Technical Support Bulletin: S3-FDTHMST-01

Field Diagnosis of Thermistors in BVS-S3

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This procedure outlines the steps required to troubleshoot the thermistors in the BVS-S3.

Note: Before performing this calibration, read this entire document. If you have any questions, contact BTECH Technical Support. We are here to assist you!

ELECTROCUTION HAZARD!

This procedure involves working with high voltage. The voltage sensing leads and load current leads carry full battery voltage. Battery Voltage can be as high as 600Vdc depending on the battery system! If you are not trained to work with high voltage equipment, do not attempt to use this procedure!

Tools Required:
Multimeter
Temperature Calibration Plug

Follow the steps below and refer to the attached drawing when troubleshooting thermistors in your BVS-S3. You may stop after any step if the problem has been resolved.

1. Turn **OFF** the **NICAD** battery switch and move the **RUN/STANDBY** switch to the **STANDBY** position. These switches are located on the top of the right-hand side of the chassis.

2. Unplug **ALL** of the black load current lead connector(s) from the sockets located at the top left-hand side of the cabinet. **NOTE: The button on the connector must be depressed to release the latch!**

3. Check the operation of the thermistors by entering the diagnostic mode. Press B B A D C to enter the Diagnostic Mode, then press 3, 4, 5, and 6 to display the corresponding thermistor readings on the BVS.

4. If there is a problem with one or more of the readings, unplug the thermistor connector and check the resistance between screw terminals 1 & 2, 2 & 3, 4 & 5, and 5 & 6. The resistance should be approximately 10 KΩ at 25° C (77° F). If the temperature is colder, the resistance should be higher and vice versa. If the resistance is not approximately 10 kilo-ohms, the thermistor is bad and needs to be replaced.

5. Insert the Temperature Calibration Plug in the thermistor socket. Measure the voltage between screw terminals 1 & 2, 2 & 3, 4 & 5, and 5 & 6. The voltage between these terminals should be 1.00 V +/- 0.05 V. If the voltage is not approximately 1.00 V, the motherboard needs to be replaced. **NOTE**: If a Temperature Calibration Plug is not available, the thermistors should be inserted. The 1.00 V measurement will vary if the thermistor temperatures are not 25° C (77° F).

6. With the Temperature Calibration Plug inserted, measure the voltage on the wires in the 5 pin red connector, J3 (see diagram), on the A/D board with respect to chassis ground. The black wire is ground and a voltage reading of 0 V is expected. A voltage reading of 0.5 V is expected on the other wires. If any of the voltages is not approximately 0.5 V (excluding the black wire), proceed to the next step. **NOTE**: If a Temperature Calibration Plug is not available, the thermistors should be inserted. The 0.5 V measurement will vary if the thermistor temperatures are not 25° C (77° F).

7. Unplug the 5 pin red connector, J3 (see diagram), from the A/D board and measure the voltage on the wires in the connector on the motherboard, which is at the other end of the harness. The voltage on the black wire should be 0 V and 0.5 V on the other wires. If any of the voltages is not approximately 0.5 V (excluding the black wire), the thermistor pot of the offending thermistor (see diagram for location) needs to be adjusted. The pot is adjusted to obtain a 0.5 V reading. If a 0.5 V reading cannot be obtained, the motherboard needs to be replaced. **NOTE**: If a Temperature Calibration Plug is not available, the thermistors should be inserted. The 0.5 V measurement will vary if the thermistor temperatures are not 25° C (77° F).

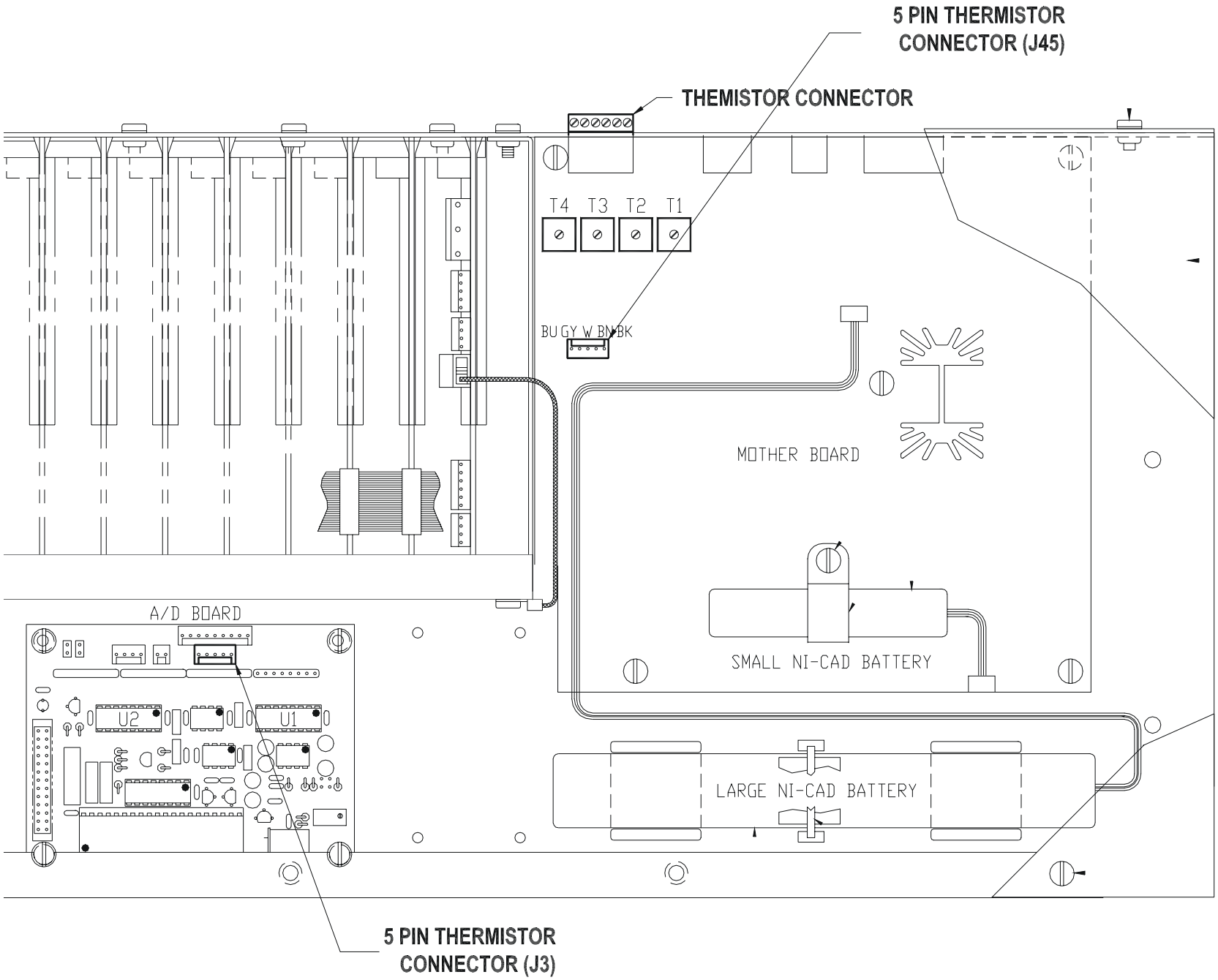
8. Reinstall the connector on the A/D board. Then, firmly seat all ICs in sockets on the A/D board. Re-enter the Diagnostic Mode (press B B A D C) and press the appropriate button for the offending thermistor to check for the correct measurement.

9. Shut down BVS by removing the Low Voltage Power Input Connector. Remove and replace U1 and U2 on the A/D board (see diagram). Be sure to orient U1 and U2 correctly (the marking should be in the upper, right corner). Power up system by inserting the power input connector. Enter the Diagnostic Mode and check for the correct measurement.

10. If the temperatures are still reading incorrectly, shut down the system and replace the A/D board. Power up system by inserting the power input connector. Enter the Diagnostic Mode and check for the correct measurement.

11. When the temperature readings are correct, replace chassis cover, reinsert the load leads (upper left corner of the BVS) and turn the **NiCad** switch to the **ON** position and the **RUN/STANDBY** switch to the **RUN** position.

Please call **BTECH Inc.** Technical Support if any questions arise.


5 PIN THERMISTOR
CONNECTOR (J45)
THEMISTOR CONNECTOR
T4 T3 T2 T1
BU GY W BN BK
MOTHER BOARD
A/D BOARD
U2
U1
SMALL NI-CAD BATTERY
LARGE NI-CAD BATTERY
5 PIN THERMISTOR
CONNECTOR (J3)