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TEMPCHECK OPERATING INSTRUCTIONS

PURPOSE:

The TEMPCHECK was developed to assist laboratory personnel in quickly determining temperature of bags or containers of red cells, plasma and other materials. Non-invasive, accurate temperature readings are provided in seconds.

DESIGN:

The TEMPCHECK is an electronic instrument which incorporates a thermocouple, insulated pad and four character digital readout.

MODEL & RANGE:

We presently offer three models :

<u>MODEL</u>	<u>RANGE</u>
TC-3	-40 to 40 °C.
TC-3P Portable	-40 to 40 °C.

ELECTRICAL:

The TEMPCHECK uses a wall plug-in 12 VDC power supply. In the case of the Portable unit (TC-3P), a built-in rechargeable NiCad battery is included.

OPERATION:

For best results, the product which you are sensing should be placed on the sensor, located in the center of the insulated pad, with the labels up. If there are labels on the back, peel enough of the label back so that when the product is placed on the sensor, no part of the label is touching it. Labels act as an insulator and give either a false reading or take longer to sense the correct temperature.

PORTABLE OPERATION:

When you wish to use the Model TC-3P for portable operation, press the button on the upper left hand side of the face plate. The display will light and stay on for 2.5 minutes. When the unit is fully charged you may do this 100 times. To recharge the battery, plug unit into an outlet for 8 hours. While the unit is being charged, it will function as a standard Model TC-3. The built-in battery is for portable operation only.

PLASMA:

Plasma taken out of a water bath should have all water drops removed from the part of the bag that comes in direct contact with the sensor. Water acts as an insulator and may give false readings. Units taken from a microwave plasma thawer can be placed directly on the sensor.

TIME:

Once you have placed the plasma unit on the sensor, you should have an accurate reading in about 30 seconds.

When using the Model TC-3 below 0°C you will have farther to ramp from ambient and it will take approx. 20 seconds more to obtain a correct temperature reading. The time is reduced if you are reading several units in succession, since the TEMP CHECK will not return to ambient and does not have as far to ramp.

CALIBRATION CHECK:

To do a simple calibration check at 0°C, use a plastic bag with ice cubes and water, well agitated.

Place bag on insulated pad, constantly agitating it by rolling the bag around so that the ice and water are a good mix, keeping the temperature close to 0°C. The TEMP CHECK should reach 0°C within about 30 seconds. Ideally, the TEMP CHECK readout should be flickering from 000 to -000.

The user can also verify the bag temperature by using a precision thermometer, on the sensor pad or separately.

Placing a thermometer tip on the sensor pad, covering with some insulation, and allowing the thermometer and TEMP CHECK to equilibrate, can provide additional temperature reference points.

If you determine that the TEMP CHECK is out of calibration, return unit to Hampshire Controls Corp. for recalibration, or go through the procedure described below.

Hampshire Controls Corp. recommends calibration check once a year.

CALIBRATION PROCEDURE:

These Instructions allow a technician to re-calibrate the TEMPCHECK unit for proper temperature display.

Equipment:

Plastic bag with ice cubes and a small amount of water
4 digit voltmeter with clip leads
Dial-up voltage output box
Small flat screwdriver
1 Meg ohm resistor

Procedure:

First, check the zero calibration, as described above. Opening the box and doing electrical adjustments should only be done if the calibration is definitely off.

1. Put paper or tape on the base plate surface to avoid scratching it.
2. Remove the four screws holding the TEMPCHECK panel into its case.
Gently
pull it out of the case, being careful not to pull any wires or leads loose.
3. Plug the TEMPCHECK unit into a 110v power source.
4. Calibrating the Zero
 - a. Place the ice-cube bag on the sensor button of the unit. Swish it over the button so that the thermocouple is reading the temperature of the melting ice.
 - b. Wait for the sensor to equilibrate, then use a small, flat screwdriver to adjust the "zero" potentiometer R14 (marked "0" on the board) until it does the display of the TEMPCHECK flickers between 000 and -000.

Once the zero has been calibrated, let the TEMPCHECK settle into equilibrium with the air temperature. The TEMPCHECK unit should display the same air temperature as the room thermometer.

NOTE: Adjusting the zero pot R14 might affect the range pot R10. If the unit does not show the correct air temperature, re-calibrate the range per step 5.

5. Calibrating the Range:

Use a calibrated voltage source (voltage box) to adjust the 0°C to 40°C range of the TEMPCHECK by switching from zero output to 1.612 millivolt output.

- a. Make certain the unit is un-powered.
- b. Connect the positive lead (usually red) of the voltage box to TC+ and the negative lead (black) to TC-.
- c. Locate the row of test points on the board. Short out the two test points labeled "Agnd" and "Ta" by using a jumper connector. This disables the ambient temperature compensation circuit.
- d. Plug the unit into a power supply.
- e. Set the voltage box to 1.612 millivolts. Adjust the "gain" potentiometer R10 until the display flickers from 039 to 040
- f. Switch the voltage box to zero output and adjust the offset potentiometer R14 until the display flickers from 000 to -000.
- g. Repeat steps e. and f. until the range is correct

6. Repeat the zero adjustment in section 4. to get an actual 0°C calibration.

APPLICATIONS:

*Checking the temperature of red cells being returned to blood bank from the floor.

*Checking the temperature of red cells being returned to the blood bank from O.R.

*Validating the temperature of thawed plasma.

*Enhancing normal blood bank procedures and quality control.

*Verifying the temperature of blood products being received in the blood bank.