

Preventive Maintenance Checklist

Model 245 Fluid Warmer



PM # _____
Date: _____

The operating temperature and alarms should be tested at least every 6 months or according to institutional protocol.

Operating temperature: _____ °C
(Specification = 41°C±1)

Over-temperature alarm points: _____ °C
(Specification = 43°C±1 and 46°C [44-49°C])

Testing instructions are listed below. Refer to the Ranger Service Manual for complete testing and service details.

Test Setup

CAUTION

Temperature adjustments cannot be made to the Ranger warming unit. If the test shows the temperature is out of specification, please call Arizant Healthcare Technical Support at 1-800-733-7775.

TOOLS AND EQUIPMENT

- Thermocouple: 0.005" lead or smaller
- Calibrated thermocouple temperature monitor
- Aluminum tape
- Ranger standard flow warming set
- Phillips screwdriver
- Saline/water

1. Use aluminum tape to affix a thermocouple to the top surface of the Ranger warming cassette as shown in Figure 1.
2. Slide the warming cassette into the slot of the Ranger warming unit.

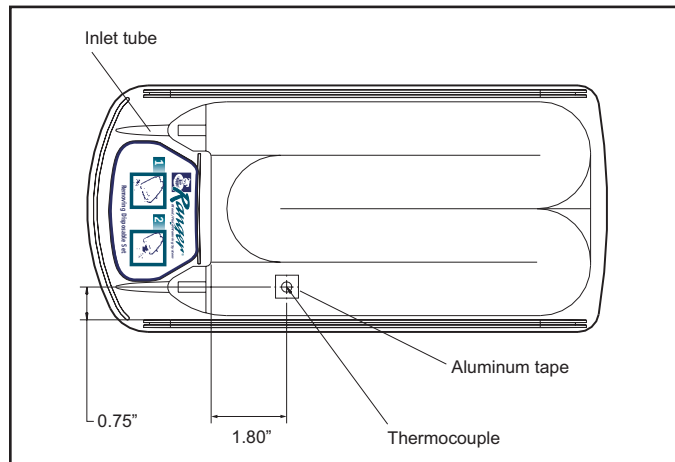


FIG. 1: RANGER STANDARD FLUID WARMING CASSETTE

3. Using room temperature saline/water, prime the cassette per instructions included with it.

NOTE: To achieve correct results, fluids must be administered into the **inlet** tube, NOT into the outlet tube.

4. Close patient line with white clamp to stop flow.

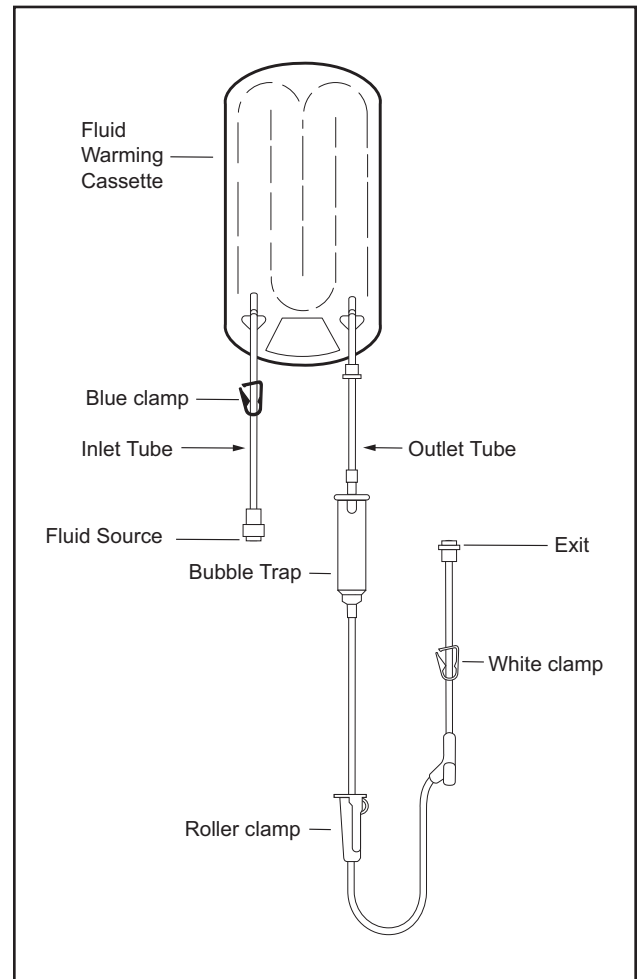


FIG. 2: RANGER STANDARD FLOW WARMING SET

Testing the operating temperature

1. Perform Test Setup.
2. Turn the Ranger unit ON and allow it to warm up for 5 minutes.
3. The Ranger unit display should read 41°C±1. Note the temperature on the thermocouple temperature monitor. If the temperature reading is not 41°C±1, call Arizant Healthcare Technical Support.

NOTE: Most hand-held temperature meters have a ±1°C tolerance.

Testing the over-temperature alarm points (43° and 46°C)

The over-temperature alarm test causes the Ranger unit to go into an over-temperature test mode by manually overriding the primary control system and engaging the heaters. The Ranger system is very responsive to heater input; therefore the test procedures are technique sensitive. Read instructions thoroughly before beginning these tests.

The first alarm point at 43°C alerts user to the rise in temperature (see step 3). At the 46°C secondary alarm set point, the unit cuts power to the heaters (see step 4). Please note that due to the heaters' rapid response, you may see temperature readings drift within the range of 44-49°C.

1. Perform Test Setup.
2. Turn the Ranger unit ON and allow it to stabilize at normal operating temperature (41°C±1) for 5 minutes.

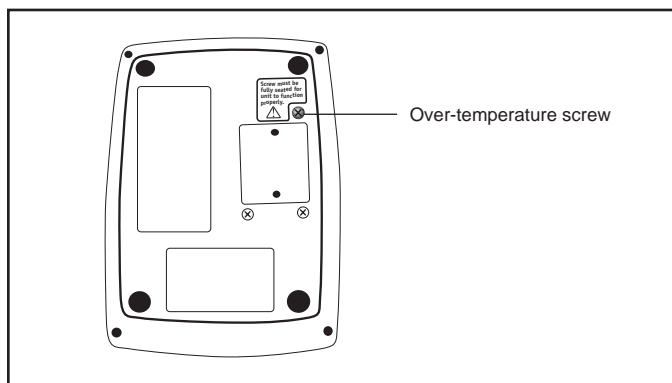


FIG. 3: RANGER OVER-TEMPERATURE SCREW

3. Slowly loosen the over-temperature screw on the bottom of the Ranger unit (see Figure 3). Listen for a slight click as the microswitch opens. **Stop turning the over-temperature screw as soon as you hear the click.** This unit is now in over-temperature test mode, and the temperature output of the unit should begin to rise. When the display reads 43°C, verify that an audible alarm sounds, the alarm light illuminates, and the display alternately flashes "HI" and the plate temperature.

4. Listen for the power relay to click between 44-49°C (you can feel the click when holding the lower left corner of the unit as you face the front display). The click signifies the secondary alarm trip point and signals that power to the heaters has been shut off. The over-temperature alarm sounds, the alarm light illuminates, and the alphanumeric display alternately reads "HI" and the plate temperature. Watch the thermocouple temperature monitor to determine the unit's peak temperature output (less than 1 minute). The temperature reading on the monitor should peak between 44-49°C.

NOTE: If the temperature displayed on the thermocouple monitor exceeds 49°C during the test, tighten the over-temperature test screw on the bottom of the Ranger unit, unplug it, and run cold fluids through the warming cassette. This returns the unit to normal operating temperature. Call Arizant Healthcare Technical Support.

5. The secondary alarm is designed to latch. Verify this feature by momentarily turning off the power switch, then turning it on again. The Ranger unit should continue alarming throughout this sequence.
6. Securely tighten the over-temperature screw, turn off the Ranger unit, and unplug the unit. Once power is cut to the Ranger unit, the alarm will cease. The unit is ready to return to service after it cools to normal operating temperature (approximately 20-30 minutes).



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10393 West 70th Street, Eden Prairie, MN 55344 USA
TEL 800-733-7775 • 952-947-1200
FAX 800-775-0002 • 952-947-1400
www.rangerfluidwarming.com

Authorized Representative in the European Community (as defined in Article 14 of the Medical Device Directive: 93/42/EEC):
Actamed Limited, Calder Island Way, Wakefield, WF2 7AW, United Kingdom
TEL (44) 1924 200550
FAX (44) 1924 200518

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