

# CALIBRATION INSTRUCTIONS FOR HAKKO 191, 191B THERMOMETERS

Ever and anon we receive queries about calibrating the ubiquitous Hakko 191. It is something well within the capabilities of the average technician, and we encourage users to do their own calibration whenever possible. HOWEVER - American Hakko cannot and will not issue certificates of calibration unless we do the calibration ourselves AND the customer asks for a certificate. This applies to new 191s as well as used.

## TOOLS REQUIRED

Room temperature thermometer:  $\pm 1^{\circ}\text{F}$ .

Regulated DC power supply OR Thermometer Calibrator (i.e., Yokogawa model 2422-11)

N<sup>o</sup> 1 Phillips screwdriver

1. Allow the unit to 'soak' at room temperature ( $68^{\circ}\text{F} \pm 6^{\circ}$  or  $23^{\circ}\text{C} \pm 3^{\circ}$ ) for at least 30 minutes.
2. Remove the four Phillips screws holding the two halves of the case together.
3. Separate the two halves, leaving the battery in place.
4. Remove the two Phillips screws securing the PCB.
5. Turn the PCB over, so that the component side of the board is accessible.
6. Remove the sensor wire from the posts on the cover. Put a jumper wire between the red and blue posts.
7. Turn the power switch ON.
8. Note the room temperature. Adjust potentiometer VR1 so that the digital display reads room temperature.

### CAUTION

Do NOT touch the sensor RTH 1 during this process. So to do will cause an erroneous reading on the digital display during adjustment.

9. Attach the leads from the regulated DC power supply to the sensor posts: Positive (+) lead to the RED post; negative (-) lead to the BLUE post.

### NOTE

(If you are using a thermometer calibrator, skip instruction 10 and follow the instructions for the calibrator. Use potentiometer VR2 to adjust the reading of the digital display.)

10. Apply the voltages as indicated in the table below. The 191 display should read the temperature given in the table, plus the room temperature. If the reading is not correct, adjust potentiometer VR2 until the display is correct.

Factory tolerance for the Hakko 191 is  $\pm 3^{\circ}\text{C}$ ; for the Hakko 191B,  $\pm 5^{\circ}\text{F}$ .

MILLIVOLT SETTING	191 (CELSIUS)	191B (FAHRENHEIT)
12.207	$300^{\circ} + \text{ROOM TEMPERATURE } (^{\circ}\text{C})$	$572^{\circ} + \text{ROOM TEMPERATURE } (^{\circ}\text{F})$
16.395	$400^{\circ} + \text{ROOM TEMPERATURE } (^{\circ}\text{C})$	$752^{\circ} + \text{ROOM TEMPERATURE } (^{\circ}\text{F})$
20.640	$500^{\circ} + \text{ROOM TEMPERATURE } (^{\circ}\text{C})$	$932^{\circ} + \text{ROOM TEMPERATURE } (^{\circ}\text{F})$

11. If the unit cannot be calibrated, call Hakko for an RA number and return it for repair.
12. Replace the PCB and its Phillips screws. Tighten the screws only enough to secure the board.
13. Put the two halves of the case together, making sure that the black plate covering the switch is in place. Replace the four Phillips screws.