagram

WARNING: This positioner is intended for use with a filter - regulator. Failure to use a filter - regulator may effect operation and void the warranty.

**Reverse Acting
(RA facing down - DA facing up)**

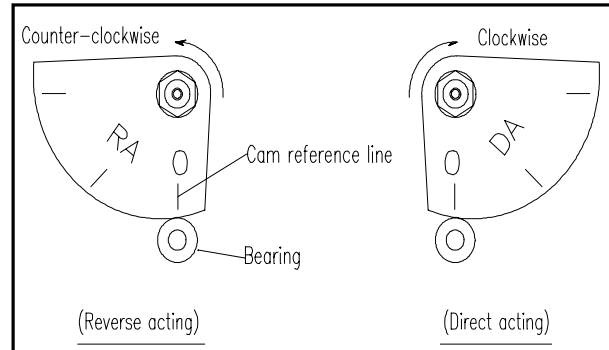
**Direct Acting
(DA facing down - RA facing up)**



Cam and Indicator Adjustment

WARNING: When adjusting or replacing cams, be sure to shut off air supply to positioner. Otherwise the positioner might react suddenly and cause damage or injury

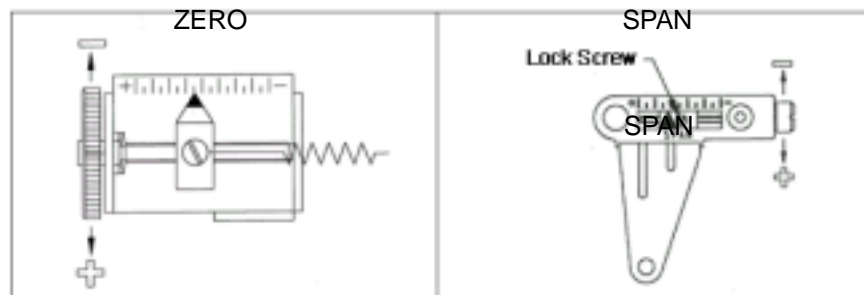
1. Make sure actuator is rotated to end of stroke.
2. Use the DA face (DA facing down, RA facing up) of the cam to rotate the actuator counter clockwise on increasing signal. Use the RA face (RA facing down, DA facing up) of the cam to rotate the actuator clockwise on increasing signal.
3. Loosen the flange nut on the cam. Match the part of the cam with "0" marked on it with the center of bearing, as shown to the right.



2. Tighten the flange nut of the cam after setting the cam. The position for indicator should be arranged according in the scale (0 - 90Deg) shown on the cover.

Calibration - Zero & Span Adjustment

1. Set input signal to 4 mA while positioner is at the 0% or stroke starting point. Turn the zero adjustment knob clockwise or counter clockwise to set the zero position.
2. Stroke the actuator with a 20 mA input. If the stroke does not meet 100%, loosen the lock screw and turn the span adjustment screw clockwise or counter clockwise until 100% is reached.
3. Set the input signal back to 4 mA and adjust the zero adjustment screw until starting point is reached.
4. Repeat the process until the desired set points are reached.

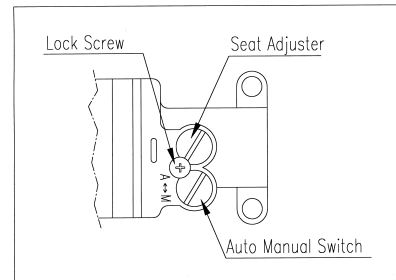


Pilot Valve Seat Adjuster

1. The seat adjuster (sensitivity adjusting screw) located on the pilot valve is used to adjust the positioner for double acting actuators. Normally no adjustment is required.
2. Do not loosen the stopper screw, it is set to avoid the screw coming off.
2. When the sensitivity is not optimal, rotate this screw clockwise. If there is hunting, rotate the screw counter clockwise. For smaller actuators, it might be necessary to insert the small pilot valve orifice inserts if adjusting the seat does not improve performance.

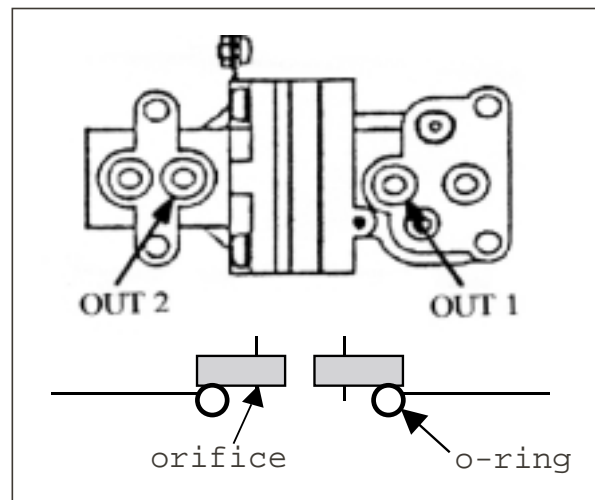
Auto / Manual Operation

1. For manual operation using an external air regulator, set the Auto / Manual switch located on the pilot valve to "M". This will bypass the 4 mA to 20 mA input signal.
2. Make sure the Auto / Manual switch is set to "A" before returning to automatic mode.



Optional Restricted Pilot Valve Orifice

1. For improved control using smaller actuators, a restricted pilot valve orifice kit is available for the positioner.
2. To install, the pilot valve must be removed from the positioner. Remove the four screws holding the pilot valve to the positioner body.
3. As you remove the valve, be sure to hold the compensation spring in place. Flip the pilot valve so the bottom faces you.
4. Remove the o-rings from the out1 and out2 ports (as shown in the diagram at right).
5. Place the orifice plates in their place then replace the o-rings above them, and reinstall the pilot valve, making sure the compensation spring is back in place.
6. The positioner is now set for smaller actuators.

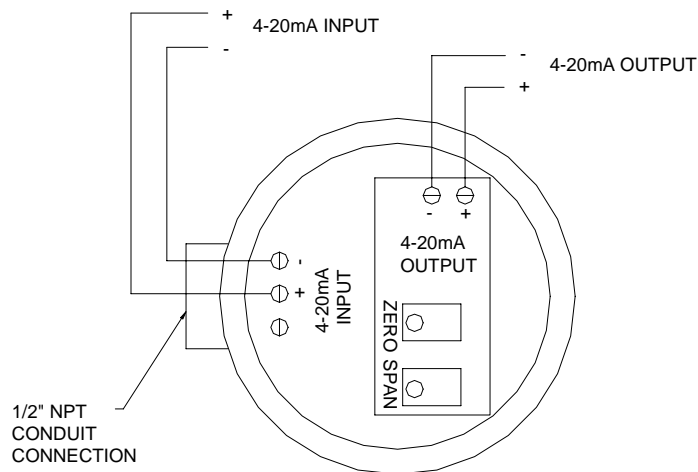


Volume Of Actuator	Orifice Diameter
Below 5.5 Cubic Inches	0.03" Dia.
5.5 ~ 11 Cubic Inches	0.04" Dia.
Over 11 Cubic Inches	None

Optional Transmitter

Wiring & Calibration

1. Connect the wires to the output terminals per the below wiring diagram.
2. Calibrate the transmitter only after the positioner is calibrated and fully functional.
3. To set the output signal to 4mA while positioner is at 0% or stroke starting point, turn the zero adjustment screw clockwise or counter clockwise to set the 4mA output signal.
4. Stroke the actuator with a 20mA input. turn the span adjustment screw clockwise or counter clockwise to set the 20mA output signal.
5. Repeat the process until the desired set point are reached



Troubleshooting Tips

Hunting

1. If your actuator is small, install orifice restrictions in port 1 and 2 of the pilot valve.
2. The nozzle might be clogged. Remove the nozzle (Note nozzle position) and clean with metal wire. Reinstall nozzle to original position.

Poor Linearity

1. Air supply might be unstable - check or install a filter regulator.
2. Check Zero and Span adjustments.
3. Loose feedback lever - tighten feedback lever.

Poor Hysteresis

1. Loose mounting of the actuator to the positioner - Double check the mounting.
2. Adjust the seat, using the seat adjuster