



## *Service Note 1092-204*

# **Changing the EPROM for the Turbo-Pump Controller in the Helium-3 Option**

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Quantum Design has found that the Helium-3 option randomly fails after a voltage spike, and the problem is not resolved by unplugging the voltage supply line for 10 seconds. Investigation has shown that the failure originates from the Helium-3 turbo-pump controller EPROM, which has reverted to the factory default startup settings. Because the default settings are for a handheld tool that communicates through J2, the controller can no longer communicate with the PPMS computer through the serial port. This situation can be remedied by replacing the controller EPROM with a new version (Rev. 9507\_S10) that has a startup default to RS232. You can obtain this EPROM by contacting Customer Service at Quantum Design.<sup>1</sup>

**Note:** This service note and the new EPROM revision apply only to the turbo-pump controller of the Helium-3 option, not to the controller for the Turbo Pump High Vacuum option.

The failure symptoms for the controller EPROM include incorrect readings for the turbo-pump temperature and speed. You also will see an error message when the Helium-3 option is activated ("Pump Failure: Illegal answer from pump. No answer returned.") or when you attempt to run **He3GasMon**<sup>2</sup> ("Pump: No answer returned."). The Helium-3 option will not run at all. **He3GasMon**, the gas-monitoring software, will show the temperature of the pump as a random number (generally above 5000 °C).

Please note that several types of connectivity problems could cause the same symptoms. One example is a problem with power connections, such as those to the diaphragm pump assembly. Another example is the RS232 connection between the PC and the turbo-pump controller. Therefore, before you decide that your pump controller has failed, check the power connections. Also, use the Helium-3 connection diagram to verify that the black control cable connections have been made properly.

Instructions for installing the new EPROM revision are on page 2 of this note.

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<sup>1</sup> Quantum Design Service Engineers: If you have been using the Varian handheld tool, you will no longer need it after you replace the EPROM.

<sup>2</sup> **He3GasMon** is located in C:\QdPpms\He3Option\He3GasMon.exe.

## **Installing EPROM Rev. 9507\_S10**

1. Deactivate the Helium-3 option:
  - a. In the MultiVu dropdown menus, select **Utilities >> Option**.
  - b. When the **Option Manage** dialog opens, select Helium3 and move it from the **Active Option** panel to the **Available Option** panel by clicking on the << **Deactivate** button.
2. Unplug the Helium-3 power cord.
3. Remove the pump-controller assembly from the Helium-3 cart, and then remove the controller from the assembly.
4. Open the controller cover and remove the four mounting bolts for the plate that holds the very large transformer. Save the bolts for reinstallation of the plate.
5. Carefully lift up the transformer and its mounting plate. Locate the EPROM, which is in the socket labeled U26, underneath the plate. Make a note of the orientation of the EPROM so that you will be able to insert the new one correctly.
6. Remove and discard the old EPROM.
7. Insert the new EPROM (Rev. 9507\_S10).
8. Verify that the orientation of the new EPROM is the same as the original and that all pins are completely inserted into their sockets.
9. Insert and screw in the bolts that hold the transformer and its mounting plate in the controller.
10. Close the controller cover and remount it into the Helium-3 controller assembly.
11. Plug in the power to the Helium-3 option.
12. Verify that all the cables are connected properly and that the power cable to the controller is connected to the correct inlet and is firmly inserted.
13. Start the Helium-3 gas monitor program (**He3GasMon**) and verify that it displays reasonable values for the turbo-pump speed and temperature.