AEP-100

Installation Operation & Maintenance Instructions



Jpmar® VALVE

IMPORTANT
Please read the installation operation and maintenance instruction prior to using any Jomar Valve component. Failure to follow the instructions may damage the component and/or void the warranty.

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General

The electro-pneumatic positioner EP-100 is used for rotary operation of pneumatic rotary valve actuators by means of electrical controller or control systems with an analog output signal of 4 to 20mA or split ranges.

Features

- There is no resonance in the range of 5-200Hz.
- Performing - Split Control without any other substitutes.
- Easy to adjust zero and span.
- Easy to convert from Reverse Action to Direct Action or vice versa.
- Fast and accurate response
- Low air consumption
- Easy to protect from hunting effect by using output orifice in small size of actuator.
- Designed as Multi-port type of for air tubing
- Easy to install air tubing connection in any direction
- Designed as modular structure for maintenance and repair

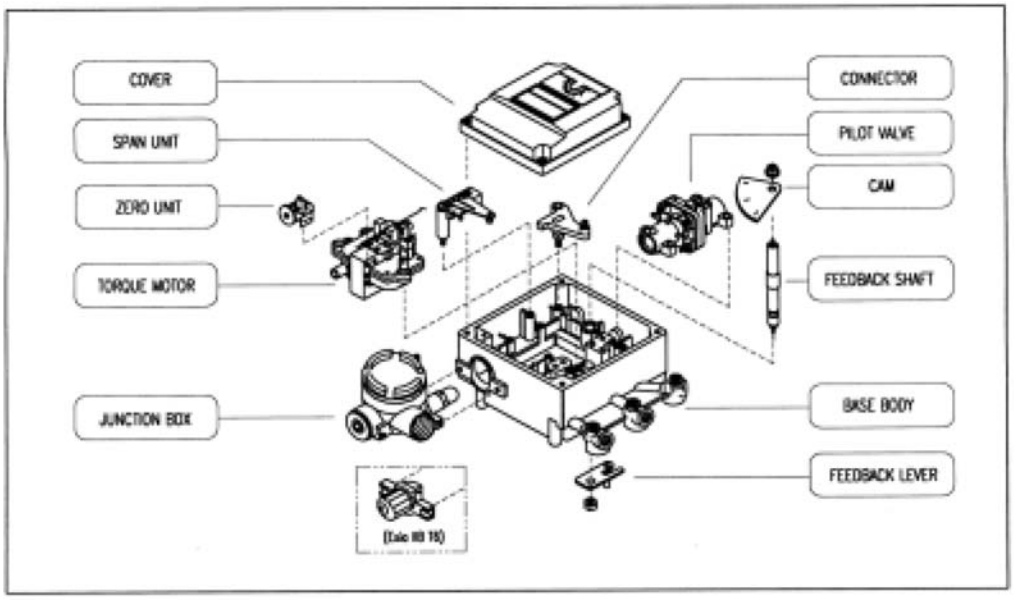
Specifications

	AEP-100	
	Single Acting	Double Acting
Input Signal	1-20mA Dc below 24V (1/2 split range available)	
Impedance	250± 15	
Supply Pressure	20 - 110 PSI	
Stroke	0-90°	
Air Connection	NPT	
Gauge Connection	NPT	
Conduit	PF	
Enclosure	IP66 Dust and Watertight	
Explosion Proof	ExdmIIBT5	
Temperature Range	4°F ~ 158°F	
Linearity	±2% FS	
Hysteresis	1% FS	
Sensitivity	±0.5% FS	
Repeatability	±0.5% FS	
Air Consumption	3LPM	
Air Flow Capacity	80LPM	
Houseing	Aluminum Die Cast	
Weight	6 lbs.	

Ordering

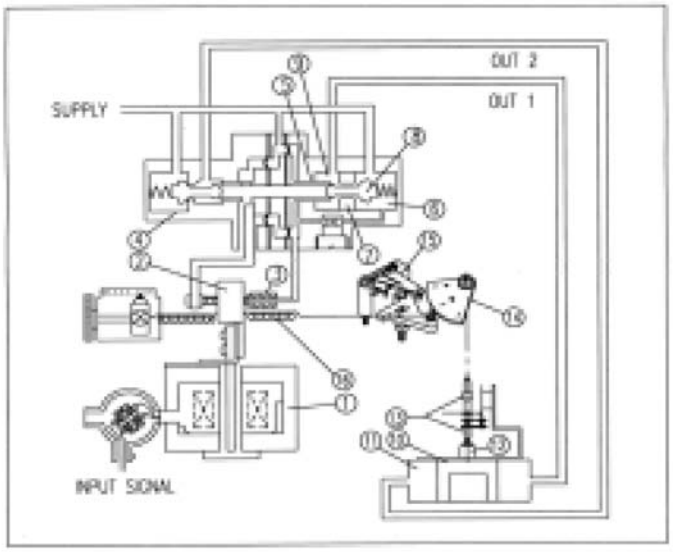
Model EP-100 is shipped standard with a steel mounting bracket.

Inside View

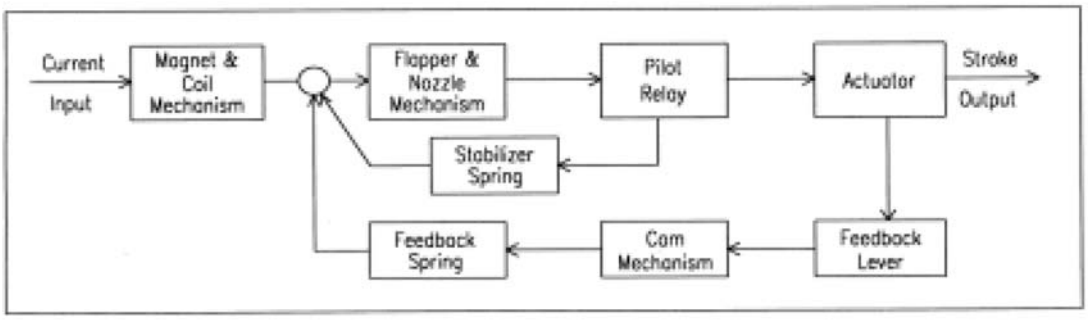


Principle of Operation

Increase the input current signal to change position of valve. Force exerted by ①Torque Motor reduces Nozzle Back Pressure with increase in gap between ②Flapper and ③Nozzle. Then ⑤Spool moves upward and the ⑦Seat opens simultaneously. Air pressure of OUT1 pipe is discharged to (10)Actuator. As pressure in the actuator chamber goes up, ⑫Actuator stem starts to rotate. The movement of ⑫Actuator stem exerts force to the Feedback Spring through the Feedback Shaft connection. Then the ⑫Actuator will stop at the point of force balance exerted by the input current signal and the feedback spring



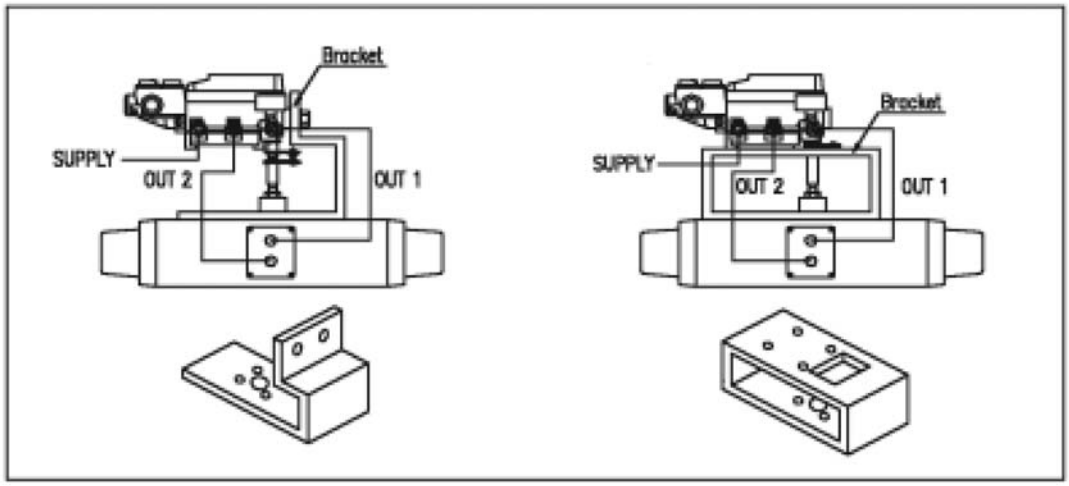
Block Diagram of AEP-100



Installation

Example of attaching to actuator

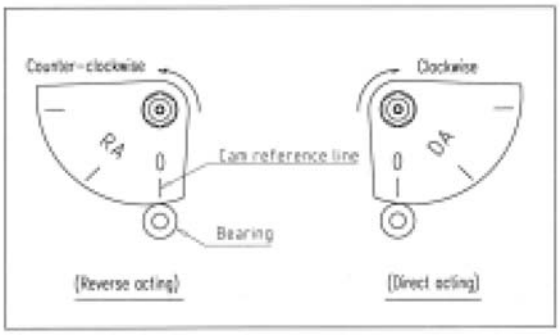
Jomar provides a stamped steel bracket (above right) for mounting to the bottom of the positioner. However the PP-100 is drilled and tapped on the side for side mounting of a custom fabricated bracket (above left).



Connection with feedback shaft

All Jomar positioners come with a standard NAMUR type spaded shaft for direct mounting to all Jomar actuators, and most other brands of rack and pinion actuators manufactured with the NAMUR type slotted top shaft.





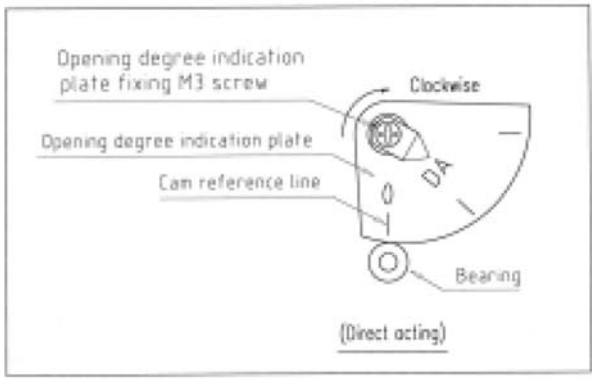
Note: Information subject to change without notice.

Cam attaching procedure

1. Use the DA face of cam to turn the actuator main shaft clockwise (as viewed from the positioner top view cover removed). Use the RA face to turn it counterclockwise (reverse action). Correctly attach the cam to the flange part of feedback shaft.
2. Attach the cam by loosening the hexagonal nut with flange first, setting actuator to the starting position and then setting the cam reference line and the bearing contact point of span adjusting arm unit to the matching position.
3. Do not apply the supply pressure when attaching the cam as otherwise it is very dangerous.
4. When the positioner is shipped out of our plant, the cam is tentatively tightened to the shaft. Be sure to firmly lock the cam to the lock nut (tightening torque approx 18 inch. Pounds).

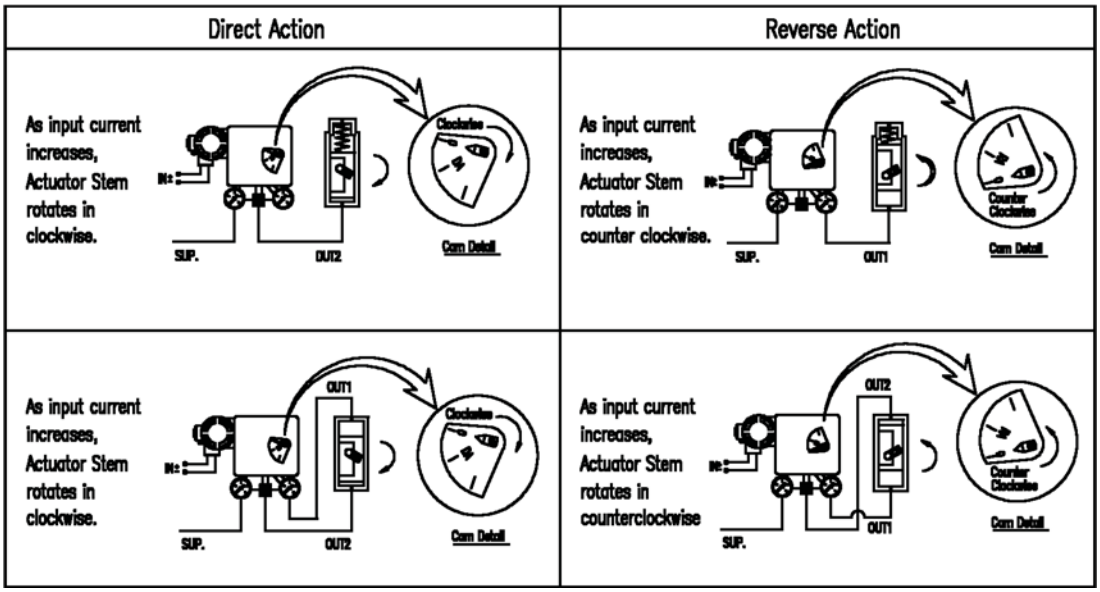
Attaching procedure of opening degree indication plate

Lock the cam and then adjust the zero point and span. Then fix the opening degree indication plate to the shaft using the M3 screw provided. At this time, set the opening degree indication plate to the reference line.



Air Piping Connection

1. Fully purge the pipe to remove foreign matter.
2. Use a clean supply air fully removed of humidity and dust.
3. Use filter regulator to keep supply air pressure constant.
4. When using the double acting type as single acting type, plug either OUT1 or OUT2 and also remove the pressure gauge to close its connection.



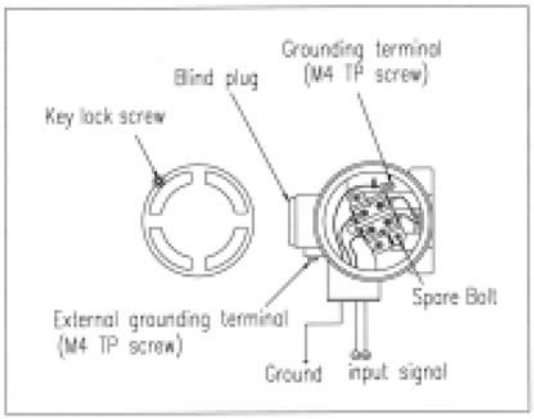
Electrical Wiring

1. Connect the (+) and (-) output terminals from signal with the (+) and (-) input terminals, respectively.
2. For Explosion Proof, both pressure tight conduit thread connection type and pressure tight packing type are available.
3. Use PF _ standard for conduit thread connection type.
4. Close Junction box cover and lock Key Lock Screw.
5. There is a Spare Bolt in terminal board.

Adjustment

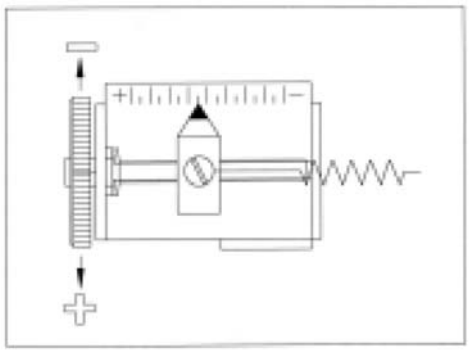
Check the following prior to starting the adjustment.

1. Check that the pipeline is correctly connected with the pressure supply port and OUT1 and OUT2 port.
2. Check that the wires are correctly connected with the (+), (-) and grounding terminals.
3. Check that the actuator and positioner are sturdily connected.
4. Check for locking of the auto/manual changeover screw of pilot valve(fully tightened in the clockwise direction).
5. Check that the span adjusting lever of internal feedback lever is attached to the correct (Direct or Reverse) position.
6. Check for correct use of the cam face (Direct or Reverse) and that flange nut is firmly locked.



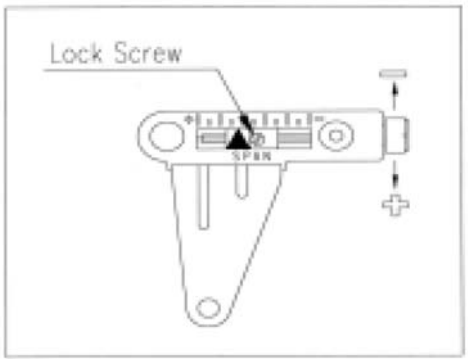
Zero Adjustment

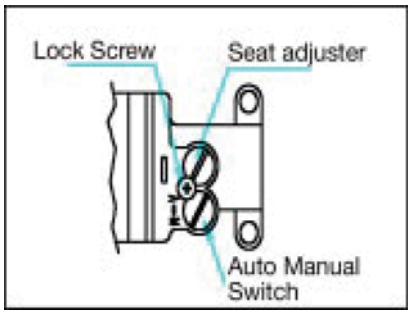
1. Set a signal to the Stroke starting signal(4mA) then turn Zero Adjuster clockwise or counterclockwise, to calibrate to zero gauge.
2. In case of Spring Actuator, check if it is set to standard pressure in Zero Point. If not, repeat zero adjustment.



Span Adjustment

1. Adjust Range Adjustment so that an Actuator stops at 0% position of the Stroke by the 0% applied input signal and 100% position for 100% input signal respectively.
2. Check Zero Point and repeat Zero Span Adjustment. _ Split Range can be used by Zero and Span Adjustment.
3. After Setting, tighten up Lock Screw of Span adjustment.





Auto/Manual Switch

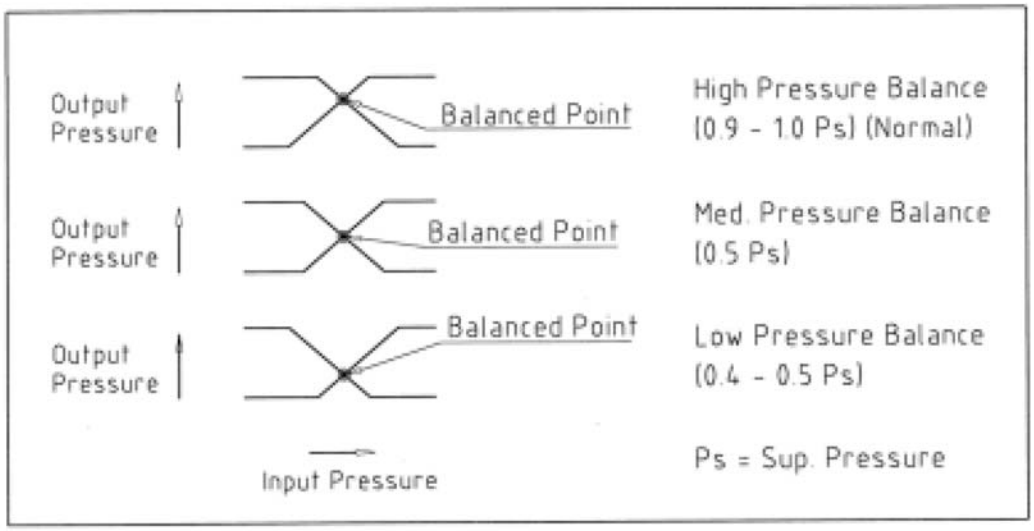
1. This is a Switch for changing from Auto and Manual.
2. Shipped products are set for Auto. To use Manual operation, turn A/M Switch counterclockwise.
3. In manual operation, the supply pressure is routed directly to the actuator through output 1.
4. This feature is only available for directing supply pressure through output 1.

Seat Adjuster (sensitivity adjustment)

1. No need to adjust in the field because the Seat Adjuster Is adjusted before shipment for balanced pressure point of output pressure.
2. Seat Adjuster is always used for Double-acting. If the need arises to balance pressure point of output Pressure, use Seat Adjuster.
3. If the sensitivity is poor because of the actuator type or load condition, turn the seat adjuster screw counterclockwise.

(The amount of turning varies by actuators. Do not loosen the stopper screw at this time since it is set to avoid coming off the seat adjuster.)

4. If hunting occurs due to an actuator of small capacity, refer to description in Options on page 11.



Maintenance And Check

1. If the supply air is fouled, the positioner may not operate normally. Periodically check the compressed air cleaning system and make sure that clean air is always supplied.
2. When you disassemble the pilot valve, grease the sliding section of o-ring.
3. When the fixed orifice is clogged with carbon particles or others, remove the pilot valve Auto/Manual changeover screw (built-in fixed aperture) and clean it by inserting a Ø0.2 wire into the aperture. If it must be replaced with new one, close the supply pressure and remove the stopper screw of the pilot valve.
4. Check the positioner once a year. When you find excessively worn diaphragm, O-ring and other packing of unit, it should be changed with new ones. Treatment at an early stage is especially import if the positioner is used in a place of severe environment such as coastal areas of the country.

Caution On Handling

1. Do not apply large vibration or impact to the positioner. It causes trouble. The positioner must be handled very carefully during transportation and operation.
2. If the positioner is used under temperature outside of the specification, the sealing materials deteriorate quickly and also the positioner may not operate normally.
3. Do not remove the terminal cover at a dangerous position during power conduction.
4. Be sure that the terminal cover and body cover are put on during the operation.
5. If you leave the positioner at the operation site for a long time without using it, put the cover on it so that the rain water does not enter the positioner. If the atmosphere is of high temperature or high humidity, take measures to avoid condensation inside. The condensation control measures must be taken thoroughly for export shipment.

Trouble Shooting

Trouble	Check if...	Solution
Not operational when input signal applied	Air supply is too low or blocked	Input supply air
	Connections are loose	Tighten set screw of terminal
	Wiring for ⊕ and ⊖ are correct	Connect wiring ⊕ and ⊖
	Short or open circuit in the terminal motor	Replace motor unit
	Nozzle is clogged	Replace motor unit
	Feedback lever is loose or on the wrong setting	Correct setting and tighten
OUT1 pressure raises and stays, and then doesn't come down	A/M switch is leaking	Tighten or replace A/M switch
	Flapper is scratched or wrong contact	Replace motor unit
	Fixed orifice is clogged	Clean or replace fixed orifice
Output pressure is operated by A/M switch only	Nozzle is clogged	Clean nozzle or replace motor unit
Hunting occurs	Off-position stabilizer spring	Insert stabilizing spring
	Too low of actuator volume	Insert orifice
	Fixed orifice is clogged	Clean or replace fixed orifice
Actuator is operated by On/Off only	Wrong connection of OUT1 and OUT2 tubing	Correct position of tubing

Trouble	Check if...	Solution
Linearity is not good	Feedback lever is on the wrong setting	Readjustment zero, span adjustment
	Wrong zero, span adjustment	Readjustment zero, span adjustment
	Supply pressure is unstable	Replace regulator
Hysteresis is poor	Wrong setting of seat adjustment	Readjust seat adjuster
	Loose connection of actuator and positioner	Tighten connection
	Cam shaft is worn out	Replace cam shaft

Option

Pilot valve with output orifice

1. Hunting may occur when the positioner is attached to a small capacity actuator.In such case, use a pilot valve having a output orifice for OUT1 and OUT2. The output orifice is removable.
2. Output orifice types. (Refer to description in chapter 4. Ordering Symbols.)

Volume of Actuator	Output orifice diameter	Ordering No.
Below 6 cubic inches	Ø 0.7	RO1
6~10 cubic inches	Ø 1.0	RO2
Over 10 cubic inches	None	

3. After pulling out the O-ring from OUT1 and OUT2 port, push proper orifice and then mount the O-ring to OUT1 and OUT2 again. When mounting the output orifice, pay attention not to let dust and others enter the port hole.
4. If the hunting does not stop even after mounting the output orifice, please contact us.

