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# Miris Heater

08-06-101 EU model

08-06-102 US model

*User Manual*

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## 2 How to use this operating manual

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This operating manual will allow you to unpack, set up and operate this water bath correctly and safely. Important safety information, symbols and warnings are listed below and should be read carefully.

If there is a technical matter that this operating manual does not address, or any other questions concerning this product, please contact Miris or your local distributor who will be able to provide any additional information.

## 3 Safety information

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### 3.1 Safety compliance

Miris Heaters meet the requirements of international safety standard IEC 61010 – “Safety requirements for electrical equipment for measurement, control, and laboratory use”. They also comply with the equivalent national standards including:

EN 61010-2-010  
UL 61010A-2-010  
CAN/CSA-C22.2 NO. 61010-2-010-04.

### 3.2 Safety symbols

The symbols below are marked on the equipment and in this manual to indicate:



**Caution: Surfaces and water can be hot during and after use**



**Read this manual before using the bath**



**Important safety warning**






**Recommended operation  
Failure to follow may affect the performance of the equipment**

### 3.3 Safety warnings



Read the whole of the instructions. Safety may be impaired if they are not followed.

 	<p>Surfaces and water can be hot during and after use. Before emptying a bath, allow the water temperature to fall to a safe level</p> <p>This bath is only intended for use with water or metallic heat transfer beads. Use of other fluids or heat transfer media may invalidate the warranty and present a risk of fire or explosion.</p> <p>The tray must be removed when using heat transfer beads.</p> <p>Place on a stable flat surface to reduce the risk of accidental spillage.</p> <p>No user serviceable parts. Risk of electric shock after disassembly or operation with covers removed.</p> <p>Not for use in environments with a risk of flammable or explosive gases. To be operated within the limits listed in this guide</p> <p>Only use the mains cord provided or one with an identical rating. Ensure that the mains plug and the switch are easily accessible.</p> <p>A clearance of &gt;10cm around the bath is required to ensure adequate air flow.</p> <p>If a potentially hazardous liquid is spilt onto the equipment, disconnect it from the power supply and have it checked by a competent person. It is the user's responsibility to carry out appropriate decontamination if hazardous material is spilt on the equipment.</p> <p>Clean the outside of the equipment with a damp cloth, using water and domestic cleaning products only. The use of other chemical cleaning agents may damage the equipment. Always follow the manufacturer's instructions and any applicable legislation about the use of potentially hazardous substances.</p>
	<p>To preserve your water bath in peak condition, consult the extra guidance listed below.</p> <p>Failure to do so may affect your warranty. For optimum performance prevent tray from touching bath sides.</p> <p>Before first switching on the bath please remember to fill the bath with water. Switching the bath on dry can damage the heater and could invalidate the product warranty.</p> <p>If the equipment has been transported or stored in cold or humid conditions, condensation may form inside it. If that could have happened, allow time (at least 2 hours at room temperature) for the condensation to evaporate before using the equipment.</p> <p>When operating the bath in high ambient temperatures (&gt; 30°C) the temperature of the water used to fill the bath should be no more than 10°C below the ambient.</p>

## 4 Operating instructions

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### 4.1 Unpacking instructions

Standard equipment includes:

- Thermostatic water bath
- Mains cord with plug
- Gabled polycarbonate lid
- Polycarbonate tray
- Operating manual

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Remove packing materials carefully, and retain for future shipment or storage of the equipment.

### 4.2 Assembly of the equipment and components

The water bath has three main components, the bath, the lid and the base tray. The base tray fits into the bath with the feet downward so that it creates a gap between the bottom of the tank and the tray.



For optimum temperature stability, avoid allowing the base tray to touch the sides of the tank when using water.

The base tray must be removed when using heat transfer beads

The lid should only be lifted by the handle, as other parts can become hot during use. It also has a vent/thermometer hole – this hole should not be sealed as pressure could build up inside the bath.

### 4.3 Installation

Place the water bath on a level, non-combustible surface. Ensure that the mains plug and the switch are easily accessible.

### 4.4 Electrical supply

Check that the supply voltage marked on the serial number label, and the type of mains plug, are correct for your mains supply outlet, which must have a ground connection.

To disconnect the equipment from the mains supply, remove the mains plug from the mains supply outlet.

## 5 Operating procedures

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### 5.1 Using the bath with water

#### 5.1.1 Water level

The bath will provide optimum performance when filled to the swage line which is typically 25mm below the top of the tank.

Do not fill above the swage line.

The water level used in the tank will influence the temperature accuracy and stability. Using liquid levels below the swage line needs consideration, especially when operating at higher water temperatures (>50°C) and without a lid. We recommend the following minimum fill level

Tank size	Recommended min % fill	Approximate water depth (mm)
5l	40%	50

**Table 1 - Recommended minimum fill levels**

When using a larger bath with vessels which only require a shallow immersion, we recommend filling the bath as close to the swage line as possible and using raised shelves in the bath to elevate the vessel to the desired immersion depth.

#### 5.1.2 Operating the bath without water (dry, DTC)

Do not attempt to use your bath without water in the tank. The bath has an inbuilt protection mechanism known as dry start protection which will detect this condition in most circumstances and prevent the bath from continuing to heat. In this instance, the bath will display dry and sound an alarm.



The tank internal surface can become very hot if an accidental dry start has occurred, even if the dry start cut out has operated. Avoid touching the tank until it has been left to cool for several minutes.

Once you have filled the bath, you will need to switch the bath off and on in order to resume operation.



Repeated dry starting of the bath stresses key components in the bath which can affect service life and the equipment's warranty.

The bath also includes an independent safety temperature cut-out which will protect the bath in the unlikely event of a fault or if the dry protection alarm is switched off (see section 5.1.5). If the cut-out is activated then the bath will stop heating, show DTC on the display and sound an alarm. The bath should be switched off, unplugged and allowed to cool for at least 30 minutes. Contact Miris for information on how your bath can be reset.

### 5.1.3 Operation above 60°C

The lid must be used above 60°C to maintain proper temperature control and to ensure that the water temperature reaches the set point

The lid will also prevent excessive evaporation that requires the bath to be filled more often and will save energy.

### 5.1.4 Flat bottomed vessels

Do not place flat-bottomed vessels or other objects directly on the bottom of the tank. Always use the base tray. This avoids possible damage to the heater mounted under the tank. The base tray also improves temperature control.

### 5.1.5 Allowing the bath to run dry (dPA )

Always take care to avoid allowing the water to evaporate to the point that the bath runs dry. This can lead to the bath's internal safety cut-out operating. In this situation the display will show  $\square E \square$  and sound an alarm. Contact Miris for information on how your bath can be reset.

The bath has a built-in advanced detection mechanism to greatly reduce the chances of the safety cut out occurring in most circumstances where the bath is left to accidentally run dry. This feature is only enabled automatically when the following criteria are met:

- The set temperature is  $>50^{\circ}\text{C}$
- The bath has been operating for a least one hour
- The water is not set to boiling point ( $\geq 99^{\circ}\text{C}$ )

If the bath detects signs that the bath water level may be becoming low, it will alert the user by displaying  $d r \square$  and sounding an alarm

Once you have checked the water level and topped up the water level as necessary you will need to switch the bath off and on in order to resume operation.

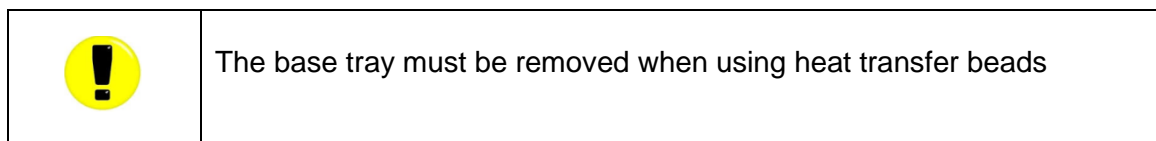
For users with specialist applications where this feature maybe unnecessarily triggered it can be disabled. Press the set key to enter the bath menu and use the arrow keys to select dPA (Dry Protection Alarm). Press the set key and use the arrow keys to select OFF. Use the set key to confirm that the dry start and run dry protection are switched off.

### 5.1.6 Emptying the baths

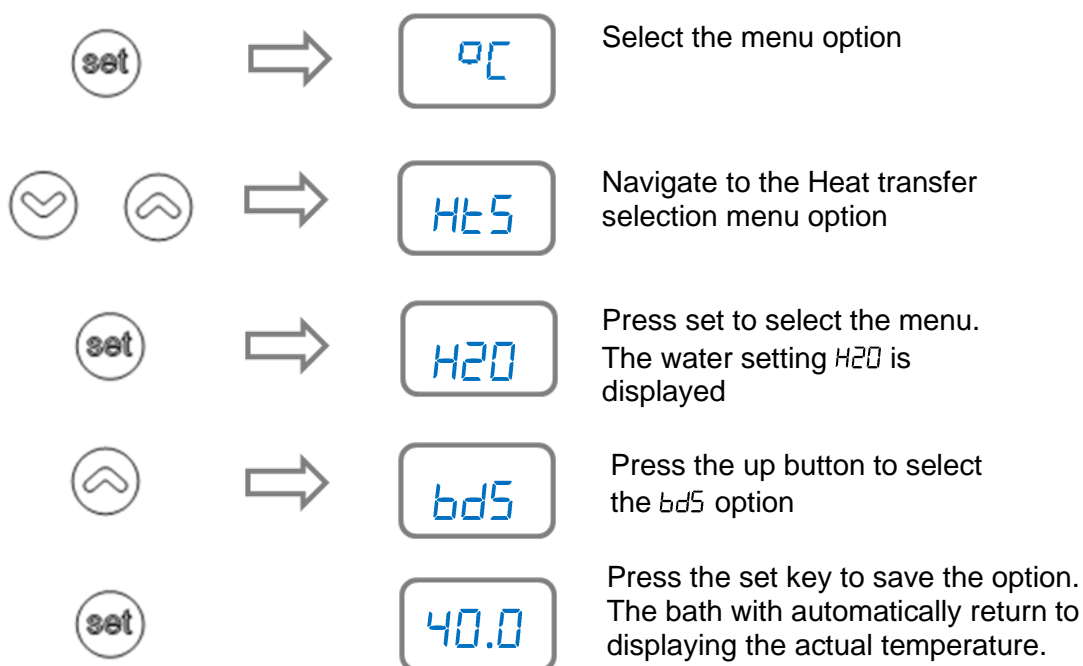
Before emptying any bath allow the water temperature to fall to a safe level and take reasonable precautions to prevent accidental spillage.

## 5.2 Using the bath with heat transfer beads (bd5)

Miris Heater baths can be set up to operate with heat transfer beads as an alternative to water.



Configure the bath using the Heat transfer selection menu as follows:



**Figure 1 – Setting the bath for heat transfer beads**

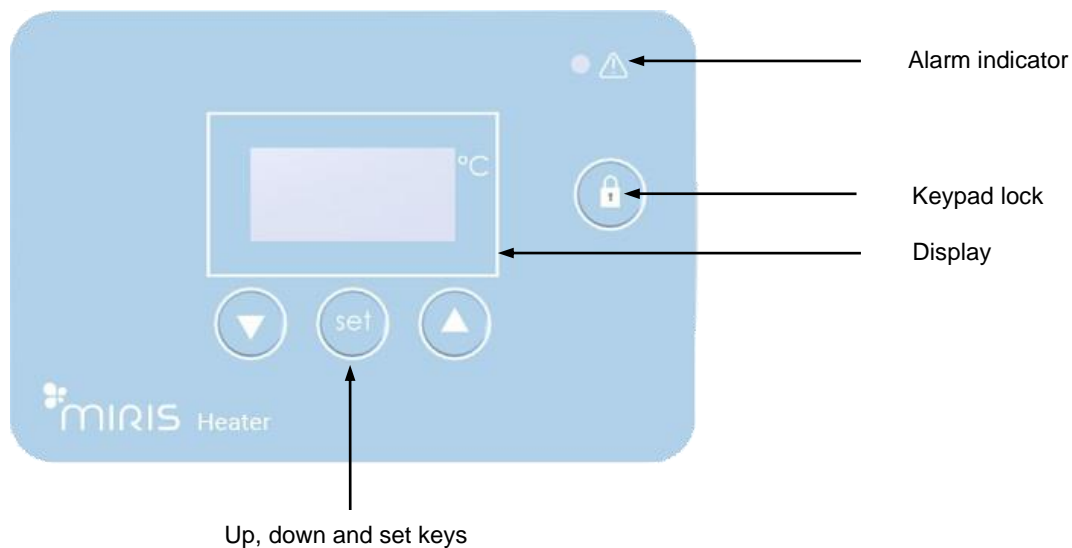
When operating the bath configured for heat transfer beads the temperature range is limited to 80°C maximum. The Dry Protection Alarm is no longer required so is not available on the bath menu.

Important note: Baths using heat transfer beads behave differently from water baths. Performance specification of the Miris Heater detailed in Section 8 is for water only. Performance with heat transfer beads will be significantly different. Users should refer to the bead manufacturer's recommendations for use and performance.

Any existing protocols for sample preparation will need to be revalidated to prevent possible overheating.

## 6 Using the water bath

### 6.1 Bath controls



### 6.2 Indicators

There are two indicators:

- Main display – used to show temperature and short messages
- Alarm - Flashes red when activated. A buzzer also sounds.

### 6.3 Setting the control temperature (°C)

The water temperature of the bath can be set using the main display. The following example shows setting the water bath to 40.0°C. Note that once the set point is entered the bath shows a scrolling bar display indicating the bath is heating. Once the bath is with 1°C of the set temperature this will change to displaying the actual water temperature in the bath.

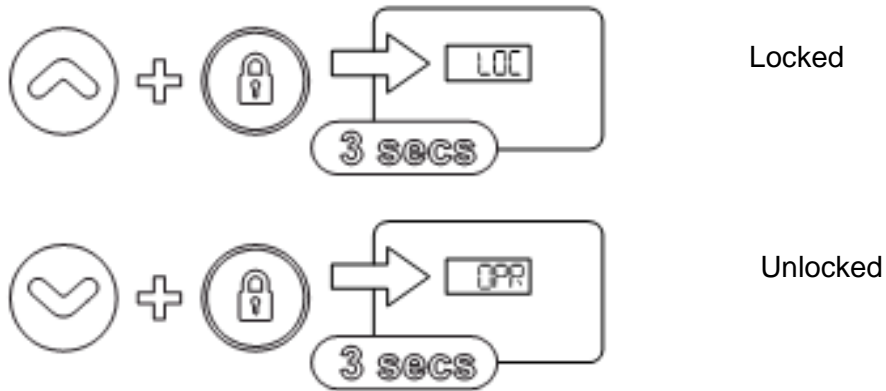


Figure 2 - Setting the bath temperature

## 6.4 Enabling the keypad lock

The keypad lock is intended to help users avoid accidental changes to the set point temperature of the bath.

To enable and disable the lock, press and hold the **lock** and **up** or **down** keys for three seconds as shown below



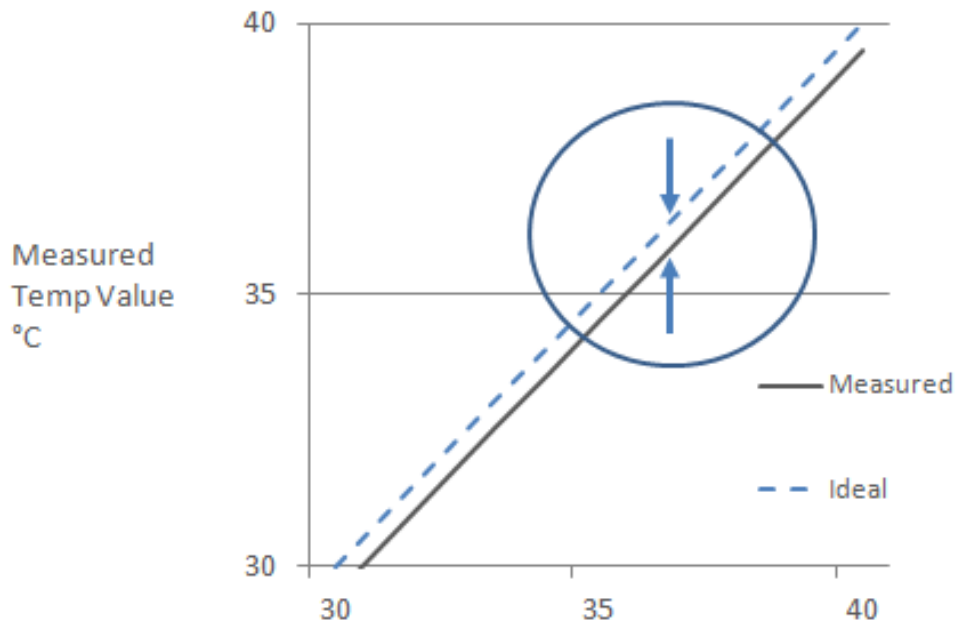
**Figure 3 - Locking and unlocking the keypad**

## 7 Calibration

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### 7.1 Single point calibration (SPC)

A single point calibration applies a single offset over the bath temperature curve. For this reason the calibration temperature is usually the same as the intended working temperature for the bath or particular experiment:



The quality of the calibration is highly dependent on:

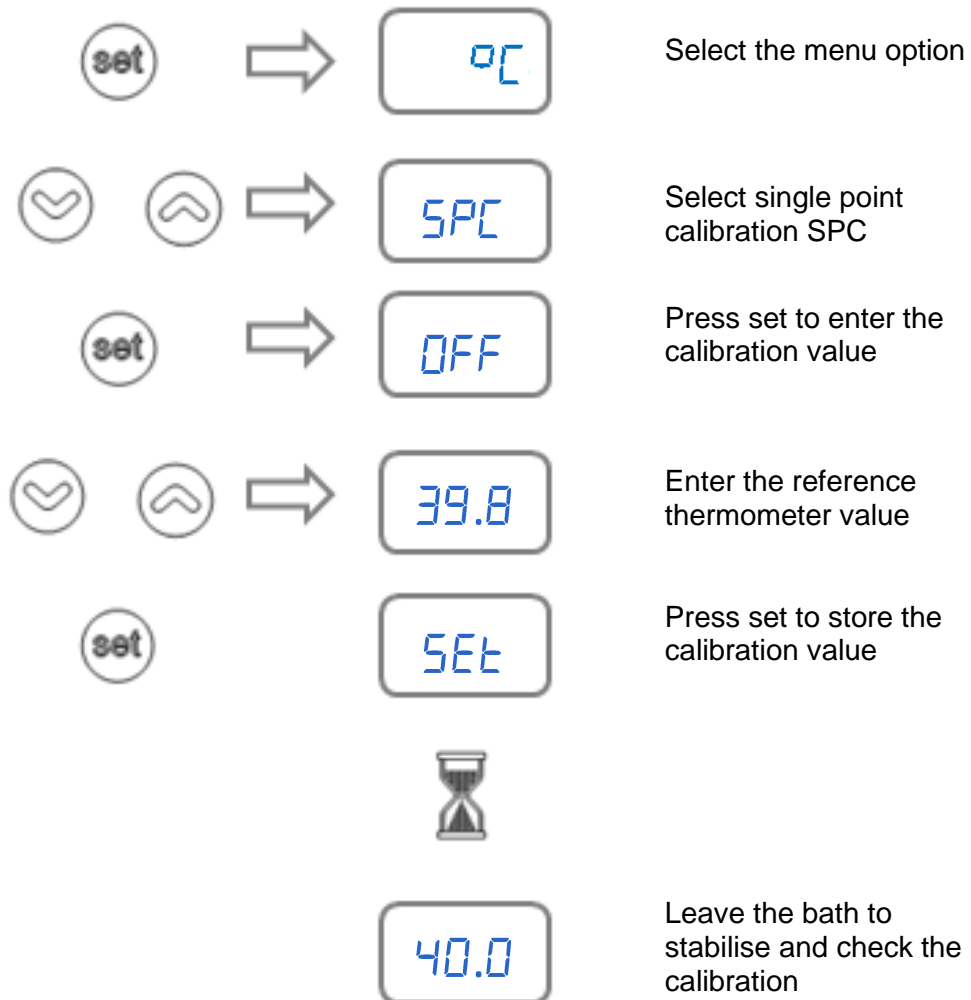
Use of a suitable reference thermometer, ideally 10 times the accuracy you are trying to achieve.

Performing a calibration in a stable ambient environment ( $\pm 1^{\circ}\text{C}$ ) free from draughts or cooling air currents.

To configure a single point calibration:

Firstly, set the bath to the desired set point and leave to stabilise for at least an hour.

Place the reference thermometer either in the centre of the bath, or if using a lid, through the thermometer hole. Note the temperature shown by the reference thermometer and enter it into the calibration menu by following the steps below.



**Figure 4 - Setting a single point calibration**

## 8 Technical specifications

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### Operating conditions

Ambient Temperature	5 to 40°C
Maximum relative humidity	80% R.H. in room temperatures up to 31°C decreasing linearly to 50 % R.H. at 40°C
Altitude above sea level	Up to 2,000 m (6,500 ft)
Operating Environment	Indoor use only

### Electrical details

**S7** Mains supply: 220-230V @ 50/60 Hz or 110-120V @ 50/60 Hz  
Pollution degree: 2  
Installation Category: II

Note: Mains supply voltage fluctuations are not to exceed  $\pm 10\%$  of the nominal supply voltage

Model	Capacity (l)	Current rating (A)	
		120V	230V
08-06-101	5	-	1.5
08-06-102	5	3.0	-

### Bath performance

<b>S2</b>	Temperature range	5°C above ambient to 95°C
	Setting scale	10 to 95°C in 0.5°C steps
<b>S3</b>	Temperature stability	$\pm 0.5^\circ\text{C}$

All performance data specified tested in accordance with DIN12876.

## Technical tips

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### 8.1 Which water should you use in your bath?

- Use tap water with care. Water with a high lime content will cause scale build up and should be avoided.
- Distilled water and some types de-ionised water may be used. Avoid ultra high purity de-ionised waters.
- Avoid using water with high levels of salts or iron. These will reduce the life of your bath
- Regular water changing and frequent cleaning of your bath is needed to preserve the baths corrosion resistance
- Ensure you bath is stored dry.
- Use care in placing other metallic items in the bath. Some metals (e.g. ferrous materials such as iron filings and swarf) can cause an electro-chemical reaction leading to corrosion.
- The product warranty may be affected by the use of inappropriate or corrosive liquids

## 9 Warranty information

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When used in laboratory conditions according to this manual, this product is guaranteed for THREE YEARS against faulty materials or workmanship.

## 10 Maintenance and service

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No routine maintenance is required except for cleaning. There are no user serviceable parts inside the unit.

### 10.1 Cleaning

Clean the outside of the equipment with a damp cloth. Domestic detergents may be used to remove stubborn dirt. Scale on immersed parts can be removed using chemical de-scaling products designed for use on kitchen equipment that have metal parts. De-scaling products may be toxic and manufacturer's instructions should always be followed.

Before using any other cleaning or decontamination method, check with Miris or your local representative to make sure that the proposed method will not damage the equipment.

### 10.2 Fuses

The fuses are internal and should not need to be replaced.

#### 10.2.1 Replacing the mains cord

Any replacement mains cord-set used with the water baths must meet the same specification as the one originally supplied with the unit to maintain safety of the unit.

For Europe (including the UK), the cable must have the following markings; <HAR>, HO5VV-F 3Gx1mm<sup>2</sup> and be rated to carry 10A. The mains plug and IEC connector must carry approvals from a European certification body (e.g. BSI, VDE or equivalent).

For North America, the cable must have the following markings; SVT, 3x 18AWG, VW-1, 75°C, 300V, FT2 and be rated to carry 10A. The mains plug, lead and IEC connector must carry 3<sup>rd</sup> party approval marks for Canada and the US (e.g. CSA and UL marks/file numbers).

#### 10.2.2 Routine safety tests

If routine tests are to be made, we recommend a test of the integrity of the protective earth conductor and an insulation test at 500 V DC. Routine flash tests are not recommended for any electrical equipment, because repeated high voltage tests degrade insulation materials.

### 10.3 Service

If service is required, switch off the unit and contact Miris or your local representative for repairs.

## 11 Troubleshooting

Symptom	Possible cause	Action required
Temperature does not rise when expected	Set temp is lower than liquid temp  Set temperature is too close to ambient	Check that the bath set temperature is correct (see section 6).  Increase the set temperature (see section 6). Minimum temp is 5°C above ambient.
Temperature continues to rise when not expected	Set temp is higher than liquid temp  Set temperature is too close to ambient	Check that the bath set temperature is correct (see section 6).  Increase the set temperature (see section 6). Minimum temp is 5°C above ambient.
Display shows <i>dry</i>	Bath has been heated with no water  Bath has run out of water	Fill the bath with water. Switch the bath off and on to restart  Refill the bath with water. Switch the bath off and on to restart
Display shows <i>oEtC</i>	Bath has overheated due to lack of water  Objects have been placed directly on the base of the bath	The over temperature cut-out needs to be reset. Contact Miris for instructions on how to do this.  After reset has been completed, use a tray on the bath base
Display shows <i>oPEn</i>	Faulty temperature probe	Have a competent person check the probe for an open circuit fault or contact Miris.
Display shows <i>Short</i>	Faulty temperature probe	Have a competent person check the probe for a short circuit fault or contact Miris.
Display shows <i>dEF</i>	Bath is running on its default settings	Contact Miris for assistance.

## 12 Compliance

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### 12.1 Equipment disposal



This equipment is marked with the crossed out wheeled bin symbol to indicate that this equipment must not be disposed of with unsorted waste. Instead it's your responsibility to correctly dispose of your equipment at lifecycle-end by handling it over to an authorized facility for separate collection and recycling. It's also your responsibility to decontaminate the equipment in case of biological, chemical and/or radiological contamination, to protect from health hazards the persons involved in the disposal and recycling of the equipment.

For more information about where you can drop off your waste of equipment, please contact your local dealer from whom you originally purchased this equipment.

By doing so, you will help to conserve natural and environmental resources and you will ensure that your equipment is recycled in a manner that protects human health.

### 12.2 RoHS directive

All the products covered by this manual comply with the requirements of the RoHS Directive (Directive 2011/65/EU).

### 12.3 Electrical safety and electromagnetic compatibility

All the products covered by this manual comply with the requirements of the Low Voltage Directive (2014/35/EU) for electrical safety and the EMC directive (2014/30/EU) for electromagnetic compatibility.