

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 **130** **– WH**
Range Size Applicable extras
(see p.5) (see below) (see p.15)

Approximate Dimensions (not all ranges available in all sizes)

Size	External H x W x D (mm)	Internal H x W x D (mm)	Empty Weight (kg)
30	570 x 415 x 422	220 x 315 x 315	20
40	670 x 415 x 422	320 x 315 x 315	25
50	625 x 590 x 422	240 x 490 x 315	30
52-WALL	845 x 590 x 300	470 x 490 x 195	35
75	625 x 590 x 565	248 x 490 x 460	35
120	735 x 590 x 660	360 x 490 x 550	45
130	845 x 590 x 570	470 x 490 x 460	45
150	845 x 590 x 660	470 x 490 x 550	50
210	957 x 590 x 750	582 x 490 x 640	65
240	1180 x 590 x 660	803 x 490 x 550	73
280	940 x 750 x 780	566 x 650 x 660	78
350	1105 x 750 x 780	729 x 650 x 660	95
355	1620 x 590 x 660	1345 x 490 x 550	95
440	1620 x 690 x 660	1345 x 590 x 550	105
575	1725 x 875 x 770	1350 x 775 x 550	135

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 $\pm 0.2^\circ\text{C}$

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 $\pm 0.2^\circ\text{C}$

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 $\pm 0.2^\circ\text{C}$

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



**National Institute for
Health and Clinical Excellence**

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)*



“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.

“In-line warmers certainly provide the most common and recommended practice for warming blood and blood products.”²



**British Committee for
Standards in Haematology**

“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

¹ NATIONAL INSTITUTE FOR HEALTH AND CLINICAL EXCELLENCE (2008) *Inadvertent Perioperative Hypothermia : The management of inadvertent perioperative hypothermia in adults*. CG65. (available at http://www.rcn.org.uk/_data/assets/pdf_file/0006/197358/003_282.pdf)

² Email from MHRA.

³ Harris, AM. et al (2009), *Guideline on the Administration of Blood Components*, London, British Committee for Standards in Haematology (available at http://www.bcsghguidelines.com/documents/Admin_blood_components_bcsgh_05012010.pdf)

Handbook of Transfusion Medicine ⁴

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.”⁵

“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.”⁶

⁴ Norkolk, D. (ed.) (2013) *Handbook of Transfusion Medicine*, 5th edition, London, The Stationery Office.

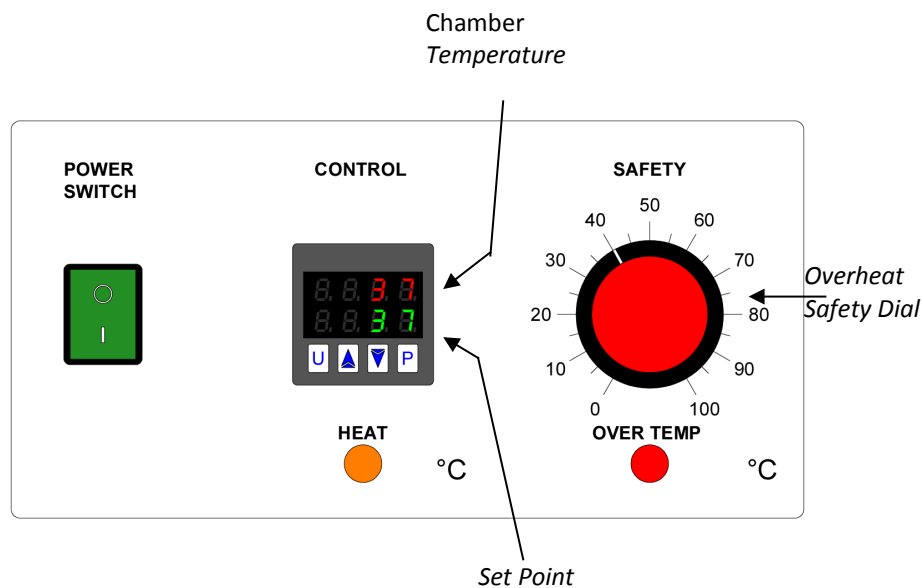
⁵ Paidas, M. et al. (2010) *Hemostasis and Thrombosis in Obstetrics & Gynecology* Chichester, Wiley-Blackwell, p.187

⁶ (2011) *Blood and Blood Products Transfusion Procedure Manual*, Tasmania, Northern Area Health Service & North West Area Health Service, (available at http://www.northwestpath.com.au/media/63961/nahs_nwahs_blood_procedure_manual_2011_9_27.pdf)

INSTALLATION / OPERATING INSTRUCTIONS

- 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.
NB. 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 \wedge and \vee 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.

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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 be 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.

TROUBLESHOOTING CHECKLIST

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)

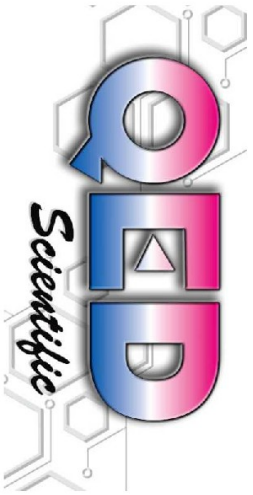
- Call QED Scientific for a replacement ‘Roller Catch and Stud’. Fitting instructions are available.

Door handle is loose (models with a twist handle)

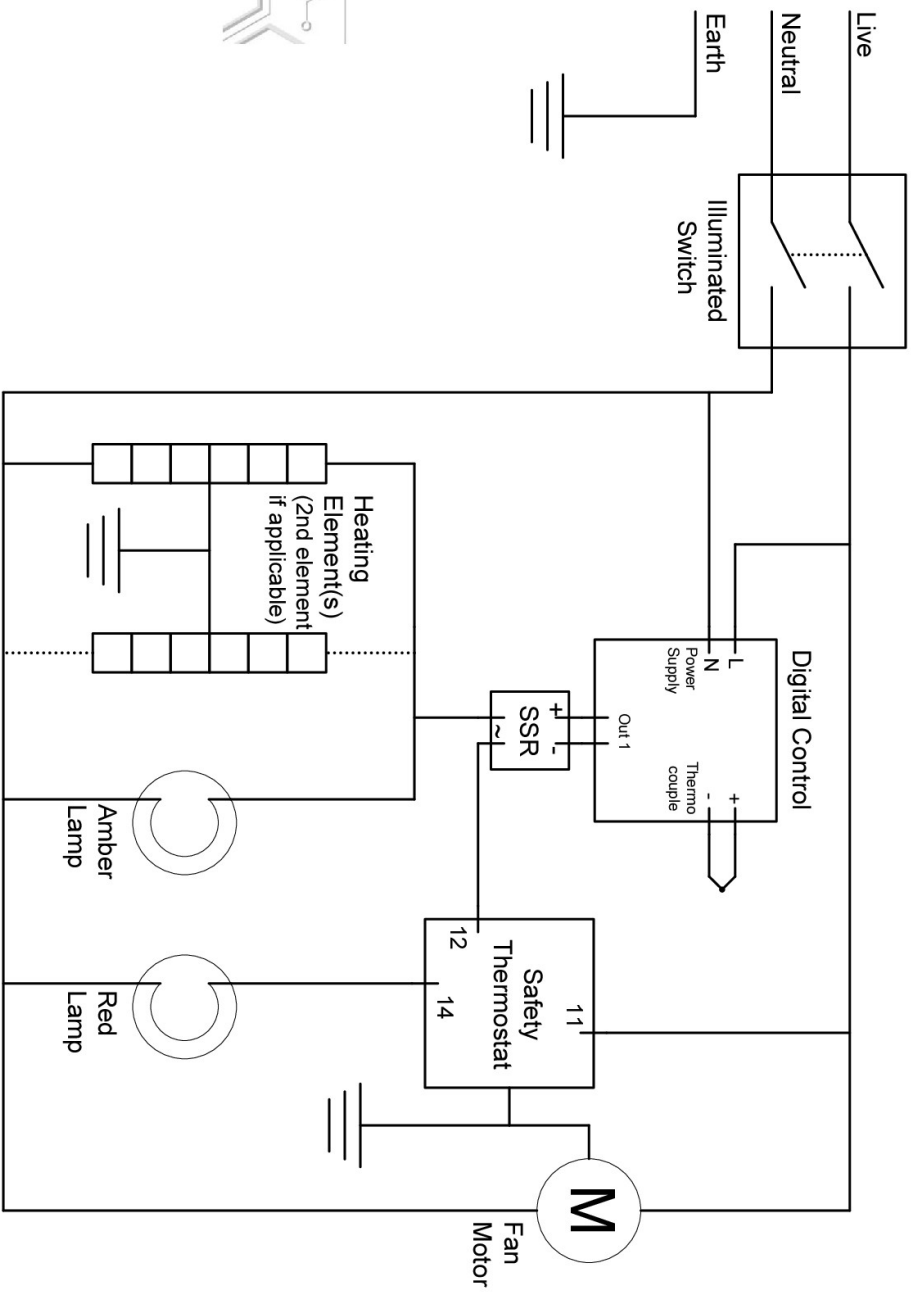
- Call QED Scientific and explain this.

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.



Circuit Diagram
 Medical Warmers
 Digital Control



MODIFICATIONS AVAILABLE

Description	Model Number	Details
Wheels	-WH	Front Pair Lockable
Wall bracket	-WALL	For sizes up to 75
Viewing panel	-DGW	In door
Glass door	-VIS	Fully glazed
2 nd shelf	-2S	For MW40 only
Audible alarm	-AUD	Temperature alarm

Sizes above 350 include –WH as standard

EXTRAS AVAILABLE

Description	Order Number	Details
Wheeled dolly	WH2-[model]	Front Pair Lockable
Small wheeled stand	ST1-[model]	With wheels, for sizes up to 150
Large wheeled stand	ST2-[model]	With wheels, for sizes from 210 to 350
Small stand with feet	ST3-[model]	For sizes up to 150
Large stand with feet	ST4-[model]	for sizes from 210 to 350
Full width basket	BASK1-[model]	For sizes above 40
Basket with divider	BASK2-[model]	Full width, with central divider, sizes above 40
Half width basket	BASK3-[model]	For sizes above 50

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

Digital controller	Mains supply cable
Solid state relay (SSR)	Mains input socket and filter
Thermocouple	Door Handle, pull type
Overheat protection device	Door handle, twist type
Fan motor (compet)	Roller catch and stud
Heating element-[model]	Shelf-[model]
Mains power switch (illuminated)	

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.



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Patient Warming Systems

Patient Warming Blankets	Theatre and recovery warming blankets to meet NICE Guidelines. Cost effective alternative to forced air warming
Heated theatre mattresses	Durable, sterilisable patient warming mattresses
Neonate Warming	Heated swaddling blankets, mattresses
Neonate & Infant warmers	Free-standing warming systems

Warming Cabinets

Fluid Warming Cabinets	(For operating theatres) 9 to 180 1-litre bottles
Blanket Warming Cabinets	(For theatre recovery) 4 - 40 blankets
Contrast Media Warming Cabinets	Warming media & lotions in radiology, CT, etc
Combination Warming Cabinets	Combined fluid and blanket warming cabinets

Custom build options available

Refrigeration

Blood Bank Refrigerators	Capacities from 20 to 700 bags
Pharmacy Refrigerators	Ward & clinic models from 36 to 155 litres Pharmacy models from 36 to 2040 litres
Medical Refrigerators	Safe storage at +4C From 36 litres upwards

Other Patient Care and Storage solutions

Neonate Phototherapy	LED phototherapy systems
DVT Prophylaxis	Sequential compression with disposable sleeves
Filtered Specimen Storage	For safe storage of specimens in theatre areas