Operating Instructions and Troubleshooting Guide

Fluid, Blanket and Contrast Media Warming Cabinets

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Operating instructions and troubleshooting guide for all medical warming cabinets supplied by QED Scientific Ltd, with model numbers beginning ‘FW’, ‘BW’ or ‘MW’

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* This product is not a blood warmer and must not be used to warm blood or blood products
**CONTROLS**

All QED cabinets are factory calibrated to UKAS traceable equipment. It is recommended that all cabinets are serviced and calibrated annually. Please call QED Scientific for details of preventative maintenance solutions, including calibration certificates.

**WARNING LABELS USED**

- Caution Hot Surface
- Read instructions before use
- Mains electricity (AC voltage shown)
- Remove all connections to mains electricity before opening

**OTHER LABELS**

The manufacturer is registered with a PCS scheme in compliance with WEEE regulations. Please dispose of accordingly. Call for details.

This is CE marked and compliant with all relevant directives. More information available on request.

**MODEL NUMBER**

FW

<table>
<thead>
<tr>
<th>Range (see p.5)</th>
<th>Size (see below)</th>
<th>Applicable extras (see p.15)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FW-30</td>
<td>570 x 415 x 422</td>
<td>220 x 315 x 315</td>
</tr>
<tr>
<td>30</td>
<td>20</td>
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<tr>
<td>FW-40</td>
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<tr>
<td>FW-50</td>
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<tr>
<td>FW-52-WALL</td>
<td>845 x 590 x 300</td>
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<td>52-WALL</td>
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<td>FW-75</td>
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<td>FW-120</td>
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<td>FW-130</td>
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<td>FW-150</td>
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<td>FW-210</td>
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<td>582 x 490 x 640</td>
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<td>FW-240</td>
<td>1180 x 590 x 660</td>
<td>803 x 490 x 550</td>
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<td>240</td>
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<tr>
<td>FW-280</td>
<td>940 x 750 x 780</td>
<td>566 x 650 x 660</td>
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<tr>
<td>280</td>
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<tr>
<td>FW-350</td>
<td>1105 x 750 x 780</td>
<td>729 x 650 x 660</td>
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<td>350</td>
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<td>FW-355</td>
<td>1620 x 590 x 660</td>
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<td>FW-440</td>
<td>1620 x 690 x 660</td>
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<tr>
<td>FW-575</td>
<td>1725 x 875 x 770</td>
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<td>575</td>
<td>135</td>
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</tr>
</tbody>
</table>

**Draw style models** state the number of draws in the size suffix, e.g. FW-2D, or BW-3D
SAFETY, CLEANING & OPERATING INSTRUCTIONS

ELECTRICAL

This is a Class 1 appliance.

The wires in the mains lead are coloured in accordance with the following code:

GREEN & YELLOW = EARTH
BLUE = NEUTRAL
BROWN = LIVE

A fused mains plug or distribution board must protect this apparatus (maximum 13 amp fuse).

THIS APPARATUS MUST BE EARTHEd

FOR A COMPLETE ELECTRICAL DISCONNECTION PULL OUT THE MAINS PLUG

If the supply cord is damaged, it must be replaced by a special cord or assembly available from the manufacturer or its service agent.

There are no user repairable parts inside - all repairs must be carried out by trained personnel

CLEANING INSTRUCTIONS

This is an electrical appliance. The chamber and outside cabinet should only be cleaned with a damp detergent cloth or 70% alcohol wipe when disconnected from the mains supply. Leave the door open to aid safe drying before switching the appliance on again. This meets with the recommendations of the AAGBI Guidelines for cleaning surfaces in and around operating theatres.

SPILLAGES

Any spillage must be cleaned up immediately. If it is suspected that fluids may have entered the fan or control area, the appliance must immediately be disconnected from the mains supply, taken out of use, cleaned and checked for electrical safety before being put into use again. It is against all accepted good practices to place opened bottles of fluid back into a warming cabinet, especially if lying on their side, even if the lid has been put back on securely. It is usual for the bottles / bags to mention this specifically on their labels. Any damage caused by leaking fluids is misuse, and is not covered by the guarantee.

MAINTENANCE & REPAIRS

It is accepted practice that this equipment receives a preventative inspection and calibration once annually by a qualified engineer. This is to ensure that the equipment is known to be calibrated, working correctly and is fit for purpose. Repairs must be by a qualified engineer. Please contact QED to discuss this.

WARNING

THIS APPLIANCE MUST NOT BE USED IN THE PRESENCE OF FLAMMABLE VAPOURS OR ANAESTHETIC GASES.

NOTE

This equipment must not be modified, altered or used for anything other than its intended purpose.
LIFTING AND MOVING
This equipment is heavy. You must use appropriate lifting and moving aids as well as more than one person. Do not lift by the door. If in doubt consult your Health & Safety or Estates department.

WALL FIXED MODELS
Wall fixing brackets are available for cabinets up to size 75 (not including drawer models). Please note that the cabinet weight details on page 3 are empty weights, and that (for example) a single 1 litre bag of 0.9% saline weighs more than 1 kg. Cabinets must only be fixed to suitable walls (stud walls are not appropriate), and at a height at which the rear of the top shelf is comfortably accessible without assistance. Please consult your estates department to assess the suitability of any fixing site.

INTENDED USES
These cabinets are intended for uses as follows:

FW range for warming irrigation fluids, lotions and creams routinely used in operating theatres, critical care wards, trauma theatres, etc. Temperatures up to 42°C are common although higher temperatures up to 60°C may be clinically required.
If in doubt about the best temperature to use you must ask your clinical team.

BW range for warming standard hospital cotton blankets for the purpose of ‘comfort warming’ patients who are cold or have the ‘post anaesthetic shivers’.
NB. Acrylic, or other synthetic blankets should not be used.
Blankets are usually warmed at temperatures up to 80°C.
If in doubt about the best temperature to use you must ask your clinical team.

MW range are intended for warming bottles of contrast media or small surgical instruments to body temperature only. The temperature is fixed at 37°C.

PERFORMANCE
FW models range from about 10°C above ambient to a maximum of 60°C
Temperature stability is typically better than ± 0.2°C
Recovery time after door opening typically < 3 minutes
Warm up time from cold & cool down time typically < 30 minutes

BW models range from about 10°C above ambient to a maximum of 80°C
Temperature stability is typically better than ± 0.2°C
Recovery time after door opening is typically < 3 minutes
Warm up time from cold & cool down time is typically < 30 minutes

MW models are factory fixed to operate only at 37°C
Temperature stability is typically better than ± 0.2°C
Recovery time after door opening is typically < 3 minutes
Warm up time from cold & cool down time is typically < 20 minutes

(All performance characteristics are representative of the ranges and based on empty cabinets)
This is not a Blood Warmer and must not be used to warm blood or blood products

CG65¹:
“The GDG [Guidance Development Group] also considered it clinically negligent not to warm intravenous fluids, other than those for the delivery of drugs. Taking all these things into consideration, they recommended that when IV fluids of 500ml or more are given, they should be warmed using a fluid warming device and not taken from a warming cabinet.” (section 4.2.5)

“Intravenous fluids (500 ml or more) and blood products should be warmed to 37°C using a fluid warming device.” (section 1.3.6) Please note that “fluid warming device” is as distinct from “thermostatically controlled cabinet” (section 1.3.10)

² We are currently regulating freezers, fridges and transport coolers intended to preserve tissues, fluids and blood intended for re-introduction, as they satisfy the definition of a medical device in Article 1 of Directive 93/42/EEC.

“Blood should only be warmed using approved, specifically designed and regularly maintained blood warming equipment with a visible thermometer and audible warning. Settings should be monitored regularly throughout the transfusion” ³

² Email from MHRA.
Blood warmers

“Only CE-marked blood warmers should be used. Some operate up to 43°C but are safe if used in accordance with the manufacturer’s instructions. Improvised blood-warming, such as immersion of the pack in hot water, in a microwave or on a radiator must never be used.” (p.38)

“Rapid infusion devices
Infusion rates [of rapid infusion devices] range from 6 to 30 L/hour and most incorporate a blood-warming device.” (p.38)

Other References

“Hypothermia impairs blood clotting. Studies in surgical patients have found an association between hypothermia at the end of surgery and an increased incidence of post-operative infections and myocardial ischaemia. Hypothermia during surgery should be avoided. Blood and other infused fluids should be warmed. Rapid infusion of cold fluids (> 100 ml/minute) has been reported to cause potentially lethal cardiac arrhythmias. Infusion through a central catheter terminating in or near the right atrium may increase the risk.”

“Red cells should only be warmed as they flow through a giving set using a specifically designed, approved commercial device … The entire bag must not be warmed.”

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1. Site the appliance on an even, level surface, QED stand or wall fixing kit as supplied by QED Scientific. Ensure that it is level.  
*If bench space is at a premium, we supply stands and wall fixing brackets for cabinets up to 75 Litres*

2. Connect to the mains supply. Ensure that the plug is accessible, so that it can be removed if necessary.

3. Turn on the mains power switch (the green power light will come on). Ensure that the Safety dial is set 3°C above the set operating temperature (*Set Point*).

4. The cabinet has been factory calibrated and will automatically warm the chamber to the temperature selected in the *Set Point*. See page 9 for instructions to change the operating temperature.  
*N.B. The chamber Temperature may rise to just above the Set Point before it settles at the selected level. This is normal and will resolve within a few minutes (see p.5) The Over Temp light may show during this time.*

5. Load the chamber as per the loading instructions on p.10.

**CONTROL PANEL**

*WALL FIXED MODELS*

Wall fixing brackets are available for cabinets up to size 75 (not including drawer models). Please note that the cabinet weight details on page 3 are empty weights, and that (for example) a single 1 litre bag of 0.9% saline weighs more than 1 kg. Cabinets must only be fixed to suitable walls (stud walls are not appropriate), and at a height at which the rear of the top shelf is comfortably accessible without assistance. Please consult your estates department to assess the suitability of any fixing site.
Digital Controller K49:

When the cabinet is turned on, it will automatically warm up to the pre-set temperature.

When warming up from cold, the chamber temperature may go above the set temperature. This is normal and does not occur during normal use. Depending on the size of the cabinet, it may take up to 30 minutes to settle out from room temperature (smaller cabinets will take less time).

To change the operating temperature (set point):

Push the P button once
Use the \ and \ buttons to set the new temperature as shown on the lower digits.
Press the P button again to save the new setting. Do not push any other buttons.

After approximately 5 seconds the screen will return to normal.

Set the Safety dial to approximately 3°C above the new operating temperature.

NB. If the set point selected is very different from the previous one, it may take a few minutes for the cabinet to settle at the new temperature. This is normal and will resolve within a few minutes. The red ‘Over Temp’ light may show during this time.

During warm up and once the air in the cabinet is at temperature, the Heating Active light will pulse on and off. This is normal as the controller is only using as much energy as is required to hold the cabinet at temperature as efficiently as possible.

Temperature Ranges

Fluid warming cabinets are factory limited to a maximum of 60°C. This is factory set.
Blanket warming cabinets are factory limited to a maximum of 80°C. This is factory set.
Media warming cabinets have a fixed operating temperature of 37°C. This is factory set.

Irrigation fluids are usually warmed in the range 37°C to 42°C. Occasionally warmer temperatures are used. If in doubt you must consult your clinical governance manager.
LOADING INSTRUCTIONS

Do not overfill the shelves

It is important that air flow is unrestricted. Load the chamber evenly and do not over-fill the shelves as it can cause the temperature stability to be impeded and may create uneven heating (warm / cold spots).

If you experience a temperature control problem, empty the bags, bottles or blankets from the cabinet and test it again before contacting your electrician.

Check the temperature

As with all temperature controlled products, anything taken from the cabinet should be checked. If it feels either cooler or warmer than expected, check the chamber temperature (the top line of the digital display) and other items in the cabinet. If there is one that feels to be at a more appropriate temperature, then replace the initial item, and use the latter.

Allow time

Once a product has been placed inside the cabinet, it will take some time to reach temperature. The time taken will depend on the set point and the size and type of product, as well as how many other cool items are placed inside at the same time.

If the chamber is loaded entirely with products at room temperature, the average temperature of the cabinet will drop and it will need more time to re-settle than if only some items are placed inside at once.

Plan warming

In most cases it is recommended that the cabinet is stocked each evening with what items will be required for the following day’s procedures. This will allow all of the products ample time to evenly reach the required temperature.

Only warm as much as is required and rotate stock.
Store items correctly

Open or partially used bottles or bags must not be placed in the cabinet. This includes bags which have been removed from the outer packaging. All bottles must be stored upright.

Use baskets where required

Baskets should be used when warming bags of fluid or blankets. These prevent the outer pouch or blanket from blocking the air flow. Baskets come as standard with blanket warming cabinets, but are also available for fluid warming cabinets.

Do not store items against the fan duct

In cabinets with top controls, items should not come within 50mm (approx 2 inches) of the fan duct at the top of the chamber. This may cause them to overheat, but will also restrict airflow (see ‘Do not overfill).

In cabinets with controls at the bottom, all items must be stored on shelves. None must placed directly onto the fan duct at the base of the chamber.

Use the correct type of shelf

Small items (50 / 100 ml bottles or bags, or contrast media bottles etc) should be stored on perforated rather than wire mesh shelves. These are supplied as standard with contrast media warming (MW) cabinets, but can be requested for other ranges.

Drawer style models are available if they are more appropriate.

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If you wish you can phone QED Scientific direct for telephone assistance.

NB all engineer call-outs that are the result of operator error or misuse are chargeable even within the warranty period, although telephone support is not.

MAINTENANCE AND SERVICE CONTRACTS ARE AVAILABLE. PLEASE CALL.
No lights come on

1 – Check that the power cable is securely plugged into the power socket and into the cabinet.
2 – Check power switch and plug socket switch.
3 – Try an alternative power cable.
4 – Try an alternative plug socket.
5 – Try another piece of equipment that you know works (eg. a desk lamp or a radio) in the same socket.
   • If this equipment also doesn’t work, it is likely that there is a problem with the electricity supply. Call your electrician to investigate.
   • If it does work, but the warmer still does not, call QED Scientific and explain what you have tried.

Green power light comes on, but not any other lights or the digital controller

1 – Turn the Safety dial down to below room temperature (the dial will give a small click). The red Over Temp indicator should light.
   • If so, it is possible that the digital controller is either in standby or at fault. Note the model of the controller (it will be written on the corner of the face plate) and call QED Scientific
   • If the Over Temp indicator stays off, there is an electrical fault. Call QED Scientific and explain this

Red Over Temp light is on constantly and Temperature is as required

1 – Check the Set Point (the bottom line of the display)
   • If the Set Point is higher than the setting on the red Safety dial, then the safety device is being used to control the cabinet. This is not recommended and can shorten the life of the components. Adjust the Set Point (see p.9) to the required temperature and set the dial approximately 3°C above this.
   • If the Set Point and Safety dial are set correctly it is possible that the Safety dial requires calibration. Call QED Scientific and explain this.

Heating Active light pulses or is on constantly, but the cabinet does not heat

1 – Check the Temperature of the chamber (the top line of the display)
2 – Check the Set Point (the bottom line of the display)
3 – Check whether the Overheat light is on.
   • If it is, and the Temperature is lower than the Set Point, turn the cabinet off. Leave it for 10 seconds and turn it back on. If the problem persists, call QED Scientific and explain this.
   • If it is and the Temperature is more than 3°C higher than the Set Point, then the overheat protection is active. Allow the cabinet time to settle out. If the Temperature remains at least 3°C higher than the Set Point, turn the cabinet off and open the door. Leave it for approximately 3 minutes. Close the door and turn it on again. Allow the cabinet time for the Temperature to settle out. If the problem persists, call QED Scientific and explain this.
   • If the Overheat light is not on, and the Temperature is around room temperature, or less than 30°C, then it is likely that the heating element has failed. Call QED Scientific and explain this.
There is a loud noise, or the chamber is silent with no airflow.

- It is likely that the fan motor has failed. Turn the cabinet off and call QED Scientific for assistance.
  
  *NB. A fan motor failure may be accompanied by a strong smell from the motor itself.*

Temperature control seems:

- **unstable** (often changes from the set point, or takes a long time to respond)
- **uneven** (some items are warmer / cooler than others)

1 – Empty the chamber and allow the Temperature to settle out.

- If the problem is corrected, refer to the loading instructions on page 10.
- If not, check the sound of the fan motor (see above) and call QED Scientific for assistance.

Items removed from the cabinet seem warmer or cooler than expected

*NB. Items will take time to reach temperature – check other items inside first.*

1 – Check that the chamber is loaded correctly (refer to the loading instructions on page 10)

2 – Check that the Set Point is set at the required temperature.

3 – Check that Temperature is at (or close to) the Set Point.

4 – Check the internal chamber temperature with a separate, calibrated thermometer.

- All QED cabinets are factory calibrated to UKAS traceable equipment. In the unlikely event that this has been altered, calibration instructions are available from QED Scientific. It is recommended that all cabinets are serviced and calibrated annually. Please call QED Scientific for details of preventative maintenance solutions.

Door catch is worn (models with a pull handle)

- Call QED Scientific for a replacement ‘Roller Catch and Stud’. Fitting instructions are available.

Door handle is loose (models with a twist handle)

- Call QED Scientific and explain this.

Technical assistance is available from QED Scientific on 01663 735494 or via info@qedscientific.co.uk

Please supply details of the cabinet (e.g. model reference and serial number) as well as details of the query (e.g. Set Point, Temperature, controller model etc).

Any repairs or replacements of parts must be performed by a competent person.
MODIFICATIONS AVAILABLE

<table>
<thead>
<tr>
<th>Description</th>
<th>Model Number</th>
<th>Details</th>
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<tbody>
<tr>
<td>Wheels</td>
<td>-WH</td>
<td>Front Pair Lockable</td>
</tr>
<tr>
<td>Wall bracket</td>
<td>-WALL</td>
<td>For sizes up to 75</td>
</tr>
<tr>
<td>Viewing panel</td>
<td>-DGW</td>
<td>In door</td>
</tr>
<tr>
<td>Glass door</td>
<td>-VIS</td>
<td>Fully glazed</td>
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<tr>
<td>2nd shelf</td>
<td>-2S</td>
<td>For MW40 only</td>
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<tr>
<td>Audible alarm</td>
<td>-AUD</td>
<td>Temperature alarm</td>
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Sizes above 350 include -WH as standard

EXTRAS AVAILABLE

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<th>Description</th>
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<th>Details</th>
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<tbody>
<tr>
<td>Wheeled dolly</td>
<td>WH2-[model]</td>
<td>Front Pair Lockable</td>
</tr>
<tr>
<td>Small wheeled stand</td>
<td>ST1-[model]</td>
<td>With wheels, for sizes up to 150</td>
</tr>
<tr>
<td>Large wheeled stand</td>
<td>ST2-[model]</td>
<td>With wheels, for sizes from 210 to 350</td>
</tr>
<tr>
<td>Small stand with feet</td>
<td>ST3-[model]</td>
<td>For sizes up to 150</td>
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<tr>
<td>Large stand with feet</td>
<td>ST4-[model]</td>
<td>For sizes from 210 to 350</td>
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<tr>
<td>Full width basket</td>
<td>BASK1-[model]</td>
<td>For sizes above 40</td>
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<tr>
<td>Basket with divider</td>
<td>BASK2-[model]</td>
<td>Full width, with central divider, sizes above 40</td>
</tr>
<tr>
<td>Half width basket</td>
<td>BASK3-[model]</td>
<td>For sizes above 50</td>
</tr>
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When ordering, include the model of cabinet it is to be used with, for example WH2-FW50
Sizes above 350 include –WH as standard

SPARE PARTS AVAILABLE

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
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<tbody>
<tr>
<td>Digital controller</td>
<td>Mains supply cable</td>
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<tr>
<td>Solid state relay (SSR)</td>
<td>Mains input socket and filter</td>
</tr>
<tr>
<td>Thermocouple</td>
<td>Door Handle, pull type</td>
</tr>
<tr>
<td>Overheat protection device</td>
<td>Door handle, twist type</td>
</tr>
<tr>
<td>Fan motor (complete)</td>
<td>Roller catch and stud</td>
</tr>
<tr>
<td>Heating element-[model]</td>
<td>Shelf-[model]</td>
</tr>
<tr>
<td>Mains power switch (illuminated)</td>
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</tbody>
</table>

When ordering, please include the model of cabinet and serial number.

Technical assistance is available from QED Scientific on 01663 735494 or via info@qedscientific.co.uk
Please supply details of the cabinet (e.g. model reference and serial number) as well as details of the query (e.g. Set Point, Temperature, controller model etc).

Any repairs or replacement of parts must be performed by a competent person.
### Patient Warming Systems

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
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<tbody>
<tr>
<td>Patient Warming Blankets</td>
<td>Theatre and recovery warming blankets to meet NICE Guidelines. Cost effective alternative to forced air warming</td>
</tr>
<tr>
<td>Heated theatre mattresses</td>
<td>Durable, sterilisable patient warming mattresses</td>
</tr>
<tr>
<td>Neonate Warming</td>
<td>Heated swaddling blankets, mattresses</td>
</tr>
<tr>
<td>Neonate &amp; Infant warmers</td>
<td>Free-standing warming systems</td>
</tr>
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### Warming Cabinets

<table>
<thead>
<tr>
<th>Cabinet Type</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Fluid Warming Cabinets</td>
<td>(For operating theatres) 9 to 180 1-litre bottles</td>
</tr>
<tr>
<td>Blanket Warming Cabinets</td>
<td>(For theatre recovery) 4 - 40 blankets</td>
</tr>
<tr>
<td>Contrast Media Warming Cabinets</td>
<td>Warming media &amp; lotions in radiology, CT, etc</td>
</tr>
<tr>
<td>Combination Warming Cabinets</td>
<td>Combined fluid and blanket warming cabinets</td>
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*Custom build options available*

### Refrigeration

<table>
<thead>
<tr>
<th>Refrigerator Type</th>
<th>Description</th>
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<tbody>
<tr>
<td>Blood Bank Refrigerators</td>
<td>Capacities from 20 to 700 bags</td>
</tr>
<tr>
<td>Pharmacy Refrigerators</td>
<td>Ward &amp; clinic models from 36 to 155 litres</td>
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<tr>
<td></td>
<td>Pharmacy models from 36 to 2040 litres</td>
</tr>
<tr>
<td>Medical Refrigerators</td>
<td>Safe storage at +4C From 36 litres upwards</td>
</tr>
</tbody>
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### Other Patient Care and Storage solutions

<table>
<thead>
<tr>
<th>Service Type</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Neonate Phototherapy</td>
<td>LED phototherapy systems</td>
</tr>
<tr>
<td>DVT Prophylaxis</td>
<td>Sequential compression with disposable sleeves</td>
</tr>
<tr>
<td>Filtered Specimen Storage</td>
<td>For safe storage of specimens in theatre areas</td>
</tr>
</tbody>
</table>