



Biomedical Engineering Department

Indira Gandhi Memorial Hospital

Male', Republic of Maldives

Patient Warmer

1. GENERAL REQUIREMENTS

- **Equipment:** Patient Warmer
- **Technology Type:** The patient warming system shall utilize carbon fiber technology for heat generation.
- **Intended Use:** The system must be suitable for the perioperative prevention and treatment of involuntary patient hypothermia in both adult and paediatric clinical settings.
- **Clinical Application:** The technology shall be designed to assist in the reduction of surgical site infections, cardiac disturbances, and recovery room residence time.
- **System Versatility:** The system shall offer a choice of single or dual-channel controllers to accommodate various clinical requirements.

2. PERFORMANCE AND TEMPERATURE CONTROL

- **Adjustable Range:** The output temperature shall be adjustable from 30°C to 40°C in increments of 0.1°C.
- **Heating Speed:** The system shall possess fast-heating capabilities, reaching the target temperature within 5–7 minutes.

- **Safety Cut-off:** An automatic hardware safety circuit must be integrated to provide a high-temperature cut-off at 41°C.
- **Control Logic:** For enhanced patient safety, the controller shall employ two independent microprocessors for continuous monitoring.
- **Acoustic Profile:** The system must feature ultra-quiet or silent operation to minimize noise in sensitive clinical environments.

3. MATTRESS AND BLANKET SPECIFICATIONS

- **Construction:** Warming mattresses and blankets shall be ultra-sonically sealed to prevent liquid ingress and ensure durability.
- **Patient Comfort:** Mattresses shall incorporate memory foam technology, and blankets must be lightweight and soft to ensure patient comfort.
- **Hygiene and Maintenance:** Outer covers shall be removable and capable of being laundered at temperatures up to 90°C.
 - Mattress and blanket surfaces must be compatible with standard hospital-grade disinfectants and cleaning solutions.
- **Available Configurations:** The provider shall offer a range of sizes to suit various patient profiles and surgical needs:

Component Category	Size Variations	Key Features
Warming Mattresses	Small (800mm) to Large (1900mm)	Foam-core and standard options
Warming Blankets	Small (800mm) to Large (1900mm)	Specialized arm/shoulder designs
Specialized Support	Bariatric Dimensions	High-density foam for heavy-duty use

4. PHYSICAL AND ELECTRICAL CHARACTERISTICS

- **Input Power:** 220V AC, 50Hz/60Hz with 13A type g plug top.
- **Portability:** The controller unit must be lightweight, with a maximum weight not exceeding 6kg.
 - A battery-powered controller option must be available for continuous warming during patient transfer or ambulance use.
- **Footprint:** The controller shall have a compact design, approximately 187×282×87mm, to facilitate use in space-constrained areas.

5. STANDARDS, SAFETY, AND COMPLIANCE

- **Classification:** The device shall be classified as a Medical Device Class IIb.
- **Safety Alarms:** The system shall include integrated audible and visual alarms for the following conditions: power failure, pad connection issues, high temperature, and high/low temperature deviations.
- **Environmental Operating Limits:**
 - **Operating Ambient Temperature:** 15°C to 40°C.
 - **Storage Ambient Temperature:** -10°C to 55°C.
- **Regulatory Compliance:** The system must be CE marked.

6. ACCESSORIES AND EXPANSION

- **Connectivity:** The system shall support at least a 2M extension cable to allow for flexible placement of the controller.
- **Monitoring:** Provisions for a skin probe must be available for precise patient temperature monitoring.
- **Mobility:** A mobile stand with a storage basket shall be available as an optional accessory for organized transport.

7. INSTALLATION, TRAINING & WARRANTY

