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TEMPCHECK OPERATING INSTRUCTIONS

PURPOSE:

The TEMPCHECK was developed to assist laboratory personnel in determining the temperature of bags or containers of red cells, plasma and other materials in seconds. The TEMPCHECK is a non-invasive device and provides an accurate temperature reading in a few 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	0 to 40 °C.
	TC-3P	0 to 40 °C.
	TC-3-20	0 to -30 °C.

ELECTRICAL:

The TEMPCHECK has a 120/1/60 power transformer supplying 12 VDC. While you do not need a dedicated line, you should insure that the line does not drop below 100 VAC.

PORTABLE UNIT:

The Model TC-3P not only operates with the above power supply but it also has a built-in NiMH battery with trickle charger. When the battery is fully charged, it will operate for 230 minutes.

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-based plasma thawing unit 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 10 seconds.

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

CALIBRATION CHECK:

Put ice cubes and water in a plastic bag. Place a calibrated thermometer into the bag. Place bag on insulated pad. The temperature probe of the thermometer should be placed on the sensor spot. Allow 30 seconds for the thermometer to reach correct temperature. Both thermometer and TEMPCHECK should read the same.

If you determine that the TEMPCHECK is out of calibration, return unit to Hampshire Controls Corp. for recalibration.

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:

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:
 - 4.1. 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 ice.
 - 4.2. The display of the TempCheck unit should be flickering between 000 and -000. If it is not, use a small, flat screwdriver to adjust pot R14 (marked "0" on the board) until it does.

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 may 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 fixed output volt box to simulate the 0°C to 40°C range of the TempCheck™.

- 5.1. Set Up Unit for Calibration:
 - 5.1.1. Make certain the unit is un-powered.
 - 5.1.2. Insert a 1MΩ resistor in the K thermocouple connector (TC+/- vertical terminal block). Be careful not to damage the thermocouple wires.
 - 5.1.3. Connect the positive lead of the voltage supply to TC+ and the black lead to TC-.
 - 5.1.4. Locate the row of test points on the board. Short out the two test points labeled "Agnd" and "Ta" by connecting them together, using a jumper connector. This disables the ambient temperature compensation circuit.
 - 5.1.5. Plug the unit into a power supply.
- 5.2. Check the Span Calibration of Board:
 - 5.2.1. Set the voltage supply to 1.612 milli-volts.
 - 5.2.2. The display should read "40". If it does not, adjust the R10 pot until it does. Adjust the pot very slowly, and make sure that it is well within the 40 range, in other words, the display should not be just on the edge of changing from 39 to 40 or 40 to 41. Tweak it back and forth a few times to make sure you are right in the center of making it show 40.
6. Repeat steps 3-5 until the Temp-Check™ unit displays "000" with the ice bag on the sensor, as well as the proper air temperature.
7. The Temp-Check™ unit is now recalibrated.

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.