

TRI-MATIC

MODEL TFRW



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Recommended Test Procedure

This test was written for a Blanketrol device. It can be used for other devices, but the displays and buttons that are referenced in the procedure may differ.

Set up the TRI-MATIC, Model TFRW, in series with the device to be tested, as recommended in the instruction guide. Perform all verification tests in a temperature controlled room between 68°F and 75°F (20°C and 24°C).

Manual Mode Tests

1. Turn the device to be tested on.
2. Adjust the set point of the device to 10°C/50°F.
3. Depress "MANUAL CONTROL" switch. The compressor should turn on and the status indicator should display "COOLING".
4. The flow should be above 36 GPH/136 LPH.
5. Set the TRI-MATIC temperature to 28°C/82.4°F. The "patient temperature" display on the device should read 28°C/82.4°F ($\pm 0.25^\circ\text{C}/\pm 0.5^\circ\text{F}$). Repeat the same procedure for the 37°C and 42°C temperatures on the TRI-MATIC.
6. When the device status indicator displays "AT SETPT", continue to step 7.
7. To check the water temperature accuracy, record the thermometer well temperature and the water temperature display reading every 30 seconds for 5 minutes. The average of these readings should not vary from the displayed temperature by more than $\pm 1.5^\circ\text{C}/3^\circ\text{F}$.
8. Change the set point of the device to 40°C/104°F.
9. Depress the "MANUAL CONTROL" switch. The compressor should turn off (if it was running) and the status indicator should display "HEATING".
10. When the device status indicator displays "AT SETPT", continue to step 11.
11. To check the water temperature accuracy, record the thermometer well temperature and the water temperature display reading every 30 seconds for 5 minutes. The average of these readings should not vary from each other by more than $\pm 1.5^\circ\text{C}/\pm 3^\circ\text{F}$.
12. Continue on to step 13.

Automatic Mode Tests

13. Set the TRI-MATIC temperature to 37°C/98.6°F.
14. Adjust the set point of the device to 35°C/95°F.
15. Depress the "AUTO CONTROL" switch. The compressor should turn on and the status indicator should display "COOLING".
16. Adjust the set point of the device to 38°C/100°F.
17. Depress the "AUTO CONTROL" switch. The compressor should turn off and the status indicator should display "HEATING".
18. Set the TRI-MATIC temperature to 28°C/82.4°F. The status indicator should display "CK PROBE". The device's display should also go blank and the audible alarm should sound.
19. Depress the "SILENCE ALARM" switch.
20. Set the TRI-MATIC temperature to 37°C/98.6°F.
21. Reset the device by depressing the "TEMP SET" switch first. Then depress the "AUTO CONTROL" switch.

Monitor Only Mode Test

22. Depress the "MONITOR ONLY" switch. The status indicator should display "MONITOR".
23. Set the TRI-MATIC temperature to 28°C/82.4°F. The "patient temperature" display on the device should read 28°C/82.4°F ($\pm 0.25^\circ\text{C}/\pm 0.5^\circ\text{F}$). Repeat the same procedure for the 37°C and 42°C temperatures on the TRI-MATIC.

If the device that was tested did not meet specifications, refer to the troubleshooting guide in the back of the device's technical manual. For technical assistance, contact Gentherm Medical, LLC, Technical Services at 1-800-989-7373.

Gentherm Medical, LLC, reserves the right to make equipment changes and improvements which may not be reflected in this operating instruction guide.



TRI-MATIC

MODEL TFRW

INSTRUCTION GUIDE

GENERAL DESCRIPTION

The TRIMATIC Model TFRW Tester provides a convenient means of verifying every-hyper-hypothermia system functions in accordance with the required manufacturer's specifications, prior to patient therapy. The TRI-MATIC Tester may be used with all Gentherm Medical hyper-hypothermia systems or, by means of adapters, with other types of systems.

TRI-MATIC TESTS/OBJECTIVES

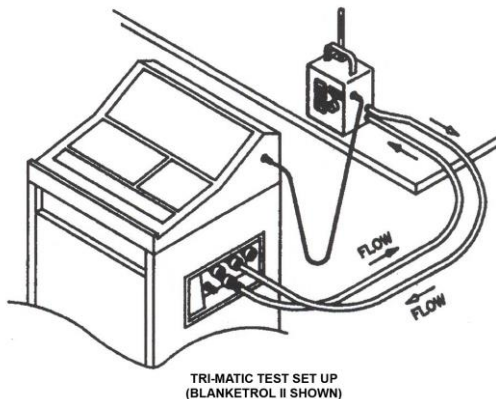
1. Flow Rate - To verify the machine's water flow is within machine specifications. Low flow will result in poor quality thermal transfer. Possible sources of defects for low flow include: pump, pump impeller housing, water lines, quick disconnect fittings or restricted water filter. Do not use on machines with water pressure over 15 PSI.
2. Water Temperature Accuracy - The thermometer well, when filled with water, will act as a coupling medium between the thermometer well water and the machine's system water for the temperature sensing device. This will enable an accurate measurement of the water temperature as it comes from the hyper-hypothermia machine. This test ensures the water temperature matches the displayed temperature on the hyper-hypothermia machine. This test can be initiated in either manual or automatic control modes.
3. Microprocessor/Control Accuracy - Through the use of three fixed resistors ($\pm 0.1\%$), temperatures can be simulated to check the different temperature points of the hyper-hypothermia system. In the automatic control mode, this test ensures the machine responds properly to patient temperature. In the manual or monitor only modes, this test ensures the patient or water temperature matches the patient displayed temperature on the hyper-hypothermia machine. This test is for systems that utilize 400 series probes only. Possible sources of simulated temperature error include: probe jack or microprocessor board malfunction.

REQUIRED EQUIPMENT

1. Thermometer. Accuracy of any of the aforementioned should be equal to or less than $\pm 1^\circ\text{F}$ over a range of $40^\circ\text{F} - 110^\circ\text{F}$ or $\pm 0.5^\circ\text{C}$ over a range of $5^\circ\text{C} - 45^\circ\text{C}$.
2. Inlet and Outlet Hose Assembly. For more accurate testing, use only $3/8"$ inner diameter hose. To minimize temperature loss, hoses should be less than 5' in length. (Gentherm Medical Cat. No. TM6 for Gentherm machines and Cat. No. TM7 for some competitors' machines).
3. Probe Jack Extension. Dual male mono jacks - 10' length. (Gentherm Medical Cat. No. TM4A for Gentherm and most competitors' machines).

TRI-MATIC TEST SET UP

1. Place TRI-MATIC on a level surface or mount on IV pole by using Cat. No.UMC-1.
2. Fill thermometer well with water to provide "coupling" medium for water temperature test. Do not overfill.
3. Insert thermometer or probe of choice into thermometer well.
4. Connect water hoses in series with hyper-hypothermia machine.
5. Connect Probe Jack Extension into both devices.
6. Verify Flow Rate, Water Temperature and Simulated Patient Temperature Points.



Refer to the manufacturer's technical manual for test procedure details and performance specifications. Modifications to the procedure may be necessary for other types of hyper-hypothermia systems. Perform all verification tests in ambient temperatures 68°F - 75°F (20°C - 24°C).

If the hyper-hypothermia machine measurements do not meet specifications, refer to the Troubleshooting Guide in the back of the manufacturer's technical manual.

For technical assistance, contact Gentherm Medical, LLC, Technical Services at 1-800-989-7373.

TRI-MATIC TESTER STORAGE

1. Remove Probe Jack Extension Cord from TRI-MATIC Tester.
2. Drain water from the thermometer well by turning the TRI-MATIC Tester upside down.
3. Remove the hose assemblies and drain water from internal components by turning the TRI-MATIC Tester on its side (barbed fittings facing down).
4. Wipe all water off the exterior of the TRI-MATIC Tester.
5. Place hose assembly and Probe Jack Extension in dry and convenient storage place.

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