

1. PRINCIPLE

The performance of thermal cycler units used for incubation of enzymatic reactions is critical to the quality control and quality assurance of all the enzymatic steps required for reverse transcription, polymerase chain reaction and cycle-sequencing reactions as well as other research applications. The PE GeneAmp 9700 is a low maintenance thermal cycler. Heating and cooling is achieved through Peltier electron transfer. Preventative maintenance for these units is not available from the manufacturer. Diagnostic programs afford in-lab performance checks. Routine rate and cycle performance and cleaning is performed to ensure that the units are running efficiently at all times.

2. STANDARD/CONTROL

- 2.1. The Rate Performance Test shall indicate, "Pass".
- 2.2. The Cycle Performance Test shall indicate, "Pass".
- 2.3. If the unit fails to pass either diagnostic test, remove from use. Contact Perkin Elmer for service. Document corrective action taken.

3. PROCEDURE**3.1. Rate Performance Test**

- 3.1.1. Perform this diagnostic test monthly and whenever performance is suspect.
- 3.1.2. Turn on the power to the unit.
- 3.1.3. From MAIN menu select "UTIL" for utilities.
- 3.1.4. Select "Diag" from utilities screen for "diagnostics."
- 3.1.5. Select "System."
- 3.1.6. Select "Rate."
- 3.1.7. Insert a 96-well plate and cover when prompted.
- 3.1.8. Select "Cont" to continue.
- 3.1.9. The Rate test will begin when the cover reaches the required temperature.
- 3.1.10. At the conclusion of test, the display will indicate "PASS" or "FAIL" as well as the rates of heating and cooling.
- 3.1.11. Record status and rates on the Thermal Cycler QC Log.

3.2. Cycle Performance Test

- 3.2.1. Perform this diagnostic test monthly and whenever performance is suspect.
- 3.2.2. Ensure that the unit has power.
- 3.2.3. From MAIN menu select "UTIL" for utilities.
- 3.2.4. Select "Diag" from utilities screen for "diagnostics."
- 3.2.5. Select "System."
- 3.2.6. Select "Cycle."
- 3.2.7. Insert a 96-well plate and cover when prompted.
- 3.2.8. Select "Cont" to continue.
- 3.2.9. The Cycle test will begin when the cover reaches the required temperature.
- 3.2.10. At the conclusion of the test, the display will indicate "PASS" or "FAIL" and average cycle time.
- 3.2.11. Record status and cycle time on the Thermal Cycler QC Log.

3.3. Cleaning

- 3.3.1. Wipe all surfaces of the unit with 10% bleach.
- 3.3.2. Wipe with 70% ethanol to remove bleach and prevent corrosion.
- 3.3.3. Using cotton-tipped applicators, clean out the heater cover and main chamber wells with 10% bleach followed by 70% ethanol.
- 3.3.4. Record on the Thermal Cycler QC Log.

4. ATTACHMENTS

- 4.1. Thermal Cycler QC Log.

5. REFERENCES

- 5.1. Perkin Elmer GeneAmp 9700 Product Manual.