



Product Overview

The AX-EPC range is an analogue to pneumatic converter which converts an analog input signal to a proportional pneumatic output, modulating its control valve(s) to regulate the branch line pressure to the set point determined by the input signal. Output pressure ranges are jumper shunt selectable for 0 to 10, 0 to 15 and 0 to 20 psig, and adjustable in all ranges. A 0-5 VDC feedback signal indicating the resultant branch line pressure, is also provided. AX-EPC's are designed with electrical terminals on one end and pneumatic connections on the other, allowing for maximum convenience in wiring and tubing installation when panel mounted.

Features

- Field Selectable Offset and Span
- Field Adjustable Pressure Output Ranges
- Field Selectable Analogue Input Ranges
- Closed Loop control
- Analogue feedback on branch pressure
- Not position sensitive
- Manual / auto toggle switch reports override status to controller

Applications

- Pneumatic valve & Damper actuator control
- Fan Vane control
- DDC control
- Pilot Positioner control
- Mixing & VAV Boxes

Product Specifications

Power Supply:	Voltage	24Vdc +10/-5%
		24Vac +/-10% 50/60Hz
	Current	180mA max (200mA on AX-EPC2-FS)
Inputs:		0-5Vdc, 0-10Vdc, 0-15Vdc, 0-20mA @250Ohms
Feedback Output Signal:		0-5Vdc
Air Supply:		Maximum 25psig min 18psig (main pressure must be 2psig above max o/p)
Air Supply Consumption:		15psig (750scim) supply valve
	AX-EPC2-LG	30psig (1400 scim) supply valve
Output Pressure Range:		0-10, 0-15, 0-20 psig jumper selectable
Manual Auto Override:		Manual - output can be varied Auto - output controlled by input
Manual Auto Override Feedback:		Dry Contact 24Vac/dc 1A Max N.O.
Accuracy:		1% @ room temperature
Pneumatic Capacity:		Supply Valves @ 25psig
Filter:		80-100 integral-in-barb micron filter (except-LG with a 5 micron filter)
Electrical Terminals:		14 Gauge wire plug in blocks
Pneumatic Fittings:		Brass barbed 1/8" FNPT
Pneumatic Tubing Size:		1/4" OD 1/8" ID nominal
Ambient Temp:		0-50°C Humidity: 5% to 95% non condensing
Dimensions:		85(L) x 85(W) x 45(H) mm (-G = 82mm high)
Weight:	single valve	142gms (pcb only)
	dual valve	196gms (pcb only)
	gauge	add 65gms
Country of Origin:		U.S.A.

AX-EPC

Analogue to Pneumatic Converter



The AX-EPC is a constant bleed interface with branch exhaust response time determined by the bleed orifice size and pressure differentials. If power fails to the AX-EPC, it will continue to bleed through the bleed orifice until branch pressure is zero psig. The AX-EPC2 incorporates two valves (one controls exhaust) and does not bleed air at set point. It's branch exhaust flow and response time are not limited by an internal restrictor and are similar to its load rate.

AX-EPC2-LG operates as the AX-EPC2, but has a higher air flow rate (1400 scim) using an external 5 micron filter, and includes a 0-30 psi gauge. If power fails to the AX-EPC2 or AX-EPC2-LG, branch line pressure remains constant if the branch line does not leak air.

FAIL SAFE: The **AX-EPC2-FS** shares the same specifications as the AX-EPC2 except its 3-way branch valve will exhaust branch line air upon power failure.

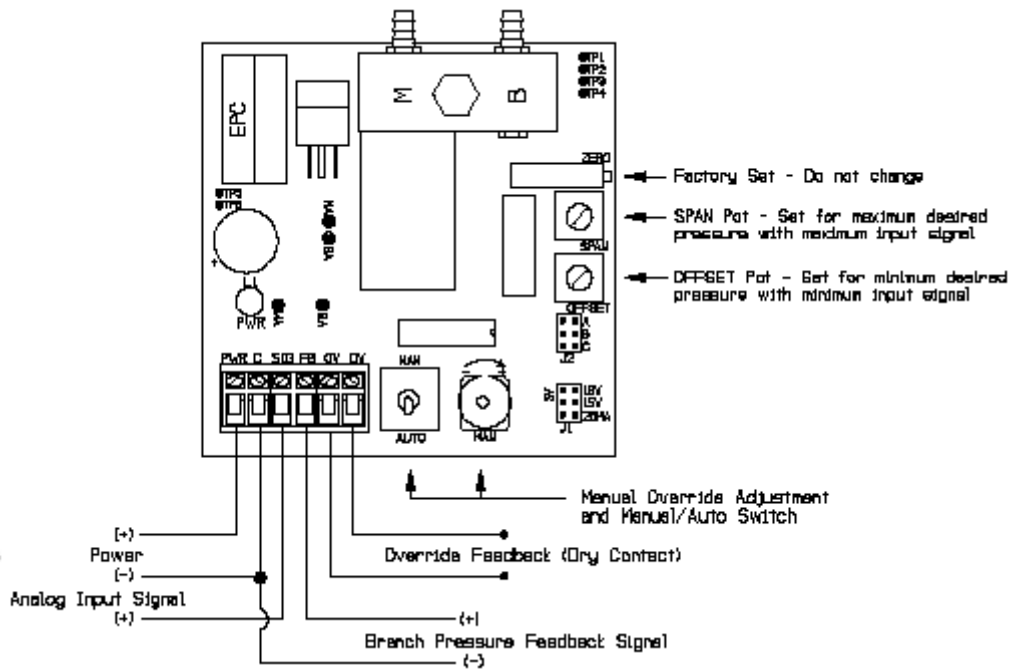
All factory calibrated products are NIST traceable.

Certificates of Compliance must be ordered with product.

Order Codes

AX-EPC	-	Single Valve Analogue to Pneumatic Converter 0 to 15 psig
AX-EPC-G	-	Single Valve Analogue to Pneumatic Converter + Gauge 0 to 15psig
AX-EPC2	-	Dual Valve Analogue to Pneumatic Converter 0 to 15 psig
AX-EPC2-G	-	Dual Valve Analogue to Pneumatic Converter + Gauge 0 to 15 psig
AX-EPC2-LG	-	Dual Valve Analogue to Pneumatic Converter + Gauge 0-30psig
AX-EPC2-FS	-	Dual Valve Analogue to Pneumatic Converter - Failsafe 0 to 15 psig

AX-EPC



Power Supply Voltage:

24 VDC (+10%/-5%)
24 VAC (+/-10%) 50/60 Hz at EPC terminals

Supply Current:

180 mA max.

Feedback Signal Output:

Factory Calibrated 0-5 VDC = range selected

Input Signal Ranges:

0-5 VDC@ Infinite ohms
0-10 VDC@ Infinite ohms
0-10 VDC@ Infinite ohms
0-20 mA @ 250 ohms

Air Supply:

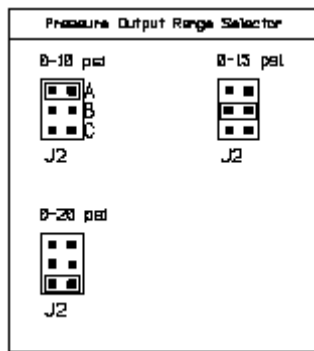
Maximum 25 psig (172.38 kPa), minimum 18 psig (124.11 kPa) main air supply, 0-10 psig (68.95 kPa), 0-15 psig (103.43 kPa), and 0-20 psig (137.9 kPa) jumper selectable output pressure ranges.

Air Flow, @ 20 psig (137.9 kPa) main/15 psig (103.43 kPa)
Exhaust rate: 41 scim

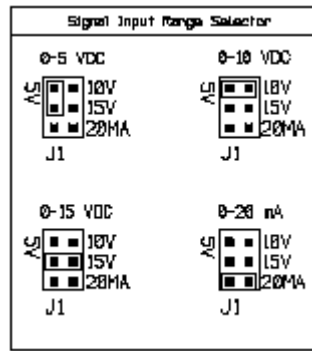
Accuracy: 1% full scale at room temperature, 2% full scale @ 32 to 120°F (0 to 48.8°C)

Override Contact Rating: 24 VAC or 24 VDC, 1 A maximum

AX-EPC



Jumpers



AX-EPC Installation

READ THESE INSTRUCTIONS BEFORE YOU BEGIN INSTALLATION.

Ground yourself before touching board. Some components are static sensitive.

MOUNTING:

Circuit board may be mounted in any position. If circuit board slides out of snap track, a nonconductive “stop” may be required. Use only fingers to remove board from snap track. Slide out of snap track or push against side of snap track and lift that side of the circuit board to remove. Do not flex board. Use no tools.

POWER CONNECTIONS:

- 1) **24 VDC** - with power off, connect 24 volt DC power supply to PWR (+) and C (-) or common terminals on the board.
- 2) **24 VAC** - with power off, connect one transformer secondary leg to PWR (+) and the other to C (-) or common terminals on the board. Check the wiring configuration of any other loads that may be connected to this transformer. Any field device connected to this transformer must use the same common. If you are not sure of other field device configuration, use separate transformers.
- 3) **If the 24 volt AC power is shared** with devices that have coils such as relays, solenoids, or other inductors, each coil must have an MOV, AC Transorb, or other spike snubbing device across each of the shared coils. Without these snubbers, coils produce very large voltage spikes when de-energizing that can cause malfunction or destruction of electronic circuits.
- 4) **If the 24 volt DC power is shared** with devices that have coils such as relays, solenoids, or other inductors, each coil must have an MOV, DC Transorb, or a diode placed across the coil or inductor. The cathode or banded side of the diode (or DC Transorb) connects to the positive side of the power supply.
- 5) The secondary voltage should be isolated from earth ground, chassis ground, and neutral leg of the primary winding. Grounding should be to the system common only. Failure to follow these procedures can result in failure.

Do not power without main air supply provided.

You should measure the actual voltage output of the secondary. If the output is not fully loaded you may read a higher voltage than the circuit board can handle. The gauge port will accept a miniature 1/8"-27 FNPT back-ported pressure gauge to allow direct reading of branch line pressure. The gauge should be sealed by teflon sealing tape, and should be tightened just snug. A backup wrench should be used to hold the manifold. **ADJUSTMENT OF INSTALLED GAUGES.** If installation requires adjustment of the gauge

for proper reading of the face, turn the gauge no more than 1/2 turn in either direction. O rings in the bottom of the gauge port will allow this without leakage. Warranty does not include malfunction due to clogged valve. Main air port is filtered with the supplied 80-100 micron integral-in-barb filter. Periodically check the filter for contamination and flow reduction, and clean with a brush or replace if needed (Part # PN004).

The surface between the manifold and pressure transducer is a pressure seal. Minimize stress between the circuit board and the manifold by holding the manifold in one hand while installing pneumatic tubing onto the fittings, and use care when removing tubing to avoid damaging fittings or moving manifold. The bleed orifice can be unscrewed with a 1/4" hex nut driver for cleaning or inspection. Do not lose the sealing gasket or insert anything into the precision bleed orifice. Clean by swabbing with a degreaser and blowing clean air through the orifice from the opposite direction. This unit requires at least two cubic inches (minimum) of branch air line capacity (approx. 15 feet of 1/4" O.D. polyethylene tubing) to operate without oscillation. **Main air must be minimum of 2 psig above highest desired branch output pressure.**

Every effort has been taken in the production of this data sheet to ensure it's accuracy. Axio can not, however, accept responsibility for any damage, expense, injury, loss or consequential loss resulting from any errors or omissions. Axio has a policy of continuous improvement and reserves the right to change this specification without notice.

AX-EPC Commissioning

Select one of the four input signal combinations by moving the jumper shunt J1 identified as “Input Signal Range Selector”. Select a preset pressure output range by moving jumper shunt J2 identified as “Pressure Output Range Selector”, or set custom range as described below.

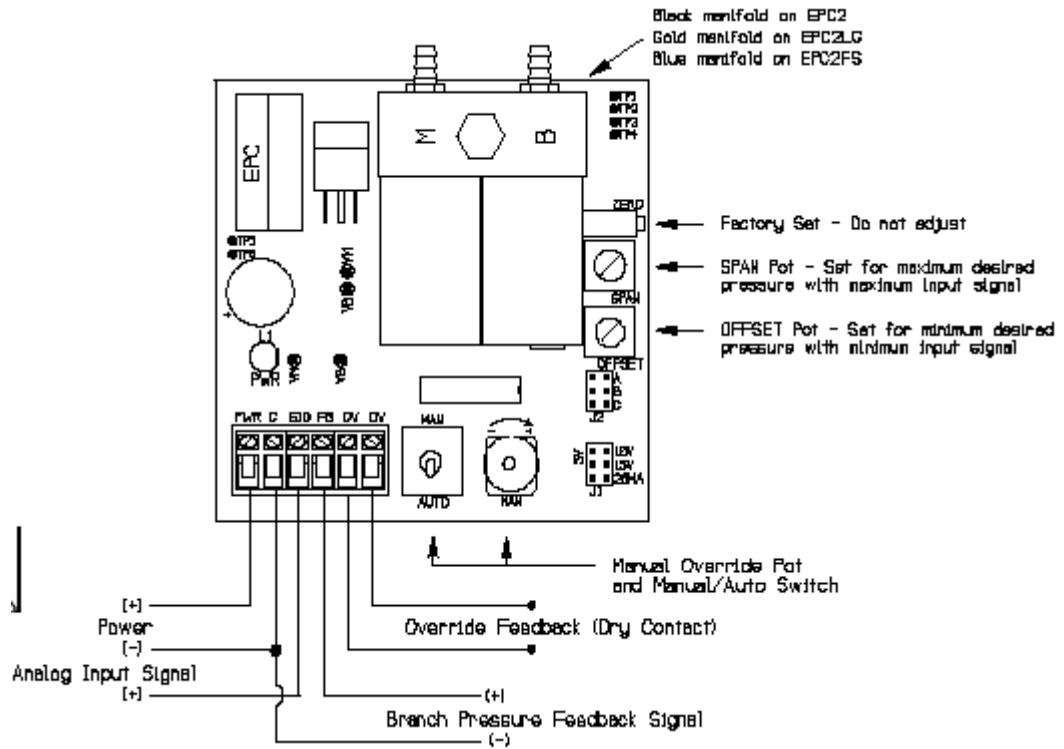
Verify the MAN/AUTO switch is in the AUTO position. In AUTO, the manual override pot is inactive, the override contacts are open, and the analog input signal is supplying the set-point. The offset pot may be adjusted to any desired offset between 0 and 14 psig. When in the MAN position, the override contacts are closed, the offset pot is inactive and the manual override pot is supplying the set point (the analog input signal is locked out). Supply power and the LED power indicator will light, but only measurement will verify proper voltage

1. Setting the minimum pressure. Make sure the signal connections are made and input is at minimum. Place the manual override switch to the AUTO position. Adjust the OFFSET pot to the desired pressure output, or until the actuator just starts to move. The adjustment range of the OFFSET pot is 0 to 9 psig (62.05 kPa), 0 to 14 psig (96.53 kPa), or 0 to 19 psig (131kPa) depending on range selected.

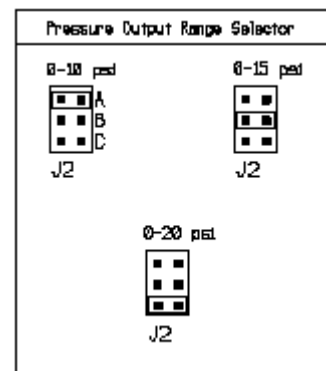
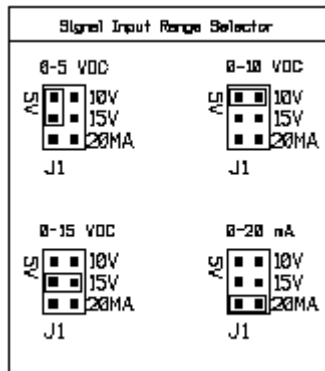
2. Setting the maximum pressure. Now place the manual override switch to the MAN position. Turn the MANual pot to produce the maximum branch line pressure available. Turn the SPAN pot for the maximum desired output pressure, or until the actuator just stops. **Be sure the MAIN air pressure is at least 2 psig greater than the desired maximum branch output pressure.**

3. Repeat. Because the OFFSET and SPAN pots are slightly interactive, steps 1 and 2 must be repeated until the desired minimum and maximum pressures are repeatable. Since the MANual pot is set for maximum pressure, it is only required that you switch the manual override switch back and forth from MAN to AUTO when repeating steps 1 and 2. Calibration is usually accomplished in less than 3 iterations. Apply minimum and maximum input signals and measure response. Response between the minimum and maximum values will be linear, therefore software algorithms are easy to derive. The feedback signal range on all selections is 0-5 VDC and is proportional to the output pressure range selected. The output and feedback signal will continue to vary proportionally if the input signal is increased beyond its upper limit (if enough main air pressure is available). The EPC is a constant bleed interface and utilizes a precision bleed orifice to maintain a measured flow of air across the valve. The branch exhaust response time is determined by the combined exhaust air flow as well as pressure differentials. If power to the EPC is lost, it will continue to bleed through the orifice until branch pressure is 0 psig. To use the manual override, place the AUTO/MAN switch in the MAN position. The potentiometer is now operable, and by turning the knob you may increase or decrease the pneumatic output.

AX-EPC2



Jumpers



Power Supply Voltage:

24 VDC (+10%/-5%)
24 VAC (+/-10%) 50/60 Hz at terminals

Supply Current:

180 mA max. (200 mA max. for EPC2FS)

Feedback Signal Output:

Factory Calibrated 0-5 VDC = range selected

Input Signal Ranges:

0-5 VDC @ Infinite ohms
0-10 VDC @ Infinite ohms
0-10 VDC @ Infinite ohms
0-20 mA @ 250 ohms

Air Supply:

Maximum 25 psig 172.38 kPa, minimum 18 psig (124.11 kPa) main air supply, 0-10 psig (68.95 kPa), 0-15 psig (103.43 kPa), and 0-20 psig (137.9 kPa) jumper selectable output pressure ranges.

EPC2 Air Flow, @ 20 psig (137.9 kPa) main/15 psig (103.43 kPa) Out, 750 scim

EPC2LG Air Flow, @ 20 psig (137.9 kPa) main/15 psig (103.43 kPa) Out, 1400 scim

Exhaust rate: EPC2/EPC2FS - 750 scim, EPC2LG - 1400 scim

Accuracy: 1% full scale at room temperature, 2% full scale @ 32 to 120°F (0 to 48.8°C)

Override Contact Rating: 24 VAC or 24 VDC, 1 A maximum

AX-EPC2 Installation**READ THESE INSTRUCTIONS BEFORE YOU BEGIN INSTALLATION.**

Ground yourself before touching board. Some components are static sensitive.

MOUNTING:

Circuit board may be mounted in any position. If circuit board slides out of snap track, a nonconductive “stop” may be required. Use only fingers to remove board from snap track. Slide out of snap track or push against side of snap track and lift that side of the circuit board to remove. Do not flex board. Use no tools.

POWER CONNECTIONS:

1) **24 VDC** - with power off, connect 24 volt DC power supply to “PWR” (+) and “C” (-) or common terminals on the board.

24 VAC - with power off, connect one transformer secondary leg to “PWR” (+) and the other to “C” (-) or common terminals on the board.

2) **If the 24 volt AC power is shared** with devices that have coils such as relays, solenoids, or other inductors, each coil must have an MOV, AC Transorb, or other spike snubbing device across each of the shared coils. Without these snubbers, coils produce very large voltage spikes when de-energizing that can cause malfunction or destruction of electronic circuits.

3) **If the 24 volt DC power is shared** with devices that have coils such as relays, solenoids, or other inductors, each coil must have an MOV, DC Transorb, or a diode placed across the coil or inductor. The cathode or banded side of the diode (or DC Transorb) connects to the positive side of the power supply. *Do not power without main air supply provided.*

4) If you are not sure of other field device configuration, use separate transformers. It is highly suggested that the 24 VAC neutral of all transformers be earthed at the transformer. Analog input, digital input, and analog output circuits should not be earth grounded at two points. Any field device connected to this transformer must use the same common. If you are not sure of other field device configuration, use separate transformers.

5) You should measure the actual voltage output of the secondary. If the output is not fully loaded you may read a higher voltage than the circuit board can handle. The gauge port will accept a miniature 1/8"-27 FNPT back-ported pressure gauge to allow direct reading of branch line pressure. The gauge should be sealed by teflon sealing tape, and should be tightened just snug, using a backup wrench to hold the manifold.

ADJUSTMENT OF INSTALLED GAUGES. If installation requires adjustment of the gauge for proper reading of the face, turn the gauge no more than 1/2 turn in either direction. O rings in the bottom of the gauge port will allow this without leakage. Warranty does not include malfunction due to clogged valve. Main air port on EPC2 is filtered with the supplied 80-100 micron integral-in-barb filter (Part #PN004). A 5 micron external in-line filter (Part #PN021) is supplied with the EPC2LG. Periodically check the filter for contamination and flow reduction. Replace if needed.

The surface between the manifold and pressure transducer is a pressure seal. Minimize stress between the circuit board and the manifold by holding the manifold in one hand while installing pneumatic tubing onto the fittings, and use care when removing tubing to avoid damaging fittings or moving manifold. For optimum performance and reduced noise, the EPC2FS unit requires a branch air line capacity equal to at least 25 feet of 1/4" O.D. polyethylene tubing to operate without oscillation, and the EPC2 and EPC2LG unit require a branch air line capacity equal to at least 15 feet of 1/4" O.D. polyethylene tubing to operate without oscillation.

AX-EPC2 Commissioning

Select one of the four input signal combinations by moving the jumper shunt J1 identified as “Input Signal Range Selector”. Select a preset pressure output range by moving jumper shunt J2 identified as “Pressure Output Range Selector”, or set custom range as described below. Verify the MAN/AUTO switch is in the AUTO position. In AUTO, the manual override pot is inactive, the override contacts are open, and the analog input signal is supplying the set-point. The offset pot may be adjusted to any desired offset between 0 and 14 psig. When in the MAN position, the override contacts are closed, the offset pot is inactive and the manual override pot is supplying the set point (the analog input signal is locked out). Supply power and the LED power indicator will light, but only measurement will verify proper voltage

1. Setting the minimum pressure. Make sure the signal connections are made and input is at minimum. Place the manual override switch to the AUTO position. Adjust the OFFSET pot to the desired pressure output, or until the actuator just starts to move. The adjustment range of the OFFSET pot is 0 to 9 psig (62.05 kPa), 0 to 14 psig (96.53 kPa), or 0 to 19 psig (131kPa) depending on range selected. Zero pot is factory set - do not adjust.

2. Setting the maximum pressure. Now place the manual override switch to the MAN position. Turn the MANual pot to produce the maximum branch line pressure available. Turn the SPAN pot for the maximum desired output pressure, or until the actuator just stops. **Be sure the MAIN air pressure is at least 2 psig greater than the desired maximum branch output pressure.**

3. Repeat. Because the OFFSET and SPAN pots are slightly interactive, steps 1 and 2 must be repeated until the desired minimum and maximum pressures are repeatable. Since the MANual pot is set for maximum pressure, it is only required that you switch the manual override switch back and forth from MAN to AUTO when repeating steps 1 and 2. Calibration is usually accomplished in less than 3 iterations. Apply minimum and maximum input signals and measure response. Response between the minimum and maximum values will be linear, therefore software algorithms are easy to derive. The feedback signal range on all selections is 0-5 VDC and is proportional to the output pressure range selected. The output and feedback signal will continue to vary proportionally if the input signal is increased beyond its upper limit (if enough main air pressure is available). The EPC2, EPC2LG and EPC2GFS incorporate two valves and are not constant bleed controllers. Branch exhaust flow and response time is not limited by any internal restrictor and is similar to the load rate. The EPC2 and EPC2LG are ideal for long branch line runs and multiple actuators because of their capacity (EPC2 - 750 scim/EPC2LG - 1400 scim). Note: If power to the EPC2 or EPC2LG is lost, the branch line control valve will close and branch line pressure will be maintained (assuming no branch line leaks). If power to the EPC2FS (Fail-Safe) is lost, the branch line 3-way valve will exhaust branch line pressure to 0 psig (0 kPa).