



Keep these instructions in a safe place for future reference









## **Thermino® e Heat Battery Installation and User Manual**



# Safety Notice

## Symbols and Notices Used and Their Meanings

Symbols			
			
Warning	Electric Hazard	Take note	Cross reference
Warning Notices	Consequences	Likelihood	
 <b>WARNING</b>	Death/serious injury (irreversible)	Potential risk	
 <b>CAUTION</b>	Damage/minor injury (reversible)	Potential risk	



DO NOT install outdoors. This product is for indoor use only.

Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury and death.

ONLY competent persons who are suitably qualified to carry out plumbing and electrical work and have successfully completed product training by Sunamp Ltd or an authorised training partner may undertake installations, repairs or relocations.

The system must be earthed correctly and have its own independent electrical supply with correct voltage and circuit breakers.

The point of connection to the mains should be readily accessible and adjacent to the Heat Battery installation. Connection must allow isolation of the electrical supply. Disconnection must be achieved in accordance with the wiring rules.

Only use this product for the intended purpose described in this manual.

There are no user serviceable, adjustable, or settable parts in this product.

**Read the full Safety Instructions in Section 1 of this manual  
before you install this product.**



# Document Purpose

To instruct competent persons on how to safely install **Thermino® 70 e, 150 e & 210 e Heat Batteries**. Competent persons are those suitably qualified to carry out plumbing and electrical work. Product training on the full range of Thermino Heat Batteries by Sunamp Ltd or an authorised training partner, is available.

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# 1 Safety Instructions



Sunamp Ltd is not responsible for the failure of components not specified in this manual and/or supplied by other manufacturers.

## 1.1 Intended Use

The intended use of the **Thermino e** range of products is for the provision of hot water for domestic purposes by means of electric charging of the Heat Battery. It is not intended for use with other charging methods or in applications other than the provision of domestic hot water.

## 1.2 Pre-installation Safety Advice

- Sunamp Ltd is not responsible for the selection, specification or effectiveness of equipment, unless stated in writing. Responsibility lies with customers and any experts or consultants involved in design and/or installation.
- Where applicable, this manual should be read in conjunction with manufacturer documentation for any components specified in the installation requirements of this manual.
- Where necessary, refer to the Sunamp website ([www.sunamp.com](http://www.sunamp.com)) for contact and support information.

## 1.3 Mechanical Safety

### **⚠ WARNING**

- DO NOT install outdoors. This product is only suitable for installations indoors in a frost-free environment, to avoid weather damage.
- DO NOT tilt the product more than **45 degrees** during the transportation or installation process.
- Install the product on a **hard, solid and level surface** that can support its weight.



- DO NOT use **detachable hose-sets** to connect the system to water mains.
- All hot works (such as soldering, welding or brazing) must be performed on tubes detached from the heat battery (minimum 1 metre away).
- This product is NOT suitable for tank fed hot water system.
- DO NOT immerse this product in water or any other liquid.
- DO NOT use any sharp objects in proximity of the Vacuum Insulation located at the side of the Heat battery.
- DO NOT stack the Heat Batteries with internal controller directly on top of each other, if using multiple Heat Batteries.

## 1.4 Electrical Safety

### **⚠ WARNING**

- The product must be earthed correctly and have its own independent electrical supply (with correct voltage and circuit breakers).
- The point of connection to the mains should be readily accessible and adjacent to the Heat Battery installation.
- Connection must allow isolation of the electrical supply. The means of isolation must be accessible to the end user after installation.
- All electrical wiring should be carried out by a competent person and be in accordance with the latest IET Wiring Regulations.
- Each circuit must be protected by a suitable fuse and double-pole isolating switch with a contact separation of at least 3mm in both poles.
- Ensure that there is water in the system before switching on electrical supply.
- All models in this manual are designed for heating by integrated electric heaters only.

## 1.5 Water Safety

### **⚠️WARNING**

- **Minimum** working pressure of Heat Battery is **0.15 MPa / 1.5 Bar**. **Maximum** working pressure of Heat Battery is **1.0 MPa / 10 Bar**. See section 2.5.2 for detailed specifications.

## 1.6 User Competence, Qualification, and Approval

### **⚠️WARNING**

- ONLY competent persons who are suitably qualified to carry out plumbing and electrical work, may undertake installations, repairs or relocations. Product training on the full range of Thermino Heat Batteries by Sunamp Ltd or an authorised training partner, is available.
- DO NOT allow children or any other unqualified or unapproved persons to install, repair, clean, relocate, interfere or tamper with the product.
- This product is not designed for use by children, or persons with reduced physical, sensory or mental capabilities, and should not be used by such persons unless they can do so safely. Where necessary, such persons (or anyone with lack of experience or knowledge) should first be given supervision or instruction concerning use of the product by a person responsible for their safety.

## 1.7 Compliance with Safety Laws and Regulations

### **⚠️CAUTION**

- Installations, repairs and relocations must comply with all relevant local laws and regulations ('statutory obligations'), particularly concerning electrics, water supplies, building regulations and Manual Handling Operations, as issued by the Government *Health and Safety Executive* ('HSE'). Water distribution and central heating installations ('systems') must comply with all statutory obligations.



Statutory obligations always override manufacturer documentation where there is a conflict.

## 1.8 Post-Installation Safety

- All goods are sold subject to Sunamp Ltd's 'Conditions of Sale', as listed on the company website.
- As Sunamp Ltd continuously improves products, they may be modified without notice. In such circumstances this manual and other relevant documentation should be disregarded. Updated documentation will be produced, supplied with new product ranges and made available on request.
- Once installed:
  - Perform a test run to ensure normal operation.
  - Explain all safety precautions to the end user.
  - Provide a copy of this manual to the end user.
- It is the responsibility of the end user to supply this manual to any other subsequent users.

## 1.9 Repair and Relocation

### **⚠WARNING**

- DO NOT attempt to carry out repairs or maintenance before the system components - including the **Thermino e Heat Batteries** - have cooled down to ambient room temperature. To speed up the process, disconnect power supply and open hot water taps in the dwelling to draw off hot water and cool system down.
- DO NOT attempt to move an assembled system without using appropriate lifting equipment.
- There are no user serviceable, adjustable or settable parts in this product.

**SAVE THESE INSTRUCTIONS AND  
PROVIDE A COPY TO THE END USER.**

## 2 Thermino e Heat Battery Overview

### 2.1 Introduction

Thank you for choosing a Sunamp Ltd **Thermino** Heat Battery, our innovative, super-compact heat storage system based on Plentigrade® phase-change materials (PCM). We are sure you will be delighted with the performance, compactness, ease of installation and quality of our product.

Sunamp Ltd's decade-long history of research and innovation in PCM technology has made it the world-leading manufacturer in Heat Battery technology – developed, designed and manufactured in the UK.

Sunamp Ltd has a wide portfolio of Heat Batteries for different applications. Please visit our website ([www.sunamp.com](http://www.sunamp.com)) or look at our catalogue for more information about our portfolio for:

- Water heating
- Space-heating
- Combined space- and water-heating
- Cooling

The Sunamp Ltd **Thermino e** Heat Batteries are:

- Designed to produce domestic hot water and are heated directly by grid electricity only.
- Equivalent to direct electrically heated hot water cylinders and hot water only thermal stores.
- Heated by internal electric heating elements only, and therefore able to replace direct unvented cylinders.
- Classified as a *Primary* Thermal store. By transferring heat from the PCM to the mains water flowing through the heat exchanger, they produce hot water instantaneously and on demand.
- Class I stationary appliances that use a single-phase electrical supply.



See the [downloads section](#) of our website ([www.sunamp.com](http://www.sunamp.com)) for other useful information on Sunamp Ltd products.



## 2.2 Product Overview

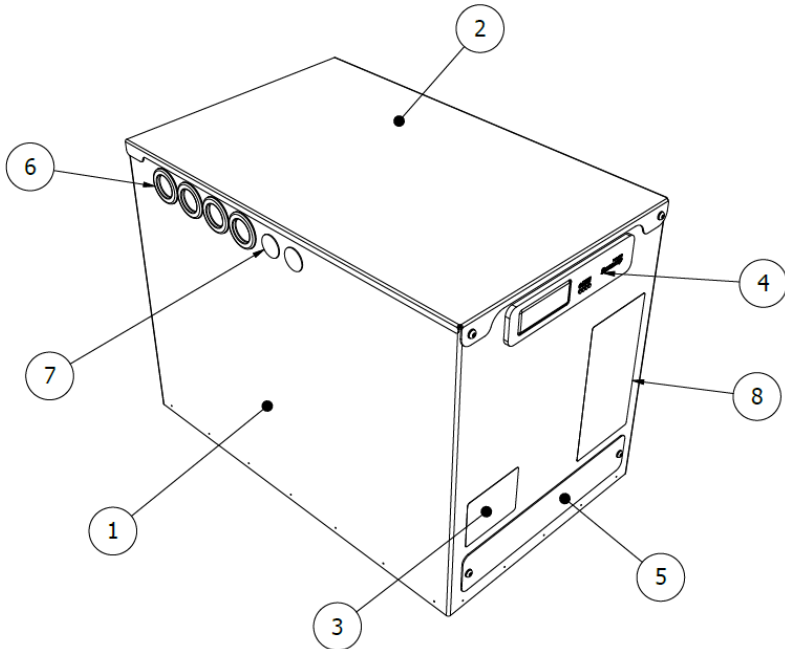


Figure 1: Heat Battery (external)

Item	Description
1	Heat Battery - main body
2	Heat Battery - lid
3	Data badge / serial number
4	Controller interface
5	Terminal cover plate
6	Tube entries (3 sides)
7	Cable entries (3 sides)
8	Energy label - to be applied by installer (if applicable)

Table 1: Product overview (external)

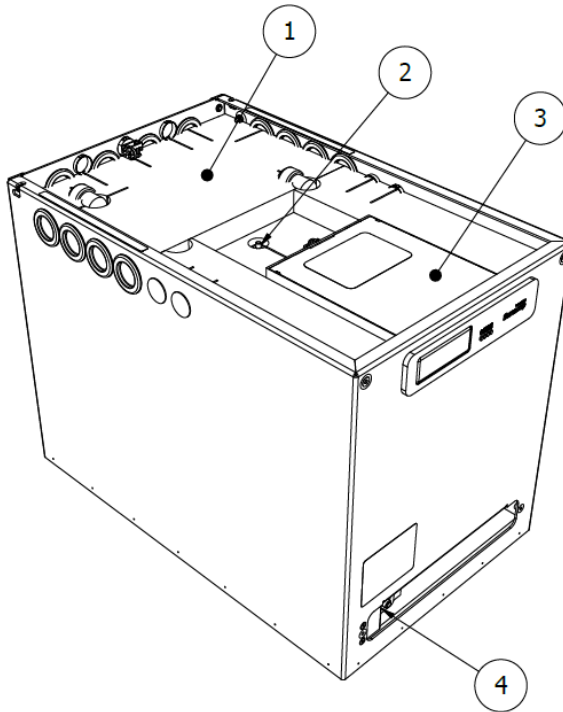


Figure 2: Heat Battery (internal)

Item	Description
1	Insulation layers - to be cut to suit copper tube and cable entries
2	Temperature sensor
3	Electrical control box - PCB, relays, terminal block
4	Non-self-resetting overhear thermostat (OHT)

Table 2: Product overview (internal)

### 2.3 Product Identification

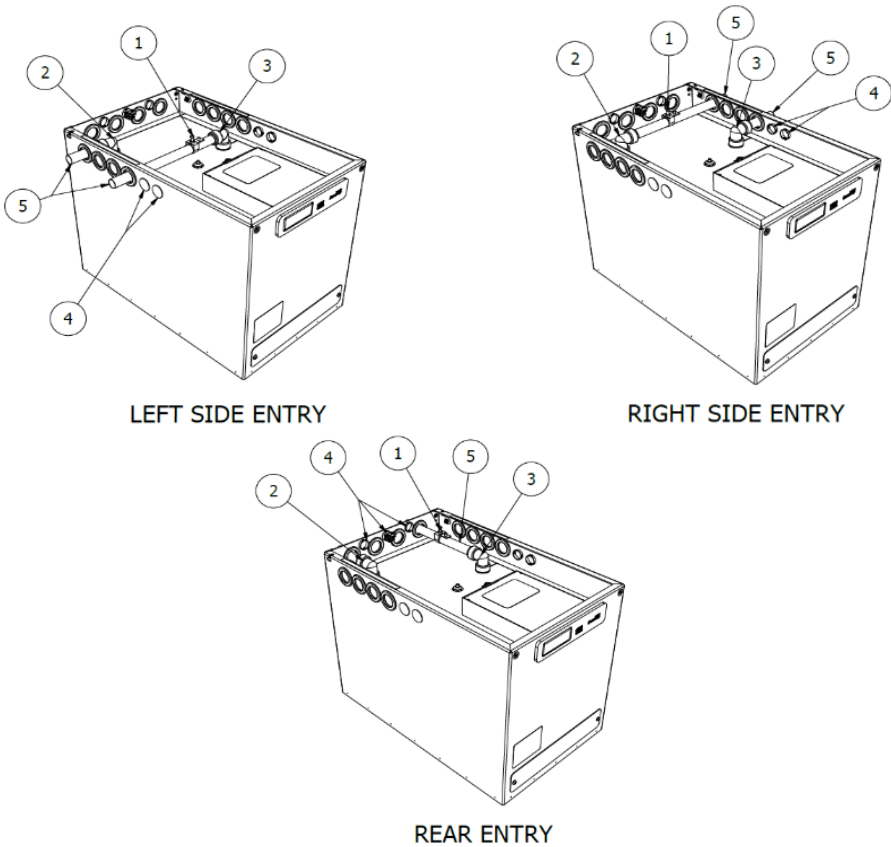


Figure 3: Heat Battery views showing the three tube exits


Item	Description	Item	Description
1	Earth Clamp (supplied) - to be clamped to Ø22mm copper tube	4	Cable Entry via Gland - supplied but not fitted
2	Cold Water Inlet - 'A' - Ø22mm elbow - rotatable 360 degrees	5	Ø22mm Copper Tube to BSEN1057 - suitable for installation (not supplied)
3	Hot Water Outlet - 'D' - Ø22mm elbow - rotatable 360 degrees		Tube and cable entries are used depending on installation location

Table 3: Product installation options

### 2.3.1 LED Interface

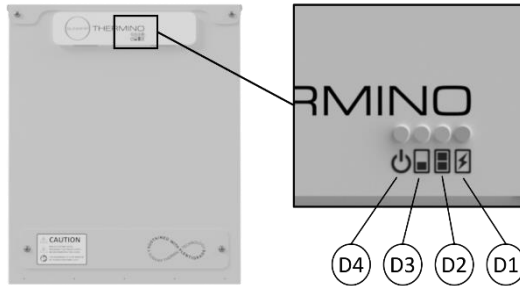


Figure 4: LED interface

Item	Description
D4	Mains power LED
D3	Charge level status LED
D2	Charge level status LED
D1	Heater 'Active' LED

Table 4: LED interface

## 2.4 Accessories and Parts

Part Number	Description
C5388	Tempering Valve
C5407	Expansion Vessel 0.5L
C5381	Water conditioner
C5377	22mm Tectite Pro Elbow TX12 65524 (see note)
C5379	22mm Tectite Pro Tee TX24 65676
C5412	Conex BM8090 0220000 22mm >B<Push elbow

Table 5: Accessories



**Note:** 2 x C5377/C5412 are supplied with the product as standard. Visit our website ([www.sunamp.com](http://www.sunamp.com)) for all the latest accessories and spare parts.

## 2.5 Technical Specifications

### 2.5.1 Basic Specifications

Battery Model	Height (mm)	Depth (mm)	Length (mm)	Gross Weight (kg)	Net Weight (kg)
Thermino 70 e	440	365	575	79	75
Thermino 150 e	640			139	136
Thermino 210 e	870			178	172

Table 6: Model specific dimensions. **Net Weight** refers to an **empty Heat Battery** (i.e. no water in the tubes); **Gross Weight** refers to tubes being filled with water.

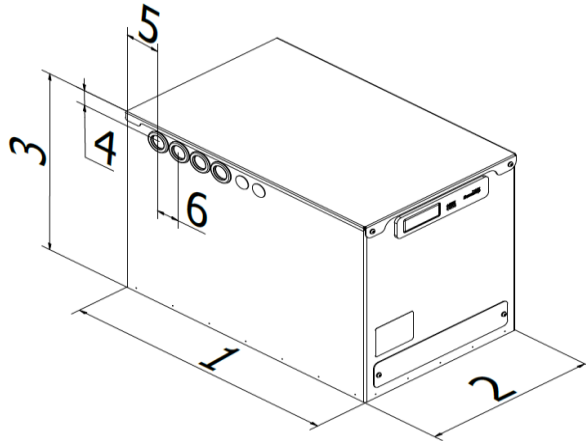


Figure 5: Additional Sunamp Ltd Thermino e Heat Battery dimensions

Item	Description	Item	Description
1	Length: See Table 6	4	Tube Entry: 37mm
2	Depth: See Table 6	5	Tube Entry: 78mm
3	Height: See Table 6	6	Tube Entry: 50mm

Table 7: Common product dimensions



## 2.5.2 Detailed Specifications

Specification	Thermino 70 e	Thermino 150 e	Thermino 210 e	See Note
Water Content (L)	3.2	3.2	5.9	<b>1</b>
Equivalent Hot Water Cylinder Size (L)	74	140	212	<b>2</b>
V <sub>40</sub> , Volume of Hot water available at 40°C (L)	105	199	301	<b>3</b>
Standby heat loss rate (kWh / 24h   (W))	0.48   (20)	0.67   (28.1)	0.77   (32.1)	
Energy efficiency rating class	C			<b>5</b>
Recommended HW flow rate (L/Min)	6	15	20	
Minimum mains supply pressure at inlet of Heat Battery (MPa   (Bar))	0.15   (1.5)			
Maximum working pressure (MPa   (Bar))	1.0   (10)			
Pressure loss characteristics K <sub>v</sub> Values	Figure 6.1 (Section 2.6)			
Hot water outlet temperature at design flow rate (°C)	45-55			<b>4</b>
Connected load at ~ 230 V, 50Hz (W)	2,800			
Power supply   Standby consumption (W)	1 PH ~ 230 V   7			
Electrical efficiency (η <sub>elecwh</sub> ) (%)	81.4	89.6	93.8	<b>6</b>
Annual electricity consumption (AEC) (kWh/annum)	542	1398	2690	
Tapping cycle	S	M	L	

Table 8: Detailed specifications for **Thermino e** Heat Battery models



### Notes to Table 8:

1. Water content of the Heat Battery for sizing expansion vessels.
2. Calculated from the storage capacity of the Heat Battery and assuming that the equivalent hot water cylinder thermostat is set at 60°C, mains cold water inlet temperature is at 10°C and the stored energy utilisation factor of the cylinder is 0.85.
3. The hot water volume available from the Heat Battery normalised to an average outlet temperature of 40°C when it is fully charged.
4. Recommended setting range for hot water inline tempering valve.
5. When installed as an electric water heater.
6. Based on standard: BS EN 50440:2015.



For more detailed specifications, also see the **Thermione Heat Batteries General Product Application and Design Manual**, available from the [downloads section](#) of our website ([www.sunamp.com](http://www.sunamp.com)).

## 2.6 Pressure Loss Characteristics

Pressure loss characteristics can be calculated using the graph below (Figure 6.1). The points that the pressure loss for the Heat Battery are displayed in (Figure 6.2)

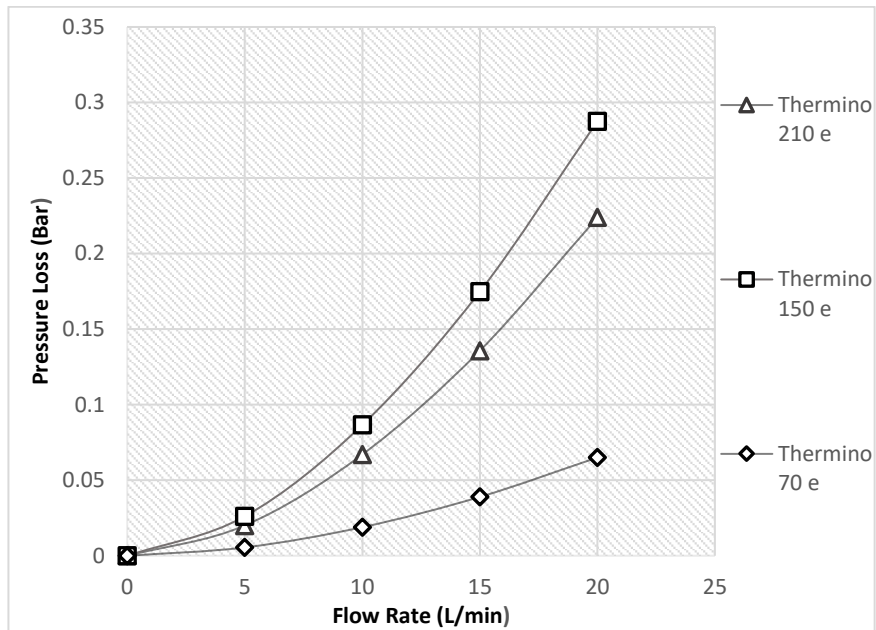


Figure 6.1: Thermino e Heat Battery pressure loss characteristics graph

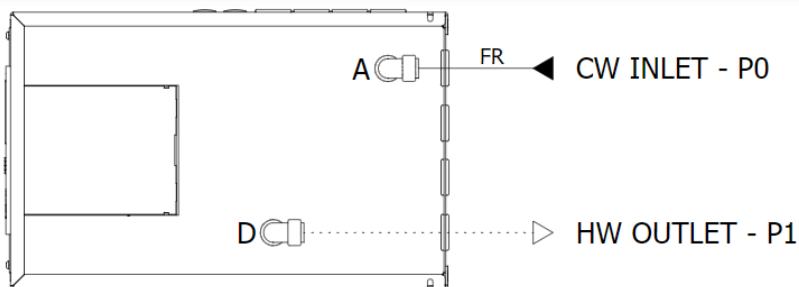


Figure 6.2: Pressure loss at inlet & outlet of the Heat Battery



## 3 Installation



Always read the safety instructions in Section 1 of the manual before installing **Thermino e** Heat Batteries.

### 3.1 Installation Process

Preparation:

- Assess the location of installation considering spatial requirements, clearances, cable runs and tube runs.
- Unpack and discard or recycle packaging according to local disposal or recycling rules.
- Identify which side you wish to make hydraulic and electrical cable entries (see Figure 3 in Section 2.3).
- Prepare the system hydraulics and electrics.
- Lift unit into position using appropriate lifting methods.

**Hydraulic Connection:**



**Note:-** Cold water inlet connects to port A; hot water outlet connects to port D (Figure 6.2).

- Remove lid. The lid is secured by 2 x M5 button head cap screws at the front and two locating pins at the back (Figure 7):
  - Remove 2 x M5 button head cap screws using 3mm hex head and set aside.
  - Slide the lid forward, then lift the lid up and set aside.
- Remove the top two layers of insulation (layer 1 is 10mm and layer 2 is 32mm thick) and set aside.
- Rotate the elbows to the side you wish to connect the hydraulics (left, right or back).
- Remove the respective rubber grommets in the outer housing and cut the centres (with a cross) with a knife. Reinsert the cut grommets.
- Cut and prepare the two off lengths of Ø22mm copper tube to suit the rest of the installation/system:

- Always cut the tube square, using a rotary tube cutter whenever possible. Ensure the cutter wheel is appropriate for the copper tube.
  - Deburr the tube end, both internally and externally to create a 1mm chamfer on the outside of the tube.
  - Check the tube ends are free from damage and clean, wiping away any swarf to avoid damaging the 'O' ring on tube insertion.
  - Tube end must also be free from stickers, tape and adhesive residues.
  - Mark the socket depth (27mm) on the tube with a marker.
  - Insert the tube firmly with a slight twisting action until it reaches the tube stop with a positive 'click'.
  - Ensure the depth insertion mark corresponds with the mouth of the fitting, then pull the tube firmly to ensure the fitting is secure.
- Fit the earth clamp to the Ø22mm copper tube (See Figure 3 in Section 2.3).
  - Connect to the rest of the fixed system hydraulics.
  - Fill the system with water, purging any air out of the system. This may take several minutes and can be aided by repeatedly opening and closing the outlet.
  - Once finished purging and with the system pressurised, inspect the piping/tubing and joints for any leaks. Take remedial action if necessary.



### **Electrical Connections:**

- Move the cable strain relief fittings to the side you wish to make the entries/exits. Cover all other holes in the enclosure with the supplied blanking grommets (Figure 8).
- Feed the mains cable through the strain relief bushing in the heat battery housing.
- If applicable, feed the signal cable through the additional strain relief fittings.
- Line up the cable strain relief fitting ratchet feature and compress firmly so that the fitting grips the cable.

- Open the internal controller enclosure using a flat head screwdriver to remove the snap in' lid.
- Connect the wires according to the wiring options if not already fitted.
- Remove or make links according to the wiring options.
- Close up the internal controller enclosure replacing the 'snap fit' lid and check the earth clamp on the copper tube is secure.

### Final Fit After Commissioning:



Commissioning instructions are provided in Section 4 of this manual. Follow the instructions below after commissioning.

- Cut the 32mm thick insulation layer to suit the tube and cable entries. This layer has several perforations for guidance. This can be done with a sharp knife or scissors.
- Replace the newly cut 32mm thick insulation layer nesting the insulation around the tube work and cables. Makes sure the main and signal cables sit above this layer.
- Replace the top 10mm layer of insulation.
- Replace the lid, aligning the rear pins with the slots in the rear of the unit, slide back, fit the 2 x M5 button head cap screws using 3mm hex head.

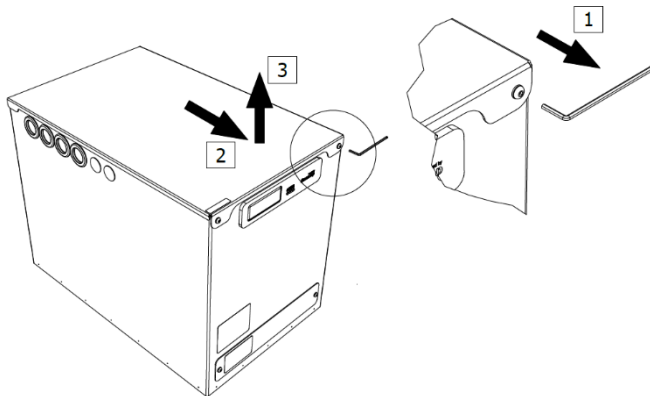


Figure 7: Access to Heat Battery connections

Description	
1	Remove fasteners x2 using 3mm Allen Key
2	Slide lid forward
3	Lift lid

Table 9: Access to Heat Battery connections

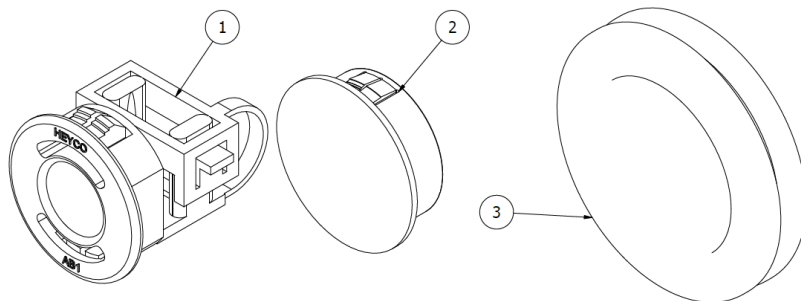


Figure 8: Cable and tube interfaces

Item	Description
1	Cable entry strain relief gland
2	Cable entry blanking bush
3	Tube entry grommet

Table 10: Cable and tube interfaces

## 3.2 Water Supply Requirements



**Important:** All components fitted in the water system should be *Water Regulations Advisory Scheme (WRAS)* approved.

### 3.2.1 General



For information regarding expansion vessel sizing and pressure relief valves, refer to the information provided on the product data label regarding water content and industry guidance.



**Important:** Although the Heat Batteries are designed for **1.0MPa (10 bar)** maximum working pressure, it is recommended that if the incoming mains pressure is greater than **0.5MPa (5 bar)**, a WRAS approved pressure regulator set at 0.5MPa (5 bar) should be fitted.

- Mains cold water supply should be connected to Heat Battery connection 'A'. The hot water outlet should be connected to 'D' (see Figures 3, 12.1 and 13.1).
- DO NOT use detachable hose-sets to connect the product to the water mains.
- Minimum - Maximum dynamic mains water supply pressure: **0.15MPa (1.5 bar) - 1.0MPa (10 bar)**.
- Minimum mains cold and hot water tube sizes: **Ø22mm copper or equivalent**.
- Expansion vessel charge pressure = incoming mains pressure (MPa).
- A potable water expansion relief valve MUST be fitted, unless it has been established that the water is able to expand back into the mains. In case of doubt over the presence of non-return valves in the system, a potable water expansion relief valve should be fitted as a precaution.
  - The valve should be fitted in compliance with Building Regulations Approved Document G.
  - The valve should be chosen based upon the mains water pressure, with a maximum allowable rating of **1MPa (10 bar)**.
- A WRAS approved hot water tempering valve should be fitted at the outlet from the heat battery. The tempering valve should be set to deliver hot water between 45°C and 55°C.

### 3.2.2 Hard Water and Limescale



Where mains water hardness can exceed **150 ppm Total Hardness**, you must install a scale reducing device in the cold-water supply to the Heat Batteries.

Limescale can be controlled using: chemical limescale inhibitors, polyphosphate dosing, electrolytic scale reducers or water softeners.

### 3.3 Location and Space Requirements

- The Heat Battery is suitable for indoor use only.
- Avoid locations in close proximity to other building services, hot works and other sources of heat, Hot works, such as soldering, welding or brazing must **ONLY** be undertaken at a **minimum distance of 1m from the system**, and by using cooling clips or other heat absorbent materials.
- Due to the weight of the Heat Battery, ensure the floor is level, sound and capable of supporting its weight (Table 6).
- Allow for space of 150mm around the Heat battery (i.e. to view LED lights), and space of 450mm above it (i.e. to remove the lid if necessary):

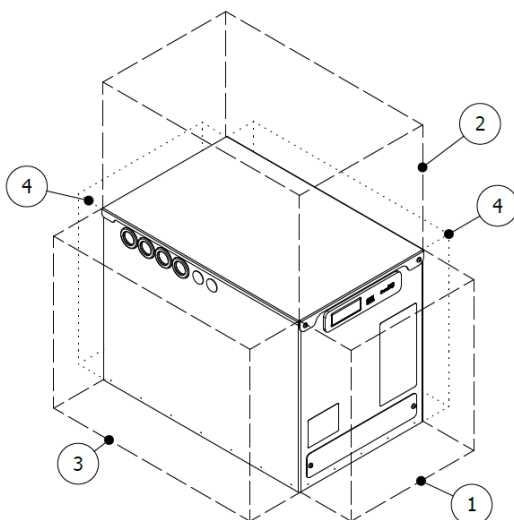


Figure 9: Spacing (in mm) surrounding the Heat Battery

Item	Space	Reason
1	150mm	To access terminal cover and to ensure visibility of the data badge and LEDs
2	450mm	To remove lid and access internals
3	150mm	To allow for tube and cables entry (side dependent)
4	10mm	If no access required (side dependent)
-	< 3000mm	Recommended length of cable runs

Table 11: Space requirements

### 3.4 Hydraulic Requirements



Sunamp Ltd Heat Batteries are NOT suitable for tank-fed hot water systems.

- All connection tube work inside the Heat Battery casing must be **Ø22mm copper tube**. This is to allow the earth connection between the case, inlet, and outlet tube fittings.
- Ensure that the unit is **electrically isolated** from mains and that the controller lid is closed whilst performing any hydraulic pipework. This is to avoid water or particles coming into contact with the PCB and other electrical components.
- DO NOT fit Isolation valves between the expansion vessel and the Heat Battery.
- The tube grommets used for inlet and outlet into the Heat Battery must be cut to allow the passage of the copper tubes by safely using an appropriate cutting tool.
- Although Ø22mm copper or equivalent plastic tube work should suffice in most installations:
  - Plastic tube work must ONLY be used outside the heat battery and no plastic tube connections must be made to the heat battery inlet or outlet ports.

- It is recommended that sizing of the tube work should consider mains water supply pressure, the design flow rates, size of the Heat Battery and pressure loss.

### 3.5 Temperature and Insulation Requirements



Applying excessive heat to the system tubes will cause damage to the Heat Battery and its internal components.

- Heat Batteries use the Plentigrade® P58 Phase-Change Material (PCM), which has a **phase transition temperature of 58°C**.
- All connected tubes should be insulated for **at least 1m** from their connection points with the Heat Battery.

### 3.6 Electrical and Wiring Requirements

All range models within this manual are fitted with an internal controller situated at the top of the Heat Battery. Two wiring options are available:

1. **No time-switch:** 24-hour electricity grid supply only.
2. **Time-switch:** Standard electricity grid supply only. Zero Volt Time switch with options for tariffs such as E7 and E10.

Regardless of the option chosen, the Heat Battery is charged by the heating element from bottom to top and discharged during hot water draw-off from top to bottom.

#### 3.6.1 General



External wiring to the Heat Batteries must be in accordance with current IET (BS.7671) Wiring Regulations and any other applicable local regulations. **Local Means for disconnection must be incorporated in the fixed wiring in accordance with the wiring rules.**



**Note:** The lid cover of the controller can be removed by using a flat head screwdriver.

- The Heat Batteries must be earthed correctly.
- The point of connection to the mains should be readily accessible and adjacent to the Heat Battery installation.
- The product must have its own **dedicated 16A MCB protected** supply.



- Connection must allow isolation of the electrical supply, such as a double pole switch having a 3mm (1/8") contact separation in both poles. The means of isolation must be accessible to the end user after installation.
- All models are designed for heating by integrated electric heaters only. Wiring must be installed in accordance with the instructions provided (Sections 3.7 & 3.8).
- All models are fitted with only one 2.8kW heating element at ~230V AC and therefore recharging times increase with size of the Battery.
- The mains power cable to the Sunamp Controller should be a minimum of 2.5mm<sup>2</sup>, 3 core H05 VV-F sheathed cable, to BS 6500. This cable must be prepared according to Figure 10 (below), where the Green/ Yellow (Protective Earth) wire is 15mm longer than the Brown (Live) and Blue (Neutral) wires.

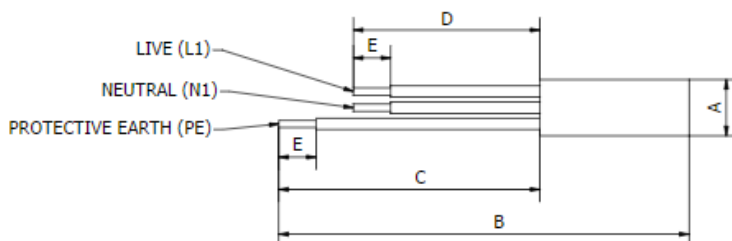


Figure 10: Wire length preparation diagram

Item	Description
<b>L1</b>	Live
<b>N1</b>	Neutral
<b>PE</b>	Protective Earth
<b>A</b>	∅10.5mm MAX
<b>B</b>	< 3000mm from Heat Battery to fixed disconnection
<b>C</b>	75mm
<b>D</b>	60mm
<b>E</b>	8mm

Table 12: Wire lengths

### 3.6.2 Controller Wiring Diagram

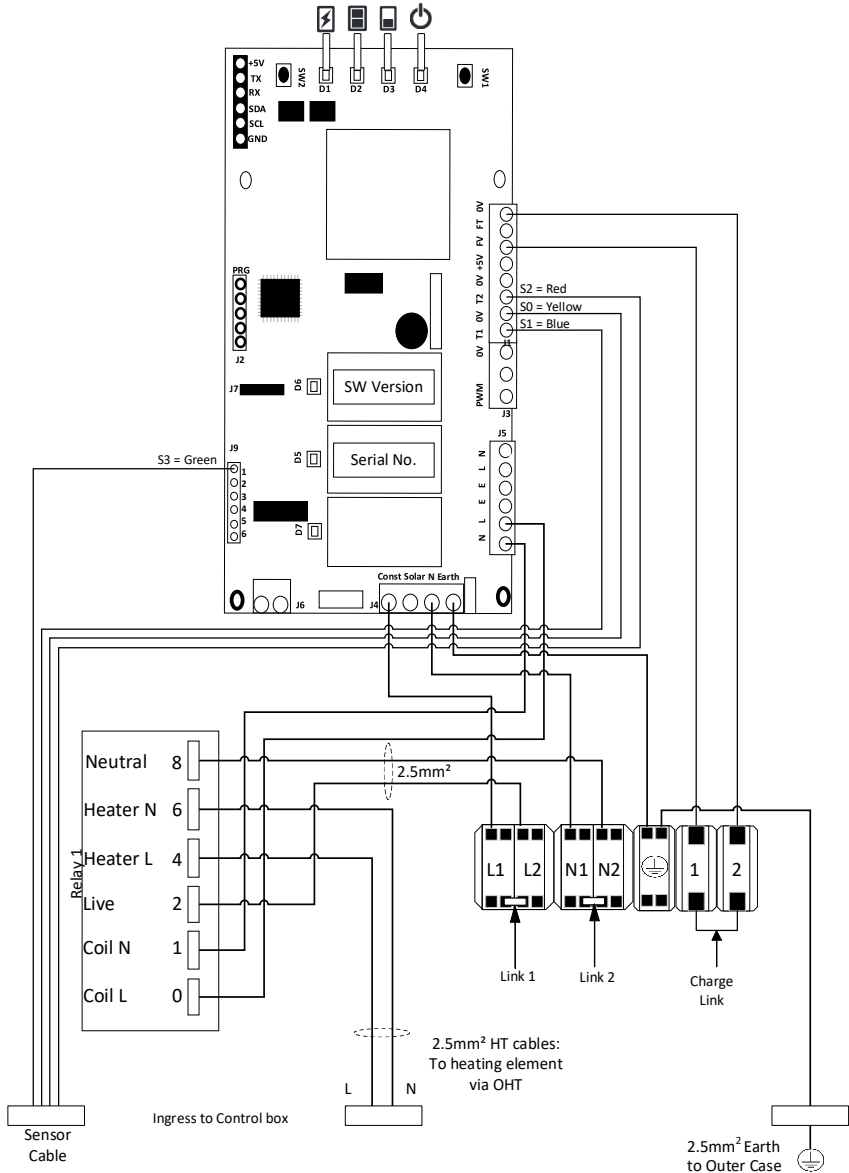


Figure 11: Internal controller wiring diagram (wire sizes=0.75mm<sup>2</sup>, unless stated otherwise)

### 3.7 Wiring Option 1 – 24h Grid Supply Without Time-Switch



**Important:** Please follow (Table 13) for information regarding the Links.

Link specification	Removed or Fixed
Link 1	Fixed
Link 2	Fixed
Charge Link	Fixed

Table 13: Link settings wiring option 1 – 24h Grid supply without time-switch

- Run and connect 3 Core mains power supply cable (16A minimum, minimum 2.5mm<sup>2</sup> CSA) from the Double-pole isolating switch to the Heat Battery controller (Figures 12.1 and 12.2).
- Wire the cable via the appliance case grommets and into the control box housing (Figures 8, 12.1 and 12.2).
- Prepare, if necessary (Figure 10) and wire the mains power cable in the following terminals (Figure 12.1):
  - **Brown (Live):** Terminal L1 (Live)
  - **Blue (Neutral):** Terminal N1 (Neutral)
  - **Green/Yellow (Earth):** Terminal PE (Protective Earth)

### 3.7.1 Controller Wiring Schematic and Diagram

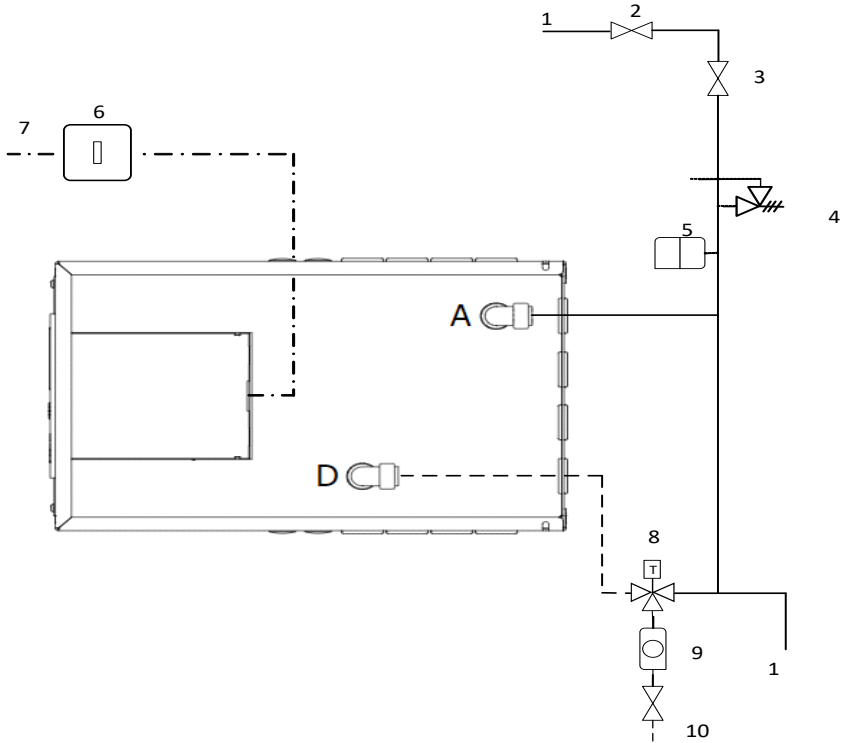


Figure 12.1: Example wiring option 1 schematic (see Figure 3 for piping and electrical options available)

Item	Description	Item	Description
1	Mains cold water supply	6	Double-pole isolating switch, (min. 16A)
2	Check valve	7	230VAC, 16A power supply
3	Cold Water pressure regulator	8	Hot Water Tempering Valve
4	Mains Expansion Relief Valve (max. of 10 bar)	9	Hot Water flow regulator
5	Expansion Vessel	10	Hot water supply to dwelling

Table 14: Explanation of components

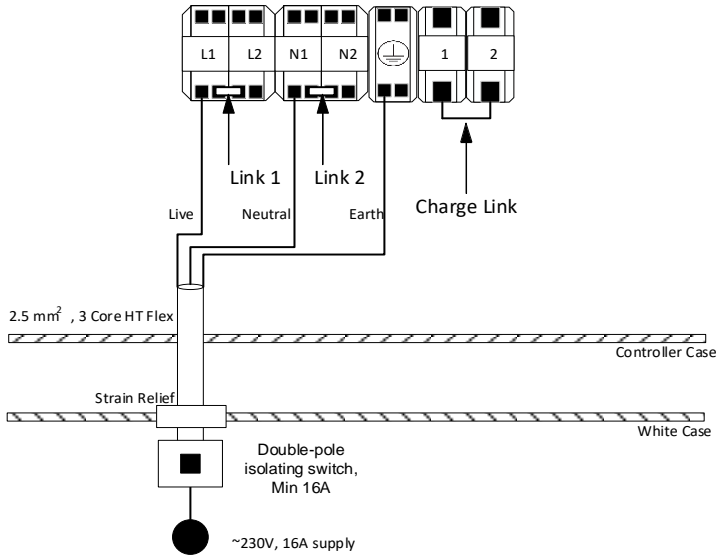


Figure 12.2: Wiring option 1 diagram - 24h Grid supply without time-switch

### 3.8 Wiring Option 2 – On-/Off-Peak Tariff with External Time-Switch



**Important:** Please follow (Table 15) for information regarding the Links.

Link specification	Removed or Fixed
Link 1	Fixed
Link 2	Fixed
Charge Link	Removed

Table 15: Link settings for wiring option 2 – on/off-peak tariff with external time-switch

- Run and connect 3 core mains power supply cable (16A minimum, minimum 2.5mm<sup>2</sup> CSA) from the Double-pole isolating switch to the Heat Battery controller (Figures 13.1 and 13.2).
- Wire the cable via the appliance case grommets and into the control box housing (Figures 8, 13.1 and 13.2).
- Prepare, if necessary and wire the mains power cable in the following terminals (Figure 13.1):
  - **Brown (Live):** Terminal L1 (Live)
  - **Blue (Neutral):** Terminal N1 (Neutral)
  - **Green/Yellow (Earth):** Terminal E (Protective Earth)

#### 3.8.1 Time-switch wiring to controller



**Warning:** The cable between the Time switch and the Heat Battery MUST be Volt Free.

- Install a volt-free signal time switch according to the manufacturer's instructions.
- Remove charge link, connecting terminals 1 & 2 on the Sunamp controller (Figure 13.2).
- Connect time-switch signal switching wiring cables, independently into terminals 1 and 2. Using a 2 core PVC insulated cable (minimum 0.75mm<sup>2</sup> CSA, 24 x 0.2mm according to BS EN 50525).

### 3.8.2 Controller Wiring Schematic and Diagram

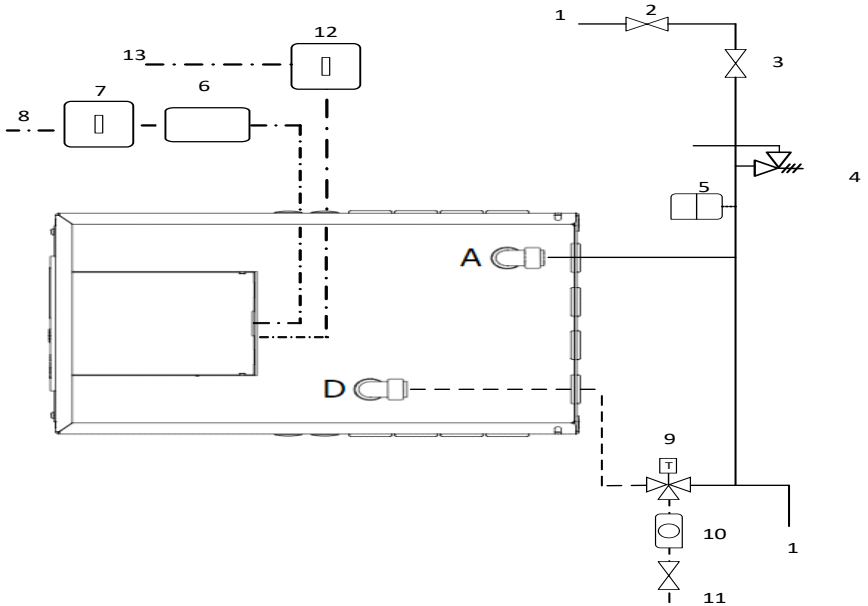


Figure 13.1: Example wiring option 2 schematic (see Figure 3 for tubing and electrical options available)

Item	Description	Item	Description
1	Mains cold water supply	7	Local 2-pole isolator, 3A
2	Check valve	8	230VAC, spurred fused power supply
3	Cold Water pressure regulator	9	Hot Water Tempering Valve
4	Mains Expansion Relief Valve (max. of 10 bar)	10	Hot Water flow regulator
5	Expansion Vessel	11	Hot water supply to dwelling
6	Time-switch	12	Double-pole isolating switch, (Min. 16A)
13	230VAC, 16A power supply		

Table 16: Explanation of components

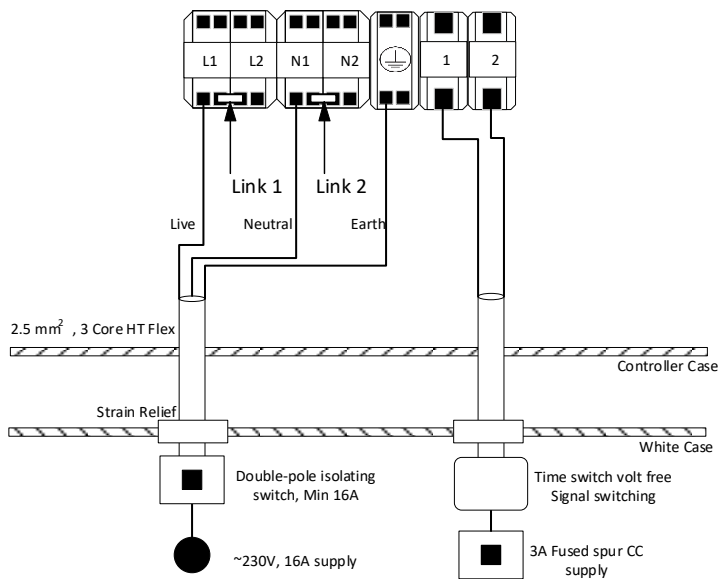


Figure 13.2: Wiring option 2 - on-/off-peak tariff with external time-switch



## 4 Commissioning



Before commissioning the product, first ensure that you have properly reviewed the previous sections, particularly in regard to Heat Battery specifications as well as location, electrical supply and water supply requirements.



The Heat Battery and its associated pipework **MUST** be filled and fully vented before the Heat Battery power supply is switched ON.

### 4.1 Preparation

- Ensure all packaging material has been removed.
- Ensure all components are clean and undamaged.


### 4.2 Process

1. Ensure that the temperature sensor of the Heat Battery is fully inserted into its pocket. The white marker should be sitting on top of the blue cable gland.
2. Turn on the water supply and ensure that there are no leaks.
3. Fully open any hot water taps in the dwelling and allow to run for a **minimum time of 2 minutes**. This is for any air to leave the system. This may vary depending on the Heat Battery model size.

**Note:** For larger models such as the Thermino 210 e, the **minimum time is increased to 4 minutes**.

4. Switch ON the power supply to the Heat Battery, via the Double pole isolating Switch, Min 16A.
5. If applicable, ensure the off-peak times are set correctly to the **desired tariff**, on the time switch.
6. If available press the BOOST button on the time switch (if the time-switch is fitted).
7. Continue to run the tap for a further **2 minutes**, then close.
8. Check the front of the Heat Battery to ensure that the 'power' and 'heating element' LED's are lit (see Table 17).



9. Allow the Heat Battery to charge for approximately **30 minutes** with the hot water tap closed.
10. Please note that on first charge or when the Heat Battery has been deep discharged, the heating element will cycle ON and OFF for up to one hour, depending on the Heat Battery size. This is normal operation. If heating element cycling persists for more than one hour, please refer to (Table 18 & 19).
11. After 30 minutes open the hot water tap and check for hot water.
12. Adjust the Hot Water Tempering Valve, so that the output temperature is **45°C to 55°C**.
13. Check hot water temperature at all hot water outlets in the dwelling with the customer and advise on temperature settings.
14. Ensure that the Heat Battery charges to half charge and that there are no lights flashing (which may otherwise indicate an error, see Table 17).
15. Leave all product information and literature with the customer/end user.
-  16. Fill in and return the Sunamp Ltd commissioning certificate, provided with the product. **These documents MUST be compiled and returned to Sunamp after installation.**

## 5 Operation



Always read the safety instructions in Section 1 of the manual before operating the **Thermino e** Heat Batteries.

### 5.1 Switch On/Off

Power is supplied to the Heat Battery via the Double pole isolating Switch, Min 16A. The Heat Battery will remain in operation whilst it is connected to the mains. The Heat Battery will switch off if you disconnect it from the mains.

### 5.2 LED Indicators and Status

LED Indicators are available to observe the status of the **Thermino e** Heat Battery installed.





	Status	Meaning
	OFF	Power OFF
	ON	Power ON
	Pulsing	Heat Battery charging from 0 - 50%
	ON	Heat Battery charge level >50%
	Off	Heat Battery charge level 0 - 50%
	Pulsing	Heat Battery charging from 50 - 100%
	Solid	Heat Battery charge level 100%
	Off	Heating element INACTIVE
	Solid	Heating element ACTIVE

Table 17: LED indicators

## 5.3 Troubleshooting

### 5.3.1 During Installation

Fault	Possible Cause(s)	Possible Solution
<b>The appliance does not deliver hot water after installation</b>	System not powered or not powered correctly	Check wiring and power supply and rectify where necessary.
	Non-self-resetting thermal cut-out has tripped	<p>Make sure the appliance is full of water and purge if necessary:</p> <ol style="list-style-type: none"> <li>1. Disconnect the power supply</li> <li>2. Open the electrical cover at the base of the unit</li> <li>3. Reset the non-self-resetting thermal cut-out</li> <li>4. Check if the temperature sensor is fully inserted in the Heat Battery (section 4.2, 1)</li> <li>5. Reassemble the unit, and</li> <li>6. Reconnect the supply</li> </ol> <p><b>If the problem persists, please contact Sunamp Ltd.</b></p>
<b>LED D4 (power symbol) is rapidly flashing</b>	Temperature sensor string is faulty	<p>Check that the sensor cable is properly connected to the PCB and that the connector block is properly pushed in.</p> <p><b>If the problem persists, please contact Sunamp Ltd.</b></p>
<b>The flowrate from the appliance is lower than expected</b>	Air might still be trapped in the system	<p>Check that the mains supply valve is fully opened.</p> <p>Make sure the appliance is fully de-aired and purge if necessary.</p>
	Incoming water pressure is too low	Measure the incoming pressure from the mains supply and <b>contact Sunamp Ltd.</b>

Table 18: Installation troubleshooting

### 5.3.2 After Installation or During Use



**Warning:** This product does not contain any user-serviceable or user-settable components. All fault-finding and fault-remediation works therefore need to be carried out by a competent person

Fault	Possible Cause(s)	Possible Solution
<b>No hot water</b>	Power supply has been temporarily or permanently disconnected	Check power supply. If power supply ON call your installer.  If the power supply is OFF, switch on and wait for hot water. If the power supply fails again call installer.
	The off-peak switch is not on (if fitted)	
<b>Water leak</b>	Various	Isolate the water and electricity supply to the unit and contact your installer.

Table 19: Post-installation troubleshooting

## 6 Maintenance



Where undertaking maintenance, repairs or removals, and where necessary, ensure that the system is first disconnected from the electrical and/or water supply.

- The product does NOT require any regular maintenance.
- In areas, where the mains water hardness can exceed 150 ppm total hardness and a scale-reducing device has been fitted, the service and maintenance requirements of this device (especially re-fill requirements) need to be adhered to.
- The air pressure in the expansion vessel should be checked every 2-3 years and topped up if necessary.
- If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard, please refer to the Electrical wiring sections (3.6 - 3.8).

### 6.1 Removal of Lids



Warning: Disconnect power mains before accessing (live components on PCB). **Strictly no live parts.**

- The lid of the Heat Battery is fixed to the outer case using **2 x M5 Button Head cap screws**. These can be undone by using a **3mm hexagonal Allen key** (Figure 7).
- The terminal cover plate can be removed by unscrewing the **2 x M5 Button Head cap screws**. These can be undone by using a **3mm hexagonal Allen key**.
- The lid of the controller cover is a snap fit lid to be pried off with a flat head screwdriver to be removed.

### 6.2 Cleaning

- The product does not require any regular cleaning.
- Should the product exterior have become dirty, it can be wiped down with a damp cloth and a mild detergent after having been isolated from the electricity supply. Let the product dry before reconnecting.

## 6.3 Warranty



Information regarding product warranty can be found on the Sunamp Ltd website: [www.sunamp.com/warranty](http://www.sunamp.com/warranty).

## 7 Recycling and Disposal



This symbol on the product and accompanying documents means the product should not be mixed with general household waste at the end of its life.

For proper treatment, recovery and recycling, please take this product to designated collection points where it will be accepted free of charge at the end of its life.

Disposing of this product correctly will help save valuable resources and prevent any potential negative effects on human health and the environment, which could otherwise arise from inappropriate waste handling.

Please contact your local authority for further details of your nearest designated collection point. Penalties may be applicable for incorrect disposal of this waste, in accordance with your national legislation.

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