

# Model WT-5300A

## Patient Warming System Operator's Manual



To obtain information about a warranty, if any, contact Nellcor's Technical Services Department (1.800.635.5267), or your local Nellcor representative.

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# Safety Information

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## Warnings



**WARNING: Possible explosion hazard. Do not use the *WarmTouch*<sup>®</sup> Model WT-5300A patient warming system in the presence of flammable anesthetic agents.**

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**WARNING: Possible electrical shock hazard. To reduce the risk of electrical shock do not remove the back case. Servicing is only to be done by qualified personnel.**

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**WARNING: Possible electric shock hazard. Grounding reliability can be achieved only when the warming system is connected to an equivalent socket marked “HOSPITAL ONLY” or “HOSPITAL GRADE.”**

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**WARNING: Possible fire hazard. Prevent the blanket material from coming into contact with a laser or an electrosurgical active electrode; rapid combustion could result.**

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**WARNING: Possible burn hazard. Do not apply heat directly to open wounds. All patient’s wounds should be covered while using the warming system.**

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**WARNING: Possible patient burns. Use caution and consider discontinuing use on patients during vascular surgery when an artery to an extremity is clamped. Do not apply the warming system to ischemic limbs. This could possibly cause the patient to be burned.**

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**WARNING: Possible patient burns. Use caution and monitor closely if used on patients with severe peripheral vascular disease. This could possibly cause the patient to be burned.**

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**WARNING: Possible patient burns. Do not warm patients with the warming system hose only. Thermal injury may result. Always attach the hose to a *WarmTouch* blanket before providing warming therapy.**

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**WARNING: *WarmTouch CareDrape*<sup>™</sup> and *CareQuilt*<sup>®</sup> blankets are for single patient use only.**

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**WARNING: MRI scanning. The warming system is not suitable for use during magnetic resonance imaging (MRI) scanning. The warming system may affect the MRI image.**

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**WARNING: Continuously monitor the patient's temperature. Reduce the air temperature or discontinue therapy when normothermia is reached.**

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## Cautions



Caution: Federal (U.S.A.) law restricts the use of the warming system to sale by or on the order of a physician.



Caution: The warming system is fitted with an air filter; however, airborne contamination should be considered when using the warming system.



Caution: If the warming system is mounted on the intravenous (IV) pole, it should be installed with the top of the unit's handle less than 76 cm (30 inches) above the floor to prevent the IV pole from tipping over.



Caution: If a malfunction occurs in the warming system, discontinue use. Notify your sales/service center of the malfunction. Service is only to be done by qualified personnel.



Caution: The Model WT-5300A should not be operated in the presence of electromagnetic fields that are greater than 3 Volts/meter. This could cause shutdown of the Model WT-5300A by the fail-safe function within the equipment.



Caution: Ensure that the patient is dry or the warming system may be ineffective.



# Introduction

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## Intended Use

The *WarmTouch* Model WT-5300A Patient warming system (warming unit and blanket) is intended for prevention and treatment of hypothermia. For example, with the surgical patient, the patient in the preoperative holding area, the pregnant woman who shivers during epidural anesthesia due to hypothermia, or any patient who is uncomfortable anywhere in the cold critical care environment.

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## Manual Availability

The most recent revision of this manual is available on the Internet at:

[http://www.mallinckrodt.com/respiratory/resp/Serv\\_Supp/ProductManuals.html](http://www.mallinckrodt.com/respiratory/resp/Serv_Supp/ProductManuals.html)

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## Background Information

There are numerous ways of warming your patient, from cotton blankets to water mattresses. Research has shown that low temperatures surrounding the patient are a major factor contributing to hypothermia.<sup>1), 2)</sup> The warming system covers the patient with warm air and actively transfers heat across the skin. The result is to achieve normal thermia.

In creating this warm customized pocket of air around the hypothermic patient, it is important to note that stagnant air, even if it is warm, does not work as an effective heat transfer medium. Stagnant air acts as an insulator, preventing the boundary layer of molecules next to the skin surface from transferring heat.

Forced air warming causes warmed air molecules to flow over cooler skin surface. It is this active flow of warmed molecules that acts as a heat transfer medium. With the warming system, air is warmed and delivered into a lightweight blanket (*CareQuilt* or *CareDrape* Blanket) that rests over or under the patient. The *CareQuilt* and *CareDrape* blankets have many small perforations on the underside that allow air to exit the blanket and surround the patient.

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1) Morris RH, Wilkey BR. "The Effects of the Ambient Temperature on Patient Temperature During Surgery Not Involving Body Cavities." *Anesthesiology* 32:102-107, 1970.

2) Morris RH. "Influence of Ambient Temperature on Patient Temperature During Intra-abdominal Surgery." *Annals of Surgery* 173:230-233, 1971.

## Safety Features

The Warming System is designed to give healthcare professionals more control over the patient's core body temperature. There are several safety features of the warming system which make it safe and appropriate for such use.

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### Customized Warming Therapy

Clinicians select temperature range setting at the onset of warming therapy to help ensure the appropriate setting is selected for every patient.

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### Automatic Temperature Stepdown

The warming system provides a 45-minute temperature stepdown feature. When in the Boost mode, blower temperature will automatically drop to the high mode after each 45-minutes of use. The temperature may be reset to the Boost mode by selecting the Boost temperature on the unit front panel to start another 45-minute cycle.

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### Automatic Over Temperature Shutdown

The automatic temperature controller and two back-up systems help to ensure temperature will not reach excessive levels. If necessary, the back-up systems automatically turn off the heater and illuminates the warning light. The warming system heater will start producing heat when the warming system temperature drops to approximately 34°C to 37°C.

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### Warning Light

When the warning light on the control panel is illuminated, it indicates that one of the two thermostats has turned off the heater. The reason for the heater turn-off should be investigated as soon as possible after use.

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### HEPA Filter

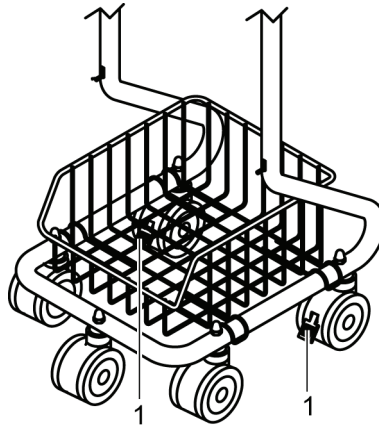
The system's High Efficiency Particulate Air Filter is 99.97% efficient at 0.3-micron particle size.

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### Wheel Locks

The cart is equipped with two wheel locks. The wheel locks prevent the cart from moving while in use. The wheel locks must be released when moving the cart.

Press the wheel lock arm down to lock the wheel. Lift the wheel lock arm to release the wheel lock. See Figure 1.


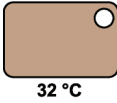
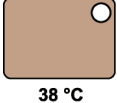
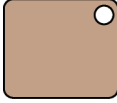

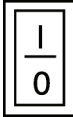



**Figure 1: Cart Wheel Lock**

## Symbols

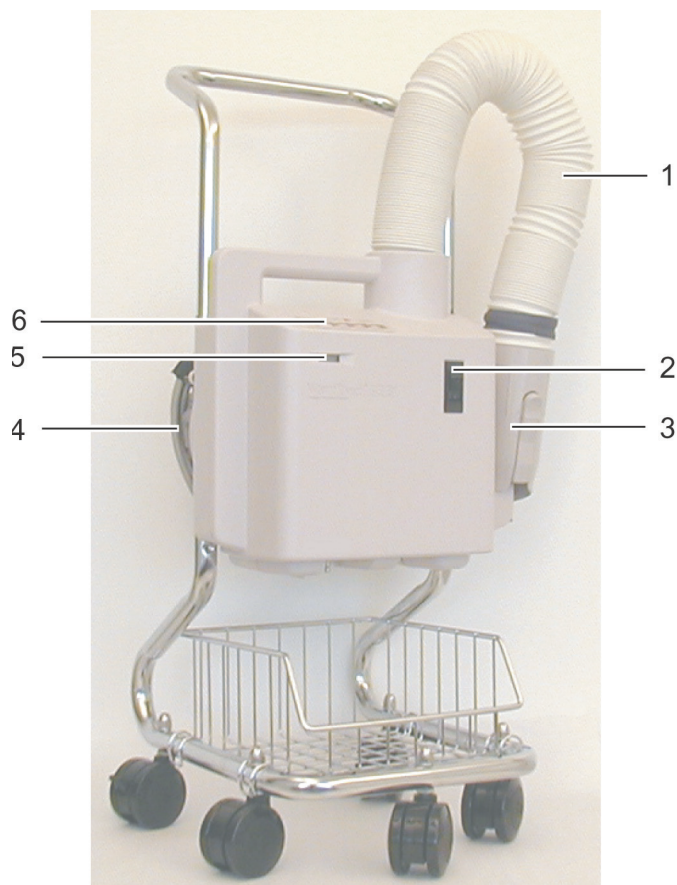
The symbols identified in Table 1 are the symbols used on the WT-5300A and all WT-5300A labeling.

**Table 1: WT-5300A Symbols**

	Attention symbol, consult accompanying documentation
<p>Low</p>  <p>32 °C</p>	Temperature Control Low (32 °C)
<p>Medium</p>  <p>38 °C</p>	Temperature Control Medium (38 °C)
<p>High</p>  <p>43 °C</p>	Temperature Control High (43 °C)
<p>Boost</p>  <p>45 min 45 °C</p>	Temperature Control Boost (45 °C for 45 minutes)
	1 Power On 0 Power Off
<p>Class 1</p> 	Protection Class I Protection Type BF

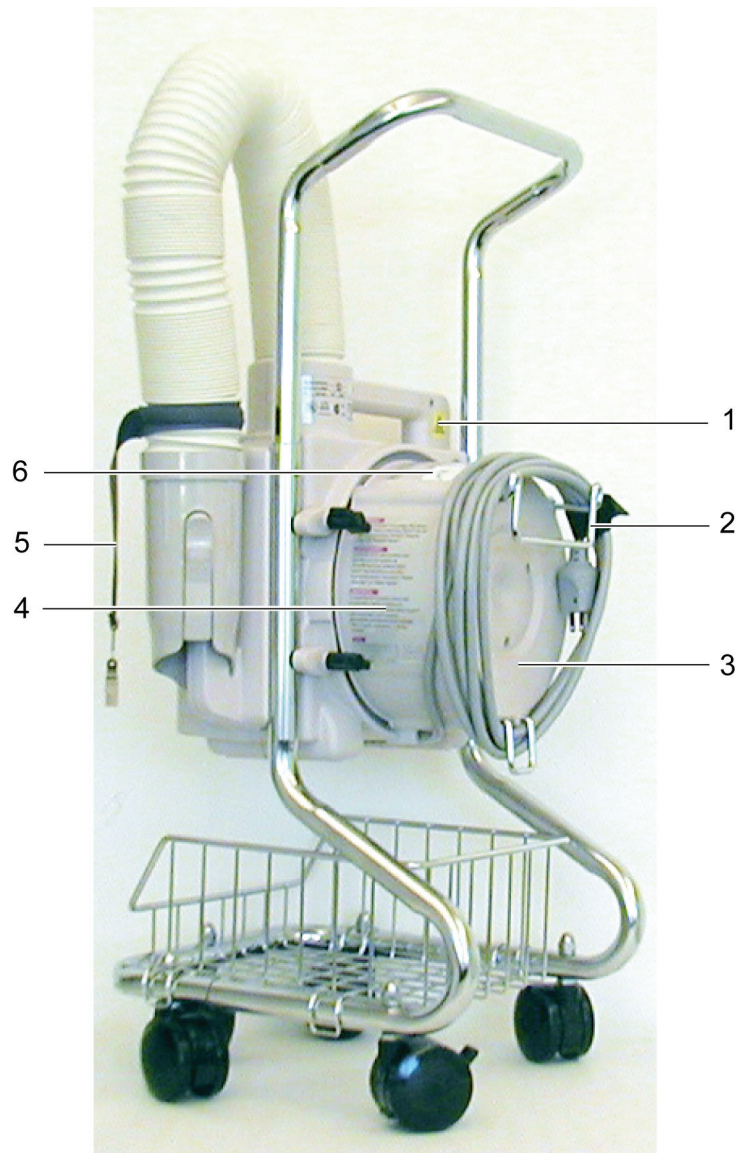
## Description of the Warming System

The *WarmTouch* Model WT-5300A Patient warming system (Figure 2 and Figure 3), *CareQuilt* and *CareDrape* blankets are intended for prevention and treatment of hypothermia. For example, with the surgical patient, the patient in the preoperative holding area, the pregnant woman who shivers during epidural anesthesia due to hypothermia, or any patient who is uncomfortable cold in the critical care environment.



1 — Hose	4 — Power Cord
2 — Main Power Switch	5 — Hour Meter
3 — Nozzle	6 — Control Panel

**Figure 2: Model WT-5300A Front View**



1 — Over-Temperature Test Port	4 — Warning Label
2 — Bed Hook Bracket	5 — Nozzle Strap with Clip
3 — Filter Cover	6 — Instruction Label

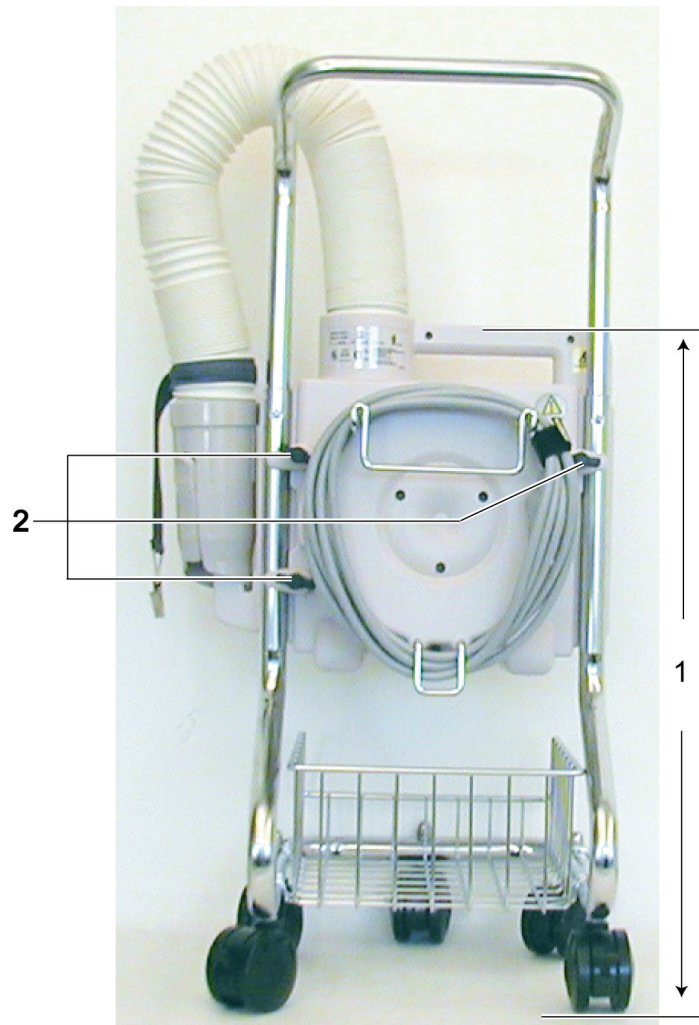
**Figure 3: Model WT-5300A Back View**

# Installation

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## Cart Installation

The warming system is shipped installed on the warming system cart. See Figure 4. The warming system should not be placed on the cart with the handle any higher than 61.6 cm (24.25 inches). At this height, the warming system and cart pass a 10-degree tilt test. Ensure that the three blower cart clamps are tight.



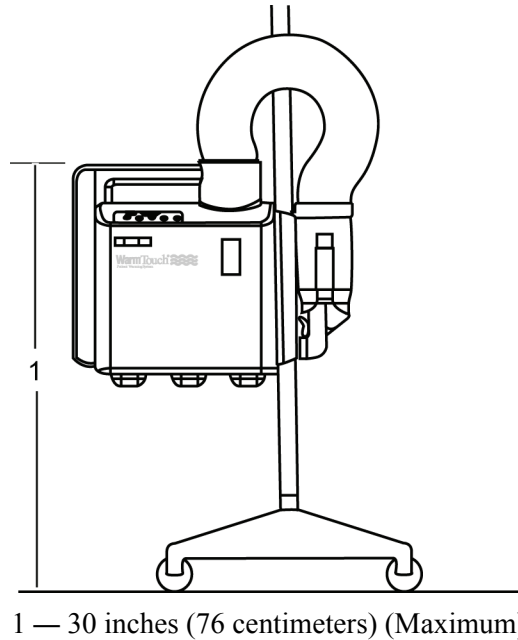
1 — 24.25 inches (61.6 centimeters) (Maximum)

2 — Blower cart clamps

**Figure 4: Warming System Cart Installation**

## IV Pole Installation

Figure 5 illustrates the installation of the warming system installed on an IV pole. The warming system should not be installed on the IV pole with the handle higher than 76 centimeters (30 inches).



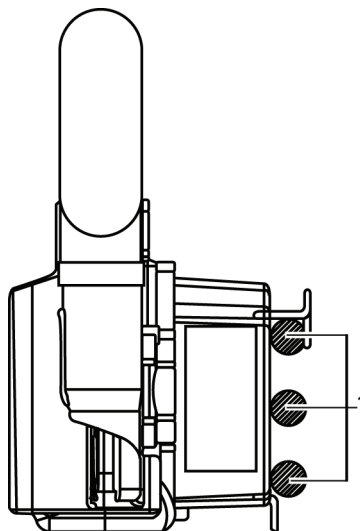
**Figure 5: Warming System IV Pole Installation**



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## Patient Bed Installation

Figure 6 illustrates the installation of the warming system on a patient bed. The patient rail connectors will fit on bed rails up to 1.4 inches (3.6 centimeters) wide.



1 — Bed Rails 1.4 inches (3.6 centimeters)

**Figure 6: Warming System Patient Bed Installation**

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# Using the Warming System

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## Power Supply Cord

Plug the warming system power cord into a "hospital grade" or suitable mains outlet.

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## Main Power

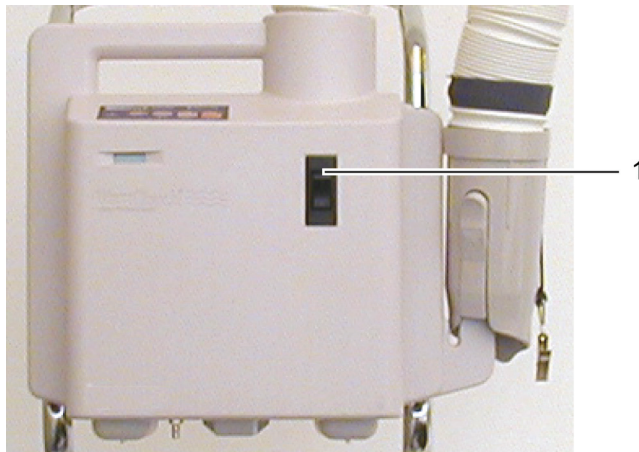
Power is controlled through one main rocker switch located on the front of the warming system. To begin operation, press the Main Power switch to the ON position (Figure 7). The Low temperature light on the control panel will illuminate and the unit will begin to blow air in the low temperature mode. See Figure 8.



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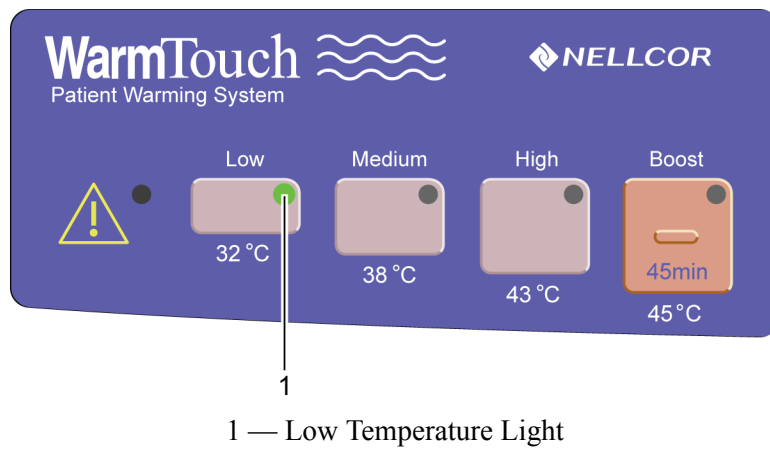
**WARNING: No free-hosing. Do not use the blower without a blanket. Applying heat to a patient directly from the blower nozzle will cause patient burns.**

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1 — Main Power Switch

**Figure 7: Main Power Switch**



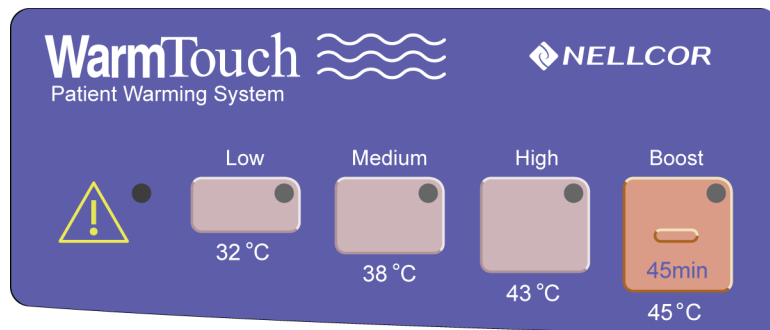
**Figure 8: Low Temperature Light**

## Temperature Control

The heating temperature is controlled through the panel of buttons. This panel has four temperature settings:

- Low 32 °C (89.6 °F)
- Medium 38 °C (100.4 °F)
- High 43 °C (109.4 °F)
- Boost 45 °C (113 °F) for 45 minutes

The temperature settings represent the range of air temperature entering the blanket. For patients with severe hypothermia requiring rapid warming, select the Boost temperature setting. To help prevent hypothermia or for treatment of mild hypothermia, select High, Medium or Low. The selected temperature light will illuminate. See Figure 9.



**Figure 9: Control Panel**



**WARNING: The patient must be closely monitored for rewarming. Vasodilation and possible hypotension can occur. Use good judgment when selecting a temperature. If unsure of proper setting, consult with the attending physician.**

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## Air Filter

The warming system contains a HEPA filter rated 99.97% efficient at 0.3-micron particle size. See *Routine Maintenance* on page 17 for filter replacement procedure.

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## Self-Supporting Air Hose

Air is delivered into the *CareQuilt* or *CareDrape* blankets through a wire-reinforced hose, attached to the warming system.

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## Using *WarmTouch CareQuilt* and *CareDrape* Blankets

*WarmTouch CareQuilt* and *CareDrape* blankets come in a range of sizes and configurations to fit patient's individual sizes, surgical procedures, and comfort needs. Follow the instructions provided with all *WarmTouch* blankets for specific information concerning their recommended use.

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# Routine Maintenance

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Caution: The institution should follow local governing ordinances and recycling instructions regarding disposal or recycling of filter and device components or end of life of the product.

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## Cleaning the Warming System



Caution: Do not spray, pour, or spill any liquid on the warming system, its accessories, connectors, switches, or openings in the case.

For *surface-cleaning* and *disinfecting*, follow your institution's procedures or:

- The warming system may be *surface-cleaning* by using a soft cloth dampened with either a commercial, nonabrasive cleaner or a solution of 70% alcohol in water, and lightly wiping the surfaces of the monitor.
- The warming system may be *disinfected* using a soft cloth saturated with a 10% solution of chlorine bleach in tap water.

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## Other Routine Maintenance

Refer to the WT-5300A service manual for routine maintenance procedures that require a qualified technician to perform.

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# Specifications

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## Warming System Specifications

No special transport or storage methods are required for the warming system.

**Table 2: Model WT-5300A Blower Specifications**

<b>Dimensions:</b>	38 cm x 41 cm x 28 cm (15 inches x 16 inches x 11 inches)
<b>Weight:</b>	6.8 kgs (15 lbs.)
<b>Power Requirements</b>	120 VAC, 50 - 60 Hz, 10 A
<b>Automatic Temperature Stepdown (Boost to High Temperature)</b>	After 45-minutes of continuous use.
<b>Power Supply Cord:</b>	4.26 m (14 feet)
<b>Thermal Protection:</b>	Thermostat (internal): 47 °C - 50 °C (117 °F - 122 °F)
<b>Ambient Blower Operating Temperature Range:</b>	18 °C - 28 °C (64.4 °F - 82.4 °F)
<b>Protection Against Ingress of Fluids:</b>	IEC 60601-1, sub-clause 44.6 for class IPX0
<b>Protection Class:</b>	1
<b>Protection Type:</b>	B

**Table 3: Model WT-5300A Cart Specifications**

<b>Weight</b>	4.6 kg (10.1 pounds)
<b>Height with Handle Extended</b>	87.6 cm (34.5 inches)
<b>Height with Handle Retracted</b>	70.5 cm (27.8 inches)
<b>Width</b>	31.8 cm (12.5 inches)
<b>Depth</b>	38.6 cm (15.2 inches)

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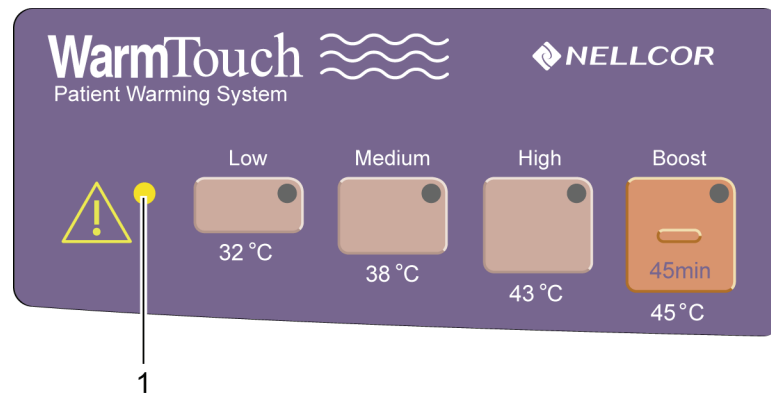
## Transport and Shipping in Shipping Container

Temperature	-40°C to 70°C (-40°F to 158°F)
Altitude	-390 m to 6,096 m (-1,280 ft to 20,000 ft)
Barometric Pressure	1,060 hPa to 500 hPa (375 mmHg to 795 mmHg)
Relative Humidity	15% to 95% (non-condensing)

# Principles of Operation

## Control Panel

The control panel features four manually switched temperature settings. The selected temperature is indicated by an LED indicator.



**Figure 10: Control Panel**

Each temperature setting represents the average temperature of air entering the blanket. The four temperature settings are:

- Low                            32 °C (89.6 °F)
- Medium                        38 °C (100.4 °F)
- High                            43 °C (109.4 °F)
- Boost                            45 °C (113 °F) for 45 minutes

There is a warning light on the control panel. See Figure 10. The warning light indicates that the warming system's safety thermostats have disabled the heater. The warming system will continue to blow air until the output temperature has decreased below the thermostat threshold temperature of 50 °C. If there is no malfunction in the warming system, it should function normally. If the warning light illuminates again, the blower should be replaced and the faulty blower should be checked by qualified hospital personnel.

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*Healthcare*