CERTIFICATION

ACI recommends checking it at a certain temperture with a highly accurate, NIST traceable reference sensor. For best accuracy, ACI recommends a reference better than 0.05°F.

Place the reference probe directly next to the probe. Let it stabilize. Compare that to the output. For finding the correct output on transmitter based on temperature there are 2 ways to do it:

1. Plot it using ACI Website

a. Go to WorkACI Website
b. Hover the "Info" tab at top of web page
c. Under the "Technical" tab click on the "Span to Output" tab
http://www.workaci.com/content/span-output
d. Enter the low end of the span
e. Enter the high end of the span
f. Click on the output of the transmitter. *Note- For the temperature transmitter it will only either be: 4-20mA, 1-5VDC, 2-10VDC

2. Calculate it:

Conversion from a current (I) to a temperature value formula.

$$I = \frac{I\,high - I\,low}{High\,Temp\,Value - Low\,Temp\,Value} \times \left(Temp\,Value - Low\,Temp\right) + I\,low$$

Example: 0 - 100°F Span, 4-20 mA output

$$I = \frac{20-4}{100-0} \times (75 - 0) + 4$$

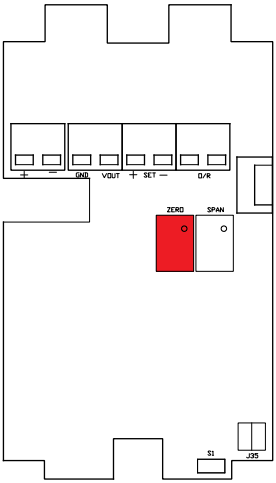
75°F = 16 mA output

The calculated output should match the reference temp.

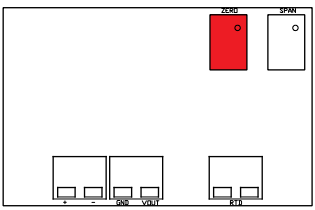
If you find the transmitter output does match the reference temperature: You can do a small adjustment with Zero turn pot on board. Adjust the Zero potentiometer until the current output is equal to the desired temperature reading. This allows you to offset most of the error between the temperature transmitter and the platinum RTD.

FIGURE 1: CALIBRATION

ROOM



DUCT



Automation Components, Inc.
2305 Pleasant View Road | Middleton, WI 53562
Phone: 1-888-967-5224 | **Website:** workaci.com

Version: 1.0
I0000914

CALIBRATION

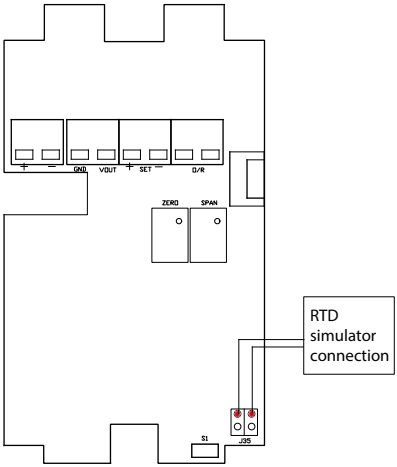
For best accuracy we recommend to send it back to ACI. If that is not preferred, see below:
Pick 2 points in between the two endpoints of the overall temperature span.

For example, a 0 to 100°F span would be calibrated at 25 and 75°F. Calculate what the currents should be at 25 and 75°F by using the following formula(see above for full breakdown of equation):
16 mA / 100°F (25°F – 0°F) + 4 mA = 8 mA (Current Output @ 25°F)
16 mA / 100°F (75°F – 0°F) + 4 mA = 16 mA (Current Output @ 75°F)

The 1k or 100 ohm Platinum Resistance chart will also be needed.

Simulate the resistances for both of the temperatures by using a RTD simulator. The RTD simulator will need to be connected to the PCB. This will vary depending on part.

FIGURE 2: CALIBRATION OF ROOM



ROOM

Remove jumper shunts from J35(bottom right of PCB). Connect RTD simulator to top two pins as shown in **Figure 2** below. After finished with calibration, make sure to insert jumper shunt back onto J35.

DUCT

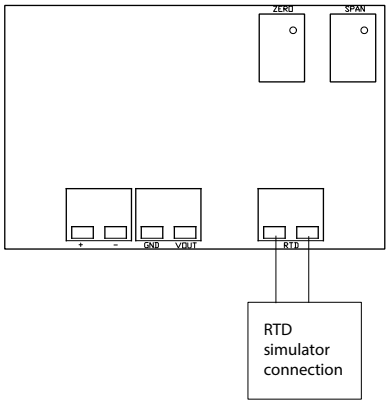
Remove RTD probe wires from RTD terminal block. Connect RTD simulator into RTD terminal block as shown in **Figure 3** below. After finished with calibration, make sure to connect RTD probe back into RTD terminal block.

The values listed above and below are for a 25°F, and 75°F.

Set the RTD simulator equal to the resistance at 25°F (984.79 ohms) and adjust the Zero potentiometer until the current output reads 8 mA. Then set the RTD simulator equal to the resistance at 75°F (1093.03 ohms) and adjust the Span potentiometer until the current reaches 16 mA. This process is then repeated until the transmitter readings are equal to what the calculated current output readings should be.

Due to the interaction of both of the Zero and Span potentiometers, this process will usually have to be done 2 to 3 times before calibration is complete. Set the transmitter equal to the resistance for 50°F(half of temp span) and verify that the current reading is equal to approximately 12 mA +/- 1% of the overall temperature span. The total error is made up from the inaccuracies of the sensor and by the tolerances of the parts used in the overall production of the transmitter.

FIGURE 2: CALIBRATION OF DUCT



Automation Components, Inc.
2305 Pleasant View Road | Middleton, WI 53562
Phone: 1-888-967-5224 | **Website:** workaci.com

Version: 1.0
I0000914

To take it a step further, ACI recommends checking it at a certain temp with a highly accurate, NIST traceable reference sensor. For best accuracy, we recommend a reference better than 0.05°F.

Place the reference probe directly next to the probe. Let it stabilize. Compare that to the output. Adjust the Zero potentiometer until the current output is equal to the desired temperature reading. This allows you to offset most of the error between the temperature transmitter and the platinum RTD. ACI's calibration system use high precision 0.01% tolerance programmable resistance decade box. The meter used has a 365 day stability as low as 2.7 ppm, with a 24 hour stability of 0.5 ppm, ensuring confidence in ACI's measurement can be the same as it was yesterday or last year. The meter is an 8.5-digit resolution instrument designed specifically for metrologists with a high accuracy(± 7.5 ppm of reading).

Automation Components, Inc.
2305 Pleasant View Road | Middleton, WI 53562
Phone: 1-888-967-5224 | **Website:** workaci.com

Version: 1.0
I0000914