

## **Mastering: Setting the Pneumatic Spread & Zero Controls**

### **Application - L8356 Air-to-Electronic Converters & L9100 Air Columns**

Sometimes, operators who are not well trained with air gauge setup and calibration will experience problems, and are unsure as to how to achieve calibration with Min and Max masters. This brief guide is intended to assist in those situations.

#### ***Initial Considerations:***

- 1/ Ensure that the instrument is receiving an incoming air supply of at least 80 p.s.i.
- 2/ Ensure that the correct Min and Max masters are being used.
- 3/ Ensure that the Min and Max masters are not mistakenly being interchanged. When inserted in the fixture, the max master should move the bar display to a higher position than the min master does when inserted.
- 4/ Automastering (if used in your application) will require a reasonable degree of fixture repeatability in order to work. Place the same part into the fixture several times, checking the bar position of your display each time. There should not be a variation of more than about 2 % on a low sensitivity range, and no more than about 4 % on a high sensitivity range.

#### ***Manual Mastering:***

1/ Prior to adjusting the pneumatic controls, it is important that you set your electronic zero and gain controls to their centre, or mid positions. For an L8356 Air-to-Electronic Converter connected to a computer gaging system, these settings will be found within the Setup menu of your computer gaging system. For an L9100 Air Column Gage, these settings will be found within your programming menu under the 'Manual' sub-menu.

2/ Next, adjust the Spread and Zero pneumatic controls such that they are no more than 2 or 3 turns out from the front panel.

3/ Place the Min master in the fixture, and adjust the Spread and Zero controls until the display is close to the desired Min master position.

4/ Place the Max master in the fixture, and adjust the Spread and Zero controls again till the display is at the Max master position. Turning the Spread knob clockwise, has the effect of increasing the signal gain, or spread between the masters.

5/ Re-insert the Min master into the fixture. If the bar display is significantly lower than the desired Min master position, or off the bottom of the display, then you will need to decrease the signal gain by turning the spread control counter-clockwise. If the display is significantly above the desired Min master position, then you will need to increase signal gain by turning the Spread control clockwise. Readjust the Spread and Zero Controls until the display is again close to the desired Min position.

6/ Repeat steps 3 and 4 as many times as necessary until the display is within a few percent of the desired Min and Max positions when the masters are inserted into the fixture.

If you are using Automastering and have achieved this, then the instrument is ready for automastering. If you are using Manual mastering only, continue the above process till your display is at the desired Min & Max positions when the respective masters are inserted.

If you have not been able to master the column manually by this method, or if the Spread or Zero controls have to be more than 12 turns out (counterclockwise) from the column, then you may have to change the electronic gain setting in the display device to either increase the spread or decrease it.

Manual mastering of air fixtures requires some degree of expertise, and practice will make the task easier and quicker.

## Notes

- 1) Automastering and Manual Zero and Gain adjustments should be done with TIR in the "Off" mode
- 2) If Spread or Zero controls are turned too far out ( counterclockwise ), then the resulting "play" in the control threads may contribute towards inaccurate readings and a lack of repeatability.
- 3) Air columns may not calibrate properly if the internal pneumatic lines are clogged with oil or particulate matter. This is why it is important to have proper filters on the air supply to the A/E converters or columns.
- 4) A series of air converters or columns all connected to one manifold may not have the same incoming air pressure. A pressure meter connected to the end of the manifold away from the supply line pressure will verify if the incoming supply to the last column is sufficient. This measurement must be checked **with the correct masters inserted, and after the spread & zero controls have been correctly set.**
- 5) If an instrument is not mastering correctly, the simplest means of determining if the problem is with the instrument, or with the fixture or masters, - is to substitute another similar instrument in its place.