



INSTALLATION & OPERATING INSTRUCTIONS

SERIES VP-900 Positioners

Description of Device

Valtorc Series VP-900 pneumatic (3-15psi) and electro-pneumatic (4-20mA) positioners are advanced control devices for rotary or linear valves which provide unparalleled stability in difficult environments.

- ! Rugged Aluminum Housing With a Triple Corrosion-Resistant Interior and Exterior Coating stands up to harsh environments
- ! Reduced Bleed Pilot Valve reduces air consumption by more than 50%
- ! Precise Calibration with simple SPAN and ZERO adjustments.
- ! Magnetic 4-20 mA I/P Converter provides automatic compensation for supply pressure, atmospheric pressure and ambient temperature changes, and is unaffected by EMF.
- ! Zero-Hysteresis Coupling System provides superior accuracy and repeatability by eliminating "slop".
- ! Vibration Resistant Design maintains consistent performance in poor conditions - no resonance effects from 5 - 200Hz
- ! Stainless Steel Gauges
- ! Optional Limit Switches and 4-20mA Feedback
- ! Each Positoner Performance Tested - Test results are included with each positioner



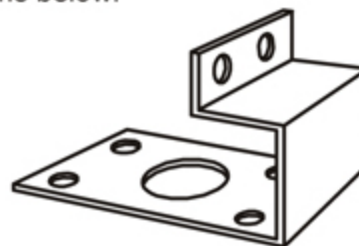
CAUTION: To reduce the risk of ignition of hazardous atmospheres, disconnect the device from the supply circuit before opening. Keep assembly tightly closed during operation.

Positioning

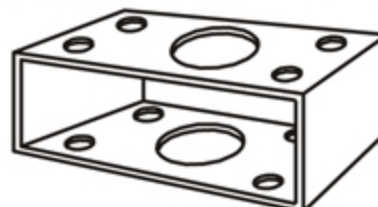
Valtorc Series VP-900 positioners can be mounted in any position.

Mounting Brackets

For the installation of the rotary positioner, a mounting bracket has been designed for actuators with the 80 x 30 mm NAMUR accessory pattern. For the 130 x 30 pattern, the block-type mounting bracket is available. See diagrams below:



Bracket for the 80 x 30 NAMUR pattern



Bracket for the 130 x 30 NAMUR pattern

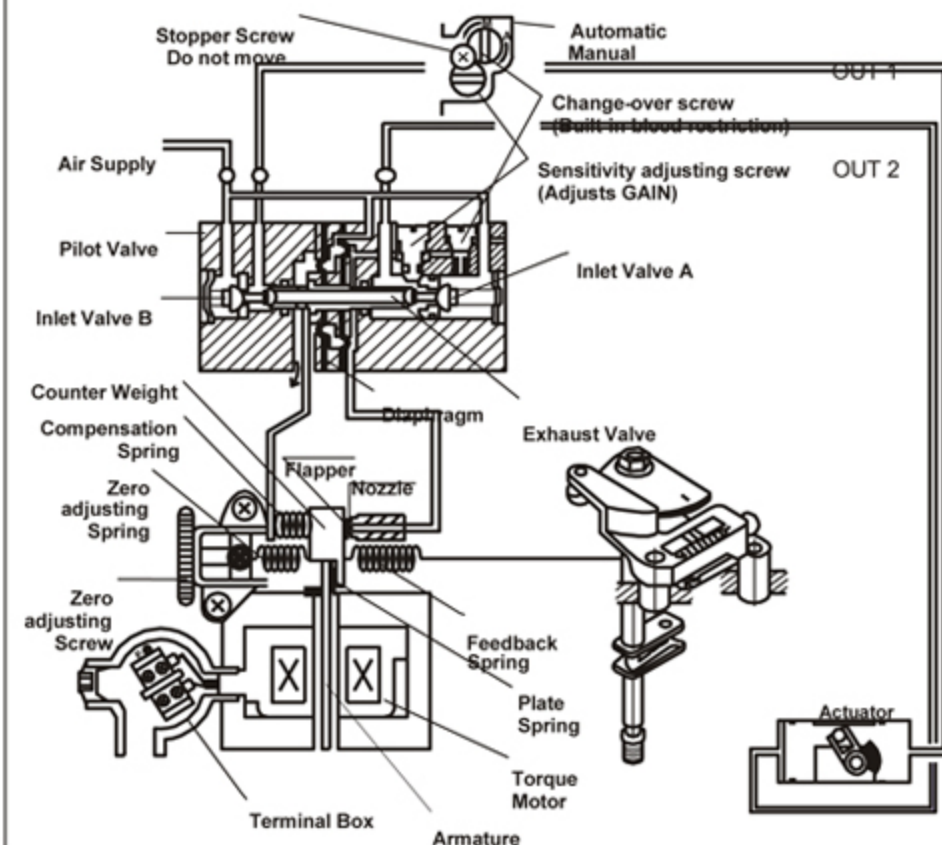
Specifications -3-15 psi Pneumatic

Input Signal	3 - 15 psig Split Range Available
Impedance	N/A
Stroke Range:	0 - 90°
Supply Range:	20 to 100 PSIG
Air Delivery:	7 SCFM
Air Consumption:	0.26 SCFM
Operating Temperature:	-4° to +158° F
Linearity	+/- 1%
Hysteresis	1% max.
Sensitivity	+/- 0.5%
Repeatability	+/- 0.5%
Pneumatic Connections:	1/8 NPT - Gauge Ports 1/4 NPT - Supply / Outlet
Enclosure:	Designed to NEMA 4, 4X
Enclosure Weight:	Approx. 4.8 lbs.

Specifications - 4-20 mA Electro-Pneumatic

Input Signal	4 - 20 mA @ 24 VDC Split Range Available
Impedance	250 +/- 15 ohms
Stroke Range:	0 - 90°
Supply Range:	20 to 100 PSIG
Air Delivery:	7 SCFM
Air Consumption:	0.15 SCFM
Operating Temperature:	-4° to +158° F
Linearity	+/- 1%
Hysteresis	1% max.
Sensitivity	+/- 0.5%
Repeatability	+/- 0.5%
Pneumatic Connections:	1/8 NPT - Gauge Ports 1/4 NPT - Supply / Outlet
Enclosure:	Designed to NEMA 4, 4X
Enclosure Weight:	Approx. 6.5 lbs.

Principle Of Operation

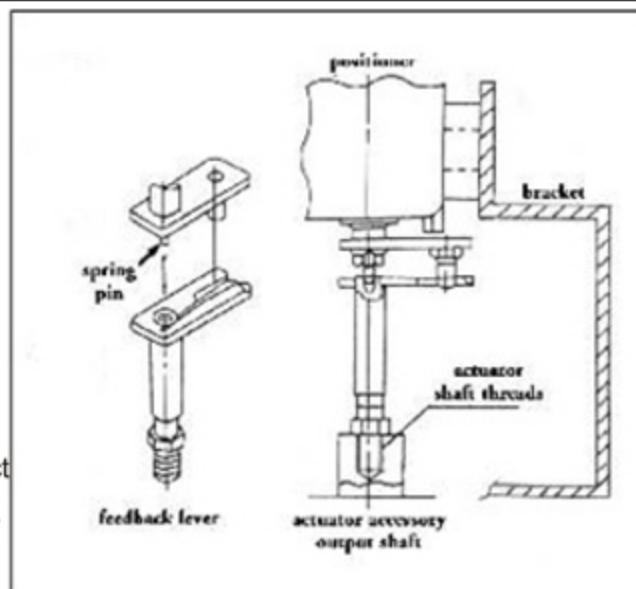


As the signal current from the controller increases, the plate spring of the torque motor works as a pivot. As the armature receives the rotary torque in the counter-clockwise direction, the counter-weight is pushed to the left, the clearance between the nozzle and the flapper will increase, and the nozzle back pressure will decrease. As a result, the exhaust valve of the pilot valve moves to the right, and the output pressure of OUT1 increases (as OUT 2 decreases) to move the actuator.

The movement of the actuator in turn rotates the feedback shaft and spring. The actuator stays in the position where the spring force is balanced with the force generated by the input current in the torque motor. The compensation spring is for direct feedback of the motion of the exhaust valve, and is connected to the counter weight to enhance the stability of the loop. The zero point is adjusted by changing the zero adjustment spring tension.

Mounting the Positioner and Attaching the Feedback Lever

1. Mount the bracket to the actuator. The bracket kits include screws for both metric and English threads.
2. Mount Feedback lever to actuator -three different feedback levers are included in the bracket kit with different threads to match your actuator and are labeled accordingly. Thread the proper lever into the actuator first before mounting the positioner and bracket to the actuator.
3. 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. The spring pin of feedback shaft acts as a guide and should be placed in the orifice of the feedback lever. Please note that linearity and hysteresis will suffer if alignment is not correct.

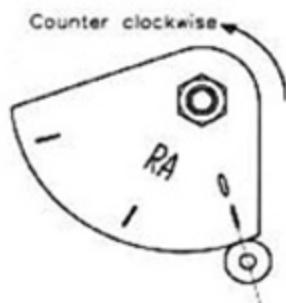


Air Connections

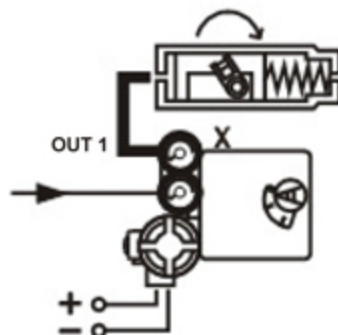
Reverse Acting



Actuator Stem Rotates Counter-Clockwise As Input Signal Increases (Clockwise to close) - Cam should be set with RA upwards (standard factory setting)

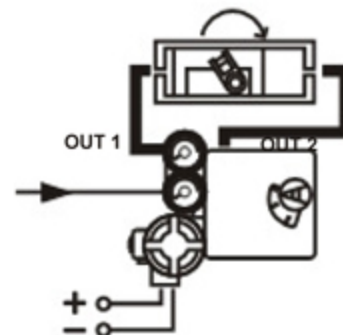


Spring-Return Actuators



OUT 2 Port must be plugged

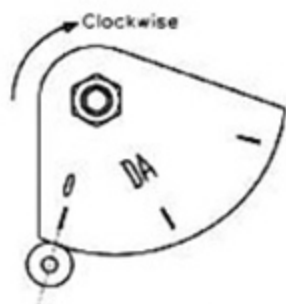
Double-Acting Actuators



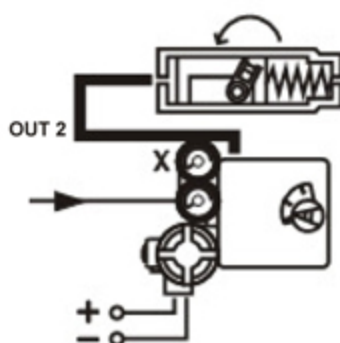
Direct Acting



Actuator Stem Rotates Clockwise As Input Signal Increases (Counter-clockwise to close) - Cam should be set with DA upwards

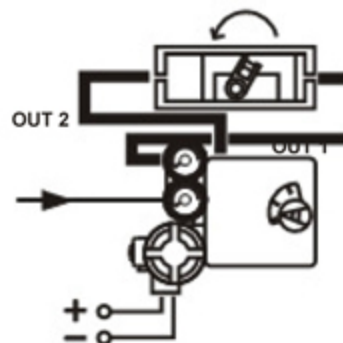


Spring-Return Actuators



OUT 1 Port must be plugged

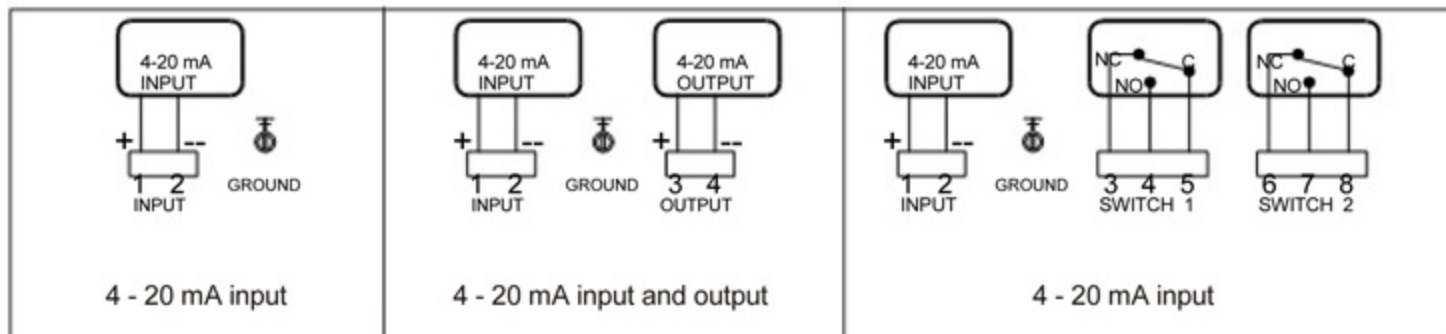
Double-Acting Actuators



Wiring Diagrams

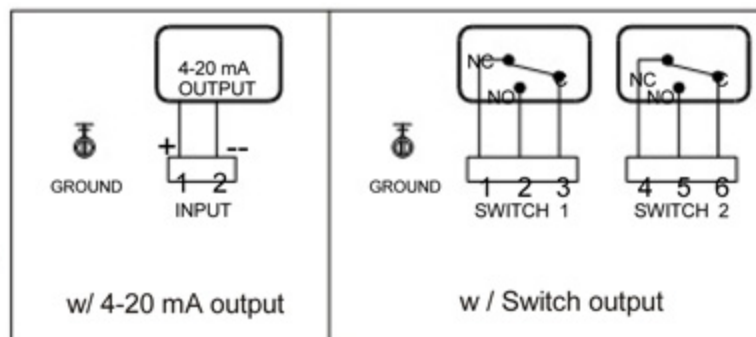


CAUTION: Always check that the electrical load is within the range stated on the nameplate. Failure to remain within electrical ratings may result in damage to or premature failure of the electrical switches, sensors or transmitter electronics.



Specifications - Current Output

Power Supply Rating	15 - 28 VDC loop power
Recommended Power Supply	24 VDC
Output Signal	4 - 20 mA
Operating Temperature	-20° to 175 ° F
Load Impedance	0 - 10K ohms at 24 VDC
Max. Output	55 mA DC
Linearity	+/- 1.0%
Hysteresis	1.0% of full scale
Repeatability	+/- 0.5% of full scale
Adjustment	Zero and Span in Terminal Box



Specifications - Limit Switches

Contacts	SPDT Form C
AC Rating	5A - 125 VAC / 3A - 250 VAC
DC Rating	1A - 24 VDC
Adjustment	cams with set screws

Cam and Indicator Adjustment

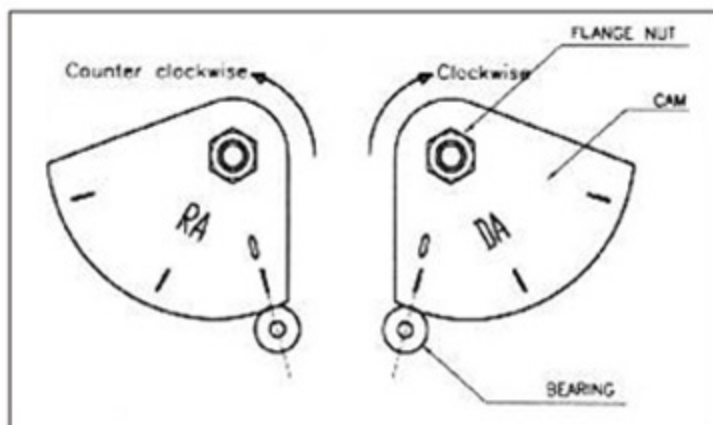
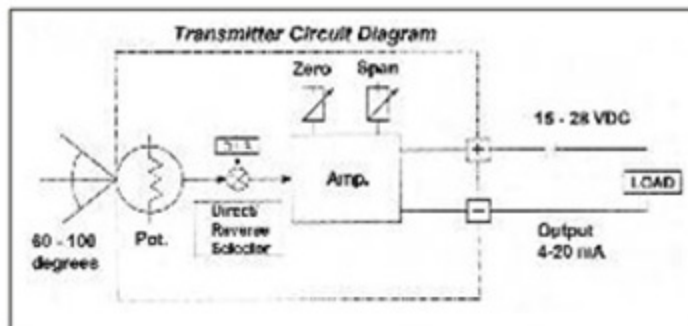


WARNING: When adjusting or replacing cams, be sure to shut off air supply to the positioner. Otherwise, the positioner might react suddenly and cause damage or injury.

1. 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. The span adjusting arm unit should now be aligned.

2. Tighten the flange nut of cam after setting the cam.

3. After cam installation, proceed to adjust zero and span. Once this is complete, secure the indicator with the blot (M3) to the feedback shaft. The position for indicator should be arranged according in the scale (0 - 90 degrees) shown on the cover.





WARNING: Before adjusting the Span and Zero, or making any other adjustments to the positioner, make sure all air connections are correct and match your actuator type. See page 3 for details.

Span and Zero Adjustment

- 1) Set input signal to 4mA (24 VDC) 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) Check the stroke of actuator by setting the signal to 20 mA at 24 VDC. If the stroke does not meet 100%, turn the span adjustment screw clockwise or counter clockwise until 100% is reached.
- 3) Set input signal back to 4 mA (24 VDC) and adjust the zero adjustment screw until starting point is reached.
- 4) Repeat the process until the desired set points are reached.

NOTE: Due to variations in circuitry and environmental effects, often 0% is set at 4.5 mA and 100% 13.5 mA to make sure that at the end points the valve will be fully open or fully closed.

Auto / Manual Operation - Pilot Valve Calibration

For manual operation using an external air regulator, set the Auto / Manual switch on the located on the pilot valve to M. This will bypass the 4-20 mA input signal. Normally this function is not used.

The pilot valve is calibrated at the factory. For reliable operation of the positioner, no adjustments should be made.

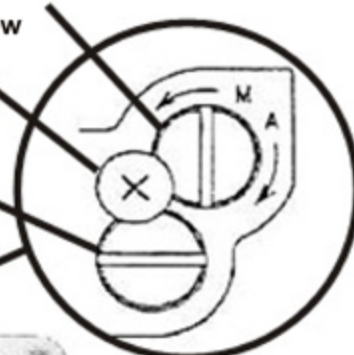


WARNING: Adjusting the factory calibration screw will void the warranty and may cause irreversible damage to the positioner.

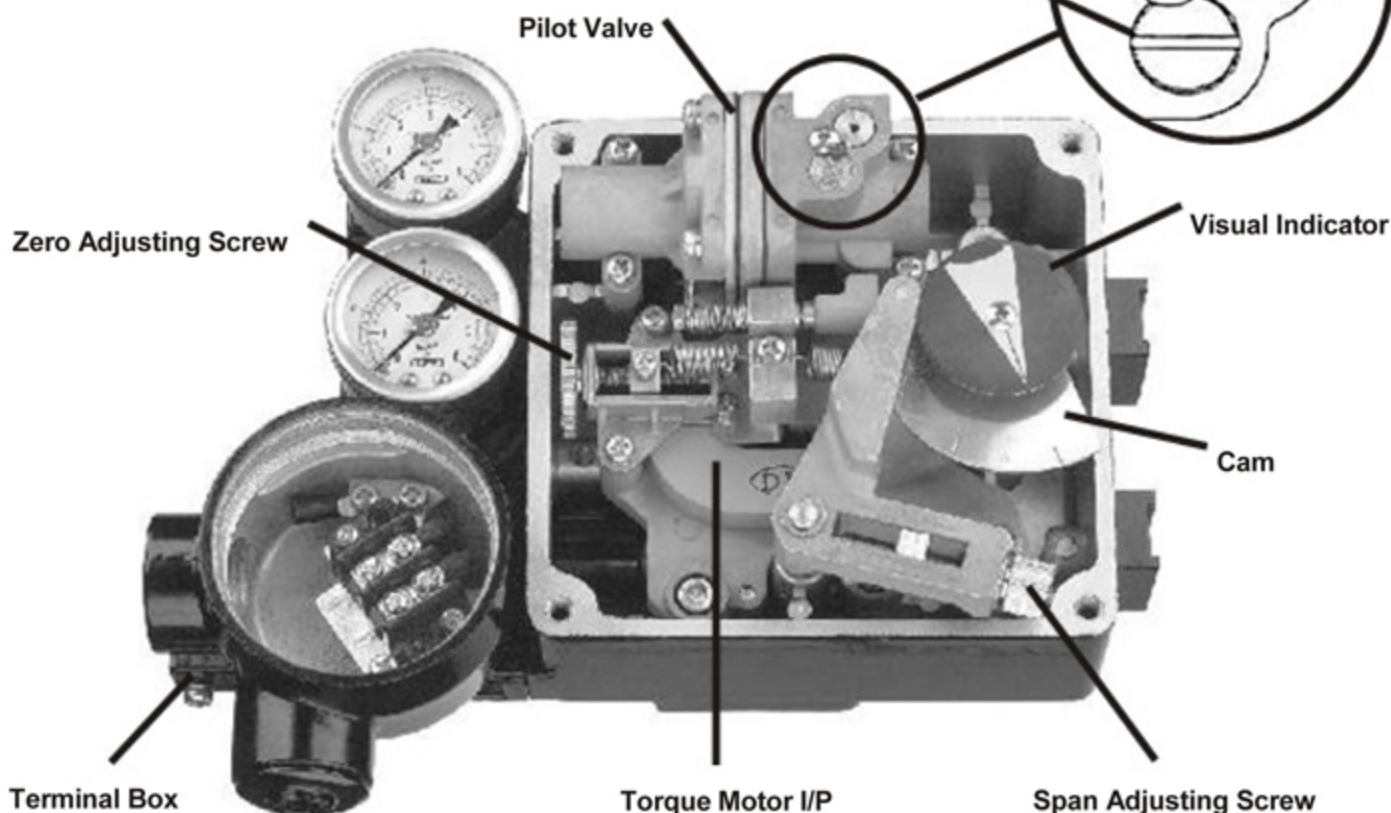
Auto / Manual Screw

Stopper Screw

Factory Calibration Screw
DO NOT MOVE



Internal View Of the Series 900

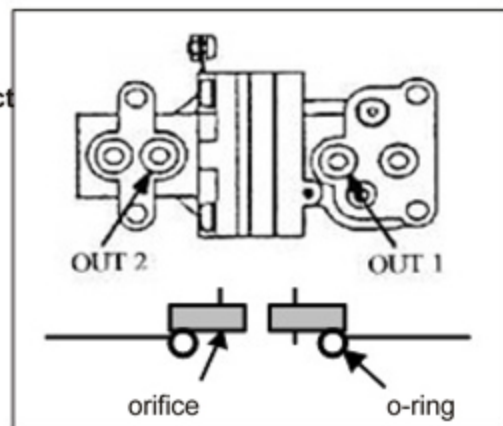


Optional Restricted Pilot Valve Orifice



WARNING: Before removing pilot valve, be sure to disconnect positioner from the signal and compressed air source.

For improved control using smaller actuators, a restricted pilot valve orifice kit is included with the positioner. To install, the pilot valve must be removed from the positioner. Remove the four screws holding the pilot to the positioner body. As you remove the valve, be sure to hold the compensation spring (see page 2) in place. Flip the valve so the bottom faces you. Remove the o-rings from the *out 1* and *out 2* ports (as shown in the diagram at right). Place the orifice plates in their place with new o-rings above them, and re-install the pilot valve, making sure the compensation spring is back in place. The positioner is now set up for smaller actuators.



Troubleshooting Tips

Hunting

- * If your actuator is small, install orifice restrictions in ports 1 and 2 of the pilot valve.
- * The nozzle might be clogged. Take the metal wire located in the positioner cover and clean the nozzle.

Poor Linearity

- * Air supply might be unstable - check or install a pressure regulator.

- * Check Zero and Span adjustments
- * Loose feedback lever - tighten feedback lever

Poor Hysteresis

- * Loose mounting of the actuator to the positioner - tighten the mounting bracket.
- * Adjust the seat, using the seat adjuster (double acting actuators only)

Dimensions (in.)

