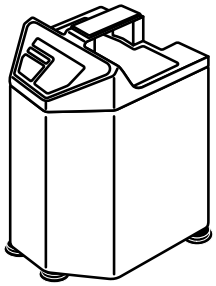


3M
Bair Hugger™
Model 505 Warming Unit

Service Manual

Warning: **Electrical Shock Hazard. There are electrically live parts within the warming unit when it is connected to a power source, even when the switches are in the *OFF* or *STANDBY* position.**

Please forward to Biomedical Engineering Department

UNITÉ DE GESTION DE TEMPÉRATURE BAIR HUGGER MODÈLE 505 SERVICE MANUEL

Mise en garde : Risque d'électrocution. Certaines pièces sont électriquement chargées dans les appareils de réchauffement, lorsque ceux-ci sont connectés à une source d'alimentation et ce, même si l'appareil est en position ***OFF*** (arrêt) ou ***STANDBY*** (attente).

A transmettre au Service d'ingénierie biomédicale

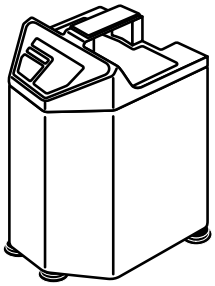
BAIR HUGGER MODELL 505 TEMPERATURMANAGEMENTGERÄT SERVICE GEBRAUCHSANLEITUNG

Vorsicht: Gefährliche elektrische Spannung. In einem an das Stromnetz angeschlossenen Wärmegerät stehen bestimmte elektrische Komponenten auch dann unter Strom, wenn der Schalter auf ***AUS*** oder ***BEREITSCHAFTSMODUS*** geschaltet ist.

Bitte an die Abteilung für biomedizinische Technik weiterleiten

Bair Hugger™

Total Temperature Management™ System



3M

Bair Hugger

Model 505 Warming Unit

Service Manual

Table of Contents

Introduction

Description of the Total Temperature Management™ System

The 3M™ Bair Hugger™ brand Total Temperature Management system consists of a Bair Hugger forced-air temperature management unit (with available rolling stand and sheet clip) and disposable components, including Bair Hugger forced-air blankets, 3M™ Bair Paws™ patient warming gowns, and the 3M™ 241™ blood/fluid warming set. You can use the Model 505 temperature management unit in all clinical settings including the operating room to provide patient temperature management.

The Bair Hugger warming unit is attached to the blanket or gown by means of a flexible hose. Warm air is generated in the unit and flows through the hose and into the blanket or gown. Depending on the model, the blanket or gown is placed either around, over, or underneath the patient. Small perforations on the blanket or gown allow the warm air to be dispersed over the patient. For fluid warming applications, the Model 241 blood/fluid warming set is inserted in the warming unit hose. When the unit is turned ON and a temperature setting is selected, warm air flows over the Model 241 tubing and warmed fluid exits from the distal end of the tubing. For additional information on Bair Hugger blankets, Bair Paws gowns, the 241 warming set, or other accessories visit us online at bairhugger.com or bairpaws.com.

This manual describes how to service the Model 505 warming unit, and includes maintenance instructions and specifications. For information about using Bair Hugger blankets, the 241 blood/fluid warming set, or Bair Paws gowns with Bair Hugger units, refer to the “Instructions for Use” included with each of these disposable components.

Indications

The Bair Hugger temperature management system is intended to prevent and treat hypothermia. In addition, the temperature management system can be used to provide patient thermal comfort when conditions exist that may cause patients to become too warm or too cold. The temperature management system can be used with adult and pediatric patients.

Contraindications

Do not apply heat to lower extremities during aortic cross-clamping. Thermal injury may occur if heat is applied to ischemic limbs.

Definition of Symbols


ON/STANDBY

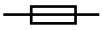
ON (used on isolation switch)


OFF (used on isolation switch)


ON/OFF push button switch


Temperature Control


An equipotentiality plug (grounded) conductor other than a protective earth conductor or a neutral conductor, providing a direct connection between electrical equipment and the potential equalization busbar of the electrical installation.
Please consult IEC 60601-1; 2005 for requirements.


Fuse


CAUTION


Dangerous Voltage


Type BF Equipment (patient applied)

Voltage, Alternating Current (AC)


This system is subject to European WEEE Directive 2002/96/EC. This product contains electrical and electronic components and must not be disposed of using standard refuse collection. Please consult local directives for disposal of electrical and electronic equipment.


Protective earth ground


No free hosing


Date of manufacture

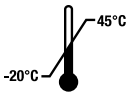

Manufacturer


Consult instructions for use


Follow instructions for use

Recycle to avoid environmental contamination. This product contains recyclable parts. For information on recycling, please contact your nearest 3M Service Center for advice.

Keep dry



Temperature limit

Explanation of Signal Word Consequences

WARNING:

Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION:

Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE:

Indicates a situation which, if not avoided, could result in property damage only.

WARNINGS

1. Do not leave patients with poor perfusion unmonitored during prolonged warming therapy sessions. Thermal injury may result.
2. The Bair Hugger temperature management unit has been designed to operate safely ONLY with 3M Patient Warming disposable components. Use with other products may cause thermal injury. (To the full extent permitted by law, the manufacturer and/or importer declines all responsibility for thermal injury resulting from the unit being used in conjunction with non-3M Patient Warming products.)
3.  Do not warm patients with the temperature management unit hose alone. Thermal injury may result. Always connect the hose to a Bair Hugger blanket or Bair Paws gown before providing therapy.
4. Do not place the non-perforated side of the blanket on the patient. Thermal injury may result. Always place the perforated side (the side with small holes) towards the patient.
5. Do not continue temperature management therapy if the Over-temp indicator light illuminates and the alarm sounds. Thermal injury may result. Unplug the unit, and contact a qualified service technician.

6. Do not continue 241 blood/fluid warming therapy if the Over-temp indicator light illuminates and the alarm sounds. Immediately stop fluid flow, and discard the blood/fluid warming set. Unplug the temperature management unit, and contact a qualified service technician.
7. Do not use a forced-air warming device over transdermal medication. Increased drug delivery and patient injury or death may occur.
8. Do not allow the patient to lie on the warming unit hose or allow the hose to directly contact the patient's skin during patient warming; thermal injury may result.
9. Reusable blankets made from woven fabric, or blankets without discrete, visible holes, can cause the safety system of this unit to fail, which may result in serious thermal injury. This warming unit has been designed to operate safely ONLY with Bair Hugger blankets and Bair Paws gowns.
10. Do not connect a Bair Hugger blanket, 241 blood/fluid warmer, or Bair Paws gown to the warming unit if it has been cut or damaged; thermal injury may result.
11. Do not use a Bair Hugger blanket to transfer or move the patient; injury may result.To reduce the risks associated with hazardous voltage and fire:
    - keep power cord visible and accessible at all times. The plug on the power cord serves as the disconnect device. The wall socket outlet shall be as close as practical and shall be easily accessible.
    - use only the power cord specified for this product and certified for the country of use.
    - do not allow the power cord to get wet.
    - do not use the warming unit when it appears the warming unit, power cord or any component is damaged. Contact 3M Patient Warming Technical Support at 1-800-733-7775.
    - this equipment must only be connected to a supply mains with protective earth.
12. To reduce the risks associated with exposure to biohazards always perform the decontamination procedure prior to returning the warmer for service and prior to disposal.
13. Do not retain the patient using a warming blanket alone, as injury may result. Use a draw, sheet safety strap, or other means to retain the patient.
14. Do not modify this equipment without authorization of the manufacturer.
15. To ground the Bair Hugger warming unit, only connect to receptacles marked "Hospital Only," "Hospital Grade," or a reliable grounded outlet.

⚠ CAUTIONS

1. Except for specific blanket models, Bair Hugger blankets are not sterile and are all intended for single patient use ONLY. Placing a sheet between the Bair Hugger blanket and the patient does not prevent contamination of this product.
2. Monitor the temperature and cutaneous response of patients who are incapable of reacting, communicating and/or who are without a sense of feeling every 10-20

minutes or according to institutional protocol. Monitor the patient's vital signs regularly. Adjust air temperature or discontinue therapy when the therapeutic goal is reached or if vital sign instability occurs. Notify physician of vital sign instability immediately.

3. Do not leave pediatric patients unattended during therapy.
4. Do not initiate temperature management therapy unless the temperature management unit is free from mechanical damage and is safely placed on a hard surface or securely mounted. Otherwise, injury may result.
5. To prevent tipping, clamp the Model 775 temperature management unit to an IV pole at a height that provides stability. We recommend clamping the unit no higher than 44" (112 cm) on an IV pole with a minimum 28" (71 cm) diameter wheelbase. Failure to do so may result in IV pole tipping, catheter site trauma, and patient injury.
6. Electrical shock hazard. Do not disassemble the temperature management unit unless you are a qualified service technician. There are electrically live parts within the unit when it is connected to a power source, even when the unit is in *Standby* mode.
7. To reduce the risks associated with environmental contamination follow applicable regulations when disposing of this device or any of its electronic components.

NOTICES

1. The Bair Hugger temperature management unit meets medical electronic interference requirements. If radio frequency interference with other equipment should occur, connect the unit to a different power source.
2. Federal law (USA) restricts this device to sale by or on the order of a licensed healthcare professional.
3. To avoid Bair Hugger warming unit damage:
   - do not immerse the Bair Hugger warming unit or warming unit parts or accessories in any liquid or subject them to any sterilization process.
   - do not use solvents such as acetone or thinner to clean the warming unit; avoid abrasive cleaners.
   - clean warming unit exterior with soft cloth using plain water or a mild, all-purpose or nonabrasive cleaner.

Read Before Servicing Equipment

The repair, calibration, and servicing of the warming unit requires the skill of a qualified medical equipment service technician who is familiar with good practice for medical device repair. If service is designated as not requiring manufacturer's attention, the technical information is provided in this service manual or will be provided, on request, by 3M Patient Warming

Refer to Service Manual

Perform all repairs and maintenance in accordance with the instructions in this service manual.

Safety Inspection

Perform a safety inspection after making repairs to the Bair Hugger warming unit and before returning the warming unit to service. A safety inspection should include a test of the operating temperatures (described in this service manual), the Over Heat alarm system, as well as a leakage current test.

Proper Use and Maintenance

3M Patient Warming assumes no responsibility for the reliability, performance, or safety of the equipment if:

- Modifications or repairs are performed by non-authorized personnel.
- The equipment is used in a manner other than that described in the Operator's or Service Manuals.
- The equipment is installed in an environment that does not meet the relevant grounding requirements.

Service Procedures

Cabinet Cleaning

Tools/Equipment

Soft cloth, *lightly* dampened with water and mild detergent.

Method

1. Disconnect the warming unit from the power source.
2. Wipe the exterior of the warming unit clean.

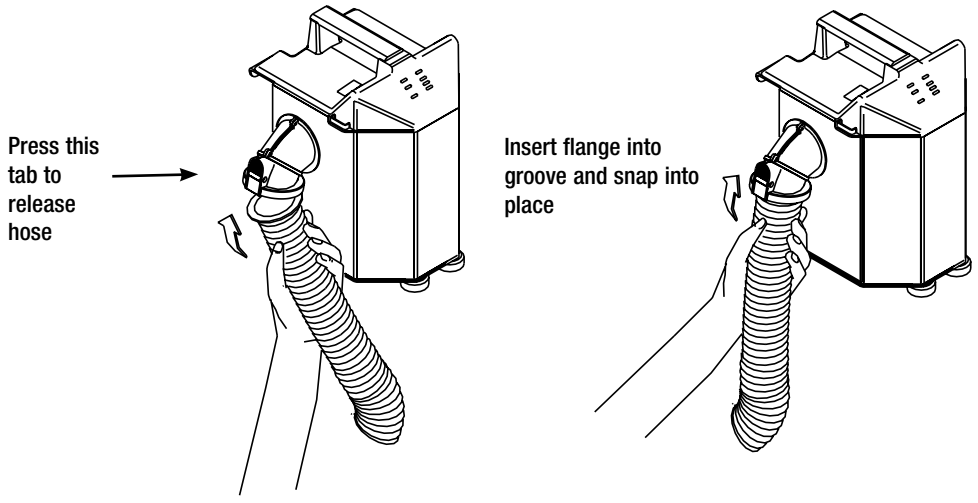
CAUTION: *Do not use a dripping wet cloth when cleaning the warming unit. Moisture may seep into the electrical contacts and damage the components. Also, do not use alcohol or other solvents to clean the cabinet. Solvents may damage the labels and other plastic parts.*

Hose Replacement

Method

1. Press the tab on the blower outlet to release the existing hose.
2. Attach the replacement hose by inserting the flange end at a 45° angle in the grooved blower outlet, then snap the hose into place. (See Figure 1.)

Figure 1. Attaching the Replacement Hose



Power Fuse Replacement

The power fuses are located in the power entry module. A spare fuse is located in the fuse carrier (see Figure 2).

Tools/Equipment

Phillips-head screwdriver

Small slotted screwdriver

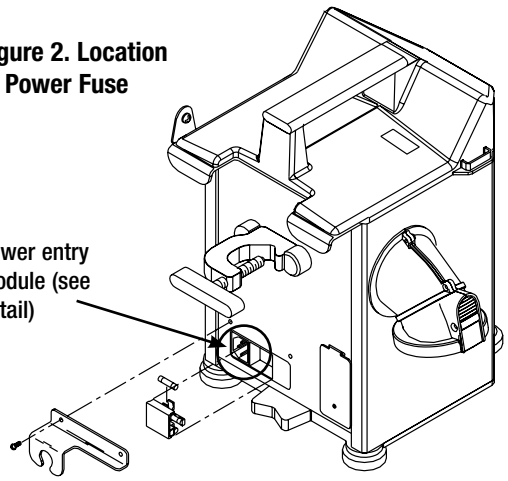
Method

1. Disconnect the warming unit from the power source.
2. Remove the 2 Phillips-head screws that secure the cord retainer. Remove the power cord.
3. Locate the fuse carrier in the center of the power entry module (see Figure 2).
4. Use the small screwdriver to remove the fuse carrier from the power entry module.
5. Remove the blown fuse(s) from the fuse carrier.
6. Place the new fuse(s) (as marked) into the fuse carrier.

CAUTION: *Replace only with the fuse capacity and type that is indicated on the adjacent label.*

7. Replace the fuse carrier into the power entry module.
8. Reattach the power cord.
9. Replace the 2 Phillips-head screws to reattach the cord retainer.
10. Reconnect the warming unit to the power source.
11. Record the maintenance action taken and the hours of operation (read from the hour meter) in the *Maintenance Log* section.

Figure 2. Location of Power Fuse



Control Board Fuse Replacement

Control board fuses are located on the control board. (See Figure 3.) The internal fuses on the Model 505 are for control board functions only.

The power fuses are located in the power entry module. Instructions for power fuse replacement can be found in the *Power Fuse Replacement* section.

Tools/Equipment

Phillips-head screwdriver

Method

1. Disconnect the warming unit from the power source.
2. Turn the Model 505 unit over, so that the bottom panel is facing up.
3. Using the Phillips-head screwdriver, remove the screw from each of the 2 front feet (bumpers) and remove the feet.
4. Remove the Phillips-head screw from the center of the upper rear panel.
5. Remove the 2 Phillips-head screws located under the bed hooks on the upper rear panel. Turn the unit right side up.
6. Lift the top cover and unhook the front of the top cover from the retainer bracket inside. The control panel is located on the underside of the top cover. See Figure 3 for location of the fuse.
7. Remove the fuse and replace with the new one.

CAUTION: *Replace only with the fuse capacity and type that is indicated on the adjacent label.*

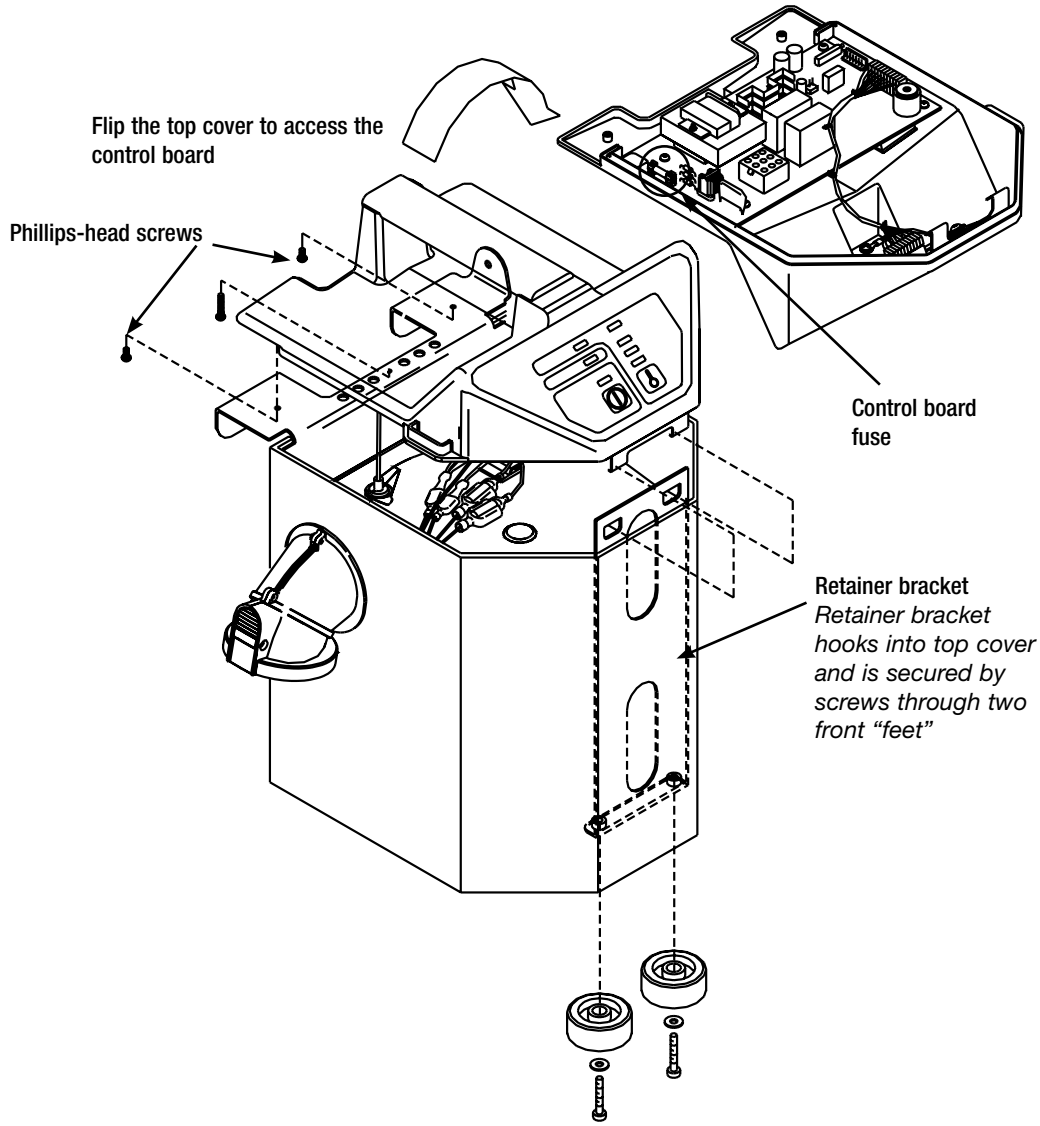
Control Board Fuse Replacement

8. Hook the retainer bracket onto the front of the top cover.
9. Place the top cover back into position. Replace all screws.

   NOTE: *It may be necessary to remove the air filter to correctly position the lower portion of the retainer bracket inside the unit.*

10. Reconnect the warming unit to the power source.
11. Record the maintenance action taken and the hours of operation (read from the hour meter) in the *Maintenance Log* section.

Figure 3. Location of Control Board Fuse



Air Filter Replacement

The air filter is mounted in the bottom of the warming unit (See Figure 4).

Tools/Equipment

Phillips-head screwdriver

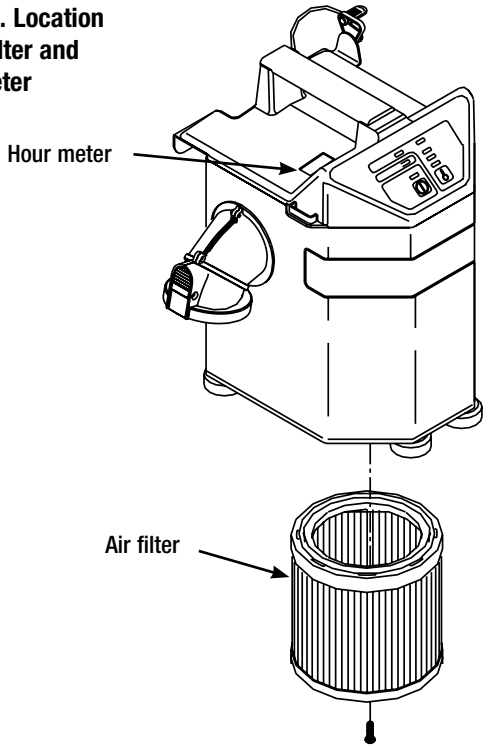
Service Frequency

Every 12 months or 500 hours of use.

Method

1. Disconnect the warming unit from the power source.
2. Remove the M6 x 25 pan-head screw on the bottom of the unit. The filter should slide out easily.
3. Record the hour meter reading and date on the new air filter label. The hour meter is located in the lower left corner of the top warning label (see Figure 4).
4. Slide the new filter into the base of the unit.
5. Replace the M6 x 25 pan-head screw on the bottom of the unit.
6. Reconnect the warming unit to the power source.
7. Record the hour meter reading and maintenance action taken in the *Maintenance Log* section.

Figure 4. Location of Air Filter and Hour Meter



Over Heat Alarm Testing

WARNING: *Perform all testing and adjustments of warming unit temperature with Temperature Test Unit Model 22110. 3M Patient Warming assumes no responsibility for the reliability, safety, or performance of the Bair Hugger system if warming unit temperature testing or adjustments are made in any other manner than that described here. Improper measurement or adjustment of the warming unit's over heat alarm setting could result in patient exposure to temperatures outside of the indicated range, and may lead to patient injury.*

NOTE: *The Temperature Test Unit Model 22110 is designed to simulate the operating characteristics of Bair Hugger blankets and Bair Paws gowns when used with Bair Hugger warming units; use of the temperature test device with any other warming system may result in imprecise readings.*

The Temperature Test Unit Model 22110 temperature readings are taken from a calibrated temperature meter.

Service Frequency

12-month intervals or 500 hours of use

Tools/Equipment

Phillips-head screwdriver

- Use a calibrated temperature meter that can accept a male subminiature connector and read a K style thermocouple (e.g., a Fluke Model 52 K/J Thermometer).
- If the connector does not fit your meter, you can remove the provided connector and attach a connector that fits your meter.

Over Heat Alarm Testing

Method

The Over Heat alarm test panel is located on the back panel of the Model 505 (see Figure 5).

1. Insert the open hose end from the warming unit in the port on the Temperature Test Unit (see Figure 6).

   NOTE: *Do not block the rear air vents on the test device.*

Figure 5. Location of Over Heat Alarm Test Panel

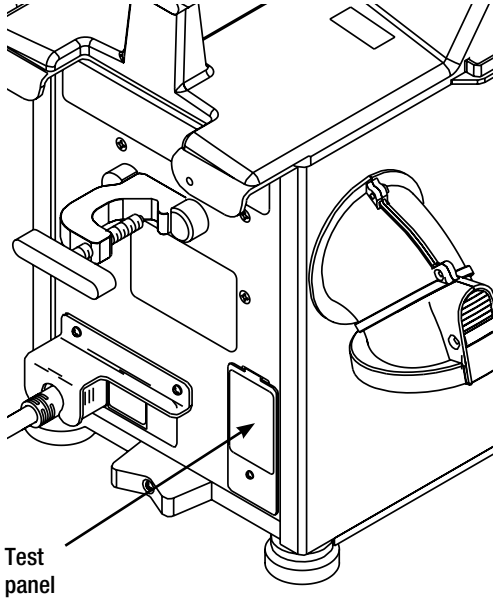
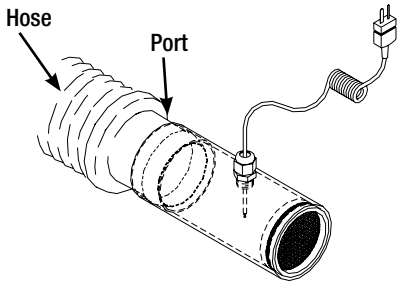


Figure 6. Temperature Test Unit Model 22110



2. Connect the warming unit to the power source and press the system ON button.

   NOTE: *The temperature setting will not affect the Over Heat test.*

3. Using the Phillips-head screwdriver, remove the screw on the alarm test panel. The unit will go into an over heat condition when the test panel is loose.

4. When the over heat alarm activates both visually and audibly, note the maximum temperature achieved. Let the alarm operate for at least 1 minute or until the temperature test kit read-out is approximately 38°C (100°F), then press Standby; the alarm should also turn off. The alarm and manual reset constitutes one cycle. Pressing ON again will restart the overheat cycle.

   NOTE: *If the alarm does not turn off, allow the unit to alarm for 1 more minute before turning the warming unit to STANDBY, then ON again.*

Over Heat Alarm Testing

5. Allow the warming unit to cycle 2 times more after the first satisfactory reading. When the alarm activates, note the alarm temperature read-out from the test kit. See Table 1 for specified limits.

   NOTE: *The first over heat cycle temperature may be slightly higher when started from a cold start.*

6. If the results of the test **did not** meet specified limits, adjust the over heat thermostat. See the *Over Heat Alarm Thermostat Adjustment* section.
7. If the results of the test **did** meet specified limits, turn the warming unit to STANDBY, and disconnect the warming unit from the power source.
8. Remove the hose end from the port on the Temperature Test Unit.
9. Retighten the screw on the over heat alarm test panel.
10. Record the maintenance action taken and hours of operation (read from the hour meter) in the *Maintenance Log* section.

Table 1. Over Heat Specification

High Temperature Thermostat Model 505
The thermostat interrupts power to the heater and activates the alarm at a preset high temperature of 53° ± 3°C (127.4° ± 5.4°F) or less at the end of the hose, as determined by the Temperature Test Unit Model 22110.

Over Heat Alarm Thermostat Adjustment

WARNING: *Improper adjustment of the warming unit's over heat alarm setpoint could result in patient exposure to temperatures outside of the indicated range, and may lead to patient injury.*

- *Closely follow instructions for thermostat adjustment.*

- *Dangerous voltages are present at the terminals of the thermostat.*
- *Always use a Temperature Test Unit Model 22110 to verify output temperatures.*
- *The Temperature Test Unit Model 22110 does not need to be calibrated. The meter it is connected to must be calibrated. Follow the calibration instructions in the meter service manual or follow standard facility calibration schedules.*
- *When in doubt, contact 3M Patient Warming Technical Support for assistance in temperature adjustment.*

Tools/Equipment

- Temperature Test Kit Model 22110
- Small slotted screwdriver
- Phillips-head screwdriver

Method

1. Insert the open hose end from the warming unit in the port on the temperature test device.

   NOTE: *Do not block the rear air vents on the test device.*

2. Connect the warming unit to the power source and turn the warming unit power ON.

   NOTE: *The temperature setting will not affect the over heat adjustment.*

3. Using the Phillips-head screwdriver, remove the screw on the alarm test panel. Lift and remove the panel.

Over Heat Alarm Thermostat Adjustment

4. Locate the over heat adjustment thermostat (see Figure 7).

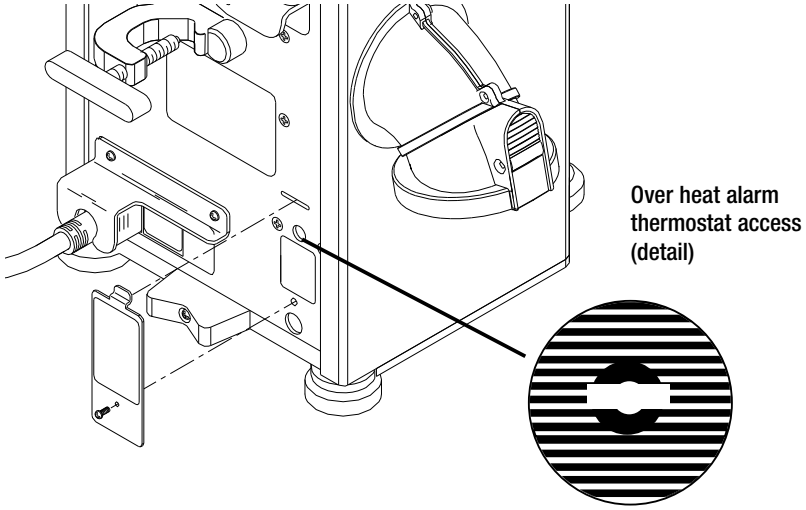
   NOTE: *Adjustment of the over heat alarm thermostat is most easily done while the temperature read-out is climbing.*

5. Use a small slotted screwdriver to adjust the thermostat.

   - If the tested alarm temperature was **below** the specified limits, turn the screwdriver CLOCKWISE to increase the alarm temperature.
   - If the tested alarm temperature was **above** specified limits, turn the screwdriver COUNTERCLOCKWISE to lower the alarm temperature.

6. Fine-tune the adjustment until the warming unit alarms at the specified temperature.
7. Manually turn the warming unit to STANDBY, then ON again. This manual reset constitutes one cycle.
8. Retest the alarm temperature to verify correct adjustment at least 2 times. Allow the warming unit to cycle before each test.
9. When the warming unit alarm setting is within the specified limit, turn the warming unit to STANDBY and disconnect it from the power source.
10. Remove the hose end from the temperature test device.
11. Replace the over heat alarm test panel. Resecure the screw.
12. Record the maintenance action taken and the hours of operation (read from the hour meter) in the *Maintenance Log* section.

Figure 7. Location of Over Heat Alarm Thermostat



Normal Operating Temperature Testing

WARNING: *Perform all testing and adjustments of warming unit temperature a Temperature Test Unit Model 22110. Arizant Healthcare Inc. assumes no responsibility for the reliability, safety, or performance of the Bair Hugger system if warming unit temperature testing or adjustments are made in any other manner than that described here. Improper measurement or adjustment of the warming unit's normal operating temperature could result in patient exposure to temperatures outside of the indicated range, and may lead to patient injury.*

Service Frequency

6-month intervals, or 500 hours of use

Tools/Equipment

Temperature Test Unit Model 22110

Method

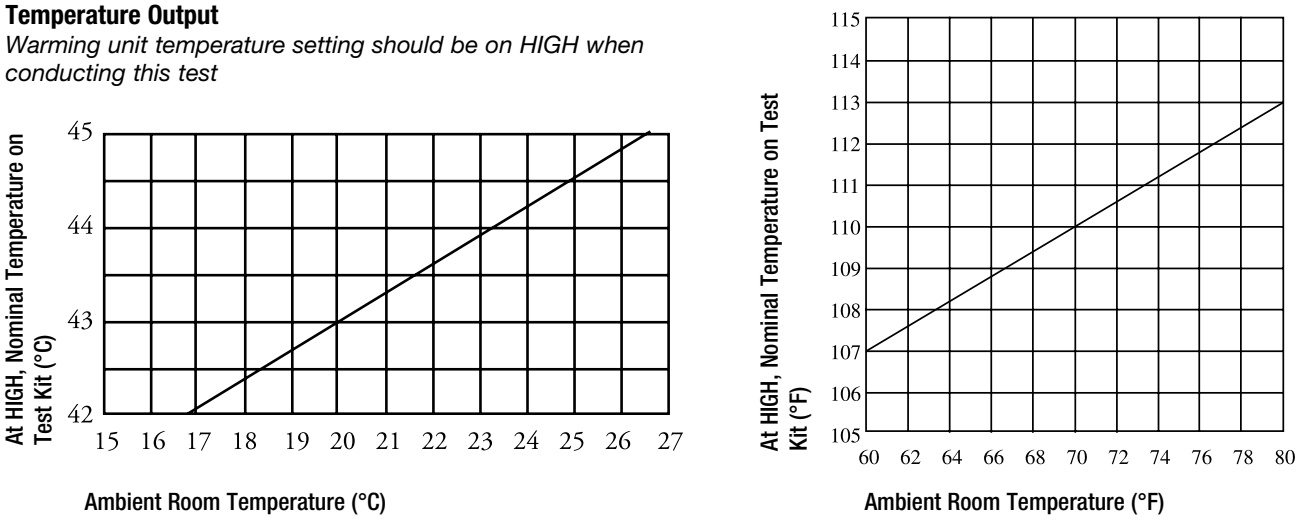
1. Insert the open hose end from the warming unit in the port on the temperature test device (see Figure 6).

   NOTE: *Do not block the rear air vents on the test device.*

2. Turn the warming unit power ON and select the HIGH temperature setting. Always begin testing at the HIGH setting.
3. Note the ambient room temperature.
4. After approximately 5 minutes of operation, note the temperature read-out. Use Figure 8 to correlate ambient temperature to the warming unit's operating temperature.

Figure 8. Room Temperature vs. High Temperature Output

Warming unit temperature setting should be on HIGH when conducting this test



Normal Operating Temperature Testing

5. After correcting for ambient temperature, the tested normal operating temperature should meet the limits specified in Table 2.
6. If the HIGH temperature setting is not within specified limits, adjust the normal operating temperature. See the *Normal Operating Temperature Adjustment* section.
7. If the HIGH temperature setting is within specified limits, verify the MED and then LOW settings against specified limits (allow the warming unit to operate at each temperature setting for about 3 to 5 minutes before test).
8. Turn the warming unit to STANDBY. Remove the hose end from the port on the temperature test device.
9. Record the maintenance action taken and the hours of operation (read from the hour meter) in the *Maintenance Log* section.

Table 2. Operating Temperatures Model 505

(Operating temperature = Average temperature at the end of the hose.)

HIGH:	43° ± 3°C	(109.4° ± 5.4°F)
MED:	38° ± 3°C	(100.4° ± 5.4°F)
LOW:	32° ± 3°C	(89.6° ± 5.4°F)

Note: Air temperature reaching the patient is approximately 2°C lower than the listed temperatures.

Normal Operating Temperature Adjustment

WARNING: *Improper adjustment of the warming unit's normal operating temperature could result in patient exposure to temperatures outside of the indicated range, and may lead to patient injury.*

- *Closely follow instructions for temperature adjustment.*
- *Always use a Temperature Test Unit Model 22110 to verify output temperatures.*
- *Always make adjustments relative to the HIGH temperature setting on the warming unit. When the HIGH setting is accurately adjusted, the MED and LOW settings should also be within specified limits. If the HIGH range is properly set, and MED and/or LOW do not meet specs, call Technical Service.*
- *The Temperature Test Unit Model 22110 does not need to be calibrated. The meter it is connected to must be calibrated. Follow the calibration instructions in the meter service manual or follow standard facility calibration schedules.*
- *When in doubt, contact Technical Service for assistance in temperature adjustment.*

Tools/Equipment

Temperature Test Unit Model 22110
Small slotted screwdriver

Method

The operating temperature adjustment potentiometer may be accessed through openings in the upper right corner of the rear access panel (see Figure 9).

1. Insert the open hose end from the warming unit in the port on the temperature test device.

   NOTE: *Do not block the rear air vents on the test device.*

2. Turn the warming unit power ON, and allow it to operate at HIGH for about 3 to 5 minutes before adjusting the potentiometer.

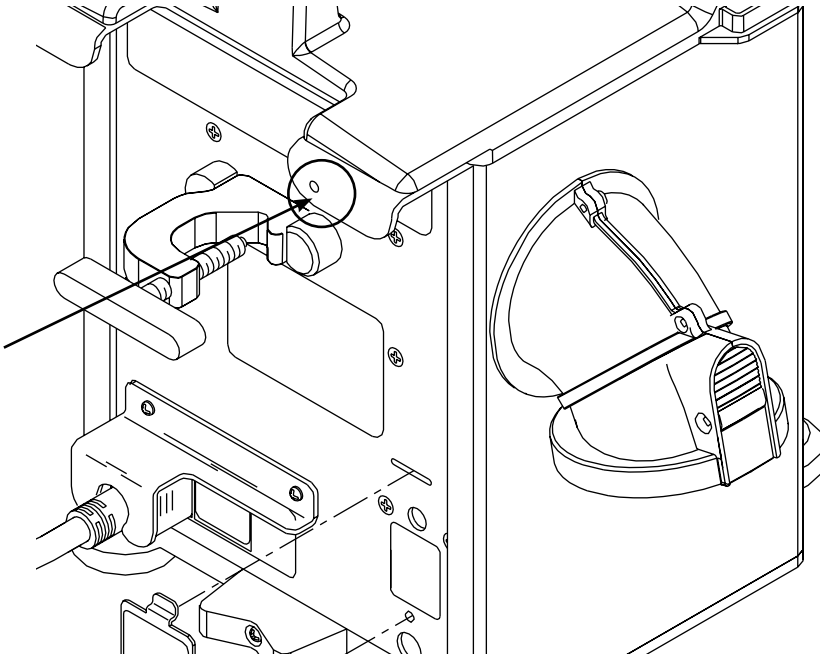
Normal Operating Temperature Adjustment

3. Insert the slotted screwdriver in the potentiometer access hole. You must access the potentiometer blindly, so carefully move the screwdriver until it fits into the slot of the potentiometer.

    - If the tested operating temperature was **below** specified limits, turn the screwdriver CLOCKWISE to increase the operating temperature.
    - If the tested operating temperature was **above** specified limits, turn the screwdriver COUNTERCLOCKWISE to lower the operating temperature.

4. Adjust the potentiometer until the temperature read-out meets the limits specified in Table 2 for the HIGH temperature setting (correlated to ambient temperature as in Figure 8).
5. Verify that the MED and then LOW temperature settings are also within specified limits. If the HIGH range is properly set, and MED and/or LOW do not meet specs, call Technical Service.
6. Place the warming unit in Standby and remove the hose from the port on the Temperature Test Unit.
7. Record the maintenance action taken and hours of operation (read from the hour meter) in the *Maintenance Log* section.

Figure 9. Location of Operating Temperature Adjustment Potentiometer



Troubleshooting

Call Technical Support for Replacement Parts

Problem	Possible Cause	Remedy; Service Procedure
The warming unit does not turn on.	Damaged or unplugged power cord.	Replace the cord or plug in the warming unit.
	Blown power fuses	Replace the blown fuses. See *Power Fuse Replacement* procedure.
	Poor or loose wire connections.	Check the connectors at the power entry module. Ensure that connector J1 is firmly seated (see Figure 10).
	No power to outlet.	Check power at the outlet.
	Loose cord at power entry cord.	Firmly seat the power cord.
The warming unit circulates air but it does not heat.	Poor connections of the thermocouple (J2) on the control board. (See Figure 10.)	Reattach any loose thermocouple leads connections.
The warming unit heats at some temperature settings but not on others. Example: the warming unit works on LOW setting, but not on HIGH setting.	Loose connection at J2. (See Figure 10) Warming unit has been in an over heat condition and temperature has decreased. Loose wire connections at the desired heat setting.	Reattach loose connections. Turn the warming unit OFF and then back ON. Reattach any loose connections.
Warming unit alarms upon startup.	Open thermostat. Poor wire connections at thermostat. Over-temperature door open.	Call Technical Service. Reattach any loose connections to thermostat. (See Figure 10). Close over-temperature door. Tighten door screw.
Warming unit alarms at too low or too high a temperature.	Over heat thermostat not in calibration.	See *Over Heat Alarm Thermostat Adjustment* procedure.

Technical Support and Customer Service

Technical Service
and Order Placement TEL: 1-800-228-3957

When You Call for Technical Support

We will need to know the serial number of your Bair Hugger unit when you call us. On Model 505 units, the serial number label is affixed to the rear panel.

In-Warranty Repair and Exchange USA

Replacement parts to correct a problem are delivered at no charge. To return a device to 3M Patient Warming for service, first obtain a Return Authorization (RA) number from a technical service representative. Please use this number on all correspondence when returning a device for service. A shipping carton will be delivered to you at no charge, if needed. We will service and ship your device within five (5) working days of our receipt.

Worldwide

Contact your local distributor concerning in-warranty repair and exchange.

Returning Units for Service

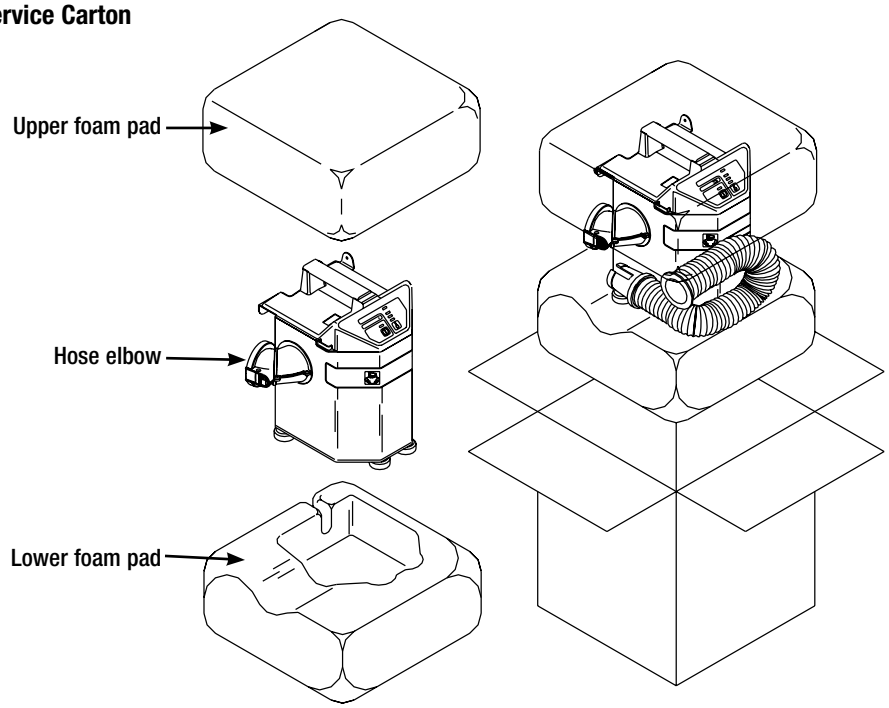
Tools/Equipment

- 3M Patient Warming service carton
- Tape dispenser
- Shipping label
- Marking pen

Method

1. Call Technical Support (see inside front cover for phone number) to get a Return Authorization (RA) number and a service carton.
2. Open the carton and remove the upper foam pad. Leave the lower foam pad in place in the bottom of the carton.
3. Rotate the hose elbow toward the back of the unit, and carefully lower the unit into the carton. Place the hose as shown in Figure 10.
4. Insert the upper foam pad (see Figure 10).
5. Seal the carton with tape.
6. Apply the shipping label addressed to 3M Patient Warming.
7. Using the marking pen, write your RA number (from Technical Support) on the outside of the carton.

Figure 10. Service Carton



Specifications

Physical Characteristics

DIMENSIONS	13 in. high x 10 in. deep x 11 in. wide 33 cm high x 25 cm deep x 28 cm wide
WEIGHT	13.6 lb; 6.2 kg
MOUNTING	IV pole clamp, bedrail hook with safety strap; can be placed on hard surface
RELATIVE NOISE LEVEL	53 decibels
HOSE	Detachable, flexible, washable; compatible with the 241 blood/fluid warming system
FILTRATION SYSTEM	0.2µm level
RECOMMENDED FILTER CHANGE	Every 12 months or 500 hours of use.

Temperature Characteristics

TEMPERATURE CONTROL	Electronically controlled using a thermocouple sensor
HEAT GENERATED	1800 BTUs (average)
SYSTEM TIME TO 100°F (37.7°C)	~17 secs
OPERATING TEMPERATURES	Air temperatures reaching the patient are approximately 2°C lower than the listed temperatures. Average temperatures at the end of the hose: HIGH: 43°C ± 3°C 109.4°F ± 5.4°F MED: 38°C ± 3°C 100.4°F ± 5.4°F LOW: 32°C ± 3°C 89.6°F ± 5.4°F

Safety System

THERMOSTAT	Independent bulb and capillary
OVERCURRENT PROTECTION	Dual fused input lines
ALARM SYSTEM	Over-heat: flashing red light with audible alarm; heater shuts down
CERTIFICATIONS	IEC 60601-1; IEC/EN 60601-1-2; UL 60601-1; CAN/CSA-C22.2, No.601.1; EN 55011; EN 80601-2-35.
CLASSIFICATION	**MEDICAL — GENERAL MEDICAL EQUIPMENT AS TO ELECTRICAL SHOCK, FIRE AND MECHANICAL HAZARDS ONLY IN ACCORDANCE WITH UL 60601-1; CAN/CSA-C22.2, No.601.1; ANSI/AAMI ES60601-1:2005 CSA-C22.2 No. 60601-1:08; EN 80601-2-35; Control No.4HZ8** Classified under IEC 60601-1 Guidelines (and other national versions of the Guidelines) as Class I, Type BF, Ordinary equipment, Continuous operation. Not suitable for use in the presence of flammable anesthetic mixtures with air or with oxygen or nitrous oxide. Classified by Underwriters Laboratories Inc. with respect to electric shock, fire and mechanical hazards only, in accordance with UL 60601-1, EN 80601-2-35 and in accordance with Canadian/CSA C22.2, No. 601.1. Classified under the Medical Device Directive as a Class IIb device.

Electrical Characteristics

BLOWER MOTOR	Operating speed: 3150 rpm Airflow: 28-30 cfm
POWER CONSUMPTION	Peak: 1000W Average: 450W
LEAKAGE CURRENT	<100µA
HEATING ELEMENT	850W Resistive
POWER CORD	15-foot, SJT, 3 cond., 10A 4.6 meter, HAR, 3 cond., 10A
DEVICE RATINGS	110-120 VAC, 60 Hz, 9.5 Amperes, or 220-240 VAC, 50 Hz, 4.5 Amperes, or 100 VAC, 50/60 Hz, 10 Amperes
FUSES	10A, 200mA (110 - 120 VAC Units) 6.3A, 100mA (220 - 240 VAC Units) 15A, 160mA (100 VAC Units)
DIAGNOSTICS	Over-heat test can be performed by the biomedical group.

Exploded Drawing

Detail of Control Board

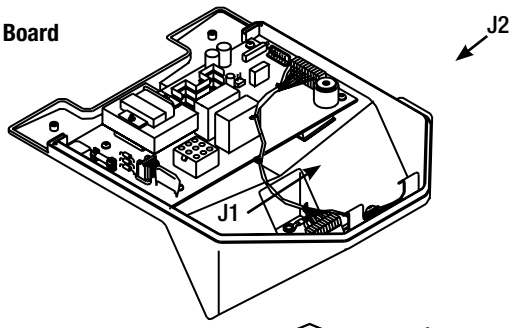
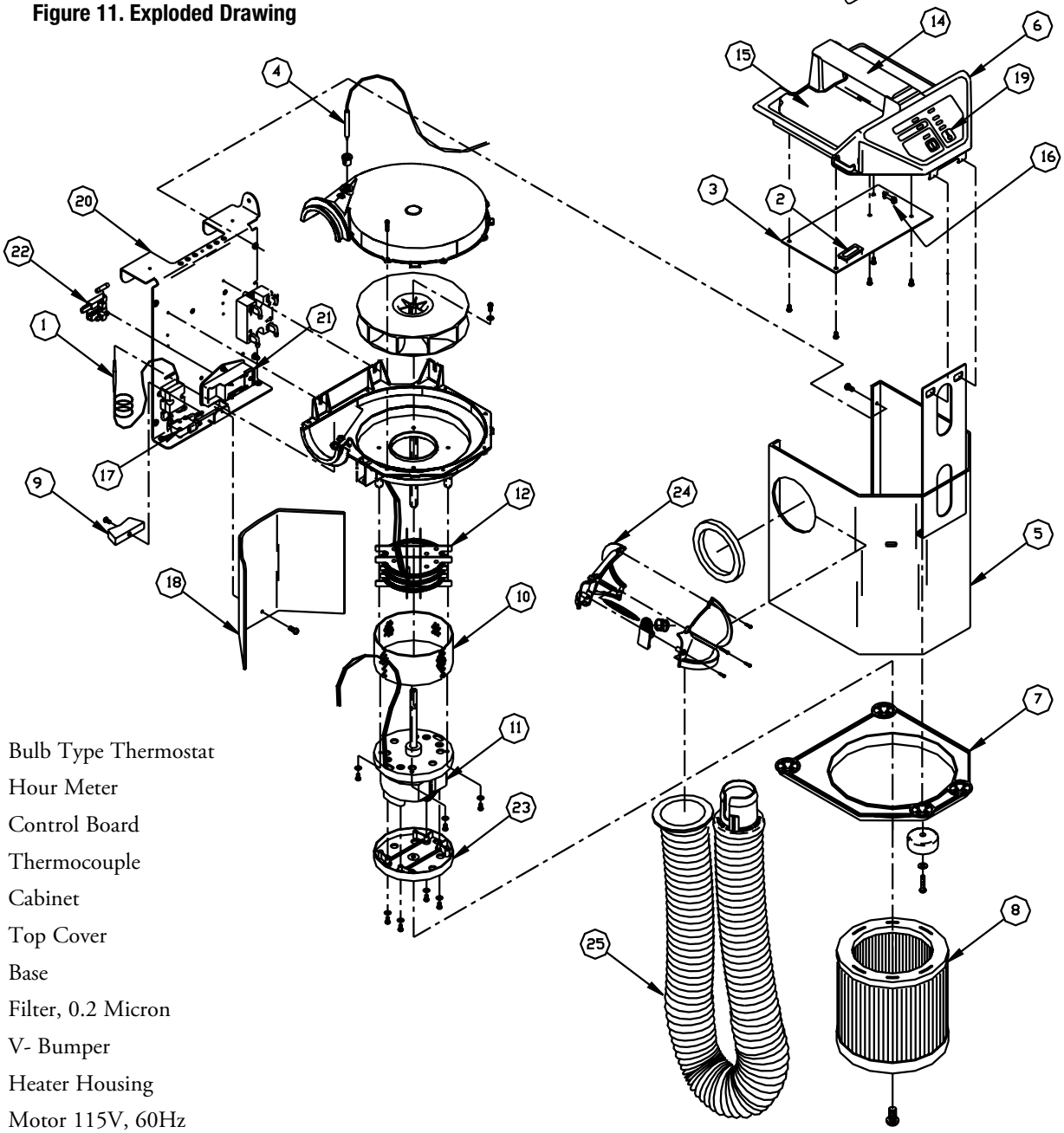


Figure 11. Exploded Drawing



1 Bulb Type Thermostat
2 Hour Meter
3 Control Board
4 Thermocouple
5 Cabinet
6 Top Cover
7 Base
8 Filter, 0.2 Micron
9 V- Bumper
10 Heater Housing
11 Motor 115V, 60Hz
12 Heater 120V
14 Handle
15 Top Warning Label
16 Control Board Fuse 200mA
17 Overtemp Switch
18 Electrical Shield
19 Control Panel Label
20 Back Plate
21 Power Entry Module
22 Power Fuses (2)
23 Filter Bracket
24 Elbow Assembly
25 Hose Assembly

Maintenance Log		
Date	Maintenance Action Performed	Hour Meter

Maintenance Log

Date	Maintenance Action Performed	Hour Meter

CE 0086

Made in the USA of globally sourced material by 3M Health Care.

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202430A 05/13