



**BW1**  
**Blood warming bath**

*Operating instructions*

## BW1

### General Description

Rapid infusion of cold blood in large quantities is known to increase the risk of cardiac arrest. This can be greatly reduced by infusing through a suitable, disposable, sterile heat-exchange coil placed in a Blood-warming bath. Blood at the required temperature is available more quickly than if bags or bottles themselves are warmed by immersion in warm water, and there is no risk of overheating. A further advantage is that no more blood is warmed than is actually required.

The BW1 Blood-warming bath has a clamp for attachment to drip stands between 12 and 30 mm in diameter. The pre-set temperature control is set to maintain water temperature at  $37^{\circ}\text{C} \pm .5^{\circ}\text{C}$ . At low rates of blood flow, the outlet blood will be approximately the same temperature as the bath. At higher flow rates, the outlet temperature will depend on the flow rate and the efficiency of the heat-exchange coil.

With blood at an initial temperature of  $4^{\circ}\text{C}$  and using a blood-warming coil, outlet blood temperature will not fall below  $32^{\circ}\text{C}$  at blood flows up to 100ml/min.

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## 1 Safety

This product is for use in a hospital environment by suitably qualified medical staff. When flammable anaesthetics are used, DHSS regulations permit the use of these baths except within 25cm of anaesthetic breathing circuits.

The following symbols marked on the equipment mean:-



Caution: Read these operating instructions fully before use and pay particular attention to sections containing this symbol



### Always observe the following safety precautions

- Use only as specified by the operating instruction, or the intrinsic protection may be impaired.
- Connect only to a power supply with a voltage corresponding to that on the serial number label.
- Connect only to a power supply which provides a safety earth (ground) terminal.
- Before moving, disconnect at the power supply socket.
- Do not check the temperature by touch, use the temperature display or a thermometer.
- Ensure that the mains switch is easily accessible during use.
- Do not block or restrict ventilation slots.
- If liquid is spilt inside the unit, disconnect it from the power supply and, after cleaning, have it checked for electrical safety and safe, correct operation.
- It is the user's responsibility to carry out appropriate decontamination if hazardous material is spilt on or inside the equipment.
- Do not connect to a power supply or switch on before filling the tank.
- This bath is for use only with water.
- Take care when topping up or draining.
- If the **alarm** lamp is illuminated do not touch the liquid or the heater, they may be very hot. Refill carefully, a hot heater can cause a spattering of very hot water droplets and scalding steam.
- To reduce the risk of eye injury use safety goggles or spectacles.
- Drain before moving the bath.
- If flammable anaesthetics are being used, do not place the bath within 25cm of anaesthetic breathing circuits.



## 2 Installation

### 2.1 Unpacking

Remove packing materials carefully and retain for further shipment or storage of the unit. The BW1 bath pack should contain:

- BW1 bath
- Lid
- Perforated mesh tray
- Clamp
- Operating instructions

### 2.2 Assembly

The blood warming bath can if required, be mounted to a transfusion drip stand. To fit it to a drip stand remove the three countersunk screws from the rear of the unit and use them to fix the drip-stand clamp to the unit. The clamp will grip drip-stand columns from 12 to 30mm diameter. Ensure that the tray is fitted, to prevent the heat-exchange coil from touching the heater.

### 3 Operation

#### 3.1 Controls and indicator lamps

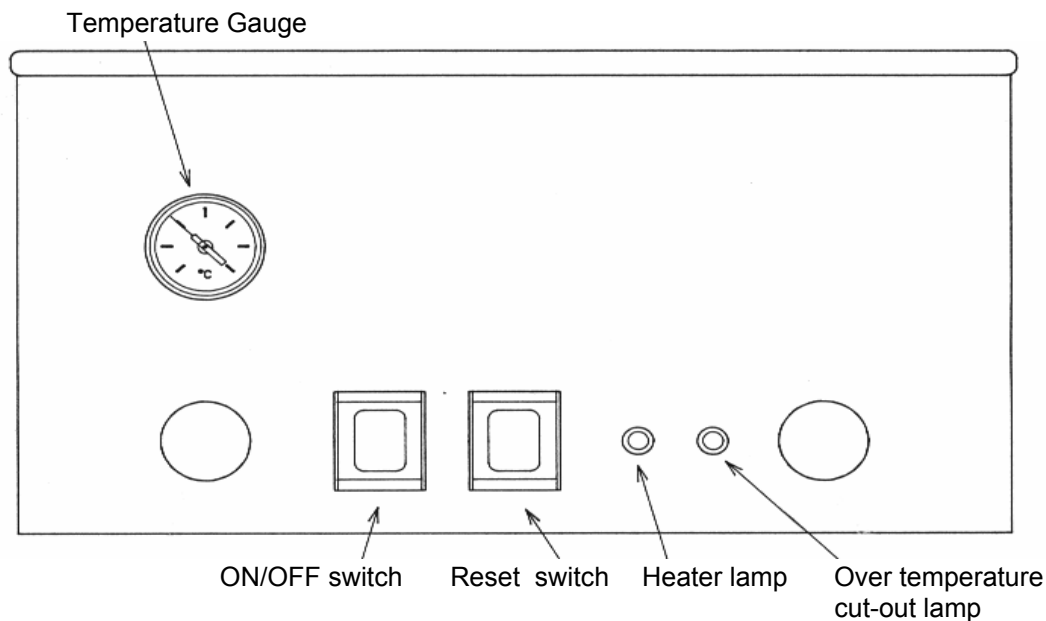


Figure 1

##### 3.1.1 Heater lamp

The **heater** lamp (orange) indicates when the heater is on.

##### 3.1.2 Overtemperature cut-out

The **overtemperature cut-out** lamp (red) illuminates on switch 'on' and when the **overtemperature** cut-out has operated.

##### 3.1.3 The buzzer

The **buzzer** (internal) operates on switch 'on' and when the overtemperature cut-out has operated.

##### 3.1.4 The reset switch

The reset switch, used to override the cut-out, on switch 'on' and cut-out test (see 5.1.2).

#### 3.2 Filling

Fill the tank with cold water (below 35°C) to approximately 12mm below the ledge.

### 3.3 Starting

**CAUTION:** When the unit is to be used for clinical purposes it must be operated only by suitably qualified medical personnel.

**WARNING:** The equipment must be earthed (grounded). It is protected by internal electrical fuses. We strongly recommend that the power supply to any equipment for heating liquids should include a residual-current circuit breaker (earth leakage trip).

Check that the voltage rating of the products, given on the serial number plate at the power cable entry, is correct for your supply.

Connect the bath to the power supply and switch on.

The overtemperature lamp will light up and a buzzer will sound. Press the reset button to cancel. If this sequence of events fails, the bath must be returned for service.

Allow the bath to stabilise at  $37\text{ }^{\circ}\text{C} \pm 1^{\circ}\text{C}$ . Place a disposable heat exchange coil (not supplied) in the bath. Fit the lid such that the tubing passes through the two slots in the corners of the lid. The equipment is now ready to use.

### 3.4 Running

The liquid must be monitored to ensure that it does not get so low as to affect the efficiency of the transfusion coil.

**Caution:** if the over-temperature lamp lights up and/or the buzzer sounds the control temperature may have been exceeded, the unit has stopped controlling the water temperature and switched off the heating. Check the water level in the bath; if the bath has run out of water allow to cool before refilling. If the unit does fail to operate correctly the bath must be taken out of use and returned for repair

The unit relies on an electrical power supply to warm the water and hence the blood in the coil. If the power fails, heating of the liquid stops. Although the water will take a time to significantly reduce its temperature, the operator should monitor the unit to ensure the power is being supplied and temperature on the in-built thermometer is within the required range.

### 3.5 Storage after use

Empty the bath, wash out with tap water. Allow the unit to drain dry.

## 4 Technical specification

This equipment is for indoor use and will meet the requirements of EN60601 within the ambient temperature range  $10^{\circ}\text{C}$  to  $40^{\circ}\text{C}$ , with maximum relative humidity of 80% non-condensing.

This equipment is designed to operate at  $37^{\circ}\text{C}$  and will cease to control the temperature of the liquid at ambients above this level.

Installation category II (transient voltages). Pollution degree 2 in accordance with IEC 664. For operation at altitudes of up to 2000 metres.

Temperature	$37^{\circ}\text{C} \pm 1^{\circ}\text{C}$
Supply voltage range	220 - 240V 50/60Hz
Power rating	460W
Overtemperature protection	Thermostat
Overall dimensions	340 x 180 x 200mm (excluding clamp and lid handle)

## 5. Maintenance and service

This product can be flash tested. It is fitted with radio frequency interference suppressers. Therefore it is recommended that only a d.c. test is performed.

### 5.1 Monthly checks

At monthly intervals, check correct operation as follows:-

#### 5.1.1 Bath temperature

Allow the bath to heat up and stabilise. Measure the temperature of the water in the bath: it should be  $37^{\circ}\text{C} \pm 0.5^{\circ}\text{C}$ .

#### 5.1.2 Overtemperature cut-out

Test by holding down the Test/Reset button until the buzzer and overtemperature light come on. The water temperature should be  $40.0^{\circ}\text{C} \pm 0.5^{\circ}\text{C}$ .

If the unit fails any test it should be returned for service or checked by a competent person.

### 5.2 Cleaning

The cases can be cleaned with a damp cloth after disconnection. Do not use solvents. The immersed parts can be cleaned using proprietary heating element cleaners. CAUTION: these may be toxic - follow the cleaner manufacturer's instructions.

Before using any decontamination or cleaning method except that recommended, check with our service department, or in other countries with our distributor, that the proposed method will not damage the equipment.

## 6. Guarantee

When used in laboratory conditions and according to these operating instruction, these baths are guaranteed for THREE YEARS against faulty materials or workmanship.

## 7. Service

For service, return to our Service Department in the UK, or to our distributor.

Service Address: Grant Instruments (Cambridge) Ltd.  
SHEPRETH  
Cambs  
SG8 6GB  
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