

# **VWR®** Unstirred Water Baths

# **OPERATING MANUAL**



# **European Catalogue Number(s):**

462-0554, 462-0555, 462-0556, 462-0557, 462-0558, 462-0559

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# **Legal Address of Manufacturer**

## **Europe**

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# **Country of origin - United Kingdom**

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## 1. Intended Use

The products listed are general purpose series of thermostatically controlled unstirred water baths designed for indoor laboratory use by a professional user.

462-0554, 462-0555, 462-0556, 462-0557, 462-0558, 462-0559

# 2. How to use this Operating Manual

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 the supplier who will be able to provide any additional information.

# 3. Safety Information

## 3.1 Safety compliance

The water baths 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:

BS EN 61010-2-010:2014

### **RoHS** directive

All the products listed in this Operating Manual comply with the requirements of the RoHS Directive (Directive 2011/65/EC and its amendment 2015/863/EU).

### 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.

### 3.2 Symbols and conventions



**CAUTION** This symbol indicates a potential risk and alerts you to proceed with caution



**CAUTION** This symbol indicates the presence of high voltage and warns the user to proceed with caution



**CAUTION** This symbol indicates risks associated with hot surfaces

### 3.3 Safety Instructions



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



No user serviceable parts. Risk of electric shock after disassembly or operation with covers removed.



Only use the mains cord provided or one with an identical rating. Ensure that the mains plug and the switch are easily accessible.



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.



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.



Not for use in environments with a risk of flammable or explosive gases. To be operated within the limits listed in this guide



Surfaces and water can be hot during and after use. Before emptying a bath, allow the water temperature to fall to a safe level. For 12, 18, and 26, litre baths, empty the bath before moving it.



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.



When operating the bath in high ambient temperatures (> 30°C) the temperature of the water used to fill the bath should be no more than 10°C below the ambient.



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.



If the equipment has been transported or stored in cold or humid conditions, condensation may form inside it. If that happens, allow time (at least 2 hours at room temperature) for the condensation to evaporate before using the bath equipment.

# 4. Package Contents

Description	Quantity
Thermostatic water bath	1
UK Mains cord with plug	1
EU Mains cord with plug	1
Gabled polycarbonate lid	1
Polycarbonate base tray	1
Quick Start Guide	1
Operating Manual	1
Drain Stopper	1

# 5. Operating Instructions

## 5.1 Unpacking Instructions

- Remove packing materials carefully, and retain for future shipment or storage of the equipment.
- Check all parts are available against list in contents list.
- Notify supplier before continuing to use if any parts are missing.
- Do not substitute with any alternate parts than those provided

## 5.2 Assembly of 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.

### 5.3 Installation

### CAUTION. PLEASE FILL BATH WITH WATER BEFORE SWITCHING ON.

- a) Place the bath on a stable flat surface to reduce the risk of accidental spillage
- b) A clearance of >10cm around the bath is required to ensure adequate air flow.
- c) For optimum temperature stability, avoid allowing the base tray to touch the sides of the tank when using water.
- d) 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.
- e) Only use the mains cord provided or one with an identical rating. Ensure that the mains plug and the switch are easily accessible.
- f) Switching the bath on dry can damage the heater and could invalidate the product warranty.
- g) The base tray must be removed when using heat transfer beads
- h) To disconnect the equipment from the mains supply, remove the mains plug from the mains supply outlet.

# 6. Operating Procedures

## 6.1 Operation

### 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 levels

Bath size	Recommended min % fill	Approximate water depth (mm)
2LS	80%	32
2L		50
5L		50
12L		50
18L	40%	50
26L		70

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.

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 6.1.5). If the cut-out is activated then the bath will stop heating, show <code>DEE</code> on the display and sound an alarm. The bath should be switched off, unplugged and allowed to cool for at least 30 minutes.

### 6.2 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.

### 6.3 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.

### 6.4 Allowing the bath to run dry (dPR)

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  $\Box \vdash \mathcal{L}$  and sound an alarm.

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°C
- The bath has been operating for a least one hour
- The water is not set to boiling point (>=99°C)

If the bath detects signs that the bath water level may be becoming low, it will alert the user by displaying dry 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 dPR (Dry Protection Alarm). Press the set key and use the arrow keys to select DFF. Use the **set** key to confirm that the dry start and run dry protection are switched off.

### 6.5 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.

Larger baths have drain taps to make emptying easier.

To empty the bath using the drain tap, push the supplied drain insert into the drain tap. Note that the water will begin to empty as soon as the drain insert is fully engaged. A length of hose can be added to the barbed end of the drain insert if required.

### 6.6 Using the bath with heat transfer beads (HL5)

VWB baths can be set up to operate with heat transfer beads as an alternative to water. Remove the tray before filling the bath with the beads.

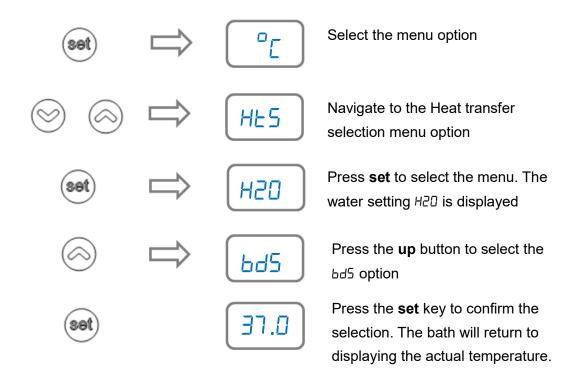


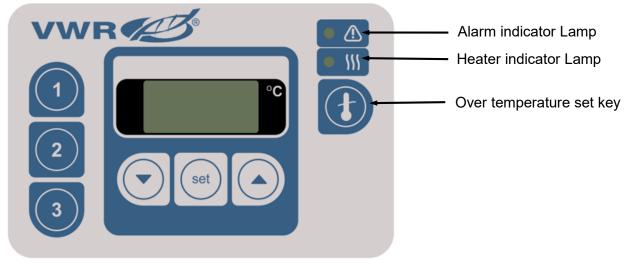
Figure 1 - Setting the bath for heat transfer beads

When operating a bath that is configured for heat transfer beads then 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. The performance specification of VWR baths detailed in Section 9 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.

## 7. Instructions for use



Pre-set keys Up, down and set keys

### **Buttons and indication lamps**

## 7.1 Operational keys

- Alarm indicator lamp Flashes red when activated. A buzzer also sounds.
- Heater indicator lamp Heater light on indicates operation and will periodically illuminate to show the bath is heating.
- Up and down keys Used to increase or decrease functions (Temperature)
- Pre-Set key Used for setting pre-set temperatures regularly used
- Over-temperature set key Setting the over-temperature alarm

## 7.2 Setting the control temperature (°[)

The water temperature of the bath can be set using the main display. The following example shows setting the water bath to 37.0°C. Once the new temperature has been set the heater indicator will come on (if the new setpoint is higher) and then as the water approaches the control temperature the heater indicator will start to flash as it maintains the temperature.



Figure 2 - Setting the bath temperature

## 7.3 Enabling the keypad lock

The control panel can be locked by pressing the **set** and **up** keys simultaneously for at least 3 seconds.

The display will show LOE to confirm that the keypad has locked.

The control panel can be unlocked by pressing the **set** and **down** keys simultaneously for at least 3 seconds. The display will show  $\Box P_{\Gamma}$  to confirm that the keypad is operational.

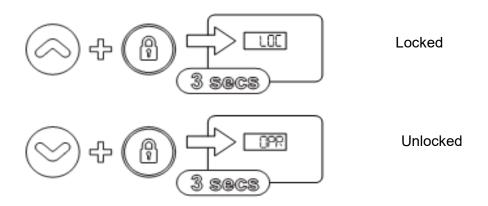


Figure 2 - Locking and unlocking the keypad

### 7.4 Setting the over temperature protection (DEP)

The over temperature protection can be used to protect samples by setting a maximum temperature limit the bath is allowed to heat to. If the bath exceeds this temperature, it will stop heating, display <code>DLR</code> (over temperature alarm) and sound an alarm.

To silence alarm press the **set** key once

Allow the bath to cool down before switching the bath off and on to resume normal operation. Note that if the cause of overheating is an incorrect set point, this will need to be corrected otherwise the alarm will operate again.

You should set the over temperature value, allowing for a safety margin to the sample maximum temperature limit if possible. Additionally, the <code>DEP</code> limit should be greater than the bath set point to avoid nuisance alarms.

To set the over temperature alarm:

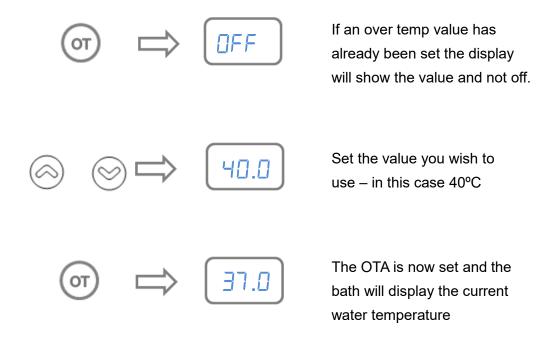


Figure 4 - Setting the over temperature alarm

To disable the alarm, set the over temperature alarm limit to 10.0°C and then press the down button one further time so the display shows ΔFF. Save by pressing the over temperature alarm key.

## 7.5 Configuring and running temperature pre-sets (Pr 1, Pr2, Pr3)

Temperature pre-sets allow you to conveniently store bath temperature settings you routinely use. The bath has 3 pre-sets, numbered 1 to 3.

You can set the bath to the value stored in the temperature pre-set by pressing the pre-set button you require, followed by set.

Before you can use pre-sets you need to store the values you wish to use in at least one of the pre-sets using the following sequence:

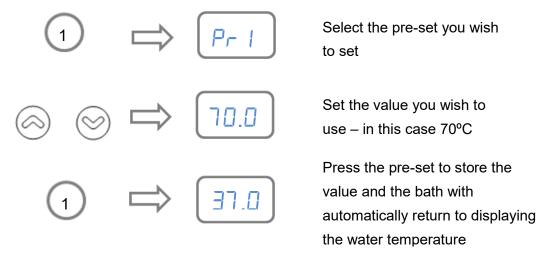
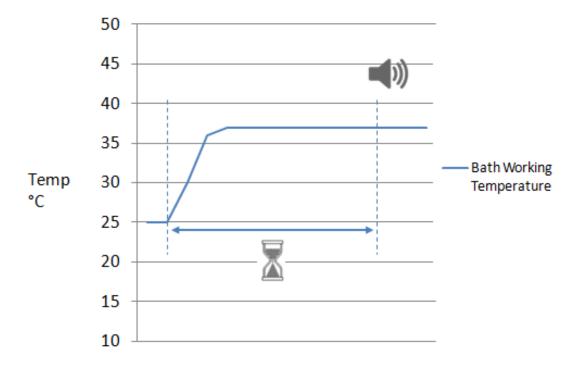


Figure 5 - Configuring a pre-set value

## 7.6 Setting the countdown timer ([dt]

A countdown timer can be set in the range of 1 to 999 minutes. The countdown timer will sound an alarm at the end of a countdown period. It can be used to time experiments or remind you to take a further action.

Note the countdown timer does not take into account if the bath has not reached the set temperature. If the bath has not reached the set temperature, this will need to be taken into account when starting the countdown timer.



When the countdown timer expires the bath will sound an alarm and display End. Press **set** to silence the alarm

To set the countdown timer:

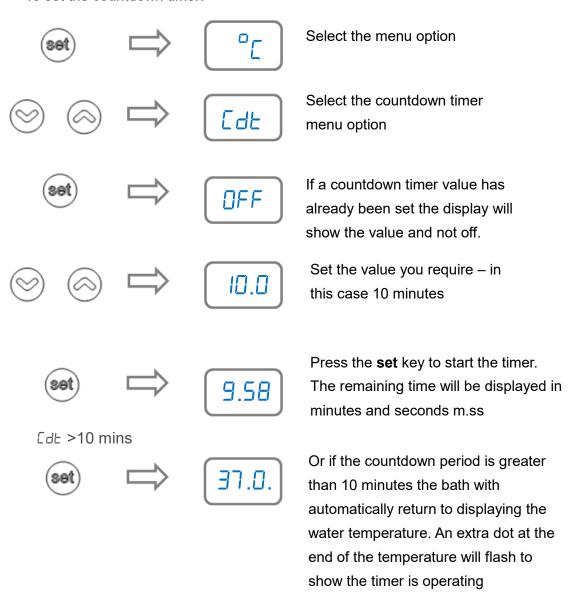


Figure 6 - Setting the countdown timer

To find out the water temperature whilst the display is showing the remaining time, press the **set** button.

To enter the configuration menus whilst the display is showing the remaining time, press the **set** button twice.

The timer can be turned off at any time by selecting the <code>EdE</code> menu option and pressing the down arrow button until the display shows <code>BFF</code>.

# 8. Calibration

## 8.1 Calibration options

Two calibration options exist:

- Single point calibration
- Dual point calibration

The quality of the calibration is highly dependent on:

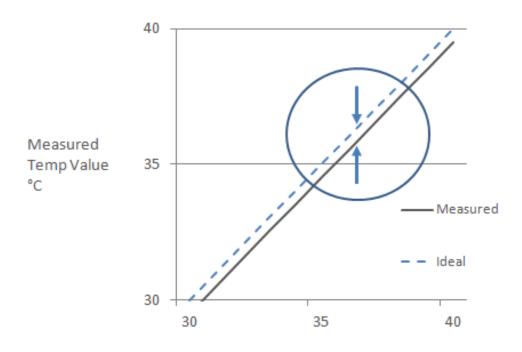


Use of a suitable reference thermometer, ideally 10 times the accuracy you are trying to achieve.

Performing a calibration in a stable ambient environment (+/-1°C) free from draughts or cooling air currents.

## 8.2 Single point calibration

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



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.

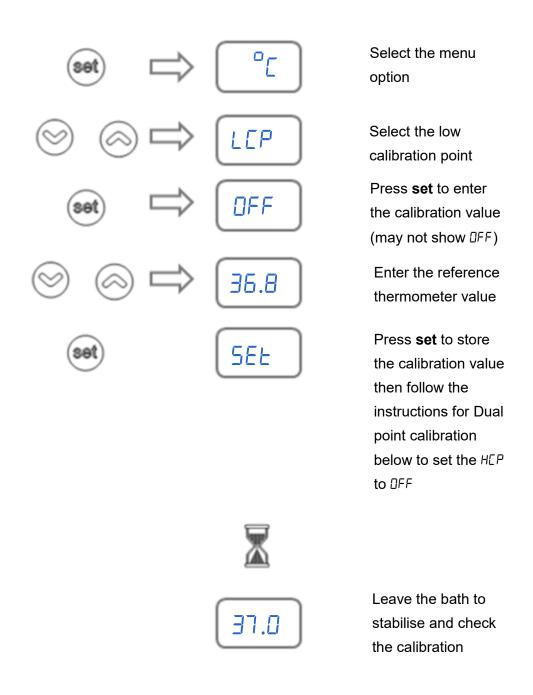
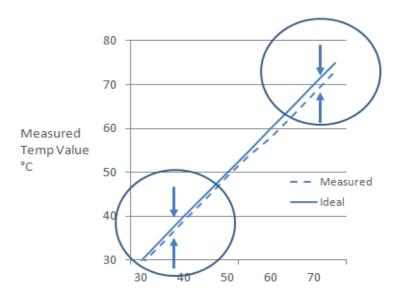


Figure 7 - Setting a single point calibration

## 8.3 Dual point calibration (LEPand HEP)

Dual point calibration is typically used on baths which are operated over a range of temperatures.

Two calibration points are entered into the calibration menu: the low calibration point (LEP) and high calibration point (HEP). These points are typically selected as just below and above the normal working temperature range for the bath.



Note that if only one calibration point is entered then the bath will behave as described in Single point calibration above.

To configure a dual point calibration, follow the steps below.

Set the bath to the lower working temperature and allow 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 value of the reference thermometer and enter it into the calibration menu by following the steps below.

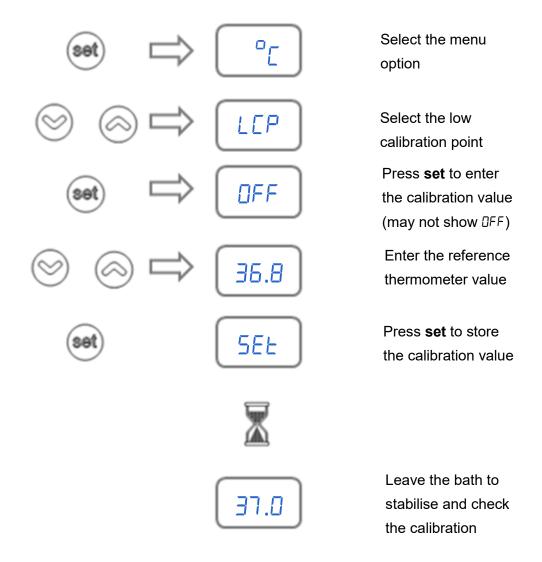


Figure 8 - Setting the low point calibration

Secondly set the bath to the upper working temperature and allow 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 value of the reference thermometer and enter it into the calibration menu by following the steps below.

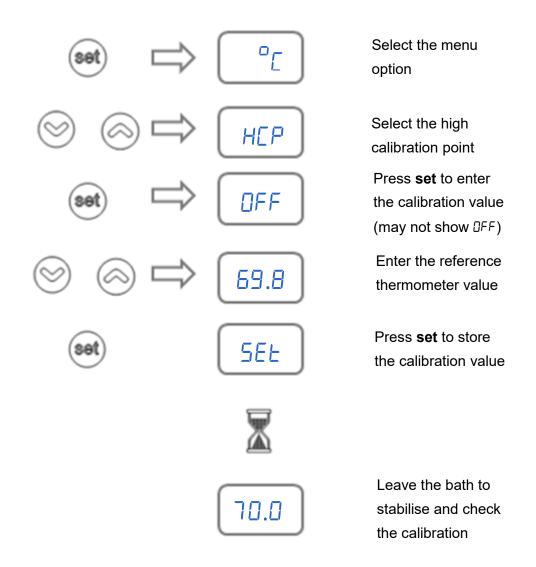


Figure 9 - Setting the high calibration point

# 9. Specification

## 9.1 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

## 9.2 Electrical details

Mains supply 220-230V @ 50/60 Hz

Pollution degree: 2
Installation Category II

**Note:** Mains supply voltage fluctuations are not to exceed ±10% of the nominal supply voltage

Models	ECN	Capacity (L)	Current rating (A) 230V
VWB2 2	462-0554	2	1.0
VWB2 2S	462-0555	2	1.5
VWB2 5	462-0556	5	1.5
VWB2 12	462-0557	12	3.5
VWB2 18	462-0558	18	6.0
VWB2 26	462-0559	26	6.0

All performance data specified is tested in accordance with DIN12876.

# 10. Important Guidelines

- 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) can cause an electro-chemical reaction leading to corrosion.
- The product warranty may be affected by the use of inappropriate or corrosive liquids

# 11. Troubleshooting

Review the information in the table below to troubleshoot operating problems.

Problem	Cause	Solution	
Temperature does not rise when	Set temp is lower than liquid temp	Check that the bath set temp is	
expected		correct (see section 7).	
	Set temperature is too close to	Increase the set temperature.	
	ambient		
Temperature continues to rise when	Set temp is higher than liquid temp	Check that the bath set temp is	
not expected		correct	
	Set temp is too close to ambient	Increase the set temperature	
Display shows DER	Water temp has gone above the OTP	Let water cool.	
	alarm temperature		
		Check OTP is set above the	
		required water operating temp	
Display shows ਰ구성	Bath has been heated with no water	Fill the bath with water. Switch the	
		bath off and on to restart	
	Bath has run out of water	Refill the bath with water. Switch	
		the bath off and on to restart	
Display shows מצב	Bath has overheated due to lack of	The over temperature cut-out	
	water	needs to be reset. Contact VWR	
		for instructions on how to do this.	
	Objects have been placed directly on	After reset has been completed,	
	the base of the bath	use a tray on the bath base	
Display shows Prb	Faulty temperature probe	Have a competent person check	
		the probe for faults or contact	
		Supplier	
Display shows dEF	Bath is running on its default settings	Contact Service Department for	
		assistance.	

# 12. Maintenance and service

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

# 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 VWR or your local representative to make sure that the proposed method will not damage the equipment.

# **Fuses**

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

### 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 3Gx1mm2 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).

### 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.

# 13. User replaceable accessories and spare parts

The following accessory parts can be ordered upon request

Description	Quantity	ECN
Test tube racks stainless steel for 10mm tubes	1	462-0560
Test tube racks stainless steel for 13mm tubes	1	462-0561
Test tube racks stainless steel for 16mm tubes	1	462-0562
Test tube racks stainless steel for 19mm tubes	1	462-0563
Test tube racks stainless steel for 25mm tubes	1	462-0564
Test tube racks stainless steel for 30mm tubes	1	462-0565
Test tube racks stainless steel for 0.5ml micro-tubes	1	462-0566
Test tube racks stainless steel for 1.5ml micro-tubes	1	462-0567
Raised shelf stainless steel for VWB2 12	1	462-0568
Raised shelf stainless steel for VWB2 18	1	462-0569
Raised shelf stainless steel for VWB2 26	1	462-0570
Base tray stainless steel for VWB2 2	1	462-0571
Base tray stainless steel for VWB2 2S, VWB2 5	1	462-0572
Base tray stainless steel for VWB2 12	1	462-0573
Base tray stainless steel for VWB2 18, VWB2 26	1	462-0574
Base tray polycarbonate for VWB2 2	1	462-0575
Base tray polycarbonate for VWB 2S, VWB2 5	1	462-0576
Base tray polycarbonate for VWB2 12	1	462-0577
Base tray polycarbonate for VWB2 18, VWB2 26	1	462-0578
Lid gabled polycarbonate for VWB2 2	1	462-0579
Lid gabled polycarbonate for VWB2 2S	1	462-0580
Lid gabled polycarbonate hinged for VWB2 5	1	462-0581
Lid gabled polycarbonate hinged for VWB2 12	1	462-0582
Lid gabled polycarbonate hinged for VWB2 18, VWB2 26	1	462-0583
Polypropylene spheres (pack of 300) suitable for use with all unstirred baths	1	462-0584
Drain stopper, pack of 5, for use with VWB 2 baths 5L or more	1	462-0585

## 14. Technical service

### **Web Resources**

Visit the VWR website at www.vwr.com for:

- Complete technical service contact information
- · Access to the VWR Online Catalogue, and information about accessories and related products
- Additional product information and special offers

**Contact us:** For any information or technical assistance contact your local VWR representative or visit. www.vwr.com.

# 15. Warranty

**VWR** warrants that this product will be free from defects in material and workmanship for a period of two (2) years from date of delivery. If a defect is present, VWR will, at its option and cost, repair, replace, or refund the purchase price of this product to the customer, provided it is returned during the warranty period. This warranty does not apply if the product has been damaged by accident, abuse, misuse, or misapplication, or from ordinary wear and tear. If the required maintenance and inspection services are not performed according to the manuals and any local regulations, such warranty turns invalid, except to the extent, the defect of the product is not due to such non-performance.

Items being returned must be insured by the customer against possible damage or loss. This warranty shall be limited to the aforementioned remedies. IT IS EXPRESSLY AGREED THAT THIS WARRANTY WILL BE IN LIEU OF ALL WARRANTIES OF FITNESS AND IN LIEU OF THE WARRANTY OF MERCHANTABILITY.

# 16. Compliance with local laws and regulations

The customer is responsible for applying for and obtaining the necessary regulatory approvals or other authorisations necessary to run or use the Product in its local environment. VWR will not be held liable for any related omission or for not obtaining the required approval or authorisation, unless any refusal is due to a defect of the product.

# 17. 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, so as 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.

Thank you



## **Your Distributor**

#### Australia

VWR International Pty. LTD Level 1, Unit 1a/60 Enterprise Place Tingalpa QLD 4173 Australia Tel.: 1300 727 696 Email: sales.au@vwr.com

#### Austria

VWR International GmbH Graumanngasse 7 1150 Vienna Tel.: +43 1 97 002 0 Email: info.at@vwr.com

### Belgium

VWR International bvba Researchpark Haasrode 2020 Geldenaaksebaan 464 3001 Leuven Tel.: 016 385 011 Email: vwr.be@vwr.com

#### China

VWR International China Co., Ltd Shanghai Branch Room 256, No. 3058 Pusan Road Pudong New District Shanghai 200123 Tel.:+86-21-5898 6888 Fax:+86-21-5855 8801 Email: info\_china@vwr.com

### Czech Republic

VWR International s. r. o. Veetee Business Park Pražská 442 CZ - 281 67 Stříbrná Skalice Tel.: +420 321 570 321 Email: info.cz@vwr.com

### Denmark

VWR - Bie & Berntsen Transformervej 8 2730 Herlev Tel.: 43 86 87 88 Email: info.dk@vwr.com

### Finland

VWR International Oy Valimotie 9 00380 Helsinki Tel.: 09 80 45 51 Email: info.fi@vwr.com

### France

VWR International S.A.S.
Le Périgares – Bâtiment B
201, rue Carnot
94126 Fontenay-sous-Bois cedex
Tel.: 0 825 02 30 30 (0,18 EUR TTC/min)
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