

# Technical Data Sheet

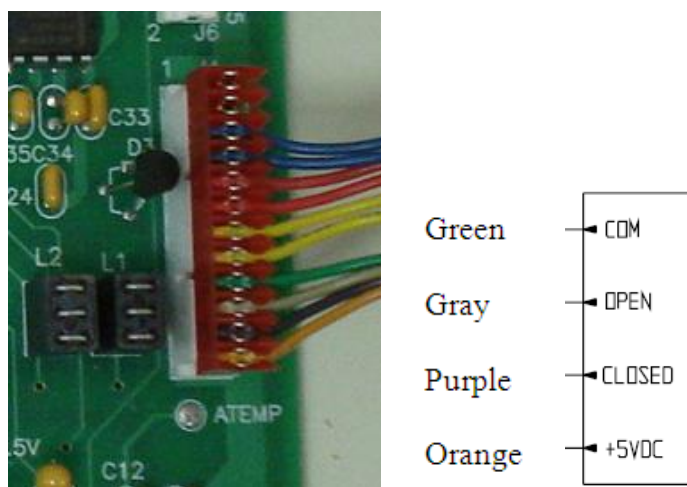
*TC Sensor Diagnostics for -5% CO<sub>2</sub> Display*

310, 370, 3110, 3950
Revision Date: May 15, 2014

## TC Sensor Diagnostics for -5% CO2 Display

### Steps to diagnose the cause for low negative CO2 display reading e.g. (-4.5 to -5%)

1. Verify the Zero and Span values in the Configuration Menu match the values on the TC sensor.  
\*\*\* See Warning Note below \*\*\*
2. Make chamber with 0% CO2, stable temperature and high humidity. (Wait minimum 2 hours after door opening)
3. Measure VDC at Purple (+) and Green (- ground); record voltage.
4. Measure VDC at Gray (+) and Green (- ground); record voltage.
5. Subtract lower recorded voltage from higher recorded voltage to determine difference between gray and purple (Open / Closed thermistors).
6. Differences greater than 0.050 VDC with a stable temp and RH would suggest that drift has occurred. This drift can't be corrected in the field and the CO2 sensor is considered to be defective. Replace CO2 TC sensor with part number 290090 for models 310, 3110 & 3950 and part # 290168 for model 370.



**\*\*\* Warning about viewing or changing either the Zero and Span values in the Config Menu \*\*\***

Any time the “Enter” button is pressed while viewing or changing either the Zero or Span values in the “Config” menu, the existing CO2 calibration/offsets will be (erased) and the sensor zero and span values will have no offset correction applied.

## TC Sensor Diagnostics for -5% CO2 Display

This operation of using the “Enter” button can be used to identify the unknown amount of CO2 offset correction previously applied by observing the change in the CO2 display value before and after this “Enter” button action.

This operation can also be useful to determine the incubator and CO2 sensor accuracy at 0% CO2 level.

1. Prepare the chamber to operate at 0% CO2 while temperature is stable at 37C \* and humidity pan is full. Measure CO2 through Sample Port to confirm.
2. Press Mode button to select the “Config” Menu. Press the Right Arrow button to display either the “T/C Z#” (Zero) or “T/C S#” (Span) displays.  
Press the “Enter” button.
3. Observe any changes in the CO2 display.
4. CO2 Display values near “0.0” (+/- 0.5%) confirms the CO2 sensor has a good reference to 0% CO2 and has encountered minimal sensor drift.
5. CO2 Display values greater than +/-0.5 to 2% suggests some drift has occurred and maybe normal as the sensor ages or if it were exposed to sensor pollution.
6. CO2 Display values greater than +/-2 to 3% drift has occurred show signs of significant sensor drift/pollution and should maybe be considered for replacement.
7. CO2 Display values greater than +/-3% should be replaced

\* Note the Zero CO2 factory calibration for the 290090 & 290168 T/C sensors is performed at 37C, 90% RH, and 0% CO2. To verify the sensor amount of drift, it is important to verify the above steps under the same condition the sensor was zeroed at the factory.

“Sensor pollution” is referring to when the TC thermistor sensor has been exposed to stresses or conditions that have potentially caused a level of sensor drift. Examples of sensor pollution would be if a user has directly sprayed a cleaning agent or chemical into the metal diffuser and the chemical or substances has left a film or residual residue on the internal thermistor that alters the electrical state. Other forms of pollution do not require direct exposure such as exposure to Carbonic Acid over a long period of time. Carbonic Acid is a normal byproduct of CO2 mixing with water/RH. Sensor pollution may also be a result of exposure to high levels of EOTH or other chemical vapors or compounds.