

# Electro-Pneumatic Positioner EPL Series Instruction Manual





1. Read all safety instructions in this manual carefully before using this EPL positioner. All work should be done by staff with the necessary training and experience.
2. The air filter regulator should be installed before this EPL positioner.
3. The EPL positioned approved for ATEX Eex md IIB T5 must be connected to a fuse with the following ratings:
  - Max 125mA, breaking capacity 35A
  - Suitable 1/2" PF threaded, certified EEx d cable glands and plugs must be used.

### 1. Part Number System

EPL	—	Protection Class	Feedback Lever	Pressure Gauge (SUP. OUT)	Pilot Valve Orifice	Position Feedback	Connection Threads	High Temp	Mounting Bracket
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<u>Description</u>	<u>Code</u>	<u>Description</u>	<u>Code</u>
<b>Protection Class:</b>	F: Flameproof Ex md IIB T6 D: Flameproof Ex md IIC T6 A: Flameproof  Eex md IIB T5 ATEX I: Intrinsic safety (Ex ia IIB T6) W: Weatherproof to IP66	<b>Position Feedback: (only for weatherproof type)</b>	N: None (standard) O: Position transmitter (4~20mA output signal)
<b>Feedback Lever:</b>	A: stroke (10~40mm) B: stroke (10~80mm) C: stroke (80~150mm)	<b>Connection Threads: (pneumatic – electrical)</b>	3: PT 1/4 – PT 1/2 (standard) 4: NPT 1/4 – NPT 1/2 5: PT 1/4 – M20 x 1.5
<b>Pressure Gauge:</b>	1: 6 bar (90 psi) 2: 10 bar (150 psi)	<b>High Temperature: (only for weatherproof type)</b>	T: 70 °C (standard) H: 120 °C (without position feedback option) 85 °C (with position feedback option)
<b>Pilot Valve Orifice:</b>	S: Standard (actuator volume over 180 cm <sup>3</sup> ) M: Small orifice (Φ1.0 or Φ0.7) (actuator volume 90~180 cm <sup>3</sup> )	<b>Mounting Bracket:</b>	N: None L: For DIN / IEC 534

### 2. Specifications

EPL	
Linear Type (Lever Feedback)	
	Single
Input Signal	4~20mA DC (Note. 1)
Input Resistance	235 ± 15Ω
Air Supply	Max. 7.0bar (100psi) free of oil, water, and moisture
Standard Stroke	10~80mm (Note. 2)
Pneumatic Connections	Rc 1/4 (NPT 1/4)
Electrical Connections	Rc 1/2 (NPT 1/2)
Protection Class	Ex md IIB T6, Ex md IIC(H2) T6, IP66, Ex ia IIB T6 Eex md IIB T5 ATEX
Ambient Temperature	-20~70 °C

Pressure Gauge	Stainless Steel	
Output Characteristics	Linear	
Linearity	Within $\pm 1.0\%$ F.S	Within $\pm 1.5\%$ F.S
Sensitivity	Within $\pm 0.2\%$ F.S	Within $\pm 0.5\%$ F.S
Hysteresis	Within $\pm 1.0\%$ F.S	
Repeatability	Within $\pm 0.5\%$ F.S	
Air Consumption	5 LPM (Sup. 1.4kgf/cm <sup>2</sup> )	
Flow Capacity	80 LPM (Sup. 1.4kgf/cm <sup>2</sup> )	
Material	Aluminum Die-cast	
Weight	2.9 kg (with terminal box)	

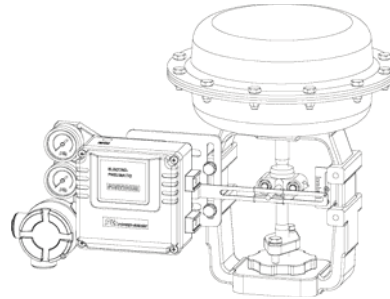
Note: 1) 1/2 split range is available for 4-12mA input signal or 12-20mA input signal.  
 2) Operating stroke can be extended up to 80-150mm.

### 3. Mounting and Selecting RA (reverse acting) or DA (direct acting)

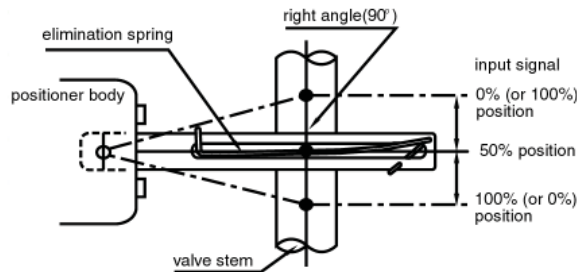
**CAUTION:** To reduce the risk of ignition of hazardous atmospheres, disconnect the device from the supply circuit before opening. Keep assembly tightly closed during operation.

#### A. Mounting and Attaching Feedback Lever

- Mount the EPL positioner to the control valve as shown to the right.
- Fix the EPL positioner and the feedback lever to the control valve stem at position where the angle between the valve stem is settled to 90 degrees as shown below when the input signal is set to 12mA (50%). Be sure that the elimination spring should be installed.
- The feedback lever A is for stroke 10~40mm and the feedback lever B is for stroke 10~80mm. For up to stroke 150mm, please connect a feedback lever A and a feedback lever B with each other. The operation angle of the EPL positioner is minimum 10° and maximum 30°.



**CAUTION:** Connect the feedback lever and the enclosed additional feedback lever with each other for a stroke extension of over 80mm.

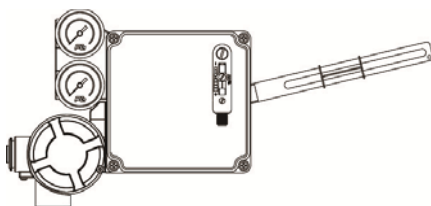


[Elimination Spring Installation]

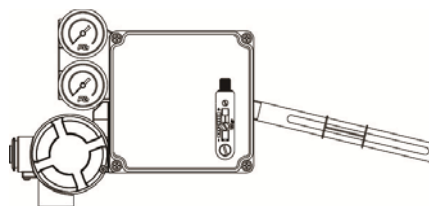
#### B. Position of Span Adjuster According to Actuator Type (RA or DA)

Span adjuster is set to RA (reverse acting) as a standard factory setting. But it is necessary to re-set its position for DA (direct acting) as shown below.

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

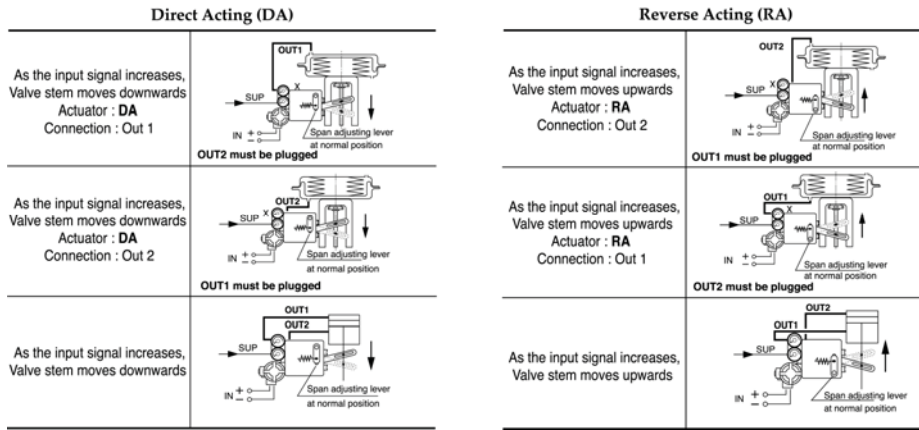


Direct Acting (DA)

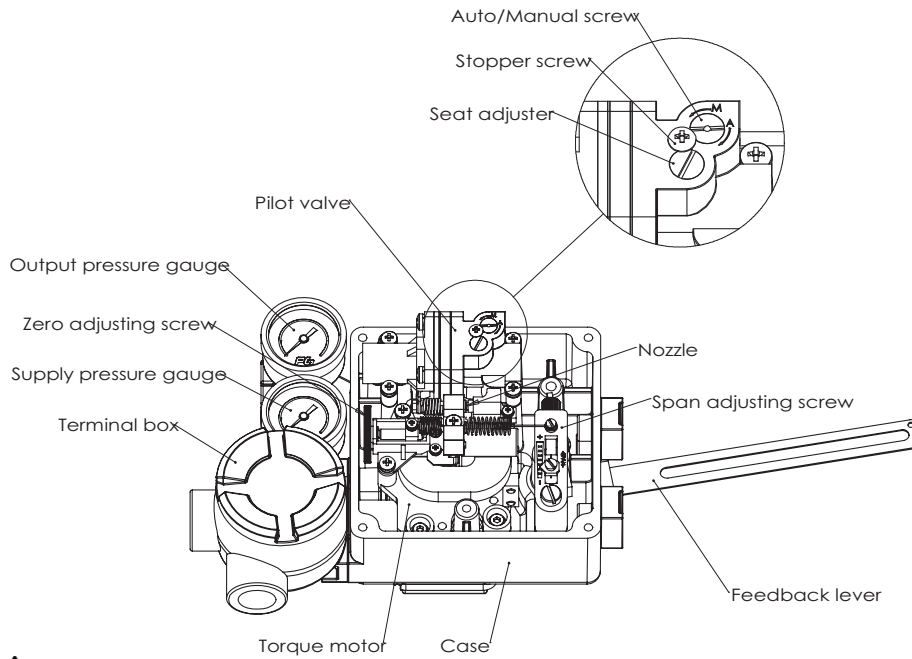


Reverse Acting (RA)

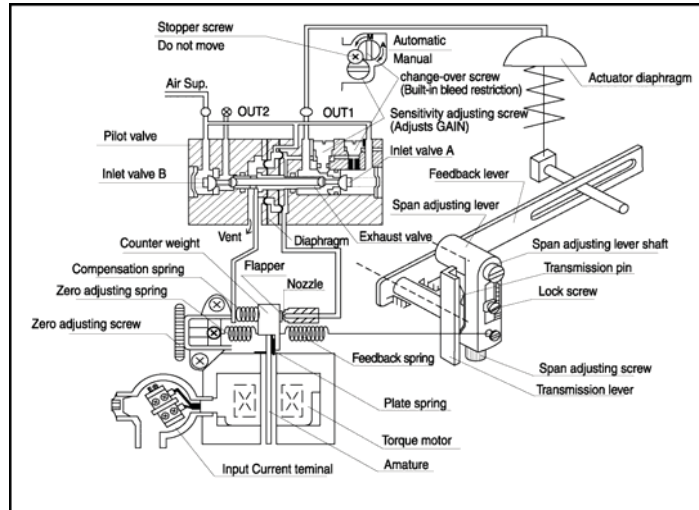
### 4. Air Connections



### 5. Internal View



**⚠ Never move the seat adjuster. It was already set at the factory precisely.**

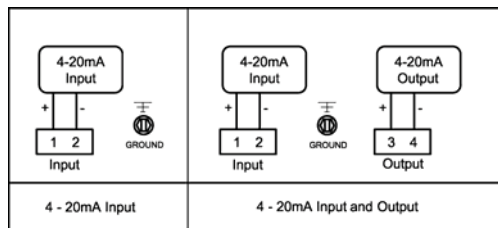


## 6. Span and Zero Adjustment

- ① Check the proper installation of the EPL positioner and the feedback lever.
- ② Check the proper position of a span adjuster according to the actuator type (direct acting or reverse acting).
- ③ Connect all air connections.
- ④ Supply air and set the input signal to 4mA. Turn the zero adjusting screw clockwise or counter clockwise to set the zero position.
- ⑤ Check the stroke of the control valve by setting the input signal to 20mA. If the stroke does not meet 100%, turn the span adjusting screw clockwise or counter clockwise until 100% is reached.
- ⑥ Set the input signal back to 4mA and adjust the zero adjusting screw until the zero point is reached.
- ⑦ Repeat the process of ④ to ⑥ until the desired set points are reached.
- ⑧ If the strokes of the control valve perfectly meet 0% and 100%, each setting point of 8, 12, and 16mA is automatically reached.

**⚠ NOTE:** Due to variations in circuitry and environmental effects, often 0% is set at 4.5mA and 100% at 19.5mA to make sure that at the end points the valve will be fully open or fully closed.

## 7. Wire Diagrams

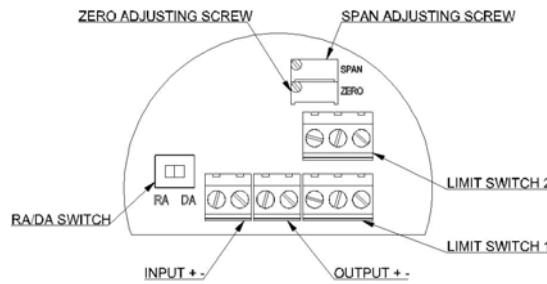


**⚠ CAUTION:** Always check that the electrical load is within the range stated on the nameplate. Failure to remain within electrical ratings may result in damage to or premature failure of the electrical switches, sensors or transmitter electronics.

**⚠ NOTE:** For the ATEX-approved product, please connect a fuse with the ratings of Max. 125mA, breaking capacity 35A and suitable 1/2" PF threaded certified EEx d cable glands and plugs must be used.

## 8. Position Transmitter (4...20mA output signal)

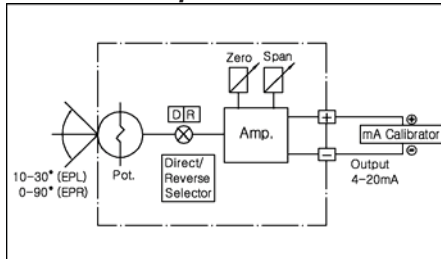
### A. Board View



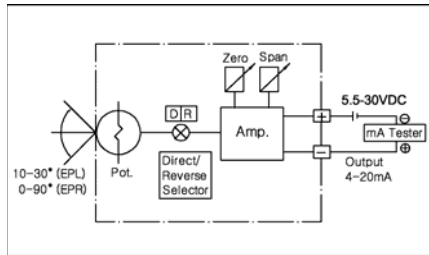
### B. Specifications

Power Supply Rating	5.5~30V DC loop-powered
Recommended Power Supply	24V DC
Output Signal	4~20mA
Operating Temperature	-20° to 70°C
Load Impedance	0~600 ohms
Max. Output	30mA DC
Linearity	± 1.0 %
Hysteresis	1.0 % of full scale
Repeatability	± 0.5 % of full scale
Adjustment	Zero and Span in terminal box

### C. With mA loop calibrator



### D. With multimeter tester



### E. Span and Zero Adjustment

- ① Select RA or DA on a board in the terminal box. For reference, RA (reverse acting) is a standard factory setting.
- ② Supply 4mA input signal and turn the zero adjusting screw on a board clockwise or counter clockwise until output signal becomes 4mA.
- ③ Supply 20mA input signal and turn the span adjusting screw on a board clockwise or counter clockwise until output signal becomes 20mA.
- ④ Repeat the process of ② to ③ until output signal approaches input signal.



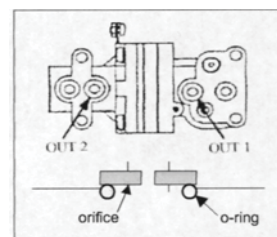
1. Be sure that Span and Zero of the EPL positioner should be exactly set before setting Span and Zero of the position transmitter.
2. Be sure that 5.5 - 30VDC should be supplied in case of using the mA tester (multimeter tester).
3. Check a loop power if the output power indicating lamp ⑥ is not on.

## 9. Optional Restricted Pilot Valve Orifice

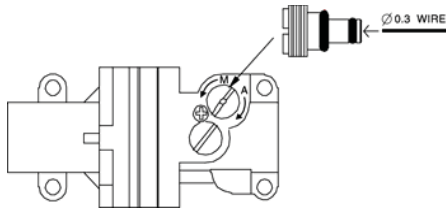


**WARNING:** Before removing the pilot valve, be sure to disconnect the EPL positioner from the signal and compressed air source

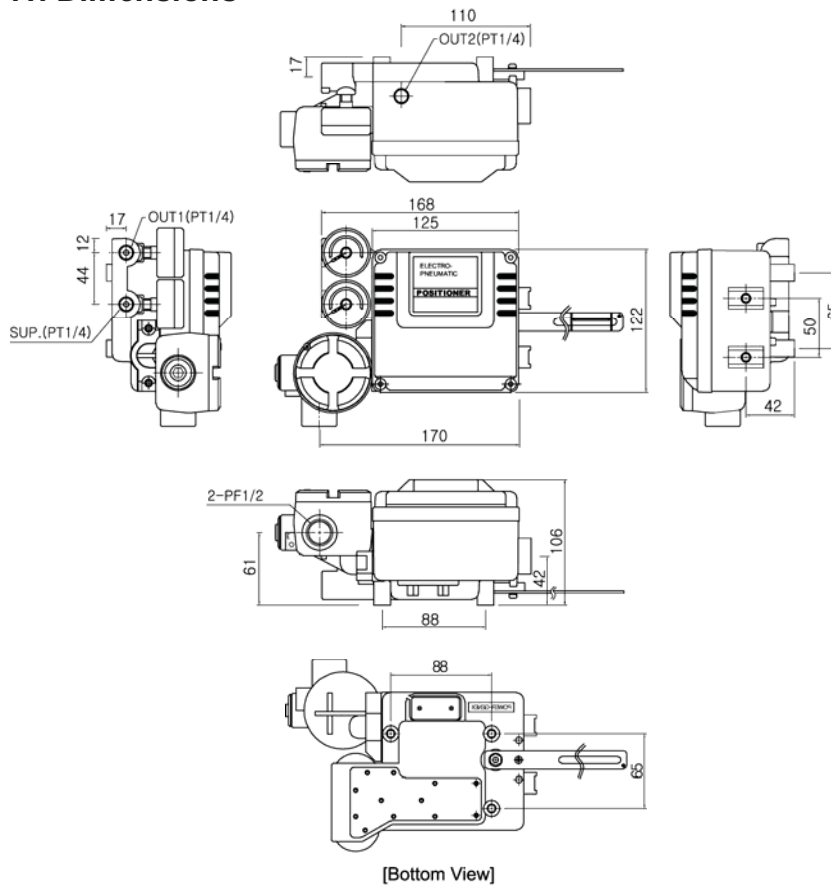
For improved control using smaller actuators, a restricted pilot valve orifice kit is included with the EPL positioner. To install, the pilot valve must be removed from the EPL positioner. Remove four screws holding the pilot valve to the EPI positioner body. As you remove the pilot valve, be sure to hold the compensation spring 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 EPL positioner is now set up for smaller actuators.



### 10. Troubleshooting Tips

Troubles	Solutions
There happens a hunting with a small pneumatic actuator	Install two orifices at the bottom of the pilot valve as instructed in 12. Optional Restricted Pilot Valve Orifice
The valve always opens regardless of input signal.	The orifice of the Auto/Manual screw on the pilot valve is clogged. Disconnect supply air and clean the orifice with a wire attached inside of the EPL positioner cover as shown below.  <b>⚠ Never move the seat adjuster. It was already set at the factory precisely.</b>
The valve always opens or closes with input signal	The air connections are not made properly. Check again if the pneumatic actuator type is RA (reverse acting) or DA (direct acting) and make the proper air connections. See 7. Air Connections.
Linearity is very poor	Re-set Zero and Span.
Hysteresis is very poor	Tighten a mounting bracket.

### 11. Dimensions





Clorius Controls A/S  
Tempovej 27  
DK-2750 Ballerup  
Denmark  
Tel.: +45 77 32 31 30  
Fax: +45 77 32 31 31  
[www.cloriuscontrols.com](http://www.cloriuscontrols.com)