

Using the Model 8495 Transducer Display and Monitor with the CERTIFIER[®] Calibrator

Application Note TI-121

The Model 8495 Transducer Display & Monitor has a special feature that allows the user to use the Transducer Display and Monitor with the TSI CERTIFIER[®] Calibrator. This feature allows the user to obtain direct velocity readings from the CERTIFIER[®] Calibrator. The Transducer Display and Monitor will directly convert the pressure readings to actual velocity by using look up tables and entering the plate number. Standard velocity readings can also be obtained by entering a density correction factor and the plate being used.

Calculating the Density Correction Factor

If using Imperial (or English) units, the equation would be: $K = \frac{29.92}{P} \left(\frac{460 + T}{530} \right)$

where:

T = ambient temperature (°F)

P = ambient pressure (in Hg)

If using metric units, the equation would be: $K = \frac{760}{P_m} \left(\frac{273.15 + T_m}{294.25} \right)$

where:

T_m = ambient temperature (°C)

P_m = ambient pressure (mmHg)

The density correction factor under standard conditions is 1.0000. This will be the default value in the Transducer Display & Monitor.

Setting Up the Transducer Display & Monitor with the CERTIFIER[®] Calibrator

To connect the Transducer Display & Monitor to the CERTIFIER[®] Calibrator, the wires from the pressure transducer must be connected to the Transducer Display & Monitor in the following fashion. The black wire is connected to the COM SIG and the red wire is connected to the SIG+ on the terminal block of the

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Transducer Display and Monitor. Which SIG+ terminal will vary depending on the pressure transducer being used. The pressure transducer that comes with the CERTIFIER[®] Calibrator will need to be connected to the 10V SIG+ terminal. (If your pressure transducer operates on a 0 to 5V signal, you would connect the red wire to the 5V SIG+ terminal.)

Now the following parameters must be set on the Transducer Display and Monitor before it will operate correctly with the CERTIFIER. For a more detailed explanation of how to set these values, see the Transducer Display and Monitor manual.

1. The full scale must be set to that of the pressure transducer (10.000 for the TSI supplied pressure transducer).
2. The input signal must be set to 0 to 10 V (or that of your pressure transducer).
3. The zero adjust must be set to zero. (Make sure that the dart controller is off during this portion of setup. No signal can be supplied in order to set the zero.)
4. CERTIFIER[®] Calibrator function must be turned ON.
5. Once the CERTIFIER[®] Calibrator function is turned on, the measurement units you desire must be selected (feet/min or meters/sec), the k factor (density correction factor) must be entered, and the plate number being used must be selected. (See explanation below or the Transducer Display and Monitor manual for more details on how to set these values.)

When you first turn the CERTIFIER[®] Calibrator mode ON, you will then need to set the measurement units, density correction factor, and plate number being used. To do this, follow these steps:

1. Measurement units: Press the up and down arrow keys to choose either feet (feet/min) or meters (meters/sec). Once you have selected your measurement units, press the **SET** key to continue.
2. Density correction factor: Press the up and down arrow keys until the desired value is shown. Press **SET** to confirm your choice. This value can be between 0.1000 and 1.9000 (under standard conditions the density correction factor equals 1.0000). This is the factor that was calculated on the previous page.
3. Plate number: Using the arrows, choose the plate number that is inserted in the CERTIFIER[®] Calibrator and press **SET** to confirm your choice.

Once this setup has been done, you are ready to operate the CERTIFIER[®] Calibrator.

Changing Plate Numbers

When you are ready to change the plate in the CERTIFIER[®] Calibrator, follow these steps. Once the Transducer Display and Monitor is displaying velocity measurements, simply press the up or down arrow key to choose the appropriate plate and press **SET** to confirm your choice. The Transducer Display and Monitor will automatically return to velocity measurement mode.

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