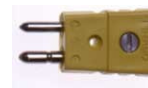


Use this procedure along with the Excel Calibration Certificate for the ProHeat 35(# 232171). Add your company name and address to the Certificate of Calibration as indicated. You may want to add your company logo. Once complete, you may protect the document using the lock feature in Excel. This only allows entries into those fields in yellow. You may want to keep a record of all calibration certificates so they may be obtained in the future. The procedure is listed step by step.

The following items are required for verifying calibration:

- 1** Fluke-714 Thermocouple Calibrator or equivalent
<http://www.fluke.com/products/home.asp?SID=13&AGID=9&PID=1707>
Specify primary standard certification when ordering.
- 2** A type-K mini connector (Fluke # 80CK-M) or equivalent
http://us.fluke.com/usen/products/AccessoryDetail.htm?cs_id=9477%28FlukeProducts%29&catalog_name=FlukeUnitedStates
- 3** A length of type-K thermocouple wire
Red to (-) negative and yellow to (+) positive when connecting wires to connectors
- 4** A type-K 2-pin male connector (Newport # OST-K-M) or equivalent
<http://www.newportus.com/Products/AccCalib/OST.htm>
- 5** Blue Calibration labels – (# QCC306BU) or equivalent
<http://www.q-cees.com/itemdetail.aspx?item=206>
- 6** A Precision DVM accurate to thousandths.
(Agilent Multimeter Model #34401A or Hewlett Packard Multimeter Model #34401A) or equivalent
- 7** Recommended primary power for the ProHeat 35.
Recommended power for the testing equipment.



To make the test more convenient a 5 foot interconnecting cable can be attached to the RC9 connector in the rear of the machine. It has leads that can be connected to a test board or a 6 position switch that can be set close to the front of the machine. This would save time when moving the TC calibrator from TC1 to TC6 in the front of the machine and then going to the rear of the machine to take a voltage measurement with the precision DVM. This same cable can be used to verify the calibration of the Recorder. Miller part #300168 can be purchased through our Sales Department.

- 1) Excel Spreadsheet Set-up (first time use)
 - a) Open Excel Calibration Verification Spreadsheet.
 - b) Select the appropriate tab (ProHeat 35 in °F or °C).
 - c) Enter your company name and address in top right corner. Add your logo if you would like.
 - d) Enter your company name in the certification statement (two places).
 - e) Enter Fluke 714 Thermocouple Calibrator serial number.
 - f) Enter Precision DVM brand, Model number and serial number.
 - g) Protecting the spreadsheet from accidental editing in the wrong areas may be a desired option.

- 2) Initial Test Set-up
 - a) Power switch off.
 - b) Have qualified person connect primary power to ProHeat 35.
 - c) Turn ProHeat 35 power switch on.
 - d) Press & Hold the "Program" button, then press "Parameters" to enter setup mode.
 - e) Press Cursor button 4 times to get to "Control Mode" line.
 - f) Press the "Decrease" button to change to "Manual" if necessary.
 - g) Press the "Run Status" button.
(TC5 and TC6 will show in upper RH corner of display)
 - h) Let unit idle for a minimum of 15 minutes before checking calibration.
 - i) Turn on Fluke-714 Thermocouple Calibrator and Precision DVM. Leave them on for a minimum of 15 minutes before checking calibration.

- 3) Excel Spreadsheet
 - a) Open Excel.
 - b) Right click the tab for "ProHeat in °F" or "ProHeat in °C".
 - c) Click on "Move or Copy...".
 - d) In the pop up menu, highlight either "ProHeat in °F" or "ProHeat in °C" to be copied.
 - e) Check the box labeled "Create a Copy".
 - f) Click "OK".
 - g) Right click the tab you just created. It can be identified by the "(2)" next to the description.
 - h) Click "Rename".
 - i) Locate the serial number on PC3 inside of the unit; do not just use original Calibration Label Serial number. Check PC3 serial number when the primary power is off and disconnected. Rename the tab using the ProHeat 35 TC board serial number and date as the tab name.
i.e.: "C05286121 012506" for January 25, 2006.
This will be a copy for your records.
 - j) Fill in, TC1 Serial Number, Calibration Date (Recalibration Date will auto-fill to 1 year later), and Certified By.

4) TC input/output check.

- a) Connect precision DVM (DC Volts set to display in thousandths) to RC9. This is the top connector located on the back of the ProHeat 35. Red lead to pin 1 and black to pin 5.
- b) Set TC calibrator to 382.0 °F or 194.5 °C. Connect to TC1 input jack on front of ProHeat.
- c) Verify TC display value of ($\pm 3^{\circ}\text{F}$) or ($\pm 2^{\circ}\text{C}$). RC9 output has a tolerance of ($\pm 6^{\circ}\text{F}$) or ($\pm 3.3^{\circ}\text{C}$). DVM reads 2.787 Vdc (± 0.038) (2.749 – 2.825).
- d) Enter DVM values into spreadsheet (the associated temperatures will auto-fill). If you are creating your own spreadsheet the voltage to temperature calculation would be (DC voltage out $\times 155$) – 50 = °F or (DC voltage out $\times 86.1$) – 45.5 = °C.
- e) Repeat steps a-d for TC2 – TC6 input jacks.
 - i) For TC2 move red precision DVM lead to RC9 pin 2.
 - ii) For TC3 move red precision DVM lead to RC9 pin 3.
 - iii) For TC4 move red precision DVM lead to RC9 pin 4.
 - iv) For TC5 move red precision DVM lead to RC9 pin 6.
 - v) For TC6 move red precision DVM lead to RC9 pin 7.

Note: TC5 and TC6 will show in upper RH corner of display.
- f) Repeat steps a-e with TC calibrator set to 882.0 °F or 472.2 °C, verify TC display value ($\pm 3^{\circ}\text{F}$) or ($\pm 2^{\circ}\text{C}$). RC9 output has a tolerance of ($\pm 6^{\circ}\text{F}$) or ($\pm 3.3^{\circ}\text{C}$). DVM reads 6.013 Vdc (± 0.038) (5.975 – 6.041).
- g) Repeat steps a-e with TC calibrator set to 1382.0 °F or 750 °C, verify TC display value ($\pm 3^{\circ}\text{F}$) or ($\pm 2^{\circ}\text{C}$). RC9 output has a tolerance of ($\pm 6^{\circ}\text{F}$) or ($\pm 3.3^{\circ}\text{C}$). DVM reads 9.239 Vdc (± 0.038) (9.201 – 9.277).

5) Removal of test equipment and completion of forms.

- a) If ProHeat 35 was set for “Temp” in “Control Mode” follow steps 1d-1f to change it back to “Temp”.
- b) Turn ProHeat 35 power switch off.
- c) Disconnect primary power.
- d) Remove precision DVM and TC calibrator.
- e) Complete calibration label & place it on unit directly above recorder.

I.D. No. (TC board serial number) **Be sure the serial number matches the board in the machine.**
By (your initials) Date (today's date)
Due (date 1 year from today)
- f) Print a copy of the certificate to send with the ProHeat 35.
- g) For Excel 2003, Click File and then Save on Spreadsheet and close.
For Excel 2007, Click Office and then Save on Spreadsheet and close.