IMMERSUN®

SOMETHING NEW UNDER THE SUN

Installation & User Guide

trusine™
power control technology

V1.4 ENG

Contents

Introducing the immerSUN

Thank you for choosing immerSUN - You have made an excellent choice!

The immerSUN is an automatic power controller for heaters. It tracks available surplus power from a grid-tied PV or Wind turbine system and varies the power to the heater to match the surplus power, therefore ensuring all of the green energy is fully utilised.

trusine® Power Control Technology

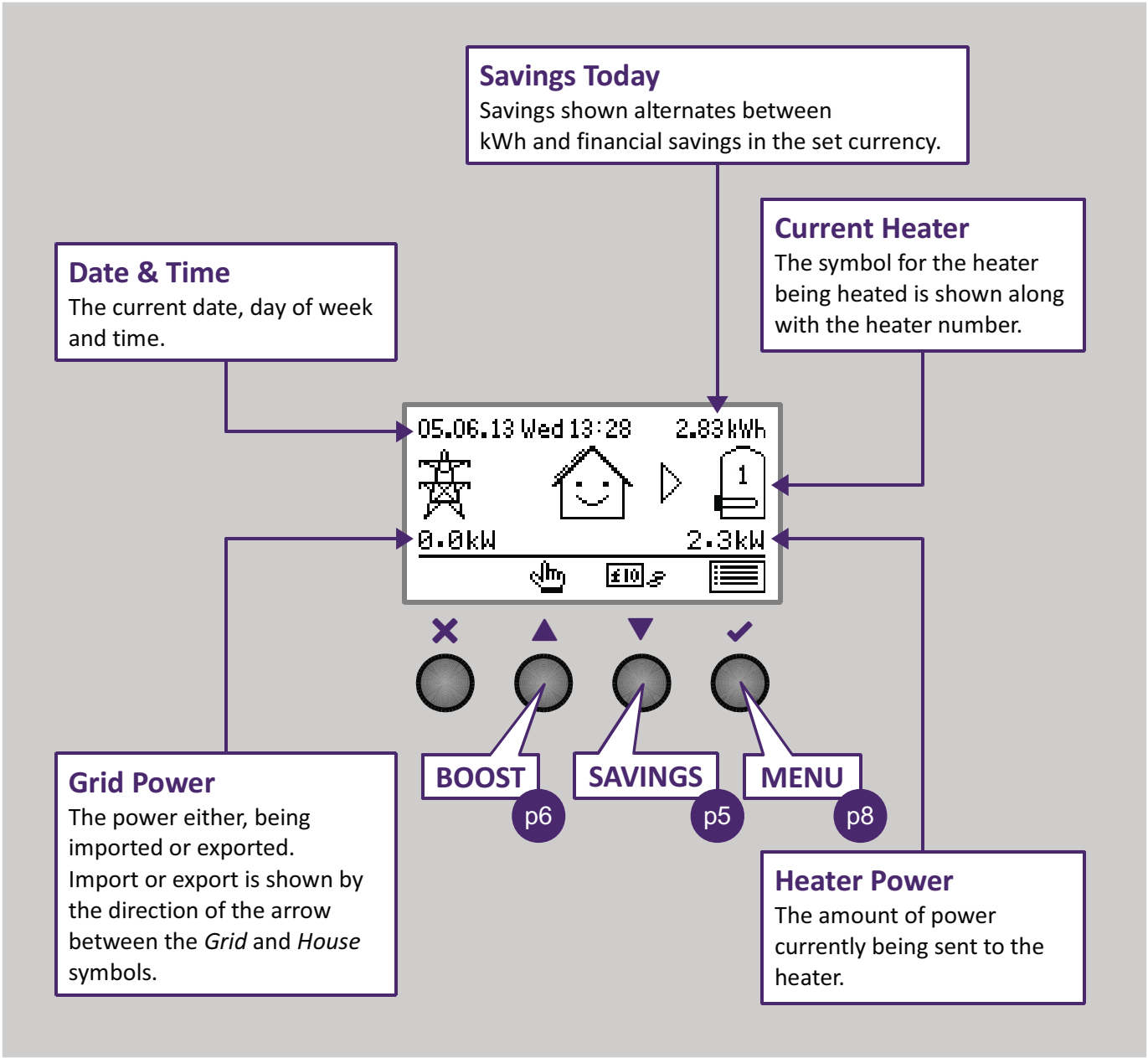
The immerSUN uses trusine® power control technology. This means that the voltage is very smoothly adjusted to alter the power to the heater. The power going to the load is a non-distorted true sine wave, only the voltage is altered.
This control technology is unique to the immerSUN and is more sophisticated than any similar product on the market. trusine® technology ensures trouble free operation with all inverters and compatibility with all import/export energy monitors.

Feature Set

- Tracks surplus power and diverts this energy to the load
- trusine® technology for fast and smooth automatic power adjustment
- Works with many microgeneration systems including PV, Wind and Hydro systems
- Clear graphical backlit LCD display
- Indicates current import/export power levels as well as diverted power to the heater
- Savings are accurately reported for the day, month, year as well as the total since installation.
- Savings can be displayed in several currencies as well as kWhs
- No need to change immersion heater
- Works with many types of heater including storage, panel and underfloor
- One immerSUN can control up to 3 heaters sequentially
- Only one current sensor for ease of installation with the option of a wireless sensor
- Built-in 7-day programmable boost timer
- Manual boost function for both heater outputs
- Integral multi-function relay to provide additional functions such as: Economy-7 control, cylinder de-stratification pump control and export power threshold detect
- Up to 5 immerSUN's can be linked together for larger systems
- Optional wireless sensor
- Remote monitoring add-on available - see *www.myimmersun.com*
- Smart, sturdy metal enclosure designed with the installer in-mind
- Fully short circuit protected in case of load fault
- Over load protection
- Soft starting to avoid power surges
- Smart meter compatible
- Compatible with third-party energy monitors
- Complete CE product approvals
- Made in Britain

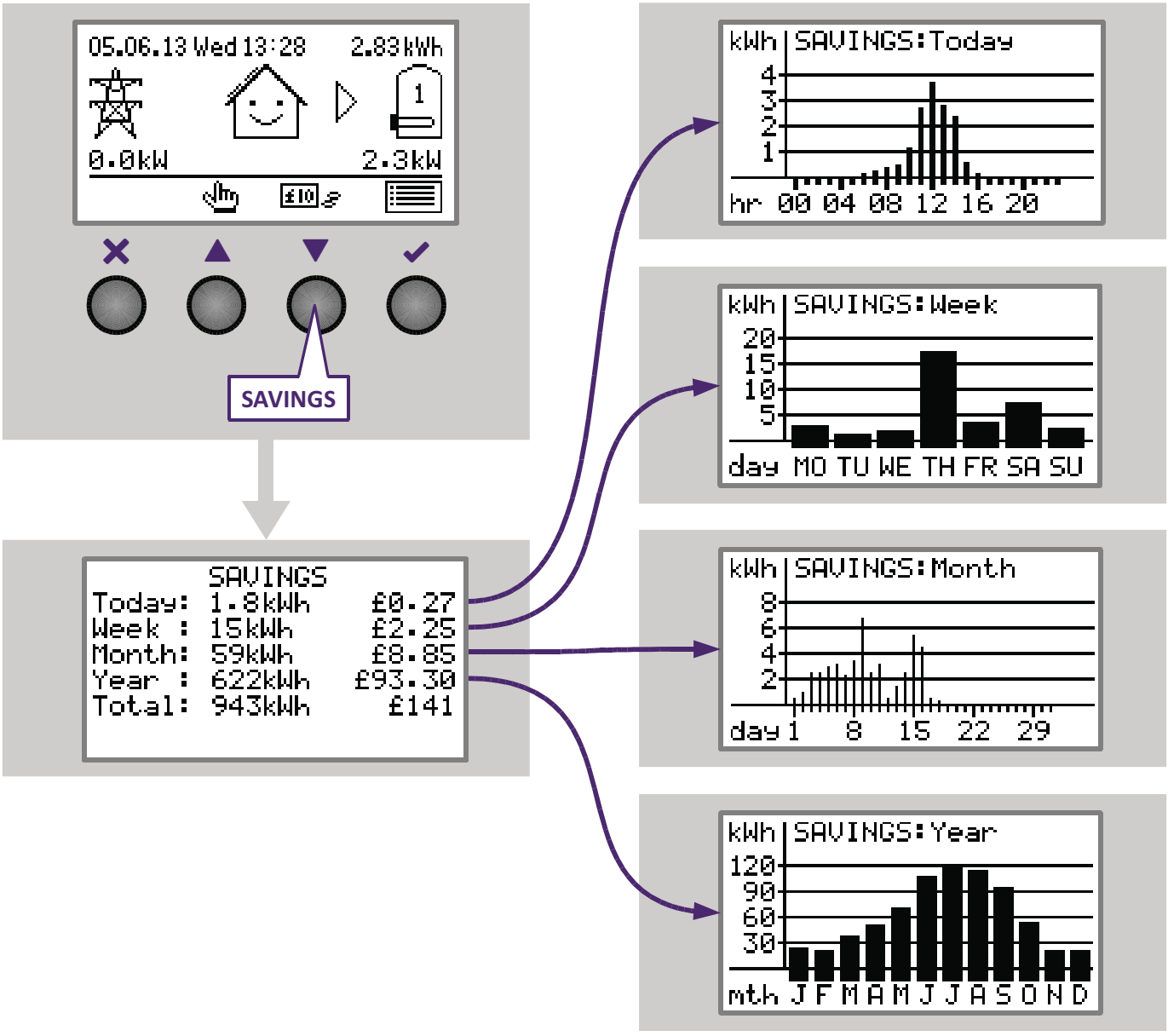
Main Screen

The main screen shows the status of the immerSUN, the imported or exported power, the date and time and the savings made today.
The house in the centre of the screen will be 'happy' if no power is being imported, otherwise a straight face will be displayed. Arrows either side of the house show the direction of power.
From this screen the *Menu* can be accessed, a manual *Boost* can be triggered and there is a short-cut to the *Savings* data.



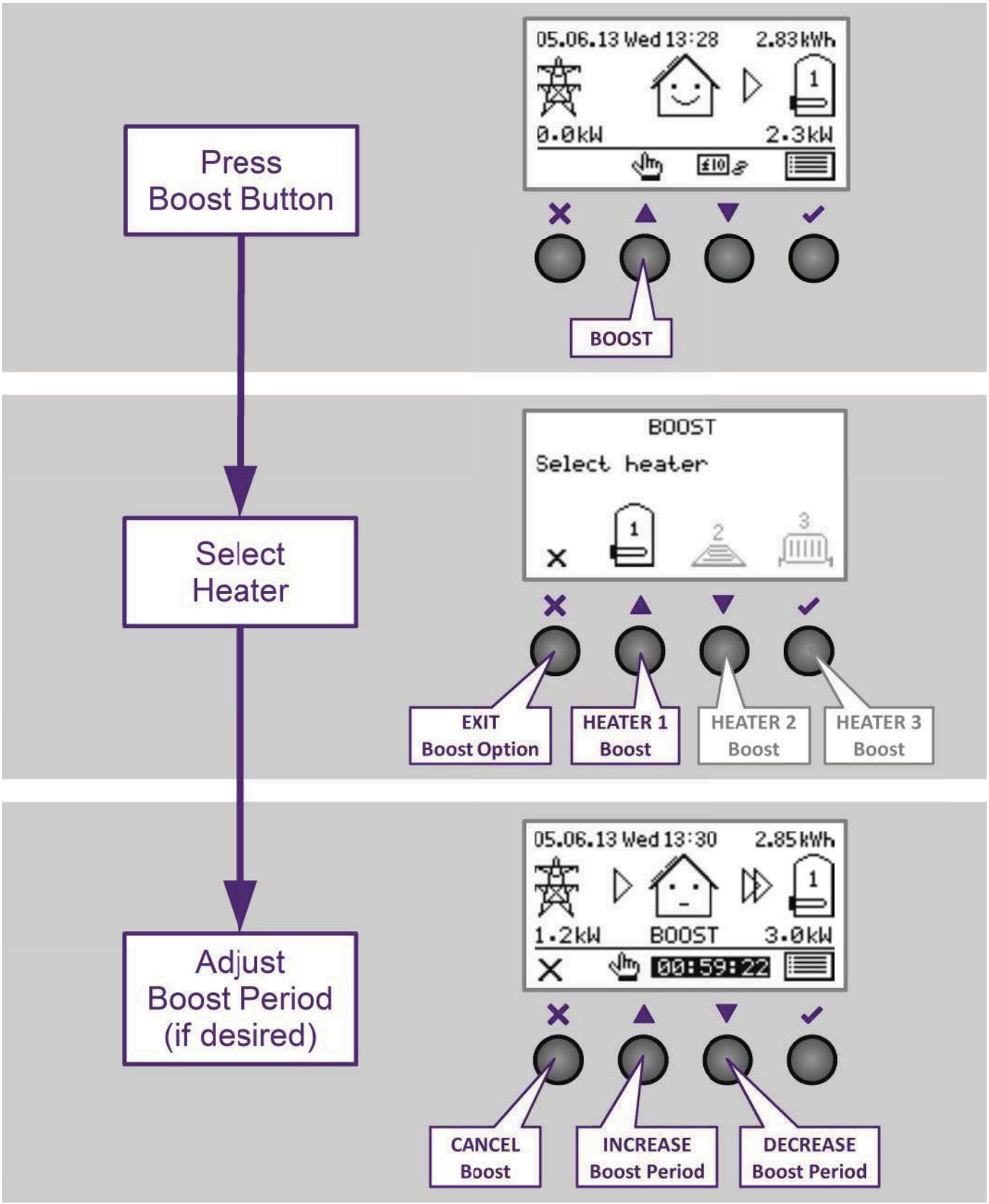
Savings

Savings that have been made by your immerSUN are stored in permanent memory. The savings can be shown for Today, this Week, this Month and this Year as well as the Total since the immerSUN has been installed. The savings can be displayed as a list or in a graph.
The savings are shown in kWh as well as financially in the chosen currency. For the financial savings to be correct, the user must keep the tariff up to date. The *Set Tariff* option in the *Main Menu* allows the user to set the current tariff, this should be set to reflect the kWh cost for the fossil fuel normally used to heat the heater.



Boost (Manual)

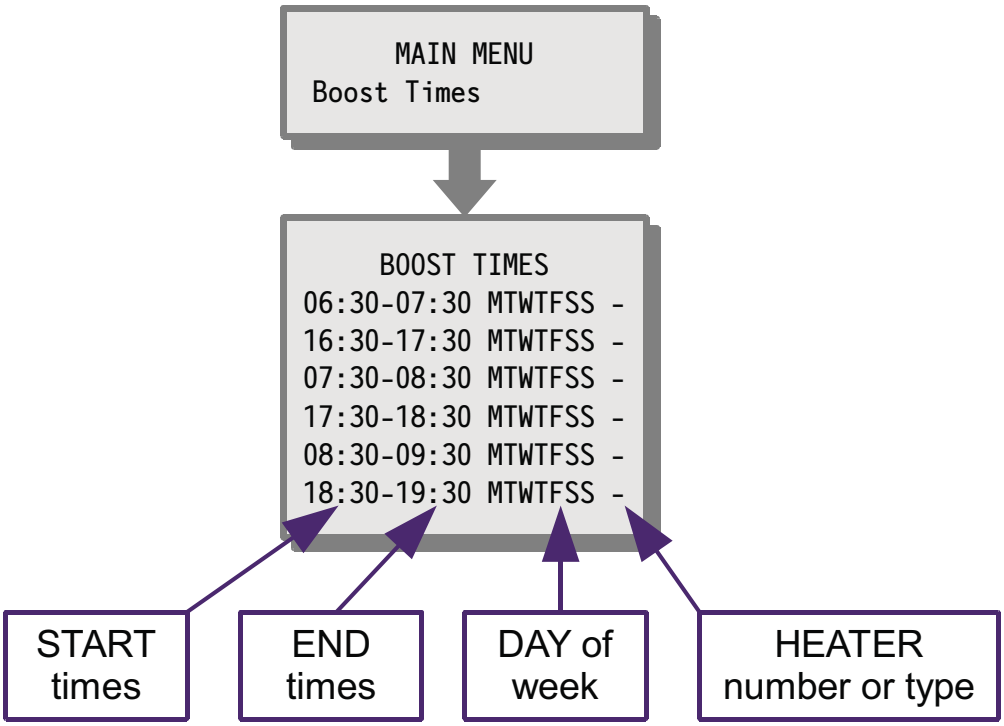
A heater can be 'boosted' to full power for a short period regardless of the amount of available export power, this function is called *Manual Boost* and is activated from the main screen. Once the boost starts, the remaining boost period will be displayed, this will start at 1 hour but can be adjusted during the boost. A manual boost can be cancelled at any time.



Boost (Timed)

The immerSUN can be programmed to 'boost' the heating for each heater at certain times. Boost means that the heater will be at full power regardless of the amount of available export power. This means that power may be drawn from the mains grid supply during boost times.

The *Boost Times* can be accessed from the *Main Menu.*
Once in the *BOOST TIMES* screen, use the ▲ and ▼ buttons to select the boost time you wish to change, then press ✔ . You can now edit the boost times, use the ▲ and ▼ buttons to change the start time; end time; days of the week and heater number for the boost (press the ✔ button to move to next section). Press the ✕ button to exit edit mode.



Special heater types

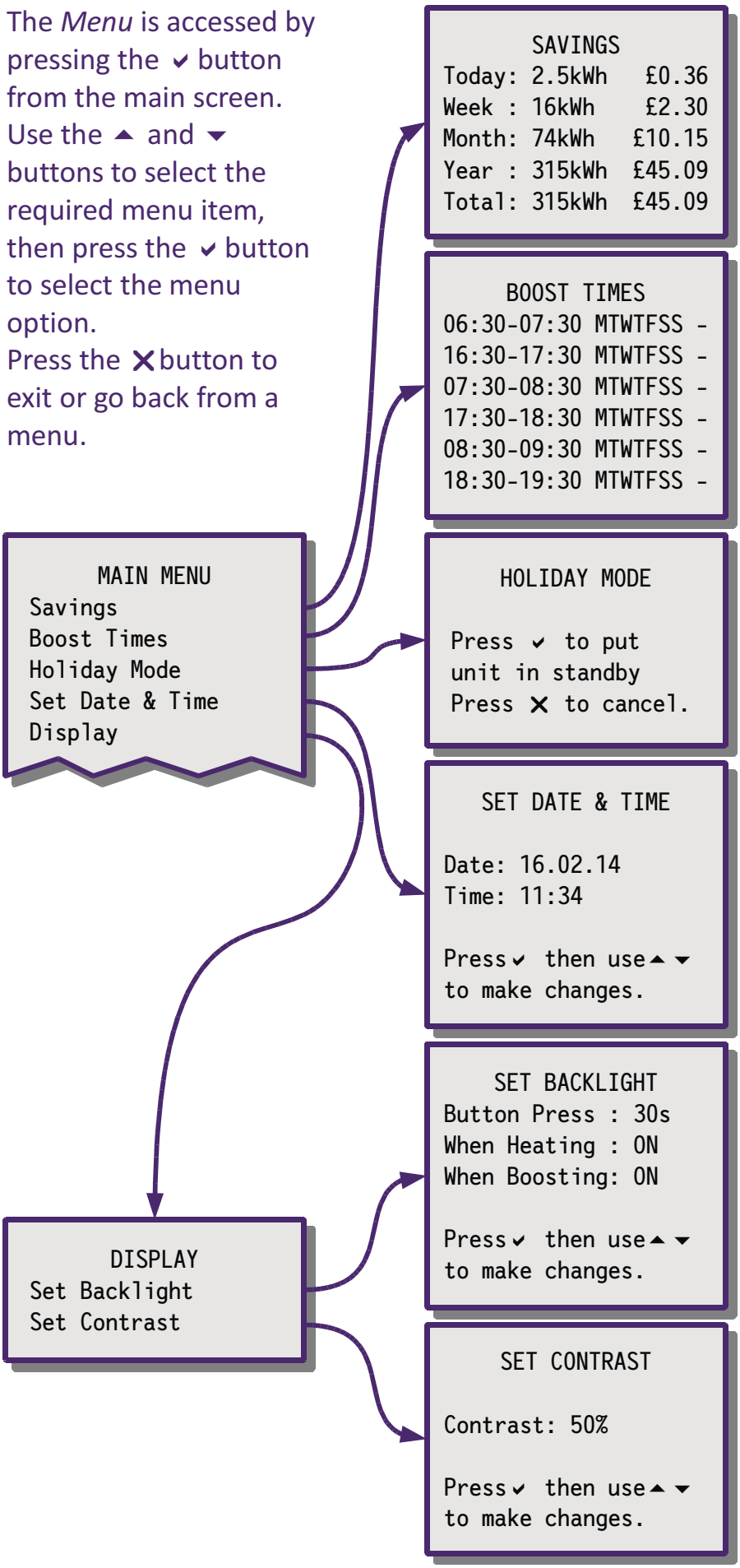
There are two special heater types; T and B. These will only be available if the Multi Function Relay is set to Export Threshold or Boiler Boost and wired correctly.
***T** : Export Threshold boost - the appliance will be activated for the boost period.*
***B** : Boiler boost - the boiler will be activated for the boost period.*

Important points

- Up to six different boost times can be entered.
- Each week day can be individually selected for each boost time.
- Only ONE heater can be boosted at any one time.
- If any boost times overlap, the latest timed boost will take precedence.
- For boost times crossing midnight, two time slots will need to be used.

Menu

The *Menu* is accessed by pressing the ✔ button from the main screen.
Use the ▲ and ▼ buttons to select the required menu item, then press the ✔ button to select the menu option.
Press the ✕ button to exit or go back from a menu.



Savings
Savings made by the immerSUN are accumulated. The savings are shown in kWh as well as in currency. The savings are displayed for Today, this Week, Month and the total this Year. Also the total savings since installation are shown.
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Boost Times
Boost times can be set to turn on the selected heater at full power regardless of surplus export power available.
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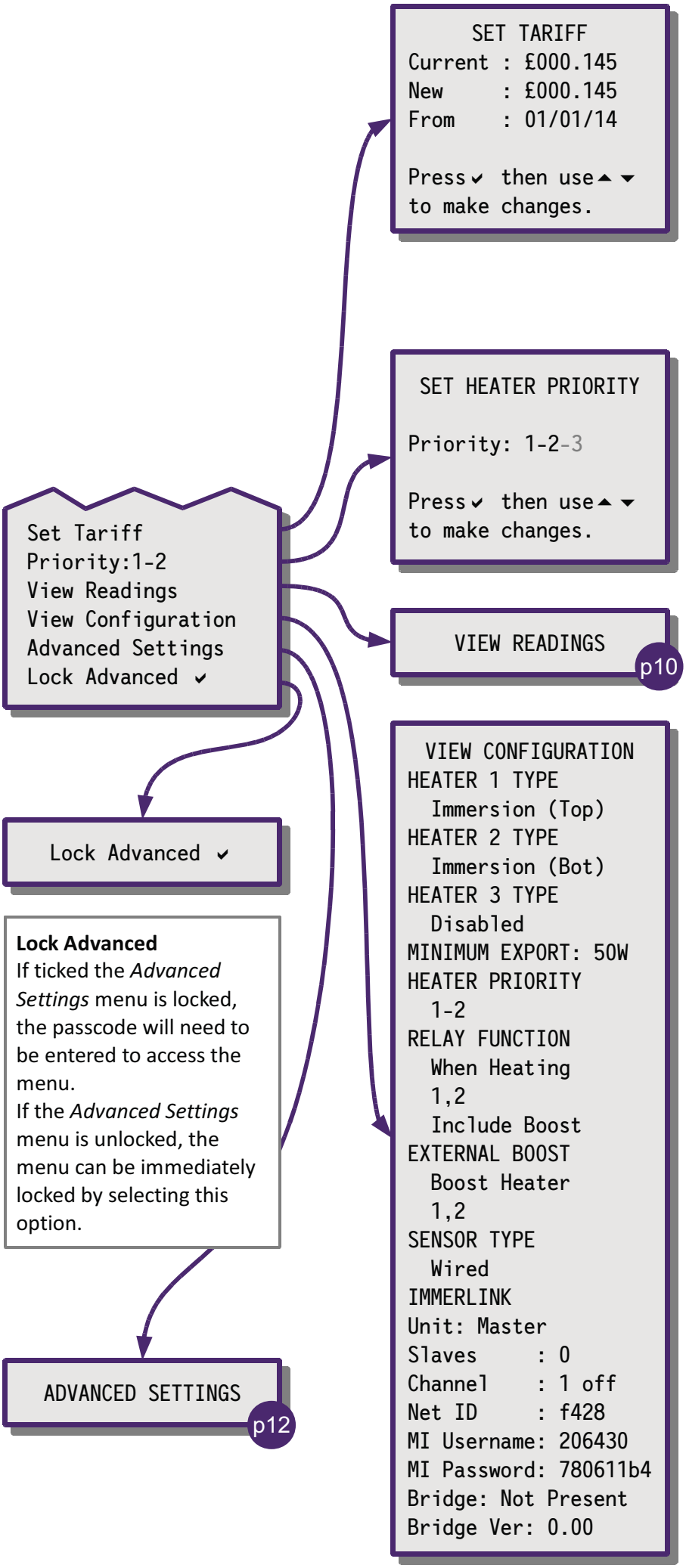
Holiday Mode
The immerSUN can be set to *Holiday Mode*, when you are away from home. This will stop the immerSUN from heating. The timed boost will also not operate.

Set Date & Time
The date and time should be set during installation. Use this menu option to change the current date or time.
The date & time will be retained during a power outage for at least 2 days.

Set Backlight
The display backlight can be set to illuminate for a few seconds after a button press.
Also the backlight can be set to illuminate whenever the unit is heating and/or boosting.

Set Contrast
The display contrast can be adjusted if required.



Set Tariff
The tariff should be set to that shown on your utility bill. You will need to adjust the tariff from time to time as the tariff changes. The tariff should be that of the fossil fuel you normally use to heat the appliance.
The *New* tariff will take effect *From* the date entered, which can be a past or future date, meaning the *New* tariff does not need to be set on the day it changes.

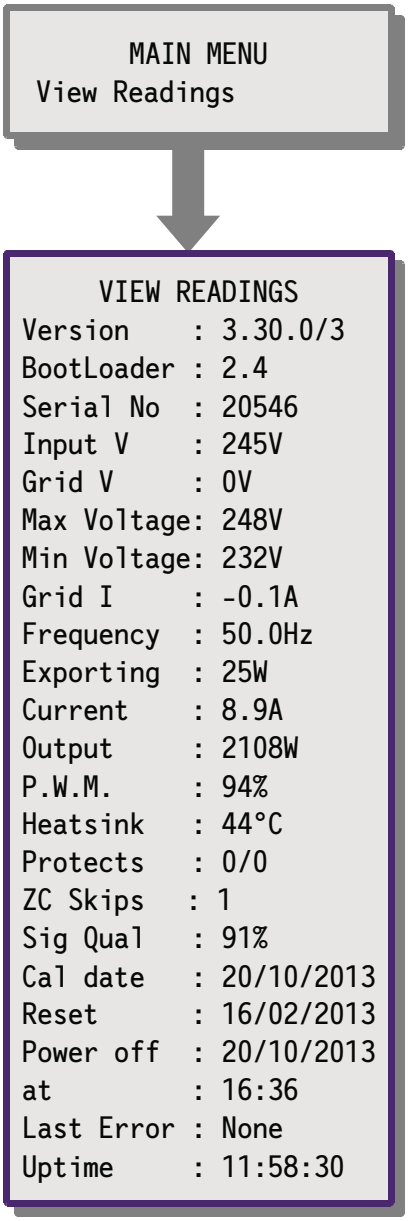
Set Heater Priority
If two or three heaters are connected, the heating sequence can be selected.
The higher priority heater will be heated until the thermostat opens, then the next priority heater will start to be heated and so on. When heating a lower priority heater, the unit will switch back to the higher priority heater periodically, this period is set by *Check Period* in the *Advanced Settings* menu.
If the heating priority is set to *Equal*, then each heater will be heated in-turn for the time set by the *Check Period* in the *Advanced Settings* menu.

View Configuration
This screen gives an overview of the immerSUN configuration
It is useful to check the current settings.

Lock Advanced
If ticked the *Advanced Settings* menu is locked, the passcode will need to be entered to access the menu.
If the *Advanced Settings* menu is unlocked, the menu can be immediately locked by selecting this option.

View Readings

This screen shows various readings and other information. See the list below for a description of the readings.
This screen is useful for diagnosing installation issues.

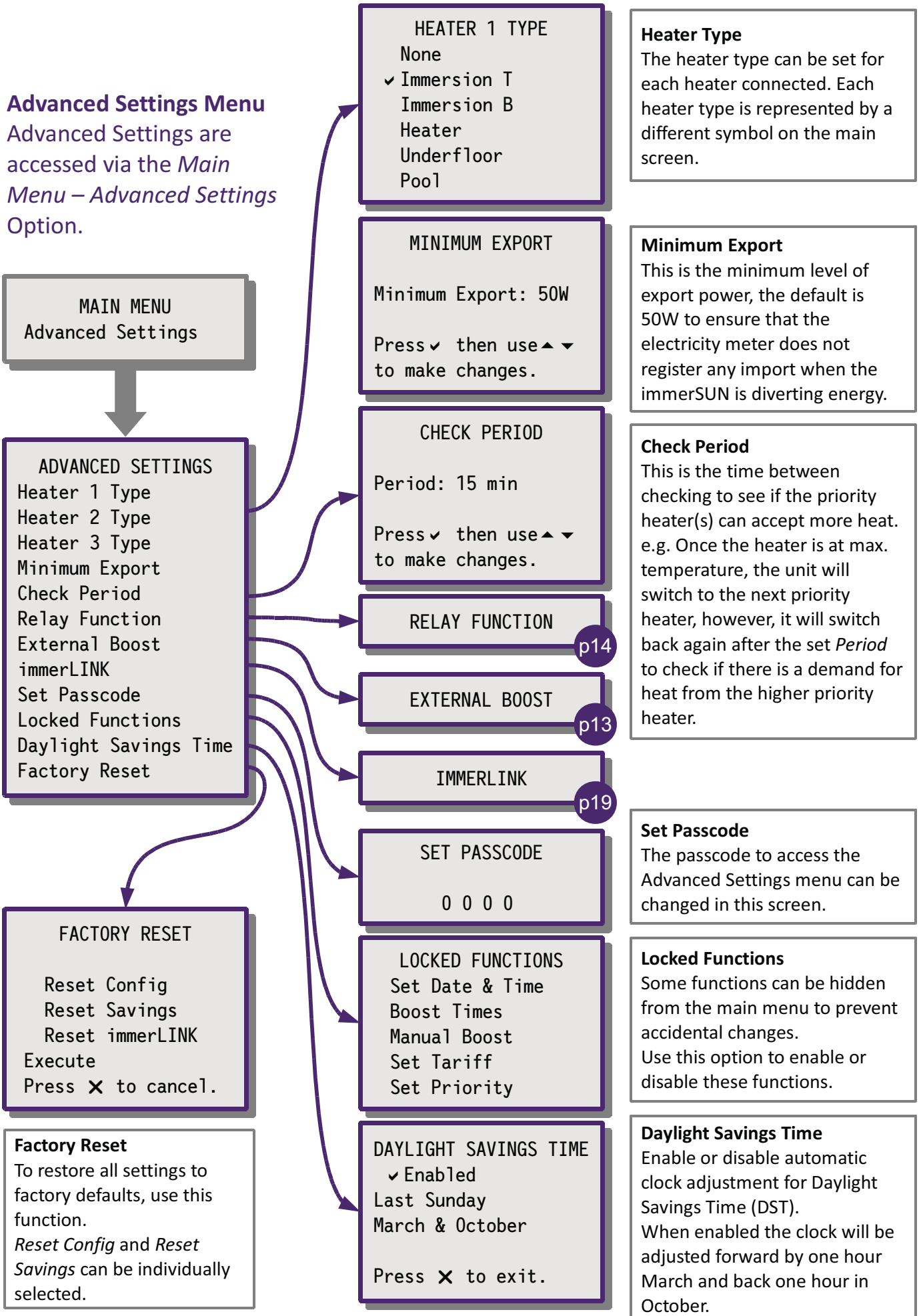


Title	Description
Version:	Firmware version number and hardware type.
BootLoader:	Firmware version number of the bootloader.
Serial No:	Serial number of the unit.
Input V:	Supply input AC voltage.
Grid V:	Voltage of the supply connected to the Wireless Sensor (where fitted), otherwise the same as *Input V.*
Max Voltage:	Maximum supply voltage recorded since last switch on.
Min Voltage:	Minimum supply voltage recorded since last switch on.
Grid I:	Current seen by the sensor clamp.
Frequency:	Supply frequency.
Exporting/ Importing:	Power level currently being imported or exported.
Current:	Input current of the unit.
Output:	Power being delivered to the load.
P.W.M:	Output voltage percentage.
Heatsink:	Temperature of the internal heatsink.
Protects:	Count of over-current protections and retries today.
ZC Skips:	Count of half-cycle skips today due to mains distortion.
Sig Qual:	Signal quality of immerLINK™ wireless connection.
Cal Date:	Date the unit was calibrated at the factory.
Reset:	Date the unit was factory reset.
Power Off:	Last date and time power was lost to to unit.
Last Error:	Last error number with date and time.
Uptime:	Length of time unit has been on.

Advanced options...

Advanced Settings

Advanced Settings Menu
Advanced Settings are accessed via the *Main Menu – Advanced Settings* Option.



Heater Type
The heater type can be set for each heater connected. Each heater type is represented by a different symbol on the main screen.

Minimum Export
This is the minimum level of export power, the default is 50W to ensure that the electricity meter does not register any import when the immerSUN is diverting energy.

Check Period
This is the time between checking to see if the priority heater(s) can accept more heat. e.g. Once the heater is at max. temperature, the unit will switch to the next priority heater, however, it will switch back again after the set *Period* to check if there is a demand for heat from the higher priority heater.

Set Passcode
The passcode to access the Advanced Settings menu can be changed in this screen.

Locked Functions
Some functions can be hidden from the main menu to prevent accidental changes.
Use this option to enable or disable these functions.

Daylight Savings Time
Enable or disable automatic clock adjustment for Daylight Savings Time (DST).
When enabled the clock will be adjusted forward by one hour March and back one hour in October.

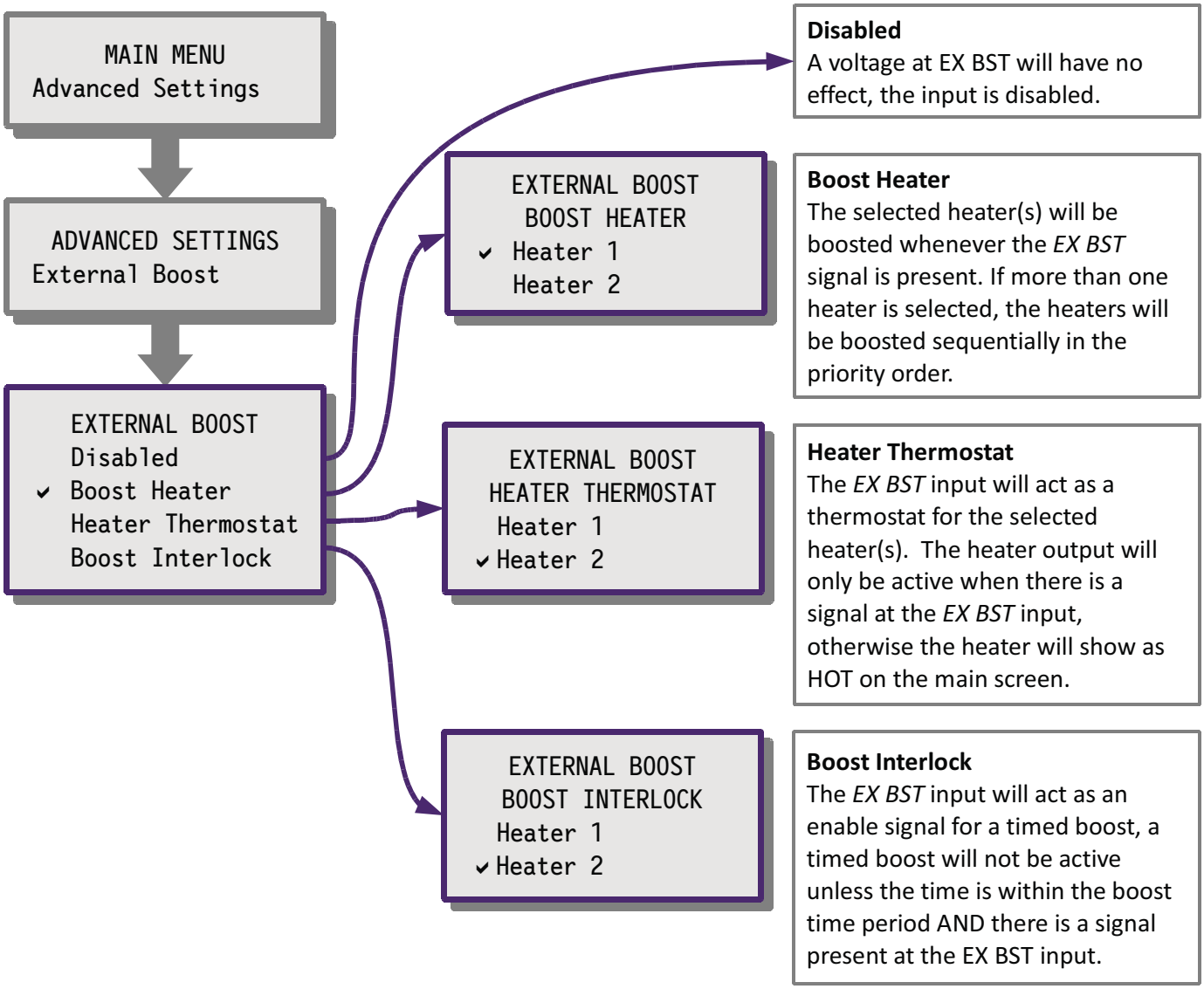
Factory Reset
To restore all settings to factory defaults, use this function.
Reset Config and *Reset Savings* can be individually selected.

External Boost Input

What Does It Do?

This is an external input which can be used to trigger a boost or enable/disable heater outputs.

The External Boost input is the 2-terminal connector labelled EX BST. Any AC voltage from 24V to 240V present on these terminals will be recognised by the immerSUN.



Disabled
A voltage at EX BST will have no effect, the input is disabled.

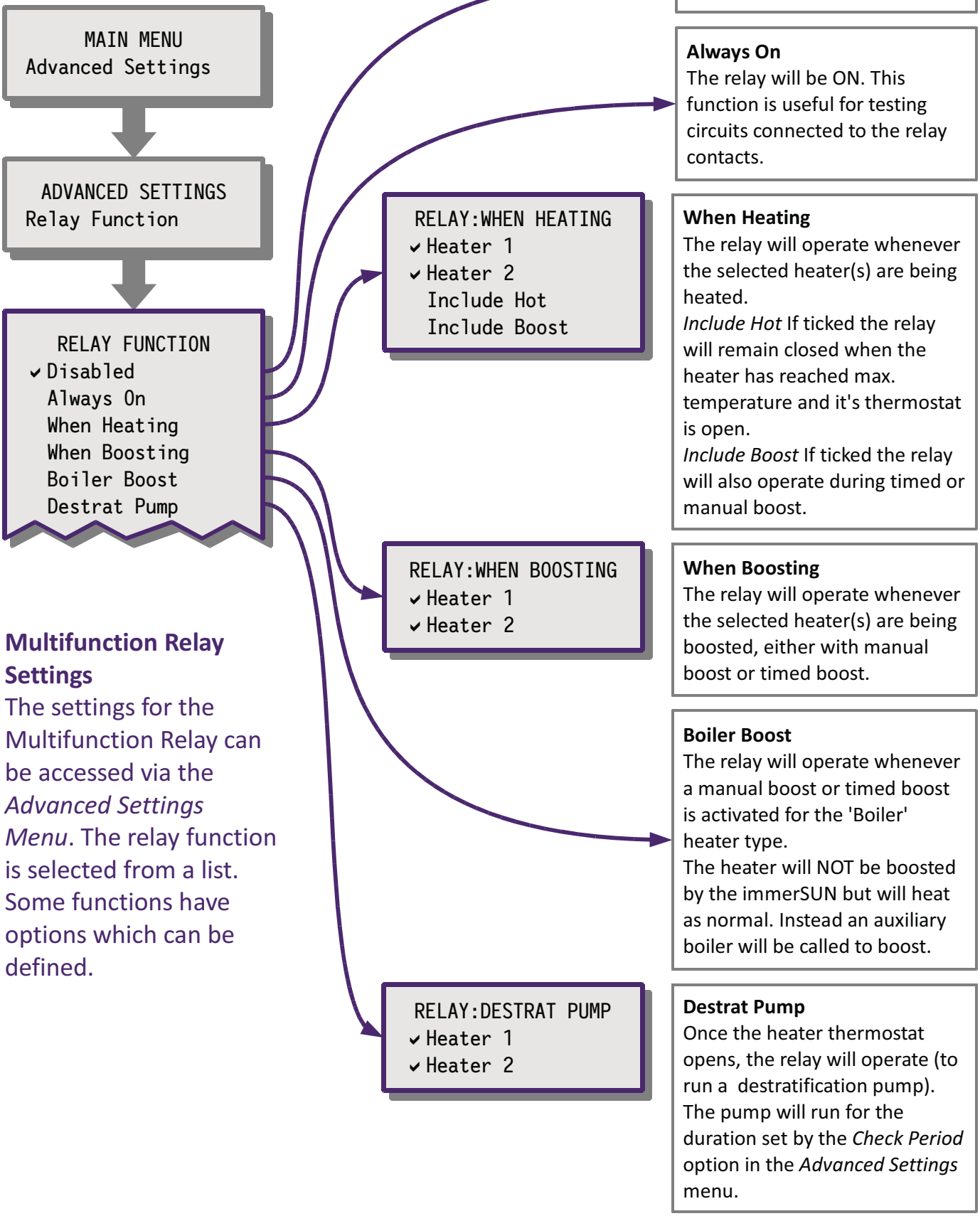
Boost Heater
The selected heater(s) will be boosted whenever the *EX BST* signal is present. If more than one heater is selected, the heaters will be boosted sequentially in the priority order.

Heater Thermostat
The *EX BST* input will act as a thermostat for the selected heater(s). The heater output will only be active when there is a signal at the *EX BST* input, otherwise the heater will show as HOT on the main screen.

Boost Interlock
The *EX BST* input will act as an enable signal for a timed boost, a timed boost will not be active unless the time is within the boost time period AND there is a signal present at the EX BST input.

EX BST
External Boost Input
24 – 240VAC Sense Input
This input is isolated

Multifunction Relay



Multifunction Relay Settings

The settings for the Multifunction Relay can be accessed via the *Advanced Settings Menu*. The relay function is selected from a list. Some functions have options which can be defined.

What Does It Do?

The Multifunction Relay is a relay that can be used for many different purposes. The operation is controlled by the immerSUN and will operate when certain conditions are met, these conditions can be user defined. The relay can be used to control pumps, send signals to the boiler and switch on/off appliances etc.

```
Third Heater
When External Boost
Export Threshold
Fault Signal
```

3rd Heater
The relay is used to switch heater 2 output between two different heater loads, therefore enabling 3 heaters to be sequentially controlled.
When this option is set *Heater 3* will be available on some menu options.

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When External Boost
The relay will activate whenever there is an AC voltage at the EX BST input connector.
In this mode the relay can also be controlled with the *Manual* and *Timed Boost* options.

Fault Signal
The relay will DEACTIVATE if a fault is detected. It will remain deactivated until the fault is cleared or the immerSUN is restarted.

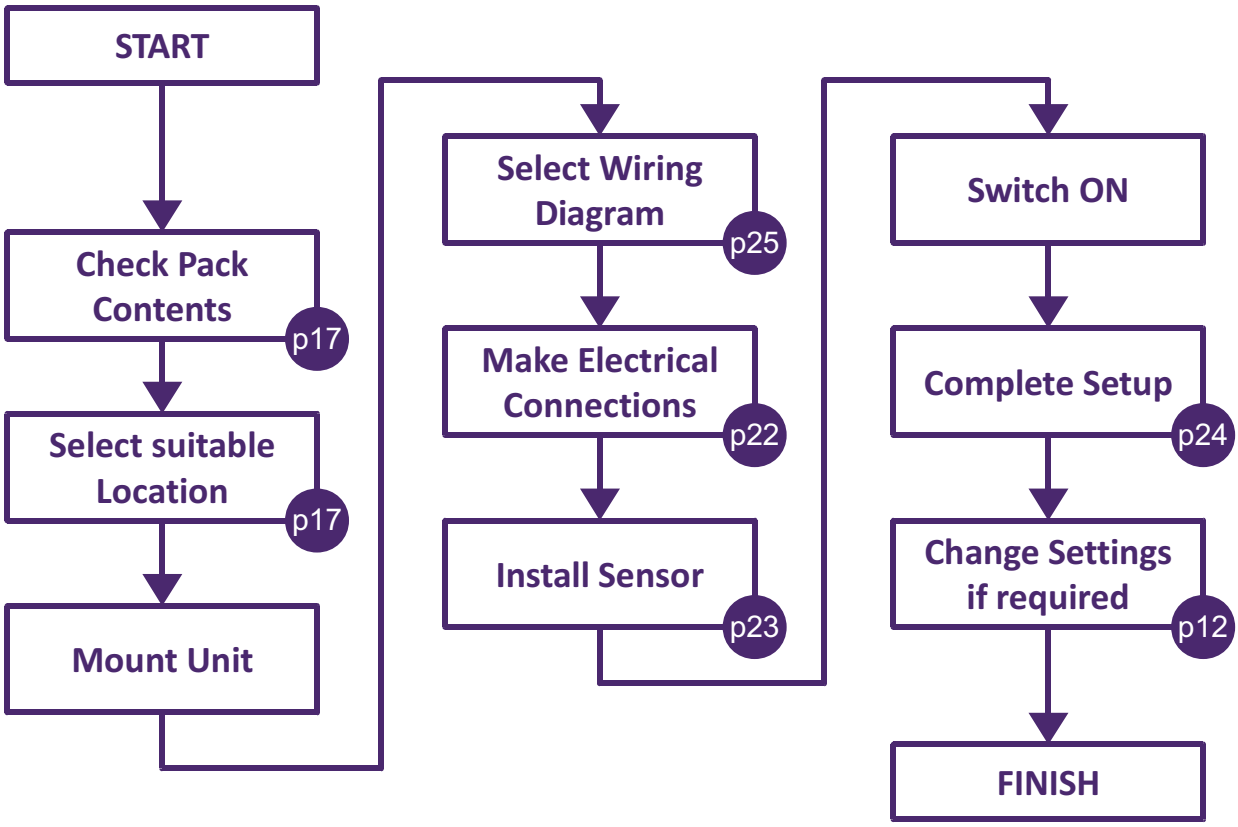
```
RELAY:EXP. THRESHOLD

Threshold: 500W
ON Period: 15min
OFF Period: 0min
Priority: High
```

Export Threshold
The relay will activate when a set export power *Threshold* is reached. The relay will remain activated a set minimum *ON Period.* After this period the relay will deactivate, unless the export threshold still exceeds the set level. If the export has fallen below the threshold after the *ON Period*, the relay will immediately deactivate and will remain so for the set *OFF Period.*
This function operates independent to the heater outputs.
When the *Priority* is set to *HIGH* the relay will activate when the surplus power exceeds the threshold set. i.e. it will include the already diverted power when waiting for the threshold to be exceeded.
With the priority set to *LOW*, the relay will activate when the exported power is greater than the set threshold.
Note: In this mode the relay can also be controlled with the *Manual* and *Timed Boost* options.

Multifunction Relay Contacts
NO – Normally Open
C – Common
NC – Normally Closed

Installation

The immerSUN should only be installed by a competent person. If in doubt, please consult a qualified electrician



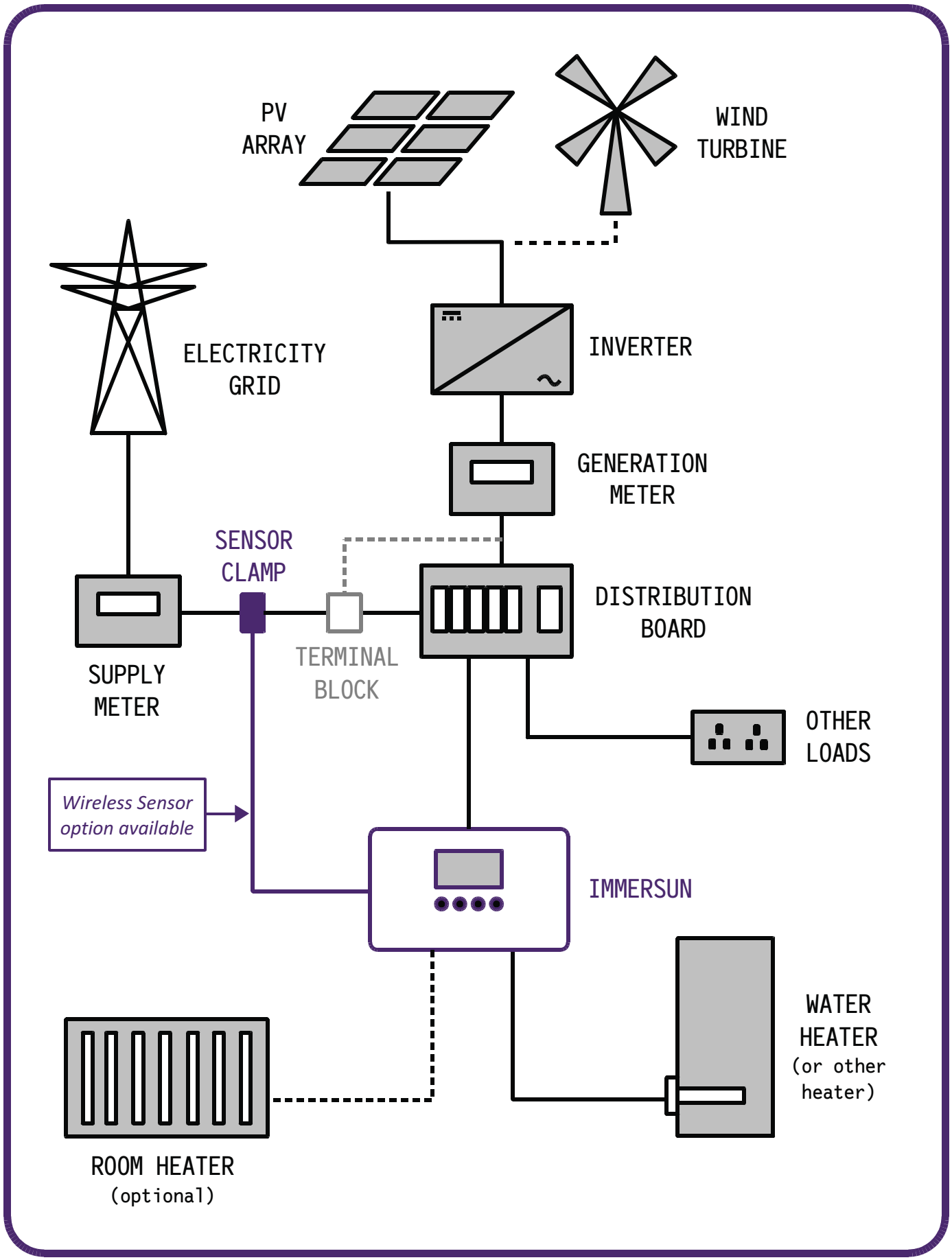
Heat Pumps & Solar Thermal – Legionella Control
Heat pumps often need to use the immersion heater to get the hot water to a high temperature for the purpose of Legionella control. This is an ideal application for the ***External Boost*** input.

The immersion heater should ONLY be connected to the immerSUN, do not connect the immersion heater to the heat pump or solar thermal controller.

ON/OFF Control of Other Appliances
Only resistive loads (e.g. heaters) can be connected to the variable power Heater 1 and Heater 2 outputs. However, it is possible to simply switch ON/OFF other types of devices by using the ***Threshold*** option of the ***Multifunction Relay***.

Cylinder Destratification
The effective capacity of a hot water cylinder with a top mounting immersion can be increased by pumping the hot water to the bottom of the cylinder, therefore allowing the immersion heater to heat the top section of the cylinder again. The ***Multifunction Relay*** has a ***De-strat Pump*** control option for this purpose.

System Overview

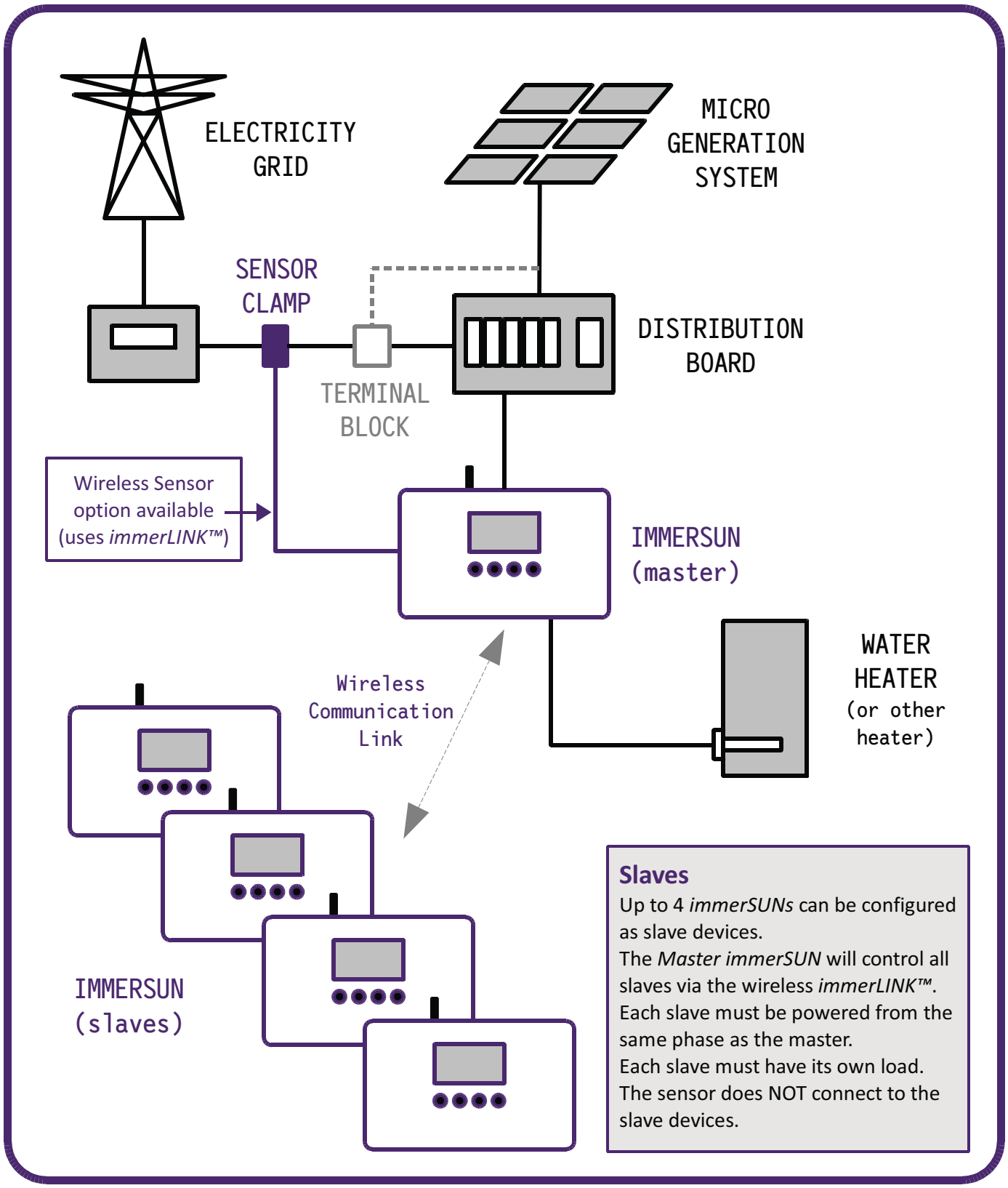


immerLINK™ (linking units)

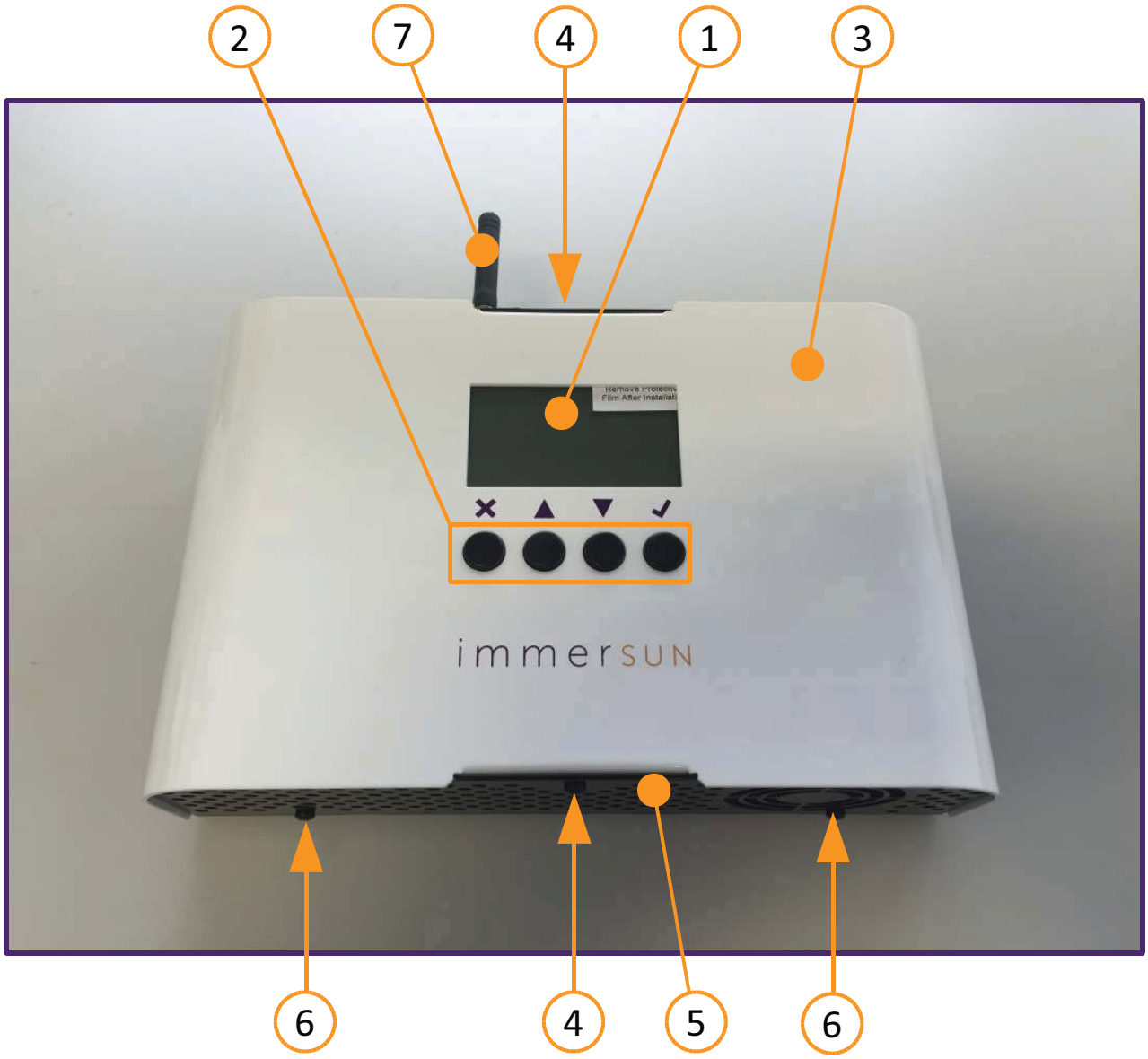
immerLINK™ is a wireless network used by immerSUN devices.
Up to 5 immerSUN units can be 'linked' together by using immerLINK™.

Linking several units enables more export power to be consumed, with each device being able to control a 3kW load, up to 15kW of would-be exported power can be utilised.

Use the *immerLINK Search* option in the *Advanced Menu* to link devices.



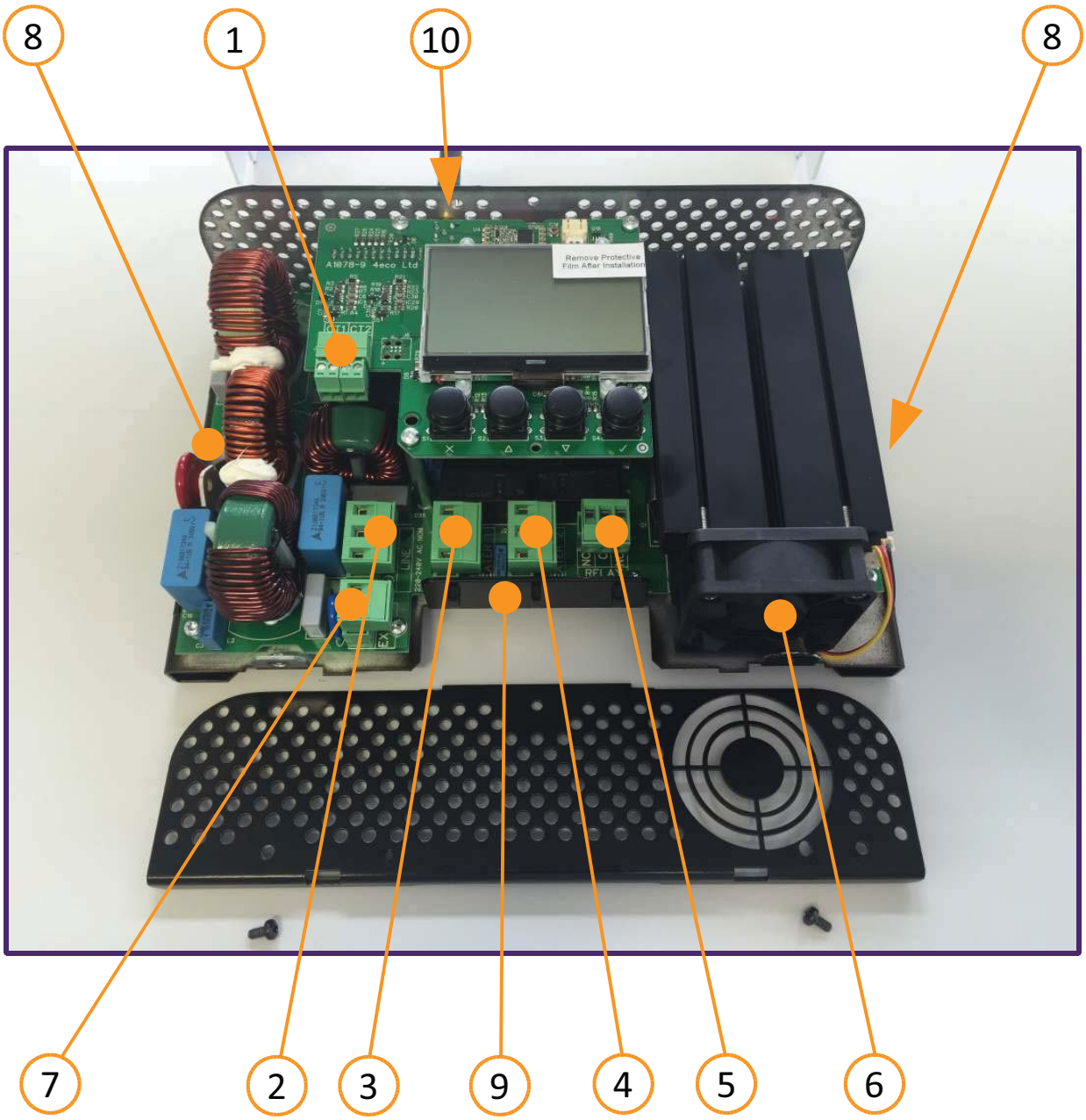
immerSUN at a glance



External overview

1) LCD display
2) Control buttons
3) Cover (removable)
4) Cover screws
5) Bottom panel (removable)
6) Bottom panel screws
7) Antenna (for immerLINK accessories)

Always isolate power before removing the cover



Cover & Bottom Panel Removed

1) Sensor Clamp terminal plugs
2) LINE terminal plug – mains supply input
3) HEATER 1 terminal plug
4) HEATER 2 terminal plug
5) RELAY terminal plug – Multifunction Relay
6) Cooling fan
7) EX BST terminal plug – External Boost input
8) Mounting holes
9) Cable anchor points
10) Antenna connector

What's in the Pack

- **immerSUN**
- **Sensor Clamp**
- **Fixing Kit**
- **Antenna**
- **Installation & User Guide**

Locating the immerSUN

Often, the most suitable location for the immerSUN is near to the distribution board as all the connections required are usually available here.
Alternatively the unit can be mounted next to the load. Note that the *Sensor* clamp must be clamped around the supply meter-tail. There is the option of using the Wireless Sensor to simplify the installation if required.

The following should be considered when deciding upon the most suitable location:

- Close to the main incoming mains electrical supply of the property – otherwise the Sensor Clamp will need to be extended, or the Wireless Sensor option used.
- Access to heater supply cable (this is usually at the consumer unit)
- Access to suitable supply via **16A MCB or 13A fused outlet**
- **User access** to the buttons and visibility of LCD screen
- Adequate ventilation – keep vents clear and provide airflow around the unit. **Minimum clearance top and bottom is 100mm** although more is recommend for ease of access to case screws. There are no clearance requirements for the sides.
- Cable access point – through the top, bottom or rear of the unit - the **bottom panel is removable** to give better access when wiring.

Voltage Optimisers

If there is a voltage optimiser installed at the property, care will need to be taken when positioning and wiring the immerSUN. The Sensor Clamp and the immerSUN will need to 'see' the same voltage, whether this is the optimised voltage or the non-optimised voltage.

Check the manufacturers instructions before connecting the immerSUN to an optimised circuit – some optimisers should not be connected to heaters.

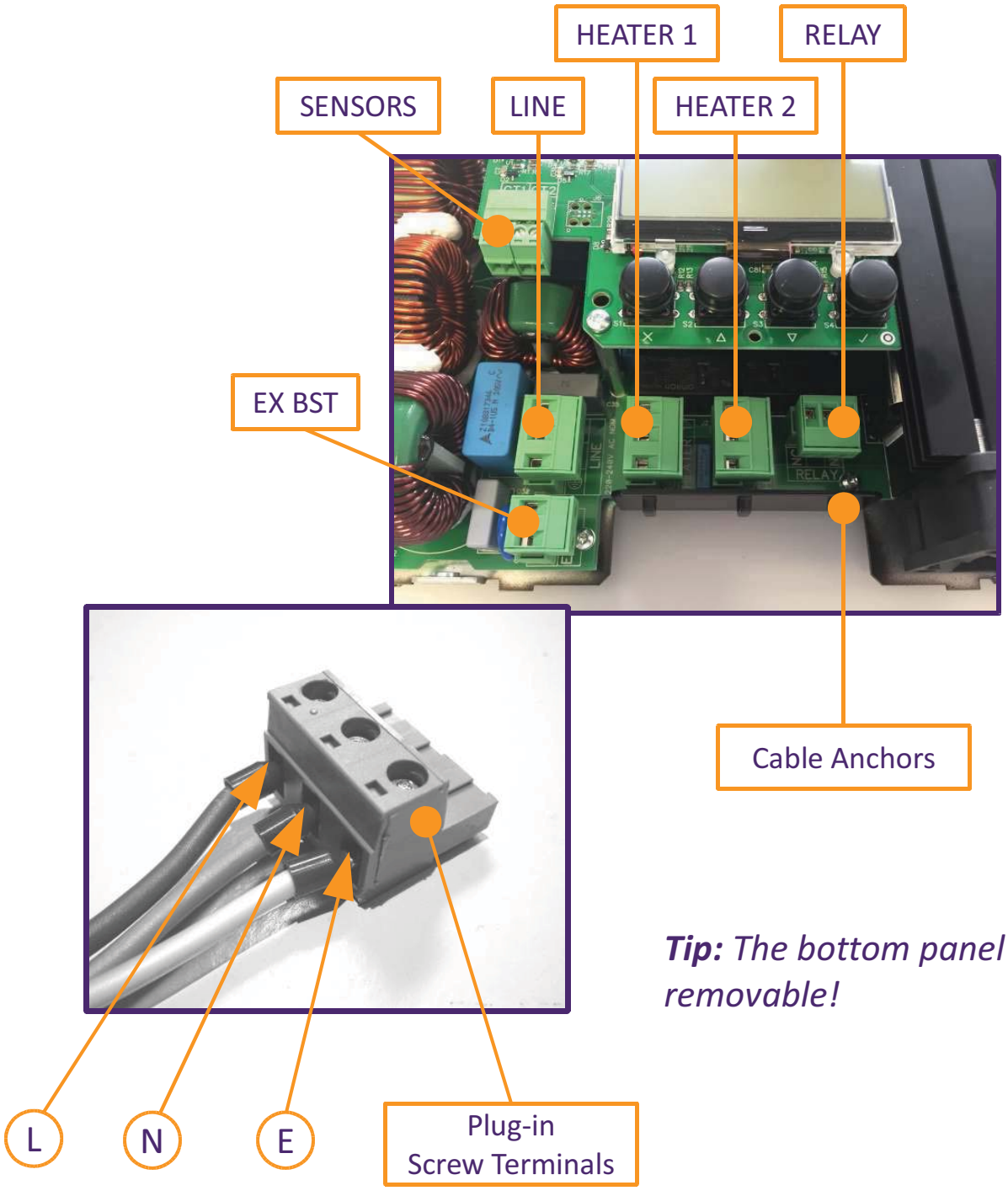
Three-Phase Systems

The immerSUN and the Sensor Clamp must be on the SAME PHASE.

If the generation is 3-phase, an immerSUN can be used on each phase, if only one or two immerSUN's are used, only one-third or two-thirds of the surplus power will be able to be utilised. The loads will need to be single phase.

Electrical Connections

The electrical connections are made by the pluggable screw terminals.
See ***Wiring Diagrams*** section and choose the most appropriate wiring scheme for the installation.



Tip: *The bottom panel is removable!*

Important!

- Earth MUST be connected
- Ensure wires are secure in screw terminals
- Check plugs are fully inserted
- Secure cables to the cable anchor points with the cable-ties provided
- Always isolate power before removing the cover

Sensor Installation

The sensor should be located at the incoming grid supply to the building. This will be the supply from the electric supply meter (NOT the PV generation meter). Clamp the sensor around the LIVE or NEUTRAL from the meter. Ensure the clamp is securely closed around the cable.

It does not matter which way round the sensor is clamped around the cable, the immerSUN will work out the import/export direction automatically.

PV connected via Henley Block

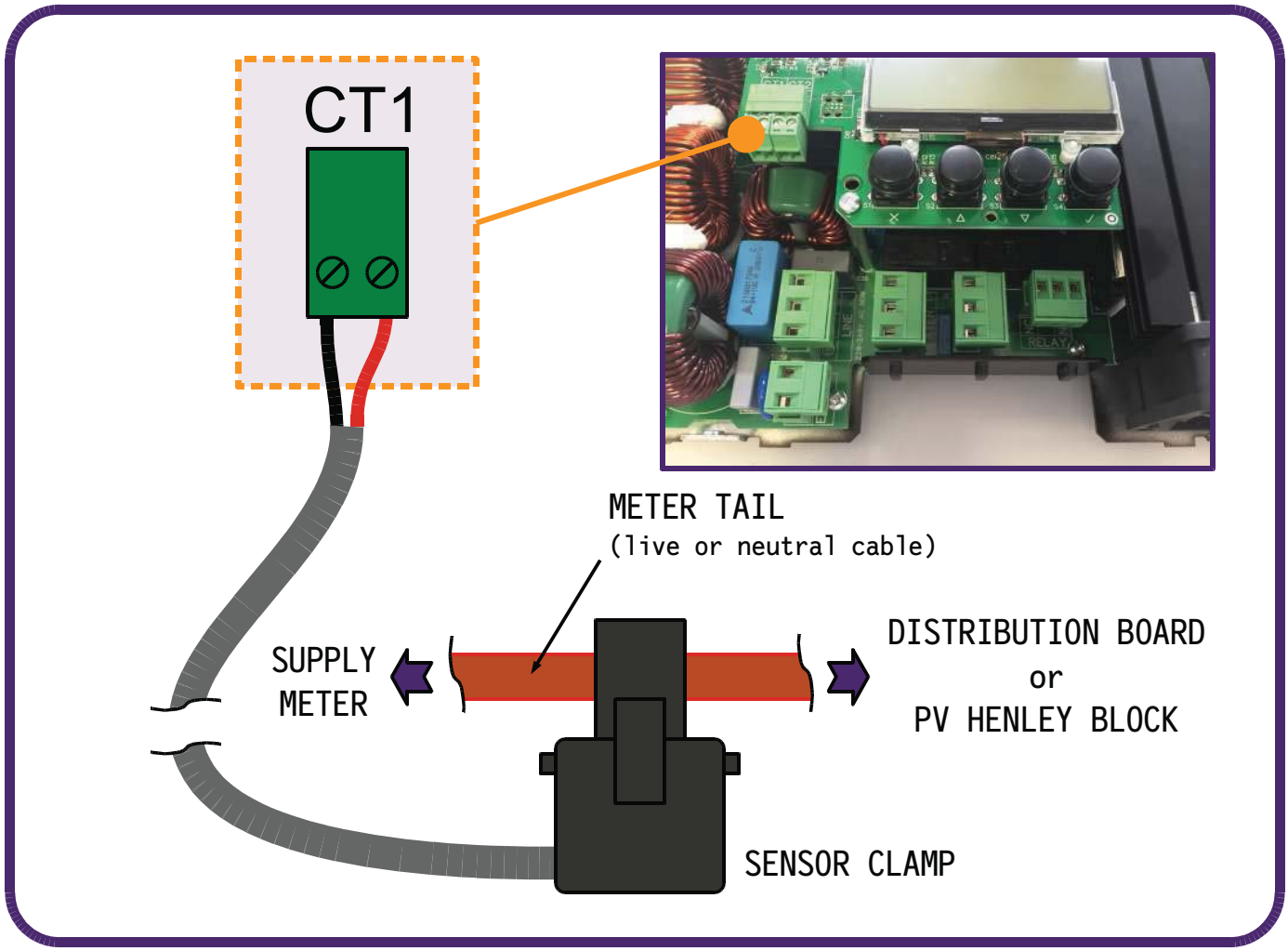
If the PV system is connected via a terminal then the clamp should be installed on the grid side of the block, i.e. between the meter and terminal block.

More than one consumer unit

Where there is more than one consumer unit, the clamp should be installed at the primary incoming supply (i.e. before it splits).

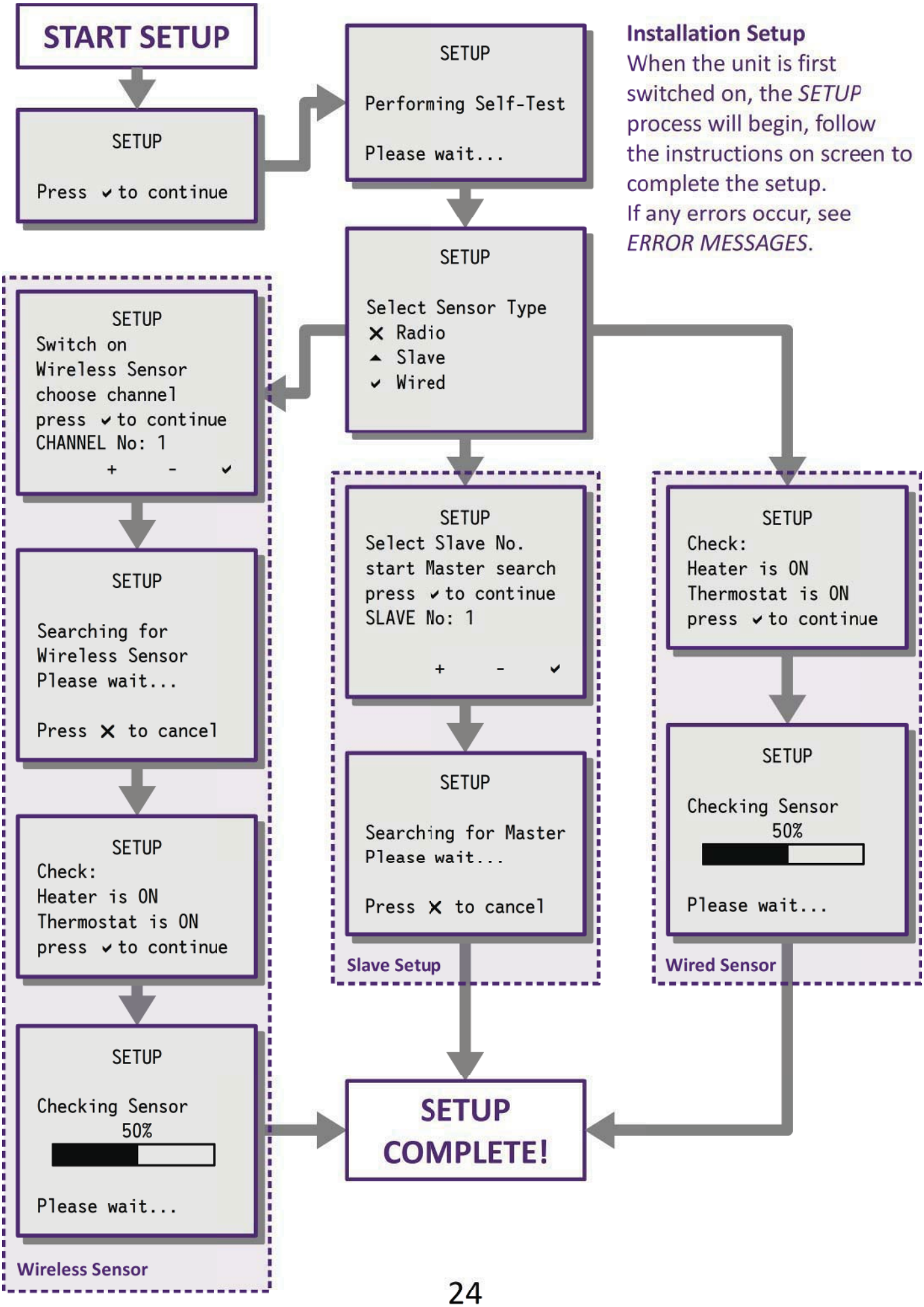
Using the Wireless Sensor (Optional)

There is an option to use a wireless sensor. The wireless sensor is available to purchase as an optional extra. When using the wireless sensor option, the sensor clamp should NOT be connected directly to the immerSUN. See the installation instructions for the Wireless Sensor.



Setup

Replace cover before switching on



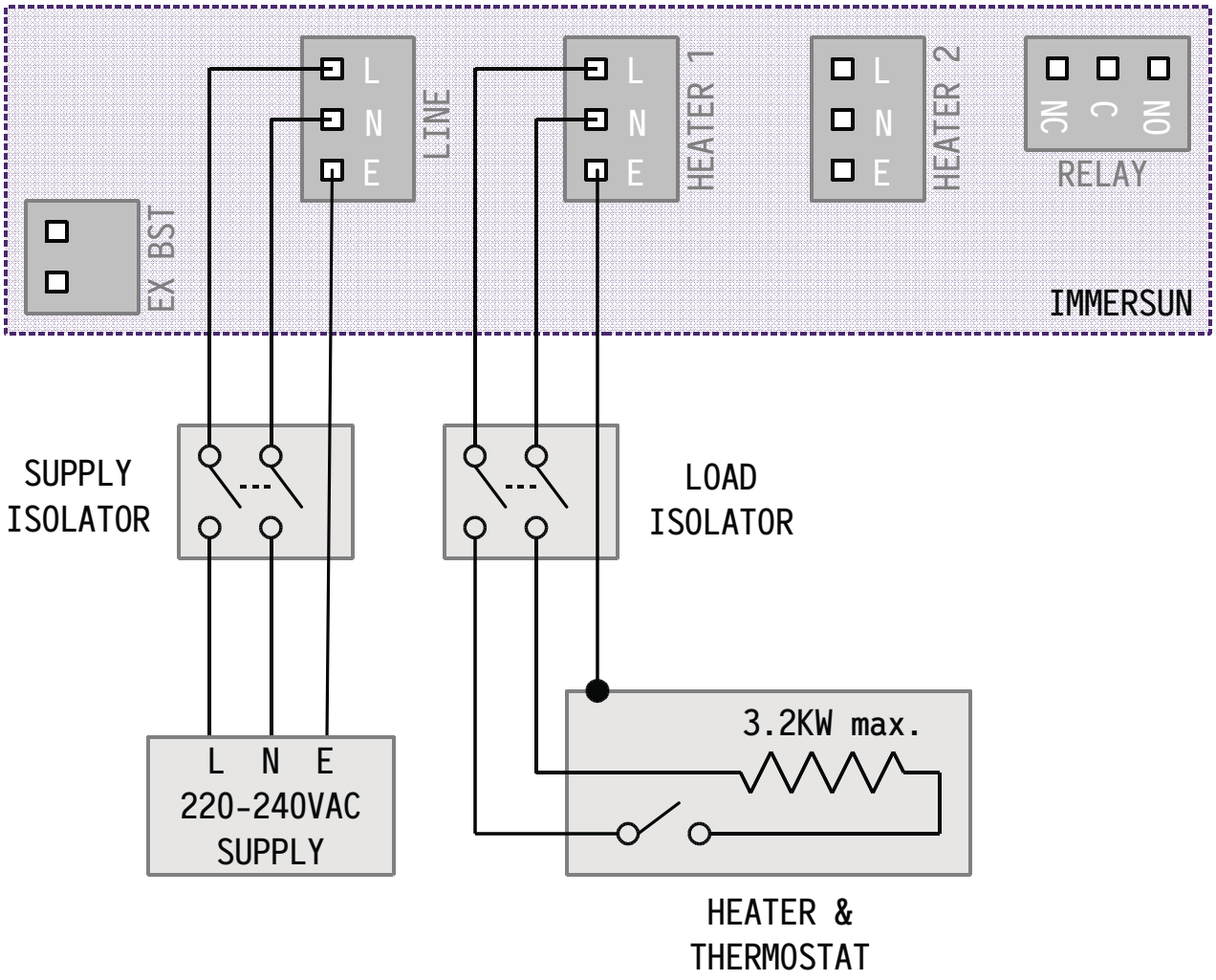
Installation Setup

When the unit is first switched on, the *SETUP* process will begin, follow the instructions on screen to complete the setup.
If any errors occur, see *ERROR MESSAGES*.

Wiring diagrams...

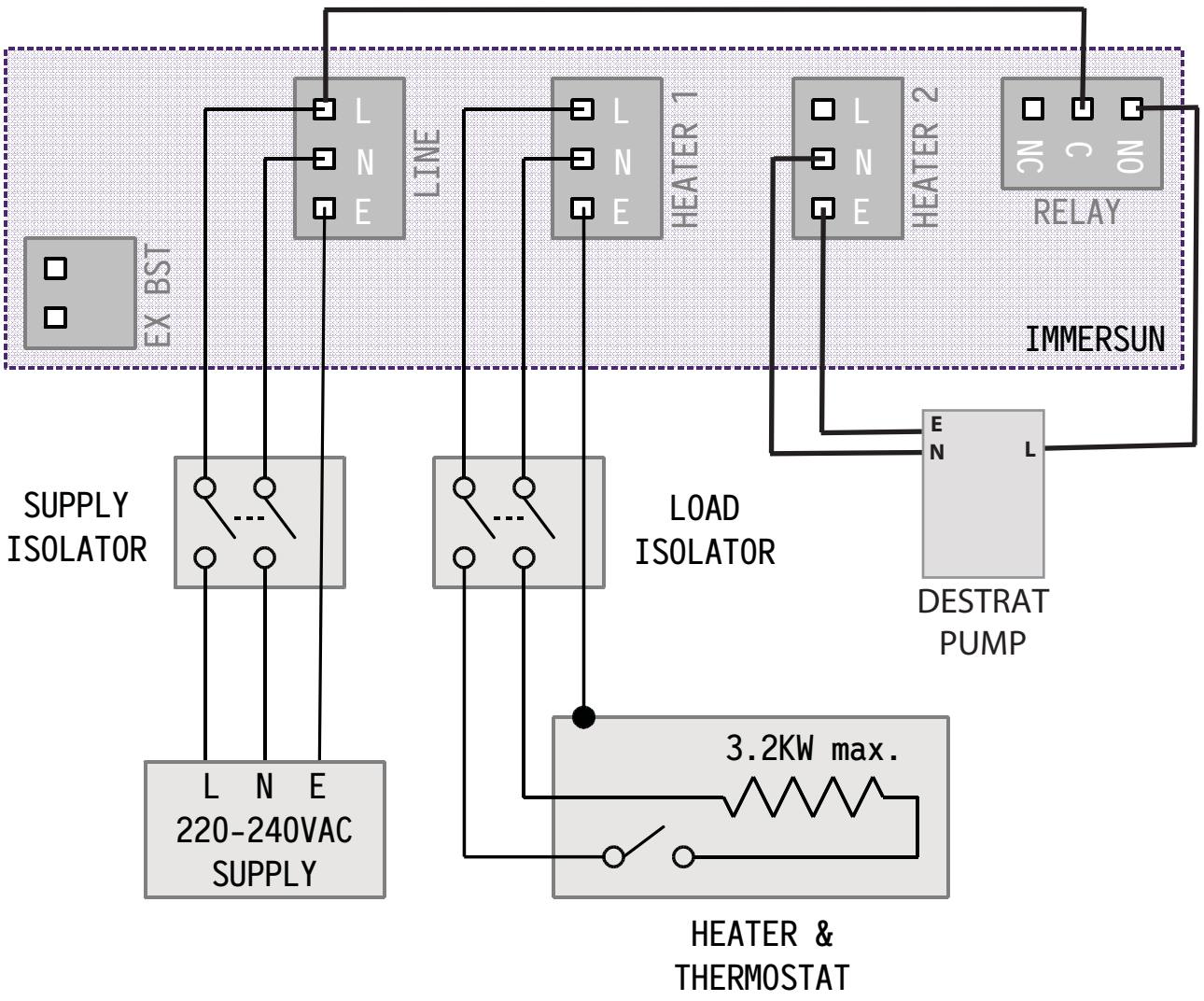
Wiring: Single Heater

1



Wiring: Destrat Pump

1



Insert

Single Heater Wiring

This is most simple installation and the most common.
One heater is wired to the Heater 1 output.
The heater is heated with surplus power until the thermostat opens, the immerSUN will then display *HOT*. The surplus power will then be exported until the thermostat closes and heating will resume.

Isolators

The isolators shown may not be required but there should always be a way of isolating the supply, e.g. the MCB can be used for isolation, if the immerSUN is located next to the consumer unit. Likewise, the load isolator can be eliminated if the immerSUN and the supply isolation switch are located near the heater.

Important!

- Maximum load: 3.2KW
- Minimum load: 150W
- Recommended cable size: 2.5mm²
- Must be a simple resistive load without electronic controls

Settings

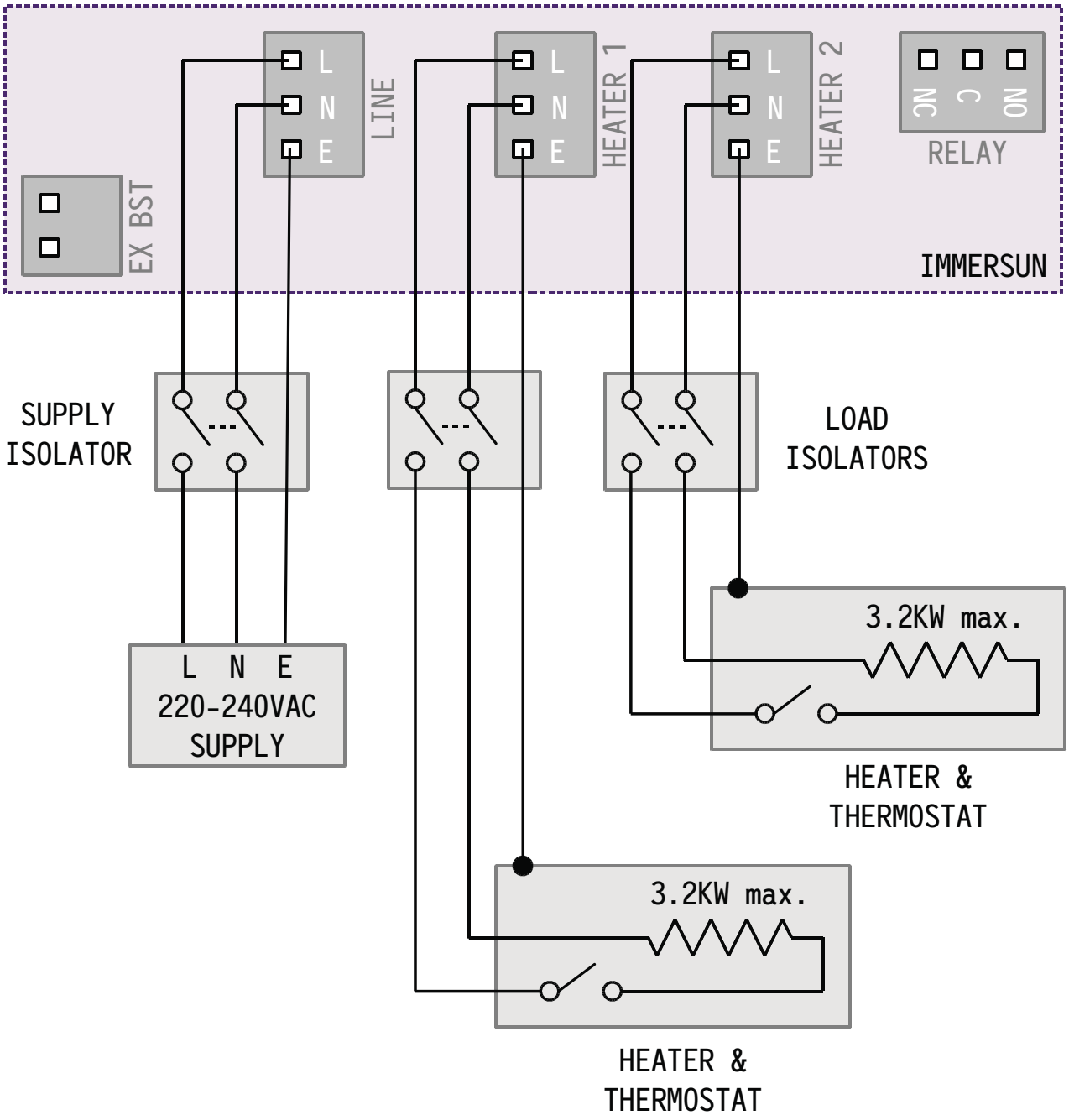
Heater 1 Type:	Set to match the load
Heater 2 Type:	None
Heater 3 Type:	None
Relay Function:	Not used
External Boost:	Not used

Tips & Ideas

- Smaller loads can be connected in parallel as long as the maximum load is not exceeded.
- The immerSUN has built-in timers that can replace any timers that have been removed.
- The *Multifunction Relay* is free to use to control other devices.
- The *External Boost* input is free to use if an auxiliary device needs to have some control over the immerSUN.

Wiring: Two Heater

2



Two Heater Wiring

This is the same as the Single Heater wiring, only with a second heater connected. One heater is wired to the Heater 1 output, a second heater is wired to the Heater 2 output.

The heaters are heated sequentially, i.e. Heater 1 is heated with surplus power until the thermostat opens, the immerSUN will then display *HOT*. After a few seconds, (provided export power is still available), Heater 2 will start to be heated. If Heater 2 reaches maximum temperature, the display will show *HOT* and the immerSUN will switch back to Heater 1. During heating of the lower priority heater, the immerSUN will switch to the higher priority heater periodically to check if it can take more heat. The heating priority can be set in the Main Menu *(Set Priority)*. Also the period of time between heater 'checks' can be set in the Advanced Settings Menu *(Priority Check)* .
When both heaters are *HOT* any surplus power will be exported.

Important!

- Maximum load: 3.2KW
- Minimum load: 150W
- Recommended cable size: 2.5mm²
- Must be a simple resistive load without electronic controls

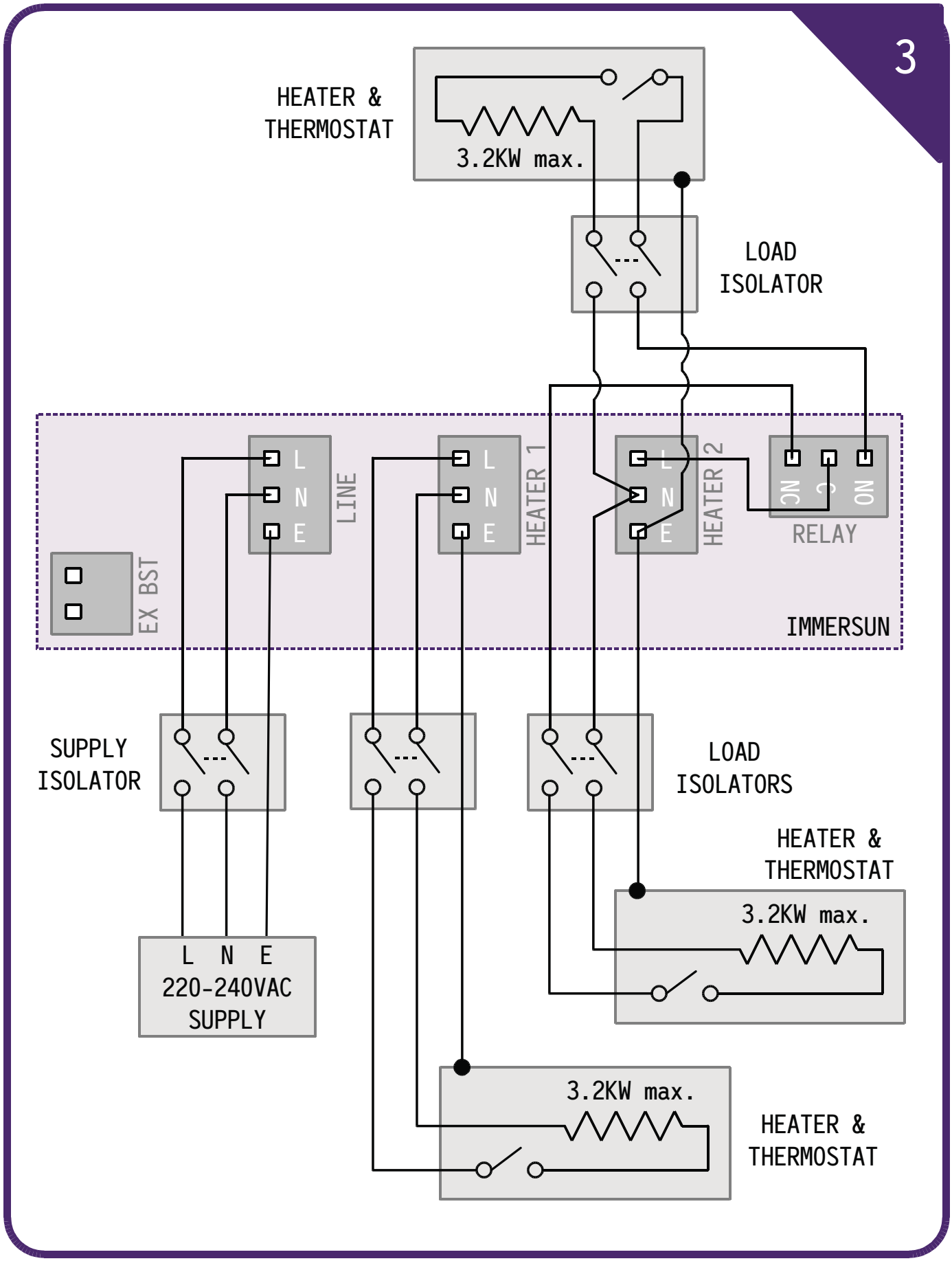
Settings

Heater 1 Type:	Set to match the load
Heater 2 Type:	Set to match the load
Heater 3 Type:	Disabled
Relay Function:	Not used
External Boost:	Not used

Tips & Ideas

- Smaller loads can be connected in parallel as long as the maximum load is not exceeded.
- The immerSUN has built-in timers that can replace any timers that have been removed.
- The *Multifunction Relay* is free to use to control other devices.
- The *External Boost* input is free to use if an auxiliary device needs to have some control over the immerSUN.

Wiring: Three Heater



Three Heater Wiring

By making use of the Multifunction Relay it is possible to connect 3 heaters. One heater is wired to the Heater 1 output, the Heater 2 output is wired to the Common of the relay, the other two heaters are then connected to the Normally Open and Normally Closed contacts.

The heaters are heated sequential, i.e. Heater 1 is heated with surplus power until the thermostat opens, the immerSUN will then display *HOT*. After a few seconds, (provided export power is still available), Heater 2 will start to be heated. If Heater 2 reaches maximum temperature, the display will show *HOT* and the immerSUN will switch the relay over so that Heater 3 can be heated.
During heating of a lower priority heater, the immerSUN will switch to the higher priority heater periodically to check if it can take more heat. The heating priority can be set in the Main Menu *(Set Priority)*. Also the period of time between heater 'checks' can be set in the Advanced Settings Menu *(Priority Check)* .

Important!

- Maximum load: 3.2KW (each heater)
- Minimum load: 150W (each heater)
- Recommended cable size: 2.5mm²
- Must be a simple resistive load without electronic controls

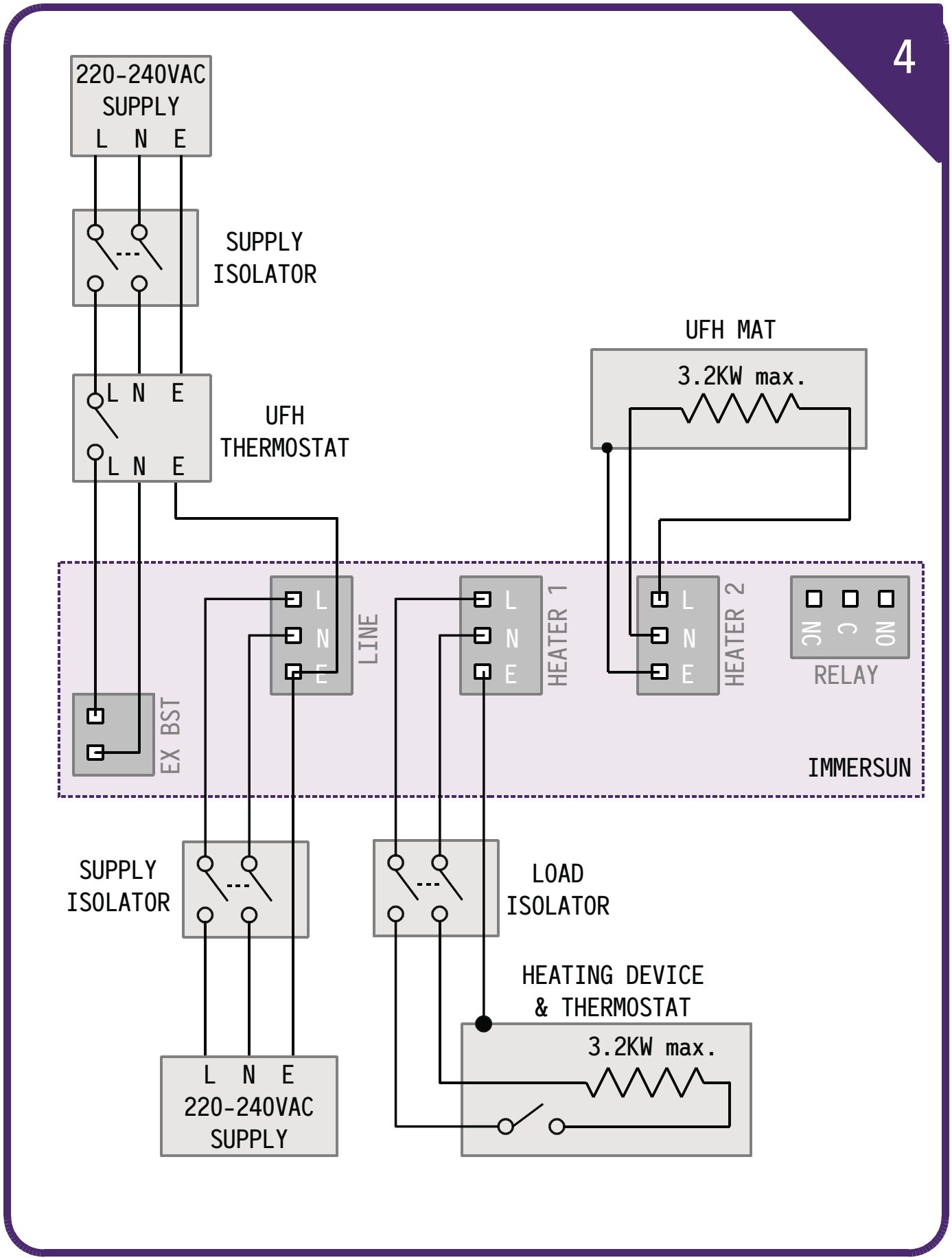
Settings

Heater 1 Type:	Set to match the load
Heater 2 Type:	Set to match the load
Heater 3 Type:	Set to match the load
Relay Function:	Third Heater
External Boost:	Not used

Tips & Ideas

- Smaller loads can be connected in parallel as long as the maximum load is not exceeded.
- The immerSUN has built-in timers that can replace any timers that have been removed.
- The *External Boost* input is free to use if an auxiliary device needs to have some control over the immerSUN.

Wiring: Underfloor Heating (opt. 1)



Underfloor Heating – Option 1

Electric underfloor heating (UFH) can usually be used with the immerSUN. This wiring diagram assumes that the UFH is to be used alongside another heater (most likely an immersion heater). However the UFH system can be used as the only heater by wiring to the Heater 1 output.

The UFH thermostat is wired so that the *External Boost* sees a voltage when the thermostat is closed. The UFH mat is connected directly to Heater 2 output.

The External Boost input is used in 'thermostat' mode so that the Heater 2 output is active only when the UFH thermostat is calling for heat.

Important!

- Maximum load: 3.2KW (each heater)
- Minimum load: 150W (each heater)
- Recommended cable size: 2.5mm²
- Must be a simple resistive load without without electronic controls

Settings

Heater 1 Type:	Set to match the load
Heater 2 Type:	Underfloor Heating
Heater 3 Type:	Disabled
Relay Function:	Not used
External Boost:	Heater Thermostat: Heater 2

Tips & Ideas

- Smaller loads can be connected in parallel as long as the maximum load is not exceeded.
- The immerSUN has built-in timers that can replace any timers that have been removed.
- The *Multifunction Relay* is free to use to control other devices..

Wiring: Underfloor Heating (opt. 2)

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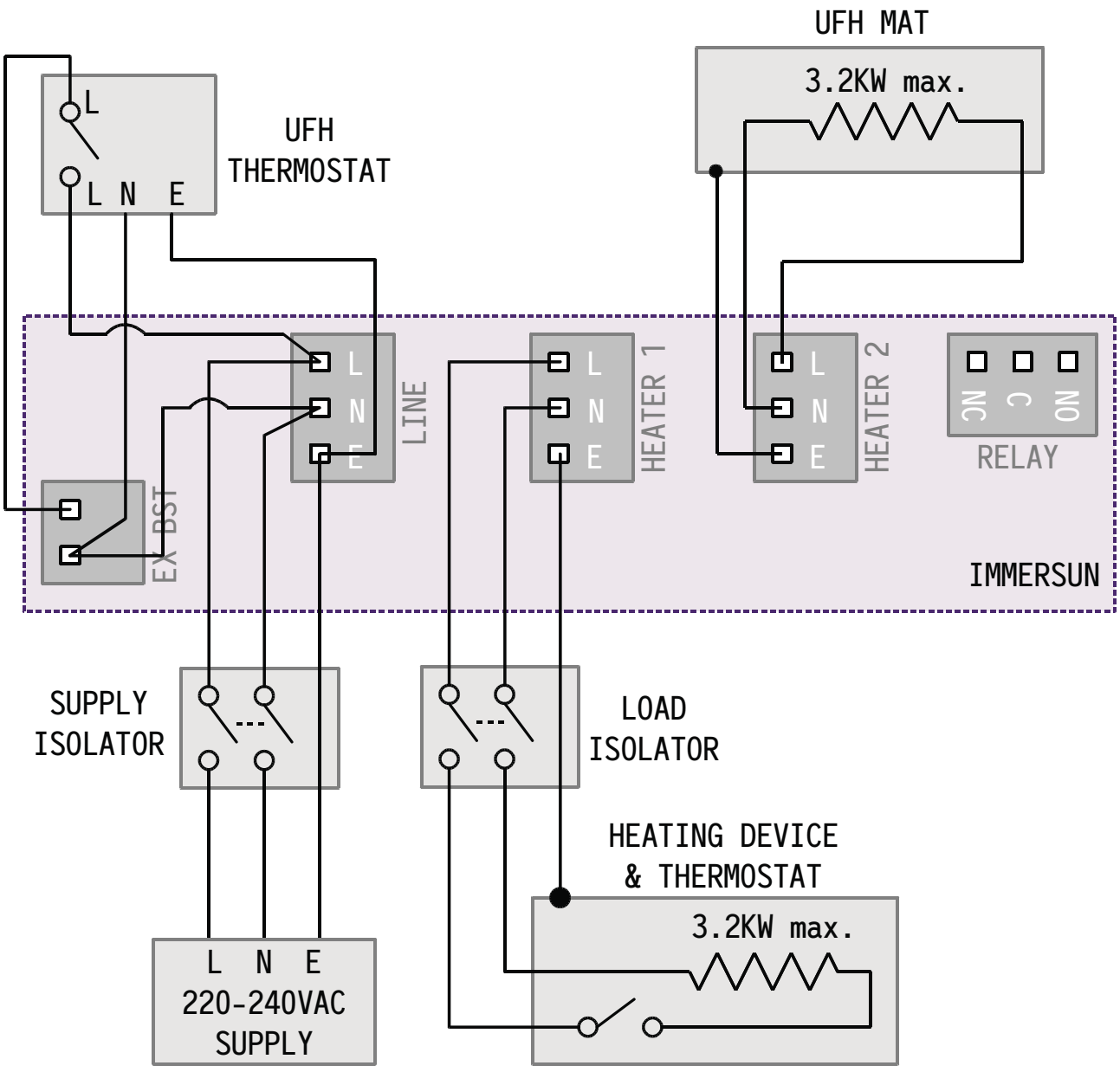


Underfloor Heating – Option 2

Electric underfloor heating (UFH) can usually be used with the immerSUN. This wiring diagram assumes that the UFH is to be used alongside another heater (most likely an immersion heater). However the UFH system can be used as the only heater by wiring to the Heater 1 output.

The UFH thermostat is wired solely to the immerSUN, power is taken from the immerSUN supply and *External Boost* input is used to sense the UFH thermostat state. The UFH mat is connected directly to Heater 2 output.

The External Boost input is used in 'thermostat' mode so that the Heater 2 output is active only when the UFH thermostat is calling for heat.

Important!

- Maximum load: 3.2KW (each heater)
- Minimum load: 150W (each heater)
- Recommended cable size: 2.5mm²
- Must be a simple resistive load without electronic controls

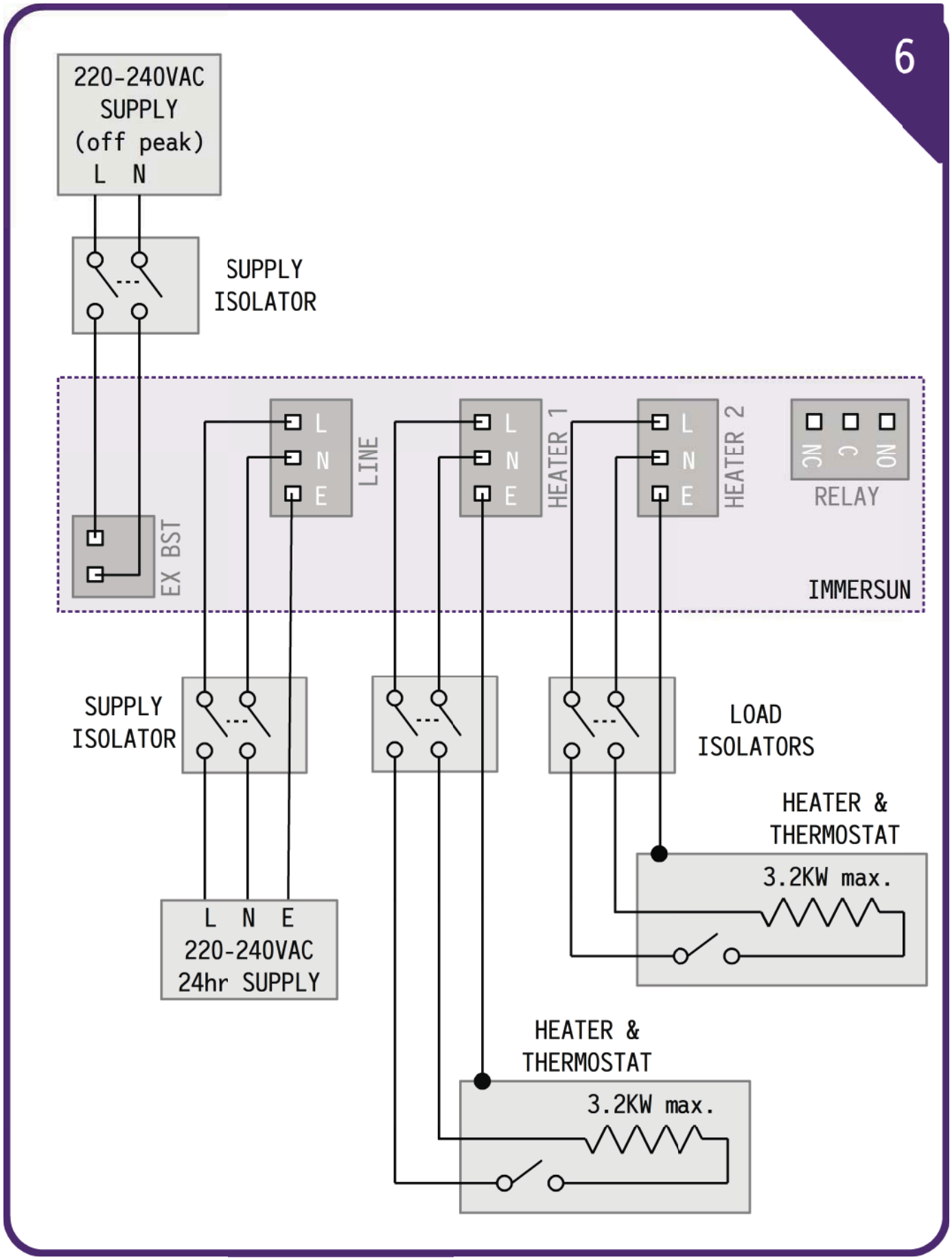
Settings

Heater 1 Type:	Set to match the load
Heater 2 Type:	Underfloor Heating
Heater 3 Type:	Disabled
Relay Function:	Not used
External Boost:	Heater Thermostat: Heater 2

Tips & Ideas

- Smaller loads can be connected in parallel as long as the maximum load is not exceeded.
- The immerSUN has built-in timers that can replace any timers that have been removed.
- The *Multifunction Relay* is free to use to control other devices.

Wiring: Dual Tariff (Single Meter)



Dual Tariff Wiring – Single Meter

It is simple to wire the immerSUN to handle dual rate tariffs when there is only one supply meter. The *External Boost* input can be used to detect when the economy rate electricity is available and automatically boost the heater output.

The Heaters are connected to the Heater 1 and 2 outputs as normal.

The *External Boost* input is connected to the economy rate supply.

Important!

- Maximum load: 3.2KW (each heater)
- Minimum load: 150W (each heater)
- Recommended cable size: 2.5mm²
- Must be a simple resistive load without electronic controls

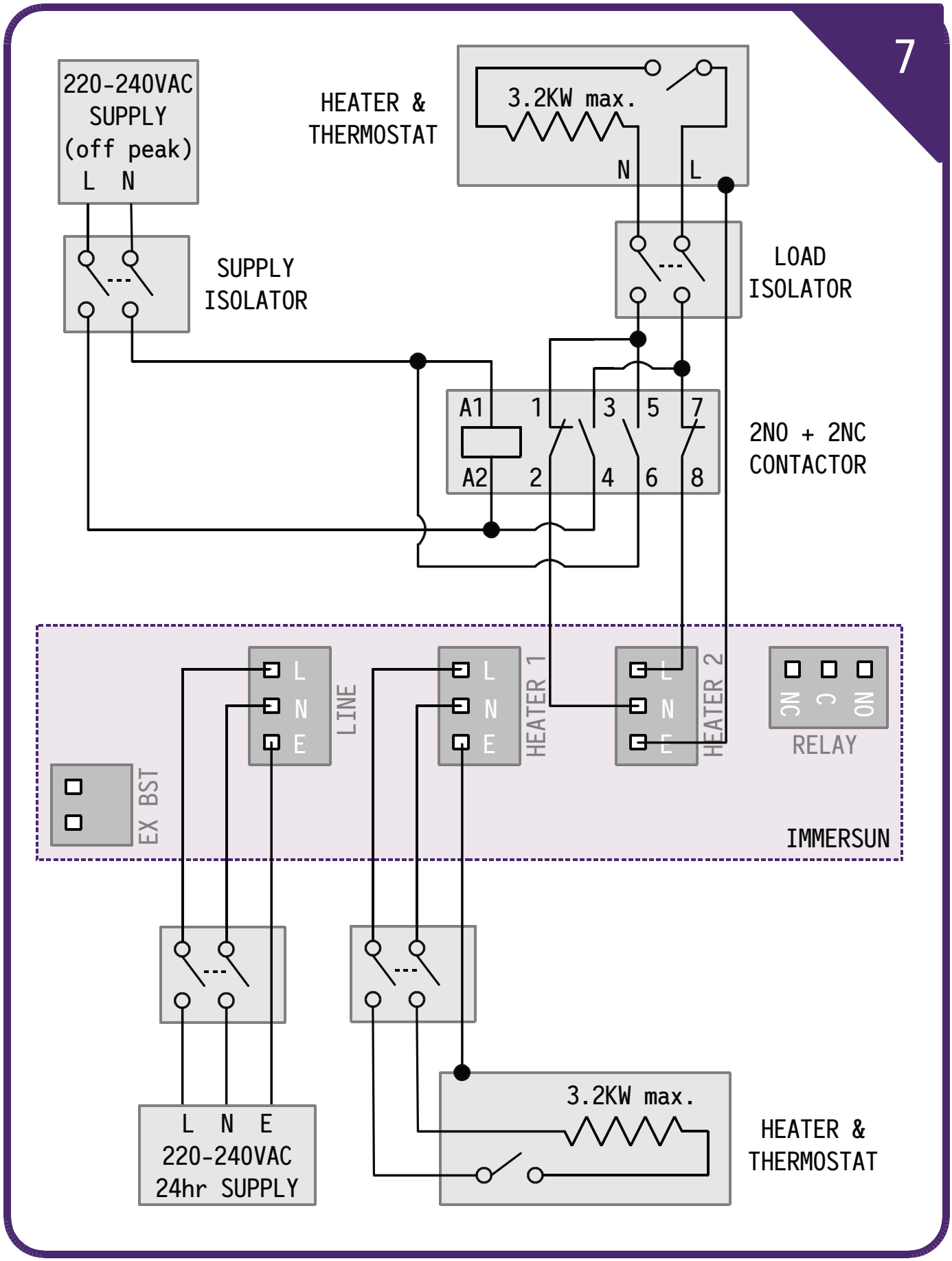
Settings

Heater 1 Type:	Set to match the load
Heater 2 Type:	Set to match the load
Heater 3 Type:	Disabled
Relay Function:	Not used
External Boost:	Boost Heater: Heater 1 & 2

Tips & Ideas

- By changing the External Boost heater number, the user can select Heater 1, Heater 2 or both to be automatically boosted whenever the economy rate tariff is available.
- Rather than connecting the External Boost, it is possible to simply program the boost times to coincide with the economy rate times.
- Smaller loads can be connected in parallel as long as the maximum load is not exceeded.
- The immerSUN has built-in timers that can replace any timers that have been removed.
- The *Multifunction Relay* is free to use to control other devices.

Wiring: Dual Tariff (Two Meters)



Dual Tariff Wiring – Two Meter

If there are two meters at the property, for dual tariff metering, it is necessary to make sure that power is drawn from the correct meter.
The immerSUN must be powered from a 24-hour supply and the heater must be connected directly to the immerSUN, however, during the economy tariff times, the heater needs to draw power from the economy tariff meter.
This can be achieved by switching the heater from the immerSUN output to the economy supply during the times when the economy supply is available. It is best to switch over the live and neutral lines, this can be done by using a separate 2NO + 2NC contactor.

With this configuration, only Heater 2 will be able to be billed at the economy rate.

Important!

- Maximum load: 3.2KW (each heater).
- Minimum load: 150W (each heater).
- Recommended cable size: 2.5mm².
- Must be a simple resistive load without electronic controls.
- Do NOT be tempted to use the immerSUN multifunction relay in place of the contactor as this can cause excessive currents in the neutral supply line.

Settings

Heater 1 Type:	Set to match the load
Heater 2 Type:	Set to match the load
Heater 3 Type:	Disabled
Relay Function:	Not used
External Boost:	Not used

Tips & Ideas

- Smaller loads can be connected in parallel as long as the maximum load is not exceeded.
- The immerSUN has built-in timers that can replace any timers that have been removed.
- The *External Boost* input is free to use if an auxiliary device needs to have some control over the immerSUN.

Error Messages

ERROR 1 VOLTAGE BACK-FEED 1 Check: Heater 1 wiring	**VOLTAGE BACK-FEED** During self-test, the unit has detected unexpected voltage at the Heater 1 output, this could damage the unit. *THE UNIT SHOULD NEVER BE BACK-FED* **Check:** The wiring must be incorrect, check wiring.
ERROR 2 VOLTAGE BACK-FEED 2 Check: Heater 2 wiring	**VOLTAGE BACK-FEED** During self-test, the unit has detected unexpected voltage at the Heater 2 output, this could damage the unit. *THE UNIT SHOULD NEVER BE BACK-FED* **Check:** The wiring must be incorrect, check wiring.
ERROR 3 HEATER NOT DETECTED Check: Heater is ON Thermostat is ON	**HEATER NOT DETECTED** During setup, the unit did not detect any current being draw by Heater 1. To get through setup, Heater 1 MUST be connected and functional. **Check:** The heater is not isolated, the thermostat is closed (e.g. the water is not already hot), the heater is not faulty. **Test:** The heater can be tested by measuring the L – N resistance, it should be between 17Ω and 350Ω ***Note:*** The immerSUN MUST BE OFF for this test.
ERROR 4 SENSOR ERROR Check: Sensor wiring Sensor location	**SENSOR ERROR** The sensor is giving unusual readings. **Check:** The sensor is properly located and clamped around the correct cable, the sensor is wired to the CT terminals. **Test:** The sensor can be checked by measuring the resistance across the CT terminals, it should be about 200Ω when not plugged in. When connected to the unit, it should be approximately 38Ω. ***Note****:* The sensor may need to be unclipped from the cable before testing.
ERROR 6 UNIT OVERHEAT Check: Ventilation	**UNIT OVERHEAT** The unit is overheating. **Check:** There is adequate ventilation and the vents are not blocked.
ERROR 7 OUTPUT OVERLOAD Check: Heater rating	**OUTPUT OVERLOAD** The output current is too high, the heater connected is too large. **Check:** The heater KW rating, it should be less than 3.2kW and more than 150W.

ERROR 8 LOAD SHORT-CIRCUIT Check: Heater	**LOAD SHORT-CIRCUIT** One of the heater outputs is shorted, the heater may be faulty. *Note:* This error can sometimes be triggered by poor mains quality, call technical support if you suspect this. **Check:** The heater for faults. **Test:** The heater can be tested by measuring the L – N resistance, it should be between 17Ω and 350Ω ***Note:*** The unit MUST BE OFF for this test.
ERROR 9 UNDER VOLTAGE	**UNDER VOLTAGE** The supply voltage is too low. **Test:** The supply should be between 215V and 259V.
ERROR 10 OVER VOLTAGE	**OVER VOLTAGE** The supply voltage is too high. **Test:** The supply should be between 215V and 259V.
ERROR 11 CPU CAL CHECKSUM WRONG	**CPU CAL CHECKSUM WRONG** There is a problem with the configuration data in the CPU board. **Try:** Switch-off power to the unit, wait a few seconds and switch back on again.
ERROR 12 PWR CAL CHECKSUM WRONG	**PWR CAL CHECKSUM WRONG** There is a problem with the calibration data. **Try:** Switch-off power to the unit, wait a few seconds and switch back on again.
ERROR 13 FAN FAULT	**FAN FAULT** The cooling fan is not functioning. **Check:** The fan is not obstructed.
ERROR 14 GENERATION CLAMP IN WRONG PLACE	**GENERATION CLAMP IN WRONG PLACE** The CT sensor clamp plugged into CT2 seems to be clamped around the wrong cable. **Check:** The generation clamp position, it should be around the LIVE cable from the inverter.

Technical Specifications

Model Number:	T1060
Supply Voltage:	220 – 240V AC @ 50Hz
MCB/Fuse Rating:	16A / 13A
Input Current (max):	13A
Load Capacity:	150W – 3200W
Output Voltage:	0V – Supply Voltage
Relay Contact Rating:	16A 250V AC
External Boost Input:	24 – 275V AC (<1W)
Sensor Current (max):	100A
Ambient Temperature:	-20 to +35°C
Standby Consumption:	3.5W
Efficiency:	98%
Power Control Method:	PWM
Control Resolution:	0.33%
Response Time:	1 second
Measurement Accuracy:	+/- 1%
Dimensions:	235 x 152 x 72mm
IP Classification:	IP20

Compliance:

EN 60335-1:2012	Household and similar electrical appliances - Safety - Part 1: General requirements.
EN 55014-1:2006 +A2:2011	Electromagnetic compatibility (EMC) Requirements for household appliances (Emissions).
EN 55014-2:1997 +A1:2001+A2:2008	Electromagnetic compatibility (EMC) Requirements for household appliances (Immunity).
EN 61000-3-2:2006 +A1:2009+A2:2009	Limits for harmonic current emissions.
EN 61000-3-3:2008	Limitation of voltage changes, voltage fluctuations and flicker.

Country of Manufacture: UK

Safety Information

- **This appliance must be earthed**
- **Do not use this product outdoors**

The device is not to be used by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the device by a person responsible for their safety.

Product Disposal

This product should not be disposed with other household waste.
To prevent possible harm to the environment or human health, please recycle it responsibly.

Warranty Statement

Subject to the provisions described below, this product is protected for twelve (12) months from the date of purchase against defects in material and workmanship**.**

Prior to returning any product to SISEM, the end customer must first have followed guidance from the appropriate support documents made publically available at www.immersun.co.uk. If product is still thought to be defective the end customer must then report the fault to SISEM through the ticket support system available at www.immersun.co.uk/support to proceed with guided troubleshooting. If SISEM confirms agreement through ticket response that the product should be returned, a Returns Number (RN) and return instructions will be issued to the end customer. The RN must be clearly marked on the packaging of the product to be returned and the customer should return the product at their own cost.

Should SISEM be in agreement that the product has failed to perform as described within the relevant warranted period set out above in consequence of its own workmanship or materials used, it will be repaired or replaced with the same or functionally equivalent product by SISEM, at it's sole discretion, free of charge provided that the end customer first: (1) returns the failed product to SISEM with shipping charge prepaid, and (2) provides SISEM with proof of the original date of purchase and full product serial number. Returned or replacement products will be returned to the end customer with shipping charges prepaid.

Replacement products may be refurbished or contain refurbished materials. If SISEM, by its sole determination, is unable to repair or replace the defective product, it will refund the depreciated purchase price of the product.

The warranty and direct technical support privileges does not apply if, in the judgement of SISEM, the product fails due to damage resulting from shipment, handling, storage, abuse, misuse, incorrect installation, accident, natural disaster, power outage, gird electricity disturbance, inappropriate use or cleaning of the product, relocation of the product after its first installation, or if it has been used or maintained in a manner not conforming to product manual instructions, has been modified in any way, or has had any serial number removed or defaced.

Repair, modification or unsolicited handling of products or internal components and circuitry by anyone other than SISEM will void this warranty. All defective products should be returned to SISEM with shipping charges prepaid by end customer. Warranty and eligibility for direct technical support privileges will further be revoked if the user attempts to threaten, extort or perform defamatory action against SISEM or any of its employees.

Nothing in this agreement will affect the end customer's statutory rights or limit or exclude SISEM's liability for (1) death or personal injury caused by its negligence, or the negligence of its employees, agents or subcontractors (as applicable), (2) fraud or fraudulent misrepresentation; (3) defective products under the Consumer Protection Act 1987;or (4) any matter in respect of which it would be unlawful for SISEM to exclude or restrict liability.

The maximum liability of SISEM under this warranty is limited to the purchase price of the product covered by the warranty. SISEM only supply products for resale for domestic and private use. SISEM accept no liability for any commercial, business or resale purpose by the buyer or end customer, and SISEM accept no liability to the buyer or end customer for any loss of profit, loss of business, business interruption, loss of business opportunity, electricity usage costs, installation fees, removal o product fees or electrician fees.

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