

LANCE INSTRUMENTS
L8356 Air-to-Electronic Convertor Manual



The L8356 Air-to-Electronic Convertor is designed to enable the use of standard air gaging on computer gaging systems, or on column gages with either LVDT or low voltage DC input capability.

The unit provides a DC output voltage which is proportional to the pneumatic back-pressure created when an air gaging fixture is connected. It includes both "Spread " and "Zero" pneumatic controls on the front panel for quick operator adjustment as required.

Features:

The L8356 Convertor is housed in a metal enclosure and has 2 pneumatic controls on the front panel, Air Spread and Air Zero. An air port connector on the panel allows for quick connection to the tooling. Two connectors on the rear allow the unit to be plugged directly to the signal conditioning device. Two additional rear panel connectors are used to supply power to and from the convertors. The unit includes a built in air pressure regulator, air valve control block, and a fully temperature compensated electronic pressure transducer with signal conditioning.

Specifications:

Case Dimensions: 1.8" Wide x 4.0" High x 8.75" Deep
Mounting: Via 4, 4-40 threaded holes in the unit bottom. It is compatible with the Lance standard column mounting plates (optional).
Air Pressure Requirements: 80-150 PSI, clean dry air supply
Air Tooling: Via front panel fitting, 7/16 x 20 # 4 flare fitting
Design centre operating pressure 24 psi. (for 0 volts DC out)
Recommended Maximum DC output voltage - 5 VDC to + 5VDC

1/ MOUNTING

On the bottom of each case are (4) baseplate mounting holes, tapped for 4-40 machine screws, which are used with the standard Lance mounting feet. Each pair of mounting feet can accommodate up to 4 units. When more than 4 units are mounted side by side, then the mounting feet of each 4th unit in a series can be offset so as to join the units together.

2/ CABLE CONNECTIONS

Power is provided to the units by means of an external supply (120 VAC Input, 12 to 14 VAC Output, Order # LD-0740). One power supply can feed up to 12, L8356 Air-to-Electronic Convertors. The supply is connected to the back of a L8356 unit by means of a 5 Pin 180 degree DIN connector (as per Dwg. No. L8356-B-003).

The rear of each convertor includes two power connectors, designated "Power-In" and "Power-Out". In a typical installation, the power supply unit will connect to the "Power-In" connector of the 1st convertor, and subsequent convertors will be interconnected by jumpering from the "Power-Out" of the 1st connector to the "Power-In" of the adjacent unit, continuing in the manner sequentially. Each convertor has its own power supply filtering and regulation, so that connecting multiple units will not have any effect on other connected convertors. (Interconnect Power Cables order # LC-0731).

The signal cables (Order # LC-0732) have 240 degree 5 pin DINs at the convertor end, , with 2 bare wires at the other end, representing the signal and signal ground connections. (Note: The signal ground is separate from the case ground). The user would normally attach the desired connector type at the wire end for connection to the signal conditioning equipment being used.

3/ AIR MODULE CALIBRATION

Prior to calibrating or using the L8356 A/E Convertor, allow a "warm-up" period of at least 5 minutes for the electronic circuitry to stabilize.

Air gage tooling should be connected to the front panel air fitting and a clean, dry air supply at 80 to 150 PSI connected to the rear inlet fitting.

With tooling connected, open the ZERO valve control at least 1/4 turn (counterclockwise). Place the MIN master in the fixture and adjust the SPREAD control so that the display reaches the desired Min location. In some cases, it may also be necessary to move the ZERO control further to achieve this position. Now place the MAX master in the fixture and re-adjust both controls as needed to place the display at the Max position. Remember that turning the spread control clockwise increases the spread between Min and Max positions. Repeat this process as many times as necessary in order to achieve a final calibration at both Min and Max positions. If the unit cannot be calibrated without having the controls all the way in or much too far out, then an adjustment may be required to the electronic gain and zero of the associated computer gage. Re-calibration is required according to the user's schedule.

NOTE: This instrument requires a suitable air filter to be mounted on the incoming factory air supply. The filter should be capable of filtering liquid and solid particles as well as oil vapour. Example Type: Norgren Models F08-200-AIDA and F40-200-AOPA together or equivalent.

4/ ELECTRONIC GAIN CONTROL

The L8356 Air-to-Electronic Converter includes a 10 turn potentiometer gain control, accessible from the bottom of the unit, through an access hole. The available gain range is 1x to 6x, with the unit set to a 3x gain (mid-point) when shipped from the factory. Turning the gain control clockwise increases the gain, while counterclockwise decreases it.

The gain control is provided to accommodate a range of gain requirements imposed by the wide variation in fixture designs. It is recommended that this control be adjusted only if absolutely necessary.

The unit operates on a design centre pressure of 24 psi, with an output voltage at this point of zero volts. If the pneumatic controls were set up (for example) to provide a fixture pressure change of +/- 10 psi with Min and Max masters in place, the unit output voltage might vary from -3 to +3 volts DC. If the L8356 gain control were then increased significantly, the output voltage might rise to a point where the unit's maximum output voltage capability was exceeded (reaching a saturated condition).

When increasing the gain setting, caution is required in order to prevent this situation from arising, where a demand for voltage swing is created which is larger than the unit can provide, which is approximately +/- 6 volts DC.

4/ TROUBLESHOOTING

No Signal:

- Check that the power supply is plugged in and receiving 120 VAC.
- Ensure that adequate air supply is provided (Minimum of 80 psi.)
- Check the signal connection to the instrumentation and measure the DC voltage with a voltmeter. With no air supplied, or with 24 psi back pressure at the air outlet, the voltage should be close to zero volts. A higher pressure will increase the voltage positively, and a lower pressure will increase the voltage negatively.

Can't Calibrate:

- Ensure that the air supply provided is at least 80 psi.
- Check the master sizes, to ensure that the correct masters are being used for the fixture.
- Adjust the electronic gain or electronic zero of the instrumentation the unit is feeding, or adjust the internal electronic gain as described above.

Linearity Problems:

- The L8356 unit is guaranteed to provide a linear response with respect to the operating range and has been tested to conform with a standard mercury manometer over the range. It is not guaranteed to provide a linear response with any specific tooling fixture, since not all tooling fixtures are strictly linear.

Aside from tooling, linearity problems are generally the result of inadequate air supply to the converter. A large number of converters, fed from a single 1/4" ID manifold can create a problem, as individual converters being fed from the manifold may not end up with sufficient air supply even though the air pressure measured at the manifold inlet may seem sufficient.

If a linearity problem is suspected, the first step should be to measure the air pressure being delivered to the individual converter. Increasing the input air pressure will often solve the problem.

Since some fixtures may not provide a completely linear response within the range defined by the Min and Max masters, the only means of correction often rests with either correcting the problem in the fixture itself, or with a software solution in the downstream hardware.

Signal Drift:

- Allow at least 5 minutes "warmup" time before calibrating, in order for the electronic components to come to a steady-state condition.
- Ensure that the air supply is not fluctuating significantly by measuring line pressure coming into the module.
- Avoid operating with the pneumatic controls turned too far out from the unit.

WARRANTY

This product is warranted to be free of defects in material and workmanship for a period of 90 days from the date of original shipping. The manufacturer will repair or replace, at its option, any part or parts that upon its inspection prove to have such defects arising under conditions of normal use and service as defined in this manual. The manufacturer will not be liable for loss of the use of the product, or any other incidental or consequential costs, expenses, or damages incurred by the purchaser. This warranty does not cover damage resulting from unreasonable use, neglect, improper service, or other causes not arising out of defects in material or workmanship.